

Kramer Electronics, Ltd.



USER MANUAL

Model:

VP-437xl

Presentation Switcher / Scaler

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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 groups¹ that are clearly defined by function.

Congratulations on purchasing your Kramer **VP-437xl** *Presentation Switcher / Scaler*. This product is ideal for:

- Projection systems in conference rooms, boardrooms, hotels and churches
- Home theater up-scaling

The package includes the following items:

- **VP-437xl** *Presentation / Switcher Scaler*
- Power cord, rack “ears” and Null-modem adapter
- Infrared remote control transmitter
- This user manual²

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 cables³

2.1 Quick Start

This Quick start chart summarizes the setup and operation steps.

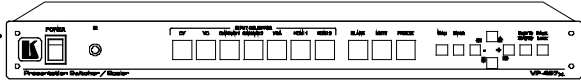
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

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

3 The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com>

Step 1: Mount the machine

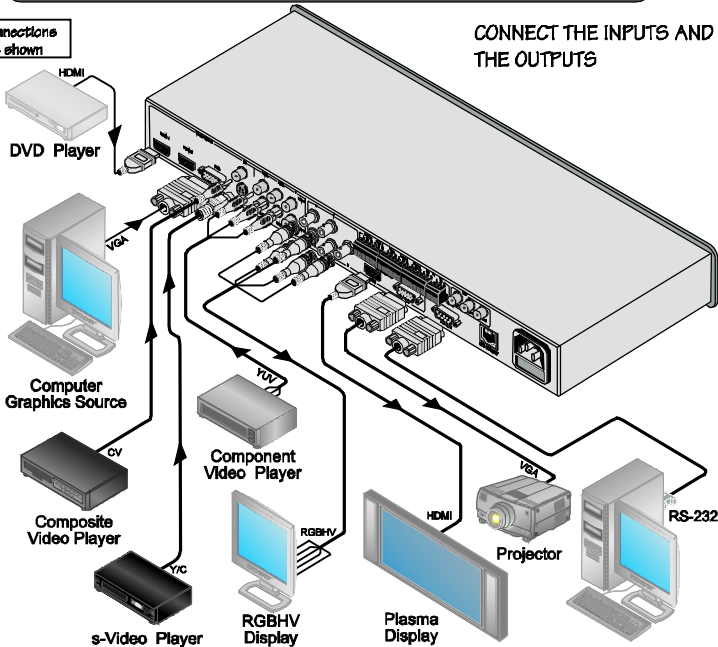
Mount the machine in a rack or stick the 4 rubber feet to the underside



Step 2: Connect the Inputs and outputs - see section 6

Audio connections are not shown

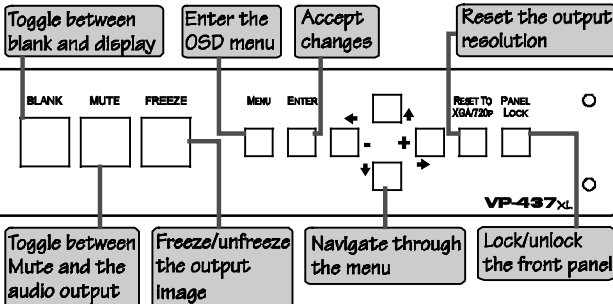
CONNECT THE INPUTS AND THE OUTPUTS



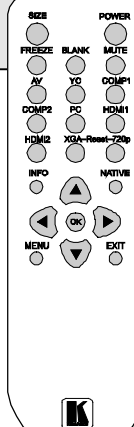
Step 3: Turn the power ON

Step 4: Control the machine - see section 7

SELECT THE INPUT VIA THE INPUT SELECTOR BUTTONS



VIA THE IR REMOTE CONTROL TRANSMITTER



3 Overview

The Kramer **VP-437xl** is a high quality presentation switcher and scaler. It accepts one of seven inputs: a component video¹ on RCA connectors, computer graphics on a 15-pin HD connector, composite video on an RCA connector, s-Video on a 4-pin connector and two HDMI signals. It scales the video, embeds the audio, and outputs the signal to the HDMI output as well as to a computer graphics output, an RGBHV video output together with a digital audio output and an analog stereo audio output.

The **VP-437xl** is HDTV compatible and the resolution can be up- or down-scaled as follows:

Native, VGA, SVGA, XGA, SXGA, UXGA, 480i, 480p, 576i, 576p, 720p², 1080i², 1080p², WXGA, WSXGA, WUXGA, 1280x800, 1440x900, 1400x1050

The **VP-437xl** Presentation Switcher / Scaler:

- Has analog audio inputs and digital (S/PDIF) and analog stereo audio outputs
- Automatically detects and selects the audio source for the HDMI input. Default selection is HDMI – if this is not present, then the machine uses the audio from the analog input
- Comes with an On-Screen Display (OSD) for easy setup and adjustment, accessible via the IR remote control and via the front-panel buttons
- Is HDCP Compliant - The HDCP (High Definition Content Protection) license agreement allows copy-protected data on the HDMI input to pass only to the HDMI output
- Has a non-volatile memory that retains the last settings used
- Supports firmware upgrade³ via RS-232

Control your **VP-437xl**:

- Directly, via the front panel push buttons
- By RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller
- Remotely, from the infrared remote control transmitter
- Via the Ethernet

¹ Also known as Y, Pb, Pr, Y, Cb, Cr and YUV; compatible with both SD and HD component

² At 50Hz and 60Hz

³ To check if firmware upgrades are available, go to our Web site at <http://www.kramerelectronics.com>

The **VP-437xl** is housed in a 19" 1U rack mountable enclosure, with rack "ears" included, and is fed from a 100-240 VAC universal switching power supply.

3.1 About HDMI

High-Definition Multimedia Interface (HDMI) is an uncompressed all-digital¹ audio/video interface, widely supported in the entertainment and home cinema industry. 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, HDMI²:

- Provides a simple³ 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 lengthy⁴ cable
- Supports standard, enhanced, high-definition video, and multi-channel digital audio⁵ on a single cable
- 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 cable⁶, and user-friendly connector
- 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.

1 Ensuring an all-digital rendering of video without the losses associated with analog interfaces and their unnecessary digital-to-analog conversions

2 HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI licensing LLC

3 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

4 HDMI technology has been designed to use standard copper cable construction at up to 15m

5 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

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

3.2 Recommendations for Best Performance

To achieve the best performance:

- Connect 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)
- Avoid interference from neighboring electrical appliances and position your Kramer **VP-437xl** away from moisture, excessive sunlight and dust

4 Your VP-437xl Presentation Switcher / Scaler

[Figure 1](#), [Table 1](#) and [Table 2](#) define the **VP-437xl** *Presentation Switcher / Scaler*:

Your VP-437xl Presentation Switcher / Scaler

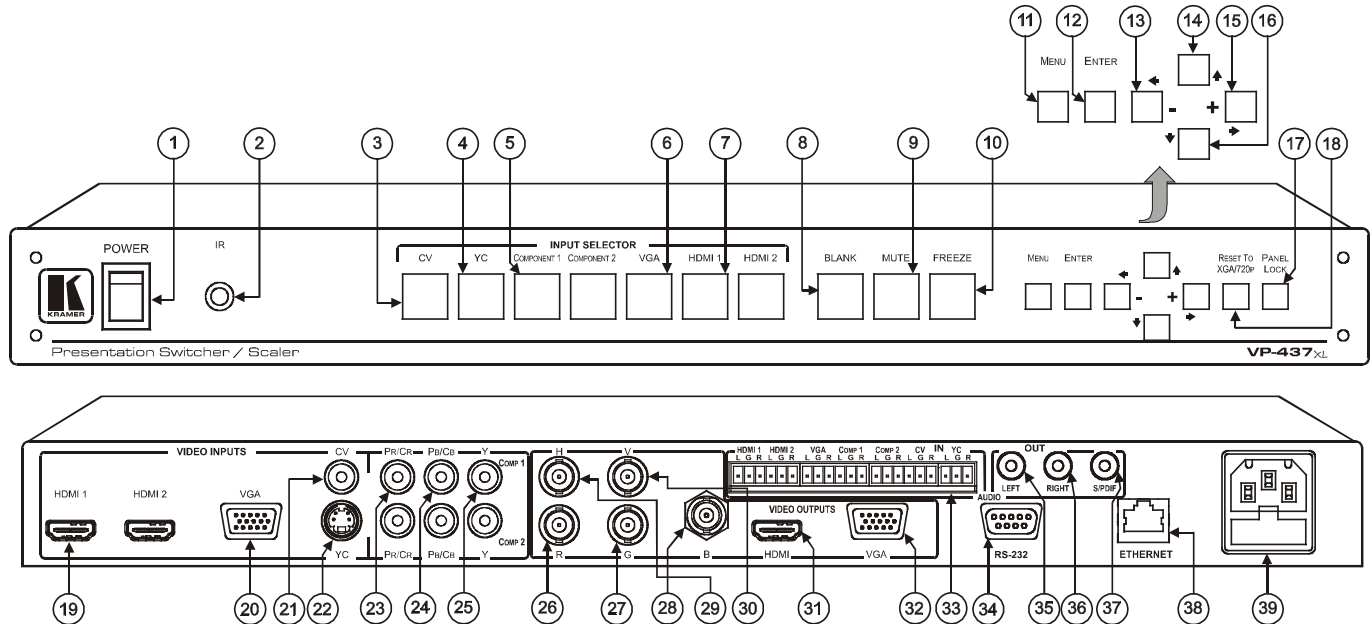


Figure 1: VP-437xl Presentation Switcher / Scaler

Table 1: VP-437xl Presentation Switcher / Scaler Front Panel Features

#	Feature	Function
1	POWER Switch	Illuminated switch for turning the unit ON or OFF
2	IR Receiver	Receives signals from the remote control transmitter
3	INPUT SELECTOR Buttons	CV
4		YC
5		COMPONENT
6		VGA
7		HDMI
8	BLANK Button	Press to toggle between a blank screen (blue or black screen) and the display ¹
9	MUTE Button	Press to toggle between muting (blocking out the sound) and enabling the audio output
10	FREEZE Button	Press to freeze/unfreeze the output video image ¹
11	MENU Button	Displays the OSD menu (see section 7.2)
12	ENTER Button	Press to accept changes, change the SETUP parameters ² and to auto adjust the image (when not within the OSD menu), see section 7.1.1
13	- ◀ Button	Press to decrease numerical values or select from several definitions. For convenience and speed—when not within the OSD menu mode—press to reduce volume
14	⬆ Button	Press to move up the menu list values ²
15	+ ▶ Button	Press to increase numerical values or select from several definitions. For convenience and speed—when not within the OSD menu mode—press to increase volume
16	⬇ Button	Press to move down the menu list ²
17	PANEL LOCK Button	Press and hold ³ to lock/unlock the front panel buttons
18	RESET TO XGA/720p Button	Press to reset the video resolution to XGA or 720p ⁴

1 Can be programmed to follow MUTE (see section [7.2.3](#))

2 See section [7.2](#)

3 For about 2 seconds

4 Press and hold for about 2 seconds to reset to XGA; or press and hold for about 5 seconds to reset to 720p

Table 2: VP-437xl Presentation Switcher / Scaler Rear Panel Features

#	Feature		Function
19	VIDEO INPUTS	HDMI Connector	Connect to the HDMI source (from 1 to 2)
20		VGA 15-pin HD Connector	Connect to the computer graphics source
21		CV RCA Connector	Connect to the composite video source
22		YC 4-pin Connector	Connect to the s-Video source
23		Pr/Cr RCA Connector	Connect to the component video source ¹ (from 1 to 2)
24		Pb/Cb RCA Connector	
25		Y RCA Connector	
26	VIDEO OUTPUTS	R BNC Connector	Connect to the RGBHV video acceptor
27		G BNC Connector	
28		B BNC Connector	
29		H BNC Connector	
30		V BNC Connector	
31		HDMI Connector	Connect to the HDMI acceptor
32		VGA 15-pin HD Connector	Connect to a VGA acceptor
33	AUDIO IN Unbalanced Stereo Terminal Block Connectors	HDMI	Connect to the analog audio HDMI source (from 1 to 2)
		VGA	Connect to the analog audio computer graphics source
		COMP	Connect to the analog audio component video source (from 1 to 2)
		CV	Connect to the analog audio composite video source
		YC	Connect to the analog audio s-Video source
34	RS-232 9-pin D-sub Port		Connect to the PC or the remote controller
35	OUT RCA Connectors	LEFT	Connect to the left stereo analog audio acceptor
36		RIGHT	Connect to the right stereo analog audio acceptor
37		S/PDIF	Connect to a digital audio acceptor
38	ETHERNET Connector		Connects to the PC or other Serial Controller through computer networking
39	Power Connector with Fuse		AC connector, enabling power supply to the unit

¹ For component video, connect all three connectors: Y, Pr/Cr, Pb/Cb (also known as YUV)

5 Installing the VP-437xl 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 range	+5° to +45° C (41° to 113° F)
Operating humidity range	10 to 90% RHL, non-condensing
Storage temperature range	-20° to +70° C (-4° to 158° F)
Storage humidity range	5 to 95% RHL, non-condensing



CAUTION!

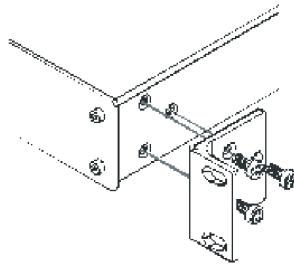
When installing on a 19" rack, avoid hazards by taking care that:

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 (3 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>

6 Connecting the VP-437xl Presentation Switcher / Scaler

To connect¹ your **VP-437xl**, as illustrated in the example in [Figure 2](#), do the following:

1. Connect an HDMI source (for example, a DVD player) to the HDMI 1 VIDEO INPUT connector².
2. Connect a computer graphics source to the VGA 15-pin HD VIDEO INPUT connector.
3. Connect a composite video source (for example, a composite video player) to the CV VIDEO INPUT RCA connector.
4. Connect an s-Video source (for example, an s-Video player) to the YC 4-pin VIDEO INPUT connector.
5. Connect a component video source (for example, a component video player) to the COMP 1 PR, PB and Y, VIDEO INPUT RCA connectors.
6. Connect the audio input signals to the AUDIO IN terminal block connectors, as required (not shown in [Figure 2](#)).
7. Connect the RGBHV VIDEO OUTPUT BNC connectors to an RGBHV acceptor (for example, an RGBHV display).
8. Connect the HDMI VIDEO OUTPUT connector to an HDMI acceptor (for example, a plasma display).
9. Connect the VGA VIDEO OUTPUT 15-pin HD connector to a VGA acceptor (for example, a projector).
10. Connect the audio output signals to the OUT stereo analog audio acceptor and/or the digital audio acceptor, as required (not shown in [Figure 2](#)).
11. Connect the power cord³ (not shown in [Figure 2](#)).

¹ You do not have to connect all the inputs and outputs, connect only those that are required

² Alternatively, you can connect the DVI connector on the DVD player to the HDMI connector on the VP-437xl via a DVI-HDMI adapter. When using this adapter, you can connect the audio signal via the terminal block connector

³ We recommend that you use only the power cord that is supplied with this machine

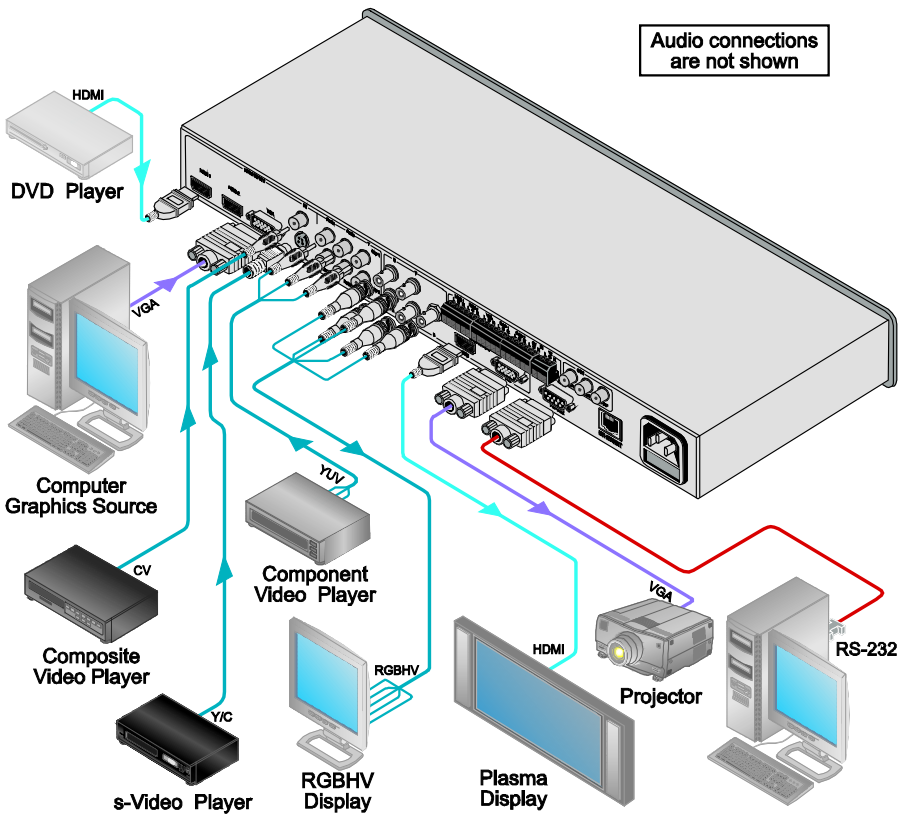


Figure 2: Connecting the VP-437xl Presentation Switcher / Scaler

7 Using the VP-437xl

The **VP-437xl** can be controlled via:

- The front panel buttons (see section [7.1](#))
- The OSD menu (see section [7.2](#))
- RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller (see section [7.3](#))
- The ETHERNET (see section [7.4](#))
- The infrared remote control transmitter (see section [7.5](#))

7.1 Controlling via the Front Panel Buttons

The **VP-437xl** includes the following front panel buttons:

- Input selector buttons for selecting the required input: CV, YC, COMPONENT (1 and 2), VGA or HDMI (1 and 2)
- BLANK, MUTE and FREEZE buttons
- MENU, ENTER, and arrow¹ buttons
- RESET TO XGA/720p and PANEL LOCK buttons²

7.1.1 The Auto Adjust Feature

The auto adjust feature³ automatically centers the image on the screen when pressing the ENTER front panel button or the OK button on the remote control transmitter⁴.

You can also implement this feature every time the input is switched to VGA or when the input resolution changes, via the FINE TUNE menu ([Table 4](#)).

7.2 Using the OSD Menu

The control buttons let you control the **VP-437xl** via the OSD menu.

Press the:

- MENU button to enter the menu⁵
- ENTER button to accept changes and to change the menu settings
- Arrow¹ buttons to move through the OSD menu, which is displayed on the video output

On the OSD menu, select EXIT to exit the menu.

¹ Up, down, left and right

² As defined in [Table 1](#)

³ Applies only to the VGA input

⁴ When not within the OSD menu

⁵ The default timeout is set to 10 seconds

7.2.1 The MAIN MENU

[Table 3](#) defines the MAIN MENU features and functions.

Table 3: The MAIN MENU Features

Mode	Function			
CONTRAST	Set the contrast ¹			
BRIGHTNESS	Set the brightness ¹			
FINETUNE	(see section 7.2.2)			
COLOR	Set the red, green and blue shades (0 to 100, default 48, 48 and 52 respectively)			
SIZE ²	Select the size of the display: FULL, OVERSCAN, UNDER1, UNDER2, LETTER BOX, PANSKAN (default, FULL)			
SOURCE	Select the source: (default VGA)			
	Appears as:	Source input	Appears as:	Source input
	CVBS ³	CV	PC	VGA
	SVIDEO	YC	HDMI1	HDMI 1
	YPBPR1	COMP 1	HDMI2	HDMI 2
	YPBPR2	COMP 2		
OUTPUT	Select the output resolution from the menu (default NATIVE):			
	Appears as:	Output resolution:	Appears as:	Output resolution:
	1080I60	1080i @60Hz	SXGA+	1400x1050
	1080P60	1080p @60Hz	WXGA	1366x768
	576I	576i	NATIVE ⁴	
	576P	576p	VGA	640x480
	720P50	720p @50Hz	SVGA	800x600
	1080I50	1080i @50Hz	XGA	1024x768
	1080P50	1080p @50Hz	SXGA	1280x1024
	1280x800	1280x800	UXGA	1600x1200
	WSXGA	1680x1050	480I	480i
	WUXGA	1920x1200	480P	480p
	WSXGA+	1440x900	720P60	720p @50Hz
AUDIO	See section 7.2.3			
OSD	Set the OSD parameters: H POSITION, V POSITION, TIMER, BACKGROUND and DISPLAY (see section 7.2.4)			
FACTORY RESET	Resets to the default parameters (resolution is set to XGA or 720p ⁵)			
INFORMATION	Displays the source, the input resolution, the output resolution and the software version			
AUTO SYNC	Turn the auto sync ON/OFF			
EXIT	Select to exit the menu			

¹ The range and default values vary according to the input signal

² UNDER1 refers to an underscan of 6% and UNDER2 refers to an underscan of 9%

³ CVBS means Composite Video Baseband Signal

⁴ Select "NATIVE" to select the output resolution from the EDID of the connected HDMI monitor

⁵ If you cannot see the display after factory reset, use the front panel Res. button to set the correct resolution: press continuously for 2 seconds to reset to XGA, or continuously for 5 seconds to reset to 720p

7.2.2 The FINETUNE Menu

[Table 4](#) defines the FINETUNE menu:

Table 4: The FINETUNE Menu Features

Input Signal	Parameter	Function
CV, YC, COMPONENT	HUE	Set the hue
	SATURATION	Set the saturation
	SHARPNESS	Set the sharpness
	NOISE REDUCTION	Select the noise reduction: OFF, HI, LOW and MID (middle)
	COLOR FILTER	Set to ON to enable color filtering ¹
VGA	PHASE	Set the Phase
	CLOCK	Set the clock
	H-POSITION	Set the horizontal position
	V-POSITION	Set the vertical position
	AUTO TUNE ²	When set to ON, auto adjusts the image ³ every time the input is switched to VGA or when the input resolution changes
	COLOR FILTER	Set to ON to enable color filtering ¹
HDMI	COLOR FILTER	Set to ON to enable color filtering ¹

7.2.3 The AUDIO Menu

[Table 5](#) defines the AUDIO menu.

Table 5: The AUDIO Menu Features

Parameter	Function
OUTPUT VOLUME	Set the output volume (from 0 to 100) ⁴
INPUT VOLUME	Set the input volume (from 0 to 100) ⁴
DELAY	Select the audio delay time: OFF, 40ms, 110ms and 150ms
SOUND	Select the sound options: ON, MUTE
MUTE FOLLOWS	Select the action that will be followed by mute: INDEPENDENT ⁵ , FREEZE, BLANK, FREEZE/BLANK ⁶
HDMI AUDIO IN ⁷	Select AUTOMATIC ⁸ , EMBEDDED ⁹ or ANALOG ¹⁰

¹ May improve the output image for certain graphic cards where color fringing is seen

² Alternatively, you can auto adjust the image by pressing the ENTER button when not within the OSD menu

³ Centers the picture correctly on the screen

⁴ This feature is disabled when the embedded audio of an HDMI input is selected

⁵ INDEPENDENT means that the audio muting is independent of the FREEZE and BLANK functions

⁶ FREEZE/BLANK means that when you FREEZE or BLANK the video, then the audio will be muted (the MUTE function follows the FREEZE and the BLANK functions)

⁷ Enabled only when one of the HDMI inputs is selected

⁸ In this case, the embedded audio on the HDMI input is selected for an HDMI signal, or the analog audio input is selected if the input is not HDMI (for example, for a DVI input signal)

⁹ In this case, the embedded audio in the HDMI signal is selected

¹⁰ In this case, the analog audio input is selected

7.2.4 The OSD Menu

[Table 6](#) defines the OSD menu.

Table 6: The OSD Menu Features

Parameter	Function
H POSITION	Set the horizontal position of the OSD (from 0 to 100)
V POSITION	Set the vertical position of the OSD (from 0 to 100)
TIMER	Set the timeout period in seconds (from 5 to 100)
BACKGROUND	Set the OSD background between 0 (solid black) and 8 (transparent)
DISPLAY	Select ¹ between INFO, ON, OFF

7.3 Connecting to the VP-437xl 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 3](#))—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.

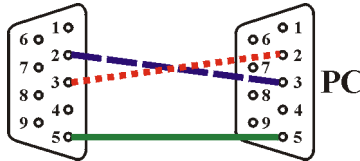


Figure 3: Crossed Cable RS-232 Connection

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.

¹ Select the information shown on the screen during operation. The information is shown permanently when set to ON; it is not shown when set to OFF, and it is shown for a few seconds when set to INFO.

Method B (Figure 4)—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 (which 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.

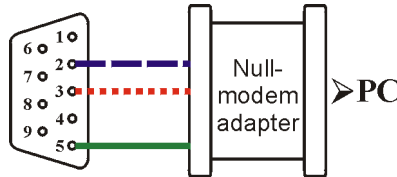


Figure 4: Straight Cable RS-232 Connection with a Null Modem Adapter

7.4 Connecting the VP-437xl via the ETHERNET Port

To connect and configure the Ethernet port of the **VP-437xl**, refer to the ETHERNET Configuration (Lantronix) GUIDE on our Web site:

<http://www.kramerelectronics.com>

7.5 Controlling via the Infrared Remote Control Transmitter

You can control the **VP-437xl** from the infrared remote control transmitter, as [Figure 5](#) and [Table 7](#) define:

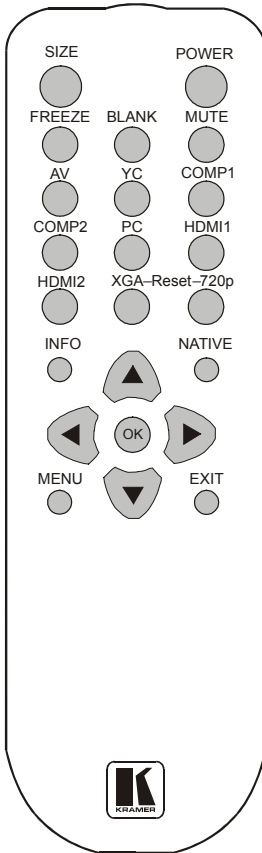



Figure 5: Infrared Remote Control Transmitter

Table 7: Infrared Remote Control Transmitter Functions

Keys	Function
SIZE	Set the size of the image displayed
POWER	Turn the VP-437xl ON or OFF ¹
FREEZE	Freeze/unfreeze the output video image
BLANK	Toggle between a blank screen (blue or black screen) and the display
MUTE	Toggle between muting (blocking out the sound) and enabling the audio output
AV	Select the composite video input
YC	Select the s-Video input
COMP1	Select the component video 1 input
COMP2	Select the component video 2 input
PC	Select the UXGA input
HDMI1	Select the HDMI1 input
HDMI2	Select the HDMI2 input
XGA Reset	Reset the resolution to XGA
720p Reset	Reset the resolution to 720p
INFO	Displays the selected input, the input and output resolutions and the firmware versions ² on the OSD
NATIVE	Select the output resolution via the EDID of the connected HDMI monitor
	Four navigation keys
OK	Press to accept changes Press also to auto adjust the picture (see section 7.1.1)
MENU	Enter the OSD menu
EXIT	EXIT the menu

¹ OFF in this case means that the outputs and the front-panel are disabled

² To check if firmware upgrades are available, go to our Web site at <http://www.kramerelectronics.com>

8 Technical Specifications

Table 8: Technical Specifications¹ of the VP-437xl Presentation Switcher /Scaler

INPUTS:	2 HDMI connectors 1 VGA on a 15-pin HD connector 1 composite video on an RCA connector 1 YC on a 4-pin connector 2 component video each on 3 RCA connectors 2 HDMI, 1 VGA, 2 COMP, 1 CV, 1 YC unbalanced stereo audio on 7 3-pin terminal block connectors
OUTPUT:	1 RGBHV on 5 BNC connectors 1 HDMI connector 1 VGA on a 15-pin HD connector 1 S/PDIF on an RCA connector 1 analog stereo audio on RCA connectors
H FREQUENCY:	15.63-90kHz
V FREQUENCY:	50-100kHz
RGB SYNCs:	H and V TTL separated syncs
RGB LEVEL:	1.2Vpp max, 75Ω load
XGA OUT LEVEL:	1.2Vpp max, 75Ω load
S/PDIF OUT LEVEL:	0.55Vpp constant
POWER SOURCE:	143mA AC x 230VAC
OUTPUT RESOLUTIONS:	Native, VGA, SVGA, XGA, SXGA, UXGA, 480i, 480p, 576i, 576p, 720p, 1080i, 1080p, WXGA, WSXGA, WUXGA, 1280x800, 1440x900, 1400x1050
OUTPUT REFRESH RATE:	60Hz for computer graphics resolutions, 50/60Hz for HDTV resolutions
CONTROLS:	CV, YC, component 1, component 2, VGA, HDMI 1, HDMI 2, input selector buttons; blank, mute, freeze buttons; menu, enter, menu arrows, reset to XGA/720p, lock buttons, RS-232, Ethernet, IR
POWER SOURCE:	100-240V AC, 33VA max.
DIMENSIONS:	19-inch (W), 7-inch(D) 1U (H) rack mountable
WEIGHT:	2.7kg (6lbs) approx.
ACCESSORIES:	Power cord, Null-modem adapter, rack "ears", IR remote control

Table 9: Input Resolutions²

Resolution/Refresh Rate	CV/s-Video	Component	VGA	HDMI
480i/576i(NTSC/PAL)	Yes (480i30x2 / 576i25x2)	Yes	No	No
480P/576P	No	Yes	Yes	Yes
720P @(60/50)	No	Yes	Yes	Yes
1080i @(60/50)	No	Yes	No	Yes
1080P @(60/50)	No	Yes	Yes	Yes
1080P @(24/30)	No	Yes	No	Yes
VGA @(60/72/75/85)	No	No	Yes	Yes
SVGA @(56/60/72/75/85)	No	No	Yes	Yes
XGA @(60/70/75/85)	No	No	Yes	Yes
SXGA @(60/75/85)	No	No	Yes	Yes
UXGA @60	No	No	Yes	Yes
WXGA@60(1366x768)	No	No	Yes	Yes
WSXGA@60(1680x1050)	No	No	Yes	Yes
WUXGA@60(1920x1200)	No	No	Yes	Yes

¹ Specifications are subject to change without notice

² Go to our Web site at <http://www.kramerelectronics.com> to check for updated resolution lists

9 RS-232 Communication Protocol

The following is the COM port setting:

Baud Rate: 9600bps

Parity: None

Data Bits: 8bits

Stop Bits: 1bit

Set CTS Mode: Off

Set XON/XOFF: Off

[Table 10](#) defines the symbol characters:

Table 10: Character Symbols Definitions

Symbol	Meaning
■	Space
[CR]	Carriage Return, ASCII code 0x0D
[LF] ¹	Line Feed, ASCII code 0x0A

Set and get command

Set Command

Type in: Y■Control_Type■Function■Param[CR]²

Reply: Z■Control_Type■Function■Param[CR][LF]

Get Command:

Type in: Y■Control_Type■Function[CR]

Reply: Z■Control_Type■Function■Param[CR][LF]

Example:

Example 1: set Contrast value as 32

Send: Y■1■16■32[CR]

Reply: Z■1■16■32[CR][LF]

Example 2: get current output resolution (current resolution is 1024x768)

Send: Y■4■21[CR]

Reply: Z■4■21■2[CR][LF]

¹ Or >

² When sending a command, a blank character may precede [CR] if desired

Table 11: RS-232 Protocol

Control Type	Function	Param (for Set)	Function Description	Comment
0	0	N/A	SIZE button on remote control	
0	1	N/A	POWER button on remote control	
0	2	N/A	FREEZE button on remote control	
0	3	N/A	480p button on remote control	
0	4	N/A	576p button on remote control	
0	5	N/A	720p button on remote control	
0	6	N/A	1080i button on remote control	
0	7	N/A	1080p button on remote control	
0	8	N/A	VGA button on remote control	
0	9	N/A	SVGA button on remote control	
0	10	N/A	XGA button on remote control	
0	11	N/A	SXGA button on remote control	
0	12	N/A	WXGA button on remote control	
0	13	N/A	UXGA button on remote control	
0	14	N/A	INFO button on remote control	
0	15	N/A	UP button on remote control	
0	16	N/A	NATIVE button on remote control	
0	17	N/A	LEFT button on remote control	
0	18	N/A	OK button on remote control	
0	19	N/A	RIGHT button on remote control	
0	20	N/A	MENU button on remote control	
0	21	N/A	DOWN button on remote control	
0	22	N/A	EXIT button on remote control	
0	23	N/A	AV button on remote control	
0	24	N/A	YC button on remote control	
0	25	N/A	COMP1 button on remote control	
0	26	N/A	HDMI1 button on remote control	
0	27	N/A	HDMI2 button on remote control	
0	28	N/A	COMP2 button on remote control	
0	29	N/A	VGA button on remote control	
0	30	N/A	BLANK button on remote control	
0	31	N/A	MUTE button on remote control	
1: Set 2: Get	4	0~100	Color: Red	
1: Set 2: Get	5	0~100	Color: Green	
1: Set 2: Get	6	0~100	Color: Blue	
1: Set 2: Get	16	0~100	Brightness	
1: Set 2: Get	17	0~100	Contrast	
1: Set 2: Get	25	0~100	Hue	

Control Type	Function	Param (for Set)	Function Description	Comment
1: Set 2: Get	26	0~100	Sharpness	
1: Set 2: Get	29	0~100	Saturation	
1: Set 2: Get	33	0~100	Output volume setting	
1: Set 2: Get	34	0~100	Input volume setting	
0: Set	35	N/A	Volume down	
0: Set	37	N/A	Volume up	
1: Set 2: Get	41	0~100	OSD Setting :H-Position	
1: Set 2: Get	42	0~100	OSD Setting: V-Position	
1: Set 2: Get	43	0~100	OSD Timeout	
1: Set 2: Get	44	0~8	OSD Background	
1: Set 2: Get	50	0~3	NR (Noise Reduction)	0: Off 1: Low 2: Mid 3: High
1: Set 2: Get	51	0~3	Audio delay	0: Off 1: 40ms 2: 110ms 3: 150ms
1: Set 2: Get	52	0~2	HDMI AUDIO IN	0 : AUTOMATIC 1 : EMBEDDED 2 : ANALOG
3: Set 4: Get	0	1~7	Select Input Source	1: AV 2: YC 3: COMP1 4: COMP2 5: VGA 6: HDMI1 7: HDMI2
3: Set 4: Get	1	0~5	Size	0: Full 1: Panscan 2: Overscan 3: Underscan 4: Letterbox
3: Set 4: Get	21	0~18	Output Resolution	0: Native 1: VGA 2: SVGA 3: XGA 4: SXGA 5: UXGA 6: 480i 7: 480p 8: 720p60 9: 1080i60 10: 1080p60

Control Type	Function	Param (for Set)	Function Description	Comment
				11: 576i 12: 576p 13: 720p50 14: 1080i50 15: 1080p50 16: WXGA 17: WSXGA 18: WUXGA 19: 1280x800, 20: WXGA+ (1440X900) 21: SXGA+ (1400X1050)
3: Set	23	1	Factory Reset	
6: Set 7: Get	0	0~1	Power	0: Power Down 1: Power On
6: Set 7: Get	1	0~1	Freeze	0: Off 1: On
6: Set 7: Get	2	0~1	Blank	0: Off 1: On
6: Set 7: Get	3	0~1	Mute	0: Off 1: On
6: Set 7: Get	4	0~1	Key lock	0: Off 1: On

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, 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: www.kramerelectronics.com, where updates to this user manual may be found. We welcome your questions, comments and feedback.



Caution

Safety Warning:

Disconnect the unit from the power supply before opening/servicing.



Kramer Electronics, Ltd.

Web site: www.kramerelectronics.com

E-mail: info@kramerel.com

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