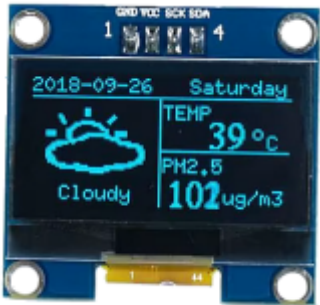


# SSH1106/SSD1306 OLED Display with I<sup>2</sup>C communication

The SSD1306 and SH1106 (often misspelled as SSH1106 or SSH1306) are both popular single-chip CMOS OLED drivers used for small monochrome displays (0.91", 0.96", 1.3"). While they are very similar and often share the same I<sup>2</sup>C address (0x3C), they are not directly compatible because of differences in memory mapping and supported operating modes.



The key difference is that the SH1106 has more internal RAM (132×64) compared to the SSD1306 (128×64). As a result, a 128×64 display using an SH1106 chip may display garbage pixels or appear shifted by 2 pixels on each side when controlled with a standard SSD1306 library.

- **SSD1306:** Works with standard libraries like Adafruit\_SSD1306
- **SH1106:** Requires specific libraries, such as Adafruit\_SH110x or U8g2 (using U8G2\_SH1106\_128X64\_NONAME...)

| Feature         | SSD1306                    | SH1106 (SSH1106)       |
|-----------------|----------------------------|------------------------|
| Max Resolution  | 128 x 64                   | 132 x 64               |
| Internal RAM    | 128 x 64 bits              | 132 x 64 bits          |
| Addressing      | Page, Horizontal, Vertical | Mostly Page Mode only  |
| Hardware Scroll | Yes                        | No                     |
| Typical Use     | 0.96" OLED                 | 1.3" OLED              |
| Driver Library  | Adafruit_SSD1306           | U8g2 / Adafruit_SH110x |

Both are commonly used with Arduino, Raspberry Pi, and ESP8266/ESP32 via I<sup>2</sup>C (SDA/SCL) or SPI, typically requiring only 4 pins (VCC, GND, SDA, SCL). If an SH1106 display is initialized with an SSD1306 library, the screen will likely show “garbage” or shifted lines.

| SSH1106 Chip 128 x 64 Pixel | SSD1306 Chip 64x48 Pixel | SSD1306 Chip 128 x 32 Pixel | SSD1306 Chip 128 x 64 Pixel |
|-----------------------------|--------------------------|-----------------------------|-----------------------------|
|                             |                          |                             |                             |

## Pinout

| Pin Label  | Function | Description                                        |
|------------|----------|----------------------------------------------------|
| <b>GND</b> | Ground   | Ground (0V)                                        |
| <b>VCC</b> | Power    | 3.3V or 5V (Most modules have a voltage regulator) |
| <b>SCL</b> | Clock    | I <sup>2</sup> C Clock (D0 pin)                    |
| <b>SDA</b> | Data     | I <sup>2</sup> C Data (D1 pin)                     |

- Note on Ordering: On some cheap modules, VCC and GND are swapped. Verify your module label before powering it up to avoid damage.
- I<sup>2</sup>C Address: Usually **0x3C** or **0x3D**.

## Features of particular types

| Name                               | ID                                                                                | Characteristics                                          |
|------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------|
| AZ-Delivery 1.30" IIC V21          |  | 1.3 inch OLED Display<br><b>SH1106</b><br>128 x 64 pixel |
| AZ-Delivery 0.96 inch OLED SSD1306 |  | 0.96 inch OLED<br><b>SSD1306</b><br>128 x 64 pixel       |

## SSH1106 Arduino

1. Installing the olikraus/u8g2 library (installation only works manually) from here:  
<https://github.com/olikraus/u8g2>
2. Example program:

```
#include <Arduino.h>
#include <U8g2lib.h>
#include <Wire.h>

// Constructor for SH1106 128x64 I2C (Hardware I2C)
// U8G2_R0: No rotation. U8X8_PIN_NONE: No hardware reset pin.
U8G2_SH1106_128X64_NONAME_1_HW_I2C u8g2(U8G2_R0, /* reset=*/ U8X8_PIN_NONE);

void setup(void) {
  u8g2.begin();
}

void loop(void) {
  u8g2.firstPage();
  do {
    u8g2.setFont(u8g2_font_ncenB14_tr); // Set font
    u8g2.drawStr(0, 24, "Hello World!"); // Draw text
  } while ( u8g2.nextPage() );
}
```

## I<sup>2</sup>C topics on lamaPLC

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