

Kramer Electronics, Ltd.



USER MANUAL

Models:

VP-720DS, *Seamless Switcher / Scaler*

VP-723DS, *Seamless Switcher / Scaler*

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1 Introduction

Dedication by Kramer Electronics since 1981, to the development and manufacture of high quality video/audio equipment, makes the Kramer line an integral part of the finest production and presentation facilities in the world. In recent years, Kramer has redesigned and upgraded most of the line, making the best even better! The Kramer 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 our high quality Kramer seamless switcher / scaler, we also offer excellent switchers and matrices, as well as distribution amplifiers, remote controllers, processors, interfaces and computer-related products.

Congratulations on purchasing your Kramer **VP-720DS** *Seamless Switcher / Scaler* and/or **VP-723DS** *Seamless Switcher / Scaler*, which are ideal for the following typical applications:

- Presentation and conference room systems
- Production studios, rental and staging

The **VP-720DS** and/or the **VP-723DS** package includes the following items:

- Seamless Switcher / Scaler
- Power cord
- Infra-red remote control transmitter
- This user manual¹
- Kramer concise product catalog/CD

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual

3 Overview

The **VP-720DS** and **VP-723DS** are *Seamless Switchers / Scalers* designed for a wide variety of presentation and multimedia applications. They are true

¹ Download up-to-date Kramer user manuals from the Internet at this URL: <http://www.kramerelectronics.com/manuals.html>

multi-standard video to RGBHV (pixel) scalers that convert composite video, s-Video, component video, VGA/SVGA/XGA/UXGA, and DVI signals to the following user-selectable pixel rates:

- VGA (640x480)
- SVGA (800x600)
- XGA (1024x768)
- SXGA (1280x1024)
- UXGA (1600x1200)
- 852x1024
- 1024x1024
- 1366x768
- 1365x1024¹
- 1280x720¹

The **VP-723DS** has 3 additional output modes used for high definition television (HDTV):

- 480p
- 720p
- 1080i

Both the **VP-720DS** and **VP-723DS** are 7-input seamless presentation switchers, that:

- Digitally reprocess the signal to correct mastering errors, and regenerate the video at a chosen line and pixel rate format, providing, for example, native-resolution video for LCD, DLP and Plasma displays
- Facilitate scaling of any graphics resolution to any other resolution²
- Incorporate a unique graphics-scaling engine with image enhancement algorithms, which are built into the firmware
- Are specifically designed to improve video quality by reducing chroma noise
- Include a built-in Picture-in-Picture inserter³, letting you insert a video source into a graphics background or vice versa, allowing the user to size and position the shrunken inserted image anywhere on the screen
- Scale and zoom (to up to 400% of the original size)

¹ Not shown on the front panel

² For example, scaling a VGA input to an UXGA output, or an SXGA input to an SVGA output

³ See section 6.2

In addition, both the **VP-720DS** and **VP-723DS**:

- Switch in true audio-follow-video mode
- Come with an OSD (on-screen display) for making the adjustments
- Incorporate full ProcAmp¹ processing for video and audio correction
- Offer high quality de-interlacing 3:2/2:2 pull down²
- Can provide non-linear scaling for 4:3, 16:9 transformation³
- Support firmware upgrade via RS-232
- Include non-volatile memory that retains the last setting, after switching the power off and then on again

Control the **VP-720DS** and/or **VP-723DS**:

- From the front panel OSD control buttons
- Remotely, from the infra-red remote control transmitter

Achieving the best performance means:

- Connecting only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoiding interference from neighboring electrical appliances that may adversely influence signal quality and positioning your Kramer **VP-720DS** and/or **VP-723DS** in a location free from moisture and away from excessive sunlight and dust

4 Your Seamless Switcher / Scaler

Figure 1 illustrates the front panels of the **VP-720DS** and **VP-723DS**, as well as the rear panel. The latter is identical on both the **VP-720DS** and **VP-723DS**. Table 1 and Table 2 define the front and rear panels of the **VP-720DS** and **VP-723DS**, respectively.

¹ Processing amplification enables adjustment of different video and audio signal parameters

² Accommodates the frame-rate of a converted movie (24 frames per second) to video frequencies (25 frames per second (PAL); 30 frames per second (NTSC))

³ See Figure 15

Your Seamless Switcher / Scaler

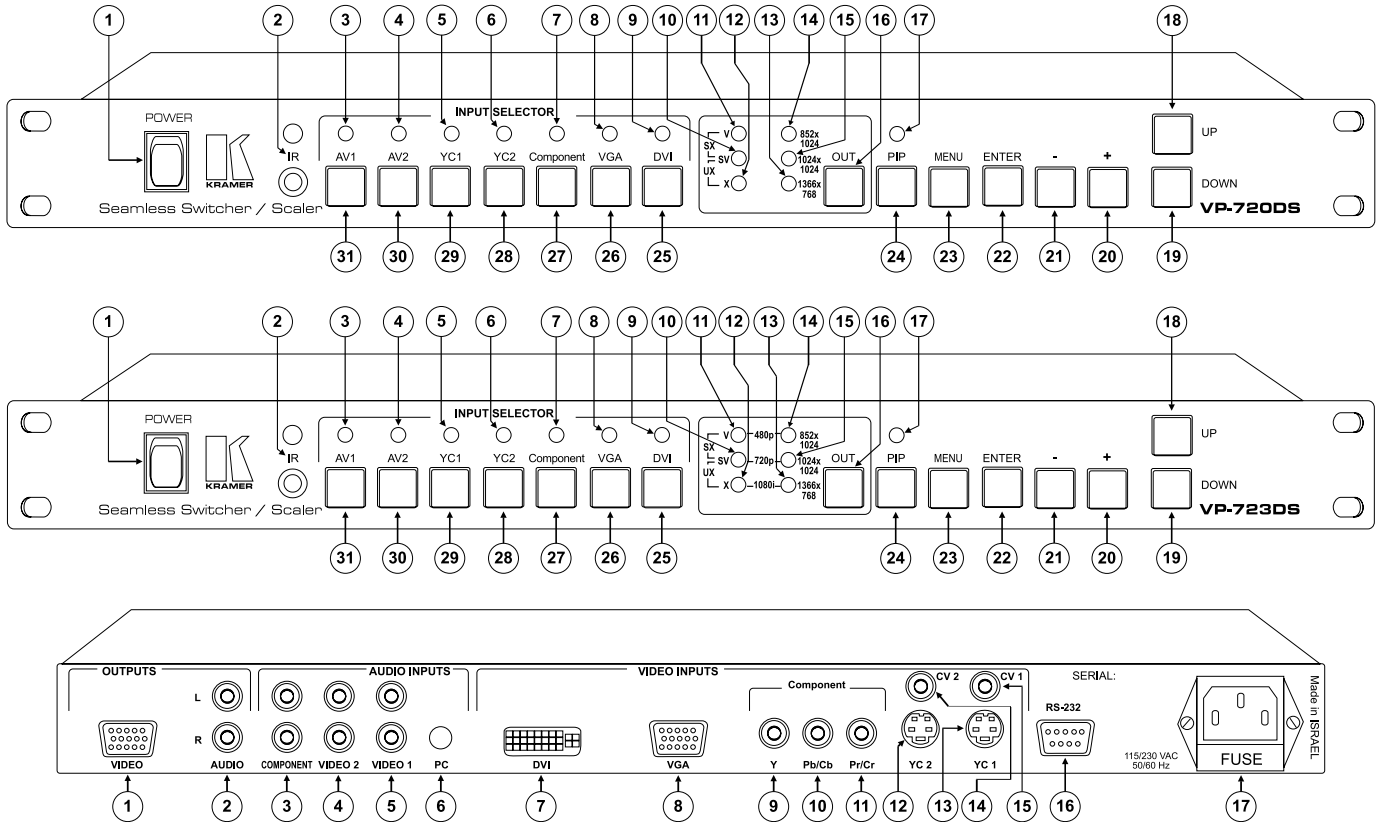


Figure 1: Front Panels of the VP-720DS and VP-723DS, and their Rear Panel

Table 1: Front Panel VP-720DS and VP-723DS, Seamless Switcher / Scaler Features

#	Feature	Function		
1	POWER Switch	Illuminated switch supplying power to the unit		
2	IR Receiver / LED	Green when the unit will accept IR remote commands		
3	INPUT SELECTOR LEDs	AV1	Illuminates when the composite video / audio source 1 is selected	
4		AV2	Illuminates when the composite video / audio source 2 is selected	
5		YC1	Illuminates when the s-Video (Y/C) / audio source 1 is selected	
6		YC2	Illuminates when the s-Video (Y/C) / audio source 2 is selected	
7		Component	Illuminates when the component video / audio source is selected	
8		VGA	Illuminates when the VGA / audio source is selected	
9		DVI	Illuminates when the DVI / audio source is selected	
10		OUT LEDs	SV	Illuminates when the SVGA resolution is selected ¹
11			V	Illuminates when the VGA resolution is selected ²
12	X		Illuminates when the XGA resolution is selected ³	
13	1366x768		Illuminates when the 1366x768 resolution is selected ⁴	
14	852x1024		Illuminates when the 852x1024 resolution is selected ⁵	
15	1024x1024		Illuminates when the 1024x1024 resolution is selected ⁶	
16	OUT Button	Selects the output resolution and illuminates the appropriate LED ⁷		
17	PIP LED	Illuminates when the picture-in-picture function is selected		
18	UP Button	Moves up one step (in the same level) in the OSD screen		
19	DOWN Button	Moves down one step (in the same level) in the OSD screen		
20	+ Button	Increases the range by one step in the OSD screen		
21	- Button	Decreases the range by one step in the OSD screen		
22	ENTER Button	Moves to the next level in the OSD screen		
23	MENU Button	Displays the OSD Menu screen ⁸		
24	PIP Button	Selects the picture-in-picture function and illuminates the PIP LED ⁹		

1 Illuminates together with the V LED when the SXGA resolution is selected, together with the X LED when the UXGA resolution is selected, and together with the 1024x1024 LED when 720p is selected (VP-723DS only)

2 Illuminates together with the SV LED when the SXGA resolution is selected, and together with the 852x1024 LED when 480p is selected (VP-723DS only)

3 Illuminates together with the SV LED when the UXGA resolution is selected, and together with the 1366x768 LED when 1080i is selected (VP-723DS only)

4 Illuminates together with the 1024x1024 LED when the 1280x720 (not shown on the front panel) resolution is selected, and together with the X LED when 1080i is selected (VP-723DS only)

5 Illuminates together with the 1024x1024 LED when the 1365x1024 (not shown on the front panel) resolution is selected, and together with the V LED when 480p is selected (VP-723DS only)

6 Illuminates together with the 852x1024 LED when 1365x1024 (not shown on the front panel) resolution is selected, together with the 1366x768 LED when the 1280x720 (not shown on the front panel) resolution is selected, and together with the SV LED when the 720p is selected (VP-723DS only)

7 See section 6.1

8 As Figure 9 illustrates

9 See section 6.2

Your Seamless Switcher / Scaler

#	Feature	Function
25	<i>DVI</i>	Selects the DVI / audio source and illuminates the DVI LED
26	<i>VGA</i>	Selects the VGA / audio source and illuminates the VGA LED
27	<i>Component</i>	Selects the component video / audio source and illuminates the component LED
28	<i>YC2</i>	Selects the s-Video (Y/C) / audio source 2 and illuminates the YC2 LED
29	<i>YC1</i>	Selects the s-Video (Y/C) / audio source 1 and illuminates the YC1 LED
30	<i>AV2</i>	Selects the composite video / audio source 2 and illuminates the AV2 LED
31	<i>AV1</i>	Selects the composite video / audio source 1 and illuminates the AV1 LED

Table 2: Rear Panel VP-720DS and VP-723DS, Seamless Switcher / Scaler Features

#	Feature	Function
1	<i>VIDEO HD15 Connector</i>	Connects to the video acceptor (for example, Plasma display, projector or monitor) that displays the scaled output (with the OSD superimposed over it)
2	<i>AUDIO L and R RCA Connectors</i>	Connects to the left and right stereo audio acceptors
3	<i>COMPONENT L and R RCA Connectors</i>	Connects to the left and right stereo audio inputs from the COMPONENT video source
4	<i>VIDEO 2 L and R RCA Connectors</i>	Connects to the left and right stereo audio inputs from one of the composite or s-Video sources ¹
5	<i>VIDEO 1 L and R RCA Connectors</i>	Connects to the left and right stereo audio inputs from one of the composite or s-Video sources ²
6	<i>PC 3.5 mm Socket</i>	Connects to the audio input from either the DVI (digital video interface) graphics source or the VGA analog graphics source
7	<i>DVI Connector</i>	Connects to the DVI (digital video interface) graphics source
8	<i>VGA HD15 Connector</i>	Connects to the VGA (analog interface) graphics source
9	<i>Component RCA Connectors</i>	<i>Y</i>
10		<i>Pb/Cb</i>
11		<i>Pr/Cr</i>
12	<i>YC 2 4p Connector</i>	Connects to the s-Video source 2
13	<i>YC 1 4p Connector</i>	Connects to the s-Video source 1
14	<i>CV 2 RCA Connector</i>	Connects to the composite video source 2
15	<i>CV 1 RCA Connector</i>	Connects to the composite video source 1
16	<i>RS-232 DB 9 Connector</i>	Connects to PC or Serial Controller
17	<i>Power Connector with FUSE</i>	AC connector enabling power supply to the unit

1 Either CV 2 or YC 2

2 Either CV 1 or YC 1

5 Connecting the Seamless Switcher / Scaler

Using the **VP-720DS** or **VP-723DS** you can select any one of the 7 inputs and scale that input to the output at the set¹ resolution.

To connect the **VP-720DS** or **VP-723DS**, connect the following² to the rear panel, as the example in Figure 3 illustrates:

1. Connect one or more of the following video sources:
 - 2 composite video sources, “Composite Video Source 1” and “Composite Video Source 2”, to the RCA connectors CV 1 and CV2, respectively³
 - 2 s-Video sources: “s-Video Source 1” and “s-Video Source 2”, to the RCA connectors, YC 1 and YC 2, respectively
 - A component video source⁴, for example, a Betacam VCR (as illustrated in Figure 3), to the 3 RCA connectors, Y, P_b/C_b, and P_r/C_b
 - A VGA graphics source, for example, a PC with an analog graphics output, to the VGA HD15F connector
 - A DVI graphics source, for example, a PC with a digital graphics output, to the DVI connector
2. Connect the stereo audio sources, as illustrated in Figure 3. In particular:
 - The audio of the “Composite Video Source 1” to the AUDIO INPUT VIDEO 1 pair of RCA connectors⁵
 - The audio of the “s-Video Source 2” to the AUDIO INPUT VIDEO 2 pair of RCA connectors⁶
 - The audio of the Component video source, the Betacam VCR, to the AUDIO INPUT COMPONENT pair of RCA connectors
 - The audio of the DVI Graphics Source to the AUDIO INPUT PC 3.5mm socket⁷. Alternatively, connect the audio from the VGA Graphics Source (not illustrated in Figure 3)
3. Connect the VIDEO OUTPUT HD15F connector to the video acceptor, for example, a projector or a Plasma monitor (as shown in Figure 3), and

1 For details of how to set the output resolution on the VP-720DS and VP-723DS, refer to section 6.1

2 Switch OFF the power on each device before connecting it to your Seamless Switcher / Scaler. After connecting your Seamless Switcher / Scaler, switch on its power and then switch on the power on each device

3 Connection to CV 2 is not shown in the example in Figure 3

4 Sometimes called YUV, or Y, B-Y, R-Y, or Y, Pb, Pr

5 The VIDEO 1 connectors are common to CV 1 and YC 1

6 The VIDEO 2 connectors are common to CV 2 and YC 2

7 The PC connector is common to DVI and VGA

connect the AUDIO OUTPUT pair of RCA connectors to the audio acceptor, for example, a power amplifier.

4. The power cord.
5. A PC (optional), as section 5.1 describes.

5.1 Connecting a PC

You can connect a PC (or other controller) to the **VP-720DS** or **VP-723DS** via the RS-232 port, for upgrading the firmware, as section 7.3 describes.

To connect the PC:

- Connect the RS-232 DB9 port on your PC to the RS-232 DB9 rear panel port on the **VP-720DS** or **VP-723DS**, as Figure 2 illustrates:

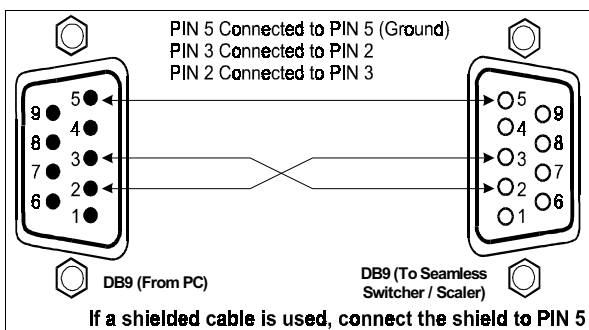


Figure 2: Connecting the PC

Connecting the Seamless Switcher / Scaler

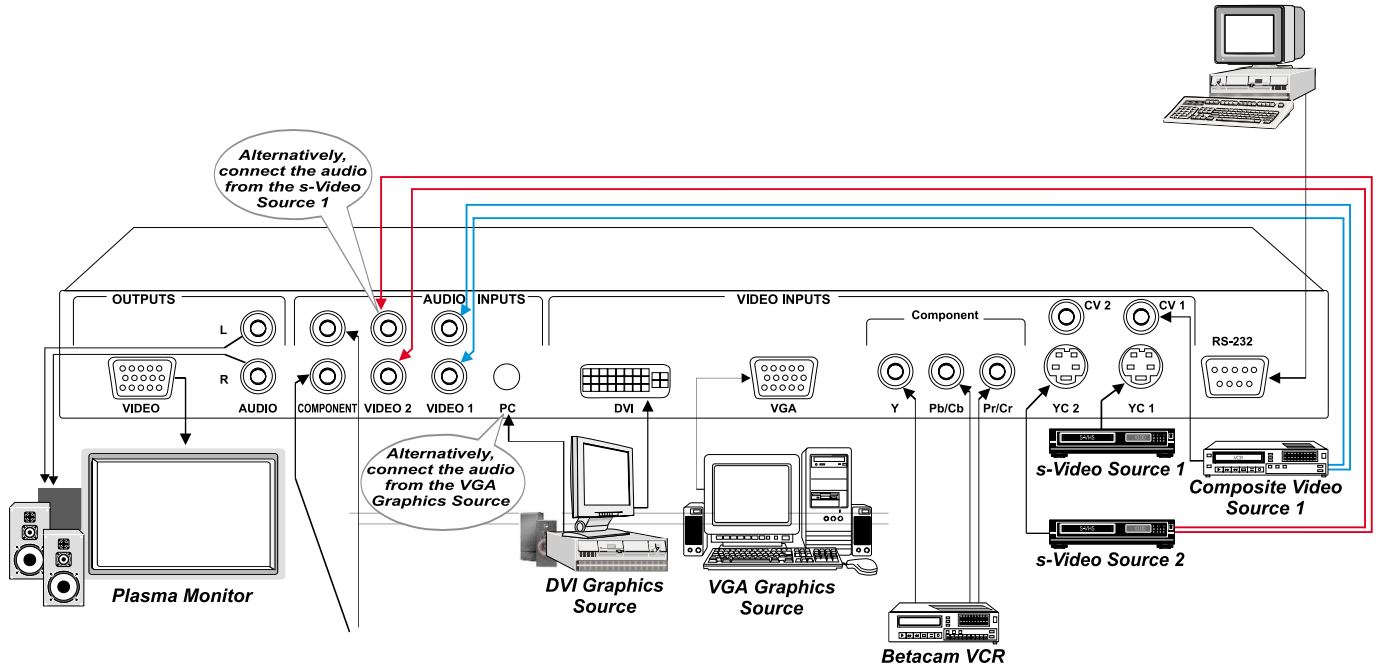


Figure 3: Connecting the VP-720DS / VP-723DS Rear Panel

6 Understanding the Seamless Switcher / Scaler

The **VP-720DS** and **VP-723DS** include the following front panel buttons:

- A set of 7 INPUT SELECTOR buttons (*AV1, AV2, YC1, YC2, Component, VGA, and DVI*)
- An OUT button (see section 6.1)
- A PIP button (see section 6.2)
- A set of 6 OSD buttons, which are described in Table 1: *MENU, ENTER, -, +, UP, and DOWN*

6.1 Understanding the OUT Button Functionality

Press the OUT button¹ to choose the desired output resolution.

Table 3 defines how to select the output resolution:

Table 3: Selecting the Output Resolution

To scale to this pixel resolution rate (VP-720DS and VP-723DS):	Press the OUT button to illuminate this LED sequence:
VGA (640x480)	V
SVGA (800x600)	SV
XGA (1024x768)	X
SXGA (1280x1024)	V and SV
UXGA (1600x1200)	SV and X
852x1024	852x1024
1024x1024	1024x1024
1366x768	1366x768
1365x1024 ²	852x1024 and 1024x1024
1280x720 ²	1024x1024 and 1366x768

To output to this high definition television (HDTV) mode (VP-723DS):	Press the OUT button to illuminate this LED sequence:
480p	V and 852x1024
720p	SV and 1024x1024
1080i	X and 1366x768

Figure 4 illustrates the OUT LED sequence for the **VP-720DS**:

¹ Item 14 in Figure 1

² Not shown on the front panel

Understanding the Seamless Switcher / Scaler

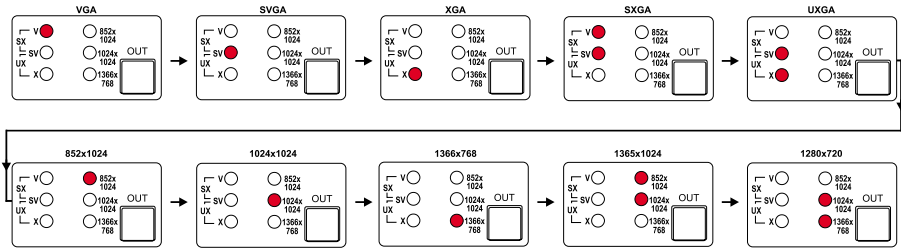


Figure 4: VP-720DS OUT LED Sequence

Figure 5 illustrates the OUT LED sequence for the VP-723DS:

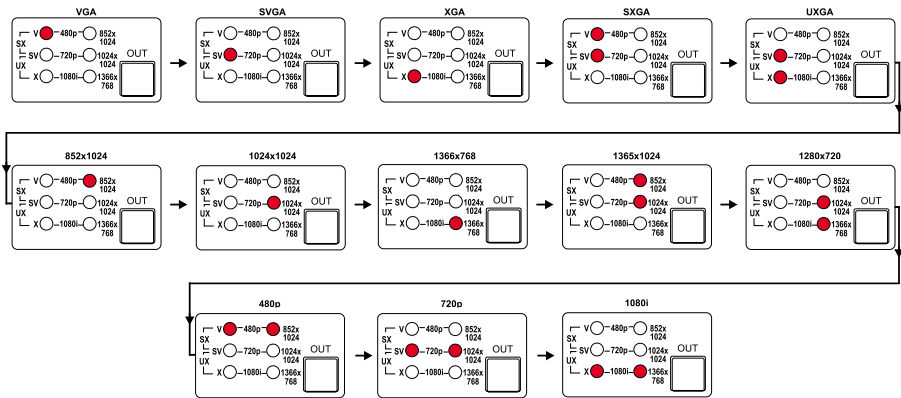


Figure 5: VP-723DS OUT LED Sequence

6.2 Understanding the PIP Button Feature

The Picture-in-Picture inserter (PIP) is used for simultaneous display of video and graphic sources, and lets you display:

- An inserted video source¹ PIP over a graphic source² display
- An inserted graphic source² PIP over a video source¹ display

Your Seamless Switcher / Scaler automatically recognizes and displays only the relevant sources, as the following 2 examples illustrate.

- Choosing the AV 1 PIP source when the VGA input is selected via the front panel INPUT SELECTOR buttons, will insert the composite video source over the VGA graphic displayed on the screen. You can choose a

¹ That is, composite, s-Video or component

² That is, DVI or VGA

Component, YC 1, YC 2 or AV 2 PIP source¹ (instead of the AV 1). You cannot choose VGA 1, VGA 2 or DVI²

- Choosing the VGA 1 PIP source when the AV 1 input is selected via the front panel INPUT SELECTOR buttons, will insert the VGA graphic source over the composite video displayed on the screen. You can choose a VGA 2 or DVI PIP source¹ (instead of the VGA 1). You cannot choose AV 2, YC 1, YC 2 or component³

6.2.1 PIP Characteristics

You can determine the following PIP characteristics:

- Size (1/4, 1/9, 1/16, 1/25 or split screen)
- Vertical and horizontal position, placing it anywhere on the screen

6.2.2 Toggling between the PIP and the Screen Source

To toggle back and forth between the PIP content and the screen source content, do the following:

- Press the SWAP key on the Infra-red remote control transmitter⁴

6.2.3 Activating the PIP Feature

To activate the PIP (which illuminates the PIP LED), do one of the following:

- Press the PIP button⁵; or
- Switch on the PIP functionality via the OSD Menu (see Figure 21)
- Press the PIP key on the Infra-red remote control transmitter

The OSD status appears superimposed over the top right corner of the screen for a few seconds, as Figure 6 illustrates.

1 As long as it is connected and switched on. Otherwise, choosing it will display a blank screen

2 As these are graphics sources and you cannot insert a graphics PIP over a graphics source

3 As these are video sources and you cannot insert a video PIP over a video source

4 Illustrated in Figure 25

5 Item 14 in Figure 1

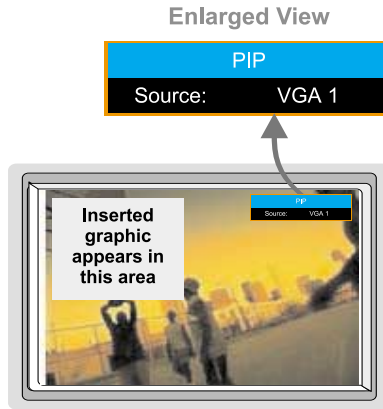


Figure 6: OSD PIP Status

7 Operating the Seamless Switcher / Scaler

Section 7.1 describes how to switch and scale an input. Section 7.2 describes the methods of controlling the Seamless Switcher / Scaler.

7.1 Switching and Scaling

7.1.1 Switching an Input

You can switch seamlessly between each input that is connected to a source, by pressing the appropriate INPUT SELECTOR button. The OSD status appears superimposed over the top right corner of the screen for a few seconds, as Figure 7 illustrates:

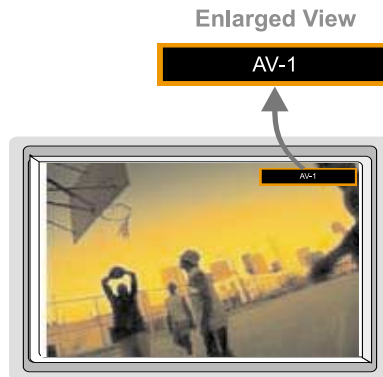


Figure 7: OSD Input Status

7.1.2 Choosing the Output Resolution

You can select the output resolution, by pressing the OUT button. The OUT button lets you choose the pixel resolution, as section 6.1 describes.

The OSD status appears superimposed over the top right corner of the screen for a few seconds¹, as Figure 8 illustrates:

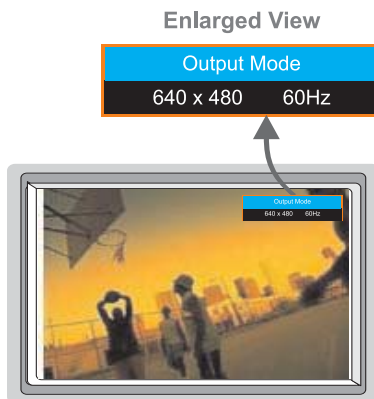


Figure 8: OSD Output Status

7.2 Controlling the Seamless Switcher / Scaler

Control the Seamless Switcher / Scaler by using one or more of these methods:

- From the Front Panel Menu, via the OSD control buttons (see section 7.2.1)
- From the Infra-red remote control transmitter (see section 7.2.2)

7.2.1 Operating via the Front Panel OSD Control Buttons

The OSD superimposes a menu on the screen from which you can control your **VP-720DS** and/or **VP-723DS**, using the *MENU*, *ENTER*, *-*, *+*, *UP* and *DOWN* front panel OSD buttons. The first OSD screen, after the Kramer logo appears, is the “Menu screen” which displays 6 interactive icons, as Figure 9 illustrates.

¹ Adjusting the output resolution results in a corresponding adjustment to the size of the OSD status window

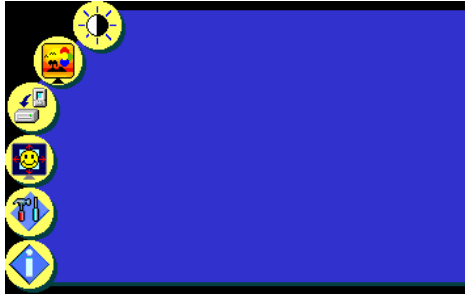


Figure 9: MENU Screen

Each icon represents a Level 1 function¹, as Table 4 defines:

Table 4: Menu Screen Icons







This icon:	Has this Level 1 functionality:
	Brightness and Contrast
	Gamma and Color
	Source
	Geometry
	Utility
	Information

Figure 10 illustrates the Brightness and Contrast Screen:



Figure 10: Brightness and Contrast Screen

¹ In addition to Level 1, the OSD structure includes Level 2 (a subset of level 1), Level 3 (a subset of level 2) Level 4 (a subset of level 3) and Range

Figure 11 illustrates the Gamma and Color Screen. You can choose Normal, Presentation, Cinema, Nature, User 1 or User 2.

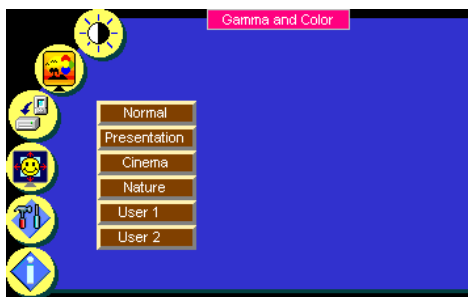


Figure 11: Gamma and Color Screen

Choosing User 1 or User 2 from the Gamma and Color Screen illustrated in Figure 11, displays the Gamma, Color Temperature and Color Manager Screen in Figure 12. Each user setting is customized to the applicable environment. The user sets the parameters and saves them for recall later.



Figure 12: Gamma, Color Temperature/Manager User 1/2 Screen

Figure 13 illustrates the Source Screen, displaying the active source, as well as facilitating changing of the source.

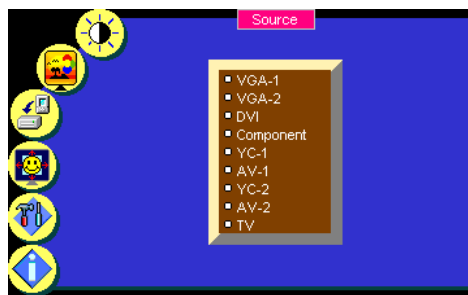


Figure 13: Source Selection Screen

Figure 14 illustrates the main Geometry Screen, from which you can scale and zoom.

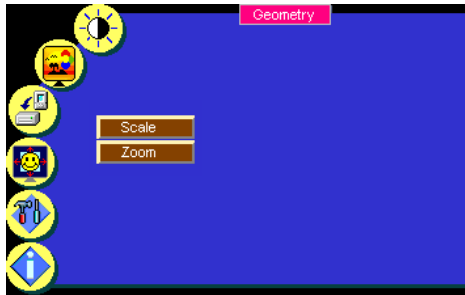


Figure 14: Geometry (Main) Screen

Figure 15 illustrates the Geometry (Scale) Screen, from which you can scale (Aspect Ratio and Nonlinear). Set the aspect ratio according to your specific requirements—the native resolution, that is, —depending on the specifications of the Plasma screen or projector. You can choose between normal ratio, a wide screen ratio, a Pan & Scan ratio (panning¹ the picture), and a 4:3² ratio.

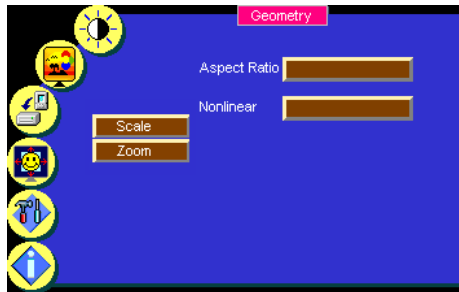


Figure 15: Geometry (Scale) Screen

Figure 16 illustrates the Geometry (Zoom) Screen, from which you can set the zoom ratio to up to 400%, and the Zoom Position Adjustment.

¹ Resizing and cropping

² 4:3 is a standard, in which the ratio between the length and height is 4:3. In the Cinema mode (used for movies and DVDs), the ratio between the length and height is 16:9 or sometimes 1:2.35

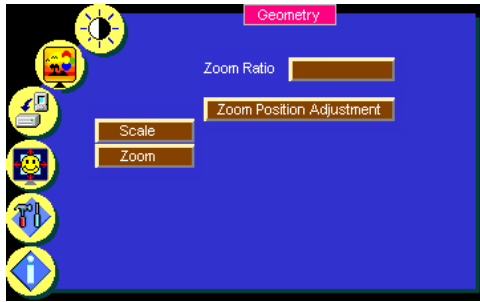


Figure 16: Geometry (Zoom) Screen

Figure 17 to Figure 24 (inclusive) illustrate various Utility Screens, in sequence.



Figure 17: Utility (Main) Screen



Figure 18: Utility (PC Data) Screen



Figure 19: Utility (Video Setting) Screen



Figure 20: Utility (Audio Setting) Screen



Figure 21: Utility (PIP Setting) Screen



Figure 22: Utility (Language Setting) Screen



Figure 23: Utility (OSD Setting) Screen



Figure 24: Utility (Output Setting) Screen

7.2.2 Operating via the Infra-red Remote Control Transmitter

Control the Seamless Switcher / Scaler remotely, from the Infra-red remote control transmitter, which:

- Is a hand held wireless instrument with a convenient keypad
- Receives its power from 2 AAA size 1.5V DC batteries
- Has a range of up to 15 meters
- Delivers instantaneous results

Figure 25 and Table 5 define the Infra-red Remote Control Transmitter:

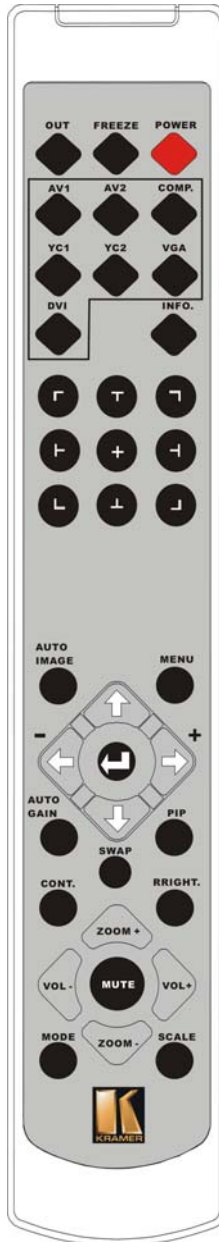






Figure 25: Infra-red Remote Control Transmitter

Table 5: Infra-red Remote Control Transmitter Functions

Keys	Function
OUT	Selects the output resolution and illuminates the appropriate LED
FREEZE	Pauses the output video
POWER	Cycles power
INPUT SELECTOR	Separate keys for selecting each of the following sources: AV1, AV2, YC1, YC2, Component, VGA and DVI
INFO.	Defines the PIP source (if applicable), the main source (e.g., AV 1 PAL), whether the Mute is ON or OFF, and the output mode
POSITIONING 	Sets the position for the PIP window location and/or focuses in on the area to be zoomed
AUTO IMAGE	Assesses the image and improves the quality accordingly, by automatically adjusting the phase, frequency and position
MENU	Displays the OSD Menu screen ¹
-	Decreases the range (one step at a time) in the OSD screen
+	Increases the range (one step at a time) in the OSD screen
UP 	Navigates up one step (in the same level) in the OSD screen
DOWN 	Navigates down one step (in the same level) in the OSD screen
ENTER 	Moves to the next level in the OSD screen
AUTO GAIN	Automatically adjusts the brightness and contrast
SWAP	Toggles between the PIP content and the screen source content
PIP	Selects the picture-in-picture function and illuminates the PIP LED ²
CONT.	Displays the contrast status ³
BRIGHT.	Displays the brightness status ³
VOL +	Increases the audio level
VOL -	Decreases the audio level
ZOOM +	Increases the resolution (up to 400 %), zooming-in to display a close-up view of the chosen part of the screen (that is, chosen via the POSITIONING keys or via the Zoom's, Zoom Position Adjustment feature from the Geometry menu (see Figure 16))
ZOOM -	Decreases the resolution, zooming-out to display more of the screen at a reduced size
MUTE	Cuts the audio output, blocking out the sound
MODE	Toggles between each of the following modes: Normal, Presentation, Cinema, Nature, User 1 and User 2
SCALE	Toggles between each of the following Aspect Ratios: Normal, Wide Screen, Pan & Scan, and 4:3 ⁴

1 As Figure 9 illustrates

2 See section 6.2

3 Adjust using the +/- keys

4 See Figure 15

7.3 Upgrading Firmware

To install the latest Kramer firmware version on a **VP-720DS / VP-723DS** unit, connect the COM port on your PC to the RS-232 port on the **VP-720DS** or **VP-723DS** unit, as section 5.1 describes, and go to the Kramer Web site at this URL: <http://www.kramerelectronics.com> for the latest information.

8 Technical Specifications

Table 6 includes the technical specifications:

Table 6: Technical Specifications of the VP-720DS/VP-723DS

Inputs:	VIDEO: 2 x composite video 1 Vpp/75 Ω on RCA connectors; 2 x Y/C (s-Video) 1 Vpp (Y), 0.3Vpp (C) / 75 Ω on 4 pin connectors; 1 x Component (Y, Pb/Cb, Pr/Cr) on RCA connectors; 1x VGA (VGA/SVGA/XGA/UXGA) on a HD15F connector; and 1x DVI connector AUDIO: 3 x stereo audio on RCA connectors (for VIDEO 1, VIDEO 2 and COMPONENT) and 1x PC audio on a 3.5mm mini socket
Outputs:	VIDEO: 1 x VGA/SVGA/XGA/UXGA (additional modes: 480p, 720, 1080i with the VP-723DS) on a HD15F connector AUDIO: 1 x stereo audio on RCA connectors
Output Resolutions:	VGA (640x480), SVGA (800x600), XGA (1024x768), SXGA (1280x1024), UXGA (1600x1200), 1024x852, 1024x1024, 1366x768, 1365x1024, 1280x720. The VP-723DS also supports 480p, 720p, and 1080i
Control:	Front panel buttons/ OSD, IR remote control, RS-232 on a DB-9 connector
Additional Controls:	Different vertical refresh rates, ProcAmp control, output image scaling and aspect ratio change
Firmware:	Frame freeze, digital zoom 4X, PIP (video-in-graphics or graphics-in-video, in sizes of up to half a screen, located anywhere on the screen), Flesh tone (special color processing), Gamma setting
H Frequency:	15.63~90kHz
V Frequency:	50~100Hz
Computer Resizing:	Auto-resizing to panel pixel number
RGB Video Signal:	RGB, 1.0 Vpp, 75 Ω
RGB Sync Signal:	Separate H/VTTL, composite sync, sync-on-green, analog
Audio Input Voltage:	0~0.5 Vrms
Audio Output Voltage:	0~0.5 Vrms
Plug&Play:	DDC1 / DDC2B
De-interlacing:	Adaptive and pixel based
Film mode detection:	2:2 / 3:2 pull down reverse
Power Source:	100-240 VAC, 50/60 Hz, 30VA automatic power supply
Dimensions:	19 " (W), 9.3" (D) 1U (H)
Accessories:	IR remote control, power cord
Weight:	3 kg (6.6 lbs.) approx.
Communication Protocol:	For the latest information, see the Kramer Web site at this URL: http://www.kramerelectronics.com

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product 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:
 - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
 - ii) Product modification, or failure to follow instructions supplied with the product
 - iii) Repair or attempted repair by anyone not authorized by Kramer
 - iv) Any shipment of the product (claims must be presented to the carrier)
 - v) Removal or installation of the product
 - vi) Any other cause, which does not relate to a product defect
 - vii) 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

The liability of Kramer for any effective 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.

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

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC Rules and Regulations: Part 15: "Radio frequency devices Subpart B – Unintentional radiators"

CAUTION!

- ☒ Servicing the machines 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.
- ☒ Use the supplied DC power supply to feed power to the machine.
- ☒ Please use recommended interconnection cables to connect the machine to other components.



**For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com.
Updates to this user manual may be found at
<http://www.kramerelectronics.com/manuals.html>.
We welcome your questions, comments and feedback.**

Kramer Electronics, Ltd.

3 Am VeOlamo Street. Jerusalem 95463, Israel Tel: (+972-2)-654-4000

Fax: (+972-2)-653-5369, E-mail: kramereel@netvision.net.il

P/N: 2900 – 007004 REV 1