



# *User Manual*

## 21.3" Panel Mount Industrial Monitor

Model No. HIS-ML21-\_\_\_ D



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# Safety and Regulatory Information

## Warning

**To prevent fire or shock hazard, do not expose the unit to rain or moisture. Dangerously high voltages are present inside the unit. Do not disassemble the unit. Refer servicing to qualified personnel only.**

**This equipment is not intended for use in critical applications where its failure to operate would create immediate life threatening circumstances. Applications including, but not limited to, nuclear reactor control, aerospace navigation systems and life support systems are not appropriate for this product.**

**This product is intended to be mounted in a suitable cabinet or other enclosure. NEMA 4, 4x or 12 ratings are applicable only when properly installed in a like rated enclosure.**

**This product is a UL Listed Product and must be used with a listed computer.**

## FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the device.

# Using the LCD Display

## Setting the Timing Mode

Setting the timing mode of your computer graphics adapter (or other video source) is important for maximizing the quality of the screen image and for minimizing eye strain. The **timing mode** consists of the **resolution** (example 1600 x 1200) and **refresh rate** (or vertical frequency; example 60 Hz). After setting the timing mode, use the OSD (On-screen Display) controls to adjust the screen image.

For the best picture quality, set your LCD display timing mode to:

**VESA 1600 x 1200 @ 60Hz.**

Please refer to the computer graphics adapter manufacturer's manual for instructions on setting the resolution and timing mode. In Microsoft Windows, these settings may be found at this location:

**ME, 2000, XP:** Control Panel > Display > Settings

**Vista:** Control Panel > Personalization > Display Settings

**WARNING:** Do not set the graphics card in your computer to exceed the maximum refresh rate of 85Hz; doing so may result in permanent damage to your LCD display.

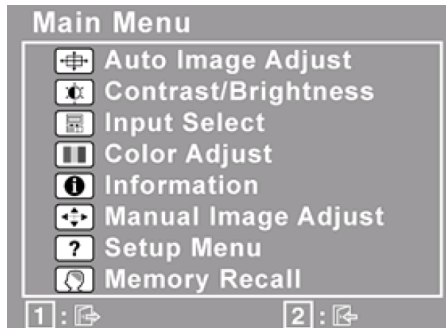
## OSD and Power Lock Settings

- **OSD Lock:** Press and hold [1] and the up arrow for 10 seconds. If any buttons are pressed the message *OSD Locked* will display for a few seconds.
- **OSD Unlock:** Press and hold [1] and the up arrow again for 10 seconds.
- **Power Button Lock:** Press and hold [1] and the down arrow for 10 seconds. If the power button is pressed the message Power Button Locked will display for 5 seconds. With or without this setting, after a power failure, your LCD display's power will automatically turn ON when power is restored.
- **Power Button Unlock:** Press and hold [1] and the down arrow again for 10 seconds.

# Adjusting the Screen Image

Use the buttons on the rear control panel to display and adjust the On-Screen Display (OSD) controls which display on the screen. Do the following to adjust the screen image:

1. To display the OSD Main Menu, press button [1].



**NOTE:** All OSD menus and adjustment screens disappear automatically after 15 seconds. This is adjustable through the OSD timeout setting in the Setup Menu

2. To select a control you want to adjust, press ▲ or ▼ to scroll up or down the Main Menu.
3. After the control is selected, press button [2]. A control screen like the one shown below appears:



The line at the bottom of the screen shows the current functions of buttons 1 and 2: Exit or select the Brightness control.




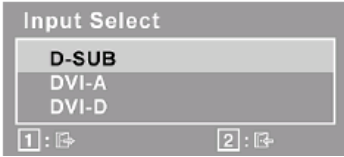
4. To adjust the control, press the up ▲ or ▼ buttons.
5. To save the adjustments and exit the menu, press button [1] twice


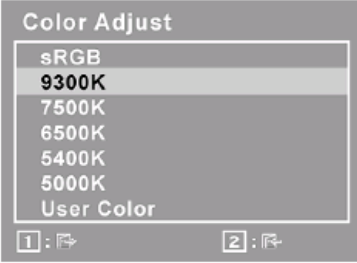

## The following tips may help you optimize your display:


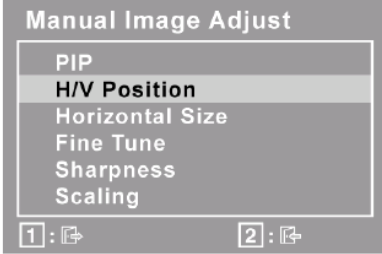
- Adjust your computer's graphic card so that it outputs a video signal 1600 x 1200 @ 60 Hz to the LCD display. (Look for instructions on "changing the refresh rate" in your graphic card's user guide.)
- If necessary, make small adjustments using H POSITION and V POSITION until the screen image is completely visible. (The black border around the edge of the screen should barely touch the illuminated "active area" of the LCD display.)

# On-Screen Display Controls


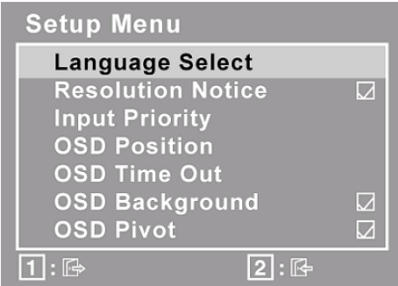

Adjust the menu items shown below by using the up ▲ and down ▼ buttons.

Control	Explanation
	<p><b>Indicator Light</b> The indicator light on the rear of the monitor glows green when the display is powered on and receiving a valid video signal; orange when the display is in power-save mode.</p>
	<p><b>Auto Image Adjust</b> automatically sizes, centers, and fine tunes the video signal to eliminate waviness and distortion.</p> <p>This feature may also be accessed by pressing [2] outside of the OSD menu.</p> <p><b>NOTE:</b> Auto Image Adjust works with most common video cards. If this function does not work on your LCD display, lower the video refresh rate to 60 Hz and set the resolution to 1600 x 1200 (or other compatible resolution listed in this manual).</p>
	<p><b>Contrast</b> adjusts the difference between the image background (black level) and the foreground (white level).</p> <p><b>Brightness</b> adjusts background black level of the screen image.</p>
	<p><b>Input Select</b> toggles between an analog and a digital signal.</p> 

Control	Explanation
	<p><b>Color Adjust</b> provides several color adjustment modes, including preset color temperatures and a User Color mode which allows independent adjustment of red (R), green (G), and blue (B). The factory setting for this product is 6500K (6500 Kelvin).</p>  <ul style="list-style-type: none"> <li>○ <b>sRGB</b> – This is quickly becoming the industry standard for color management, with support included in many of the latest applications. Enabling this setting allows the LCD display to more accurately display colors the way they were originally intended. Enabling the sRGB setting will cause the Contrast and Brightness adjustments to be disabled.</li> <li>○ <b>9300K</b> – Adds blue to the screen image for cooler white (used in most office settings with fluorescent lighting).</li> <li>○ <b>7500K</b> – Adds blue to the screen image for cooler white (used in most office settings with fluorescent lighting).</li> <li>○ <b>6500K</b> – Adds red to the screen image for warmer white and richer red.</li> <li>○ <b>5400K</b> – Adds green to the screen image for a darker color.</li> <li>○ <b>5000K</b> – Adds blue and green to the screen image for a darker color.</li> <li>○ <b>User Color</b> – Individual adjustments for red (R), green (G), and blue (B). <ul style="list-style-type: none"> <li>○ To select color (R, G or B) press button [2]</li> <li>○ To adjust selected color, press ▲ or down ▼</li> </ul> </li> </ul> <p><b>Note:</b> If RECALL from the Main Menu is selected when the product is set to a Preset Timing Mode, colors return to the 6500K factory preset.</p>
	<p><b>Information</b> displays the timing mode (video signal input) coming from the graphics card in the computer.</p> <p>See your graphics card's user guide for instructions on changing the resolution and refresh rate (vertical frequency).</p>

Control	Explanation
	<p><b>Manual Image Adjust</b> displays the Manual Image Adjust menu.</p>  <ul style="list-style-type: none"> <li>○ <b>PIP</b> allows two images to be displayed simultaneously as picture-in-picture <ul style="list-style-type: none"> <li>○ <b>PIP Position</b> moves the PIP windows and control screen</li> <li>○ <b>PIP Swap</b> swaps the main and sub window</li> </ul> </li> <li>○ <b>H./V. Position</b> moves the screen image left or right and up or down</li> <li>○ <b>Horizontal Size</b> adjusts the width of the screen image</li> <li>○ <b>Fine Tune</b> sharpens the focus by aligning text and/or graphics with pixel boundaries. <b>NOTE:</b> Try the Auto Adjust function before using the Fine Tune control</li> <li>○ <b>Sharpness</b> adjusts the clarity and focus of the screen image</li> <li>○ <b>Scaling</b> adjusts the video input signal of a screen size other than 1600x1200 <ul style="list-style-type: none"> <li>○ <b>Fill All</b> scales the image to fill the screen</li> <li>○ <b>Fill Aspect Ration</b> fills the screen while maintaining a correct aspect ratio</li> <li>○ <b>1:1</b> adjusts the video signal so that the height and width of the picture are the same.</li> </ul> </li> </ul>



Control	Explanation
	<p><b>Setup Menu</b> displays the menu shown below.</p>  <ul style="list-style-type: none"> <li>○ <b>Language Select</b> allows you to choose the language used in the menus and control screens.</li> <li>○ <b>Resolution Notice</b> advises of the optimal resolution to use.</li> <li>○ <b>OSD Position</b> allows you to move the on-screen display menus and control screens</li> <li>○ <b>OSD Timeout</b> sets the length of time an on-screen display screen is displayed. For example, with a “15 second” setting, if a control is not pushed within 15 seconds, the display screen disappears.</li> <li>○ <b>OSD Background</b> allows you to turn the On-Screen-Display background on or off.</li> <li>○ <b>OSD Pivot</b> rotates the OSD menu to Landscape or Portrait mode.</li> </ul>
	<p><b>Memory Recall</b> returns user-configured setting changes back to factory defaults.</p> <p><b>Note:</b> This control does not affect changes made with the User Color control, Language Select or Power Lock setting.</p>

# Installation Instructions

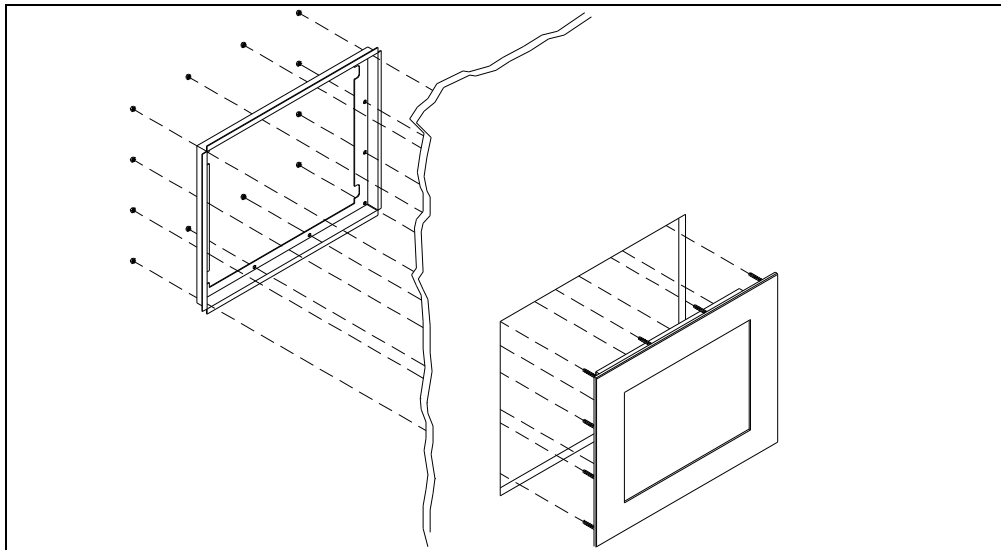
## Preparing for Installation

**Important!** Perform the following steps **BEFORE** installation of the monitor into the panel.

1. Ensure that sufficient power is available.
2. Ensure that sufficient space is available to allow for proper airflow into and out of the unit.
3. Ensure that the air temperature around the unit (top and bottom) will not exceed the rated specifications of the unit.
  - ***The maximum rated temperature of the HIS-ML21 is 50°C (122°F)***
  - ***Remember that heat rises – the temperature at the top of the cabinet will be much hotter than at the bottom when the air is not circulating.***
  - ***Also, remember that even though this product is designed to operate at 50°C with proper ventilation, the life span of any electronic device is shortened when it is consistently operated at high temperatures. Therefore it is wise to take steps to keep the temperature of the ambient air around the unit as low as possible.***
4. Ensure that the ambient humidity of the air around the unit does not exceed the rated specifications for the unit
  - ***The maximum rated humidity for the HIS-ML21 is 90% non-condensing***
5. If the display will be mounted far from the computer using long cables or extender devices, the full configuration should be bench-tested prior to final installation for easy troubleshooting.

## Installation into Panel

1. Refer to the drawing below.
2. Locate position in panel for mounting of the monitor. Assure that there is adequate space behind the panel. Allow extra space (0.5 in. behind and on each side) for air ventilation.
3. Cut a rectangular hole in the panel. Clean and deburr.  
Dimensions: 21.13" (536mm) W x 16.70" (424mm) H ; +/- .020"
4. Separate the rear collar from the unit by removing the 14 nuts.
5. Insert the unit into the front of the panel and re-attach the collar.
6. Tighten all 14 nuts to a torque of 24 inch-pounds to assure a water-tight seal between the poron bezel gasket on the monitor and equipment panel. *HIS will not assume liability for damage to internal electronics due to improper installation.*



# Touchscreen Driver Installation

The enclosed CD-ROM contains documentation and drivers for all major operating systems (touchscreen models only). To assure you have the most current information, check the following Internet address:

[http://HopelIndustrial.com/Touchscreen\\_Drivers.htm](http://HopelIndustrial.com/Touchscreen_Drivers.htm)

# Cleaning

**CAUTION! DO NOT USE ABRASIVE MATERIALS SUCH AS PAPER TOWELS OR DIRTY SHOP RAGS ON THE DISPLAY, AS IT WILL SCRATCH THE PROTECTIVE COATING. ALWAYS USE A SOFT CLOTH, PREFERABLY MADE OF COTTON.**

## **Resistive Touchscreen Model**

Any standard glass cleaner can be used to clean the touchscreen. Always spray the glass cleaner on the cloth or towel and then clean the touchscreen. Glass cleaner sprayed directly on the monitor could possibly leak inside a non-sealed unit and cause damage.

Vinegar or ammonia will not hurt the touchscreen. Again, spray the cloth and then clean the touchscreen.

## **Tempered Anti-Reflective Glass Window**

Use any standard glass cleaner as long as there is no abrasive or oily content. The anti-reflective coatings are physically part of the surface of the glass and resist degradation to the Military Specifications.

## **Acrylic Window**

Monitors with acrylic protective windows can be cleaned in the same manner as the touchscreen or glass window.

# Video Troubleshooting

## Blank Screen

After installing the power cable and connecting video cable to a PC, the monitor displays a blank screen.

- Press the power button and check to see if the power LED is lit.
- If the LED is not lit, make sure the PC is powered on. Make sure all cables are connected.
- If the LED stays yellow, check to see if the PC is in the power saving mode by pressing any keys on the keyboard. When the display is powered on and receiving a video signal, the LED will be green.

## Rolling / Unstable Screen

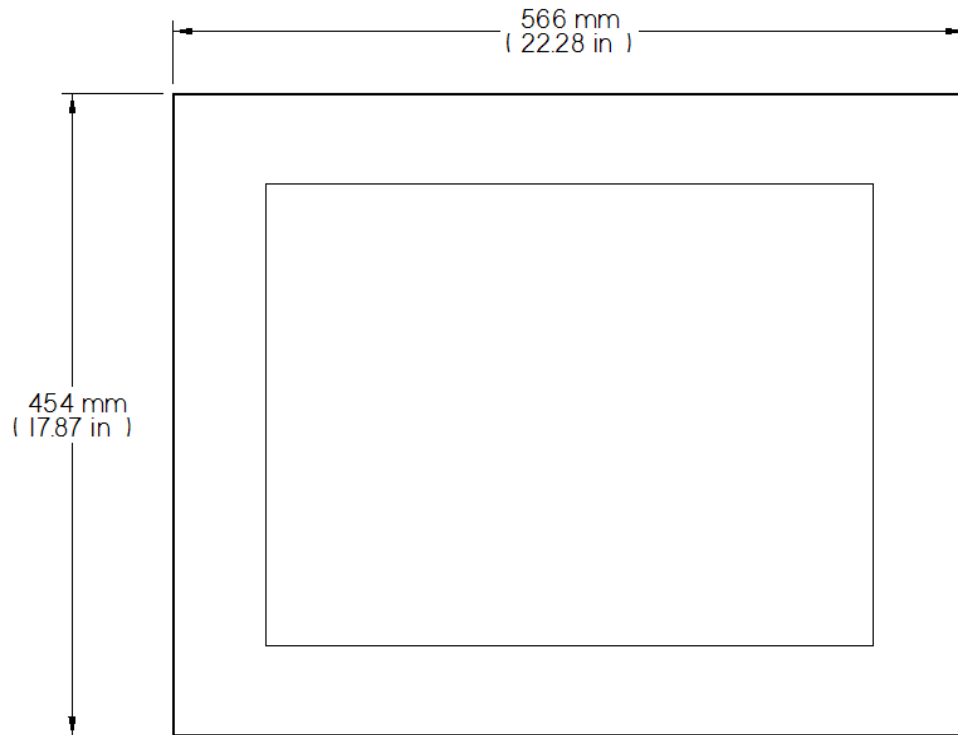
- Press "Auto Adjust" function on OSD menu.
- Make sure the PC display resolution is not set greater than 1600x1200 at 60Hz.
- Make sure the PC display resolution matches one of the factory-preset timings in this manual.
- Change the PC display resolution to 1600x1200 at 60Hz.
- Reset the monitor to the factory setting using the OSD.

## Screen is not perfect

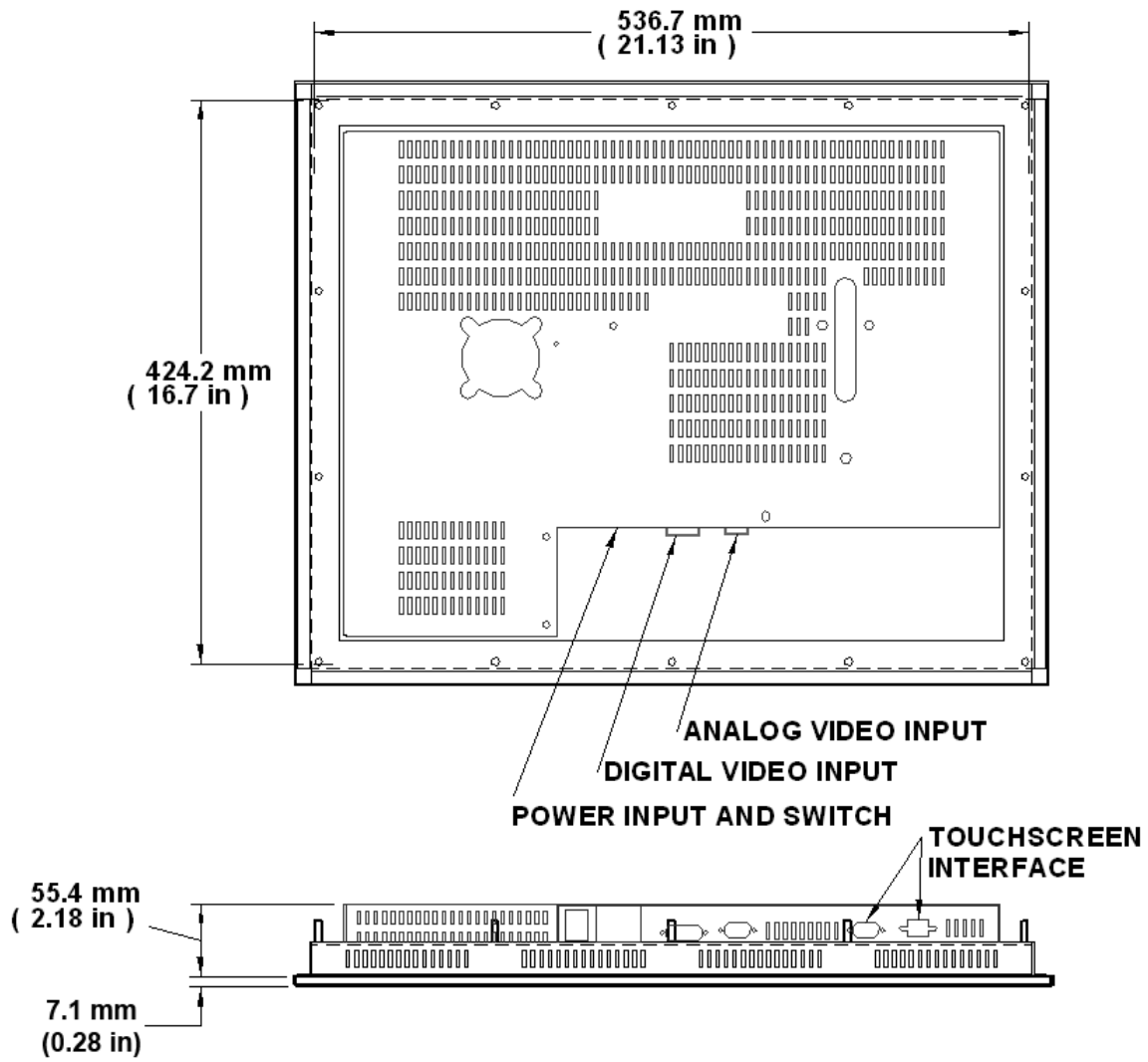
- Make sure the PC display resolution matches one the factory preset timings shown in this manual.
- Recall factory setting. Refer to panel controls and OSD functions in this manual.
- Fine-tune the picture by performing Manual Image Adjustments. Refer to OSD functions in this manual.

# Drawings

## Front View



## Bottom and Rear Views (Showing Cutout Dimensions)





# Specifications

## Display

Type	Thin-film transistor (TFT) Active Matrix Liquid Crystal
Size	21.3" diagonal
Image Size	17.00" (432 mm) W x 12.75" (324 mm) H
Native Resolution	UXGA (1600 x 1200) @ 60 Hz
Plug and Play	DDC1/2B compatible
Minimum Resolution	VGA (640 x 480)
Pixel Pitch	0.255 mm x 0.255 mm
Number of Colors	16.8 million (24 bit)
Viewing Angle (H/V)	178° / 178° (typical)
Brightness (white)	300 nits (cd/m <sup>2</sup> )
Contrast Ratio	1000:1 (typical)
Backlight	Six CCFTs (Cold Cathode Fluorescent Tube); 50,000 hours to half brightness; replaceable
Screen Protector (when not shipped with touchscreen)	Tempered glass to ANSI-Z97.1 SPEC; AR coated on both sides; 98% Transmission of light; 99% Reduction of glare; 53% UV blocking; 30% NIR Blocking

## Video

Input Connectors	HD-15, DVI-I (optional BNC input using HD-15 to 5-wire BNC adapter; see "Input Signal Formats" for a list of compatible video signals)
Input Signal Formats	<ul style="list-style-type: none"> <li>• RGB Analog video, 0.7Vp-p Positive at 75 Ohms (+/-5%), TTL Level (V high <math>\geq</math> 2.0 V, V low <math>\leq</math> 0.8 V); Compatible sync modes: Separate H/V sync, Combined sync, Sync on Green</li> <li>• DVI</li> <li>• NTSC/PAL composite input available (call for details)</li> </ul>
Horizontal Scan	30 kHz – 92 kHz
Vertical Scan	50 Hz – 85 Hz
Supported Video Standards	1600 x 1200 @ 60 Hz 1280 x 1024 @ 60, 75 Hz 1024 x 768 @ 60, 70, 72, 75 Hz 800 x 600 @ 56, 60, 72, 75 Hz 640 x 480 @ 60, 75 Hz 720 x 400 @ 70 Hz
Response Rate	8 ms (typical)

## Environmental

Temperature	0° to 50°C (32° to 122°F)
Humidity	10% to 90% non-condensing
Operating Shock	15 g, 6 msec, half-sine
Operating Vibration (sine)	1.0g, swept sine 9-500 Hz
Transport Vibration (random)	0.1g <sup>2</sup> / Hz, 10-200 Hz; 0.03g <sup>2</sup> / Hz, 200-2000 Hz
Altitude	Operating: up to 10,000 feet; Non-operating: up to 40,000 feet

## Electrical

Power Input	100-120/220-240 VAC, 2/1 A, 60/50 Hz
Power Consumption	53 W (typical)
Power Management	DPMS/energy star, < 2W

## Compliances and Certifications

Electrical	UL 508A Listed (File No. E318630); FCC Class A
Environmental	RoHS
Enclosure	UL 50E (File No. E318630)

## Functional

Panel Controls (rear)	Power, 1 (OSD), 2 (Select), Up, Down
OSD (On-Screen Display) Controls	Auto Image Adjust, Contrast/Brightness, Input, Color Adjust, Info, Manual Image Adjust, Setup Menu, Memory Recall
Touchscreen Option	5-wire resistive system; emulates a mouse; Serial RS-232 or USB interface to host computer

## Enclosure

Type	Panel mount; rear collar compressed panel gasket (5/16" maximum panel thickness); held by 14 x 10-32 studs
Panel Rating	NEMA 12/4/4X (with proper installation) – built to IP66 standards

## Physical

Depth behind Panel	2.18" (55.4 mm) maximum
Bezel	Black Powder-Coated Carbon Steel or Stainless Steel
Front Bezel outside dimensions	22.28" (566 mm) W x 17.87" (454 mm) H x 0.28" (7.1 mm) thick (not including gasket)
Cutout Dimensions	21.13" (537 mm) W x 16.70" (425 mm) H ; +/- .020"
Net Weight	23 lbs.
Shipping Weight	27 lbs.

## VGA Pin Assignment

Pin No.	Signal	Pin No.	Signal
1	Red	9	No pin
2	Green	10	Ground
3	Blue	11	Ground
4	Ground	12	SDA
5	Ground	13	H. sync
6	Ground	14	V. sync
7	Ground	15	SCL
8	Ground		

# Warranty Statement

## **Who is Covered?**

This warranty covers the purchaser of this product only and is not transferable without our written consent.

## **What Does This Warranty Cover and What is the Period of Coverage?**

We warrant this product to be free from defects in material and workmanship, subject to the conditions set forth below. The warranty on all industrial display products and KB-R2-EXT and KB-M2-EXT series keyboards remains in force for a three year period beginning on the date we invoice you. The warranty period on KB-PL1 keyboards is two years, and all other keyboards carry a one year warranty. If HIS repairs or replaces a product under warranty, its warranty term is not extended.

## **What Will We Do to Correct Problems and How Do You Get Service?**

We will repair or replace (at our sole option) any part of the unit which proves to be defective. Replacement parts may be new or refurbished and will meet the same specifications of the original parts or unit. We will return the product to you, by the shipping method we choose in the U.S.A. at our expense. You must pay for shipments to locations outside of the U.S.A. In order to receive warranty service you must get prior approval from HIS. To request warranty service you can telephone us at 678-762-9790 or send an email to support@HopelIndustrial.com. If we determine that warranty service is needed we will give you a Return Material Authorization (RMA) number. This RMA number must be conspicuously marked on the outside of the shipping box. HIS will not accept shipments not accompanied by the RMA number. You must ship or deliver the product to HIS Freight prepaid.

## **Pixel Faults**

Permanently dark or bright pixels can happen to TFT displays. Five or less permanently dead pixels (out of 1.3 million) do not make a good case for exchanging the unit. Please contact our Customer Service Department if the number of pixel faults exceeds the above-mentioned figure.

## **What Does This Warranty Not Cover?**

This warranty does not cover equipment which has been damaged due to misuse, abuse or accident such as: operating the equipment outside of published specifications; exposure to chemicals or gases not covered by specified NEMA standards; displaying fixed images for long periods of time resulting in afterimage effects; improper or unauthorized repair by anyone other than HIS or a service agency authorized by HIS to perform such repairs; fire, flood, "acts of God", or other contingencies beyond the control of HIS.

HIS' responsibility for malfunctions and defects in hardware is limited to repair and replacement as set forth in this warranty statement. HIS shall not be liable for direct, indirect, incidental, consequential, or other types of damages resulting from the use of any HIS product other than the liability stated above. These warranties are in lieu of all other warranties express or implied, including, but not limited to, the implied warranties of merchantability or fitness for a particular purpose. Some states do not allow the exclusion of implied warranties or the limitation or exclusion of liability for incidental or consequential damages so the above exclusions or limitations may not apply to you. You are cautioned that the performance of this product can be affected by many factors, such as system configuration, software, application, and operator control of the system. It is your responsibility to determine suitability of this product for your purpose and application.

**Hope Industrial Systems, Inc.**

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