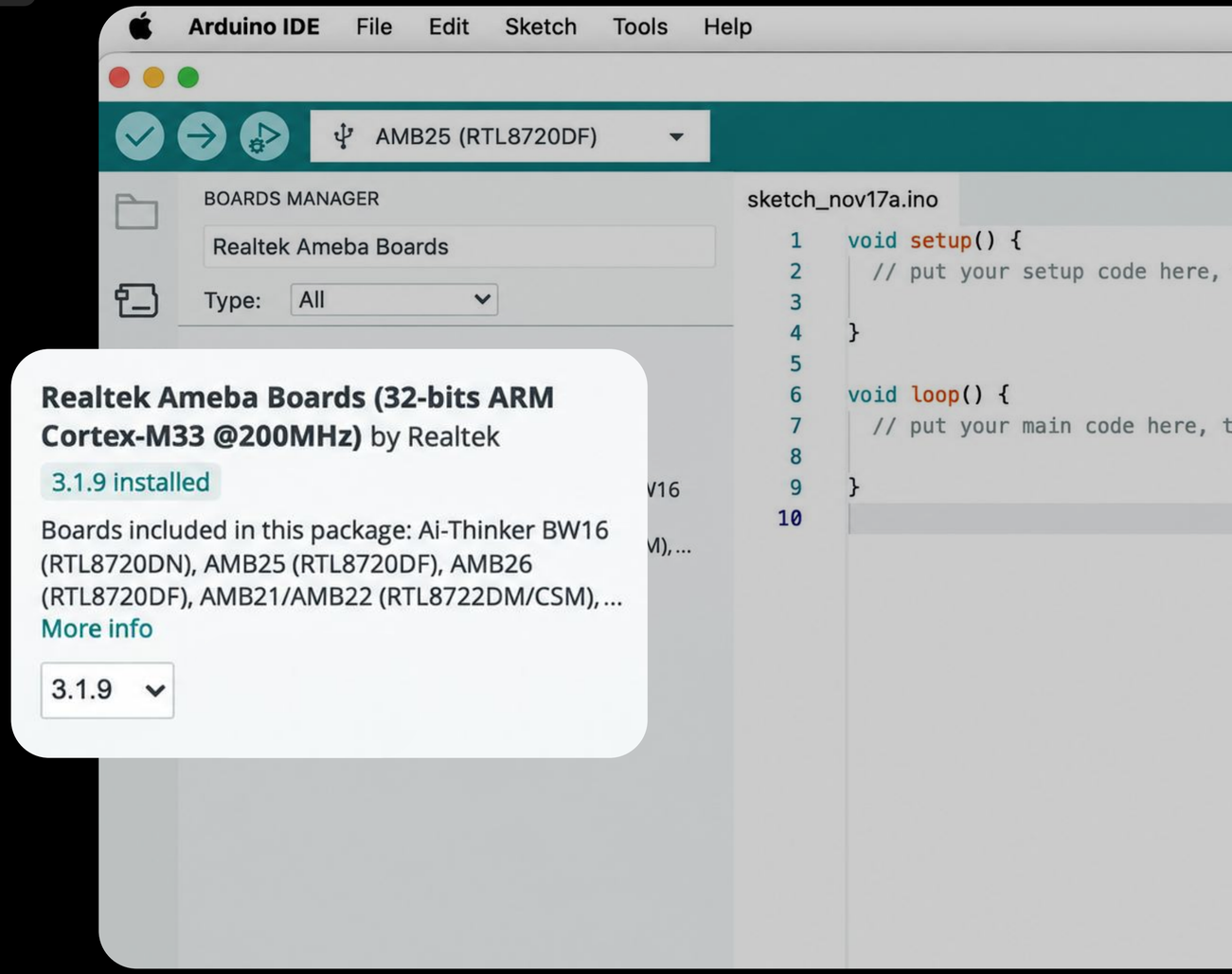
📌 NU80 DK Getting Started: From Development Environment Setup to Running Code

NUCODE NU-87 TinyDK Getting Started Guide

Board Getting Started Guide v1.0



NUCODE

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⚒️ Use whichever you prefer — Claude or Codex. Then open a new chat

01 Quick Start with Generative AI

AI-Assisted Development Setup & Execution

Prompt *

Download AI Prompt

Schematic *

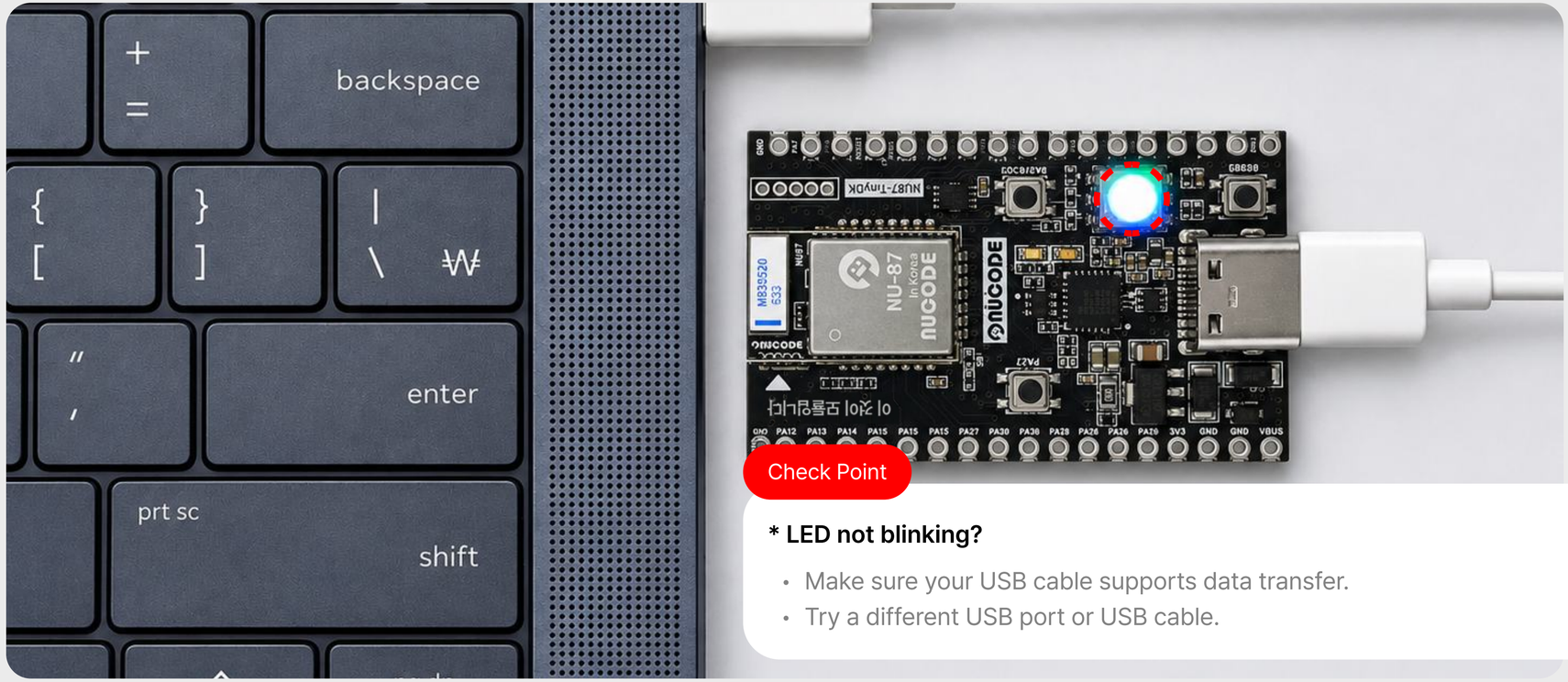
Download PDF

```
# NUCODE NU87-TinyDK AI Automated Setup and Basic Function Test

You are an embedded automation agent responsible for automatically installing and

**Goal: The user should only need to manually operate the DOWNLOAD (BOOT) and RESE
   compilation, firmware uploading, and error recovery.**

Do not merely provide installation instructions or delegate tasks to the user. Exe

**Core principle: The NU87-TinyDK is shipped with RGB LED Blink test firmware and
   configuration.**

## 1. Hardware Information

- Board: NUCODE NU87-TinyDK
- Wireless module: NU-87
- SoC: Realtek RTL8720DF
- Wireless connectivity: 2.4GHz / 5GHz Wi-Fi, BLE 5.0
- Arduino core: Realtek AmebaD
- Board configuration: AMB26 (RTL8720DF)
- USB interface: Silicon Labs CP2102N USB-UART
- USB connection: USB-C data cable
- Upload method: USB-UART Flash
- Upload control: Auto Flash Mode or DOWNLOAD (BOOT) + RESET
- RGB LED: 'LED_R', 'LED_G', 'LED_B'
- LED GPIO: Red PA13 / Green PA12 / Blue PA14
- Factory-configured Wi-Fi Channel Plan: '0x7F'
- Serial Monitor Baud Rate: 115200

Do not use the STM32duino, STM32CubeProgrammer, USB DFU, or ST-LINK procedures in

If the NU87-TinyDK schematic, datasheet, or Start Guide is attached, refer to tho

## 2. Automated Development Environment Installation

Directly perform the following tasks.

1. Identify the operating system and CPU architecture.
```

STEP 1 · Connecting the Board

Connect the NU-87 TinyDK to Your PC

Connect the NU-87 TinyDK board to your PC using a USB-C data cable.
After connecting the board, check that it is receiving power properly.



Check Point

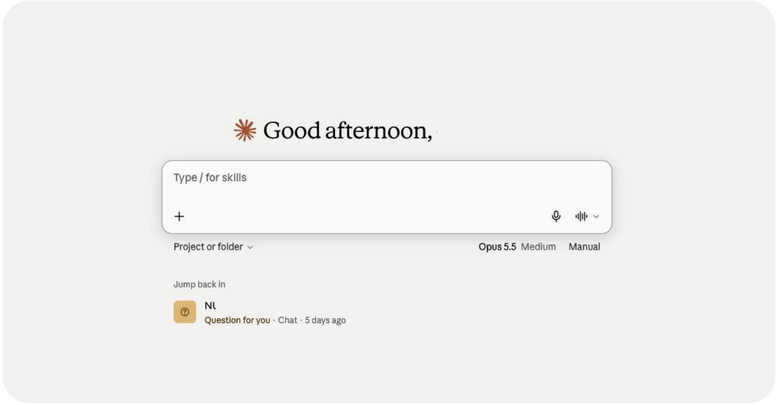
*** LED not blinking?**

- Make sure your USB cable supports data transfer.
- Try a different USB port or USB cable.

STEP 2 · Installing AI Tools

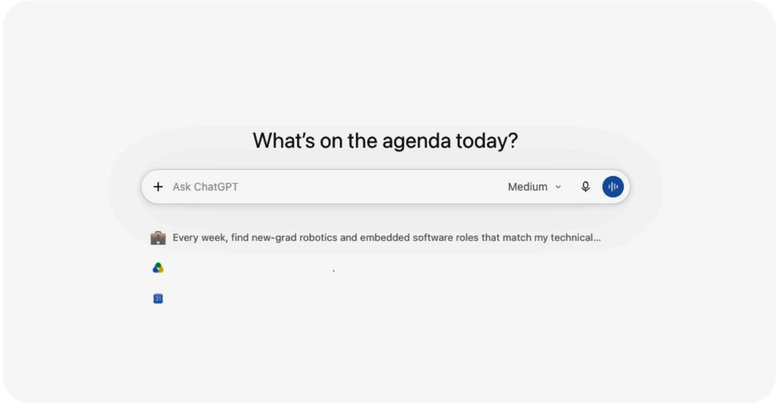
Install an AI Development Tool and Launch It

Install Codex or Claude on your PC, then open a new chat.
Use the links below to visit the official websites for each AI tool.



Claude

https://claude.com/



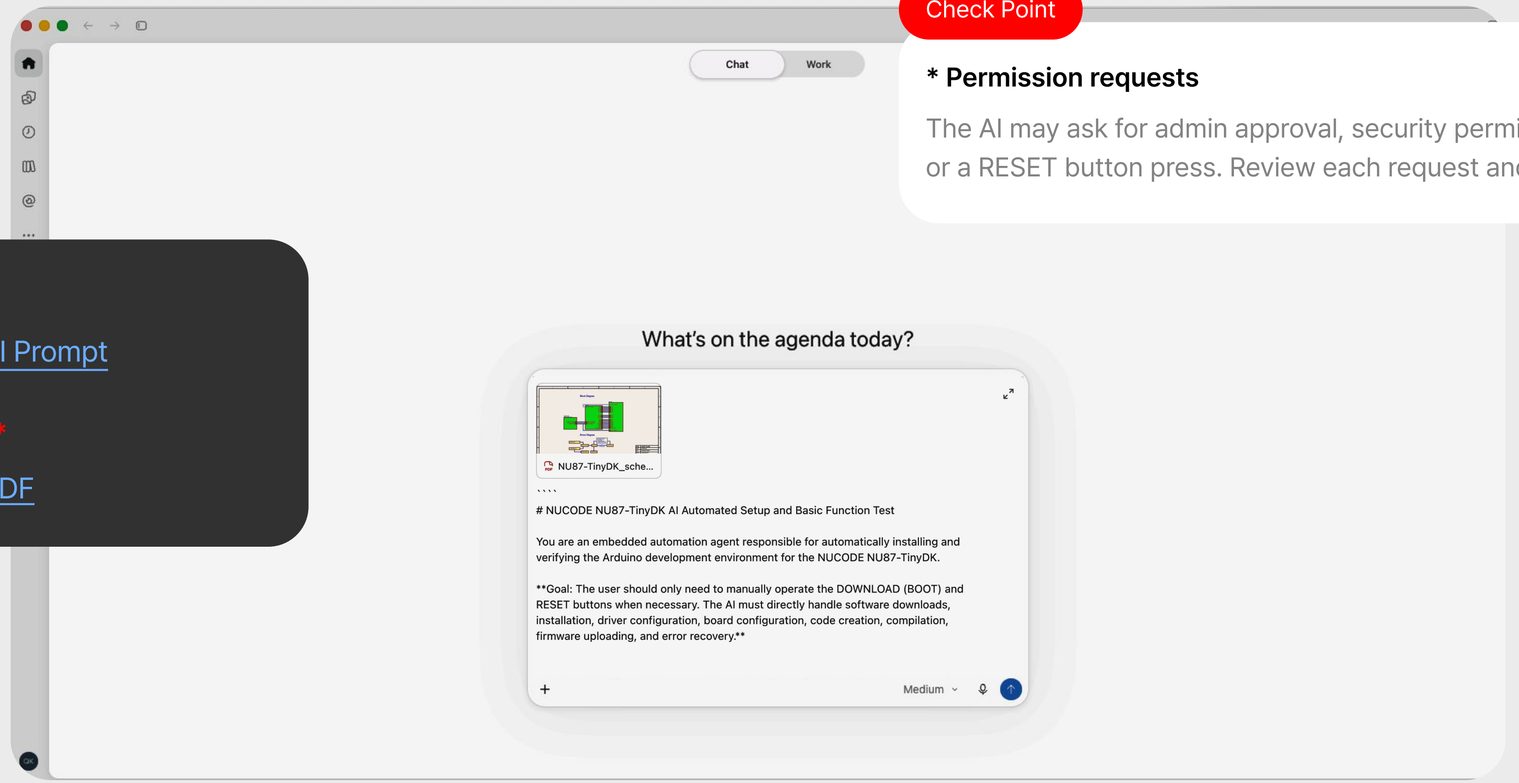
Codex

https://openai.com/codex/

STEP 3 · Attaching the Prompt and Reference Materials

Attach the Prompt and Reference Materials to the AI Chat

Download both files and attach them to the AI chat. The AI takes it from there, in order: checking your PC, setting up the environment, connecting the board, and uploading the code.



Check Point

*** Permission requests**

The AI may ask for admin approval, security permissions, a USB reconnect, or a RESET button press. Review each request and follow the on-screen instructions.

STEP 12 · Setup Complete

NU40DK Connection and Setup Are Complete

After uploading the code, LED1 on the NU40DK board blinks at one-second intervals, indicating that the board is operating correctly.



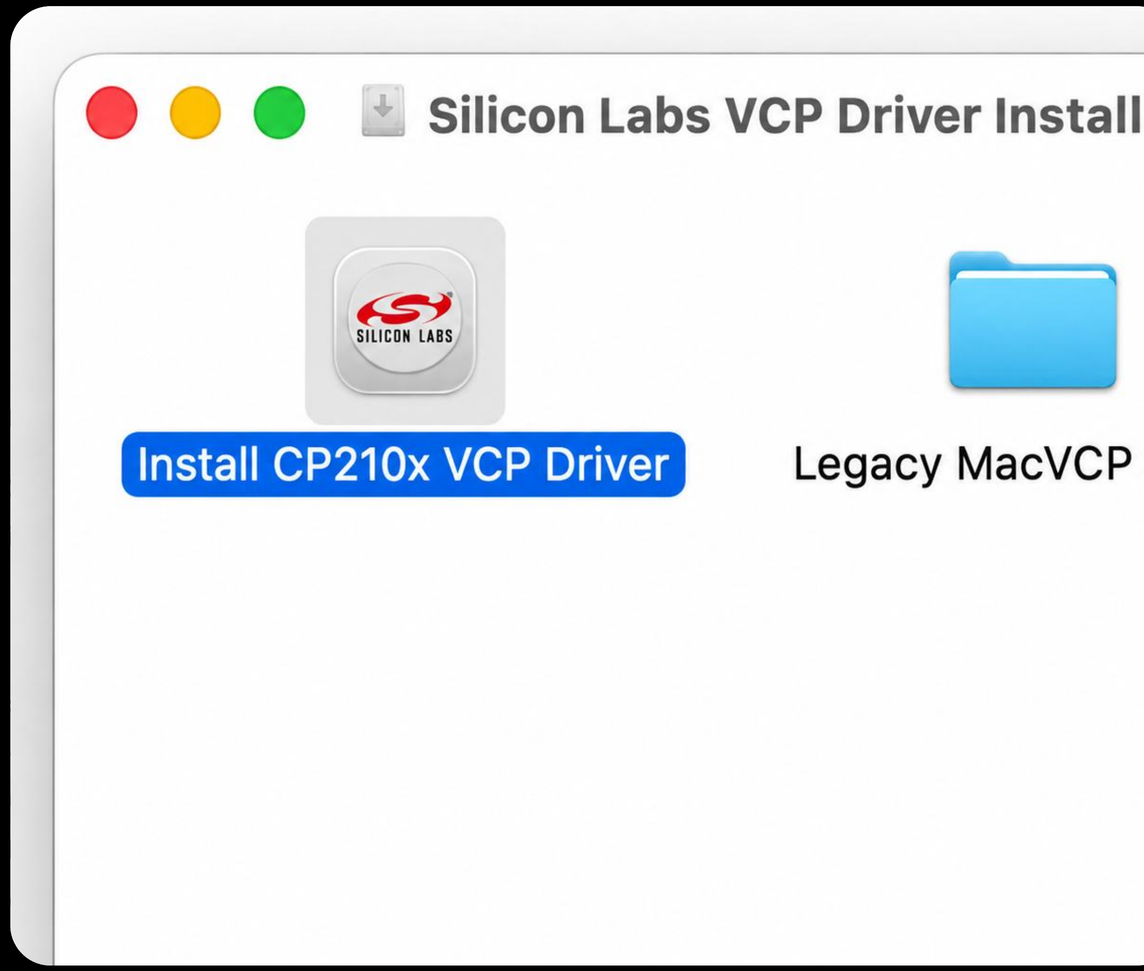


Board Setup Check

If the LED on the NU-87 TinyDK starts blinking in the order RED → GREEN → BLUE, the development environment setup is complete.

02-1 Installing the USB-UART Driver

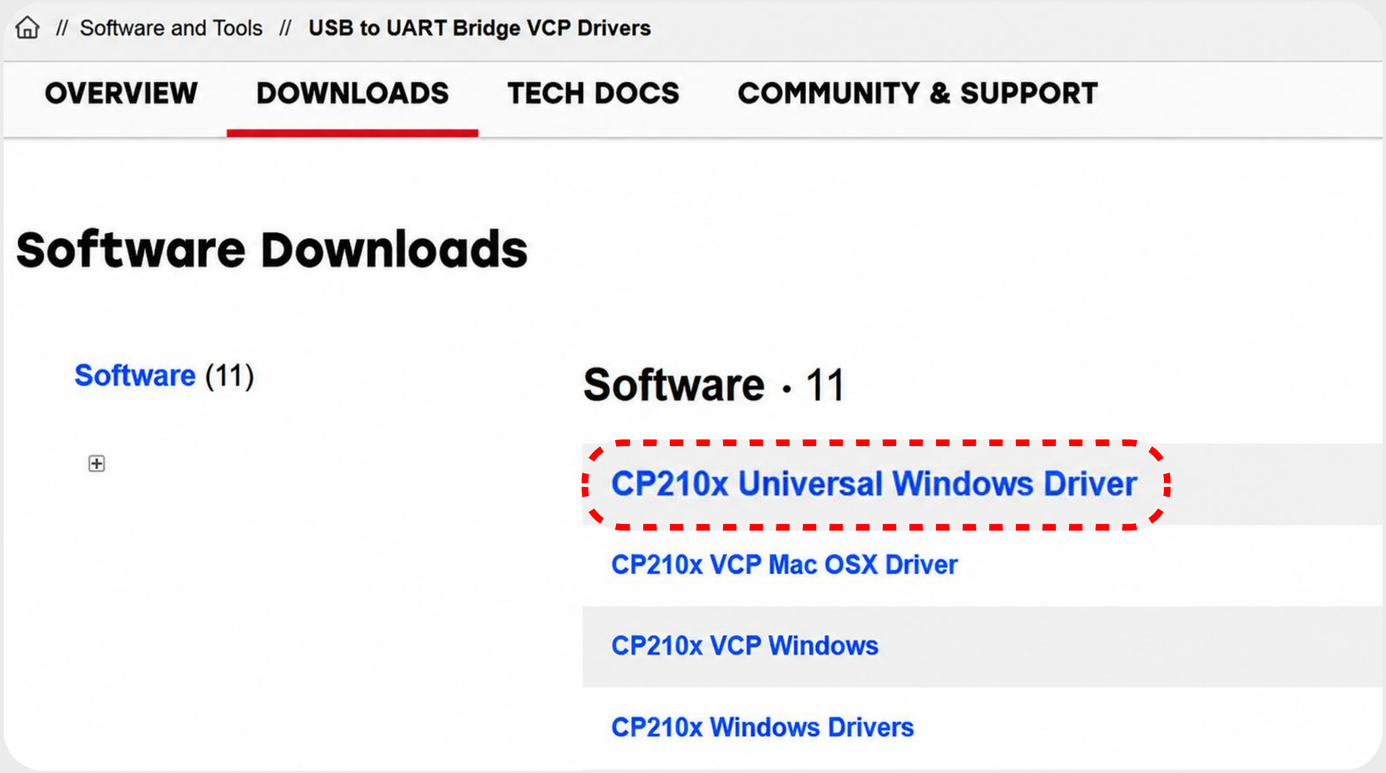
Check the CP210x USB-UART driver to enable USB serial communication and port recognition on the NU-87 TinyDK.



STEP 1-1 · Downloading the Windows Driver

Download the CP210x Driver for Windows

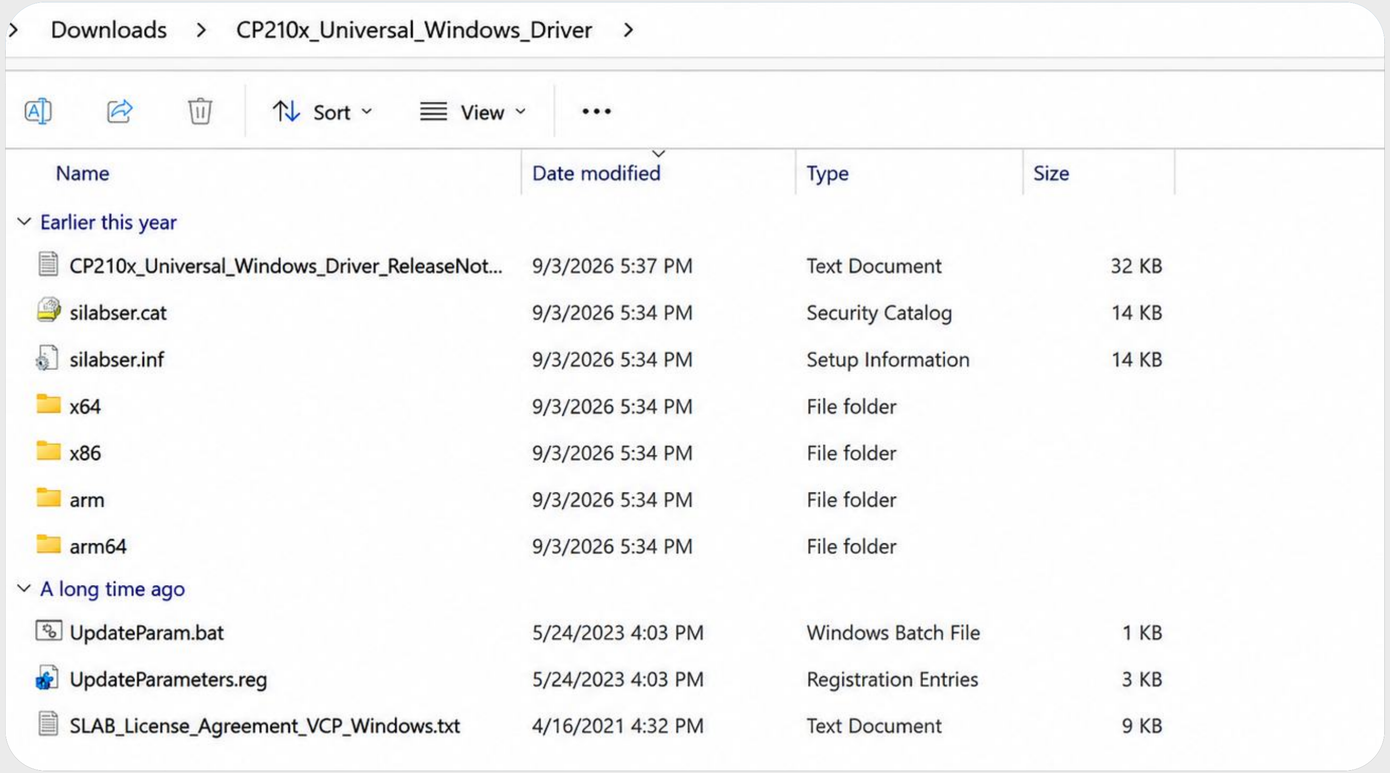
Visit the following website: https://www.silabs.com/software-and-tools/usb-to-uart-bridge-vcp-drivers
Download the CP210x Universal Windows Driver.



STEP 1-2 · Extracting the ZIP File

Extract the Downloaded ZIP File

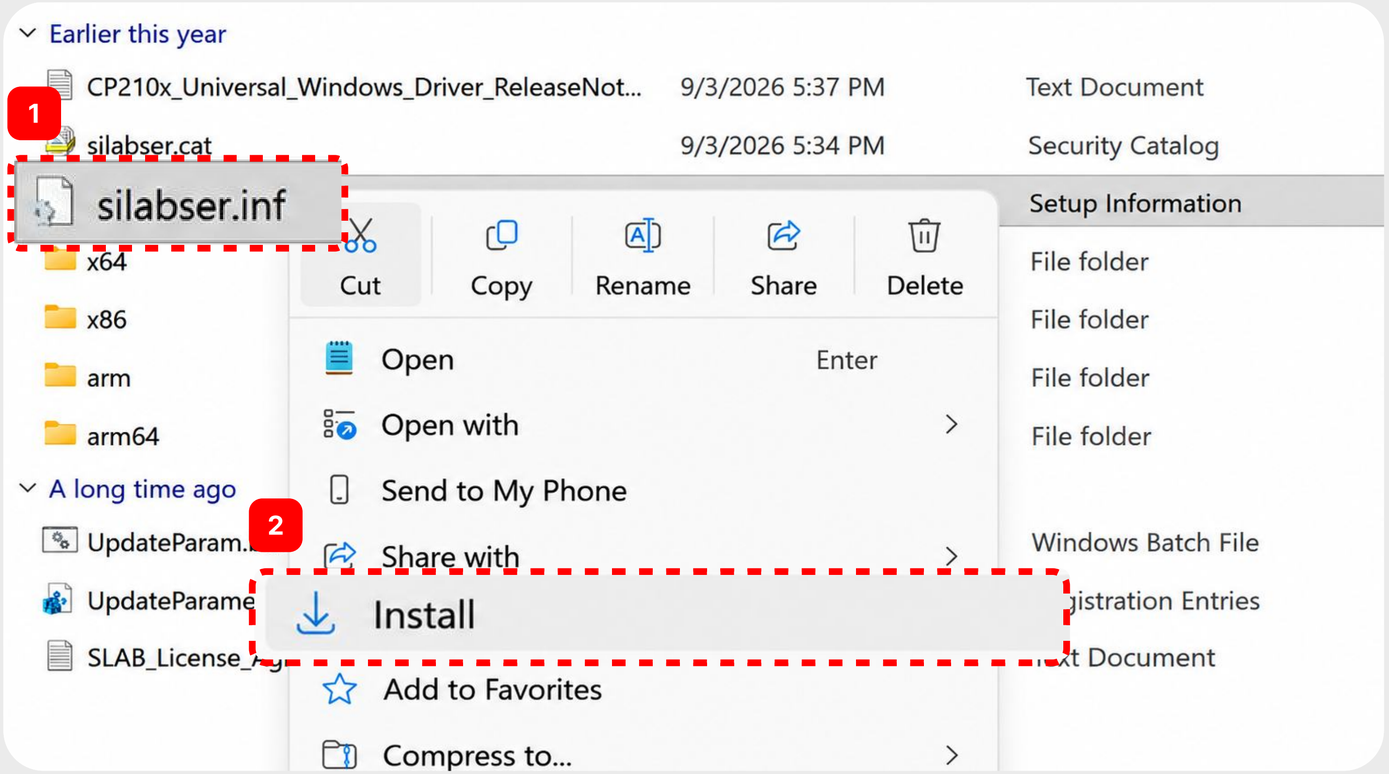
Extract the downloaded
CP210x Universal Windows Driver ZIP file.



STEP 1-3 · Installing the Driver

Install the CP210x Driver

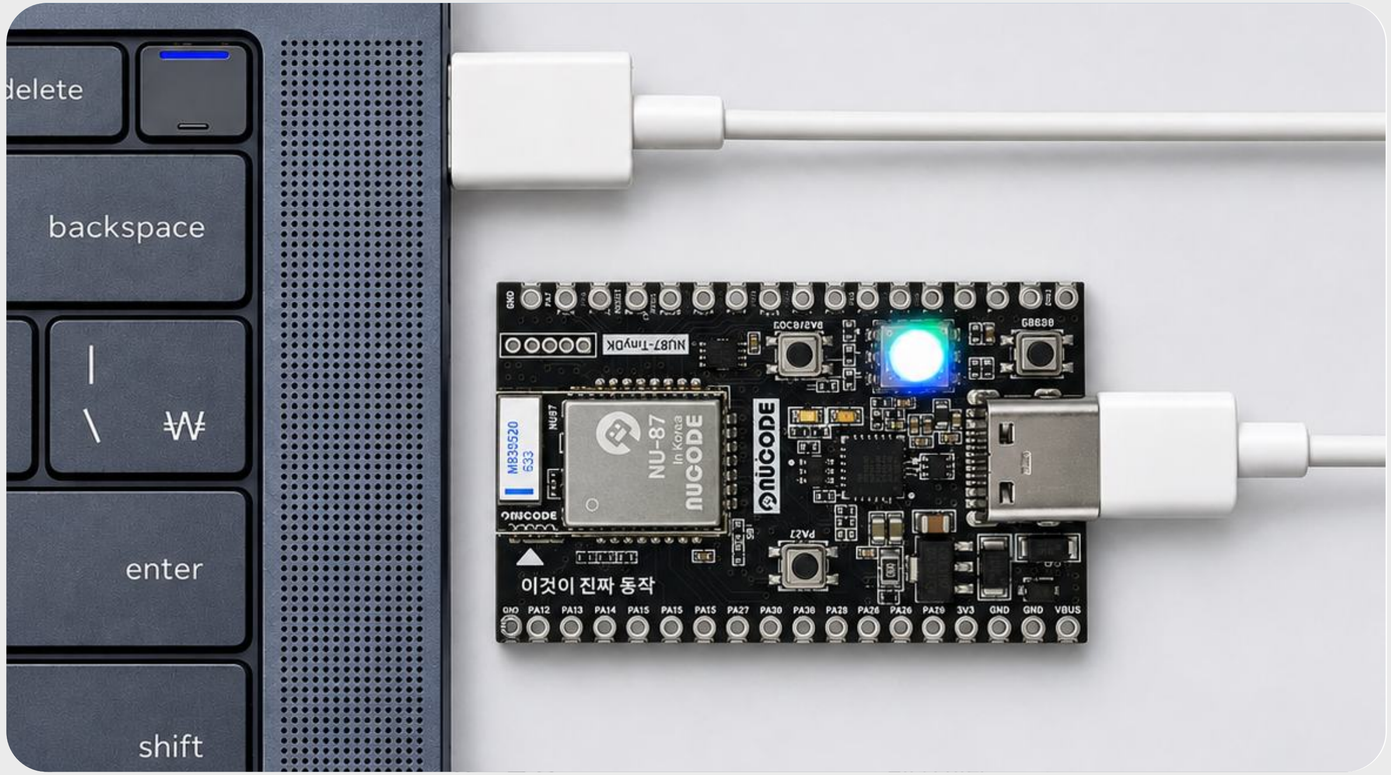
Locate the silabser.inf file in the extracted folder.
Right-click the file and select Install.



STEP 1-4 · Connecting the Board

Connect the NU-87 TinyDK to Your PC

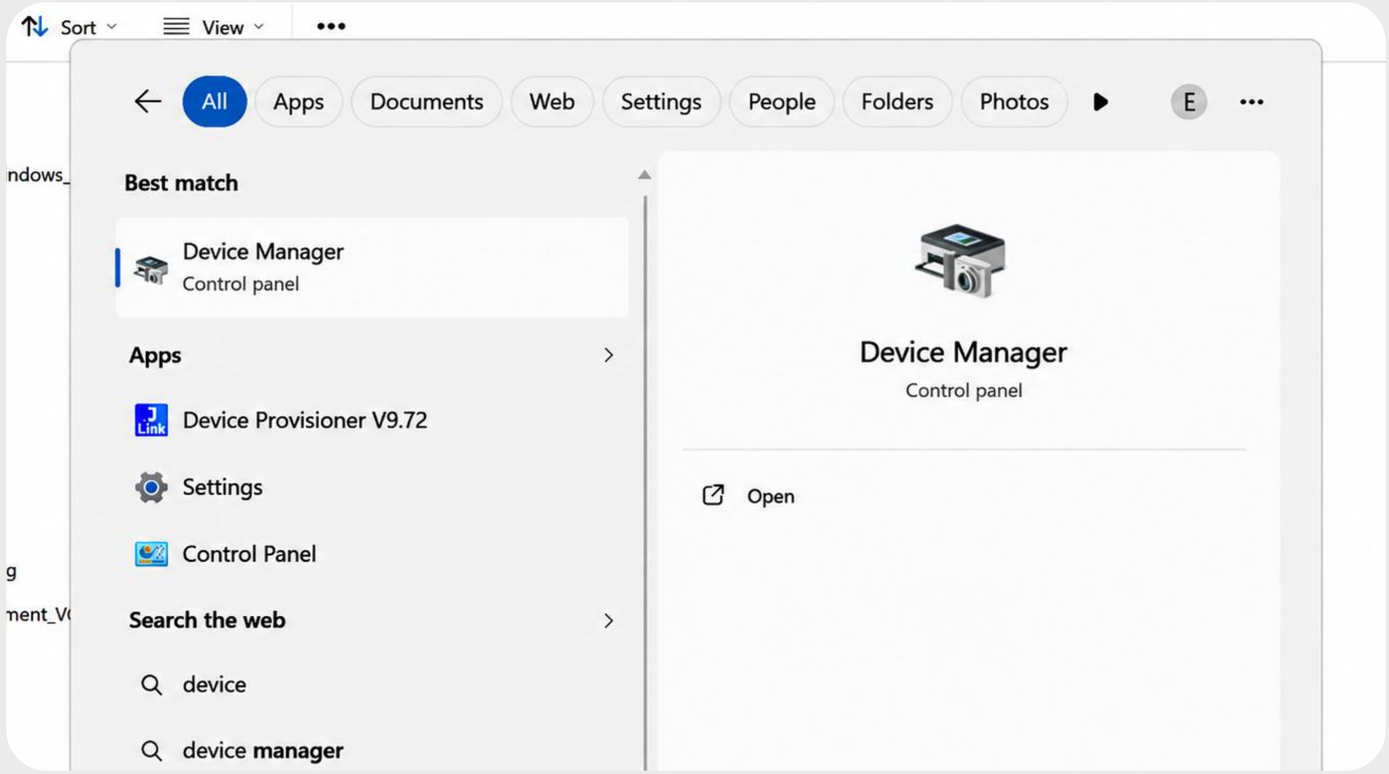
Once the driver installation is complete, connect the NU-87 TinyDK to your PC using a USB cable.



STEP 1-5 · Opening Device Manager

Open Windows Device Manager

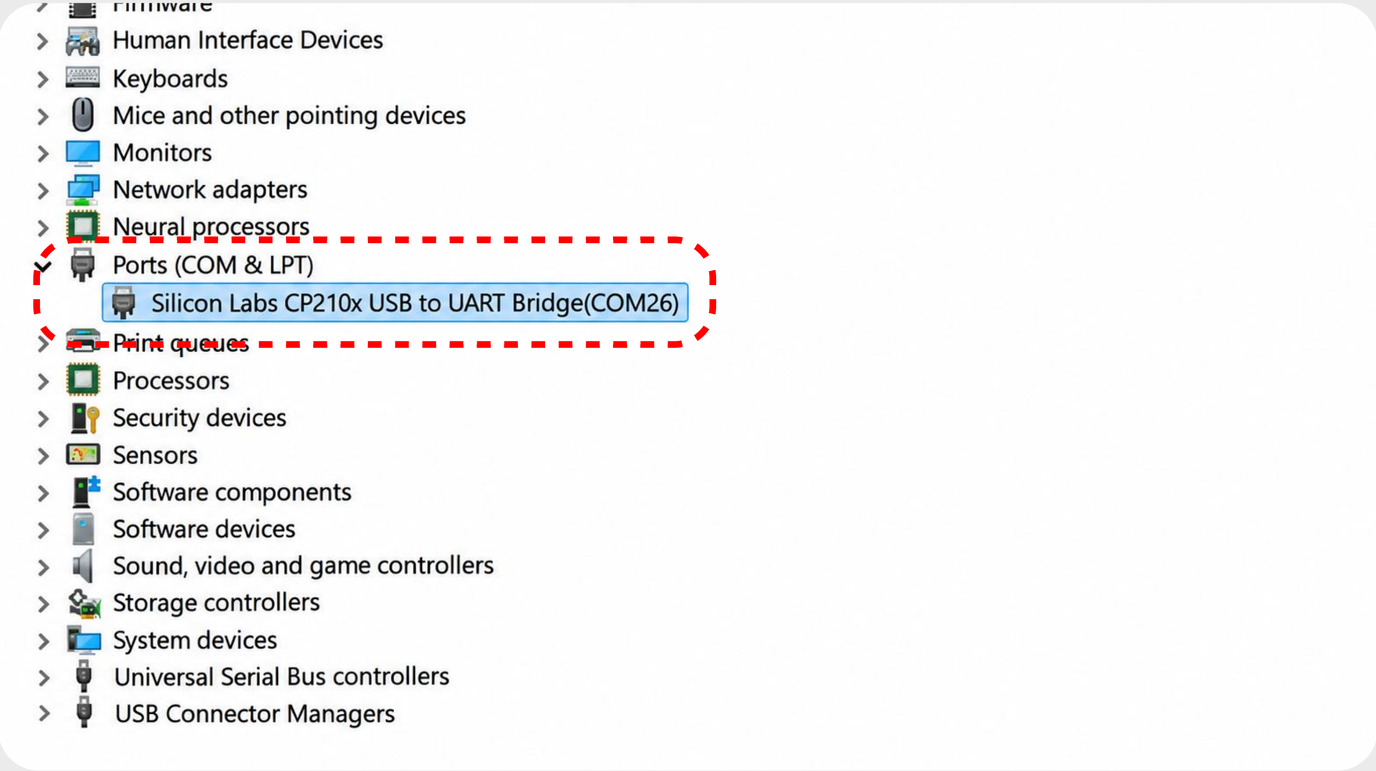
Open Device Manager
in Windows.



STEP 1-6 · Verifying the Driver Installation

Verify That the USB-UART Driver Has Been Installed Successfully

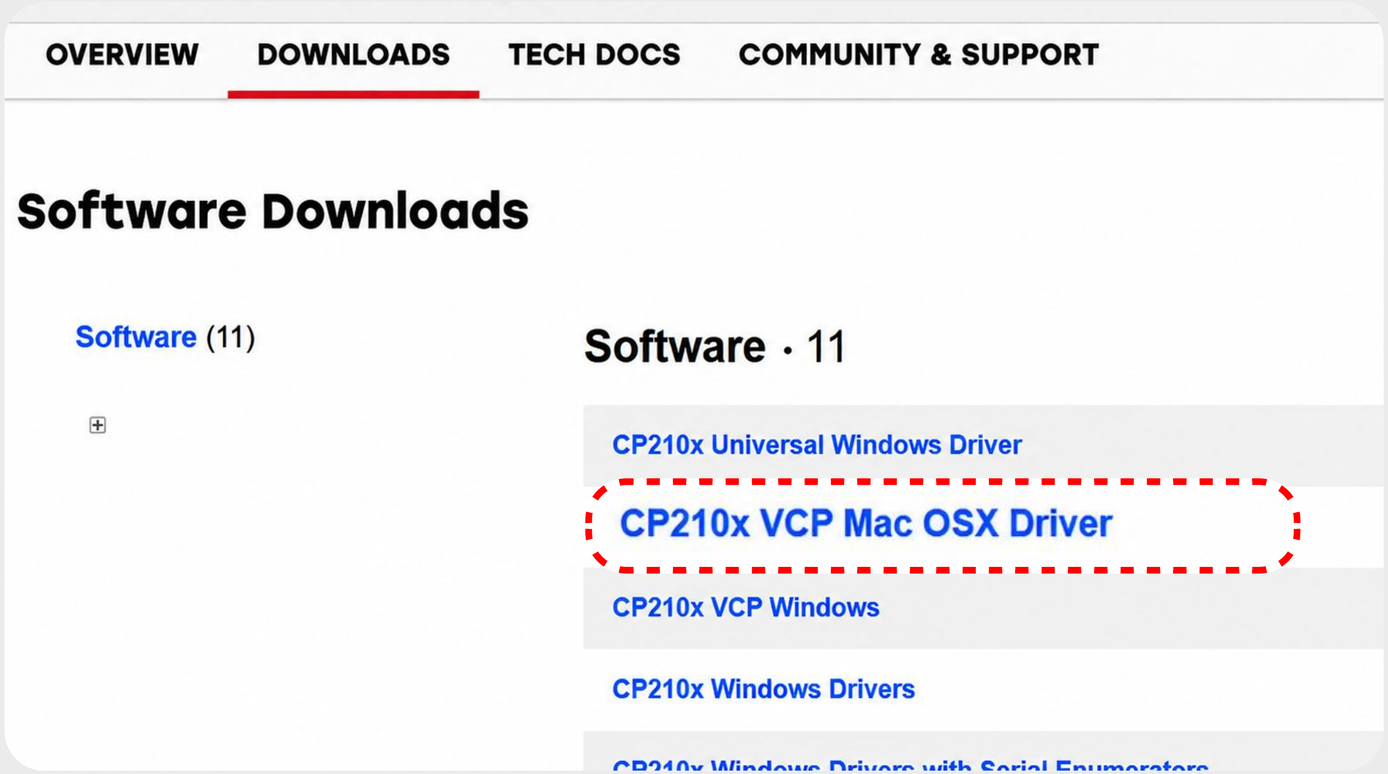
In Device Manager, expand Ports (COM & LPT) and check that the following device appears:
Silicon Labs CP210x USB to UART Bridge (COMx)



STEP 2-1 · Downloading the macOS Driver

Download the CP210x Driver for macOS

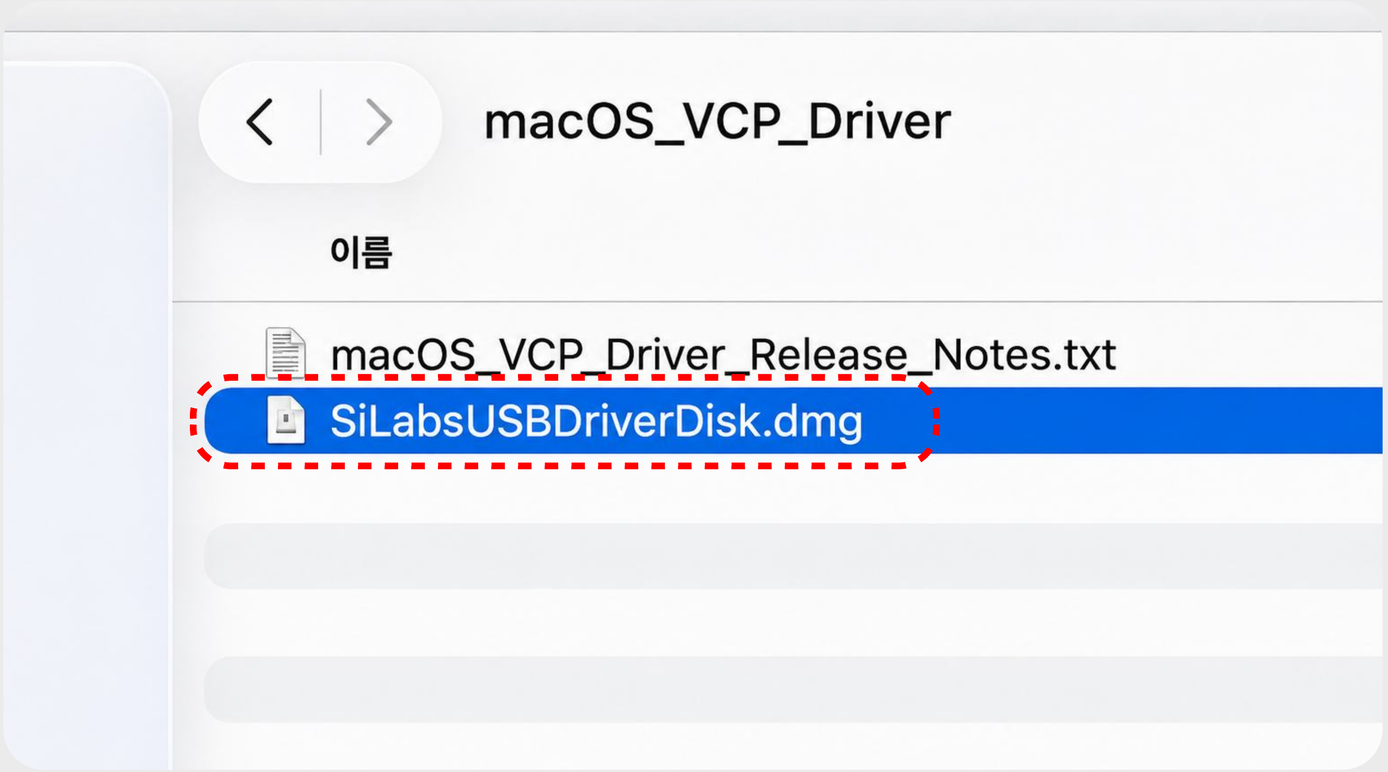
Visit the following website: https://www.silabs.com/software-and-tools/usb-to-uart-bridge-vcp-drivers
Download the CP210x VCP Mac OSX Driver.



STEP 2-2 · Opening the Installation File

Open the Downloaded Installation File

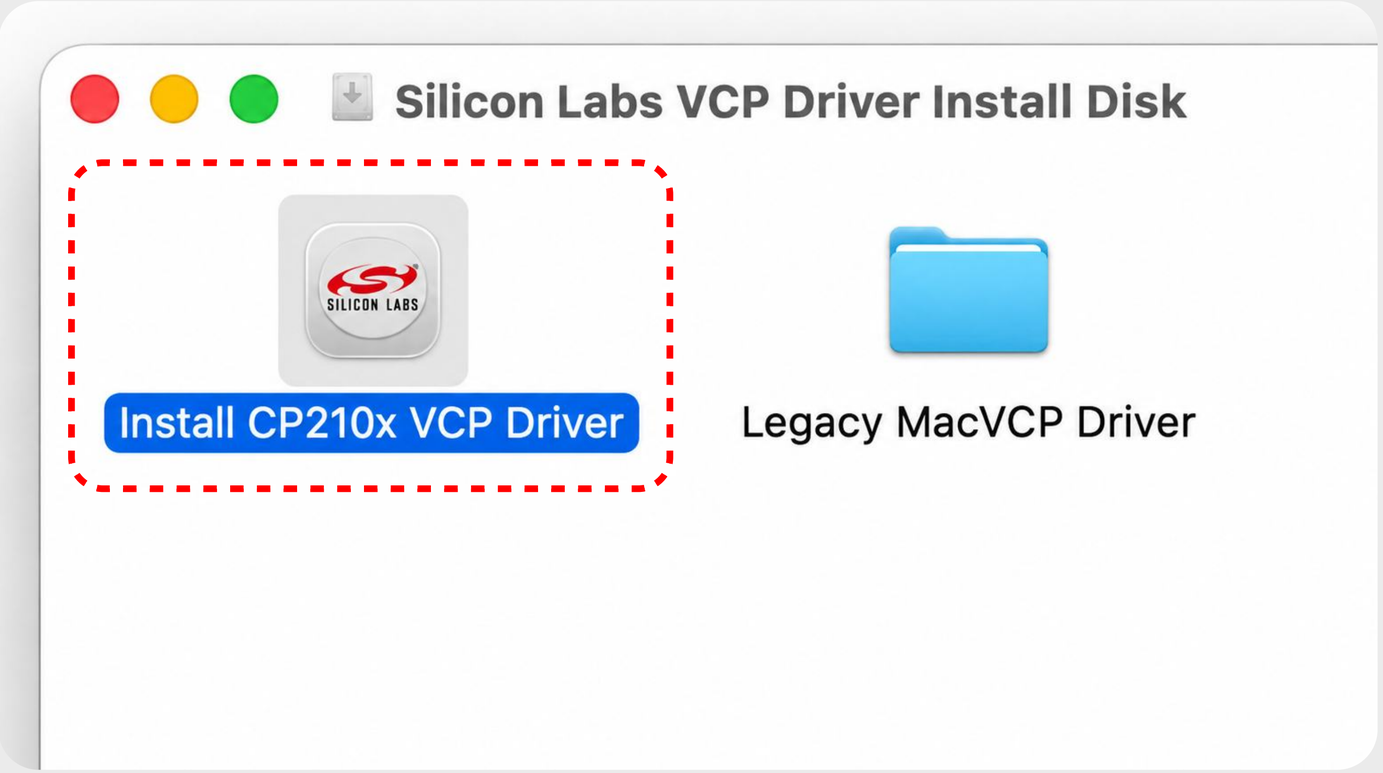
Extract the downloaded ZIP file,
then open SiLabsUSBDriverDisk.dmg.



STEP 2-3 · Launching the Driver Installer

Launch the CP210x Driver Installer

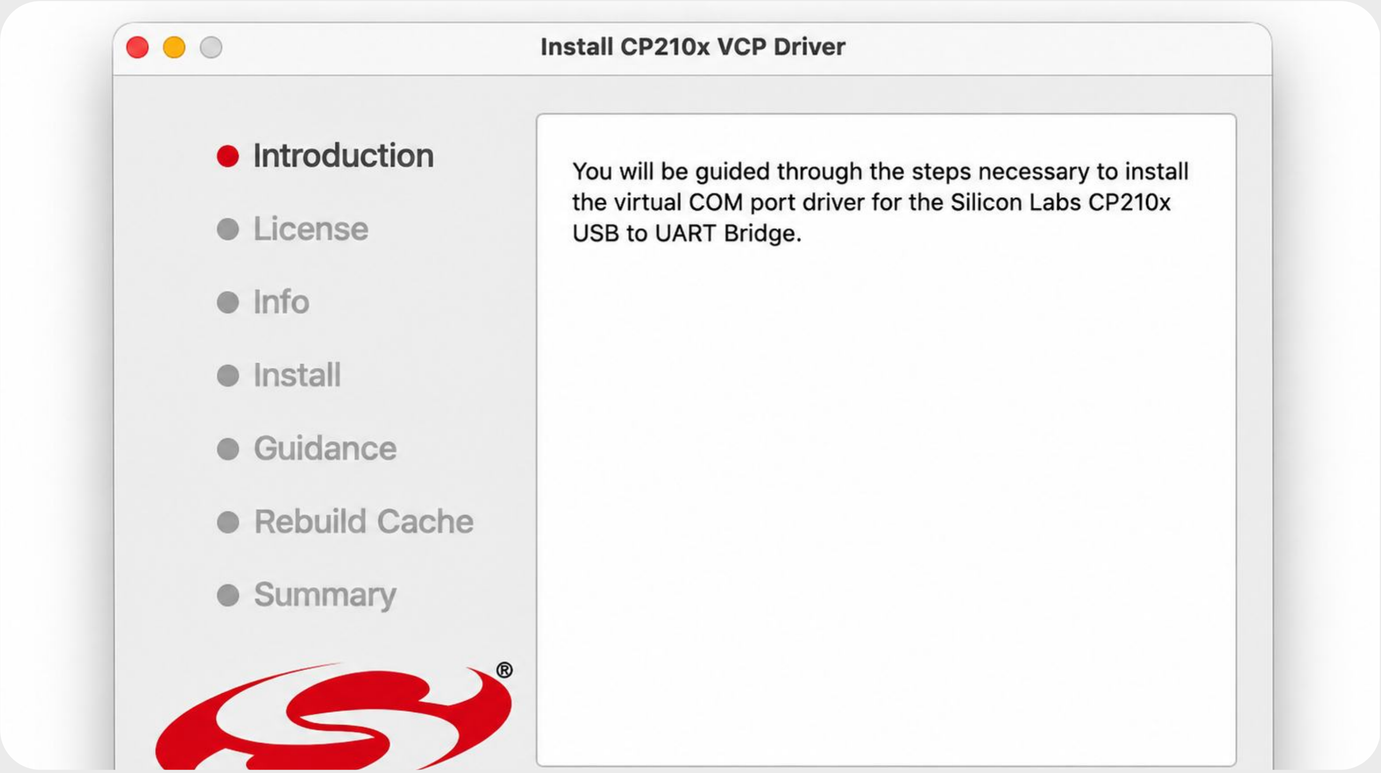
From the mounted disk,
launch the Install CP210x VCP Driver installer.



STEP 2-4 · Completing the Driver Installation

Follow the On-Screen Instructions to Complete the Installation

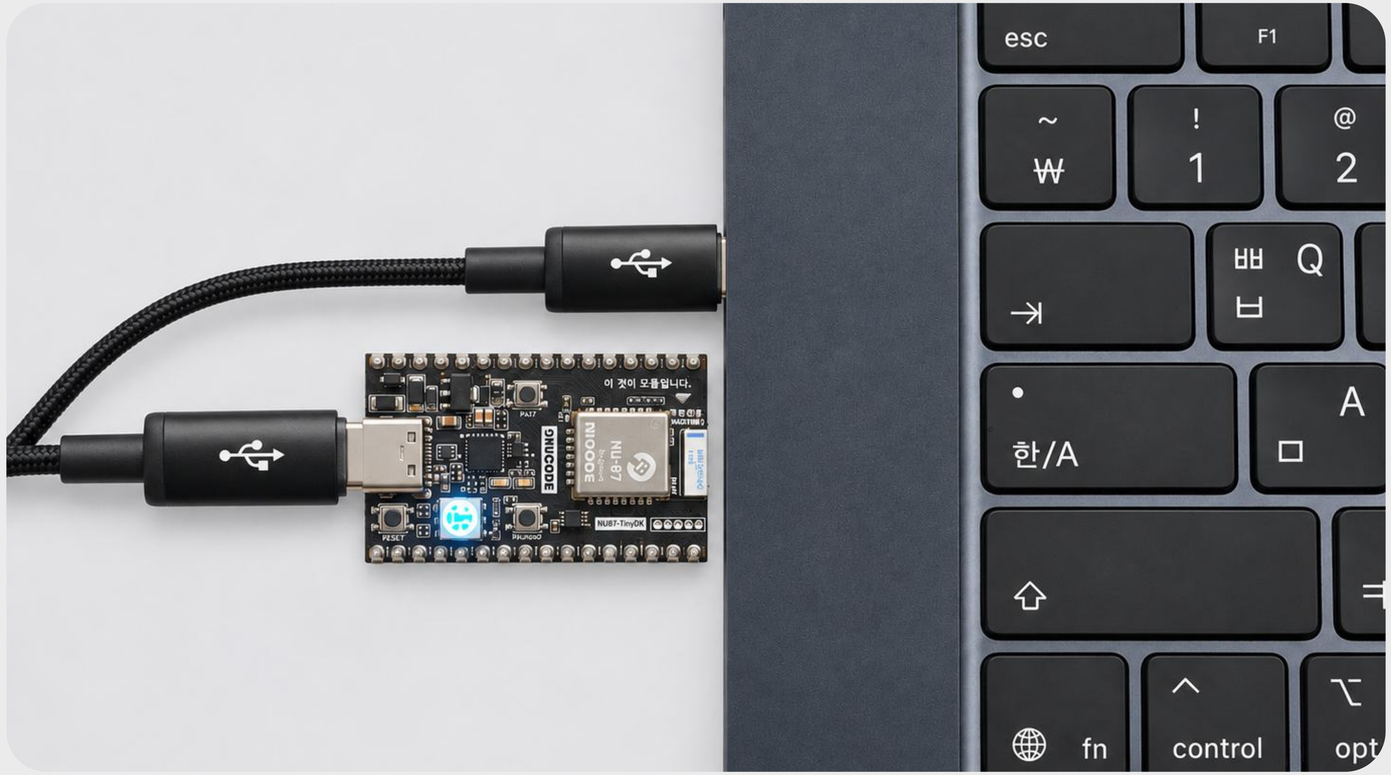
Follow the on-screen instructions to install the driver.
Enter your administrator password if prompted.



STEP 2-5 · Connecting the Board

Connect the NU-87 TinyDK to Your Mac

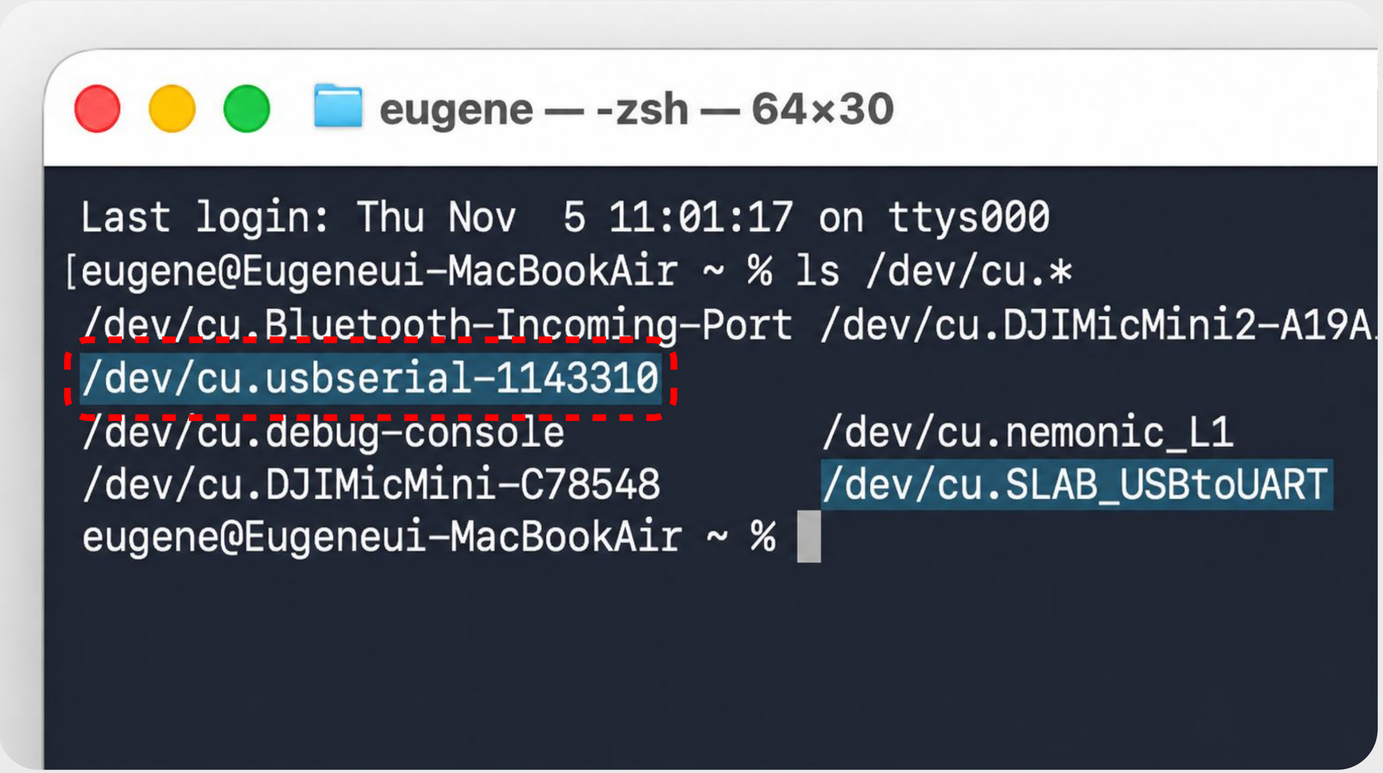
Once the driver installation is complete, connect the NU-87 TinyDK to your Mac using a USB cable.



STEP 2-6 · Checking the Serial Port

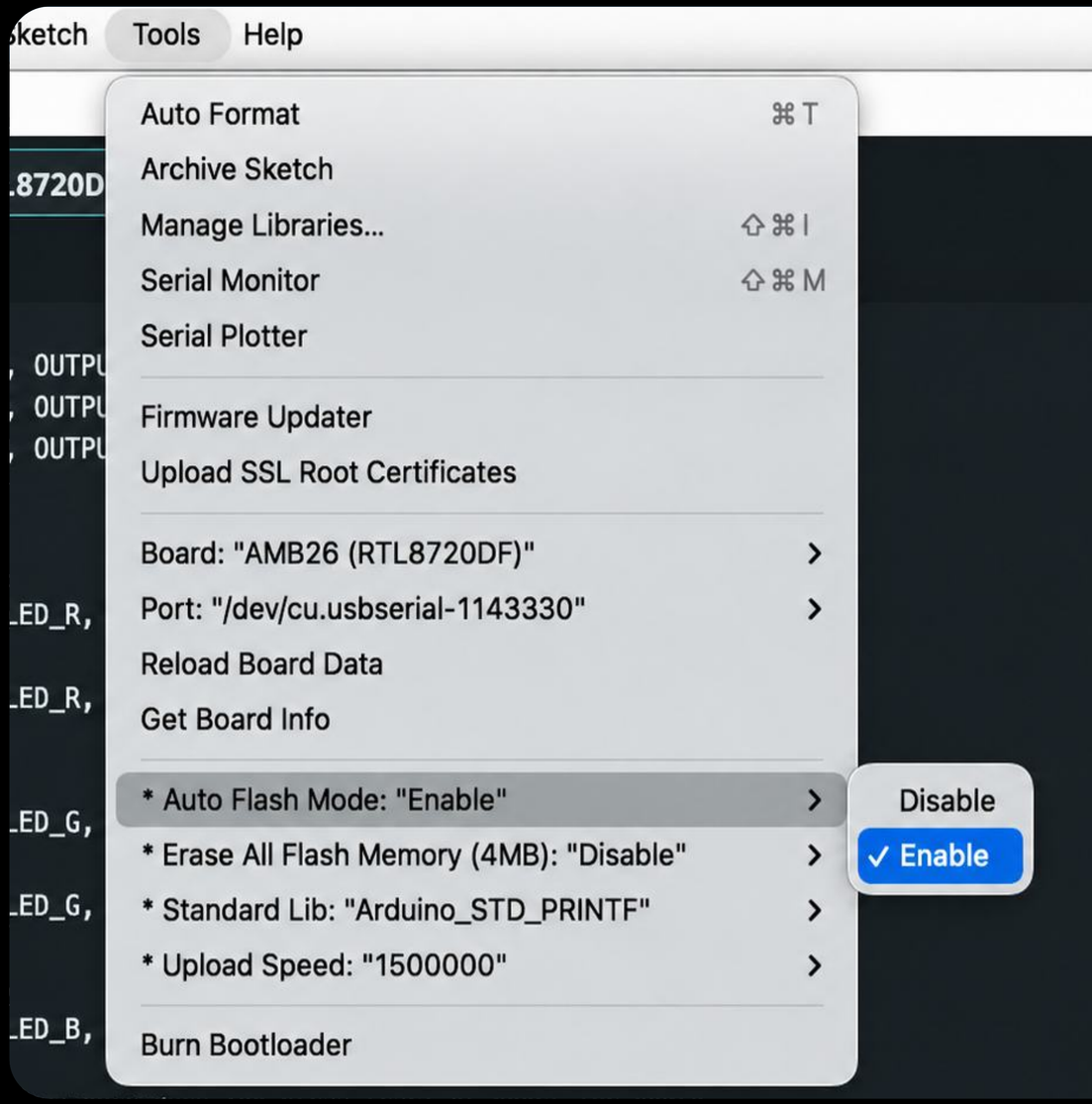
Verify That the USB Serial Port Is Recognized Correctly

Open Terminal on macOS and enter the following command: ls /dev/cu.*
Check that a device such as the following appears: /dev/cu.usbserial-xxxx



02-2 Hands-On Development with the NU-80DK

Set up the Arduino IDE and development tools yourself, then write and run the code.

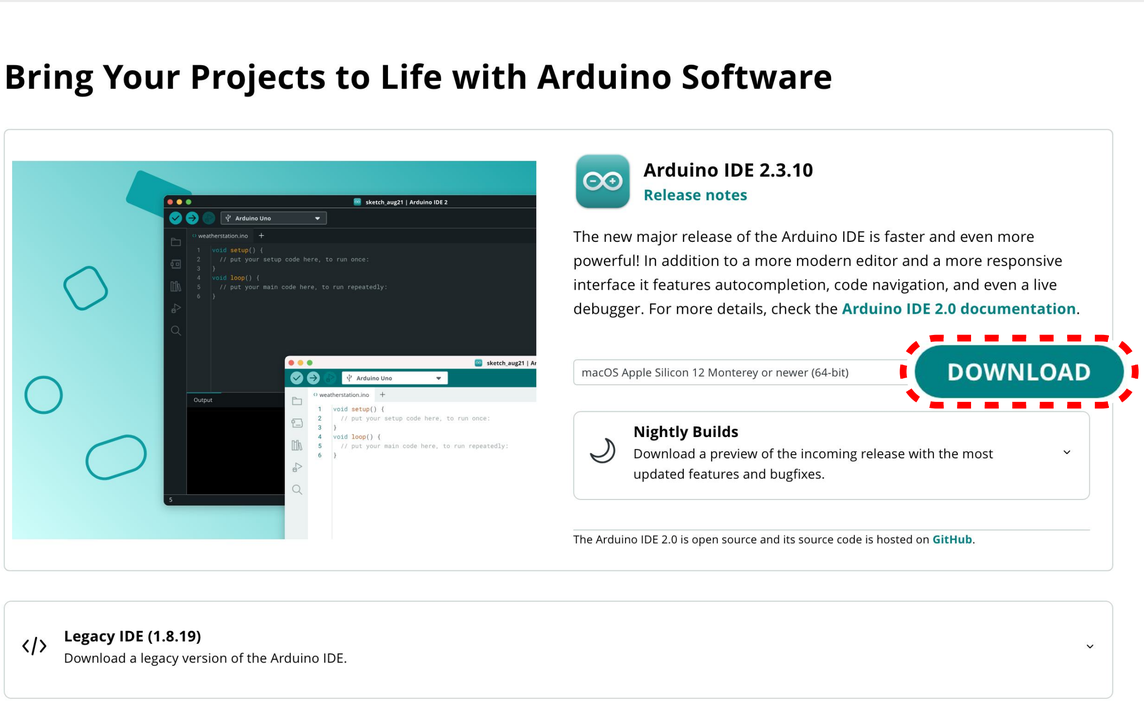


STEP 1 · Installing the Arduino IDE

Install
the Arduino IDE

Visit the following website: https://www.arduino.cc/en/software/

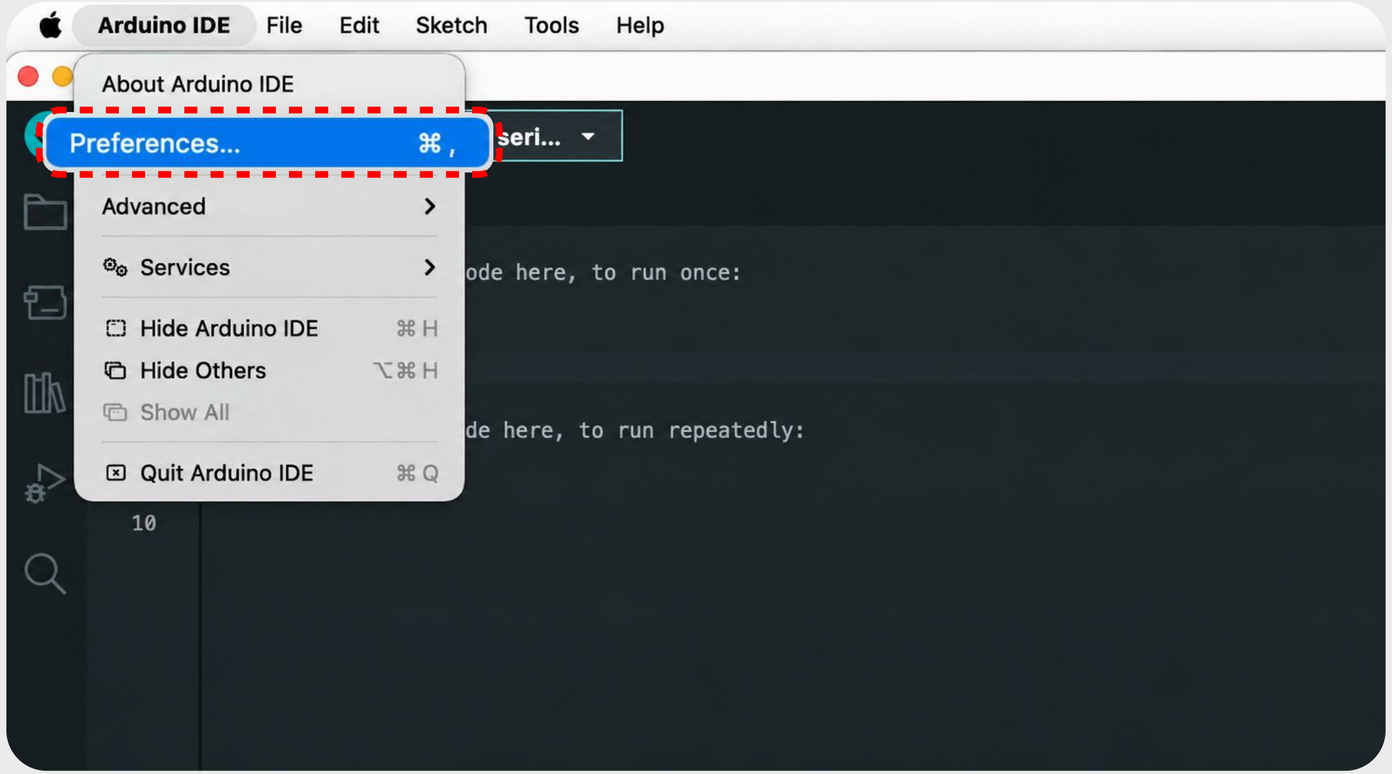
Download the Arduino IDE, run the installer, and complete the installation.



STEP 2 · Opening Preferences

Open Preferences in the Arduino IDE

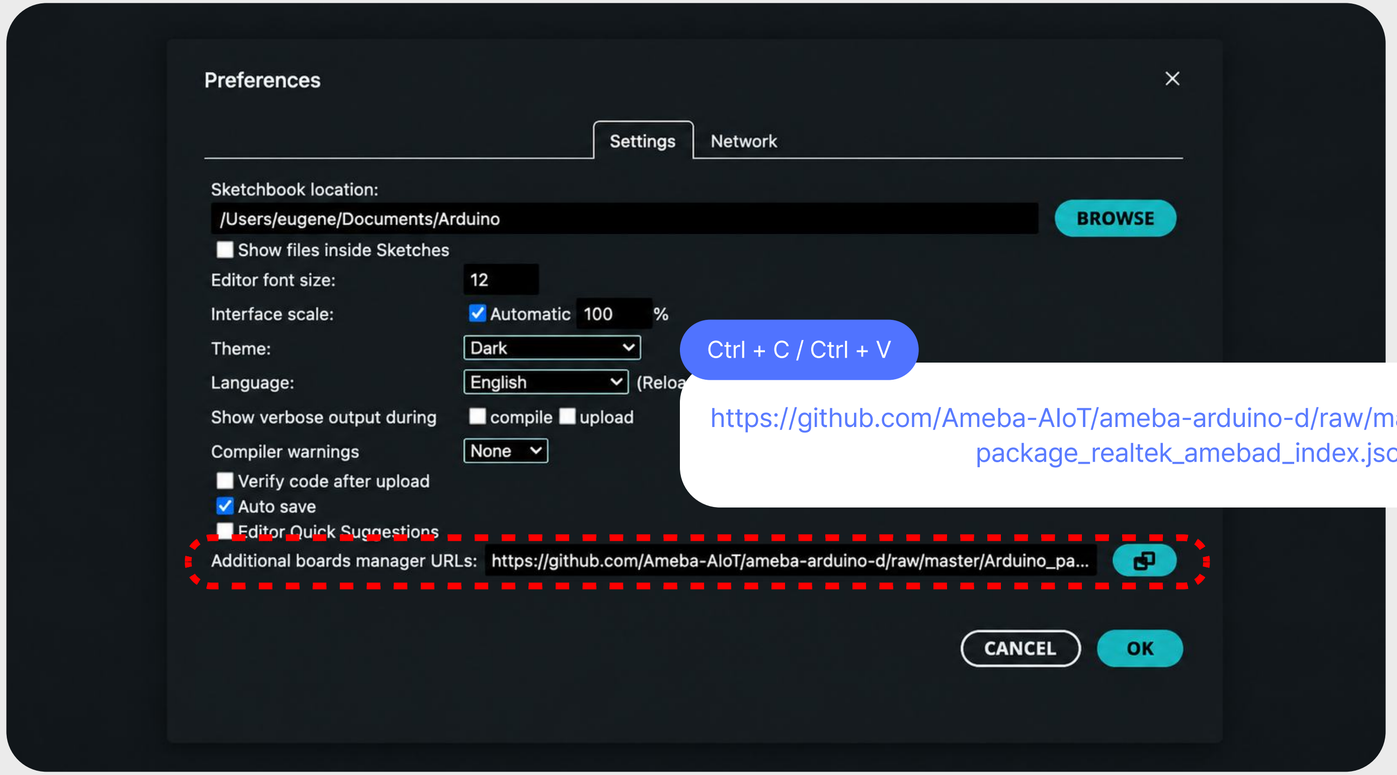
From the top menu, select:
Arduino IDE → Preferences



STEP 3 · Registering the BSP URL

Add the NUCODE BSP Package URL

In Preferences, paste the following URL into the Additional boards manager URLs field, then click OK.

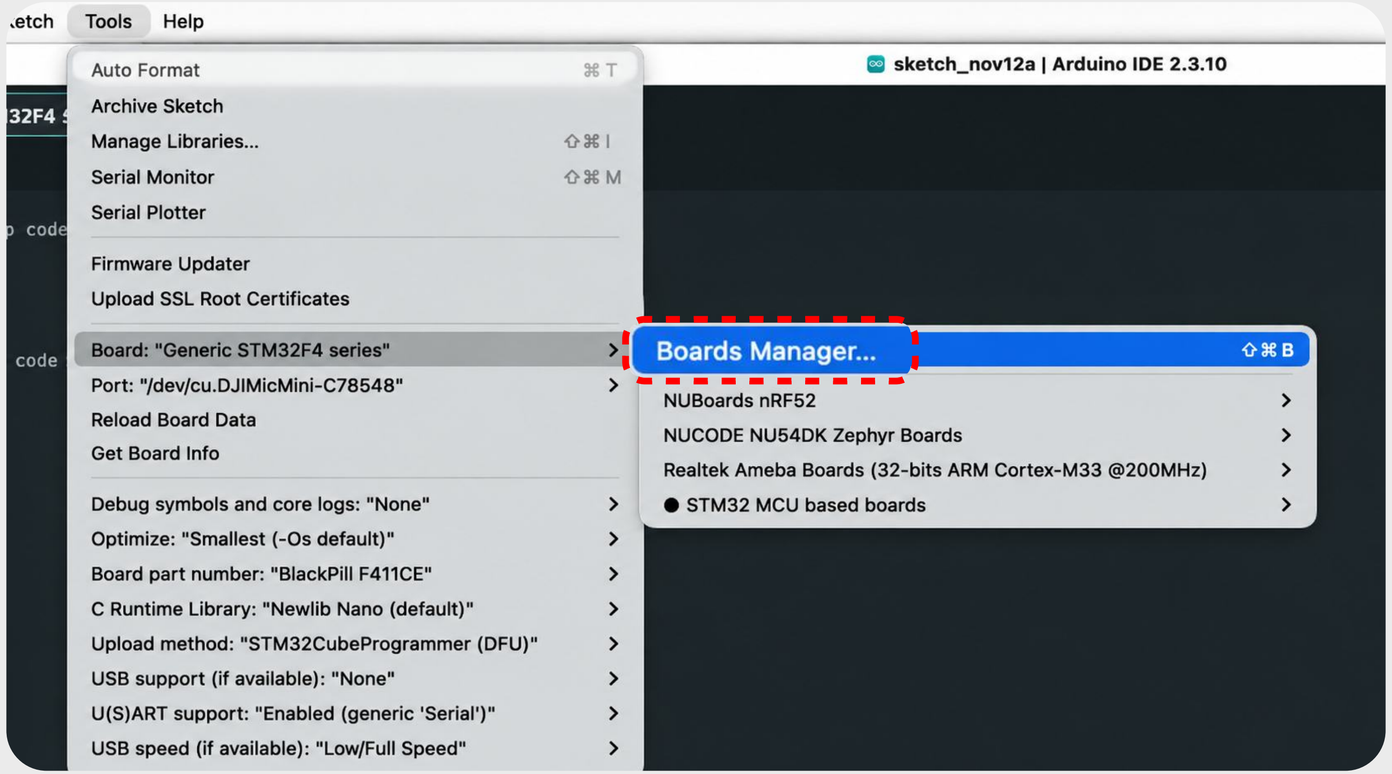


STEP 4 · Opening the Boards Manager

Find NUCODE BSP in the Boards Manager

From the top menu, select:

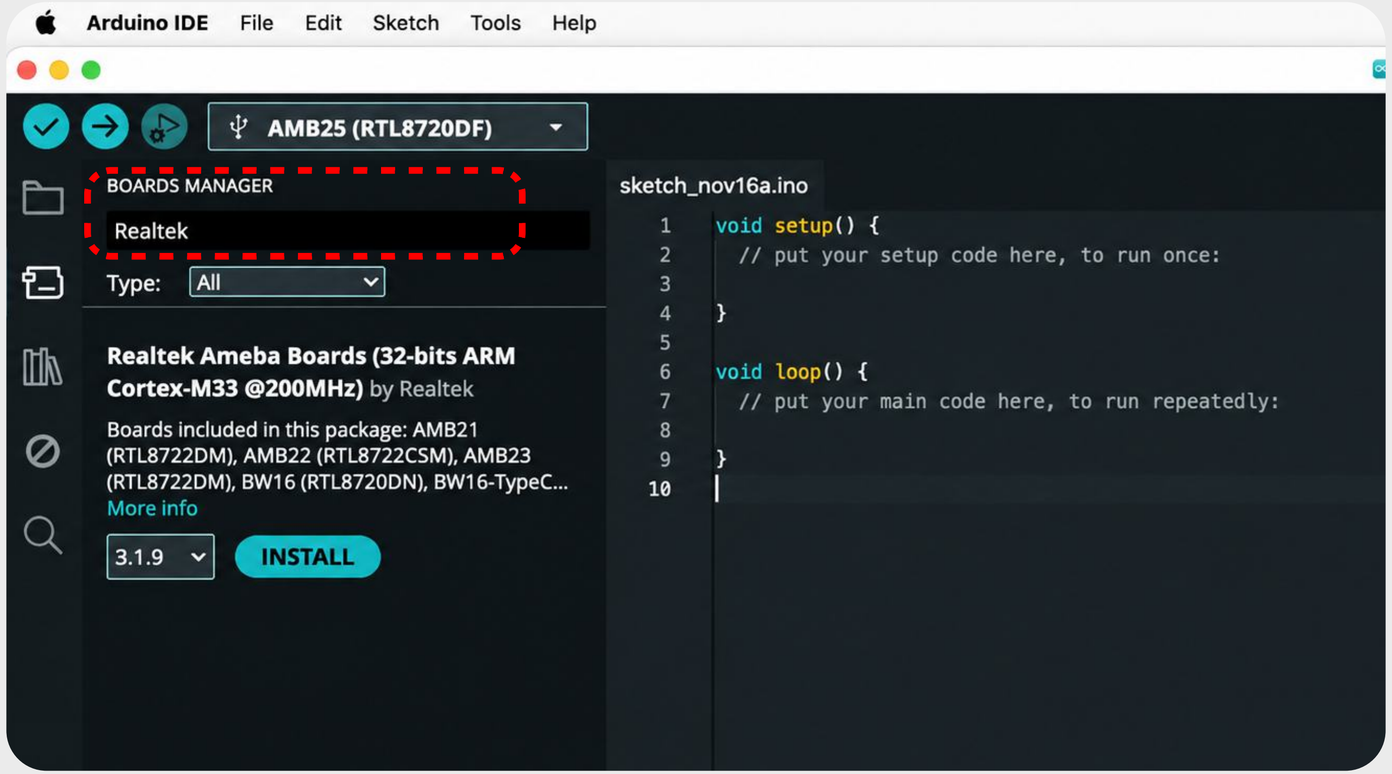
Tools → Board → Boards Manager



STEP 5 · Installing the Ameba Board Package

Search for and Install Realtek Ameba Boards

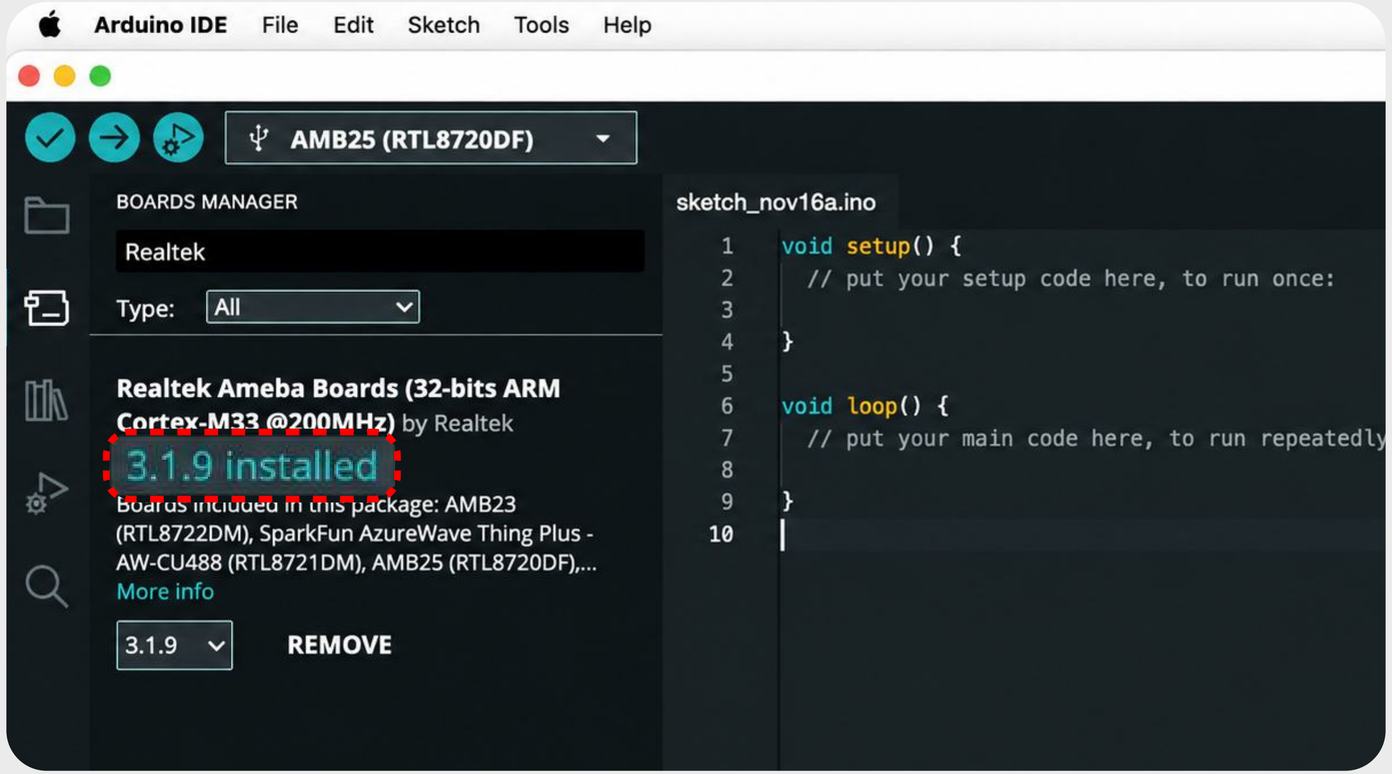
Type Realtek Ameba Boards in the Boards Manager search box.
Find Realtek Ameba Boards and click INSTALL.



STEP 6 · Verifying the BSP Installation

Check That Realtek Ameba Has Been Installed Successfully

Once installation is complete, INSTALLED appears in the Realtek Ameba Boards entry.
You can now use the NU-87 TinyDK with the Arduino IDE.



STEP 7 · RGB LED Blink Test

Write the RGB LED Blink Code

Enter the following code
in the Arduino IDE editor.



Complete Code

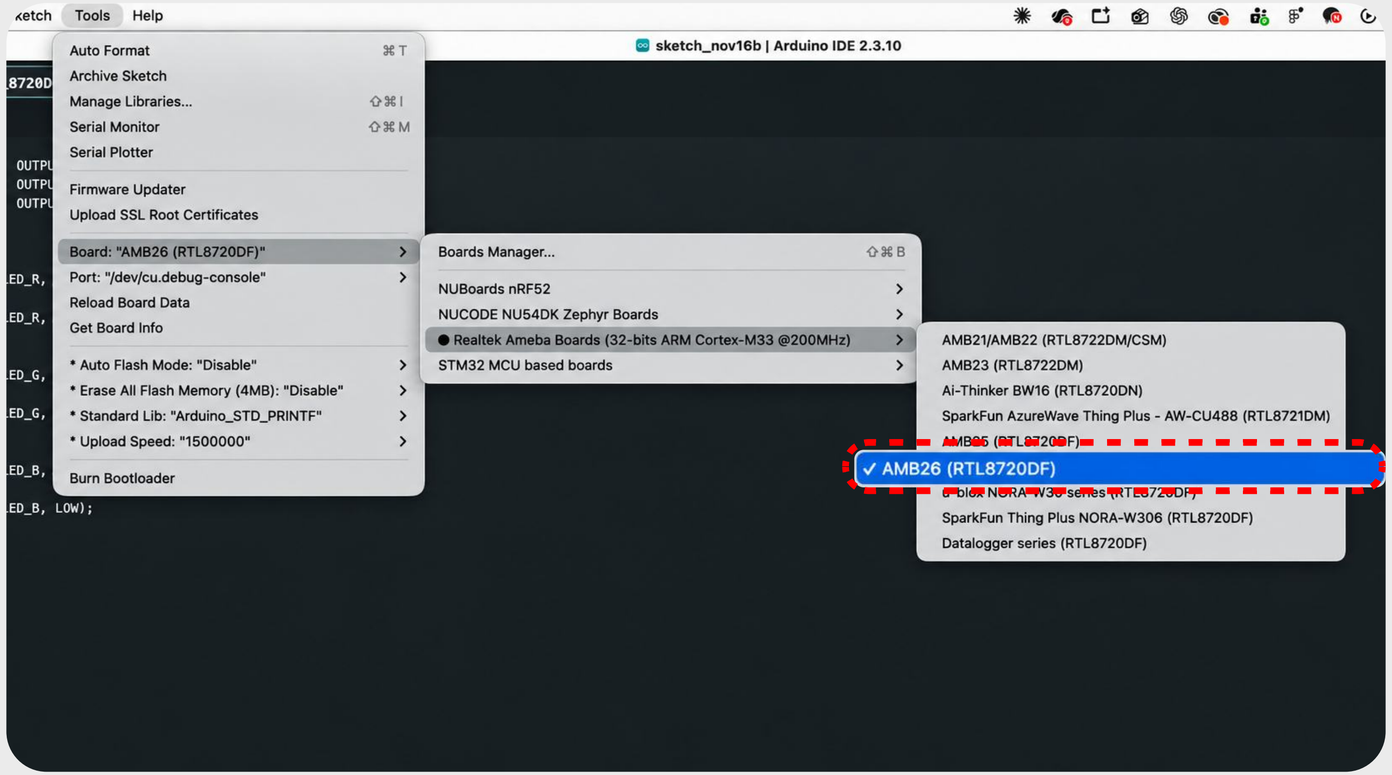
```
void setup() {
  pinMode(LED_R, OUTPUT);
  pinMode(LED_G, OUTPUT);
  pinMode(LED_B, OUTPUT);
}

void blink() {
  digitalWrite(LED_R, HIGH);
  delay(1000);
  digitalWrite(LED_R, LOW);
  delay(1000);

  digitalWrite(LED_G, HIGH);
  delay(1000);
  digitalWrite(LED_G, LOW);
  delay(1000);

  digitalWrite(LED_B, HIGH);
  delay(1000);
  digitalWrite(LED_B, LOW);
  delay(1000);
}

void loop() {
  blink();
  delay(1000);
}
```

STEP 8 · Selecting the NU-87 TinyDK Board

Select the Board for the NU-87 TinyDK

From the Arduino IDE top menu, select:

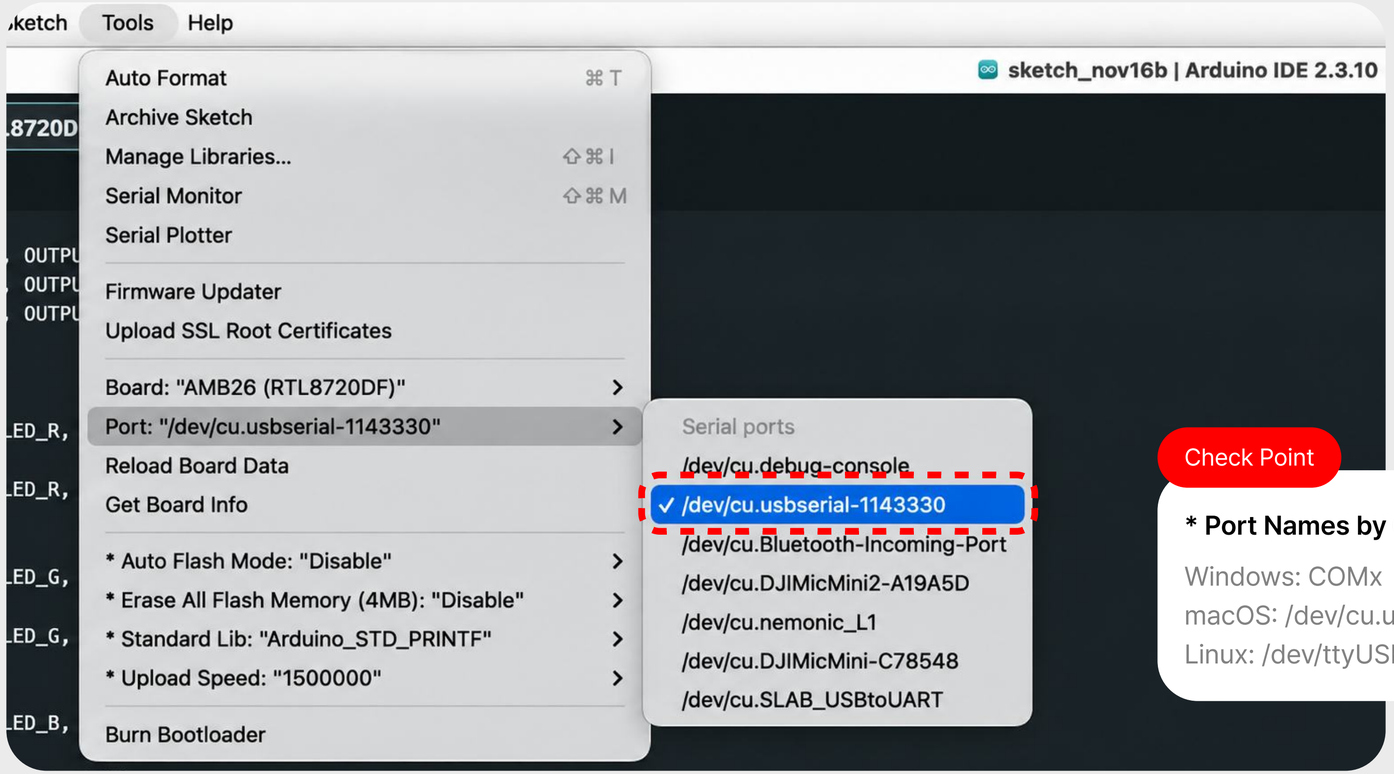
Tools → Board → Realtek Ameba Boards → AMB26 (RTL8720DF)



STEP 9 · Selecting the Serial Port

Select the Port for the NU-87 TinyDK

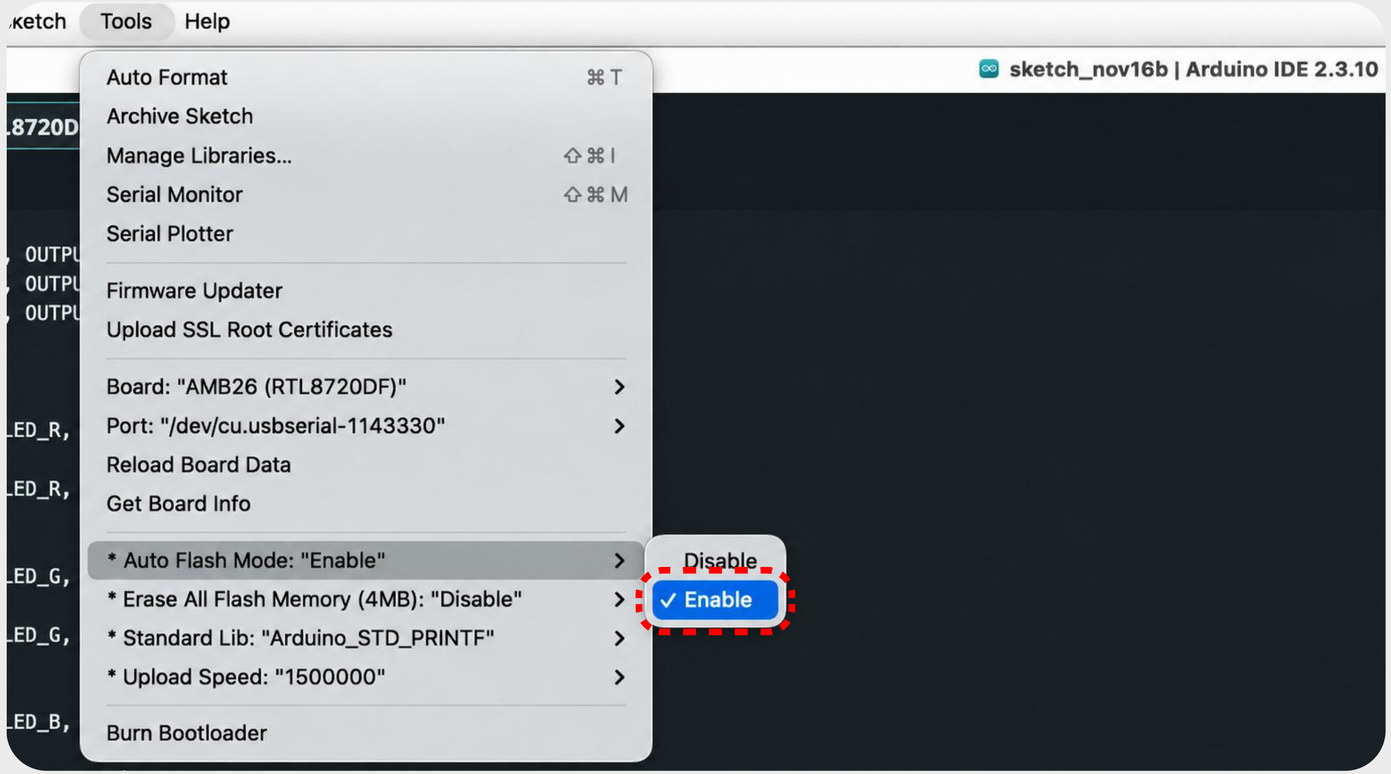
From the Arduino IDE top menu, select: Tools → Port
Select the serial port assigned to your board.



STEP 10 · Uploading the Code

Configure Auto Flash Mode

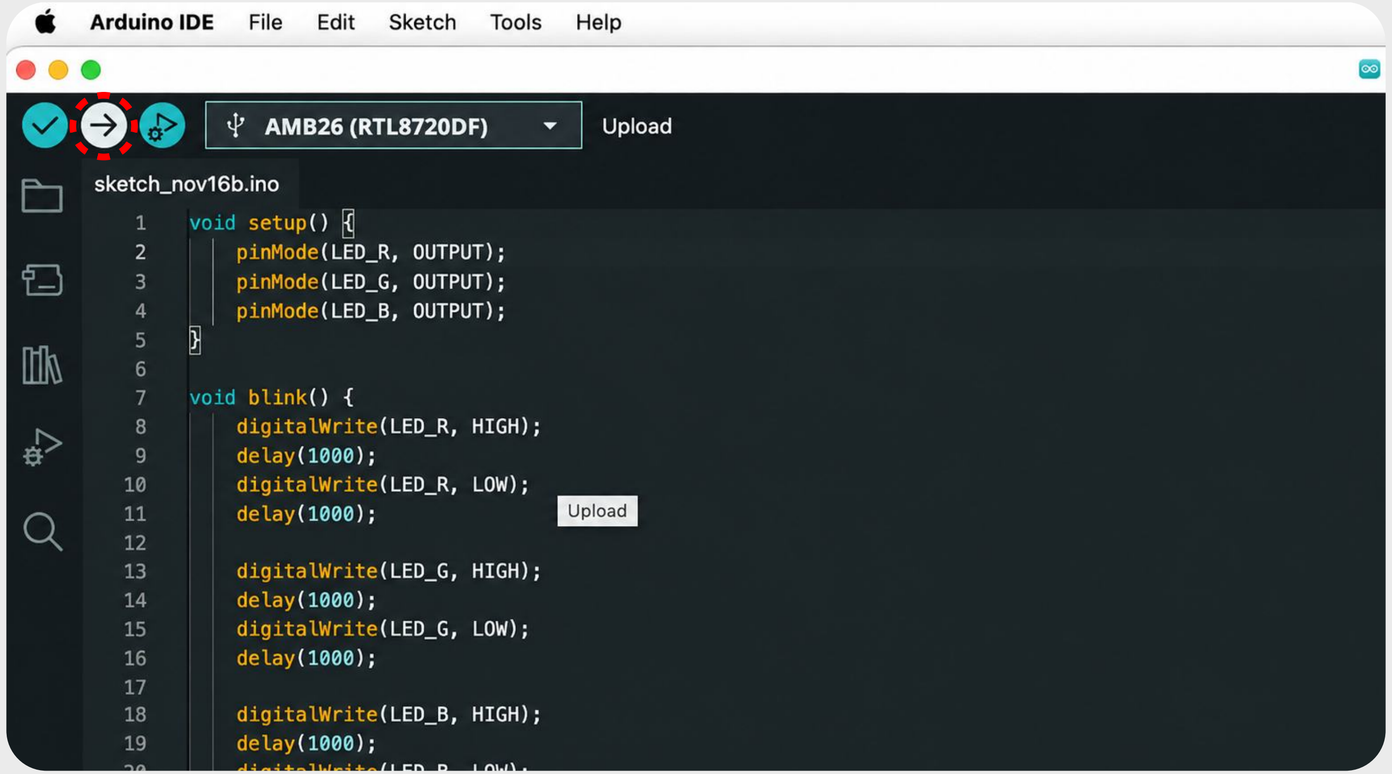
From the Arduino IDE top menu, select:
Tools → Auto Flash Mode → Enable



STEP 11 · Uploading the Code

Upload the RGB LED Blink Code to the NU-87 TinyDK

Click the Upload (→) button at the top of the Arduino IDE to upload the RGB LED Blink code.



STEP 12 · Setup Complete

NU40DK Connection and Setup Are Complete

After uploading the code, LED1 on the NU40DK board blinks at one-second intervals, indicating that the board is operating correctly.



Board Setup Check

If the LED on the NU-87 TinyDK starts blinking in the order RED → GREEN → BLUE, the development environment setup is complete.

03 Contact NUCODE

Reach out about NUCODE products, development, support, and production.

Datasheets *

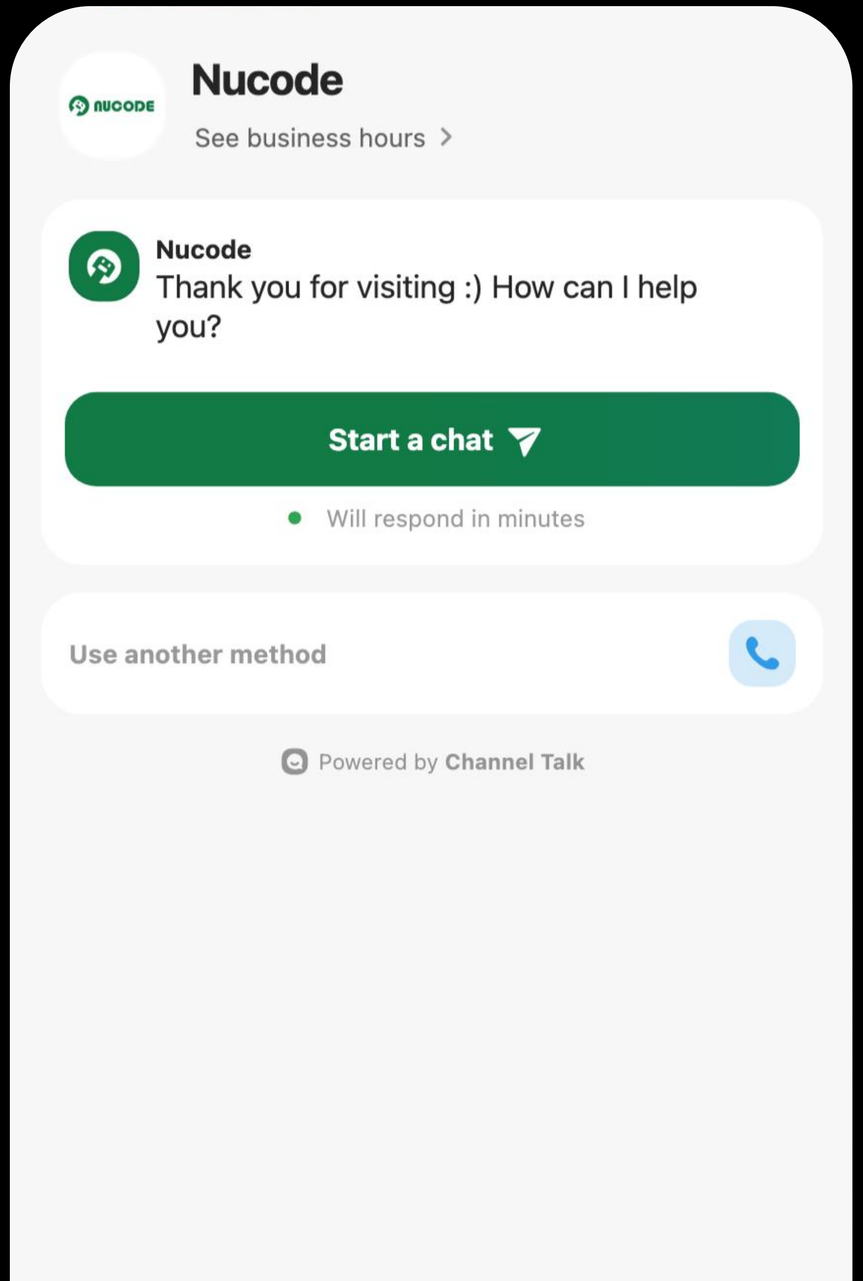
https://nucode.gitbook.io/nuseries

Homepage *

https://nuworks.io/

Channel Talk *

https://nucode.channel.io/home



Thank you for working with NUCODE.

Always something NU on board, NUCODE



Created by Jihyeon Yoo & Eugene Bae

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