KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

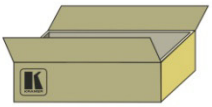
VP-747
Universal Presentation Matrix Switcher / Scaler

P/N: 2900-000563 Rev 3

VP-747 Quick Start Guide

This guide takes you through a basic installation and first-time use of your **VP-747**.
For more detailed information, see the **VP-747** user manual. You can download the latest manual at http://www.kramerelectronics.com.

Step 1: Check what's in the box



- The **747** Universal Presentation Matrix Switcher/Scaler
- IR remote control transmitter with batteries
- 1 Null-modem adapter
- 1 Set of rack ears
- 4 Rubber feet
- 1 Power cord
- 1 Quick start guide
- 1 User Manual

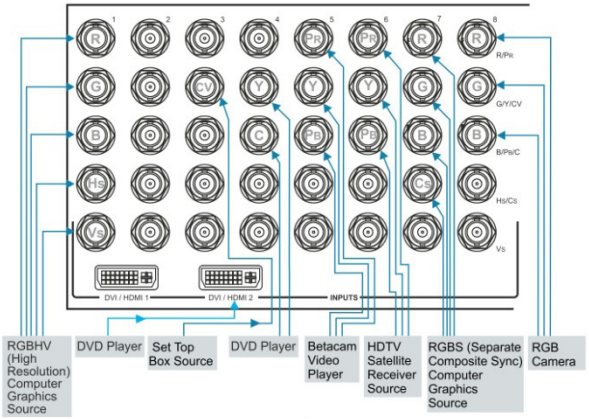
Save the original box and packaging materials in case your Kramer product needs to be returned to the factory for service.

Step 2: Install the VP-747

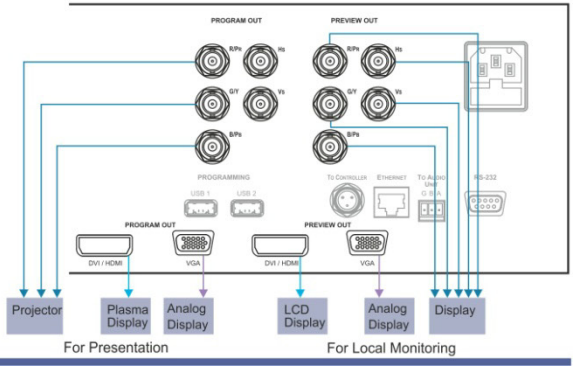
Mount the machine in a rack or place on a table.

Step 3: Connect inputs and outputs

Always switch OFF the power on each device before connecting it to your **VP-747**.



For best results, we recommend that you always use Kramer high-performance cables to connect AV equipment to the **VP-747**.



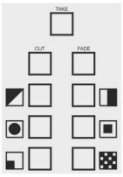
Step 3: Connect the controls

Connect to the control ports (optional): RS-232, RS-485 and/or the Ethernet.

Step 4: Connect the power

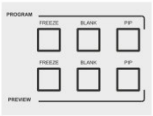
Connect AC power to the rear of the **VP-747**, switch on its power and then switch on the power on each device.

Step 5: Operate via the front panel buttons and the remote control transmitter



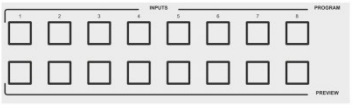
TAKE causes a transition to occur
CUT selects an instantaneous transition from Preview to Program
FADE selects a dissolved transition from Preview to Program
Select transitions: diagonal, wipe, circle, square, corner or chessboard

POWER
Cycles power

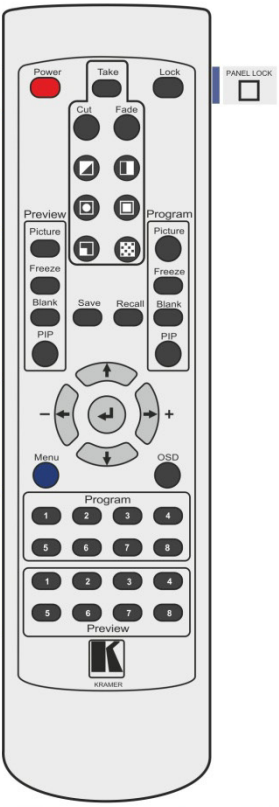


Preview and Program separate buttons for:
Picture adjusts the contrast, brightness and so on
Freeze toggles the freeze function of the output video image
Blank toggles a blank screen
PIP toggles the picture-in-picture function

Press the MENU button to access the menu and show the main OSD menu.
The arrow buttons and ENTER button let you navigate within the OSD menu.



Press to select one of the eight inputs for both the program and preview outputs.



If you cannot see an image, verify that the output cable to your display, TV, or projector is in good working order and is connected to the **VP-747**.

Step 6: Configure and operate via the OSD menu

Contents

Figures

1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Our 1,000-plus different models now appear in 11 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters and GROUP 11: Sierra Products.

Congratulations on purchasing your Kramer **VP-747** *Universal Presentation Matrix Switcher / Scaler*. The **VP-747** is a true multi-standard video to graphics scaler and seamless switcher with eight universal inputs comprised of five BNC connectors each of which can accommodate a composite video, s-Video (Y/C), component video (RGB/YUV), RGBS, or RGBHV signal. Input 1 and input 2 also accommodate DVI/HDMI inputs. (The HDMI connector connects to a DVD source via the Kramer ADC DM/HF adapter). It has dual scalers, one for the preview and the other for the program output. Dual scalers are required to do "live" seamless transitions from one source to another. It is ideal for these typical applications:

- Presentation applications that require a preview option
- Projection systems in conference rooms, board rooms, auditoriums, hotels, and churches
- Presentations requiring seamless switching between inputs, using special effects, cuts and fades

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
- Use Kramer high performance high resolution cables
- Use only the power cord that is supplied with this machine

Go to http://www.kramerelectronics.com to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **VP-747** away from moisture, excessive sunlight and dust

3 Overview

The **VP-747** Universal Presentation Matrix Switcher/Scaler is a true multi-standard video to graphics scaler and presentation switcher for a wide variety of presentation and multimedia applications. It consists of a very high quality scaler with many user-selectable graphics or HDTV output resolutions, as well as a user-definable output mode (recommended for advanced users only – non-standard settings may not be recognized by the display device).

The **VP-727A** *Audio Switcher* and **VP-727A-BA** *Balanced Audio Switcher* are audio companion switchers for the **VP-747**, and either can operate in conjunction with it and the **VP-747T** *Presentation Switcher Control Panel* and also with the **VP-727T**.

In particular, the **VP-747** features:

- Silicon Optix HQV® Video Processing (Hollywood Quality Video) which represents the state-of-the-art in video processing technology, with the highest quality de-interlacing, noise reduction, and scaling performance for both standard-definition and high-definition signals
- Eight sets of universal INPUT BNC connectors: R/PR, G/Y/CV, B/PB/C, HS/CS, and VS. Each set can be programmed to operate as: composite video, s-Video, component video, RGsB/YUV, RGBS, or RGBHV
  Sometimes called YUV, or Y, B-Y, R-Y, or Y, Pb, Pr. The component input type (HDTV or YCbCr) may be set as HD or SD.
- Two DVI/HDMI inputs (the HDMI connector connects to a DVD source via the Kramer ADC DM/HF adapter) (for input 1 and input 2) that support up to 1.65Gbps bandwidth per graphic channel (suitable for resolutions up to UXGA at 60Hz, and for all HD resolutions)
- HDTV compatibility and HDCP compliance
  The HDCP (High Definition Content Protection) license agreement allows copy-protected data on the HDMI input to pass to the HDMI output only.
- Scaling of selected sources to DVI/HDMI, RGBHV (Y, Pb, Pr) and VGA outputs simultaneously

- Dual scalers—for “live” seamless transitions from one source to another—with two independent outputs: a PREVIEW OUT and a PROGRAM OUT (see Section 7.2).

  The PREVIEW output—including an OSD menu for making adjustments—is for determining how the scaled output looks before displaying live during a presentation, as well as for setting the special effects that harmonize the transition when changing between sources.
  Both outputs have separate sets of connectors for DVI/HDMI, VGA (a 15-pin HD computer graphics video connector), and RGBHV/YPbPr (on BNC connectors)

- Eight PREVIEW input buttons for switching a selected input to the PREVIEW output and eight PROGRAM input buttons for switching a selected input to the PROGRAM output

- Two transition modes (accessible via the OSD): the Swap mode and the Follow mode. When pressing the TAKE button in the Swap mode, the preview and program inputs switch positions; when pressing in the Follow mode, the program input follows the preview input

- Scaling and zooming (to up to 400% of the original size)

- High quality de-interlacing 3:2/2:2 pull down

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

- K-IIT XL™ Picture-in-Picture Image Insertion Technology with ultra stable picture-in-picture, picture-and-picture, and split screen capability for both the PREVIEW and the PROGRAM outputs. Any video source can be inserted into or positioned next to a computer graphics video source or vice versa with window positioning and sizing controls

- Saving of all settings in non-volatile memory in the unit

- Support for firmware upgrade via USB

- A sophisticated front panel lockout (see Section 7.5)

- A Take button for executing preview to program switching (with transition effects, which include cuts, fades, and wipes The direction of the wipe may be selected by the user. The speed of each transition can be adjusted)

- ProcAmp controls for both outputs (processing amplification enables adjustment of different video and audio signal parameters)

- Multi-standard video support: PAL, SECAM, and NTSC (3.58/4.43)

- A built-in Time Base Corrector (TBC) that stabilizes video sources with unstable sync
- Multiple color space, outputting RGB or YUV
- Support for embedded audio on the HDMI inputs and outputs

  The embedded audio feature is not available for the **RGB** resolutions 1920x1200 and 1920x1080. (It is available for 1080p)
- Digital reprocessing of the signal to correct mastering errors, and regenerates the video at a chosen line and pixel rate format, providing, for example, native-resolution video for LCD, DLP and Plasma displays
- Scaling of graphics resolutions to other resolutions
- A unique graphics-scaling engine with image enhancement algorithms, which are built into the firmware
- A special design to improve video quality by reducing chroma and temporal noise
- Reduced digital artifacts such as mosquito and block noise
- T-bar emulation via RS-232
- A rugged, professional 19" 3U rack-mountable metal enclosure
- A universal 100-240V AC automatic power supply, and rear panel power switch

Control the **VP-747** via the:

- Front panel and a user-friendly menu-driven OSD (see Section 8.1)
- High contrast LCD Display (see Section 8.2)
- IR remote control transmitter (see Section 8.3)
- Ethernet/RS-232 (see Section 8.4)
- Kramer **VP-747T** Presentation Switcher Control Panel

  See the separate user manual on our Web site at http://www.kramerelectronics.com.

3.1 About HDMI

High-Definition Multimedia Interface (HDMI) is an uncompressed all-digital audio/video interface, widely supported in the entertainment and home cinema industry. HDMI ensures an all-digital rendering of video without the losses associated with analog interfaces and their unnecessary digital-to-analog conversions. It delivers the maximum high-definition image and sound quality in use today. Note that Kramer Electronics Limited is an HDMI Adopter and an HDCP Licensee.

In particular, HDMI:

- Provides a simple interface between any audio/video source, such as a set-top box, DVD player, or A/V receiver and video monitor, such as a digital flat LCD/plasma television (DTV), over a single lengthy cable

  SIMPLICITY - With video and multi-channel audio combined into a single cable, the cost, complexity, and confusion of multiple cables currently used in A/V systems is reduced

  LENGTHY CABLE - HDMI technology has been designed to use standard copper cable construction at up to 15m

- Supports standard, enhanced, high-definition video, and multi-channel digital audio on a single cable

  MULTI-CHANNEL DIGITAL AUDIO - HDMI supports multiple audio formats, from standard stereo to multi-channel surround-sound. HDMI has the capacity to support Dolby 5.1 audio and high-resolution audio formats

- Transmits all ATSC HDTV standards and supports 8-channel digital audio, with bandwidth to spare to accommodate future enhancements and requirements

- Benefits consumers by providing superior, uncompressed digital video quality via a single cable, and user-friendly connector

  HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner

- Is backward-compatible with DVI (Digital Visual Interface)

- Supports two-way communication between the video source (such as a DVD player) and the digital television, enabling new functionality such as automatic configuration and one-button play

- Has the capacity to support existing high-definition video formats (720p, 1080i, and 1080p/60), standard definition formats such as NTSC or PAL, as well as 480p and 576p

3.2 Defining the VP-747 Switcher Scaler

This section defines the **VP-747**.

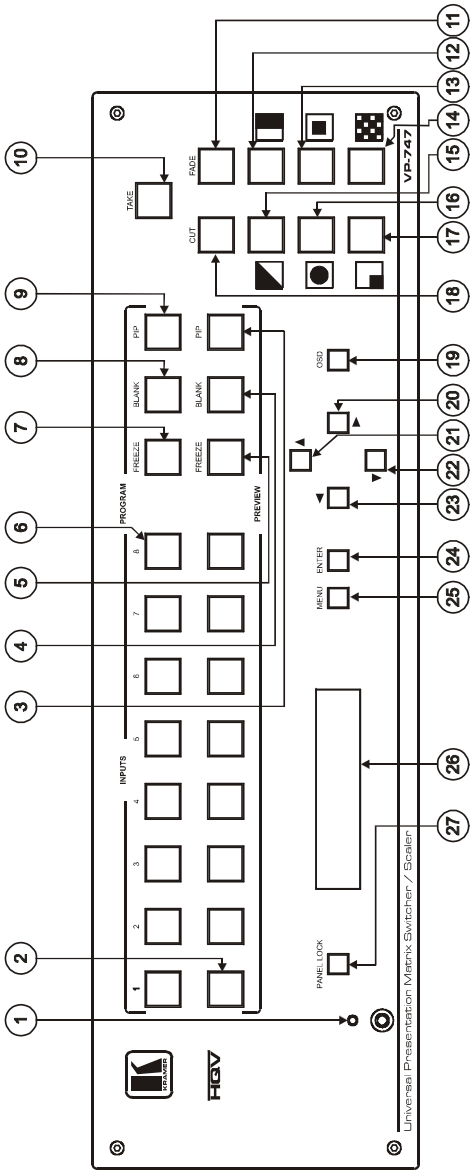


Figure 1: VP-747 Universal Presentation Matrix Switcher / Scaler Front Panel

#	Feature		Function
1	IR Receiver/LED		Green when ON; red when OFF OFF in this case means that the outputs and the front-panel are disabled
2	PREVIEW Buttons	INPUTS	Selects the video source (from 1 to 8) for the Preview output From the five BNC (universal) inputs for each of the inputs. The INPUT buttons 1 and 2 can also select the DVI/HDMI sources
3		PIP	Toggles the picture-in-picture function on and off on the Preview output
4		BLANK	Toggles between a blank screen and the selected input on the preview output
5		FREEZE	Freezes the output video image (toggle) on the Preview output
6	PROGRAM Buttons	INPUTS	Selects the video source (from 1 to 8) for the Program output
7		FREEZE	Freezes the output video image (toggle) on the Program output
8		BLANK	Toggles between a blank screen and the selected input on the Program output
9		PIP	Toggles the picture-in-picture function on and off on the Program output
10	*TAKE* Button		Pressing *TAKE* causes the transition to occur The effect is only seen in PROGRAM Mode. The PREVIEW screen blanks during the transition
11	*FADE* Button		Selects a dissolved transition from the PREVIEW output to the PROGRAM output
12	TRANSITION Buttons		Selects a **WIPE** transition effect To choose the direction from where the effect starts: “left to right”, “right to left”, “up” or “down”, see Section 8.1.3
13			Selects a **SQUARE** transition effect
14			Selects a **CHESSBOARD** transition effect
15			Selects a **DIAGONAL** transition effect To choose the direction from where the effect starts: “top left”, “bottom left”, “top right” or “bottom right”, see Section 8.1.3
16			Selects a **CIRCLE** transition effect To choose the direction of the effect: “in” or “out”, see Section 8.1.3
17			Selects a **CORNER** transition effect
18	*CUT* Button		Selects an instantaneous transition from the PREVIEW output to the PROGRAM output Only for setting up the unit for the effect. The effect only occurs when the Take button is pressed
19	*OSD* Button		Activates/deactivates access to the OSD Menu on the Preview output
20	NAVIGATION Buttons	►	Toggles within each level 2 command/increases the range by one step
21		▲	Moves up one step (in the same level) in the OSD menu
22		▼	Moves down one step (in the same level) in the OSD menu
23		◄	Toggles within each level 2 command/decreases the range by one step
24	*ENTER* Button		Moves to the next level in the OSD menu
25	*MENU* Button		Displays the OSD Menu screen (or moves to the previous level in the OSD menu)
26	LCD STATUS Display		Displays the status of the unit, and is used for menu navigation
27	PANEL LOCK Button		Locks/unlocks the front panel Press and hold for about 2 seconds to toggle

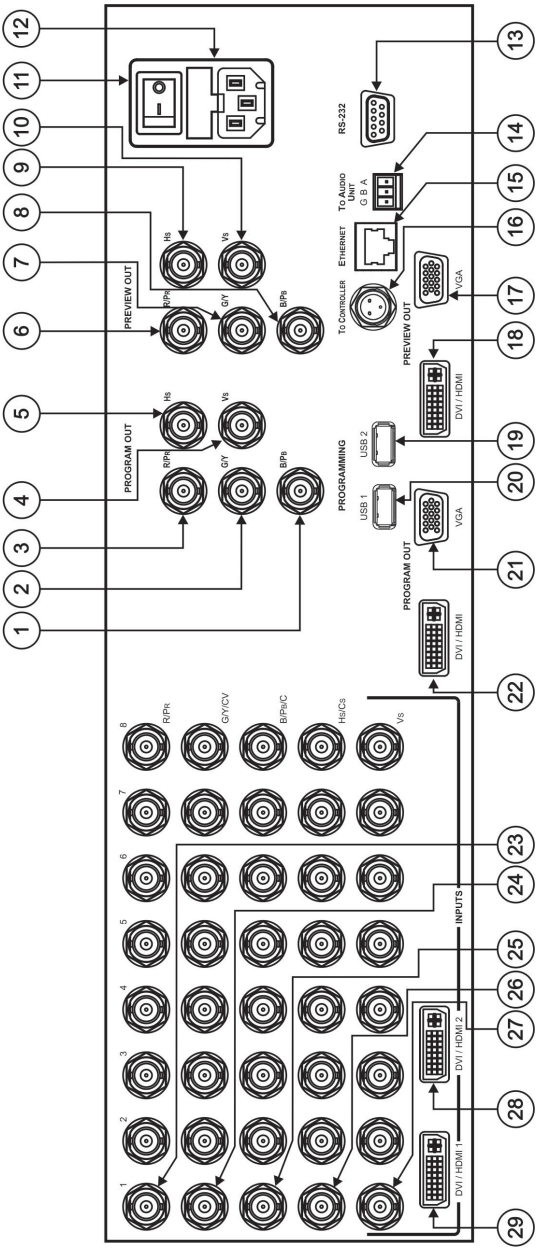


Figure 2: VP-747 Universal Presentation Matrix Switcher / Scaler Rear Panel

#	Feature		Function
1	*PROGRAM OUT*	*B/PB* BNC Connector	Connects to the PROGRAM display device (component video or RGB or RGBHV acceptor) Sometimes called YUV; Y, B-Y, R-Y; Y, Pb, Pr; or Y, Cb, Cr
2		*G/Y* BNC Connector	
3		*R/PR* BNC Connector	
4		*Vs* BNC Connector	
5		*Hs/Cs* BNC Connector	
6	*PREVIEW OUT* Connectors	*R/PR* BNC Connector	Connects to the PREVIEW display device (component video or RGB or RGBHV acceptor)
7		*G/Y* BNC Connector	
8		*B/PB* BNC Connector	
9		*Hs/Cs* BNC Connector	
10		*Vs* BNC Connector	
11	*POWER* Switch		Illuminated switch for turning the unit ON or OFF
12	Power Connector with FUSE		AC connector enabling power supply to the unit
13	*RS-232* 9-pin D-sub Connector		Connects to PC or Serial Controller
14	*TO AUDIO UNIT* Port	Connects to the Kramer **VP-727A** *Audio Switcher* (optional). Pins B (-) and A (+) are for RS-485; pin G may be connected to the Ground or the shield if desired;	
15	*Ethernet* Port	Connects to your LAN	
16	*TO CONTROLLER* Mini XLR Connector	Connects to the Kramer **VP-747T** *Presentation Switcher Control Panel* (optional). Pins B (-) and A (+) are for RS-485; pin G may be connected to the Ground or the shield if desired	
17	*PREVIEW OUT*	*VGA* 15-pin HD Connector	Connects to a VGA (analog interface) graphics acceptor
18		*DVI/HDMI* Connector	Connects to a DVI or HDMI acceptor Using a DVI/HDMI adapter or the Kramer C-HM/DM HDMI to DVI Single Link (18+1 pin) cable
19	*PROGRAMMING*	*USB 2* Connector	For Program firmware download
20		*USB 1* Connector	For Preview firmware download
21	*PROGRAM OUT*	*VGA* 15-pin HD Connector	Connects to a VGA (analog interface) graphics acceptor
22		*DVI/HDMI* Connector	Connects to a DVI or HDMI acceptor
23	*INPUTS* (from 1 to 8)	*R/PR* BNC Connector	Connects to the R or PR output of the RGB, RGBHV, RGBS, or component video source
24		*G/Y/CV* BNC Connector	Connects to the G, Y or CV output of the RGB, RGBHV, RGBS, component video, composite video, or s-Video source Made up of the Y on the G/Y/CV connector together with the C on the B/Pb/C connector
25		*B/PB/C* BNC Connector	Connects to the B, PB or C output of the RGB, RGBHV, RGBS, component video or s-Video source
26		*Hs/Cs* BNC Connector	Connects to the horizontal or composite sync RGBHV or RGBS source
27		*Vs* BNC Connector	Connects to the vertical sync RGBHV source
28	*INPUTS*	*DVI/HDMI 2* Connector	Connect to the DVI/HDMI 2 source
29		*DVI/HDMI 1* Connector	Connect to the DVI/HDMI 1 source

4 Installing in a Rack

This section provides instructions for rack mounting the unit.

Before Installing in a Rack

Before installing in a rack, be sure that the environment is within the recommended range:

OPERATING TEMPERATURE:	0º to +55ºC (32º to 131ºF)
STORAGE TEMPERATURE:	-45º to +72ºC (-49º to 162ºF)
HUMIDITY:	10% to 90%, RHL non-condensing

CAUTION!

When installing on a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.

2. Once rack mounted, enough air will still flow around the machine.

3. The machine is placed straight in the correct horizontal position.

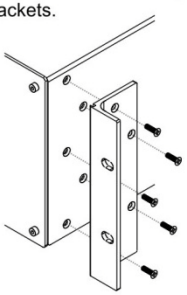
4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.

5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

How to Rack Mount

To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (5 on each side), and replace those screws through the ear brackets.



2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note:

- In some models, the front panel may feature built-in rack ears
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions available from: http://www.kramerelectronics.com)

5 Connecting the VP-747

Always switch off the power to each device before connecting it to your **VP-747**. After connecting your **VP-747**, connect its power and then switch on the power to each device.

The **VP-747** is a universal presentation matrix switcher/scaler that lets you choose what sources to connect to the inputs. For example, you can connect just five sources: an RGBHV source, two DVI/HDMI sources, an HDTV source and an RGBS source (as the example in Figure 3 shows).

To connect the **VP-747** as illustrated in the example in Figure 3, do the following:

1. Connect the following video sources:
   - An HDMI source to the INPUT DVI/HDMI 1 connector
   - An HDMI source to the INPUT DVI/HDMI 2 connector
   - An HDTV satellite receiver source to the R/PR, G/Y/CV, and B/PB/C BNC INPUT 6 connectors (PR/Y/PB)
   - An RGBHV computer graphics source to the R/PR, G/Y/CV, B/PB/C, HS/CS and V BNC INPUT 8 connectors (R, G, B, H, V)
2. Connect the PROGRAM OUT:
   - DVI/HDMI connector to the plasma display
   - VGA 15-pin HD connector to the analog display
   - R/PR, G/Y, B/PB, (PR, Y, PB) BNC OUTPUT connectors to the YUV acceptor, for example, a projector (PR,Y, PB)
3. Connect the PREVIEW OUT R/PR, G/Y, B/PB, HS and VS BNC OUTPUT connectors to the display (R, G, B, H, V)
4. Connect the power cord.

5. If required, connect:
   - A PC via RS-232, see Section 6.1
   - The Kramer **VP-727A** *Audio Switcher* via the To AUDIO UNIT RS-485 port, see Section 6.2
   - The Kramer **VP-747T** *Presentation Switcher Control Panel* via the TO CONTROLLER mini XLR port, see Section 6.3
   - The Ethernet port, see Section 6.4

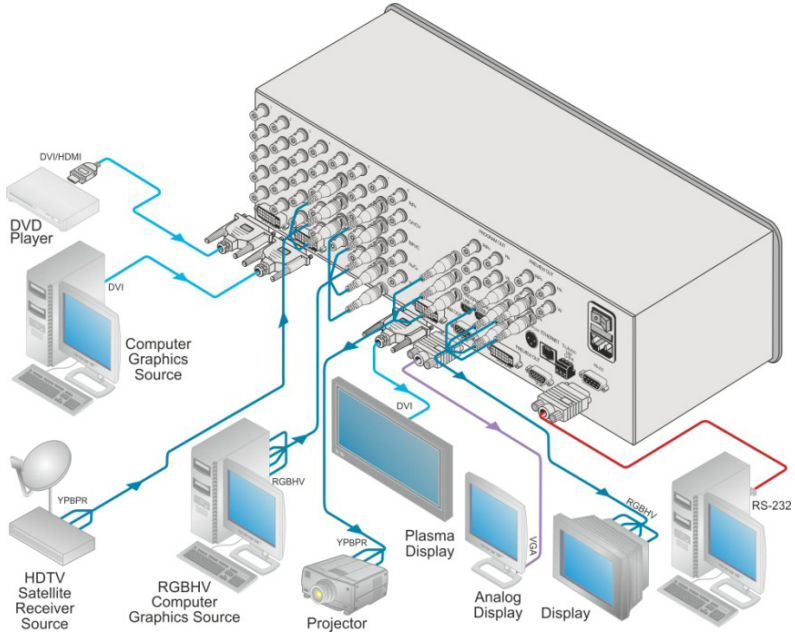


Figure 3: Connecting to the VP-747

5.1 Connecting Different Source Types

As the **VP-747** is universal, you can connect any type (format) of video to the inputs. Figure 4 shows an example of how to connect eight sources to the rear panel of the **VP-747**: an RGBHV source, an HDMI source, a CV source, a Y/C source, a component video source, an HDTV source, an RGBCs source and an RGB source.

	Connecting the Different Source Types							
	Input 1: RGBHV	Input 2: HDMI	Input 3: CV	Input 4: Y/C	Input 5: Component	Input 6: HDTV	Input 7: RGBCs	Input 8: RGB
R/PR	R				PR	PR	R	R
G/Y/CV	G		CV	Y	Y	Y	G	G
B/PB/C	B			C	PB	PB	B	B
HS/CS	HS						CS	
VS	VS							
HDMI		HDMI						

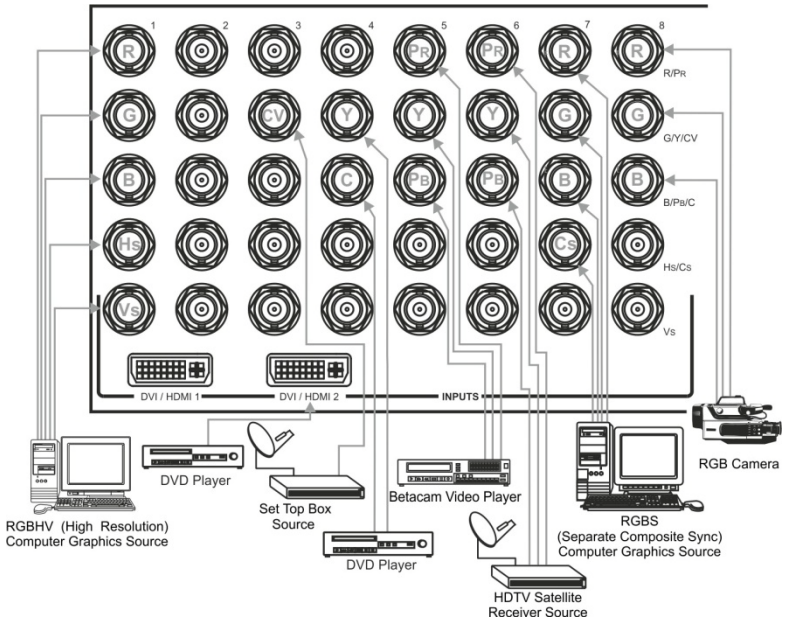


Figure 4: Example for Connecting the INPUTS

5.2 Connecting the Outputs

Figure 5 illustrates an example of the different connection types available for the Preview and Program outputs:

For PROGRAM OUT, connect the:

- R/PR, G/Y, B/PB, (PR, Y, PB) BNC OUTPUT connectors to the YUV acceptor, for example, a projector
- HDMI connector to a plasma display
- VGA a 15-pin HD computer graphics video connector to an analog display
- For PREVIEW OUT, connect the:
- HDMI connector to an LCD display
- VGA 15-pin HD computer graphics video connector to an analog display
- R/PR, G/Y, B/PB, HS and VS BNC OUTPUT connectors to a display

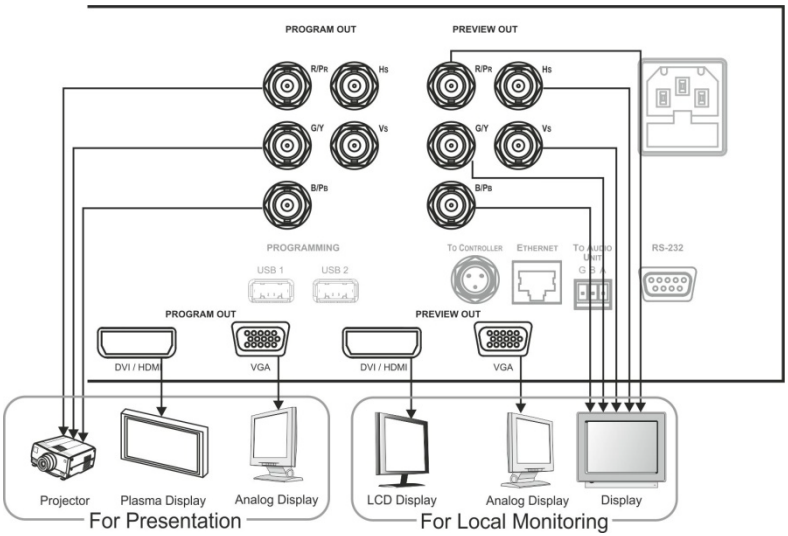


Figure 5: Connecting the PREVIEW OUT/PROGRAM OUT Connectors

6 Connecting the VP-747 Control Ports

This section describes how to connect the **VP-747** control ports, that is, the:

- RS-232 port, see Section 6.1
- TO AUDIO UNIT port, see Section 6.2
- TO CONTROLLER port, see Section 6.3
- Ethernet port, see Section 6.4

6.1 Connecting to the VP-747 via RS-232

You can connect to the unit via a crossed RS-232 connection, using for example, a PC. A crossed cable or null-modem is required as shown in method A and B respectively. If a shielded cable is used, connect the shield to pin 5.

Method A (Figure 6)—Connect the RS-232 9-pin D-sub port on the unit via a crossed cable (only pin 2 to pin 3, pin 3 to pin 2, and pin 5 to pin 5 need be connected) to the RS-232 9-pin D-sub port on the PC.
Note: There is no need to connect any other pins.

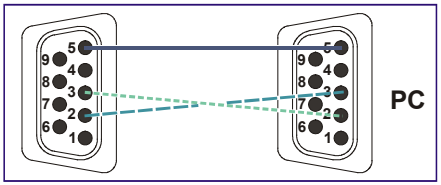


Figure 6: Crossed Cable RS-232 Connection

Hardware flow control is not required for this unit. In the rare case where a controller requires hardware flow control, short pin 1 to 7 and 8, and pin 4 to 6 on the controller side.

Method B (Figure 7)—Connect the RS-232 9-pin D-sub port on the unit via a straight (flat) cable to the null-modem adapter, and connect the null-modem adapter to the RS-232 9-pin D-sub port on the PC. The straight cable usually contains all nine wires for a full connection of the D-sub connector. Because the null-modem adapter (that already includes the flow control jumpering described in

Method A above) only requires pins 2, 3 and 5 to be connected, you are free to decide whether to connect only these 3 pins or all 9 pins.

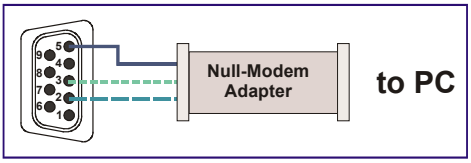


Figure 7: Straight Cable RS-232 Connection with a Null Modem Adapter

6.2 Connecting the Audio Control Port

The Kramer **VP-727A** *Audio Switcher* operates in conjunction with the **VP-747**. When connected, the audio switcher signals follow the video signals.

See the separate VP-727A user manual on our Web site at http://www.kramerelectronics.com

To connect the **VP-747** to the Kramer **VP-727A** *Audio Switcher* via the TO AUDIO UNIT RS-485 port, as illustrated in the example in Figure 8, do the following:

- Connect the “A” (+) PIN on the AUDIO CONTROL RS-485 rear panel port of the **VP-747** to the A (+) PIN on the RS-485 rear panel port of the **VP-727A** unit
- Connect the “B” (-) PIN on the AUDIO CONTROL RS-485 rear panel port of the **VP-747** to the B (-) PIN on the RS-485 rear panel port of the **VP-727A** unit
- If shielded twisted pair cable is used, the shield may be connected to the “G” (Ground) PIN on one of the units

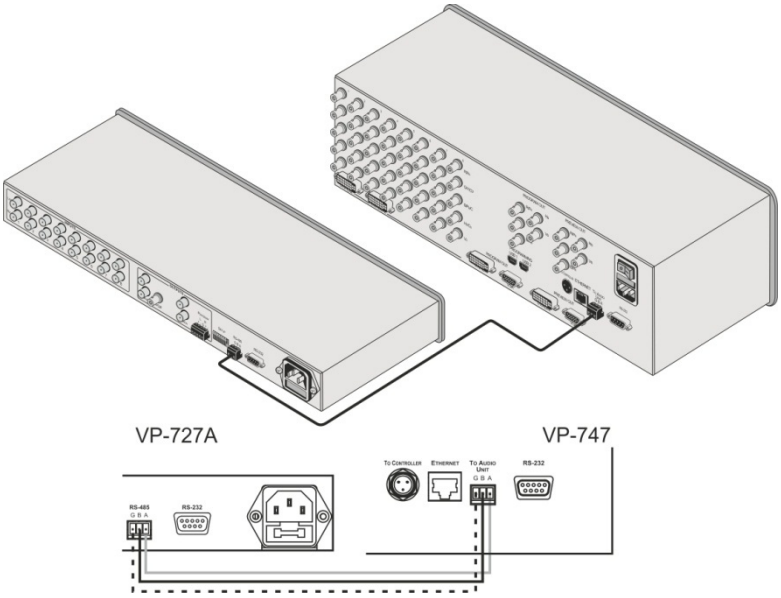


Figure 8: Connecting the VP-727A to the VP-747

6.3 Connecting the VP-747 to the Kramer VP-747T

For optimal operation of the **VP-747** via the **VP-747T**, set the **VP-747** "Optimize T-Bar" mode in the "Transition" menu to on (see Section 8.1.3).

Up to four **VP-747** machines can be connected to the **VP-747T** *Presentation Switcher Control Panel*.

You can connect the **VP-747** to the **VP-747T** by:

- One-to-one connection, from the TO CONTROLLER mini XLR connector on the **VP-747** to the TO VP-747 mini XLR connector on the **VP-747T**
- Wired connection, from the TO CONTROLLER mini XLR connector on the **VP-747** to the TO VP-747 3-pin terminal block connector on the **VP-747T** (see Section 6.3)

6.3.1 Connect the VP-747 to the VP-747T by Wired Connection

To connect the **VP-747** to the Kramer **VP-747T** *Presentation Switcher Control Panel* via the 3-pin terminal block connector, as illustrated in Figure 9, do the following:

- Connect the “A” PIN on the TO CONTROLLER mini XLR connector of the **VP-747** to the A (+) PIN on the RS-485 rear panel port of the **VP-747T** unit
- Connect the “B” (-) PIN on the TO CONTROLLER mini XLR connector of the **VP-747** to the B (-) PIN on the RS-485 rear panel port of the **VP-747T** unit
- If shielded twisted pair cable is used, the shield may be connected to the “G” (Ground) PIN on one of the units

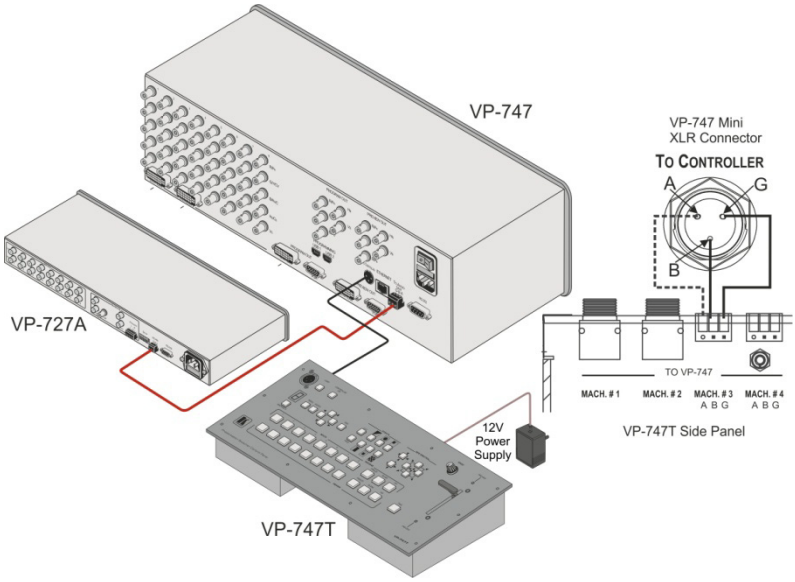


Figure 9: Connecting the VP-747 to the VP-747T

For the best results when working with the T-bar, we recommended setting PROGRAM and PREVIEW to the same output resolutions

6.4 Connecting the VP-747 via the Ethernet port

To connect the **VP-747** via the Ethernet port, do the following:

- Connect the Ethernet port of the **VP-747** to the LAN port of your PC, via a crossover cable with RJ-45 connectors.

If connecting the Ethernet port of the **VP-747** to the LAN port on a network hub or network router, use a straight-through cable with RJ-45 connectors.

7 Understanding the VP-747

This section describes the:

- UNIVERSAL inputs, see Section 7.1
- PREVIEW/PROGRAM outputs, see Section 7.2
- Switching/Scaling of an input, see Section 7.3
- PIP feature, see Section 7.4
- Panel Lock, see Section 7.5

7.1 Understanding the UNIVERSAL Inputs

The **VP-747** has eight sets of inputs (Each set consists of five BNC connectors: R/Pr, G/Y/CV, B/Pb/C, Hs/Cs, and Vs); each set can be programmed to operate as composite video, s-Video, component video, RGB/YUV, RGBS, RGsB, or RGBHV. INPUT 1 and INPUT 2 can also accept DVI/HDMI inputs.

The **VP-747** is a **universal** presentation matrix switcher/scaler: you choose what type of source to connect to each input. You can connect different video types or the same or similar video types. See the examples in Figure 3 and Figure 4.

7.2 Understanding the PREVIEW/PROGRAM Outputs

The **VP-747** has two outputs: a PREVIEW output, and a PROGRAM output. Each of these outputs functions independently and has DVI/HDMI connectors and VGA connectors, as well as sets of five BNC connectors used to output one of the following: RGB, RGBHV, or component video): R/PR, G/Y, B/PB, HS, and VS.

The HDMI signal is usually HDCP protected. We recommended using an HDCP compliant display, otherwise the HDMI output does not appear on the screen

Using the **PREVIEW** output, you can:

- See how the scaled output looks before displaying live during a presentation. As the example in Figure 10 illustrates, after seeing how the RGB source looks when scaled to HDMI, it can be interchanged with the YUV source, seamlessly, using an elaborate (in this case chessboard) transition effect
- Harmonize transition to the PROGRAM output after determining the look and feel when in the PREVIEW output
- Use the OSD menu to make adjustments and choose the settings
- Set the transition, choosing one of any eight special effects

  Using the **PROGRAM** output, after pressing the TAKE button, you can see the transition. The PREVIEW output is not available during the transition period. After making some changes in the unit (for example, selecting a new input to the PREVIEW output), the TAKE button is turned off (not illuminated) momentarily (until the unit successfully locks to this input). The TAKE button should not be pressed until it lights up again.

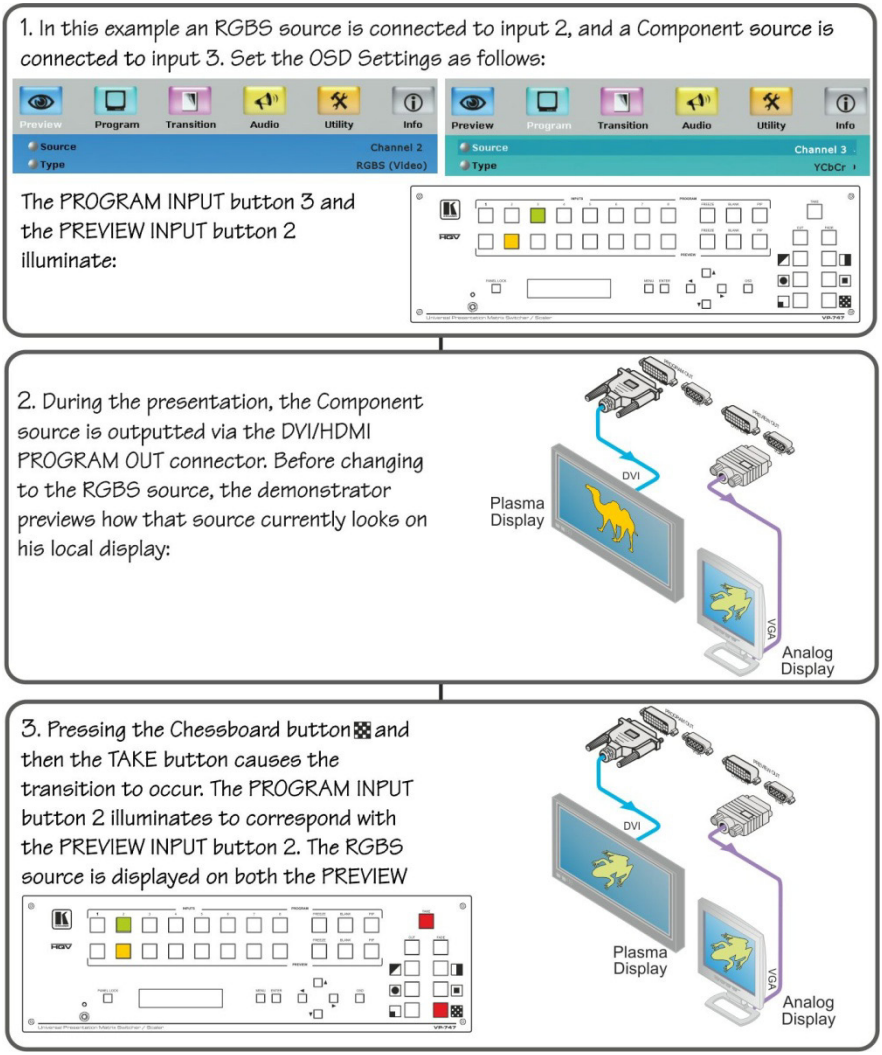


Figure 10: PREVIEW and PROGRAM Output Example

7.2.1 The Transition from Preview to Program

The transition can occur in one of two modes (As selected via the Transition OSD Menu, see Section 8.1.3):

- The Swap mode (default for the **VP-747**) (shown in Figure 10), in which the PREVIEW input buttons and the PROGRAM input buttons switch places after pressing the TAKE button. For example, in Figure 10 the PROGRAM input button 3 would switch to 2 and the PREVIEW input button 2 would switch to 3, so the RGBS source is displayed on the PROGRAM screen and the Component source is displayed on the PREVIEW screen.
- The Follow mode in which the PROGRAM input button is switched to the same position as the PREVIEW input button after the TAKE button is pressed

7.3 Switching/Scaling of an Input

The **VP-747** scales the selected sources to HDMI, RGBHV or YUV and VGA simultaneously. It switches seamlessly between sources using the selected special effects, which include cuts, fades, and wipes. Select the appropriate source (from channel 1 to 8) via the Input command in both the Preview Setting OSD screen and/or the Program Setting OSD screen (see Section 8.1), via the IR or front panel pushbuttons, or via the serial or Ethernet control.

Composite video, s-Video, component video (sometimes called YUV or Y, B-Y, R-Y or Y, Pb, Pr), RGB/YUV, RGBS, RGsB, or RGBHV.

7.4 Understanding the PIP Button Feature

The Picture-in-Picture inserter (PIP) is used for the simultaneous display of video and graphic sources, and lets you display an inserted video PIP source over a graphic source (for example, a composite video or s-Video PIP source inserted over a component, RGB/YUV, RGBS, RGsB, or RGBHV graphic source), or an inserted graphic PIP source over a video source (for example, a component (graphics), RGB/YUV, RGBS, RGsB, or RGBHV graphic PIP source inserted over a composite video, s-Video, or component video source), as in the table below. Both the Preview and Program outputs can support the PIP function.

Since the HDMI signal is HDCP protected, an HDMI signal cannot appear on a display that is not HDCP compliant.

		PIP Source							
		VIDEO		GRAPHIC					
	Main Source	CV	YC	COMP	RGB/ YUV	RGBS	RGsB	RGBHV	HDMI
VIDEO	CV	No	No	Yes	Yes	Yes	Yes	Yes	Yes
	YC	No	No	Yes	Yes	Yes	Yes	Yes	Yes
GRAPHIC	COMP	Yes	Yes	No	No	No	No	No	No
	RGB/YUV	Yes	Yes	No	No	No	No	No	No
	RGBS	Yes	Yes	No	No	No	No	No	No
	RGsB	Yes	Yes	No	No	No	No	No	No
	RGBHV	Yes	Yes	No	No	No	No	No	No
	HDMI	Yes	Yes	No	No	No	No	No	No

Select the PIP source (from channel 1 to 8), via the PIP source command in both the Preview Setting OSD screen and/or the Program Setting OSD screen.

Activate the PIP Feature by:

- Pressing the PIP front panel button
- Switching on the PIP functionality via the OSD Menu (see Section 8.1)
- Pressing the PIP key on the remote control transmitter (see Section 8.3)
- Selecting the Serial or the Ethernet port
- Pressing the PIP button on the **VP-747T** *Presentation Switcher Control Panel*

Use the OSD menu (see Section 8.1**) to**:

- Select the PIP type
- Resize the PIP
- Create a PIP frame

7.5 Locking and Unlocking the Front Panel

To prevent changing the settings accidentally or tampering with the unit via the front panel buttons, lock your **VP-747**. Unlocking releases the protection mechanism. When the front panel is locked, control is still available via RS-232, the Ethernet, and/or the CONTROL connector.

To lock the **VP-747**:

- Press and hold for a few seconds the PANEL LOCK button on the front panel

  The front panel is locked and the PANEL LOCK button is illuminated. Pressing a button has no effect.

To unlock the **VP-747**:

- Press and hold for a few seconds the illuminated PANEL LOCK button on the front panel

  Or the Lock key on the infrared remote control transmitter (see Figure 20)

- The front panel unlocks and the PANEL LOCK button is no longer illuminated

  For a description of the Save Lock and Input Lock OSD functions, see Section 8.1.5.

8 Operating the VP-747

You can operate the **VP-747** via the:

- OSD Menu, see Section 8.1
- LCD Display, see Section 8.2
- Infrared Remote Control Transmitter, see Section 8.3
- Ethernet/RS-232, see Section 8.4

8.1 Operating via the OSD MENU Screen

The OSD superimposes a menu on the Preview screen from which you can control your **VP-747**. When the OSD front panel button is on, pressing the MENU button on the front panel or the Menu key on the infrared remote control transmitter displays the first OSD screen (or the last used OSD screen), the “Preview Setting” screen. If the OSD is off, pressing the MENU button on the front panel or the Menu key on the infrared remote control transmitter does not display the “Menu screen”. In this case, you can navigate via the front panel LCD.

Figure 11 defines the six interactive icons:

Figure 11: Menu Screen Icons

8.1.1 Preview and Program Setting Commands

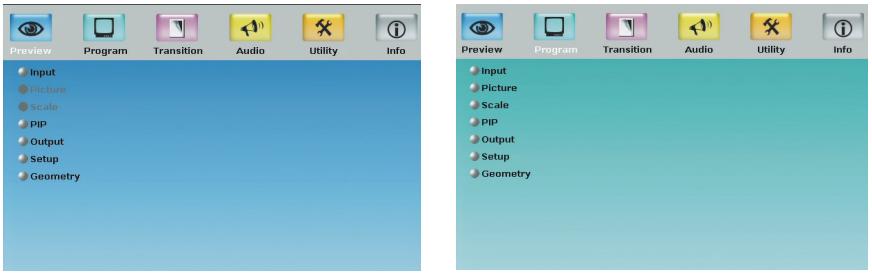


Figure 12: Preview and Program Setting OSD Menus

Preview and Program Setting OSD Menus		
Setting	**Function**	**Default**
Input Sub-menu		
Source	Select the input source: Channel 1 to 8	Channel 1
Type	Set the video type: RGBHV, RGBS (PC/Video), RGsB (PC/Video), YCbCr, Y/C or video, HDMI (for input 1 and input 2 only)	RGBHV
Video Standard	Set the Video standard: Auto, NTSC, PAL, PAL-M, PAL-N, NTSC 4.43, SECAM or PAL 6	Auto
H-Position	Set the horizontal position for UXGA and component video inputs The range changes according to the input mode	
V-Position	Set the vertical position	
Frequency	Adjust the frequency for UXGA inputs	
Phase	Adjust the phase only for a VGA Source: 0 to 31	0
Auto Image	Assesses the image and improves the quality accordingly, by automatically adjusting the phase, frequency and position. Upon completion, the relevant OSD values are updated (H-Position, V-Position, Phase and Frequency)	
Overscan	Allows stretching of the outputted picture: On or Off Enabled only for HD input resolutions	On
Picture Sub-menu		
Brightness	Adjust the brightness: -50 to 50	0
Contrast	Adjust the contrast: -50 to 50	0
Color	Adjust the color: -50 to 50	0
Hue	Adjust the hue: -180 to 180	0
Sharpness	Adjust the sharpness: -50 to 50	0
Output Gamma	Adjust the gamma: 1 to 4	1
Film Mode	Set the film mode: Auto, Video or Film	Auto
Temporal NR	Set the temporal noise reduction level: Off, Low, Medium or High You do not have to press ENTER after selecting the desired parameter to change it	High
Mosquito NR	Set the Mosquito noise reduction level: Off, Low, Medium, High	Low
Block NR	Set the block noise reduction level: Off or On	High
Detail Enhancement	Set the detail enhancement: Off, Low, Medium or High	Off

Preview and Program Setting OSD Menus		
Setting	**Function**	**Default**
Luma Transition Enhance	Set the luminance transition enhance level: Off, Low or High	Low
Chroma Transition Enhance	Set the chrominance transition enhance level: Off, Low or High	Low
Scale		
Aspect Ratio	Set the aspect ratio: **Best Fit**: The best possible compromise between the input and the output aspect ratios without distorting or cropping the picture **Letterbox** **Follow Output:** Scales the picture to fill the entire output screen When the input and output aspect ratios are the same, the only available option will be Follow Output. (The HQV considers resolution 1920x1200 as 16:9) **Virtual Wide** **Follow Input**: Shows the picture without scaling it (pixel-to-pixel mapping) **Custom**	Best fit
H-Pan	Horizontal pan: -16 to 16 Available when selecting Custom aspect ratio	0
V-Pan	Vertical pan: -16 to 16 Available when selecting Custom aspect ratio	0
H-Zoom	Horizontal zoom: -8 to 8 Available when selecting Custom aspect ratio	0
V-Zoom	Vertical zoom: -8 to 8 Available when selecting Custom aspect ratio	0
Zoom	Set the Zoom: 100%, 150%, 200%, 225%, 250%, 275%, 300%, 325%, 350%, 375%, 400%, Custom The zoom feature is disabled in cases such as when the aspect ratio is set to custom or when the PIP feature is on	100
Custom Zoom	Set the zoom: From 0 to 32 (this range is equivalent to 100% to 400%) This function is available after setting the Zoom to custom	0
Zoom H-Pan	-16 to 16 Not available if the zoom is set to 100%	0
Zoom V-Pan	-16 to 16 Not available if the zoom is set to 100%	0
PIP		
On/Off	Activate/deactivate the PIP feature: On/Off When PIP is activated and that input is not connected, the PIP window appears black. If the zoom function is ON, the OSD prompts “cancel zoom?"	Off
Type	Select the PIP type: Picture-In-Picture, Picture + Picture or Split	Picture-In-Picture
Source	Select the PIP source: Channel 1 to Channel 8 Maintains the aspect ratio	
PIP Size	Select the PIP size: 1/25, 1/16, 1/9, 1/4, or Custom	1/4
H - Position	Set the horizontal position of the PIP on the display: 0 to 128	3
V - Position	Set the vertical position of the PIP on the display: 0 to 128	0
H - Size	Set custom size (the actual range depends upon the input resolution): 1 to 255	14

Preview and Program Setting OSD Menus		
Setting	**Function**	**Default**
V - Size	Set custom size: 1 to 255	5
Frame	Turn the PIP frame: On or Off	On
Frame Color	Select the color of the PIP frame: Red, Green or Blue	Blue
Output		
Resolution	640x480x60Hz, 640x480x75Hz, 800x600x50Hz, 800x600x60Hz, 800x600x75Hz, 832x624x60Hz, 852x480x60Hz, 1024x768x50Hz, 1024x768x60Hz, 1024x768x75Hz, 1280x768x50Hz, 1280x768x60Hz, 1280x720x60Hz, 1280x800x60Hz, 1280x1024x50Hz, 1280x1024x60Hz, 1280x1024x75Hz, 1366x768x50Hz, 1366x768x60Hz, 1400x1050x50Hz, 1400x1050x60Hz, 1440x900x60Hz, 1600x1200x50Hz, 1600x1200x60Hz, 1680x1050x60Hz, 1920x1080x50Hz, 1920x1080x60Hz, 1920x1200x60Hz, 480px60Hz, 576px60Hz, 720px50Hz, 720px60Hz, 1080ix50Hz, 1080ix60Hz, 1080px50Hz, 1080px60Hz, 1080p@24Hz, 480px59.94Hz, 720px59.94Hz, 1080ix59.94Hz, 1080px23.97Hz, 1080px29.97Hz, 1080px59.94Hz or one of 4 Custom resolutions The embedded audio feature is not available for the **RGB** resolutions 1920x1200 and 1920x1080. (It is available for 1080p) If the custom resolution is set to be the same as the default resolution, the scaler refers to the default resolution	1024x768 x60Hz
HQV Color Setting	Set the Red, Green, Blue, Cyan, Magenta and Yellow saturation: -100 to 100	0
Setup		
	Input Mode Setting (see Figure 13)	
	Output mode setting (see Figure 14)	
Geometry		
Application	Select the output application: Keystone, Anyplace or Rotation	keystone
Location	Select the location of the display: Front, Ceiling, Rear or Rear ceiling	Front
Horizontal Keystone	Adjust the horizontal keystone: -40 to 40 If the projector is located at an angle to the left or right of the screen	0
Vertical Keystone	Adjust the vertical keystone: -30 to 30 If the projector is located at an angle above or below the screen	0
Diagonal Projection	Move the location of each corner of the display separately (horizontally and vertically): Top Left, Top Right, Bottom Left, Bottom Right or Reset (to reset diagonal projections settings)	Top Left
Pincushion/ Barrel	Adjust the pincushion or barrel appearance of the screen: -20 to 20 For projection onto curved surfaces	0
Rotation	Rotate the display clockwise or counterclockwise (in 1° increments): -180 to 180	0
Reset all	Resets the geometry settings to their default values	

8.1.2 Preview and Program Input and Output Settings

Figure 13 defines the input Mode Setting:

Figure 13: Input Mode Setting Screen

Input Mode Functions			
Setting	**Function**	**Range**	**Default**
Custom Input	Set custom values	Custom 1 to 4	
HT	Horizontal Total		1344
HW	Horizontal sync pulse width		136
HS	Horizontal active start point		296
HA	Horizontal active region		1024
HP	Horizontal polarity		
VT	Vertical Total		806
VW	Vertical sync pulse width		6
VS	Vertical active start point		35
VA	Vertical active region		768
VP	Vertical polarity		
OCLK	Output clock		65
Enable			off
Save	Click to save settings		N/A

Figure 14 defines the Output Mode Setting:

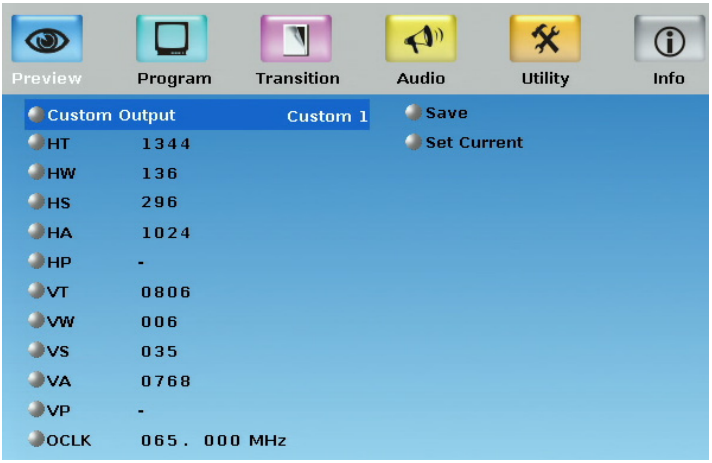


Figure 14: Output Mode Setting Screen

Output Mode Functions			
Setting	**Function**	**Range**	**Default**
Custom Output	Set custom values	Custom 1 to 4	
HT	Horizontal total		1344
HW	Horizontal sync pulse width		136
HS	Horizontal active start point		296
HA	Horizontal active region		1024
HP	Horizontal polarity		
VT	Vertical total		806
VW	Vertical sync pulse width		6
VS	Vertical active start point		35
VA	Vertical active region		768
VP	Vertical polarity		
OCLK	Output clock		65
Save	Click to save the settings		
Set Current	Import the values of the currently selected output resolution into the User Mode Setting		N/A

8.1.3 The Transition Menu Items

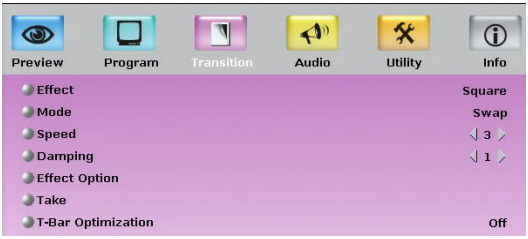


Figure 15: Transition Screen

Transition Screen Functions			
Setting	**Function**	**Selection/Range**	**Default**
Effect	Set the transition effect: Cut, Fade, Diagonal, Wipe, Circle, Square, Corner or Chessboard		Fade
Mode	Set the transition mode: Swap or Follow		Swap
Speed	Set the transition speed: 1 to 5		3
Damping	Set the transition damping: 0 to 4 When using the **VP-747** together with the T-Bar controller		0
Effect Option	Diagonal:	Top left, Bottom left, Top right, Bottom right	Top Left
	Wipe:	Left to right, Right to left, Up, Down	Left to Right
	Circle:	In, Out	Out
	Square:	In, Out	In
	Corner:	Top left, Bottom left, Top right, Bottom right	Bottom Left
	Chessboard:	In, Out Each block within the chessboard either shrinks (In) or expands (out)	In
Take	Pressing causes the transition from preview to program (SWAP or FOLLOW) If the resolutions of Preview and Program are different, pressing the TAKE button when in the Freeze mode, disables the Freeze mode		
T-Bar Optimization	On/Off For optimal performance, set to ON when working with the **VP-747T** presentation switcher control panel When ON, the resolution of the PREVIEW output is always identical to the PROGRAM output		Off

8.1.4 The Audio Menu Items

The audio menu controls the **VP-727A** audio companion (Download up-to-date Kramer user manuals from the Internet at this URL: http://www.kramerelectronics.com). See the **VP-727A** user manual for further detail.

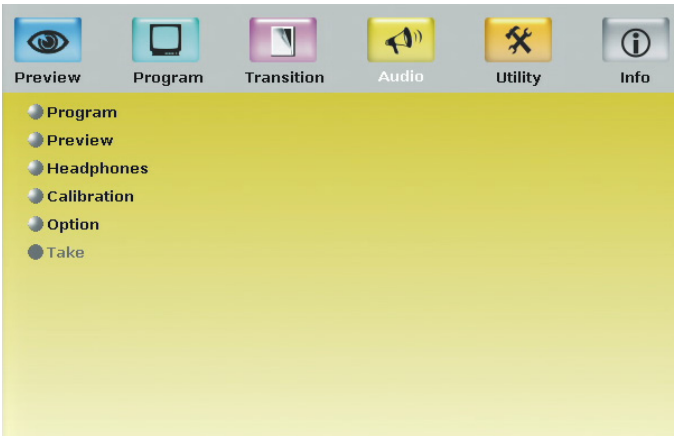


Figure 16: Audio Screen

Audio Screen Functions		
Setting	**Function**	**Default**
Program	Source: Channel 1 to Channel 8	Channel 1
	Input Volume: -82 (mute) to +45	0
	Output Volume: -22 (mute) to +9	0
	Delay: 0 to 127 [msec] Sets the pipeline delay of the audio (to compensate the delay in the video processing)	0
Preview	Source: Channel 1 to Channel 8	Channel 1
	Input Volume: -82 (mute) to +45	0
	Output Volume: -82 (mute) to +45	0
Headphones	Set the headphone source: Program or Preview	Program
	Volume: -12 (mute) to 4	0
Calibration	Bass: -6 to 6	0
	Treble: -6 to 6	0
	Balance: -10 to 10	0
Option	Audio-Follow-Video: Follow or audio breakaway	Follow
	Fade: On or Off	On
	Mute-Follow: Freeze, Blank or Freeze & Blank	none
Take	In the breakaway mode, preview and program audio inputs switch positions	

8.1.5 The Utility Menu Items

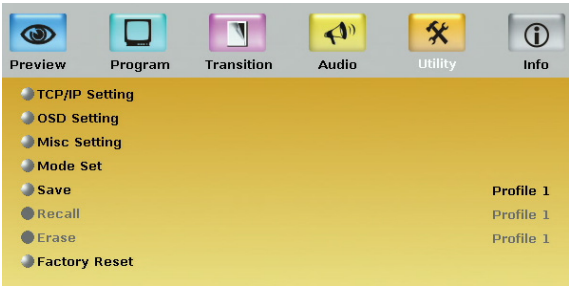


Figure 17: Utility Screen

Utility Screen Functions		
Setting	**Function**	**Default**
TCP/IP Setting	DHCP: Off or On	Off
	IP Address	192.168.1.39
	Subnet Mask	255.255.255.0
	Gateway	192.168.1.254
	Apply: Apply settings	
OSD	Menu Position: Center, Top Left, Top Right, Bottom Left or Bottom Right	Center
	Time-Out: 5, 10, 20, 30, 60, 90 seconds or Off	30 Sec
Misc. Settings	Logo: Off, On or Custom **ON** for the start up Kramer logo to appear on the screen; **OFF** to disable the logo. **CUSTOM** to select the downloaded custom Logo (Flash ROM) Downloaded via USB (Logo Download)	On
	Save Lock (see Section 8.1.5.1)	
	Input Lock: Off or On (see Section 8.1.5.2)	On
	Background: Blue, Black or Disable Analog Sync	Black
	Blank Color: Black or Blue	
	Event Mode: Off or On If On is selected, the LCD displays "Invalid operation in the event of pressing any program button"	Off
	Baud Rate: 9600 or 115200	115200
	Firmware Download: Download the firmware via the USB connection, select the correct file from the memory stick and Confirm Do not press any buttons while the firmware is downloading	
	Logo Download: Download a new logo via the USB port using a memory stick (see Section 8.1.5.3)	

Utility Screen Functions		
Setting	**Function**	**Default**
Misc. Settings (cont.)	HDCP Setting: Follow Input, Follow Output Define whether the HDCP follows the input or the output When Follow Input is selected, the Scaler changes its HDCP output setting (for the HDMI output) according to the HDCP of the input. This option is recommended when the HDMI Scaler output is connected to a splitter/switcher (in this mode, switching may not be glitch-free) When Follow Output is selected, the Scaler matches its HDCP output to the HDCP setting of the HDMI acceptor to which it is connected. This ensures smooth switching, regardless of the input	Follow Output
	Auto Image: Manual or Auto	Manual
Mode Set	Mode 1: 1400x1050@60Hz or 1680x1050@60Hz	1680x1050x60Hz
	Mode 2: 1280x1024x75Hz or 1280x1024@76Hz	1280x1024x75Hz
	Mode 3: 1280x768@60Hz or 1366x768@60Hz	1280x768x60Hz
Save	Save profile: from 1 to 8 (see Section 8.1.5.1)	
Recall	Recall profile: from 1 to 8	
Erase	Erase profile: from 1 to 8 or all	
Factory reset		

8.1.5.1 Save Lock

The Save Lock qualifies the Panel Lock. When set to On, the status of the Panel lock is saved on power down, and then recalled when the unit is turned on again.

For a description of how to lock the front panel using the PANEL LOCK button, see Section 7.5.

If the Save Lock is OFF, the Panel Lock is OFF when the machine is powered up (even if the Panel Lock was ON before the power was turned OFF).

8.1.5.2 Input Lock

The Input Lock qualifies the Panel Lock. When set to On, the 8x2 Input buttons and the TAKE button are included in the buttons which are locked when the Panel Lock is on.

If the Input Lock is ON, access to the front panel buttons is blocked when Panel Lock is On, including the PROGRAM and PREVIEW INPUT selector front panel buttons, and the Program and Preview IR remote transmitter keys. When Input Lock is Off, then you can still access the 8x2 Input buttons and the TAKE button, even if the Panel Lock is On.

8.1.5.3 Logo Download

Use one of the rear panel USB ports to download a custom Logo to the **VP-747**. To download a new logo:

1. Load the JPEG (JPEG files are recognized up to 2048x1536) images to a USB memory stick.
2. Insert the memory stick into one of the USB ports.
3. In the Utility menu, select Misc Settings and set Logo to Custom.
4. In the Misc menu, select Logo Download and press Enter.
5. If a list of the available images is **not** shown, press TAKE, and then repeat step #4 above.
6. Select the desired image and press Enter. When the download is complete (this takes several seconds), the list of images no longer shows.

8.1.5.4 Save/Recall/Erase Setting Commands

You can save/recall up to 8 settings. In each setting you can preserve the entire machine's settings. All parameters are saved/recalled, including the Universal Input configurations, ProcAmp settings, output resolutions, and so on. You can also erase a single setting or all of them.

This is useful, for example, for configuring the machine for multiple presentations. Up to 8 presentation configurations can be saved in the machine's memory

8.1.6 The Information Menu Items

From the Info screen (see Figure 18), you can verify the program and preview source, video type and video standard as well as the PIP program and PIP Preview source, video type and video standard. The Info screen also displays the Preview and Program output resolutions.

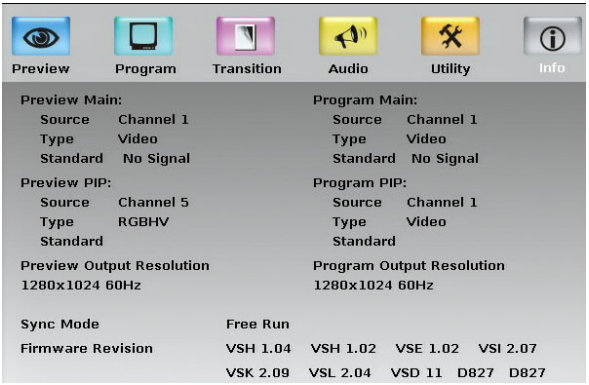


Figure 18: Info Screen

8.2 Operating via the Front Panel LCD Display

You can control the **VP-747** PREVIEW output from the front panel, high contrast, LCD Display, using the:

- Front panel OSD buttons: MENU, ENTER, ►, ◄, ▲, and ▼
- Infrared remote control transmitter (see Figure 20) keys: MENU, and the direction keys

For example, to set the time out to 60 seconds via the LCD Display, using the front panel buttons, do the following:

1. Turn the **VP-747** unit ON, and press the OSD ON button (if selected).
2. Press the appropriate front panel OSD buttons (as defined in Figure 19).

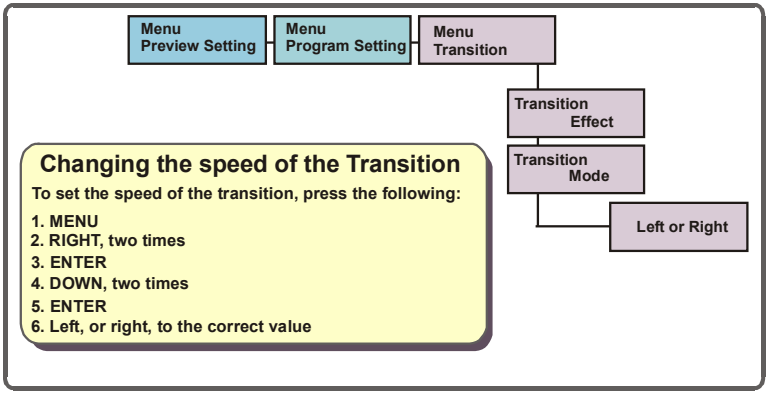


Figure 19: Example of how to use the LCD Display

8.3 Operating via the Infrared Remote Control Transmitter

You can control the **VP-747** remotely, from the infrared remote control transmitter (that has a range of up to 15 meters and is powered by two AAA size 1.5V DC batteries).

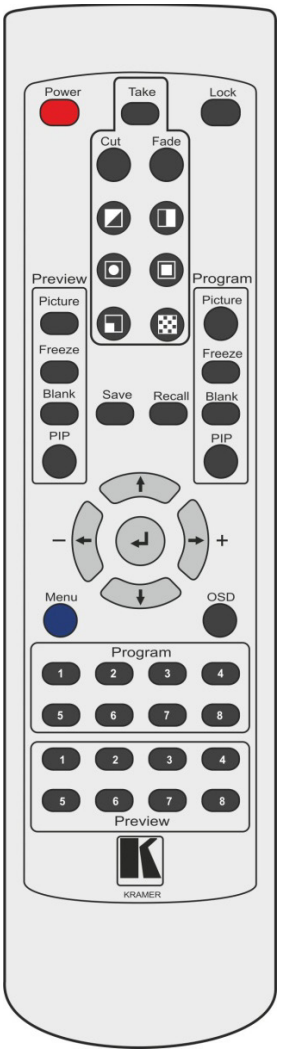


Figure 20: Remote Transmitter

Remote Transmitter Functions		
Keys	**Function**	
Power	Cycles power When "Off" the machine shuts down its outputs, disables the front panel, and causes the IR Receiver/LED to light red (instead of green)	
Take	Pressing TAKE causes the transition to occur The effect is only seen on the PROGRAM output	
Lock	Locks/unlocks the front panel	
Cut	Selects an instantaneous transition from the PREVIEW output to the PROGRAM output Only for setting up the unit for the effect. The effect only occurs when the Take button is pressed	
Fade	Selects a dissolved transition from the PREVIEW output to the PROGRAM output	
	Selects a **Diagonal** transition effect Choose the direction from where the effect starts: "top left", "bottom left", "top right" or "bottom right" (see Section 8.1.3)	
	Selects a **WIPE** transition effect Choose the direction from where the effect starts: "left to right", "right to left", "up" or "down" (see Section 8.1.3)	
	Selects a **CIRCLE** transition effect Choose the direction from where the effect starts: "in" or "out" (see Section 8.1.3)	
	Selects a **SQUARE** transition effect	
	Selects a **CORNER** transition effect	
	Selects a **CHESSBOARD** transition effect	
Picture	Separate keys for PREVIEW/ PROGRAM	Adjusts the picture contrast, brightness, saturation, auto gain, and auto image
Freeze		Toggles the freeze function of the output video image
Blank		Toggles a blank screen
PIP		Toggles the picture-in-picture function
Save	Saves the setting	
Recall	Recalls the setting	
Navigation Keys	Consists of a set of 5 separate keys that allow maneuvering within an OSD screen	
Menu	Displays the OSD Menu screen (or moves to the previous level in the OSD menu)	
OSD	Activates/deactivates access to the OSD Menu	
Selector	8 separate selector keys for both the Program and the Preview outputs	

8.4 Operating via the Ethernet

The control application lets you control the **VP-747** by clicking the desired buttons in the control application screen (which includes all the front panel buttons). To control the **VP-747** via the Ethernet/Serial Port:

1. Connect the Ethernet port (see Section 6.4) of the **VP-747** to the Ethernet port of your PC or connect the serial port of your **VP-747** to the serial port of your PC (see Section 6.1).

2. Install and configure the Control Application (see Section 8.4.1).

8.4.1 Installing and Running the Configuration Software

To install the **VP-747** Control Application, do the following:

1. Insert the product CD into your CD-ROM drive.
   You can download the software from our Web site on http://www.kramerelectronics.com.

2. Save the zip file on your computer.

3. Run the installer setup.

4. Respond to the installation wizard prompts.

8.4.2 Configuring the Ethernet Connection

Double click the *VP747.exe* icon. The *VP747 Control Application* main screen appears (see Figure 21).

You can configure the Ethernet (the **VP-747** communication port is 5000) in any one of the following ways; via

- The Ethernet connection, using the Lantronix device software
- The **VP-747** Device menu (the OSD) or via the Control Application menu: <Utility> <TCP/IP setting>, and then setting the IP Address, subnet mask and so on, and then clicking Apply
- RS-232 communication between the PC and the **VP-747**, and setting the IP Address through the Com port menu in the Control Application

Figure 21: VP-747 Control Application Screen

The control menu items are defined here:

VP-747 Control Application Menu	
Menu	**Items**
File	Save Configuration, Exit
Com port	Select (the com port), Connect (to the selected com port)
Ethernet	Connect to the Ethernet
Menu	Menu options (enter the **VP-747** menu, see Section 8.1)
Help	About

8.4.3 Control the VP-747 via the Ethernet/Serial Port

To control the **VP-747** via the Ethernet/serial port click the buttons on the virtual **VP-747** front panel and/or open the Menu item and use the OSD menus.

9 Technical Specifications

INPUTS:	2 HDMI/DVI inputs connectors (HDMI and HDCP version 1.2) on DVI connectors 8 sets of universal BNC connectors: R/Pr, G/Y/CV, B/Pb/C, Hs/Cs, and Vs, each programmable for use as CV, YC, RGB, YCbCr, YPbPr, RGBS or RGBHV
PREVIEW OUTPUT:	1 x HDMI/DVI input connector (HDMI and HDCP version 1.2) on a DVI connector 1 x VGA (VGA through UXGA) on a 15-pin HD connector 1 x RGBHV/YPbPr on BNC connectors
PROGRAM OUTPUT:	1 x HDMI/DVI input connector (HDMI version 1.2 and HDCP version 1.2) on a DVI connector 1 x VGA (VGA through UXGA) on a 15-pin HD connector 1 x RGBHV/YPbPr on BNC connectors
OUTPUT RESOLUTIONS:	640x480 60Hz, 640x480 75Hz, 800x600 50Hz, 800x600 60Hz, 800x600 75Hz, 832x624 75Hz, 852x480 60Hz, 1024x768 50Hz, 1024x768 60Hz, 1024x768 75Hz, 1280x720 60Hz, 1280x768 50Hz, 1280x768 60Hz, 1280x800 60Hz, 1280x1024 50Hz, 1280x1024 60Hz, 1280x1024 75Hz, 1366x768 50Hz, 1366x768 60Hz, 1400x1050 50Hz, 1400x1050 60Hz, 1440x900 60Hz, 1600x1200 50Hz, 1600x1200 60Hz, 1680x1050 60Hz, 1920x1080 50Hz, 1920x1080 60Hz, 1920x1200 60Hz, 480px60Hz, 576p, 720p 50Hz, 720p 60Hz, 1080i 50Hz, 1080i 60Hz, 1080p 50Hz, 1080p 60Hz, 1080p 24Hz (for HDMI), 480px59.94Hz, 720px59.94Hz, 1080ix59.94Hz, 1080px23.97Hz, 1080px29.97Hz, 1080px59.94Hz or one of 4 Custom resolutions For the most up-to-date resolution list, go to our Web site at http://www.kramerelectronics.com
CONTROLS:	Front panel buttons, high contrast LCD, IR remote control, Ethernet, AUDIO CONTROL, RS-232 and RS-485 for optional T-bar remote controller
ADDITIONAL CONTROLS:	Freeze, zoom, different selectable vertical refresh rates, ProcAmp control, output image scaling, Picture-In-Picture, and aspect ratio change
POWER SOURCE:	100-240 VAC, 50/60Hz 65VA
DIMENSIONS:	19” (W), 9.3” (D), 3RU (H) rack mountable
WEIGHT:	5.5kg. (12.2lbs) approx.
ACCESSORIES:	IR remote control, power cord, rack “ears”, and null-modem adapter
OPTIONS:	VP-747T control panel
Specifications are subject to change without notice at http://www.kramerelectronics.com	

9.1 Default Communication Parameters

RS-232 Communication Protocol	
Baud Rate:	9600 / 115200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	HEX
Example (select channel 1 as program input):	Y■0■151■0■CR
Ethernet	
IP Address:	192.168.1.39
TCP Port Number:	5000
Network Mask:	255.255.255.0
Default Gateway:	192.168.1.1

10 VP-747 Communication Protocol

The following is the COM port setting:

Baud rate：9600 / 115200 (Bits per second)

Parity: None

Data Bits: 8bits

Stop Bits: 1bit

Character Symbols Definitions	
Symbol	**Meaning**
■	Space
[CR]	Carriage Return, ASCII code 0x0D
[LF] or >	Line Feed, ASCII code 0x0A

Communication Confirm:

Send CR

Reply CRLF >

Set Command

Send Y■Control_Type■Function■Param■CR

Reply Z■Control_Type■Function■Param■ CRLF >

Get Command

Send Y■Control_Type■Function■CR

Reply Z■Control_Type■Function■Param■ CRLF >

Example: set Preview Source Type of Current Channel = RGBHV

Send Y■0■43■0■CR

Reply Z■0■43■0■CR>

Example: get Preview Source Type of Current Channel

Send Y■1■43■CR

Reply Z■1■43■0■ CRLF >

■: ASCII Code 0x20

CR : Ascii Code 0x0D

CRLF : Ascii Code 0x0d+0x0A

After set, type command setting. The system responds with a string.

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
0	1	0	0:Off 1:On	-	-	-	Power
0	1	1	0:Off 1:On	-	-	-	Panel Lock
0	-	2	-	-	-	-	Take
0	-	3	-	-	-	-	Cut
0	-	4	-	-	-	-	Fade
0	-	5	-	-	-	-	Diagonal
0	-	6	-	-	-	-	Wipe
0	-	7	-	-	-	-	Circle
0	-	8	-	-	-	-	Square
0	-	9	-	-	-	-	Corner
0	-	10	-	-	-	-	Chessboard
0	-	11	-	-	-	-	Preview Picture
0	1	12	0:Off 1:On	-	-	-	Preview Freeze
0	1	13	0:Off 1:On	-	-	-	Preview Blank
0	-	14	-	-	-	-	Program Picture
0	1	15	0:Off 1:On	-	-	-	Program Freeze
0	1	16	0:Off 1:On	-	-	-	Program Blank
0	-	17	-	-	-	-	Up
0	-	18	-	-	-	-	Down
0	-	19	-	-	-	-	Left
0	-	20	-	-	-	-	Right
0	-	21	-	-	-	-	Menu
0	-	22	-	-	-	-	Enter
0	1	23	0: Off 1: On	-	-	-	OSD
0	1	41	0: Channel 1 1: Channel 2 2: Channel 3 3: Channel 4 4: Channel 5 5: Channel 6 6: Channel 7 7: Channel 8	-	-	-	Preview Input Source
0	1	42	0: RGBHV 1: RGBS(PC) 2: RGsB(PC) 3: RGBS(Video) 4: RGsB(Video) 5: YCbCr 6: Y/C 7: Video 8: HDMI	-	-	-	Preview Input Type HDMI can only be selected for Channel 1 or Channel 2
0	1	43	0: Auto 1: NTSC 2: PAL 3: PAL-M 4: PAL-N 5: NTSC 4.43 6: SECAM 7: PAL 60	-	-	-	Preview Input Video Standard

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
0	1	44	1 ~ N	-	-	-	Preview Input Main Source H-Position N: unfixed, changes with Input Mode
0	1	45	2 ~ N	-	-	-	Preview Input Main Source V-Position N: unfixed, changes with Input Mode
0	1	46	-A ~ A	-	-	-	Preview Input Frequency A = (max - min)/2 min = 0 , max = changes with Input Mode
0	1	47	0 ~ 31	-	-	-	Preview Input Phase (only for VGA Source)
0	-	48	-	-	-	-	Preview Auto Image
0	1	49	0: Off 1: On	-	-	-	Preview Over Scan Status
0	1	50	-50 ~ 50	-	-	-	Preview Picture Brightness
0	1	51	-50 ~ 50	-	-	-	Preview Picture Contrast
0	1	52	-50 ~ 50	-	-	-	Preview Picture Color
0	1	53	-180 ~ 180	-	-	-	Preview Picture Hue
0	1	54	-50 ~ 50	-	-	-	Preview Picture Sharpness
0	1	55	0: Gamma 1 1: Gamma 2 2: Gamma 3 3: Gamma 4 4: Gamma 5	-	-	-	Preview Picture Output Gamma
0	1	56	0: Auto 1: Video 2: Film	-	-	-	Preview Picture Film Mode
0	1	57	0: Off 1: Low 2: Medium 3:High	-	-	-	Preview Picture Temporal NR
0	1	58	0: Off 1: Low 2: Medium 3: High	-	-	-	Preview Picture Mosquito NR
0	1	59	0: Off 1: On	-	-	-	Preview Picture Block NR
0	1	60	0: Off 1: Low 2: Medium 3: High	-	-	-	Preview Picture Detail Enhancement
0	1	61	0: Off 1: Low 2: High	-	-	-	Preview Picture Luma Transition Enhance
0	1	62	0: Off 1: Low 2: High	-	-	-	Preview Picture Chroma Transition Enhance
0	1	63	0: Best Fit 1: Letterbox 2: Follow Output	-	-	-	Preview Scale Aspect Ratio

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
			3: Virtual Wide 4: Follow Input 5: Custom				
0	1	64	-16 ~ 16	-	-	-	Preview Scale H-Pan
0	1	65	-16 ~ 16	-	-	-	Preview Scale V-Pan
0	1	66	-8 ~ 8	-	-	-	Preview Scale H-Zoom
0	1	67	-8 ~ 8	-	-	-	Preview Scale V-Zoom
0	1	68	0: Off 1: 150% 2: 200% 3: 225% 4: 250% 5: 275% 6: 300% 7: 325% 8: 350% 9: 375% 10: 400% 11:Custom	-	-	-	Preview Scale Zoom
0	1	69	0 ~ 32	-	-	-	Preview Scale Custom Zoom
0	1	70	-16 ~ 16	-	-	-	Preview Scale Zoom H-Pan
0	1	71	-16 ~ 16	-	-	-	Preview Scale Zoom V-Pan
0	1	72	0: Off 1: On	-	-	-	Preview PIP On/Off
0	1	73	0: Picture-In-Picture 1: Picture + Picture 2: Split	-	-	-	Preview PIP Type
0	1	74	0: Channel 1 1: Channel 2 2: Channel 3 3: Channel 4 4: Channel 5 5: Channel 6 6: Channel 7 7: Channel 8	-	-	-	Preview PIP Source
0	1	75	0: 1/25 1: 1/16 2: 1/9 3: 1/4 4: Custom	-	-	-	Preview PIP Size
0	1	76	0 ~ 128	-	-	-	Preview PIP H-Position
0	1	77	0 ~ 128	-	-	-	Preview PIP V-Position
0	1	78	1 ~ 255	-	-	-	Preview PIP H-Size
0	1	79	1 ~ 255	-	-	-	Preview PIP V-Size
0	1	80	0: Off 1: On	-	-	-	Preview PIP Frame
0	1	81	0:Red 1:Green 2:Blue	-	-	-	Preview PIP Frame Color

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
0	1	82	0: Native 1: 640x480 60Hz 2: 640x480 75Hz 3: 800x600 50Hz 4: 800x600 60Hz 5: 800x600 75Hz 6: 832x624 75Hz 7: 852x480 60Hz 8: 1024x768 50Hz 9: 1024x768 60Hz 10: 1024x768 75Hz 11: 1280x720 60Hz 12: 1280x768 50Hz 13: 1280x768 60Hz 14: 1280x800 60Hz 15: 1280x1024 50Hz 16: 1280x1024 60Hz 17: 1280x1024 75Hz 18: 1366x768 50Hz 19: 1366x768 60Hz 20: 1400x1050 50Hz 21: 1400x1050 60Hz 22: 1440x900 60Hz 23: 1600x1200 50Hz 24: 1600x1200 60Hz 25: 1680x1050 60Hz 26: 1920x1080 50Hz 27: 1920x1080 60Hz (CVT-R) 28: 1920x1200 60Hz 29: 480px60Hz 30: 576p 31: 720p 50Hz 32: 720p 60Hz 33: 1080i 50Hz 34: 1080i 60Hz 35: 1080p 50Hz 36: 1080p 60Hz 37: 1080p 24Hz 38:480px59.94Hz 39:720px59.94Hz 40:1080ix59.94Hz 41:1080px23.97Hz 42:1080px29.97Hz 43:1080px59.94Hz 44: Custom 1 45: Custom 2 46: Custom 3 47: Custom 4	-	-	-	Preview Output Resolution
0	1	83	-100 ~ 100	-	-	-	Preview Red Saturation
0	1	84	-100 ~ 100	-	-	-	Preview Green Saturation
0	1	85	-100 ~ 100	-	-	-	Preview Blue Saturation
0	1	86	-100 ~ 100	-	-	-	Preview Cyan Saturation
0	1	87	-100 ~ 100	-	-	-	Preview Magenta Saturation
0	1	88	-100 ~ 100	-	-	-	Preview Yellow Saturation
0	1	89	0: Custom 1 1: Custom 2	-	-	-	Preview Custom Input Target

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
			2: Custom 3 3: Custom 4				
0	1	90	512 ~ 3071	-	-	-	Preview Input Setting User Mode HT
0	1	91	32 ~ (HS-48)	-	-	-	Preview Input Setting User Mode HW
0	1	92	80~(HT-HA-12)	-	-	-	Preview Input Setting User Mode HS
0	1	93	640~1920 <= (HT-92)	-	-	-	Preview Input Setting User Mode HA
0	1	94	0: - 1: +	-	-	-	Preview Input Setting User Mode HP
0	1	95	384~2047	-	-	-	Preview Input Setting User Mode VT
0	1	96	2~(HS-13)	-	-	-	Preview Input Setting User Mode VW
0	1	97	15~(VT-VA-1)	-	-	-	Preview Input Setting User Mode VS
0	1	98	480~1200 <= (VT-16)	-	-	-	Preview Input Setting User Mode VA
0	1	99	0: - 1: +	-	-	-	Preview Input Setting User Mode VP
0	1	100	25 ~ 165 (Integer Value)	0 ~ 999 (Decimal Value)	-	-	Preview Input Setting User Mode OCLK
0	1	101	0:Off 1:On	-	-	-	Preview Input Setting Enable
0	-	102	-	-	-	-	Preview Input Setting User Mode Save
0	1	103	0: Custom 1 1: Custom 2 2: Custom 3 3: Custom 4	-	-	-	Preview Custom Output Target
0	1	104	512 ~ 3071	-	-	-	Preview Output Setting User Mode HT
0	1	105	32 ~ (HS-48)	-	-	-	Preview Output Setting User Mode HW
0	1	106	80~(HT-HA-12)	-	-	-	Preview Output Setting User Mode HS
0	1	107	640 ~ 1920	-	-	-	Preview Output Setting User Mode HA
0	1	108	0: - 1: +	-	-	-	Preview Output Setting User Mode HP
0	1	109	384~2047	-	-	-	Preview Output Setting User Mode VT
0	1	110	2~(HS-13)	-	-	-	Preview Output Setting User Mode VW
0	1	111	15~(VT-VA-1)	-	-	-	Preview Output Setting User Mode VS
0	1	112	480 ~ 1200	-	-	-	Preview Output Setting User Mode VA
0	1	113	0: - 1: +	-	-	-	Preview Output Setting User Mode VP
0	1	114	25 ~ 165 (Integer Value)	0 ~ 999 (Decimal Value)	-	-	Preview Output Setting User Mode OCLK
0	-	115	-	-	-	-	Preview Output Setting User Mode Save
0	-	116	-	-	-	-	Preview Output Setting User Mode Set Current
0	1	117	0:Keystone	-	-	-	Preview Geometry

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
			1:Anyplace 2:Rotation				Application
0	1	118	0: Front 1: Ceiling 2: Rear 3: Rear Ceiling	-	-	-	Preview Geometry Location
0	1	119	-40 ~ 40	-	-	-	Preview Geometry H-Keystone
0	1	120	-30 ~ 30	-	-	-	Preview Geometry V-Keystone
0	1	121	0: Top Left 1: Top Right 2: Bottom Left 3: Bottom Right	0: Horizontal 1: vertical	-2000 ~ 2000	-	Preview Geometry Diagonal Projection
0	-	122	-	-	-	-	Preview Geometry Diagonal Projection Reset
0	1	123	-20 ~ 20	-	-	-	Preview Geometry Pincushion/Barrel
0	1	124	-180 ~ 180	-	-	-	Preview Geometry Rotation
0	-	125	-	-	-	-	Preview Geometry Reset all
0	1	151	0: Channel 1 1: Channel 2 2: Channel 3 3: Channel 4 4: Channel 5 5: Channel 6 6: Channel 7 7: Channel 8	-	-	-	Program Input Source
0	1	152	0: RGBHV 1: RGBS(PC) 2: RGsB(PC) 3: RGBS(Video) 4: RGsB(Video) 5: YCbCr 6: Y/C 7: Video 8: HDMI	-	-	-	Program Input Type HDMI can only be selected for Channel 1 or Channel 2
0	1	153	0: Auto 1: NTSC 2: PAL 3: PAL-M 4: PAL-N 5: NTSC 4.43 6: SECAM 7: PAL 60	-	-	-	Program Input Video Standard
0	1	154	1 ~ N	-	-	-	Program Input Main Source H-Position N: unfixed, changes with Input Mode
0	1	155	2 ~ N	-	-	-	Program Input Main Source V-Position N: unfixed, changes with Input Mode
0	1	156	-A ~ A	-	-	-	Program Input Frequency A = (max - min)/2 min = 0 , max =

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
							changes with Input Mode
0	1	157	0 ~ 31	-	-	-	Program Input Phase (only for VGA Source)
0	-	158	-	-	-	-	Program Auto Image
0	1	159	0: Off 1: On	-	-	-	Program Over Scan Status
0	1	160	-50 ~ 50	-	-	-	Program Picture Brightness
0	1	161	-50 ~ 50	-	-	-	Program Picture Contrast
0	1	162	-50 ~ 50	-	-	-	Program Picture Color
0	1	163	-180 ~ 180	-	-	-	Program Picture Hue
0	1	164	-50 ~ 50	-	-	-	Program Picture Sharpness
0	1	165	0: Gamma 1 1: Gamma 2 2: Gamma 3 3: Gamma 4 4: Gamma 5	-	-	-	Program Picture Output Gamma
0	1	166	0: Auto 1: Video 2: Film	-	-	-	Program Picture Film Mode
0	1	167	0: Off 1: Low 2: Medium 3:High	-	-	-	Program Picture Temporal NR
0	1	168	0: Off 1: Low 2: Medium 3: High	-	-	-	Program Picture Mosquito NR
0	1	169	0: Off 1: On	-	-	-	Program Picture Block NR
0	1	170	0: Off 1: Low 2: Medium 3: High	-	-	-	Program Picture Detail Enhancement
0	1	171	0: Off 1: Low 2: High	-	-	-	Program Picture Luma Transition Enhance
0	1	172	0: Off 1: Low 2: High	-	-	-	Program Picture Chroma Transition Enhance
0	1	173	0: Best Fit 1: Letterbox 2: Follow Output 3: Virtual Wide 4: Follow Input 5: Custom	-	-	-	Program Scale Aspect Ratio
0	1	174	-16 ~ 16	-	-	-	Program Scale H-Pan
0	1	175	-16 ~ 16	-	-	-	Program Scale V-Pan
0	1	176	-8 ~ 8	-	-	-	Program Scale H-Zoom
0	1	177	-8 ~ 8	-	-	-	Program Scale V-Zoom
0	1	178	0: Off 1: 150% 2: 200% 3: 225% 4: 250%	-	-	-	Program Scale Zoom

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
			5: 275% 6: 300% 7: 325% 8: 350% 9: 375% 10: 400% 11:Custom				
0	1	179	0 ~ 32	-	-	-	Program Scale Custom Zoom
0	1	180	-16 ~ 16	-	-	-	Program Scale Zoom H-Pan
0	1	181	-16 ~ 16	-	-	-	Program Scale Zoom V-Pan
0	1	182	0: Off 1: On	-	-	-	Program PIP On/Off
0	1	183	0: Picture-In-Picture 1: Picture + Picture 2: Split	-	-	-	Program PIP Type
0	1	184	0: Channel 1 1: Channel 2 2: Channel 3 3: Channel 4 4: Channel 5 5: Channel 6 6: Channel 7 7: Channel 8	-	-	-	Program PIP Source
0	1	185	0: 1/25 1: 1/16 2: 1/9 3: 1/4 4: Custom	-	-	-	Program PIP Size
0	1	186	0 ~ 128	-	-	-	Program PIP H-Position
0	1	187	0 ~ 128	-	-	-	Program PIP V-Position
0	1	188	1 ~ 255	-	-	-	Program PIP H-Size
0	1	189	1 ~ 255	-	-	-	Program PIP V-Size
0	1	200	0: Off 1: On	-	-	-	Program PIP Frame
0	1	201	0:Red 1:Green 2:Blue	-	-	-	Program PIP Frame Color
0	1	202	0: Native 1: 640x480 x60Hz 2: 640x480 x75Hz 3: 800x600 x50Hz 4: 800x600 x60Hz 5: 800x600 x75Hz 6: 832x624 x75Hz 7: 852x480 x60Hz 8: 1024x768 x50Hz 9: 1024x768 x60Hz 10: 1024x768 x75Hz 11: 1280x720 x60Hz 12: 1280x768 x50Hz 13: 1280x768 x60Hz 14: 1280x800 x60Hz 15: 1280x1024x50Hz 16: 1280x1024x60Hz	-	-	-	Program Output Resolution

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
			17: 1280x1024x75Hz 18: 1366x768x50Hz 19: 1366x768x60Hz 20: 1400x1050x50Hz 21: 1400x1050x60Hz 22: 1440x900x60Hz 23: 1600x1200x50Hz 24: 1600x1200x60Hz 25: 1680x1050x60Hz 26: 1920x1080x50Hz 27: cvt-r 1920x1080x60Hz 28: 1920x1200x60Hz 29: 480px60Hz 30: 576p 31: 720px50Hz 32: 720px60Hz 33: 1080ix50Hz 34: 1080ix60Hz 35: 1080px50Hz 36: 1080px60Hz 37: 1080px24Hz 38:480px59.94Hz 39:720px59.94Hz 40:1080ix59.94Hz 41:1080px23.97Hz 42:1080px29.97Hz 43:1080px59.94Hz 44: Custom 1 45: Custom 2 46: Custom 3 47: Custom 4				
0	1	203	-100 ~ 100	-	-	-	Program Red Saturation
0	1	204	-100 ~ 100	-	-	-	Program Green Saturation
0	1	205	-100 ~ 100	-	-	-	Program Blue Saturation
0	1	206	-100 ~ 100	-	-	-	Program Cyan Saturation
0	1	207	-100 ~ 100	-	-	-	Program Magenta Saturation
0	1	208	-100 ~ 100	-	-	-	Program Yellow Saturation
0	1	209	0: Custom 1 1: Custom 2 2: Custom 3 3: Custom 4	-	-	-	Program Custom Input Target
0	1	210	512~3071	-	-	-	Program Input Setting User Mode HT
0	1	211	32~(HS-48)	-	-	-	Program Input Setting User Mode HW
0	1	212	80~(HT-HA-12)	-	-	-	Program Input Setting User Mode HS
0	1	213	640~1920 <= (HT-92)	-	-	-	Program Input Setting User Mode HA
0	1	214	0: - 1: +	-	-	-	Program Input Setting User Mode HP
0	1	215	384~2047	-	-	-	Program Input Setting User Mode VT

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
0	1	216	2~(HS-13)	-	-	-	Program Input Setting User Mode VW
0	1	217	15~(VT-VA-1)	-	-	-	Program Input Setting User Mode VS
0	1	218	480~1200 <= (VT-16)	-	-	-	Program Input Setting User Mode VA
0	1	219	0: - 1: +	-	-	-	Program Input Setting User Mode VP
0	1	220	25 ~ 165 (Integer Value)	0 ~ 999 (Decimal Value)	-	-	Program Input Setting User Mode OCLK
0	1	221	0: Off 1: On	-	-	-	Program Input Setting Enable
0	-	222	-	-	-	-	Program Input Setting User Mode Save
0	1	223	0: Custom 1 1: Custom 2 2: Custom 3 3: Custom 4				Program Custom Output Target
0	1	224	512~3071	-	-	-	Program Output Setting User Mode HT
0	1	225	32~(HS-48)	-	-	-	Program Output Setting User Mode HW
0	1	226	80~(HT-HA-12)	-	-	-	Program Output Setting User Mode HS
0	1	227	640~1920 <= (HT-92)	-	-	-	Program Output Setting User Mode HA
0	1	228	0: - 1: +	-	-	-	Program Output Setting User Mode HP
0	1	229	384~2047	-	-	-	Program Output Setting User Mode VT
0	1	230	2~(HS-13)	-	-	-	Program Output Setting User Mode VW
0	1	231	15~(VT-VA-1)	-	-	-	Program Output Setting User Mode VS
0	1	232	480~1200 <= (VT-16)	-	-	-	Program Output Setting User Mode VA
0	1	233	0: - 1: +	-	-	-	Program Output Setting User Mode VP
0	1	234	25 ~ 165 (Integer Value)	0 ~ 999 (Decimal Value)	-	-	Program Output Setting User Mode OCLK
0	-	235	-	-	-	-	Program Output Setting User Mode Save
0	-	236	-	-	-	-	Program Output Setting User Mode Set Current
0	1	237	0:Keystone 1:Anyplace 2:Rotation				Program Geometry Application
0	1	238	0: Front 1: Ceiling 2: Rear 3: Rear Ceiling	-	-	-	Program Geometry Location
0	1	239	-40 ~ 40	-	-	-	Program Geometry H-Keystone
0	1	240	-30 ~ 30	-	-	-	Program Geometry V-Keystone
0	1	241	0: Top Left 1: Top Right 2: Bottom Left 3: Bottom Right	0:H 1:V	-2000 ~ 2000	-	Program Geometry Diagonal Projection

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
0	-	242	-	-	-	-	Program Geometry Diagonal Projection Reset
0	1	243	-20 ~ 20	-	-	-	Program Geometry Pincushion/Barrel
0	1	244	-180 ~ 180	-	-	-	Program Geometry Rotation
0	-	245	-	-	-	-	Program Geometry Reset all
0	1	271	0: Cut 1: Fade 2: Diagonal 3: Wipe 4: Circle 5: Square 6: Corner 7: Chessboard	-	-	-	Transition Effect
0	1	272	0:Swap 1:Follow	-	-	-	Transition Mode
0	1	273	1 ~ 5	-	-	-	Transition Speed
0	1	274	0 = no damping 1 = damping with a maximum jump size of 10 steps 2 = damping with a maximum jump size of 5 steps 3 = damping with a maximum jump size of 3 steps 4 = damping with a maximum jump size of 2 steps				Transition Damping
0	1	275	0: Top left 1: Bottom left 2: Top right 3: Bottom right	-	-	-	Transition Effect Option - Diagonal
0	1	276	0: Left to right 1: Right to left 2: Up 3: Down	-	-	-	Transition Effect Option - Wipe
0	1	277	0: In 1: Out	-	-	-	Transition Effect Option - Circle
0	1	278	0: In 1: Out	-	-	-	Transition Effect Option - Square
0	1	279	0: Top left 1: Bottom left 2: Top right 3: Bottom right	-	-	-	Transition Effect Option - Corner
0	1	280	0: In 1: Out	-	-	-	Transition Effect Option - Chessboard
0	-	281	-	-	-	-	Transition Take
0	1	282	0: Off 1: On				T-Bar Optimization
0	1	283	16 ~ 240	Checksum	-	-	T-Bar Command Checksum Rule: 1. Set Command Only 2. Checksum = (Control Type + Function + Param1) % 256 3. Example : Y 0 283 100 127

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
							: Y 1 283
0	1	286	0: Channel 1 1: Channel 2 2: Channel 3 3: Channel 4 4: Channel 5 5: Channel 6 6: Channel 7 7: Channel 8	-	-	-	Audio Program input source
0	1	287	-82 ~ 45	-	-	-	Audio Program Input Volume, -82 = Mute
0	1	288	-22 ~ 9	-	-	-	Audio Program Output Volume, -22 = Mute
0	1	289	0 ~ 127	-	-	-	Audio Program Input Delay
0	1	290	0: Channel 1 1: Channel 2 2: Channel 3 3: Channel 4 4: Channel 5 5: Channel 6 6: Channel 7 7: Channel 8	-	-	-	Audio Preview input source
0	1	291	-82 ~ 45	-	-	-	Audio Preview Input Volume, -82 = Mute
0	1	292	-82 ~ 45	-	-	-	Audio Preview Output Volume, -82 = Mute
0	1	293	0: Preview 1: Program	-	-	-	Audio headphone source
0	1	294	-12 ~ 4	-	-	-	Audio Headphone Volume, -12 = Mute
0	1	295	-6 ~ 6	-	-	-	Audio Bass
0	1	296	-6 ~ 6	-	-	-	Audio Treble0
0	1	297	-10 ~ 10	-	-	-	Audio Balance
-	1	298	0: Audio Follow Video 1: Audio Breakaway	-	-	-	Audio Follow Video or Audio Breakaway
0	1	299	0: Off 1: On	-	-	-	Audio Fade
0	1	300	0:None 1:Freeze 2:Blank 3:Freeze&Blank	-	-	-	Audio Mute-Follow
0	1	301	-	-	-	-	Audio TAKE
0	1	306	0: Off 1: On	-	-	-	TCPIP DHCP
0	1	307	0 ~ 255	0 ~ 255	0 ~ 255	0 ~ 255	TCPIP IP Address
0	1	308	0 ~ 255	0 ~ 255	0 ~ 255	0 ~ 255	TCPIP Subnet Mask
0	1	309	0 ~ 255	0 ~ 255	0 ~ 255	0 ~ 255	TCPIP Gateway
0	-	310	-	-	-	-	TCPIP Apply
0	1	311	0: Center 1: Top Left 2: Top Right 3: Bottom Left 4: Bottom Right	-	-	-	OSD Setting Menu Position
0	1	312	0: 5 seconds 1: 10 seconds	-	-	-	OSD Setting TimeOut

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
			2: 20 seconds 3: 30 seconds 4: 60 seconds 5: 90 seconds 6: off				
0	1	313	0: Off 1: On (Kramer) 2: Custom	-	-	-	Misc Setting Logo
0	1	314	0: Off 1: On	-	-	-	Misc Setting Save Lock
0	1	315	0: Off 1: On	-	-	-	Misc Setting Input Lock
0	1	316	0:Blank 1:Blue 2:Disable Analog Sync	-	-	-	Misc Setting Background
0	1	317	0: Black 1: Blue	-	-	-	Misc Setting Blank Color
0	1	318	0:Off 1:On	-	-	-	Misc Setting Event Mode
0	1	319	0:9600 1:115200	-	-	-	Misc Setting Baudrate
0	1	320	0: Follow Output 1: Follow Input	-	-	-	Misc Setting HDCP Setting
0	-	321	0: Profile 1 1: Profile 2 2: Profile 3 3: Profile 4 4: Profile 5 5: Profile 6 6: Profile 7 7: Profile 8	-	-	-	Save
0	-	322	0: Profile 1 1: Profile 2 2: Profile 3 3: Profile 4 4: Profile 5 5: Profile 6 6: Profile 7 7: Profile 8	-	-	-	Recall
0	-	323	0: Profile 1 1: Profile 2 2: Profile 3 3: Profile 4 4: Profile 5 5: Profile 6 6: Profile 7 7: Profile 8 8: All	-	-	-	Erase
0	-	324	-	-	-	-	Factory Reset
0	1	325	0:Mode1 1400x1050@60HZ 1:Mode1 1680x1050@60HZ	-	-	-	Mode Set Mode1
0	1	326	0:Mode2 1280x1024@75HZ 1:Mode2 1280x1024@76HZ	-	-	-	Mode Set Mode2

Set Commands (F = Function)							
Control Type		Function	Param 1	Param 2	Param 3	Param 4	Description
Set	Get						
0	1	327	0:Mode3 1280x768@60HZ 1:Mode3 1366x768@60HZ	-	-	-	Mode Set Mode3
0	1	328	0:Manual (Default) 1:Auto	-	-	-	Auto Image Mode
-	1	329	0~32767 1->ON, 0->OFF bit 0: Chessboard bit 1: Panel lock bit 2: Menu bit 3: Enter bit 4: Left bit 5: Up bit 6: Down bit 7: Right bit 8: OSD	0~32767 1->ON, 0->OFF bit 0: Program Channel 8 bit 1: Preview Freeze bit 2: Program Freeze bit 3: Preview Blank bit 4: Program Blank bit 5: Preview PIP bit 6: Program PIP bit 7: Take bit 8: Cut bit 9: Diagonal bit 10: Circle bit 11: Corner bit 12: Fade bit 13: Wipe bit 14: Square	0~32767 1-> ON, 0->OFF bit 0: Preview Channel 1 bit 1: Program Channel 1 bit 2: Preview Channel 2 bit 3: Program Channel 2 bit 4: Preview Channel 3 bit 5: Program Channel 3 bit 6: Preview Channel 4 bit 7: Program Channel 4 bit 8: Preview Channel 5 bit 9: Program Channel 5 bit 10: Preview Channel 6 bit 11: Program Channel 6 bit 12: Preview Channel 7 bit 13: Program Channel 7 bit 14: Preview Channel 8	-	Keypad LED status
0	1	330	0: Off 1: On	-	-	-	Low Latency Mode

LIMITED WARRANTY

We warrant this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven 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 us 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, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
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.

  * FCC and CE approved using STP cable (for twisted pair products)

For the latest information on our products and a list of Kramer distributors, visit our Web site where updates to this user manual may be found.

We welcome your questions, comments, and feedback.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com

SAFETY WARNING
Disconnect the unit from the power supply before opening and servicing

P/N: 2900-000563 Rev: 3