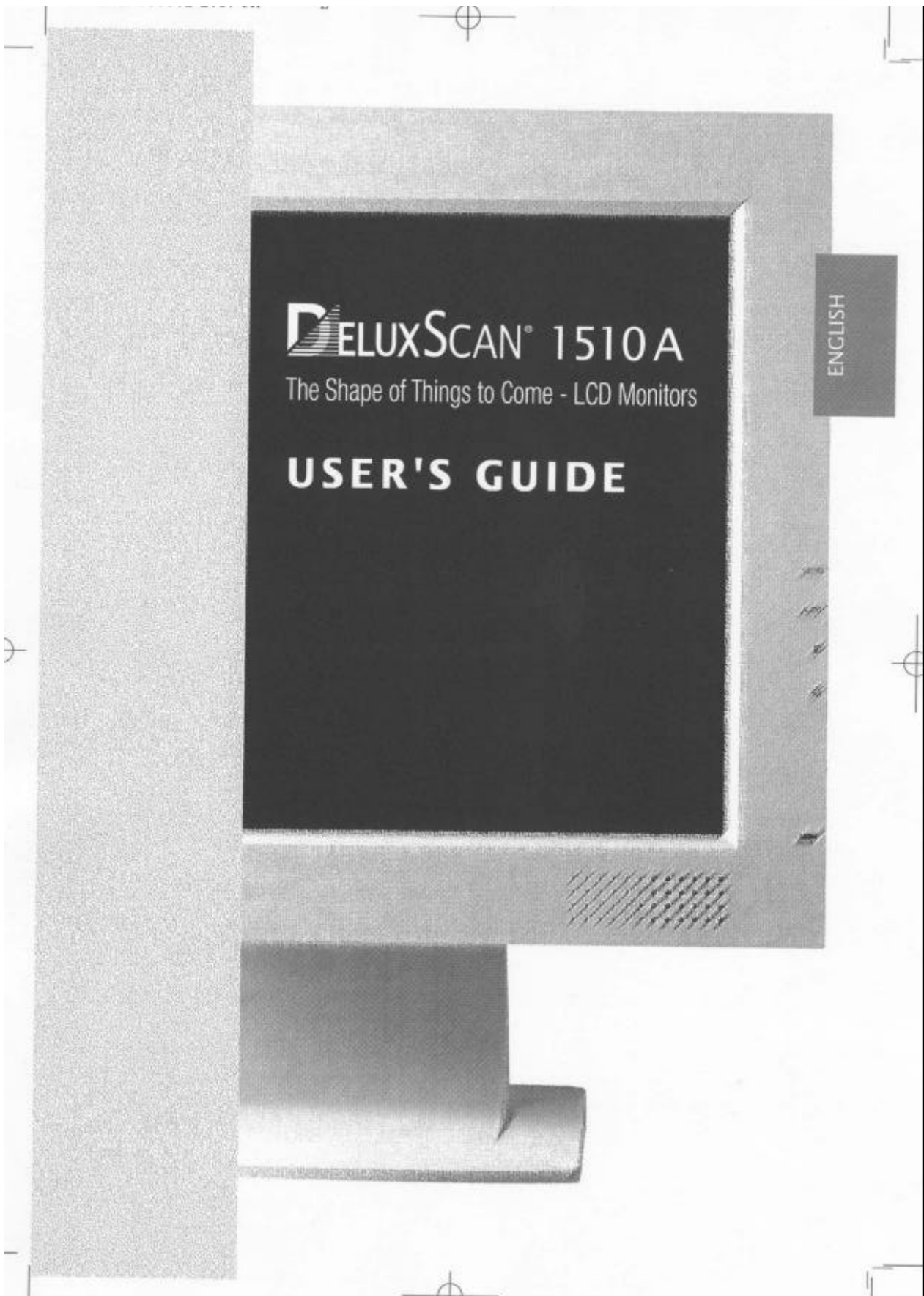


ATTACHMENT E. USERS MANUAL



U.S.A.

**U.S.FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE STATEMENT
INFORMATION TO THE USER**

NOTE : This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet of a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for assistance.

Changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
Connecting of peripherals requires the use of grounded, shielded signal cables.

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How to get the most out of this monitor

This is a 15" color LCD monitor (Model: HLM 1510A) which can display signals from a personal or micro computer.

This manual has been prepared to familiarize you with your new display monitor.

Features

- 15" viewable XGA (1024 x 768) resolution LCD module
- 16.7 Mil Colors
- DPMS (Display Power Management Signaling)
- OSD (On-Screen Display) controls, multi-language OSD Menu
- Automatically adjust the image Position, the Clock, the Clock Phase settings
- Universal 100-240V AC power supply
- DDC 1/2B features

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General safety precautions

This Monitor has been engineered and manufactured to assure your safety. You can prevent serious electrical shock and other hazards by keeping in mind the following:



Do not place anything heavy, wet or magnetic on the monitor or the power cord. Never cover the ventilation openings with any material and never touch them with metallic or inflammable materials.

Avoid operating the monitor in extreme heat, humidity or areas affected by dust.

Temperature : 5~35°C

Humidity : 30~80RH



Be sure to turn the monitor off before plugging the power cord into the socket.

Make sure that the power cord and the other cords are securely and rightly connected.

Overloaded AC outlets and extension cords are dangerous, as are frayed power cords and broken plugs, which may cause electric shock or fire. Call your service technician for replacement.



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Do not use sharp tools such as a pin or a pencil near the monitor, as they may scratch the LCD surface.

Do not use a solvent, such as benzene, to clean the monitor, as it will damage the LCD surface.



Maintenance



Do not open the monitor. There are no user-serviceable components inside, and there is a risk of exposure to high-voltage electricity inside, even when power is turned off. If the display monitor does not operate properly, remove the power cord from the wall outlet and contact your dealer. As with any electrical equipment, careless use and unprofessional maintenance are liable to cause a serious electric shock and other hazards.

Packing List

HLM 1510A LCD Monitor



User's Guide



Audio Cable



USB Cable (Option)

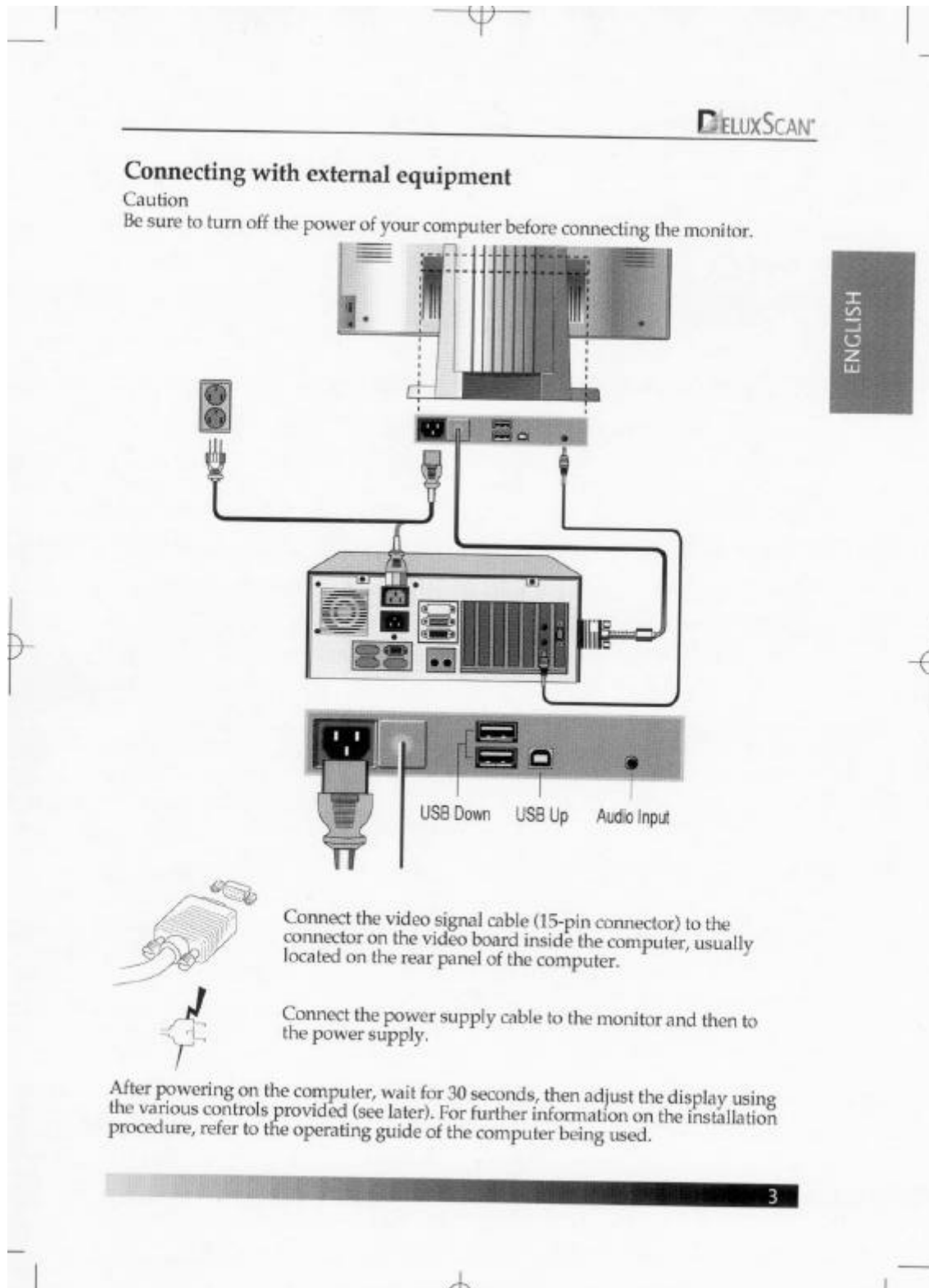


Power Cord



Attached Signal Cable

! Above power cord can be changed upon different voltage areas.



User's Guide

Micro-controller features

The micro-controller automatically detects the video board installed in your system. When you turn on the monitor, the micro-controller first checks the display-mode memory stored in the user-setting area and the factory-presetting area.

Display-mode memory

The micro-controller has the memory capacity to store 30 different display modes including timing formats and display settings. This memory capacity is divided into two parts. One is the user-setting area, and the other is the factory-presetting area.

User-setting area

The user can add nonstandard modes. If you adjust your display image, the image is saved automatically. The micro-controller will then always detect and display the last mode stored in the user-setting area when the monitor is turned on.

The user-setting area maintains the last 10 display modes set by the user in its memory. When the user-setting area is full (i.e. when 10 modes are registered), the oldest timing settings will be deleted as new ones are added.

Factory-presetting area

There are 20 display modes stored in this area. These display modes are preset at the factory and include most of the display modes currently available (see Preset-mode table in this manual).

You can also retrieve the factory-preset mode by selecting the RECALL menu.

Automatic save

The monitor automatically saves the setting value after certain times (5, 10, 15, 20, 25, 30, 35, 40, 45, 50 sec) of adjusting OSD menu.

DDC 1/2B (Display Data Channel 1/2B)

DDC 1/2B (Display Data Channel 1/2B) is a communication channel through which the monitor automatically informs the host system of its capabilities.

DDC 1/2B uses a formerly unconnected signal pins in the 15-pin VGA connector.

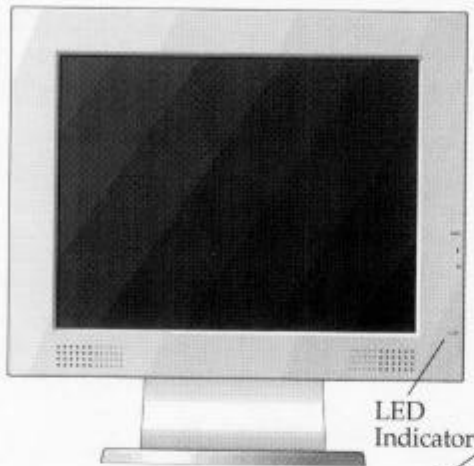
The system will perform as a "Plug & Play" feature if both monitor and host systems support DDC 1/2B protocol.



Some computer systems are not compatible with the DDC 1/2B standard. If your monitor displays the wrong resolution, please check your computer system, including the DDC compatible video card.

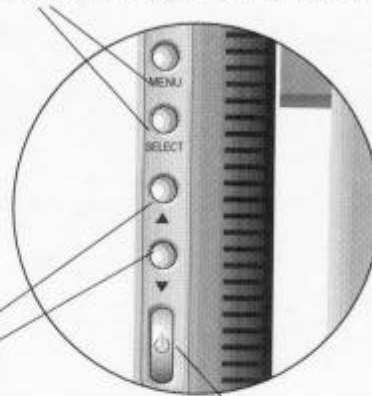


On-screen controls and LED indicator



LED Indicator

Enable the each Sub menu
 1) Enable the OSD Menu
 2) Return to higher level of menu



On/Off Power

- 1) Choose the sub-menu
- 2) Adjust the value of each menu
- 3) Adjust Contrast/Bright with pop-up

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Main menu and control selection

Press the MENU and select key to access the main menu. The resolution and frequency are displayed at the top of the menu box.
 When a nonstandard signal is detected, the frequency is also displayed.
 Place the color box on the control icon you wish to adjust by using the ▲ or ▼ key.
 Press the select key to access the control.

Exit menu

Press the MENU key to exit the OSD screen.

Auto exit

The OSD images disappear automatically after a few seconds of inactivity.

Auto save

The monitor automatically saves the new setting when OSD closes.

Normal mode

When the video signal is working in normal display mode, power LED is lit Green.

DPMS mode

The LED indicates different status when this unit operates in different power-saving modes.

Out of range

When an unsuitable signal is detected, the OSD displays an Out of Range message.

User's Guide

On-screen display settings



The menu for screen setting adjustment is located in the OSD and can be viewed in one of five languages. OSD feature and main Menu functions are as follows:

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Brightness
Adjust the screen's intensity.



Contrast
Adjust the contrast of the screen image.



H-Position
Adjust the horizontal position of the screen image.



V-Position
Adjust the vertical center of the screen image.



Clock
Adjust the width of the screen image.



Clock-Phase
Adjust the noise of the screen image.



Recall
Reload the factory-preset mode



Color Control
Display the Color Control menu.



Informations
Display the factory-preset timing.



Language
Select from 9 languages.



OSD Control
Displays the OSD position adjustment menu.
Select the OSD display timing.



Test pattern
Displays the TEST-pattern

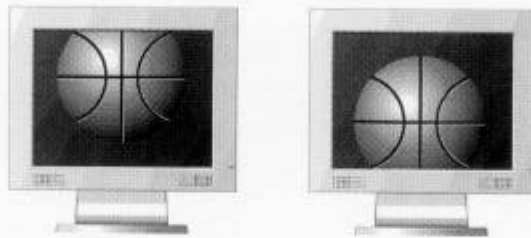


The Clock Phase may not be optimized in case VESA timing could not meet the standard. In order to get the optimized result of Auto Adjust function, please brighten the background image.



Refining the picture

- Step 1. At first display, a full screen, such as Window background or "H" character should be achieved by using Editor (eq; notepad).
- Step 2. Adjust the screen to the center of the display (LCD) by using the top and bottom display controls (i.e. using V-Position Adjust menu).



- Step 3. Adjust the screen to the center of the Display (LCD) by using the right and left display controls (i.e. using Clock and H-Position adjust menu).



- Step 4. Adjust the Clock-Phase until the "H" Character displays clear.




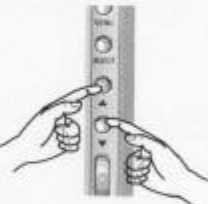

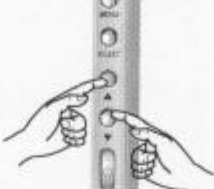
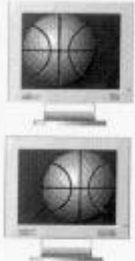

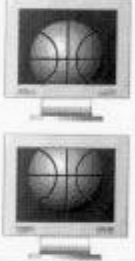
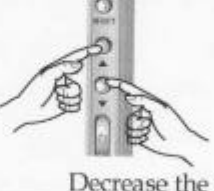

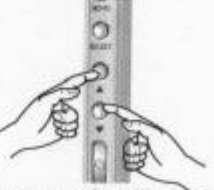
- Step 5. Using the Contrast, Brightness, and Color Control menu, set the color to your preference.
- Step 6. When you finish the adjustment, you can save your settings by pressing on the menu until the OSD screen has disappeared.

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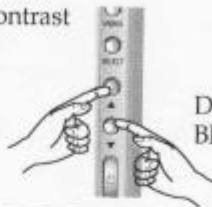
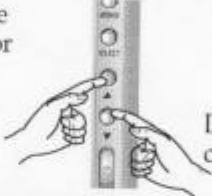
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User's Guide

Adjust Sequence

How to enable the menu	Adjust method		
<p>Step1. Press the menu key to enable the OSD menu.</p>  <p>Step2. Press the ▼(Down) / ▲(Up) key to select the Menu icon.</p>  <p>Step3. Press the SEL key to enable the selected icon.</p> 	H-Position	<p>Move to right</p>  <p>Move to left</p>	
	V-Position	<p>Move up</p>  <p>Move down</p>	
	Clock	<p>Increase the size</p>  <p>Decrease the size</p>	
	Clock Phase	<p>Increase the phasedelay</p>  <p>Decrease the phase delay</p>	



How to enable the menu	Adjust method	
Brightness/ Contrast		Increase the BRT/Contrast  Decrease the BRT/Contrast
Color Control		Select the color temperature Increase the color  Decrease the color
Recall	Reloads factory-preset mode	
Preset Mode	Shows the factory-preset timing	
Language	Selects from 9 different languages	
Hot Key Function	Brightness	Press the ▼ (Down) key to enable the brightness menu. Use the ▼ (Down) and ▲ (Up) key to adjust the brightness .
	Contrast	Press the ▲ (Up) key to enable the contrast menu Use the ▼ (Down) and ▲ (Up) key to adjust the contrast
	Auto Adjust	Press the Select-key to Enable Auto-Adjust

ENGLISH

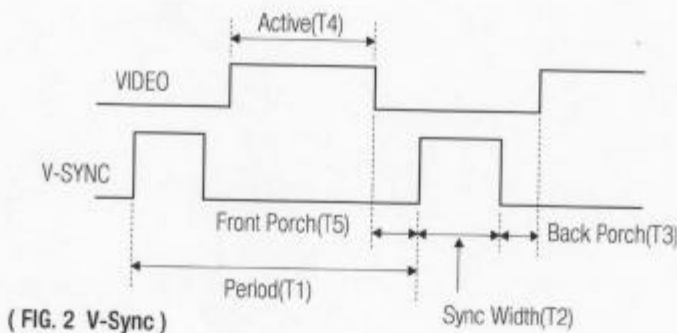
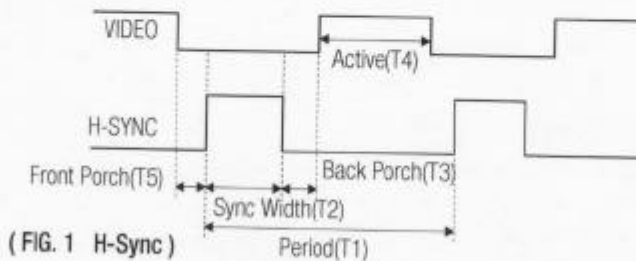
User's Guide

Preset mode chart

Timing charts

Supported video timings;
This monitor shall be capable of displaying following video-timing charts.

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Input timing limits

H-sync pulse width $1.0\mu s \leq \text{sync pulse width} \leq 8.0\mu s$
V-sync pulse width $0.04\text{ms} \leq \text{sync pulse width} \leq 0.5\text{ms}$

! If the sync pulse width of input timing is out of range of input timing limits, monitor may operate abnormally. Be sure to check the input timing sync pulse width.

Input level limits

Low level: 0.4V max
High level: 2.4V min



Preset-mode table

The timing shown in the following table will be factory preset for display.

Horizontal	Pixel	640	640	720	640	640	720	640	640	800	800	800	800	800	832	1024	1024	1024	1024		
Pixel Clock	MHz	25.175	25.056	28.322	31.500	31.500	35.500	25.175	31.500	36.000	36.000	40.000	50.000	49.500	56.250	57.283	44.9	65.000	75.000	78.750	94.500
Frequency	kHz	31.469	31.320	31.469	37.861	37.927	31.469	37.861	43.269	35.156	37.879	48.077	46.875	53.674	49.725	35.522	48.363	56.476	60.023	68.677	
Period (T1)	µs	31.778	31.928	31.777	26.413	26.366	31.778	26.413	23.111	28.444	26.400	20.800	21.333	18.631	20.111	28.151	20.677	17.707	16.660	14.561	
Sync Width (T2)	µs	3.813	3.831	3.813	2.032	2.028	3.813	1.270	1.556	2.000	3.200	2.400	1.616	1.138	1.117	1.247	2.092	1.813	1.219	1.016	
Back Porch (T3)	µs	1.906	1.916	1.907	3.048	3.048	1.907	4.064	2.222	3.556	2.200	1.280	3.232	2.702	3.910	3.920	2.462	1.920	2.235	2.201	
Active (T4)	µs	25.422	25.543	25.422	20.317	20.317	20.282	25.422	20.317	17.778	22.222	20.000	16.000	16.162	14.222	14.524	22.806	15.754	13.653	13.003	10.836
Front Porch (T5)	µs	0.636	0.639	0.636	1.016	1.016	0.636	0.762	1.556	0.667	1.000	1.120	0.323	0.569	0.559	0.178	0.369	0.320	0.203	0.508	
Vertical	Lines	350	400	400	350	400	480	480	480	600	600	600	600	600	600	624	768	768	768	768	
Frequency	Hz	70.086	69.755	70.087	85.080	85.080	85.039	59.940	72.809	85.008	56.250	60.317	72.188	75.000	85.061	74.550	43.479	60.004	70.069	75.029	84.997
Period (T1)	ms	14.268	14.336	14.268	11.754	11.754	11.759	16.683	13.735	11.764	17.778	16.579	13.853	13.333	11.756	13.414	23.000	16.666	14.272	13.328	11.765
Sync Width (T2)	ms	0.064	0.064	0.064	0.079	0.079	0.064	0.079	0.069	0.057	0.106	0.125	0.064	0.056	0.060	0.563	0.124	0.106	0.050	0.044	
Back Porch (T3)	ms	1.906	1.117	1.112	1.585	1.083	1.108	1.048	0.739	0.578	0.626	0.607	0.478	0.448	0.503	0.785	0.113	0.600	0.513	0.466	0.524
Active (T4)	ms	11.122	12.771	12.711	9.244	10.565	10.546	15.253	12.678	11.093	17.067	15.840	12.480	12.800	11.179	12.549	21.620	15.880	13.599	12.795	11.183
Front Porch (T5)	ms	1.176	0.383	0.381	0.845	0.027	0.026	0.318	0.237	0.023	0.028	0.026	0.770	0.021	0.019	0.020	0.000	0.062	0.053	0.017	0.015
Interlaced	V/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N
Sync Polarity	H	+	-	-	+	-	-	-	-	-	+	+	+	+	+	+	-	-	-	+	+
	V	-	-	-	+	-	-	-	-	-	+	+	+	+	+	+	-	-	-	-	+

The monitor is compatible with additional modes within one of the following specified frequency ranges, provided that they are different at least for one of the following:

- Horizontal frequency: ±0.8kHz



Even if the monitor detects the input timing as a factory-preset mode, you may not be able to set the size and position as desired. Check the input timings are under the specifications you want. For better display image quality, use the timing and polarity shown in the preset-mode table. Please see your video card user guide to ensure compatibility.

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User's Guide

Universal Serial Bus

General USB Specifications Summary

USB is the simple and flexible way to connect external device to your desktop or notebook. USB will enable the PC to be easily reconfigured with new degree of connectivity and interactivity.

- 1) 12Mbps design with specific cost consideration for low cost peripherals
- 2) Supports up to 127 devices
- 3) Both isochronous and asynchronous data transfers
- 4) Up to 5 meters per cable segment
- 5) Built in power distribution for low power devices
- 6) Supports daisy chaining through a tiered star multidrop topology

Included USB Hub Feature

- 1) The USB Hub support both full speed 12Mbps and low speed 1.5Mbps bus rate
- 2) Include 1.53 meter USB Cable length
- 3) Self-Powered USB Hub
- 4) Support up to 2 downstream ports



To activate the USB Hub, the host system should support USB Hardware and Operating System software

How to connect to the downstream ports of the USB Hub

- 1) USB ports description

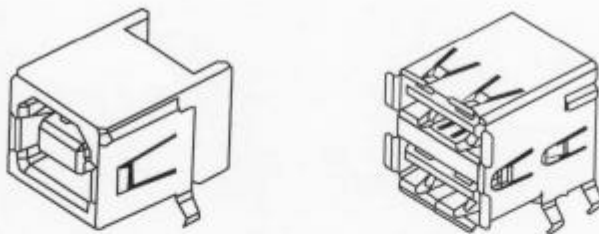


FIGURE (USB Upstream Ports, downstream Ports)

- 2) The USB Hub have 1 upstream port and 2 downstream ports The upstream port can be attached to root hub of host PC or the other downstream port. And each downstream port allows to attach another USB device as USB mouse, joystick, printer, etc.



- !** 1) The maximum supply current of down stream port is 500mA each When self powered Hub.
- 2) To activate the USB Hub, your host system should have USB capability.

USB connector Terminal DATA

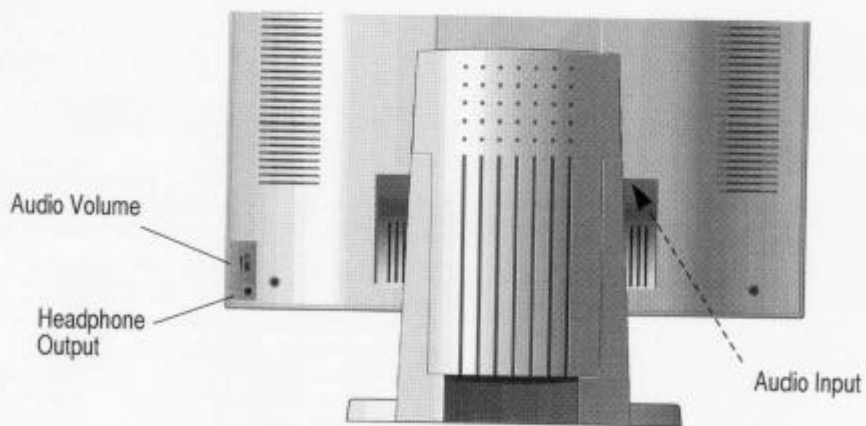
Contact Number	Signal name
1	Vbus
2	D-
3	D+
4	GND

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Audio System

This monitor has a audio system including two micro loudspeakers. Each of two micro loudspeakers has a 1Wrms(Max.) output power. This system also supports a headphone (earphone) output.

- !** This system has been tuned to get a best tone quality which a audio input level is under max 600mVp-p. If more than 600mVp-p, because a audio output tone may be distort, you must tune down audio input.



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User's Guide

Power management

This monitor is equipped with a DPMS (Display Power Management Signaling) function that automatically cuts power use to just a little less than 5W when the computer is left unattended.

Although the monitor can be left in power-saving mode for longer periods, we recommend that you turn it off after your daily work.

Operation

The DPMS function requires support from the computer system for any software DPMS function applied. If the keyboard (or mouse) is left unattended for a certain period, the program or system will set the sync signals to DPMS mode.

The recommended signals, power consumption, and recovery times are shown in the table below.

Status	Signal			Power Consumption	Recovery Time	LED Indicator
	H Sync	V Sync	Video			
On	Pulse	Pulse	Active	40 Watt	-	Green
Standby	No Pulse	Pulse	Blank	Less than 15 Watt	Within 2 sec	Alternating Green/Orange(1sec)
Suspend	Pulse	No Pulse	Blank	Less than 10 Watt	Within 3 sec	Alternating Green/Orange(0.5sec)
Off	No Pulse	No Pulse	Blank	Less than 5 Watt	Within 3 sec	Orange



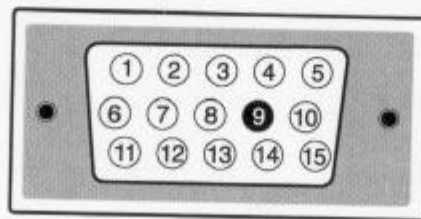
Video input terminal

A 15 pin D-sub connector is used as the input signal connector.
Pin and input signals are shown in the table below.

Pin Number	Signal Name
1	RED
2	GREEN
3	BLUE
4	GROUND
5	DDC-Return
6	RED-Ground
7	GREEN-Ground
8	BLUE-Ground
9	N.C.
10	Logic-Ground
11	Ground
12	SDA(DDC)
13	H-Sync
14	V-Sync
15	SCL(DDC)

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15 Pin D-Sub Connector



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User's Guide

Specifications

LCD	Type	AM-TFT
	Size	15" viewable, Diagonal
	Dot Pitch	0.297 mm
	Brightness	180cd/m ² (Min), 200cd/m ² (Typ)
	Response Time	40msec Max.
Input	Signal	RGB Analog
	Type	15 pin D-sub
Sync	H-Freq	31.3~68.7kHz
	V-Freq	56~85Hz
Video Band Width		94.5MHz Max
Display	Area	304 x 228 mm
	Color	16.7 Million colors
Resolution (Max.)		1024 x 768 @ 85Hz
User Controls & OSD Controls		Contrast, Brightness, H/V Position, Clock, Clock-Phase, Recall, Preset Mode, Color Control, Language, OSD Control(Position, Display Time), Test Pattern
USB Spec.		Compliant with Rev. 1.1
Audio System	Audio Input	600mVp-p Max.
	Output Power	2 x 1W micro loudspeaker(std.)
Power Management		VESA DPMS Standard
Plug & Play		VESA DDC 1/2B
Safety & Regulation	Ergonomics	TCO' 99
	EMC	FCC Class B, CE
	Safety	cUL, CE, TÜV-GS, SEMKO, NEMKO, DEMKO, FIMKO
Temperature	Operating	5 to 35°C
	Storage	-5 to 45°C
Humidity	Operating	30% to 80% (Non-condensing)
	Storage	5% to 90% (Non-condensing)
Weight	Unit	5.4Kg
	Carton	6.7Kg
Dimension (W x H x D mm)		387 x 388 x 201 mm

► Specification is subject to change without notice for performance improvement.