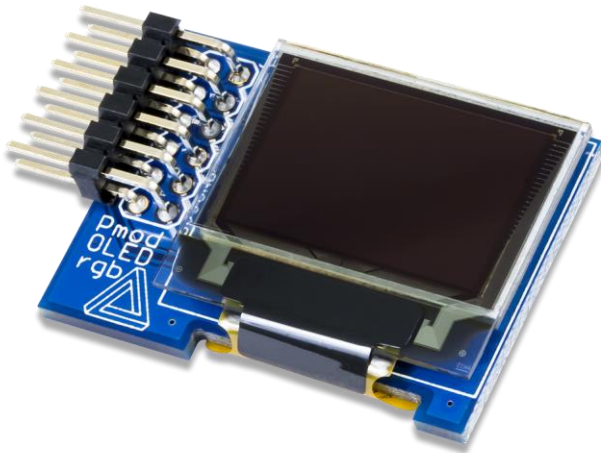# PmodOLEDrgb™ Reference Manual

Revised April 26, 2016
This manual applies to the PmodOLEDrgb rev. B

Overview

The Digilent PmodOLEDrgb is an organic RGB LED module with a 96×64 pixel display capable of 16-bit color resolution.

The PmodOLEDrgb.

Features include:

- 96×64 pixel RGB OLED screen
- 0.8" x 0.5" graphical display
- 16-bit color resolution
- Two low-power display shutdown modes
- Small PCB size for flexible designs (1.4" x 1.0")
- 12-pin Pmod connector with SPI interface
- Library and example code available in resource center

1   Functional Description

The PmodOLEDrgb utilizes a Solomon Systech SSD1331 display controller to receive information from the host board and display the desired information on the OLED screen.

2   Interfacing with the Pmod

The PmodOLEDrgb communicates with the host board via the SPI protocol. By driving and keeping the Chip Select (CS) line at a logic level low, users may send both commands and data streams to the display controller based on the state of the Data/Command (D/C) pin.

As a graphical display interface, users may light up any individual pixel on the OLED, display predefined characters, or even load bitmaps onto the screen. Each pixel can be set to one of the 65,535 colors that are available. The OLED display has a specific power-up and power-down sequence to ensure the longevity of the device.

There are two field-effect transistors (FETs) that control the display's two power supplies. The VCCEN control toggles the positive voltage supply to the screen itself and the PMODEN control toggles the power supply ground to the display. Users may turn off either one of these controls to reduce the power consumption of the PmodOLEDrgb to approximately 200 nA.

2.1   Power-on Sequence

1.   Apply power to VCC.
2.   Send Display Off command.
3.   Initialize display to default settings.
4.   Clear screen.
5.   Apply power to VCCEN.
6.   Delay 100ms.
7.   Send Display On command.

2.2   Power-off Sequence

1.   Send Display Off command
2.   Power off VCCEN
3.   Delay 100ms
4.   Power off VCC

A pinout table of the PmodOLEDrgb is provided below.

Pin	Signal	Description
1	CS	Chip Select
2	MOSI	Master-Out-Slave-In
3	NC	Not Connected
4	SCK	Serial Clock
5	GND	Power Supply Ground
6	VCC	Power Supply (3.3V)
7	D/C	Data/Command Control
8	RES	Power Reset
9	VCCEN	Vcc Enable
10	PMODEN	Vdd Logic Voltage Control
11	GND	Power Supply Ground
12	VCC	Power Supply (3.3V)

Table 1. Header J1 pinout descriptions.

Although users are welcome to create their own interface code for the PmodOLEDrgb if they so desire, pre-constructed libraries that provide functions for initializing the display and rendering simple text and graphics onto the screen exist. They are available on the PmodOLEDrgb example code page and can be used as-is or as a starting point for a more sophisticated graphics library.

Any external power applied to the PmodOLEDrgb must be within 2.7V and 5V; however, it is recommended that Pmod is operated at 3.3V.

3   Physical Dimensions

The pins on the pin header are spaced 100 mil apart. The PCB is 1.4 inches long on the sides parallel to the pins on the pin header and 1 inch long on the sides perpendicular to the pin header.

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