



# XGA1 Miniature LCD

1.8" / 46mm diagonal

1024 x 768 pixels



## Features

- Miniature transmissive TFT LCD
- High resolution – XGA (1024 x 768 pixels) LCD
- Fast response twisted nematic liquid crystal structure
- High contrast
- Binary and greyscale operation
- PC (analogue) input signal
- Sharp images, clear text
- Lightweight and portable
- Simple system integration
- Minimal space requirements
- Range of accessories available, including backlighting options
- Customisation service available
- Also available in the XGA range of products:
  - [XGA2 -1.3"/ 33mm](#)
  - [XGA3 -0.9"/ 23mm](#)
  - [XGA4 -0.7"/ 18mm](#)

## Applications

- Spatial light modulation
  - Simulation (projection)
  - Printing
  - Holography
  - Stereolithography
  - Optics / electro-optics R&D
- LCD
  - Simulation (direct view)
  - Thermal imaging
  - Head-up displays

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## Description

The XGA1 miniature LCD is supplied to users as an instant plug and play unit, consisting of an LCD panel and an associated interface PCB. To display an image on the LCD panel, simply supply an XGA signal from the external monitor port of a PC.

The LCD panel displays binary and continuous greyscale monochrome patterns and images with a spatial resolution of 1024 x 768 pixels. The unit uses the miniature LCD panel as the intensity modulating element. Optimised for amplitude modulation, the LCD panel is suitable for both high and low intensity light applications and allows users to integrate the unit into evaluation prototypes and end-user products.

The LCD panel is an active matrix, thin film transistor (TFT) type that uses a twisted nematic liquid crystal material. The panel is fabricated using a high temperature, polysilicon-on-quartz process that allows a high aperture ratio and good optical transmission to be achieved. The matrix is constructed with a metal mask that covers the inter-pixel spaces, obscuring the TFTs and preventing light leakage through the unswitched parts of the panel.

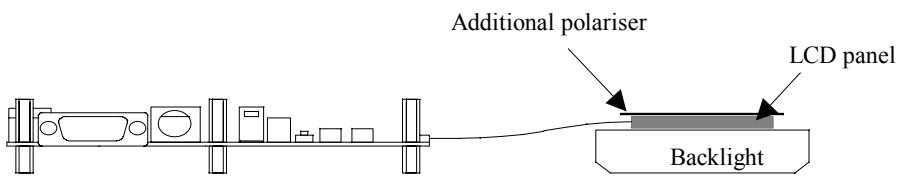
When used in conjunction with suitable external polarisers, the panel is capable of contrast ratios of greater than 100:1 for greyscale imagery and its response is fast enough to allow the display of motion video, with minimal smearing.

To view an image on the LCD panel using conventional illumination, polarisers are required on both the entry and exit sides of the panel.

An entry polariser is not necessary if a polarised light source is used. Should the application result in high levels of thermal dissipation, bonding an entry polariser onto the LCD panel is not recommended.

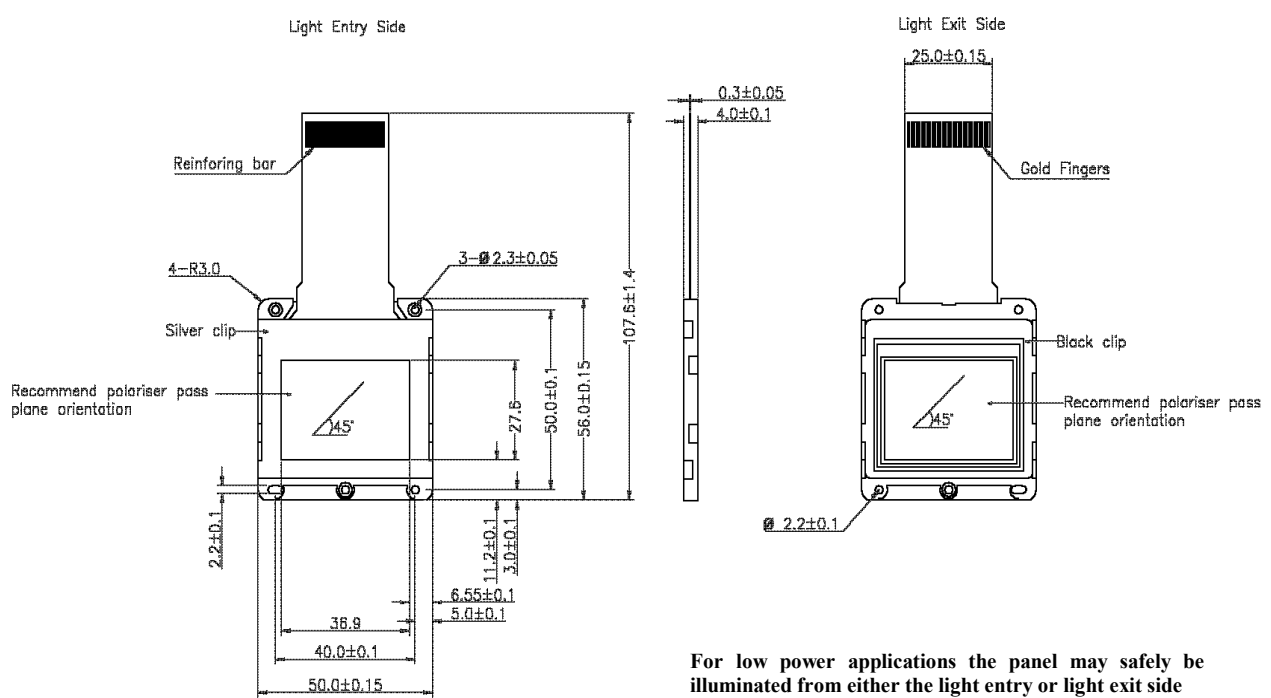
For more information on the board configurations and connection arrangements see below.

## General Configuration



Test configuration showing XGA1L01 LCD panel (bonded-on polariser on light exit side)

### 1. LCD Panel Specifications

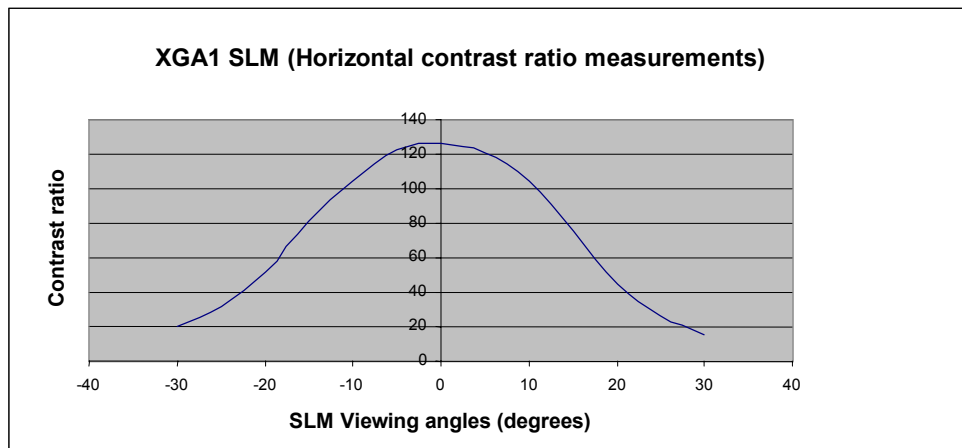
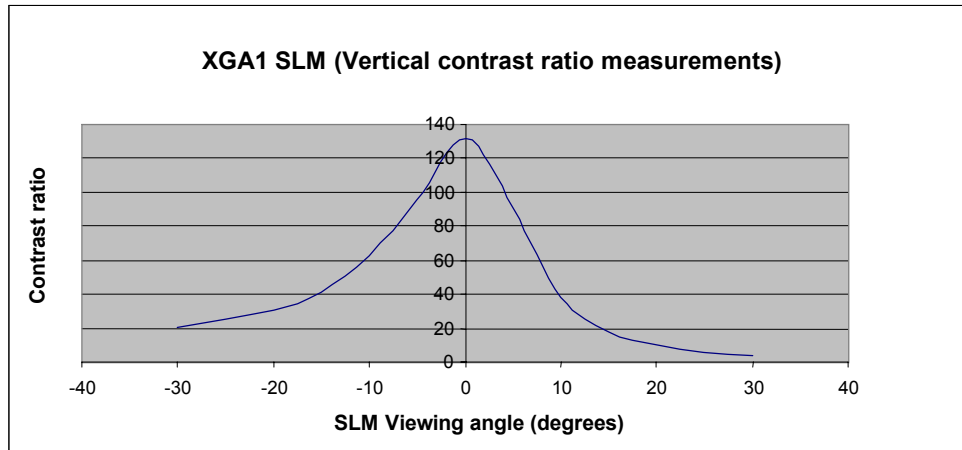


Type	Active matrix TFT transmission mode panel using twisted nematic liquid crystal material. <sup>1</sup>
Spatial resolution	1024 (H) by 768 (V) monochrome pixels
Pixel pitch	36µm (H) x 36µm (V)
Pixel dimensions	33µm (H) x 25µm (V) rectangular pixels
Panel dimensions	Active area 36.9mm (H) x 27.6mm (V)
Transmission	21% typical at 600nm
Fill factor	64% with opaque metal mask between pixels
Contrast ratio <sup>2</sup>	>100:1 readily achievable on axis

(1) Supplied with or without polarisers  
 (2) XGA1L01 panel measured with Polaroid HN22 film polariser in close proximity to LCD on light input side and bonded-on polariser on light exit side

LCD Panel specifications continued...

### Contrast ratio measurements



Note: Contrast ratio can vary between individual SLMs (these are typical plots)

## 2. Interface Specifications

The interface allows the SLM to be driven directly by the video adapter of a personal computer set to XGA resolution (1024 x 768 pixels) and running at a frame rate of 60Hz. Power for the unit is supplied by single rail external DC power supply.

The interface makes extensive use of digitally controlled analogue chips in the video signal path. These chips can be accessed by the use of a Remote Control Cable (RCC), supplied separately. This allows the interface to be plugged into a PC running suitable terminal emulation software such as "Hyper Terminal" providing access to all of the control registers on the interface and enables the user to remotely adjust image linearisation (gamma correction), contrast, brightness and position (horizontal, vertical).

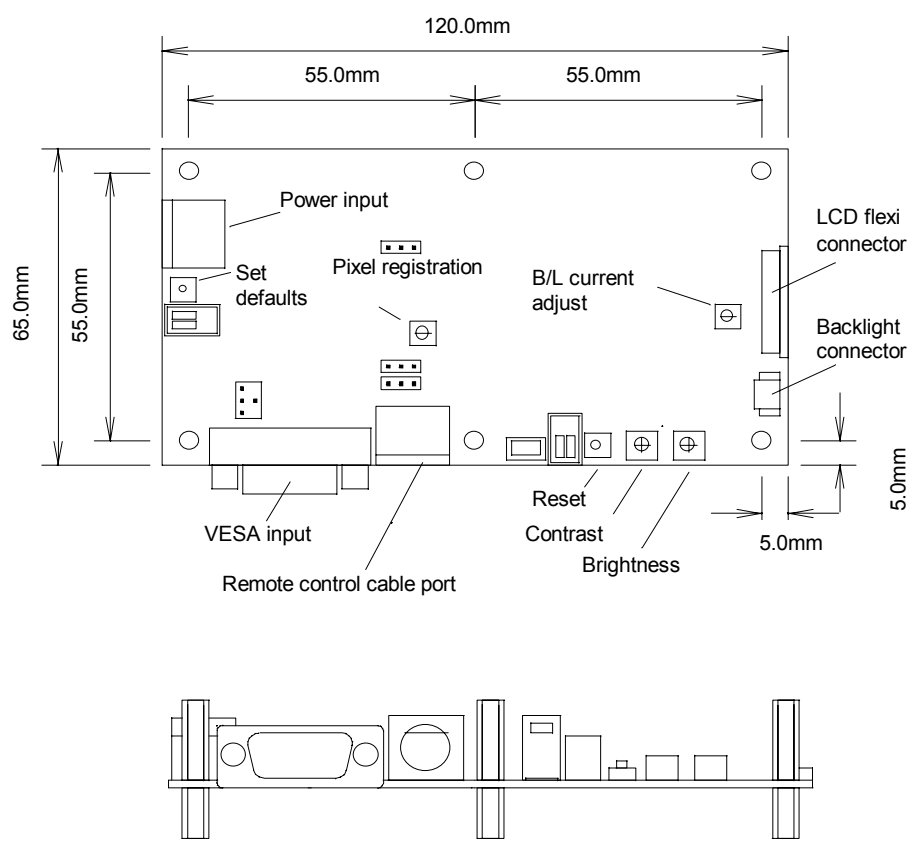
Rotary controls and switches mounted on the interface allow manual adjustment of contrast, brightness and image orientation (horizontal, vertical inversion).

The interface provides support for a Cold Cathode Fluorescent Lamp (CCFL) to be used as a backlight for the LCD.

If required, an optional extension flexi may be inserted between the interface and the LCD, to allow remote operation of the LCD panel flexi (supplied separately).

*Interface specifications continued...*

**Interface PCB**



Six mounting holes, 3.5mm I/D fitted with 3mm hex pillars

**Interface general**

Operating voltage	5V ±10%
Power consumption: Without backlight With backlight at full power	4.3W typical 6W typical
Operating temperature range: Interface LCD panel	-10 to 70°C -10 to 70°C
PCB dimensions including mounting posts	125mm (L) x 65mm (W) x 27.5mm (H) approx.
Backlight	3-pin 1.25mm pitch header connector

**Interface timing**

Type	PC XGA
Refresh rate	60Hz, non-interlaced
Line frequency	48.4kHz
Pixel frequency	65MHz

Note: Complies with VESA guideline #901101A, "1024 x 768 @ 60Hz"



## Product Ordering

To place an order please quote:

## Product Configuration

XGA1L11      XGA1 LCD panel without polarisers  
XGA1P01      XGA1 interface PCB

## Optional Accessories

XGA1L01      XGA1 LCD panel with bonded-on exit polariser  
XGA1L12      XGA1 LCD panel with bonded-on entry and exit polarisers  
CRLBL50      Cold Cathode Fluorescent Lamp (CCFL) backlight (50mm diagonal)  
CRLCVMO      PC-to-interface video cable  
CRLCMAX      Mains cable - USA  
CRLCMOX      Mains cable - UK  
CRLCMEX      Mains cable - Europe  
CRLPS05      5 volt power supply  
CRLXGAX      LCD panel extension flexi cable – 300mm or 450mm (please specify)  
CRLXGAB      Pendant controller - enables remote control of brightness, contrast, horizontal and vertical positioning of the image using push button switches. Controller cable length 2 metres  
CRLXGAP      Remote Control Cable (RCC) - enables wired remote control of image linearisation (gamma correction), contrast, brightness and position (horizontal, vertical) via a PC running Hyper Terminal. RCC cable length 2 metres

\*Mains cables for Denmark, Switzerland, Italy and Australia are available on request.

For more information on the XGA family or our exclusive range of SVGA video compatible transmissive displays please refer to the relevant product datasheets on our website <http://www.crlopto.com> or contact CRL Opto directly: [sales@crlopto.com](mailto:sales@crlopto.com)