

## USER MANUAL

### MODEL:

VP-440X

4K 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-440X](http://www.kramerav.com/downloads/VP-440X) to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

## Achieving 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-440X** away from moisture, excessive sunlight and dust.

## Safety Instructions



### Caution:

- This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.
- For products with relay terminals and GPIO ports, please refer to the permitted rating for an external connection, located next to the terminal or in the User Manual.
- There are no operator serviceable parts inside the unit.



### Warning:

- Use only the power cord that is supplied with the unit.
- Disconnect the power and unplug the unit from the wall before installing.
- Do not open the unit. High voltages can cause electrical shock! Servicing by qualified personnel only.
- To ensure continuous risk protection, replace fuses only according to the rating specified on the product label which located on the bottom of the unit.

## 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

Congratulations on purchasing your Kramer **VP-440X 4K Presentation Switcher / Scaler**.

**VP-440X** is a high-performance 18G 4K HDR presentation switcher/scaler with four HDMI™ inputs and one computer graphics (VGA) input. It scales the video, embeds the audio, and outputs the signal to two identical outputs – one HDMI and one HDBaseT – together with an analog stereo audio output. Via HDBaseT, it extends video signals to up to 40m (130ft) over CAT copper cables at up to 4K@60Hz (4:2:0) 24bpp video resolution and provides even further reach for lower HD video resolutions.

**VP-440X** provides exceptional quality, advanced and user-friendly operation, and flexible control.

## Exceptional Quality

- High-Performance Professional Scaler – Up-scales, down-scales and cross-scales up to resolutions of 4K@60 (4:4:4). The output resolution can be set to the native resolution of either of the sinks, or manually set to another resolution. When the product is configured to scale to 18G resolutions (4K@60 4:4:4), the HDBT output automatically down-samples the 4K chroma sampling to 4:2:0 coding.
- Smooth Switching – Constant output sync, prevents output glitches while switching between inputs, even when no video is detected.
- Powerful Audio Processing – Supports DSP technology including audio equalization, mixing, delay, and microphone talk-over (ducking).
- HDMI Signal Extension – HDCP 2.2 and HDCP 1.4 compliant.
- HDR10 support.
- EDID Pass-Through – EDID passed through from the source to the display.
- CEC Support – Supports passing of CEC from input to output. Automatically sends CEC commands to shut down the output display after a timeout period when no input signal is found and to power up the display when the input returns.
- Easy Installation – Half 19" size enables mounting in a 1U rack space with the recommended rack adapter.

- HDMI Support – HDR10, CEC, x.v.Color™ (on input), 7.1 PCM, Dolby TrueHD/DTS-HD (by-pass mode).

## Advanced and User-friendly Operation

- A USB port for upgrading the firmware.
- Firmware Upgrade – Ethernet-based, via a user-friendly software upgrade tool.
- Built-in video Proc-Amp – color, hue, sharpness, contrast, and brightness are set individually for each input.
- Bidirectional RS-232 Extension – Serial interface data flows in both directions, on each extension line, enabling data transmission and control of devices.
- Diverse Control Options – Control the unit using an OSD (On-Screen Display) via front panel buttons, embedded webpages via Ethernet and/or serial communication via RS-232 transmitted by a PC, touch screen system or other serial controller. Additionally, connect to the contact closure connector for remote switching of sources and for toggling the display ON and OFF.
- An OSD (On-Screen Display) – for making adjustments – that can be located anywhere on the screen.
- Efficient power-saving features.
- Advanced EDID management per input.
- Includes non-volatile memory that retains the last settings after switching the power off and then on again.

## Flexible Connectivity

- Flexible Digital and Analog Audio – Select a dedicated unbalanced analog audio input to embed into each input. In addition, a microphone input is provided on the front panel for mixing, switching or talk-over (ducking). Any of the signals can play audio through the unbalanced audio output.
- 5 input buttons for switching a selected input to the outputs.
- Scaled video outputs – up to 4K60 4:4:4.
- Embedded audio and analog audio on the HDMI inputs, as well as an analog audio input to accompany the VGA input.
- Unbalanced analog audio output.

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## Typical Applications

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

- Educational – classrooms, lecture theatres where 18G 4K support is required.
- Projection systems in conference rooms, boardrooms, hotels and churches requiring a 4K presentation switcher / scaler.
- Home theatre up-scaling.

## Controlling your VP-440X

Control your **VP-440X** directly via the front panel push buttons (with on-screen menus), or:

- By RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller.
- Via the Ethernet using built-in user-friendly webpages.

# Defining VP-440X 4K

## Presentation Switcher / Scaler

This section defines VP-440X.

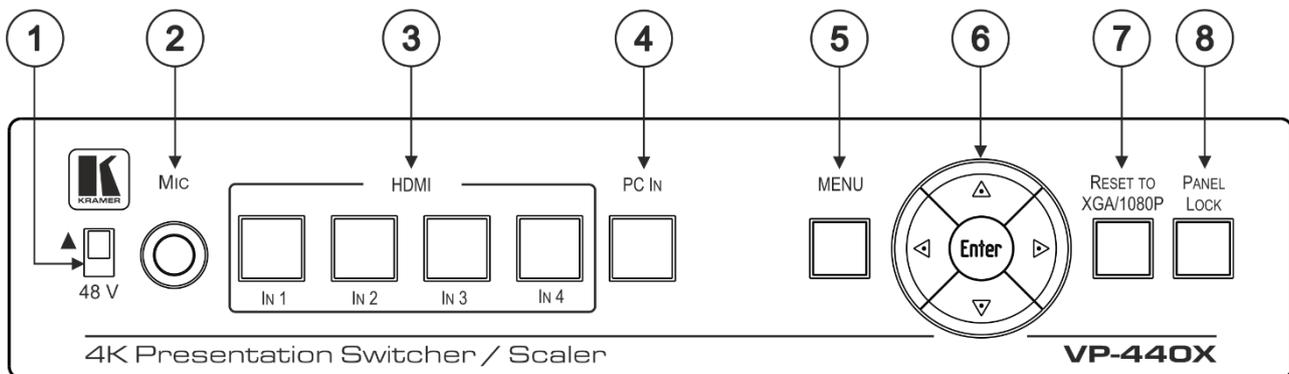


Figure 1: VP-440X 4K Presentation Switcher / Scaler Front Panel

#	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 <b>VP-440X</b> ).	
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.
⑤	MENU Button	Displays the OSD menu.	
⑥	Menu 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.
⑦	RESET TO XGA/1080P Button	Press and hold for about 5 seconds to toggle the output resolution between XGA and 1080p, alternatively.	
⑧	PANEL LOCK Button	Press and hold for about 5 seconds to lock/unlock the front panel buttons. To set Lock button functionality, see <a href="#">Locking Front Panel Buttons</a> on page <a href="#">18</a> .	

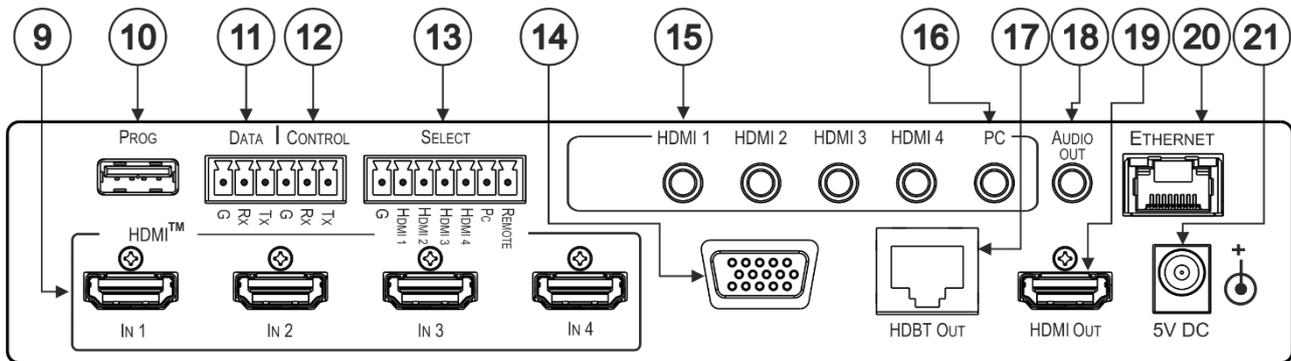


Figure 2: VP-440X 4K Presentation Switcher / Scaler Rear Panel

#	Feature	Function
⑨	HDMI™ IN Connectors	Connect to an HDMI source (from 1 to 4).
⑩	PROG USB Type A Connector	Use to upgrade the firmware.
⑪	DATA (Tx, Rx, GND) Terminal Block Connectors	Connect to a PC to Extend RS-232 signals via the HDBT OUT port to control peripheral devices that are connected to the HDBT receiver (for example, a projector connected to <b>TP-780Rxr</b> ) and/or control a source (e.g. a Blu-ray player) using an RS-232 controller at the receiver.
⑫	CONTROL (Tx, Rx, GND) Terminal Block Connectors	Connect to a PC or serial controller to control the <b>VP-440X</b> or control the output display (configurable).
⑬	SELECT 7-pin Terminal Block Connector	HDMI 1 to HDMI 4 and PC: connect to contact closure switches (by momentary contact between the desired pin and G pin) to select an input. REMOTE: connect the pin to G to turn on/off the display or the device (configurable, see <a href="#">Configuring the REMOTE Pin</a> on page 18).
⑭	PC IN 15-pin HD Connector	Connect to the computer graphics (VGA) source.
⑮	AUDIO INPUT Unbalanced Stereo 3.5 Mini Jack	HDMI™
⑯		PC
⑰	HDBT OUT RJ-45 Connector	Connect to an HDBT receiver (for example, <b>TP-780Rxr</b> ).
⑱	AUDIO OUT 3.5 Mini Jack	Connect to an unbalanced stereo audio acceptor.
⑲	HDMI OUT Connector	Connect to the HDMI acceptor.
⑳	ETHERNET Connector	Connects to the PC or other controller through computer networking.
㉑	5V DC	+5V DC connector for powering the unit.

# Mounting VP-440X

This section provides instructions for mounting **VP-440X**. 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-440X before connecting any cables or power.

**Warning:**

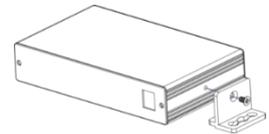
- Ensure that the environment (e.g., maximum ambient temperature & air flow) is compatible for the device.
- Avoid uneven mechanical loading.
- Appropriate consideration of equipment nameplate ratings should be used for avoiding overloading of the circuits.
- Reliable earthing of rack-mounted equipment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

## To mount the VP-440X on a rack

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

## To mount the VP-440X on a table or shelf

- Attach the rubber feet and place the unit on a flat surface.
- Fasten a bracket (included) on each side of the unit and attach it to a flat surface.



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

# Connecting VP-440X



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

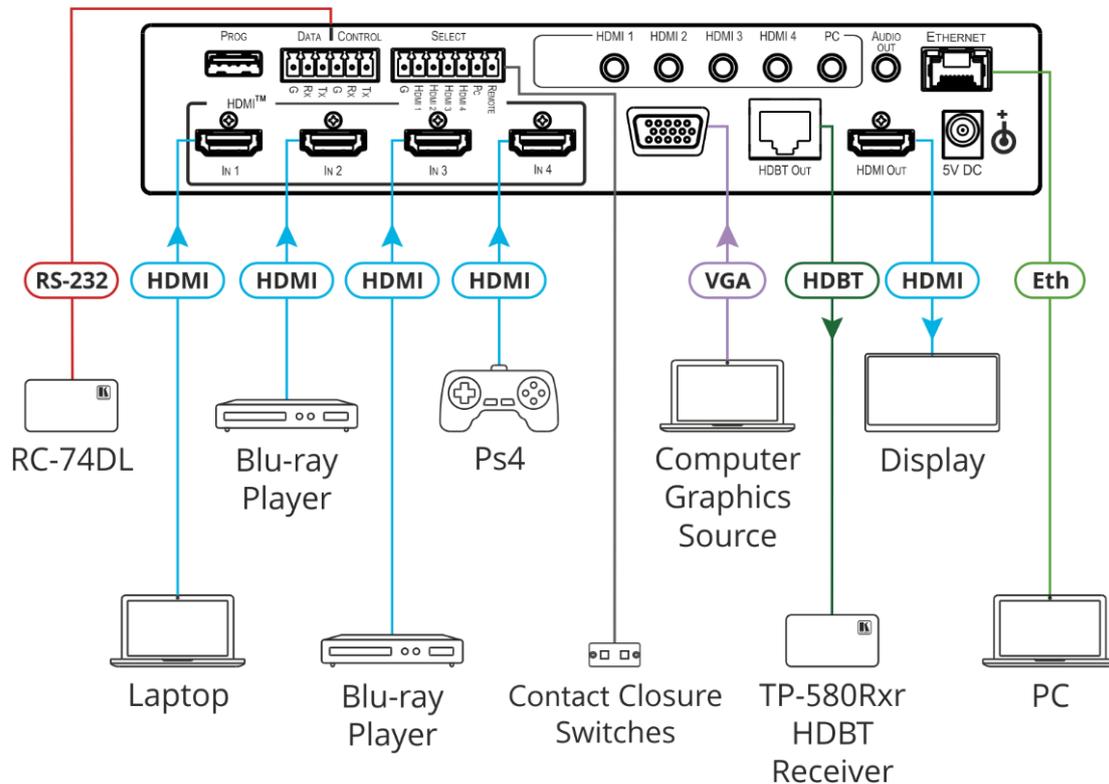


Figure 3: Connecting to the VP-440X Rear Panel

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

- Connect the video sources.
  - A computer graphics source to the PC IN 15-pin HD connector (14).
  - HDMI sources (for example, a laptop, two Blue-ray players, and a gaming console) to the four HDMI IN connectors (9).
- Connect an analog stereo audio source (not shown in [Figure 3](#)) for each of the four HDMI inputs (15) and for the PC input (16) to the 3.5mm mini jack connectors.
- Connect the video outputs:
  - An HDBaseT receiver (for example, Kramer **TP-580Rxr**) to the HDBT IN RJ-45 connector (17).
  - An HDMI acceptor to the HDMI OUT connector (19).
- Connect an unbalanced stereo audio acceptor (for example, active speakers, not shown in [Figure 3](#)) to the AUDIO OUT 3.5mm mini jack (18).
- Connect a laptop to the Ethernet RJ-45 connector (20).
- Connect the 5V power supply to the 5V DC power terminal block (21).
- Connect a PC or serial controller (not shown in [Figure 3](#)) to the CONTROL (Tx, Rx, G) terminal block connector (12), to control the unit via serial control.

# Connecting to VP-440X via RS-232

You can connect to the **VP-440X** via an RS-232 connection using, for example, a PC.

**VP-440X** features two RS-232 3-pin terminal block connectors:

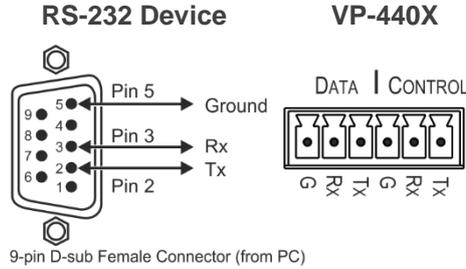
- **CONTROL** (12) – to control **VP-440X** (for example, via a connected PC) or for **VP-440X** to control an external device (for example, the projector on the HDMI output).
- **DATA** (11) – RS-232 on this port is passed via HDBT to/from the RS-232 port on the HDBT receiver.

**i** For **VP-440X** to control an external device at the HDBT receiver (for example, the projector on the HDBT receiver’s output), connect the **CONTROL** port to the **DATA** port (Rx to Tx and Tx to Rx) and connect the external device to the HDBT receiver’s RS-232 port.

Connect the RS-232 terminal block on the rear panel of the **VP-440X** to a PC/controller, as follows:

From the RS-232 9-pin D-sub serial port connect:

- Pin 2 to the TX pin on the **VP-440X** RS-232 terminal block.
- Pin 3 to the RX pin on the **VP-440X** RS-232 terminal block.
- Pin 5 to the G pin on the **VP-440X** RS-232 terminal block.

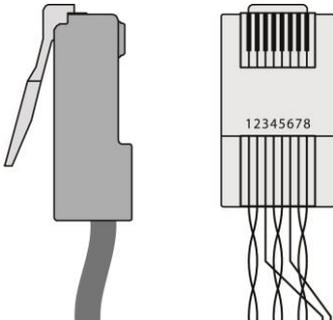


# Wiring RJ-45 Connectors

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

**i** 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



# Operating and Controlling VP-440X

Operate and control **VP-440X** via:

- Front panel buttons (see [Using Front Panel Buttons](#) on page 10).
- Remote control switches to select an input (see [Connecting the Remote Control Switches](#) on page 10).
- OSD menu (see [Using the OSD Menu](#) on page 11).

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## Using Front Panel Buttons

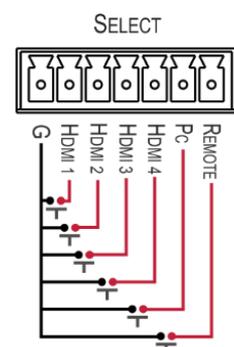
Press the **VP-440X** front panel buttons to:

- Select the required INPUT (HDMI IN 1, HDMI IN 2, HDMI IN 3, HDMI IN 4 (3) or PC IN (4)).
- Reset the resolution to XGA/1080p (7).
- Lock the front panel (8).
- Control the device via the OSD menu, using the MENU, Enter, and navigation buttons (6) (see [Using the OSD Menu](#) on page 11).

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## Connecting the Remote Control Switches

Pin Name	Function
REMOTE	User-configurable ON/OFF switch for turning the display on or off (see <a href="#">Configuring the REMOTE Pin</a> on page 18).
PC	Momentarily connect to G to select the PC input.
HDMI 1	Momentarily connect to G to select the HDMI 1 input.
HDMI 2	Momentarily connect to G to select the HDMI 2 input.
HDMI 3	Momentarily connect to G to select the HDMI 3 input.
HDMI 4	Momentarily connect to G to select the HDMI 4 input.



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## Using the OSD Menu

VP-440X enables controlling and defining the device parameters via the OSD, using the front panel MENU buttons.

To enter and use the OSD menu buttons:

1. Press MENU.
2. Press:
  - **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.
  - **EXIT** to exit the menu.



The default OSD timeout is set to 10 seconds.

Use the OSD menu to perform the following operations:

- [Adjusting Image Parameters](#) on page [12](#).
- [Selecting an Input Signal](#) on page [12](#).
- [Setting Output Parameters](#) on page [13](#).
- [Setting Audio Parameters](#) on page [13](#).
- [Setting OSD Parameters](#) on page [15](#).
- [Managing EDID via OSD](#) on page [15](#).
- [Setting HDCP](#) on page [16](#).
- [Setting Sleep Mode](#) on page [16](#).
- [Setting Switching Mode](#) on page [17](#).
- [Setting Ethernet Parameters](#) on page [17](#).
- [Locking Front Panel Buttons](#) on page [18](#).
- [Defining CEC](#) on page [18](#).
- [Viewing Device Information](#) on page [19](#).
- [Performing a Reset](#) on page [19](#).
- [Updating the Firmware](#) on page [19](#).

## Adjusting Image Parameters

VP-440X enables adjusting the image parameters such as contrast, brightness and so on.

To adjust the image parameters:

1. On the front panel press **MENU**. The menu appears.
2. Click **Picture** and define the image parameters according to the information in the following table:

Menu Item	Function	
Contrast	Set the contrast.	
Brightness	Set the brightness.	
Finetune	PC	PHASE – Adjust the phase of the VGA input sampling.
		CLOCK – Adjust the VGA input clock sampling rate.
		H_POSITION – Set the vertical position of the image on the VGA input.
		V_POSITION – Set the horizontal position of the image on the VGA input.
	Video	HUE – Set the color hue.
		SATURATION – Set the color saturation.
		SHARPNESS – Set the sharpness of the picture.
		NOISE REDUCTION – Select the noise reduction filter: Off (default), Low, Middle or High.
Color	Set the Red, Green and Blue shades.	

Image parameters are adjusted.

## Selecting an Input Signal

Select the VP-440X input source via the OSD menu.

To set the input source:

1. On the front panel press **MENU**. The menu appears.
2. Click **Input** and select the **Source**:
  - HDMI 1 (default), HDMI 2, HDMI 3, HDMI 4.
  - PC.

An input signal is selected.

## Setting Output Parameters

VP-440X enables setting output parameters such as the size of the image and output resolution via the OSD MENU buttons.

To set the output parameters:

1. On the front panel press **MENU**. The menu appears.
2. Click **Output** and define the output parameters according to the information in the following table:

Menu Item	Function			
Size	Set the size of the image: Over Scan, Full, Best Fit (default), Pan Scan, Letter Box, Under 2, Under 1, Follow In.			
Resolution	Select the output resolution (default, Native HDMI):			
	640x480 @60Hz	720x480P @60Hz	800x600 @60Hz	1280x720P @60Hz
	1024x768 @60Hz	1920x1080P @60Hz	1280x768 @60Hz	720x576P @50Hz
	1280x800 @60Hz	1280x720P @50Hz	1280x1024 @60Hz	1920x1080P @50Hz
	1360x768 @60Hz	1920x1080P @24Hz	1400x1050 @60Hz	1920x1080P @25Hz
	1440x900 @60Hz	1920x1080P @30Hz	1600x1200 @60Hz	3840x2160P @24Hz
	1680x1050 @60Hz	3840x2160P @25Hz	1920x1200 @60Hz RB	3840x2160P @30Hz
	2560x1600 @60Hz RB	3840x2160P @50Hz	1920x1080 @60Hz	3840x2160P @60Hz
	1280x720 @60Hz	4k2k @50Hz (4:2:0)	2560x1440 @60Hz RB	4k2k @60Hz (4:2:0)

Image size and output resolution are defined.

## Setting Audio Parameters

VP-440X enables defining the audio source per input, the audio delay time, the input and output volume, as well as microphone settings.

To set the audio:

1. On the front panel press **MENU**. The menu appears.
2. Click **Audio** and define the audio parameters according to the information in the following table:

Menu Item	Function	
Input Volume	Set the input volume for each of the inputs: HDMI 1, HDMI 2, HDMI 3, HDMI 4 or PC.	
Output Volume	Set the AUDIO OUT output volume (default is 80 = 0dB).	
Settings	Delay	Set the audio delay time (lip sync) to off, 40ms (default), 110ms or 150ms.
	DRC	Set dynamic range compression OFF (default) or ON. Set to ON to dynamically create a sound range according to the volume level. For example, in a movie, if the volume is high enough to hear dialogue and at the same time loud, sudden noises are toned down.
	Loudness	Set the loudness on or off (default).
Mute	Mute or unmute the audio output.	
Source	HDMI 1	Select Embedded, Analog, or Automatic (default).
	HDMI 2	Embedded selects the embedded HDMI audio source; Analog selects the analog audio corresponding to the input; and Automatic (default) selects the embedded audio when an HDMI
	HDMI 3	
	HDMI 4	

Menu Item	Function	
	source is detected, or the analog audio when a DVI input is detected.	
Mic Settings	Mic Mode	Set to Off (default), Mixer, Talkover or Mic Only.
	When Mic Mode is set to Talkover (see <a href="#">Talkover Mode</a> on page 14), set the following:	
	Depth [%]	Set the depth value to determine the decrease of the audio level during microphone takeover (press + to further decrease the talkover audio output level; press – to lessen the talkover output audio decrease level).
	Trigger [dB]	Set the trigger value to determine the microphone threshold level that triggers the audio output level decrease.
	Attack Time	Set the attack time to set the transition time of the audio level reduction after the signal rises above the threshold level.
	Hold Time	Set the hold time to define the time-period talkover remains active although the signal falls below the threshold level (for a short period of time).
Release Time	Set the 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.	
Mic Volume	Set microphone volume.	
EQ	Set the equalizer for the 120Hz, 200Hz, 500Hz, 1200Hz, 3000Hz, 7500Hz and 12000Hz frequency bands.	
Embedded In -> Out	Apply DSP (default) to the embedded audio or ByPass it. Bypassed signals are routed directly to the HDMI and HDBT outputs and are not processed by the DSP circuitry.  Select ByPass for compressed audio sources, for example, sources with Dolby or DTS encoding.	

Audio parameters are defined.

## Talkover Mode

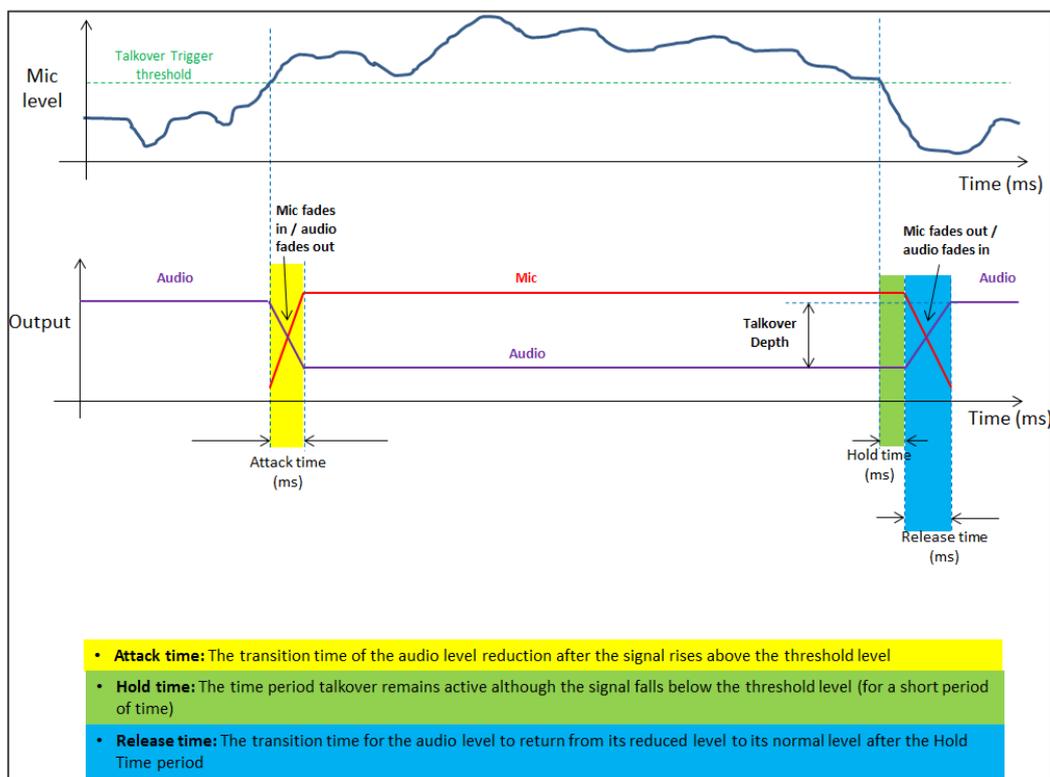


Figure 4: Talkover Mode

## Setting OSD Parameters

VP-440X enables adjusting OSD parameters for your convenience via the OSD MENU buttons.

To set the OSD parameters:

1. On the front panel press **MENU**. The menu appears.
2. Click **OSD** and define the OSD parameters according to the information in the following table:

Menu Item	Function
H-Position	Set the horizontal position of the OSD.
V-Position	Set the vertical position of the OSD.
Timer	Set the timeout period to Off or up to 60 seconds (default 10).
Transparency	Set the OSD background between 100 (transparent) and 0 (opaque).
Display	Select the information displayed on-screen during operation: Info (default) – the information appears for 10 seconds. On – the information appears constantly. Off – the information does not appear.

OSD parameters are set.

## Managing EDID via OSD

VP-440X enables managing the EDID via the OSD MENU buttons.

To manage the EDID:

1. On the front panel press **MENU**. The menu appears.
2. Click **EDID Manage** and define the EDID parameters according to the information in the following table:

Menu Item	Function
EDID on HDMI (1 to 4)	For each HDMI input, select a built-in EDID file and press enter: Def.1080P (default), Def. 4K(3G), Def. 4K(4:2:0), Def. 4K(6G), HDMI Output, HDBT output, or use an external file.
EDID on PC	Default

A selected built-in EDID file is sent to a selected input.

### Uploading EDID from an External File

To select the EDID from an external file:

1. Save an EDID file via the EDID webpage (see [Managing EDID](#) on page 35).
2. On the front panel press **MENU**. The OSD menu appears.
3. Click **Advanced** and select **EDID Manage**.
4. Select an HDMI input and then select **File**.  
The external EDID file (as stored via the EDID embedded page) is stored.

An external EDID file is sent to a selected input.

## Setting HDCP

**VP-440X** enables setting the HDCP on the input and on the output via the front panel **MENU** buttons.

**To set the HDCP on the inputs and output:**

1. On the front panel press **MENU**. The menu appears.
2. Click **Advanced** and define the HDCP parameters according to the information in the following table:

Menu Item	Function
HDCP On Input	Set HDCP support on HDMI 1 IN to HDMI 4 IN to ON (default) or OFF. Note that: <ol style="list-style-type: none"> <li>1. HDCP must be enabled (ON) to support HDCP encrypted sources.</li> <li>2. Sources such as Mac computers always encrypt their outputs when detecting that the sink supports HDCP. If the content does not require HDCP, you can prevent these sources from encrypting by disabling (OFF) HDCP on the input.</li> </ol>
HDCP On Output	Select FOLLOW OUTPUT (default) or FOLLOW INPUT on HDMI OUT. Select FOLLOW OUTPUT (recommended) for the scaler to match its HDCP output to the HDCP setting of the acceptor to which it is connected. Select FOLLOW INPUT to change its HDCP output setting according to the HDCP of the input (recommended when the output is connected to a splitter/switcher).

HDCP is set on the input/output.

## Setting Sleep Mode

Auto Sync Off turns off the output after a period of not detecting a valid video signal on the input(s) until a valid input is again detected or any keypad button is pressed.

**VP-440X** enables configuring the Auto Sync Off delay time when a connected display enters sleep mode.

**To set Auto Sync Off:**

1. On the front panel press **MENU**. The menu appears.
2. Click **Advanced** and select **Auto Sync Off**.
3. Define Auto Sync Off according to the information in the following table:

Menu Item	Function
Off (default)	Leave outputs active always.
Slow	Disable outputs after ~ 2 minutes of no input detection.
Fast	Disable outputs after ~ 10 seconds of no input detection.
Immediate	Disable outputs immediately.

Sleep mode is defined.

## Setting Switching Mode

**VP-440X** enables configuring for automatic switching of the input source upon signal loss or when a source is plugged in.

To set the switching mode:

1. On the front panel press **MENU**. The menu appears.
2. Click **Advanced** and select **Auto Switching**.
3. Select the switching mode according to the information in the following table:

Menu Item	Function
Off	For manual switching.
Scan From HDMI	Scans for a valid input, starting with HDMI 1, when no signal is found on the selected input.
Scan From PC	Scans for a valid input, starting with PC, when no signal is found on the selected input.
Last Connected	Automatically switches to the last connected input and reverts to the previously selected input after that input is lost.

Switching mode is defined.

## Setting Ethernet Parameters

**VP-440X** enables defining the Ethernet parameters via the MENU front panel buttons.

To set the Ethernet parameters:

1. On the front panel press **MENU**. The menu appears.
2. Click **Advanced** and define the Ethernet parameters according to the information in the following table:

Menu Item	Function
IP Mode	Select Static IP (default) or DHCP.
Static IP Address	Enter to change the IP address.
Subnet Mask	Enter to change the subnet mask.
Default Gateway	Enter to change the default gateway.
TCP Port	Enter TCP port # (5000, by default).
UDP Port	Enter UDP port # (50000, by default).
IP	View the current IP address.
MAC ADDRESS	View the MAC address.

Network parameters are defined.

## Locking Front Panel Buttons

VP-440X enables defining the function of the PANEL LOCK front panel button (8). For example, the PANEL LOCK button can be defined to lock all the front panel buttons or only the menu buttons.

To define the front panel button locking mode:

1. On the front panel press **MENU**. The menu appears.
2. Click **Advanced** and select **Lock Mode**.
3. Set panel lock mode according to the information in the following table:

Menu Item	Function
All (default)	Lock all the front panel buttons.
Menu Only	Lock the menu buttons only.
All & Save	Lock all the front panel buttons and keep locked after cycling power. To unlock the panel, press both PANEL LOCK (8) and RESET TO XGA/1080P (7) buttons simultaneously for about 5 seconds.
Menu Only and Save	Lock the menu buttons only and keep locked after cycling power. To unlock the panel, press both PANEL LOCK (8) and RESET TO XGA/1080P (7) buttons simultaneously for about 5 seconds.

PANEL LOCK button mode is defined.

## Defining CEC

VP-440X enables passing CEC commands via the connected source to the connected display.

To set the CEC (Consumer Electronic Control) functionality:

1. On the front panel press **MENU**. The menu appears.
2. Click **Advanced** and select **HDMI Output CEC**.
3. Select:
  - **Off** – Automatically send CEC commands to shut down the output display after a timeout period when no input signal is found and to power up the display when the input returns.
  - **On** – Pass CEC commands via the source connected to the selected HDMI input.

CEC is enabled/disabled.

## Configuring the REMOTE Pin

VP-440X enables defining the function of the REMOTE pin (13) on the rear panel.

To configure the REMOTE pin (see [Connecting the Remote Control Switches](#) on page 10):

1. On the front panel press **MENU**. The menu appears.
2. Click **Advanced** and select **Remote Pin**.
3. Select the REMOTE configuration:
  - Momentary Contact (toggle on/off).

- Closed (On); Open (Off).
- Closed (Off); Closed (On).
- Disable.

Remote pin button is defined.

## Viewing Device Information

Device information includes the selected source, the input and output resolutions, and the software version.

**To view the information:**

1. On the front panel press **MENU**. The menu appears.
2. Click **INFO** and view the input resolution, output resolution and software version information is displayed.

## Performing a Reset

**VP-440X** enables performing either a soft reset or a full reset via the front panel **MENU** buttons.

**To reset the device:**

1. On the front panel press **MENU**. The menu appears.
2. Click **Factory** and select either Reset (full reset) or a Soft Reset (reset device information excluding Ethernet parameters), then click **Yes**.  
Wait for completion of factory reset (resolution is set to Native).

Device is reset.

## Updating the Firmware

**VP-440X** enables performing firmware update via the front panel **MENU** buttons.

**To update the firmware:**

1. Save the new firmware file to a memory stick.



The memory stick should only include this file.

2. Power the device.
3. Connect an input source and a display to the device, to indicate firmware upgrade completion.
4. Plug the memory stick into the PROG USB port (10) on the device rear panel.
5. On the front panel press **MENU**. The menu appears.
6. Click **FW Update** and select **On**.
7. Wait for completion of firmware update.

Firmware upgrade is complete when an image appears on the display.

## Operating via Ethernet

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

- Directly to the PC using a crossover cable (see [Connecting Ethernet Port Directly to a PC](#) on page 20).
- Via a network hub, switch, or router, using a straight-through cable (see [Connecting Ethernet Port via a Network Hub or Switch](#) on page 22).



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 Ethernet Port Directly to a PC

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

After connecting the **VP-440X** 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 5](#).

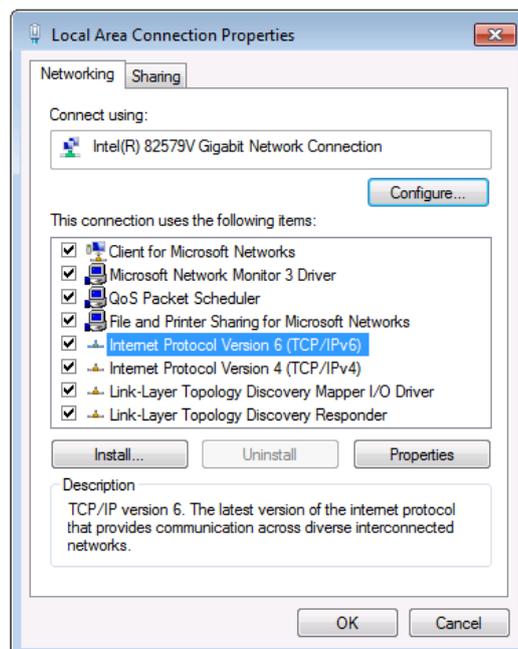


Figure 5: Local Area Connection Properties Window

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

5. Click **Properties**.

The Internet Protocol Properties window relevant to your IT system appears as shown in [Figure 6](#) or [Figure 7](#).

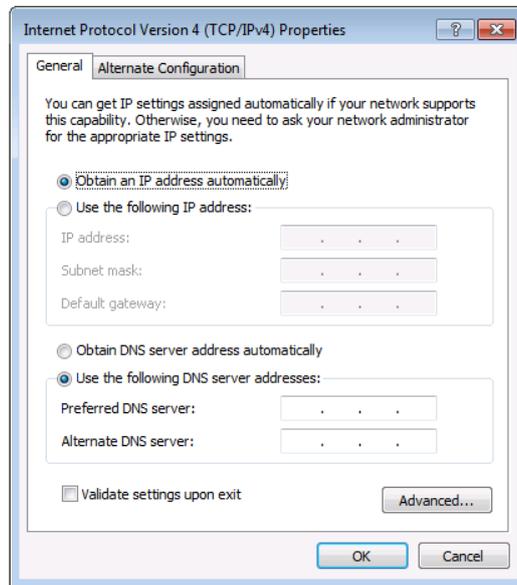


Figure 6: Internet Protocol Version 4 Properties Window

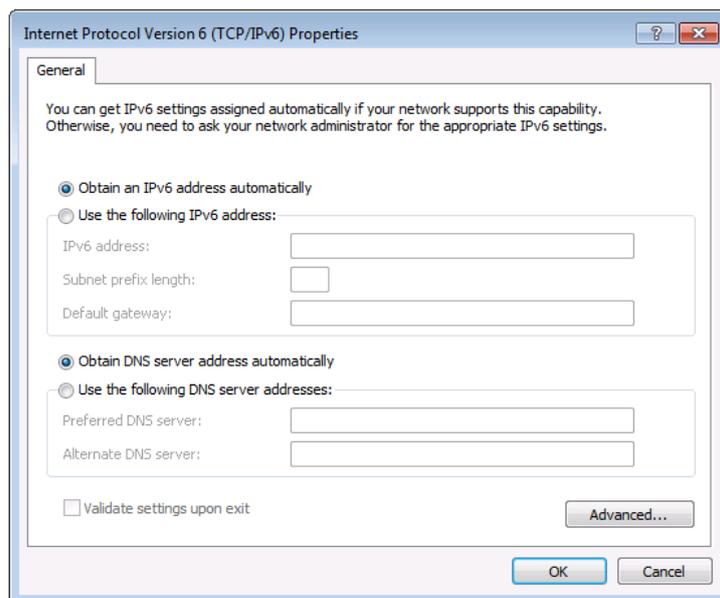


Figure 7: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in [Figure 8](#).

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.

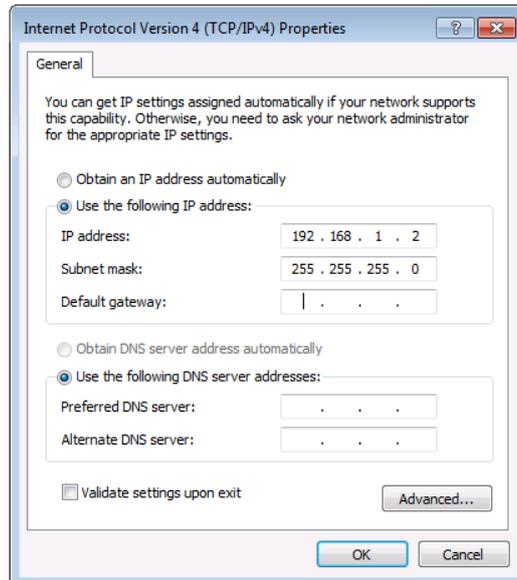


Figure 8: Internet Protocol Properties Window

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

## Connecting Ethernet Port via a Network Hub or Switch

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

## Configuring Ethernet Port

You can set the Ethernet parameters via the embedded webpages.

# Using Embedded Webpages

The **VP-440X** can be operated remotely using the embedded webpages. The webpages are accessed using a Web browser and an Ethernet connection.

Before attempting to connect:

- Perform the procedures in [Operating via Ethernet](#) on page [20](#).
- Ensure that your browser is supported.

The following operating systems and Web browsers are supported:

Operating Systems	Versions
Windows 7	IE
	Firefox
	Chrome
	Safari
Windows 10	IE
	Edge
	Firefox
	Chrome
Mac	Safari
iOS	Safari



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

### To browse the VP-440X webpages:

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.

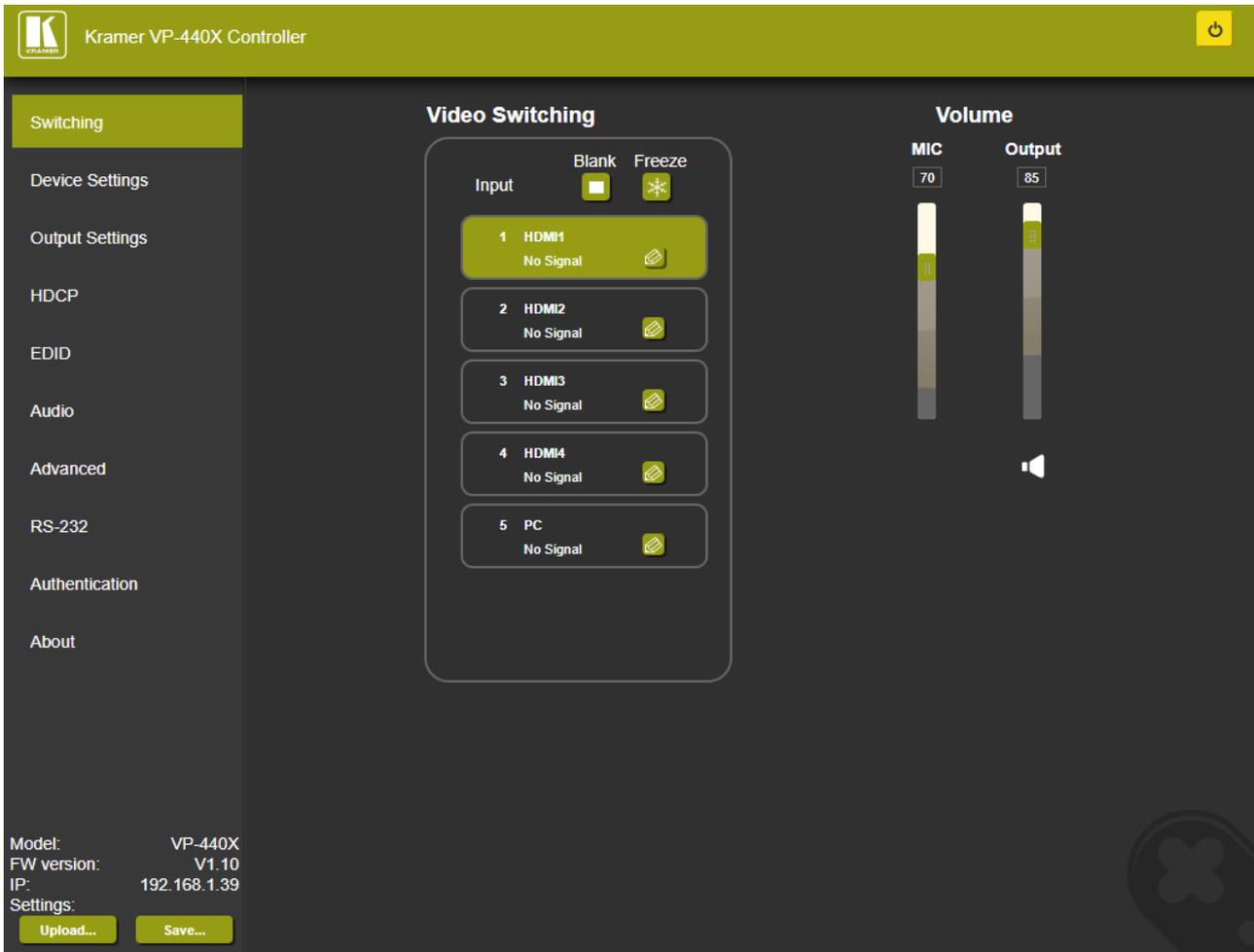


Figure 9: Embedded Webpage with Navigation List on Left

3. View the FW version and IP address.
4. Click the tabs on the left side of the screen to access the relevant webpage.

The VP-440X enables performing the following:

- [Loading and Saving Configurations](#) on page [25](#).
- [Entering Standby Mode](#) on page [26](#).
- [Configuring Video Input Settings](#) on page [26](#).
- [Switching an Input to the Outputs](#) on page [27](#).
- [Freezing / Blanking Video Outputs](#) on page [28](#).
- [Adjusting Microphone and Output Volume](#) on page [28](#).
- [Viewing Device Settings](#) on page [29](#).

- [Upgrading Firmware](#) on page [29](#).
- [Configuring Network Settings](#) on page [31](#).
- [Configuring Video Output Settings](#) on page [32](#).
- [Configuring HDCP per Input/Output](#) on page [34](#).
- [Managing EDID](#) on page [35](#).
- [Adjusting Audio Input Settings](#) on page [37](#).
- [Adjusting Microphone Settings](#) on page [38](#).
- [Defining Additional Audio Settings](#) on page [38](#).
- [Setting Equalizer](#) on page [38](#).
- [Setting Auto Sync Off](#) on page [39](#).
- [Configuring Automatic Switching Settings](#) on page [40](#).
- [Defining Lock Mode](#) on page [40](#).
- [Controlling via the RS-232 Terminal Block Connectors](#) on page [41](#).
- [Password Protecting Webpage Access](#) on page [44](#).

---

## Loading and Saving Configurations

VP-440X enables you to save a configuration to recall it in the future.

### Saving a Configuration

To save the current configuration:

1. Configure the device as required.
2. In the Navigation pane, click **Switching**. The Switching page opens ([Figure 9](#)).
3. Click **Save**.  
The Save File window appears.



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

The current configuration is saved.

### Loading a Configuration

To load a configuration:

1. In the navigation pane click **Switching**. The Switching page opens ([Figure 9](#)).
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-440X features a power saving standby mode that disables the outputs and consumes less power.

To toggle between standby mode and normal operation:

- Click the power icon on the right-hand side of the webpages header. When in standby mode, the icon displays a gray background.



Figure 10: VP-440X Power Button

## Configuring Video Input Settings

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

To configure video input settings:

1. In the Navigation pane click **Switching**. The Switching page appears.

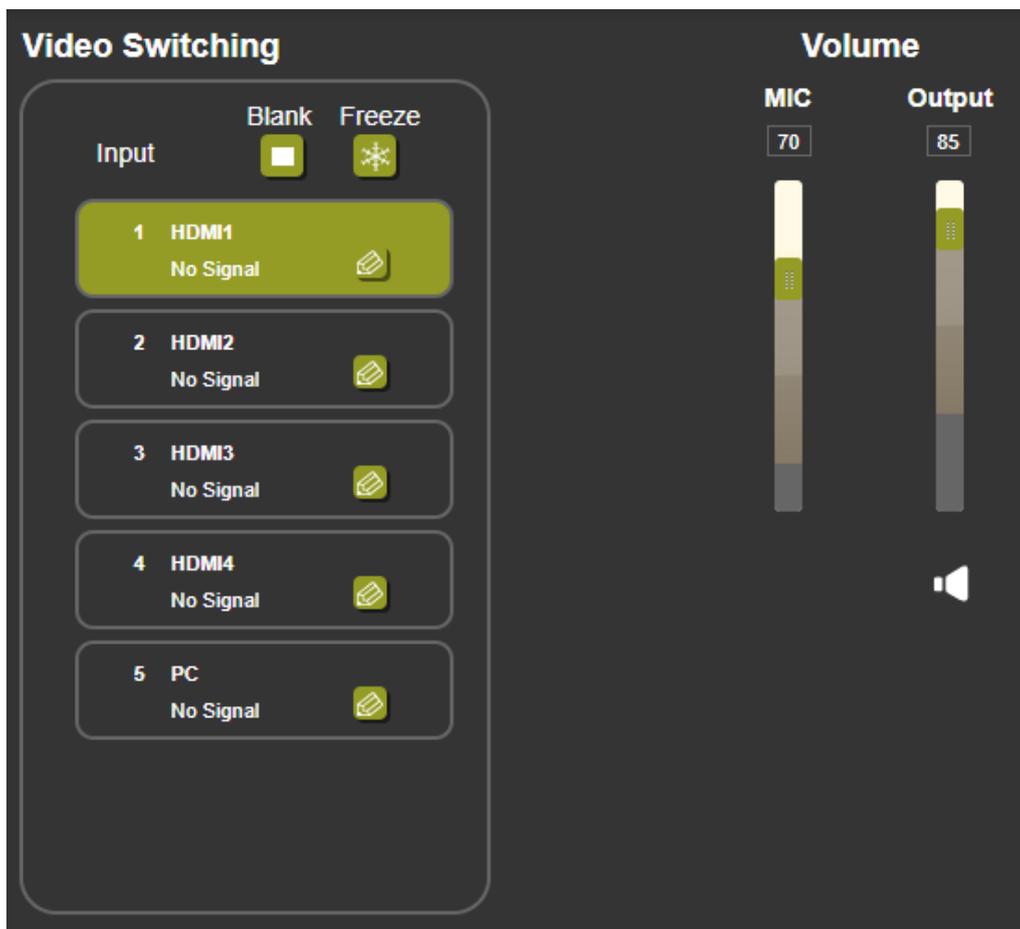


Figure 11: Switching Page

- 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.

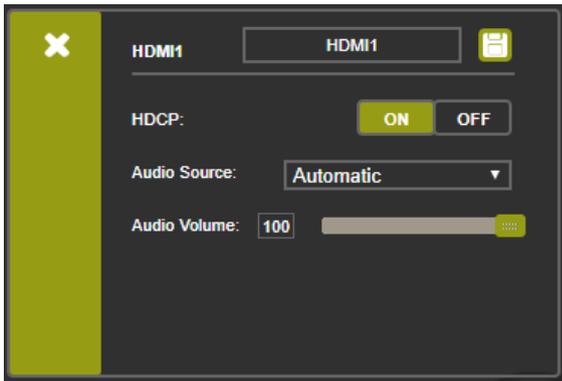


Figure 12: Setting Window for HDMI Inputs

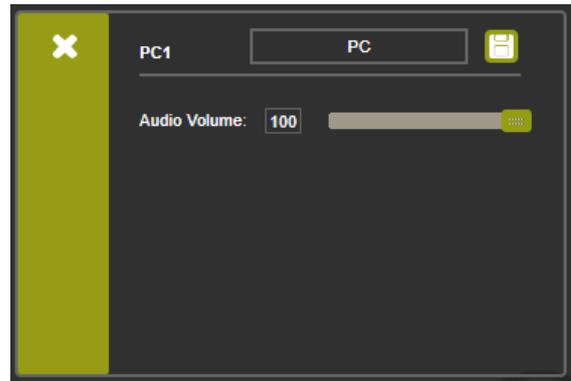


Figure 13: Setting Window for the PC Input

- If required, enter a new input name and click the save icon. The input name appears in the webpages.
- 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.

- Select an Audio Source (for HDMI inputs only):
  - Analog – The analog audio input is selected.
  - Embedded – The embedded audio in the HDMI signal is selected.
  - Automatic (default) – 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).
- Adjust the input volume using the slider or entering a value.
- Upon completion, save the changes () and click the exit icon (.

Video input settings are configured.

## Switching an Input to the Outputs

To select an input to switch to the HDBT and HDMI outputs:

- In the Navigation pane click **Switching**. The Switching page appears. ([Figure 11](#)).
- In the Video Switching area, click an input button.  
The input button turns green, the corresponding input button LED on the front panel lights.

The selected input is switched to the outputs.

---

## Freezing / Blanking Video Outputs

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

1. In the Navigation pane click **Switching**. The Switching page appears ([Figure 11](#)).
2. In the Video Switching area, click the following:
  -  – Freezes the currently displayed video frame.
  -  – Clears the video output from the display; the display goes blank.

The output is set to freeze or blank.

---

## Adjusting Microphone and Output Volume



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

To adjust the microphone and output volume:

1. In the Navigation pane click **Switching**. The Switching page appears ([Figure 11](#)).
2. Use the slider controls in the Volume area of the webpage (or enter the volume level).
3. Click  to mute the output.

The microphone and/or output volume is adjusted.

## Viewing Device Settings

You can view the **VP-440X** model name, device name, SN, MAC address and current firmware version via the Device Settings page.

To view **VP-440X** settings:

1. In the Navigation pane click **Device Settings**.  
The Device Settings page appears.

The screenshot shows the 'Device Settings' page for a VP-440X device. The settings are as follows:

Model:	VP-440X
Device Name:	Kramer_440X
Serial Number:	12345678901234
MAC Address:	00-1D-56-04-CF-DA
Firmware Version:	V1.09
Firmware Update:	Choose File VP_440X_...V110.bin Upgrade
<input type="checkbox"/> DHCP On	
DHCP IP Address:	0 . 0 . 0 . 0
Static IP Address:	192 . 168 . 1 . 39
GateWay:	192 . 168 . 0 . 1
Subnet:	255 . 255 . 0 . 0
UDP Port:	50000
TCP Port:	5000
Set Changes	
Soft Factory Reset	

Figure 14: Device Settings Page

2. View the model name, device name, SN, MAC address and current firmware version.

## Upgrading Firmware

Upgrade **VP-440X** easily via the webpages or via the PROG USB port <sup>(10)</sup> (see [Upgrading Firmware](#) on page 47).

To upgrade the **VP-440X** firmware:

1. In the Navigation pane click **Device Settings**.  
The Device Settings page appears (see [Figure 14](#)).
2. Next to Firmware Update, click **Choose File**.  
A file browser appears.

- 3. Open the required upgrade file.  
The file name appears on the webpage.
- 4. Click **Upgrade**. The following message appears.

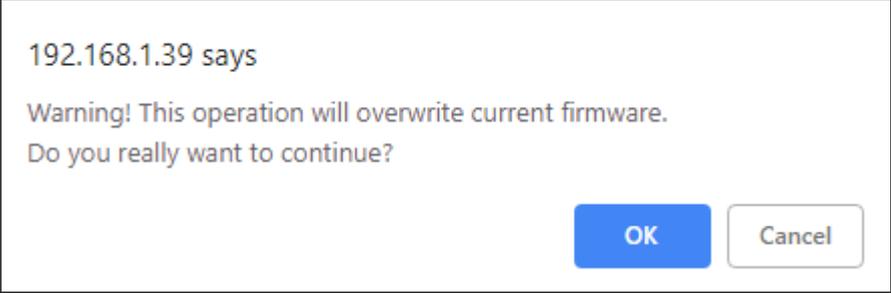


Figure 15: Device Settings Page – Firmware Upgrade Message

- 5. Click **OK**. The new firmware is uploaded:
- 6. Once the file is uploaded follow the instructions on the webpage.

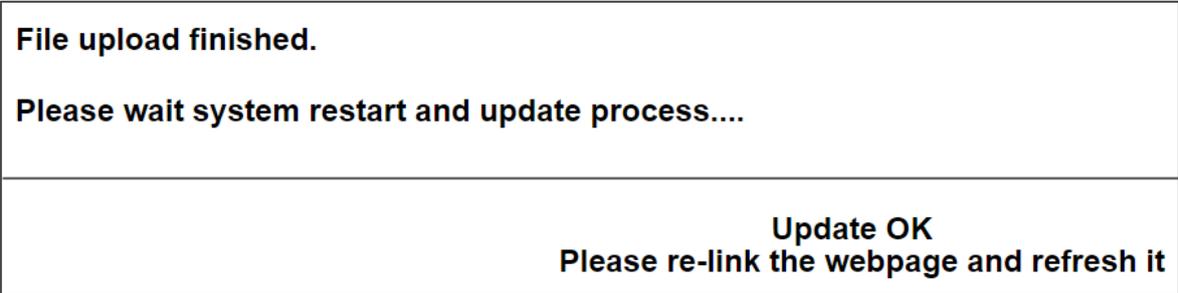


Figure 16: Device Settings Page – New Firmware Update Complete

- 7. Make sure that the new version appears on the lower left side of the webpage.

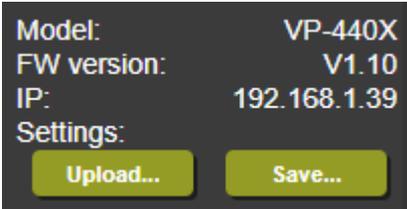


Figure 17: Current Firmware Information Display

The new firmware is uploaded to the device.

## Configuring Network Settings

VP-440X enables configuring network settings setting, including DHCP and static IP addresses.

To configure network settings:

1. In the Navigation pane click **Device Settings**. The Device Settings page appears (see [Figure 14](#)).

**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 18: 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.

3. Click **OK** to confirm the change.

The current webpage session is disconnected. To access the webpages, 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.

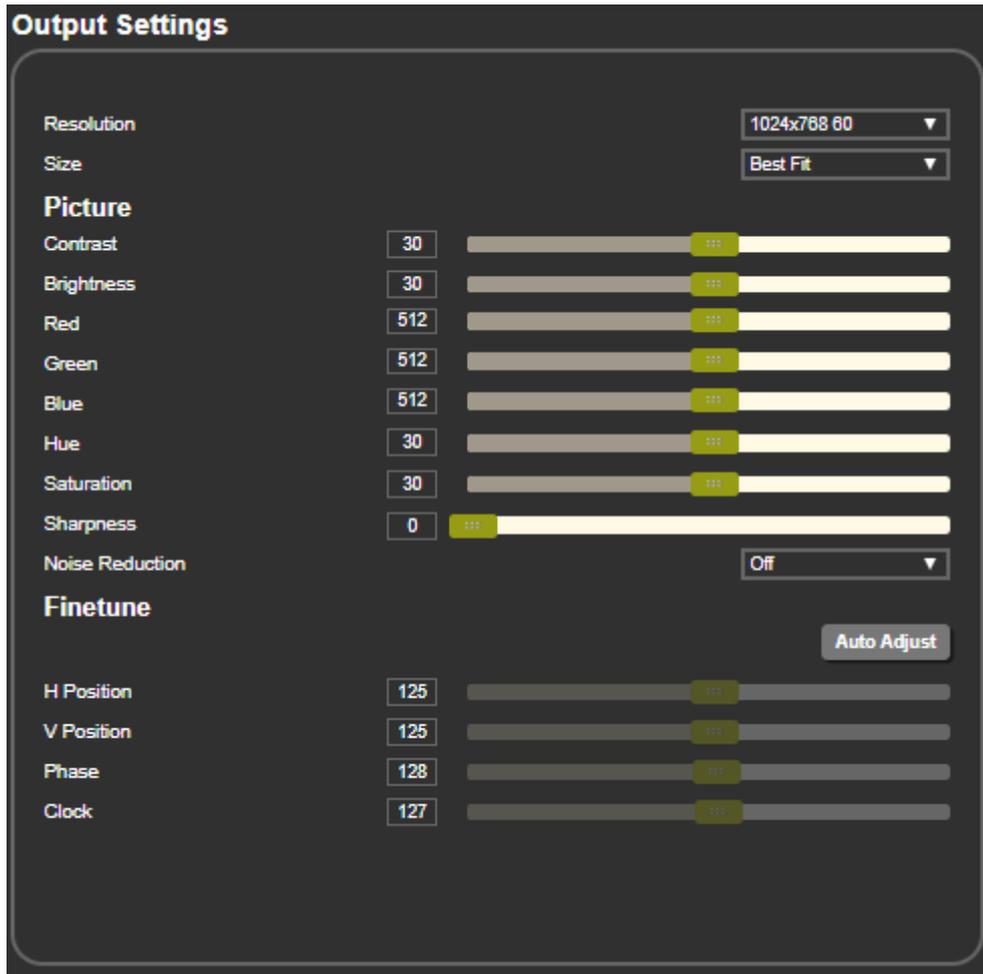
Network settings are defined.

## Configuring Video Output Settings

VP-440X enables you to configure settings for the video that is passed through the HDBT and HDMI outputs via the Output Settings webpage.

To configure video output settings:

1. Click **Output Settings** on the Navigation List.  
The Output Settings page appears.
  - For HDMI inputs:



The screenshot shows the 'Output Settings' interface. At the top, 'Resolution' is set to '1024x768 60' and 'Size' is set to 'Best Fit'. Below this is the 'Picture' section with sliders for Contrast (30), Brightness (30), Red (512), Green (512), Blue (512), Hue (30), and Saturation (30). The Sharpness slider is set to 0. The Noise Reduction dropdown is set to 'Off'. The 'Finetune' section includes an 'Auto Adjust' button and sliders for H Position (125), V Position (125), Phase (128), and Clock (127).

Figure 19: The Output Settings Page – HDMI IN is the Input

- For the PC input:

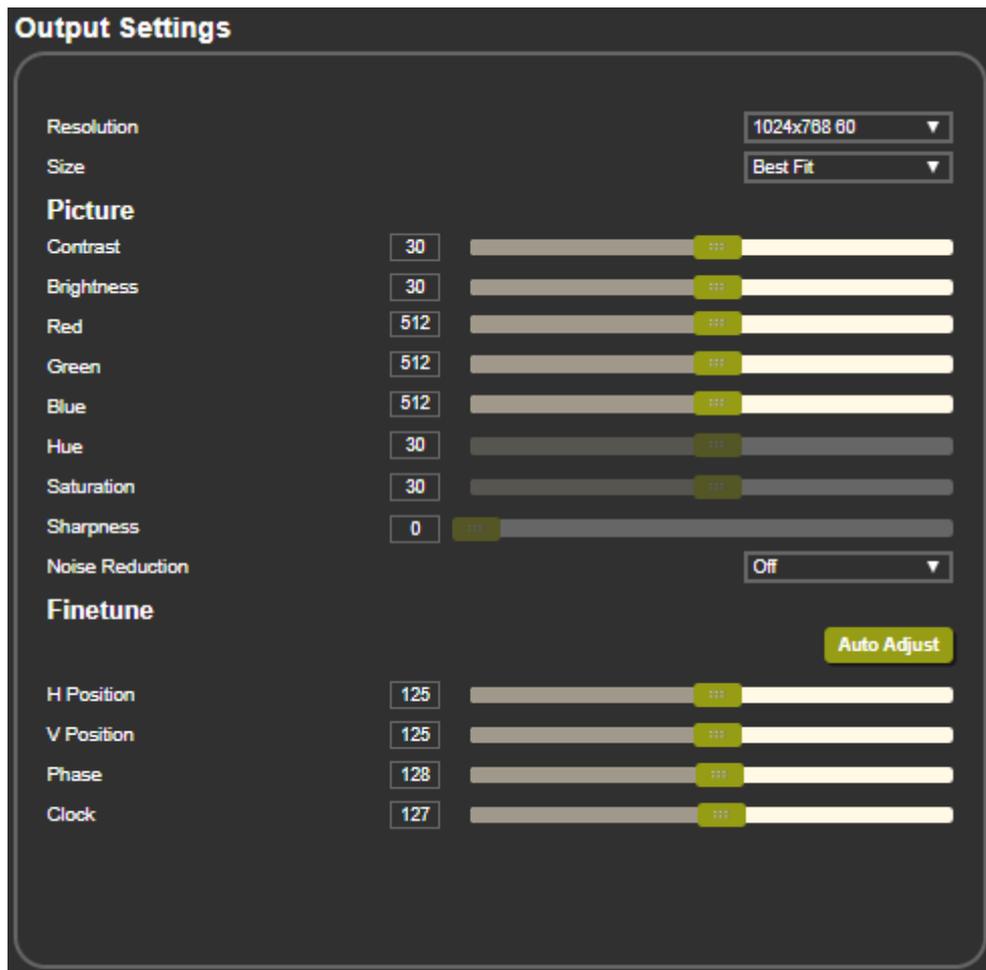


Figure 20: The Output Settings Page – PC IN is the Input

2. In the Resolution drop-down box, select the required output resolution or:
  - **Native HDBT** – Set the output resolution to match the native resolution of the device connected to HDBT OUT.
  - **Native HDMI** – Set the output resolution to match the native resolution of the device connected to HDMI OUT.
3. In the Size drop-down box and select the video size on the display:
  - Over Scan
  - Best Fit (default)
  - Full
  - Pan Scan
  - Letter Box
  - Under 2
  - Under 1
  - Follow In

4. In the Picture area, use the available slider controls (for HDMI inputs or PC input) to adjust the display picture quality.
5. In 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:
  - **H-Position** – Set the horizontal position of the video on the display screen.
  - **V-Position** – Set the vertical position of the video on the display screen.
  - **Phase** – Set the phase of the input sampling clock.
  - **Clock** – Set the input sampling rate.

Output settings are defined.

---

## Configuring HDCP per Input/Output

VP-440X enables you to configure HDCP individually for each input/output via the HDCP webpage.

To configure HDCP:

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

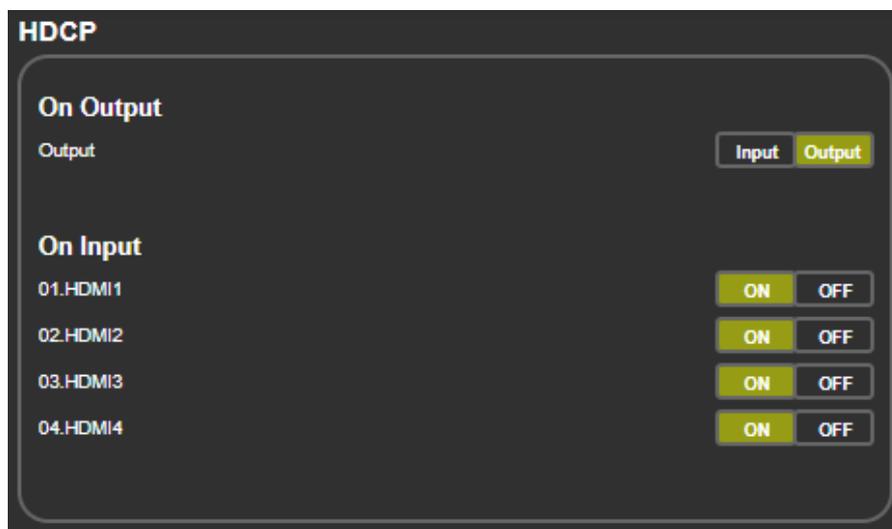


Figure 21: The HDCP Page

2. In the On Output area, click one of the following for 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 supporting HDCP encryption for that input.

HDCP is configured.

## Managing EDID

VP-440X enables you to individually configure and manage EDID settings for each of the 5 inputs via the EDID webpage.

### To manage EDID:

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

**EDID**

Read from:

Outputs:

HDMI Out

HDBT Out

Default:

1080p

4k2k3G

4k2k420

4k2k6G

Default-VGA

Browse...

Copy to:

Inputs

HDMI 1

HDMI 2

HDMI 3

HDMI 4

PC1

Copy

NONE

to

NONE

Figure 22: 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, check 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 23: The EDID Page –The Copy EDID Results

5. Click **Close**.

EDID is copied.

## Adjusting Audio Input Settings

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

To adjust audio input settings:

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



Figure 24: The Audio Settings Page

2. In the Delay drop-down box, set the audio delay time in milliseconds.
3. In the Input area:
  - Use the slider controls or enter a number from 0 to 100 in the field to adjust the HDMI and PC volume per input.
  - For each HDMI input, 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.

Audio settings are defined.

---

## Adjusting Microphone Settings

VP-440X enables you to define settings for a microphone connected to the MIC jack (2) such as talkover/mixer mode, Depth and Trigger, via the audio webpage.

To adjust microphone settings:

1. Click **Audio** on the Navigation List.  
The Audio page appears (see [Figure 24](#)).
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 (see [Figure 4](#)).

- Mic only – microphone audio overrides the main output audio.
- Off – microphone is disabled (default).

Microphone settings are adjusted.

---

## Defining Additional Audio Settings

Set DRC, loudness and DSP (see [Setting Audio Parameters](#) on page [13](#) for further details).

To define additional settings:

1. Click **Audio** on the Navigation List.  
The Audio page appears (see [Figure 24](#)).
2. in the Settings area, open the specific drop-down box to define the following:
  - DRC On or Off.
  - Loudness On or Off.
  - Embedded In -> Out to DSP or ByPass.

Audio settings are defined.

---

## Setting Equalizer

To adjust equalizer

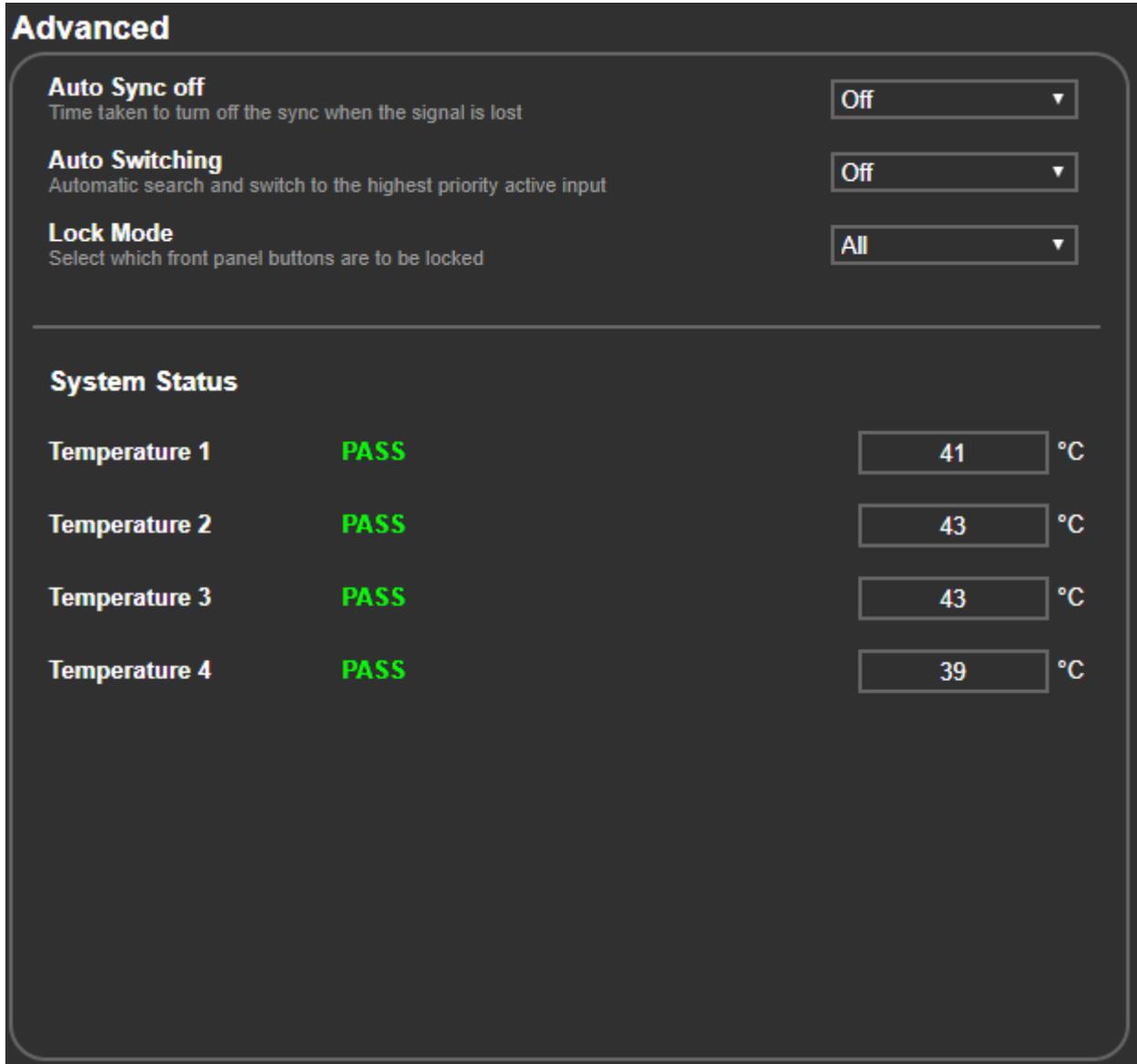
1. Click **Audio** on the Navigation List.  
The Audio page appears (see [Figure 24](#)).
2. In the Equalizer area, use the slider to select equalizer frequencies.

EQ is adjusted.

## Setting Auto Sync Off

See [Setting Sleep Mode](#) on page [16](#) for Auto Sync off option details.

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



**Advanced**

**Auto Sync off**  
Time taken to turn off the sync when the signal is lost

Off

**Auto Switching**  
Automatic search and switch to the highest priority active input

Off

**Lock Mode**  
Select which front panel buttons are to be locked

All

---

**System Status**

Temperature 1	PASS	41	°C
Temperature 2	PASS	43	°C
Temperature 3	PASS	43	°C
Temperature 4	PASS	39	°C

Figure 25: The Advanced Page

2. Set Auto Sync off to Off, Fast, Slow or Immediate.  
Auto Sync Off is set.

---

## Configuring Automatic Switching Settings

See [Setting Switching Mode](#) on page [17](#) for auto switching option details.

To configure automatic switching settings:

1. Click **Advanced** on the Navigation List (see [Figure 25](#)).  
The Advanced page appears.
2. Open the Auto Switching drop-down box and select:
  - Off – Disable auto switching.
  - Scan From HDMI – Set auto-scanning and select the HDMI 1 input from which to begin the scanning.
  - Scan From PC – Set auto-scanning and select PC input from which 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.

Automatic switching is defined.

---

## Defining Lock Mode

Define which buttons are disabled when you click the PANEL LOCK button  on the front panel. When selecting Save modes, the front panel remains locked after power up of the device (see [Locking Front Panel Buttons](#) on page [18](#)).

To define the Panel Lock button:

1. Click **Advanced** on the Navigation List (see [Figure 25](#)).  
The Advanced page appears.
2. Open the Lock Mode drop-down box and select:
  - All
  - Menu Only
  - All & Save
  - Menu Only & Save

Lock mode is defined.

## Controlling via the RS-232 Terminal Block Connectors

Use the RS-232 DATA port (11) for control between **VP-440X** and the HDBT receiver. To communicate with the RS-232 port on the HDBT receiver:

- Connect to the Rx and Tx pins on the DATA RS-232 port on **VP-440X**. Doing this establishes a hardware link to the receiver's Tx and Rx signals.

Use the RS-232 CONTROL port (12) to perform the following actions:

- [User Control of VP-440X via RS-232](#) on page 41.
- [VP-440X Control of a Device via RS-232](#) on page 42.

### User Control of VP-440X via RS-232

To control VP-440X via RS-232:

1. Connect your controlling device (e.g., PC) to the CONTROL RS-232 port (see [Connecting to VP-440X via RS-232](#) on page 9).
2. Click **RS-232** on the Navigation List. The RS-232 page appears.
3. Set "Use RS-232 Port for control of" drop-down box to **Scaler**.

**RS-232**

Use RS-232 Port for control of Scaler

**RS-232 control of External Device**

**RS-232 Configuration**

Baud Rate : 9600

Data Bits : 8

Parity : None

Stop Bits : 1

**External Device commands configuration**

Command	Description	Trigger	Delay(sec)	Hex	Enable
		5V On	30	<input type="checkbox"/>	<input type="checkbox"/>

Add

Figure 26: RS-232 Page – Controlling the VP-440X

CONTROL RS-232 port is used to control the **VP-440X**.

## VP-440X Control of a Device via RS-232

To set up VP-440X to control an external device via RS-232:

1. Connect the CONTROL RS-232 port on the **VP-440X** to the RS-232 port of an external device (for example, a display connected to HDMI OUT).
2. Click **RS-232** on the Navigation List. The RS-232 page appears.
3. Set “Use RS-232 Port for control of” drop-down box to **External Control**.

**RS-232**

Use RS-232 Port for control of External Device

**RS-232 control of External Device**

**RS-232 Configuration**

Baud Rate : 9600

Data Bits : 8

Parity : None

Stop Bits : 1

**External Device commands configuration**

Command	Description	Trigger	Delay(sec)	Hex	Enable
		<span>5V On</span>	<span>30</span>	<input type="checkbox"/>	<input type="checkbox"/>

Add

Figure 27: RS-232 Page – Controlling an External Device

4. Set RS-232 Configuration parameters to enable communication with the display connected to the acceptor:
5. Configure the external device commands as follows:
  - Enter a device command (for example, turn POWER OFF).
  - Enter the command description (for example, Turn Display Off).
  - Select a trigger from the drop-down box to carry out the command (**5V On**, **5V Off**, **Sync/Clock**, **No Sync/No Clock**).
  - Enter a delay time, if required.
  - Check Hex for command Hex format, if required.

- Check **Enable** to enable the command.

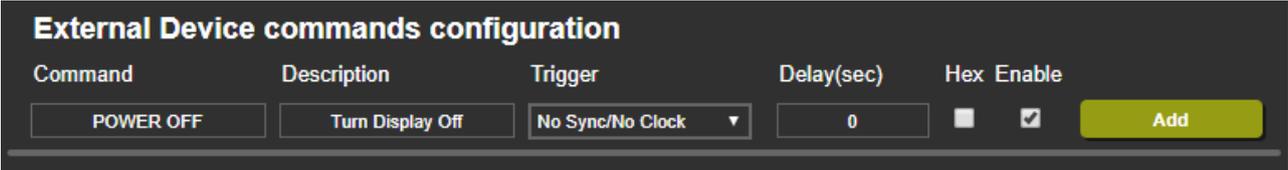


Figure 28: RS-232 Page – Creating a Command

6. Click **Add**.

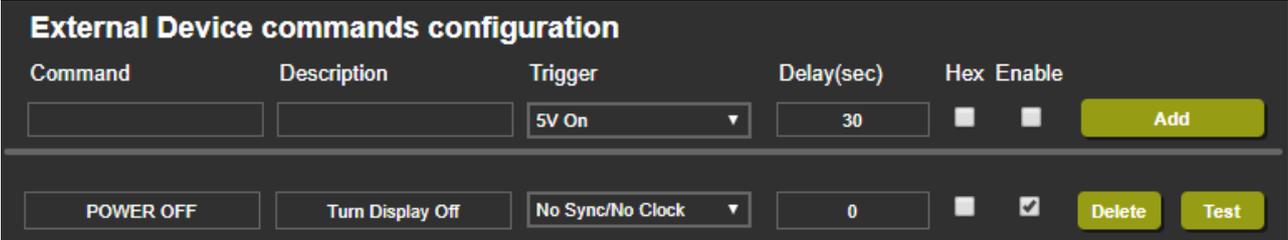


Figure 29: RS-232 Page – Command Added

7. You can:

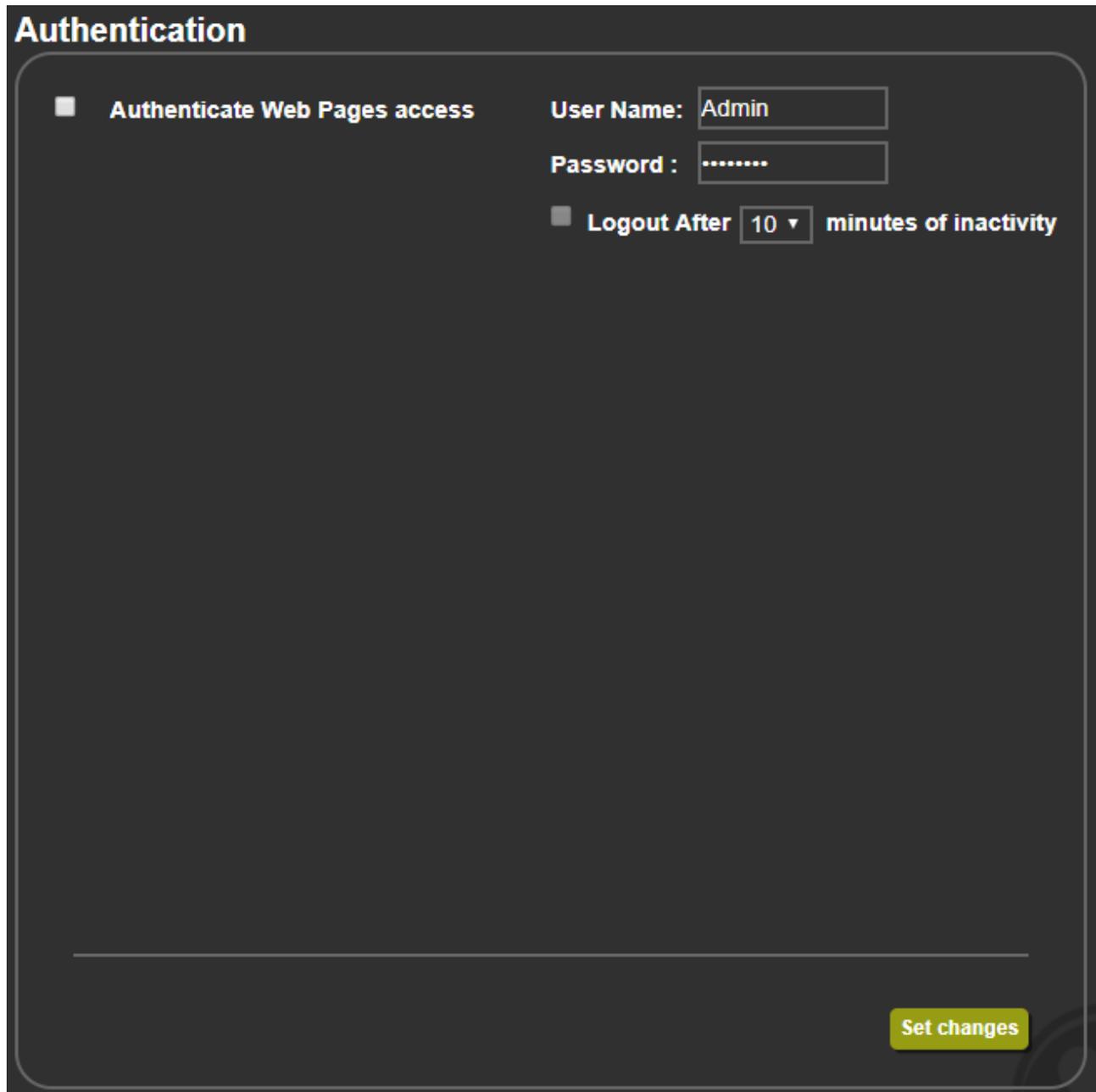
- Click **Delete** to delete the command.
- Click **Test** to test the command.
- Change any of the command configurations.
- Enable or disable the command.

Control the display via the RS-232 port.

 For RS-232 control of an external device on the receiver side (for example, the display at the HDBT receiver), set up as above, connect the CONTROL RS-232 port to the DATA RS-232 port and connect Rx and Tx on the receiver to the display.

## Password Protecting Webpage Access

By default, accessing the webpages does not require a password.



The screenshot shows a dark-themed configuration window titled "Authentication". On the left, there is a checkbox labeled "Authenticate Web Pages access" which is checked. To the right of this checkbox are three input fields: "User Name:" with the text "Admin", "Password:" with a masked password of seven dots, and "Logout After" with a dropdown menu showing "10" and the text "minutes of inactivity". At the bottom right of the window is a green button labeled "Set changes".

Figure 30: Authentication Page

### To secure the webpages with a username 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 webpages to lock.
3. Enter a **User Name** (Admin, by default).
4. Enter a **password** (Admin, by default).

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



Figure 31: White Key Indicating Webpages Are Password Protected.

The webpages lock according to your settings.

## Accessing Webpages with a Password

When the webpages are locked, you will be prompted for your username and password.

To access secured webpages:

1. Click **Authentication** on the left side of the webpage ([Figure 30](#)).
2. Enter the correct username and password.
3. Click the right arrow.

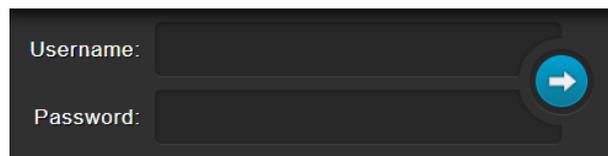


Figure 32: Prompt to Unlock Webpages

Webpage is accessed via password.

## Removing Password Protection from Webpages

1. Click **Authentication** on the Navigation List.  
The Authentication page appears ([Figure 30](#)).
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.

Authentication is removed.

## Viewing Device Information

In the Navigation page, open the About page to view the webpage version and Kramer Electronics details.



Figure 33: About Page

# Upgrading Firmware

Upgrade the firmware via any of the following options:

- [Updating the Firmware](#) on page [19](#).
- [Upgrading Firmware](#) on page [29](#).

# Technical Specifications

Inputs	4 HDMI	On female HDMI connectors
	1 VGA	On a 15-pin HD connector
	5 Stereo Analog Unbalanced Audio	On 3.5mm mini jacks
	1 Microphone	On a 6.3mm jack
Outputs	1 HDMI	On a female HDMI connector
	1 HDBaseT	On an RJ-45 connector
	1 Stereo Analog Unbalanced Audio	On a 3.5mm mini jack
Ports	1 Ethernet	On an RJ-45 female connector
	1 DATA RS-232	On a 3-pin terminal block for serial link extension
	1 CTRL RS-232	On a 3-pin terminal block for device control
	6 Contact Closure Switches	On a 7-pin terminal block connector
	1 USB	On a female USB-A connector for firmware upgrade
Video	Max. Resolution	4K@60Hz (4:4:4)
	Max Data Rate	18Gbps (6Gbps per graphic channel)
	Standards Compliance	HDCP 1.4 & 2.2. Supports HDR10
	Max. Switching Time Between Inputs	3 seconds
	Video Latency	1–2 frames
Analog Audio	Maximum Line level	1.2Vrms
	Maximum Mic level	20mVrms
	Line Input Impedance	20kΩ
	Line Output Impedance	500Ω
	Frequency Response	20Hz - 20kHz @ -1dB
	Audio THD + Noise:	0.01%, 20Hz - 20kHz, at unity gain
	Crosstalk	-85 dB, 20Hz to 20kHz
	THD + NOISE	0.03% @1kHz at nominal level
Extended Ethernet	Max Transmission Bandwidth	100Mbps
Extended RS-232	Baud Rate	300 to 115200 baud
Control RS-232	Baud Rate	115200
Extension Line	Compliance	HDBaseT 1.0
	When using Kramer HDBaseT cables:	
	Up to 40m (130ft)	At 4K@60Hz (4:2:0)
	Up to 70m (230ft)	At full HD (1080p @60Hz 24bpp)
Controls	Rear Panel	Input-select remote contact closures
	Front Panel	Input-select buttons, menu buttons, reset resolution button, panel lock button, mic mode select switch
Power	Consumption	5V DC, 3700mA
	Source	5V DC, 4A
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
Regulatory Compliance	Safety	CE, UL, FCC
	Environmental	RoHs, WEEE

Enclosure	Size	Half 19" 1U
	Type	Aluminum
	Cooling	Convection Ventilation
General	Net Dimensions (W, D, H)	21.5cm x 16.3cm x 4.4cm (8.5" x 6.4" x 1.7")
	Shipping Dimensions (W, D, H)	35.1cm x 21.2cm x 7.2cm (13.8" x 8.4" x 2.8")
	Net Weight	1kg (2.2lbs)
	Shipping Weight	1.6kg (3.5lbs) approx.
Accessories	Included	Power adapter cord
	Optional	For optimum range and performance use the recommended USB, Ethernet, serial and IR Kramer cables available at <a href="http://www.kramerav.com/product/VP-440X">www.kramerav.com/product/VP-440X</a>
Specifications are subject to change without notice at <a href="http://www.kramerav.com">www.kramerav.com</a>		

## Default Communication Parameters

RS-232	
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Example (route HDMI 2 to the output):	#ROUTE_1,1,2<CR>
Ethernet	
To reset the IP settings to the factory reset values go to: Menu->Setup -> Factory Reset-> press Enter to confirm	
IP Address:	192.168.1.39
Subnet mask:	255.255.0.0
Default gateway:	192.168.0.1
TCP Port #:	5000
UDP Port #:	50000
Maximum TCP Ports:	4
Authentication	
User/Password	Admin/Admin
Full Factory Reset	
OSD	Go to: Menu-> Setup -> Factory Reset -> press Enter to confirm
Front panel buttons	Press the Reset to XGA/720p Button while plugging the power to reset the machine

## Input Resolution Support

Resolution/Refresh Rate	HDMI	PC
480I/576I	Yes	No
480P/576P	Yes	No
720P@(60/50)	Yes	No
1080I@(60/50)	Yes	No
1080P@(60/50)	Yes	No
1080P@(24/25/30)	Yes	No
640x480@(60/67/72/75/85)	Yes	Yes
800x600@(56/60/72/75)	Yes	Yes
1024x768@(60/70/75)	Yes	Yes
1280x1024@(60/75)	Yes	Yes
1280X960@60	Yes	Yes
1280X720@60	Yes	Yes
1920X1080@60	Yes	Yes
1600X1200@60	Yes	Yes
1280x768@60	Yes	Yes
1280x800@60	Yes	Yes
1360x768@60	Yes	Yes
1366x768@60	Yes	Yes
1400x1050@60	Yes	Yes
1600X900@60 RB	Yes	Yes
1680x1050@60	Yes	Yes
1920x1200@60 RB	Yes	Yes
2560x1400@60 RB	Yes	No

Resolution/Refresh Rate	HDMI	PC
2560X1600@60 RB	Yes	No
2048x1080@(24/25/30/50/60)	Yes	No
4K2K@(24/25/30/50/60)	Yes	No
4K2K(4:2:0)@(50/60)		No

## Output Resolution Support

Resolution/Refresh Rate	HDMI	HDBT
640x480@60	Yes	Yes
800x600@60	Yes	Yes
1024x768@60	Yes	Yes
1280x768@60	Yes	Yes
1280x800@60	Yes	Yes
1280x1024@60	Yes	Yes
1360x768@60	Yes	Yes
1400x1050@60	Yes	Yes
1440x900@60	Yes	Yes
1600x1200@60	Yes	Yes
1680x1050@60	Yes	Yes
1920x1200 RB@60	Yes	Yes
2560X1600 RB@60	Yes	Yes
1920x1080@60	Yes	Yes
1280x720@60	Yes	Yes
2560X1440 RB@60	Yes	Yes
720x480P@60	Yes	Yes
720x576P@50	Yes	Yes
1280x720P@50/60	Yes	Yes
1920x1080P@(24/25/30/50/60)	Yes	Yes
4K2K@(24/25/30)	Yes	Yes
4K2K@(50/60)	Yes	No
4K2K(4:2:0)@(50/60)	No	Yes

## Default EDID

This section describes the following default EDIDs:

- [Default EDID 1080P](#) on page [51](#).
- [Default EDID 4K\(3G\)](#) on page [53](#).
- [Default EDID 4K\(4:2:0\)](#) on page [55](#).
- [Default EDID 6G](#) on page [56](#).

### Default EDID 1080P

Monitor  
 Model name..... VP-440X  
 Manufacturer..... KMR  
 Plug and Play ID..... KMR031D  
 Serial number..... 49  
 Manufacture date..... 2016, ISO week 19  
 .....

EDID revision..... 1.3  
 Input signal type..... Digital

Color bit depth..... Undefined  
 Display type..... RGB color  
 Screen size..... 360 x 290 mm (18.2 in)  
 Power management..... Standby, Suspend, Active off/sleep  
 Extension blocs..... 1 (CEA-EXT)  
 -----  
 DDC/CI..... n/a

## Color characteristics

Default color space..... Non-sRGB  
 Display gamma..... 2.40  
 Red chromaticity..... Rx 0.611 - Ry 0.329  
 Green chromaticity..... Gx 0.312 - Gy 0.559  
 Blue chromaticity..... Bx 0.148 - By 0.131  
 White point (default).... Wx 0.320 - Wy 0.336  
 Additional descriptors... None

## Timing characteristics

Horizontal scan range.... 27-91kHz  
 Vertical scan range..... 23-85Hz  
 Video bandwidth..... 170MHz  
 CVT standard..... Not supported  
 GTF standard..... Not supported  
 Additional descriptors... None  
 Preferred timing..... Yes  
 Native/preferred timing.. 1920x1080p at 60Hz (16:9)  
 Modeline..... "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync  
 Detailed timing #1..... 1280x800p at 60Hz (16:10)  
 Modeline..... "1280x800" 83.500 1280 1352 1480 1680 800 803 809 831 -hsync +vsync

## Standard timings supported

640 x 480p at 60Hz - IBM VGA  
 640 x 480p at 72Hz - VESA  
 640 x 480p at 75Hz - VESA  
 800 x 600p at 56Hz - VESA  
 800 x 600p at 60Hz - VESA  
 800 x 600p at 72Hz - VESA  
 800 x 600p at 75Hz - VESA  
 1024 x 768p at 60Hz - VESA  
 1024 x 768p at 70Hz - VESA  
 1024 x 768p at 75Hz - VESA  
 1280 x 1024p at 75Hz - VESA  
 1600 x 1200p at 60Hz - VESA STD  
 1280 x 1024p at 60Hz - VESA STD  
 1400 x 1050p at 60Hz - VESA STD  
 1920 x 1080p at 60Hz - VESA STD  
 640 x 480p at 85Hz - VESA STD  
 800 x 600p at 85Hz - VESA STD  
 1024 x 768p at 85Hz - VESA STD  
 1280 x 1024p at 85Hz - VESA STD

## EIA/CEA-861 Information

Revision number..... 3  
 DTV underscan..... Supported  
 Basic audio..... Supported  
 YCbCr 4:4:4..... Supported  
 YCbCr 4:2:2..... Supported  
 Native formats..... 3  
 Detailed timing #1..... 1440x900p at 60Hz (16:10)  
 Modeline..... "1440x900" 106.500 1440 1520 1672 1904 900 903 909 934 -hsync +vsync  
 Detailed timing #2..... 1366x768p at 60Hz (16:9)  
 Modeline..... "1366x768" 85.500 1366 1436 1579 1792 768 771 774 798 +hsync +vsync  
 Detailed timing #3..... 1920x1200p at 60Hz (16:10)  
 Modeline..... "1920x1200" 154.000 1920 1968 2000 2080 1200 1203 1209 1235 +hsync -vsync  
 Detailed timing #4..... 1600x900p at 60Hz (16:9)  
 Modeline..... "1600x900" 108.000 1600 1624 1704 1800 900 901 904 1000 +hsync +vsync  
 Detailed timing #5..... 1680x1050p at 60Hz (16:10)  
 Modeline..... "1680x1050" 146.250 1680 1784 1960 2240 1050 1053 1059 1089 -hsync +vsync

## CE video data (timings supported)

1920 x 1080p at 60Hz - HDTV (16:9, 1:1) [Native]  
 1920 x 1080p at 50Hz - HDTV (16:9, 1:1)  
 1280 x 720p at 60Hz - HDTV (16:9, 1:1)  
 1280 x 720p at 50Hz - HDTV (16:9, 1:1)  
 1920 x 1080i at 60Hz - HDTV (16:9, 1:1)  
 1920 x 1080i at 50Hz - HDTV (16:9, 1:1)  
 720 x 480p at 60Hz - EDTV (4:3, 8:9)  
 720 x 576p at 50Hz - EDTV (4:3, 16:15)  
 720 x 480i at 60Hz - Doublescan (4:3, 8:9)  
 720 x 576i at 50Hz - Doublescan (4:3, 16:15)  
 1920 x 1080p at 30Hz - HDTV (16:9, 1:1)  
 1920 x 1080p at 25Hz - HDTV (16:9, 1:1)

1920 x 1080p at 24Hz - HDTV (16:9, 1:1)  
 NB: NTSC refresh rate = (Hz\*1000)/1001

## CE audio data (formats supported)

LPCM 2-channel, 16/20/24 bit depths at 32/44/48 kHz

## CE speaker allocation data

Channel configuration..... 2.0  
 Front left/right..... Yes  
 Front LFE..... No  
 Front center..... No  
 Rear left/right..... No  
 Rear center..... No  
 Front left/right center.. No  
 Rear left/right center... No  
 Rear LFE..... No

## CE vendor specific data (VSDB)

IEEE registration number. 0x000C03  
 CEC physical address..... 0.1.0.0  
 Maximum TMDS clock..... 165MHz

## Report information

Date generated..... 23/07/2019  
 Software revision..... 2.41.0.818  
 Operating system..... 6.2.9200.2

## Raw data

00,FF,FF,FF,FF,FF,FF,00,2D,B2,1D,03,31,00,00,00,13,1A,01,03,80,24,1D,8C,EA,9C,20,9C,54,4F,8F,26,  
 21,52,56,2F,CF,00,A9,40,81,80,90,40,D1,C0,31,59,45,59,61,59,81,99,02,3A,80,18,71,38,2D,40,58,2C,  
 45,00,10,09,00,00,00,1E,9E,20,00,90,51,20,1F,30,48,80,36,00,10,0A,00,00,00,1C,00,00,00,FC,00,56,  
 50,2D,34,34,30,58,0A,20,20,20,20,00,00,00,FD,00,17,55,1B,5B,11,00,0A,20,20,20,20,20,01,60,  
 02,03,20,F3,4D,90,1F,04,13,05,14,02,11,06,15,22,21,20,23,09,07,07,83,01,00,00,65,03,0C,00,10,00,  
 9A,29,A0,D0,51,84,22,30,50,98,36,00,10,0A,00,00,00,1C,66,21,56,AA,51,00,1E,30,46,8F,33,00,10,09,  
 00,00,00,1E,28,3C,80,A0,70,B0,23,40,30,20,36,00,10,0A,00,00,00,1A,30,2A,40,C8,60,84,64,30,18,50,  
 13,00,10,09,00,00,00,1E,21,39,90,30,62,1A,27,40,68,B0,36,00,10,0A,00,00,00,1C,00,00,00,00,00,08

## Default EDID 4K(3G)

## Monitor

Model name..... VP-440X  
 Manufacturer..... KMR  
 Plug and Play ID..... KMR040D  
 Serial number..... 49  
 Manufacture date..... 2018, ISO week 6  
 -----

EDID revision..... 1.3  
 Input signal type..... Digital  
 Color bit depth..... Undefined  
 Display type..... RGB color  
 Screen size..... 360 x 360 mm (20.0 in)  
 Power management..... Standby, Suspend  
 Extension blocs..... 1 (CEA-EXT)  
 -----

DDC/CI..... n/a

## Color characteristics

Default color space..... Non-sRGB  
 Display gamma..... 2.40  
 Red chromaticity..... Rx 0.611 - Ry 0.329  
 Green chromaticity..... Gx 0.313 - Gy 0.559  
 Blue chromaticity..... Bx 0.148 - By 0.131  
 White point (default).... Wx 0.320 - Wy 0.336  
 Additional descriptors... None

## Timing characteristics

Horizontal scan range.... 15-136kHz  
 Vertical scan range..... 23-61Hz  
 Video bandwidth..... 300MHz  
 CVT standard..... Not supported  
 GTF standard..... Not supported  
 Additional descriptors... None  
 Preferred timing..... Yes  
 Native/preferred timing.. 3840x2160p at 30Hz (16:9)  
 Modeline..... "3840x2160" 297.000 3840 4016 4104 4400 2160 2168 2178 2250 +hsync +vsync  
 Detailed timing #1..... 1920x1080p at 60Hz (16:9)  
 Modeline..... "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync

## Standard timings supported

640 x 480p at 60Hz - IBM VGA  
 640 x 480p at 72Hz - VESA

640 x 480p at 75Hz - VESA  
 800 x 600p at 56Hz - VESA  
 800 x 600p at 60Hz - VESA  
 800 x 600p at 72Hz - VESA  
 800 x 600p at 75Hz - VESA  
 1024 x 768p at 60Hz - VESA  
 1024 x 768p at 70Hz - VESA  
 1024 x 768p at 75Hz - VESA  
 1280 x 1024p at 75Hz - VESA  
 1600 x 1200p at 60Hz - VESA STD  
 1280 x 1024p at 60Hz - VESA STD  
 1400 x 1050p at 60Hz - VESA STD  
 1920 x 1080p at 60Hz - VESA STD  
 640 x 480p at 85Hz - VESA STD  
 800 x 600p at 85Hz - VESA STD  
 1024 x 768p at 85Hz - VESA STD  
 1280 x 1024p at 85Hz - VESA STD

#### EIA/CEA-861 Information

Revision number..... 3  
 DTV underscan..... Supported  
 Basic audio..... Supported  
 YCbCr 4:4:4..... Supported  
 YCbCr 4:2:2..... Supported  
 Native formats..... 0  
 Detailed timing #1..... 1440x900p at 60Hz (16:10)  
 Modeline..... "1440x900" 106.500 1440 1520 1672 1904 900 903 909 934 -hsync +vsync  
 Detailed timing #2..... 1366x768p at 60Hz (16:9)  
 Modeline..... "1366x768" 85.500 1366 1436 1579 1792 768 771 774 798 +hsync +vsync  
 Detailed timing #3..... 1920x1200p at 60Hz (16:10)  
 Modeline..... "1920x1200" 154.000 1920 1968 2000 2080 1200 1203 1209 1235 +hsync -vsync

#### CE video data (timings supported)

1920 x 1080p at 60Hz - HDTV (16:9, 1:1)  
 1920 x 1080p at 50Hz - HDTV (16:9, 1:1)  
 1280 x 720p at 60Hz - HDTV (16:9, 1:1)  
 1280 x 720p at 50Hz - HDTV (16:9, 1:1)  
 1920 x 1080i at 60Hz - HDTV (16:9, 1:1)  
 1920 x 1080i at 50Hz - HDTV (16:9, 1:1)  
 720 x 480p at 60Hz - EDTV (4:3, 8:9)  
 720 x 576p at 50Hz - EDTV (4:3, 16:15)  
 720 x 480i at 60Hz - Doublescan (4:3, 8:9)  
 720 x 576i at 50Hz - Doublescan (4:3, 16:15)  
 1920 x 1080p at 30Hz - HDTV (16:9, 1:1)  
 1920 x 1080p at 25Hz - HDTV (16:9, 1:1)  
 1920 x 1080p at 24Hz - HDTV (16:9, 1:1)  
 1920 x 1080p at 24Hz - HDTV (16:9, 1:1)  
 1920 x 1080p at 24Hz - HDTV (16:9, 1:1)  
 1920 x 1080p at 24Hz - HDTV (16:9, 1:1)  
 NB: NTSC refresh rate = (Hz\*1000)/1001

#### CE audio data (formats supported)

LPCM 2-channel, 16/20/24 bit depths at 32/44/48 kHz

#### CE speaker allocation data

Channel configuration.... 2.0  
 Front left/right..... Yes  
 Front LFE..... No  
 Front center..... No  
 Rear left/right..... No  
 Rear center..... No  
 Front left/right center.. No  
 Rear left/right center... No  
 Rear LFE..... No

#### CE vendor specific data (VSDB)

IEEE registration number. 0x000C03  
 CEC physical address..... 0.1.0.0  
 Supports AI (ACP, ISRC).. No  
 Supports 48bpp..... Yes  
 Supports 36bpp..... Yes  
 Supports 30bpp..... Yes  
 Supports YCbCr 4:4:4..... Yes  
 Supports dual-link DVI.. No  
 Maximum TMDS clock..... 300MHz  
 Data payload..... 20008001020304

#### Report information

Date generated..... 23/07/2019  
 Software revision..... 2.41.0.818  
 Operating system..... 6.2.9200.2

## Raw data

```
00,FF,FF,FF,FF,FF,FF,00,2D,B2,0D,04,31,00,00,00,06,1C,01,03,80,24,24,8C,CA,90,20,9C,54,50,8F,26,
21,52,56,2F,CF,00,A9,40,81,80,90,40,D1,C0,31,59,45,59,61,59,81,99,04,74,00,30,F2,70,5A,80,B0,58,
8A,00,BA,88,21,00,00,1E,02,3A,80,18,71,38,2D,40,58,2C,45,00,BA,88,21,00,00,1E,00,00,00,FC,00,56,
50,2D,34,34,30,58,0A,20,20,20,20,00,00,00,FD,00,17,3D,0F,88,1E,00,0A,20,20,20,20,20,01,89,
02,03,2C,F0,50,10,1F,04,13,05,14,02,11,06,15,22,21,20,5D,5E,5F,23,09,07,07,83,01,00,00,6E,03,0C,
00,10,00,78,3C,20,00,80,01,02,03,04,9A,29,A0,D0,51,84,22,30,50,98,36,00,10,0A,00,00,00,1C,66,21,
56,AA,51,00,1E,30,46,8F,33,00,10,09,00,00,00,1E,28,3C,80,A0,70,B0,23,40,30,20,36,00,10,0A,00,00,
00,1A,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,08
```

## Default EDID 4K(4:2:0)

## Monitor

```
Model name..... VP-440X
Manufacturer..... KMR
Plug and Play ID..... KMR031D
Serial number..... 49
Manufacture date..... 2016, ISO week 19
-----
EDID revision..... 1.3
Input signal type..... Digital
Color bit depth..... Undefined
Display type..... Monochrome/grayscale
Screen size..... 360 x 360 mm (20.0 in)
Power management..... Standby, Suspend, Active off/sleep
Extension blocs..... 1 (CEA-EXT)
-----
DDC/CI..... n/a
```

## Color characteristics

```
Default color space..... Non-sRGB
Display gamma..... 2.40
Red chromaticity..... Rx 0.611 - Ry 0.329
Green chromaticity..... Gx 0.313 - Gy 0.559
Blue chromaticity..... Bx 0.148 - By 0.131
White point (default)... Wx 0.320 - Wy 0.336
Additional descriptors... None
```

## Timing characteristics

```
Horizontal scan range.... 15-136kHz
Vertical scan range..... 23-61Hz
Video bandwidth..... 300MHz
CVT standard..... Not supported
GTF standard..... Not supported
Additional descriptors... None
Preferred timing..... Yes
Native/preferred timing.. 3840x2160p at 30Hz (16:9)
Modeline..... "3840x2160" 297.000 3840 4016 4104 4400 2160 2168 2178 2250 +hsync +vsync
Detailed timing #1..... 1920x1080p at 60Hz (16:9)
Modeline..... "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync
```

## Standard timings supported

```
640 x 480p at 60Hz - IBM VGA
640 x 480p at 72Hz - VESA
640 x 480p at 75Hz - VESA
800 x 600p at 56Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 72Hz - VESA
800 x 600p at 75Hz - VESA
1024 x 768p at 60Hz - VESA
1024 x 768p at 70Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1600 x 1200p at 60Hz - VESA STD
1280 x 1024p at 60Hz - VESA STD
1400 x 1050p at 60Hz - VESA STD
1920 x 1080p at 60Hz - VESA STD
640 x 480p at 85Hz - VESA STD
800 x 600p at 85Hz - VESA STD
1024 x 768p at 85Hz - VESA STD
1280 x 1024p at 85Hz - VESA STD
```

## EIA/CEA-861 Information

```
Revision number..... 3
DTV underscan..... Supported
Basic audio..... Supported
YCbCr 4:4:4..... Supported
YCbCr 4:2:2..... Supported
Native formats..... 0
Detailed timing #1..... 1440x900p at 60Hz (16:10)
Modeline..... "1440x900" 106.500 1440 1520 1672 1904 900 903 909 934 -hsync +vsync
Detailed timing #2..... 1366x768p at 60Hz (16:9)
Modeline..... "1366x768" 85.500 1366 1436 1579 1792 768 771 774 798 +hsync +vsync
Detailed timing #3..... 1920x1200p at 60Hz (16:10)
Modeline..... "1920x1200" 154.000 1920 1968 2000 2080 1200 1203 1209 1235 +hsync -vsync
```

## CE video data (timings supported)

```
1920 x 1080p at 60Hz - HDTV (16:9, 1:1)
1920 x 1080p at 50Hz - HDTV (16:9, 1:1)
1280 x 720p at 60Hz - HDTV (16:9, 1:1)
1280 x 720p at 50Hz - HDTV (16:9, 1:1)
1920 x 1080i at 60Hz - HDTV (16:9, 1:1)
1920 x 1080i at 50Hz - HDTV (16:9, 1:1)
720 x 480p at 60Hz - EDTV (4:3, 8:9)
720 x 576p at 50Hz - EDTV (4:3, 16:15)
720 x 480i at 60Hz - Doublescan (4:3, 8:9)
720 x 576i at 50Hz - Doublescan (4:3, 16:15)
1920 x 1080p at 30Hz - HDTV (16:9, 1:1)
1920 x 1080p at 25Hz - HDTV (16:9, 1:1)
1920 x 1080p at 24Hz - HDTV (16:9, 1:1)
1920 x 1080p at 24Hz - HDTV (16:9, 1:1)
```

1920 x 1080p at 24Hz - HDTV (16:9, 1:1)  
 1920 x 1080p at 24Hz - HDTV (16:9, 1:1)  
 NB: NTSC refresh rate = (Hz\*1000)/1001

CE audio data (formats supported)  
 LPCM 2-channel, 16/20/24 bit depths at 32/44/48 kHz

CE speaker allocation data  
 Channel configuration.... 2.0  
 Front left/right..... Yes  
 Front LFE..... No  
 Front center..... No  
 Rear left/right..... No  
 Rear center..... No  
 Front left/right center.. No  
 Rear left/right center.. No  
 Rear LFE..... No

CE vendor specific data (VSDB)  
 IEEE registration number. 0x000C03  
 CEC physical address..... 0.1.0.0  
 Supports AI (ACP, ISRC).. No  
 Supports 48bpp..... Yes  
 Supports 36bpp..... Yes  
 Supports 30bpp..... Yes  
 Supports YCbCr 4:4:4.... Yes  
 Supports dual-link DVI... No  
 Maximum TMDS clock..... 300MHz  
 Data payload..... 20008001020304

Report information  
 Date generated..... 23/07/2019  
 Software revision..... 2.41.0.818  
 Operating system..... 6.2.9200.2

Raw data  
 00,FF,FF,FF,FF,FF,FF,00,2D,B2,1D,03,31,00,00,00,13,1A,01,03,80,24,24,8C,E2,90,20,9C,54,50,8F,26,  
 21,52,56,2F,CF,00,A9,40,81,80,90,40,D1,C0,31,59,45,59,61,59,81,99,04,74,00,30,F2,70,5A,80,B0,58,  
 8A,00,BA,88,21,00,00,1E,02,3A,80,18,71,38,2D,40,58,2C,45,00,BA,88,21,00,00,1E,00,00,00,FC,00,56,  
 50,2D,34,34,30,58,0A,20,20,20,20,00,00,00,FD,00,17,3D,0F,88,1E,00,0A,20,20,20,20,20,01,57,  
 02,03,30,F0,50,10,1F,04,13,05,14,02,11,06,15,22,21,20,5D,5E,5F,23,09,07,07,83,01,00,00,6E,03,0C,  
 00,10,00,78,3C,20,00,80,01,02,03,04,E3,0E,61,60,9A,29,A0,D0,51,84,22,30,50,98,36,00,10,0A,00,00,  
 00,1C,66,21,56,AA,51,00,1E,30,46,8F,33,00,10,09,00,00,00,1E,28,3C,80,A0,70,B0,23,40,30,20,36,00,  
 10,0A,00,00,00,1A,00,52

## Default EDID 6G

Monitor  
 Model name..... VP-440X  
 Manufacturer..... KMR  
 Plug and Play ID..... KMR060D  
 Serial number..... 49  
 Manufacture date..... 2018, ISO week 6  
 -----  
 EDID revision..... 1.3  
 Input signal type..... Digital  
 Color bit depth..... Undefined  
 Display type..... Monochrome/grayscale  
 Screen size..... 360 x 360 mm (20.0 in)  
 Power management..... Standby, Suspend  
 Extension blocs..... 1 (CEA-EXT)  
 -----  
 DDC/CI..... n/a

Color characteristics  
 Default color space..... Non-sRGB  
 Display gamma..... 2.40  
 Red chromaticity..... Rx 0.611 - Ry 0.329  
 Green chromaticity..... Gx 0.313 - Gy 0.559  
 Blue chromaticity..... Bx 0.148 - By 0.131  
 White point (default).... Wx 0.320 - Wy 0.336  
 Additional descriptors... None

Timing characteristics  
 Horizontal scan range... 15-136kHz  
 Vertical scan range..... 23-61Hz  
 Video bandwidth..... 600MHz  
 CVT standard..... Not supported  
 GTF standard..... Not supported  
 Additional descriptors... None  
 Preferred timing..... Yes  
 Native/preferred timing.. 3840x2160p at 60Hz (16:9)  
 Modeline..... "3840x2160" 594.000 3840 4016 4104 4400 2160 2168 2178 2250 +hsync +vsync  
 Detailed timing #1..... 1920x1080p at 60Hz (16:9)  
 Modeline..... "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync

Standard timings supported  
 640 x 480p at 60Hz - IBM VGA  
 640 x 480p at 72Hz - VESA  
 640 x 480p at 75Hz - VESA  
 800 x 600p at 56Hz - VESA  
 800 x 600p at 60Hz - VESA  
 800 x 600p at 72Hz - VESA  
 800 x 600p at 75Hz - VESA  
 1024 x 768p at 60Hz - VESA  
 1024 x 768p at 70Hz - VESA  
 1024 x 768p at 75Hz - VESA  
 1280 x 1024p at 75Hz - VESA  
 1600 x 1200p at 60Hz - VESA STD  
 1280 x 1024p at 60Hz - VESA STD  
 1400 x 1050p at 60Hz - VESA STD  
 1920 x 1080p at 60Hz - VESA STD  
 640 x 480p at 85Hz - VESA STD  
 800 x 600p at 85Hz - VESA STD

1024 x 768p at 85Hz - VESA STD  
1280 x 1024p at 85Hz - VESA STD

## EIA/CEA-861 Information

Revision number..... 3  
DTV underscan..... Supported  
Basic audio..... Supported  
YCbCr 4:4:4..... Supported  
YCbCr 4:2:2..... Supported  
Native formats..... 0  
Detailed timing #1..... 1440x900p at 60Hz (16:10)  
Modeline..... "1440x900" 106.500 1440 1520 1672 1904 900 903 909 934 -hsync +vsync  
Detailed timing #2..... 1366x768p at 60Hz (16:9)  
Modeline..... "1366x768" 85.500 1366 1436 1579 1792 768 771 774 798 +hsync +vsync  
Detailed timing #3..... 1920x1200p at 60Hz (16:10)  
Modeline..... "1920x1200" 154.000 1920 1968 2000 2080 1200 1203 1209 1235 +hsync -vsync

## CE video data (timings supported)

1920 x 1080p at 60Hz - HDTV (16:9, 1:1)  
1920 x 1080p at 50Hz - HDTV (16:9, 1:1)  
1280 x 720p at 60Hz - HDTV (16:9, 1:1)  
1280 x 720p at 50Hz - HDTV (16:9, 1:1)  
1920 x 1080i at 60Hz - HDTV (16:9, 1:1)  
1920 x 1080i at 50Hz - HDTV (16:9, 1:1)  
720 x 480p at 60Hz - EDTV (4:3, 8:9)  
720 x 576p at 50Hz - EDTV (4:3, 16:15)  
720 x 480i at 60Hz - Doublescan (4:3, 8:9)  
720 x 576i at 50Hz - Doublescan (4:3, 16:15)  
1920 x 1080p at 30Hz - HDTV (16:9, 1:1)  
1920 x 1080p at 25Hz - HDTV (16:9, 1:1)  
1920 x 1080p at 24Hz - HDTV (16:9, 1:1)  
1920 x 1080p at 24Hz - HDTV (16:9, 1:1)  
1920 x 1080p at 24Hz - HDTV (16:9, 1:1)  
1920 x 1080p at 24Hz - HDTV (16:9, 1:1)  
1920 x 1080p at 24Hz - HDTV (16:9, 1:1)  
1920 x 1080p at 24Hz - HDTV (16:9, 1:1)  
NB: NTSC refresh rate = (Hz\*1000)/1001

## CE audio data (formats supported)

LPCM 2-channel, 16/20/24 bit depths at 32/44/48 kHz

## CE speaker allocation data

Channel configuration.... 2.0  
Front left/right..... Yes  
Front LFE..... No  
Front center..... No  
Rear left/right..... No  
Rear center..... No  
Front left/right center.. No  
Rear left/right center... No  
Rear LFE..... No

## CE vendor specific data (VSDB)

IEEE registration number. 0x000C03  
CEC physical address..... 0.1.0.0  
Supports AI (ACP, ISRC).. No  
Supports 48bpp..... Yes  
Supports 36bpp..... Yes  
Supports 30bpp..... Yes  
Supports YCbCr 4:4:4..... Yes  
Supports dual-link DVI... No  
Maximum TMDS clock..... 300MHz  
Data payload..... 20008001020304

## CE vendor specific data (VSDB)

IEEE registration number. 0xC45DD8  
CEC physical address..... 1.0.8.7  
Supports AI (ACP, ISRC).. Yes  
Supports 48bpp..... No  
Supports 36bpp..... No  
Supports 30bpp..... No  
Supports YCbCr 4:4:4..... No  
Supports dual-link DVI... No  
Maximum TMDS clock..... 35MHz

## Report information

Date generated..... 23/07/2019  
Software revision..... 2.41.0.818  
Operating system..... 6.2.9200.2

## Raw data

00,FF,FF,FF,FF,FF,FF,00,2D,B2,0D,06,31,00,00,00,06,1C,01,03,80,24,24,8C,C2,90,20,9C,54,50,8F,26,  
21,52,56,2F,CF,00,A9,40,81,80,90,40,D1,C0,31,59,45,59,61,59,81,99,08,E8,00,30,F2,70,5A,80,B0,58,  
8A,00,BA,88,21,00,00,1E,02,3A,80,18,71,38,2D,40,58,2C,45,00,BA,88,21,00,00,1E,00,00,00,FC,00,56,  
50,2D,34,34,30,58,0A,20,20,20,20,00,00,00,FD,00,17,3D,0F,88,3C,00,0A,20,20,20,20,20,01,F9,  
02,03,3B,F0,52,10,1F,04,13,05,14,02,11,06,15,22,21,20,5D,5E,5F,60,61,23,09,07,07,83,01,00,00,6E,  
03,0C,00,10,00,78,3C,20,00,80,01,02,03,04,67,D8,5D,C4,01,78,80,07,E4,0F,00,00,03,9A,29,A0,D0,51,  
84,22,30,50,98,36,00,10,0A,00,00,00,1C,66,21,56,AA,51,00,1E,30,46,8F,33,00,10,09,00,00,00,1E,28,  
3C,80,A0,70,B0,23,40,30,20,36,00,10,0A,00,00,00,1A,00,00,00,00,00,00,00,00,00,00,00,00,00,00,E0

# Protocol 3000

Kramer devices can be operated using Kramer Protocol 3000 commands sent via serial or Ethernet ports.

## Understanding Protocol 3000

Protocol 3000 commands are a sequence of ASCII letters, structured according to the following.

- **Command format:**

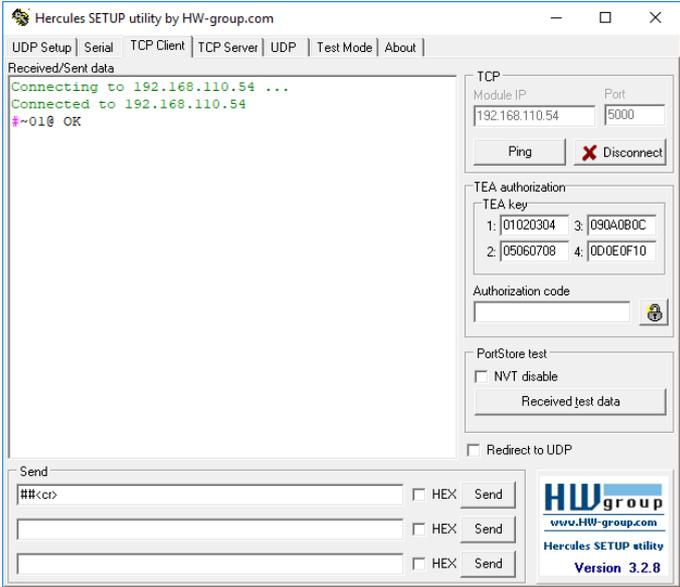
Prefix	Command Name	Constant (Space)	Parameter(s)	Suffix
#	Command	_	Parameter	<CR>

- **Feedback format:**

Prefix	Device ID	Constant	Command Name	Parameter(s)	Suffix
~	nn	@	Command	Parameter	<CR><LF>

- **Command parameters** – Multiple parameters must be separated by a comma (,). In addition, multiple parameters can be grouped as a single parameter using brackets ([ and ]).
- **Command chain separator character** – Multiple commands can be chained in the same string. Each command is delimited by a pipe character (|).
- **Parameters attributes** – Parameters may contain multiple attributes. Attributes are indicated with pointy brackets (<...>) and must be separated by a period (.).

The command framing varies according to how you interface with the VP-440X. The following figure displays how the # command is framed using terminal communication software (such as Hercules):



# Protocol 3000 Commands

Function	Description	Syntax	Parameters/Attributes	Example
#	Protocol handshaking.  ① Validates the Protocol 3000 connection and gets the machine number.  Step-in master products use this command to identify the availability of a device.	<b>COMMAND</b> #<CR> <b>FEEDBACK</b> ~nn@_ok<CR><LF>		#<CR>
AUD-EMB	Set audio in video embedding status.	<b>COMMAND</b> #AUD-EMB_in_index,out_index,emb_mode<CR> <b>FEEDBACK</b> ~nn@AUD-EMB_in_index,out_index,emb_mode<CR><LF>	<b>in_index</b> – Number that indicates the specific input: 0– HDMI 1 1– HDMI 2 2– HDMI 3 3– HDMI 4 <b>out_index</b> – 0 <b>emb_mode</b> – Embedding status 0– Analog 1– Embedded 2– Auto	Set audio in video embedding status for input 3 and output 1 to analog: #AUD-EMB_2,0,0<CR>
AUD-EMB?	Get audio in video embedding status.	<b>COMMAND</b> #AUD-EMB?_in_index,out_index<CR> <b>FEEDBACK</b> ~nn@AUD-EMB_in_index,out_index,emb_mode<CR><LF>	<b>in_index</b> – Number that indicates the specific input: 0– HDMI 1 1– HDMI 2 2– HDMI 3 3– HDMI 4 <b>out_index</b> – 0 <b>emb_mode</b> – Embedding status 0– Analog 1– Embedded 2– Auto	Get audio in video embedding status for input 2: #AUD-EMB?_1,1<CR>
AUDIO-BYPASS	Bypass audio IN-OUT processing or set to DSP	<b>COMMAND</b> #AUDIO-BYPASS_state <CR> <b>FEEDBACK</b> ~nn@AUDIO-BYPASS_state<CR><LF>	<b>state</b> – Audio Processing status: 0– DSP 1– Bypass	Set audio processing status to DSP: #AUDIO-BYPASS_0<CR>
AUDIO-BYPASS?	Get audio IN-OUT processing status.	<b>COMMAND</b> #AUDIO-BYPASS?_state<CR> <b>FEEDBACK</b> ~nn@AUDIO-BYPASS_state<CR><LF>	<b>state</b> – Audio Processing status: 0– DSP 1– Bypass	Get threshold and time for channel 1: #AUDIO-BYPASS?_state<CR>
AUD-LVL	Set volume level.	<b>COMMAND</b> #AUD-LVL_io_mode,io_index,vol_level<CR> <b>FEEDBACK</b> ~nn@AUD-LVL_io_mode,io_index,vol_level<CR><LF>	<b>io_mode</b> – Input/Output 0– Input 1– Output <b>io_index</b> – Number that indicates the specific input or output port. for input: 0– HDMI 1 1– HDMI 2 2– HDMI 3 3– HDMI 4 2– PC For output: 0 <b>vol_level</b> – Volume level 0 to 100; ++ (increase current value by 1dB); -- (decrease current value by 1dB)	Set AUDIO IN 2 level to 50: #AUD-LVL_0,1,50<CR>
AUD-LVL?	Get volume level.	<b>COMMAND</b> #AUD-LVL?_io_mode,io_index<CR> <b>FEEDBACK</b> ~nn@AUD-LVL_io_mode,io_index,vol_level<CR><LF>	<b>io_mode</b> – Input/Output 0– Input 1– Output <b>io_index</b> – Number that indicates the specific input or output port. for input: 0– HDMI 1 1– HDMI 2 2– HDMI 3 3– HDMI 4 4– PC For output: 0 <b>vol_level</b> – Volume level 0 to 100; ++ (increase current value by 1dB); -- (decrease current value by 1dB)	Get AUDIO OUT level #AUD-LVL?_1,0<CR>
BASS	Set audio bass level.	<b>COMMAND</b> #BASS_io_index,bass_level<CR> <b>FEEDBACK</b> ~nn@BASS_io_index,bass_level<CR><LF>	<b>io_index</b> – 1 <b>bass_level</b> – 0-30	Set audio bass level to 5: #BASS_1,5<CR>
BASS?	Get audio bass level.	<b>COMMAND</b> #BASS?_io_index<CR> <b>FEEDBACK</b> ~nn@BASS_io_index,bass_level<CR><LF>	<b>io_index</b> – 1 <b>bass_level</b> – 0-30	Get audio bass level: #BASS?_1<CR>
BUILD-DATE?	Get device build date.	<b>COMMAND</b> #BUILD-DATE?_date,time<CR> <b>FEEDBACK</b> ~nn@BUILD-DATE_date,time<CR><LF>	<b>date</b> – Format: YYYY/MM/DD where YYYY = Year MM = Month DD = Day <b>time</b> – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds	Get the device build date: #BUILD-DATE?<CR>

Function	Description	Syntax	Parameters/Attributes	Example
CEC	Set display to ON/OFF	<b>COMMAND</b> #CEC_state<CR> <b>FEEDBACK</b> ~nn@CEC_state_OK<CR><LF>	<b>state</b> – CEC state 0 – Off 1 – On	Set display to ON via CEC: #CEC_ON<CR>
CEC-PASS	Set display ON/OFF.	<b>COMMAND</b> #CEC-PASS_state<CR> <b>FEEDBACK</b> ~nn@CEC-PASSw_state<CR><LF>	<b>state</b> – CEC state 0 – Off 1 – On	Set display status to off: #CEC-PASS_0<CR>
CEC-PASS?	Get display status.	<b>COMMAND</b> #CEC-PASS?_<CR> <b>FEEDBACK</b> ~nn@CEC-PASSw_state<CR><LF>	<b>state</b> – CEC state 0 – Off 1 – On	Get display status: #CEC-PASS?_<CR>
DISPLAY?	Get output HPD status.	<b>COMMAND</b> #DISPLAY?_out_index<CR> <b>FEEDBACK</b> ~nn@DISPLAY_out_index, status<CR><LF>	<b>out_index</b> – Number that indicates the specific output: 1 – HDMI 2 – HDBT <b>status</b> – HPD status according to signal validation 0 – Signal or sink is not valid 1 – Signal or sink is valid 2 – Sink and EDID is valid	Get the output HPD status of HDMI output: #DISPLAY?_1<CR>
DPSW-STATUS?	Get the DIP-switch state.	<b>COMMAND</b> #DPSW-STATUS?_dip_id<CR> <b>FEEDBACK</b> ~nn@DPSW-STATUS_dip_id, status<CR><LF>	<b>dip_id</b> – 0 <b>status</b> – Up/down 0 – Up 1 – Down	get the DIP-switch status: #DPSW-STATUS?_0<CR>
EQ-LVL	Set equalization level.	<b>COMMAND</b> #EQ-LVL_io_mode, eq_type, eq_level<CR> <b>FEEDBACK</b> ~nn@EQ-LVL_io_mode, io_index, eq_type, eq_level<CR><LF>	<b>io_mode</b> – 1 <b>eq_type</b> – Equalizer Types [Hz]: 120 200 500 1200 3000 7500 12000 <b>eq_level</b> – Equalizer level (-10dB to 10dB): 0 to 40	Set 200Hz EQ level to 12: #EQ-LVL_1,200,12<CR>
EQ-LVL?	Get equalization level.	<b>COMMAND</b> #EQ-LVL?_io_mode, io_index, eq_type<CR> <b>FEEDBACK</b> ~nn@EQ-LVL_io_mode, io_index, eq_type, eq_level<CR><LF>	<b>io_mode</b> – 1 <b>eq_type</b> – Equalizer Types [Hz]: 120 200 500 1200 3000 7500 12000 <b>eq_level</b> – Equalizer level (-10dB to 10dB): 0 to 40	Get 120Hz EQ level: #EQ-LVL?_1,120<CR>
ETH-PORT	Set Ethernet port protocol.  ⓘ If the port number you enter is already in use, an error is returned. The port number must be within the following range: 0-(2 <sup>16</sup> -1).	<b>COMMAND</b> #ETH-PORT_port_type, port_id<CR> <b>FEEDBACK</b> ~nn@ETH-PORT_port_type, port_id<CR><LF>	<b>port_type</b> – TCP/UDP <b>port_id</b> – TCP/UDP port number (0 – 65535)	Set the Ethernet port protocol for TCP to port 12457: #ETH-PORT_0,12457<CR>
ETH-PORT?	Get Ethernet port protocol.	<b>COMMAND</b> #ETH-PORT?_port_type<CR> <b>FEEDBACK</b> ~nn@ETH-PORT_port_type, port_id<CR><LF>	<b>port_type</b> – TCP/UDP TCP UDP <b>port_id</b> – TCP / UDP port number (0 – 65535)	Get the Ethernet port protocol for UDP: #ETH-PORT?_1<CR>
FACTORY	Reset device to factory default configuration.  ⓘ 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.	<b>COMMAND</b> #FACTORY<CR> <b>FEEDBACK</b> ~nn@FACTORY_ok<CR><LF>		Reset the device to factory default configuration: #FACTORY<CR>

Function	Description	Syntax	Parameters/Attributes	Example
HDCP-MOD	<p>Set HDCP mode.</p> <p>ⓘ Set HDCP working mode on the device input:</p> <p>HDCP supported - HDCP_ON [default].</p> <p>HDCP not supported - HDCP OFF.</p> <p>HDCP support changes following detected sink - MIRROR OUTPUT.</p> <p>When you define 3 as the mode, the HDCP status is defined according to the connected output in the following priority: OUT 1, OUT 2. If the connected display on OUT 2 supports HDCP, but OUT 1 does not, then HDCP is defined as not supported. If OUT 1 is not connected, then HDCP is defined by OUT 2.</p>	<p><b>COMMAND</b></p> <pre>#HDCP-MOD?_io_mode,io_index,mode&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@HDCP-MOD_io_mode,io_index,mode&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>io_mode</b> – Input/Output</p> <p>0– Input</p> <p>1– Output</p> <p><b>io_index</b> – Number that indicates the specific input or output port.</p> <p>for input:</p> <p>1– HDMI 1</p> <p>2– HDMI 2</p> <p>3– HDMI 3</p> <p>4– HDMI 4</p> <p>For output: 1</p> <p><b>mode</b> – HDCP mode:</p> <p>for input:</p> <p>0– HDCP Off</p> <p>1– Auto</p> <p>For output:</p> <p>2– Follow in</p> <p>3– Follow out</p>	<p>Set the input HDCP-MODE of IN 1 to Off:</p> <pre>#HDCP-MOD_0,1,0&lt;CR&gt;</pre>
HDCP-MOD?	<p>Get HDCP mode.</p> <p>ⓘ Set HDCP working mode on the device input:</p> <p>HDCP supported - HDCP_ON [default].</p> <p>HDCP not supported - HDCP OFF.</p> <p>HDCP support changes following detected sink - MIRROR OUTPUT.</p>	<p><b>COMMAND</b></p> <pre>#HDCP-MOD?_io_mode,io_index&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@HDCP-MOD_io_mode,io_index,mode&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>io_mode</b> – Input/Output</p> <p>0– Input</p> <p>1– Output</p> <p><b>io_index</b> – Number that indicates the specific input or output port.</p> <p>for input:</p> <p>1– HDMI 1</p> <p>2– HDMI 2</p> <p>3– HDMI 3</p> <p>4– HDMI 4</p> <p>For output: 1</p> <p><b>mode</b> – HDCP mode:</p> <p>for input:</p> <p>0– HDCP Off</p> <p>1– Auto</p> <p>For output:</p> <p>2– Follow in</p> <p>3– Follow out</p>	<p>Get the input HDCP-MODE of HDMI 1:</p> <pre>#HDCP-MOD?_0,1&lt;CR&gt;</pre>
HELP	<p>Get command list or help for specific command.</p>	<p><b>COMMAND</b></p> <pre>#HELP&lt;CR&gt;</pre> <pre>#HELP_cmd_name&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <p>1..ulti-line:</p> <pre>~nn@Device_cmd_name,,cmd_name&lt;CR&gt;&lt;LF&gt;</pre> <p>To get help for command use: HELP (COMMAND_NAME)&lt;CR&gt;&lt;LF&gt;</p> <pre>~nn@HELP_cmd_name:&lt;CR&gt;&lt;LF&gt;</pre> <pre>description&lt;CR&gt;&lt;LF&gt;</pre> <pre>USAGE:usage&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>cmd_name</b> – Name of a specific command</p>	<p>Get the command list:</p> <pre>#HELP&lt;CR&gt;</pre> <p>To get help for AV-SW-TIMEOUT:</p> <pre>HELP_av-sw-timeout&lt;CR&gt;</pre>
IMAGE-PROP	<p>Set the image size.</p> <p>ⓘ Sets the image properties of the selected scaler.</p>	<p><b>COMMAND</b></p> <pre>#IMAGE-PROP_scaler_id,video_mode&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@IMAGE-PROP_scaler_id,video_mode.&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>scaler_id</b> – Scaler number – 1</p> <p><b>video_mode</b> – Status</p> <p>0– Over scan</p> <p>1– Full</p> <p>2– Best fit</p> <p>3– Pan scan</p> <p>4– Letter box</p> <p>5– Under 2</p> <p>6– Under 1</p> <p>7– Follow in</p>	<p>Set the image size to Best fit:</p> <pre>#IMAGE-PROP_1,2&lt;CR&gt;</pre>
IMAGE-PROP?	<p>Get the image size.</p> <p>ⓘ Gets the image properties of the selected scaler.</p>	<p><b>COMMAND</b></p> <pre>#IMAGE-PROP?_scaler_id&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@IMAGE-PROP_scaler_id,video_mode&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>scaler_id</b> – Scaler number – 1</p> <p><b>video_mode</b> – Status</p> <p>0– Over scan</p> <p>1– Full</p> <p>2– Best fit</p> <p>3– Pan scan</p> <p>4– Letter box</p> <p>5– Under 2</p> <p>6– Under 1</p> <p>7– Follow in</p>	<p>Get the image size:</p> <pre>#IMAGE-PROP?_1&lt;CR&gt;</pre>
LOCK-FP	<p>Lock the front panel.</p> <p>ⓘ In NT-52N, this command includes the PortNumber (1-2) parameter.</p>	<p><b>COMMAND</b></p> <pre>#LOCK-FP_lock/unlock&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@LOCK-FP_lock/unlock&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>lock/unlock</b> – On/Off</p> <p>0– Off unlocks EDID</p> <p>1– On locks EDID</p>	<p>Unlock front panel:</p> <pre>#LOCK-FP_0&lt;CR&gt;</pre>
LOCK-FP?	<p>Get the front panel lock state.</p> <p>ⓘ In NT-52N, this command includes the PortNumber (1-2) parameter.</p>	<p><b>COMMAND</b></p> <pre>#LOCK-FP?_&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@LOCK-FP_lock/unlock&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>lock/unlock</b> – On/Off</p> <p>0– Off unlocks EDID</p> <p>1– On locks EDID</p>	<p>Get the front panel lock state:</p> <pre>#LOCK-FP?&lt;CR&gt;</pre>
LOUDNESS	<p>Set audio loudness.</p>	<p><b>COMMAND</b></p> <pre>#LOUDNESS_io_index,enabled&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@LOUDNESS_io_index,enabled&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>io_index</b> – 1</p> <p><b>enabled</b> – On/Off</p> <p>0– Off</p> <p>1– On</p>	<p>Set audio loudness:</p> <pre>#LOUDNESS_1,1&lt;CR&gt;</pre>

Function	Description	Syntax	Parameters/Attributes	Example
LOUDNESS?	Get audio loudness.	<b>COMMAND</b> #LOUDNESS?_io_index<CR> <b>FEEDBACK</b> ~nn@LOUDNESS_io_index,enabled<CR><LF>	io_index – 1 enabled – On/Off 0 – Off 1 – On	Get audio loudness: #LOUDNESS?_1<CR>
MIC-GAIN	Set the microphone gain.  Sets the microphone input audio gain.	<b>COMMAND</b> #MIC-GAIN_mic_id,level<CR> <b>FEEDBACK</b> ~nn@MIC-GAIN_mic_id,level<CR><LF>	mic_id – 0 level – Level – 0 to 100 ++ (increase current value); -- (decrease current value)	Set the microphone gain to 10: #MIC-GAIN_1,10<CR>
MIC-GAIN?	Get the microphone gain.  Gets the microphone input audio gain.	<b>COMMAND</b> #MIC-GAIN?_mic_id<CR> <b>FEEDBACK</b> ~nn@MIC-GAIN_mic_id,level<CR><LF>	mic_id – 0 level – Level – 0 to 100 ++ (increase current value); -- (decrease current value)	Get the microphone gain: #MIC-GAIN?_0<CR>
MIC-TLK	Set mic talkover parameters.	<b>COMMAND</b> #MIC-TLK_out_index,mic_index,value<CR> <b>FEEDBACK</b> ~nn@MIC-TLK_out_index,mic_index,value<CR><LF>	out_index – 0 mic_index – Parameter setting 0 – Depth 1 – Trigger 2 – Attack time 3 – Hold time 2 – Release time value – MIC_INDEX value Depth – 0~100 [%] Trigger – 0~100 (-60dB~40dB) Attack time / Hold time / Release time – 0~200 (0~20sec)	Set mic depth to 20%: #MIC-TLK_0,0,20<CR>
MIC-TLK?	Get mic talkover parameters.	<b>COMMAND</b> #MIC-TLK?_out_index,mic_index<CR> <b>FEEDBACK</b> ~nn@MIC-TLK_out_index,mic_index,value<CR><LF>	out_index – 0 mic_index – Parameter setting 0 – Depth 1 – Trigger 2 – Attack time 3 – Hold time 2 – Release time value – MIC_INDEX value Depth – 0~100 [%] Trigger – 0~100 (-60dB~40dB) Attack time / Hold time / Release time – 0~200 (0~20sec)	Get mic attack time: #MIC-TLK?_0,2<CR>
MODEL?	Get device model.  This command identifies equipment connected to VP-440X and notifies of identity changes to the connected equipment. The Matrix saves this data in memory to answer REMOTE-INFO requests.	<b>COMMAND</b> #MODEL?_<CR> <b>FEEDBACK</b> ~nn@MODEL_model_name<CR><LF>	model_name – String of up to 19 printable ASCII chars	Get the device model: #MODEL?_<CR>
MUTE	Set audio mute.	<b>COMMAND</b> #MUTE_out_index,mute_mode<CR> <b>FEEDBACK</b> ~nn@MUTE_out_index,mute_mode<CR><LF>	out_index – Number that indicates the specific output: 0 mute_mode – On/Off 0 – Off 1 – On	Set Output to mute: #MUTE_0,1<CR>
MUTE?	Get audio mute.	<b>COMMAND</b> #MUTE?_out_index<CR> <b>FEEDBACK</b> ~nn@MUTE_out_index,mute_mode<CR><LF>	out_index – Number that indicates the specific output: 0 mute_mode – On/Off 0 – Off 1 – On	Get mute status of output #MUTE_0?<CR>
NAME	Set machine (DNS) name.  The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).	<b>COMMAND</b> #NAME_machine_name<CR> <b>FEEDBACK</b> ~nn@NAME_machine_name<CR><LF>	machine_name – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Set the DNS name of the device to room-442: #NAME_room-442<CR>
NAME?	Get machine (DNS) name.  The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).	<b>COMMAND</b> #NAME?_<CR> <b>FEEDBACK</b> ~nn@NAME_machine_name<CR><LF>	machine_name – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Get the DNS name of the device: #NAME?_<CR>
NAME-RST	Reset machine (DNS) name to factory default.  Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number.	<b>COMMAND</b> #NAME-RST<CR> <b>FEEDBACK</b> ~nn@NAME-RST_ok<CR><LF>		Reset the machine name (S/N last digits are 0102): #NAME-RST_kramer_0102<CR>

Function	Description	Syntax	Parameters/Attributes	Example
NET-DHCP	<p>Set DHCP mode.</p> <p><b>i</b> Only 1 is relevant for the mode value. To disable DHCP, the user must configure a static IP address for the device.</p> <p>Connecting Ethernet to devices with DHCP may take more time in some networks.</p> <p>To connect with a randomly assigned IP by DHCP, specify the device DNS name (if available) using the <b>NAME</b> command. You can also get an assigned IP by direct connection to USB or RS-232 protocol port, if available.</p> <p>For proper settings consult your network administrator.</p> <p><b>i</b> For Backward compatibility, the <b>id</b> parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.</p>	<p><b>COMMAND</b></p> <pre>#NET-DHCP _dhcp_state&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@NET-DHCP _dhcp_state&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>dhcp_state</b> –</p> <p>0 – Do not use DHCP. Use the IP set by the factory or using the <b>net-ip</b> or <b>net-config</b> command.</p> <p>1 – Try to use DHCP. If unavailable, use the IP set by the factory or using the <b>net-ip</b> or <b>net-config</b> command.</p>	<p>Enable DHCP mode #NET-DHCP_1&lt;CR&gt;</p>
NET-DHCP?	<p>Get DHCP mode.</p> <p><b>i</b> For Backward compatibility, the <b>id</b> parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.</p>	<p><b>COMMAND</b></p> <pre>#NET-DHCP?_&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@NET-DHCP _dhcp_mode&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>dhcp_mode</b> –</p> <p>0 – Do not use DHCP. Use the IP set by the factory or using the <b>net-ip</b> or <b>net-config</b> command.</p> <p>1 – Try to use DHCP. If unavailable, use the IP set by the factory or using the <b>net-ip</b> or <b>net-config</b> command.</p>	<p>Get DHCP mode : #NET-DHCP?_&lt;CR&gt;</p>
NET-GATE	<p>Set gateway IP.</p> <p><b>i</b> A network gateway connects the device via another network and maybe over the Internet. Be careful of security issues. For proper settings consult your network administrator.</p>	<p><b>COMMAND</b></p> <pre>#NET-GATE _ip_address&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@NET-GATE _ip_address&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>ip_address</b> – Format: xxx.xxx.xxx.xxx</p>	<p>Set the gateway IP address to 192.168.0.1: #NET-GATE_192.168.000.001&lt;CR&gt;</p>
NET-GATE?	<p>Get gateway IP.</p> <p><b>i</b> A network gateway connects the device via another network and maybe over the Internet. Be aware of security problems.</p>	<p><b>COMMAND</b></p> <pre>#NET-GATE?_&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@NET-GATE _ip_address&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>ip_address</b> – Format: xxx.xxx.xxx.xxx</p>	<p>Get the gateway IP address: #NET-GATE?_&lt;CR&gt;</p>
NET-IP	<p>Set IP address.</p> <p><b>i</b> For proper settings consult your network administrator.</p>	<p><b>COMMAND</b></p> <pre>#NET-IP _ip_address&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@NET-IP _ip_address&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>ip_address</b> – Format: xxx.xxx.xxx.xxx</p>	<p>Set the IP address to 192.168.1.39: #NET-IP_192.168.001.039&lt;CR&gt;</p>
NET-IP?	<p>Get IP address.</p>	<p><b>COMMAND</b></p> <pre>#NET-IP?_&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@NET-IP _ip_address&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>ip_address</b> – Format: xxx.xxx.xxx.xxx</p>	<p>Get the IP address: #NET-IP?_&lt;CR&gt;</p>
NET-MAC?	<p>Get MAC address.</p> <p><b>i</b> For backward compatibility, the <b>id</b> parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.</p>	<p><b>COMMAND</b></p> <pre>#NET-MAC?_id&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@NET-MAC _id,mac_address&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>id</b> – Network ID—the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3....</p> <p><b>mac_address</b> – Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit</p>	<p>#NET-MAC?_id&lt;CR&gt;</p>
NET-MASK	<p>Set subnet mask.</p> <p><b>i</b> For proper settings consult your network administrator.</p>	<p><b>COMMAND</b></p> <pre>#NET-MASK _net_mask&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@NET-MASK _net_mask&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>net_mask</b> – Format: xxx.xxx.xxx.xxx</p>	<p>Set the subnet mask to 255.255.0.0: #NET-MASK_255.255.000.000&lt;CR&gt;</p>
NET-MASK?	<p>Get subnet mask.</p>	<p><b>COMMAND</b></p> <pre>#NET-MASK?_&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@NET-MASK _net_mask&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>net_mask</b> – Format: xxx.xxx.xxx.xxx</p>	<p>Get the subnet mask: #NET-MASK?_&lt;CR&gt;</p>
PROT-VER?	<p>Get device protocol version.</p>	<p><b>COMMAND</b></p> <pre>#PROT-VER?_&lt;CR&gt;</pre> <p><b>FEEDBACK</b></p> <pre>~nn@PROT-VER _3000:version&lt;CR&gt;&lt;LF&gt;</pre>	<p><b>version</b> – XX.XX where X is a decimal digit</p>	<p>Get the device protocol version: #PROT-VER?_&lt;CR&gt;</p>

Function	Description	Syntax	Parameters/Attributes	Example
RESET	Reset device.  ❗ 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.	<b>COMMAND</b> #RESET<CR> <b>FEEDBACK</b> ~nn@RESET_<ok><CR><LF>		Reset the device: #RESET<CR>
ROUTE	Set layer routing.  ❗ This command replaces all other routing commands.	<b>COMMAND</b> #ROUTE_<layer_type>,<out_index>,<in_index><CR> <b>FEEDBACK</b> ~nn@ROUTE_<layer_type>,<out_index>,<in_index><CR><LF>	<b>layer_type</b> Layer Enumeration 1- Video+Audio <b>out_index</b> - 1 <b>in_index</b> - Source id 1- HDMI 1 2- HDMI 2 3- HDMI 3 4- HDMI 4 5- PC	Route video HDMI 2 to the output: #ROUTE_<1,1,2><CR>
ROUTE?	Get layer routing.  ❗ This command replaces all other routing commands.	<b>COMMAND</b> #ROUTE?_<layer_type>,<scaler><CR> <b>FEEDBACK</b> ~nn@ROUTE_<layer_type>,<out_index>,<in_index><CR><LF>	<b>layer_type</b> Layer Enumeration 1- Video+Audio <b>out_index</b> - 1 <b>in_index</b> - Source id 1- HDMI 1 2- HDMI 2 3- HDMI 3 4- HDMI 4 5- PC	Get the layer routing: #ROUTE?_<1,1><CR>
SCLR-AS	Set auto-sync features.  ❗ Sets the auto sync features for the selected scaler.	<b>COMMAND</b> #SCLR-AS_<scaler_index>,<sync_speed><CR> <b>FEEDBACK</b> ~nn@SCLR-AS_<scaler_index>,<sync_speed><CR><LF>	<b>scaler_index</b> - Scaler Number - 1 <b>sync_speed</b> - 0, 1 or 2 0- off 1- fast 2- slow	Set auto-sync features: #SCLR-AS_<1,1><CR>
SCLR-AS?	Get auto-sync features.  ❗ Gets the auto sync features for the selected scaler.	<b>COMMAND</b> #SCLR-AS?_<scaler_index><CR> <b>FEEDBACK</b> ~nn@SCLR-AS_<scaler_index>,<sync_speed><CR><LF>	<b>scaler_index</b> - Scaler Number - 1 <b>sync_speed</b> - 0, 1 or 2 0- off 1- fast 2- slow	Get auto-sync features: #SCLR-AS?_<1><CR>
SCLR-AUDIO-DELAY	Set the scaler audio delay.  ❗ Sets the audio delay for the selected audio output.	<b>COMMAND</b> #SCLR-AUDIO-DELAY_<scaler_index>,<delay><CR> <b>FEEDBACK</b> ~nn@SCLR-AUDIO-DELAY_<scaler_index>,<delay><CR><LF>	<b>scaler_index</b> - Audio output number - 1 <b>delay</b> - 0- Off 1- 40ms 2- 110ms 3- 150ms	Set the scaler audio delay to 40ms: #SCLR-AUDIO-DELAY_<1,1><CR>
SCLR-AUDIO-DELAY?	Get the scaler audio delay.  ❗ Gets the audio delay for the selected audio output.	<b>COMMAND</b> #SCLR-AUDIO-DELAY?_<scaler_index><CR> <b>FEEDBACK</b> ~nn@SCLR-AUDIO-DELAY_<scaler_index>,<delay><CR><LF>	<b>scaler_index</b> - Audio output number - 1 <b>delay</b> - 0- Off 1- 40ms 2- 110ms 3- 150ms	Get the scaler audio delay: #SCLR-AUDIO-DELAY?_<1><CR>
SCLR-PCAUTO	Set PC auto sync of scaler.  ❗ Trigger the Auto Adjust feature of PC input.	<b>COMMAND</b> #SCLR-PCAUTO_<scaler_index>,<auto_scan><CR> <b>FEEDBACK</b> ~nn@SCLR-PCAUTO_<scaler_index>,<auto_scan><CR><LF>	<b>scaler_index</b> - Scaler Number 1 <b>auto_scan</b> - 1 ("Yes" triggers the Auto-scan function. When complete, the unit returns to the "No" state)	Set PC auto sync of scaler: #SCLR-PCAUTO_<1,1><CR>
SIGNAL?	Get input signal status.	<b>COMMAND</b> #SIGNAL?_<in_index><CR> <b>FEEDBACK</b> ~nn@SIGNAL_<in_index>,<status><CR><LF>	<b>in_index</b> - Number that indicates the specific input: 1- HDMI 1 2- HDMI 2 3- HDMI 3 4- HDMI 4 <b>status</b> - Signal status according to signal validation: 0- Off 1- On	Get the input signal lock status of IN 1: #SIGNAL?_<1><CR>
SN?	Get device serial number.	<b>COMMAND</b> #SN?_<CR> <b>FEEDBACK</b> ~nn@SN_<serial_num><CR><LF>	<b>serial_num</b> - 14 decimal digits, factory assigned	Get the device serial number: #SN?_<CR>
TEST-MODE	Perform device test according to defined test parameters.  ❗ This command starts device test procedure.	<b>COMMAND</b> #TEST-MODE<CR> <b>FEEDBACK</b> ~nn@TEST-MODE_<result><CR><LF>	<b>result</b> - Test Results 0- OK 1- Failed (general) 2 to N - Device specific failed error code	Perform device test according to defined test parameters: #TEST-MODE<CR>
TLK	Set audio talkover mode status.	<b>COMMAND</b> #TLK_<io_index>,<talkover_mode><CR> <b>FEEDBACK</b> ~nn@TLK_<io_index>,<talkover_mode><CR><LF>	<b>io_index</b> - 1 <b>talkover_mode</b> - Talkover mode 0- Off 1- Mixer 2- Talkover 3- Mic only	Set audio talkover mode to Mixer: #TLK_<1,1><CR>
TLK?	Get audio talkover mode status.	<b>COMMAND</b> #TLK?_<io_index><CR> <b>FEEDBACK</b> ~nn@TLK_<io_index>,<talkover_mode><CR><LF>	<b>io_index</b> - 1 <b>talkover_mode</b> - Talkover mode 0- Off 1- Mixer 2- Talkover 3- Mic only	Get audio talkover mode status: #TLK?_<1><CR>

Function	Description	Syntax	Parameters/Attributes	Example
TREBLE	Set audio treble level.	<b>COMMAND</b> #TREBLE, <u>io_index</u> ,treble_level<CR> <b>FEEDBACK</b> ~nn@TREBLE, <u>io_index</u> ,treble_level<CR><LF>	io_index – 1 bass_level – 0-30	Set audio treble level to 10: #TREBLE, <u>1</u> ,10<CR>
TREBLE?	Get audio treble level.	<b>COMMAND</b> #TREBLE?, <u>io_index</u> <CR> <b>FEEDBACK</b> ~nn@TREBLE, <u>io_index</u> ,treble_level<CR><LF>	io_index – 1 bass_level – 0-30	Get audio treble level: #TREBLE?, <u>1</u> <CR>
VERSION?	Get firmware version number.	<b>COMMAND</b> #VERSION?, <u> </u> <CR> <b>FEEDBACK</b> ~nn@VERSION, <u>firmware_version</u> <CR><LF>	firmware_version – XX.XX.XXXX where the digit groups are: major.minor.build version.	Get the device firmware version number: #VERSION?, <u> </u> <CR>
VFRZ	Set freeze on selected output.	<b>COMMAND</b> #VFRZ, <u>out_index</u> ,freeze_flag<CR> <b>FEEDBACK</b> ~nn@VFRZ, <u>out_index</u> ,freeze_flag<CR><LF>	out_index – Number that indicates the specific output: 1. freeze_flag – On/Off 0 – Off 1 – On	Set freeze on selected output: #VFRZ, <u>1</u> ,1<CR>
VFRZ?	Get output freeze status.	<b>COMMAND</b> #VFRZ?, <u>out_index</u> <CR> <b>FEEDBACK</b> ~nn@VFRZ, <u>out_index</u> ,freeze_flag<CR><LF>	out_index – Number that indicates the specific output: 1. freeze_flag – On/Off 0 – Off 1 – On	Get output freeze status: #VFRZ?, <u>1</u> <CR>
VID-RES	Set output resolution. ⓘ “Set” command with is_native=ON sets native resolution on selected output (resolution index sent = 0). Device sends as answer actual VIC ID of native resolution.  To use “custom resolutions” (entries 100-105 In View Modes), define them using the DEF-RES command.	<b>COMMAND</b> #VID-RES, <u>io_mode</u> , <u>io_index</u> , <u>is_native</u> ,resolution<CR> <b>FEEDBACK</b> ~nn@VID-RES, <u>io_mode</u> , <u>io_index</u> , <u>is_native</u> ,resolution<CR><LF>	io_mode – Output 1 – Output io_index – Number that indicates the specific input or output port: 1. is_native – 0 resolution – Resolution index 200=Native 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=2560x1600 216=2560x1440 217=480p 218=576p 219=720p50 220=720p60 221=1080p24 222=1080p25 223=1080p30 224=1080p50 225=1080p60 226=4k24 227=4k25 (HDMI only) 228=4k30 (HDMI only) 229=4k50 230=4k60	Set output resolution to 4k24: #VID-RES, <u>1</u> , <u>1</u> , <u>1</u> ,226<CR>

Function	Description	Syntax	Parameters/Attributes	Example
VID-RES?	Get output resolution.  <i>i</i> “Get” command with is_native=ON returns native resolution VIC, with is_native=OFF returns current resolution. To use “custom resolutions” (entries 100-105 In View Modes), define them using the DEF-RES command.	<b>COMMAND</b> #VID-RES?_io_mode,io_index,is_native<CR>  <b>FEEDBACK</b> ~nn@VID-RES?_io_mode,io_index,is_native,resolution<CR><LF>	<b>io_mode</b> – Output 1 – Output  <b>io_index</b> – Number that indicates the specific input or output port: 1. <b>is_native</b> – 0 <b>resolution</b> – Resolution index 200=Native 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=2560x1600 216=2560x1440 217=480p 218=576p 219=720p50 220=720p60 221=1080p24 222=1080p25 223=1080p30 224=1080p50 225=1080p60 226=4k24 227=4k25 (HDMI only) 228=4k30 (HDMI only) 229=4k50 230=4k60	Get output resolution: #VID-RES?_1,1,0<CR>
VMUTE	Set enable/disable video on output.  <i>i</i> Video mute parameter 2 (blank picture) is not supported.	<b>COMMAND</b> #VMUTE_out_index,flag<CR>  <b>FEEDBACK</b> ~nn@VMUTE_out_index,flag<CR><LF>	<b>out_index</b> – Number that indicates the specific output: 1. <b>flag</b> – Video Mute 0 – Off 1 – On	Disable the video on the output: #VMUTE_1,0<CR>
VMUTE?	Get video on output status.  <i>i</i> Video mute parameter 2 (blank picture) is not supported.	<b>COMMAND</b> #VMUTE?_out_index<CR>  <b>FEEDBACK</b> ~nn@VMUTE_out_index,flag<CR><LF>	<b>out_index</b> – Number that indicates the specific output: 1. <b>flag</b> – Video Mute 0 – Off 1 – On	Get video on output status: #VMUTE?_1<CR>

## Result and Error Codes

### Syntax

In case of an error, the device responds with an error message. The error message syntax:

- **~NN@ERR XXX<CR><LF>** – when general error, no specific command
- **~NN@CMD ERR XXX<CR><LF>** – for specific command
- **NN** – machine number of device, default = 01
- **XXX** – error code

### Error Codes

Error Name	Error Code	Description
P3K_NO_ERROR	0	No error
ERR_PROTOCOL_SYNTAX	1	Protocol syntax
ERR_COMMAND_NOT_AVAILABLE	2	Command not available
ERR_PARAMETER_OUT_OF_RANGE	3	Parameter out of range
ERR_UNAUTHORIZED_ACCESS	4	Unauthorized access
ERR_INTERNAL_FW_ERROR	5	Internal FW error
ERR_BUSY	6	Protocol busy
ERR_WRONG_CRC	7	Wrong CRC
ERR_TIMEOUT	8	Timeout
ERR_RESERVED	9	(Reserved)
ERR_FW_NOT_ENOUGH_SPACE	10	Not enough space for data (firmware, FPGA...)
ERR_FS_NOT_ENOUGH_SPACE	11	Not enough space – file system
ERR_FS_FILE_NOT_EXISTS	12	File does not exist
ERR_FS_FILE_CANT_CREATED	13	File can't be created
ERR_FS_FILE_CANT_OPEN	14	File can't open
ERR_FEATURE_NOT_SUPPORTED	15	Feature is not supported
ERR_RESERVED_2	16	(Reserved)
ERR_RESERVED_3	17	(Reserved)
ERR_RESERVED_4	18	(Reserved)
ERR_RESERVED_5	19	(Reserved)
ERR_RESERVED_6	20	(Reserved)
ERR_PACKET_CRC	21	Packet CRC error
ERR_PACKET_MISSED	22	Packet number isn't expected (missing packet)
ERR_PACKET_SIZE	23	Packet size is wrong
ERR_RESERVED_7	24	(Reserved)
ERR_RESERVED_8	25	(Reserved)
ERR_RESERVED_9	26	(Reserved)
ERR_RESERVED_10	27	(Reserved)
ERR_RESERVED_11	28	(Reserved)
ERR_RESERVED_12	29	(Reserved)
ERR_EDID_CORRUPTED	30	EDID corrupted
ERR_NON_LISTED	31	Device specific errors
ERR_SAME_CRC	32	File has the same CRC – not changed
ERR_WRONG_MODE	33	Wrong operation mode
ERR_NOT_CONFIGURED	34	Device/chip was not initialized

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.



## 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 website where updates to this user manual may be found.

We welcome your questions, comments, and feedback.

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