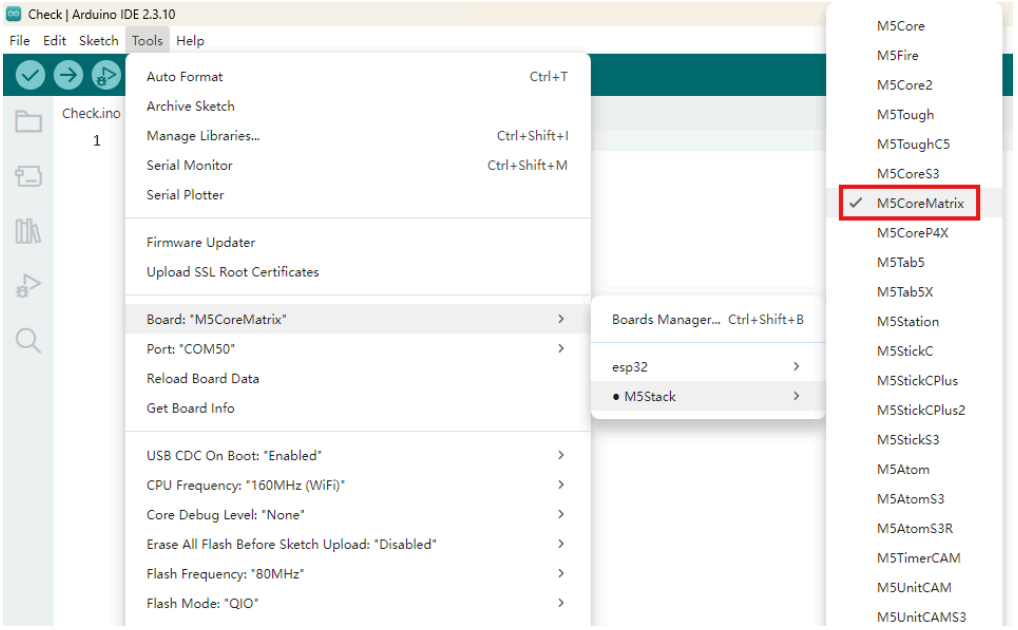
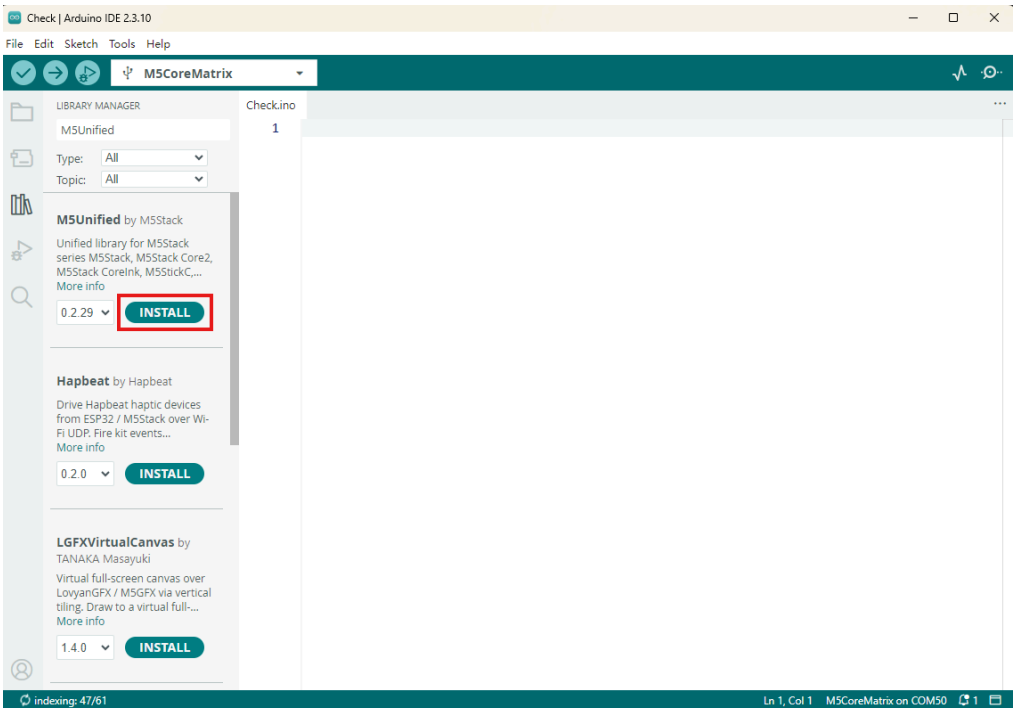
# CoreMatrix Arduino Program Compile & Upload

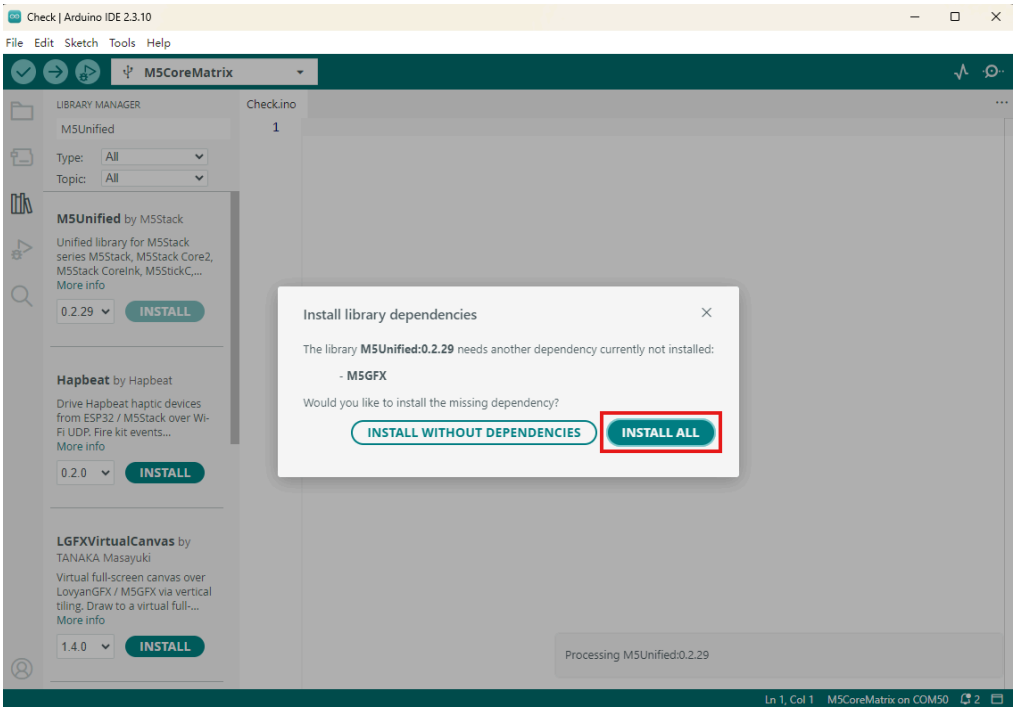
## 1. Preparation

- 1. Install Arduino IDE: Follow the Arduino IDE installation guide to install the IDE.
- 2. Install the board package: Follow the Basic Environment Setup guide to install the M5Stack board package and select the `M5CoreMatrix` board.




- 3. Install the required libraries: Follow the Library Manager installation guide to install the `M5Unified` and `M5GFX` libraries, then install all dependencies as prompted.



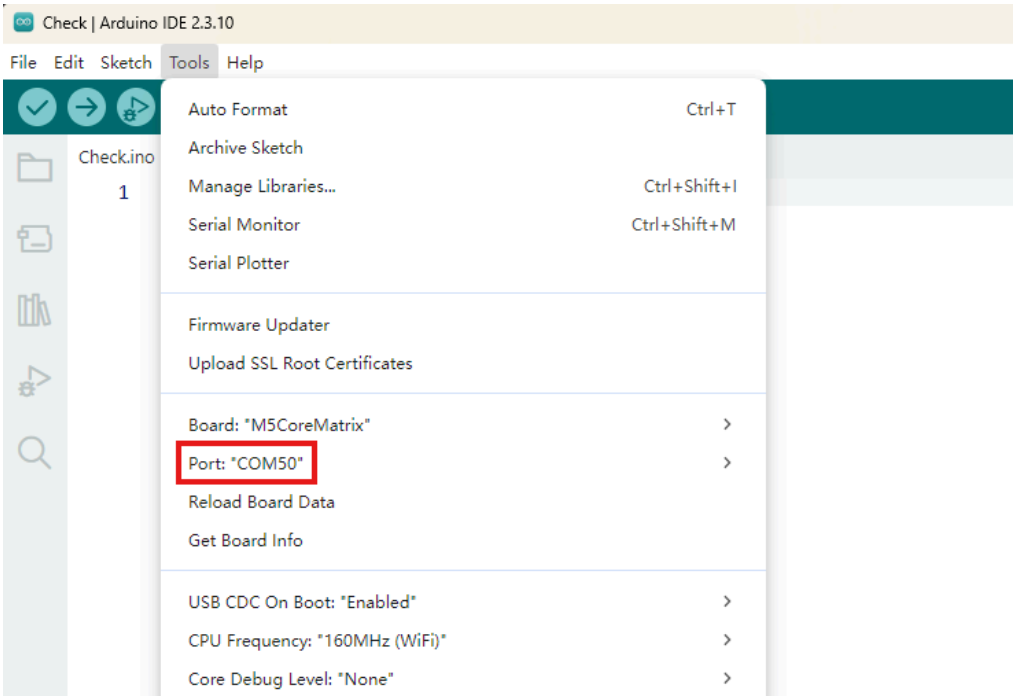

## 2. Download Mode

Normally, CoreMatrix programs can be uploaded directly over a USB Type-C data cable. If an upload error occurs during development and debugging, press and hold the power button to force download mode.




## 3. Port Selection

Connect the device to the computer with a USB data cable. Select the corresponding device port in Arduino IDE.




## 4. Program Compile & Upload

Create a new program in Arduino IDE, copy the code below into the editor, and click the upload button to compile and upload.

```cpp
```

```cpp
#include <M5Unified.h>

static const uint16_t HEART[16] = {
  0b0000000000000000,
  0b0000011001100000,
  0b0001111111111000,
  0b0011111111111100,
  0b0111111111111110,
  0b0111111111111110,
  0b0111111111111110,
  0b0011111111111100,
  0b0001111111111000,
  0b0000111111110000,
  0b0000011111100000,
  0b0000001111000000,
  0b0000000110000000,
  0b0000000000000000,
  0b0000000000000000,
  0b0000000000000000,
};

static void drawHeart()
{
  M5.Display.startWrite();
  M5.Display.fillScreen(TFT_BLACK);

  for (int y = 0; y < 16; ++y) {
    for (int x = 0; x < 16; ++x) {
      if (HEART[y] & (0x8000u >> x)) {
        M5.Display.drawPixel(x, y, TFT_WHITE);
      }
    }
  }

  M5.Display.endWrite();
  M5.Display.display();
}

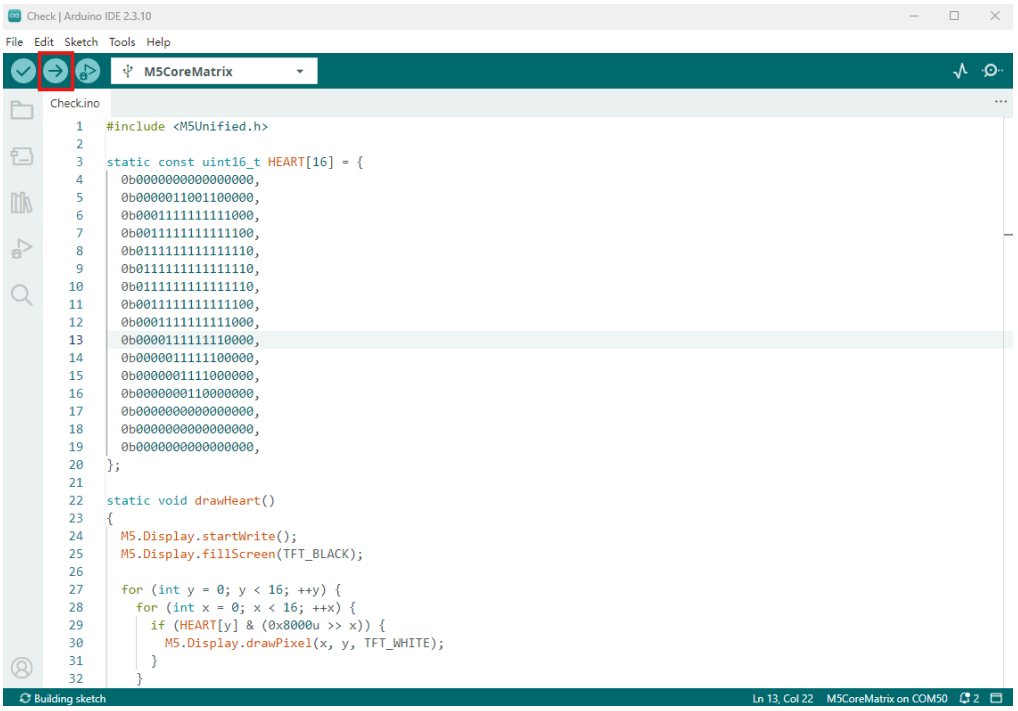
void setup()
{
  auto cfg = M5.config();
  cfg.serial_baudrate = 115200;
  M5.begin(cfg);

  M5.Display.setColorDepth(8);
  M5.Display.setRotation(1);
  M5.Display.setBrightness(128);

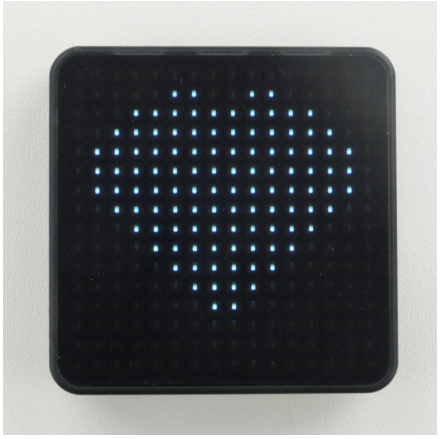
  Serial.printf("CoreMatrix display: %d x %d\n",
                M5.Display.width(), M5.Display.height());
  drawHeart();
}

void loop()
{
```

```
  M5.update();
  delay(100);
}
```




After uploading, the CoreMatrix LED matrix displays a 16 x 16 heart pattern.



## 5. Related Resources

- Arduino Library
  - M5Unified
  - M5GFX
  - M5PM1
  - M5IOE1
- Arduino API & Examples
  - Battery
  - Button
  - Buzzer
  - Display
  - IMU
  - microSD
  - Wakeup

- M5PM1 & M5IOE1