



SXGA-R2-1 Microdisplay

0.88" / 22.4mm diagonal

1280 x 1024 pixels



Features

- Reflective microdisplay - 0.88"/22.4mm diagonal
- High resolution - SXGA (1280 x 1024 pixels)
- Ferroelectric Liquid Crystal on Silicon (FLCOS) technology
- **Flexi-carrier mounted microdisplay**
- Colour sequential operation
- Illuminator drive output
- 24 bit colour (R:8, G:8, B:8)
- Separate interface electronics with flexible, lightweight connecting cable
- Analogue PC graphics and Digital Video input (DVI) formats
- Fast motion video
- Sharp images, clear text
- Lightweight and portable microdisplay module
- Programmable display addressing sequences
- Also available in the SXGA range of products:
 - [SXGA-R2-H1 -optimised for monocular HMD applications](#)
 - [SXGA-R2-H2 -optimised for binocular HMD applications](#)
 - [SXGA-R2-L1 -employs LVDS link to position the display remotely from the interface electronics](#)
 - [SXGA-R2-L2 -employs LVDS link to position the 2 displays remotely from the interface electronics](#)

Applications

- Personal viewers for PCs, DVDs.
- Head mounted displays
- Helmet mounted displays
- LED based projection
- Simulation
- Thermal imaging
- Holographic displays
- Microscopy
- Ophthalmic

Description

The SXGA-R2-1 is supplied to end-users as an instant plug and play unit consisting of a reflective microdisplay module and interface electronics. Together, these components generate an SXGA resolution image with up to 24-bit colour depth.

The microdisplay module enables the user to easily position the high-resolution display in a range of near-eye applications where the optical assembly is either head or helmet mounted or where space is at a premium.

The microdisplay is a digital Liquid Crystal On Silicon (LCOS) device based on a CMOS process, whose backplane forms a 1280 × 1024 active pixel plane for the LCD. The liquid crystal cell is constructed on top of the backplane with a sub micron cell gap.

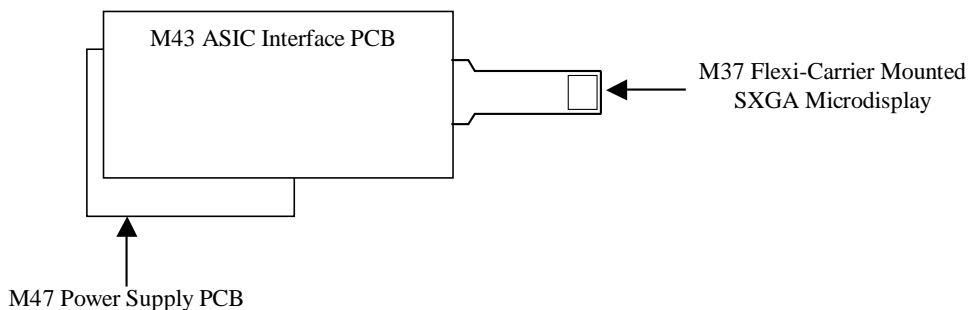
Grey scale and colour are achieved by the use of temporal dithering. This utilises the fast switching speed and digital characteristics of the device, which along with the low-pass temporal filter effect of the human eye, gives the viewer a perception of grey scales.

The SXGA-R2-1 microdisplay module is flexi-carrier mounted and driven directly from the interface electronics, consisting of the ASIC Interface PCB and a power supply. The ASIC Interface PCB accepts SXGA VESA standard graphics input in either analog or DVI formats and generates the addressing sequence and control signals for the microdisplay. It also provides the drive output for an optional RGB LED illuminator/viewer. The power supply for the interface is mounted on a separate PCB beneath the ASIC Interface PCB.

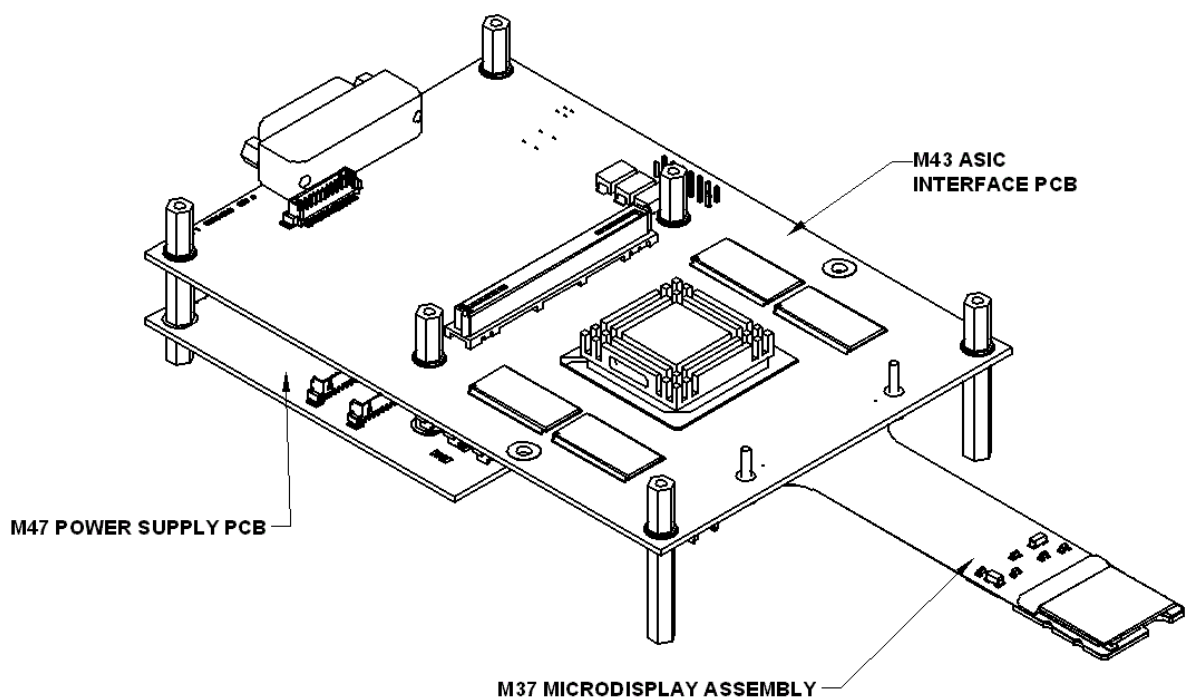
The SXGA-R2-1 is very flexible and through the PC-based graphical user interface (GUI) software allows the user to change addressing schemes, to vary LED brightness and gamma correction and to flip the image. CRL Opto also offers custom development of drive schemes for specific applications.

For more information on the board configurations and connection arrangements see below.

General Configuration

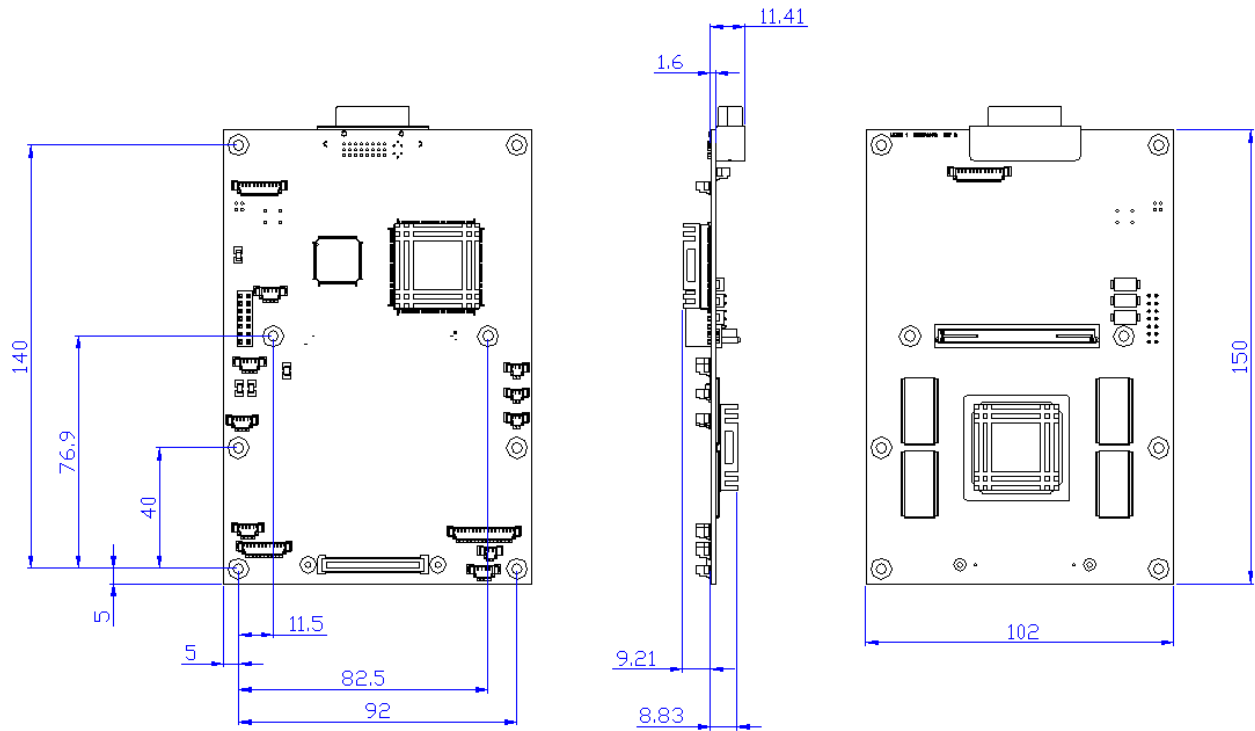


Mechanical Configuration

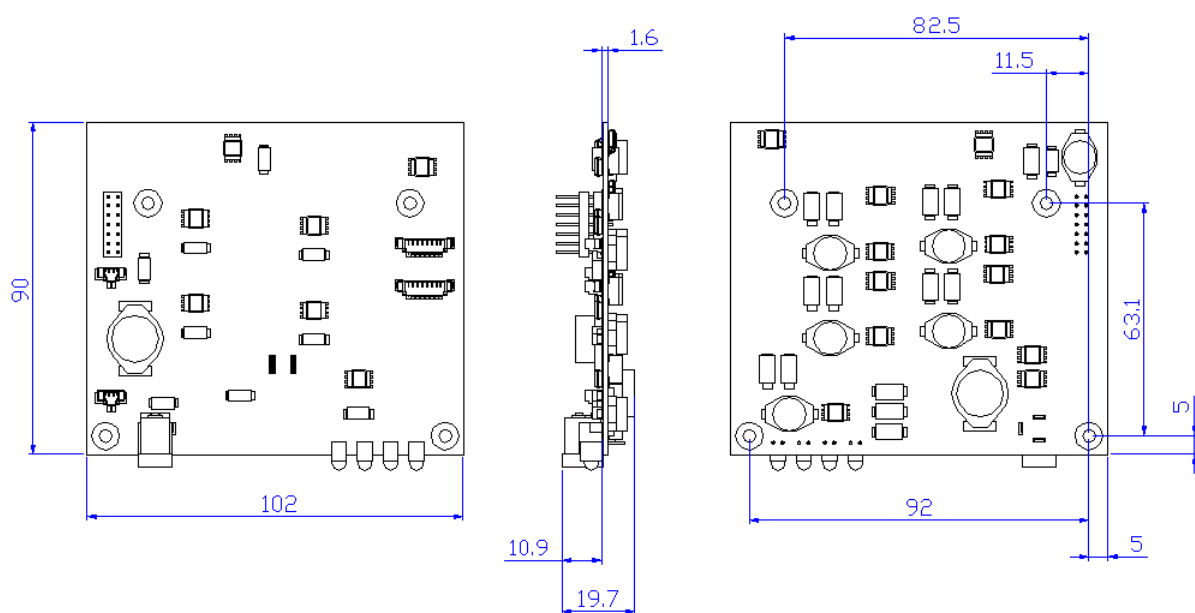


Mechanical Outline

1. M43 ASIC Interface PCB

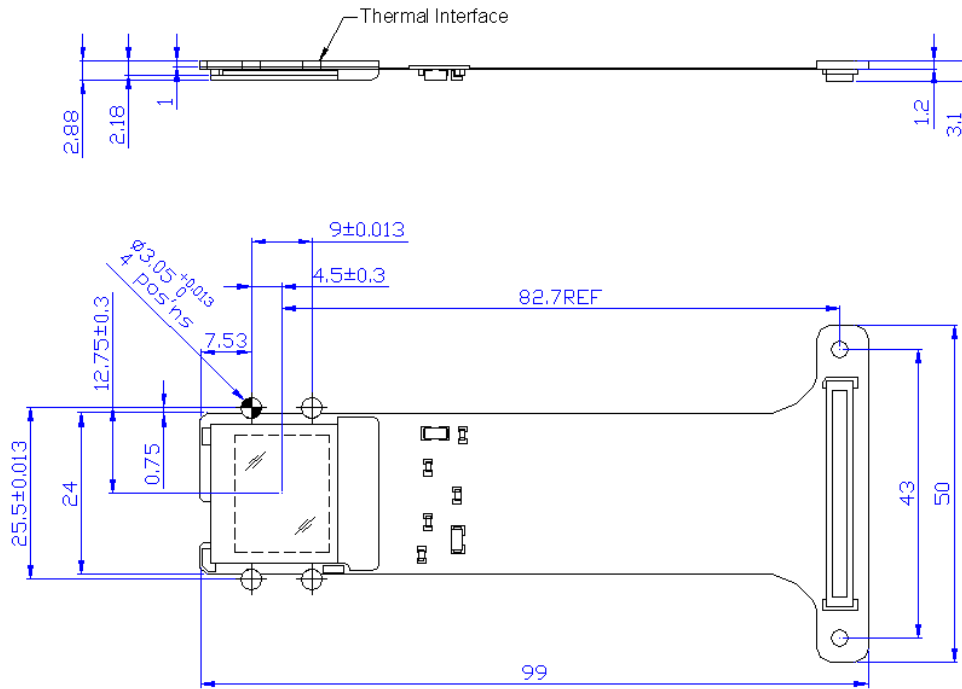


2. M47 Power Supply PCB



Mechanical Outline continued...

3. M37 Flexi-Carrier Mounted SXGA Microdisplay



Microdisplay Module Specification

Display type	FLCOS, reflective mode
Spatial resolution	1280 (H) by 1024 (V) pixels
Active area	17.43mm (H) x 13.95mm (V)
Pixel pitch	13.62µm (H) x 13.62µm (V)
Fill factor / Aperture Ratio	93%
Optical efficiency	>70% (including switching angle, ITO and cover glass losses)
Contrast ratio	>200:1
Uniformity	95%
Colour technique	Colour sequential
Colour depth	24 bits (red 8; green 8; blue 8)
Operating temperature range	+10°C to +60°C
Storage temperature range	-40°C to +85°C

Interface Specification

Input format	Mode	SXGA (1280 x 1024 pixels)
	Frame rate	60Hz, non-interlaced
Input connector	DVI connector mounted on M43 ASIC Interface PCB Optional HD15 socket (female) to DVI adaptor available for analogue input. (HD15 socket can also be supplied on optional mating cable assembly for M43 PCB)	

Interface Specification continued...

User controls	PC-based GUI software provides control over Gamma correction, LED brightness, Image flip (left-right and top-bottom invert) and <i>Colourwheel</i> drive parameters, and also a soft system reset. The GUI also enables different microdisplay drive sequences to be loaded up and updates of ASIC microcode to be installed. Image can also be flipped horizontally/vertically by two external switches (provided on optional mating cable assembly). Hard system reset can also be applied via external reset switch (also provided on optional cable assembly)
LED Output	Outputs for LED drive available from M43 ASIC Interface PCB via 4-way Molex header
Optional Outputs	Additional outputs for LED drive, <i>ColorSwitch™</i> and <i>Colourwheel</i> drive and control available on M43 ASIC Interface PCB (via optional cable assemblies)
Supply voltage range	12V DC +/- 10%
Power input connector	2.5mm jack plug on M47 Power Supply PCB (mains power supply with universal input, 12V DC output supplied as optional extra)
PCB footprint	150mm (L) x 102mm (W) x 22mm (H) approx. for M43 ASIC Interface PCB alone. Height (H) increases to 37mm with M47 Power Supply PCB fitted.

Product Ordering

To place an order please quote:

Product Configuration

SXGA-R2-1 SXGA microdisplay and Interface Electronics assembly consisting of: 1 x M37 configuration SXGA microdisplay connected to 1 x M43 ASIC Interface PCB and 1 x M47 Power Supply PCB.

Note All orders, irrespective of quantity, are supplied with 1 x Programming pack and User's Manual on CD ROM, plus 1 x HD15 socket (female) to DVI adaptor as standard. Please specify if greater quantities required.

Optional Accessories

CRLSXGV Viewer and LED illuminator assembly
 CRLCMAX Mains cable - USA
 CRLCMOX Mains cable – UK
 CRLCMEX Mains cable - Europe
 CRLPS12X 12 volt power supply

For more information on our exclusive range of SXGA (1280 x 1024) reflective microdisplays please refer to the relevant product datasheets on our website <http://www.crlopto.com> or contact CRL Opto directly: sales@crlopto.com