Part 2

lesson 14

OLED

Overview

In this tutorial,　shows how to use the SSD1306 0.96 inch I2C OLED display with the ESP32. We'll show you some features of the OLED display, how to connect it to the ESP32 board, and how to write text.

Component Required:

(1) x Elegoo ESP32

(1) x I2C OLED Display

(5) x F-F wires (Female to Female jumper wires)

Component Introduction

I2C OLED Display

The organic light-emitting diode (OLED) display that we'll use in this tutorial is the SSD1306 model: a monocolor, 0.96-inch display with 128×64 pixels as shown in the following figure.

The OLED display doesn't require backlight, which results in a very nice contrast in dark environments. Additionally, its pixels consume energy only when they are on, so the OLED display consumes less power when compared with other displays.

The model we're using here has only four pins and communicates with the ESP32 using I2C communication protocol. There are models that come with an extra RESET pin. There are also other OLED displays that communicate using SPI communication.

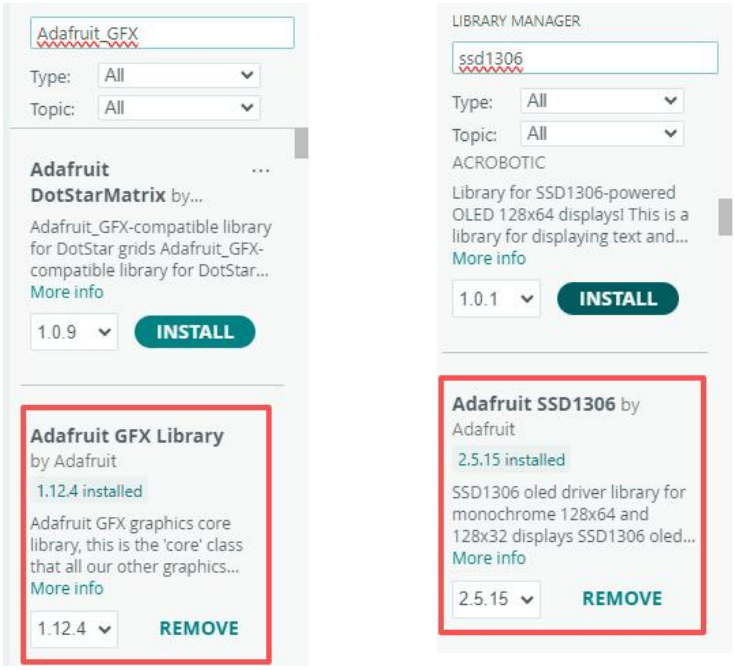
Because the OLED display uses I2C communication protocol, wiring is very simple. You just need to connect to the ESP32 I2C pins as D21(SDA)、D22(SCL)

To control the OLED display you need the adafruit_SSD1306.h and the adafruit_GFX.h libraries. Follow the next instructions to install those libraries.

1. Open your Arduino IDE and go to Sketch > Include Library > Manage Libraries. The Library Manager

should open.

2. Type “SSD1306” in the search box and install the SSD1306 library from Adafruit.



Tips for writing text using these libraries

Here’s some functions that will help you handle the OLED display library to write text or draw simple graphics.

display.clearDisplay() – all pixels are off

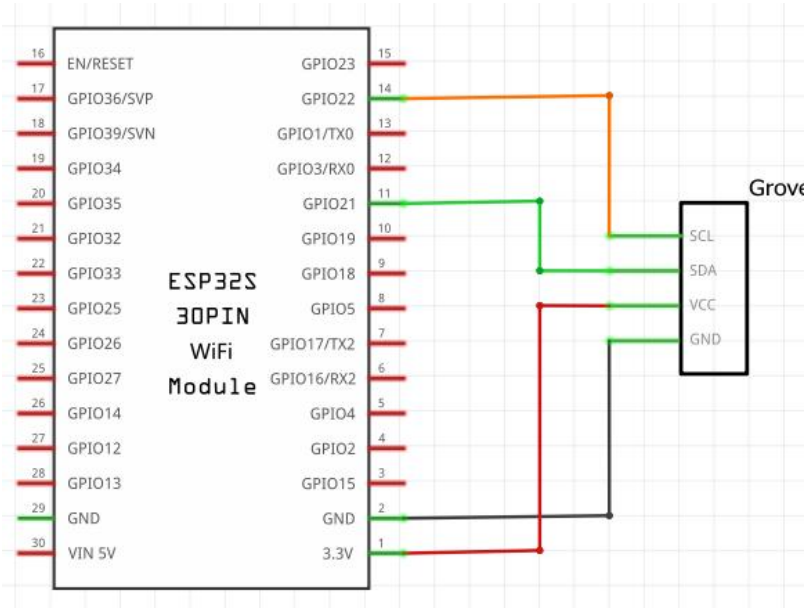
display.drawPixel(x,y, color) – plot a pixel in the x,y coordinates

display.setTextSize(n) – set the font size, supports sizes from 1 to 8

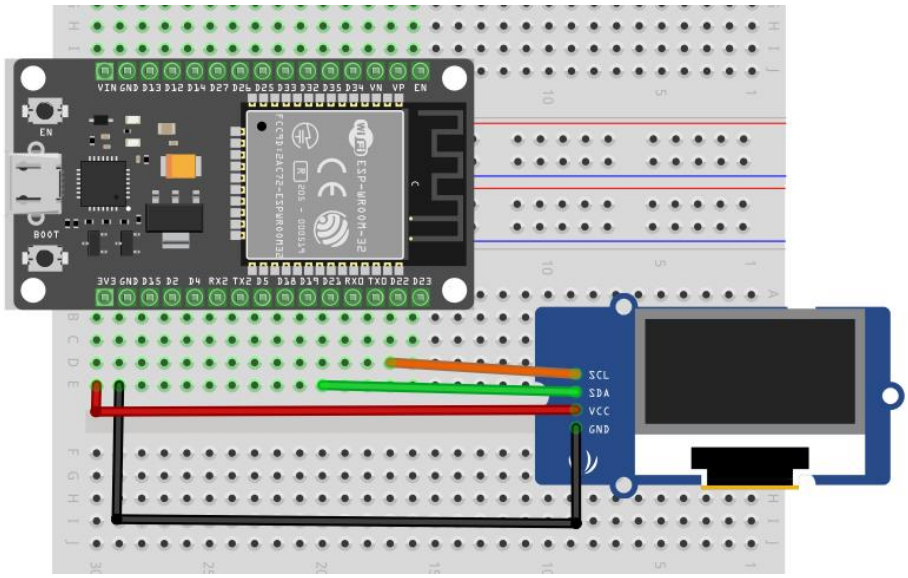
display.setCursor(x,y) – set the coordinates to start writing text

display.print(“message”) – print the characters at location x,y

display.display() – call this method for the changes to make effect



Connection Schematic



Wiring diagram

Code

After wiring, please open the program in the code **OLED_code**and click UPLOAD to upload the program. See Lesson 5 in part 1 for details about program uploading if there are any errors.

Before you can run this, make sure that you have installed the library or re-install it, if necessary. Otherwise, your code won't work.

For details about loading the library file, see Lesson 5 in part 1.

On ESP32, the I²C pins (SDA & SCL) can be freely remapped to any available GPIOs; you must explicitly call Wire.begin(SDA, SCL). The example wires the OLED to GPIO 21 for SDA and GPIO 22 for SCL—unlike the fixed A4/SDA and A5/SCL on Arduino UNO—adjust as required

```
Wire.begin(21, 22);
```