KRAMER

USER MANUAL

MODEL:

VP-440H2
4K Presentation Switcher/Scaler

MIC
HDBT IN
HDMI IN 1
HDMI IN 2
HDMI IN 3
PC IN
MENU
RESET TO XGA/1080P
PANEL LOCK
48 V
Enter
4K Presentation Switcher / Scaler
VP-440H2
CONTROL
HDBT IN
HDBT OUT
G Rx Tx
G Rx Tx G Rx Tx
HDMI 1
HDMI 2
HDMI 3
PC
AUDIO INPUTS
AUDIO OUT
ETHERNET
VIDEO INPUTS
+ -
HDBT IN
HDMI IN1
HDMI IN2
HDMI IN3
PC IN
HDBT OUT
HDMI OUT
48V DC

P/N: 2900-300644 Rev 1

www.KramerAV.com

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Introduction

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

Our 1,000-plus different models now appear in 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 & Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Mounting and Rack Adapters; GROUP 11: Sierra Video; GROUP 12: Digital Signage; GROUP 13: Audio; GROUP 14: Collaboration; and GROUP 15: KM & KVM Switches.

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 www.kramerav.com/downloads/VP-440H2 to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

Achieving 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-440H2** 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.

Safety Instructions (DC)

Caution:	There are no operator serviceable parts inside the unit
Warning:	Use only the Kramer Electronics power supply that is provided with the unit
Warning:	Disconnect the power and unplug the unit from the wall before installing

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 www.kramerav.com/support/recycling.

Overview

Congratulations on purchasing your Kramer **VP-440H2** 4K Presentation Switcher/Scaler. **VP-440H2** is a high−performance 4K@60Hz (4:4:4) presentation scaler/switcher with one HDBaseT/POE, three HDMI and one computer graphics (VGA) inputs. The unit scales the video, embeds the audio and outputs the signal to an HDMI output and an HDBaseT output simultaneously. The unit includes analog and embedded audio inputs and outputs.

- PixPerfect™ Scaling Technology – Kramer's precision pixel mapping and high–quality scaling technology.
- HDTV Compatible.
- HDCP Compliant.
- HDBaseT Certified.
- System Range – For the HDBT inputs and outputs, extended reach of up to 100m (330ft) using Kramer recommended cables.

For optimum range and performance using HDBaseT™, use recommended Kramer cables, available at www.kramerav.com/product/VP-440H2.

- Supports Input PoE (Power over Ethernet) for powering the transmitter
- Max. HDMI Resolution – 4K@60Hz (4:4:4).
- Max. HDBaseT Resolutions – 4K@30Hz / 4K@60 (4:2:0)
- Max. VGA Resolution – 1920 x 1200 @60Hz.
- Multiple Aspect Ratio Selections – Full, best fit, overscan, underscan, letter box and panscan.
- Built–in ProcAmp – Color, hue, sharpness, noise, contrast and brightness.
- Constant Output Sync – No output disruption while switching between inputs when no video is detected.

- Auto Input Switching – Last connected & auto-scan, selectable.
- Powerful Audio Features – Via DSP technology including audio equalization, mixing, delay, etc.
- Audio –With individual input and output level controls.
- Audio embedding and de-embedding
- Companion AFV (Audio-Follow-Video) – Stereo audio for HDMI and PC inputs, on 3.5mm mini jacks.
- Microphone Input – For mixing, switching or talk–over.
- HDBaseT Tunnelling – Supports full HDBT tunnelling of Ethernet and RS–232 data.
- Front Panel Lockout.
- Non–Volatile Memory – Saves final settings.
- Flexible Control Options – Front panel push buttons, RS–232, OSD (on–screen display) menu with front panel navigation buttons, Ethernet with built–in Web pages.

Control your **VP-440H2**:

- Directly, via the front panel push buttons
- By RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller
- Via the OSD (on-screen display)
- Via the Ethernet with built-in Web pages

The **VP-440H2** is housed in a 1/2 19" 1U enclosure, enabling 2 units to be rack mounted side-by-side in a 1U rack space with the optional **RK-1** universal rack adapter.

For optimum range and performance use the recommended Kramer cables available at www.kramerav.com/product/VP-440H2.

Typical Applications

VP-440H2 is ideal for the following typical applications:

- Educational – classrooms, lecture theaters
- Projection systems in conference rooms, boardrooms, hotels and churches
- Home theater up-scaling

Defining VP-440H2 4K Presentation Switcher/Scaler

This section defines **VP-440H2**.

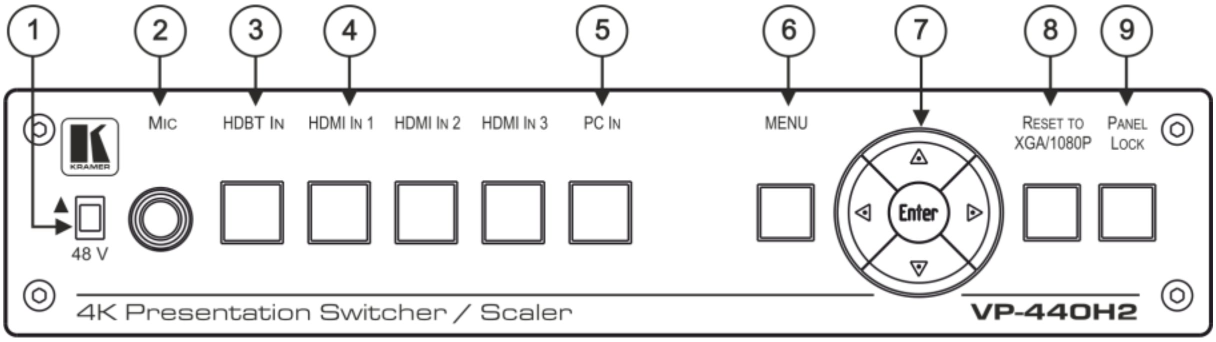


Figure 1: VP-440H2 4K Presentation Switcher/Scaler Front Panel

#	Feature		Function
①	48 V (▲) Slide Switch		Slide up (48V) to select a condenser type microphone; slide down to select a dynamic type microphone (we recommend that you slide down if a microphone is not connected to the **VP-440H2**).
②	MIC 6.3mm Jack		Connect to the microphone.
③	Input Selector Buttons	HDBT IN	Press to select the HDBT input.
④		HDMI IN	Press to select the HDMI input (from 1 to 3).
⑤		PC IN	Press to select the computer graphics input.
⑥	MENU Button		Displays the OSD menu.
⑦	Navigation Buttons	◄	Press to decrease numerical values or select from several definitions. When not in the OSD menu, press to reduce the output volume.
		▲	Press to move up the menu list values.
		►	Press to increase numerical values or select from several definitions. When not in the OSD menu, press to increase the output volume.
		▼	Press to move down the menu list.
		ENTER	Press to accept changes and change the SETUP parameters.
⑧	RESET TO XGA/1080p Button		Press and hold for about 5 seconds to toggle the output resolution between XGA and 1080p, alternatively.
⑨	PANEL LOCK Button		Press and hold for about 5 seconds to lock/unlock the front panel buttons.

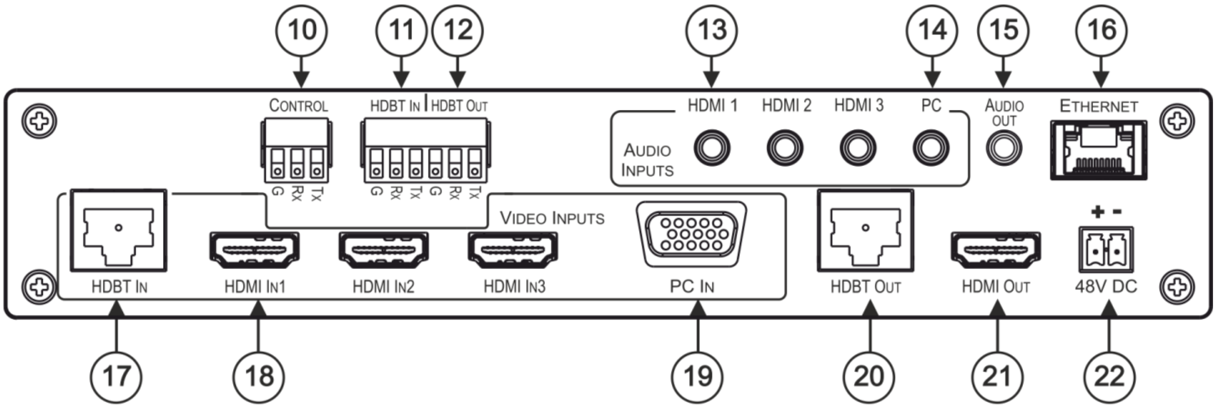

10
11
12
13
14
15
16
CONTROL
G Rx Tx
HDBT IN
HDBT OUT
G Rx Tx G Rx Tx
AUDIO INPUTS
HDMI 1
HDMI 2
HDMI 3
PC
AUDIO OUT
ETHERNET
VIDEO INPUTS
HDBT IN
HDMI IN1
HDMI IN2
HDMI IN3
PC IN
HDBT OUT
HDMI OUT
+ -
48V DC
17
18
19
20
21
22

Figure 2: VP-440H2 4K Presentation Switcher/Scaler Rear Panel

#	Feature		Function
⑩	CONTROL (Tx, Rx, GND) Terminal Block Connectors		Connect to the PC or the serial controller to control the device.
⑪	HDBT IN RS-232 Terminal Block Connectors		Connect to an RS-232 controller to control peripheral devices that are connected to the HDBT transmitter (for example, a Blu-ray player connected to **WP-20**) or connect to a device to control from a controller at the HDBT transmitter (see Controlling External Devices via HDBT on page 9).
⑫	HDBT OUT RS-232 Terminal Block Connectors		Connect to an RS-232 controller to control peripheral devices that are connected to the HDBT receiver (for example, a projector connected to **TP-580Rxr**) or connect to a device to control from a controller at the HDBT receiver (see Controlling External Devices via HDBT on page 9).
⑬	AUDIO INPUT Unbalanced Stereo 3.5 Mini Jack	HDMI	Connect to the analog audio HDMI source (from 1 to 3).
⑭		PC	Connect to the analog audio computer graphics source.
⑮	AUDIO OUT 3.5 Mini Jack		Connect to an unbalanced stereo audio acceptor.
⑯	ETHERNET Connector		Connects to the PC or other controller through computer networking.
⑰	VIDEO INPUT Connectors	HDBT IN RJ-45	Connect to an HDBT transmitter (for example, **WP-20**). Can supply PoE (up to 13W) to the transmitter.
⑱		HDMI IN	Connect to the HDMI source (from 1 to 3).
⑲		PC IN on15-pin HD	Connect to the computer graphics source.
⑳	HDBT OUT RJ-45 Connector		Connect to an HDBT receiver (for example, **TP-580Rxr**).
㉑	HDMI OUT Connector		Connect to the HDMI acceptor.
㉒	48V DC Power Terminal Block		+48V DC connector for powering the unit.

Installing in a Rack

This section provides instructions for rack mounting **VP-440H2**. Before installing in a rack, verify that the environment is within the recommended range:

- Operation 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.

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

- It is located within recommended environmental conditions. Operating ambient temperature of a closed or multi-unit rack assembly may exceed ambient room temperature.
- Once rack mounted, there is enough air still flow around VP-440H2.
- VP-440H2 is placed upright in the correct horizontal position.
- You do not overload the circuit(s). When connecting VP-440H2 to the supply circuit, overloading the circuits may 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.
- VP-440H2 is earthed (grounded) and connected only to an electricity socket with grounding. Pay particular attention when electricity is supplied indirectly (for example, when the power cord is not plugged directly into the wall socket but to an extension cable or power strip). Use only the supplied power cord.

To rack-mount VP-440H2:

- Use an optional **RK-T2B** rack adapter.

Some models, may feature built-in rack ears:

- Detachable rack ears can be removed for desktop use.
- Always mount **VP-440H2** in the rack before connecting any cables or 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 www.kramerav.com/downloads/VP-440H2.

Connecting VP-440H2

Always switch off the power to each device before connecting it to your **VP-440H2**. After connecting your **VP-440H2**, connect its power and then switch on the power to each device.

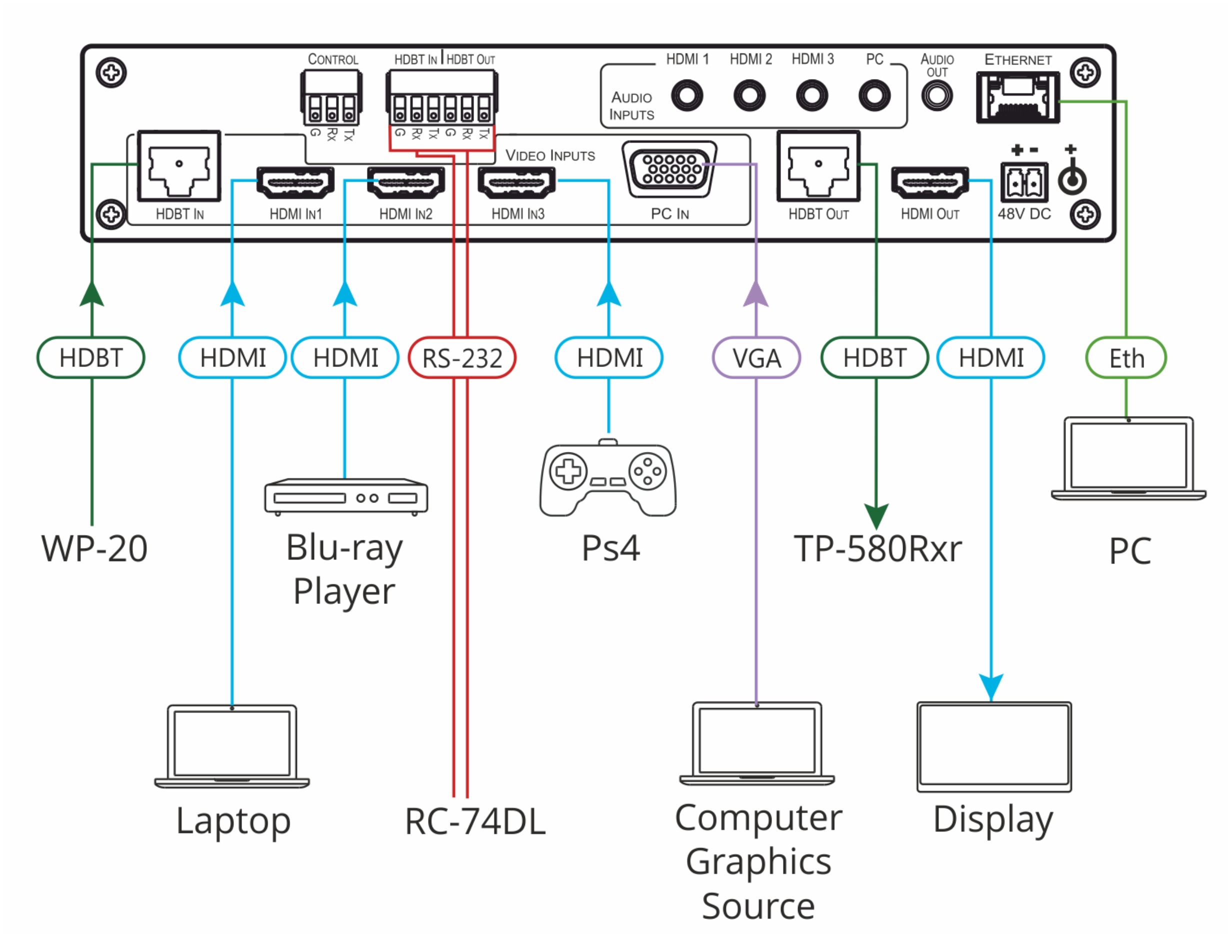

CONTROL
HDBT IN
HDBT OUT
G
Rx
Tx
AUDIO INPUTS
HDMI 1
HDMI 2
HDMI 3
PC
AUDIO OUT
ETHERNET
VIDEO INPUTS
HDBT IN
HDMI IN1
HDMI IN2
HDMI IN3
PC IN
HDBT OUT
HDMI OUT
48V DC
HDBT
HDMI
HDMI
RS-232
HDMI
VGA
HDBT
HDMI
Eth
WP-20
Blu-ray Player
Ps4
TP-580Rxr
PC
Laptop
RC-74DL
Computer Graphics Source
Display

Figure 3: Connecting to the VP-440H2 Rear Panel

To connect VP-440H2 as illustrated in the example in Figure 3, do the following:

1. Connect the video sources
   - A computer graphics source to the PC IN 15-pin HD connector ⑲.
   - An HDBaseT transmitter (for example, Kramer **WP-20** Wall Plate Transmitter) to the HDBT IN RJ-45 connector ⑰.
   - HDMI sources (for example, a laptop, a blue-ray player, and a gaming console) to the three HDMI IN connectors ⑱.
2. Connect an analog stereo audio source (not shown in Figure 3) for each of the three HDMI inputs and for the PC input to the 3.5mm mini jack connectors ⑮.

3. Connect the video outputs:
   - An HDBaseT receiver (for example, Kramer **TP-580Rxr**) to the HDBT IN RJ-45 connector ⑳.
   - An HDMI acceptor to the HDMI OUT connector ㉑.
4. Connect an unbalanced stereo audio acceptor (for example, active speakers, not shown in Figure 3) to the AUDIO OUT 3.5mm mini jack ⑮.
5. Connect a laptop to the Ethernet RJ-45 connector ⑯.
6. Connect an RS-232 controller (for example, Kramer **RC-74DL**) to the HDBT IN ⑪ and HDBT OUT ⑫ terminal block connectors.
7. Connect the 48V power supply to the 48V DC power terminal block ㉒.
8. If required, connect a PC or serial controller (not shown in Figure 3) to the CONTROL (Tx, Rx, G) terminal block connector, to control the unit via serial control ⑮.

Connecting to the VP-440H2 via RS-232

To control VP-440H2 via RS-232:

- Connect the RS-232 Terminal block connector on **VP-440H2** to the RS-232 9-pin D-sub port on your PC/controlled device as shown in the PIN table below:

Terminal Block PIN	9-pin D-sub PIN
Tx	PIN 2
Rx	PIN 3
GND	PIN 5

Microphone Pinout

Microphone 6.3mm jack pinout for a condenser microphone:

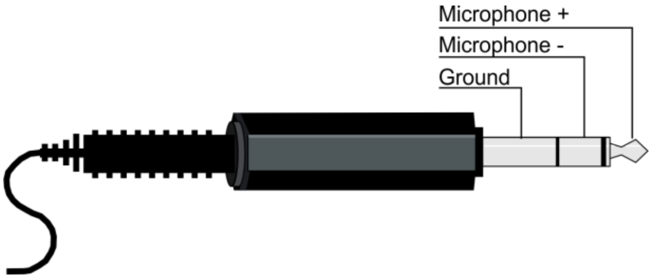


Figure 4: Condenser Microphone Pinout

Microphone 6.3mm jack pinout for a Dynamic microphone:

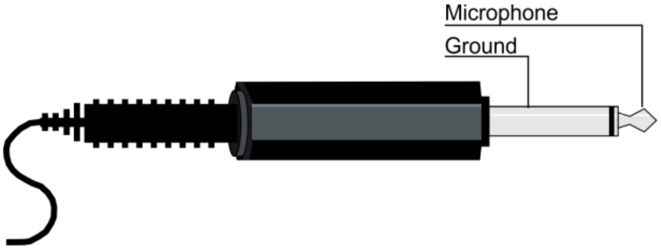


Figure 5: Dynamic Microphone Pinout

Controlling External Devices via HDBT

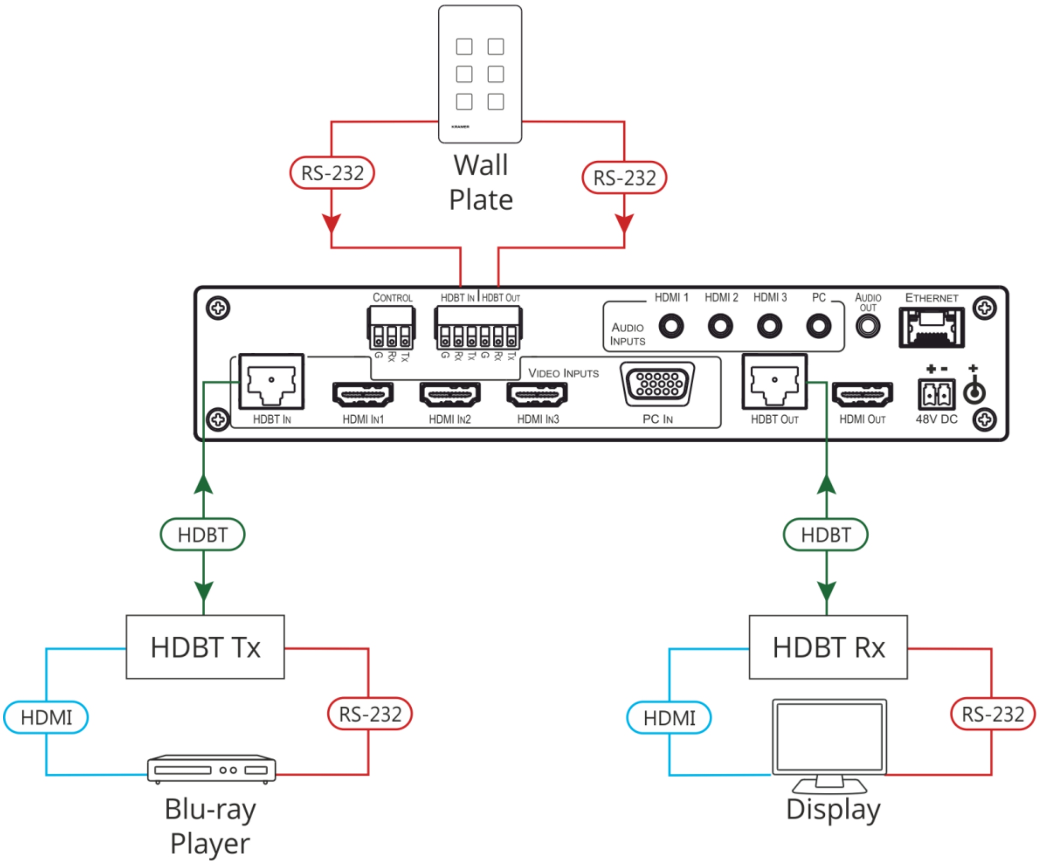

Wall
Plate
RS-232
RS-232
CONTROL
G Rx Tx
HDBT IN
HDBT OUT
G Rx Tx G Rx Tx
AUDIO INPUTS
HDMI 1
HDMI 2
HDMI 3
PC
AUDIO OUT
ETHERNET
VIDEO INPUTS
HDBT IN
HDMI IN1
HDMI IN2
HDMI IN3
PC IN
HDBT OUT
HDMI OUT
48V DC
HDBT
HDBT
HDBT Tx
HDBT Rx
HDMI
RS-232
HDMI
RS-232
Blu-ray
Player
Display

Figure 6: Controlling External Devices via HDBT

Operating VP-440H2

VP-440H2 can be controlled using any of the following methods:

- Front panel controls (see Using the Front Panel Controls on page 10)
- OSD Menu, using the front panel buttons (see Using the OSD Menu on page 11)
- Embedded web pages (see Using the Embedded Web Pages on page 18).
- Protocol 3000 commands via RS-232 and / or TCP control (see Protocol 3000 Commands on page 39).

Using the Front Panel Controls

Selecting the Input to be Switched to the Outputs

VP-440H2 enables selecting one of five inputs to be switched to the two outputs.

To select the input to be routed to the outputs:

- Press the one of the input selector buttons ③, ④, or ⑤.

OR do one of the following:

- Go to the Input Select page of the embedded web pages (see Selecting the Input to be Switched to the Outputs on page 22).
- Use the Protocol 3000 ROUTE command (see ROUTE on page 48).

Selecting the Microphone Type

To select the microphone type:

- Move the 48 V ① button up to select a condenser type microphone or down to select a dynamic type microphone.

We recommend keeping the switch down if a microphone is not connected to the **VP-440H2**.

Setting the Resolution to XGA/1080p

To set the resolution from the front panel:

- Press the RESET TO XGA/1080p button ⑧ to reset the video resolution to XGA or 1080p.
- Press and hold the RESET TO XGA/1080p button ⑧ for about 5 seconds to toggle between switching to XGA or 1080p.

Locking the Front Panel Buttons

The front panel buttons can be locked (disabled) to prevent unintentional button pressing.

To lock the front panel buttons:

- Press and hold the Panel Lock button ⑨ for about 5 seconds.
  The Panel Lock button lights red and the front panel buttons are locked.

To unlock the front panel buttons:

- Press and hold the Panel Lock button ⑨ for about 5 seconds.
  The Panel Lock button light goes out and the front panel buttons are unlocked.

Using the OSD Menu

The front panel navigation buttons ⑦ enable you to control **VP-440H2** via the OSD menu.

To use the OSD menu:

1. Press the MENU button ⑥ to enter the menu.
   The OSD menu appears on the video output display.
2. Use the navigation buttons ⑦:
   - Press the ENTER button to accept changes or to change the parameters.
   - Press the arrow buttons to move through the OSD menu.
3. On the OSD menu, select EXIT to exit the menu.

If there is no button activity for the defined timeout period while within the OSD menu, the menu disappears from the display.

OSD Menus and Submenus

Menu	Sub menu	Parameter	Parameters Description
Picture	CONTRAST		Set the contrast level.
	BRIGHTNESS		Set the brightness level.
	FINETUNE (HDMI/HDBT)	HUE	Set these parameters for the HDMI and HDBT inputs only.
		SATURATION	
		SHARPNESS	
		NR (NOISE REDUCTION)	
	FINETUNE (PC)	PHASE	Set these parameters for the PC input only.
		CLOCK	
		H_POSITION	
		V_POSITION	
	COLOR	RED	Set the color levels.
		GREEN	
		BLUE	

Menu	Sub menu	Parameter	Parameters Description
Input	SOURCE		Select the input to be switched to the output.
Output	SIZE		Select the image size: FULL, OVERSCAN, UNDER1, UNDER2, LETTERBOX, PANSCAN or BEST FIT
	4KIN > 4KOUT		Select BYPASS to avoid scaling when the input resolution is 4K and the output is set to 4K. Select SCALER to enable 4K to 4K scaling. See 4K In to 4K Out Bypassing on page 14.
	RESOLUTION		Select the required resolution for the output.
AUDIO	OUTPUT VOLUME		Set the volume for the outputs.
	SOURCE	HDMI1	Select EMBEDDED for the embedded HDMI audio ANALOG for the analog audio that corresponds to the output, or AUTOMATIC.
		HDMI2	
		HDMI3	
	SETTING	DELAY	Select the audio delay time, 40ms–200ms.
		DRC (Dynamic Range Compression)	Set to ON to dynamically create a sound range according to the volume level. For example, in a movie, the volume is high enough to hear dialogue and at the same time loud, sudden noises are toned down.
		BASS	Set the bass level.
		TREBLE	Set the treble level.
		LOUDNESS	Enable / disable the loudness function.
	MIC SETTINGS	MIC MODE	Select the microphone mode from the following: OFF / MIXER / TALKOVER / MIC ONLY.
		IN TALKOVER MIC MODE, SET THE FOLLOWING (see Microphone Talkover on page 15 for details):	
		DEPTH	Set the decrease of the audio level during microphone talkover.
		TRIGGER	Set the microphone threshold level that triggers the audio output-level decrease.
		ATTACK TIME	Set the transition time of the audio level reduction after the signal rises above the threshold level.
		HOLD TIME	Set the time period that talkover remains active after the signal falls below the threshold level.
		RELEASE TIME	Set the transition time for the audio level to return from its reduced level to its normal level after the Hold Time period.
	MIC VOLUME	MIC	Set the microphone input volume.
	INPUT VOLUME	HDBT	Set the volume for each video input.
		HDMI1	
		HDMI2	
		HDMI3	
		PC	
	MUTE		Mute the audio output.

Menu	Sub menu	Parameter	Parameters Description
OSD	H POSITION		Adjust the OSD horizontal/vertical position on the video display.
	V POSITION		
	TIMER		Set the timeout for the OSD to disappear from the display when not in use.
	TRANSPARENCY		Set the OSD background between 100 (transparent) and 0 (opaque).
	DISPLAY		Select how information is shown on the display during operation: INFO: the information is shown for 10 seconds ON: the information is shown constantly OFF: the information is not shown
ADVANCED	HDCP ON INPUT	HDBT	Enable/disable HDCP for each of the inputs.
		HDMI1	
		HDMI2	
		HDMI3	
	HDCP ON OUTPUT	HDMI OUT	Enable/disable HDCP for each of the outputs.
		HDBT OUT	
	AUTO-SYNC OFF		This feature shuts down VP-440H2 when there are no active inputs. Select one of the following: OFF – disable the AUTO SYNC OFF feature FAST – shuts down after about 10 seconds SLOW – shuts down after about 2 minutes
	AUTO SWITCHING		Select one of the following to set the input with the highest scan priority, to select “Last connected” operation, or to disable auto switching: Off: Disables auto switching Scan from HDMI / HDBT / PC: Set auto-scanning, and select from which input to begin the scanning Last connected: When detecting that a source is connected to an input (which previously had no signal), automatically switch to that input
	EDID MANAGE	HDMI 1 EDID	Set the EDID for each input.
		HDMI 2 EDID	
		HDMI 3 EDID	
		HDBT EDID	
		PC EDID	
	ETHERNET	IP MODE	Set the IP mode to DHCP or Static.
		STATIC IP ADDRESS	Define the IP address.
		SUBNET MASK	Define the Subnet Mask.
		DEFAULT GATEWAY	Define the Default Gateway.
		CONTROL PORT	Enter the control port.
		IP	View the IP address.

Menu	Sub menu	Parameter	Parameters Description
		MAC ADDRESS	View the MAC address.
INFO	SOURCE		View the selected video input.
	INPUT		View the in input resolution.
	OUTPUT HDMI		View the HDMI output resolution.
	OUTPUT HDBT		View the HDBT output resolution.
	VERSION:		Displays the FW version.
FACTORY	RESET		Resets all system settings to factory default and erases any saved configurations.
	SOFT RESET		Power cycles the unit.

4K In to 4K Out Bypassing

VP-440H2 can upscale to any resolution (up to 4K), or downscale (from up to 4K) to any resolution. Although the **VP-440H2** enables “cross-scaling” (that is, scaling the output to the same resolution as the input), this may result in picture quality deterioration – especially when the output refresh rate is different to the input refresh rate.

To overcome the artifacts of 4K to 4K scaling:

- In the OSD menu, select Output > 4K in->4K out > ByPass
  –OR–
  On the Output Settings page of the embedded web pages select 4Kin->4Kout > ByPass.

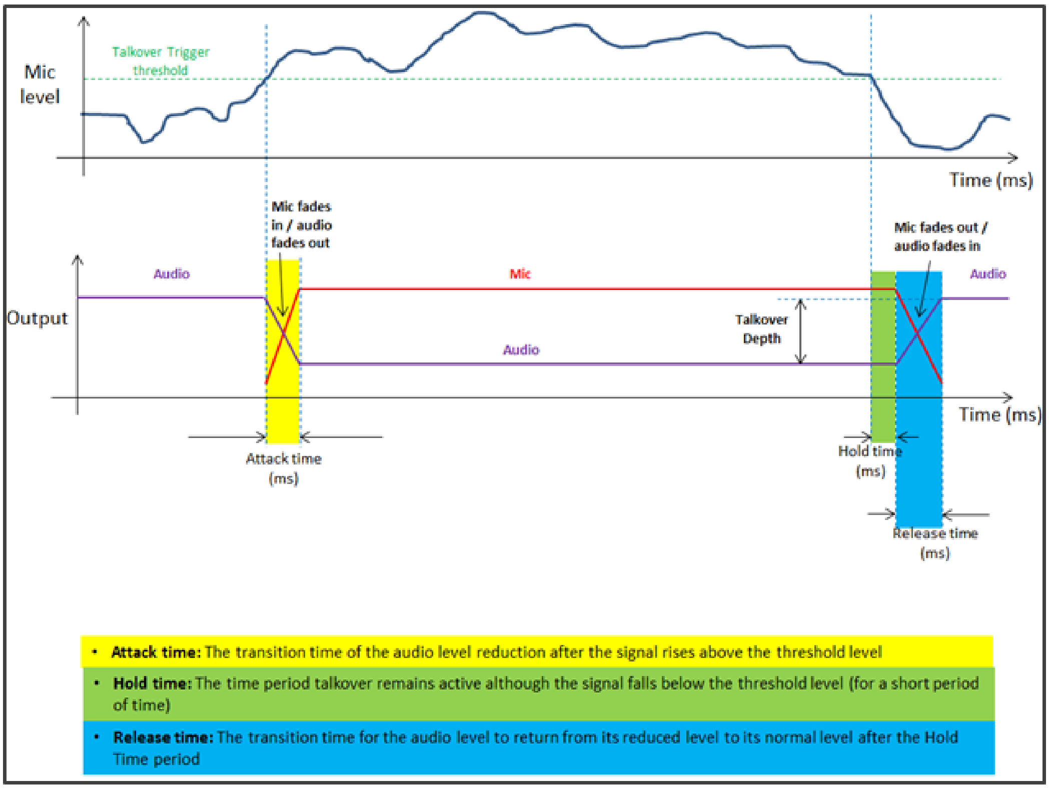
When set to ByPass, all 4K resolutions can be processed to the same refresh rate without scaling, and conversion from 4:4:4 to/from 4:2:0 color space can be performed.

BYPASS must be selected in order to support 4K HDR functionality.

The following table displays the resolutions that can be bypassed:

	Input Resolution	Selected Output Resolution
Bypass Path	4K@24	4K@24
	4K@25	4K@25
	4K@30	4K@30
	4K@50 4:4:4	4K@50 4:4:4
	4K@50 4:4:4	4K@50 4:2:0
	4K@50 4:2:0	4K@50 4:4:4
	4K@60 4:4:4	4K@60 4:4:4
	4K@60 4:4:4	4K@60 4:2:0
	4K@60 4:2:0	4K@60 4:4:4

Microphone Talkover


Mic
level
Talkover Trigger
threshold
Time (ms)
Mic fades
in / audio
fades out
Mic fades out /
audio fades in
Audio
Mic
Audio
Output
Talkover
Depth
Audio
Time (ms)
Attack time
(ms)
Hold time
(ms)
Release time
(ms)

- **Attack time:** The transition time of the audio level reduction after the signal rises above the threshold level
- **Hold time:** The time period talkover remains active although the signal falls below the threshold level (for a short period of time)
- **Release time:** The transition time for the audio level to return from its reduced level to its normal level after the Hold Time period

Figure 7: Microphone Talkover Mode

Operating via Ethernet

You can connect to the **VP-440H2** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see Connecting the Ethernet Port Directly to a PC on page 15)
- Via a network hub, switch, or router, using a straight-through cable (see Connecting the Ethernet Port via a Network Hub or Switch on page 17)

Connecting the Ethernet Port Directly to a PC

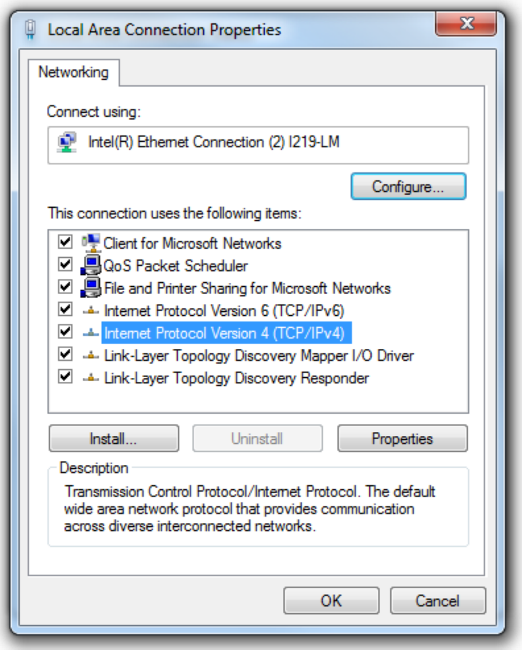
You can connect the Ethernet port of the **VP-440H2** directly to the Ethernet port on your PC using a crossover cable with RJ-45 connectors.

This type of connection is recommended for identifying the **VP-440H2** with the factory configured default IP address.

After connecting the **VP-440H2** 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 8.



Local Area Connection Properties

Networking

Connect using:

Intel(R) Ethernet Connection (2) I219-LM

Configure...

This connection uses the following items:

- ☑ Client for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Install... Uninstall Properties

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

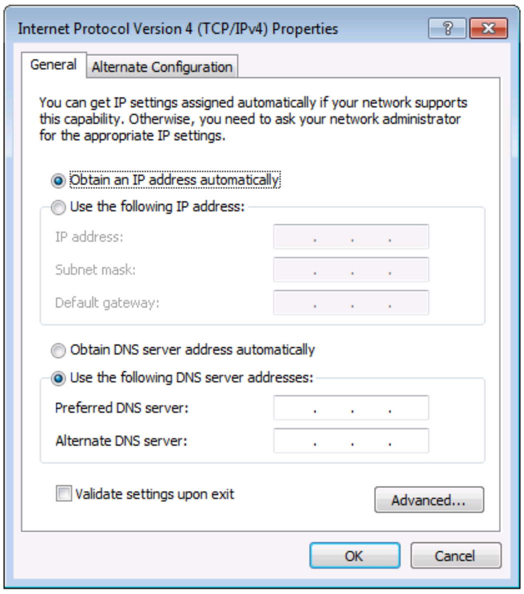
OK Cancel

Figure 8: Local Area Connection Properties Window

4. Highlight **Internet Protocol Version 4 (TCP/IPv4)**.

5. Click **Properties**.

The Internet Protocol Properties window relevant to your IT system appears.



Internet Protocol Version 4 (TCP/IPv4) Properties

General | Alternate Configuration

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

☐ Validate settings upon exit

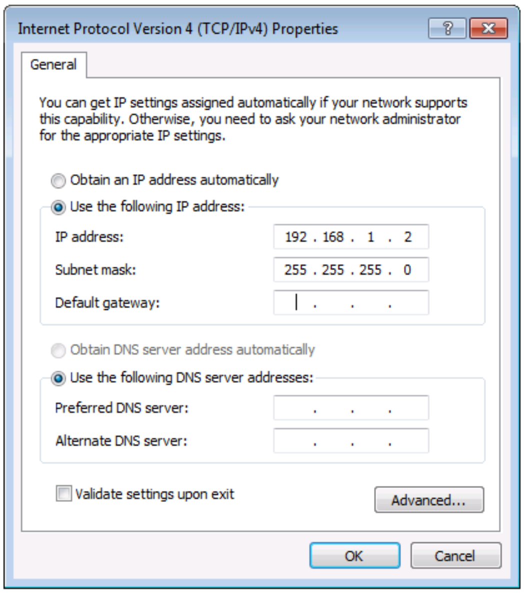
Advanced...

OK Cancel

Figure 9: Internet Protocol Version 4 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in Figure 10.

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.



You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically
● Use the following IP address:
IP address: 192 . 168 . 1 . 2
Subnet mask: 255 . 255 . 255 . 0
Default gateway: . . .

○ Obtain DNS server address automatically
● Use the following DNS server addresses:
Preferred DNS server: . . .
Alternate DNS server: . . .

☐ Validate settings upon exit

Figure 10: Internet Protocol Properties Window

7. Click **OK**.

8. Click **Close**.

Connecting the Ethernet Port via a Network Hub or Switch

You can connect the Ethernet port of the **VP-440H2** to the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

Configuring the Ethernet Port

You can set the Ethernet parameters via the embedded Web pages (Configuring Network Settings on page 23).

Using the Embedded Web Pages

The web pages let you control the **VP-440H2** via the Ethernet. They are accessed using a web browser and an Ethernet connection.

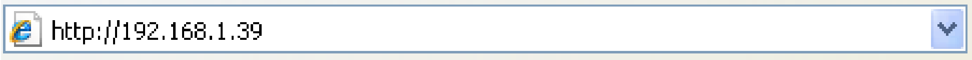
- Before attempting to connect, ensure that your browser is supported. See Technical Specifications on page 33 for a list of supported browsers.

The **VP-440H2** web pages enable performing the following:

- Loading and Saving Configurations on page 19
- Entering Standby Mode on page 20
- Configuring Video Input Settings on page 21
- Selecting the Input to be Switched to the Outputs on page 22
- Freezing or Clearing the Video Output on page 22
- Adjusting Microphone and Output Volume on page 22
- Configuring Network Settings on page 23
- Upgrading the Firmware on page 24
- Configuring Video Output Settings on page 25
- Configuring HDCP per Input/Output on page 27
- Managing EDID on page 28
- Adjusting Audio Input Settings on page 29
- Adjusting Microphone Settings on page 30
- Configuring Automatic Switching Settings on page 31
- Defining Freeze Button on page 32

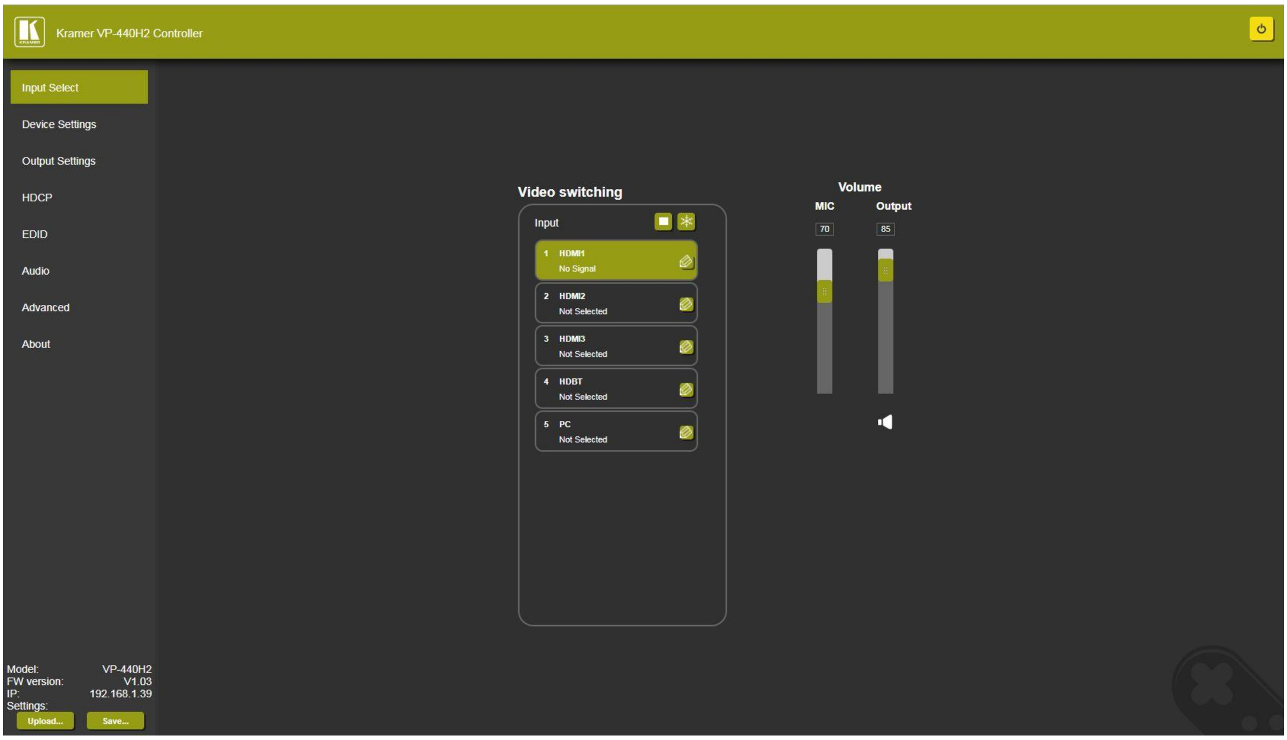
To browse the VP-440H2 Web pages:

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



http://192.168.1.39

The Controller application page appears.


Kramer VP-440H2 Controller
Input Select
Device Settings
Output Settings
HDCP
EDID
Audio
Advanced
About
Video switching
Input
1 HDMI1
No Signal
2 HDMI2
Not Selected
3 HDMI3
Not Selected
4 HDBT
Not Selected
5 PC
Not Selected
Volume
MIC
Output
70
85
Settings:
Upload...
Save...

Model: VP-440H2
FW version: V1.03
IP: 192.168.1.39

Figure 11: Controller Application Page with Navigation List on Left

3. Click the tabs on the left side of the screen to access the relevant web page.

Loading and Saving Configurations

VP-440H2 web pages enable you to save a configuration for easy recall in the future.

At the bottom left hand side of all web pages there is an Upload and a Save button. These enable you to save the current configuration and load any pre-saved configurations.

To save the current configuration:

1. Configure the device as required.
2. Click **Save**.
   The Save File window appears.
3. Browse to the required location to which to save the file.
4. Enter the required name for the saved preset.

5. Click **OK**.
   The current configuration is saved.

When using Chrome, the file is automatically saved in the Downloads folder.

To load a configuration:

1. Click **Upload**.
   An Explorer window opens.
2. Select the required file and click **Open**.
   The device is configured according to the saved preset.

Entering Standby Mode

Standby mode puts the device in a low power consumption mode without turning it off.

To toggle between standby mode and normal operation:

- Click the power icon on the right-hand side of the web pages header.
  When in standby mode, the icon appears dim:

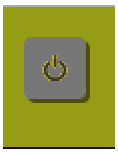


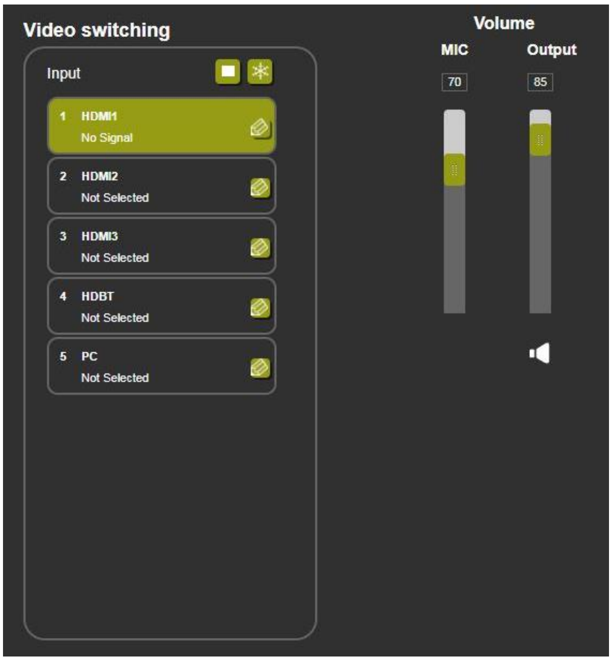
Figure 12: The VP-440H2 Standby Mode

Configuring Video Input Settings

VP-440H2 web pages enable you to individually configure settings for each of the video inputs.

To configure video input settings:

1. Click **Input Select** on the left side of the web page (Figure 11).
   The Input Select page appears.

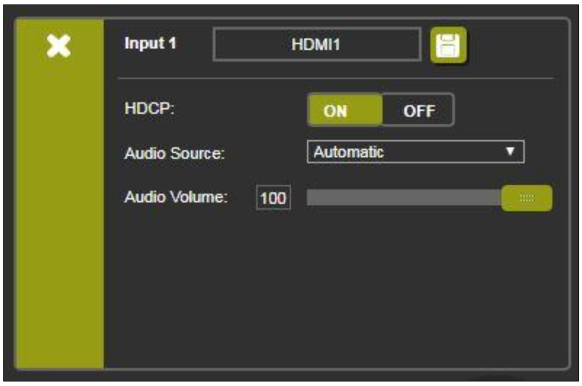


1 HDMI1 No Signal
2 HDMI2 Not Selected
3 HDMI3 Not Selected
4 HDBT Not Selected
5 PC Not Selected

MIC: 70
Output: 85

Figure 13: Web Pages – Input Select Page

2. In the Video Switching area, click the edit icon on the right side of the relevant video input.
   The settings window appears for the selected input.



Input 1: HDMI1
HDCP: ON OFF
Audio Source: Automatic
Audio Volume: 100

Figure 14: Setting Window for Input 1

3. If required, type a new name in the top field and click the save icon to change the name of the input that appears in the web pages.

4. Click **ON**/**OFF** to enable/disable the HDCP decryption on the selected input.

If HDCP is disabled on an input, an HDCP encrypted source will not pass through the unit.

5. For Audio Source, select one of the following:
    - Automatic – the embedded audio on the HDMI input is selected for an HDMI signal, or the analog audio input is selected if the input is not HDMI (for example, for a DVI input signal)
    - Analog – the analog audio input is selected
    - Embedded – the embedded audio in the HDMI signal is selected
6. Adjust the audio volume for this input by typing a number in the box or using the slider control.
7. Click the **X** to exit the input settings window.

Selecting the Input to be Switched to the Outputs

To select the input to be switched to the outputs using the web pages:

1. Click **Input Select** on the left side of the web page (Figure 11).
   The Input Select page appears (Figure 13).
2. In the Video Switching area, click the required input button.
   The input button turns green, the corresponding INPUT LED on the front panel lights and the selected input is switched to the output.

Freezing or Clearing the Video Output

To freeze or clear the video output, do one of the following:

1. Click **Input Select** on the left side of the web page (Figure 11).
   The Input Select page appears (Figure 13).
2. In the Video Switching area, click on of the following:
    - ❄ – Freezes the currently displayed video frame.

To define what happens when you press the Freeze button, see Defining Freeze Button on page 32).

- ▣ – Clears the video output from the display; the display goes blank.

Adjusting Microphone and Output Volume

The microphone and output volume can also be adjusted from the Audio web page.

To adjust the microphone and output volume:

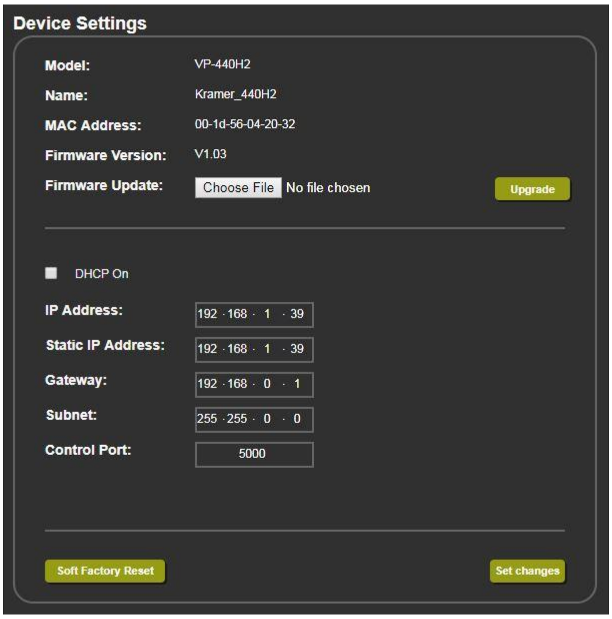
1. Click **Input Select** on the left side of the web page (Figure 11).
   The Input Select page appears (Figure 13).
2. Use the slider controls in the Volume area of the web page.
3. Click 🔇 to mute the output.

Configuring Network Settings

VP-440H2 web pages enable you to use DHCP mode or to turn DHCP mode off and change Network Settings.

To configure network settings:

1. Click **Device Settings** on the left side of the web page (Figure 11).
   The Device Settings page appears.



Device Settings

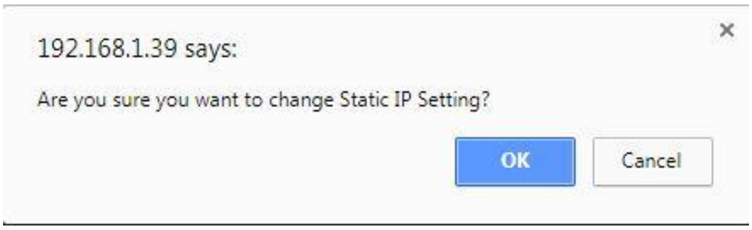
Model: VP-440H2
Name: Kramer_440H2
MAC Address: 00-1d-56-04-20-32
Firmware Version: V1.03
Firmware Update: No file chosen
☐ DHCP On
IP Address: 192 . 168 . 1 . 39
Static IP Address: 192 . 168 . 1 . 39
Gateway: 192 . 168 . 0 . 1
Subnet: 255 . 255 . 0 . 0
Control Port: 5000

Figure 15: Device Settings Page

2. Change the network settings as required and click **Set changes**.

   –OR–

   Select the **DHCP On** check box and click **Set changes**.
   A message appears asking you to confirm the setting change.



192.168.1.39 says:

Are you sure you want to change Static IP Setting?

Figure 16: Device Settings Page – Setting Change Confirmation

3. Click **OK** to confirm the change.
   The current web page session is disconnected. To access the web pages, reload with the new setting.

4. Click **Soft Factory Reset** to restart the unit.

Upgrading the Firmware

To upgrade the VP-440H2 firmware:

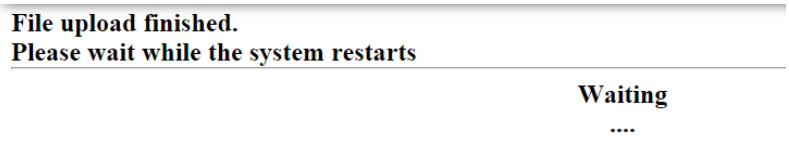
1. Click **Device Settings** on the left side of the web page (Figure 11).
   The Device Settings page appears (Figure 15).

2. Under Firmware Update, click **Choose File**.
   A file browser appears.

3. Open the required upgrade file.
   The file name appears on the web page.

4. Click **Upgrade**.

The new firmware is uploaded:

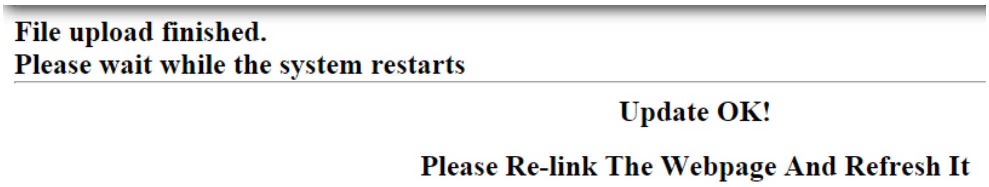


File upload finished.
Please wait while the system restarts

Waiting
....

Figure 17: Device Settings Page – Uploading the New Firmware File

5. Once the file is uploaded follow the instructions on the Web page:
   The new firmware is uploaded:



File upload finished.
Please wait while the system restarts

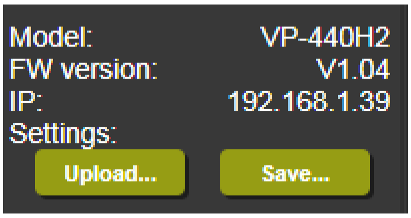
Update OK!

Please Re-link The Webpage And Refresh It

Figure 18: Device Settings Page – New Firmware File Uploading Complete

6. Restart the device, re-enter the IP address, and refresh the web page.

7. Make sure that the new version appears on the lower left side of the web page.



Model: VP-440H2
FW version: V1.04
IP: 192.168.1.39
Settings:

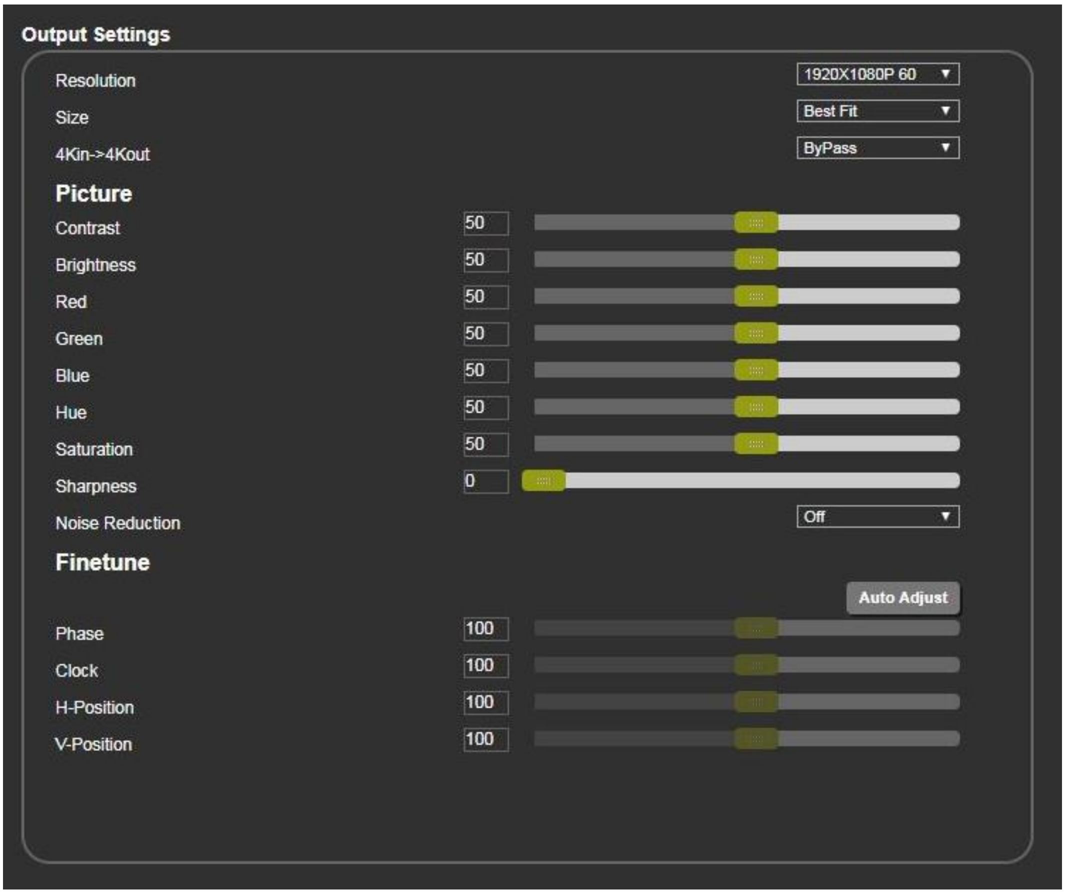
Figure 19: Current Firmware Information Display

Configuring Video Output Settings

VP-440H2 web pages enable you to configure settings for the video that is passed through the HDBT and HDMI outputs.

To configure video output settings:

1. Click **Output Settings** on the left side of the web page (Figure 11).
   The Output Settings page appears (Figure 15).



Output Settings

Resolution	1920X1080P 60
Size	Best Fit
4Kin->4Kout	ByPass

Picture

Contrast	50
Brightness	50
Red	50
Green	50
Blue	50
Hue	50
Saturation	50
Sharpness	0
Noise Reduction	Off

Finetune

Phase	100
Clock	100
H-Position	100
V-Position	100

Figure 20: Output Settings Page

2. Under Resolution, select the required output resolution or select one of the following:
   - Native HDBT – sets the output resolution to match the native resolution of the device connected to HDBT OUT.
   - Native HDMI – sets the output resolution to match the native resolution of the device connected to HDMI OUT.

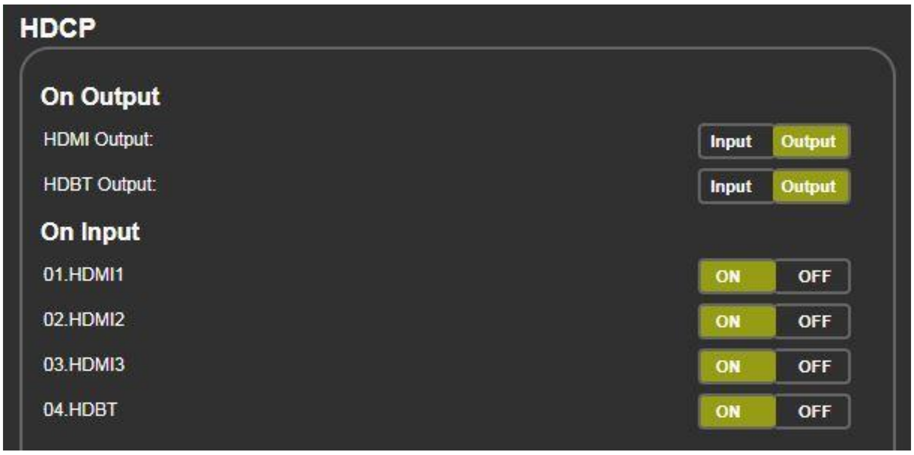
3. Under Size, select one of the following to configure how the video fits on the display:
    - Best Fit
    - Full
    - Pan Scan
    - Letter Box
    - Under Scan
    - Follow In
4. Under 4Kin->4Kout, select one of the following (see 4K In to 4K Out Bypassing on page 14):
    - ByPass
    - Scaler
5. In the Picture area, use the slider controls to adjust the display picture quality.
6. Under Noise Reduction, select the level of noise reduction or select Auto.
7. When the active input is VGA, in the Finetune area, click **Auto Adjust** to automatically adjust the video output or use the slider controls to adjust the following:
    - Phase
    - Clock
    - H-Position – horizontal position of the video on the display screen
    - V-Position – vertical position of the video on the display screen

Configuring HDCP per Input/Output

VP-440H2 web pages enable you to configure HDCP individually for each input/output.

To configure HDCP:

1. Click **HDCP** on the left side of the web page (Figure 11).
   The HDCP page appears (Figure 15).



HDCP

On Output

HDMI Output: Input **Output**

HDBT Output: Input **Output**

On Input

01.HDMI1 **ON** OFF

02.HDMI2 **ON** OFF

03.HDMI3 **ON** OFF

04.HDBT **ON** OFF

Figure 21: HDCP Page

2. In the On Output area, click one of the following for each of the outputs:
   - **Input** – signal only sent with HDCP encryption when the input includes HDCP encryption
   - **Output** – signal is always sent with HDCP encryption when the output supports it, even if the input does not include encryption
3. In the On Input area, click **ON** or **OFF** for each of the four inputs to turn on or off the HDCP encryption for that input.

Managing EDID

VP-440H2 web pages enable you to individually configure and manage EDID settings for each of the 5 inputs.

To manage EDID:

1. Click **EDID** on the left side of the web page (Figure 11).
   The EDID page appears.

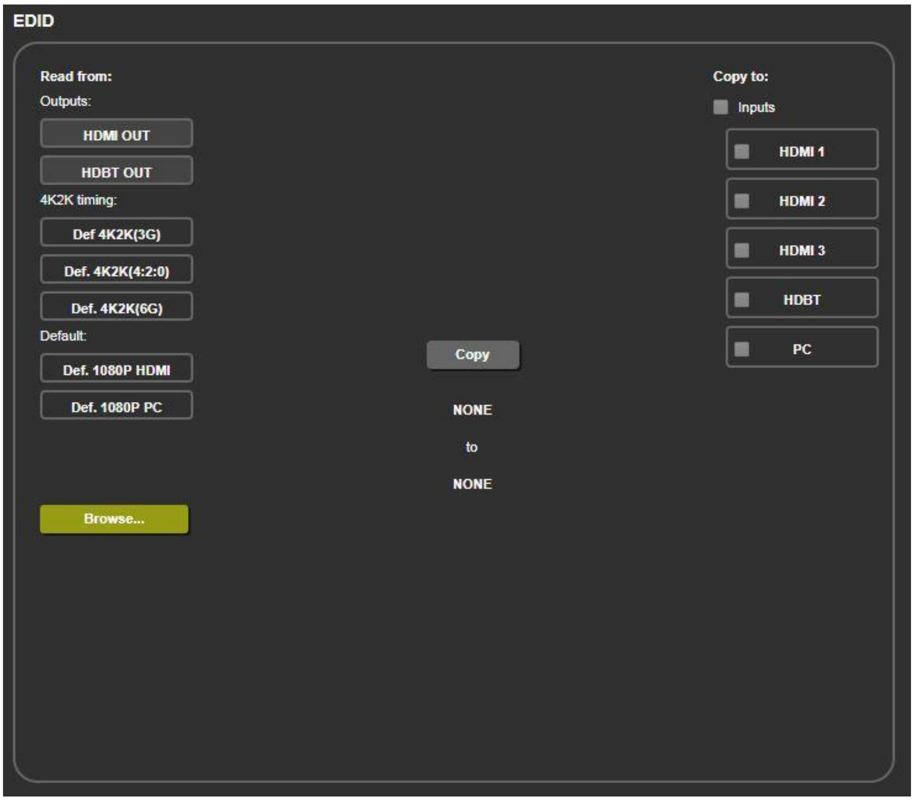
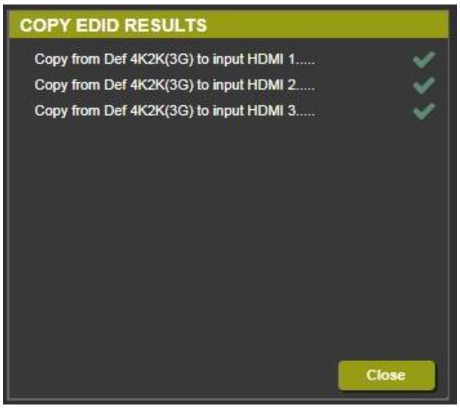

EDID
Read from:
Outputs:
HDMI OUT
HDBT OUT
4K2K timing:
Def 4K2K(3G)
Def. 4K2K(4:2:0)
Def. 4K2K(6G)
Default:
Def. 1080P HDMI
Def. 1080P PC
Browse...
Copy
NONE
to
NONE
Copy to:
☐ Inputs
☐ HDMI 1
☐ HDMI 2
☐ HDMI 3
☐ HDBT
☐ PC

Figure 22: EDID Page

2. Under Read from, click the required EDID source or click **Browse** to use an EDID configuration File.
3. Under Copy to, click the inputs to copy the selected EDID to.
   The Copy button is enabled.
4. Click **Copy**.

The selected EDID is copied to the selected inputs and the Copy EDID Results message appears.



COPY EDID RESULTS

Copy from Def 4K2K(3G) to input HDMI 1..... ✓
Copy from Def 4K2K(3G) to input HDMI 2..... ✓
Copy from Def 4K2K(3G) to input HDMI 3..... ✓

Figure 23: Copy EDID Results Message

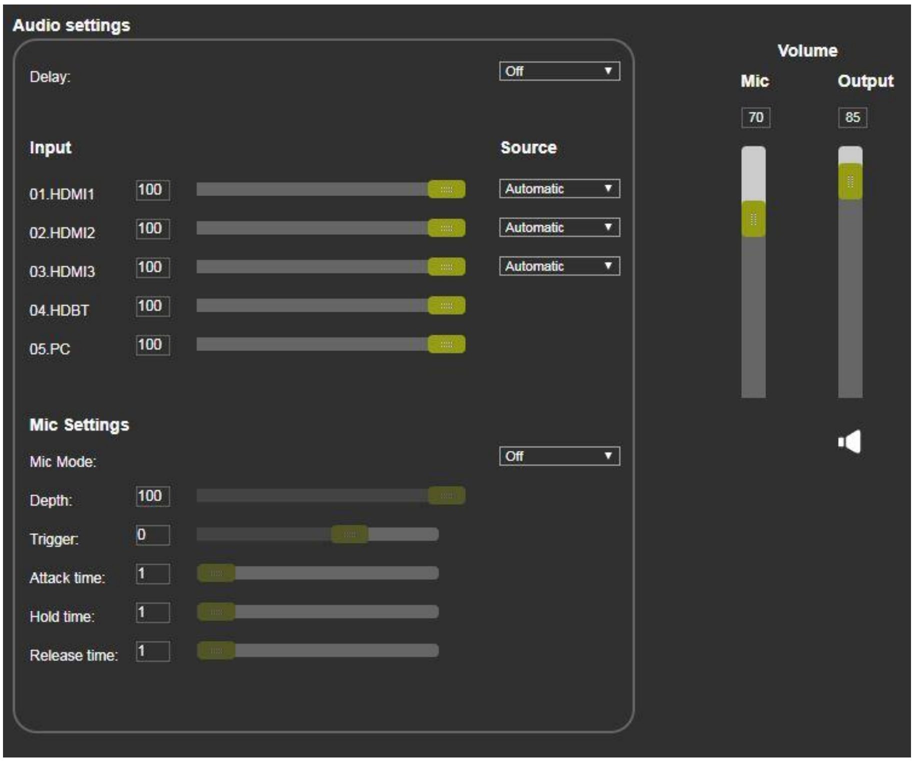
5. Click **Close**.

Adjusting Audio Input Settings

VP-440H2 web pages enable you to individually define the audio volume and source for each of the inputs.

To adjust audio input settings:

1. Click **Audio** on the left side of the web page (Figure 11).
   The Audio page appears.



Audio settings

Delay: Off

Input		Source
01.HDMI1	100	Automatic
02.HDMI2	100	Automatic
03.HDMI3	100	Automatic
04.HDBT	100	
05.PC	100	

Mic Settings

Mic Mode: Off
Depth: 100
Trigger: 0
Attack time: 1
Hold time: 1
Release time: 1

Volume
Mic: 70
Output: 85

Figure 24: Audio Page

2. For Delay, select a time value in milliseconds.

3. In the Source area, select an audio source option for each of the HDMI inputs:
   - Automatic – the embedded audio on the HDMI input ⑬ is selected for an HDMI signal, or the analog audio input is selected if the input is not HDMI (for example, for a DVI input signal)
   - Analog – the analog audio input is selected
   - Embedded – the embedded audio in the HDMI signal is selected
4. In the Input area, use the slider controls or enter a number from 0–100 in the field to adjust the volume of each of the inputs.

Adjusting Microphone Settings

VP-440H2 web pages enable you to define settings for a microphone connected to the MIC jack ② such as talkover/mixer mode, Depth and Trigger.

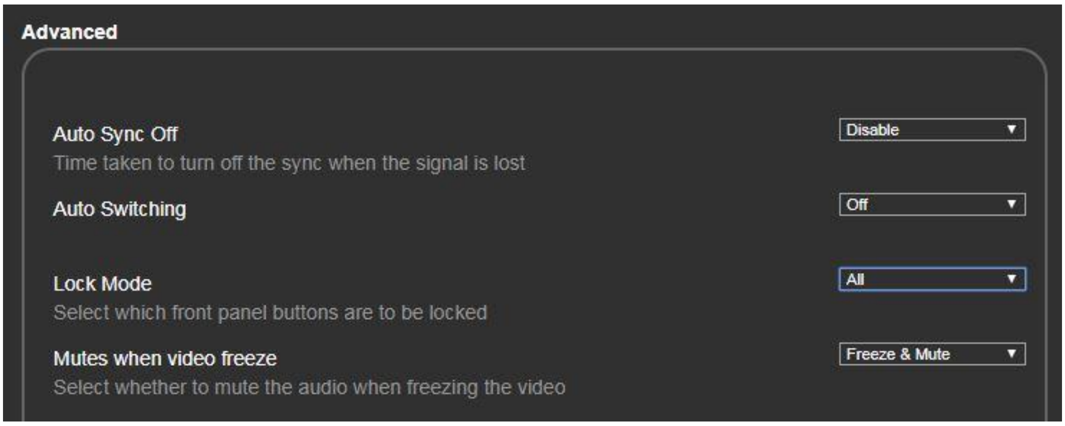
To adjust microphone settings:

1. Click **Audio** on the left side of the web page (Figure 11).
   The Audio page appears (Figure 24).
2. In the Mic Settings area, under Mic Mode, select one of the following:
   - Mixer –Microphone audio plays together with the main output audio
   - Talkover – Decreases the main output audio volume when the microphone is active
   - Mic only – Microphone audio overrides the main output audio
   - Off – Microphone is disabled
3. When Talkover mode is selected, use the slider controls or enter a number in the fields to adjust the microphone settings.

Configuring Automatic Switching Settings

To configure automatic switching settings:

1. Click **Advanced** on the left side of the web page (Figure 11).
   The Advanced page appears.



Advanced

Auto Sync Off: Disable
Time taken to turn off the sync when the signal is lost

Auto Switching: Off

Lock Mode: All
Select which front panel buttons are to be locked

Mutes when video freeze: Freeze & Mute
Select whether to mute the audio when freezing the video

Figure 25: Advanced Page

2. For Auto Sync Off, select one of the following:
   - Disable – disable the Auto Sync Off feature
   - Fast – shuts down after about 10 seconds
   - Slow – shuts down after about 2 minutes
3. Auto Switching
   - Off – Disable auto switching
   - Scan from HDMI / HDBT / PC – Set auto-scanning, and select from which input to begin the scanning
   - Last connected – When detecting that a source is connected to an input (which previously had no signal), automatically switch to that input

Defining Panel Lock Button

VP-440H2 web pages enable you to define which buttons are disabled when you click the PANEL LOCK button ⑨ on the front panel.

To define the PANEL LOCK button:

1. Click **Advanced** on the left side of the web page (Figure 11).
   The Advanced page appears (Figure 25).

2. For Lock Mode, select All, Menu Only, All & Save, or Menu Only & Save.

Defining Freeze Button

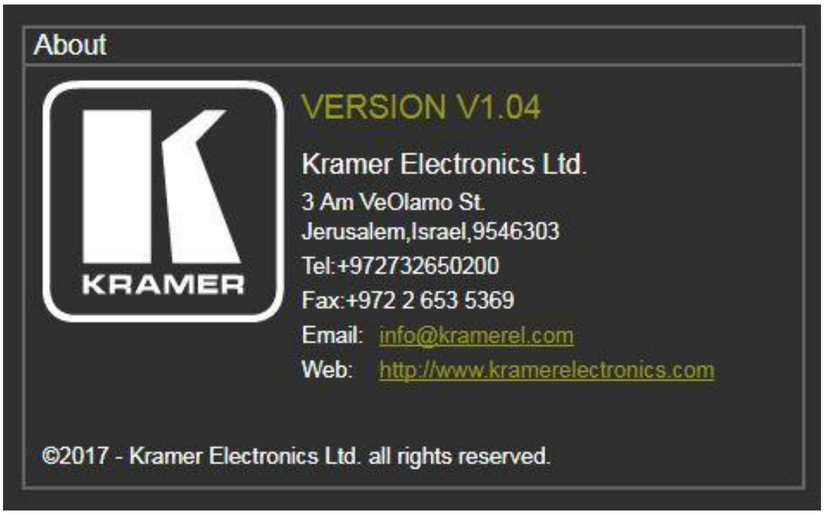
VP-440H2 web pages enable you to define what happens when you click the Freeze button on the Input Select page (see Freezing or Clearing the Video Output on page 22).

To define the Freeze button:

1. Click **Advanced** on the left side of the web page (Figure 11).
   The Advanced page appears (Figure 25).
2. For Mutes when video freeze, select one of the following:
   - Freeze Only
   - Freeze + Mute
   - Mute Only

The About Page

The **VP-440H2** About page lets you view the Web page version and Kramer Electronics Ltd details.



About

VERSION V1.04

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Figure 26: The About Page

Technical Specifications

Inputs	3 HDMI	On female HDMI connectors
	1 VGA	On a 15–pin HD connector
	1 HDBT	On an RJ-45 connector
	1 Stereo Analog Unbalanced Audio	On a 3.5mm mini jack
	1 microphone	On a 6.3mm jack connector (with selectable 48V phantom power)
Outputs	1 HDMI	On a female HDMI connector
	1 HDBT	On an RJ-45 connector
	1 unbalanced stereo audio	On a 3.5mm mini jack
Video	Max Resolution	4K@60Hz (4:4:4)
	Switching Time Between Inputs	2 to 3 seconds
	HDMI Compliance	HDMI 2.0
	HDCP Compliance	HDCP 2.2
Supported PC Web Browsers	Windows 7 and Higher	Internet Explorer (32/64 bit) version 10 Firefox version 30 Chrome version 35
	MAC	Chrome version 35 Firefox version 30 Safari version 7
	Minimum Browser Window Size	1024 x 768
Power	Source	48V DC
	Consumption	850mA
Cooling	Convection Ventilation	
Environmental Conditions	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
Enclosure	Size	Half 19” 1U
	Type	Aluminum
General	Net Dimensions (W, D, H)	21.46cm x 16.30cm x 4.36cm (8.45" x 6.42" x 1.72")
	Shipping Dimensions (W, D, H)	40.50cm x 29.70cm x 9.00cm (15.94" x 11.69" x 3.54")
	Net Weight	1.5kg (3.3lbs) approx
	Shipping Weight	2.6kg (5.7lbs) approx
Accessories	Included	Power supply (48V)
	Optional	**RK–1** rack adapter
Specifications are subject to change without notice at www.kramerav.com		

Input Resolutions

Resolution/Refresh Rate	HDMI	HDBT	PC
480i	Yes	Yes	No
480p	Yes	Yes	No
576i	Yes	Yes	No
576p	Yes	Yes	No
720p@50/60Hz	Yes	Yes	No
1080i@50/60Hz	Yes	Yes	No
1080p@24/25/30/50/60Hz	Yes	Yes	No
640x480@60/67/72/75/85Hz	Yes	Yes	Yes
800x600@56/60/72/75Hz	Yes	Yes	Yes
1024x768@60/70/75Hz	Yes	Yes	Yes
1280x1024@60/75Hz	Yes	Yes	Yes
1280x720@60Hz	Yes	Yes	Yes
1280x768@60Hz	Yes	Yes	Yes
1280x800@60Hz	Yes	Yes	Yes
1280x960@60Hz	Yes	Yes	Yes
1920x1080@60Hz	Yes	Yes	Yes
1600x1200@60Hz	Yes	Yes	Yes
1360x768@60Hz	Yes	Yes	Yes
1366x768@60Hz	Yes	Yes	Yes
1400x1050@60Hz	Yes	Yes	Yes
1600x900RB@60Hz	Yes	Yes	Yes
1680x1050@60Hz	Yes	Yes	Yes
1920x1200RB@60Hz	Yes	Yes	Yes
4K@24/25/30Hz	Yes	Yes	No
4K(4:2:0)@50/60Hz	Yes	Yes	No
4K(4:4:4)@50/60Hz	Yes	No	No

Output Resolutions

Resolution/Refresh Rate	HDMI	HDBT
480p	Yes	Yes
576p	Yes	Yes
720p@50/60Hz	Yes	Yes
1080p@24/25/30/50/60Hz	Yes	Yes
640x480@60Hz	Yes	Yes
800x600@60Hz	Yes	Yes
1024x768@60Hz	Yes	Yes
1280x768@60Hz	Yes	Yes
1280x720@60Hz	Yes	Yes
1280x800@60Hz	Yes	Yes
1360x768@60Hz	Yes	Yes
1280x1024@60Hz	Yes	Yes
1440x900@60Hz	Yes	Yes
1400x1050@60Hz	Yes	Yes
1680x1050@60Hz	Yes	Yes
1600x1200@60Hz	Yes	Yes
1920x1080@60Hz	Yes	Yes
1920x1200RB@60Hz	Yes	Yes
4K@24/25/30Hz	Yes	Yes
4K(4:2:0)@50/60Hz	Yes	Yes
4K(4:4:4)@50/60Hz	Yes	Downsampled to 4:2:0

When outputting HDMI 4K 4:4:4@50/60Hz, the color sampling on the HDBT output is set to 4:2:0.

Default Communication Parameters

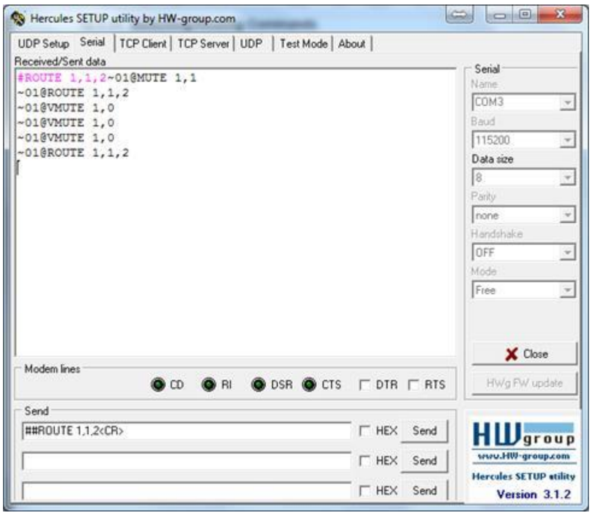
RS-232	
Baud Rate:	9600
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Example (Route the video from HDMI IN 3 to HDMI OUT): ROUTE 1,1,2<CR>	
Ethernet	
IP Address:	192.168.1.39
Subnet mask:	255.255.0.0
Default gateway:	192.168.0.1
TCP Port #:	5000
Maximum TCP Ports:	1
Full Factory Reset	
OSD	Go to : Factory > Reset-> press Enter to confirm

Protocol 3000

The **VP-440H2 4K Presentation Switcher/Scaler** can be operated using the Kramer Protocol 3000 serial commands. The command framing varies according to how you interface with **VP-440H2**.

Generally, a basic video input switching command that routes a layer 1 video signal to HDMI out 1 from HDMI input 2 (`ROUTE 1,1,2`), is entered as follows:

- Terminal communication software, such as Hercules:



Hercules SETUP utility by HW-group.com
UDP Setup
Serial
TCP Client
TCP Server
UDP
Test Mode
About
Received/Sent data
Serial
Modem lines
CD
RI
DSR
CTS
DTR
RTS
Send
HEX
Send
Close
HWg FW update
HWgroup
www.HW-group.com
Hercules SETUP utility
Version 3.1.2

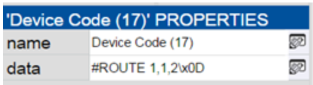
```
#ROUTE 1,1,2~01@MUTE 1,1
~01@ROUTE 1,1,2
~01@VMUTE 1,0
~01@VMUTE 1,0
~01@VMUTE 1,0
~01@ROUTE 1,1,2
```

Name: COM3
Baud: 115200
Data size: 8
Parity: none
Handshake: OFF
Mode: Free

Send: `##ROUTE 1,1,2<CR>`

The framing of the command varies according to the terminal communication software. .

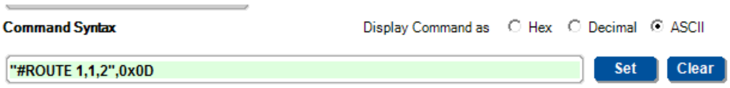
- K-Touch Builder (Kramer software):



'Device Code (17)' PROPERTIES

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

- K-Config (Kramer configuration software):



Command Syntax

Display Command as ○ Hex ○ Decimal ● ASCII

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

All the examples provided in this section are based on using the 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 **VP-440H2**. 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 Protocol 3000 commands, see:

- Understanding Protocol 3000 on page 37
- Kramer Protocol 3000 Syntax on page 37
- Protocol 3000 Commands on page 39

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.

- **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.

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
#	*`Device_id@`*	**Message**	`CR`

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

Start	Body	Delimiter
#	**Command** `SP` *Parameter_1,Parameter_2,…*	`CR`

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

Start	Address	Body	Delimiter
#	*`Device_id@`*	**Command_1** *Parameter1_1,Parameter1_2,…*| **Command_2** *Parameter2_1,Parameter2_2,…*| **Command_3** *Parameter3_1,Parameter3_2,…*|…	`CR`

- **Device Message Format**:

Start	Address (optional)	Body	Delimiter
~	*`Device_id@`*	**Message**	`CR` `LF`

- Device Long Response – Echoing command:

Start	Address (optional)	Body	Delimiter
~	*`Device_id@`*	**Command** `SP` **[***Param1,Param2 …***]** **result**	`CR` `LF`

Protocol 3000 Commands

This section includes the following commands:

- System Commands (page 39)
- Communication Commands (page 45)
- Switching/Routing Commands (page 48)
- Video Commands (page 49)
- Audio Commands (page 51)
- Multiviewer/Scaler Commands (page 55)

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)

#

Functions		**Permission**	**Transparency**
Set:	**#**	End User	Public
Get:	-	-	-
Description		**Syntax**	
Set:	Protocol handshaking	**#** CR	
Get:	-	-	
Response			
~nn@ SP **OK** CR LF			
Notes			
Validates the Protocol 3000 connection and gets the machine number. Used to identify the availability of the device.			
K-Config Example			
`“#”,0x0D`			

BUILD-DATE

Functions		**Permission**	**Transparency**
Set:	**-**	-	-
Get:	**`BUILD-DATE?`**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get device build date	`#`**`BUILD-DATE?`**CR	
Response			
`~`nn`@`**`BUILD-DATE`**SP*`date`*SP*`time`*CR LF			
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			
Response Triggers			
Notes			
K-Config Example			
`“#BUILD-DATE?”,0x0D`			

FACTORY

Functions		**Permission**	**Transparency**
Set:	**`FACTORY`**	End User	Public
Get:	-	-	-
Description		**Syntax**	
Set:	Reset device to factory default configuration	`#`**`FACTORY`**CR	
Get:	-	-	
Response			
`~`nn`@`**`FACTORY`**SP`OK`CR LF			
Parameters			
Response Triggers			
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			
`“#FACTORY”,0x0D`			

HELP

Functions		Permission	Transparency
Set:	**-**	-	-
Get:	**HELP**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get command list or help for specific command	1. #**HELP**CR 2. #**HELP**SP*COMMAND_NAME*CR	
Response			
1. Multi-line: ~nn@Device available protocol 3000 commands:CR LF *command,*SP*command...* CR LF 2. Multi-line: ~nn@HELPSP*command*:CR LF*description*CR LFUSAGE:*usage*CR LF			
Parameters			
COMMAND_NAME – name of a specific command			
Response Triggers			
Notes			
K-Config Example			
1. Get a list of all **VP-440H2** commands: "#HELP",0x0D 2. Get help for the ETH-PORT command: "#HELP ETH-PORT",0x0D			

MODEL

Functions		Permission	Transparency
Set:	**-**	-	-
Get:	**MODEL?**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get device model	#**MODEL?**CR	
Response			
~nn@**MODEL**SP*model_name*CR LF			
Parameters			
model_name – String of up to 19 printable ASCII chars			
Response Triggers			
Notes			
This command identifies equipment connected to **VP-440H2** and notifies of identity changes to the connected equipment.			
K-Config Example			
"#MODEL?",0x0D			

PROT-VER

Functions		Permission	Transparency
Set:	**-**	-	-
Get:	**PROT-VER?**	End User	Public

Description		Syntax
Set:	-	-
Get:	Get device protocol version	#**PROT-VER?** CR

Response
~nn@**PROT-VER** SP 3000:*version* CR LF
Parameters
version – XX.XX where X is a decimal digit
Response Triggers
Notes
K-Config Example
“#PROT-VER?”,0x0D

RESET

Functions		Permission	Transparency
Set:	**RESET**	Administrator	Public
Get:	**-**	-	-

Description		Syntax
Set:	Reset device	#**RESET** CR
Get:	-	-

Response
~nn@**RESET** SP **OK** CR LF
Parameters
Response Triggers
Notes
K-Config Example
“#RESET<CR>”,0x0D

SN

Functions		**Permission**	**Transparency**
Set:	**-**	-	-
Get:	**SN?**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get device serial number	#**SN?**CR	
Response			
~nn@**SN**SP*serial_number*CR LF			
Parameters			
serial_number – 11 decimal digits, factory assigned			
Response Triggers			
Notes			
This device has a 14 digit serial number, only the last 11 digits are displayed			
K-Config Example			
`“#SN?”,0x0D`			

VERSION

Functions		**Permission**	**Transparency**
Set:	**-**	-	-
Get:	**VERSION?**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get firmware version number	#**VERSION?**CR	
Response			
~nn@**VERSION**SP*firmware_version*CR LF			
Parameters			
firmware_version – `XX.XX.XXXX` where the digit groups are: major.minor.build version			
Response Triggers			
Notes			
K-Config Example			
`“#VERSION?”,0x0D`			

DISPLAY

Functions		Permission	Transparency
Set:	-	-	-
Get	**DISPLAY?**	End User	Public

Description		Syntax
Set:	-	-
Get:	Get output HPD status	#**DISPLAY?** SP *out_id* CR

Response
~nn@**DISPLAY** SP *out_id,status* CR LF

Parameters
out_id – output number*:* 0 (HDMI OUT), 1 (HDBT OUT) *status* – HPD status according to signal validation: 0 (Off), 1 (On), 2 (On and all parameters are stable and valid)

Response Triggers
A response is sent to the com port from which the Get was received, after command execution and: After every change in output HPD status from On to Off (0) After every change in output HPD status from Off to On (1) After every change in output HPD status from Off to On and all parameters (new EDID, etc.) are stable and valid (2)

Notes

K-Config Example
Get the output HPD status of HDBT OUT: `“#DISPLAY? 1”,0x0D`

HDCP-MOD

Functions		Permission	Transparency
Set:	**HDCP-MOD**	Administrator	Public
Get:	**HDCP-MOD?**	End User	Public

Description		Syntax
Set:	Set HDCP mode	#**HDCP-MOD** SP *stage_id,mode* CR
Get:	Get HDCP mode	#**HDCP-MOD?** SP *stage_id* CR

Response
Set / Get: ~nn@**HDCP-MOD** SP *inp_id,mode* CR LF

Parameters
stage_id – input number: 0 (HDBT IN), 1 (HDMI IN 1), 2 (HDMI IN 2), 3 (HDMI IN 3): output *mode* – HDCP mode, for input: 0 (HDCP disabled), 1 (HDCP enabled); for output: 2 (follow IN), 3 (follow OUT)

Response Triggers
A response is sent to the com port from which the set (before execution) / get command was received A response is sent to all com ports after command execution if `HDCP-MOD` was set by any other external control device (device button, device menu or other) or if the HDCP mode changed

Notes
When you define 3 as the mode, the HDCP status is defined according to the connected output in the following priority: HDMI OUT, HDBT OUT. If the connected display on HDBT OUT supports HDCP, but HDMI OUT does not, then HDCP is defined as not supported. If HDMI OUT is not connected, then HDCP is defined by HDMI OUT.

K-Config Example
Disable HDCP mode on HDMI IN 2: `“#HDCP-MOD 2,0”,0x0D`

LOCK-FP

Command Name		**Permission**	**Transparency**
Set:	**`LOCK-FP`**	End User	Public
Get:	**`LOCK-FP?`**	End User	Public
Description		**Syntax**	
Set:	Lock the front panel	#**LOCK-FP**␠*Lock/Unlock*␍	
Get:	Get the front panel lock state	#**LOCK-FP?**␍	
Response			
~nn@**LOCK-FP**␠*Lock/Unlock*␍␊			
Parameters			
Lock/Unlock – `0` (unlock), `1` (lock)			
Response Triggers			
Notes			
K-Config Example			
Lock the front panel buttons: `“#LOCK-FP 1”,0x0D`			

Communication Commands

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

NET-DHCP

Functions		**Permission**	**Transparency**
Set:	**`NET-DHCP`**	Administrator	Public
Get:	**`NET-DHCP?`**	End User	Public
Description		**Syntax**	
Set:	Set DHCP mode	#**NET-DHCP**␠*mode*␍	
Get:	Get DHCP mode	#**NET-DHCP?**␍	
Response			
~nn@**NET-DHCP**␠*mode*␍␊			
Parameters			
mode – `0` (do not use DHCP. Use the IP address set by the factory or the `NET-IP` command), `1` (try to use DHCP. If unavailable, use the IP address set by the factory or the `NET-IP` command)			
Response Triggers			
Notes			
Connecting Ethernet to devices with DHCP may take more time in some networks.			
K-Config Example			
Enable DHCP mode, if available: `“#NET-DHCP 1”,0x0D`			

NET-GATE

Functions		Permission	Transparency
Set:	**NET-GATE**	Administrator	Public
Get:	**NET-GATE?**	End User	Public

Description		Syntax
Set:	Set gateway IP	#**NET-GATE**SP*ip_address*CR
Get:	Get gateway IP	#**NET-GATE?**CR

Response

~nn@**NET-GATE**SP*ip_address*CR LF

Parameters

ip_address – gateway IP address, in the following format: `xxx.xxx.xxx.xxx`

Response Triggers

Notes

A network gateway connects the device via another network, possibly over the Internet. Be careful of security problems. Consult your network administrator for correct settings.

K-Config Example

Set the gateway IP address to 192.168.0.1:

`“#NET-GATE 192.168.000.001”,0x0D`

NET-IP

Functions		Permission	Transparency
Set:	**NET-IP**	Administrator	Public
Get:	**NET-IP?**	End User	Public

Description		Syntax
Set:	Set IP address	#**NET-IP**SP*ip_address*CR
Get:	Get IP address	#**NET-IP?**CR

Response

~nn@**NET-IP**SP*ip_address*CR LF

Parameters

ip_address – IP address, in the following format: `xxx.xxx.xxx.xxx`

Response Triggers

Notes

Consult your network administrator for correct settings.

K-Config Example

Set the IP address to 192.168.1.39:

`“#NET-IP 192.168.001.039”,0x0D`

NET-MAC

Functions		Permission	Transparency
Set:	**-**	-	-
Get:	**`NET-MAC?`**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get MAC address	`#`**`NET-MAC?`**`CR`	

Response

`~nn@`**`NET-MAC`**`SP`*`mac_address`*`CR LF`

Parameters

`mac_address` – unique MAC address. Format: `XX-XX-XX-XX-XX-XX` where `X` is a hex digit

Response Triggers

Notes

K-Config Example

`“#NET-MAC?”,0x0D`

NET-MASK

Functions		Permission	Transparency
Set:	**`NET-MASK`**	Administrator	Public
Get:	**`NET-MASK?`**	End User	Public
Description		**Syntax**	
Set:	Set subnet mask	`#`**`NET-MASK`**`SP`*`net_mask`*`CR`	
Get:	Get subnet mask	`#`**`NET-MASK?`**`CR`	

Response

`~nn@`**`NET-MASK`**`SP`*`net_mask`*`CR LF`

Parameters

`net_mask` – format: *`xxx.xxx.xxx.xxx`*

Response Triggers

The subnet mask limits the Ethernet connection within the local network.
Consult your network administrator for correct settings.

Notes

K-Config Example

Set the subnet mask to 255.255.0.0:
`“#NET-MASK 255.255.000.000”,0x0D`

Switching/Routing Commands

Command	Description
`ROUTE`	Set/get layer routing

ROUTE

Command Name		**Permission**	**Transparency**
Set:	**`ROUTE`**	End User	Public
Get:	**`ROUTE?`**	End User	Public
Description		**Syntax**	
Set:	Set layer routing	**#ROUTE**␠*layer,dest,src*␍	
Get:	Get layer routing	**#ROUTE?**␠*layer,src*␍	
Response			
~nn@**ROUTE**␠*layer,dest,src*␍␊			
Parameters			
layer – 1 (video + audio) *dest* – 1 (HDMI OUT) *src* – input number: 0 (HDMI IN 1), 1 (HDMI IN 2), 2 (HDMI IN 3), 3 (PC IN), 4 (HDBT IN)			
Response Triggers			
Notes			
K-Config Example			
Route the video from HDMI IN 3 to HDMI OUT: `“ROUTE 1,1,2”,0x0D`			

Video Commands

Command	Description
`VFRZ`	Set/get output freeze status
`VMUTE`	Set/get enable/disable video on output status
`VID-RES`	Set/get output resolution

VFRZ

Command Name		Permission	Transparency
Set:	**VFRZ**	End User	Public
Get	**VFRZ?**	End User	Public

Description		Syntax
Set:	Set freeze on selected output	**#VFRZ** SP *out_id,freeze_flag* CR
Get:	Get output freeze status	**#VFRZ?** SP *out_id* CR

Response
~nn@**VFRZ** SP *win_num, freeze_flag* CR LF

Parameters
out_id -output number: 1 (HDMI OUT) *freeze_flag* – 0 (unfreeze), 1 (freeze)

Response Triggers
After execution, response is sent to the com port from which the Set/Get was received After execution, response is sent to all com ports if VFRZ was set by any other external control device (button press, device menu and similar)

Notes

K-Config Example
Freeze the video on the HDMI OUT output: `“#VFRZ 1,1”,0x0D`

VMUTE

Functions		Permission	Transparency
Set:	**VMUTE**	End User	Public
Get:	**VMUTE?**	End User	Public
Description		**Syntax**	
Set:	Set enable/disable video on output	**#VMUTE** SP *output_id,flag* CR	
Get:	Get video on output status	**#VMUTE?** SP *output_id* SP CR	
Response			
Set / Get: ~nn@**VMUTE** SP *output_id,flag* CR LF			
Parameters			
out_id – output number: 1 (HDMI OUT+HDBT OUT) *flag* – 0 (enable video on output), 1 (disable video on output)			
Response Triggers			
Notes			
K-Config Example			
Disable the video output on HDMI OUT: “#VMUTE 1,1”,0x0D			

VID-RES

Command Name		Permission	Transparency
Set:	**VID-RES**	End User	Public
Get	**VID-RES?**	End User	Public
Description		**Syntax**	
Set:	Set output resolution	**#VID-RES** SP *stage,stage_id,is_native,resolution* CR	
Get:	Get input/output resolution	**#VID-RES?** SP *stage,stage_id,is_native* CR	
Response			
~nn@**VID-RES** SP *stage,stage_id,is_native,resolution* CR LF			
Parameters			
stage – 0 (input), 1 (output) *stage_id* – output number: 1 (HDMI OUT) *is_native* – 0 (OFF, do not use native resolution) *resolution* – number that represents the required resolution: 200–231 (640x480–Native OUT2)			
Response Triggers			
After execution, response is sent to the com port from which the Set/Get was received. After execution, response is sent to all com ports if VID-RES was set by any other external control device (button press, device menu and similar).			
Notes			
“Set” command is only applicable for *stage*=output. “Set” command with *is_native*=ON sets native resolution on selected output (resolution index sent = 0). Device sends as a response, the actual VIC ID of the native resolution. “Get” command with *is_native*=ON returns native resolution VIC ID, with *is_native*=OFF returns current resolution.			
K-Config Example			
Set the output resolution to 640x480: “#VID-RES 1,1,0,200”,0x0D			

Audio Commands

Command	Description
AUD-EMB	Set/get audio in video embedding status
AUD-LVL	Set/get volume level
MUTE	Set/get audio mute status
MIC-GAIN	Set/get the microphone gain level
MIC-TLK	Set/get mic talkover parameters
TLK	Set/get audio talkover mode status

AUD-EMB

Command Name		Permission	Transparency
Set:	**AUD-EMB**	End User	Public
Get:	**AUD-EMB?**	End User	Public
Description		**Syntax**	
Set:	Set audio in video embedding status	**#AUD-EMB**SP*inp_id,out_id,status*CR	
Get:	Get audio in video embedding status	**#AUD-EMB?**SP*inp_id,out_id* CR	
Response			
Set/Get: ~nn@**AUD-EMB**SP*inp_id,out,status*CR LF			
Parameters			
inp_id – input number: 0 (HDMI IN 1), 1 (HDMI IN 2), 2 (HDMI IN 3) *out_id* – 0 (HDMI OUT) *status* – 0 (Analog), 1 (Embedded), 2 (Auto)			
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 AUD-EMB was set by any other external control device (button press, device menu and similar)			
Notes			
K-Config Example			
Set the audio embedding status for HDMI IN 3 to Analog: `#AUD-EMB 2,0,0”,0x0D`			

AUD-LVL

Command Name		**Permission**	**Transparency**
Set:	**`AUD-LVL`**	End User	Public
Get:	**`AUD-LVL?`**	End User	Public
Description		**Syntax**	
Set:	Set volume level	**`#AUD-LVL`** ␠*`stage`*`,`*`channel`*`,`*`volume`*␍	
Get:	Get volume level	**`#AUD-LVL?`**␠*`stage`*`,`*`channel`*␍	
Response			
~nn@**`AUD-LVL`**␠*`stage`*`,`*`channel`*`,`*`volume`*␍␊			
Parameters			
`stage` – `0` (input processing), `1` (output processing) *`channel`* – inputs: `0` (HDBT IN), `1` (HDMI IN 1), `2` (HDMI IN 2), `3` (HDMI IN 3), `4` (PC IN); output: `0` *`volume`* – volume level: `0` to `100`			
Response Triggers			
Notes			
K-Config Example			
Set the volume on the output to 75: `“#AUD-LVL 1,0,75”,0x0D`			

MUTE

Command Name		**Permission**	**Transparency**
Set:	**`MUTE`**	End User	Public
Get:	**`MUTE?`**	End User	Public
Description		**Syntax**	
Set:	Set audio mute status	**`#MUTE`**␠*`channel`*`,`*`mute_mode`*␍	
Get:	Get audio mute status	**`#MUTE?`**␠*`channel`*␍	
Response			
~nn@**`MUTE`**␠*`channel`*`,`*`mute_mode`*␍␊			
Parameters			
`channel` – `1` (HDMI OUT) *`mute_mode`* – `0` (OFF, unmuted), `1` (ON, muted)			
Response Triggers			
Notes			
K-Config Example			
Mute the audio on the outputs: `“#MUTE 1,1”,0x0D`			

MIC-GAIN

Command Name		**Permission**	**Transparency**
Set:	**`MIC-GAIN`**	End User	Public
Get:	**`MIC-GAIN?`**	End User	Public
Description		**Syntax**	
Set:	Set the microphone gain level	**`#MIC-GAIN`** SP *`P1`*`,`*`P2`* CR	
Get :	Get the microphone gain level	**`#MIC-GAIN?`** SP *`P1`* CR	
Response			
Set / Get : ~nn@**`MIC-GAIN`** SP *`P1`*`,`*`P2`* CR LF			
Parameters			
`P1` – `0` *`P2`* – gain level:`0` to `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 MIC-GAIN was set any other external control device (button press, device menu and similar).			
Notes			
Sets the microphone input audio gain.			
K-Config Example			
Set the microphone audio gain to 50: `“#MIC-GAIN 0,50”,0x0D`			

MIC-TLK

Command Name		**Permission**	**Transparency**
Set:	**`MIC-TLK`**	End User	Public
Get:	**`MIC-TLK?`**	End User	Public
Description		**Syntax**	
Set:	Set mic talkover parameters	**`#MIC-TLK`** SP *`channel`*`,`*`P1`*`,`*`value`* CR	
Get:	Get mic talkover parameters	**`#MIC-TLK?`** SP *`channel`*`,`*`P1`* CR	
Response			
~nn@**`MIC-TLK`** SP *`channel`*`,`*`P1`*`,`*`value`* CR LF			
Parameters			
`channel` – `0` *`P1`* – talkover setting: `0` (Depth), `1` (Trigger), `2` (Attack time), `3` (Hold time), `4` (Release time) *`value`* – `0`–`100` for Depth, `0`–`100` (-60dB–40dB) for Trigger, `0`–`200` (0–2 seconds) for Attack/Hold/Release time			
Response Triggers			
Notes			
K-Config Example			
Set the mic talkover Trigger to -50dB: `“MIC-TLK 0,1,31”,0x0D`			

TLK

Command Name		**Permission**	**Transparency**
Set:	**TLK**	End User	Public
Get:	**TLK?**	End User	Public
Description		**Syntax**	
Set:	Set audio talkover mode status	**#TLK** SP *channel*,*talkover_mode* CR	
Get:	Get audio talkover mode status	**#TLK?** SP *channel* CR	
Response			
~nn@**TLK** SP *channel*,*talkover_mode* CR LF			
Parameters			
channel – 1 (HDMI OUT) *talkover_mode* – 0 (off), 1 (mixer), 2 (talkover), 3 (mic only)			
Response Triggers			
Notes			
K-Config Example			
Set the talkover mode on HDMI OUT to talkover: `“#TLK 1,2”,0x0D`			

Multiviewer/Scaler Commands

Command	Description
`IMAGE-PROP`	Set/get the image size
`SCL-AS`	Set/get the image size
`SCL-AUDIO-DELAY`	Set/get the scaler audio delay setting
`SCL-PCAUTO`	Set PC auto sync of scaler

IMAGE-PROP

<table>
<tr><th colspan="2">Command Name</th><th>Permission</th><th>Transparency</th></tr>
<tr><td>Set:</td><td>IMAGE-PROP</td><td>End User</td><td>Public</td></tr>
<tr><td>Get:</td><td>IMAGE-PROP?</td><td>End User</td><td>Public</td></tr>
<tr><th colspan="2">Description</th><th colspan="2">Syntax</th></tr>
<tr><td>Set:</td><td>Set the image size</td><td colspan="2">#IMAGE-PROP SP <i>P1,image_size</i> CR</td></tr>
<tr><td>Get :</td><td>Get the image size</td><td colspan="2">#IMAGE-PROP? SP <i>P1,image_size</i> CR</td></tr>
<tr><th colspan="4">Response</th></tr>
<tr><td colspan="4">Set / Get : ~nn@IMAGE-PROP SP <i>P1,image_size…</i> CR LF</td></tr>
<tr><th colspan="4">Parameters</th></tr>
<tr><td colspan="4"><i>P1</i> – 1 (output)
<i>image_size</i> – 0 (Overscan), 1 (Full), 2 (Best fit), 3 (Panscan), 4 (Letterbox), 5 (Underscan), 6 (Follow In)</td></tr>
<tr><th colspan="4">Response Triggers</th></tr>
<tr><td colspan="4">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 IMAGE-PROP was set any other external control device (button press, device menu and similar).</td></tr>
<tr><th colspan="4">Notes</th></tr>
<tr><td colspan="4">Sets the image properties of the selected scaler</td></tr>
<tr><th colspan="4">K-Config Example</th></tr>
<tr><td colspan="4">Set the image size to Panscan:
“#IMAGE-PROP 1,3”,0x0D</td></tr>
</table>

SCLR-AS

Command Name		**Permission**	**Transparency**
Set:	**SCLR-AS**	End User	Public
Get:	**SCLR-AS?**	End User	Public
Description		**Syntax**	
Set:	Set auto-sync feature setting	**#SCLR-AS** SP *P1,auto-sync* CR	
Get :	Get auto-sync feature setting	**#SCLR-AS?** SP *P1* CR	
Response			
Set / Get : ~nn**@SCLR-AS** SP *P1,auto-sync* LF			
Parameters			
P1 – 1 (Scaler) *auto-sync* – Auto-sync setting: 0 (off), 1 (fast), 2 (slow)			
Response Triggers			
The auto-sync feature determines whether the outputs are turned off when no video is detected on the selected input			
Notes			
Sets the auto sync features for the selected scaler			
K-Config Example			
Set the auto-sync feature for the outputs to fast: `“#SCLR-AS 1,1”,0x0D`			

SCLR-AUDIO-DELAY

Command Name		**Permission**	**Transparency**
Set:	**SCLR-AUDIO-DELAY**	End User	Public
Get:	**SCLR-AUDIO-DELAY?**	End User	Public
Description		**Syntax**	
Set:	Set the scaler audio delay setting	**#SCLR-AUDIO-DELAY** SP *P1,audio_delay* CR	
Get :	Get the scaler audio delay setting	**#SCLR-AUDIO-DELAY?** SP *P1,audio_delay* CR	
Response			
Set / Get : ~nn**@SCLR-AUDIO-DELAY** SP *P1,audio_delay* CR LF			
Parameters			
P1 – 1 (Scaler) *audio_delay* – 0 (Off), 1 (40ms), 2 (50ms), 3 (60ms), 4 (70ms), 5 (80ms), 6 (90ms), 7 (100ms), 8 (110ms), 9 (110ms), 10 (120ms), 11 (130ms), 12 (140ms), 13 (150ms), 14 (160ms), 15 (170ms), 16 (180ms), 17 (190ms)			
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 `SCLR-AUDIO-DEL` was set any other external control device (button press, device menu and similar).			
Notes			
Sets the audio delay for the audio output			
K-Config Example			
Set the audio delay for the outputs to 80ms: `“#SCLR-AUDIO-DELAY 1,5”,0x0D`			

SCLR-PCAUTO

Command Name		**Permission**	**Transparency**
Set:	**SCLR-PCAUTO**	End User	Public
Get:	-	-	-
Description		**Syntax**	
Set:	Set PC auto-adjust of scaler	**#SCLR-PCAUTO** SP *P1*,*P2* CR	
Get :	-	-	
Response			
~nn@**SCLR-PCAUTO** SP *P1*,*P2* CR LF			
Parameters			
P1 – 1 (scaler) *P2* – 1 (initiates the auto-adjust function)			
Response Triggers			
The auto-adjust feature is implemented every time P2 is set to “Yes”.			
Notes			
Trigger the auto-adjust feature of PC input.			
K-Config Example			
Initiate the PC auto-adjust feature: “#SCLR-PCAUTO 1,1”,0x0D			

Parameters

Video Resolutions

VIC Number	Video Resolution
200	Native out 1
201	640x480
202	800x600
203	1024x768
204	1280x768
205	1360x768
206	1280x720
207	1280x800
208	1280x1024
209	1440x900
210	1400x1050
211	1680x1050
212	1600x1200
213	1920x1080
214	1920x1200
215	480p
216	576p
217	720p@50Hz
218	720p@60Hz
219	1080p@24Hz
220	1080p@25Hz
221	1080p@30Hz
222	1080p@50Hz
223	1080p@60Hz
224	4K@24Hz
225	4K@25Hz
226	4K@30Hz
227	4K@50Hz (HDMI Only)
228	4K@60Hz (HDMI Only)
229	4K@50Hz (4:2:0)
230	4K@60Hz (4:2:0)
231	Native out 2

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3. All Kramer Cobra products, all Kramer Calibre products, all Kramer Minicom digital signage products, all HighSecLabs products, all streaming, and all wireless products are covered by a standard three (3) year warranty.
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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.

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KRAMER

P/N: 2900- 300644 Rev: 1

SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

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We welcome your questions, comments, and feedback.

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