Solutions for Demanding Applications

VARTECH
SYSTEMS INC.

VT231 Series

VT231W – VT231WX – VT231RP

User's Guide

Read instructions completely before attempting to operate your Display

Contents

1 GENERAL DESCRIPTION

The monitor uses a TFT Liquid Crystal Display. It is fitted with interface circuits that allow it to be connected easily to standard PC graphics cards or to a composite video source. The TFT LCD has a 23.1" display diagonal with a native resolution of 1600 x 1200 pixels (UXGA). The monitor can accept signals of lower resolution, such as VGA and SVGA, and these signals are scaled so that they are displayed full screen.

Along with conventional brightness and contrast controls, this display has an advanced brightness dimming technique, with a 1000:1 dynamic range, is employed to meet the demanding needs of night-time operation in maritime environments.
The front panel houses an ambient light sensor, and in conjunction with the LED control knob, adjusts the brightness of the panel LED to suit prevailing ambient light levels.

A simple user interface with On Screen Display (OSD) allows the user to adjust a wide variety of parameters if necessary. Once the parameters are set they are stored in non-volatile EEPROM. This ensures that the set-up is retained after power is switched off.
Operating parameters may also be modified using a RS232 serial data interface. There is a loop through RS232 connector allowing the data to pass through to a series of similar displays. With each display having a unique address (set on an internal DIP switch), individual displays can be accessed from a remote controller for dynamically adjusting display parameters.

The RGB input is buffered and routed to an auxiliary output socket to enable a single source signal to be distributed to a string of serially linked displays. All incoming and outgoing signals are terminated at 75 Ohms.

The AC model has an IEC mains outlet socket that supplies mains power to an auxiliary piece of equipment whilst the monitor is powered and switched on.

The monitor is designed for operation from AC supply 90 - 265V.
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2 HANDLING PRECAUTIONS

The casing of the monitor gives good protection to its internal components. However, to prevent damage to the LCD display at the front it is important to observe a few simple precautions.
When the surface is soiled, wipe lightly with clean absorbent cotton or other soft cloth.
The TFT panel and the circuit boards contain devices that are sensitive to Electrostatic Discharge. Adequate ESD precautions should be taken during unpacking, handling and installation of the TFT monitor.
There are no user serviceable parts inside the monitor and all servicing must be carried out by qualified personnel.
The cover should never be removed by unqualified personnel, as there are potentially harmful voltages within this equipment.

3 SPECIFICATIONS

Supply Input voltage	90 - 265V AC (Automatic Detect)
Power consumption	65W max
Fuse Rating	5A (ceramic High Rupture) AC & DC models
Display area	376.3mm (H) x 301.1mm (V)
Dot Pitch	0.294mm
Pixel Format	1600 (H) x 1200 (V)
Intensity	200 cd/m2 (typical) see note 1
Contrast Ratio	500:1 (typical)
Colour Depth	8 Bits per colour (16 million colours)
Viewing Angle	+/- 85 deg.
Response Time	15mS (typical)
Brightness Uniformity	25%
Backlight Life	50,000 Hours (typical)
Image Resolutions	640 x 480 pixels 800 x 600 pixels 1024 X 768 pixels 1280 X 1024 pixels 1600 X 1200 pixels
Signal Sources	RGB + V&H syncs (interlaced & non-interlaced) PAL/NTSC S-Video (Y/C)
Horizontal scan	31- 91KHz
Vertical scan	60 - 85Hz
Clock rate	135MHz max

Connectors		
	IEC mains inlet.	3 pin IEC Male
	IEC mains outlet.	3 pin IEC Female
	RGB video input.	15 way ‘D’ socket
	RGB video output.	15 way ‘D’ plug
	Composite video input	Phono (RCA 3mm) socket.
	S-Video input.	S-Video socket
	RS232 input.	9 way ‘D’ plug
	RS232 output.	9 way ‘D’ socket

Dimensions:	444mm (high) x 483 (wide) x 98.5mm (deep)
Fixing Centres	267mm (high) x 464.64mm (wide)
Fixing Screws	6mm
Ingress Protection	IP65 (front aspect) IP20 (rear aspect)

Operating Temperature	-15 to +55 deg C
Storage Temperature	-20 to +60 deg C
Operating Humidity	30% to 90% (non-condensing)
Storage Humidity	10% to 90% (non-condensing)
	For long term reliability, we do not recommend routine operation at extreme temperature and humidity levels.
Construction	Aluminium Housing Toughened safety glass with contrast enhancing optical coatings.
Approvals	Designed to comply with: IEC 60945 (2002) 4th Edition weather protection. IEC 61174
Type Approvals	Pending

Note 1: Display Brightness (Intensity)

Display Brightness is specified with peak white picture content displayed at maximum brightness and contrast settings of the monitor. The TFT backlights require 30 minutes of continuous operation to warm up and reach full brightness.

Some flicker may be noticed during the first moments after switch on as the backlights settle.

5 POWER AND SIGNAL CONNECTORS

The power and signal inputs to the monitor are located on the rear of the unit.

From left to right:

(Top) RS232 Input from controller – 9 way 'D' Socket
(Bottom) RS232 Output to other displays – 9 way 'D' Plug
IEC AC Power Outlet – AC model
(DC model does not have a power output connector)
IEC Filtered and Fused AC Power Inlet – AC model
(DC model has a 3 pole screw locking input connector in this location)
LED Brightness Adjustment Control
(Top) RGB Buffered Video Output – 15 way high density Plug
(Bottom) RGB Video Input – 15 way high density Socket S-VHS Video Input
PAL/NTSC Composite Video Input - Phono Socket. Blanking Plate for unused facility.

DATA INPUT

Standard hi-density 15way video connection

VIDEO PAL/NTSC INPUT

75Ω BNC input for PAL/NTSC composite video
1V peak-peak

Pin number	Function
1	Red video
2	Green Video
3	Blue Video
4	Not connected
5	Not connected
6	Red ground
7	Green ground
8	Blue ground
9	Not connected
10	Sync ground
11	Not connected
12	Horizontal sync
13	Vertical sync
14	Not connected
15	

SVHS Y/C INPUT

4 way Mini Din socket for connection to SVHS component video (Y/C)

RS232

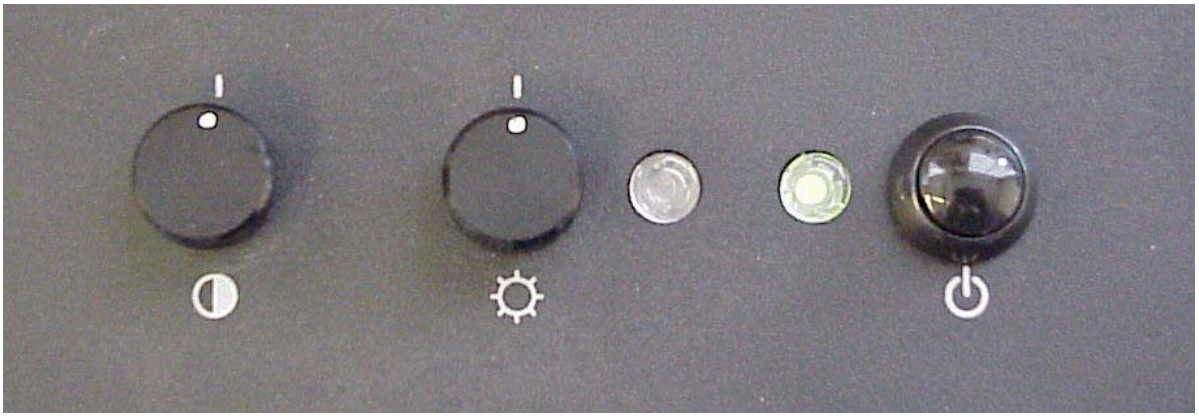
See connector details in RS232 section of the technical manual.

5 OPERATING INSTRUCTIONS

The monitor must be connected to a suitable ac power source and a suitable video signal.
The monitor is switched on using the push button on the front.

USER CONTROLS

Adjustments to the brightness & contrast are made by front panel controls.



Contrast | Brightness | On/Off standby switch

Note: Standby switch requires only short press to switch ON, but button must be pressed for 5 seconds to switch OFF – This feature prevents accidental switching off by user.
To the left of the On/Off switch is the Power Indicator LED
To the right of the Brightness control is the ambient light sensor.

SERVICE/INSTALLATION (On Screen Display) CONTROLS

Pressing menu button activates the monitor's main set-up controls. When this is done the monitor displays a menu of adjustments. The functions of the brightness and contrast buttons are now changed to operate this menu.

By pressing the ш and ш SEL buttons the user may highlight different items on the menu. The highlighted item may be adjusted or set by pressing the ш and ш ADJ buttons.

Note that these buttons are sometimes referred to as **+** and **–** on the OSD menu.

When OSD parameter setting is complete pressing the menu button can close the menu. Alternatively, the menu can be left to time out and disappear by itself.
Detailed description of the OSD menus are included in the following pages.

OPERATIONAL NOTES

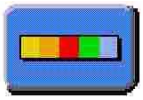
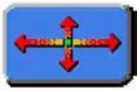
In the absence of a video signal the display will show the message “No Signal”

For navigational applications an external, and variable source of illumination is required to overcome the brightness knob and control pushbuttons not having variable self lighting. The requirement is specified in IEC 60945, 6.5c, and can be accomplished with a goose-neck lamp on a dimmer circuit.

6 ON SCREEN DISPLAY (OSD) MENU

To turn on the OSD menu: Press the MENU button
Move to next icon: Press the MENU button
Select options within icon menu: Use SEL UP/SEL DN buttons, the selected option is in yellow. Increase/decrease setting: Use +/- buttons
Move selection left/right: Use +/- buttons, the selected option is in green
To confirm the selection: Use + button

OSD functions

	**Brightness and Contrast :** Brightness  Increase/decrease panel brightness level, total: 100 steps Contrast  Increase/decrease panel contrast level, total: 100 steps
	**Color Temperature :** 9500K / 8000K / 6500K / 5000K Adjust the warmness of the image displayed. The higher temperature the coolest image looks like. The lower temperature the warmest image looks like.
	**Video Adjustment :** (DISPLAYED IN VIDEO MODE ONLY) Color:  adjust video color level Tint:  adjust video tint level Sharpness:  adjust video image sharpness level Video Type: DVD / VCR change brand width to match the source
	**Frequency and Phase :** (DISPLAYED IN PC MODE ONLY) Frequency Phase  Adjust the image horizontal size Fine tune the data sampling position (adjust image quality)
	**Video System :** Select video system and input signals (DISPLAYED IN VIDEO MODE ONLY) AUTO : automatic detection of NTSC and PAL system (not applicable in SECAM system) NTSC / NTSC 4.43 : manual select NTSC system PAL / PAL M : manual select PAL system SECAM : manual select SECAM system
	**Status :** (DISPLAYED IN PC MODE ONLY) Display graphic information: resolution and frequency
	**Position :** Image up/down : Use SEL UP/SEL DN to move the image vertically Image left/right : Use +/- to move the image horizontally
	**Rotation :** (DISPLAYED IN VIDEO MODE ONLY) Rotates the image from landscape format to portrait format.

Picture in Picture : (DISPLAYED IN PC MODE ONLY)

PIP Size : Off / 1 / 2 / 3 — Select PIP window size: close, size 1, size 2 and size 3

PIP Source : Auto / Comp / Svid /YCbCr — Select video source to be display in PIP window:
Auto – automatic detection of Composite, S-video and Component
Comp – manual select composite video only
SVid – manual select S-video only
YCbCr – manual select component video only

Horizontal Position  adjust the position of the PIP window horizontally

Vertical Position  adjust the position of the PIP window vertically

Advanced PIP Settings :

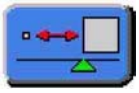
Brightness  adjust the image brightness of the PIP window

Contrast  adjust the image contrast of the PIP window

Sharpness  adjust the image sharpness of the PIP window Tint

 adjust the tint of the image of the PIP window

Color  adjust the color of the image of the PIP window

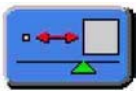


Video Scaling : (DISPLAYED IN VIDEO MODE ONLY)

Use the UP and DOWN arrow keys to select the following scaling modes.

Normal
Letterbox
Letterbox with Subtitles

Nonlinear Scaling Modes : Horiz Clipping / Horiz Offset / Horiz Stretch / Vert Clipping / Vert Offset / Vert Stretch



Graphic Scaling Modes : (DISPLAYED IN PC MODE ONLY)

Use the up and down arrow keys to choose a scaler mode.
Use the + or - key to modify a following scaler parameters.

One to One :
Horizontal Pan 

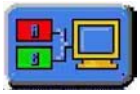
Vertical Pan 

Fill Screen : enable full screen expansion for lower resolution Image
Fill to Aspect ratio : enable fill screen expansion for lower resolution image according to aspect ratio

Nonlinear Scaling Modes : Horiz Clipping / Horiz Offset / Horiz Stretch / Vert Clipping / Vert Offset / Vert Stretch

Language : Select OSD menu language display

1. English
2. Danish



Video source : Select the input video signal

Analog RGB / Component Video / Composite Video / S-Video.

Utilities :

User Setting : User Timeout : adjust the OSD menu timeout period in a step of 5 seconds
DPMS : Disable / Enable the DPMS function

Auto Source Select : Off - Disable auto source select function.
Low - Auto source select enable ONLY in power up.
High - Auto source select ALWAYS enable.

Gamma : 1.0 (Default setting)
1.6
2.2

OSD Setting : OSD Horz Position :  move the OSD menu horizontally
OSD Vert Position :  move the OSD menu vertically OSD
Background : Translucent / Opaque
OSD Rotate : Normal / Rotate

Freeze Frame : Freeze the image (use "+" button)

Zoom : Zoom level : enable the zoom in function on the image displayed.
Use "+" button to zoom in the image.
Use "-" button to decrease the zoomed image.

Horizontal Pan : 
Vertical Pan : 

Direct Access #1:Define the hot key function ("+" and "-") for one of the following adjustments : Brightness / Contrast / Volume / Freeze / Zoom /Video Source*/ PIP

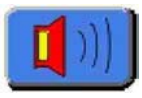
Direct Access #2:Define the hot key function ("SEL UP" and "SEL DN") for one of the following adjustments : Brightness / Contrast / Volume / Freeze /Zoom /Video Source*/ PIP

Display Orientation : Normal / Horizontal Inverse / Vertical Inverse / Inverse

Calibrate RGB Gain : Color Calibration (DISPLAYED IN PC MODE ONLY)

Load Factory Defaults : Recall factory default settings.

* By pressing the hot key, the source is in sequence of Analog RGB/Composite Video/S-Video/ Component Video.



Volume :

Adjust the audio volume level (functions only if the audio add-on installed)
Most products are not fitted with this option – contact factory for details.

Exit menu
The OSD settings chosen will be stored in memory. The OSD menu can be cleared from the screen by moving the selection bar to the EXIT icon pressing the + button otherwise it will automatically clear after a few seconds (time-out period) of non-use.

OSD Firmware version

Activate the menu selection button, and repeat the menu button until the "Utilities" page is displayed. The firmware version is displayed on the right hand side of this page as V1.2E or similar.

7 PICTURE ADJUSTMENT

When the monitor is switched on for the first time and a signal applied to the screen will adjust itself to factory default settings and display a picture.

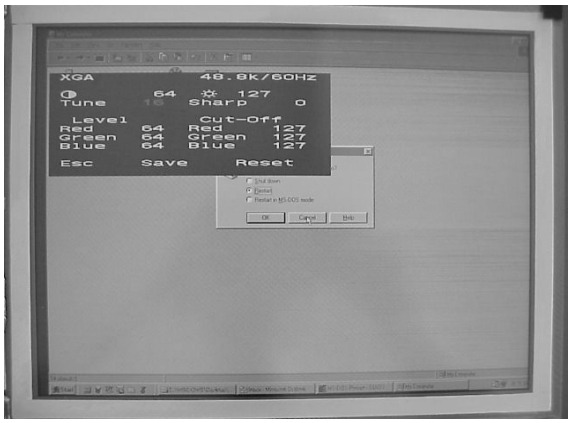
Use of the menu Autoset facility will bring the picture into near correct adjustment.

It is possible that some adjustments will be needed to obtain optimum picture quality. Use the OSD controls to adjust the Frequency and Phase parameters. See Item 4 in the
OSD Menu section.
The first step is to adjust the *Frequency.*

FREQUENCY ADJUSTMENT:

It is advisable to display a picture that has a large number of single pixels or vertical lines. The Windows 95 or 98 Shutdown screen is very good for assessing the *frequency* effect.
Poor adjustment of *frequency* causes vertical lines of noise to be displayed. Adjust the *frequency* so that the noise lines move further apart from each other. Keep adjusting until the noise lines disappear.

Windows Shutdown screen showing poor *frequency*



Windows Shutdown screen showing correct *frequency*

8 TROUBLE SHOOTING GUIDE

Symptom	Cause
Picture not displayed	No power – blank screen. No signal – blue screen with legend "No Signal"
Noisy picture over whole screen	*Phase* adjustment needed
Noisy picture in bands	*Frequency* adjustment needed

9 Video Modes & Signal Timings

Mode	Resolution	Clock (MHz)	Horizontal Freq (KHz)	Vertical Freq (Hz)
E1_70	640 x 350	25.175	31.469	70
E1_85	640 x 350	31.500	37.861	85
E2_70	640 x 400	25.175	31.469	70
E2_85	640 x 400	31.500	37.861	85
T_70	720 x 400	28.322	31.469	70
T_85	720 x 400	35.500	37.927	85
V_60	640 x 480	25.175	31.469	60
V_67	640 x 480	31.500	37.500	67
V_72	640 x 480	31.500	37.861	72
V_75	640 x 480	31.500	37.500	75
V_85	640 x 480	36.000	43.269	85
SV_56	800 x 600	36.000	35.156	56
SV_60	800 x 600	40.000	37.879	60
SV_72	800 x 600	50.000	48.077	72
SV_75	800 x 600	49.500	46.875	75
SV_85	800 x 600	56.250	53.674	85
X_60	1024 x 768	65.500	48.363	60
X_70	1024 x 768	75.000	54.476	70
X_72	1024 x 768	75.000	57.515	72
X_75	1024 x 768	78.750	60.023	75
X_87I	1024 x 768	44.900	35.522 Interlaced	87
X_85	1024 x 768	94.500	68.677	85
SX_60	1280 x 1024	108.000	63.981	60
SX_72	1280 x 1024	135.000	78.125	72
SX_75	1280 x 1024	135.000	79.976	75
SX_85	1280 x 1024	149.844	91.146	85
NTSC	S-Video	14.318	15.734	60
PAL	S-Video	17.75	15.625	50
NTSC	Composite	14.318	15.734	60
PAL	Composite	17.75	15.625	50

10 Glossary of Terms and Acronyms

Colour Depth	The number of bits used to store each of the primary colours.
IP	Ingress Protection rating for equipment sealing against liquid and dust.
LCD	Liquid Crystal Display
NTSC	National Television Standards Committee - Standard for American composite video signal.
OSD	On Screen Display
PAL	Phase Alternated by Line - Standard for European composite video signal.
PIP	Picture In Picture
RGB	Red-Green-Blue. Video signal format using separate signal lines for the three primary colours and sync signals.
Response Time	The average response time for the display to react to a change in electrical signal from white to black, or black to white.
TFT	Thin Film Transistor – the mechanism for flat screen pixel control.
VGA	Display resolution of 640 x 480
SVGA	Display resolution of 800 x 600
XGA	Display resolution of 1024 x 768
SXGA	Display resolution of 1280 x 1024
UXGA	Display resolution of 1600 x 1200

Due to a policy of continual improvement the information in this manual is subject to change without notice.

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