



KRAMER ELECTRONICS, Ltd.

USER MANUAL

VIDEO SCALERS

Models:

VP-721DS, VP-722DS

**IMPORTANT: Before proceeding, please read paragraph entitled
"Unpacking and Contents"**



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1 INTRODUCTION

Congratulations on your purchase of this Kramer Electronics Video Scaler. Since 1981, Kramer has been dedicated to the development and manufacture of high quality video/audio equipment. The Kramer line has become an integral part of many of the best production and presentation facilities around the world. In recent years, Kramer has redesigned and upgraded most of the line, making the best even better. Kramer's line of professional video/audio electronics is one of the most versatile and complete available, and is a true leader in terms of quality, workmanship, price/performance ratio and innovation. In addition to the Kramer line of high quality Video Scalers, such as the one you have just purchased, Kramer also offers a full line of high quality Video Scalers, matrix switchers, distribution amplifiers, processors, interfaces, controllers and computer-related products. This manual includes configuration, operation and option information of the following Kramer Video Scalers for the video professional. These Video Scalers are similar in operation but differ in features.

VP-721DS	VP-722DS
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1.1 A Word about Video Scalers

Kramer's Digital Video Scalers are designed to convert Composite and S-Video signals to a variety of computer resolutions. Different versions are required to handle NTSC and PAL video standards. Kramer Video Scalers have many features to enhance performance. AFM (Adaptive Film Mode) is an automatic 3:2 pull-down detector that provides clear and crisp de-interlacing video from 24 frames-per-second film. It offers significant enhancements when viewing movies on a large screen. VT (Vertical Temporal Filter) can remove jagged edges and other de-interlacing artifacts for video motion sequences. Our Static Picture Detector uses a simple field merging technique to perform de-interlacing and it is very beneficial for static images or scenes with very little or no motion.

1.2 Factors Affecting Quality of Results

There are many factors affecting the quality of results when Composite or S-Video signals are de-interlaced and up-converted (scaled) to computer resolutions. Some basic precautions will ensure the best possible performance from your Video Scaler.

- **Output display device** – The quality of the output signal will depend largely upon the type and quality of display device used. Specifically, some video projectors just look better than others.
- **Distance between the Video Scaler and the display device** – This plays a major role in the final result. Long distances are possible, but special measures should be taken in order to avoid cable losses. These include using high quality (coax-type) cables or adding line amplifiers.
- **Output connection cables** – Low quality cables are susceptible to interference. They degrade signal quality due to poor matching and cause elevated noise levels. Therefore, cables should be of the best quality. Coax-type computer cables are because of their superior internal shielding characteristics.
- **Interference from neighboring electrical appliances** – These can have an adverse effect on signal quality. For example, an older computer monitor often emits very high electromagnetic fields that can interfere with the performance of video equipment in its proximity.



2 SPECIFICATIONS

	VP-721DS	VP-722DS
Computer Input (Loop-Through)	1x RGB with HV Sync	4x RGB with HV Sync
Maximum Computer Input Resolution	1600x1200	1600x1200
Computer Input Connection	HD15 Jack	4x HD15 Jack
Computer Input Signal Level	RGB @ 0.7V Peak Level H&V Sync @ TTL	RGB @ 0.7V H&V Sync @ TTL
Video Inputs	Composite Video @ 1V P-P S-Video @ 1V P-P	Composite Video @ 1V P-P S-Video @ 1V P-P
Video Standard	NTSC Version PAL Version	NTSC Version PAL Version
Video Input Connectors	Composite Video on BNC, S-Video on 4-Pin Mini-DIN	Composite Video on BNC S-Video on 4-Pin Mini-DIN
Scaled Output Resolutions	VGA 640x480 SVGA 800x600 XGA 1024x768	VGA 640x480 SVGA 800x600 XGA 1024x768
Scaled Output Vertical Refresh Rates	NTSC Version 59.94Hz PAL Version 50Hz	NTSC Version 59.94Hz PAL Version 50Hz
Scaled Output Horizontal Scan Rates	VGA 31.5KHz SVGA 37.8KHz XGA 48.4KHz	VGA 31.5KHz SVGA 37.8KHz XGA 48.4KHz
Control Type	Manual Front Panel Buttons	Manual Front Panel Buttons RS-232 Serial Interface
Video Adjustments	Horizontal Position Vertical Position Brightness Contrast Color Saturation Hue (NTSC Version) Sharpness	Horizontal Position Vertical Position Brightness Contrast Color Saturation Hue (NTSC Version) Sharpness
Weight	3.0 kg (6.6 lbs.) Approx.	4.0 kg (.8 lbs.) Approx.
Dimensions (HxWxD)	19" x 8.25" x 1.75" (1RU) (482mm x 210 mm x 44.5mm)	19" x 8.25" x 1.75" (1RU) (482mm x 210 mm x 44.5mm)
Power Source	100-240VAC, 50/60 Hz	100-240VAC, 50/60 Hz
Power Consumption	700 mA	900 mA

3 HOW DO I GET STARTED?

The fastest way to get started is to take your time and do everything right the first time. Taking 15 minutes to read the manual may save you a few hours later. You don't even have to read the whole manual - if a certain section doesn't apply to you, you don't have to spend your time reading it.

4 UNPACKING AND CONTENTS

The items contained in your Kramer accessory package are listed below. Please save the original box and packaging materials for possible future transportation and shipment of the unit.

- Video Scaler
- AC Power Cable
- VGA Cable – HD15 to HD15
- Composite Video Input Cable
- S-Video Input Cable
- Rackmount Screws (Qty 4) for EIA 19" Racks
- User Manual
- Kramer Concise CD ROM Product Catalog
- Disk containing sample Remote Control software (supplied with VP-722DS only)

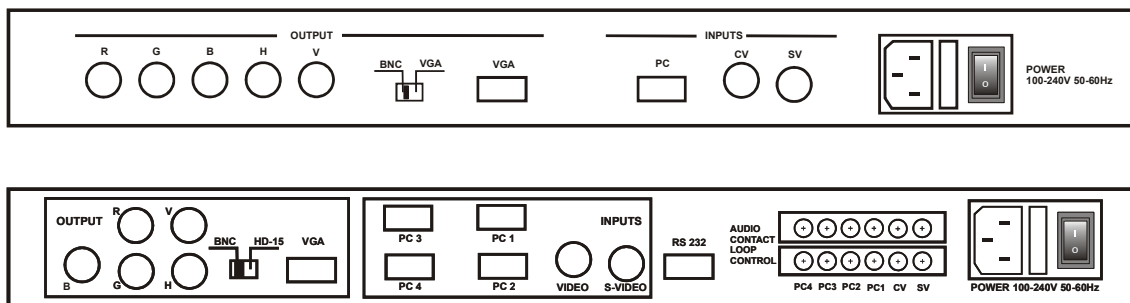
4.1 Optional Accessories

The following optional accessories, which are available from Kramer, can enhance implementation of your Video Scaler. For information regarding these accessories, contact your Kramer dealer.

- RGBHV Output Cable Assemblies - 5 BNC to 5 BNC
- VGA-style Output Cable Assemblies - HD15 to HD15
- RS-232 Cable (VP-722DS Only)

5 CONNECTING THE HARDWARE

The first step is to connect the Video Converter and related hardware. Below is a drawing of the rear panels of the two units.



5.1 Rack Mounting

Each of the Video Scalers described in this manual mount in a standard 19" (1RU) EIA rack assembly. These devices do not require spacing above or below the unit for ventilation. Four standard rackmounting screws are provided for each of the four corner holes in the rack ears.

5.2 Connecting the Video Inputs

The Video Scaler provides for a Composite Video or an S-Video input signal for scaling, as well as a computer signal input (4 in the case of the VP-722DS) that is passed through the unit when it is in the Bypass Mode.

- **Composite Video** - use the composite video cable provided to connect from the composite video output of the source video equipment to the back of the Video Scaler (the BNC connector marked CV).
- **S-Video** - use the S-Video cable provided to connect from the S-Video output of the source video equipment to the back of the Video Scaler (the 4-Pin Mini-DIN connector marked SV). S-Video provides improved performance over Composite Video.
- **Computer RGB with H&V Sync** - connect the source computer's RGBHV (Red, Green, Blue, H.Sync and V.Sync) output signal to the Video Scaler's PC In HD15 connector. In the case of the VP-722DS, four such source computer signals may be connected to the Video Scaler at the HD15 Input connectors labeled PC1, PC2, PC3 and PC4. **Note** – These Computer Input Signals are not scaled, but are available for pass-through when the Video Scaler is in the Bypass Mode.

5.3 Connecting the Video Output

Connect the Video Scaler's RGBHV output to the target computer monitor, video projector or other destination via the 5 BNC connectors or the single HD15 connector labeled Output. The slide switch between these output connectors is used to select whether the output signal is sent to the 5 BNC's or the HD15. **Note** – The output signal is not available at both simultaneously.

5.4 Connecting the Serial Cable

In addition to the Front Panel Buttons, the VP-722DS can have its Video Input selection made by an external control device. This is accomplished by connecting the unit's RS-232 port to an external control system. See the section on 'RS-232 Control' later in this manual on how to use this control feature.

5.5 Connecting the AC Power

The Video Scaler requires an AC input power source of 100-240VAC@50-60Hz. The unit's switching power supply automatically accommodates this input power range. With the Power On/Off switch on the rear of the Video Scaler in the Off position, plug the AC Cable supplied into the AC Receptacle on the back of the unit and plug the AC Cable into the power outlet.

5.6 Connecting the Audio Control (VP-722DS Only)

The VP-722DS has the ability to control an external Kramer audio routing switcher (with contact closure control) for audio-follow-video applications. This is accomplished by providing a set of contact closures that follow the Video Input selection. This connector strip is located on the rear panel of the unit and a "normally-open" pair of contacts is provided to correspond to each input: SV, CV, PC1, PC2, PC3 and PC4. When a particular video input is selected via the front panel Input Button, its respective set of contacts "close", thus providing an indication to the external audio switcher. Please refer to the Kramer audio switcher's user manual for instructions on connecting the Video Scaler's contacts to the audio switcher's contacts.

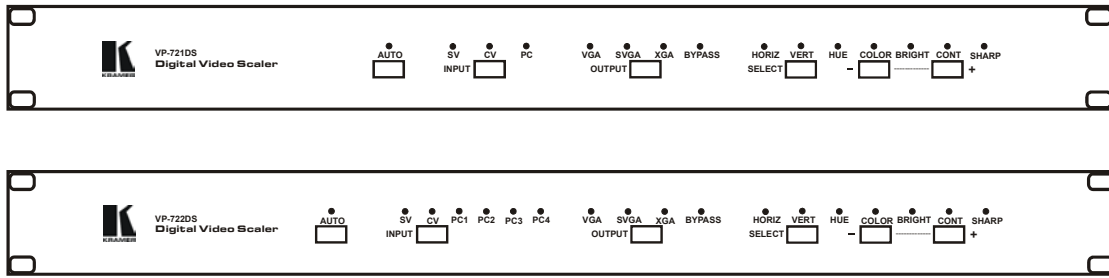
5.7 Turning the Video Scaler On

Make sure that all cables are connected and that all other equipment is turned on. The Video Scaler's AC Power Switch on the rear panel should be switched to the On position. When the Video Scaler is switched on, some of the LED indicators on the front panel will illuminate. If a video input signal is present, an image should be seen on the output display device. If there is no picture on the display device, go to the Troubleshooting section.

6 ABOUT THE VIDEO SCALER

The Video Scaler is controlled via the Front Panel Buttons and its status determined by the Front Panel LED indicators. The VP-722DS may also be controlled via an external control device connected to its RS-232 port, which will be covered later in this manual.

Shown below are diagrams that indicate the main features of the Front Panels of the Video Scalers. Both models covered by this manual appear similar and their basic operation is identical.



The following sections go through the Front Panel Buttons and what control they provide over the Video Scaler. It also provides information on the Status Indications given by the Front Panel LED's.

7 INPUT SELECTON

The Video Scaler's Input can be chosen from the Front Panel in two ways:

- **Automatic Input Select Mode** - the Video Scaler determines when a video signal is present at either the Composite Video or S-Video input connector and automatically selects that as the active input. If a signal is present at both inputs, priority is given to the S-Video input. E.g., this feature allows input selection to be done by switching power on or off to the source video devices.
- **Manual Input Select Mode** - allows manual selection of which input video signal is chosen. Repeatedly pressing the button toggles through the available inputs:
 - a) VP-721DS = Composite Video, S-Video or PC.
 - b) VP-722DS = Composite Video, S-Video, PC1, PC2, PC3 or PC4.
- **Note** – The PC Inputs are simply pass-through connections to the output and are not scaled.

7.1 Auto Button

Pressing the Auto Button places the Video Scaler in the Automatic Input Select Mode.

- **AUTO LED** – The Auto Button illuminates when the Video Scaler is in the Automatic Input Select Mode.

7.2 Input Button

Pressing the Input Button allows manual selection of which input video signal is chosen. Repeatedly pressing the button toggles through the available inputs:

- **SV LED** - The SV LED is illuminated when the S-Video input has been chosen by repeatedly pressing the Input Button until that source has been selected.
- **CV LED** - The CV LED is illuminated when the Composite Video input has been chosen by repeatedly pressing the Input Button until that source has been selected.
- **PC LED (VP-721DS)** - The PC LED is illuminated when the Bypass Mode has been chosen by repeatedly pressing the Input Button until that source has been selected. The Bypass LED also illuminates.
- **PC 1, PC2, PC3, PC4 LEDs (VP-722DS)** - The PC1, PC2, PC3 or PC4 LED is illuminated when the Bypass Mode has been chosen by repeatedly pressing the Input Button until the corresponding PC Input has been selected. The Bypass LED also illuminates.

8 OUTPUT SELECTION

The Video Scaler is capable of up-converting the input Composite or S-Video signal to either of three output resolutions: VGA, SVGA or XGA. This selection is via the Output Button on the Front Panel.

8.1 Output Button

Pressing the Output Button chooses the resolution of the scaled output video signal. Repeatedly pushing this button toggles through the selections of VGA, SVGA and XGA.

- **VGA LED** – The VGA LED illuminates when the 640x480 Output Resolution has been selected by pressing the Output Button.
- **SVGA LED** – The SVGA LED illuminates when the 800x600 Output Resolution has been selected by pressing the Output Button.
- **XGA LED** – The XGA LED illuminates when the 1024x768 Output Resolution has been selected by pressing the Output Button.
- **BYPASS LED** – The Bypass LED illuminates when the Bypass Mode has been chosen by pressing the Input Button until the PC Input has been selected, or in the case of the VP-722DS, until PC1, PC2, PC3 or PC4 is chosen.

9 VIDEO SIGNAL ADJUSTMENT

The Video Scaler has an integral processing amplifier capable of adjusting various signal parameters of the incoming Composite or S-Video signal. This is done by using the Select Button to choose the desired parameter and then using the + and – Buttons to make the adjustment.

9.1 Select, + and – Buttons

Repeatedly pressing the Select Button toggles through the available adjustments, as indicated by the respective LED. Pressing the + Button increases the value of the selection, while pressing the – Button decreases the value. The LED will flash rapidly when the end of the adjustment range is reached. The settings are automatically saved after adjustment and will remain in memory, even when power is switched off. Pressing the + and – Buttons at the same time returns all settings to the factory preset levels. **Note** - These adjustments have no effect on the incoming computer signals, which are simply passed through the Video Scaler.

- **Horiz LED** – The Horizontal Position LED illuminates when the Select Button is pressed repeatedly until this parameter is available for adjustment. This is for horizontally centering the image. When this LED is illuminated, pressing the + Button moves the position of the image to the right on the output screen. Pressing the – Button moves the position of the image to the left on the output screen.
- **Vert LED** – The Vertical Position LED illuminates when the Select Button is pressed repeatedly until this parameter is available for adjustment. This is for vertically centering the image. When this LED is illuminated, pressing the + Button moves the image up on the output screen. Pressing the – Button moves the image down on the output screen.
- **Hue LED** – The Hue LED illuminates when the Select Button is pressed repeatedly until this parameter is available for adjustment. Hue is sometimes called Tint or Color Phase. When this LED is illuminated, pressing the + Button increases the chroma phase in relation to the current setting and pressing the – Button decreases it. **Note** – This adjustment is only available on the NTSC versions.
- **Color LED** - The Color Saturation LED illuminates when the Select Button is pressed repeatedly until this parameter is available for adjustment. When this LED is illuminated, pressing the + Button increases the chroma saturation and pressing the – Button decreases it.
- **Bright LED** – The Brightness LED illuminates when the Select Button is pressed repeatedly until this parameter is available for adjustment. When this LED is illuminated, pressing the + Button increases the Brightness level and pressing the – Button decreases it.
- **Cont LED** – The Contrast LED illuminates when the Select Button is pressed repeatedly until this parameter is available for adjustment. When this LED is illuminated, pressing the + Button increases the Contrast level and pressing the – Button decreases it.
- **Sharp LED** – The Sharpness LED illuminates when the Select Button is pressed repeatedly until this parameter is available for adjustment. Sharpness is sometimes called Detail or Enhancement. When this LED is illuminated, pressing the + Button increases the Sharpness level and pressing the – Button decreases it.

Note – Pressing the + and – Buttons at the same time returns all settings to the factory preset positions.

10 RS-232 CONTROL OF THE VP-722DS VIDEO SCALER

The Video Input selection and signal parameter settings for the VP-722DS can also be made via an external control system by using the RS-232 port on the unit. If information for this control method is required, beyond the scope of the instructions provided in this section, please contact Kramer Technical Support at: www.kramerelectronics.com/searchdx.html. A disk is provided with the VP-722DS containing a sample Windows Control Panel that permits remote control of the unit from a PC via RS-232.

* The connection between VP-722SC and RS-232 remote controller with modem cable.

Pins definition of modem cable

Video Scaler			Remote Controller	
PIN	Definition		PIN	Definition
1	NC		1	NC
2	TxD		2	RxD
3	RxD	→	3	TxD
4	NC		4	DTR
5	GND	←	5	GND
6	NC		6	DSR
7	NC		7	RTS
8	NC		8	CTS
9	NC		9	NC

* RS-232 transmission format:

Baud Rate: 9600bps	Data Bit: 8 bits	Parity: None	Stop Bit: 1 bit
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* Command/Response codes of RS-232 transmission:

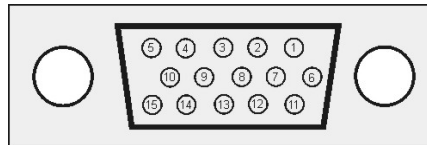
(The command/response code is the combination of 3 characters.)

Remote Controller		→	Video Scaler	
Command Code	Comment	←	Response Code	Comment
none			OK1	video scaler power on ready
AU!	AUTO		AU0 AU1	AUTO OFF AUTO ON
IN!	INPUT		IN0 IN1 IN2 IN3 IN4 IN5	S-video Composite Video PC1 PC2 PC3 PC4
OU!	OUTPUT		OU0 OU1 OU2	VGA SVGA XGA
SE!	SELECT		SE0 SE1 SE2 SE3 SE4 SE5	Horizon Vertical Hue Color Bright Contrast

			SE6	Sharpness
MI!	[-] minus		MI0	If excess minimum value
PL!	[+] plus		PL0	If excess maximum value
AL!	ALL		AU? OU? SE? IN? LO1	Return all video scaler status if INPUT system locked under AUTO mode
RE!	RESET		none	
none			RE1	video scaler reset
none			LO0	INPUT system unlocked under AUTO mode
none			LO1	INPUT system locked under AUTO mode or change to non-AUTO mode

11 TECHNICAL DATA

11.1 HD15 Connector Information



Pin	Use
1	Red 0.7v max. / 75 Ohms
2	Green 0.7v max. / 75 Ohms
3	Blue 0.7v max. / 75 Ohms
4	ID 2, passed to PC monitor pin 4
5	Ground
6	Red ground
7	Green ground
8	Blue ground

Pin	Use
9	Passed to PC monitor pin 9
10	Ground
11	Ground
12	ID 1, passed to PC monitor pin 12
13	Horizontal Sync TTL
14	Vertical Sync TTL
15	Passed to PC monitor pin 15

11.2 Fuse Replacement

The Video Scaler's AC fuse is located next to the On/Off Switch on the rear panel and is easily accessible. If fuse replacement is necessary, be sure to use the same type and size as the original.

12 TROUBLESHOOTING

If the recommended actions still do not result in satisfactory operation, please consult your Kramer Dealer. Before seeking technical assistance, if the problem is image related, please try to find out the screen resolution and refresh rate being used from the computer and if the problem only affects one particular resolution.

Problem	Remedy
The picture on the video display is black and white.	<ol style="list-style-type: none"> 1. Check the condition of the cables being used. In particular, a faulty S-Video cable will cause this problem. 2. Make sure that the version of the Video Scaler (NTSC or PAL) matches the video standard of the equipment you are using: NTSC or PAL. 3. Ensure that the color controls on your computer monitor or video projector are all set correctly. 4. Ensure that the Color adjustment on the Video Scaler is not adjusted completely down. It may be necessary to reset the video levels by pressing the + and – Buttons simultaneously.
There is no picture on the video monitor.	<ol style="list-style-type: none"> 1. If no LED's on the Video Scaler are illuminated, ensure that the proper AC Power is being supplied to the unit and check the fuse (The procedure located elsewhere in this manual). 2. If the LED's are illuminated: a) Check that the output switch on the rear panel of the Video Scaler is set to the proper position, either BNC or HD15, depending upon which method is used to connect to the display, b) Check that the output you are using from the Video Scaler is also connected at the unit and the display, and c) Check that your display is switched on and set to the correct input and that its Brightness and Contrast are set correctly.
Some colors come out wrong on the video monitor.	<ol style="list-style-type: none"> 1. Try altering the color (saturation), hue (tint) contrast and brightness settings on your display. These are usually set up for viewing computer images, which may be somewhat different from viewing images that have been up-converted from video. 2. Make sure your output cable assembly is not faulty. Perhaps the Red, Green or Blue signal is not being passed through the cable.
How can I reduce smearing?	<ol style="list-style-type: none"> 1. Smearing usually occurs when a Composite Video input is used and is generally unavoidable, unless you can switch to using S-Video. It occurs because the luminance and color information is combined as one signal and the two parts have to be 'bandwidth-limited' to avoid them interfering with each other. 2. Using good quality video cable will help towards reducing this affect.



13 LIMITED WARRANTY

Kramer Electronics (hereafter Kramer) warrants this product to be free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for three years from the date of the first customer purchase.

WHO IS PROTECTED

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
 - a) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature.
 - b) Unauthorized product modification, or failure to follow instructions supplied with the product.
 - c) Repair or attempted repair by anyone not authorized by Kramer.
 - d) Any shipment of the product (claims must be presented to the carrier).
 - e) Removal or installation of the product.
 - f) Any other cause, which does not relate to a product defect.
 - g) Cartons, equipment enclosures, cables or accessories used in conjunction with the product.

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

Kramer's liability for any defective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

Note - All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

14 COMPLIANCE NOTICE

This equipment has been tested to determine compliance with the requirements of:

EN 55022	CE emissions standards, Class B
EN-50081	Generic Immunity standard for residential, commercial and light industrial)
CFR-47	FCC Rules and Regulations: Part 15- Radio frequency devices: Subpart B - Unintentional radiators

CAUTION!

- ⊗ Servicing the Video Scaler can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- ⊗ Please use recommended interconnect cables to connect the machine to other components.
- ⊗ When used, it is assumed that the unit is grounded by normal means (e.g. via the computer video input cable, rack-mount chassis ground, or video output cable to display device). Use of the equipment without any form of grounding may affect radiated emissions, but will not affect the product's safety.



**The list of Kramer distributors appears on our web site:
www.kramerelectronics.com
From the web site it is also possible to e-mail factory headquarters.
We welcome your questions, comments and feedback.**

KRAMER ELECTRONICS, LTD.

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