Rugged Military ARP920X
Flat Panel Display

User's Guide
For
ARP920X
Rack Mount
With DVC Controller
And Full Dimming

i-TECH COMPANY
www.i-techcompany.com
Toll Free: 1-888-483-2418
USA: 1-510-429-9288
Fax: 1-510-372-2736

The carton contains the items listed below:

Model ARP920X

- ARP920X LCD Display
- Power cord (except for DC Input versions)
- 15-pin VGA HD15 to HD15 Video Cable
- Mounting Hardware (if applicable)
- Product CD containing:
  - This User's Guide
  - Warranty Guide

Please check the carton and its contents for damage that may have occurred during the shipment

Report any damage to the shipping agent immediately and do not operate the display if it appears to have been damaged. All warranty returns must use the original shipping carton and packaging materials to prevent shipping damage.

TABLE OF CONTENTS

DISPLAY FEATURES

- **Capable of displaying 16,772,166 colors**: The displays high contrast LCD enhances color vibrancy and improves focus with no geometric distortion.
- **On-Screen Display:** All picture and display functions are controlled using an On-Screen Display (OSD).
- **Multiple Frequency Technology:** Automatically adjusts the display to the video cards scanning frequency, thus displaying the resolution required.
- **Auto Screen size adjustment**: Will adjust display for optional performance and provide full screen images on even non-native formats.
- **DPMS Power Management:** the 4420 features a power management system compliant with the Energy Star program when used with a computer and video card equipped with DPMS.
- **Wide viewing angle:** ±85° typical all directions.
- **Low power consumption**.

1.0 CONNECTIONS AND SETUP

To connect the LCD display to your system, follow these instructions:

CAUTION: Turn power off to the computer, display, and power supply before making any connections.

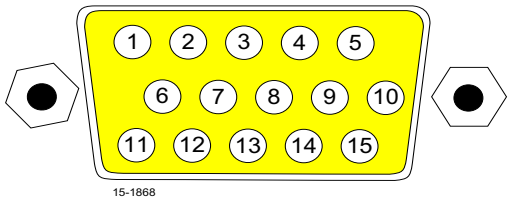
1.1 Power Connections

Connect the AC line power cord from the AC input connector to a grounded electrical outlet. For maximum protection, use a good surge protector between the outlet and the power supply to avoid damage to the display due to electrical service abnormalities.

1.2 Signal Connections

1.2.1 Video Signal Connections

The LCD is supplied with a 15-pin, D-sub to 15-pin, D-sub cable.
Pin assignments for the 15-pin connector are shown below.



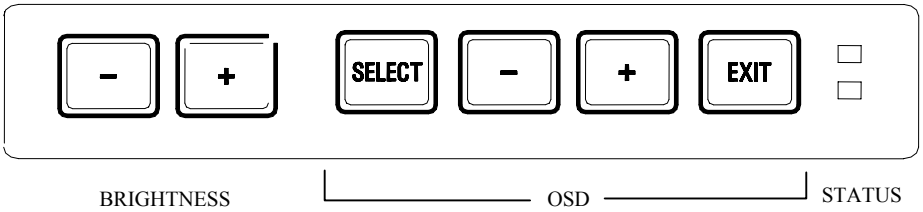
Pin	Signal	Pin	Signal
1	Red Video Signal	9	No Connection
2	Green Video Signal	10	Ground
3	Blue Video Signal	11	Ground
4	Ground	12	No Connection
5	No Connection	13	Horizontal Sync Signal
6	Ground for Red Video Signal	14	Vertical Sync Signal
7	Ground for Green Video Signal	15	No Connection
8	Ground for Blue Video Signal		

2.0 DISPLAY ADJUSTMENT

If you have any problems connecting, setting up or operating the display, please refer to the Troubleshooting section of this guide.

Plug the LCD power cord into an AC power source. The green ON LED should light. When the display has power applied, and either the computer or video card is in power save mode, the amber SAVE LED will be on.

A typical adjustment sequence is: Width, Horizontal Position, repeat Width, Focus and then Vertical Position. Display height is preset and not adjustable.



2.1. Control Panel Function Buttons

2.1.1 LCD Adjustment Pushbuttons

When necessary, the unit is adjusted using an On-Screen Display (OSD) and the following pushbuttons:

OSD and SELECT MODE 

Enables the Main Menu, Sub Menu, and parameter to be adjusted.

ADJUST & SELECT 

The pushbuttons are used to select a main or sub menu and are then used to make the adjustments once a function is selected using the OSD and SELECT MODE key.

EXIT 

The EXIT pushbutton is the complement of SELECT MODE and allows you to exit menu selections by returning the user to the previous menu or exiting the OSD.

2.1.2 Brightness Adjustment Pushbuttons

When necessary, the Brightness is adjusted using the following pushbuttons:

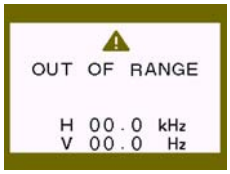
ADJUST 

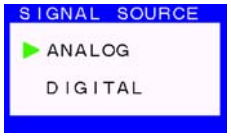
The pushbuttons are used to increase and decrease the Brightness of the display from full Brightness to full OFF.

2.1.3 Power Management

When Horizontal or Vertical Sync is not detected, the unit will revert to a power saving mode. The green POWER status indicator will extinguish and the amber SAVE indicator will light and the Power Save symbol will appear on the OSD (see below).

When the Horizontal or Vertical Synchronization frequencies being supplied to the unit are not within the range of the AMLCD monitor, the OUT OF RANGE symbol will appear on the OSD. When No Signal is applied, the No SIGNAL symbol will appear on the OSD. The ANALOG DIGITAL input signal symbol may also appear. This is normal, since the digital input signal mode is not supported on this model.





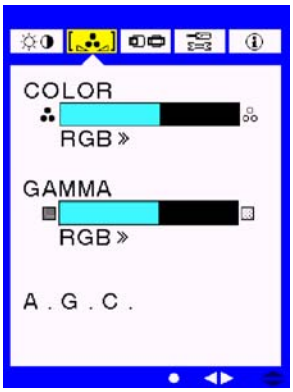
2.2 On-Screen Control Function Items

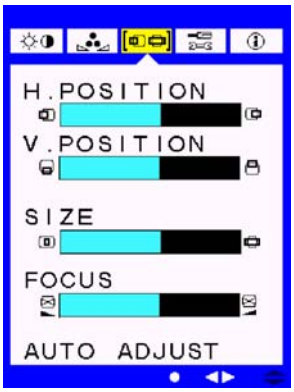
1	**Brightness**	Luminance of backlight control
	Contrast	White-level of video signal control
	Sub Menu **R G B »**	Adjust each color [R-G-B] video level high lights
2	**Color**	Adjust overall color of the video level low lights
	Sub Menu **R G B »**	Adjust each color [R-G-B] video level low lights
	Gamma	Adjust overall color of the video level high lights
	Sub Menu **R G B »**	Adjust each color [R-G-B] video level high lights
	A. G .C.	Auto gain control for the amplitude on the video input signal
3	**Position** **Size** **Focus** **Auto Adjust**	**H. Position** – used to center the image left to right **V. Position** – used to center the image up & down **Size** – Adjust the width of the display by changing the sampling rate of the incoming video. **Focus** – Adjust the phase of the sampling clock to produce a sharp image. **Auto Adjust** – automatically adjusts all four items above to produce the optimal picture. (*Note: May require some minor adjustments on non-standard formats*)
4	**OSD Position »**	Changes the position of the OSD to 1 of 5 positions
	Language »	Changes OSD language (English, German, French & Spanish)
	ALL RESET	Resets all function to their factory-default value
5	**Video Signal Information**	Displays the Resolution, Hsync and Vsync frequency

Each selected value is stored in LCD memory after EXIT button is depressed or time out occurs. The stored values are not affected even if the power is turned off. However, the selected value is not stored if power is turned off before time out or pressing the EXIT button.

2.3 OSD Operating Instructions and Menus

1. Apply power to the LCD Display.
2. Depressing either of these buttons SELECT + − once will bring up the On- Screen Display. The first menu that comes up is the Brightness and Contrast as show below and is indicated by this symbol [☼◑] . As you press either the + or − keys the Icons on the top of the main menu will change. The five main menus are shown below.





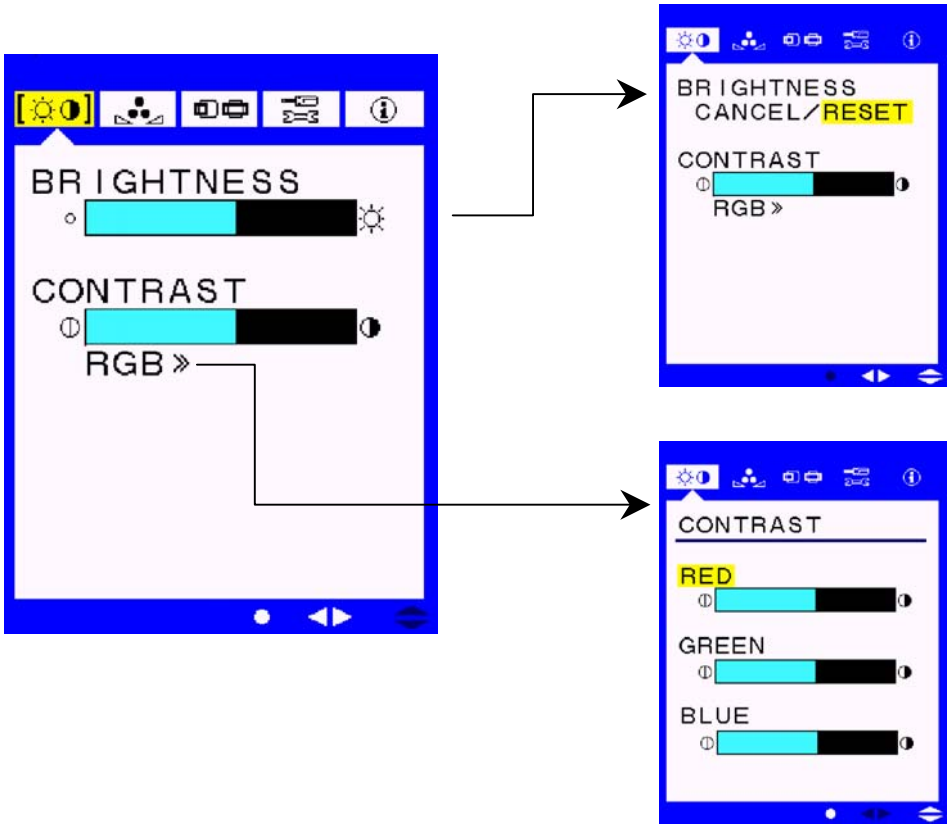
3. Once you have selected the main menu that you want to use, you must then press the Mode Select Key to activate that menu. When the menu has been activated, the first selection on the menu will become highlighted. By using the [+] or [-] keys, each selection on the menu will become highlighted (background becomes light yellow). To activate the selected function, press the Mode Select Key, this will then highlight the adjustment indicator bar. By pressing the [+] or [-] keys the value of the function can be adjusted.

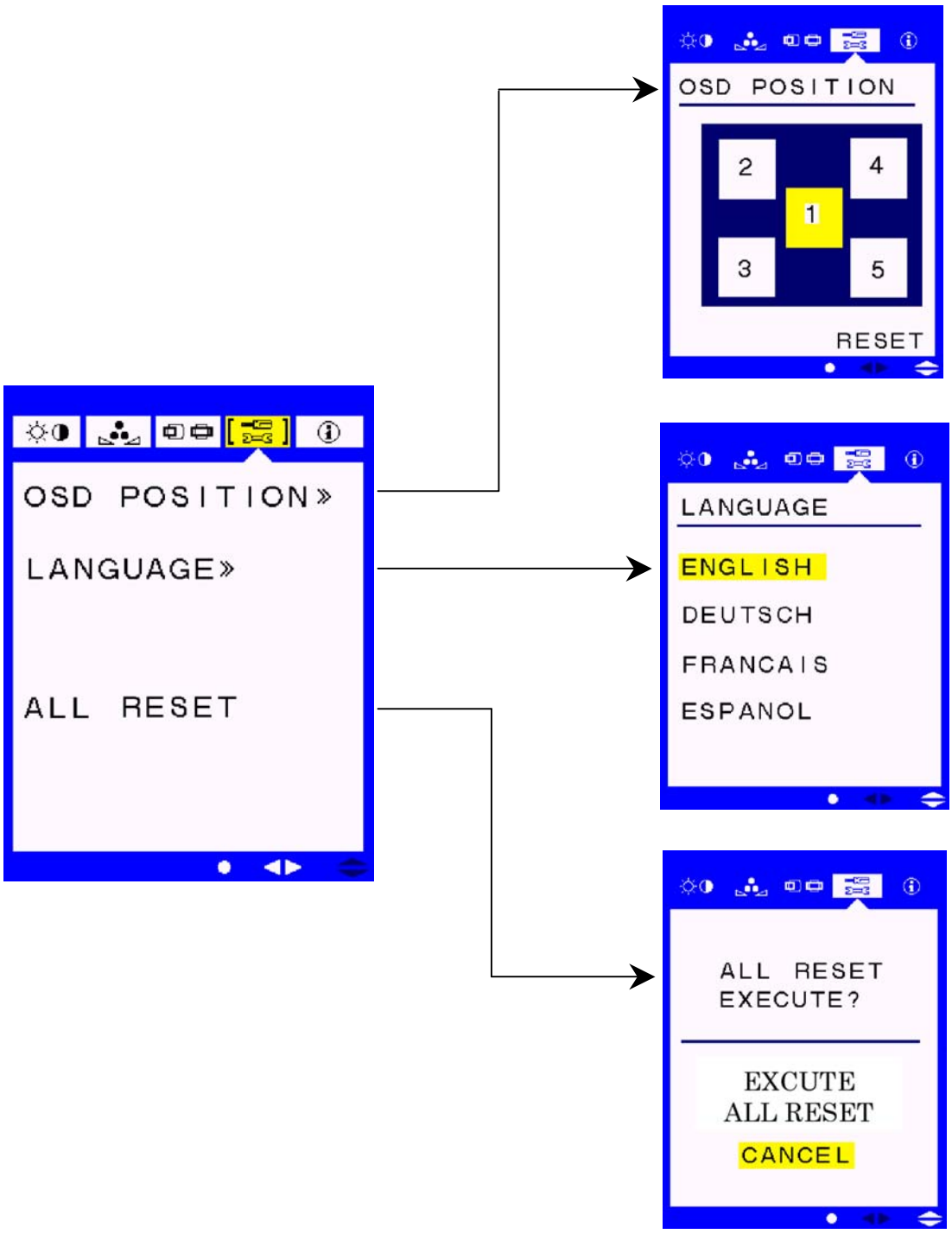
4. To save this setting, use the Exit Key to move up one level in the menu. Note, each time you press the exit key you will move up one level until you exit the OSD all together. To reset any individual setting back to the factory setting, first select the function as described above, then press the Mode Select key until the

Cancel/Reset is present. Use the [+] / [-] keys to select either cancel or reset, then use the Mode Select Key to enter your selection. See example of the OSD screen displays for resetting the Brightness function.

5. Some menus have another Sub Menu attached and are indicated by the symbol [»] after the name of the function. The sub menus are activated in the same way as described for the main menu. See example of the sub menus for Contrast, OSD Position, Language, and Reset Functions.

6. Each selected value is stored in the LCD's memory after the Exit button is depressed or time out occurs. The stored values are not affected even if the power is turned off. However, the selected value is not stored if power is turned off before time out or pressing the Exit button has occurred.





Notes:

1. There is an automatic timeout for the OSD. If no pushbuttons are depressed for five to ten seconds, the OSD will turn off and any adjustments made to that point will be stored.

2. Both the A. G. C. and Auto Adjust function take 2 seconds to be performed.

3. If both the Sync on Green and separate sync are present at the same time, then the Auto Adjust function will not function properly.

2.4 Full Dimming Option

This option allows the operator to adjust the brightness of the display from full Brightness to full OFF depending on the time of day or ambient lighting conditions. The Brightness Adjustment pushbuttons are located at the bottom of the front panel.

3.0 4420 SPECIFICATIONS

NOTE

Technical specifications are subject to change without notice.

LCD Module

- Active matrix thin film transistor (TFT) liquid crystal display (LCD)
- Native Resolution (Pixel Count): 1280 x 1024
- Pixel pitch: 0.312m(H) x 0.312(V) mm dot pitch
- Viewing angle: ±85° (typical all directions with more than 10:1 contrast ratio)
- Luminance: 250cd/m^2 White typical
- Contrast Ratio: 300:1 typical
- Display colors: 16,777,216
- Diagonal: 20.1 inches
- Viewable Image Size: 399.36(H) x 319.49(V) mm

Input Signal

- Video: Analog 0.7 Vp-p/75 Ohms
- Sync: Separate Sync TTL Level; Horizontal Sync Positive/Negative; Vertical Sync Positive/Negative; Composite Sync Positive/Negative, TTL Level; Sync on Green Video (Positive) 0.7 Vp-p and sync Negative 0.3 Vp-p

Synchronization Range

Both Horizontal and Vertical sync are performed automatically.

- Horizontal: 24.0 kHz to 80 kHz
- Vertical: 56.0 Hz to 76 Hz

Resolutions Supported

NOTE

Resolution is based on horizontal and vertical frequencies only. Some systems may not support all modes listed.

- 720 x 400* VGA text
- 640 x 480 at 60Hz to 75Hz
- 800 x 600* at 56Hz to 75Hz
- 832 x 624* at 75Hz
- 1024 x 768* at 60Hz to 75Hz
- 1280 x 1024 at 60Hz to 75Hz; for optimal display performance at this resolution, operation at 60Hz is recommended.

** Interpolated Resolutions: when resolutions are displayed that are lower than the pixel count (native resolution) of the LCD module, text may appear choppy or lines may appear to be bold. This is normal and necessary for all current flat panel*

technologies when displaying none-native resolutions full screen. In flat panel technologies, each dot on the screen is one pixel, so to expand resolutions to full screen, an interpolation of the resolution must be done. When the interpolated resolution is not an exact multiple of the native resolution, some lines may appear thicker than others.

4420 Display Formats Timing Requirements

Mode (Resolution)	Dot Clock [MHz]	H Freq. [kHz]	V Freq. [Hz]	V Pulse [H]	V B. Porch [H]	H Pulse [DotClk]	H B. Porch [DotClk]	Sync Logic V,H	Remarks
SXGA (1280x1024)	108.000	63.981	60.020	3	38	112	248	+,+	VESA
	135.000	79.976	75.025	3	38	144	248	+,+	VESA
XGA (1024x768)	65.000	48.363	60.004	6	29	136	160	-,-	VESA
	75.000	56.476	70.069	6	29	136	144	-,-	VESA
	78.750	60.023	75.029	3	28	96	176	-,-	VESA
MAC (832x624)	57.283	49.725	74.500	3	39	64	224	S on G	MAC
SVGA (800x600)	40.000	37.879	60.317	4	23	128	88	+,+	VESA
	49.500	46.875	75.000	3	21	80	160	+,+	VESA
VGA (640x480)	25.175	31.469	59.940	2	33	96	48	-,-	IBM
	31.500	37.500	75.000	3	16	64	120	-,-	VESA
	30.240	35.000	66.667	3	39	64	96	S on G	MAC
VGA text (720x400)	28.322	31.469	70.087	2	35	108	45	+,-	IBM

Power Consumption

- Input 120 V AC: 120 V AC 60Hz @ 0.92 Amps 100 Watts typical

Dimensions

See the dimension drawings at the back of this Users Guide.

Weights

- Rack Mount: 24 lbs. MAX

Operating Environment

- Shock: MIL-S-901D, Grade A
- Vibration: MIL-STD-167-1, Type 1
- EMI: MIL-STD-461D
- Drip Proof: MIL-STD-810E, Method 506.3
  Procedure II; Front Panel Only
- Sand/Dust: MIL-STD-810E, Method 510.3
  Front Panel Only
- Operating Temperature: 32º F to 122º F (0º C to +50º C)
- Humidity: 5% to 95%
- Altitude: 0 to 42,000 feet
- Storage Temperature: -25º C to +71º C
- Storage Altitude: 0 to 45,000 feet

4.0 TROUBLESHOOTING TIPS

If you experience trouble with your 4420 display, check the following items before contacting Aydin Displays or your dealer.

Trouble	Troubleshooting Tip
No picture	• The signal cable should be completely connected to the display card/computer. • The display card should be completely seated in the slot. • Display power connector should be plugged in and computer power switch should be in the ON position. Make sure that a supported mode has been selected on the display card. Please check your display card or system manual to change graphics mode. • Check the monitor and your display card for compatibility and recommended settings. • Check the signal cable connector for bent or pushed-in pins.
Image persistence.	• Image persistence occurs when a ghost of an image remains on the screen even after the monitor has been turned off. Unlike a CRT monitor, a LCD monitors image persistence is not permanent. To erase an image ghost, turn the monitor off for as long as the image was displayed. If an image was on the monitor for an hour and a ghost of that image remains, the monitor should be turned off for an hour to erase the image. To avoid this problem, use a screen saver whenever the screen is idle.
Image is unstable, unfocused or swimming Is apparent.	• Signal cable should be completely attached to the computer. • Use the controls to focus and readjust the display for optimum operation. When the display mode is changed, settings may need to be readjusted. • Check the monitor and your display card for compatibility and recommended signal timings.
Power LED on monitor is not lit.	• Power cable should be connected and power supply plugged into an AC power source. • Make certain the computer is not in a power-saving mode (touch the keyboard or mouse.)
Display image is not sized properly.	• Use the width control to adjust horizontal size. • Ensure that a supported mode is selected on the display card or system being used. Consult the display card or system manual to change graphics mode.

If these troubleshooting tips do not solve your problem, contact Aydin Displays Customer Support at 610-404-5370 or fax us at 610-404-8186.