

# KRAMER



## USER MANUAL

MODEL:

**VP-445**

Presentation Switcher/Scaler



## VP-445 Quick Start Guide

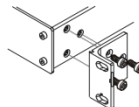
This guide helps you install and use your product for the first time. For more detailed information, go to <http://www.kramerav.com/downloads/VP-445> to download the latest manual (or scan the QR code) and check if firmware upgrades are available.

### Step 1: Check what's in the box

- ✓ The **VP-445** Presentation Switcher/Scaler
- ✓ 1 Set of rack ears
- ✓ 4 Rubber feet
- ✓ 1 Power cord
- ✓ IR remote control transmitter with batteries
- ✓ 1 Quick start guide

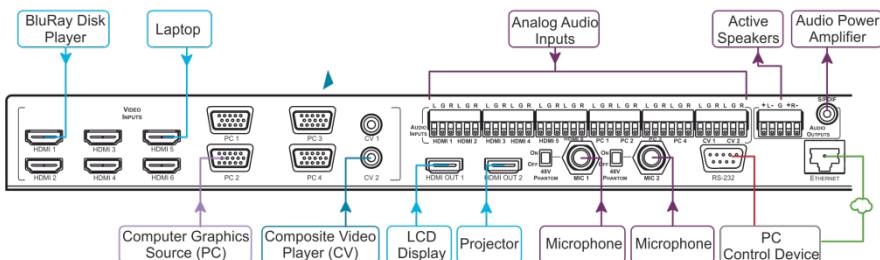
### Step 2: Install the VP-445

To rack mount the machine attach both ear brackets to the machine (by removing the three screws from each side of the machine and replacing those screws through the ear brackets) or place the machine on a table.



### Step 3: Connect inputs and outputs

Always switch OFF the power on each device before connecting it to your **VP-445**.  
For best results, we recommend that you always use Kramer high-performance cables to connect AV equipment to the **VP-445**.



#### RJ-45 Pinout

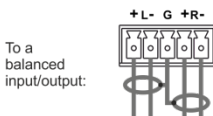
For the Ethernet connector, see the proper wiring diagram below



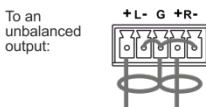
EIA / TIA 568B	
PIN	Wire Color
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown

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:



To a balanced input/output:



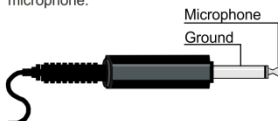
To an unbalanced output:

#### The Microphone Pinout:

For a condenser microphone:



For a dynamic microphone:



## Step 4: Connect the power

Connect AC power to the rear of the **VP-445**, 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. 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, is connected to the **VP-445**, and that the **VP-445** is selected as its source. 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.

Mode	Function
OUTPUT:	Select the source, the image size, the resolution
PICTURE:	Set the contrast, brightness, shade, hue, saturation and sharpness. Select the noise reduction level and fine-tune the VGA settings
AUDIO:	Set the input volume for each input, set the output volume, select the audio delay time, the audio source for each HDMI input and the mute options. Set the MIC mixer and volume, and set noise mute to on or off.
ADVANCED:	Set HDCP on the input and output, set auto sync off, set the OSD parameters, mute follow freeze and mute button function. Set the auto switching mode and priority. Set the Ethernet parameters and lock modes
FACTORY RESET	Reset the machine to its factory default settings
INFORMATION	Display the device information

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

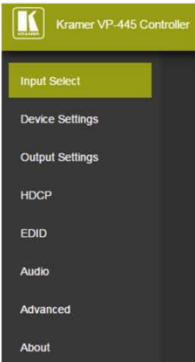
### IR Remote Controller:



### RS-232 and Ethernet:

RS-232	
Baud Rate:	9,600
Data Bits:	8
Stop Bits:	1
Parity:	None
Ethernet	
To reset the IP settings to the factory reset values go to: Menu-> Factory-> RESET->Change the option to YES and press Enter	
IP Address:	192.168.1.39
Subnet mask:	255.255.255.0
Default gateway:	192.168.1.254
TCP Port #:	Not supported
Default UDP Port #:	50000
Maximum UDP Ports:	4
Full Factory Reset	
OSD	Go to: Menu-> Factory-> RESET->Change the option to YES and press Enter
RS-232/Ethernet (UDP) Command Protocol	
Command Format:	ASCII protocol 3000
Example (Route the video HDMI3 input to the output ports):	
#ROUTE 12,1,2<cr>	

### Embedded Web Page:



# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Getting Started</b>	<b>2</b>
2.1	Achieving the Best Performance	2
2.2	Safety Instructions	3
2.3	Recycling Kramer Products	3
<b>3</b>	<b>Overview</b>	<b>4</b>
3.1	Defining the VP-445 Presentation Switcher/Scaler	5
<b>4</b>	<b>Installing in a Rack</b>	<b>8</b>
<b>5</b>	<b>Connecting the VP-445</b>	<b>9</b>
5.1	Connecting the Balanced Stereo Audio Output	11
5.2	Microphone Pinout	11
<b>6</b>	<b>Controlling the VP-445</b>	<b>12</b>
6.1	Controlling via the Front Panel Buttons	12
6.2	Using the OSD Menu	12
6.3	Connecting to the VP-445 via RS-232	16
6.4	Operating via Ethernet	16
6.5	Using the Infrared Remote Control Transmitter	20
<b>7</b>	<b>Using the Embedded Web Pages</b>	<b>21</b>
7.1	Browsing the VP-445 Web Pages	21
7.2	Input Select Page	22
7.3	Device Settings Page	25
7.4	Output Settings Page	27
7.5	HDCP Page	28
7.6	EDID Page	29
7.7	Audio Page	32
7.8	Advanced Page	33
7.9	About Page	33
<b>8</b>	<b>Technical Specifications</b>	<b>34</b>
8.1	Default Communication Parameters	35
8.2	Input Resolutions	35
<b>9</b>	<b>The RS-232/Ethernet (UDP) Communication Protocol</b>	<b>36</b>
9.1	Understanding Protocol 3000	37
9.2	Kramer Protocol 3000 Syntax	39
9.3	Protocol 3000 Commands	40
9.4	Kramer Protocol 3000 –Command Keys	60

## Figures

Figure 1: VP-445 Presentation Switcher/Scaler Front Panel	6
Figure 2: VP-445 Presentation Switcher/Scaler Rear Panel	7
Figure 3: Connecting the VP-445 Presentation Switcher / Scaler	10
Figure 4: Connecting the Balanced Stereo Audio Output	11
Figure 5: Connecting an Unbalanced Stereo Audio Acceptor to the Balanced Output	11
Figure 6: Condenser Microphone Pinout	11
Figure 7: Dynamic Microphone Pinout	11
Figure 8: Talkover Mode	14
Figure 9: Local Area Connection Properties Window	17

Figure 10: Internet Protocol Version 4 Properties Window	18
Figure 11: Internet Protocol Version 6 Properties Window	18
Figure 12: Internet Protocol Properties Window	19
Figure 13: Infrared Remote Control Transmitter	20
Figure 14: Input Select Page	22
Figure 15: VP-445 Standby Mode	23
Figure 16: HDMI Input Edit Window	23
Figure 17: PC and CV Input Edit Window	24
Figure 18: Device Settings Page	25
Figure 19: Device Settings Page – Static IP Confirmation.	25
Figure 20: Device Settings Page – Uploading the New Firmware File	26
Figure 21: Device Settings Page – Uploading Process	26
Figure 22: Device Settings Page – New Firmware Updated	27
Figure 23: Output Settings Page	27
Figure 24: HDCP Page	28
Figure 25: EDID Page	29
Figure 26: EDID Page – Copying a Selected Input Resolution	30
Figure 27: EDID Page – Copying EDID Results	30
Figure 28: EDID Page – Copying EDID from an Output	31
Figure 29: Audio Page	32
Figure 30: Advanced Page	33
Figure 31: About Page	33

---

# 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-445** Presentation Switcher/Scaler. This product, which incorporates HDMI™ technology, is ideal for:

- Projection systems in conference rooms, boardrooms, hotels and churches.
- 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.kramerav.com/downloads/VP-445> 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 neighbouring electrical appliances that may adversely influence signal quality.
- Position your Kramer **VP-445** 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 **VP-445** is a high-performance presentation scaler/switcher for HDMI, computer graphics and composite video signals. The unit scales the video, embeds the audio, and outputs the signal to two HDMI (with embedded audio) outputs (with S/PDIF and balanced stereo audio) simultaneously.

The **VP-445** features:

- PixPerfect™ scaling technology – Kramer's precision pixel mapping and high quality scaling technology. High-quality 3:2 and 2:2 pull down de-interlacing and full up and down scaling of all video input signals.
- HDTV compatibility
- HDCP compliance – The HDCP (High Definition Content Protection) license agreement allows copy-protected data on the HDMI input to pass only to the HDMI outputs.
- 12 video inputs – 6 HDMI on HDMI connectors, 4 computer graphics video on 15-pin HD connectors and 2 composite video on RCA connectors.
- Two HDMI scaled outputs (mirrored)
- Up to UXGA/1080p output resolutions
- Two microphone inputs that can be used by mixing, switching or talk-over.
- Companion AFV (Audio-Follow-Video) – stereo audio for every input (on terminal blocks).
- 12 unbalanced stereo inputs on terminal blocks as well as embedded audio for the HDMI inputs, each with individual level controls.
- Audio outputs – one S/PDIF on an RCA connector, one balanced stereo audio on a terminal block as well as embedded audio on the HDMI outputs.
- Multiple aspect ratio selections - full, best fit, over scan, under scan, letter box and pan scan.
- Powerful audio features via DSP technology including audio equalization, mixing, delay and so on.
- Built-in ProcAmp – color, hue, sharpness, noise, contrast and brightness.

- Supports 4:4:4 (RGB and YUV) as well as 4:4:2 (YUV) color sampling.
- Maintains constant output sync – there is no disruption on the output while switching between inputs and when no video is detected.
- Front panel control – audio mute and freeze frame
- Front panel lockout
- Non-volatile memory – saves final settings

Control your **VP-445**:

- 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 with OSD (on-screen display).
- Via the Ethernet with built-in Web pages
- Via ETH using UDP

The **VP-445** is housed in a 19" 1U rack mountable enclosure, with rack "ears" included, and is fed from a 100-240 VAC universal switching power supply.

### 3.1 Defining the VP-445 Presentation Switcher/Scaler

This section defines the **VP-445**.

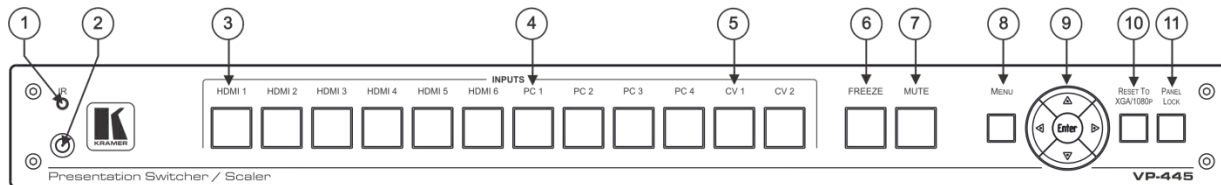


Figure 1: VP-445 Presentation Switcher/Scaler Front Panel

#	Feature	Function
1	IR LED	Lights when the unit accepts IR remote commands
2	IR Receiver	Receives signals from the remote control transmitter
3	INPUT Selector Buttons	HDMI Press to select the HDMI input (from 1 to 6)
4		PC Press to select the computer graphics input (from 1 to 4)
5		CV Press to select the composite video input (from 1 to 2)
6	FREEZE Button	Press to freeze/unfreeze the output video image; audio can be programmed to MUTE when freezing the video (see <a href="#">Section 6.2.1</a> )
7	MUTE Button	Press to toggle between muting (blocking out the sound) and enabling the audio output
8	MENU Button	Displays the OSD menu (see <a href="#">Section 6.2</a> )
9	Navigation Buttons	◀ Press to decrease numerical values or select from several definitions When not within the OSD menu mode, press to decrease the output volume
		▲ Press to move up the menu list values (see <a href="#">Section 6.2</a> )
		▶ Press to increase numerical values or select from several definitions When not within the OSD menu mode, press to increase the output volume
		▼ Press to move down the menu list (see <a href="#">Section 6.2</a> )
		ENTER Press to accept changes and change the SETUP parameters (see <a href="#">Section 6.2</a> )
10	RESET TO XGA/1080p Button	Press to reset the video resolution to XGA or 1080p Press and hold for about 5 seconds to toggle between switching to XGA or 1080p
11	PANEL LOCK Button	Press and hold for about 5 seconds to lock/unlock the front panel buttons

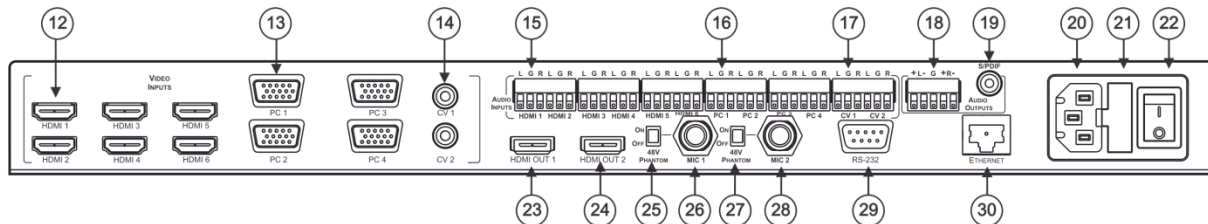


Figure 2: VP-445 Presentation Switcher/Scaler Rear Panel

#	Feature		Function
12	VIDEO INPUT Connectors	HDMI	Connects to an HDMI source (from 1 to 6)
13		PC 15-pin HD	Connects to a computer graphics source (from 1 to 4)
14		CV RCA	Connects to a composite video source (from 1 to 2)
15	AUDIO INPUT Unbalanced Stereo Terminal Blocks	HDMI	Connects to an analog audio HDMI source (from 1 to 6)
16		PC	Connects to an analog audio computer graphics source (from 1 to 4)
17		CV	Connects to an analog audio composite video source (from 1 to 2)
18	AUDIO OUTPUTS	Balanced Stereo Terminal Block	Connects to a balanced stereo analog audio acceptor
19		S/PDIF 3.5 Mini Jack Connector	Connects to a digital audio acceptor
20	Mains Socket		Connect the mains power cord
21	Mains Fuse Holder		Fuse for protecting the device
22	Power Switch		Switch for turning the unit ON or OFF
23	HDMI OUT 1		Connect to the HDMI acceptor 1
24	HDMI OUT 2		Connect to the HDMI acceptor 2
25	COND / DYN Switch for MIC 1		Move up to select a condenser type microphone; down to select a dynamic type microphone
26	MIC 1 6mm Jack		Connect to the microphone source 1
27	COND / DYN Switch for MIC 2		Move up to select a condenser type microphone; down to select a dynamic type microphone
28	MIC 2 6mm Jack		Connect to the microphone source 2
29	RS-232 9-pin D-sub Port		Connect to the PC or the remote controller
30	ETHERNET Connector		Connects to the PC or other Serial Controller through computer networking

## 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



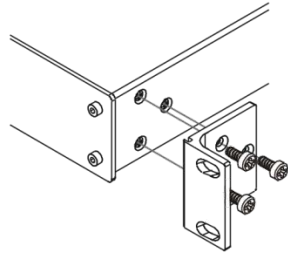
### CAUTION!

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-445



Always switch off the power to each device before connecting it to your **VP-445**. After connecting your **VP-445**, connect its power and then switch on the power to each device.



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

To connect the **VP-445**, as illustrated in the example in [Figure 3](#), do the following:

1. Connect an HDMI source (for example, a BluRay disk player) to the HDMI VIDEO INPUT connector (from 1 to 6).  
Alternatively, you can connect the DVI connector on the DVD player to the HDMI connector on the **VP-445** 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 (from 1 to 4).
3. Connect a composite video source to the CV 1 RCA connector (from 1 to 2).
4. Connect the audio input signals to the AUDIO IN terminal block connectors, as required (not shown in [Figure 3](#)).
5. If required, connect a microphone to the MIC 1 6mm jack (from 1 to 2) and set the phantom power (48V) on or off.
6. Connect the HDMI OUT 1 connector to an HDMI acceptor (for example, an LCD display), from 1 to 2.
7. Connect the audio output signals to the OUT stereo analog audio acceptor and/or the digital audio acceptor, as required (not shown in [Figure 3](#)).
8. Connect the power cord (not shown in [Figure 3](#)).

9. If required, connect:

- A PC via RS-232, see [Section 6.3](#)
- The ETHERNET port, see [Section 6.4](#)

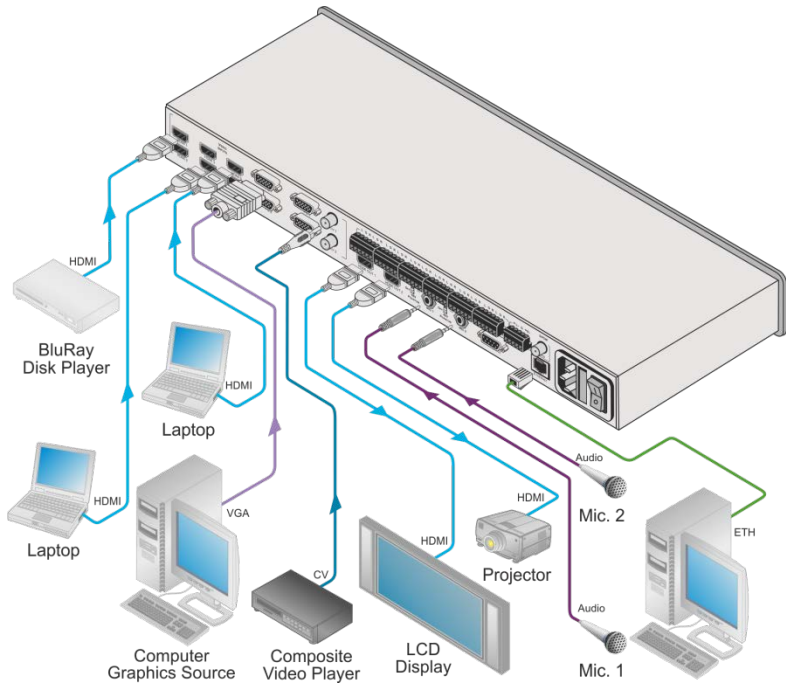


Figure 3: Connecting the VP-445 Presentation Switcher / Scaler

5.1 Connecting the Balanced Stereo Audio Output

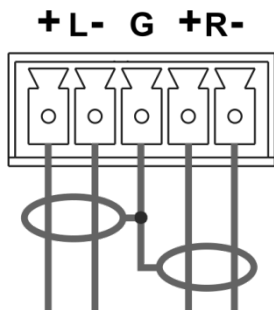


Figure 4: Connecting the Balanced Stereo Audio Output

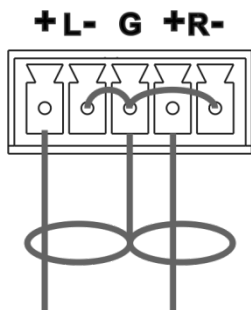


Figure 5: Connecting an Unbalanced Stereo Audio Acceptor to the Balanced Output

5.2 Microphone Pinout

The microphone 6mm jack pinout for a condenser microphone.

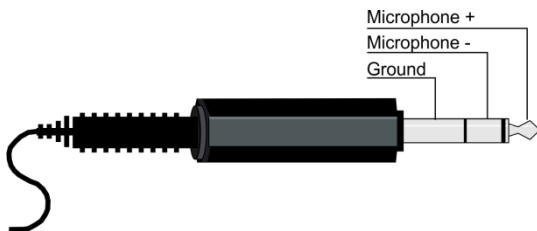


Figure 6: Condenser Microphone Pinout

The microphone 6mm jack pinout for a dynamic microphone.

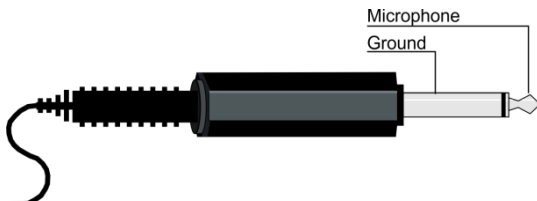


Figure 7: Dynamic Microphone Pinout



---

## 6 Controlling the VP-445

The **VP-445** 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 Ethernet (see [Section 6.4](#))
- The infrared remote control transmitter (see [Section 6.5](#))

### 6.1 Controlling via the Front Panel Buttons

The **VP-445** includes the following front panel buttons:

- Input selector buttons for selecting the required input: HDMI (1 to 6), PC (1 and 4) and CV (1 to 2)
- MUTE and FREEZE buttons
- MENU, ENTER, and up, down, left and right arrow buttons
- RESET TO XGA/1080p and PANEL LOCK buttons

#### 6.1.1 The Auto Adjust Feature

The auto adjust feature is implemented every time the input is switched to VGA or when the input resolution changes, via the FINETUNE menu (see [Section 6.2.1](#)).

### 6.2 Using the OSD Menu

The control buttons let you control the **VP-445** 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

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

## 6.2.1 MAIN MENU

Mode	Function			
OUTPUT				
SOURCE:	Select the input: HDMI 1(default), HDMI 2, HDMI 3, HDMI 4, HDMI 5, HDMI 6, PC1, PC2, PC3, PC4, CV1 or CV2			
SIZE:	Select the image size: FULL, OVER SCAN, UNDER 1, UNDER 2, LETTER BOX, PANSKAN or BEST FIT (default)			
RESOLUTION:	Select the output resolution from the menu:			
	Output resolution:	Appears as:	Output resolution:	Appears as:
	Native OUT1		1680x1050 @60Hz	1680x1050 60
	Native OUT2		1600x1200 @60Hz	1600x1200 60
	640x480 @60Hz	640x480 60	1920x1080 @60Hz	1920x1080 60
	800x600 @60Hz	800x600 60	1920x1200 @60Hz	1920x1200 60
	1024x768 @60Hz	1024x768 60	480p @60Hz	720x480P 60
	1280x768 @60Hz	1280x768 60	720p @60Hz	1280x720P 60
	1360x768 @60Hz	1360x768 60	1080i @60Hz	1920x1080I 60
	1280x720 @60Hz	1280x720 60	1080p @60Hz	1920x1080P 60
	1280x800 @60Hz	1280x800 60	576p @50Hz	720x576P 50
	1280x1024 @60Hz	1280x1024 60	720p @50Hz	1280x720P 50
	1440x900 @60Hz	1440x900 60	1080i @50Hz	1920x1080I 50
	1400x1050 @60Hz	1400x1050 60	1080p @50Hz	1920x1080P 50
	NATIVE - Select NATIVE to select the output resolution from the EDID of the connected HDMI monitor			
PICTURE				
CONTRAST:	Set the contrast (the range and default values vary according to the input signal)			
BRIGHTNESS:	Set the brightness (the range and default values vary according to the input signal)			
RED	Set the red shade			
GREEN	Set the green shade			
BLUE	Set the blue shade			
HUE	Set the color hue (not applicable for VGA inputs)			
SATURATION	Set the color saturation (not applicable for VGA inputs)			
SHARPNESS	Set the sharpness of the picture (not applicable for VGA inputs)			
NOISE REDUCTION	Select the noise reduction: OFF (default), LOW, MID (middle) and HIGH (not applicable for VGA inputs)			
FINETUNE	Enabled for VGA: AUTO ADJUST (NO/YES), H-POSITION, V-POSITION, PHASE, CLOCK (value depends on input resolution), WXGA/XGA, RESET (NO/YES)			
AUDIO				
INPUT VOLUME:	Set the volume separately for each input: HDMI 1, HDMI 2, HDMI 3, HDMI 4, HDMI 5, HDMI 6, PC1, PC2, CV1 and CV2			
OUTPUT VOLUME:	Set the output volume			
SETTINGS	Set the BASS and TREBLE values Set the delay to OFF, 40ms, 110ms or 150ms (default is OFF)			
MUTE:	Select the sound mute options: ON, OFF (default)			

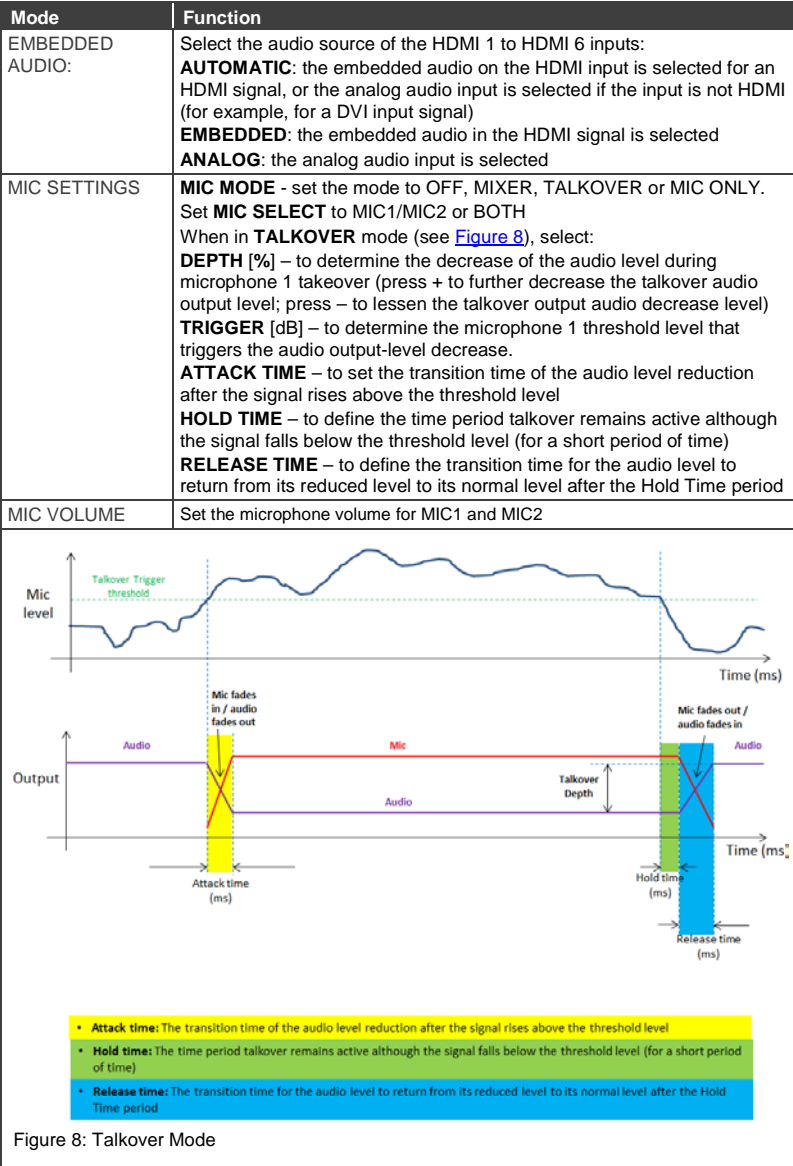


Figure 8: Talkover Mode

Mode		Function
<b>ADVANCED</b>		
HDCP ON INPUT	<p>Select the HDCP option for the HDMI input: either ON (the default) or OFF.</p> <p>Setting HDCP support to enabled (ON, default) on the HDMI input allows the source to transmit a non-HDCP signal if required (for example, when working with a Mac computer)</p>	
HDCP ON OUTPUT	<p>Set HDMI OUT1 and HDMI OUT2:</p> <p>Select FOLLOW INPUT or FOLLOW OUTPUT (FOLLOW OUTPUT) to define whether the HDCP will follow the input or the output</p> <p>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</p> <p>When FOLLOW OUTPUT is selected, the scaler matches its HDCP output to the HDCP setting of the HDMI acceptor to which it is connected</p>	
AUTO SYNC OFF	<p>Turn to OFF (default), FAST (for almost immediate shut down if no input is present – about 10 seconds) or SLOW (for shutdown after about 2 minutes). This is useful, for example, when the output is connected to a projector, and the projector automatically shuts down when it has no input</p>	
OSD	H POSITION	Set the horizontal position of the OSD
	V POSITION	Set the vertical position of the OSD
	TIMER	Set the timeout period in seconds
	TRANSPARENCY	Set the OSD background between 100 (transparent) and 0 (opaque)
	DISPLAY	<p>Select the information shown on the screen during operation:</p> <p>INFO: the information is shown for 10 seconds</p> <p>ON: the information is shown permanently</p> <p>OFF: the information is not shown</p>
MUTE FOLLOWS FREEZE	Set to ON (default) to have MUTE follow FREEZE. Otherwise set to OFF	
MUTE BUTTON DEF:	Define the MUTE button to function as MUTE, BLANK or BLANK & MUTE	
AUTO SWITCHING	MODE	<p>Set the auto switching mode to OFF (default) or AUTO SCAN.</p> <p>PRIORITY (below) is enabled when AUTO SCAN is selected</p> <p>When AUTO SCAN is selected, audio is enabled only when a video signal is detected</p>
	SCAN PRIORITY	Set to HDMI to begin scan with HDMI, PC or CV to begin scan with HDMI 1, PC1 or CV 1 respectively
ETHERNET	IP MODE	Set the IP mode to DHCP or STATIC (default)
	STATIC IP ADDRESS (when the IP MODE is STATIC, provide the following):	
	IP ADDRESS	Enter the IP address (192.168.39)
	SUBNET	Enter the subnet (255.255.0.0)
	GATEWAY	Enter the gateway (0.0.0.0)
	REMOTE PORT	Enter the remote port (1-65535)
	MAC ADDRESS	MAC address appears

Mode	Function	
LOCK MODE	ALL	Lock all the front panel buttons
	MENU ONLY	Lock the MENU (and navigation) front panel buttons only
	ALL & SAVE	Lock all the front panel buttons. The lock status is saved when the <b>VP-445</b> is powered down
	MENU ONLY & SAVE	Lock the MENU (and navigation) front panel buttons only. The lock status is saved when the <b>VP-445</b> is powered down
FACTORY RESET		
RESET	Select NO (default) or YES	
INFORMATION		
	Displays the INPUT and OUTPUT RESOLUTION, INPUT and OUTPUT HDCP, the firmware version and the IP ADDRESS	

## 6.3 Connecting to the VP-445 via RS-232

You can connect to the **VP-445** 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-445** via RS-232, connect the RS-232 9-pin D-sub rear panel port on the **VP-445** via a 9-wire straight cable (only connect pin 2 to pin 2, pin 3 to pin 3, and pin 5 to pin 5) to the RS-232 9-pin D-sub port on your PC

## 6.4 Operating via Ethernet

You can connect to the **VP-445** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see [Section 6.4.1](#))
- Via a network hub, switch, or router, using a straight-through cable (see [Section 6.4.2](#))

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

### 6.4.1 Connecting the Ethernet Port Directly to a PC

You can connect the Ethernet port of the **VP-445** directly to the Ethernet port on your PC using a crossover cable with RJ-45 connectors.



This type of connection is recommended for identifying the **VP-445** with the factory configured default IP address.

After connecting the **VP-445** 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 9](#).

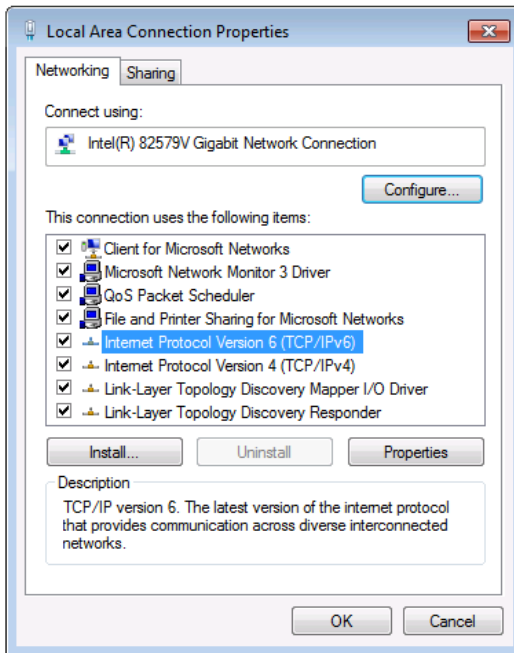


Figure 9: Local Area Connection Properties Window

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 [Figure 10](#) or [Figure 11](#).

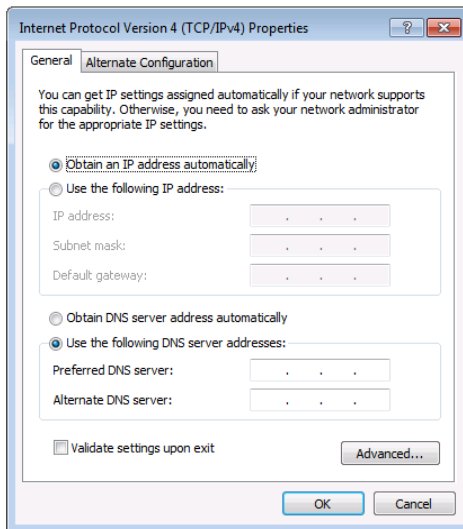


Figure 10: Internet Protocol Version 4 Properties Window

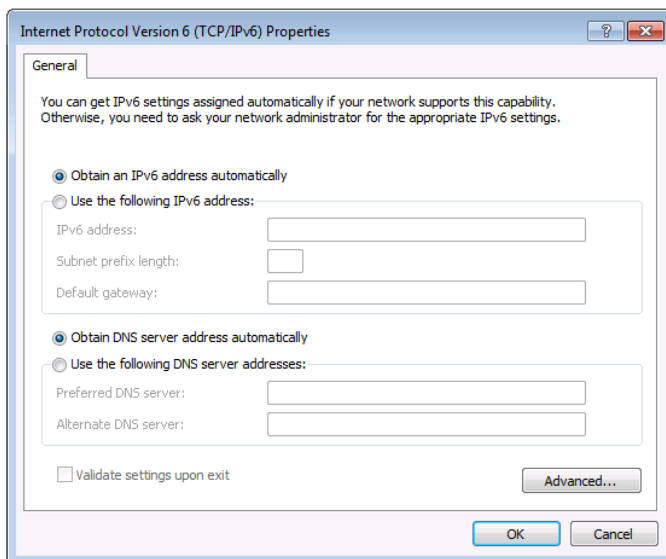


Figure 11: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and enter the details as shown in [Figure 12](#).

For TCP/IPv4 you can use any IP address between 192.168.1.1 to 192.168.1.255 (excluding 192.168.1.39) that is provided by your IT department.

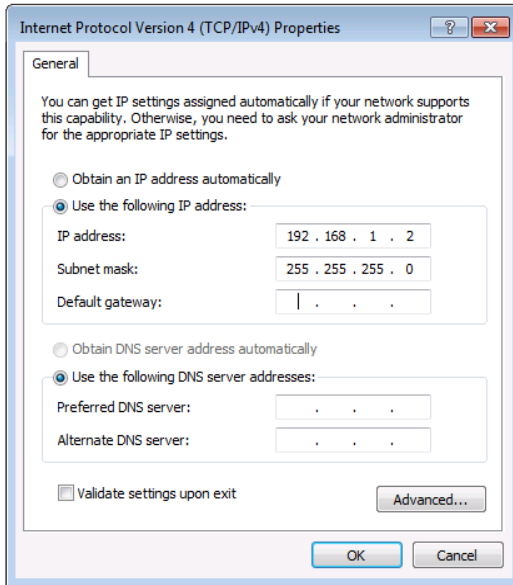


Figure 12: Internet Protocol Properties Window

7. Click **OK**.
8. Click **Close**.

#### 6.4.2 Connecting the Ethernet Port via a Network Hub or Switch

You can connect the Ethernet port of the **VP-445** to the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

#### 6.4.3 Configuring the Ethernet Port

You can set the Ethernet parameters via the embedded Web pages.



## 6.5 Using the Infrared Remote Control Transmitter

You can control the **VP-445** from the infrared remote control transmitter:




Keys	Function
POWER	Toggle the power save mode ON or OFF
HDMI	Select the HDMI input (from 1 to 6)
PC	Select the PC input (from 1 to 4)
PC2	Select the CV input (from 1 to 2)
XGA Reset	Reset the resolution to XGA
1080p Reset	Reset the resolution to 1080p
	Four navigation keys When not in the OSD, the left and right arrows also control the output volume
OK	Press to accept changes Press also to auto adjust the picture (see <a href="#">Section 6.1.1</a> )
MENU	Enter the OSD menu
EXIT	EXIT the menu
FREEZE	Freeze/unfreeze the output video image
Panel Lock	Lock/unlock the front panel buttons
MUTE	Toggle between muting (blocking out the sound) and enabling the audio output

Figure 13: Infrared Remote Control Transmitter

---

## 7 Using the Embedded Web Pages

The **VP-445** can be operated remotely using the embedded Web pages. The Web pages are accessed using a Web browser and an Ethernet connection.

Before attempting to connect:

- Perform the procedures in [Section 6.4](#).
- Ensure that your browser is supported
- The following operating systems and Web browsers are supported:

<b>Windows 7 and higher:</b>	
Chrome version 25	Internet Explorer version 9
Firefox version 19	
<b>Mac (PC) Yosemite 10 and higher:</b>	
Chrome version 51	
<b>iOS 8.0 and higher:</b>	
Chrome version 47	Safari N/A
<b>Android OS 5.0 and higher:</b>	
Chrome version 50	

### 7.1 Browsing the VP-445 Web Pages

There are eight Web pages:

- The Input Select page (see [Section 7.2](#))
- The Device Settings page (see [Section 7.3](#))
- The Output Settings page (See [Section 7.4](#))
- The HDCP page (see [Section 7.5](#))
- The EDID page (see [Section 7.6](#))
- The Audio page (see [Section 7.7](#))
- The Advanced page (see [Section 7.8](#))
- The About page (see [Section 7.9](#))

To browse the **VP-445** Web pages:

1. Open your Internet browser.
2. Type the IP address of the device in the Address bar of your browser. For example, the default IP address:



The Input Select Web page appears.



## 7.2 Input Select Page

[Figure 14](#) shows the Input Select page that is also the first Web page. The column on the left shows the Input Select page selected followed by a list of all the other available Web pages. The Video switching area lets you select an input to the outputs.

The model name, FW version and IP address appear on the lower left side of the main page. The lower part of the screen lets you save the settings and upload a saved setting.



Figure 14: Input Select Page

On the right side you can set the volume of the microphones and the output. The speaker icon  lets you mute  or unmute the audio output level.

Use the freeze icon (❄️) to freeze a selected input and the blank icon (🖼️) to display a blank screen.

Click the power icon on the top right-hand side to toggle between normal operation and standby mode. When in standby mode, the icon appears dim:



Figure 15: VP-445 Standby Mode

To edit an input button, select that button and click the edit icon (✎️). The input edit window appears:

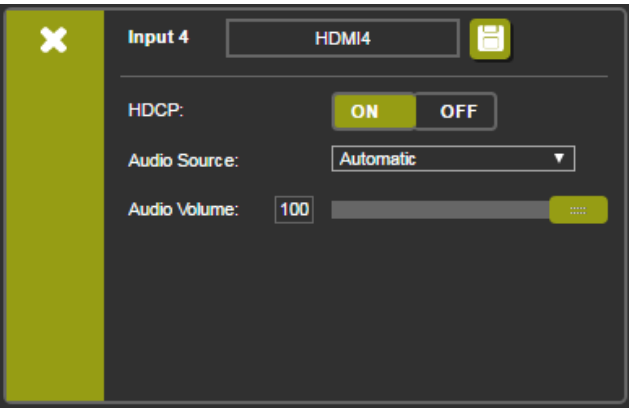


Figure 16: HDMI Input Edit Window

The input edit window lets you set the HDCP, change the name of the input as you want it to appear in the Web page (click 🖼️ to save the name), set the audio source and its volume. Click the exit icon (❌) to exit the window.

[Figure 17](#) shows the PC and CV edit window. Click the exit icon (✕) to exit the window.

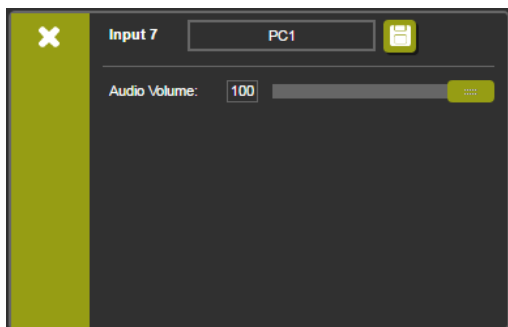


Figure 17: PC and CV Input Edit Window

### 7.3 Device Settings Page

The device Settings page ([Figure 18](#)) lets you upgrade the firmware and set the Ethernet parameters.

Device Settings

Model:

VP-445

Name:

Kramer-12345678901234

MAC Address:

00-1d-56-01-e2-51

Firmware Version:

V1.04

Firmware Update:

Choose File

No file chosen

Upgrade

☐

DHCP On

DHCP IP Address:

0 · 0 · 0 · 0

Static IP Address:

192 · 168 · 1 · 39

Gateway:

0 · 0 · 0 · 0

Subnet:

255 · 255 · 0 · 0

Control Port:

50000

Factory Reset

Set changes

Figure 18: Device Settings Page

Any change in the device settings requires confirmation, as illustrated in the example in [Figure 19](#).

192.168.1.39 says:

Are you sure you want to change Static IP Setting?

OK

Cancel

Figure 19: Device Settings Page – Static IP Confirmation.

7.3.1    **Firmware Upgrade**

To upgrade the firmware via the Device Settings page:

- 1. In the Firmware update field click the Choose File button to choose the firmware file.
- 2. Click the Upgrade button.

The new firmware is uploaded:

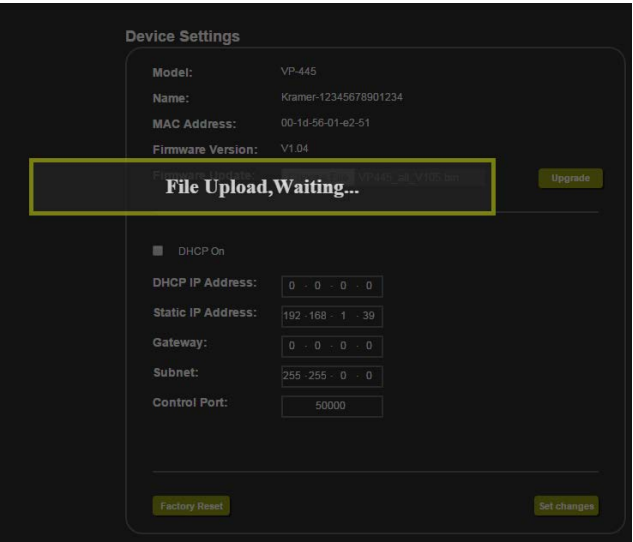


Figure 20: Device Settings Page – Uploading the New Firmware File

- 3. Once the file is uploaded follow the instructions on the Web page:

The new firmware is uploaded:

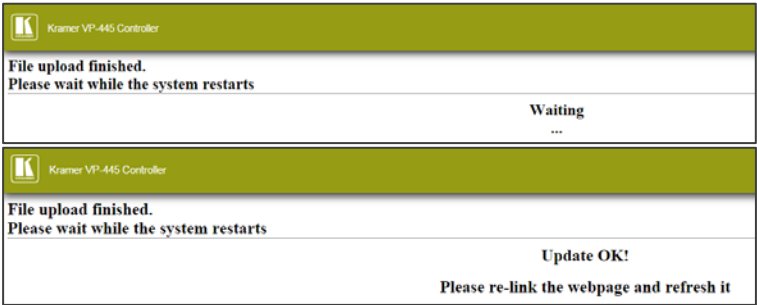


Figure 21: Device Settings Page – Uploading Process

4. After restarting the system upload the Web page once again.
5. Verify that the new version appears on the lower left corner of the Web page:

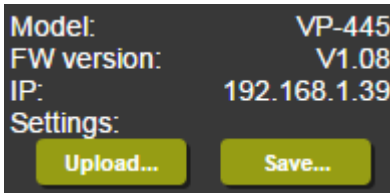


Figure 22: Device Settings Page – New Firmware Updated

## 7.4 Output Settings Page

[Figure 23](#) shows the Output Settings page:



Figure 23: Output Settings Page

The output settings include the Resolution and Size of the image, the picture settings, and the Finetune items (which are enabled for VGA inputs).



# 7.5 HDCP Page

The HDCP page lets you set the HDCP on the output (follow input or follow output) and the HDCP status for each of the HDMI inputs. [Figure 24](#) shows the HDCP page:

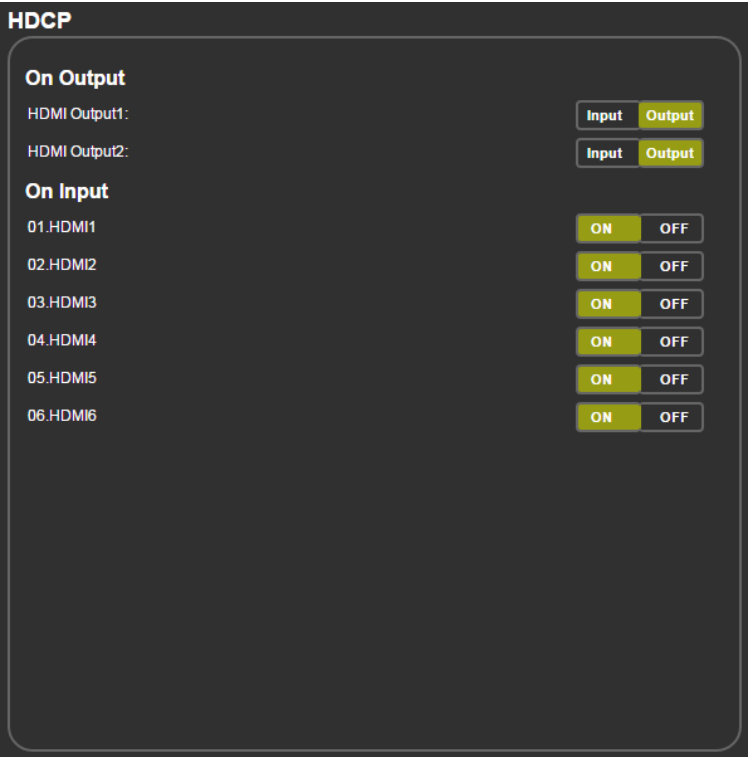


Figure 24: HDCP Page

# 7.6 EDID Page

The EDID page lets you copy a selected resolution (Native Timing) or the default resolution (HDMI or VGA) to one or more selected inputs.

EDID

Read from:

Outputs:

HDMI OUT1

HDMI OUT2

Native timing:

1024x768@60

1280x800@60

1280x1024@60

1366x768@60

1440x900@60

1400x1050@60

1600x900@60

1600x1200@60

1680x1050@60

1920x1200@60Rb

720p50

720p60

1080p50

Default:

Default-HDMI

Default-VGA

Browse...

Copy

NONE

to

NONE

Copy to:

☐ Inputs

☐ HDMI 1

☐ HDMI 2

☐ HDMI 3

☐ HDMI 4

☐ HDMI 5

☐ HDMI 6

☐ PC1

☐ PC2

☐ PC3

☐ PC4

Figure 25: EDID Page

Figure 26 shows how to select a resolution from the Native Timing list and select one or more inputs. To copy, click the **Copy** button:

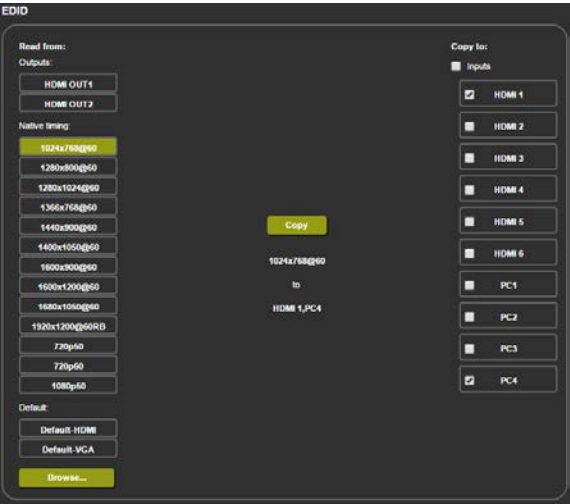


Figure 26: EDID Page – Copying a Selected Input Resolution

The EDID page displays the machine name, selected resolution, audio channels and deep color support.

After clicking **Copy**, the EDID page shows the copy EDID results:

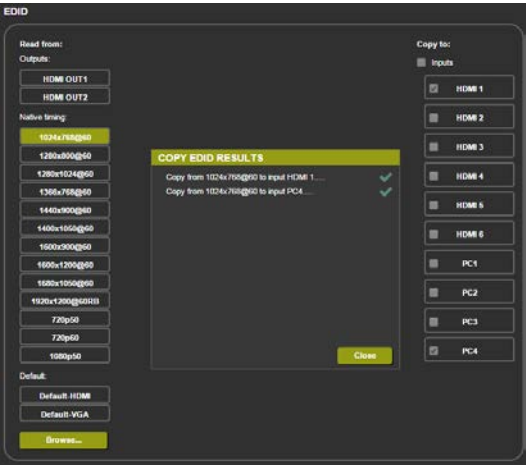


Figure 27: EDID Page – Copying EDID Results

Click Close to complete the EDID procedure.

In the same way you can read the EDID from one of the outputs. To do so, select an output and click Copy:

EDID

Read from:

Outputs:

HDMI OUT1

HDMI OUT2

Native timing:

1024x768@60

1280x800@60

1280x1024@60

1366x768@60

1440x900@60

1400x1050@60

1600x900@60

1600x1200@60

1680x1050@60

1920x1200@60Rb

720p50

720p60

1080p50

Default:

Default-HDMI

Default-VGA

Browse...

Name:

DELL P2210

Resolution:

1680x1050P59.88

Audio Channels:

Refer To Stream Header

Deep Color:

Not supported

Copy

HDMI OUT1

to

HDMI 1,HDMI 5

Copy to:

Inputs

☒

HDMI 1

☐

HDMI 2

☐

HDMI 3

☐

HDMI 4

☒

HDMI 5

☐

HDMI 6

☐

PC1

☐

PC2

☐

PC3

☐

PC4

Figure 28: EDID Page – Copying EDID from an Output

# 7.7 Audio Page

The Audio page lets you define the audio parameters for each input separately, microphone inputs (Mic 1 and Mic 2), and outputs (1 and 2 together), as illustrated in [Figure 29](#). You can set the DRC on or off as well as the bass treble and loudness.

The Audio page also enables you to set mute follow freeze and lip sync as well as the audio source (automatic, analog or embedded for the HDMI inputs) and volume level for each input.

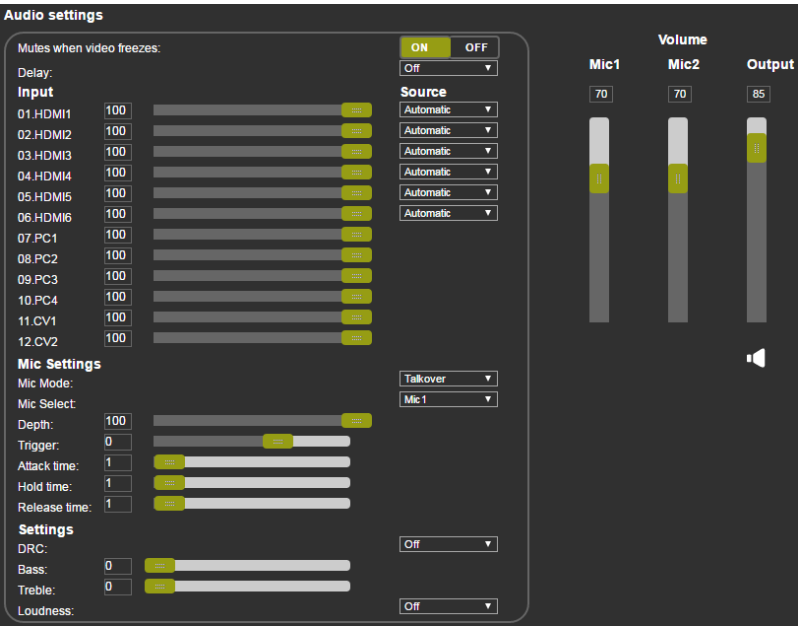


Figure 29: Audio Page

## 7.8 Advanced Page

The Advanced page lets you set the auto sync off speed (either slow or fast) or disable it (Off), set the auto switching to Off or Auto Scan, set the input priority to PC or HDMI (once the auto scan is enabled), and set the Lock Mode, see [Figure 30](#).

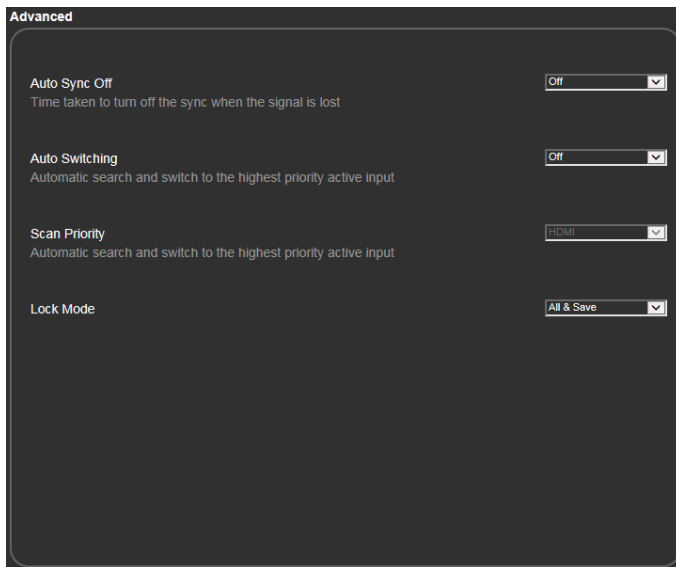


Figure 30: Advanced Page

## 7.9 About Page

The **VP-445** About page lets you view the Web page version and Kramer Electronics Ltd details.



Figure 31: About Page

## 8 Technical Specifications

INPUTS:	6 HDMI connectors (HDMI, HDCP version 1.4) 4 VGA on a 15-pin HD connector 2 CV on RCA connectors Unbalanced stereo audio on 12 3-pin terminal block connectors 2 Mic on 6mm jack connectors (with selectable 48V phantom power)
OUTPUTS:	2 HDMI connectors (HDMI, HDCP version 1.4) 1 S/PDIF on an RCA connector Balanced stereo audio on a 5-pin terminal block connector
BANDWIDTH:	Up to 1080p, UXGA
SWITCHING TIME BETWEEN INPUTS:	2 to 3 seconds
VIDEO LATENCY:	Less than 2 frames
OUTPUT RESOLUTIONS:	Native, 640x480 @60Hz, 800x600 @60Hz, 1024x768 @60Hz, 1280x768 @60Hz, 1360x768 @60Hz, 1280x720 @60Hz, 1280x800 @60Hz, 1280x1024 @60Hz, 1440x900 @60Hz, 1400x1050 @60Hz, 1680x1050 @60Hz, 1600x1200 @60Hz, 1920x1080 @60Hz, 1920x1200 @60Hz, 480p @60Hz, 720p @60Hz, 1080i @60Hz, 1080p @60Hz, 576p @50Hz, 720p @50Hz, 1080i @50Hz, 1080p @50Hz
CONTROLS	HDMI 1 to HDMI 6, PC 1 to PC 4 and CV 1 to CV 2 input selector buttons; Freeze, mute buttons; Menu and navigation buttons, Reset to XGA/1080p and lock buttons, RS-232, IR, Ethernet (OSD and Web pages)
POWER CONSUMPTION:	100-240V AC, 30VA 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:	19" x 7" x 1U (W, D, H) rack mountable
WEIGHT:	1.8kg (4lbs) approx.
INCLUDED ACCESSORIES:	Power cord, rack ears, IR remote control
Specifications are subject to change without notice at <a href="http://www.kramerav.com">http://www.kramerav.com</a>	

## 8.1 Default Communication Parameters

RS-232	
Baud Rate:	9,600
Data Bits:	8
Stop Bits:	1
Parity:	None
Ethernet	
To reset the IP settings to the factory reset values go to: Menu-> Factory-> RESET->Change the option to YES and press Enter	
IP Address:	192.168.1.39
Subnet mask:	255.255.255.0
Default gateway:	192.168.1.254
TCP Port #:	Not supported
Default UDP Port #:	50000
Maximum UDP Ports:	4
Full Factory Reset	
OSD	Go to: Menu-> Factory-> RESET->Change the option to YES and press Enter
RS-232/Ethernet (UDP) Command Protocol	
Command Format:	ASCII protocol 3000
Example (Route the video HDMI3 input to the output ports):	#ROUTE 12,1,2<cr>

## 8.2 Input Resolutions

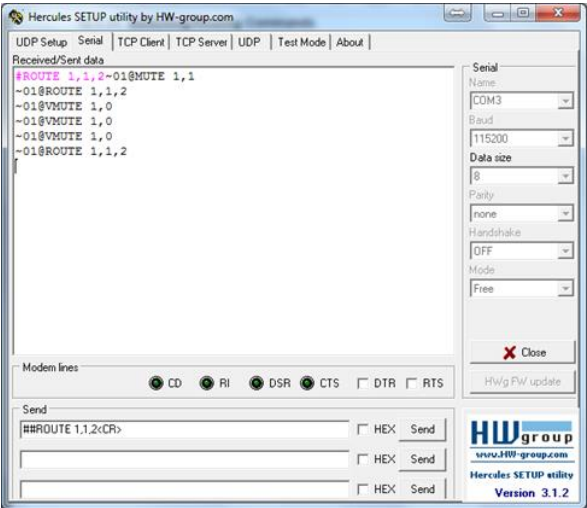
Resolution/Refresh Rate	Composite	PC	HDMI
480I/576I	Yes		
480P/576P			Yes
720P@ (50/60)			Yes
1080I@ (50/60)			Yes
1080P@ (50/60)			Yes
1080P@ (24/25/30)			Yes
VGA@ (60/67/72/75/85)			Yes
SVGA@ (56/60/72/75)		Yes	Yes
XGA@ (60/70/75)		Yes	Yes
SXGA@ (60/75)		Yes	Yes
1280X960@60		Yes	Yes
1280x720@60			Yes
1920X1080@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
1600X900@60 RB		Yes	Yes
WSXGA@60 RB(1680x1050 RB)		Yes	Yes




# 9      The RS-232/Ethernet (UDP) Communication Protocol

The **VP-445** Presentation Switcher/Scaler can be operated using the Kramer Protocol 3000 serial commands. The command framing varies according to how you interface with the **VP-445**. In the following example, a basic video input switching command that routes a layer 1 video signal to HDBT out 1 from HDMI input 2 (ROUTE 1,1,2), is entered as follows:

- Terminal communication software, such as Hercules:



 The framing of the command varies according to the terminal communication software. This command is used for demonstration purposes only and its syntax may vary per device.

- K-Touch Builder (Kramer software):

'Device Code (17)' PROPERTIES	
name	Device Code (17)
data	#ROUTE 1,1,2x0D

- K-Config (Kramer configuration software):

**Command Syntax**
Display Command as
☐ Hex
☐ Decimal
☒ ASCII

"#ROUTE 1,1,2",0x0D
Set
Clear



All the examples provided in this section are based on using the Kramer K-Config software.

You can enter commands directly using terminal communication software (e.g., Hercules) by connecting a PC to the serial or Ethernet port on the **VP-445**. To enter `CR` press the Enter key (`LF` is also sent but is ignored by the command parser).

Commands sent from various non-Kramer controllers (e.g., Crestron) may require special coding for some characters (such as, /x##). For more information, refer to your controller's documentation.

For more information about:

- Using Protocol 3000 commands, see [Section 9.1](#)
- General syntax used for Protocol 3000 commands, see [Section 9.2](#)
- Protocol 3000 commands available for the **VP-445**, see [Section 9.3](#)

## 9.1 Understanding Protocol 3000

Protocol 3000 commands are structured according to the following:

- **Command** – A sequence of ASCII letters (A–Z, a–z and –). A command and its parameters must be separated by at least one space.
- **Parameters** – A sequence of alphanumeric ASCII characters (0–9, A–Z, a–z and some special characters for specific commands). Parameters are separated by commas.
- **Message string** – Every command entered as part of a message string begins with a message starting character and ends with a message closing character.



A string can contain more than one command. Commands are separated by a pipe (|) character.

The maximum string length is 64 characters.

- **Message starting character:**
  - # – For host command/query
  - ~ – For device response
- **Device address** – K-NET Device ID followed by @ (optional, K-NET only)
- **Query sign** – ? follows some commands to define a query request
- **Message closing character:**
  - CR – Carriage return for host messages (ASCII 13)
  - CR LF – Carriage return for device messages (ASCII 13) and line-feed (ASCII 10)
- **Command chain separator character** – Multiple commands can be chained in the same string. Each command is delimited by a pipe character (|). When chaining commands, enter the message starting character and the message closing character only at the beginning and end of the string.



Spaces between parameters or command terms are ignored. Commands in the string do not execute until the closing character is entered. A separate response is sent for every command in the chain.

## 9.2 Kramer Protocol 3000 Syntax

The Kramer Protocol 3000 syntax uses the following delimiters:

- **CR** = Carriage return (ASCII 13 = 0x0D)
- **LF** = Line feed (ASCII 10 = 0x0A)
- **SP** = Space (ASCII 32 = 0x20)

Some commands have short name syntax in addition to long name syntax to enable faster typing. The response is always in long syntax.

The Protocol 3000 syntax is in the following format:

- **Host Message Format:**

Start	Address (optional)	Body	Delimiter
#	<i>Device_id@</i>	<b>Message</b>	<b>CR</b>

- **Simple Command** – Command string with only one command without addressing:

Start	Body	Delimiter
#	<b>Command</b> <b>SP</b> <i>Parameter_1,Parameter_2,...</i>	<b>CR</b>

- **Command String** – Formal syntax with command concatenation and addressing:

Start	Address	Body	Delimiter
#	<i>Device_id@</i>	<b>Command_1</b> <i>Parameter1_1,Parameter1_2,...</i> <b>Command_2</b> <i>Parameter2_1,Parameter2_2,...</i> <b>Command_3</b> <i>Parameter3_1,Parameter3_2,...</i> ...	<b>CR</b>

- **Device Message Format:**

Start	Address (optional)	Body	Delimiter
~	<i>Device_id@</i>	<b>Message</b>	<b>CR</b> <b>LF</b>

- **Device Long Response** – Echoing command:

Start	Address (optional)	Body	Delimiter
~	<i>Device_id@</i>	<b>Command</b> <b>SP</b> [ <i>Param1,Param2 ...</i> ] <b>result</b>	<b>CR</b> <b>LF</b>

### 9.3 Protocol 3000 Commands

This section includes the following commands:

- System Commands (see [Section 9.3.1](#))
- Switching/Routing Commands (see [Section 9.3.2](#))
- Video Commands (see [Section 9.3.3](#))
- Audio Commands (see [Section 9.3.4](#))
- Communication Commands (see [Section 9.3.5](#))

#### 9.3.1 System Commands

Command	Description
#	Protocol handshaking (system mandatory)
BUILD-DATE	Get device build date (system mandatory)
FACTORY	Reset to factory default configuration
HELP	Get command list (system mandatory)
MODEL	Get device model (system mandatory)
PROT-VER	Get device protocol version (system mandatory)
RESET	Reset device (system mandatory)
SN	Get device serial number (system mandatory)
VERSION	Get device firmware version (system mandatory)
DISPLAY	Get output HPD status (system)
HDCP-MOD	Set/get HDCP mode (system)
LOCK-FP	Get front panel lock state (system)

##### 9.3.1.1 #

Functions		Permission	Transparency
Set:	#	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Protocol handshaking	# <span style="border: 1px solid black;">CR</span>	
Get:	-	-	
Response			
~ <span style="border: 1px solid black;">nn</span> @ <span style="border: 1px solid black;">SP</span> <span style="border: 1px solid black;">OK</span> <span style="border: 1px solid black;">CR</span> LF			
Notes			
Validates the Protocol 3000 connection and gets the machine number Step-in master products use this command to identify the availability of a device			
K-Config Example			
" # " , 0x0D			

9.3.1.1 BUILD-DATE

Functions		Permission	Transparency
Set:	BUILD-DATE	End User	-
Get:	-	-	-
Description		Syntax	
Set:			
Get:	get device build date	#BUILD-DATE? <b>CR</b>	
Response			
~nn <b>@BUILD-DATE</b> <b>SP</b> date <b>SP</b> time <b>CR LF</b>			
Parameters			
date – Format: YYYY/MM/DD where YYYY = Year, MM = Month, DD = Day time – Format: hh:mm:ss where hh = hours, mm = minutes, ss = seconds			
K-Config Example			
Read the device build date: "#BUILD-DATE?" , 0x0D			

9.3.1.1 FACTORY

Functions		Permission	Transparency
Set:	FACTORY	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Reset device to factory defaults configuration	#FACTORYCR	
Get:	-	-	
Response			
~nn@FACTORYSPOKCR LF			
Notes			
This command deletes all user data from the device. The deletion can take some time. Your device may require powering off and powering on for the changes to take effect.			
K-Config Example			
Reset the device to its factory default configuration: "#FACTORY" , 0x0D			

### 9.3.1.1 HELP

Functions	Permission	Transparency
Set:	-	-
Get:	HELP	End User Public
Description	Syntax	
Set:	-	
Get:	Get command list or help for specific command	1. #HELP <code>CR</code> 2. #HELP <code>SP</code> COMMAND_NAME <code>CR</code>
Response		
1. Multi-line: ~nn@Device available protocol 3000 commands: <code>CR LF</code> command, <code>SP</code> command... <code>CR LF</code> 2. Multi-line: ~nn@HELP <code>SP</code> command: <code>CR LF</code> description <code>CR LF</code> USAGE:usage <code>CR LF</code>		
Parameters		
COMMAND_NAME – name of a specific command		
Notes		
To get help for a specific command use: HELP <code>SP</code> COMMAND_NAME <code>CR LF</code>		
K-Config Example		
" #HELP" , 0x0D		

### 9.3.1.2 MODEL

Functions		Permission	Transparency
Set:	-	-	-
Get:	MODEL?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device model	#MODEL? <code>CR</code>	
Response			
~nn@MODEL <code>SP</code> model_name <code>CR LF</code>			
Parameters			
model_name – String of up to 19 printable ASCII chars			
Notes			
This command identifies equipment connected to Step-in master products and notifies of identity changes to the connected equipment. The Matrix saves this data in memory to answer REMOTE-INFO requests			
K-Config Example			
Get device model: " #MODEL? ", 0x0D			

### 9.3.1.3 PROTV-ER

Functions		Permission	Transparency
Set:	-	-	-
Get:	PROT-VER?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get protocol version	#PROT-VER? CR	
Response			
~nn@PROT-VERSP3000:version CR LF			
Parameters			
Version – Format: XX.XX where X is a decimal digit			
K-Config Example			
Get the protocol version: "#PROT-VER?" , 0x0D			

### 9.3.1.1 RESET

Functions		Permission	Transparency
Set:	RESET	Administrator	Public
Get:	-	-	-
Description		Syntax	
Set:	Reset device	#RESET␣	
Get:	-	-	
Response			
~nn@RESETSP␣␣			



### 9.3.1.2 SN

Functions		Permission	Transparency
Set:	-	-	-
Get:	SN?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device serial number	#SN? <div>CR</div>	
Response			
~nn@SN <del>SP</del> serial_number <div>CR LF</div>			
Parameters			
serial_number – 14 decimal digits, factory assigned			
K-Config Example			
Get device serial number: "#SN? ", 0x0D			

### 9.3.1.3 VERSION

Functions		Permission	Transparency
Set:	-	-	-
Get:	VERSION?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get version number	#VERSION? <div>CR</div>	
Response			
~nn@VERSIONSPfirmware_version <div>CR LF</div>			
Parameters			
firmware_version – Format: XX.XX.XXXX where the digits group are: major.minor.build version			
K-Config Example			
Get the firmware version number: "#VERSION?" , 0x0D			

### 9.3.1.4 DISPLAY

Functions		Permission	Transparency
Set:	-	-	-
Get	DISPLAY?	End User	System
Description		Syntax	
Set:	-	-	
Get:	Get output HPD status	#DISPLAY? <span style="border: 1px solid black;">SP</span> <span style="border: 1px solid black;">P1</span> <span style="border: 1px solid black;">CR</span>	
Response			
~ <span style="border: 1px solid black;">nn</span> @DISPLAY <span style="border: 1px solid black;">SP</span> <span style="border: 1px solid black;">P1</span> <span style="border: 1px solid black;">CR</span> <span style="border: 1px solid black;">LF</span>			
Parameters			
P1 – Output number: 0 (HDMI 1), 1 (HDMI2)			
Response triggers			
<ul style="list-style-type: none"><li>After execution, response is sent to the com port from which the <b>Get</b> was received</li><li>Response is sent after every change in output HPD status <b>ON to OFF</b></li><li>Response is sent after every change in output HPD status <b>OFF to ON</b> and ALL parameters (new EDID, etc.) are stable and valid</li></ul>			
K-Config Example			
Get the output HPD status of HDMI 1: "#DISPLAY? 1",0x0D			

### 9.3.1.5 HDCP-MOD

Functions		Permission	Transparency
Set:	HDCP-MOD	Administrator	Public
Get:	HDCP-MOD?	End User	System
Description		Syntax	
Set:	Set HDCP mode	#HDCP-MOD[SP]P1, P2, P3[CR]	
Get:	Get HDCP mode	#HDCP-MOD?[SP]P1, P2[CR]	
Response			
Set / Get: ~[nn]@HDCP-MOD[SP]P1, P2, P3[CR]LF			
Parameters			
P1 – Input or Output: 0 (Input), 1 (Output) P2 – Scaler for Input: 0-5 (HDMI 1 - HDMI 6) and scaler for output 0-1 (HDMI 1, HDMI 2) P3 – status for Input: 0 (Off), 1 (On) and status for Output: 2 (Follow In), 3 (Follow Out)			
Response triggers			
<ul style="list-style-type: none"><li>Response is sent to the com port from which the <b>Set</b> (before execution) / <b>Get</b> command was received</li><li>Response is sent to all com ports after execution if HDCP-MOD was set any other external control device (button press, device menu and similar) or genlock status changed</li></ul>			
Notes			
Set HDCP working mode <b>on device input</b> : HDCP supported – HDCP_ON [default] HDCP not supported – HDCP OFF HDCP support changes following detected sink – MIRROR OUTPUT			
K-Config Example			
Set HDCP mode on HDMI 1 output to Follow out: "#HDCP-MOD 1,0,3",0x0D			

9.3.1.1 LOCK-FP

Functions		Permission	Transparency
Set:	LOCK-FP	End User	-
Get:	LOCK-FP?	End User	System
Description		Syntax	
Set:	Lock front panel	#LOCK-FP[SP]P1[CR]	
Get:	Get front panel lock state	#LOCK-FP?[CR]	
Response			
nn@LOCK-FP[SP]P1[SP]OK[CR]LF			
Parameters			
P1 – 0 (No) 1 (Yes)			
K-Config Example			
Lock front panel: "#LOCK-FP 1",0x0D			

9.3.2 Switching/Routing Commands

Command	Description
ROUTE	Set/get layer routing

9.3.2.1 ROUTE

Functions		Permission	Transparency
Set:	ROUTE	End User	-
Get:	ROUTE?	End User	Switching
Description		Syntax	
Set:	Set layer routing	#ROUTE[SP]P1,P2,P3[CR]	
Get:	Get layer routing	#ROUTE?[SP]P1,P2[CR]	
Response			
~[nn]@ROUTE[SP]P1,P2,P3[CR]LF			
Parameters			
P1 – Layer number: 12 (Video+Audio)			
P2 – Scaler: 1			
P3 – Video inputs: 0~11 (see <a href="#">Section 9.4.1</a> )			
Notes			
This command replaces all other routing commands.			
K-Config Example			
Select the HDMI 2 input to route to the outputs:			
"#ROUTE 12,1,1",0x0D			

9.3.3 Video Commands

Command	Description
VID-RES	Set/get ADC (VGA) sampling phase
VMUTE	Set/get video on output mute
VFRZ	Set/get the freeze on output
IMAGE-PROP	Set/get the image size
SCLR-PCAUTO	Set PC auto sync of scaler

9.3.3.1 VID-RES

Functions		Permission	Transparency
Set:	VID-RES	End User	Public
Get	VID-RES?	End User	Video
Description		Syntax	
Set:	Set video resolution	#VID-RES <sup>SP</sup> P1, P2, P3, P4 <sup>CR</sup>	
Get:	Get video resolution	#VID-RES? <sup>SP</sup> P1, P2, P3 <sup>CR</sup>	
Response			
~nn@VID-RES <sup>SP</sup> P1, P2, P3, P4 <sup>CR</sup> LF			
Parameters			
P1 – 0 (Input), 1 (Output) P2 – 1 (Scaler) P3 – 0 (Off) P4 – Select video resolutions: 200–223 (see <a href="#">Section 9.4.2</a> )			
Response triggers			
<ul style="list-style-type: none"><li>After execution, response is sent to the com port from which the <b>Set /Get</b> was received</li><li>After execution, response is sent to all com ports if <b>VID-RES</b> was set by any other external control device (button press, device menu and similar)</li></ul>			
Notes			
<ol style="list-style-type: none"><li>“Set” command is only applicable for <b>stage=Output</b></li><li>“Set” command with <i>is_native</i>=ON sets native resolution on selected output (resolution index sent = 0). Device sends as answer actual VIC ID of native resolution</li><li>“Get” command with <i>is_native</i>=ON returns native resolution VIC, with <i>is_native</i>=OFF returns current resolution</li><li>To use “custom resolutions” (entries 100-105), define them using command DEF-RES</li></ol>			
K-Config Example			
Set video resolution on output to 1360x768 @60Hz: "#VID-RES 1,1,0,204",0x0D			

### 9.3.3.1 VMUTE

Functions		Permission	Transparency
Set:	VMUTE	End User	Public
Get:	VMUTE?	End User	Video
Description		Syntax	
Set:	Set enable/disable video on output	#VMUTE[SP]P1,P2[CR]	
Get:	Get video on output status	#VMUTE?[SP]P1[SP][CR]	
Response			
Set / Get: ~[hr]@VMUTE[SP]P1,P2[CR LF]			
Parameters			
P1 – Scaler number: 1 (Scaler)			
P2 –video mute status: 0 (Off), 1 (On)			
K-Config Example			
Set Mute video on output to off: "#VMUTE 1,0",0x0D			

### 9.3.3.2 VFRZ

Functions		Permission	Transparency
Set:	VFRZ	End User	-
Get:	VFRZ?	End User	Video
Description		Syntax	
Set:	Set freeze video on output	#VFRZ[SP]P1,P2[CR]	
Get:	Get freeze on output status	#VFRZ?[SP]P1[CR]	
Response			
Set / Get: ~[an]@VFR[SP]P1,P2[CR LF]			
Parameters			
P1 – 1 (Scaler)			
P2 – freeze status: 0 (Off), 1 (On)			
K-Config Example			
Set freeze video output to off: "#TREBLE 1,0",0x0D			

9.3.3.1 Image Proportions

Functions		Permission	Transparency
Set:	IMAGE-PROP	End User	Public
Get:	IMAGE-PROP?	End User	Video
Description		Syntax	
Set:	Set the image size	#IMAGE-PROP[SP]P1[CR]	
Get:	Get the image size	#IMAGE-PROP?[SP]P1 , ... , P6[CR]	
Response			
Set / Get: ~nn@IMAGE-PROP[SP]P1 , P2...[CR LF]			
Parameters			
P1 – 1 (Scaler) P2 – Image size: 0 (Over Scan), 1 (Full), 2 (Best Fit), 3 (PanScan), 4 (Letter Box), 5 (Under 2), 6 (Under1)			
Response triggers			
Response is sent to the com port from which the <b>Set</b> (before execution) / <b>Get</b> command was received After execution, response is sent to all com ports if CMD-NAME was set any other external control device (button press, device menu and similar) or genlock status was changed			
Notes			
Sets the image properties of the selected scaler			
K-Config Example			
Set the image size to PanScan: "#IMAGE-PROP 1, 3", 0x0D			

9.3.3.2 SCLR-PCAUTO

Functions		Permission	Transparency
Set:	SCLR-PCAUTO	End User	Public
Get:		End User	Video
Description		Syntax	
Set:	Set PC auto sync of scaler	#SCLR-PCAUTO[SP]P1 , P2[CR]	
Get:			
Response			
Set / Get: ~[nn]@SCLR-PCAUTO[SP]P1 , P2...[CR LF]			
Parameters			
P1 – 1 (Scaler)			
P2 – 1 (Yes)			
Response triggers			
Response is sent to the com port from which the Set (before execution) / Get command was received After execution, response is sent to all com ports if CMD-NAME was set any other external control device (button press, device menu and similar) or genlock status was changed			
Notes			
Sets the PC Auto sync of the selected scaler			
K-Config Example			
Set the PC auto sync of the scaler to yes: "#SCLR-PCAUTO 1,1",0x0D			

9.3.4 Audio Commands

Command	Description
AUD-LVL	Set/get input/output volume
MUTE	Mute the output
BASS	Set/get the audio bass level
TREBLE	Set/get the audio treble level
LOUDNESS	Set/get the loudness
SCLR-AS	Set/get the auto sync off timer
SCLR-AUDIO-DELAY	Set/get the scaler audio delay
MIC-GAIN	Set/get the microphone gain
TLK	Set/get the talkover mode status
MIC-TLK	Set/get the microphone talkover mode status
STANDBY	Set/get the standby mode status

### 9.3.4.1 AUD-LVL

Functions		Permission	Transparency
Set:	AUD-LVL	End User	-
Get:	AUD-LVL?	End User	Audio
Description		Syntax	
Set:	Set audio level in specific amplifier stage	#AUD-LVL <sup>SP</sup> P1, P2, P3 <sup>CR</sup>	
Get:	Get audio level in specific amplifier stage	#AUD-LVL? <sup>SP</sup> P1, P2 <sup>CR</sup>	
Response			
~nn@AUD-LVL <sup>SP</sup> P1, P2 <sup>CR</sup> LF			
Parameters			
<p>P1 – Input and Output: 0 (Input), 1 (Output)</p> <p>P2– 0~11 (audio inputs) see <a href="#">Section 9.4.1</a>, 0 (Audio output)</p> <p>Note that you can choose an input channel or the output, based on the selected P1.</p> <p>P3 – 0~100 (audio level) minus sign precedes negative values.</p> <p>++ increase current value,</p> <p>-- decrease current value</p>			
K-Config Example			
Set the HDMI 45 input AUD-LVL to 75:			
"#AUD-LVL 0, 3, 75", 0x0D			

### 9.3.4.2 MUTE

Functions		Permission	Transparency
Set:	MUTE	End User	Public
Get:	MUTE?	End User	Audio
Description		Syntax	
Set:	Mute the selected output	#MUTE <sup>SP</sup> P1, P2 <sup>CR</sup>	
Get:	Mute the selected output	#MUTE? <sup>SP</sup> P1 <sup>CR</sup>	
Response			
Set / Get: ~ <sup>nn</sup> @MUTE <sup>SP</sup> P1, P2 <sup>CR</sup> LF			
Parameters			
P1 – 1 (Scaler)			
P2 – mute the output: 0 (Off), 1 (On)			
Response triggers			
Response is sent to the com port from which the <b>Set</b> (before execution) / <b>Get</b> command was received After execution, response is sent to all com ports if CMD-NAME was set any other external control device (button press, device menu and similar) or genlock status was changed			
Notes			
Mutes the selected audio output			
K-Config Example			
Mute the output: "#MUTE 1, 1", 0x0D			



### 9.3.4.3 BASS

Functions		Permission	Transparency
Set:	<b>BASS</b>	End User	Public
Get:	<b>BASS?</b>	End User	Audio
Description		Syntax	
Set:	Set audio bass level	# <b>BASS</b> [SP]channel,bass_level[CR]	
Get:	Get audio bass level	# <b>BASS?</b> [SP]channel[CR]	
Response			
~nn@ <b>BASS</b> [SP]channel,bass_level[CR LF]			
Parameters			
channel – 1 (scaler) bass_level – 0-30 (value) audio parameter in Kramer units, minus sign precedes negative values ++ increase current value -- decrease current value			
K-Config Example			
Set the bass level to 15: "#BASS 1,15",0x0D			

### 9.3.4.4 TREBLE

Functions		Permission	Transparency
Set:	TREBLE	End User	Public
Get:	TREBLE?	End User	Audio
Description		Syntax	
Set:	Set audio treble level	#TREBLE[SP]channel,treble_level[CR]	
Get:	Get audio treble level	#TREBLE?[SP]channel[CR]	
Response			
~nn@TREBLE[SP]channel,treble_level[CR LF]			
Parameters			
channel – 1 (scaler) treble_level – 0-30 (value) audio parameter in Kramer units, minus sign precedes negative values ++ increase current value -- decrease current value			
K-Config Example			
Set the audio treble level to 25: "#TREBLE 1,25",0x0D			

### 9.3.4.5 LOUDNESS

Functions		Permission	Transparency
Set:	LOUDNESS	End User	Public
Get:	LOUDNESS?	End User	Audio
Description		Syntax	
Set:	Set audio loudness	#LOUDNESS?[SP]channel,loudness[CR]	
Get:	Get audio loudness	#LOUDNESS?[SP]channel[CR]	
Response			
~nn@LOUDNESS[SP]channel,loudness[CR] LF			
Parameters			
channel – 1 (scaler) loudness – 0 (Off), 1 (On)			
K-Config Example			
Set the Loudness off: "#LOUDNESS 1,0",0x0D			

### 9.3.4.6 Scaler-As

Functions		Permission	Transparency
Set:	SCLR-AS	End User	Public
Get:	SCLR-AS?	End User	Audio
Description		Syntax	
Set:	Set the auto sync off timer	#SCLR-ASSPp1, P2CR	
Get:	Get the auto sync off timer definition	#SCLR-AS?SPp1CR	
Response			
Set / Get: ~nn@SCLR-ASSPp1, P2CR LF			
Parameters			
P1 –1 (Scaler)			
P2 – for setting the auto sync timer: 0 (Off), 1 (Fast), 2 (Slow)			
Response triggers			
Response is sent to the com port from which the <b>Set</b> (before execution) / <b>Get</b> command was received			
After execution, response is sent to all com ports if CMD-NAME was set any other external control device (button press, device menu and similar) or genlock status was changed			
Notes			
Sets the Auto Sync features for the selected Scaler			
K-Config Example			
Set the auto sync off timer to slow:			
" #SCLR-AS 1, 2", 0x0D			

9.3.4.7 Scaler Audio Delay

Functions		Permission	Transparency
Set:	SCLR-AUDIO-DELAY	End User	Public
Get:	SCLR-AUDIO-DELAY?	End User	Audio
Description		Syntax	
Set:	Set the scaler audio delay	#SCLR-AUDIO-DELAY <sup>SP</sup> P1, P2 <sup>CR</sup>	
Get:	Get the scaler audio delay	#SCLR-AUDIO-DELAY? <sup>SP</sup> P1 <sup>CR</sup>	
Response			
Set / Get: ~nn@SCLR-AUDIO-DELAY <sup>SP</sup> P1, P2 <sup>CR</sup> LF			
Parameters			
P1 – 1 (Scaler)			
P2 – for setting the audio delay: 0 (Off), 1 (40ms), 2 (110ms), 3 (150ms)			
Response triggers			
Response is sent to the com port from which the Set (before execution) / Get command was received After execution, response is sent to all com ports if CMD-NAME was set any other external control device (button press, device menu and similar) or genlock status was changed			
Notes			
Sets the audio delay for the selected audio output			
K-Config Example			
Set the scaler audio delay to 40ms: "#SCLR-AUDIO-DELAY 1,1", 0x0D			

### 9.3.4.8 MIC-GAIN

Functions		Permission	Transparency
Set:	MIC-GAIN	End User	Public
Get:	MIC-GAIN?	End User	Audio
Description		Syntax	
Set:	Set the microphone gain	#MIC-GAIN <sup>SP</sup> P <sub>1</sub> , P <sub>2</sub> , P <sub>3</sub> <sup>CR</sup>	
Get:	Get the microphone gain	#MIC-GAIN? <sup>SP</sup> P <sub>1</sub> <sup>CR</sup>	
Response			
Set / Get: ~ <sup>nn</sup> @MIC-GAIN <sup>SP</sup> P <sub>1</sub> , P <sub>2</sub> <sup>CR LF</sup>			
Parameters			
P <sub>1</sub> – 0			
P <sub>2</sub> – for selecting the mic: 0 (Mic 1), 1 (MIC 2)			
P <sub>3</sub> – for setting the level 0-100			
Response Triggers			
Response is sent to the com port from which the Set (before execution) / Get command was received After execution, response is sent to all com ports if CMD-NAME was set any other external control device (button press, device menu and similar) or genlock status was changed			
Notes			
Sets the Microphone input audio gain			
K-Config Example			
Set the microphone 2 gain to 45: " #MIC-GAIN 0, 2, 45 ", 0x0D			

### 9.3.4.9 TLK

Functions		Permission	Transparency
Set:	TLK	End User	Public
Get:	TLK?	End User	Audio
Description		Syntax	
Set:	Set audio talkover mode status	#TLK <sup>[SP]</sup> channel,talkover_mode <sup>[CR]</sup>	
Get:	Get audio talkover mode status	#TLK? <sup>[SP]</sup> channel <sup>[CR]</sup>	
Response			
~ <sup>[nn]</sup> @TLK <sup>[SP]</sup> channel,talkover_mode <sup>[CR LF]</sup>			
Parameters			
channel – 1 (Scaler) talkover_mode – 0 (Off), 1 (Mixer), 2 (Talkover), 3 (Mic only)			
K-Config Example			
Set the scaler audio talkover mode to Mic only: "#TLK 1,3",0x0D			

9.3.4.10 MIC-TLK

Functions		Permission	Transparency
Set:	MIC-TLK	End User	Public
Get:	MIC-TLK?	End User	Audio
Description		Syntax	
Set:	Set mic talkover parameters	#MIC-TLK <sup>SP</sup> channel,P1,value <sup>CR</sup>	
Get:	Get mic talkover parameters	#MIC-TLK? <sup>SP</sup> channel,P1 <sup>CR</sup>	
Response			
~nn@MIC-TLK <sup>SP</sup> channel,P1,value <sup>CR</sup> LF			
Parameters			
P1 – 0 (channel) P2 – for selecting the parameter: 0 (Depth), 1 (Trigger), 2 (Attack time), 3 (Hold time), 4 (Release time) P3 – for selecting the value for each P1parameter: 0-100 (Depth, %), 0-100 (Trigger, -60dB-40dB), 0-200 (Attack/Hold/Release time, 0-2 sec)			
K-Config Example			
Set mic-tlk trigger to 40dB: "#MIC-TLK 0,1,100",0x0D			

9.3.4.11 STANDBY

Functions		Permission	Transparency
Set:	STANDBY	End User	Public
Get:	STANDBY?	End User	Audio
Description		Syntax	
Set:	Set Standby mode	#STANDBY <sup>SP</sup> on_off <sup>CR</sup>	
Get:	Get Standby mode status	#STANDBY? <sup>CR</sup>	
Response			
~nn@STANDBY <sup>SP</sup> value <sup>CR</sup> LF			
Parameters			
on_off – standby status: 0 (Off), 1 (On)			
K-Config Example			
Set standby to on "#standby 1",0x0D			

9.3.5 Communication Commands

Command	Description
NET-MAC	Get MAC address
NET-IP	Set/get IP address
NET-GATE	Set/get gateway IP
NET-MASK	Set/get subnet mask
NET-DHCP	Set/get DHCP mode

### 9.3.5.1 NET-MAC

Functions		Permission	Transparency
Set:	-	-	-
Get:	NET-MAC?	End User	Communication
Description		Syntax	
Set:			
Get:	Get MAC address	#NET-MAC? <span style="border: 1px solid black; padding: 0 2px;">CR</span>	
Response			
~nn@NET-MAC <span style="border: 1px solid black; padding: 0 2px;">SP</span> mac_address <span style="border: 1px solid black; padding: 0 2px;">CR</span> <span style="border: 1px solid black; padding: 0 2px;">LF</span>			
Parameters			
mac_address – Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit.			
K-Config Example			
Get the MAC address:			
" #NET-MAC? XX-XX-XX-XX-XX-XX", 0x0D			

### 9.3.5.2 NET IP

Functions		Permission	Transparency
Set:	NET-IP	Administrator	-
Get:	NET-IP?	End User	Communication
Description		Syntax	
Set:	Set device IP address	#NET-IP[SP]P1[CR]	
Get:	Get device IP address	#NET-IP?[CR]	
Response			
Set: ~[nn]@NET-IP[SP]ip_address[SP]OK[CRLF]			
Get: ~[nn]@NET-IP[SP]ip_address[CR LF]			
Parameters			
P1 – IP address, in the following format: xxx.xxxx.xxx.xxx			
Notes			
For proper settings consult your network administrator.			
K-Config Example			
Set the IP address to 192.168.1.39: "#NET-IP 192.168.001.039", 0x0D			

### 9.3.5.3 NET-GATE

Functions		Permission	Transparency
Set:	NET-GATE	Administrator	-
Get:	NET-GATE?	End User	Communication
Description		Syntax	
Set:	Set Gateway IP	#NET-GATESP P1CR	
Get:	Get Gateway IP	#NET-GATE?CR	
Response			
Set: ~nn@NET-GATESP P1SP OKCR LF			
Get: ~nn@NET-GATESP ip_address CR LF			
Parameters			
P1 – gateway IP address, in the following format:			
Notes			
A network gateway connects the device via another network and maybe over the Internet. Be careful of security problems. For proper settings consult your network administrator			
K-Config Example			
Set the gateway IP address to 192.168.0.1: "#NET-GATE 192.168.000.001", 0x0D			

### 9.3.5.4 NET-MASK

Functions		Permission	Transparency
Set:	NET-MASK	Administrator	-
Get:	NET-MASK?	End User	Communication
Description		Syntax	
Set:	Set device subnet mask	#NET-MASKSPnet_maskCR	
Get:	Get device subnet mask	#NET-MASK?CR	
Response			
Set: ~nn@NET-MASKSPPlSPokCR LF			
Get: ~nn@NET-MASKSPnet_maskCR LF			
Parameters			
P1 – net-mask format: xxx.xxx.xxx.xxx			
Response triggers			
The subnet mask limits the Ethernet connection within the local network. For proper settings consult your network administrator.			
K-Config Example			
Set the subnet mask to 255.255.0.0: "#NET-MASK 255.255.000.000", 0x0D			

9.3.5.5 NET-DHCP

Functions		Permission	Transparency
Set:	NET-DHCP	Administrator	-
Get:	NET-DHCP?	End User	Communication
Description		Syntax	
Set:	Set DHCP mode	#NET-DHCPSPp1CR	
Get:	Get DHCP mode	#NET-DHCP?CR	
Response			
Set: ~nn@NET-DHCPSPp1SPokCR LF			
Get: ~nn@NET-DHCPSPmodeCR LF			
Parameters			
P1 – use static IP: 0 (Static IP) or use DHCP: 1 (DHCP). If DHCP is unavailable, use the IP address set by the factory or the NET-IP command			
Notes			
Connecting Ethernet to devices with DHCP may take more time in some networks. To connect with a randomly assigned IP by DHCP, specify the device DNS name (if available) using the command “NAME”. You can also get an assigned IP by direct connection to USB or RS-232 protocol port if available. For proper settings consult your network administrator.			
K-Config Example			
Set the DHCP mode to static: “#NET-DHCP 0 ”, 0x0D			



## 9.4 Kramer Protocol 3000 –Command Keys

This section describes the detailed commands list (see [Section 9.3](#)) as well as the Port number key (see [Section 9.4.1](#)) and the video resolutions key (see [Section 9.4.2](#)).

### 9.4.1 Port Number Key

Video Input	#	Audio input	#	Video Output	#
HDMI 1	0	HDMI 1	0	HDMI 1	0
HDMI 2	1	HDMI 2	1	HDMI 2	1
HDMI 3	2	HDMI 3	2		
HDMI 4	3	HDMI 4	3		
HDMI 5	4	HDMI 5	4		
HDMI 6	5	HDMI 6	5		
PC 1	6	PC 1	6		
PC 2	7	PC 2	7		
PC 3	8	PC 3	8		
PC 4	9	PC 4	9		
CV 1	10	CV 1	10		
CV 2	11	CV 2	11		

### 9.4.2 Output Resolutions key

Number	Resolution	Number	Resolution
200	640x480 @60Hz	212	1920x1080 @60Hz
201	800x600 @60Hz	213	1920x1200 @60Hz
202	1024x768 @60Hz	214	480p @60Hz
203	1280x768 @60Hz	215	720p @60Hz
204	1360x768 @60Hz	216	1080i @60Hz
205	1280x720 @60Hz	217	1080p @60Hz
206	1280x800 @60Hz	218	576p @50Hz
207	1280x1024 @60Hz	219	720p @50Hz
208	1440x900 @60Hz	220	1080i @50Hz
209	1400x1050 @60Hz	221	1080p @50Hz
210	1680x1050 @60Hz	222	NATIVE OUT1
211	1600x1200 @60Hz	223	NATIVE OUT2

## LIMITED WARRANTY

The warranty obligations of Kramer Electronics for this product are limited to the terms set forth below:

### What is Covered

This limited warranty covers defects in materials and workmanship in this product.

### What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

### How Long Does this Coverage Last

Seven years as of this printing; please check our Web site for the most current and accurate warranty information.

### Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

### What Kramer Electronics will do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

### What Kramer Electronics will not do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

### How to Obtain a Remedy under this Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, please visit our web site at [www.kramerelectronics.com](http://www.kramerelectronics.com) or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required. You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

### Limitation on Liability

THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

### Exclusive Remedy

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF KRAMER ELECTRONICS CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN ALL IMPLIED WARRANTIES COVERING THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO THIS PRODUCT AS PROVIDED UNDER APPLICABLE LAW.

IF ANY PRODUCT TO WHICH THIS LIMITED WARRANTY APPLIES IS A "CONSUMER PRODUCT" UNDER THE MAGNUSON-MOSS WARRANTY ACT (15 U.S.C.A. §2301, ET SEQ.) OR OTHER APPLICABLE LAW, THE FOREGOING DISCLAIMER OF IMPLIED WARRANTIES SHALL NOT APPLY TO YOU, AND ALL IMPLIED WARRANTIES ON THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE, SHALL APPLY AS PROVIDED UNDER APPLICABLE LAW.

### Other Conditions

This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Kramer Electronics or (iii) this product is not purchased from an authorized Kramer Electronics reseller. If you are unsure whether a reseller is an authorized Kramer Electronics reseller, please visit our Web site at [www.kramerelectronics.com](http://www.kramerelectronics.com) or contact a Kramer Electronics office from the list at the end of this document.

Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.

# KRAMER



P/N:

2900-300502



Rev: 2



## SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

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

We welcome your questions, comments, and feedback.

[www.kramerAV.com](http://www.kramerAV.com)  
[info@kramerel.com](mailto:info@kramerel.com)