

Pennine

Fanuc 14" TFT Replacement
Monitor

User Manual

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GENERAL DESCRIPTION

This range of TFT units can display signals of lower resolution and can scale them for displaying full screen.

In common with normal TFT Liquid Crystal Displays, this monitor can be used with standard PC type graphics cards. However, this monitor can also be used with Legacy systems which use non-standard display controllers where normal TFT Displays cannot be used.

For convenience, the monitor is supplied pre-programmed with a variety of commonly used Legacy and PC signals. These signals will be displayed correctly on the monitor without further adjustment.

If an un-programmed signal is input, the monitor automatically measures that signal and displays a picture, the user can then adjust to optimum settings.

An On Screen Display interface allows a wide variety of parameters to be adjusted if necessary. Once the parameters are set they can be stored in non-volatile EEPROM, which ensures that the set-up is retained after power is switched off.

Power input is by 110/220V ac via input connector block.

HANDLING PRECAUTIONS

1. The casing of the monitor gives good protection to components within it. But to prevent damage to the LCD display, observe the following precautions:

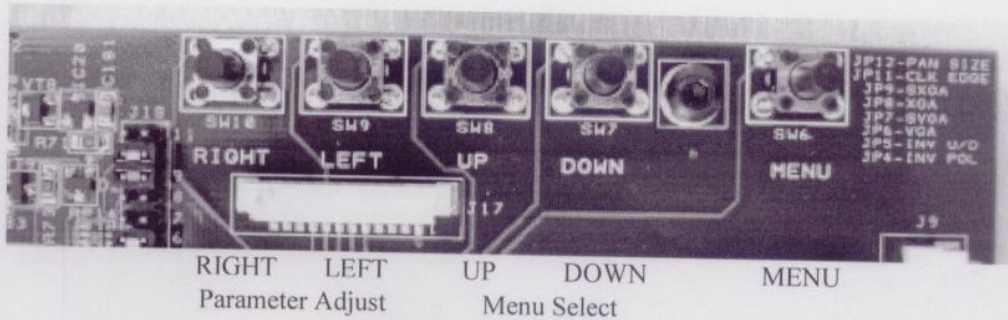
When the panel surface is soiled, wipe lightly with clean absorbent cotton or other soft cloth.

2. The TFT panel and the circuit boards contain devices which are sensitive to Electrostatic Discharge. Sensible precautions should be taken during unpacking and handling of the TFT monitor.

3. No User Serviceable parts are contained inside of the monitor and all servicing must be carried out by qualified personnel. (The Backlight Inverters operate at high voltages which are potentially harmful).

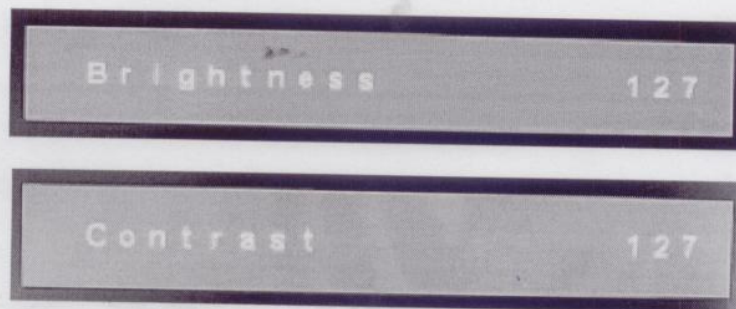
USER CONTROLS

The monitor is adjusted by OSD menus that are controlled by push buttons on the main PCB of the monitor.



Contrast & Video Brightness Quick Adjustment

Pressing one of the ▼ or ▲ buttons (without the Menu button) will allow quick adjustment of video brightness (unique to each video mode). Pressing either of the ◀ or ▶ buttons (without the Menu button) will allow quick adjustment of the contrast.



OSD MENUS

The OSD "Menu" button is used to turn the On Screen Menus on & off. When switching the Menus off, the monitor automatically saves any adjustments that have been made to the picture. Some Menu Items are only available in certain modes of operation.

The "Menu select" buttons are used to highlight the menu items.

The "Menu adjust" buttons are used to adjust the highlighted item.

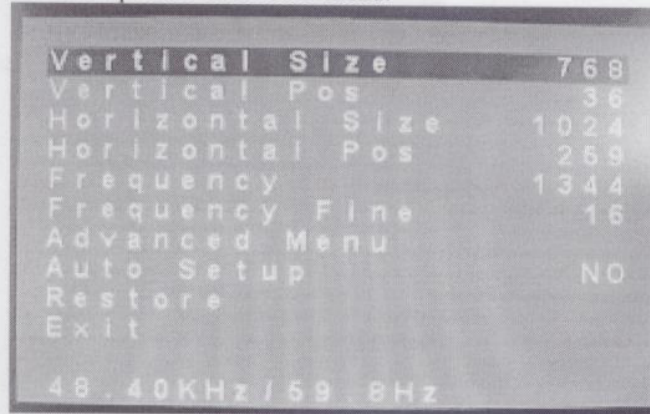
OSD Lockout Feature

Accidental User adjustment of the monitor controls can be prevented by using the OSD lockout feature. If the Menu button is held down for 15 seconds then the OSD will turn off and be locked from further access & adjustment. The only user controls will then be Brightness & Contrast.

The Monitor OSD can be restored to normal operation by holding the Menu button down for a further 15 seconds until the OSD menu reappears.

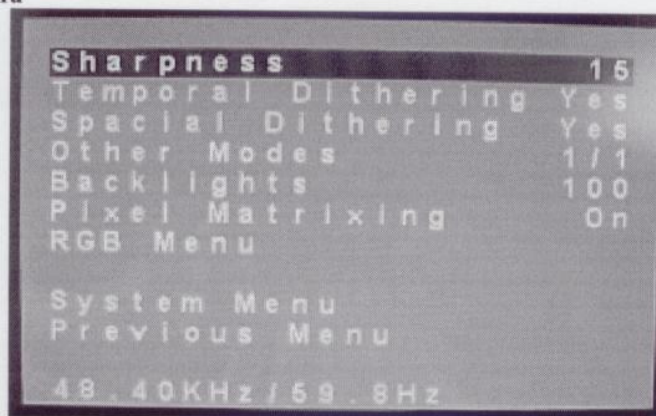
Main Menu

Press the menu button to open the main OSD menu.



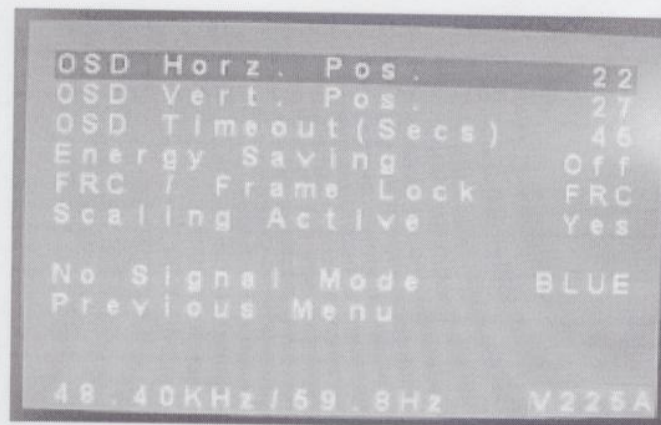
Vertical Size	<i>When increasing vertical size (i.e. making image smaller) the value will only increase to the total number of incoming video lines, less a small amount.</i>
Vertical Position	<i>Moves picture up & down on screen.</i>
Horizontal Size	<i>Changes width of picture. See Appendix A for notes on adjustment of Frequency, Width and Frequency Fine.</i>
Horizontal Position	<i>Moves picture left and right on screen.</i>
Frequency	<i>Adjusts the pixel clock frequency to match the incoming signal.</i>
Frequency Fine	<i>Fine tunes the sampling of each pixel. See Appendix A for notes on adjustment of Frequency, Width and Frequency Fine.</i>
Advanced Menu	<i>Switches to Advance Menu.</i>
Auto Setup	<i>NO (default) / VESA / USER / NEW VESA = Uses VESA default values as starting values. USER = Assumes Horizontal and vertical size are already correct. NEW = Automatically sets up monitor for current video mode based on a 4:3 aspect ratio. See Appendix B for notes on Resetting Modes.</i>
Restore	<i>Restores OSD back to the values when OSD was activated.</i>
Exit	<i>Switches the OSD Menus off and automatically saves the picture settings. Alternatively, simply press the Menu button at any time to switch off OSD and save.</i>

Advanced Menu



Sharpness	0 – 30	Default 15. Adjust on fine text to adjust preferred hard or soft image.
Temporal Dithering	Yes / No	Dithering causes averaging of pixels to create smoother greys. Some video
Spacial Dithering	Yes / No	signals on some TFT panels can cause picture artefacts when dithering is ON.
Other Modes	1/1	Other Modes can normally be ignored. If there are more than one signals with identical video timings then the user can use this feature to switch between them.
Backlights		Adjusts brightness of TFT backlights.
Pixel Matrixing	On / Off	Automatically adjusts image position every 15 minutes to reduce the effect of image retention which can be caused by displaying static pictures for long periods.
RGB Menu		Switches to RGB Menu.
System Menu		Switches to System Menu.
Previous Menu		Returns to Main Menu.

System Menu



OSD Horizontal position		<i>Location of OSD menu on the screen.</i>
OSD Vertical position		<i>Location of OSD menu on the screen.</i>
OSD timeout (secs)	3 – 45	<i>Timeout period of OSD menu.</i>
Energy Saving	On / Off	<i>When On the monitor will switch to standby mode within several seconds of having no signal input.</i>
FRC/Frame Lock		<i>Synchronise Output and Input frame rates</i>
Scaling Active	Yes / No	<i>Enables low resolution image to be viewed without scaling.</i>
No Signal Mode	BLUE/ BLACK/ NONE	<i>Colour of display when no signal is connected.</i>
Previous Menu		<i>Returns to Main Menu.</i>
Firmware version number	V****	<i>Firmware No. in lower right corner.</i>




Appendix A

Notes on Frequency, Frequency Fine and Horizontal Size.

When adjusting the *Frequency* the width of the displayed image will change. The *Frequency* control is not just a width control. For best results the *Frequency* should be correctly matched to the video signal without worrying about the picture width. When the *Frequency* is correct the width can then be corrected with the *Horizontal Size* control.

The Video signal is made up of pixels. These are generated in the video generator (process controller, PC etc). A crystal oscillator controls the rate at which the pixels are generated: This is called the Dot Clock.

When the TFT monitor receives the video signal it must convert it back to it's individual pixels in digital form. To do this it must sample the video at the same rate as the dot clock. When the *frequency* control is adjusted the monitor is changing the rate at which the video is sampled. Each press of the *frequency* control changes the sample rate by one pixel per line. The visual effect on the monitor screen of incorrect *frequency* adjustment is that there are vertical bands of darkened or noisy pixels running down the screen. The greater the *frequency* error, then the more bands there are. If the *frequency* value is wrong by two pixels, then two noisy bands will be seen. If the value is wrong by 100 pixels, then 100 noisy bands will be seen.


The actual content of the picture also has a big effect on how easy it is to see the noise bands. To set the *frequency* easily, it is best to display a picture that has a large number of individual pixels displayed – a screen of “” will be very good for helping to make the adjustment, while “” or “” will completely hide the noise bars. In practice it is not always possible to control the characters like this, so adjustment has to be made with pages of text etc.



Frequency correct



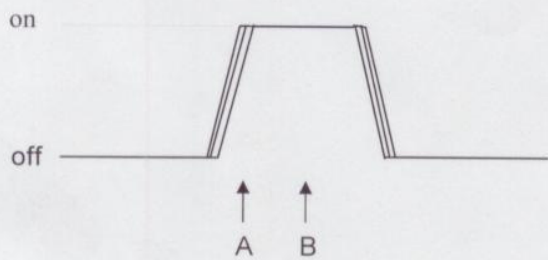
Frequency wrong

A Windows Shutdown screen contains a large amount of the “” type of video so is very good for seeing the effect of the frequency setting. The left hand picture shows the shutdown screen with frequency correctly set.

In the right hand picture there are six vertical dark bands due to incorrect frequency.

It can be helpful to practise setting frequency on this picture before trying on a real system.

Frequency Fine



This figure shows what a single bright pixel looks like in the video signal. The pixel does not have vertical sides and the exact start time of the pixel is uncertain. If the monitor samples the pixel at "B", then the pixel will look good. If it is sampled at "A" then the uncertainty of the pixels start time and the slope of the pixel edge will combine to make the pixel appear noisy and dark on the screen.

It is the *frequency fine* control that lets the monitor be adjusted so that the sample is taken at B instead of A.

Appendix B

Notes on resetting Video Modes

The monitor is shipped from the factory with a pre-loaded set of commonly used video modes. This means that the monitor can immediately be connected to a variety of video sources without any adjustment required.

The monitor may be connected to a video signal that has not been previously seen or pre-loaded. In this case the monitor will try to fit one of its existing modes to fit to the new signal. This may not cause the best results.

It can be advantageous to select the "Reset Mode(s)" NEW option on the OSD menu. This will tell the monitor to ignore the pre-loaded programs and adjust itself to the signal timing.

In general it is good to perform the NEW option when trying to connect to new signals.

The Reset Mode(s) VESA option should be used when the video signal is known to come from a PC. The auto-setup will start with known default VESA values when this option is selected.

The Reset Mode(s) USER option is selected when the horizontal and vertical size are already correct, the auto-setup will then adjust the frequency and horizontal/vertical position until the image is central.

Appendix C

Suggested Procedure for adjusting monitor

This procedure should let you get the monitor adjusted near to the best settings. Some further fine adjustment may be needed for best results.

1. Connect the signal to the correct input connectors and apply power to the monitor.
2. On the OSD Main menu select *Auto Setup - NEW*. Press the menu button. This will force the monitor to calculate settings for the new video signal.
3. Adjust the *Vertical Size* and *Vertical Position* so that the height of the picture is correct.
4. If there is particular instability of the picture at the top of the picture then increase the *Coast* value. Normally, this action is not required.
5. If the picture is flashing on & off or moving about the screen then increase the value of *Mode Change Delay*. Normally this action is not required.
6. If the picture has a vertical black band showing at the left hand side, or if the colours appear darker in some parts of the screen then adjust the *Clamp Position & Clamp size*. Normally this action is not required.
7. Adjust the *Frequency & Horizontal Size* as well as the *Horizontal position & Frequency Fine* to make the picture width and position correct. Spending time on this part of the adjustment will result in best displayed image.
Appendix A gives some information about the meaning of these adjustments.
As a starting position it is worth trying to get the *Horizontal Size* correct. You may already know from the video signal specification what its values are. These are commonly expressed in a variety of ways:
 - a. If the graphics are 512 x 320 pixels (say) then the correct value for *Horizontal Size* is 512.
 - b. There may be 80 characters with a 5 x 7 character cell. This makes the *Horizontal Size* $80 \times 5 = 400$ pixels (Or 480 pixels if a character spacing pixel is also used).
 - c. The Pixel Clock may be specified – in this case you can work out the correct *Frequency* by dividing the Pixel Clock frequency by the Horizontal Frequency that is displayed on the monitor OSD.

If there are no specifications for the video signal then just use the setting that the monitor has generated when performing the *Auto Setup - NEW*.