KRAMER ELECTRONICS LTD.

# USER MANUAL

MODEL:

VP-438
Presentation Switcher/Scaler

VP-438 Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to http://www.kramerelectronics.com/support/product_downloads.asp to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- ☑ **VP-438** Presentation Switcher/Scaler
- ☑ 1 Power cord
- ☑ 1 Set of rack "ears"
- ☑ 4 Rubber feet
- ☑ 1 Quick Start sheet
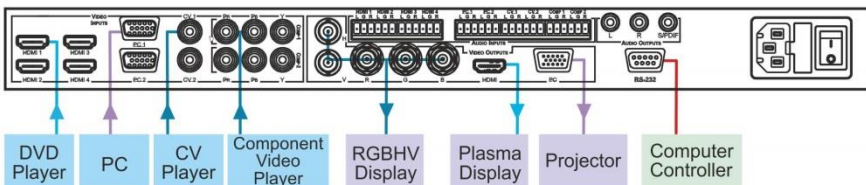- ☑ Kramer RC-IR3 Infrared Remote Control Transmitter with batteries
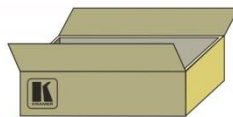
Save the original box and packaging materials in case you need to return your **VP-438** for service.

Step 2: Install the VP-438

Mount the **VP-438** in a rack (using the included rack "ears") or attach the rubber feet and place on a table.

Step 3: Connect the inputs and outputs

Always switch off the power on each device before connecting it to your **VP-438**.

| DVD Player | PC | CV Player | Component Video Player | RGBHV Display | Plasma Display | Projector | Computer Controller |

Always use Kramer high-performance cables for connecting AV equipment to the **VP-438.**
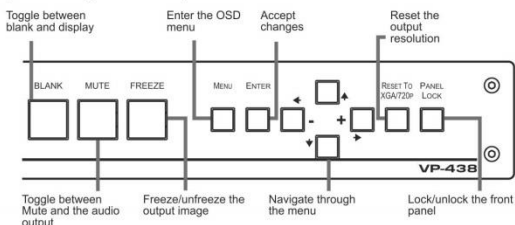
Step 4: Connect the power

Connect the power cord to the **VP-438** and plug it into the mains electricity.

Step 5: Operate the VP-438

Select the input using the front panel or the remote control.

Toggle between blank and display

Enter the OSD menu

Accept changes

Reset the output resolution

Toggle between Mute and the audio output

Freeze/unfreeze the output image

Navigate through the menu

Lock/unlock the front panel

VP-438

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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 video, audio, presentation, and broadcasting professionals 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 Routers; 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-438** *Presentation Switcher/Scaler*, which is ideal for the following typical applications:

- Projection systems in conference rooms, boardrooms, auditoriums, hotels and churches, production studios, rental and staging
- Home theater up-scaling

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

Go to http://www.kramerelectronics.com/support/product_downloads.asp 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 (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)

- Do not secure the cables in tight bundles or roll the slack into tight coils

- Avoid interference from neighboring electrical appliances that may adversely influence signal quality

- Position your Kramer **VP-438** away from moisture, excessive sunlight and dust

This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.

2.2 Safety Instructions

Caution: There are no operator serviceable parts inside the unit

Warning: Use only the power cord that is supplied with the unit

Warning: Do not open the unit. High voltages can cause electrical shock! Servicing by qualified personnel only

Warning: Disconnect the power and unplug the unit from the wall before installing

2.3 Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at *http://www.kramerelectronics.com/support/recycling/*.

3   Overview

The Kramer **VP-438** is a high-quality presentation switcher and scaler. It accepts one of 10 inputs: four HDMI signals, two computer graphics signals on 15-pin HD connectors, two composite video signals on RCA connectors and two component video signals (also known as Y, Pb, Pr, Y, Cb, Cr and YUV; compatible with both SD and HD component) on RCA connectors. It scales the video, embeds the audio, and outputs the signal to the HDMI output, as well as to a computer graphics output and an RGBHV video output with digital audio and analog stereo audio outputs.

The **VP-438** Presentation Switcher/Scaler:

- Is HDTV compatible and the resolution can be up- or down-scaled

- 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

- Output signal is available in three formats: 1 HDMI and 2 RGBHV (on 5 BNC connectors, and one 15−pin HD connector)

- Has analog audio inputs, which include volume control, 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

- Has a non-volatile memory that retains the last settings used

- Supports firmware upgrade via RS-232

Control your **VP-438**:

- 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

The **VP-438** is housed in a 19" 1U rack mountable enclosure, with rack "ears" included, and is fed from a 100-240V AC universal switching power supply.

3.1 Defining the VP-438 Presentation Switcher/Scaler
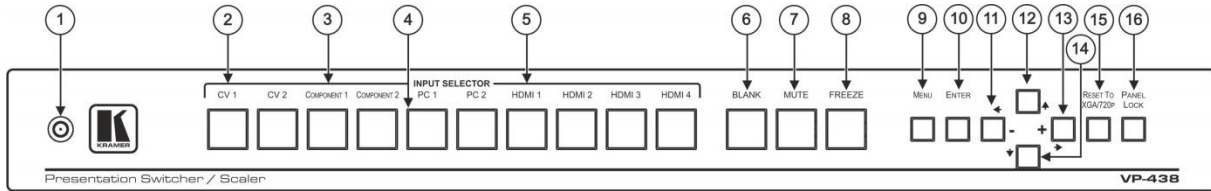
This section defines the **VP-438**.

Figure 1: VP-438 Presentation Switcher/Scaler Front Panel

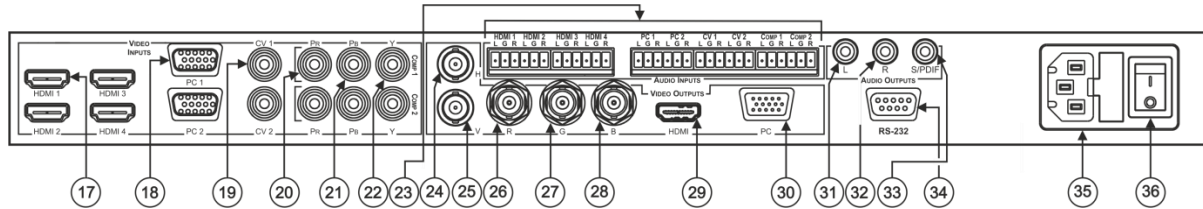| #	Feature	Function
1	IR Receiver	Receives signals from the remote control transmitter
2	CV Button	Press to select the composite video input (from 1 to 2)
3	COMPONENT Button	Press to select the component video input (from 1 to 2)
4	PC Button	Press to select the computer graphics input (from 1 to 2)
5	HDMI Button	Press to select the HDMI input (from 1 to 4)
6	BLANK Button	Press to toggle between a blank screen and the display (can be programmed to follow MUTE, see Section 6.2.3)
7	MUTE Button	Press to toggle between muting (blocking out the sound) and enabling the audio output
8	FREEZE Button	Press to freeze/unfreeze the output video image
9	MENU Button	Displays the OSD menu (see Section 6.2)
10	ENTER Button	Press to accept changes and change the SETUP parameters (see Section 6.2)
11	- ← Button	Press to decrease numerical values or select from several definitions. When not within the OSD menu mode, press to reduce volume (for embedded HDMI inputs, this does not affect the embedded output)
12	↑ Button	Press to move up the menu list
13	+ → Button	Press to increase numerical values or select from several definitions. When not within the OSD menu mode, press to increase volume (for embedded HDMI inputs, this does not affect the embedded output)
14	↓ Button	Press to move down the menu list
15	RESET TO XGA/720p Button	Press and hold to reset the video resolution to XGA or 720p (press and hold for about 2 seconds to reset to XGA; or press and hold for about 5 seconds to reset to 720p)
16	PANEL LOCK Button	Press and hold for about 2 seconds to lock/unlock the front panel buttons

Figure 2: VP-438 Presentation Switcher/Scaler Rear Panel

#	Feature		Function
17	VIDEO INPUTS	HDMI Connector	Connect to the HDMI source (from 1 to 4)
18		PC 15-pin HD Connector	Connect to the computer graphics source (from 1 to 2)
19		CV RCA Connector	Connect to the composite video source (from 1 to 2)
20		PR RCA Connector	Connect to the component video source (from 1 to 2)
21		PB RCA Connector	For component video, connect all three connectors: Y, Pr, Pb (also known as YUV)
22		Y RCA Connector	
23	AUDIO INPUTS Unbalanced Stereo Terminal Block Connectors	HDMI	Connect to the analog audio HDMI source (from 1 to 4)
		PC	Connect to the analog audio computer graphics source (from 1 to 2)
		CV	Connect to the analog audio composite video source (from 1 to 2)
		COMP	Connect to the analog audio component video source (from 1 to 2)
24	VIDEO OUTPUTS	H BNC Connector	Connect to the RGBHV video acceptor
25		V BNC Connector	
26		R BNC Connector	
27		G BNC Connector	
28		B BNC Connector	
29		HDMI Connector	Connect to the HDMI acceptor
30		PC 15-pin HD Connector	Connect to a VGA acceptor
31	AUDIO OUTPUTS RCA Connectors	L	Connect to the left stereo analog audio acceptor
32		R	Connect to the right stereo analog audio acceptor
33		S/PDIF	Connect to a digital audio acceptor
34	RS-232 9-pin D-sub Port		Connect to the PC or the remote controller
35	Power Connector with Fuse		AC connector, enabling power supply to the unit
36	Power Switch		Switch for turning the unit ON or OFF

4   Installing in a Rack

This section provides instructions for rack mounting the unit.

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

| OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
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.

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.
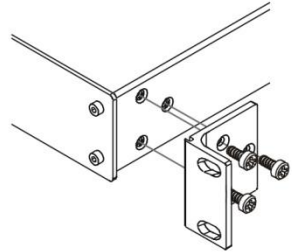
2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.
Note:
• In some models, the front panel may feature built-in rack ears
• Detachable rack ears can be removed for desktop use
• Always mount the machine 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 our Web site

5 Connecting the VP-438

Always switch off the power to each device before connecting it to your **VP-438**. After connecting your **VP-438**, connect its power and then switch on the power to each device.

To connect your **VP-438**, as illustrated in the example in Figure 3, do the following:

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

1. Connect an HDMI source (for example, a DVD player) to each of the HDMI VIDEO INPUT connectors (from 1 to 4)**.**
   Alternatively, you can connect the DVI connector on the DVD player to the HDMI connector on the VP-438 via a DVI-HDMI adapter. When using this adapter, you can connect the audio signal via the terminal block connector.

2. Connect a computer graphics source to the PC 1 15-pin HD VIDEO INPUT connector.

3. Connect a composite video source (for example, a composite video player) to both CV VIDEO INPUT RCA connectors.

4. Connect a component video source (for example, a component video player) to the COMP 1 PR, PB and Y, VIDEO INPUT RCA connectors.

5. Connect the audio input signals to the AUDIO INPUT terminal block connectors, as required (not shown in Figure 3).

6. Connect the RGBHV VIDEO OUTPUT BNC connectors to an RGBHV acceptor (for example, an RGBHV display).

7. Connect the HDMI VIDEO OUTPUT connector to an HDMI acceptor (for example, a plasma display).

8. Connect the VGA VIDEO OUTPUT 15-pin HD connector to a VGA acceptor (for example, a projector).

9. Connect the audio output signals to the AUDIO OUTPUTS stereo analog audio acceptor and/or the digital audio acceptor, as required (not shown in Figure 3).

10. Connect the power cord (not shown in Figure 3).
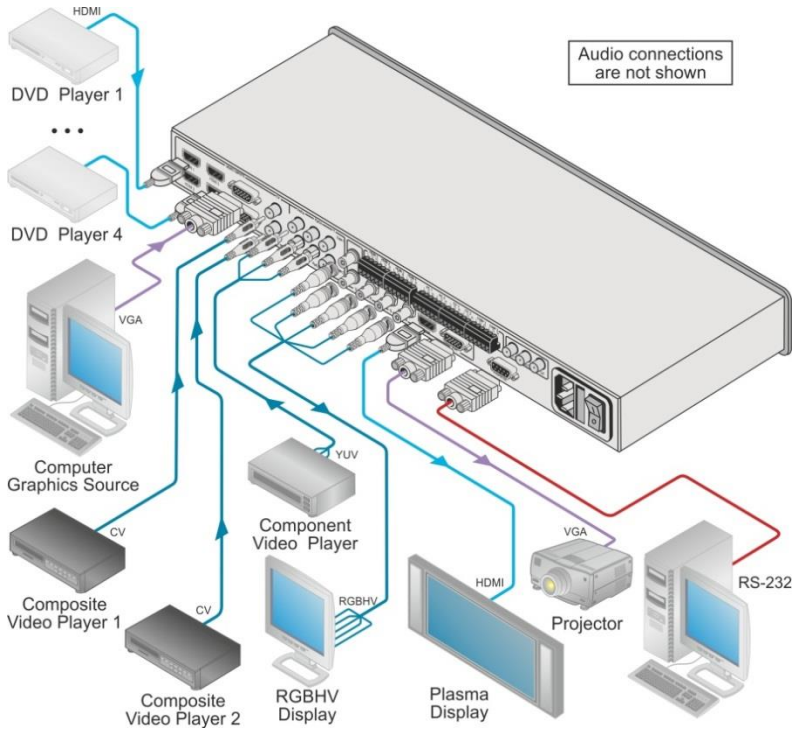
Figure 3: Connecting the VP-438 Presentation Switcher/Scaler

6 Controlling the VP-438

The **VP-438** can be controlled via:

- The front panel buttons (see Section 6.1)

- The OSD menu (see Section 6.2)

- RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller (see Section 6.3)

- The infrared remote control transmitter (see Section 6.4)

6.1 Controlling via the Front Panel Buttons

The **VP-438** includes the following front panel buttons:

- Input selector buttons for selecting the required input: CV (1 and 2), COMPONENT (1 and 2), PC (1 and 2) or HDMI (1 to 4)

- BLANK, MUTE and FREEZE buttons

- MENU, ENTER, and up, down, left and right arrow buttons

- RESET TO XGA/720p and PANEL LOCK buttons

6.2 Using the OSD Menu

The control buttons let you control the **VP-438** via the OSD menu.

Press the:

- MENU button to enter the menu (The default timeout is set to 10 seconds)

- ENTER button to accept changes and to change the menu settings

- Arrow buttons to move through the OSD menu, which is displayed on the video output

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

6.2.1 The MAIN MENU

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

Mode	Function			
CONTRAST	Set the contrast			
BRIGHTNESS	Set the brightness			
FINETUNE	(see Section 6.2.2)			
COLOR	Set the red, green and blue shades			
SIZE	Select the size of the display: FULL, OVERSCAN, UNDER1, UNDER2, LETTER BOX, PANSCAN, BEST FIT (default, FULL)			
SOURCE	Select the source: (default VGA)			
	Appears as:	Source input	Appears as:	Source input
	CV1	CV 1	PC2	VGA 2
	CV2	CV 2	HDMI1	HDMI 1
	YPBPR1	COMP 1	HDMI2	HDMI 2
	YPBPR2	COMP 2	HDMI3	HDMI 3
	PC1	VGA 1	HDMI4	HDMI 4
OUTPUT	Select the output resolution from the menu (default NATIVE):			
	Output resolution:	Appears as:	Output resolution:	Appears as:
	480i	480I	1080p @59.94Hz	1080P59
	480p	480P	640x480	VGA
	720p @50Hz	720P60	800x600	SVGA
	1080i @60Hz	1080I60	1024x768	XGA
	1080p @60Hz	1080P60	1280x1024	SXGA
	576i	576I	1600x1200	UXGA
	576p	576P	1366x768	WXGA
	720p @50Hz	720P50		NATIVE
	1080i @50Hz	1080I50	1680x1050	WSXGA
	1080p @50Hz	1080P50	1920x1200	WUXGA
	480i@59.94Hz	480I59	1280x800	1280x800
	480p@59.94 Hz	480P59	1440x900	WXGA+
	720p@59.94Hz	720P59	1400x1050	SXGA+
	1080i@59.94Hz	1080I59	1600x900	1600x900
	NATIVE - Select NATIVE to select the output resolution from the EDID of the connected HDMI monitor			
AUDIO	See Section 6.2.3			
OSD	Set the OSD parameters: H POSITION, V POSITION, TIMER, BACKGROUND and DISPLAY (see Section 6.2.4)			
HDCP ON INPUT	Select the HDCP option for the HDMI input: either ON (the default) or OFF. Setting HDCP support to enabled (ON) on the HDMI input allows the source to transmit a non-HDCP signal if required (for example, when working with a Mac computer)			

Mode	Function
HDCP ON OUTPUT	Select FOLLOW INPUT or FOLLOW OUTPUT to define whether the HDCP will follow the input or the output
	When FOLLOW INPUT is selected, it changes its HDCP output setting (for the HDMI output) according to the HDCP of the input. This option is recommended when the HDMI output is connected to a splitter/switcher
	When FOLLOW OUTPUT is selected, the scaler matches its HDCP output to the HDCP setting of the HDMI acceptor to which it is connected
FACTORY RESET	Resets to the default parameters
	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
INFORMATION	Displays the source, the input resolution, the output resolution and the software version and the H/W version
AUTO SYNC OFF	Turn the auto sync ON/OFF. When ON, a short period after not detecting a valid video signal on the selected input, the unit will disable the H and V syncs on the analog outputs until a valid input is again detected or any keypad button is pressed
EXIT	Select to exit the menu

6.2.2 The FINETUNE Menu

The following table defines the FINETUNE menu:

Input Signal	Parameter	Function
CV, COMPONENT	HUE	Set the color hue
	SATURATION	Set the color saturation
	SHARPNESS	Set the sharpness of the picture
	NOISE REDUCTION	Select the noise reduction: OFF, HI, LOW and MID (middle)
	COLOR FILTER	Set to ON to enable color filtering
		May improve the output image for certain graphic cards where color fringing is seen
VGA	PHASE	Set the clock phase
	CLOCK	Set the clock frequency
	H-POSITION	Set the horizontal position of the picture
	V-POSITION	Set the vertical position of the picture
	AUTO TUNE	When set to ON, automatically centers the picture correctly on the screen every time the input is switched to VGA or when the input resolution changes
		Alternatively, you can auto adjust the image by pressing the ENTER button when not within the OSD menu
	COLOR FILTER	Set to ON to enable color filtering
HDMI	COLOR FILTER	Set to ON to enable color filtering
	DROP LINES	Set it to ON to eliminate the green line (default is OFF)
		With some sources (mostly Apple devices) a green line sometimes appears at the bottom of the display. By factory default this option is set to OFF.

The COLOR FILTER feature may improve the output image for certain graphic cards where color fringing is seen.

6.2.3 The AUDIO Menu

The following table defines the AUDIO menu.

Parameter	Function
OUTPUT VOLUME	Set the output volume (from 0 to 100)
	Not applicable for embedded HDMI audio inputs
INPUT VOLUME	Set the input volume (from 0 to 100)
	Not applicable for embedded HDMI audio inputs
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, FREEZE, BLANK, FREEZE/BLANK
	INDEPENDENT means that the audio muting is independent of the FREEZE and BLANK functions
	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)
HDMI AUDIO IN Enabled only when one of the HDMI inputs is selected	Select AUTOMATIC (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), EMBEDDED (In this case, the embedded audio in the HDMI signal is selected) or ANALOG (In this case, the analog audio input is selected)

6.2.4 The OSD Menu

The following table defines the OSD menu.

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 the information shown on the screen during operation: **ON** - the information is shown permanently **OFF** - the information is not shown **INFO** - the information is shown for a few seconds

6.3 Connecting to VP-438 via RS-232

You can connect to the **VP-438** via an RS-232 connection using, for example, a PC. Note that a null-modem adapter/connection is not required.

To connect to the **VP-438** via RS-232, connect the RS-232 9-pin D-sub rear panel port on the **VP-438** unit via a 9-wire straight cable (only pin 2 to pin 2, pin 3 to pin 3, and pin 5 to pin 5 need to be connected) to the RS-232 9-pin D-sub port on your PC.

6.4   Controlling via the Infrared Remote Control Transmitter

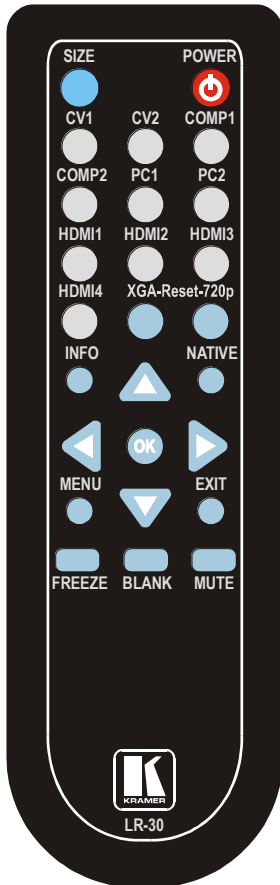You can control the **VP-438** from the infrared remote control transmitter, as defined in Figure 4:

Figure 4: Infrared Remote Control Transmitter

Keys	Function
SIZE	Set the size of the image displayed
POWER	Toggle the power save mode ON or OFF
CV1	Select the composite video 1 input
CV2	Select the composite video 2 input
COMP1	Select the component video 1 input
COMP2	Select the component video 2 input
PC1	Select the UXGA 1 input
PC2	Select the UXGA 2 input
HDMI1	Select the HDMI 1 input
HDMI2	Select the HDMI 2 input
HDMI3	Select the HDMI 3 input
HDMI4	Select the HDMI 4 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 on the OSD
NATIVE	Select the output resolution via the EDID of the connected HDMI monitor
	Four navigation keys. When not in the OSD, the left and right arrows also control the output volume. For embedded HDMI inputs, this does not affect the embedded output
OK	Press to accept changes
MENU	Enter the OSD menu
EXIT	EXIT the menu
FREEZE	Freeze/unfreeze the output video image
BLANK	Toggle between a blank screen and the display
MUTE	Toggle between muting (blocking out the sound) and enabling the audio output

7   Technical Specifications

INPUTS:	4 HDMI connectors (HDMI, HDCP version 1.1) 2 VGA on a 15-pin HD connector 2 composite video on an RCA connector 2 component video each on 3 RCA connectors Unbalanced stereo audio on 10 3-pin terminal block connectors
OUTPUT:	1 RGBHV on 5 BNC connectors 1 HDMI connector (HDMI, HDCP version 1.1) 1 VGA (RGBHV) on a 15-pin HD connector 1 S/PDIF on an RCA connector 1 analog stereo audio on 2 RCA connectors
OUTPUT COLORSPACE:	RGB
H FREQUENCY:	15.63-90kHz
V FREQUENCY:	50-100Hz
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
OUTPUT RESOLUTIONS:	480i, 480p, 720p @50Hz, 1080i @60Hz, 1080p @60Hz, 576i, 576p, 720p @50Hz, 1080i @50Hz, 1080p @50Hz, 480i@59.94Hz, 480p@59.94 Hz, 720p@59.94Hz, 1080i@59.94Hz, 1080p@59.94Hz, 640x480, 800x600, 1024x768, 1280x1024, 1600x1200, 1366x768, 1680x1050, 1920x1200, 1280x800, 1440x900, 1400x1050, 1600x900
CONTROLS:	CV 1, CV 2, component 1, component 2, PC 1, PC 2, HDMI 1, HDMI 2, HDMI 3, HDMI 4, input selector buttons; blank, mute, freeze buttons; menu, enter, menu arrows, reset to XGA/720p, lock buttons, RS-232, IR
POWER CONSUMPTION:	100-240V AC, 25VA max.
OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing
DIMENSIONS:	100-240V AC, 25VA max.
WEIGHT:	19" x 7" x 1U (W, D, H) rack mountable
ACCESSORIES:	2.7kg (6lbs) approx
OPTIONS:	Power cord, rack ears, IR remote control
Specifications are subject to change without notice at http://www.kramerelectronics.com	

7.1 Input Resolutions

Resolution/Refresh Rate	CV	Y, Pb, Pr (Component)	PC	HDMI
480I/576I(NTSC/PAL)	Yes	Yes	No	Yes
480P/576P		Yes	No	Yes
720P@(60/50)		Yes	No	Yes
1080I@(60/50)		Yes	No	Yes
1080P@(60/50)		Yes	No	Yes
1080P@(24/25/30)		Yes	No	Yes
480P/576P-RGB			Yes	Yes
720P@(60/50)-RGB			Yes	Yes
1080I@(60/50)-RGB			No	Yes
1080P@(60/50)-RGB			Yes	Yes
1080P@(24/25/30)-RGB			No	Yes
VGA@(60/67/72/75/85)			Yes	Yes
SVGA@(56/60/72/75)			Yes	Yes
XGA@(60/70/75)			Yes	Yes
SXGA@(60/75)			Yes	Yes
1280X960			Yes	Yes
1600X900@60			Yes	Yes
UXGA@60 (1600X1200)			Yes	Yes
WXGA@60(1280x800)			Yes	Yes
WXGA+@60(1440x900)			Yes	Yes
WXGA@60(1366x768)			Yes	Yes
SXGA+@60(1400x1050)			Yes	Yes
WSXGA@60(1680x1050)			Yes	Yes
WUXGA@60(1920x1200)			Yes	Yes
2K@50 (2048X1080)			Yes	Yes
2K@60 (2048X1080)			Yes	Yes

8 RS-232 Communication Protocol

The following is the COM port setting:

Baud Rate: 9600bps

Parity: None

Data Bits: 8 bits

Stop Bits: 1 bit

Set CTS Mode: Off

Set XON/XOFF: Off

The following table defines the symbol characters:

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

Set Command

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

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

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 Brightness value to 32

Send: Y■1■16■32[CR]

Reply: Z■1■16■32[CR][LF]

Example 2: get current output resolution (2 = SVGA)

Send: Y■4■21[CR]

Reply: Z■4■21■2[CR][LF]

The following table defines the 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/Volume down	Volume down when not in OSD
0	18	N/A	OK button on remote control	
0	19	N/A	RIGHT button on remote control/Volume up	Volume up when not in OSD
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	CV1 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	PC 1 button on remote control	
0	30	N/A	BLANK button on remote control	
0	31	N/A	MUTE button on remote control	
	33	N/A	Auto adjust	FW V6.12
0	34	N/A	CV2 button on remote control	
0	35	N/A	PC2 button on remote control	

Control Type	Function	Param (for Set)	Function Description	Comment
0	36	N/A	HDMI3 button on remote control	
0	37	N/A	HDMI4 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	
1: Set 2: Get	26	0~100	Sharpness	
1: Set 2: Get	29	0~100	Saturation	
1: Set 2: Get	33	0~100	set an absolute volume for Output	For embedded HDMI inputs, this does not affect the embedded output
1: Set 2: Get	34	0~100	set an absolute volume for Input	For embedded HDMI inputs, this does not affect the embedded output
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
1: Set 2: Get	84	0~1	Auto Sync Off	0 : OFF (FW:6.14) 1 : ON
1: Set 2: Get	95	0 ~1	DROP LINE	0: OFF 1: ON
1: Set 2: Get	160	0~1	HDCP ON INPUT	0 : OFF 1 : ON
1: Set 2: Get	161	0~1	HDCP ON OUTPUT	0 : Follow input 1 : Follow output

Control Type	Function	Param (for Set)	Function Description	Comment
3: Set 4: Get	0	1~10	Select Input Source	1: CV1 2: CV2 3: COMP1 4: COMP2 5: PC1 6:PC2 7: HDMI1 8: HDMI2 9: HDMI3 10: HDMI4
3: Set 4: Get	1	0~6	Size	0: Full 1: Panscan 2: Overscan 3: Underscan1 4: Letterbox 5: Underscan2 6. BEST FIT
3: Set 4: Get	21	0~27	Output Resolution	0: Native 1: VGA 2: SVGA 3: XGA 4: SXGA 5: UXGA 6: 480i 7: 480p 8: 720p60 9: 1080i60 10: 1080p60 11: 576i 12: 576p 13: 720p50 14: 1080i50 15: 1080p50 16: WXGA 17: WSXGA 18: WUXGA 19: 1280x800 20: WXGA+ (1440X900) 21: SXGA+ (1400X1050) 22: 1600x900 F/W 1.32 23: 480i59 24: 480p59 25: 720p59 26: 1080i59 27: 1080p59
3: Set	23	1	Factory Reset	

Control Type	Function	Param (for Set)	Function Description	Comment
4: Get	24	0~24	INPUT Resolution (V1.41)	0: Un-known 1: VGA 2. SVGA 3: XGA 4: SXGA 5: UXGA 6: 480i 7: 480p 8: 720p60 9: 1080i60 10: 1080p60 11: 576i 12: 576p 13: 720p50 14: 1080i50 15: 1080p50 16: WXGA 17: WSXGA 18: WUXGA 19: 1280x800 20: WXGA+ (1440X900) 21: SXGA+ (1400X1050) 22: 1600X900 23: 2048X1080/50 24: 2048X1080/60
6: Set 7: Get	0	0~2	Power	0: Power Down 1: Power On 2: Firmware reset
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
6 : Set 7 : Get	140	0~1	Auto Tune (under fine tune)	0: Clear Auto Tune 1: Set Auto Tune

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

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