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O4

Compact Drive Electronics
with Luminance Control and WF05-optic mount for
eMagin SVGA+ & SVGA-3D OLED Microdisplays

FEATURES

The O4 OLED driver board for eMagin's SVGA+ and SVGA-3D OLED microdisplays is an optimal, compact electronic solution for monocular, binocular and stereoscopic applications.

The O4's is designed to mount on top of the eMagin WF05 prismatic optic assembly, while keeping size to a minimum. This is the fastest way to achieve an optic/display/electronics subsystem that is ready for immediate integration.

A 13 pin connector inputs VESA VGA/SVGA video, NTSC/PAL composite video, 5V DC power, and a control interface. The O4 takes care of the rest including DC/DC power conversion, display initialization, and automatic video resolution and frequency detection (multi-sync). Simply attach the OLED, apply power and your video source, and the display is ready to use. Adjustment of display luminance,

signal gain and offset is also featured on the O4 by either wiring a momentary switch to the control pins, or using the O4 serial control interface.

On-board DIP switches initialize the most common set-up features:

- NTSC or PAL video
- Image Flip and Rotate
- SVGA+ / SVGA-3D Display Select

Convenient mating with an off-the-shelf display and optic assembly and ease of use makes the O4 ideal for both initial evaluation and production systems.

Contact us for quantity pricing or custom firmware and layout requirements.

eMagin OLED display is sold separately.

IMAGES

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INTERFACE

The O4 has a number of different adjustable features that help the integrator make best use of their eMagin OLED microdisplay.

The video input and microdisplay type used with the O4 is configured using the four on-board DIP switches. See Table 1 for information on how to set the composite video input type, the OLED display type, and the horizontal and vertical scan directions.

The O4 also provides a user interface for adjusting the displayed image. Two modes exist for this, the first of which is a manual switch mode that controls the display luminance. This is performed by shorting either of the control pins to the Control Ground Reference pin. Control0_Rx reduces the luminance while Control1_Tx increases the luminance. Shorting both control pins to ground will reset the luminance to a factory default.

The second control mode is done through by transmitting commands to the O4. An external controller or peripheral sends serial commands to the O4 via a standard UART interface that follows the O4 Control Protocol. The serial interface is the same as that of RS-232, however it operates a logic level voltages, 0V to 3.3VDC. Control0_Rx receives data from an external controller, while Control1_Tx is retained for future use that would allow the O4 to send information out to an external controller. The Control Ground Reference pin should be used to maintain a common ground reference.

The O4 supports dual-eye systems that are configured by the same external controller. Left-eye and Right-eye assignment is assigned with a 0-ohm resistor on the O4 identified by the red part in Figure 1; populated for left eye, open for right eye. The O4 Control Protocol documents how to send commands to either or both displays.
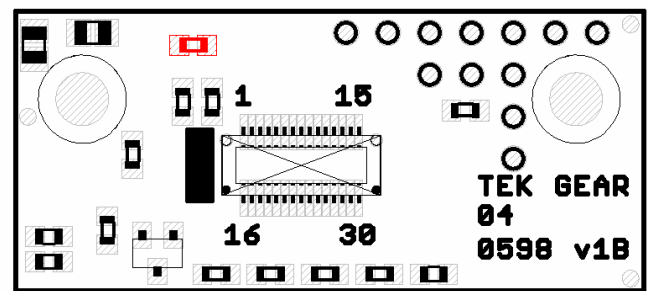

Figure 1: Left/Right eye configuration

The O4 is designed to mount on top of the eMagin WF05 optic holder. The O4 can be secured to the WF05 using two 8mm M2 machine screws.

Table 1: O4 Configuration Switches

Switch	Setting	Off	On
1	Display Select	SVGA-3D	SVGA+
2	CVBS Signal	PAL	NTSC
3	Vertical Scan Direction	Bottom to Top	Top to Bottom
4	Horizontal Scan Direction	Right to Left	Left to Right

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SPECIFICATIONS

Microdisplay: eMagin SVGA+ and SVGA-3D
Supports both standard and -XL OLED, and both rev 2 & 3 displays

Dimensions: 1.500" x 0.665"

Video Format: VESA SVGA (800x600) & VGA (640x480) @ 60/72/75/85 Hz
NTSC (60 Hz), PAL (50Hz)*

Input Voltage: 4.5 to 5.5 VDC, 5 VDC Recommended

Power Consumption: 0.25W to 0.35W** total system power, *including OLED microdisplay*

Interface Cable Pin Assignments (J1)
1.   Composite Video Signal
2.   Composite Video Ground
3.   VGA/SVGA Ground
4.   Red
5.   Green
6.   Blue
7.   Horizontal Sync
8.   Vertical Sync
9.   Control Ground reference
10. Control0_Rx
11. Control1_Tx
12. Power Ground
13. Power +5VDC

Mating Wire Housing and Crimps
13-pin 1.25mm Receptacle   Molex 51021-1300
28-32 AWG Crimp   Molex 50058-8000
26-28 AWG Crimp   Molex 50079-8000

* NTSC and PAL are displayed in monochrome. Only compatible with an SVGA+ type displays
** Exact power dependent on video input, video image, and display adjustment settings

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