

ATTACHMENT E. USERS MANUAL

V770

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.

DECLARATION OF CONFORMITY

WE **HYUNDAI ELECTRONICS INDUSTRIES CO., LTD.**
 Ami-ri Bubal-Eub Ichon-Si Kyungki-Do
 467-701 KOREA

declare under our sole responsibility that the product:

Kind of equipment : COLOR MONITOR

Type-Designation : V770

to which this declaration relates is in conformity with the following standard(s) or other normative document(s)

Safety : EN60950 : 1992 + A1, A2, A3, A4, A11
 EMC : EN 55 022/1994, EN 50 082-1/1992
 IEC 801-2/1991, IEC 801-3/1984, IEC 801-4/1988

following the provisions of the Low Voltage Directive 73/23/EEC, 93/68/EEC

Accredited testlaboratory:
 TÜV Rheinland
 Am Grauen Stein
 51105 Köln

and the EMC Directive 89/336/EEC

Accredited test laboratory
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 N-0314 OSLO NORWAY

KOREA / _____
 (Place and date of issue)

HONG KI, KIM *Hong Ki Kim*
 (Name and signature of authorized person)

ENGLISH

USER'S GUIDE



n4 lesson5 Table of Contents

ENGLISH

How to get the most out of this monitor 1

Color display tube 1

Features 1

General safety precautions 1

Video monitor precautions 2

Power source precautions 2

Cleaning and Maintenance 2

Packing List 2

Assembly and Removal of the Tilt-and-Swivel Support 3

Fixing 3

Removing 3

Monitor Installation 4

Micro-controller features 5

Display modes memory 5

User-setting area 5

Factory-presetting area 5

DDC 1/2B (Display Data Channel 1/2B) 5

On screen controls and LED indicator 6

External controls 7

Main Menu 7

Preset timing chart 9

Timing charts 9

Input timing limits 9

Input level limits 9

Timing table 10

Power management 11

Operation 11

Video input terminal 12

Pin Description 12

D-Sub miniature connector 12

Specifications 13

<http://mlab.suwon-c.ec.kr/wave/thraa4.htm>

How to get the most out of this monitor

This 17" color monitor (15.7" viewable) displays signals from personal or micro-computers.

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

Color display tube

Dot Pitch 0.27mm

! In order to prevent fire or electric shock, do not expose this display to rain or moisture.

Features

- High resolution CRT for sharp and crisp images.
- 17" Diagonal screen (15.7" viewable) with non-glare direct etched surface.
- Unlimited Color Display.
- DPMS(Display Power Management Signaling).
- OSD(On Screen Display) controls.
- DDC 1/2B (Display Data Channel 1/2B)

General safety precautions

This monitor has been engineered and manufactured to ensure 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.
- Be sure to turn the monitor off before plugging the power cord into the power source.
- Make sure the power cord and the other cords are securely and correctly connected.
- Avoid operating the monitor in extreme heat, humidity or an area affected by dust.
- Never cover the ventilation openings with any material and never touch them with metallic or inflammable materials.
- Do not overload AC outlets. Extension cords, frayed power cords and broken plugs are dangerous and may result in electric shock or fire. Call your service technician for replacement.
- Do not open the monitor. There are no user-serviceable components inside, and there is dangerously high voltages inside, even when the power is turned off. Contact your dealer if the monitor is not operating properly.
- Do not use aerosol directly on the picture tube because overspray may cause electrical shock.

ENGLISH

ENGLISH

User's Guide

Video monitor precautions

As with any electrical equipment, careless use and unprofessional maintenance may cause serious electrical shock and other hazards. In the interests of safety, the following suggestions should be followed at all time.

Power source precautions

Never remove the monitor's backcover. Doing so will expose you to high voltage electricity and other hazards. If the display monitor does not operate properly, remove the power cord from the wall outlet, and contact your dealer. As a safety feature, this monitor is equipped with a polarized, alternating-current-line plug. (Grounded, 3-prong plug) This plug will fit into the outlet one way only. If you are unable to insert the plug fully into the outlet, or if the plug simply does not fit, contact an electrician to replace the obsolete outlet. Do not defeat the safety purpose of this polarized plug by attempting to force.

! When positioning this equipment, please ensure that the main plug and the socket are easily accessible.

Cleaning and Maintenance

The monitor must be switched off and the power supply cable disconnected during all cleaning operations.

- Use a damp cloth for cleaning the monitor.
- Do not touch the screen with your fingers, as the natural oils from your body leave smears on the screen and tend to attract dust.
- Do not use petrol, alcohol, solvents or abrasives for cleaning the monitor. These substances could corrode the external parts.

Packing List

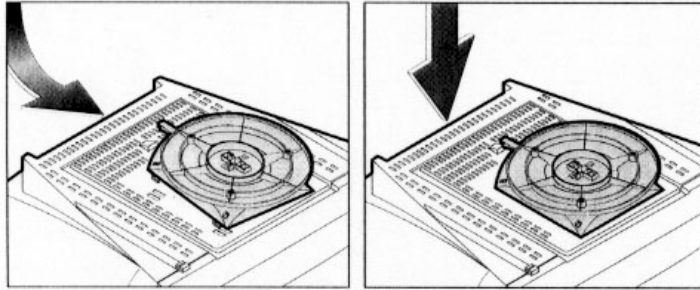


! Above power cord can be changed upon different voltage areas.

Assembly and Removal of the Tilt-and-Swivel Support

Fixing

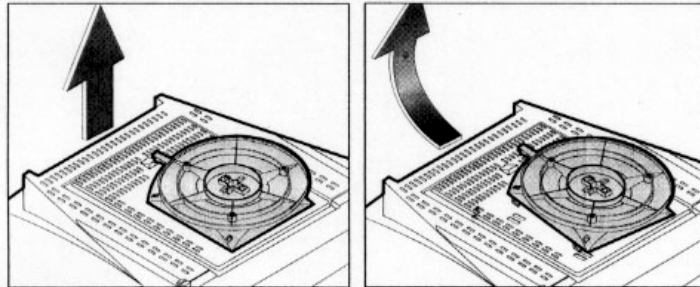
This product consists of the display monitor and the tilt and swivel. When fixing the tilt and swivel to the display monitor, please follow the steps below.



1. Push the four hooks of the tilt and swivel into the four holes at the bottom of the display monitor.
2. Then slide the tilt and swivel forward.
3. Then the latch is going to come above the tilt and swivel base, and it is fixed firmly.

Removing

Please remove the tilt and swivel when transporting for repairing.



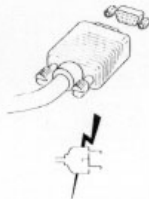
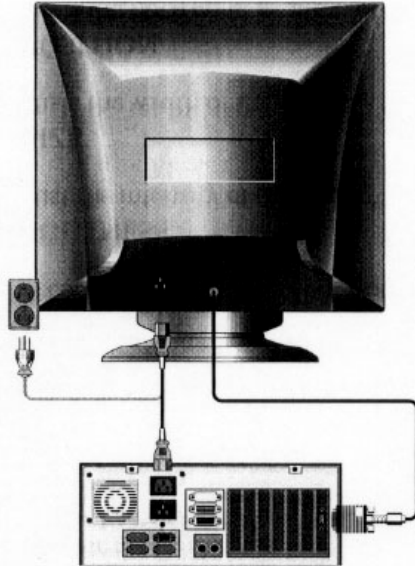
1. Push down the latch of the display monitor and pull out the tilt and swivel.
2. Slide backward the tilt and swivel from the front of the display monitor.
3. Pull out the tilt and swivel from the holes of the display monitor.

ENGLISH

User's Guide

Monitor Installation

Check that the computer is switched off before installing the monitor. The monitor is equipped with a cable for connection to the computer. The cable for connection to the power supply is provided with the computer. Follow the procedure described below to make the monitor operational :

ENGLISH

Connect the video signal cable (15-pin connector) to the connector on the video board inside the computer, usually located on the rear panel of the computer.

Connect the power supply cable to the monitor and then to the power supply.

After powering on the computer, wait for 30 seconds, then adjust the display using the various controls provided (see later). For further information on the installation procedure, refer to the operating guide of the computer being used.

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 then the factory-presetting area.

Display modes memory

The micro-controller has the memory capacity to store 24 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 display image, the image is saved automatically. The micro-controller then always detects and displays the mode stored in the user setting area when the monitor is turned on. The user-setting area maintains up to 16 display modes set by the user in its memory. When the user-setting area is full (i.e. when 16 modes are registered), the oldest timing settings will be deleted as new settings are added.

Factory-presetting area

There are 8 display modes stored in this area. These modes are preset at the factory and include most of the display modes currently available (see TIMING CHART in this manual).

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

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

This monitor includes a DDC 1/2B feature.

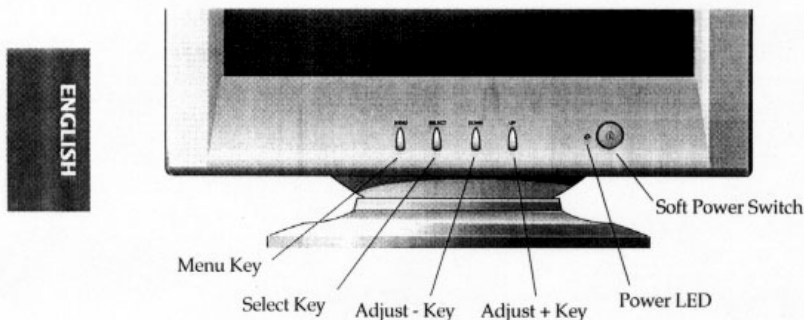
DDC 1/2B (Display Data Channel 1/2B) is a communication channel by which the monitor automatically informs the host system of its capabilities (e.g. each supported resolution with its corresponding timing).

DDC 1/2B uses a formerly unconnected signal pins in the 15-pin VGA connector. The system will perform "Plug & Play" feature if both monitor and host systems support DDC 1/2B protocol.

! Some computer systems are not compatible with the DDC standard. If your monitor displays the incorrect resolution, please check your computer system including a DDC compatible video card.

User's Guide

On screen controls and LED indicator



Main menu & control selection

Press the MENU, ▲ or ▼ key to access the main menu. The resolution, horizontal and vertical frequency are displayed on the top in the menu box. When the monitor detects a nonstandard signal, the horizontal and vertical frequency is displayed. Place the highlighted bar on the control you wish to adjust by pressing the ▲ or ▼ key. Then press the SELECT key to access the control.

Exit menu

Press the MENU key twice to exit.

Auto exit

The OSD images disappear automatically after 8 seconds.

Auto save

When user exits from OSD menu or moves the rectangle lighter by pressing adjust key the newly adjusted stare is automatically cally saved.

Normal mode

POWER LED is lit Green

DPMS mode

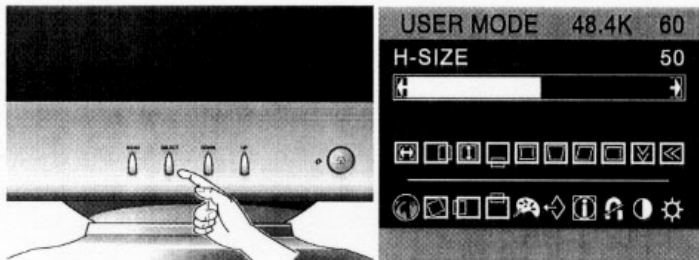
- OFF MODE : No Signal cable or signal is detected.
- Power LED is lit orange.

Out of range

When an unsuitable signal is detected, the OSD images, OUT OF RANGE, is displayed. Check your system or setup video mode again.

External controls

Main Menu



H-SIZE

- A) Press (▲) button to increase the horizontal size.
- B) Press (▼) button to decrease the horizontal size.



H-POSITION

- A) Press (▲) button to adjust the screen to the right.
- B) Press (▼) button to adjust the screen to the left.



V-SIZE

- A) Press (▲) button to increase the vertical size.
- B) Press (▼) button to decrease the vertical size.



V-POSITION

- A) Press (▲) button to adjust the screen to the top.
- B) Press (▼) button to adjust the screen to the bottom.



PINCUSHION

- A) Press (▲) button to round out the vertical side line.
- B) Press (▼) button to curve the vertical side line inward.



TRAPEZOID

- A) Press (▲) button to make the image wider at the top.
- B) Press (▼) button to make the image wider at the bottom.



PARALLEL

- Press (▲ or ▼) button to get up right Image.



PIN BALANCE

- Press (▲ or ▼) button to adjust the vertical edges' convex and concave pitch.



V-MOIRE

- Press (▲ or ▼) button to reduce a regular, wavy distortion pattern vertically.



H-MOIRE

- Press (▲ or ▼) button to reduce a regular, wavy distortion pattern horizontally.

User's Guide

ENGLISH



LANGUAGE/ENGLISH

You may select one of nine languages for your OSD. This monitor supports English, German, French, Spanish, Italian, Swedish, Finnish, Danish and Portuguese.



ROTATION

A) Press (▲) button to adjust the tilt to the clockwise direction.
B) Press (▼) button to adjust the tilt to the counterclockwise direction.



OSD H-POSITION

A) Press (▲) button to adjust the OSD to the right.
B) Press (▼) button to adjust the OSD to the left.

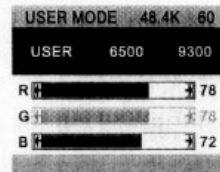


OSD V-POSITION

A) Press (▲) button to adjust the OSD to the top.
B) Press (▼) button to adjust the OSD to the bottom.



COLOR CONTROL



You can select the color temperature 9300°K or 6500°K by using this control. Select the COLOR CONTROL menu to access the sub-menu of color adjustment.

And you can define your own color by selecting user. Place the highlighted bar on the control you wish to adjust by pressing the (▲) or (▼) key.

Press the SELECT key to access the control.



RECALL

In a factory preset mode the RECALL will reset the image size, position and geometry settings to the factory presetting. In a user setting mode, this control has no effect for the image size, position and geometry settings. But the contrast will be reset to maximum luminance and brightness to cut-off level by selecting this control in any modes.



INFORMATION

Contact point for product information is showed when you press the select key.



DEGAUSS

Press the select key to eliminate any purity distortion due to tilt, rotation or residual magnetism.



Please allow a minimum of 20 minutes to elapse between uses of the Degauss Button. To avoid damage to the monitor, do not hold the button down continuously.



CONTRAST

- A) Press (▲) button to raise the contrast of the displayed image.
- B) Press (▼) button to lower the contrast of the displayed image.



BRIGHTNESS

- A) Press (▲) button to raise the brightness of the picture.
- B) Press (▼) button to lower the brightness of the picture.

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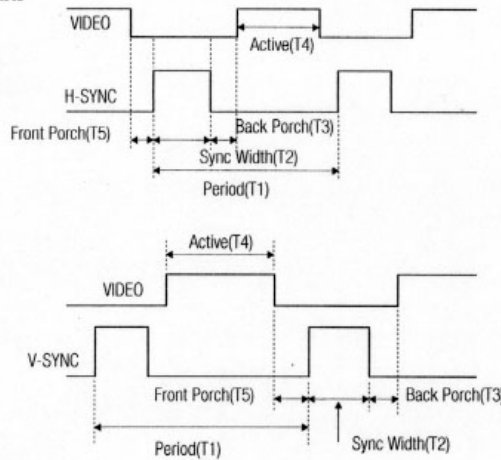
Preset timing chart

TIMING CHARTS

Supported video timings

This monitor is capable of displaying the following video timing charts.

Timing charts



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: $0.04ms \leq \text{Sync Pulse Width} \leq 0.5ms$

! If the sync pulse width of input timing is out of range of input timing limits, monitor may be able to operate abnormal.

Input level limits

Low level : 0.4V max

High level : 2.4V min

ENGLISH

User's Guide

Timing table

Horizontal	Pixel	720	640	640	800	800	800	1024	1024
Frequency	kHz	31.469	43.269	50.625	46.875	53.674	63.920	60.023	68.677
Period(T1)	µs	31.778	23.111	19.752	21.333	18.631	15.645	16.660	14.561
Sync Width(T2)	µs	3.813	1.556	1.580	1.616	1.138	1.185	1.219	1.016
Back Porch(T3)	µs	1.907	2.222	1.975	3.232	2.702	2.015	2.235	2.201
Active(T4)	µs	25.422	17.778	15.802	16.162	14.222	11.852	13.003	10.836
Front Porch(T5)	µs	0.636	1.556	0.395	0.323	0.569	0.593	0.203	0.508

Vertical	Lines	400	480	480	600	600	600	768	768
Frequency	Hz	70.080	85.008	100.05	75.000	85.061	100.03	75.029	84.997
Period(T1)	ms	14.268	11.764	9.995	13.333	11.756	9.997	13.328	11.765
Sync Width(T2)	ms	0.064	0.069	0.059	0.064	0.056	0.063	0.050	0.044
Back Porch(T3)	ms	1.080	0.570	0.435	0.448	0.503	0.501	0.466	0.524
Active(T4)	ms	12.711	11.093	9.481	12.800	11.179	9.387	12.795	11.183
Front Porch(T5)	ms	0.413	0.023	0.020	0.021	0.019	0.047	0.017	0.015
Interlaced	Y/N	1.577	0.671	0.514	0.553	0.577	0.610	0.533	0.582
Sync Polar	H	-	-	-	+	+	+	-	+
	V	+	-	-	+	+	+	-	+
Interlaced	Y/N	N	N	N	N	N	N	N	N

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

- Horizontal Freq.: ±1.0kHz MAX.
- Vertical Freq.: ±1 Hz MAX.

! Even if the monitor detects the input timing as a factory preset mode, you may not be able to set the position as desired. Check the input timings are under the specifications and adjust the image as you want.

For better display image quality, use the timing and polarity shown in the table above. Please see your video card user's guide to ensure compatibility.

Power management

This monitor is equipped with a DPMS(Display Power Management Signaling) function which 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, because degaussing, which occurs every time your power is turned on, helps maintain faultless color purity.

Operation

The DPMS function requires support from the computer system or any software DPMS function applied, currently being used. 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 DPMS function has three states. The recommended signals, power consumption and recovery times are shown in the table below.

State	Signals			Power consumption	Recovery time	LED Description
	H-Sync	V-Sync	Video			
On	pulses	pulses	active	80W (Normal)	-	Green
Stand-by	no pulse	pulses	blanked	less than 15W	within 3 sec	Orange/ Green blinking about 1 sec
Suspend	pulses	no pulse	blanked	less than 15W	within 3 sec	Orange/ Green blinking about 0.5 sec
Off	no pulses	no pulses	blanked	less than 5W	within 15 sec	Orange

ENGLISH

User's Guide

Video input terminal

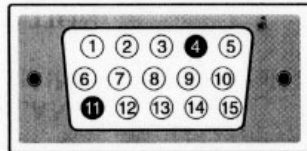
A 15 pin D-sub connector is used as the input signal connector. Pin and input signals are shown in the table below.

Pin Description

ENGLISH

PIN NO.	SIGNAL	SEPARATE SYNC
1		RED
2		GREEN
3		BLUE
4		N.C
5		GROUND
6		RED GROUND
7		GREEN GROUND
8		BLUE GROUND
9		+5V
10		LOGIC GROUND
11		N.C
12		SDA
13		H-SYNC
14		V-SYNC (VCKL)
15		SCL

D-Sub miniature connector



Specifications

CRT	SIZE	17"(15.7" viewable) Diagonal, Flat
	Dot Pitch	0.27 mm
	Type	Non-glare, Anti-Static
Input	Signal	R.G.B Analog
	Connector	15 pin attach cable
SYNC	H-F	30~70kHz(Automatic)
	V-F	50~150Hz(Automatic)
Video Bandwidth		108 MHz(Max dot rate)
Display	Area(H x V)	305X229 mm(Max. OVERSCAN)
	Color	Infinite
Resolution		Max. 1280X1024 (64kHz/60Hz)
User Controls & OSD Controls		H/V Position, H/V Size, Pincushion, Trapezoid, Parallel, Pin Balance, Rotation, H/V- Moire, Recall, Degauss, Color Control, OSD H/V Position, 9-languages, Brightness, Contrast, DPMS LED, Soft Power Switch, Information
Power Management		As per VESA Standard, Lower than EPA's recommendation
VESA DDC 1/2B		Basic
Compatibility		VESA, 8514/A, XGA, EVGA, MAC II
Power Source		100-240 VAC(Universal Power) 1.5A 80W
Safety & Regulation	TCO	Basic
	EMC	FCC Class B, CE
	Safety	UL, CSA, TÜV-GS, ISO-9241-3/7/8, DHHS, NEMKO,DEMKO, FIMKO, SEMKO
Temperature	Operating	0 to 40 degree celsius
	Storage	-20 to 60 degree celsius
Humidity	Operating	35% to 80%(Non-condensing)
	Storage	5% to 85%
Weight		•Unit : 15Kg •Carton : 17Kg
Dimension(W x H x Dmm)		404 x 408 x 420 mm

ENGLISH

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