

Solutions for Demanding Applications



VARTECH
SYSTEMS INC.

Industrial CRT and Flat Panel Displays

VT104 Ultra High Bright Series

VT104CHBU · VT104PHBU · VT104WHBU · VT104YHBU

User's Guide

Read these instructions completely before attempting to operate your new Color Display.

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1

1.1 About LCD Monitors

What you gain by using an LCD monitor in your industrial controls

LCDs are the future of display technology. Although CRTS have dropped in cost significantly, they do not offer the performance, reliability, and mounting options available with LCDs. LCD monitors consist primarily of an LCD, Video Board and a Back Light video. The LCD determines to a large extent the viewing angle, brightness and contrast. Beyond that it is the function of the video board which converts the analog RGB (Red, Green, Blue) signals from a standard video card to a high quality, digital RGB that the LCD can display.

Recently the video card has taken on a new role. It is the responsibility of this device to “scale” a particular video resolution to the “native” resolution of the LCD. Simply, consider that a computer is putting out a VGA [640x480] resolution signal, yet the LCD that is connected is an XGA [1024x768] display. The displayed picture would be in the center 1/3 of the LCD. With the introduction of the scaling engine. The converter will mathematically recalculate the 640x480 to 1024x768. This may sound simple but it is in fact a complex algorithm that adjusts for different aspect ratios and pixel alignment, essentially smoothing text and graphics to produce a picture that is pleasant to the eye.

1.2 Product Safety Precautions

- ⇒ Ensure that sufficient space is available around the display to provide the circulation necessary for cooling.
- ⇒ Ensure that the ambient air temperature will not exceed the specified maximum temperature.
- ⇒ Do not attempt to service this display yourself. The rear chassis has a seal so that non qualified personal will not expose themselves to dangerous voltages or other risks.
- ⇒ To protect from electrical shock, unplug the display power supply from the wall before moving.
- ⇒ Do not expose the display to direct sunlight or heat.
- ⇒ Do not use this display near water
- ⇒ Do not place any heavy objects on the power cords. Damage may cause electrical shock.
- ⇒ Unplug the power supply from the wall or unit if one of the following conditions exists.
 - ⇒ Power cord or plug is damaged or frayed
 - ⇒ Liquid is spilled into the display or the display is exposed to rain or water.
 - ⇒ The display does not operate normally when the operating instructions are followed.
 - ⇒ The display has been dropped or the enclosure has been damaged.
 - ⇒ The display exhibits a distinct change in performance, indicating a need for service.

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2.1 VT104HBU Series Display Features

- ⇒ The VT104HBU is capable of displaying 262,144 colors in a continuous spectrum. The high contrast LCD enhances the image with no geometric distortion.
- ⇒ The VT104HBU Series directly accepts an analog 5 wire RGB with separate H/V.
- ⇒ The VT104HBU Series is auto synchronous adjusting the display to the appropriate input between VGA or XGA.
- ⇒ The VT104HBU Series is available in Chassis, Panel, Wall / Arm Mount or Yoke Mount industrial packages.
- ⇒ The VT104HBU Series is supplied with a Anti-Reflective Screen unless equipped with an optional Touch System.
- ⇒ The VT104HBU Series uses +12VDC @ 2.1A as the standard power input on all models.
- ⇒ All models can be configured with an optional or 90-264VAC universal power supply.

2.2 Unpacking and setting up your display

Your LCD monitor package will consist of the components listed below. Open shipping container and lay all components on a flat clean surface.

2.3 What is included with your display

- ⇒ VT104CHBU or VT104PHBU or VT104WHBU or VT104YHBU LCD Monitor
- ⇒ 5 ft Video Cable.
- ⇒ 10-32 Mounting Hardware. (For use with Panel Mount only)
- ⇒ 6 ft RS232 Touch Interface Cable (Optional when touch is installed)
- ⇒ CD ROM with Touch Screen Drivers (Optional when touch is installed)
- ⇒ Users Manual

2.4 Connecting the Display

1. Connect all cables to the computer first. This would include the VGA cable and the optional RS 232 serial touch screen connection.
2. Once the 115/220VAC connection is made, the display is active.
3. If your computer was off, turn on your computer.
4. Your display should now operate as a normal computer display showing your windows or whatever video is being sent to the flat panel.

Note: If for any reason the display goes blank and gives an “out of Range” or “No Input Signal”, your computer or video source is putting out a signal that is out of range of the LCD’s video board. If this happens, reboot the computer or video source and make sure you are inputting the correct signal. If the display doesn’t work properly, it may be because:

- (a)The resolution is too high or low for the LCD.
- (b)The refresh rate is set too high. Refresh on an LCD is different than a CRT. Set the refresh to 60Hz. CRT’s need a high refresh rate to avoid flicker. The refresh rate has no impact on LCD’s.
- (c)The power source is incorrect.
- (d)The unit is malfunctioning. If you believe this to be true, disconnect the video cable from the rear of the LCD and connect to a known good computer CRT display. If the computer display is working satisfactory and the video is within the appropriate range, then contact Vartech Customer service for a RMA number at 800-223-8050.

2.5 Signal Connections

To avoid irregular operation and /or damage to the display, please insure correct video is being supplied as shown on the following page.

2.5 Signal Connections Cont.

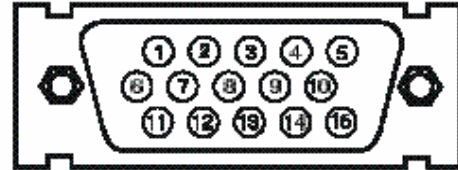
You can use an HD-15 connector cable or a BNC adapter cable to connect the flat panel monitor to the host computer. The HD-15 video cable (supplied in the kit) you use with this monitor is equipped with a conventional HD-15 connector at each end.

Note:

The following figure is the view looking into the pin end of the male connector or solder term end of the female connector.

Pin assignments for the HD15 video connector.

| Pin | |
|-----|---------------------|
| 1 | Red Video |
| 2 | Green Video |
| 3 | Blue Video |
| 4 | Not Used |
| 5 | Return |
| 6 | Red Video Ground |
| 7 | Green Video Ground |
| 8 | Blue Video Ground |
| 9 | No Connection |
| 10 | Sync Ground |
| 11 | Not Used |
| 12 | Bi-Directional Data |
| 13 | Horizontal Sync |
| 14 | Vertical Sync |
| 15 | Data Clock (SCL) |



Standard Resolutions Supported

- ⇒ 640 x 480 (VGA)
- ⇒ 800 x 600 (SVGA)
- ⇒ 1024x768 (XGA)

Composite Video Input Connector: CVBS 1.0V p-p

S-Video: S-VHS

LUMA Signal Input 0.7V p-p

CHROMA Signal Input 0.7V p-p

2.5 Signal Connections Cont.

Optional BNC Adaptor Cable

A 5BNC-to-HD15 adapter cable is available. The functions of the cables are described below.

- ⇒ **R, B, and G:** Red, Green, and Blue input connectors to establish color. These are used for RS-343 analog signals.
- ⇒ **HS/CS:** Separate horizontal/composite sync signal from the video source.
- ⇒ **VS:** Separate vertical sync signal from the video source.

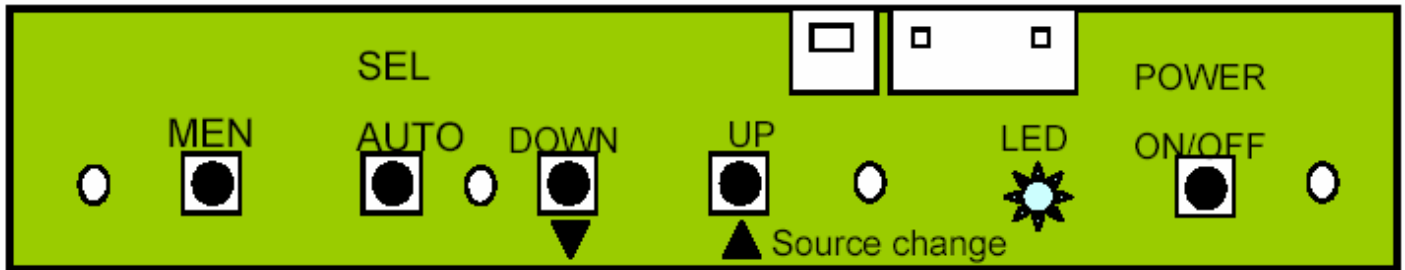
BNC Adapter Cable

This table describes the signal types you can use with the connectors:

| BNC Signal Types | | | | | | |
|---|--|---|---|---|--------|----|
| BNC Signal Type | Description | R | G | B | HS/ CS | VS |
| Sync-on-Green | Use the three video connectors. Horizontal and vertical syncs are supplied on the green video line. | X | X | X | | |
| Composite Sync (Not available) | Use the three video connectors plus the horizontal sync/ composite sync input | X | X | X | X | |
| Separate Horizontal and Vertical Sync. | Use the three video connectors plus the horizontal sync/ composite sync and vertical sync input. | X | X | X | X | X |

3**3.1 Adjusting the display**

OSD (On Screen Display) Adjustment—OSD enables the user to adjust the appearance of the image displayed on the LCD screen. Please refer to the OSD dimensional drawing for the designation of the push buttons and the indicator LED.

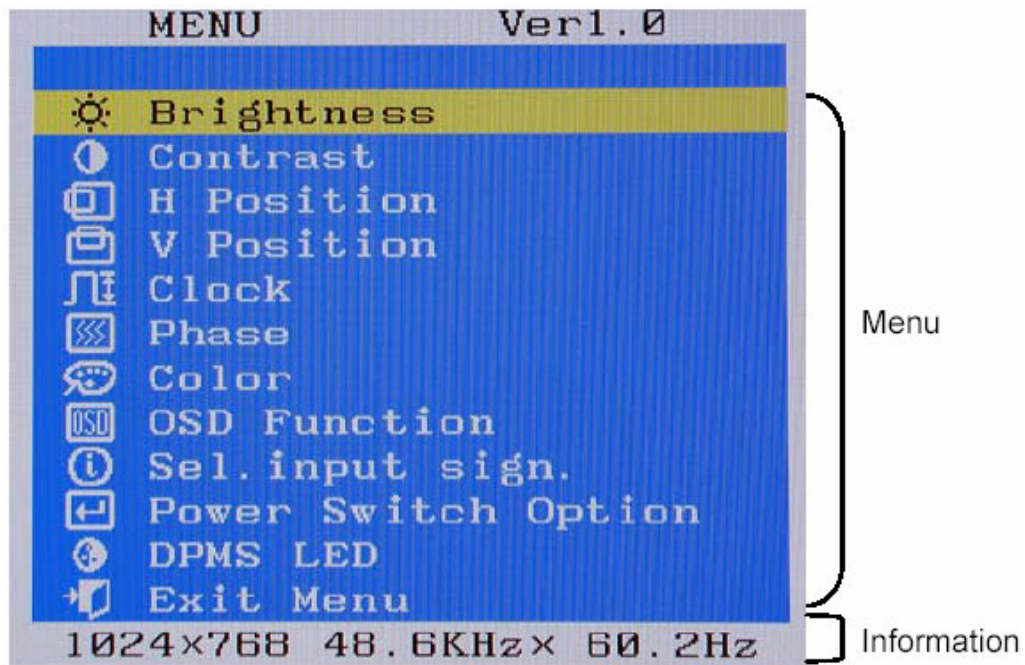


| BUTTON | FUNCTION | STATUS | HOT Key |
|------------------|---|---------------------|----------------|
| POWER | Power on/off | On/Off | |
| MENU | Activate menu | | |
| SELECT | Menu Select | | Auto setting |
| LED | Indicates operation status | Green / Off / Amber | |
| UP / DOWN ▲ ▼ | Cursor Control Increment / Decrement value | | Source change |

The chosen OSD settings will be stored in memory. The OSD menu can be cleared from the screen by moving the selection bar to the EXIT MENU icon pressing the SEL button, otherwise it will be automatically cleared after a few seconds of non-use.

3.2 Adjustment Procedure

OSD Main Menu



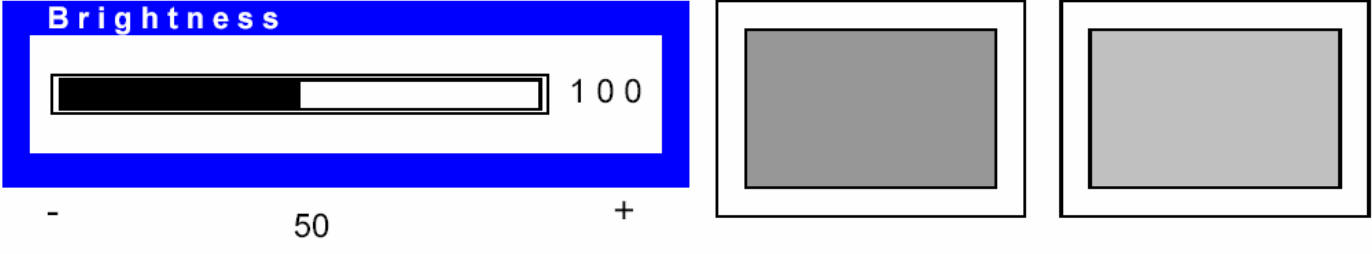
- Brightness: Increase/decrease panel brightness level, total: 100 steps
- Contrast: Increase/decrease panel Contrast level, total: 100 steps
- H, V Position: Image H, V position control total: 100 steps
- Clock: Fine tune the number of sampled data.
- Phase: Fine tune the position of sampled data (adjust image quality), total: 31 steps
- Color: Color temperature control, total: 100 steps
- OSD Function: OSD position, OSD Language, OSD Off Timer control
- Sel, input sign: Select input signal (analog, composite, S-Video)
- Power Switch Option: Select Power Switch on/off.
- DPMS LED: If when the DPMS select Amber LED color is Amber, otherwise LED is off.
- Information: Displays current video mode and frequency

3.2 Adjustment Procedure Cont.

OSD Function

Brightness
Procedure Menu > (Yellow bar Display) > Select

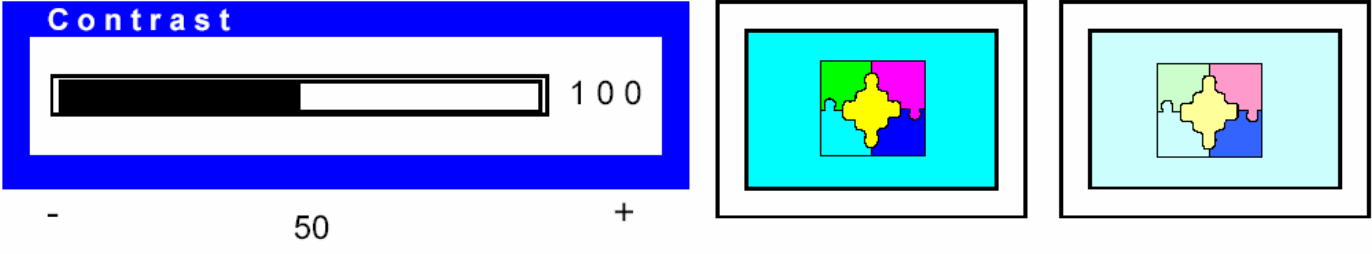
▼ Dark ▲ Bright



The diagram illustrates the brightness adjustment procedure. On the left, a blue-bordered OSD menu titled "Brightness" contains a horizontal slider bar with a black fill extending to the 50 mark, and the number "100" on the right. Below the slider are minus and plus signs. To the right, two square preview windows are shown. The first, labeled "Dark" with a downward arrow, shows a dark gray square. The second, labeled "Bright" with an upward arrow, shows a light gray square.

Contrast
Procedure Menu ▼ (Yellow bar Display) > Select

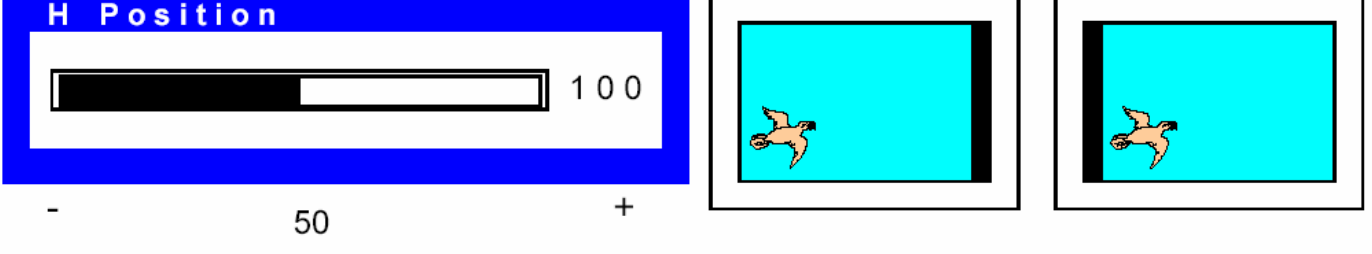
▼ Distinctive ▲ Vague



The diagram illustrates the contrast adjustment procedure. On the left, a blue-bordered OSD menu titled "Contrast" contains a horizontal slider bar with a black fill extending to the 50 mark, and the number "100" on the right. Below the slider are minus and plus signs. To the right, two square preview windows are shown. The first, labeled "Distinctive" with a downward arrow, shows a bright cyan background with a central puzzle piece graphic in green, yellow, pink, and blue. The second, labeled "Vague" with an upward arrow, shows a dimmer cyan background with the same puzzle piece graphic.

H Position
Procedure Menu > ▼▼ (Yellow bar Display) > Select (H)

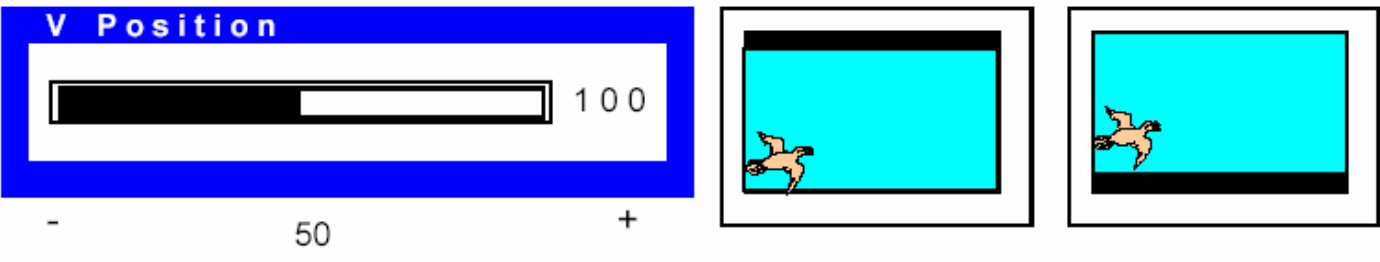
▼ ▲



The diagram illustrates the horizontal position adjustment procedure. On the left, a blue-bordered OSD menu titled "H Position" contains a horizontal slider bar with a black fill extending to the 50 mark, and the number "100" on the right. Below the slider are minus and plus signs. To the right, two square preview windows are shown. The first, labeled with a downward arrow, shows a cyan background with a bird in flight positioned towards the left side. The second, labeled with an upward arrow, shows the same bird in flight positioned towards the right side.

3.2 Adjustment Procedure Cont.

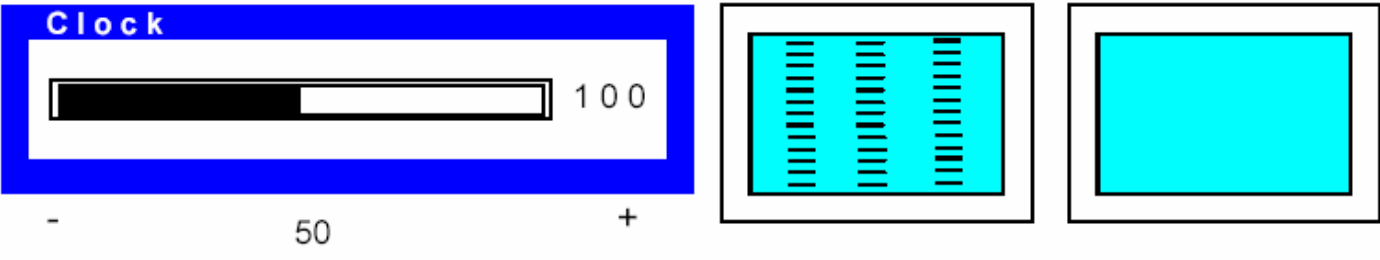
V Position
Procedure Menu > ▼▼▼ (Yellow bar Display) > Select (V



The diagram illustrates the V Position adjustment procedure. On the left, a blue-bordered control panel labeled 'V Position' features a horizontal slider with a black segment on the left and a white segment on the right. The value '100' is displayed to the right of the slider. Below the slider are markers for '- 50 +'.

To the right of the control panel are two square display windows. The left window, indicated by a downward-pointing triangle above it, shows a cyan background with a black horizontal bar at the top and a small bird icon at the bottom. The right window, indicated by an upward-pointing triangle above it, shows the same cyan background with the bird icon at the top and a black horizontal bar at the bottom.

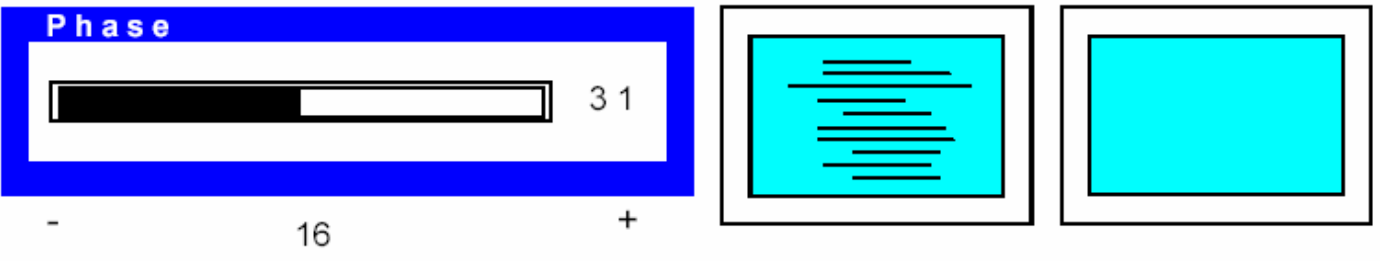
Clock
Procedure Menu > ▼▼▼▼ (Yellow bar Display) > Select



The diagram illustrates the Clock adjustment procedure. On the left, a blue-bordered control panel labeled 'Clock' features a horizontal slider with a black segment on the left and a white segment on the right. The value '100' is displayed to the right of the slider. Below the slider are markers for '- 50 +'.

To the right of the control panel are two square display windows. The left window, labeled 'Mismatch' above it, shows a cyan background with three vertical columns of horizontal black lines. The right window, labeled 'Match' above it, shows a solid cyan background.

Phase
Procedure Menu > ▼▼▼▼▼ (Yellow bar Display) > Select



The diagram illustrates the Phase adjustment procedure. On the left, a blue-bordered control panel labeled 'Phase' features a horizontal slider with a black segment on the left and a white segment on the right. The value '31' is displayed to the right of the slider. Below the slider are markers for '- 16 +'.

To the right of the control panel are two square display windows. The left window, labeled 'Mismatch' above it, shows a cyan background with several horizontal black lines. The right window, labeled 'Match' above it, shows a solid cyan background.

3.2 Adjustment Procedure Cont.

Color

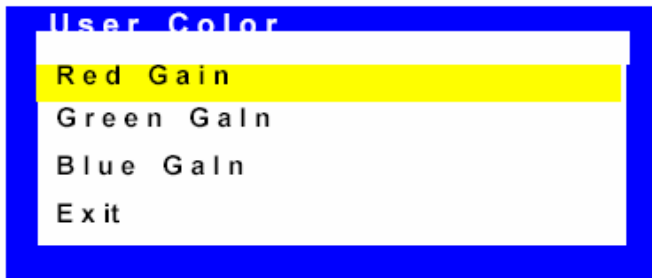
Procedure

Menu > ▼▼▼▼▼▼ (Yellow bar Display) > Select (Sub Menu 1



Preset 1: Default
Preset 2: bluish white
User Color: User Color Control

Sub Menu 1 > ▲ (Yellow bar Display) > select (Sub Menu 2 Display)



Sub Menu 2 > Select (Yellow bar Display) > Red Color Control

Sub Menu 2 > ▼ Select (Yellow bar Display) > Green Color Control

Sub Menu 2 > ▼▼ Select (Yellow bar Display) > Green Color Control

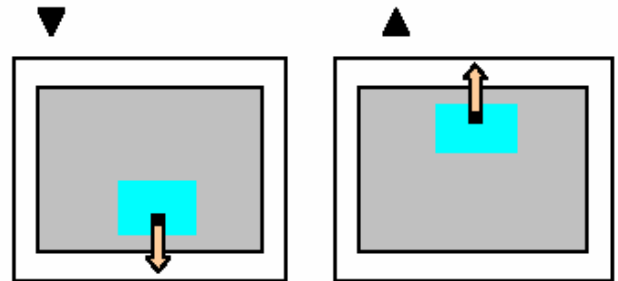
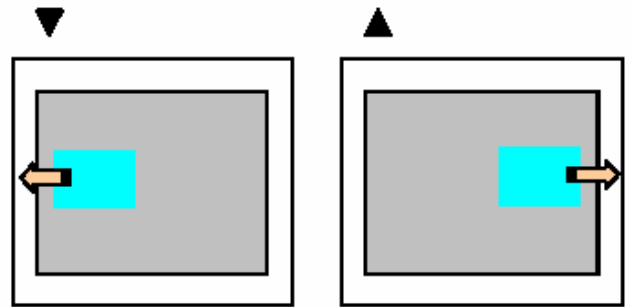
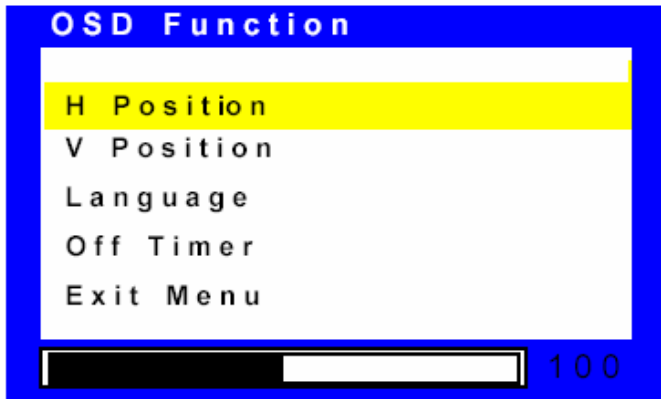


- 50 +

3.2 Adjustment Procedure Cont.

OSD Function

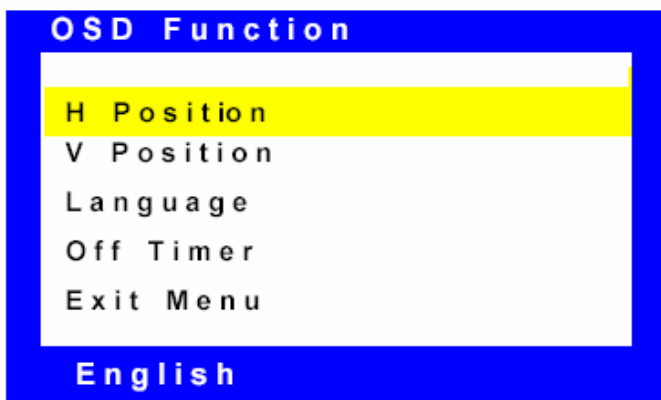
Procedure Menu > ▼▼▼▼▼▼▼▼ (Yellow bar Display) > Select (Sub Menu 1 Display) <Select



Select (Sub Menu 1 Display) < ▼▼
Select

Select (Sub Menu 1 Display) < ▼▼ Select

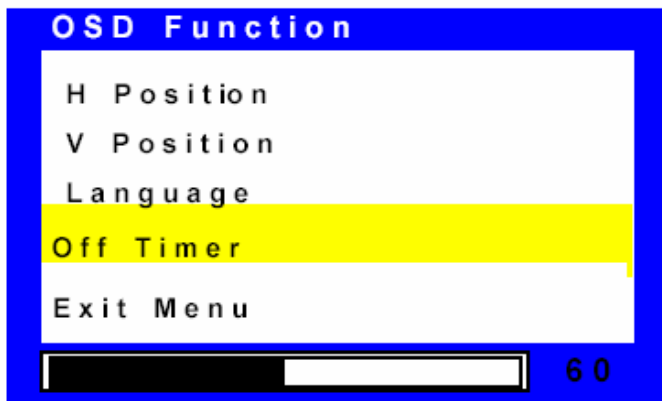
→ Language Control (English → ▼ Español → ▼ Francais → ▼ Deutsch → ▼ Italiano)



3.2 Adjustment Procedure Cont.

OSD Function

Select (Sub Menu 1 Display) < ▼▼▼ Select



OSD Menu Display Timer Control

SEL, INPUT SIGN.

Procedure Menu > ▲▲▲▲ (Analog RGB Display) >Select
▼ (Video input)<Select
▼▼ (S Video Input)<Select



Power Switch Option

Procedure Menu > ▲▲▲ (Magenta bar Display) > Select



3.2 Adjustment Procedure Cont.

DPMS LED

Procedure

Menu > ▲▲ (Magenta bar Display) > Select



AUTO SETTING . . .

Procedure

Select



4

4.1 Introduction

Touch screens are a common means to interface operator inputs to a system. The universal standard of Windows GUI (Graphical User Interface) has significantly increased the use of touch screens.

There are four main touch technologies. The technologies are resistive, surface acoustic wave (SAW), capacitive, and infrared (IR). Each touch technology has advantages and disadvantages based on different user applications.

4.2 Installation

All Vartech Systems displays configured with a touch screen are supplied with a CDROM which includes user manuals, application software, and drivers for various operating systems. Insert the supplied CDROM into a CDROM drive and follow the installation instructions that will appear on the screen.

Limited technical support is available by contacting Vartech Systems customer support at 800-223-8050.

| Troubleshooting | |
|--|---|
| Trouble | Troubleshooting Tip |
| No Picture | <ul style="list-style-type: none"> ⇒ The signal cable should be properly connected to the display card and computer. ⇒ Try disconnecting the video cable from the display and connecting to a CRT display if available to confirm the presence of proper video. ⇒ Make sure power is connected to the proper DC or AC source. ⇒ Make sure the resolution mode is supported by the display and check settings of the display card. ⇒ Confirm that the video cable is not defective. |
| Image Persistence | Image persistence occurs when a ghost of an image remains on the screen after the monitor has been turned off. Unlike a CRT monitor, an LCD monitor's image persistence is not permanent. To erase an image ghost, turn the monitor off for as long as the image was displayed. If the image was on for one hour and the ghost of the image remains, the display should be turned off for one hour to erase the image. To avoid this problem, use a screen saver. |
| Picture Quality & Image Stability | <ul style="list-style-type: none"> ⇒ Check for proper video cable for proper grounding and shielding. ⇒ Check the signal source for proper signal. ⇒ Check for proper adjustment of the Phase and Frequency controls. ⇒ Check for proper recommended signal timing. |
| Green LED not lit | Check for proper power and power connections |
| Green LED blinking | This indicates absence of video or proper video for this display |
| Display image is not properly sized | <ul style="list-style-type: none"> ⇒ Adjust the Vertical and Horizontal size controls via the OSD. (Reference setup adjustments) ⇒ Ensure that a supported mode is selected on the display card or system being used. Consult the display card or system manual for proper video. |
| No S-Video or NTSC operation | <ul style="list-style-type: none"> ⇒ Check for proper connections. ⇒ Check the setup instructions for proper input selection. |
| If these tips do not solve your problem, contact Vartech Systems Customer Service support. | |

Troubleshooting Cont.

| Trouble | Troubleshooting Tip |
|--|---|
| Screen is blank. | Screen saver activated. Video Cable problem. Check for proper installation Change video cable . Faulty video display. Needs Service. |
| Image is dim, even with brightness and contrast controls set full UP | Video cable problem. Check for proper installation of cables Faulty video source. Faulty display. |
| Image not centered | Reset the horizontal and vertical positioning using the on-screen menu. Check to see if video source is operating within the monitor's range |
| Image will not adjust | Video timing outside of range. Use the on-screen menu to adjust the Clock Setting. Make sure timing is within VESA standard. |
| Image is not stable. | Monitor has incorrect or bad sync signals. Check for proper video cable installation. Replace suspected faulty cable. Check to ensure that video source is operating within the display's range. |
| Vertical shaded bars on Screen image | Horizontal size not properly adjusted. Adjust horizontal size settings |
| Colors are missing | Faulty video cable. Missing from video source. Connect video source to another display |
| Screen jitter or noisy display | Monitor clock phase not properly adjusted |
| Slight distortion in text or Graphics. | Not working in native resolution. |
| Display is present but "bars" Appear or roll across screen | Ground loop problem between computer and display Interference from adjacent equipment |
| The background looks Acceptable but text and Icons seem to be missing rows of pixels | Video running interlace mode. |

6

CLEANING AND MAINTANENCE

Cleaning

Occasionally clean the display panel and cabinet with a soft cloth dampened (not soaked) with a mild (non-abrasive) glass cleaner. Keep turning a fresh side of the cloth toward the screen surface to avoid scratching it with accumulated grit.

Do not use paper products as they may scratch the surface. To minimize the risk of abrasion, allow the screen to stand dry.

Special care should be taken when cleaning a touch screen or polycarbonate shield that is installed over the screen. Abrasive and certain chemical cleaners can easily damage the surface.

Never use alcoholic or ammoniac cleaners to clean the polycarbonate shield or a touch screen.

Replacing a Line Cord

To avoid shock and fire hazards, the monitor's power cord should be replaced if the insulation becomes broken or if it develops a loose internal connection.

Other Maintenance

Qualified service personnel should perform all maintenance, except for the power cord replacement described above.

7.1 Panel Mount Procedure

Panel Mounting Procedure

1. Cut and drill the panel (refer to panel mount drawing). Measurements are in inches.

Panel Mounting Cutout

2. If access to the side of the monitor is not available following installation, attach the power and video cables to the side of the monitor at this time.
3. Install the monitor in the prepared cutout.
4. Install the lock nuts and washers, supplied with the monitor, behind the holes running along the sides and top/bottom of the cutout in the panel. Extra lock nuts and washers are provided.

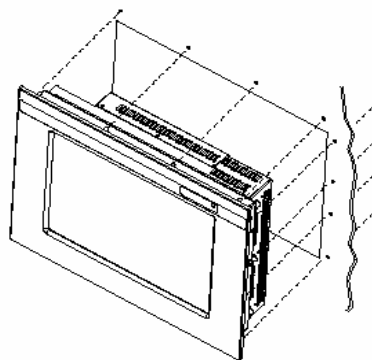
Note: Use #10-32 nuts for mounting.

5. Tighten all mounting nuts evenly to a torque of 24 inch-pounds.

ATTENTION: Mounting nuts must be tightened to a torque of 24 inch-pounds to provide panel seal and avoid potential damage. Vartech Systems assumes no responsibility for water or chemical damage to the monitor or other equipment within the enclosure due to improper installation.

6. Attach the power and video cables to the side of the monitor if you have not already done so.

Generic Panel Mount Diagram



8

SPECIFICATIONS

| ENGINEERING SPECIFICATIONS | |
|----------------------------|---|
| Panel Size | 10.4" |
| Type | Active Matrix Color Thin Film Transistor (TFT) |
| Resolution Capabilities | VGA to XGA |
| Pixel Pitch | .2055 mm |
| Active Display Area | 8.284" (w) x 6.214" (h) 210.432mm (w) x 157.824mm (h) |
| Pixel Format | 640 x 480, 800 x 600, 1024 x 768 |
| Viewing Angle (Left/Right) | 80° / 80° |
| Viewing Angle (Up/Down) | 80° / 80° |
| Contrast Ratio | 450:1 typical |
| Brightness | 1200 Nits typical |
| Response Time | (T _r + T _d) 34ms typical, 40ms max |
| Back Lights | 40,000 Hrs. CCFL |
| Video Connector | HD15, S-video, Composite |
| Colors Supported | 262,144 (6 bit) |
| Video Input | Analog 0.7v p-p/75 ohm, NTSC/PAL |
| Sync | Separate H/V, Combined |
| Input Voltage | +12VDC @ 2.1A optional: 90-264 VAC universal |
| Power consumption | 25 Watts typical |
| Operating Temperature | 0 to 50°C |
| Storage Temperature | -20 to 60°C |
| Operating Humidity | 10 to 95%NC |
| Storage Humidity | 10 to 95%NC |
| Operating Altitude | Up to 10,000 ft |
| Storage Altitude | Up to 40,000 ft |
| Optional Touch Screen | Capacitive or Resistive |

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5.03.06