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# O1

## Compact Drive Electronics for eMagin SVGA+ & SVGA-3D OLED Microdisplays

## FEATURES

The O1 OLED driver board for the eMagin SVGA+ OLED is an optimal, compact electronic solution for monocular, binocular and stereoscopic applications.

The O1's mounting tabs can securely fasten the electronics to an enclosure or can be detached, keeping the entire display engine as small as the display itself, 0.78" x 0.60".

A 12 pin connector inputs VESA VGA/SVGA video, NTSC/PAL monochrome composite video and 5V DC power. The O1 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.

Signal gain and offset is also featured on the O1 by wiring a momentary switch to the control connector.

On-board jumpers control the most common features:

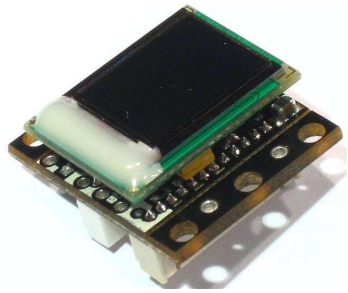
- NTSC or PAL video
- Image Flip and Rotate
- SVGA+ / SVGA-3D Display Select

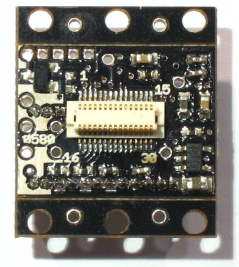
Small size and ease of use makes the O1 ideal for both initial evaluation and production systems.

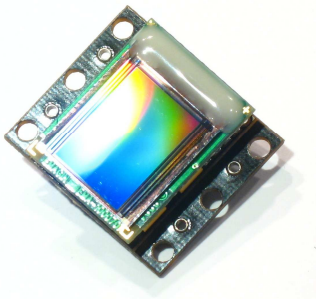
Contact us for quantity pricing or custom firmware and layout requirements.

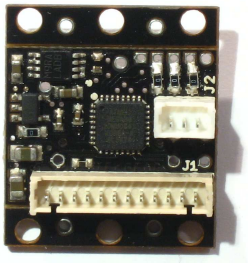
eMagin OLED display is sold separately.

## IMAGES









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# INTERFACE

The O1 provides flexible image controls by allowing both gain and offset to be changed while providing two control pins for increase and decrease adjustments.

To place the O1 into gain- or offset-adjustment mode, short Control Pin 1 or Pin 2, respectively, to Control Pin 3, (ground) during power-up. After the image appears on the display, release the pin and the adjustment mode will be set and recalled the next time power is cycled.

After power-up, the Control pins are used to increase or decrease the gain or offset. The gain and offset settings are automatically saved to non-volatile memory and retrieved at the next power cycle.

Gain and offset settings can be reset to factory default levels by shorting both control pins to ground during power-up.

The O1 also allows the user to set the type of eMagin OLED display, horizontal and vertical scan directions, and NTSC or PAL composite video input. See Figure 1, Figure 2 and Table 2 for more information on what the jumper settings represent and their locations.

Factory default has each resistor location populated with a 0-ohm resistor, which pulls the line voltage down to 0V. When the resistor is removed, pull-up resistors bring the line voltage up to 3.3V, which represents the opposite setting. To provide the user with access to these controls, the integrator should remove the appropriate resistors and instead wire in an alternate action switch from the appropriate wire pad to ground.

Custom firmware options are available.

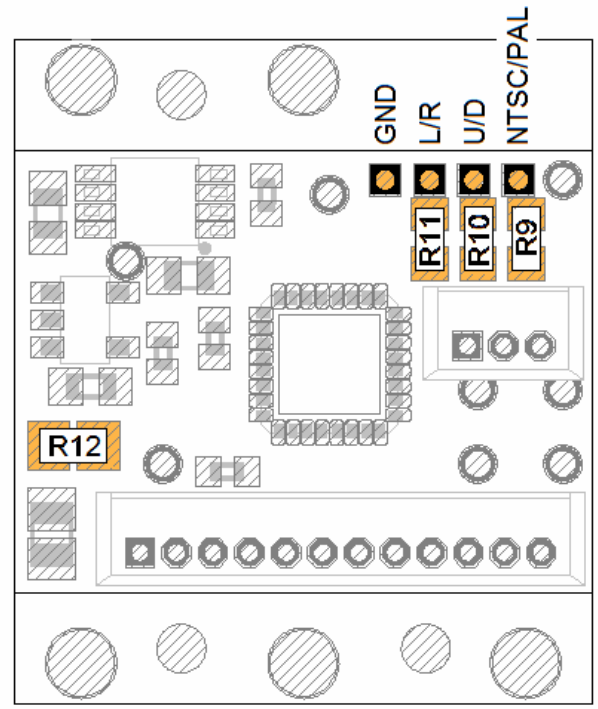


**Figure 1: Resistor and Wire Pad Locations**

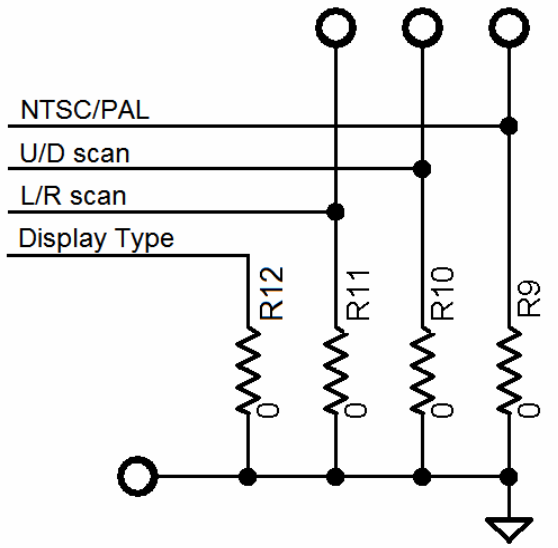


**Figure 2: Resistor and Wire Pad Schematic**

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**Table 1: Gain & Offset Operation**

| | Function | J2 | | |
|---|---|---|---|---|
| | | Pin 1 | Pin 2 | Pin 3 |
| During Power-Up | Set to Gain-Adjustment Mode | X | | X |
| | Set to Offset-Adjustment Mode | | X | X |
| | Reset Gain/Offset levels, set to Gain Adjust Mode | X | X | X |
| During Operation | Decrease Gain/Offset Level | X | | X |
| | Increase Gain/Offset Level | | X | X |
| | Reset currently selected mode to default value | X | X | X |

**Note: Connect pins indicated by 'X'**

**Table 2: Image Settings**

| Function | Resistor | Short [DEFAULT] | Open |
|---|---|---|---|
| Composite Video Format | R9 | NTSC | PAL |
| Vertical Scan Direction | R10 | Top to Bottom | Bottom to Top |
| Horizontal Scan Direction | R11 | Left to Right | Right to Left |
| eMagin OLED Display Type | R12 | SVGA+ | SVGA-3D |

## SPECIFICATIONS

**Microdisplay:** eMagin SVGA+ and SVGA-3D, standard and -XL series

**Dimensions:** With mounting tabs 19.8mm x 15.2mm (0.78" x 0.90")
Without mounting tabs 19.8mm x 22.8mm (0.78" x 0.60")

**Video Format:** 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*

**Input Cable Pin Assignments (J1)**

1. Horizontal Sync (VGA/SVGA)
2. Vertical Sync (VGA/SVGA)
3. NTSC/PAL Video Signal (NTSC/PAL)
4. NTSC/PAL Video Return (NTSC/PAL)
5. Blue (VGA/SVGA)
6. Blue Return (VGA/SVGA)
7. Green (VGA/SVGA)
8. Green Return (VGA/SVGA)
9. Red (VGA/SVGA)
10. Red Return (VGA/SVGA)
11. Power Ground (POWER)
12. Power +5V DC (POWER)

**Image Control Pin Assignments (J2)**

1. Decrease / Set to Gain-Mode
2. Increase / Set to Offset-Mode
3. Ground

**PCB Connectors**

12-pin 1.25mm Header Molex 53047-1210
3-pin 1.25mm Header Molex 53047-0310

**Mating Wire Housing and Crimps**

12-pin 1.25mm Receptacle Molex 51021-1200
3-pin 1.25mm Receptacle Molex 51021-0300
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 display
** Exact power draw dependent on video input, video image, and gain/offset values