

## USER MANUAL

### MODEL:

VP-440

Presentation Switcher/Scaler



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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!

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## 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-440](http://www.kramerav.com/downloads/VP-440) 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 neighboring electrical appliances that may adversely influence signal quality.
- Position your Kramer **VP-440** 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



**Caution:** There are no operator serviceable parts inside the unit.

**Warning:** Use only the power cord that is supplied 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](http://www.kramerav.com/support/recycling).

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## Overview

The **VP-440** is a high-performance presentation scaler/switcher for HDMI™ and computer graphics signals. The unit scales the video, embeds the audio, and outputs the signal to both an HDMI and an HDBaseT output, as well as outputting to unbalanced stereo audio.

The **VP-440** features:

- PixPerfect™ scaling technology – Kramer's precision pixel mapping and high-quality scaling technology, with full up and down scaling of all video input signals.
- HDTV compatibility.
- HDCP compliance.
- Automatic input switching selectable to last connected or auto-scan.
- 6 video inputs – 4 HDMI on HDMI connectors, 2 computer graphics video on 15-pin HD connectors.
- Scaled output on HDMI and HDBT connectors simultaneously.
- System Range for the HDBT inputs and outputs – Up to 70m (230ft).



For optimum range and performance using HDBaseT™, use recommended Kramer cables, available at [www.kramerav.com/product/VP-440](http://www.kramerav.com/product/VP-440).

- Up to UXGA/1080p output resolutions.
- Microphone input with audio DSP options including mixing and talk-over.
- Companion AFV (Audio-Follow-Video) – stereo audio for every video input.
- 6 unbalanced stereo inputs on 3.5mm connectors as well as embedded audio for the HDMI inputs, each with individual level controls.
- Audio outputs – one unbalanced stereo on a 3.5mm connector as well as embedded audio on the HDMI and HDBT 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 4:2:2 (YUV) color sampling in Native mode.
- Maintains constant output sync – there is no disruption on the output while switching between inputs and when no video is detected.
- Dedicated RS-232 port for bidirectional data tunneling via HDBT.
- Front panel lockout.
- Non-volatile memory – saves final settings.

**Control your VP-440:**

- 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 remote contact-closure switches.
- Via the Ethernet with built-in Web pages.

**Using Twisted Pair Cables for HDBT**

Kramer engineers have developed special twisted pair cables to best match our digital twisted pair products.



For optimum range and performance use the recommended Kramer shielded twisted pair cables available at [www.kramerav.com/product/VP-440](http://www.kramerav.com/product/VP-440).

**Typical Applications**

VP-440 is ideal for the following typical applications:

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

# Defining the VP-440 Presentation Switcher/Scaler

This section defines the VP-440.

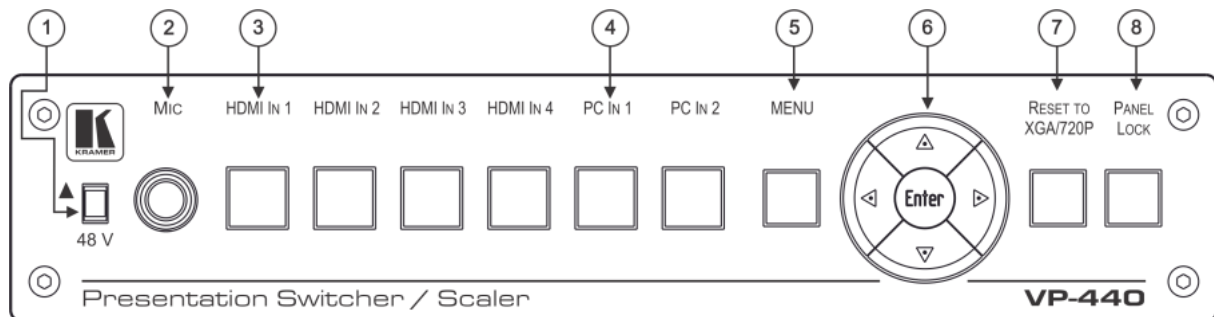


Figure 1: VP-440 Presentation Switcher/Scaler Front Panel

#	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-440).	
②	MIC 6.3mm Jack	Connect to the microphone source.	
③	Input Selector Buttons	HDMI IN	Press to select the HDMI input (from 1 to 4).
④		PC IN	Press to select the computer graphics input (from 1 to 2).
⑤	MENU Button	Displays the OSD menu (see <a href="#">Using the OSD Menu</a> on page 14).	
⑥	Navigation Buttons	◀	Press to decrease numerical values or select from several definitions. When not within the OSD menu mode, press to reduce the output volume.
		▲	Press to move up the menu list values (see <a href="#">Using the OSD Menu</a> on page 14).
		▶	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="#">Using the OSD Menu</a> on page 14).
	ENTER	Press to accept changes and change the SETUP parameters (see <a href="#">Using the OSD Menu</a> on page 14).	
⑦	RESET TO XGA/720p Button	Press to reset the video resolution to XGA or 720p. Press and hold for about 5 seconds to toggle between switching to XGA or 720p.	
⑧	PANEL LOCK Button	Press and hold for about 10 seconds to lock/unlock the front panel buttons (see <a href="#">Locking the Front Panel Buttons</a> on page 13).	

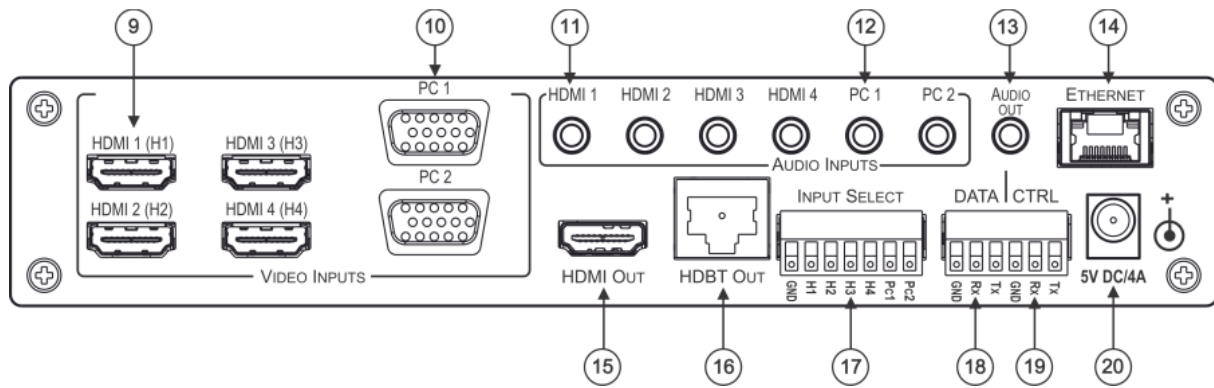


Figure 2: VP-440 Presentation Switcher/Scaler Rear Panel

#	Feature		Function
9	VIDEO INPUT Connectors	HDMI	Connect to the HDMI source (from 1 to 4).
10		PC 15-pin HD	Connect to the computer graphics source (from 1 to 2).
11	AUDIO INPUT Unbalanced Stereo 3.5 Mini Jack Connector	HDMI	Connect to the analog audio HDMI source (from 1 to 4).
12		PC	Connect to the analog audio computer graphics source (from 1 to 2).
13	AUDIO OUT 3.5 Mini Jack Connector		Connect to an unbalanced stereo audio acceptor.
14	ETHERNET Connector		Connects to the PC or other controller through computer networking.
15	HDMI OUT Connector		Connect to the HDMI acceptor.
16	HDBT RJ-45 Port		Connect to an HDBT receiver.
17	INPUT SELECT Terminal Block Connectors		For remotely switching the inputs via contact closure switches.
18	DATA (Tx, Rx, GND) Terminal Block Connectors		Connect to the PC or control device to tunnel data between this RS-232 port and the HDBT OUT port.
19	CTRL (Tx, Rx, GND) Terminal Block Connectors		Connect to the PC or the serial controller to control the device or to control an external device (e.g., a monitor).
20	5V DC/4A		+5V DC connector for powering the unit.

# Mounting VP-440

This section provides instructions for mounting **VP-440**. Before installing, 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.

**Caution:**

- Mount **VP-440** before connecting any cables or power.

**Warning:**

- Ensure that the environment (e.g., maximum ambient temperature & air flow) is compatible for the device.
- Avoid uneven mechanical loading.
- Appropriate consideration of equipment nameplate ratings should be used for avoiding overloading of the circuits.
- Reliable earthing of rack-mounted equipment should be maintained.
- Maximum mounting height for the device is 2 meters.

## Mounting the VP-440 in a Rack

Mount the unit in a rack using the recommended rack adapter (see [www.kramerav.com/product/VP-440](http://www.kramerav.com/product/VP-440)).

## Mounting the VP-440 on a Table or Shelf

Attach the rubber feet and place the unit on a flat surface.



For more information go to [www.kramerav.com/downloads/VP-440](http://www.kramerav.com/downloads/VP-440).



# Connecting the VP-440



Always switch off the power to each device before connecting it to your **VP-440**. After connecting your **VP-440**, 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.

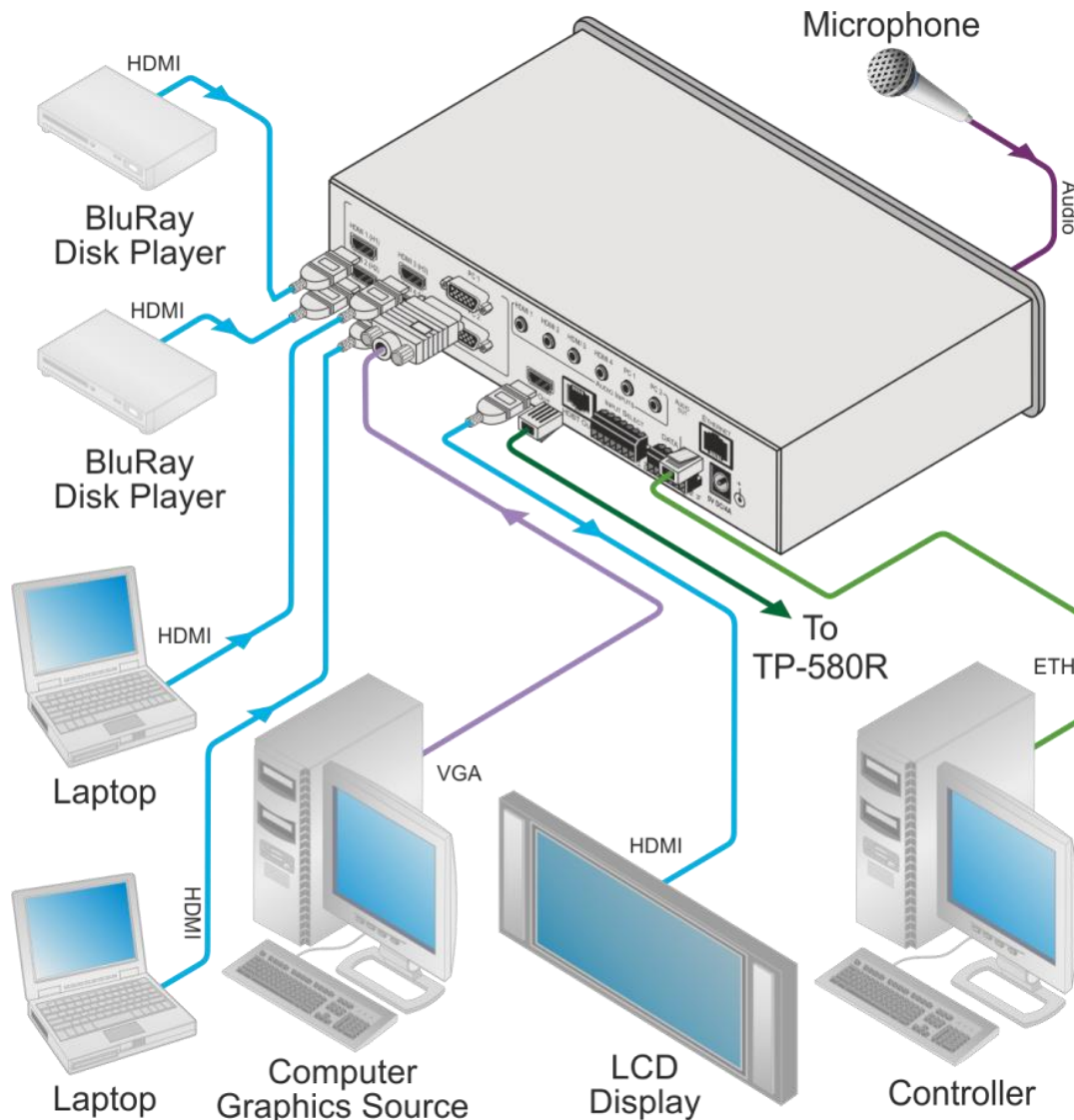


Figure 3: Connecting the VP-440 Presentation Switcher / Scaler

To connect the **VP-440**, as illustrated in the example in [Figure 3](#), do the following:

1. Connect an HDMI source (for example, a Blu-ray disk player) to the HDMI 1 (H1) VIDEO INPUT connector ⑨ (from 1 to 4).



Alternatively, you can connect the DVI connector on the DVD player to the HDMI connector on the **VP-440** via a DVI-HDMI adapter. When using this adapter, you can connect the audio signal via the 3.5mm mini jack connector ⑪.

2. Connect a computer graphics source to the PC 1 15-pin HD VIDEO INPUT connector ⑩ (from 1 to 2).

3. Connect the audio input signals to the AUDIO INPUT 3.5mm mini jack connectors (11) & (12), as required (not shown in [Figure 3](#)).
4. Connect the HDMI OUT connector (15) to an HDMI acceptor (for example, an LCD display).
5. Connect the HDBT OUT (16) connector to an HDBT receiver.
6. Connect the AUDIO OUT 3.5mm mini jack connector (13) to an unbalanced stereo audio acceptor (not shown in [Figure 3](#)).
7. On the front panel, connect a microphone to the MIC 6.3mm phone jack (2) and set it to condenser or dynamic type.
8. Connect the power cord (20) (not shown in [Figure 3](#)).  
Connect the:
  - RS-232 DATA 3-pin terminal block connector (Tx, Rx, G) (18) to a PC for sending RS-232 commands via HDBT.
  - RS-232 CONTROL 3-pin terminal block connector (Tx, Rx, G) (19) to a PC to control the device.
9. Connect the INPUT SELECT 7-pin terminal block (contact-closure remote-control pins) (17) to select an input by momentarily pressing the switch.
10. Connect the ETHERNET port (14) (see [Operating via Ethernet](#) on page [17](#)).

## Microphone Pinout

The microphone 6.3mm jack pinout for a condenser microphone.

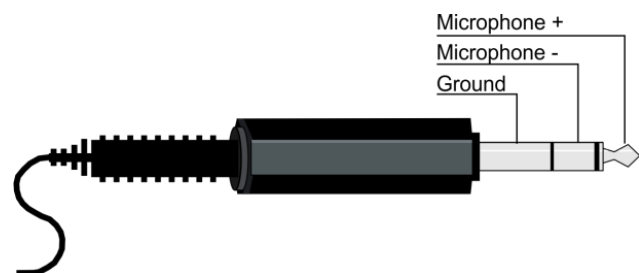


Figure 4: Condenser Microphone Pinout


The microphone 6.3mm jack pinout for a Dynamic microphone.



Figure 5: Dynamic Microphone Pinout

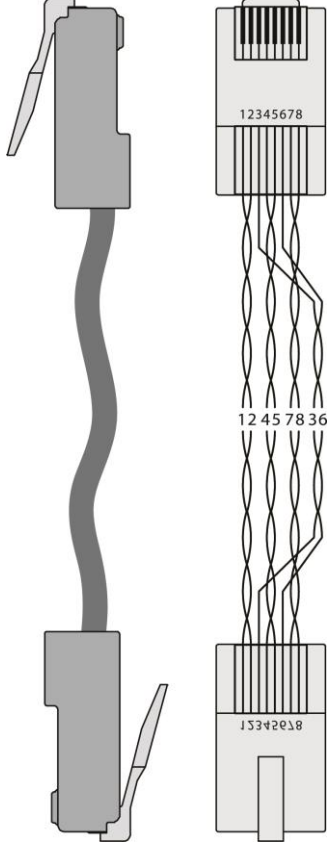
# Wiring the TP LINE OUT RJ-45 Connector

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

 For HDBT cables, it is recommended that the cable ground shielding be connected/soldered to the connector shield.

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

Figure 6: TP PINOUT



## Connecting the VP-440 via the INPUT SELECT Terminal Block Connector

The INPUT SELECT contact closure remote control pins include a GND pin and six input pins (H1 to H4 and PC1 to PC2) for selecting an input.

The contact closure remote control pins operate in a similar way to the INPUT buttons (see [Using the Front Panel buttons](#) on page 12). Using the contact closure remote control (also known as push-to-make momentary contact) you can select any of the inputs.

**To select inputs via contact closure:**

- Momentarily connect the required input pin on the INPUT SELECT terminal block connector to the GND (Ground) pin of the INPUT SELECT terminal block connector.



**Do not** connect more than one input PIN to the GND PIN at the same time.

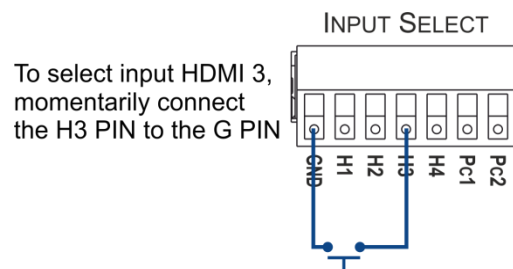


Figure 7: Connecting the Contact Closure Remote Control PINs

For more information on controlling the input buttons externally, see [Controlling VP-440 via the RS-232 Terminal Block Connectors](#) on page 34.

## Connecting to the VP-440 via RS-232

The VP-440 features two RS-232 ports:

- RS-232 DATA (Tx, Rx, GND) to pass data to and from the machine that is connected to the HDBT connector.
- RS-232 CTRL (Tx, Rx, GND) to control the VP-440 or to control an external device (e.g., a monitor).

To connect to the VP-440 via RS-232:

- Connect the RS-232 terminal block connector on the VP-440 to the RS-232 9-pin D-sub port on your PC/controlled device

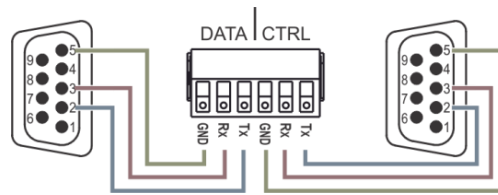


Figure 8: RS-232 Pinout

Connect this PIN on the terminal block connector	To this PIN on the 9-pin D-sub Connector
Tx	PIN 2
Rx	PIN 3
GND	PIN 5

For more information on controlling the input buttons externally, see [Controlling an External Device via the RS-232 Terminal Block Connectors](#) on page [35](#).

# Operating the VP-440

The VP-440 can be controlled via:

- Front panel buttons (see [Using the Front Panel buttons](#) on page [12](#)).
- OSD Menu (see [Using the OSD Menu](#) on page [14](#)).
- Embedded web pages (see [Using the Embedded Web Pages](#) on page [20](#)).
- Protocol 3000 commands via RS-232 and / or TCP control (see [Protocol 3000 Commands](#) on page [44](#)).

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## Using the Front Panel buttons

The VP-440 includes the following front panel buttons:

- Input selector buttons for selecting the required input: HDMI (1 to 4) and PC (1 and 2).
- MENU, ENTER, and up, down, left and right arrow buttons (for navigating OSD Menu, see [Using the OSD Menu](#) on page [14](#)).
- RESET TO XGA/720P and PANEL LOCK buttons.

## Auto Adjust Feature

The auto adjust feature may be implemented every time the input is switched to VGA or when the input resolution changes, as set in the PICTURE>FINETUNE menu (see [OSD Menu](#) on page [14](#)).

## Selecting the Microphone Type

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

To select the microphone type:

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

## Setting the Resolution to XGA/720p

Press to reset the video resolution to XGA or 720p.

To set the resolution from the front panel:

- Press and hold **RESET TO XGA/720P** **⑦** for about 5 seconds to toggle the video resolution between XGA and 720p.

## Locking the Front Panel Buttons

The front panel buttons can be locked (disabled) to prevent unintentional pressing of the buttons. Locking modes are set via the Advanced webpage (see [Defining Panel Lock Button](#) on page 33) or the ADVANCED OSD menu (see [OSD Menu](#) on page 14).

**To lock the front panel buttons:**

- Press and hold **PANEL LOCK** (8) for about 10 seconds.  
The Panel Lock button lights red and the front panel buttons are locked.

## Unlocking the Front Panel Buttons

**To unlock the front panel buttons (in case of All or Menu Only modes):**

- Press and hold **PANEL LOCK** (8) for about 10 seconds.  
The Panel Lock button light goes out and the front panel buttons are unlocked.

**To unlock the front panel buttons (in case of All & Save or Menu Only & Save modes):**

- Press and hold **PANEL LOCK** (8) and **RESET TO XGA/720P** (7) simultaneously for about 10 seconds.  
The Panel Lock button light goes out and the front panel buttons are unlocked.



The unlocking procedure in both “Save” modes involves pressing two buttons instead of one to prevent unlocking the front-panel by unauthorized users.

## Using the OSD Menu

The control buttons let you control the **VP-440** via the OSD menu. Press:

- **MENU** to enter the menu.  
The default timeout is set to 10 seconds.
- **ENTER** to accept changes and to change the menu settings.
- Arrow buttons to move through the OSD menu, which is displayed on the video output.

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

## OSD Menu

Menu	Mode	Function			
<b>OUTPUT</b>	SOURCE	Select the input: HDMI 1, HDMI 2, HDMI 3, HDMI 4, PC1 or PC2.			
	SIZE	Select the image size: FULL, OVER SCAN, UNDER 1, UNDER 2, LETTER BOX, PAN SCAN or BEST FIT.			
	RESOLUTION	Select the output resolution from the menu:			
		<b>Output resolution:</b>	<b>Appears as:</b>	<b>Output resolution:</b>	
		<b>Appears as:</b>	<b>Output resolution:</b>	<b>Appears as:</b>	
		NATIVE OUT1		1600x900 @60Hz	1600x900 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
1680x1050 @60Hz		1680x1050 60			
<b>NATIVE</b> - Select NATIVE to select the output resolution from the EDID of the connected HDMI monitor.					
<b>PICTURE</b>	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 level.			
	GREEN	Set the green level.			
	BLUE	Set the blue level.			
	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, LOW, MID (middle) and HIGH (not applicable for VGA inputs).			
	FINETUNE	Enabled for VGA: AUTO ADJUST (NO/YES), H-POSITION, V-POSITION, PHASE, CLOCK, WXGA/XGA, RESET (NO/YES).			



Menu	Mode	Function	
AUDIO	INPUT VOLUME	Set the volume separately for each input: HDMI 1, HDMI 2, HDMI 3, HDMI 4, PC1 and PC2.	
	OUTPUT VOLUME	Set the output volume.	
	DELAY	Select the audio delay time: OFF, 40ms, 110ms and 150ms.	
	MUTE	Select the sound mute options: ON or OFF.	
	EMBEDDED AUDIO	Select the audio source of the HDMI 1 to HDMI 4 inputs:	
		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).
		EMBEDDED:	The embedded audio in the HDMI signal is selected.
		ANALOG:	The analog audio input is selected.
	MIC SETTINGS	MIC MODE	<p>set the mode to OFF, MIXER, TALKOVER or MIC ONLY. When in <i>TALKOVER</i> mode (see <a href="#">OSD Menu</a>), set the following:</p> <ul style="list-style-type: none"> <li>• DEPTH [%] – To determine the decrease of the audio level during microphone 1 takeover (press + to further decrease the talkover audio output level; press – to lessen the talkover output audio decrease level).</li> <li>• TRIGGER [dB] – To determine the microphone threshold level that triggers the audio output-level decrease.</li> <li>• ATTACK TIME – To set the transition time of the audio level reduction after the signal rises above the threshold level.</li> <li>• HOLD TIME – To define the time period talkover remains active although the signal falls below the threshold level (for a short period of time).</li> <li>• RELEASE TIME – To define the transition time for the audio level to return from its reduced level to its normal level after the Hold Time period.</li> </ul>
	MIC VOLUME	Set the microphone volume for MIC.	
DRC	Dynamic Range Compression – allows a dynamic volume range. Set to ON to dynamically create a sound range according to the volume level. For example, in a movie the volume will be high enough to hear the dialogues and at the same time loud explosions and sudden noises in the soundtrack will be toned down so others would not be disturbed.		

Menu	Mode	Function	
ADVANCED	HDCP ON INPUT	Select the HDCP option for the HDMI inputs (1 to 4): either ON (the default) or OFF. Setting HDCP support to disabled (OFF) on the HDMI input allows the source to transmit a non-HDCP signal if required (for example, when working with a Mac computer).	
	HDCP ON OUTPUT	Set HDMI OUT and HDBT OUT: Select FOLLOW INPUT or FOLLOW OUTPUT to define whether the HDCP will follow the input or the output. When FOLLOW INPUT is selected, it changes its HDCP output setting (for the HDMI output) according to the HDCP of the input. This option is recommended when the HDMI/HDCP output is connected to a splitter/switcher. When FOLLOW OUTPUT is selected, the scaler matches its HDCP output to the HDCP setting of the HDMI/HDCP acceptor to which it is connected.	
	AUTO SYNC OFF	Turn to OFF (disable the AUTO SYNC OFF feature), 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 will automatically shut down when it has no input.	
	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	Select the information shown on the screen during operation: <ul style="list-style-type: none"> <li>• INFO – The information is shown for 10 seconds.</li> <li>• ON – The information is shown permanently</li> <li>• OFF – The information is not shown</li> </ul>
	AUTO SWITCHING	MODE	Set the auto switching mode to OFF, AUTO SCAN or LAST CONNECTED. SCAN PRIORITY (below) is enabled when AUTO SCAN is selected. When one of the auto switching modes is selected (AUTO SCAN or LAST CONNECTED), audio is enabled only when a video signal is detected.
		SCAN PRIORITY	Set to HDMI to begin scanning with HDMI1 or to PC to begin scanning with PC1..
	ETHERNET	IP MODE	Set the IP mode to DHCP or STATIC
		STATIC IP ADDRESS	Fill in if STATIC (above) is selected: <ul style="list-style-type: none"> <li>• IP ADDRESS</li> <li>• SUBNET</li> <li>• GATEWAY</li> <li>• CONTROL PORT</li> <li>• MAC ADDRESS</li> </ul>
	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-440</b> is powered down.	
MENU ONLY AND SAVE		Lock the MENU (and navigation) front panel buttons only. The lock status is saved when the <b>VP-440</b> is powered down.	
TIMING SHIFT	Set to ON (recommended): Implements a small shift on the horizontal sync to improve output picture stability. Set to OFF if the display shows an instability at the selected output resolution.		
FACTORY RESET	Select NO or YES.		
INFORMATION	Displays the INPUT and OUTPUT resolutions, INPUT and OUTPUT HDCP status, the IP ADDRESS and the FIRMWARE revision number.		

## Talkover Mode

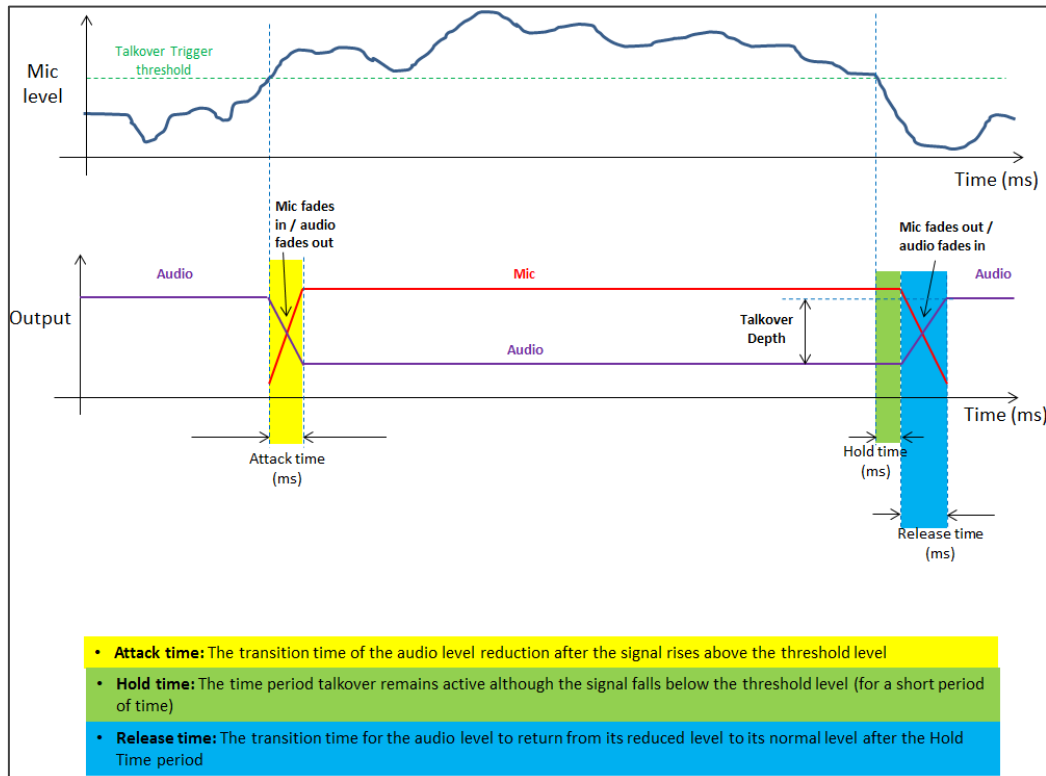


Figure 9: Talkover Mode

## Operating via Ethernet

You can connect to the **VP-440** 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 17).
- Via a network hub, switch, or router, using a straight-through cable (see [Connecting the Ethernet Port Directly to a PC](#) on page 17).



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

### Connecting the Ethernet Port Directly to a PC

You can connect the Ethernet port of the **VP-440** 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-440** with the factory configured default IP address.

After connecting the **VP-440** to the Ethernet port, configure your PC as follows:

1. Click **Start > Control Panel > Network and Sharing Center**.
2. Click **Change Adapter Settings**.

- 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 [Connecting the Ethernet Port Directly to a PC](#).

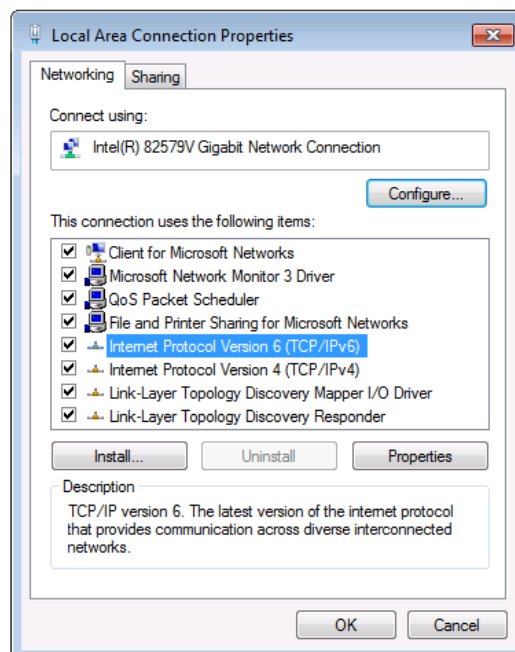


Figure 10: Local Area Connection Properties Window

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

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

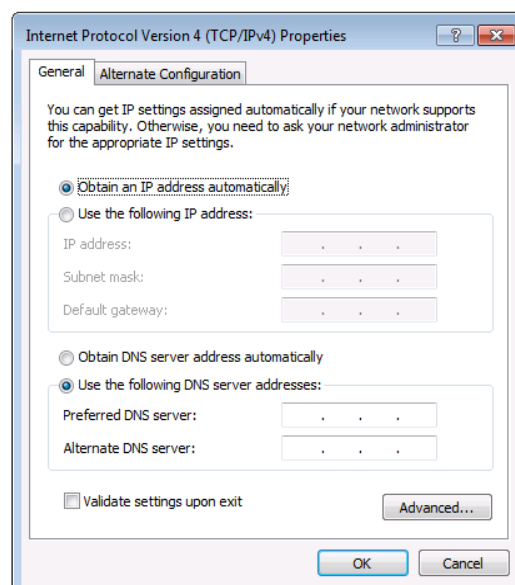


Figure 11: Internet Protocol Version 4 Properties Window

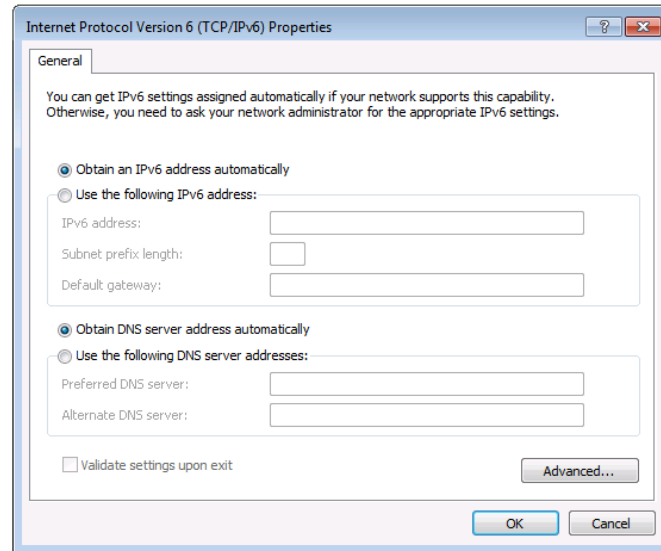


Figure 12: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in [Connecting the Ethernet Port Directly to a PC](#).

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

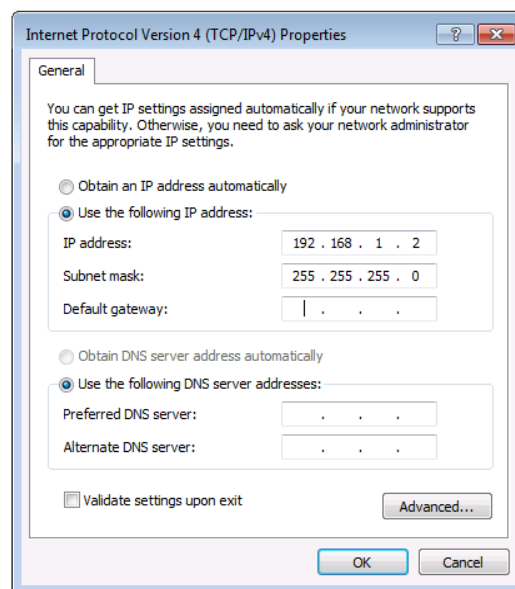


Figure 13: Internet Protocol Properties Window

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-440** 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 (see [Using the Embedded Web Pages](#) on page 20).

# Using the Embedded Web Pages

The VP-440 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 [Operating via Ethernet](#) on page [17](#).
- Ensure that your browser is supported.

The following operating systems and Web browsers are supported:

Operating Systems	Applicable Browser Versions and Higher
Windows 7	Chrome: 25 Internet Explorer: 9 Firefox 19 Opera: 11
Mac (PC)	Chrome: 25 Firefox: 19 Opera: 11
iOS	Chrome: 25 Safari (depends on the IOS version) Opera: 11
Android OS	Chrome: 25 Opera: 11



Some features might not be supported by some mobile device operating systems.

The VP-440 enables performing the following:

- [Loading and Saving Configurations](#) on page [22](#).
- [Entering Standby Mode](#) on page [22](#).
- [Configuring Video Input Settings](#) on page [23](#).
- [Selecting the Input to be Switched to the Outputs](#) on page [24](#).
- [Freezing or Clearing the Video Output](#) on page [24](#).
- [Adjusting Microphone and Output Volume](#) on page [24](#).
- [Configuring Network Settings](#) on page [25](#).
- [Upgrading the Firmware](#) on page [26](#).
- [Configuring Video Output Settings](#) on page [27](#).
- [Configuring HDCP per Input/Output](#) on page [28](#).
- [Managing EDID](#) on page [29](#).
- [Adjusting Audio Input Settings](#) on page [30](#).
- [Adjusting Microphone Settings](#) on page [31](#).
- [Configuring Automatic Switching Settings](#) on page [32](#).

- [Defining Panel Lock Button](#) on page [33](#).
- [Defining Freeze Button Behavior](#) on page [33](#).
- [Controlling VP-440 via the RS-232 Terminal Block Connectors](#) on page [34](#).
- [Controlling an External Device via the RS-232 Terminal Block Connectors](#) on page [35](#).

### To Browse the VP-440 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:



The Controller application page appears.

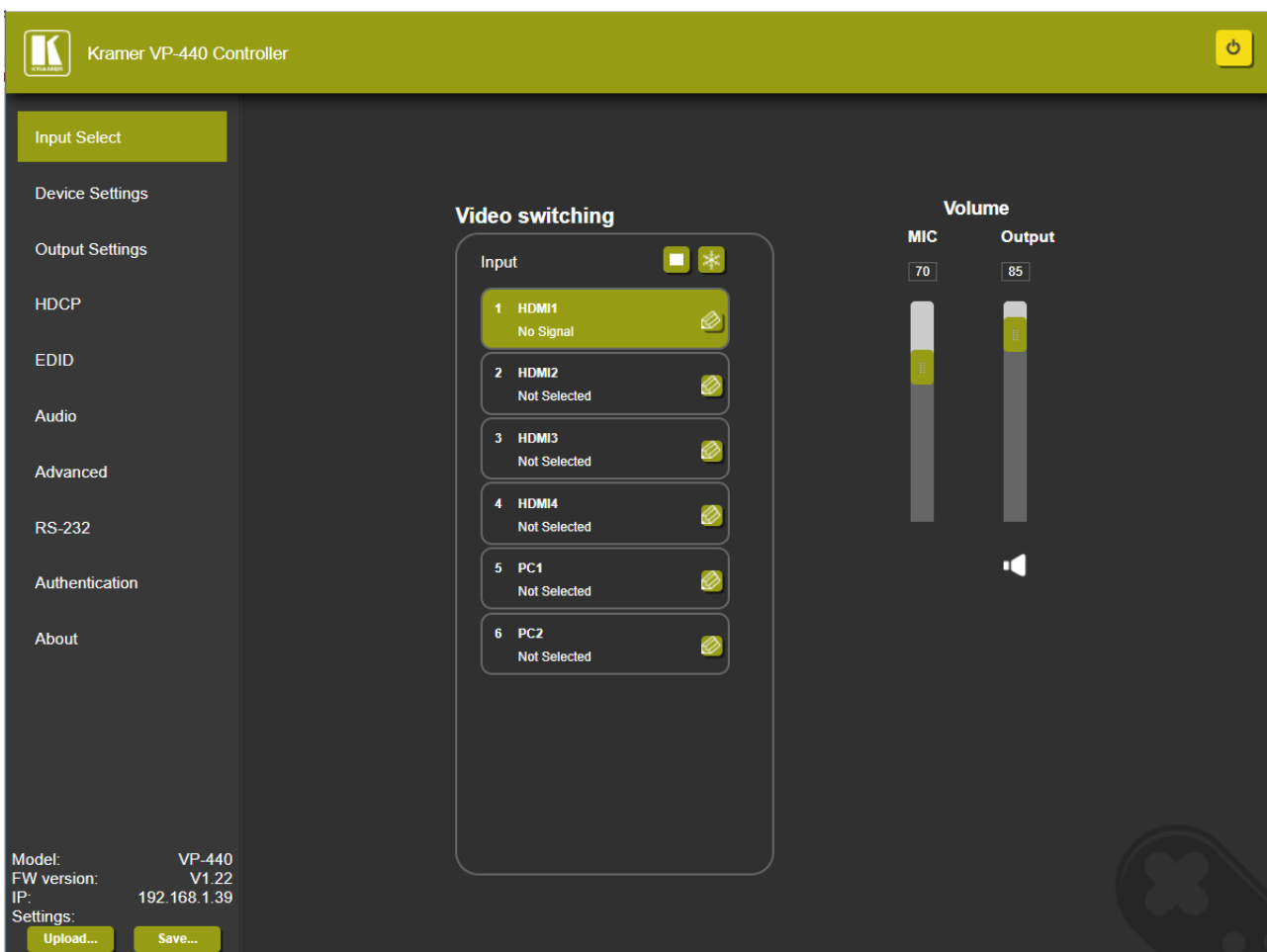


Figure 14: Controller Application Page with Navigation List on Left

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

---

## Loading and Saving Configurations

VP-440 enables you to save a configuration for easy recall in the future.

### Saving Configurations

To save the current configuration:

1. Configure the device as required.
2. Click **Input Select** on the Navigation List.  
The Input Select page appears ([Figure 14](#)).
3. Click **Save**.  
The Save File window appears.



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

### Loading Configurations

To load a configuration:

1. Click **Input Select** on the Navigation List.  
The Input Select page appears ([Figure 14](#)).
2. Click **Upload**.  
An Explorer window opens.
3. Select the required file and click **Open**.  
The device is configured according to the saved preset.

---

## Entering Standby Mode

VP-440 features a power saving standby mode that consumes less power without having to power 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 displays a gray background:



Figure 15: The VP-440 Standby Mode



## Configuring Video Input Settings

VP-440 enables you to individually configure settings for each of the video inputs.

To configure video input settings:

1. Click **Input Select** on the Navigation List.  
The Input Select page appears ([Figure 14](#)).

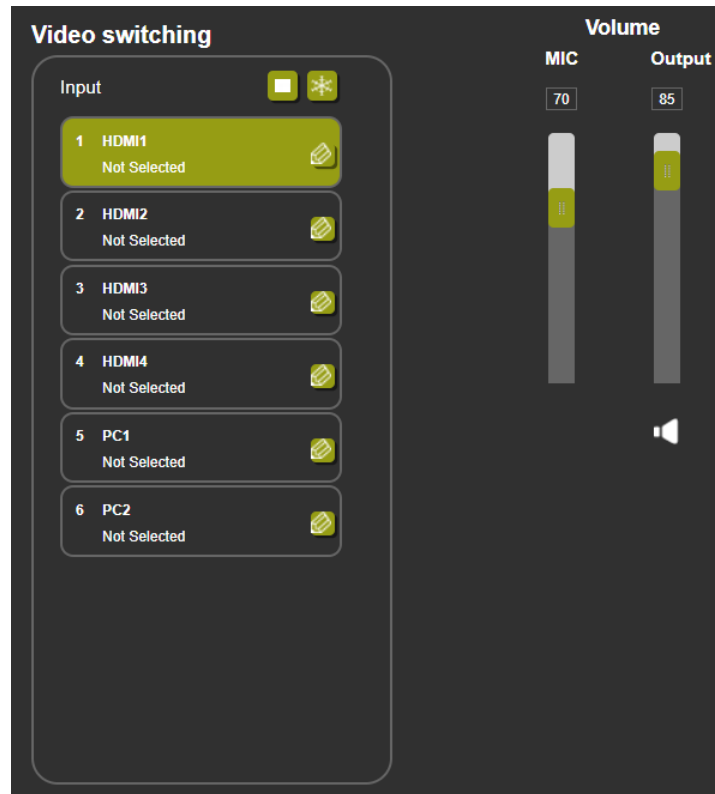


Figure 16: Web Pages – Input Select Page

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.

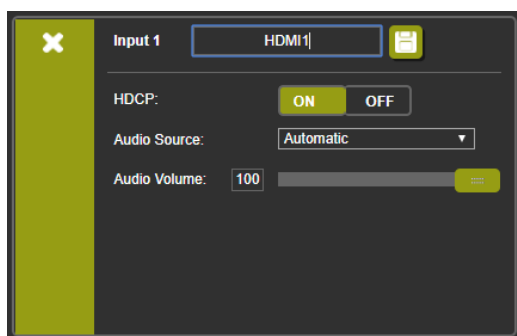


Figure 17: Setting Window for Input 1

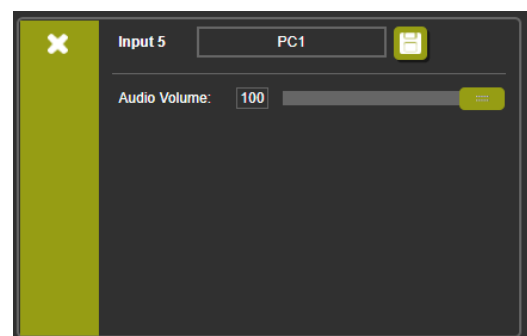


Figure 18: Setting Window for Input 5

3. If required, enter a new name 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. Select an Audio Source:

- 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 volume using the slider or entering a value.

7. Upon completion, save the changes () and click the exit icon (.

---

## 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 Navigation List.  
The Input Select page appears ([Figure 14](#)).
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 Navigation List.  
The Input Select page appears ([Figure 14](#)).
2. In the Video Switching area, click one of the following:
  -  – Freezes the currently displayed video frame.



To define what happens when you press the Freeze button, see [Defining Freeze Button Behavior](#) on page 33).

-  – 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 Navigation List.  
The Input Select page appears ([Figure 14](#)).
2. Use the slider controls in the Volume area of the web page.
3. Click  to mute the output.

## Configuring Network Settings

VP-440 enables 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 Navigation List.  
The Device Settings page appears.

**Device Settings**

**Model:** VP-440

**Serial Number:** 00000000000000

**MAC Address:** 00-1d-56-02-73-bb

**Firmware Version:** V1.19

**Firmware Update:**  No file chosen

---

DHCP On

**DHCP IP Address:**

**Static IP Address:**

**Gateway:**

**Subnet:**

**Control Port:**

---

Figure 19: The 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.

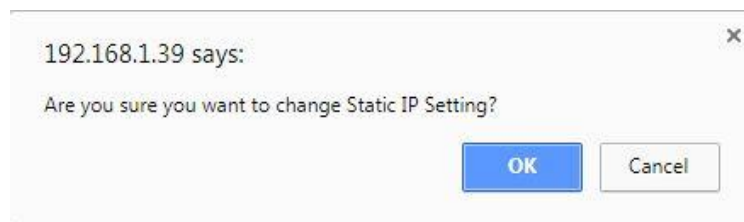


Figure 20: Device Settings Page – Setting Change Confirmation

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.  
IP address values and User/Password settings do not return to their factory default parameters.

## Upgrading the Firmware

To upgrade the VP-440 firmware:

1. Click **Device Settings** on the Navigation List.  
The Device Settings page appears ([Figure 19](#)).
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:

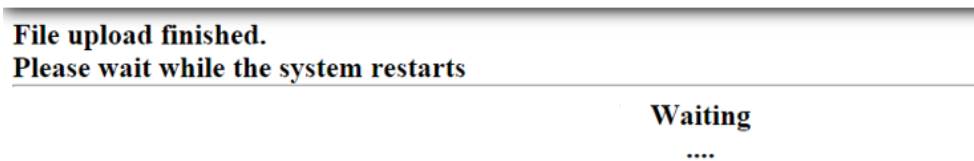


Figure 21: Device Settings Page – Uploading the New Firmware File

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

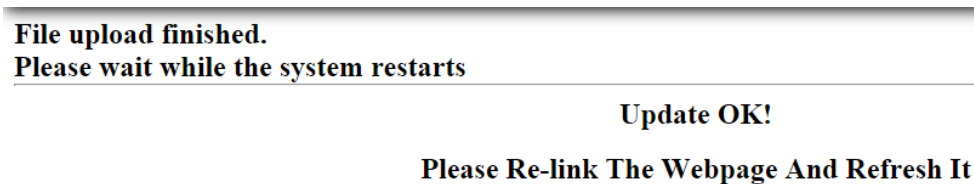


Figure 22: Device Settings Page – New Firmware File Uploading Complete

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.

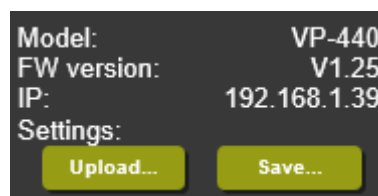


Figure 23: Current Firmware Information Display

## Configuring Video Output Settings

VP-440 enables 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 Navigation List.  
The Output Settings page appears.



Figure 24: The Output Settings Page

2. Open the Resolution drop-down box and 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. Open the Size drop-down box and select the video size on the display:
  - Best Fit
  - Full
  - Pan Scan
  - Letter Box
  - Under Scan
  - Follow In
4. In the Picture area, use the slider controls to adjust the display picture quality.
5. Open the Noise Reduction drop-down box and select the level of noise reduction or select Auto.

6. 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-440 enables you to configure HDCP individually for each input/output.

To configure HDCP:

1. Click **HDCP** on the Navigation List.  
The HDCP page appears.

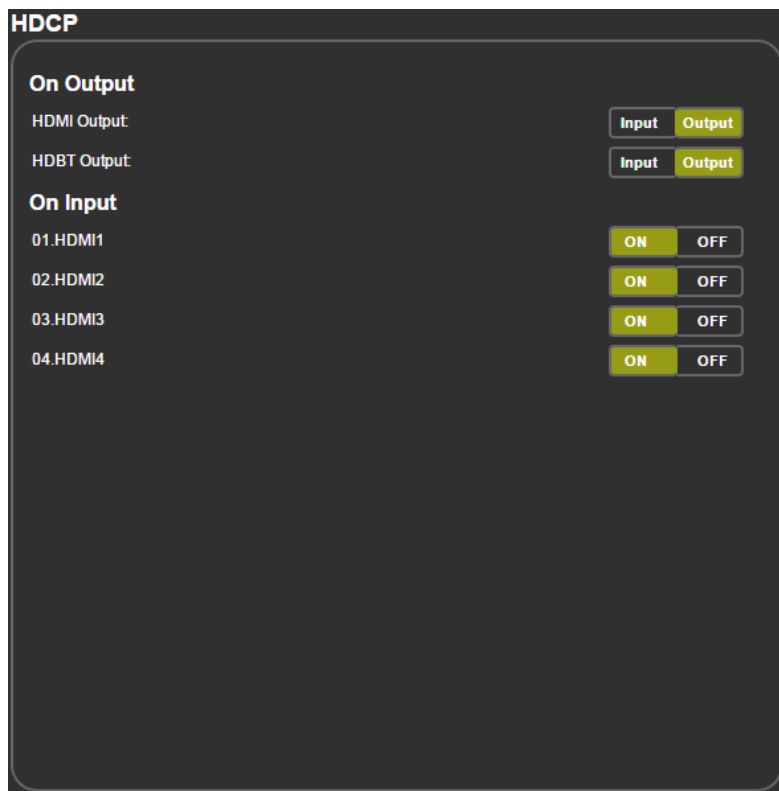


Figure 25: The HDCP Page

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-440 enables you to individually configure and manage EDID settings for each of the 6 inputs.

### To manage EDID:

1. Click **EDID** on the Navigation List.  
The EDID page appears.

**EDID**

Read from:

Outputs:

HDMI OUT

HDBT OUT

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 to:

Inputs

HDMI 1

HDMI 2

HDMI 3

HDMI 4

PC1

PC2

Copy

NONE

to

NONE

Figure 26: The 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.



Figure 27: The EDID Page –The Copy EDID Results

5. Click **Close**.

## Adjusting Audio Input Settings

VP-440 enables you to individually define the audio volume and source for each of the inputs.

To adjust audio input settings:

1. Click **Audio** on the Navigation List.

The Audio page appears.

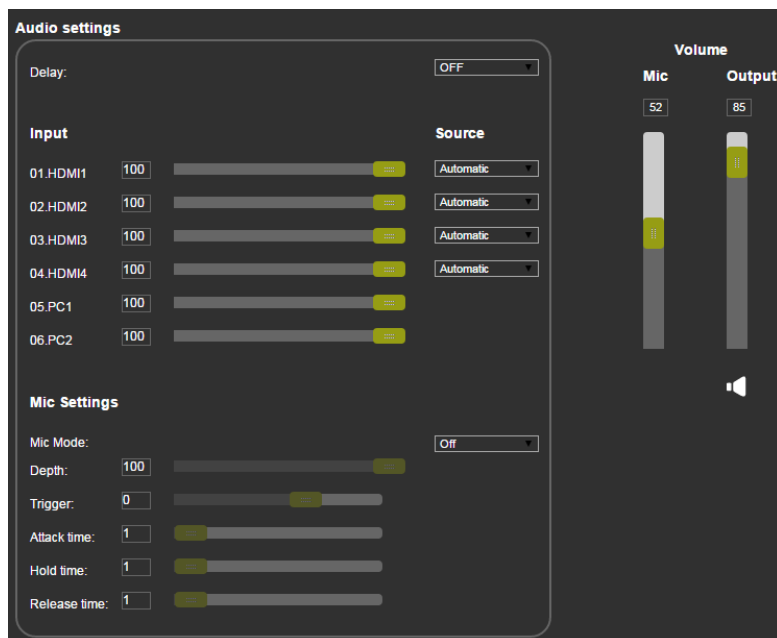



Figure 28: The Audio Settings Page


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  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 to 100 in the field to adjust the volume of each of the inputs.


---

## Adjusting Microphone Settings

**VP-440** enables you to define settings for a microphone connected to the MIC jack  such as talkover/mixer mode, Depth and Trigger.

### To adjust microphone settings:

1. Click **Audio** on the Navigation List.  
The Audio page appears (see [Figure 28](#)).
2. In the Mic Settings area, open the drop-down box and select one of the following mic modes:
  - Mixer – Microphone audio plays together with the main output audio.
  - Talkover – Decreases the main output audio volume when the microphone is active.

 When Talkover mode is selected, use the slider controls or enter a number in the fields to adjust the microphone settings.

  - Mic only – Microphone audio overrides the main output audio.
  - Off – Microphone is disabled.

## Configuring Automatic Switching Settings

To configure automatic switching settings:

1. Click **Advanced** on the Navigation List.  
The Advanced page appears.

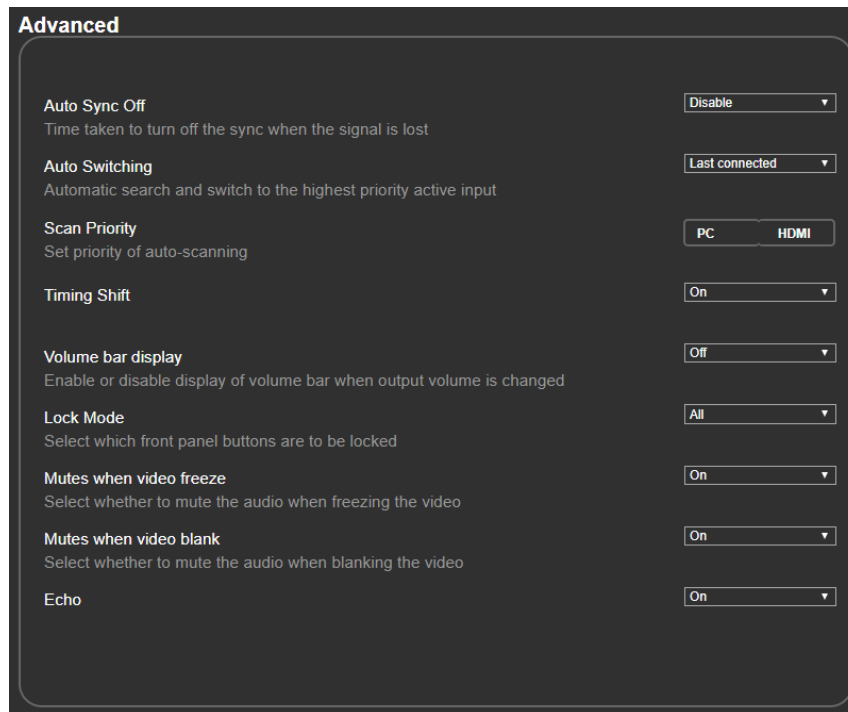


Figure 29: The Advanced Page

2. Define Auto Sync Off:
  - Disable – disable the Auto Sync Off feature.
  - Fast – shuts down after about 10 seconds.
  - Slow – shuts down after about 2 minutes.
3. Define Auto Switching:
  - Off – Disable auto switching.
  - Auto Scan– Set auto-scanning and select from Scan Priority (below) 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.
4. Set Scan Priority to PC or HDMI (once the auto scan is enabled).
5. Set Time shift (on or off) – Set to On to implement a small shift on the horizontal sync to improve output picture stability. Set to OFF if the display shows an instability at the selected output resolution.
6. Set Volume bar display – enable or disable display of volume bar when output is changed.

---

## Defining Panel Lock Button

Define which buttons are disabled when you click the PANEL LOCK button (8) on the front panel. When selecting Save modes, the front panel remains locked after power up of the device.

**To define the Panel Lock button:**

1. Click **Advanced** on the Navigation List.  
The Advanced page appears.
2. Define Lock Mode:
  - All
  - Menu Only
  - All & Save
  - Menu Only & Save

To unlock the front panel, see [Locking the Front Panel Buttons](#) on page [13](#).

---

## Defining Freeze Button Behavior

Define what happens when you click the Freeze button on the Input Select page (see [Freezing or Clearing the Video Output](#) on page [24](#)).

**To define the Freeze button:**

1. Click **Advanced** on the Navigation List.  
The Advanced page appears.
2. Set one of the following:
  - Audio mutes when video freeze (select whether to mute the audio when freezing the video).
  - Audio mutes when video blank (select whether to mute the audio when blanking video).
  - Echo (on or off).

# Controlling VP-440 via the RS-232 Terminal Block Connectors

You can control the **VP-440** via the RS-232 CONTROL port using, for example, a PC. Alternatively, you can select to control an external device (for example, turn on and off the display) via the RS-232 CONTROL port.

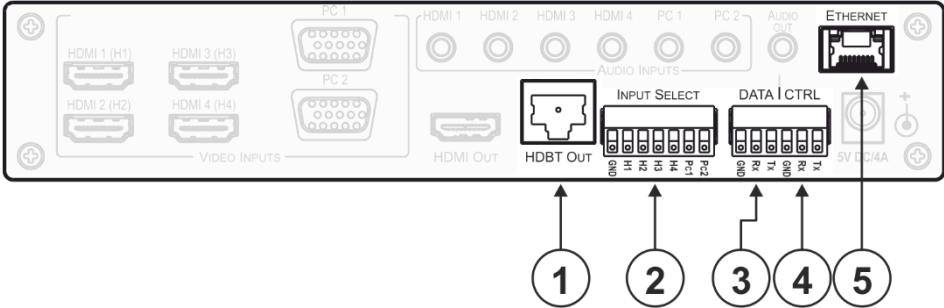


Figure 30: RS-232 Control

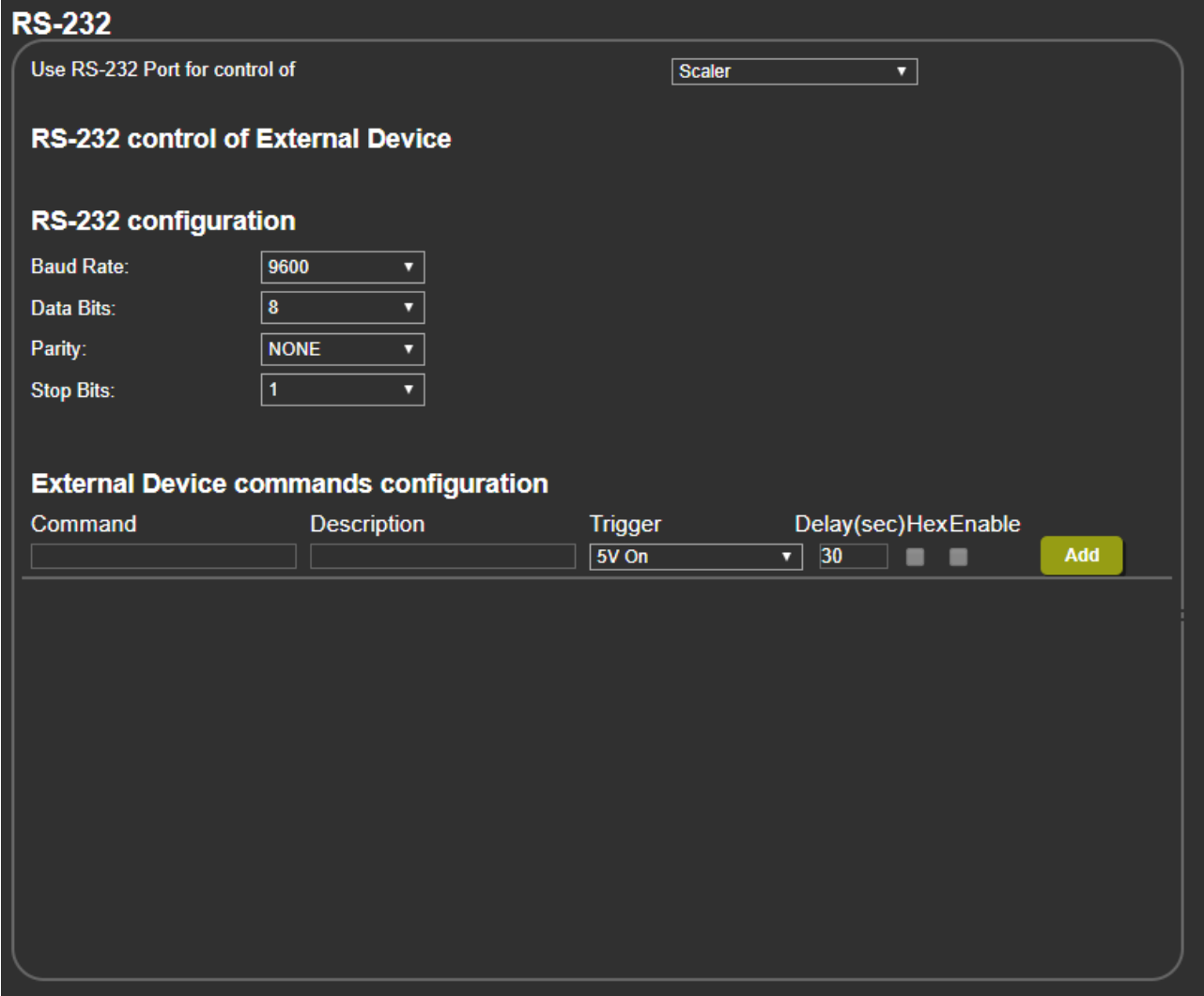


Figure 31: RS-232 Page

**To control VP-440 via RS-232:**

1. Connect your controlling device (e.g., PC) to the Input Select connector ② (see [Connecting the VP-440 via the INPUT SELECT Terminal Block Connector](#) on page 10).
2. Click **RS-232** on the Navigation List.  
The RS-232 page appears.
3. Set **Use RS-232 Port for control of** to **Scaler**.
4. For API details, see [Protocol 3000](#) on page 42.

---

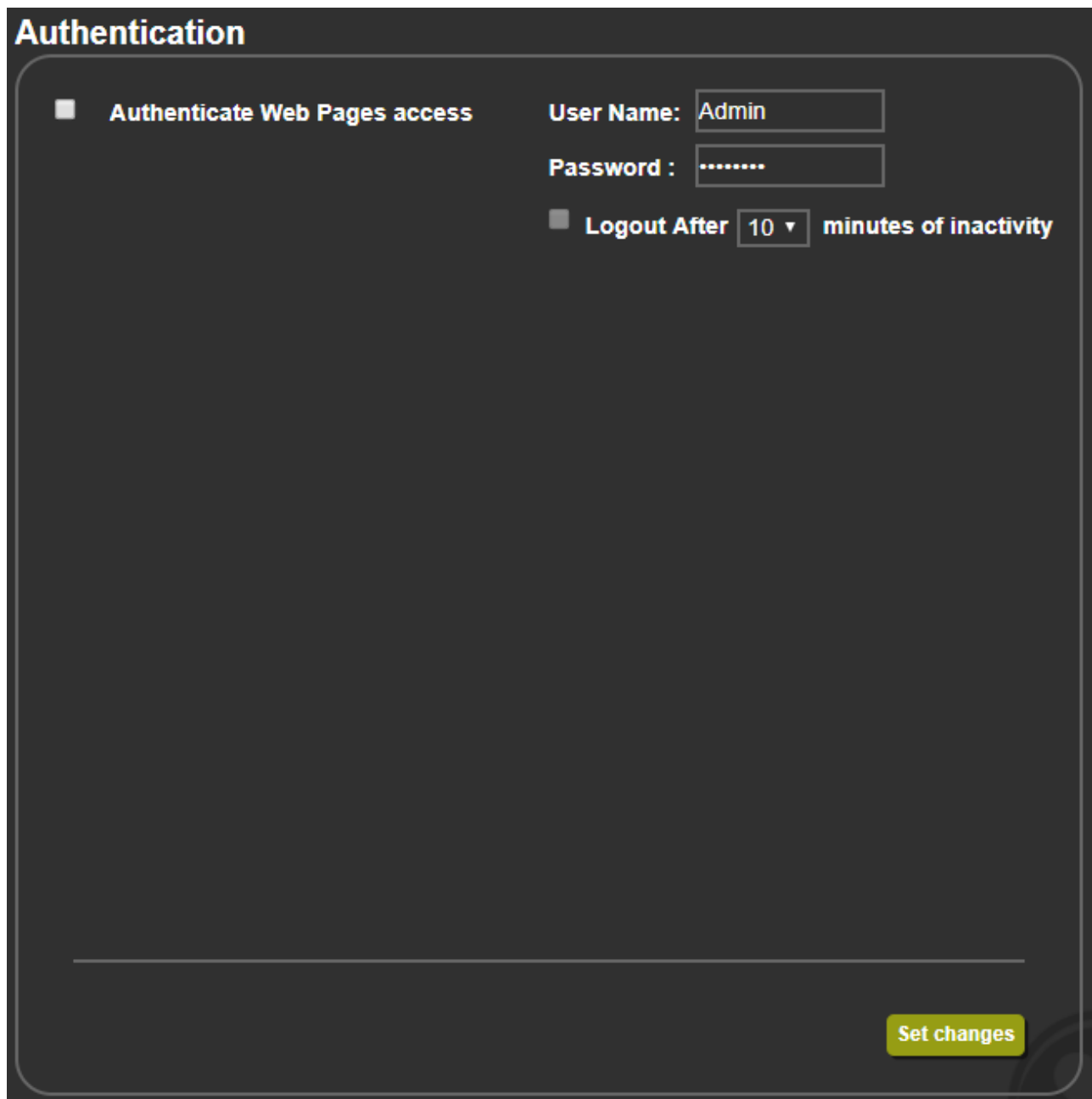
## Controlling an External Device via the RS-232 Terminal Block Connectors

**To control an external device via RS-232:**

1. Connect your external device to the CTRL connector ④ (see [Connecting to the VP-440 via RS-232](#) on page 11).
2. Click **RS-232** on the Navigation List.  
The RS-232 page appears.
3. Set **Use RS-232 Port for control of** to **External Device**.
4. Set RS-232 External configuration parameters.
5. Add a command:
  - a. Create a command name and description.
  - b. Add a trigger (On, Off, Sync/Clocks, No Sync/No Clocks).
  - c. Select the delay time.
  - d. Click **Add**.
6. Check **Enable**.

## Securing the Web Pages with a Password

By default, the Web pages are not secured.



**Authentication**

**Authenticate Web Pages access**

**User Name:**

**Password :**

**Logout After**  **minutes of inactivity**

[Set changes](#)

Figure 32: Authentication Page

**To secure the Web pages with a user name and password:**

1. Click **Authentication** on the Navigation List.  
The Authentication page appears.
2. Check **Authenticate Web Pages access** to indicate that you want the web pages to lock.
3. Fill in a **User Name** (the default is *Admin*).
4. Fill in a **Password** (the default is *Admin*).

5. If you want the unit to automatically logout after a set number of minutes of inactivity, check the box indicating **Logout After**, and set the number of minutes to wait before locking the webpages.
6. Click **Set changes** below, and you will see a small white key appear in the upper right corner.



Figure 33: White key indicating Web Pages are password protected.

The webpages will lock according to your settings.

### Accessing Web Pages with a Password

When the web pages are locked, you will be prompted for your user name and password.

**To access secured web pages:**

1. Click **Authentication** on the left side of the web page ([Figure 32](#)).
2. Enter the correct user name and password.
3. Click the right arrow.

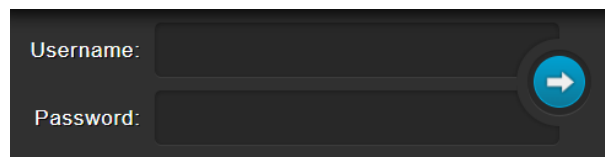


Figure 34: Prompt to unlock Web Pages

### Removing Password Protection from Web Pages

1. Click **Authentication** on the Navigation List.  
The Authentication page appears ([Figure 32](#)).
2. Uncheck **Authenticate Web Pages access** to indicate that you do not want the webpages to lock.
3. Click the Set changes button below, and you will see the small white key disappear from the upper right corner.

# Viewing the About Page

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



Figure 35: The About Page



# Technical Specifications

INPUTS:	4 HDMI connectors (HDMI, HDCP version 1.4) 2 VGA on a 15-pin HD connector 6 Unbalanced stereo audio on 3.5mm mini jack connectors 1 Mic on a 6.3mm jack connector (with selectable 48V phantom power)
OUTPUTS:	1 HDMI connector (HDMI, HDCP version 1.4) 1 HDBT on a RJ-45 connector 1 Unbalanced stereo audio on a 3.5mm mini jack connector
BANDWIDTH:	Up to 1080p, UXGA
SWITCHING TIME BETWEEN INPUTS:	2 to 3 seconds
VIDEO LATENCY:	Less than 2 frames
OUTPUT RESOLUTIONS:	Native HDMI, Native HDBT, 640x480 @60Hz, 800x600 @60Hz, 1024x768 @60Hz, 1280x768 @60Hz, 1360x768 @60Hz, 1280x720 @60Hz, 1280x800 @60Hz, 1280x1024 @60Hz, 1440x900 @60Hz, 1400x1050 @60Hz, 1680x1050 @60Hz, 1600x900 @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 4 and PC 1 to PC 2 input selector buttons; input select contact closure, Menu and navigation buttons, Reset to XGA/720p and panel lock buttons, RS-232 (control and data), Ethernet (OSD and Web pages)
POWER CONSUMPTION:	5V DC, 3A
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:	21.5cm x 16.3cm x 4.4cm (8.5" x 6.42" x 1.73"), W, D, H
WEIGHT:	1.53kg (3.37lbs) approx.
INCLUDED ACCESSORIES:	Power supply
Specifications are subject to change without notice at <a href="http://www.kramerav.com">www.kramerav.com</a>	

The terms HDMI, HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing Administrator, Inc.

## Default Communication Parameters

RS-232	
Baud Rate:	9,600
Data Bits:	8
Stop Bits:	1
Parity:	None
Ethernet	
IP Address:	192.168.1.39
Subnet mask:	255.255.0.0
Default gateway:	0.0.0.0
Default UDP Port #:	50000
Maximum UDP Ports:	4
Max. # of concurrently connected clients	4
Full Factory Reset	
OSD	Go to: Menu-> Factory-> RESET->Change the option to YES and press Enter
Protocol 3000 Command	See <a href="#">FACTORY</a> on page <a href="#">49</a>
Web Pages (Soft Factory Reset)	<ol style="list-style-type: none"> <li>1. Go to <b>Device Settings</b> (see <a href="#">Configuring Network Settings</a> on page <a href="#">25</a>).</li> <li>2. Click <b>Soft Factory Reset</b>.</li> </ol> <p>IP address values and User/Password settings do not return to their factory default parameters.</p>
RS-232/Ethernet (UDP) Command Protocol	
Command Format:	ASCII protocol 3000
Example (Route the video HDMI3 input to the output):	#ROUTE 12,1,2<cr>

## Input Resolutions

Resolution/Refresh Rate	PC 1/PC 2	HDMI 1-4
480I/576I	No	Yes
480P/576P	No	Yes
720P (50/60Hz)	No	Yes
1080I (50/60Hz)	No	Yes
1080P (50/60Hz)	No	Yes
1080P (24/25/30Hz)	No	Yes
640x480 (60/72/75/85Hz)	Yes	Yes
800x600 (56/60/72/75Hz)	Yes	Yes
1024x768 (60/70/75Hz)	Yes	Yes
1280x1024 (60/75Hz)	Yes	Yes
1280x720 60Hz	Yes	Yes
1920x1080 60Hz	Yes	Yes
1280x960 60Hz	No	Yes
1600x1200 60Hz	Yes	Yes
1280x800 60Hz	Yes	Yes
1440x900 60Hz	Yes	Yes
1366x768 60Hz	Yes	Yes
1400x1050 60Hz	Yes	Yes
1600x900 RB 60Hz	Yes	Yes
1680x1050 RB 60Hz	Yes	Yes
1920x1200 RB 60Hz	Yes	Yes

## Output Resolutions

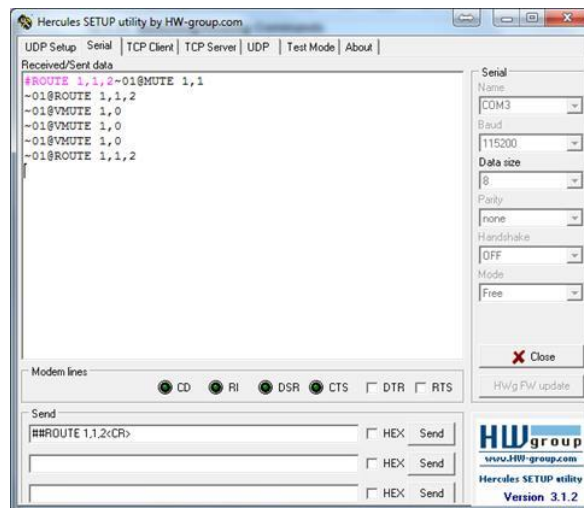
Resolution/Refresh Rate	HDMI/HDBT
640x480 60Hz	Yes
800x600 60Hz	Yes
1024x768 60Hz	Yes
1280x768 60Hz	
1280x800 60Hz	Yes
1360x768 60Hz	Yes
1440x900 60Hz	Yes
1280x1024 60Hz	Yes
1400x1050 60Hz	Yes
1680x1050 60Hz	Yes
1600x900 @60Hz	Yes
1600x1200 60Hz	Yes
1920x1200 RB 60Hz	Yes
1280x720 60Hz	Yes
1920x1080 60Hz	Yes
720x480P 60Hz	Yes
720x576P (50Hz)	Yes
1280x720P (50/60Hz)	Yes
1920x1080I (50/60Hz)	Yes
1920x1080P (50/60Hz)	Yes


# Protocol 3000

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

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:




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

- K-Touch Builder (Kramer software):



- K-Config (Kramer configuration software):



 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-440**. 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, **IX##**). For more information, refer to your controller's documentation.

For more information about Protocol 3000 commands, see:

- [Understanding Protocol 3000](#) on page [43](#)
- [Kramer Protocol 3000 Syntax](#) on page [44](#)
- [Protocol 3000 Commands](#) on page [44](#)

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## 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
#	<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 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 LF</b>

## Protocol 3000 Commands

Command	Description
#	Protocol handshaking.
AUD-EMB	Set audio in video embedding status.
AUD-EMB?	Get audio in video embedding status.
AUD-LVL	Set volume level.
AUD-LVL?	Get volume level.
AV-SW-MODE	Set input auto switch mode (per output).
AV-SW-MODE?	Get input auto switch mode (per output).
BUILD-DATE?	Get device build date.

Command	Description
DISPLAY?	Get output HPD status.
FACTORY	Reset device to factory default configuration.
HDCP-MOD	Set HDCP mode.
HDCP-MOD?	Get HDCP mode.
HELP	Get command list or help for specific command.
IMAGE-PROP	Set the image size.
IMAGE-PROP?	Get the image size.
LOCK-FP	Lock the front panel.
LOCK-FP?	Get the front panel lock state.
MENU-CMD	Emulates menu navigation
MIC-GAIN	Set the microphone gain.
MIC-GAIN?	Get the microphone gain.
MIC-SELECT	Select the microphone.
MIC-TLK	Set mic talkover parameters.
MIC-TLK?	Get mic talkover parameters.
MIX	Set audio MIX.
MIX?	Get audio MIX.
MODEL?	Get device model.
MUTE	Set audio mute.
MUTE?	Get audio mute.
NET-DHCP	Set DHCP mode.
NET-DHCP?	Get DHCP mode.
NET-GATE	Set gateway IP.
NET-GATE?	Get gateway IP.
NET-IP	Set IP address.
NET-IP?	Get IP address.
NET-MAC?	Get MAC address.
NET-MASK	Set subnet mask.
NET-MASK?	Get subnet mask.
PROT-VER?	Get device protocol version.
RESET	Reset device.
ROUTE	Set layer routing.
ROUTE?	Get layer routing.
SCLR-AS	Set auto-sync features.
SCLR-AS?	Get auto-sync features.
SCLR-AUDIO-DELAY	Set the scaler audio delay.
SCLR-AUDIO-DELAY?	Get the scaler audio delay.
SCLR-PCAUTO	Set PC auto sync of scaler.
SN?	Get device serial number.
STANDBY	Set standby mode.
STANDBY?	Get standby mode status.
TLK	Set audio talkover mode status.
TLK?	Get audio talkover mode status.
VERSION?	Get firmware version number.
VFRZ	Set freeze on selected output.
VFRZ?	Get output freeze status.
VID-RES	Set output resolution.
VMUTE	Set enable/disable video on output.
VMUTE?	Get video on output status.

# #

Functions		Permission	Transparency
Set:	#	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Protocol handshaking	# <span style="border: 1px solid black; padding: 0 2px;">CR</span>	
Get:	-	-	
Response			
~ <span style="border: 1px solid black; padding: 0 2px;">nn</span> @ <span style="border: 1px solid black; padding: 0 2px;">SF</span> OK <span style="border: 1px solid black; padding: 0 2px;">CR</span> <span style="border: 1px solid black; padding: 0 2px;">LF</span>			
Parameters			
Response Triggers			
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			

## 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 <span style="border: 1px solid black; padding: 0 2px;">SP</span> <i>in,out,status</i> <span style="border: 1px solid black; padding: 0 2px;">CR</span>	
Get:	Get audio in video embedding status	#AUD-EMB? <span style="border: 1px solid black; padding: 0 2px;">SP</span> <i>in,out</i> <span style="border: 1px solid black; padding: 0 2px;">CR</span>	
Response			
Set/Get: ~ <span style="border: 1px solid black; padding: 0 2px;">nn</span> @AUD-EMB <span style="border: 1px solid black; padding: 0 2px;">SP</span> <i>in,out,status</i> <span style="border: 1px solid black; padding: 0 2px;">CR</span> <span style="border: 1px solid black; padding: 0 2px;">LF</span>			
Parameters			
<i>in</i> - audio input to be embedded number (1... max number of inputs) <i>out</i> - video output to embed into number (1 ... max number of outputs) <i>status</i> – 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			



## AUD-LVL

Functions		Permission	Transparency
Set:	AUD-LVL	End User	-
Get:	AUD-LVL?	End User	-
Description		Syntax	
Set:	Set audio level in specific amplifier stage	#AUD-LVL <sub>[SP]</sub> P1,P2,P3 <sub>[CR]</sub>	
Get:	Get audio level in specific amplifier stage	#AUD-LVL? <sub>[SP]</sub> P1,P2 <sub>[CR]</sub>	
Response			
~nn@AUD-LVL <sub>[SP]</sub> P1,P2 <sub>[CR LF]</sub>			
Parameters			
P1 (Input/Output)– 0=Input; 1=Output P2 (Input/Output number valid according to the selected Input/Output according to P1) – audio inputs=0 (HDMI 1), 1 (HDMI 2), 2 (HDMI 3), 3 (HDMI 4), 4 (PC 1), 5 (PC 2); Audio outputs=0; P3 – 0~100; minus sign precedes negative values. ++ increase current value, -- decrease current value			

## AV-SW-MODE

Command Name		Permission	Transparency
Set:	AV-SW-MODE	End user	Public
Get:	AV-SW-MODE?	End user	Public
Description		Syntax	
Set:	Set input auto switch mode (per output)	#AV-SW-MODE <sub>[SP]</sub> /layer,output_id,mode <sub>[CR]</sub>	
Get:	Get input auto switch mode (per output)	#AV-SW-MODE? <sub>[SP]</sub> /layer,output_id <sub>[CR]</sub>	
Response			
~nn@AV-SW-MODE <sub>[SP]</sub> /layer,output_id,mode <sub>[CR LF]</sub>			
Parameters			
layer – 1 - Video 2 - Audio 3 - Data 4 - IR 5 - USB output_id - 1....num of system outputs mode - 0 - manual 1 - priority switch 2 - last connected switch			

## BUILD-DATE

Functions		Permission	Transparency
Set:	<b>BUILD-DATE</b>	End User	-
Get:	-	-	-
Description		Syntax	
Set:	Read device build date	# <b>BUILD-DATE?</b> <input type="checkbox"/> <input type="checkbox"/>	
Get:	-	-	
Response			
~ <input type="checkbox"/> <input type="checkbox"/> @ <b>BUILD-DATE</b> <input type="checkbox"/> <i>date</i> <input type="checkbox"/> <i>time</i> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Parameters			
<i>date</i> – Format: YYYY/MM/DD where YYYY = Year, MM = Month, DD = Day			
<i>time</i> – Format: hh:mm:ss where hh = hours, mm = minutes, ss = seconds			

## DISPLAY?

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>DISPLAY?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get output HPD status	# <b>DISPLAY?</b> <input type="checkbox"/> <input type="checkbox"/> P1 <input type="checkbox"/> <input type="checkbox"/>	
Response			
~ <input type="checkbox"/> <input type="checkbox"/> @ <b>DISPLAY</b> <input type="checkbox"/> P1 <input type="checkbox"/> <input type="checkbox"/>			
Parameters			
P1 (Output number) – 0=HDMI; 1=HDBaseT			
Response triggers			
After execution, response is sent to the com port from which the <b>Get</b> was received			
Response is sent after every change in output HPD status <b>ON to OFF</b>			
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			

## FACTORY

Functions		Permission	Transparency
Set:	<b>FACTORY</b>	End User	-
Get:	-	-	-
Description		Syntax	
Set:	Reset device to factory defaults configuration	# <b>FACTORY</b> <input type="checkbox"/> _CR	
Get:	-	-	
Response			
~ <input type="checkbox"/> _nn@ <b>FACTORY</b> <input type="checkbox"/> _SP OK <input type="checkbox"/> _CR LF			
Notes			
This command deletes all user data from the device. The deletion can take some time.			

## HDCEP-MOD

Functions		Permission	Transparency
Set:	<b>HDCEP-MOD</b>	Administrator	Public
Get:	<b>HDCEP-MOD?</b>	End User	Public
Description		Syntax	
Set:	Set HDCEP mode	# <b>HDCEP-MOD</b> <input type="checkbox"/> _SP P1,P2,P3 <input type="checkbox"/> _CR	
Get:	Get HDCEP mode	# <b>HDCEP-MOD?</b> <input type="checkbox"/> _SP P1,P2 <input type="checkbox"/> _CR	
Response			
Set / Get: ~ <input type="checkbox"/> _nn@ <b>HDCEP-MOD</b> <input type="checkbox"/> _SP P1,P2,P3 <input type="checkbox"/> _CR LF			
Parameters			
P1 (Input/Output) – 0=Input; 1=Output P2 (Scaler number) – Input 0-3=HDMI 1 – HDMI 4; Output 0-1=HDMI, HDBaseT P3 (Status) – Input: 0=Off; 1=On; Output: 2=Follow In, 3=Follow Out			
Response triggers			
Response is sent to the com port from which the <b>Set</b> (before execution) / <b>Get</b> command was received Response is sent to all com ports after execution if HDCEP-MOD was set any other external control device (button press, device menu and similar) or genlock status changed			
Notes			
Set HDCEP working mode <b>on device input</b> : HDCEP supported – HDCEP_ON [default] HDCEP not supported – HDCEP OFF HDCEP support changes following detected sink – MIRROR OUTPUT			

## HELP

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>HELP</b>	End User	-
Description		Syntax	
Set:	-	-	
Get:	Get command list or help for specific command	2 options: 1. # <b>HELP</b> <input type="checkbox"/> _CR 2. # <b>HELP</b> <input type="checkbox"/> _SP command_name <input type="checkbox"/> _CR	

## IMAGE-PROP

Functions		Permission	Transparency
Set:	<b>IMAGE-PROP</b>	End User	Public
Get:	<b>IMAGE-PROP?</b>	End User	Public
Description		Syntax	
Set:	Set the image size	# <b>IMAGE-PROP</b> <sub>SP</sub> P1 <sub>CR</sub>	
Get:	Get the image size	# <b>IMAGE-PROP?</b> <sub>SP</sub> P1,...,P6 <sub>CR</sub>	
Response			
Set / Get: ~ <b>nn</b> @ <b>IMAGE-PROP</b> <sub>SP</sub> P1,P2... <sub>CR LF</sub>			
Parameters			
P1 (Scaler number) – 1=Scaler P2 (Status) – 0=Over Scan; 1=Full; 2=Best Fit; 3=PanScan; 4=Letter Box; 5=Under 2; 6=Under 1			
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			

## LOCK-FP

Functions		Permission	Transparency
Set:	<b>LOCK-FP</b>	End User	-
Get:	<b>LOCK-FP?</b>	End User	-
Description		Syntax	
Set:	Lock front panel	# <b>LOCK-FP</b> <sub>SP</sub> P1 <sub>CR</sub>	
Get:	Get front panel lock state	# <b>LOCK-FP?</b> <sub>CR</sub>	
Response			
<b>nn</b> @ <b>LOCK-FP</b> <sub>SP</sub> P1 <sub>SP</sub> <b>OK</b> <sub>CR LF</sub>			
Parameters			
P1– 0=No; 1=Yes			

## MENU-CMD

Command Name		Permission	Transparency
Set:	MENU-CMD	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	This command emulates menu navigation	# MENU-CMD <input type="text" value="SP"/> param <input type="text" value="CR"/>	
Get:	-	-	
Response			
~ <input type="text" value="nn"/> @MENU-CMD <input type="text" value="SP"/> param <input type="text" value="CR LF"/>			
Parameters			
<i>param</i> – 1 - Menu 2 - OK/Enter 3 - Esc 4 - Up 5 - Down 6 - Right 7 - Left			
Response Triggers			
Notes			

## MIC-SELECT

Functions		Permission	Transparency
Set:	<b>MIC-SELECT</b>	End User	Public
Get:	<b>MIC-SELECT?</b>	End User	Public
Description		Syntax	
Set:	Select the microphone.	#MIC-SELECT <input type="text" value="SP"/> P1,P2 <input type="text" value="CR"/>	
Get:	Get the active microphone.	#MIC-SELECT? <input type="text" value="SP"/> P1 <input type="text" value="CR"/>	
Response			
Set / Get: ~ <input type="text" value="nn"/> @MIC-SELECT <input type="text" value="SP"/> P1,P2, <input type="text" value="CR LF"/>			
Parameters			
P1 1 (Scaler) P2 – Mic mode OFF=[] MIC1=1 MIC2=2 Both=[1,2], [2,1]			
Response Triggers			
Notes			

## MIC-GAIN

Functions		Permission	Transparency
Set:	<b>MIC-GAIN</b>	End User	Public
Get:	<b>MIC-GAIN?</b>	End User	Public
Description		Syntax	
Set:	Set the microphone gain	#MIC-GAIN <sub>SP</sub> P1,P2,P3 <sub>CR</sub>	
Get:	Get the microphone gain	#MIC-GAIN? <sub>SP</sub> P1 <sub>CR</sub>	
Response			
Set / Get: ~ <sub>nn</sub> @MIC-GAIN <sub>SP</sub> P1,P2, <sub>CR LF</sub>			
Parameters			
P1 (always 0) – 0 P2 - 0=Mic P3 (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 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			

## MIC-TLK

Functions		Permission	Transparency
Set:	<b>MIC-TLK</b>	End User	Public
Get:	<b>MIC-TLK?</b>	End User	Public
Description		Syntax	
Set:	Set mic talkover parameters	#MIC-TLK <sub>SP</sub> channel,P1,value <sub>CR</sub>	
Get:	Get mic talkover parameters	#MIC-TLK? <sub>SP</sub> channel,P1 <sub>CR</sub>	
Response			
~ <sub>nn</sub> @MIC-TLK <sub>SP</sub> channel,P1,value <sub>CR LF</sub>			
Parameters			
P1 (channel) – 0 P2 (parameter setting) – 0=Depth, 1=Trigger, 2=Attack time, 3=Hold time, 4=Release time P3 (value) – P1 value (in corresponding to P1 units): Depth: 0~100 [%], Trigger: 0~100 (-60dB~40dB), Attack/Hold/Release time: 0~200 (0~2 sec)			

## MIX

Command Name		Permission	Transparency
Set:	<b>MIX</b>	End User	Public
Get:	<b>MIX?</b>	End User	Public
Description		Syntax	
Set:	Set audio MIX	#MIX <sub>SP</sub> channel,mix_mode <sub>CR</sub>	
Get:	Get audio MIX	#MIX? <sub>CR</sub>	
Response			
~nn@MIX <sub>SP</sub> channel,mix_mode <sub>CR LF</sub>			
Parameters			
channel - output number mix_mode - OFF 0, ON 1			
Response Triggers			
Notes			

## MODEL?

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>MODEL?</b>	End User	-
Description		Syntax	
Set:	-	-	
Get:	Get device model	#MODEL? <sub>CR</sub>	
Response			
~nn@MODEL <sub>SP</sub> model_name <sub>CR LF</sub>			
Parameters			
model_name – String of up to 19 printable ASCII chars			

## MUTE

Functions		Permission	Transparency
Set:	<b>MUTE</b>	End User	Public
Get:	<b>MUTE?</b>	End User	Public
Description		Syntax	
Set:	Set audio mute	#MUTE <sub>SP</sub> channel,mute_mode <sub>CR</sub>	
Get:	Get audio mute	#MUTE? <sub>SP</sub> channel <sub>CR</sub>	
Response			
~nn@MUTE <sub>SP</sub> channel, mute_mode <sub>CR LF</sub>			
Parameters			
channel – Scaler=1 mute_mode - 0=Off; 1=ON			

## NET-DHCP

Functions		Permission	Transparency
Set:	<b>NET-DHCP</b>	Administrator	-
Get:	<b>NET-DHCP?</b>	End User	-
Description		Syntax	
Set:	Set DHCP mode	#NET-DHCP <sub>SP</sub> P1 <sub>CR</sub>	
Get:	Get DHCP mode	#NET-DHCP? <sub>CR</sub>	
Response			
Set: ~nn@NET-DHCP <sub>SP</sub> P1 <sub>SP</sub> OK <sub>CR LF</sub>			
Get: ~nn@NET-DHCP <sub>SP</sub> mode <sub>CR LF</sub>			
Parameters			
P1 – 0=Static IP; 1=DHCP 0 – Use static IP. 1 – Use DHCP. If unavailable, use IP as above.			
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.			

## NET-GATE

Functions		Permission	Transparency
Set:	<b>NET-GATE</b>	Administrator	-
Get:	<b>NET-GATE?</b>	End User	-
Description		Syntax	
Set:	Set Gateway IP	#NET-GATE <sub>SP</sub> P1 <sub>CR</sub>	
Get:	Get Gateway IP	#NET-GATE? <sub>CR</sub>	
Response			
Set: ~nn@NET-GATE <sub>SP</sub> P1 <sub>SP</sub> OK <sub>CR LF</sub>			
Get: ~nn@NET-GATE <sub>SP</sub> ip_address <sub>CR LF</sub>			
Parameters			
P1 (valid IP address)=xxx.xxx.xxx.xxx			
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			



## NET-IP

Functions		Permission	Transparency
Set:	<b>NET-IP</b>	Administrator	-
Get:	<b>NET-IP?</b>	End User	-
Description		Syntax	
Set:	Set device IP address	#NET-IP <sub>SP</sub> P1 <sub>CR</sub>	
Get:	Get device IP address	#NET-IP? <sub>CR</sub>	
Response			
Set: ~nn@NET-IP <sub>SP</sub> ip_address <sub>SP</sub> OK <sub>CR LF</sub>			
Get: ~nn@NET-IP <sub>SP</sub> ip_address <sub>CR LF</sub>			
Parameters			
P1 (valid IP address)= xxx.xxx.xxx.xxx			
Notes			
For proper settings consult your network administrator.			

## NET-MAC?

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>NET-MAC?</b>	End User	-
Description		Syntax	
Set:			
Get:	Get MAC address	#NET-MAC? <sub>CR</sub>	
Response			
~nn@NET-MAC <sub>SP</sub> mac_address <sub>CR LF</sub>			
Parameters			
mac_address – Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit.			

## NET-MASK

Functions		Permission	Transparency
Set:	<b>NET-MASK</b>	Administrator	-
Get:	<b>NET-MASK?</b>	End User	-
Description		Syntax	
Set:	Set device subnet mask	#NET-MASK <sub>SP</sub> net_mask <sub>CR</sub>	
Get:	Get device subnet mask	#NET-MASK? <sub>CR</sub>	
Response			
Set: ~nn@NET-MASK <sub>SP</sub> P1 <sub>SP</sub> OK <sub>CR LF</sub>			
Get: ~nn@NET-MASK <sub>SP</sub> net_mask <sub>CR LF</sub>			
Parameters			
P1 (valid IP address)=xxx.xxx.xxx.xxx			
Response triggers			
The subnet mask limits the Ethernet connection within the local network. For proper settings consult your network administrator.			

## PROT-VER?

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>PROT-VER?</b>	End User	-
Description		Syntax	
Set:	-	-	
Get:	Get protocol version	# <b>PROT-VER?</b> <input type="checkbox"/> <input type="checkbox"/>	
Response			
~ <input type="checkbox"/> <input type="checkbox"/> @ <b>PROT-VER</b> <input type="checkbox"/> 3000:version <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Parameters			
Version – Format: XX.XX where X is a decimal digit			

## RESET

Functions		Permission	Transparency
Set:	<b>RESET</b>	Administrator	-
Get:	-	-	-
Description		Syntax	
Set:	Reset device	# <b>RESET</b> <input type="checkbox"/> <input type="checkbox"/>	
Get:	-	-	
Response			
~ <input type="checkbox"/> <input type="checkbox"/> @ <b>RESET</b> <input type="checkbox"/> OK <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Notes			
To avoid locking the port due to a USB bug in Windows, disconnect USB connections immediately after running this command. If the port was locked, disconnect and reconnect the cable to reopen the port.			

## ROUTE

Functions		Permission	Transparency
Set:	<b>ROUTE</b>	End User	-
Get:	<b>ROUTE?</b>	End User	-
Description		Syntax	
Set:	Set layer routing	# <b>ROUTE</b> <input type="checkbox"/> P1,P2,P3 <input type="checkbox"/> <input type="checkbox"/>	
Get:	Get layer routing	# <b>ROUTE?</b> <input type="checkbox"/> P1,P2 <input type="checkbox"/> <input type="checkbox"/>	
Response			
~ <input type="checkbox"/> <input type="checkbox"/> @ <b>ROUTE</b> <input type="checkbox"/> P1,P2,P3 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Parameters			
P1 (Layer number) –12=Video+Audio P2 – 1=Scaler P3 (Route from, valid values are in accordance to the selected layer and Route to selected according to P1 and P2) – video inputs = 0 (HDMI 1), 1 (HDMI 2), 2 (HDMI 3), 3 (HDMI 4), 4 (PC 1), 5 (PC 2)			
Notes			
This command replaces all other routing commands.			

## SCLR-AS

Functions		Permission	Transparency
Set:	<b>SCLR-AS</b>	End User	Public
Get:	<b>SCLR-AS?</b>	End User	Public
Description		Syntax	
Set:	Set the auto sync off timer	#SCLR-AS <sub>SP</sub> P1,P2 <sub>CR</sub>	
Get:	Get the auto sync off timer definition	#SCLR-AS? <sub>SP</sub> P1 <sub>CR</sub>	
Response			
Set / Get: ~ <b>nn</b> @SCLR-AS <sub>SP</sub> P1,P2... <sub>CR LF</sub>			
Parameters			
P1 (Scaler Number) –1=Scaler P2 (Off/On) – 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			

## SCLR-AUDIO-DELAY

Functions		Permission	Transparency
Set:	<b>SCLR-AUDIO-DELAY</b>	End User	Public
Get:	<b>SCLR-AUDIO-DELAY?</b>	End User	Public
Description		Syntax	
Set:	Set the scaler audio delay	#SCLR-AUDIO-DELAY <sub>SP</sub> P1,P2 <sub>CR</sub>	
Get:	Get the scaler audio delay	#SCLR-AUDIO-DELAY? <sub>SP</sub> P1 <sub>CR</sub>	
Response			
Set / Get: ~ <b>nn</b> @SCLR-AUDIO-DELAY <sub>SP</sub> P1,P2 <sub>CR LF</sub>			
Parameters			
P1 (Audio output number) –1=Scaler P2 (Level selection) – 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			

## SCLR-PCAUTO

Functions		Permission	Transparency
Set:	SCLR-PCAUTO	End User	Public
Get:		End User	Public
Description		Syntax	
Set:	Set PC auto sync of scaler	#SCLR-PCAUTO <sub>SP</sub> P1,P2 <sub>CR</sub>	
Get:			
Response			
Set / Get: ~ <sub>nn</sub> @SCLR-PCAUTO <sub>SP</sub> P1,P2... <sub>CR LF</sub>			
Parameters			
P1 (Scaler number) -1=Scaler P2 (Off/On) -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			

## SN?

Functions		Permission	Transparency
Set:	-	-	-
Get:	SN?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device serial number	#SN? <sub>CR</sub>	
Response			
~ <sub>nn</sub> @SN <sub>SP</sub> serial_number <sub>CR LF</sub>			
Parameters			
serial_number - 14 decimal digits, factory assigned			

## STANDBY

Functions		Permission	Transparency
Set:	STANDBY	End User	Public
Get:	STANDBY?	End User	Public
Description		Syntax	
Set:	Set Standby mode	#STANDBY <sub>SP</sub> on_off <sub>CR</sub>	
Get:	Get Standby mode status	#STANDBY? <sub>CR</sub>	
Response			
~ <sub>nn</sub> @STANDBY <sub>SP</sub> value <sub>CR LF</sub>			
Parameters			
on_off - 0=Off; 1=On			

## TLK

Functions		Permission	Transparency
Set:	<b>TLK</b>	End User	Public
Get:	<b>TLK?</b>	End User	Public
Description		Syntax	
Set:	Set audio talkover mode status	# <b>TLK</b> <sub>SP</sub> channel,talkover_mode <sub>CR</sub>	
Get:	Get audio talkover mode status	# <b>TLK?</b> channel, <sub>CR</sub>	
Response			
~ <sub>nn</sub> @ <b>TLK</b> <sub>SP</sub> channel,talkover_mode <sub>CR LF</sub>			
Parameters			
channel - output number talkover_mode – 0=OFF; 1=Mixer; 2=Talkover; 3=Mic only			

## VERSION?

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>VERSION?</b>	End User	-
Description		Syntax	
Set:	-	-	
Get:	Get version number	# <b>VERSION?</b> <sub>CR</sub>	
Response			
~ <sub>nn</sub> @ <b>VERSION</b> <sub>SP</sub> firmware_version <sub>CR LF</sub>			
Parameters			
firmware_version – Format: XX.XX.XXXX where the digits group are: major.minor.build version			

## VFRZ

Functions		Permission	Transparency
Set:	<b>VFRZ</b>	End User	-
Get:	<b>VFRZ?</b>	End User	-
Description		Syntax	
Set:	Set freeze video on output	# <b>VFRZ</b> <sub>SP</sub> P1,P2 <sub>CR</sub>	
Get:	Get freeze on output status	# <b>VFRZ?</b> <sub>SP</sub> P1 <sub>CR</sub>	
Response			
Set / Get: ~ <b>nn</b> @ <b>VFRZ</b> <sub>SP</sub> P1,P2 <sub>CR LF</sub>			
Parameters			
P1 (Scaler number) – 1=Scaler P2 (Off/On) – 0=Off; 1=On			

## VID-RES

Functions		Permission	Transparency		
Set:	<b>VID-RES</b>	End User	Public		
Get:	<b>VID-RES?</b>	End User	Public		
Description		Syntax			
Set:	Set video resolution	# <b>VID-RES</b> <sub>SP</sub> P1,P2,P3,P4 <sub>CR</sub>			
Get:	Get video resolution	# <b>VID-RES?</b> <sub>SP</sub> P1,P2,P3 <sub>CR</sub>			
Response					
~ <b>nn</b> @ <b>VID-RES</b> <sub>SP</sub> P1,P2,P3,P4 <sub>CR LF</sub>					
Parameters					
P1 – 1=Output P2 – 1=Scaler P3 – 0=Off P4 - video resolutions – 200~223					
No	Resolution	No	Resolution	No	Resolution
200	640x480 @60Hz	209	1400x1050 @60Hz	217	1080i @60Hz
201	800x600 @60Hz	210	1680x1050 @60Hz	218	1080p @60Hz
202	1024x768 @60Hz	211	1600x900 @60Hz	219	576p @50Hz
203	1280x768 @60Hz	212	1600x1200 @60Hz	220	720p @50Hz
204	1360x768 @60Hz	213	1920x1080 @60Hz	221	1080i @50Hz
205	1280x720 @60Hz	214	1920x1200 @60Hz	222	1080p @50Hz
206	1280x800 @60Hz	215	480p @60Hz	223	NATIVE HDMI
207	1280x1024 @60Hz	216	720p @60Hz	224	NATIVE HDBT
208	1440x900 @60Hz				
Response triggers					
After execution, response is sent to the com port from which the <b>Set /Get</b> was received 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)					
Notes					
"Set" command is only applicable for <b>stage=Output</b> "Set" command with <i>is_native=ON</i> sets native resolution on selected output (resolution index sent = 0). Device sends as answer actual VIC ID of native resolution "Get" command with <i>is_native=ON</i> returns native resolution VIC, with <i>is_native=OFF</i> returns current resolution To use "custom resolutions" (entries 100-105), define them using command DEF-RES					

## VMUTE

Functions		Permission	Transparency
Set:	<b>VMUTE</b>	End User	Public
Get:	<b>VMUTE?</b>	End User	Public
Description		Syntax	
Set:	Set enable/disable video on output	#VMUTE <sub>SP</sub> P1, P2 <sub>CR</sub>	
Get:	Get video on output status	#VMUTE? <sub>SP</sub> P1 <sub>SP CR</sub>	
Response			
Set / Get: ~ <sub>nn</sub> @VMUTE <sub>SP</sub> P1,P2 <sub>CR LF</sub>			
Parameters			
P1 (Scaler number) – 1=Scaler P2 (Off/On) – 0=Off; 1=On			

The warranty obligations of Kramer Electronics Inc. ("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 this Coverage Lasts**

The standard limited warranty for Kramer products is seven (7) years from the date of original purchase, with the following exceptions:

1. All Kramer VIA hardware products are covered by a standard three (3) year warranty for the VIA hardware and a standard three (3) year warranty for firmware and software updates; all Kramer VIA accessories, adapters, tags, and dongles are covered by a standard one (1) year warranty.
2. Kramer fiber optic cables, adapter-size fiber optic extenders, pluggable optical modules, active cables, cable retractors, ring mounted adapters, portable power chargers, Kramer speakers, and Kramer touch panels are all covered by a standard one (1) year warranty.
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.
4. All Sierra Video MultiViewers are covered by a standard five (5) year warranty.
5. Sierra switchers & control panels are covered by a standard seven (7) year warranty (excluding power supplies and fans that are covered for three (3) years).
6. K-Touch software is covered by a standard one (1) year warranty for software updates.
7. All Kramer passive cables are covered by a ten (10) year warranty.

#### **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. If a direct or similar replacement product is supplied, the original product's end warranty date remains unchanged and is transferred to the replacement 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, visit our web site at [www.kramerav.com](http://www.kramerav.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 (RMA number). 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 of 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.

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#### **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, visit our web site at [www.kramerav.com](http://www.kramerav.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.





P/N: 2900-300476



Rev: 11



## 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.

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