



Improve Your Image

High Brightness Sunlight Readable Displays



CrystalVue Monitor Series



VARTECH
SYSTEMS INC.

HEADQUARTERS
11529 Sun Belt Ct.
Baton Rouge, Louisiana 70809

Phone 800.223.8050
International 001.225.298.0300
Fax 225.297.2440

E-mail sales@vartechsystems.com
Website www.vartechsystems.com

www.vartechsystems.com



Sunlight Readable Technology

Sunlight Readable LCD panels typically produce a maximum brightness (white light) of 200-350 nits, which is insufficient luminance (brightness) in environments where they are exposed to high ambient lighting or direct sunlight. It is VarTech Systems' experience that a luminance greater than 100 footLamberts (343 nits) is required for daylight applications, and a luminance greater than 200 footLamberts (686 nits) is required for sunlight readable applications unless a special optical bonding process is applied. It should be noted that the contrast ratio of the panel and the reflectance of the viewing surface also play significant roles in determining a display's luminance requirement in high ambient lighting conditions. VarTech Systems possesses the capability of augmenting the luminosity and daylight readability of most LCD flat panels by implementing one or more of the following passive and/or active product improvements:

- **Replace standard backlight and inverter with "high brightness" backlight and inverter equating to 700 nits to 1800 nits of brightness**
- **Add and/or replace LCD optical films**
- **Add contrast enhancement filters to surface of LCD display**
- **Optically bond contrast filters to LCD display to improve optical path and reduce surface reflectance**

VarTech's offers a comprehensive range of special Sunlight Readable LCD Monitors. These TFT LCD Monitors are designed to operate in high ambient light conditions. At 700 nits to 1800 nits of brightness, VarTech's Sunlight Readable Monitors outperform commercially available products that washout in direct and/or indirect sunlight conditions. These superior quality High Bright Sunlight Readable LCD Monitors are an ideal solution for factory automation, marine/mobile, kiosk, and process control applications.





High Brights Available in 6.4" - 21.3" Sizes

High Bright Features

- Daylight Bright Active Matrix TFT Display
- HD15, RCA, Mini Din video inputs (on most models)
- Exceptional Resolution Ranges
- 12V DC Power, 110 / 220 VAC, 24 VDC, 9-18 VDC
- Optional Touch Screen: Resistive or Capacitive
- High Contrast Ratios
- Manual or Automatic Dimming (optional)
- Optical Bonding (optional)



RESOLUTION & BRIGHTNESS

| | Resolution | Pixels | High Brightness | Ultra High Bright |
|-------|------------|-------------|-----------------|-------------------|
| 6.4" | VGA | 640 x 480 | 700 nits | N/A |
| 8.4" | VGA | 640 x 480 | N/A | 1400 nits |
| 10.4" | VGA | 640 x 480 | 850 nits | 1750 nits |
| 12.1" | XGA | 1024 x 768 | N/A | 1700 nits |
| 15.0" | XGA | 1024 x 768 | 700 nits | 1500, 1800 nits |
| 17.0" | SXGA | 1280 x 1024 | 700 nits | 1200, 1500 nits |
| 19.0" | SXGA | 1280 x 1024 | 850 nits | N/A |
| 20.1" | UXGA | 1600 x 1200 | 780 nits | N/A |
| 21.3" | UXGA | 1600 x 1200 | 750 nits | N/A |

MOUNTING OPTIONS

| | Chassis | Nema4 Panel | NEMA 4x Panel | NEMA 4 VESA | NEMA 4x Fully Enclosed VESA | Desktop | Rack | Yoke |
|-------|---------|-------------|---------------|-------------|-----------------------------|---------|------|------|
| 6.4" | • | • | • | | | | | |
| 8.4" | • | • | • | • | | | DUAL | • |
| 10.4" | • | • | • | • | | | • | • |
| 12.1" | • | • | • | • | | | • | • |
| 15.0" | • | • | • | • | • | • | • | • |
| 17.0" | • | • | • | • | | • | • | • |
| 19.0" | • | • | • | • | | • | • | • |
| 20.1" | • | • | • | • | | • | • | • |
| 21.3" | • | • | • | • | | • | • | • |



Passive Enhancements

V-BOND



**Dramatically
Improve Display
Performance**

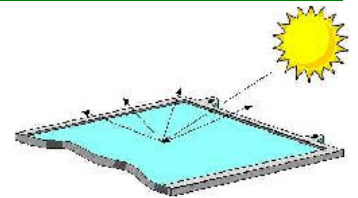
**WITHOUT
V-BOND**

**WITH
V-BOND**

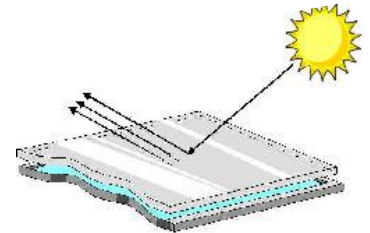
*** 6.4" - 21.3" Sizes Available**

HOW IT WORKS

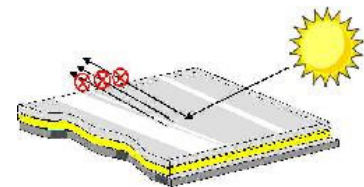
Light travels through a variety of transparent materials; such as air, glass or plastic. These materials may have differing "indices of refraction". As light transitions from one material to another, a mismatch in the "refractive index" will cause some portion of the incident light to be reflected. In the case of an air to glass interface, approximately 4% of normally incident light will be reflected. These reflections reduce the displays inherent contrast, to the point that with a bright light source, display visibility is reduced to unacceptable levels.



Reflected light increases if a cover glass or touch switch is placed over the display. The "index of refraction" mismatch will occur at each transition point; air to glass, glass to air and air to the front of the display. 4% reflective loss occurs at each transition and the loss is cumulative. An application of a simple cover glass will transmit back to the viewer over 12% of the original light source. Even in indirect sunlight, a display is quickly over-powered by the reflection and the display becomes impossible to read.



V-BOND from VARTECH is a solid, transparent bond that optically couples the front cover glass or touch screen directly to the face of the display. This coupling all but eliminates the reflection from the two internal layer interfaces. This will mean a reduction of the reflective loss by 2/3, compared to a separate cover glass, even without special treatment of the outer surface. In the most demanding applications, the front surface can be treated with anti-reflecting material. This will reduce the total reflective loss by over 90%!!! With a reduction of this nature, a 300-500 nit brightness display will be viewable in most daylight lighting conditions. At 500-800 nits brightness, most displays will be completely sunlight viewable.



Aside from the optical quality, V-BOND will add a significant degree of shock protection by reinforcing the display glass of the LCD. The outer glass will also protect the fragile, soft polarizer on the LCD from damage.

Transflectives Available in 15.0" - 21.3" Sizes

Transflective construction starts with a standard transmissive LCD and then integrated with a partially reflective mirror layer between the LCD and the backlight. When a transflective LCD is used indoors, it is illuminated by the backlight just like a transmissive LCD, except that the mirror layer blocks some of the light. When a transflective LCD is used outdoors, ambient light reflects off the mirror layer and illuminates the LCD. Note, that outdoor light has to go through the LCD twice, once on the way in and once on the way out and this tends to make the outdoor performance of a transflective LCD not as good as the indoor performance, where the light only has to go



through the LCD once. A transflective LCD is therefore by definition a compromise. It can never be as bright as a transmissive LCD indoors, and it can never be as bright as an ultra high-bright LCD outdoors, but with transflective technology, there is no added power requirement, the cost savings over traditional ultra high-bright LCDs can be significant, and the need to dissipate additional heat is minimized.

| <i>Features</i> | <i>-</i> | <i>Resolution</i> | <i>-</i> | <i>Brightness</i> |
|--|----------|-------------------|-------------|-------------------|
| <ul style="list-style-type: none"> • Daylight Bright Active Matrix TFT Display • Anti-Reflective Protective Faceplate • Digital, Analog, NTSC Inputs • HD15(F), RCA (NTSC/PAL) & 5 Pin Mini Din (S Video) • VGA to UXGA Resolution Capabilities | | Resolution | Pixels | High Brightness |
| | 15.0" | SXGA | 1280 x 1024 | Film Enhanced |
| | 17.0" | SXGA | 1280 x 1024 | Film Enhanced |
| | 19.0" | SXGA | 1280 x 1024 | Film Enhanced |
| | 20.1" | UXGA | 1600 x 1200 | Film Enhanced |
| | 21.3" | UXGA | 1600 x 1200 | Film Enhanced |



Mounting Options

| | Chassis | NEMA 4 Panel | NEMA 4X Panel | NEMA 4 VESA | NEMA 4X VESA Fully Enclosed | Rack | Desktop |
|-------|---------|--------------|---------------|-------------|-----------------------------|------|---------|
| 15.0" | • | • | • | | • | • | • |
| 17.0" | • | • | • | • | • | • | • |
| 19.0" | • | • | • | • | • | • | • |
| 20.1" | • | • | • | • | | • | • |
| 21.3" | • | • | • | • | | • | • |

