USER MANUAL

MODEL:

VP-772
Presentation Matrix Switcher /
Dual Scaler

P/N: 2900-300295 Rev 1

VP-772 Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to www.kramerav.com/manual/VP-772) to download the latest manual or scan the QR code on the

Step 1: Check what's in the box

- ☑ The **VP-772** Presentation Matrix Switcher/Dual Scaler
- ☑ IR remote control transmitter with batteries
- ☑ 1 Power cord
- ☑ 2 DVI breakout cables (C-DMA/5BM-3)

- ☑ 4 Rubber feet
- ☑ 1 Set of rack ears
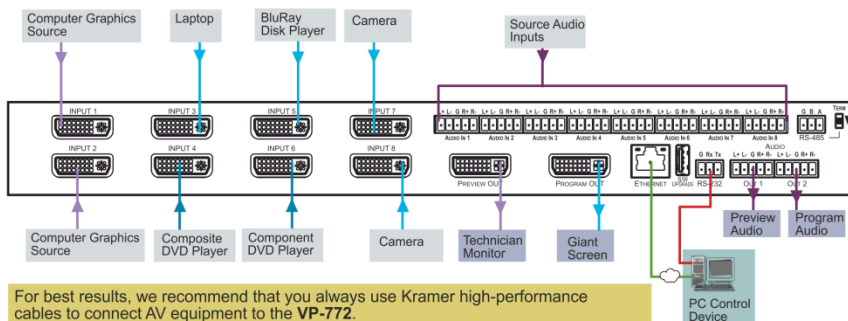- ☑ 1 Quick start guide
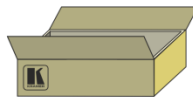
Step 2: Install the VP-772

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-772**.

For best results, we recommend that you always use Kramer high-performance cables to connect AV equipment to the **VP-772**.

RJ-45 Pinout

For the Ethernet onnector, see the proper wiring diagram below:

| EIA / TIA 568B	
PIN	Wire Color
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown

For optimum range and performance use Kramer's BC-DGKat524 (CAT 5 24 AWG), the Kramer: BC-DGKat623 (CAT 6 23 AWG cable), and the Kramer: BC-DGKat7a23 (CAT 7a 23 AWG cable). These specially built cables significantly outperform regular CAT 5 / CAT 6 / CAT 7a cables.

Connect the audio output:

L+ L- G R+ R-

To a balanced acceptor:

To an unbalanced acceptor:

L+ L- G R+ R-

Connect the audio input:

L+ L- G R+ R-
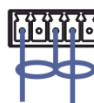
To a balanced source:

To an unbalanced source:

L+ L- G R+ R-

Step 4: Connect the power

Connect AC power to the rear of the **VP-772**, switch on its power and then switch on the power on each device.

Step 5: Set operation parameters via OSD menu

Enter the OSD menu via the MENU button on the front panel or the IR remote control transmitter. Select a menu item and set parameters as required.

If you cannot see any images, verify that the display, TV, or projector is in good working order and is connected to the **VP-772**. If you still don't see an image, press and hold the RESET TO XGA/720P button for 3 seconds to reset the output to XGA or 720p resolution.

Menu Item	Function
Inputs	Sets the parameters for each input connector such as input type, HDCP mode, Audio Input level and so on
Layout	Sets the display mode, transition settings (transition speed, mode, effects, direction, and take) and overlay settings (single window and PIP types), as well as output resolution and other output settings
Program	Sets the parameters for the program output including the source, aspect ratio, overscan, color settings, de-interlacing, noise reduction, geometry settings, audio settings, advanced settings and so on
Preview	Sets the parameters for the preview output including the source, aspect ratio, overscan, color settings, de-interlacing, noise reduction, geometry settings, audio settings, advanced settings and so on
Misc	Displays the information, OSD settings, keying parameters, FW upgrade and factory reset

Step 6: Operate via the front panel buttons and via the:

RS-232 and Ethernet

RS-232	
Protocol	3000 (Default)
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Example (decrease the volume on input 1):	#Y 0,116,-,1<CR>
Ethernet	
IP Address:	192.168.1.39
Subnet mask:	255.255.000.000
Default gateway:	000.000.000.000
TCP Port #:	5000
UDP Port #:	50000
Maximum UDP Connections:	Unlimited
Maximum TCP Connections:	Unlimited
Full Factory Reset	
OSD	Factory Reset through the Misc menu item
Protocol 3000	Use "Factory" command or #Y 0,550,1<CR>

IR Remote Controller

KR-22

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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 14 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; GROUP 11: Sierra Video Products; GROUP 12: Digital Signage; GROUP 13: Audio; and GROUP 14: Collaboration.

Congratulations on purchasing your Kramer **VP-772** Presentation Matrix Switcher / Dual Scaler. This product, which incorporates HDMI™ technology, is ideal for:

- Live events
- Presentation applications that require a preview option
- Projection systems in conference rooms, boardrooms, auditoriums, hotels and churches, production studios, rental and staging
- Any application where high quality conversion and switching of multiple and different video signals to graphical data signals is required for projection purposes
- 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

> Go to http://www.kramerav.com/downloads/VP-772 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-772** 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-772** is an eight input high quality 4K dual scaler with special effect transitions for the Rental and Staging and the Live Events market, and for other applications where a dual scaler is needed. It features DVI-U inputs (including analog, DVI and HDMI support) and stereo balanced audio signals. The unit scales and processes the selected video and audio inputs, and outputs to 2 independent DVI-I outputs (Program and Preview) together with two balanced stereo audio outputs.

The **VP-772** features:

- Pix Perfect™ Scaling Technology - Kramer's extremely high performance, State-of-the-Art scaling technology with extensive high-quality pull-down and de-interlacing algorithms, and full up-and down-scaling of the video inputs

- K-IIT XL™ Picture-in-Picture Image Insertion Technology for ultra-stable picture−in−picture, picture−and−picture and split screen capability

- Seamless video switching with cuts or built-in special effect transitions, including horizontal, vertical, diagonal, circle, and chessboard wipes, cross-fading, and more

- Dual scalers—for "live" seamless transitions from one source to another—with two independent outputs: a PREVIEW OUTPUT and a PROGRAM OUTPUT. The PREVIEW output—including an OSD menu for making adjustments—can be used to determine how the scaled output will look before being displayed live during a presentation

- Features 8 PREVIEW input buttons for switching a selected input to the PREVIEW output and 8 PROGRAM input buttons for switching a selected input to the PROGRAM output

- Output Resolutions – UHD (3840x2160) resolution as well as HDTV and computer graphics resolutions with selectable refresh rates

- Selectable HDMI, VGA, YUV or CV on each DVI-U input and VGA or HDMI on each DVI-I output

- Audio-Follow-Video (AFV) and breakaway options

- Advanced deinterlacing functions - including 3D comb filtering, film mode, diagonal correction and motion detection

- Multiple Aspect Ratio Selections

- Built-in Proc-Amp with enhanced functions such as color correction, gamma, dither and noise reduction

- Embedded HDMI audio support as well as eight balanced stereo audio inputs and two balanced stereo outputs

- Input and output audio level adjustment and audio DSP functions

- HDCP Compliance

In addition, the **VP-772**:

- Features luma- and chroma-keying

- Includes built-in test patterns for screen setup and alignment

- Analyses the connected output's EDID for optimal scaling

- Provides input and output color space control

- Supports HDMI deep color for outputs

- Comes with an On-Screen Display (OSD) for easy setup and adjustment

- Has a non-volatile memory that retains the settings

- Supports firmware upgrade via USB (via memory stick)

Control your **VP-772**:

- Directly, via the front panel push buttons

- Via the Ethernet

- By RS-485 (allowing future optional T-bar control)

- Remotely, from the infrared remote control transmitter

- By RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller

The **VP-772** is housed in a 19" 1U rack mountable enclosure, with handles and rack "ears" included, and is fed from a 100-240 VAC universal switching power supply.

3.1 HDCP Compliance for HDMI inputs

If an HDMI signal is HDCP protected, it can only appear on HDMI outputs that are connected to HDCP compliant displays.

The **VP-772** will not output a picture on an HDMI display that is not HDCP compliant; instead it will show a green screen.

In the PiP mode (see Section7.2), even if only one of the inputs is HDCP protected, and is output to a non-compliant display, it will affect the entire screen and turn it green.

When using a VGA output display, the screen will turn black.

3.2 Defining the VP-772 Presentation Matrix Switcher / Dual Scaler
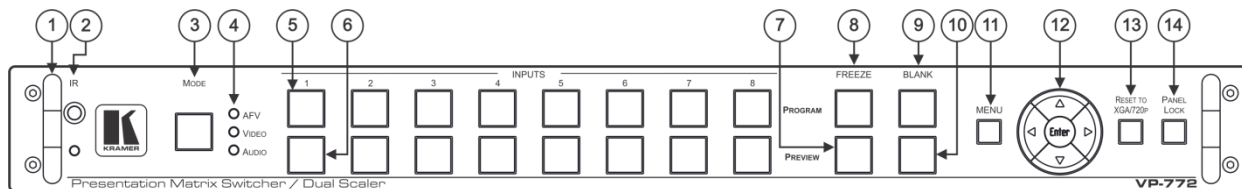
This section defines the **VP-772**.

Figure 1: VP-772 Presentation Matrix Switcher / Dual Scaler Front Panel

#	Feature		Function
1	Metal handles (x2)		Rigid handles
2	IR Receiver		Accepts IR remote commands
	IR LED		Lights red when the unit accepts IR remote commands
3	MODE Button		Select the operation mode: AFV (audio follow video), Video or audio
4	Mode LED indicators		Indicate the operation mode, as selected via the MODE button
5	INPUT Selector Buttons	PROGRAM	Press to select the DVI input (from 1 to 8) to switch to the PROGRAM output
6		PREVIEW	Press to select the DVI input (from 1 to 8) to switch to the PREVIEW output
7	FREEZE Buttons	PREVIEW	Press to freeze/unfreeze the PREVIEW output video image
8		PROGRAM	Press to freeze/unfreeze the PROGRAM output video image
9	BLANK Buttons	PROGRAM	Press to toggle between a blank screen (black) and the PROGRAM display
10		PREVIEW	Press to toggle between a blank screen (black) and the PREVIEW display
11	MENU Button		Press to access/exit the OSD menu (see Section 8.1.1) When browsing the Program OSD menu, a long press on the MENU button to jump to the Preview menu and vice versa
12	Navigation Buttons	◁ Button// VOLUME Button	Press to move to the previous level in the OSD screen (see Section 8.1.1). When in the transition mode and not within the OSD menu, press to decrease the Audio OUT 2 Program volume
		△// VOLUME Button	Press to move up the menu list values (see Section 8.1.1) and to increase numerical values. When not within the OSD menu mode, press to increase the Audio OUT 1 Preview volume
		▽// VOLUME Button	Press to move down the menu list (see Section 8.1.1) and to decrease numerical values. When not within the OSD menu mode, press to decrease the Audio OUT 1 Preview volume
		▷ Button // VOLUME Button	Press to move to the next level in the OSD screen (see Section 8.1.1). When in the transition mode and not within the OSD menu, increase the Audio OUT 2 Program volume
		ENTER Button	Press to enter sub-menu items, and save (see Section 8.1.1). When in the transition mode and not within the OSD menu, performs as the TAKE button
13	RESET TO XGA/720P Button		Press to reset the video output resolution to XGA or 720p Press and hold for about 3 seconds to toggle between reset to XGA and reset to 720p detached
14	PANEL LOCK Button		Press and hold for about 3 seconds to lock/unlock the front panel buttons
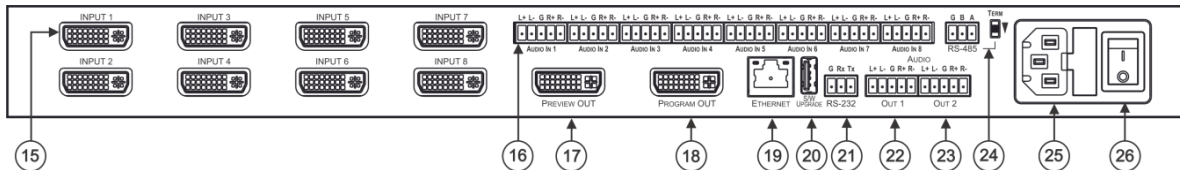
Figure 2: VP-772 Presentation Matrix Switcher / Dual Scaler Rear Panel

#	Feature	Function
15	INPUT DVI Connector	Connect to the video / embedded audio source (from 1 to 8)
16	AUDIO IN Terminal Block Connectors	Connect to the balanced stereo audio source (from 1 to 8)
17	PREVIEW OUT DVI Connector	Connect to the preview acceptor
18	PROGRAM OUT DVI Connector	Connect to the program acceptor
19	ETHERNET Connector	Connect to the PC or other Controller through computer networking
20	S/W UPGRADE USB Port	Connect to upgrade the software
21	*RS-232* (G, Rx, Tx) 3-pin Terminal Block Connector	Connect to the PC or other serial controller
22	AUDIO OUT 1 terminal Block Connectors	Connect to the program balanced stereo audio acceptor
23	AUDIO OUT 2 terminal Block Connectors	Connect to the preview balanced stereo audio acceptor
24	RS-485 Port and TERM Switch	Connect to an RS-485 controller (for example, a future optional T-bar control). Pin G is for the Ground connection; pins B (-) and A (+) are for RS-485. Set the TERM switch down if the **VP-772** is the last unit on the RS-485 line. The ground connection is sometimes connected to the shield of the RS-485 cable.
25	Power Connector with Fuse	AC connector, enabling power supply to the unit
26	*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:	0º to +40ºC (32º to 104ºF)
STORAGE TEMPERATURE:	-40º to +70ºC (-40º to 158ºF)
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.
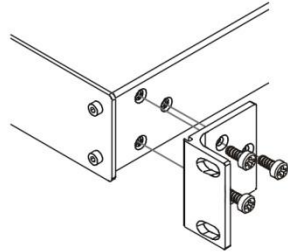
2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

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-772

> ⚠️ Always switch off the power to each device before connecting it to your **VP-772**. After connecting your **VP-772**, connect its power and then switch on the power to each device.

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

To connect the **VP-772**, as illustrated in the example in Figure 3, do the following:

1. Connect up to eight sources (for example, a PC, BluRay Disk Player, Composite DVD player and so on) to the DVI INPUT connectors, according to the Input OSD setup, see Section 6.2.

2. Connect the audio input signals to the AUDIO IN terminal block connectors, as required, see Section 5.2 (not shown in Figure 3).

3. Connect the PREVIEW OUT DVI connector to a DVI acceptor (for example, an LCD display).

4. Connect the PROGRAM OUT DVI connector to a DVI acceptor (for example, a projector).

> ℹ️ Note that when using PROGRAM/PREVIEW high output resolutions (such as 4k2k@30) we recommend that you use a DVI to HDMI cable (for example, the Kramer C-HM/DM 6' or 10').
> For lower resolutions you can connect the HDMI connector on a device to the DVI connector on the **VP-772** via a HDMI-DVI adapter

5. Connect the AUDIO OUT 1 and OUT 2 Terminal Block connectors to up to two balanced analog audio acceptors, see Section 5.2 (not shown in Figure 3).

6. If required, you can connect a PC and/or controller to the:

   - RS-232 terminal block (see Section 8.2.1)

   - Ethernet connector (see Section 8.2.2

7. Connect the power cord (not shown in Figure 3).
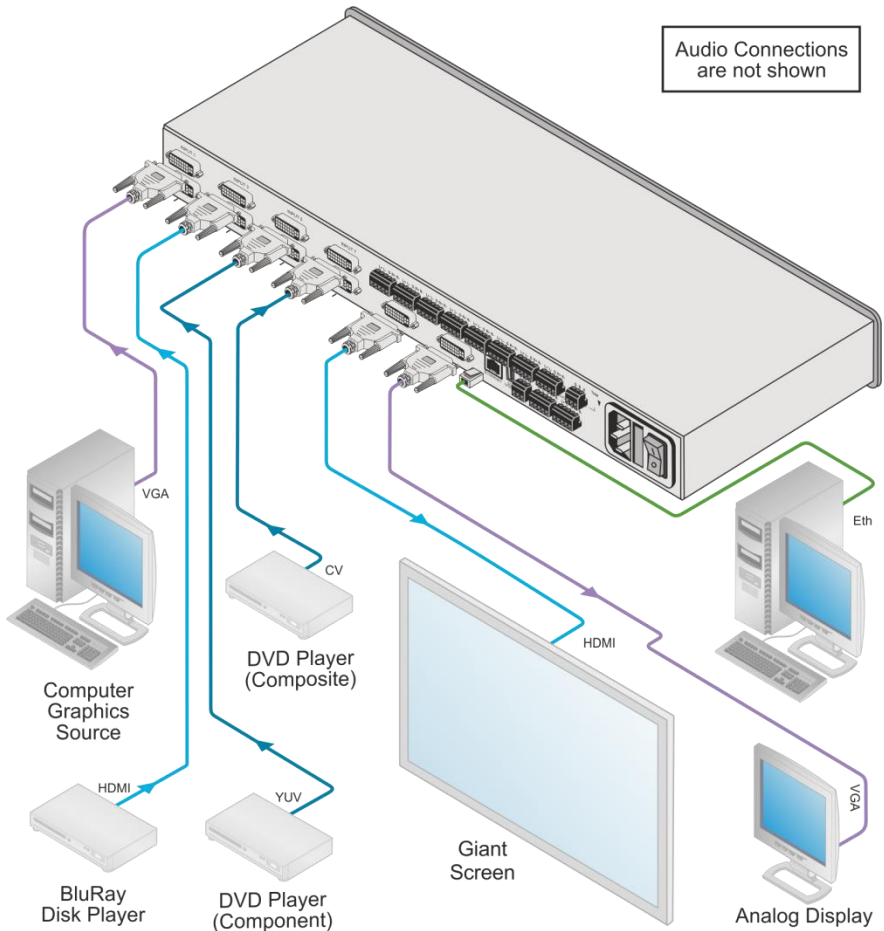
Figure 3: Connecting the VP-772 Presentation Matrix Switcher / Dual Scaler

5.1 Wiring the RJ-45 Connectors

This section defines the TP pinout, using a **straight** pin-to-pin cable with RJ-45 connectors.

EIA /TIA 568B	
PIN	**Wire Color**
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown

Figure 4: TP PINOUT
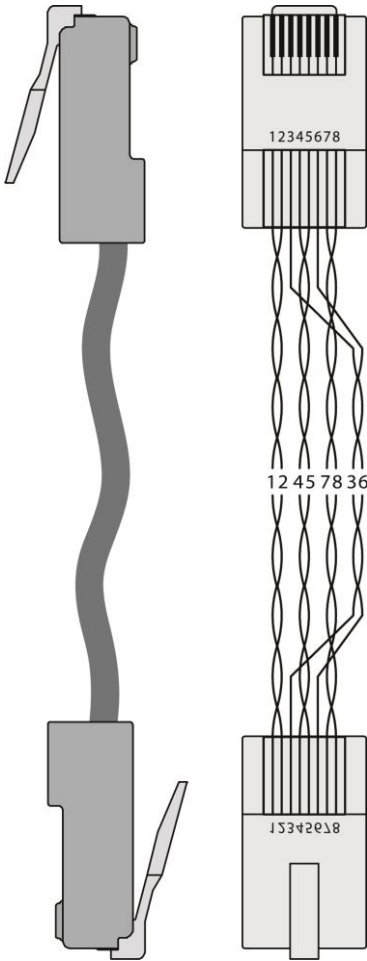
5.2 Connecting the Balanced Stereo Audio Input and Outputs

L+ L- G R+ R-
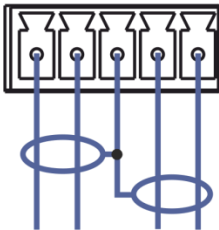
Figure 5: Balanced Stereo Audio Connection

L+ L- G R+ R-
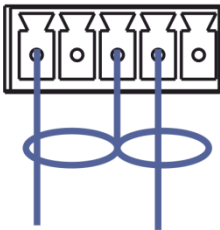
Figure 6: Unbalanced Stereo Audio Output Connection

L+ L- G R+ R-
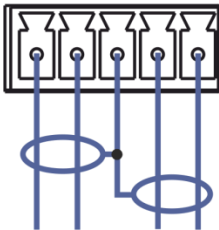
Figure 7: Balanced Stereo Audio Input Connection

L+ L- G R+ R-
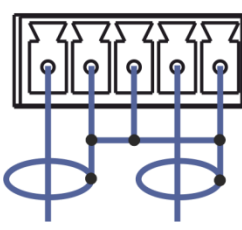
Figure 8: Unbalanced Stereo Audio Input Connection

6 The OSD Menu

The OSD menu lets you set the **VP-772** operation parameters.

The OSD sub-menu operations appear in the OSD title, as shown in the example in Section 6.1:

- When in the main menu, the OSD title appears empty

- Level 1 lists the main menu items

- Level 2 includes the second hierarchy level, below level 1

- Level 3 includes the third hierarchy level, below level 2

- Level 4 includes the fourth hierarchy level, below level 3

- Function (the fifth level), is the selectable parameter or numerical value and can appear either under level 2, 3 or 4

6.1 OSD Menu Operation Example

In the example illustrated below, the Program Aspect Ratio is set to Best Fit as illustrated in Figure 9 (see OSD menu in Section 6.4).
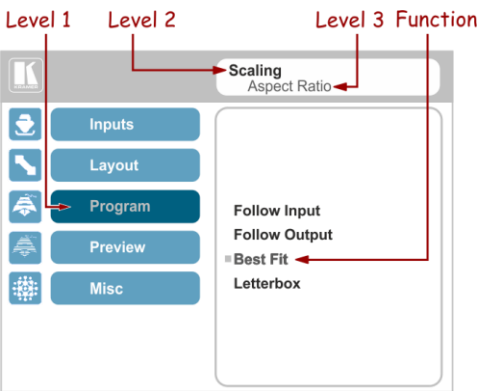
Figure 9: OSD Menu Example

The table below shows function 321 (from the Protocol in Section 11.2.2):

- 3 in the hundreds, represents "Program" which is the 3rd menu item in the main list

- 2 in the tens, represents "Scaling" which is 2nd in the Scale menu

- 1 in the units, represents "Aspect Ratio" which is first in the Scaling menu

Level 1	Level 2	Level 3	Level 4 (Function)	Range	Function
Program (3)	Scaling (2)	Aspect Ratio (1)	Follow Input	0	321
			Follow Output	1	
			Best Fit	2	
			Letterbox	3	

Note that:

- We recommend that you press Enter to save the changes to the memory immediately although exiting the menu saves the parameter to the memory

- Data is saved per window and per input (to a dedicated input + window memory), as applicable

The control buttons let you control the **VP-772** via the OSD menu. Press the:

- MENU button to enter the menu and exit the menu

- $\triangleleft$ button when in the OSD menu, to move to the previous level and change menu settings in the OSD screen.

- ENTER (or $\triangleright$) button to access sub-menu items

- Arrow buttons to move through the OSD menu

- $\triangle$ or $\triangledown$ arrows to change settings

Note that when exiting the menu, all the changes are automatically saved to the non-volatile memory.
The default OSD timeout for auto exit is set to 30 seconds and can be changed (see Section 6.5).

Note that some items appear red on the OSD menu indicating that they are disabled.

6.2 The Input Menu

The Input menu lets you set each of the **VP-772** input connector parameters (from 1 to 8):
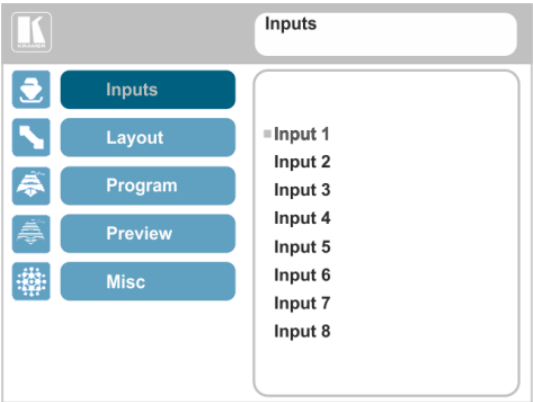
Figure 10: Input Menu

Setting	Function
INPUT 1 to INPUT 8	
Type	Set the input type to HDMI, YUV, VGA or CV
EDID Management	N/A
HDCP Mode	Set the HDCP option for each HDMI type input to either **On** (the default) or **Off**. Setting HDCP mode to Off on that input allows the source to transmit a non-HDCP signal if required (for example, when working with a Mac computer). Note that if you did not get the source to transmit the desired result, make sure you have saved the change (by pressing the ENTER button) and then physically disconnect and reconnect the cable connecting the source to the DVI input
Auto Positioning	N/A
Color Space	Select the color space for each input to **RGB**, **YPbPr** or **Follow Input**
Volume	Set the audio level for each input

6.3 The Layout Menu
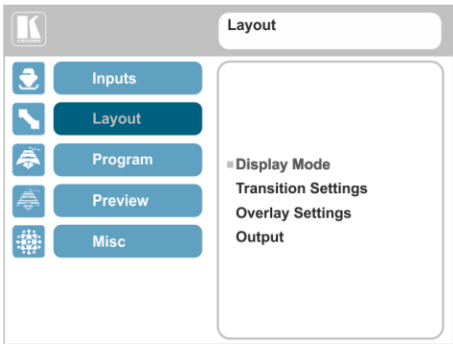
Figure 11: Layout Menu

Setting		Function
Display Mode	Transition	Set to the Transition mode
	Overlay	Set to the Picture-in-Picture mode
Transition Settings	Speed	Set the transition speed
	Mode	Set the transition mode to either **Swap** (program and preview sources switch places) or **Follow** (the preview source follows the program)
	Effect	Select one of the following effects: **Cut**, **Fade**, **Diagonal**, **Wipe**, **Circle**, **Square**, **Diamond**, **Triangle**, **Curtain**, **Chessboard** or **Blinds**
	Direction	Select the point of entry of the transition (depending on the Effect that was selected in the previous item): **From Top Right / Left to Right** / **Inbound** / **Horizontal** **From Top Left** / **Right to Left** / **Outbound** / **Vertical** **From Bottom Right** / **Up** / **Random** **From Bottom Left / Down**
	Take	Select to carry out the transition
Overlay Settings	Single Window	Set to a single window mode operation with one channel displayed
	Picture in Picture	(PiP) – dual window mode operation, a smaller window superimposed over a full screen image (see Section 7.2)
	Picture + Picture	(PoP) – dual window mode operation, both images appear side-by-side and the aspect ratios of both images are maintained (see Section 7.2)
	Split	(SbS) – dual window mode operation, both images are placed side-by-side with the same height (see Section 7.2)
	Customized Single	N/A
	Customized Dual	N/A

Setting		Function
Output	Video Resolution	Select the output resolution: Native, 640x480@60, 640x480@75, 800x600@50, 800x600@60, 800x600@75, 1024x768@50, 1024x768@60, 1024x768@75, 1280x768@50, 1280x768@60, 1280x800@60, 1280x1024@50, 1280x1024@60, 1280x1024@75, 1360x768@60, 1366x768@50, 1366x768@60, 1400x1050@50, 1400x1050@60, 1600x900@60, 1600x1200@50, 1600x1200@60, 1680x1050@60, 1920x1200@60RB, 480p60, 576p50, 720p50, 720p59.94, 720p60, 1080p23.976, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080p50, 1080p59.94, 1080p60, 1080i50, 1080i60, 2k50, 2k60, 4k2k30 ℹ️ Note that setting the output resolution to 4k2k30 will automatically change the window settings to Single Window in the Overlay mode.
	Master Connection	Set to **Program** or **Preview** to determine the Machine's behavior. If the native resolution is not supported by the selected Master Connection, the system searches for the best supported resolution. If the search fails (for example, if the master connection is disconnected or EDID is unreadable), the resolution will default to XGA.
	Deep Color	N/A
	Color Space	Select **RGB**, **YPbPr422** or **YPbPr444**
	HDCP Mode	Define the output HDCP activation policy. Set to: **Follow Output** (this option is recommended when the HDMI type output is connected to a splitter/switcher) – to activate the HDCP per output according to the setting of the HDMI acceptor to which it is connected; that is, if the HDMI acceptor is not HDCP compliant, the **VP-772** always outputs without HDCP and vice versa. **Follow Input** – to activate the HDCP on all HDMI type outputs in the case that the video on the Main or PiP window is HDCP encrypted. Note that the **VP-772** will output a green screen if the output acceptor to which it is connected is not HDCP compliant, in the case that the video on the Main or PiP window is HDCP encrypted.

6.4 The Program / Preview Menus

The Program and Preview menus are identical.

Note that when browsing the Program OSD menu, use a long press on the MENU button to jump to the Preview menu and vice versa.
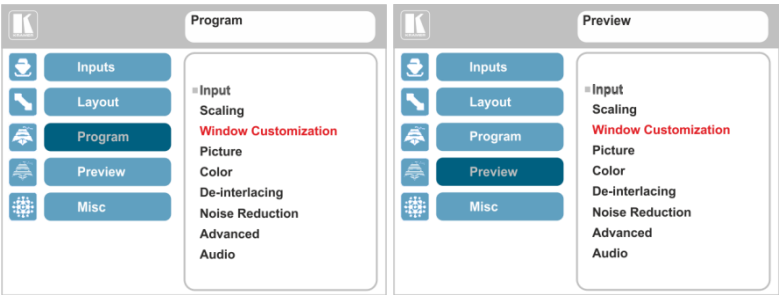
Figure 12: Program/Preview Menus

Setting		Function
Input	Input 1 to Input 8	Select the Program/Preview source and then set the parameters below (which are specific per input)
Scaling	Aspect Ratio	Set (see Section 6.4.1) to: **Follow Input** – If the input resolution ≤ output resolution, display with a blank border. input > output is denied and the aspect ratio automatically changes to Follow Output **Follow Output** – If the input resolution < output resolution, scale up the picture. If the input resolution > output resolution, scale down the picture **Best Fit** – the best possible compromise between the input and the output aspect ratios **Letterbox** – to compress the top and bottom edges of the input signal, but fill the width of the screen
	Overscan	Set the Overscan to **Follow Input**, **Off**, **5%** or **10%**
	Ratio Shift Mode	Set to: **Auto** – to fit the image to the display Customized – N/A
	Ratio	N/A
	H image Shift	Set the horizontal position of the image within the window (note that this is a volatile parameter when selecting Ratio Shift Mode > Auto)
	V image Shift	Set the vertical position of the image within the window (note that this is a volatile parameter when selecting Ratio Shift Mode > Auto)
Window Customization	N/A	
Picture	Brightness	Set the brightness level
	Contrast	Set the contrast level
	H Sharpness	Select the horizontal sharpness level

Setting		Function
Picture	V Sharpness	Select the vertical sharpness level
Color	Chroma	Set the color level
	Hue	Set the color hue
	Color Temperature	Set the color temperature to **6500K** or **9300K**
	Gamma Mode	Set the gamma correction factor to **Off**, **0.4**, **0.8**, **1.2**, **1.6**, **2.0**, **2.4** or **2.8** The higher the value, the darker the image
	Color Correction Blue	Set the blue color level from 0 to 4
	Color Correction Green	Set the green color level from 0 to 4
	Color Correction Flesh	Set the flesh color level from 0 to 4
De-interlacing	Film Mode	Set to: **Off** – for no pull-down **Follow Input** – to automatically identify the required pull-down (2:2, 2:3, 2:3:3:2, 2:3:3:2:2, 2:3:2:3:2, 5:5 or 8:7 pull-down) **24PsF** – to force 24PsF pull-down
	PD Time	Set the pull down time
	Motion Detection Sensitivity	Set (from **Level 1** to **Level 5**) Select the motion detection sensitivity for filtering of interlaced images. Set a high value for video where there is generally a large amount of motion, or a low value for little motion
	Diagonal Correction	Set the level of diagonal interpolation from 0 to 3. When set to the lower level, the diagonal image does not appear smooth
Noise Reduction	Horizontal NR	Reduces the horizontal noise
	Vertical NR	Reduces the vertical noise
	Temporal NR	The higher the level, the stronger the filtering of the image. Useful when the noise is visible to the eye
	Block NR	As the level is set higher, the block noise disappears and the image appears softer
	Mosquito NR	The higher the level, the stronger the filtering of the image
	Combing NR	Improves the quality of the subtitles
Advanced	Geometry	N/A
	V-Keystone	N/A
	Pause	Set **Freeze** to **On** to freeze the window (freezing the window will also mute the audio output) Any change in the input source may cancel the freeze and blank settings
		Set **Blank** to **On** to display a blank window (blanking the window will also mute the audio output) Any change in the input source may cancel the freeze and blank settings
		Set **Mute** to **On** to mute the audio output **E** A mute icon appears on screen
	Power Save	N/A

Setting		Function
Advanced (continued)	Test Pattern	Set the Test pattern to **Slide Bar** (non-HDCP), **Color Bar** (HDCP) or **Off**. Each test pattern includes a sinusoid audio signal at 10dB @1kHz. We recommend that you set the Display Mode to Single Window and set the Output Resolution to 1080p.
	No Signal	If there is no signal on the input set the output color to **Gray**, **Blue** or **Black**
	Auto Switching	N/A
Audio	Source	Select the audio source to be: **AFV** for the audio to follow the video **Analog 1** to **Analog 8** to select any of the analog audio inputs
	AFV Source	When in the AFV mode, select **Embedded** for the embedded audio source to follow the video Select **Analog** for the analog audio source to follow the video
	Output Volume	Set the output volume level
	Bass	Set the bass level [dB]
	Mid	Adjust the midrange frequency
	Treble	Adjust the treble
	Balance	Adjust the balance
	Lip sync	Set the Lip Sync delay value [msec]

6.4.1 Selecting the Correct Aspect Ratio

You can configure the aspect ratio of any output image to fit your application. The **VP-772** offers four different aspect ratio settings: Follow Input, Follow Output, Best Fit and Letterbox. Here is how each of these settings works.

FOLLOW INPUT – The aspect ratio and resolution of the input video or graphics signal are both preserved (no scaling). For example, a composite video image with a 4:3 aspect ratio will appear with the same aspect ratio on a 1080p (16:9) output image, surrounded by black bars

FOLLOW OUTPUT – The aspect ratio and resolution of the input signal is re-sized to precisely match the aspect ratio and resolution of the **VP-772** output signal. This may result in some distortion to the input signal images

BEST FIT – This setting re-sizes the video or graphics input signal to "best fit" the output resolution while maintaining the aspect ratio of the input signal. For example, a composite video signal (4:3 aspect ratio) will "best fit" to the top and bottom of a widescreen output image, resulting in black pillars on either side.

LETTERBOX – This setting compresses the top and bottom edges of the input signal, but fills the width of the screen. For example, to preserve a widescreen film image on a 4:3 display. When not using a 4:3 resolution, this mode is identical to Best Fit

6.5 The Misc Menu
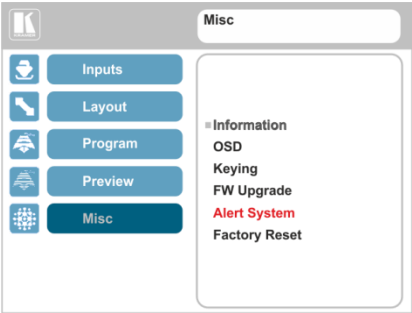
Figure 13: Misc Menu

Setting		Function
Information	Program	Displays the Program settings: selected input, input resolution, frequency and output resolution
	Preview	Displays the Program settings: selected input, input resolution, frequency and output resolution
	FW Versions	Shows the different FW versions
	Network	Displays the network information: IP address, Netmask, Gateway and DHCP
OSD	H Position	Set the horizontal position of the OSD
	V Position	Set the vertical position of the OSD
	Transparent	Set the transparency to On or Off
	Gain	Set the transparency level (once set to transparent)
	Bias	Set the transparency level
	Timeout	Set to **30** seconds before OSD timeout, **60** seconds before OSD timeout or **Off** (Off means that that the OSD appears continuously)
Keying	Chroma Keying Red	Set the threshold value of the red components for chroma keying
	Chroma Keying Green	Set the threshold value of the green components for chroma keying
	Chroma Keying Blue	Set the threshold value of the blue components for chroma keying
		Note that the combination of threshold values (for red, green and blue) determines the chroma keying threshold. Any image with combined values of red, green and blue that are below this threshold will become transparent when chroma keying is enabled (see below).

Setting	Function	
Keying (continued)	Chroma Keying	Set to **On** or **Off** to enable/disable chroma keying Note that this feature is available in overlay mode dual windows
	Luma Keying	To turn the keying on the PiP window **On** or **Off** (see Section 6.5.1) Note that this feature is available in overlay mode dual windows
		Note that either chroma keying or luma keying can be enabled. If one is set to **On**, the other will be **Off**.
FW upgrade	Upgrade	Select to upgrade the firmware (see Section 9.1)
	Rollback	Select to return to the previous firmware revision (see Section 9.2)
Alert System	N/A	
Factory Reset	Reset to factory default values (see Section 10.1). Select **Including ETH** to perform a full factory reset or **Excluding ETH** to reset without ETH parameters. Once Factory Reset is selected, a countdown appears, letting you cancel the process and revert to the previous state **DO NOT** turn the machine off during the factory reset process. The factory reset process takes up to 3 minutes in which all the front panel button lights turn off (except for the PANEL LOCK button) and then turn on again; the image on the displays reappears and only then you can turn the machine off if required	

6.5.1 The Luma Keying Feature

The luma keying feature lets you display the Preview window (the key image) as semi-transparent over the Program window. This feature can be used to have the Preview window display a static or dynamic logo, for example, which will appear on a transparent background.

To apply the luma keying feature, first set the Preview window to the desired size and location and then turn luma keying On. The Preview image will show without its background.

The lower the luminance in the Preview window, the more transparent it becomes, thus letting the Program window image show. The higher the luminance, the less transparent it becomes, not letting the Program window show through. To use this feature it is recommended to set the Preview image as follows: use low-luminance colors for the background (the key image portion) and high-luminance colors for the logo.

7 The Layout

The **VP-772** can function in two modes, the:

- Transition mode

- Overlay (Picture in Picture) mode

The operation modes are set by selecting the display Mode via the Layout menu (see Section 6.3).

7.1 The Transition Mode

In the transition mode you can setup the input, view it via the preview output and then switch it to the PROGRAM output.

The **VP-772** has two outputs: a PREVIEW output, and a PROGRAM output. Each of these outputs functions independently. An input is routed to the PROGRAM OUTPUT by pressing that PROGRAM INPUT front panel button. In the same way pressing a PREVIEW INPUT front panel button will route that input to the PREVIEW OUTPUT.

Use the PREVIEW output to:

- See how the scaled output looks before displaying live during a presentation

- Harmonize the 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

When in the transition mode, you can set the speed of the transition, and determine the type and direction of the transition via the OSD menu (see, Section 6.3).

For example, select **Cut** for an instantaneous transition from the PREVIEW output to the PROGRAM output or select **Chessboard** for a chessboard transition effect and check **Swap** to interchange the preview with the program.

To switch the inputs in the transition mode via the OSD menu, you need to set the audio signal, define the effects and select the input:

1. In the Preview>Advanced>Audio menu, set the Audio signal:

   - Set either AFV for the audio to follow the video, or an analog input from 1 to 8

   - If AFV was selected, set that audio signal to be embedded or analog

   - Set the output volume, bass, mid, treble, balance and lip sync

2. In the Layout menu, set the display mode (for example, Transition).

3. Define the transition settings: Speed, Mode, Effect and Direction.

4. In the Preview menu, select an Input.

5. In the Layout menu select Take to carry out the transition.

To switch the inputs in the transition mode via the front panel buttons:

1. In the Preview>Advanced>Audio menu, set the Audio signal:

   - Set either AFV for the audio to follow the video, or an analog input from 1 to 8

   - If AFV was selected, set that audio signal to be embedded or analog

   - Set the output volume, bass, mid, treble, balance and lip sync

2. In the Layout menu, set the display mode (for example, Transition).

3. Define the transition settings: Speed, Mode, Effect and Direction.

4. Press the desired PREVIEW INPUT front panel button.

5. Press ENTER to carry out the transition.

To set the Program input, repeat the above procedures using the Program menu

If the transition mode is set to Swap, the Preview and Program inputs switch places. If Follow was selected, the Program input setting will follow the Preview setting and both will display the same input.

7.2 The Overlay Mode

In the Overlay mode both outputs are identical and can display a single image (single window display mode), two images one over the other or two images side by side (dual window display mode).

A selected Program input appears as the main image in a dual window display mode (such as PiP) or as the only image in a single window display mode. A selected Preview input will appear as the PiP window in the dual window display mode and will not appear at all in the single window display mode.

The overlay settings item in the Layout menu (see Section 6.3) lets you set a Single Window, Picture in Picture (PiP), Picture + Picture (PoP) or Split images. For example, you can show a live video window on top of a graphic background, or show two images on screen of the same input channel. The PiP window appears even if no input signals are connected. In this case the PiP window appears in dark gray and the main window appears in light gray.

The preset PiP configurations are available:

Picture-in-Picture, with a smaller PiP window superimposed over a full main window image
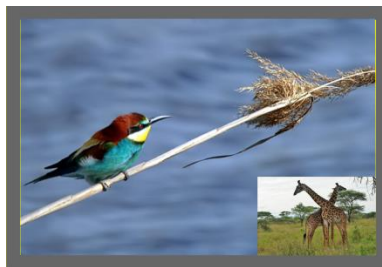
Picture + Picture, where both images appear side-by-side and the aspect ratios of both images are maintained
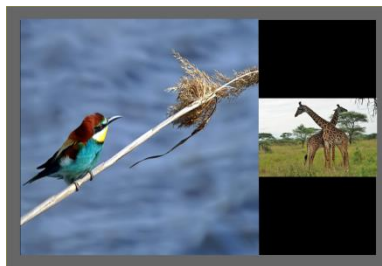
Split, where both images are placed side-by-side with the same height

You can superimpose any input type over any or the same input.

If the HDMI signal is HDCP protected, it can appear on HDMI and HDBT outputs that are connected to supported HDCP compliant displays. However, it cannot appear on a display that is not HDCP compliant and will show a green screen instead.

7.2.1 Setting the PiP

To set the PiP window in the Overlay mode:

1. In the Layout menu select Overlay Settings.
   When in the Overlay display mode

2. Select the type of image you want displayed: Picture in Picture, Picture + Picture, Split or Single Window.

7.2.1.1 Selecting the PiP Source via the Front Panel Buttons

When in the Overlay mode (set only via the OSD menu, see Section 6.3), select the main window by pressing a Program input front panel button and select the PiP window by pressing a Preview front panel button (see Figure 14).
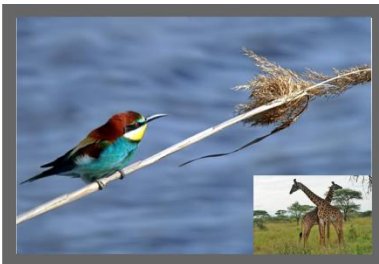
Figure 14: VGA superimposed over HDMI

7.2.1.2 Selecting the PiP Source via the IR Remote Control Transmitter

Press a Program button (from 1 to 8) to select the main window and press ENTER. Press a Preview button (from 1 to 8) to select the PiP window (see Section 8.3).

7.2.1.3 Selecting the Program/Preview Source via the OSD Menu

You can select an input source only after you set the Display mode to the Overlay mode (see Section 6.3).

To set the Program/Preview source via the OSD menu, do the following:

1. Press the MENU button to access the OSD menu.

2. In the Layout menu set Display Mode to Overlay.

3. In Overlay Settings set the image display to any of the dual window options or to single window.

4. In the Program/Preview menu, select Source.

5. Select an input (from 1 to 8).

6. Press the ENTER button.

7. Press the MENU a few times until you exit the OSD menu (changes are saved upon exit).

8 Controlling the VP-772

The **VP-772** can be controlled via:

- The front panel buttons (see Section 8.1)

- The OSD menu (see Section 8.2)

- The infrared remote control transmitter (see Section 8.3)

8.1 Controlling via the Front Panel Buttons

The **VP-772** includes the following front panel buttons:

- Mode button to select AFV, Video or Audio switching (see Section 8.1.1)

- Program and Preview input selector buttons (see Section 8.1.1)

- FREEZE and BLANK buttons (note, these buttons illuminate green when selected)

- MENU and ENTER buttons, up, down, left and right arrow buttons to navigate through the OSD menu (see Section 6)

- Enter button functions as TAKE when in the transition mode to carry out a transition

- Program output volume up ($\triangleright$) and down ($\triangleleft$) buttons (when not in the OSD mode)

- Preview output volume up ($\triangle$) and down ($\triangledown$) buttons (when not in the OSD mode)

- RESET TO XGA/720p and PANEL LOCK buttons

8.1.1 Using the Mode Buttons

Press the MODE button to toggle between the AFV (green LED) mode, the VIDEO (orange LED) mode and the Audio (red LED) mode. When selected, each mode defines the function of the Program and Preview front panel buttons when next pressing the front panel buttons. That is, when in the:

- AFV mode, press an INPUT button to select the video together with its audio signal

- VIDEO mode, to select the video inputs only

- AUDIO mode to select the audio inputs only

> Note that the MODE button indicates the status for the next press on the front panel input buttons only.

The input buttons light in accordance with the selected modes:

A bright green button indicates that both the audio and video signals of that input are selected (AFV with **embedded** audio signal)

A medium green button indicates that both the audio and video signals of that input are selected (AFV with **analog** audio signal)

An orange button indicates that only the video signal of that input is selected

A red button indicates that only the audio signal of that input is selected

The following example shows how to use the front panel buttons to switch inputs:

Program INPUT 6 and Preview INPUT 5 are selected. The AFV mode is selected (Program-embedded audio signal; Preview analog audio signal).
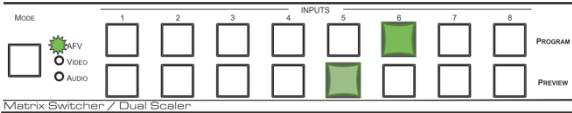
Press the MODE button to set it to the VIDEO mode. This will affect the next press of input buttons
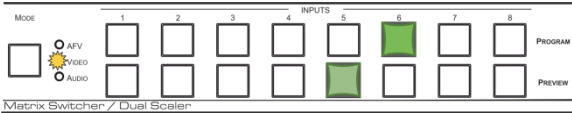
Press Program INPUT 4 – the video only switches to INPUT 4 and the audio remains in INPUT 6.
Press Preview INPUT 8 – the video only switches to INPUT 8 and the audio remains in INPUT 5
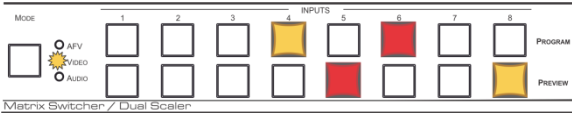
Press the MODE button to set it to the AUDIO mode. This will affect the next press of input buttons
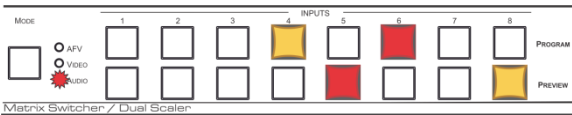
Press Program INPUT 1 – the audio only switches to INPUT 1 and the video remains in INPUT 4.
Press Preview INPUT 8 – the audio only switches to INPUT 8 and the video remains in INPUT 8 so that audio follows video and the button light green
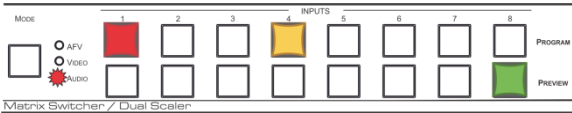
8.1.2 Button Behavior in the Transition Mode

When in the Transition mode, pressing the ENTER front panel button in the Swap mode will swap the Preview and Program inputs as follows, from:
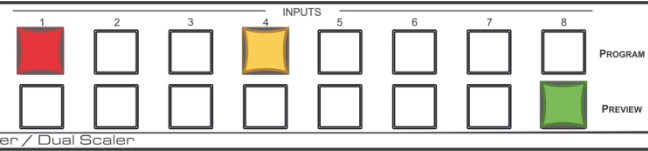
TO
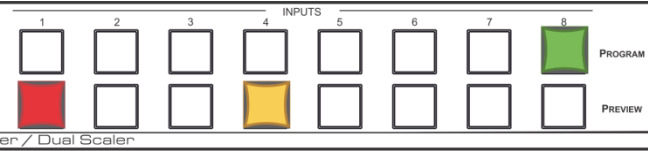
When in the Transition mode, pressing the ENTER front panel button in the Follow mode will switch the Program inputs to follow the Preview inputs:
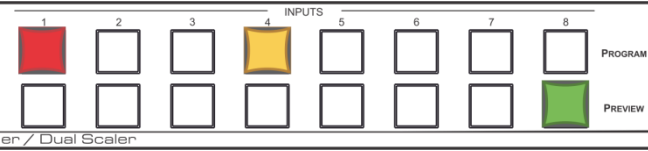
TO
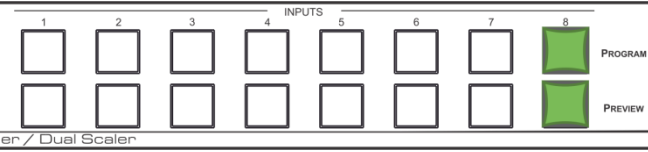
8.1.3 Button Behavior in the Overlay Mode

When in the overlay mode, the **VP-772** does not pass the Preview audio to the output.

In the Overlay dual mode the preview audio input button is dimmed:
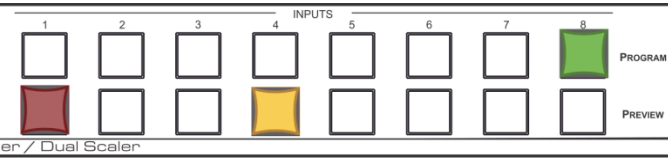
When in the Overlay mode, in the Single Window setting (see Section 6.3), the Preview buttons (Audio, Video and AFV) appear dim, as illustrated in the following examples:
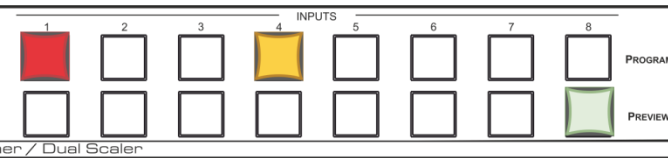
Or
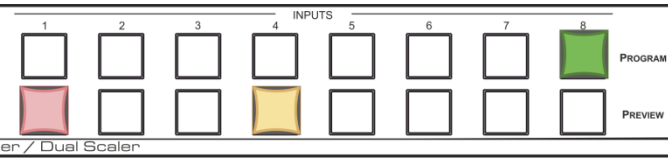
> If you want to adjust the image of a selected input in a window, press that input button again (up to 3 times) for fast tuning. Pressing that input button for the fourth time initiates full tuning of the window.

8.2 Controlling via the OSD Menu

You can change Preview/PiP Window parameters, Program/Main window parameters and entire system parameters via the OSD menu, as described in Section 6.

8.2.1 Connecting to the VP-772 via RS-232

You can connect to the **VP-772** via an RS-232 connection using, for example, a PC. To connect the RS-232 terminal block on the rear panel of the **VP-772** to a PC/controller connect the RS-232 9-pin D-sub port on your device to controller as shown in Figure 15, connect the **VP-772** RS-232 terminal block:

- TX pin to Pin 2
- RX pin to Pin 3
- GND pin to Pin 5
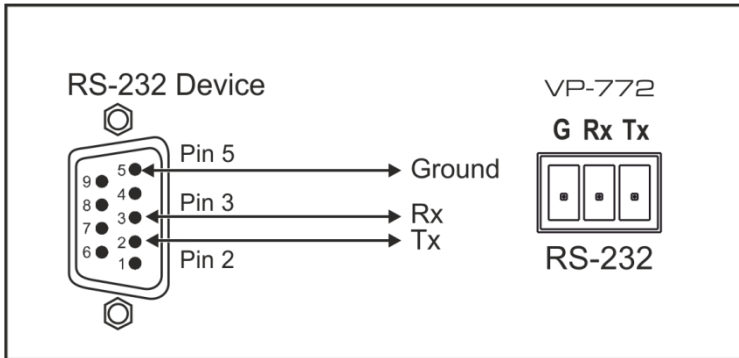
Figure 15: RS-232 Connection

8.2.2 Connecting the VP-772 via the ETHERNET Port

You can connect to the **VP-772** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see Section 8.2.2.1)
- Via a network hub, switch, or router, using a straight-through cable (see Section 8.2.2.2)

Note: If you want to connect via a router and your IT system is based on IPv6, speak to your IT department for specific installation instructions.

8.2.2.1 Connecting the Ethernet Port Directly to a PC

You can connect the Ethernet port of the **VP-772** directly to the Ethernet port on your PC using a crossover cable with RJ-45 connectors.

> ℹ️ This type of connection is recommended for identifying the **VP-772** with the factory configured default IP address.

After connecting the **VP-772** to the Ethernet port, configure your PC as follows:

1. Click **Start** > **Control Panel** > **Network and Sharing Center**.

2. Click **Change Adapter Settings**.

3. Highlight the network adapter you want to use to connect to the device and click **Change settings of this connection**.
   The Local Area Connection Properties window for the selected network adapter appears as shown in Figure 16.
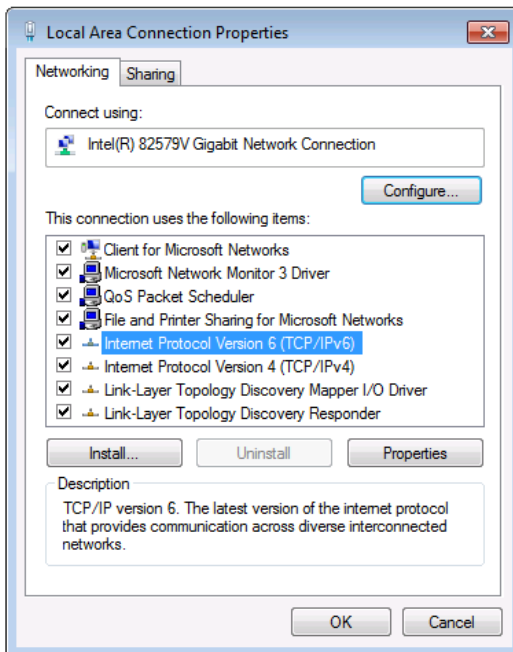
Figure 16: Local Area Connection Properties Window

4. Highlight either **Internet Protocol Version 6 (TCP/IPv6)** or **Internet Protocol Version 4 (TCP/IPv4)** depending on the requirements of your IT system.

5. Click **Properties**.

   The Internet Protocol Properties window relevant to your IT system appears as shown in <u>Figure 17</u> or <u>Figure 18</u>.
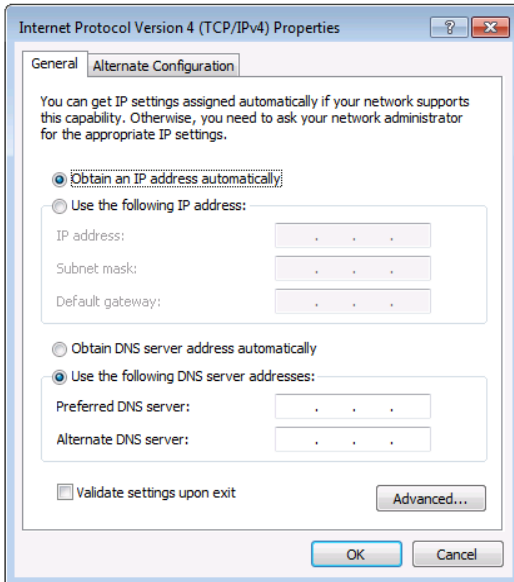
Figure 17: Internet Protocol Version 4 Properties Window
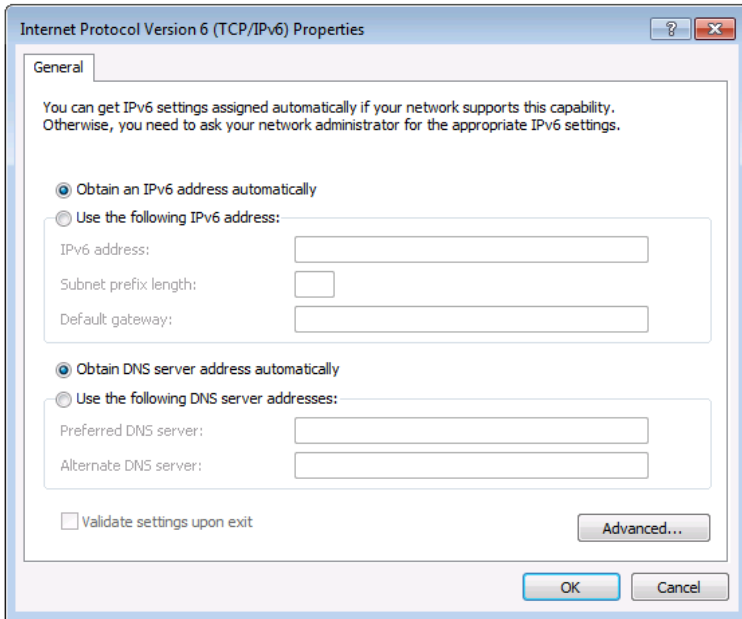
Figure 18: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in <u>Figure 19</u>.
   For TCP/IPv4 you can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding 192.168.1.39) that is provided by your IT department.
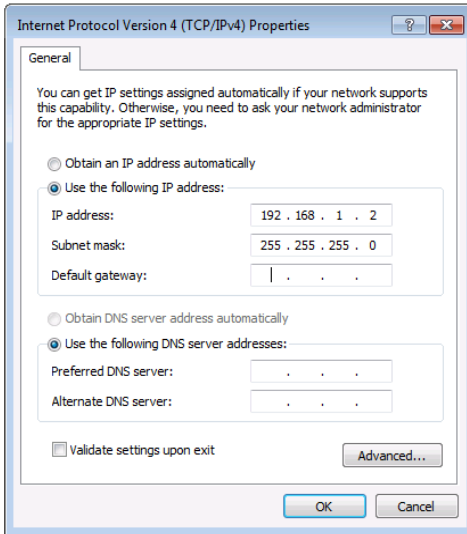
Figure 19: Internet Protocol Properties Window

7. Click **OK**.

8. Click **Close**.

8.2.2.2 Connecting the Ethernet Port via a Network Hub or Switch

You can connect the Ethernet port of the **VP-772 to** the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

8.3 Controlling via the Infrared Remote Control Transmitter

You can control the **VP-772** from the infrared remote control transmitter:

Figure 20: Infrared Remote
Control Transmitter

	Keys	Function
	POWER	Toggle the power save mode ON or OFF
	RESET	Press to reset to the default resolution (toggles between RESET TO XGA and 720p)
PROGRAM	FREEZE	Freeze/unfreeze the output video image
	BLANK	Toggle between a blank screen black screen and the display
	MUTE	Toggle between muting (blocking out the sound) and enabling the audio output
	INPUTS	Select an input from 1 to 8
		Press ENTER to access menu levels (when in the OSD) Use the up and down arrows to adjust numerical values and adjust the output volume level (when not within the OSD)
	MENU	Enter/Exit the OSD menu and return to the previous menu level
	LOCK	Lock the front panel buttons
PREVIEW	FREEZE	Freeze/unfreeze the output video image
	BLANK	Toggle between a blank screen black screen and the display
	MUTE	Toggle between muting (blocking out the sound) and enabling the audio output
	INPUTS	Select an input from 1 to 8

8.3.1 Using the IR Transmitter

You can use the IR transmitter to control the machine via the built-in IR receiver on the front panel or, instead, via an optional external IR receiver (Model: C-A35M/IRR-50). The external IR receiver can be located up to 15 meters away from the machine. This distance can be extended to up to 60 meters when used with three extension cables (Model: C-A35M/A35F-50).

Before using the external IR receiver, be sure to arrange for your Kramer dealer to insert the internal IR connection cable (P/N: 505-70434010-S) with the 3.5mm connector that fits into the REMOTE IR opening on the rear panel. Connect the external IR receiver to the REMOTE IR 3.5mm connector.

9 Firmware Upgrade

This section describes the firmware upgrade of the **VP-772** components that are described in the table below:

File Type	Description	Becomes Effective After
RBF	An *.rbf file to upgrade FPGA	**VP-772** application restart
Memory	upgrades the other Alteras and the OSD bitmap	**VP-772** application restart
Application	The main **VP-772** application	**VP-772** application restart
Linux kernel	Includes all drivers for the **VP-772** board	Rebooting the board
Cramfs	A read only Linux file system	Rebooting the board
Bootloader	Launches the Linux kernel	Rebooting the board
Jffs2	A read/write file system including the RBF and Memory files, as well as the application	Rebooting the board

> The latest firmware version can be downloaded from the Kramer Web site at http://www.kramerav.com/downloads/VP-772

9.1 The Firmware Upgrade Process

Unzip the firmware files on your desktop to a folder named "VP-772" and then copy that folder to an empty, FAT32-formated USB memory stick (with at least 30Mb of free space) as a root folder. After copying the "VP-772" folder as a single root folder, the USB memory stick is ready to be used by attaching it into the device.

> Make sure that you remove the USB memory stick safely from your PC. Failing to do so may corrupt the firmware files on the memory stick

To upgrade the firmware:

1. Connect the USB memory stick to the S/W UPGRADE USB port on the rear panel of the **VP-772**.

2. On the front panel click the MENU button, select FW Upgrade and then select Upgrade (see).
   The OSD shows the firmware version found in the memory stick:
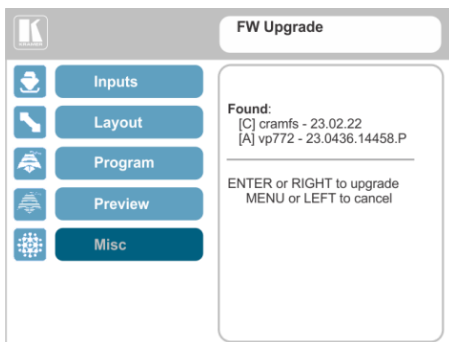
Figure 21: Firmware Upgrade – list of Files to Upgrade

3. Click the ENTER button on the front panel.

Wait for the completion of the upgrade process:
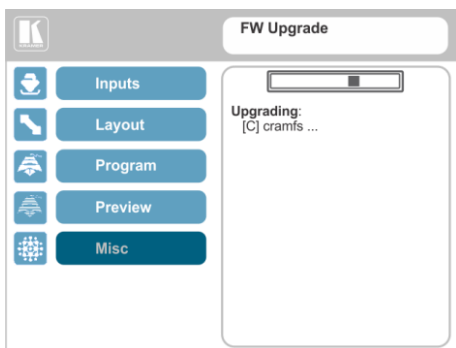
Figure 22: Firmware Upgrade – Upgrade Process

When the firmware upgrade is complete, the list of upgraded files appears:
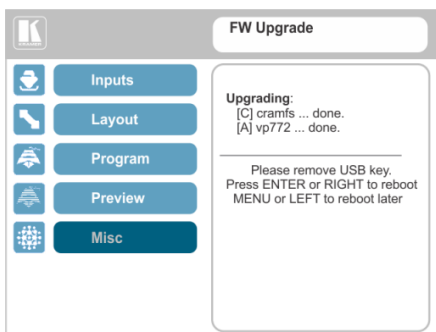
Figure 23: Firmware Upgrade – Upgrade Complete

VP-772 - Firmware Upgrade

4. Remove the USB memory stick and click the ENTER button on the front panel to reboot the system.

9.2 Rollback

The Rollback feature lets you restore the previous firmware version installed by the user. To do so:

1. On the front panel click the MENU button, select FW Upgrade and then select Rollback (see Section 6.5).
   The OSD shows the firmware version found in the system:
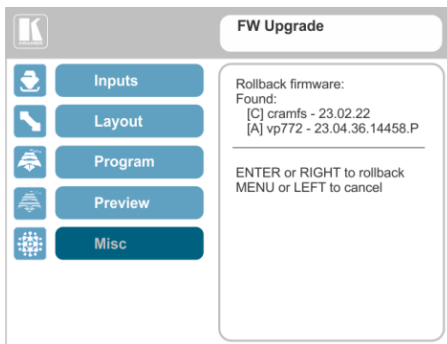
Figure 24: Firmware Upgrade – list of Files to Rollback

2. Press the ENTER button or the left arrow to proceed.
   Wait for completion of the procedure.

3. Reboot the machine by turning it off and then on again.

10   Technical Specifications

INPUTS:	8 DVI-U inputs (DVI-D, HDMI, PC, YPbPr and CV) on DVI-I connectors 8 balanced stereo audio on 5-pin terminal block connectors
OUTPUTS:	2 DVI-I outputs (DVI-D, HDMI and PC) on DVI-I connectors2 balanced stereo audio on 5-pin terminal block connector
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI (deep color) and HDCP
OUTPUT RESOLUTIONS:	640x480@60, 640x480@75, 800x600@50, 800x600@60, 800x600@75, 1024x768@50, 1024x768@60, 1024x768@75, 1280x768@50, 1280x768@60, 1280x800@60, 1280x1024@50, 1280x1024@60, 1280x1024@75, 1360x768@60, 1366x768@50, 1366x768@60, 1400x1050@50, 1400x1050@60, 1600x900@60, 1600x1200@50, 1600x1200@60, 1680x1050@60, 1920x1200@60RB, 480p60, 576p50, 720p50, 720p59.94, 720p60, 1080p23.976, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080p50, 1080p59.94, 1080p60, 1080i50, 1080i60, 2k50, 2k60, 4k2k@30
CONTROLS:	Front panel buttons, OSD, IR remote control, RS-232 on a 9-pin D-sub connector, Ethernet
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
POWER CONSUMPTION:	100-240V AC, 42VA max.
DIMENSIONS:	19" (W), 9.3" (D) 1U (H) rack mountable
WEIGHT:	4.3kg (9.5lbs) approx.
INCLUDED ACCESSORIES:	Power cord, rack "ears", IR remote control, 2 DVI breakout cables (C-DMA/5BM-3)
Specifications are subject to change without notice For the most updated resolution list, go to our Web site at http://www.kramerelectronics.com	

10.1 Default Communication Parameters

RS-232	
Protocol	3000 (Default)
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Example (decrease the volume on input 1):	#Y 0,116,-,1<CR>
Ethernet	
IP Address:	192.168.1.39
Subnet mask:	255.255.000.000
Default gateway:	000.000.000.000
TCP Port #:	5000
UDP Port #:	50000
Maximum UDP Connections:	Unlimited
Maximum TCP Connections:	Unlimited
Full Factory Reset	
OSD	Factory Reset through the Misc menu item
Protocol 3000	Use "Factory" command or #Y 0,561,1<CR>

10.2 Input Resolutions

The **VP-772** features eight DVI-U inputs. This section defines the input resolutions for each input.

10.2.1 CV Input Resolutions

NTSC and PAL

10.2.2 Component Analog Video (YPbPr) Input Resolutions

PC Input Resolutions			
NTSC	720_P50	1080_P30	1080_P50
PAL	720_P60	1080_P23_976	1080_P60
525_P60	1080_I50	1080_P24	1080_P100
625_P50	1080_I60	1080_P25	

10.2.3 RGBHV Analog Video Input Resolutions

RGBHV Input Resolutions				
640X480_60	800x600_75	625_P50	1280x1024_60	1400x1050_75
640x480_72	800x600_85	525_P60	1280x1024_75	1600x900_60
640x480_75	1024x768_60	720_P50	1280x1024_85	1600x1200_60
640x480_85	1024x768_70	720_P60	1360x768_60	1680x1050_60
800x600_56	1024x768_75	1280x800_60	1366x768_60	1920x1200_60RB
800x600_60	1024x768_85	1280x960_85	1440x900_60	1080_P50
800x600_72	1152x864_75	1280x768_60	1400x1050_60	1080_P60

10.2.4 HDMI Digital Video Input Resolutions

HDMI Input Resolutions				
NTSC	1080_I60	640x480_72	1024x768_70	1360x768_60
PAL	1080_P23_976	640x480_75	1024x768_75	1366x768_60
525_P60	1080_P24	640x480_85	1024x768_85	1440x900_60
625_P50	1080_P25	800x600_56	1152x864_75	1400x1050_60
720_P24	1080_P30	800x600_60	1280x800_60	1400x1050_75
720_P25	1080_P50	800x600_72	1280x960_85	1600x900_60
720_P30	1080_P60	800x600_75	1280x768_60	1600x1200_60
720_P50	2k50	800x600_85	1280x1024_60	1680x1050_60
720_P60	2k60	848x480_60	1280x1024_75	1920x1200_60RB
1080_I50	640X480_60	1024x768_60	1280x1024_85	

VP-772 - Technical Specifications

10.3 Output Resolutions

The **VP-772** features two DVI-I outputs. This section defines the output resolutions for each output.

10.3.1 HDMI Digital Video Output Resolutions

Technical Specifications of the HDMI Output Signal			
640x480@60	1280x1024@50	1680x1050@60	1080p30
640x480@75	1280x1024@60	1920x1200@60	1080p50
800x600@50	1280x1024@75	480p60	1080p59.94
800x600@60	1360x768@60	576p50	1080p60
800x600@75	1366x768@50	720p50	1080i50
1024x768@50	1366x768@60	720p59.94	1080i60
1024x768@60	1400x1050@50	720p60	2k50
1024x768@75	1400x1050@60	1080p23.976	2k60
1280x768@50	1600x900@60	1080p24	4k2k@30
1280x768@60	1600x1200@50	1080p25	
1280x800@60	1600x1200@60	1080p29.97	

10.3.1 RGBHV Analog Video Output Resolutions

RGBHV Output Resolutions				
640x480@60	1280x800@60	1600x1200@60	720p60	1080p59.94
640x480@75	1280x1024@60	1680x1050@60	1080p23.976	1080p60
800x600@60	1280x1024@75	1920x1200@60	1080p24	1080i50
800x600@75	1360x768@60	480p60	1080p25	1080i60
1024x768@60	1366x768@60	576p50	1080p29.97	2k50
1024x768@75	1400x1050@60	720p50	1080p30	2k60
1280x768@60	1600x900@60	720p59.94	1080p50	

11 The VP-772 RS-232 Communication Protocol

The Kramer Protocol lets you control the **VP-772** from any standard terminal software (for example, the Windows® HyperTerminal Application).

11.1 Using the Communication Protocol

There are three different methods to control the **VP-772** RS-232 or the Ethernet:

- Protocol commands mimicking the OSD, see Section 11.2

- The button functions mimicking the remote controller buttons (as well as the front panel buttons), see Section 11.3

- Protocol 3000 common commands, see Section 11.4

All three tables together include all the protocol commands, but they are not identical and do not always include the same information. Some of the data may appear in one or two of the tables but not in the third table and vice versa.

The protocol 3000 communications protocol uses a data rate of 115200 baud, with no parity, 8 data bits, and 1 stop bit.

11.2 Communication Protocol: Mimicking OSD

The audio/video protocol commands define all the function numbers, their valid parameters can be used with protocol 3000.

11.2.1 Using the Communication Protocol with Protocol 3000 (the "Y" Command)

Set Command:

Type in: "Y Control_Type=0,Function,Param"
Reply: "~id=01Y Control_Type=0,Function,Param OK"

Set command example: set HDCP mode for input 1 (113) to "On"
Send: "#y 0,113,1"
Result: "~01@Y 0,113,1 OK"

Get Command:

Type in: "Y Control_Type=1,Function"

Result: "~id=01Y Control_Type=1,Function,Param"

Get command example: get HDCP mode for input 1 (113):

Send: "#y 1,113"

Result: "~01@y 1,113,1"

> You can add a **last parameter**, to be located fourth in SET or third in GET, to define a specific window.
>
> For example:
>
> Set H Sharpness value to 10 on the Program window (1): "#y 0,343,10, **1**"
>
> Get H sharpness of the Main window (**0**): "#y 1,343,**0**"

The "Y" command also supports the value increment/decrement of any command using the '+' or '-' signs as the third parameter of the "Y" command.

For example, in order to decrease the volume on input 1 (116)

Send: "#Y 0,116,-,1<CR>"

Reply: "~01@Y 0,116,-,1 OK"

Note that if the value after the decrease is out of range, the reply will show an error such as:"~01@Y ERR -03"

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

11.2.2 Protocol Table: Mimicking OSD

You can associate a function number to its description and valid parameters intuitively by navigating the OSD menu according to the following logic:
A function number is directly related to its location in the OSD menu.
For example, the second menu on the OSD is Layout (2 in the hundreds). The third menu item in Layout is Overlay Settings (2 in the tens), therefore the function number for it will be 230 (2nd item on the Main menu and the 3rd item in the Layout submenu (see also Section 6.1). When navigating in the OSD MENU you will be able to see the Overlay Settings valid parameters.

Note that for the Inputs, menu levels 3, 4 and 5 are valid for each input from 1 to 8. For example, Type (3rd level) item is 111 for Input 1 and 121 for Input 2, and so on. In order not to repeat the Inputs menu for each input, the function list will have an x denoting the input number from 1 to 8. For example the Type item will have 1x1 as the function number x being from 1 to 8.

The following table shows the Program function numbering.

Note that some items that appear in red on the OSD menu seem missing in the table below. These items will be enabled in future firmware and will be described in detail.

The following table defines the protocol commands:

1st Level	2nd Level	3rd Level	4th Level	5th Level	Range	Func.	Notes
Inputs	Input 1	Type	HDMI		0	1x1	
	Input 2		YUV		1		
	Input 3		VGA		2		
	Input 4		CV		3		
	Input 5	HDCP Mode	On		0	1x3	
	Input 6		Off		1		
	Input 7	Color Space	RGB		0	1x5	
	Input 8		YPbPr		1		
			Follow Input		2		
		Volume			[-20:+4]	1x6	
Layout	Display Mode	Transition			0	210	
		Overlay			1		
	Transition Settings	Speed			[1:15]	221	
		Mode	Swap		0	222	
			Follow		1		
		Effect	Cut		0	223	
			Fade		1		
			Diagonal		2		
			Wipe		3		
			Circle		4		
			Square		5		
			Diamond		6		
			Triangle		7		
			Curtain		8		
			Chessboard		9		
			Blinds		10		
		Direction	Left to Right / From Top Left / Inbound		0	224	the point of entry of the transition will be available depending on the selected effect
			Right to Left / From Bottom Left / Outbound		1		
			Up / From Top Right / Horizontal		2		

1st Level	2nd Level	3rd Level	4th Level	5th Level	Range	Func.	Notes
			Down / From Bottom Right / Vertical		3		
		Take				225	
	Overlay Settings	Single Window			0	230	
		Picture in Picture			1		
		Picture + Picture			2		
		Split			3		
		Customized Single			4		
		Customized Dual			5		
	Output	Video Resolution	NATIVE		0	241	
			640x480p60		1		
			640x480p75		2		
			800x600p50		3		
			800x600p60		4		
			800x600p75		5		
			1024x768p50		6		
			1024x768p60		7		
			1024x768p75		8		
			1280x768p50		9		
			1280x768p60		10		
			1280x800p60		11		
			1280x1024p50		12		
			1280x1024p60		13		
			1280x1024p75		14		
			1360x768p60		15		
			1366x768p50		16		
			1366x768p60		17		
			1400x1050p50		18		
			1400x1050p60		19		
			1600x900p60		20		
			1600x1200p50		21		
			1600x1200p60		22		
			1680x1050p60		23		
			1920x1200p60RB		24		
			480p60		25		
			576p50		26		
			720p50		27		
			720p59_94		28		
			720p60		29		
			1080p23_976		30		
			1080p24		31		
			1080p25,		32		
			1080p29_97		33		
			1080p30		34		
			1080p50		35		
			1080p59_94		36		

1st Level	2nd Level	3rd Level	4th Level	5th Level	Range	Func.	Notes
			1080p60		37		
			1080i50		38		
			1080i60		39		
			2k50		40		
			2k60		41		
			4k2k30		42		
		Master Connection	Program		0	242	
			Preview		1		
		Color Space	RGB		0	244	
			YPbPr422		1		
			YPbPr444		2		
		HDCP Mode	Follow Output		0	245	
			Follow Input		1		

The Program and the Preview menus are identical therefore one table is shown for both. The only difference would be in the function number: Program functions start with a 3 and Preview functions start with a 4. For example, Aspect ratio is 321 for the Program aspect ratio and 421 for the Preview aspect ratio.

1st Level	2nd Level	3rd Level	4th Level	5th Level	Range	Func.	Notes
Program(3xx) / Preview(4xx)	Source	Input 1			[1:8]	310	
		Input 2					
		Input 3					
		Input 4					
		Input 5					
		Input 6					
		Input 7					
		Input 8					
	Scaling	Aspect Ratio	Follow Input		0	321	
			Follow Output		1		
			Best Fit		2		
			Letterbox		3		
		Overscan	Follow Input		0	322	
			Off		1		
			5%		2		
			10%		3		
		Ratio Shift mode	Auto		0	323	
		H Image Shift			[-50:+1023]	325	The value range is dynamic, FW prevents exceeding of boundaries
		V Image Shift			[-10:+1023]	326	
	Picture	Brightness			[-512:+512]	341	
		Contrast			[10:160]	342	
		H Sharpness			[-10:+10]	343	
		V Sharpness			[-10:+10]	344	

1st Level	2nd Level	3rd Level	4th Level	5th Level	Range	Func.	Notes
	Color	Chroma			[0:400]	351	
		Hue			[-180:+180]	352	
		Color Temperature	6500k		0	353	
			9300k		1		
		Gamma Mode	Gamma Off		0	354	
			Gamma 0.4		1		
			Gamma 0.8		2		
			Gamma 1.2		3		
			Gamma 1.6		4		
			Gamma 2.0		5		
			Gamma 2.4		6		
			Gamma 2.8		7		
		Color Correction	Blue		[0:4]	355	
			Green		[0:4]	356	
			Flesh		[0:4]	357	
	De-interlacing	Film Mode	Off		0	361	
			Follow Input		1		
			24PsF Mode		2		
		PD Time			[0:15]	362	
		Motion Detection Sensitivity	LEVEL1-5		[0:4]	363	
		Diagonal Correction			[0:3]	364	
	Noise Reduction	Horizontal NR			[0:3]	371	
		Vertical NR			[0:3]	372	
		Temporal NR			[0:3]	373	
		Block NR			[0:3]	374	
		Mosquito NR			[0:3]	375	
		Combing NR			[0:3]	376	
		Pause	Freeze	On / Off	[0:1]	3831	
			Blank	On / Off	[0:1]	3832	
			Mute	On / Off	[0:1]	3833	
		Test Pattern	Off		0	385	
			Slide Bar		1		
			Color Bar		2		
		No Signal	Gray		0	386	
			Blue		1		
			Black		2		
		Auto Switching				387	
	Audio	Source	AFV		0	391	
			[1-8]		[1-8]		
		AFV Source	Embedded		0	392	
			Analog		1		
		Output Volume			[-80:+20]	393	
		Bass			[-18:+18]	394	
		Mid			[-18:+18]	395	
		Treble			[-18:+18]	396	

1st Level	2nd Level	3rd Level	4th Level	5th Level	Range	Func.	Notes
		Balance			[-10:+10]	397	
		Lip Sync			[0:90]	398	
Misc	Information	Program/ Preview	NTSC		0	511/ 512	READ ONLY: In the OSD MENU - Input, Output video formats & FW version.

In the protocol – Get command returns the Input video format only |
			PALM		1		
			PAL60		2		
			N443		3		
			NTSC_4		4		
			SECAM		5		
			PAL		6		
			PALNC		7		
			NTSC_8		8		
			N\A		9		
			N\A		10		
			N\A		11		
			N\A		12		
			N\A		13		
			525p60		14		
			625p50		15		
			720p60		16		
			720p50		17		
			720p24		18		
			720p25		19		
			720p30		20		
			1080i60		21		
			1080i50		22		
			N\A		23		
			1080i100		24		
			1080p60		25		
			1080p50		26		
			1080p30		27		
			1080p23_976		28		
			1080p24		29		
			1080p25		30		
			2k50		31		
			2k60		32		
			640X480@60		33		
			N\A		34		
			N\A		35		
			N\A		36		
			640x480@72		37		
			640x480@75		38		
			848x480@60		39		
			640x480@85		40		
			N\A		41		
			800x600@56		42		
			800x600@60		43		
			N\A		44		

1st Level	2nd Level	3rd Level	4th Level	5th Level	Range	Func.	Notes
			800x600@72		45		
			800x600@75		46		
			800x600@85		47		
			1024x768@60		48		
			1360x768@60		49		
			1280x768@60		50		
			1024x768@70		51		
			1024x768@75		52		
			1280x800@60		53		
			1024x768@85		54		
			1400x1050@60		55		
			1400x1050@75		56		
			1440x900@60		57		
			1152x864@75		58		
			1600x900@60		59		
			1280x1024@60		60		
			1280x1024@75		61		
			1280x960@85		62		
			1920x1200@60RB		63		
			1280x1024@85		64		
			1600x1200@60		65		
			1680x1050@60		66		
			NONE		0XF5 or 0XFF		
		Preview				512	
		FW Versions				513	
		Network				514	
	OSD	H Position			[0:2047]	521	The value range is dynamic, FW prevents exceeding of boundaries
		V Position			[0:2047]	522	
		Transparent	On / Off		[0:1]	523	
		Gain			[1:4]	524	
		Bias			[-128:+127]	525	
		Timeout	Off		0	526	
			30 Sec		1		
			60 Sec		2		
	Keying	Chroma Keying Red			[0:240]	531	In steps of 16
		Chroma Keying Green			[0:240]	532	
		Chroma Keying Blue			[0:240]	533	
		Chroma Keying	On / Off		[0:1]	534	
		Luma Keying	On / Off		[0:1]	535	
	FW Upgrade	Upgrade				541	
		Rollback				542	

1st Level	2nd Level	3rd Level	4th Level	5th Level	Range	Func.	Notes
	Factory Reset	Including ETH				561	
		Excluding ETH				562	

11.3 Protocol Table: Mimicking Remote and Front Panel Buttons

The keystroke codes operate in the following way:

SET command third parameter =0,

Syntax example: "#Y 0,20,0<CR>" => MENU keystroke

GET command for keystrokes will return ERR

The following table defines the keystroke function codes:

Button	Keystroke Code	Button	Keystroke Code	Button	Keystroke Code
MENU	20	PREVIEW FREEZE	30	PROGRAM INPUT 8	40
ENTER	21	PROGRAM BLANK	31	PREVIEW INPUT 1	41
DOWN (MINUS)	22	PROGRAM FREEZE	32	PREVIEW INPUT 2	42
UP (PLUS)	23	PROGRAM INPUT 1	33	PREVIEW INPUT 3	43
LEFT	24	PROGRAM INPUT 2	34	PREVIEW INPUT 4	44
RIGHT	25	PROGRAM INPUT 3	35	PREVIEW INPUT 5	45
RESET	26	PROGRAM INPUT 4	36	PREVIEW INPUT 6	46
PANEL LOCK	27	PROGRAM INPUT 5	37	PREVIEW INPUT 7	47
MODE	28	PROGRAM INPUT 6	38	PREVIEW INPUT 8	48
PREVIEW BLANK	29	PROGRAM INPUT 7	39		

11.4 The Protocol 3000 Common Operation Commands

The following table lists the protocol 3000 commands:

Operation commands		
Command	**Syntax**	**Response**
Lock front panel	*MODE-LOCK* **FP-LOCK**	**LOCK-FP** *LOCK-MODE RESULT*
Get front panel locking state	**?FP-LOCK**	*MODE-LOCK* **FP-LOCK**
Parameters Description: LOCK-MODE = Front panel locking state: "0" or "off" to unlock front panel buttons. "1" or "on" to lock front panel buttons.		
Power state	*MODE-POWER* **POWER**	*MODE -POWER* **POWER** *RESULT*
Get power state	**?POWER**	*MODE-POWER* **POWER**
Parameters Description: POWER-MODE = power state: "0" or "off" to enter standby mode. "1" or "on" to power up.		
Restart device	**RESET**	**RESET OK**

Usually the firmware will upload to the device via a command such as LDFW A device reset may be needed to complete the process		
Reset configuration to factory default	**FACTORY**	**FACTORY** *RESULT*
Output volume	**VOLUME** *VOLUME-PARAMETER*	**VOLUME** *VOLUME-PARAMETER RESULT*
Get output volume	**VOLUME?**	**VOLUME** *VOLUME-VALUE*
Parameters Description:		
Identification commands		
Command	**Syntax**	**Response**
Protocol Handshaking	**#CR**	**~OK CRLF**
Read device model	**MODEL?**	**MODEL** MACHINE_MODEL
Read device serial number	**SN?**	**SN** SERIAL_NUMBER
Read device firmware version	**VERSION?**	**VERSION** MAJOR **.**MINOR **.**BUILD **.**REVISION
Read device build date	**BUILD-DATE?**	**BUILD-DATE** YYYY/MM/DD HH:MM:SS
Read device protocol version	**PROT-VER?**	**PROT-VER** 3000:*MAJOR* **.***MINOR*
Set machine name	**NAME** *MACHINE_NAME*	**NAME** MACHINE_NAME RESULT
Read machine name	**NAME?**	**NAME** MACHINE_NAME

Network settings commands		
Network settings commands require admin authorization		
Command	**Syntax**	**Response**
Set IP Address	**NET-IP** *IP_ADDRESS*	**NET-IP** IP_ADDRESS RESULT
Read IP Address	**NET-IP?**	**NET-IP** IP_ADDRESS
Read MAC Address	**NET-MAC?**	**NET-MAC** MAC_ADDRESS
Set subnet mask	**NET-MASK** *SUBNET_MASK*	**NET-MASK** SUBNET_MASK RESULT
Read subnet mask	**NET-MASK?**	**NET-MASK** *SUBNET_MASK*
Set gateway address	**NET-GATE** *GATEWAY*_ADDRESS	**NET-GATE** GATEWAY_ADDRESS RESULT
Read subnet mask	**NET-GATE?**	**NET-GATE** GATEWAY_ADDRESS
Set DHCP mode	**NET-DHCP** *DHCP_MODE*	**NET-DHCP** DHCP_MODE RESULT
Read DHCP mode	**NET-DHCP?**	**NET-DHCP** *DHCP_MODE*
DHCP_MODE = 0 (factory default) – Don't use DHCP (Use IP set by factory or IP set command). 1 – Try to use DHCP, if unavailable use IP as above. 2– Try to use DHCP, if unavailable use AUTO-IP		
Change protocol Ethernet port	**ETH-PORT** *PROTOCOL* , *PORT*	**ETH-PORT** PROTOCOL ,PORT RESULT
Read protocol Ethernet port	**ETH-PORT?** *PROTOCOL*	**ETH-PORT** *PROTOCOL* , *PORT*
PROTOCOL = TCP / UDP **(transport layer protocol)** *PORT* = Ethernet port to enter protocol 3000 commands. 1-65535 = User defined port 0 - reset port to factory default (50000 for UDP, 5000 for TCP)		

VP-772 - The VP-772 RS-232 Communication Protocol

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