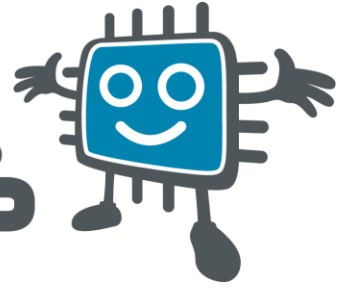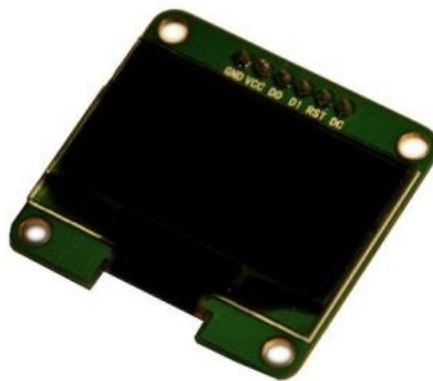Device: OLED-12864 family

This document Version: 1

Matches module hardware:

OLED-12864-BLUE, OLED-12864-WHITE,  OLED-12864-YB, OLED-12864B-WHITE

Date: 1 July 2013

Description: OLED 64 x 128 pixel LED displays

## Contents

## Introduction

The OLED-12864 family of displays give you 128 x 64 monochrome OLED goodness.

The various modules in the family give you 0.96" (white and blue models), 1.3" (white), and 0.96" dual (yellow and blue in one display).

OLED technology allows for crisp, clear displays and does not require a backlight.

## Features

Pixels, pixels and more pixels.  These displays are pretty tiny but still give you stacks of display space.

## Connections

The OLED-12864 displays have one connection port.

| | |
|---|---|
| GND | Ground (Vss) connection |
| VCC | Power (3.3V – 5V) |
| D0 | SSD1306 Clock |
| D1 | SSD1306 Data In |
| RST | SSD1306 Reset |
| DC | SSD1306 Mode - Data (high) / Command (low) |

## Technical details

The OLED-12864 family of modules are based on the awesome SSD1306 chip.  This chip allows you to dump an entire frame over a serial connection and is very easy to program.

As well, all the voltages are generated on board, meaning you can power it from 3.3V or 5V without any difficulty. It will work fantastically with a Raspberry Pi at 3.3V or an Arduino at 5V.

For more technical information about communicating with the OLED-12864 family of modules, please see the SSD1306 datasheet.  The PicPack library also contains sample code to communicate with the module, and can be downloaded from the Tutorial section of the Embedded Adventures web site.

## Initialisation

Each implementation of a SSD1306 display requires a particular initialisation, due to the way it is implemented. The equivalent of the following code is required for initialising the OLD-12864 family of displays.

```c
void ssd1306_init() {
  delay_ms(100);
  set_pin(ssd1306_rst_port, ssd1306_rst_pin);   // out of reset
  serial_print_str("Init...\n");
  ssd1306_command_mode();
  // Display Off (0x00/0x01)
  ssd1306_display_onoff(0x00);
  // Set Clock as 100 Frames/Sec
  ssd1306_divide_clock_ratio(0x80); //
  // 1/64 Duty (0x0F~0x3F)
  ssd1306_multiplex_ratio(0x3F);
  // Shift Mapping RAM Counter (0x00~0x3F)
  ssd1306_display_offset(0x00);
  // Set Mapping RAM Display Start Line (0x00~0x3F)
  ssd1306_start_line(0x00);
  // Enable Embedded DC/DC Converter
  ssd1306_charge_pump(1);
  // Set Page Addressing Mode (0x00/0x01/0x02)
  ssd1306_addressing_mode(VERTICAL_ADDRESSING_MODE);
  // Set SEG/Column
  ssd1306_segment_remap(1);
  // Set COM/Row Scan Direction
  ssd1306_scan_direction(1);
  // Set Sequential Configuration (0x00/0x10)
  ssd1306_com_pin_config(1, 0);
  // Set SEG Output Current
  ssd1306_contrast(0xCF);
  // Set Pre-Charge as 15 Clocks & Discharge as 1 Clock
  ssd1306_precharge_period(0x0F, 0x01);
  // Set VCOM Deselect Level
  ssd1306_vcomh_deselect_level(0x40);
  // Disable Entire Display on (0x00/0x01)
  ssd1306_entire_display(0x00);
  // Disable Inverse Display On (0x00/0x01)
  ssd1306_display_inverse(0x00);
  // Display On (0x00/0x01)
  ssd1306_display_onoff(0x01);
}
```

## Tips and Tricks

The OLED-12864 family are all monochrome displays – the OLED-12864-YB display gives you 16 pixels of yellow and the remainder in blue. There is approximately 1 pixels worth of gap between the blue and yellow sections, although all 128 by 64 pixels are accessible.

## Versions

| Doc Version | HW Version | Date | Comments |
|---|---|---|---|
| 1 | 1 | 1 July 2013 | Initial Version for first run boards |