

## USER MANUAL

### MODELS:

VS-88UHD, VS-66UHD, VS-84UHD,  
VS-48UHD

UHD Matrix Switcher



# Contents

<b>Introduction</b>	<b>1</b>
Getting Started	1
Overview	2
Typical Applications	3
Controlling your VS-88UHD	4
<b>Defining the UHD Matrix Switcher</b>	<b>5</b>
<b>Mounting VS-88UHD</b>	<b>8</b>
<b>Connecting the VS-88UHD</b>	<b>9</b>
Connecting to VS-88UHD via RS-232	10
Connecting VS-88UHD via the ETHERNET Port	10
<b>Operating VS-88UHD via Front Panel Buttons</b>	<b>13</b>
Routing the Signals	13
Storing and Recalling a Setup	23
Setting the Switching Mode	24
Setting the Switching Speed	24
Setting HDCP	24
Copying the EDID	25
<b>Firmware Upgrade</b>	<b>26</b>
<b>Using the Embedded Web Pages</b>	<b>27</b>
Switching and Setting the Ports	29
Changing Device Settings and Upgrading the Firmware	38
Managing Web Page Security	40
Setting the Timeout	43
Setting Switching Modes	44
Setting Step-in Devices	46
Managing the EDID	48
Viewing the About Page	53
<b>Technical Specifications</b>	<b>54</b>
Default Communication Parameters	55
Default Parameters	56
Input or Output Resolutions	57
<b>Protocol 3000</b>	<b>58</b>
Understanding Protocol 3000	59
Kramer Protocol 3000 Syntax	60
Protocol 3000 Commands	61

# 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!

---

## 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/VS-88UHD](http://www.kramerav.com/downloads/VS-88UHD) to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

## Achieving the Best Performance

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).
- Do not secure the cables in tight bundles or roll the slack into tight coils.
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality.
- Position your Kramer **VS-88UHD** 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).

## Overview

Congratulations on purchasing your Kramer **UHD Matrix Switcher**. This User Manual describes the following four devices: **VS-88UHD**, **VS-66UHD**, **VS-84UHD** and **VS-48UHD**.



The devices described in this user manual are generally referred to as **VS-88UHD** or **UHD Matrix Switcher**. A device is named specifically only when a device-specific feature is described.

The **UHD Matrix Switcher** is a high-quality switcher for 4K@60Hz (4:2:0) HDMI™ signals and embedded audio. It reclocks and equalizes the signals and can route any one of the selectable HDMI, HDCP-compliant sources to any or all outputs simultaneously.

The **UHD Matrix Switcher** offers a flexible audio scheme where any HDMI digital audio input can be routed to any HDMI digital audio output. In addition, an ARC matrix is supported to produce AV matrices, as defined in the table below:

Device Name	HDMI Video Matrix	HDMI Embedded Audio Matrix (D-Audio Matrix)	ARC Audio		
			ARC In (on HDMI OUT Ports)	ARC Out (on HDMI IN ports)	Matrix
<b>VS-88UHD</b>	8x8	8x8	8	4	8x4
<b>VS-66UHD</b>	6x6	6x6	6	3	6x3
<b>VS-84UHD</b>	8x4	8x4	4	4	4x4
<b>VS-48UHD</b>	4x8	4x8	8	2	8x2

The **UHD Matrix Switcher** provides exceptional quality, advanced and user-friendly operation, and flexible control.

## Exceptional Quality

- Max. data rate – 8.91Gbps data rate (2.97Gbps per graphics channel).
- Max. resolution – Up to 4K@60Hz UHD (4:2:0).
- Step-in over HDMI technology.
- HDMI, HDCP and DVI Compliance.
- HDMI support – Deep color, 3D, ARC, up to 7.1 uncompressed audio channels.
- Kramer reKlocking™ and equalization technology – rebuilds the digital signal to travel longer distances.

## Advanced and User-friendly Operation

- Automatic input selection – Based on priority selection or last connected input.
- Embedded pattern generator (480p) – With selectable patterns.
- Selectable HDCP per input.
- Memory locations – Up to 16 definable presets for quick access to common configurations.
- Advanced EDID management per input.
- Active source and acceptor detection.
- Easy front-panel operation.
- Selectable switching speed.
- Lock button to prevent tampering.
- Kramer protocol 3000 support.
- Firmware upgrade via mini USB, Ethernet or the RS-232 port.
- Control Options – RS-232 serial commands transmitted by a PC, touch screen system or other serial controller, Ethernet port via LAN.
- 7-segment display, indicating the video and audio status and other functions.
- Audio breakaway and AFV (audio-follow-video) operation support.
- Efficient power-saving features.
- Includes non-volatile memory that retains the last settings, after switching the power off and then on again.

## Flexible Connectivity

- HDMI signal switching.
- Independent Audio Matrix – Embedded digital inputs + ARC inputs to digital outputs + ARC outputs.
- Optional ARC from HDMI outputs to all odd-numbered HDMI inputs.
- Housed in a 19" 1U rack mountable enclosure, with rack ears included, and is fed from a 100-240 VAC universal switching power supply.

---

## Typical Applications

The **UHD Matrix Switcher** is ideal for the following typical applications:

- Control rooms with multiple displays.
- Presentation and multimedia applications.
- Systems that require automatic HDMI routing.

---

## Controlling your VS-88UHD

Control your **UHD Matrix Switcher** directly via the front panel push buttons, 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 web pages.

# Defining the UHD Matrix Switcher

This section defines the VS-88UHD, VS-66UHD, VS-84UHD and VS-48UHD.

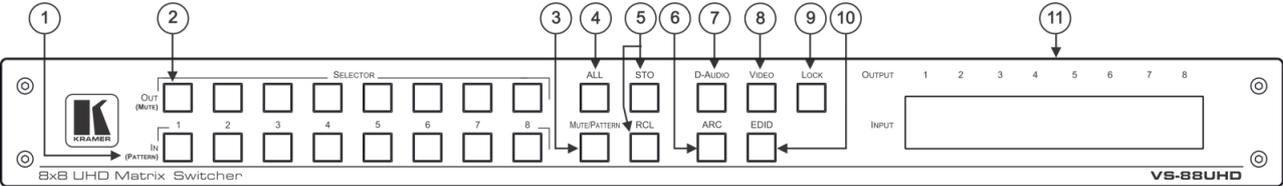


Figure 1: VS-88UHD 8x8 UHD Matrix Switcher Front Panel

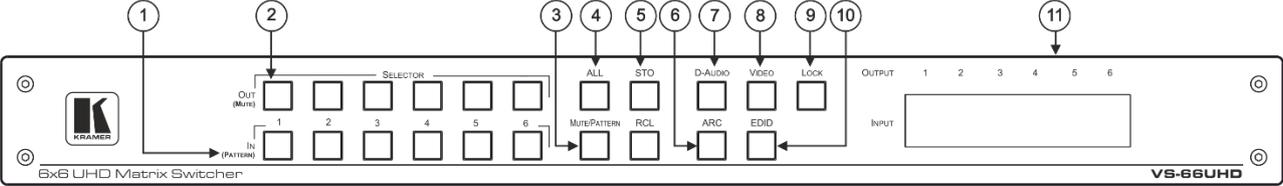


Figure 2: VS-66UHD 6x6 UHD Matrix Switcher Front Panel

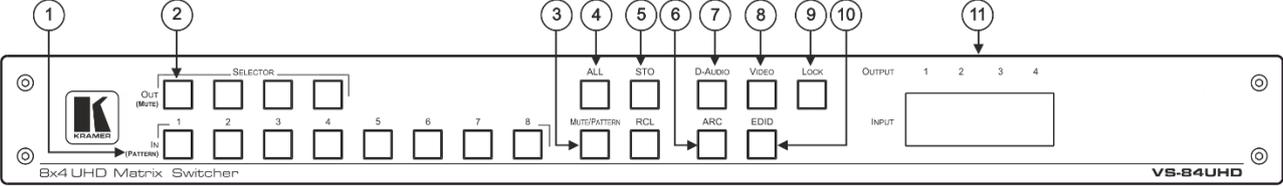


Figure 3: VS-84UHD 8x4 UHD Matrix Switcher Front Panel

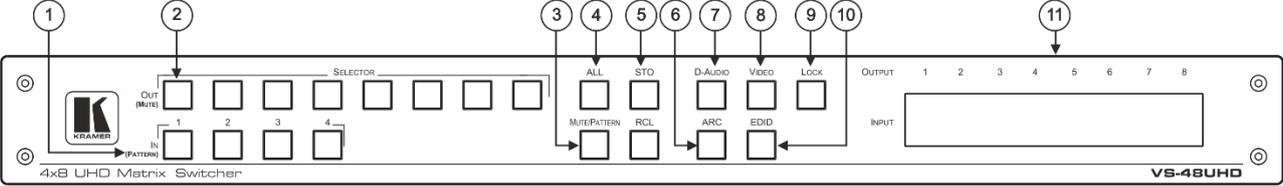


Figure 4: VS-48UHD 4x8 UHD Matrix Switcher Front Panel

#	Feature	Function
	The behavior of the front panel buttons and the 7-segment display changes along with the operation modes. For further details see <a href="#">Operating VS-88UHD via Front Panel Buttons</a> on page <a href="#">Error! Unknown switch argument.</a>	
①	IN (PATTERN) SELECTOR Buttons	Press to select the input to switch to the output that was previously selected (also used for storing machine setups in the STO-RCL modes and for selecting a pattern in the Pattern mode). In the ARC mode, inputs 1, 3, 5 and 7 can operate as audio outputs (see <a href="#">Operating in ARC Mode</a> on page <a href="#">Error! Unknown switch argument.</a> ).
②	OUT (MUTE) SELECTOR Buttons	Press to select an output to which the input is routed. Also used for storing machine presets. In the ARC mode, each output can operate as an audio input (see <a href="#">Operating in ARC Mode</a> on page <a href="#">Error! Unknown switch argument.</a> ).
③	MUTE/PATTERN Button	Press to view the current pattern status and select the output/s to which a pattern is routed. Press to mute audio or video on a selected output when D-AUDIO and/or VIDEO buttons are pressed (lit).
④	ALL Button	Press to perform an action on all outputs (for example setting Mute mode, Pattern mode and so on). For switching, press ALL and then a specific IN button to route the selected input to all outputs. For example, press ALL and then IN 2 to route input 2 to all the outputs.
⑤	STO and RCL Buttons	Press STO to store the current switching setting to a preset button. Press RCL to recall the switching setting from a preset button.
⑥	ARC Button	Press to set ARC mode on the inputs (see <a href="#">Operating in ARC Mode</a> on page <a href="#">Error! Unknown switch argument.</a> ).
⑦	D-AUDIO Button	Press to enable digital audio routing. When pressed together with VIDEO, the digital audio is routed together with the video signal.
⑧	VIDEO Button	Press to select video inputs. When pressed together with D-AUDIO, video is switched together with audio.
⑨	LOCK Button	Press and hold (for about 3 seconds) to toggle locking/releasing of the front panel buttons. Press to save the following setups: HDCP (On/Off), ARC, Fast Switch and Switch mode.
⑩	EDID Button	Press to capture the EDID.
⑪	OUTPUT/INPUT 7-segment LED Display	Displays the selected inputs switched to the outputs (marked above each input).

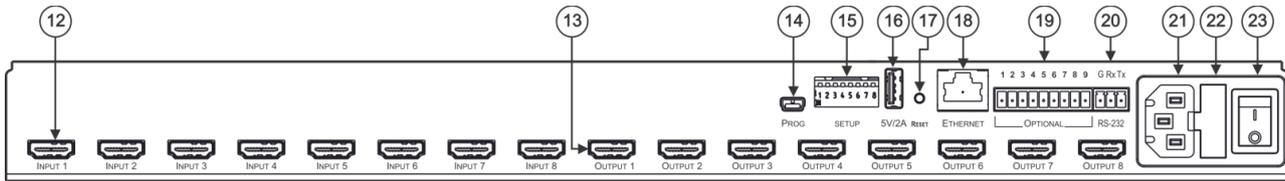


Figure 5: VS-88UHD 8x8 UHD Matrix Switcher Rear Panel

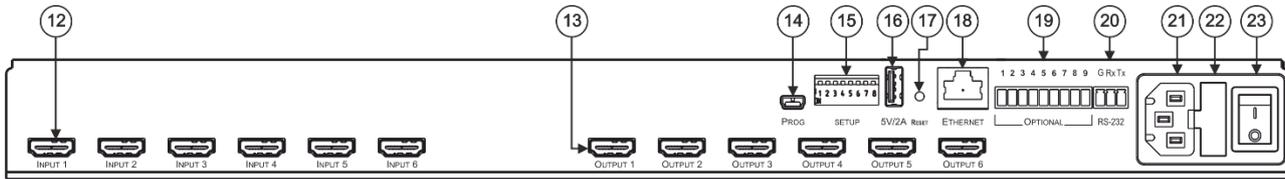


Figure 6: VS-66UHD 6x6 UHD Matrix Switcher Rear Panel

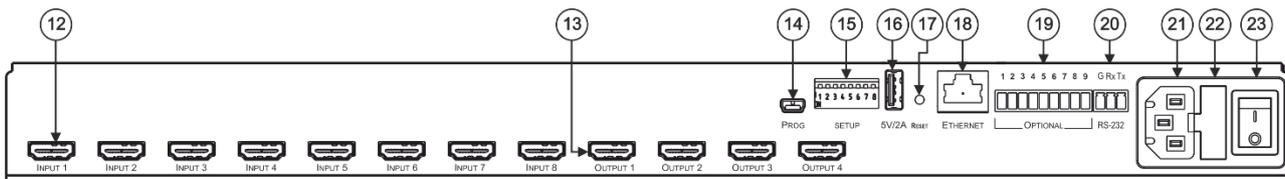


Figure 7: VS-84UHD 8x4 UHD Matrix Switcher Rear Panel

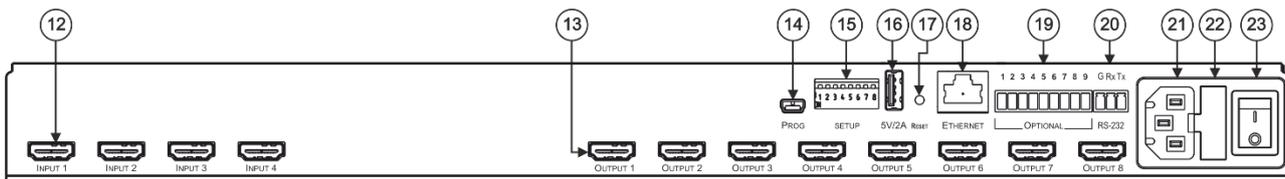


Figure 8: VS-48UHD 4x8 UHD Matrix Switcher Rear Panel

#	Feature	Function
12	INPUT HDMI™ Connector	Connect to the HDMI source.
13	OUTPUT HDMI™ Connectors	Connect to HDMI acceptors.
14	PROG Mini USB Port	Use for firmware upgrade or communication (connecting to a PC or a serial controller).
15	SETUP DIP-Switches	N/A
16	5V/2A USB Port	Use to charge a device.
17	Reset Button	Press and hold while powering the device to reset IP settings to factory default values.
18	ETHERNET RJ-45 Port	Connect to your LAN.
19	OPTIONAL Terminal Block Connectors	N/A
20	RS-232 3-pin Terminal Block Connectors	Connect to a PC or a serial controller.
21	Mains Power Connector	Connect to the mains power.
22	Mains Power Fuse	Fuse for protecting the device.
23	Mains Power Switch	Switch for turning the device on or off.

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

# Mounting VS-88UHD

This section provides instructions for mounting **VS-88UHD**. 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.



- **VS-88UHD** must be placed upright in the correct horizontal position.

## Caution:



- Mount **VS-88UHD** before connecting any cables or power.

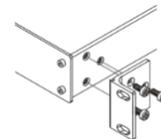
## Warning:



- 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 VS-88UHD on a rack

Attach both rack ears by removing the screws from each side of the machine and replacing those screws through the rack ears or place the machine on a table.



For more information go to [www.kramerav.com/downloads/VS-88UHD](http://www.kramerav.com/downloads/VS-88UHD)

# Connecting the VS-88UHD

-  Although this user manual describes the **VS-88UHD** only, it applies also to **VS-66UHD**, **VS-84UHD** and **VS-48UHD** except for the number of inputs and outputs per device.
-  Always switch off the power to each device before connecting it to your **VS-88UHD**. After connecting your **VS-88UHD**, connect its power and then switch on the power to each device.
-  Although this connecting example shows only several inputs and outputs that are connected, you can connect all the inputs and outputs simultaneously.

To connect the VS-88UHD as illustrated in the example in [Figure 9](#), do the following:

1. Connect up to eight video sources to the inputs <sup>(12)</sup> (from INPUT1 to INPUT 8). For example, connect:
  - Laptops to INPUT 1, 3, 4 and 8 HDMI connectors.
  - Blu-ray players to the INPUT 2 and INPUT 6 HDMI connectors.
2. Connect the eight video HDMI outputs <sup>(13)</sup> (from OUTPUT 1 to OUTPUT 8) to up to eight acceptors. For example, connect:
  - OUTPUT 1, 6 and 8 connectors to projectors.
  - OUTPUT 2, 4, 5 and 7 connectors to OLED displays.
3. Connect the power cord.  
We recommend that you use only the power cord that is supplied with this machine.
4. If required, connect:
  - The 5V/2A USB port <sup>(16)</sup> to the USB port of another device to charge it.
  - The ETHERNET port <sup>(18)</sup> to a control device.

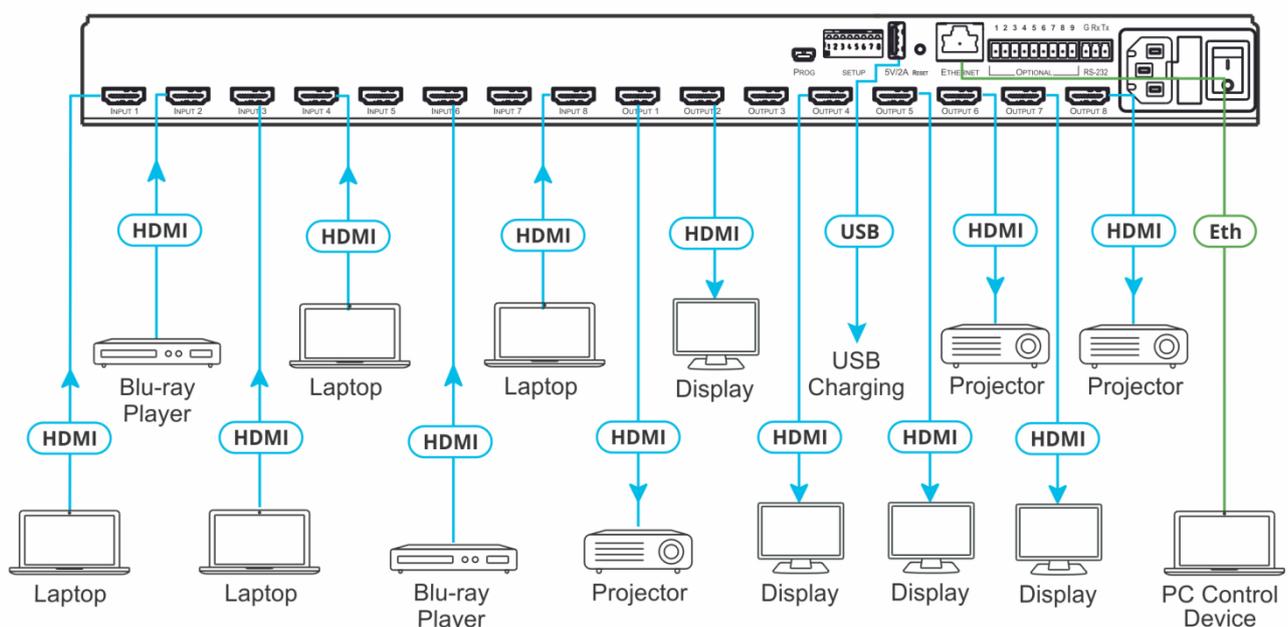


Figure 9: Connecting to the VS-88UHD Rear Panel

---

## Connecting to VS-88UHD via RS-232

You can connect to the VS-88UHD via an RS-232 connection <sup>(20)</sup> using, for example, a PC.

To connect to the VS-88UHD via RS-232:

- Connect the RS-232 rear panel port on the VS-88UHD unit via a 9-wire straight cable (only Tx to pin 2, Rx to pin 3, and G to pin 5 need to be connected) to the RS-232 9-pin D-sub port on your PC.

---

## Connecting VS-88UHD via the ETHERNET Port

You can connect to the VS-88UHD via Ethernet using either of the following methods:

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



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

## Connecting the Ethernet Port Directly to a PC

You can connect the Ethernet port of the VS-88UHD 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 VS-88UHD with the factory configured default IP address.

After connecting the VS-88UHD to the Ethernet port, configure your PC as follows: compatible

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 10](#).

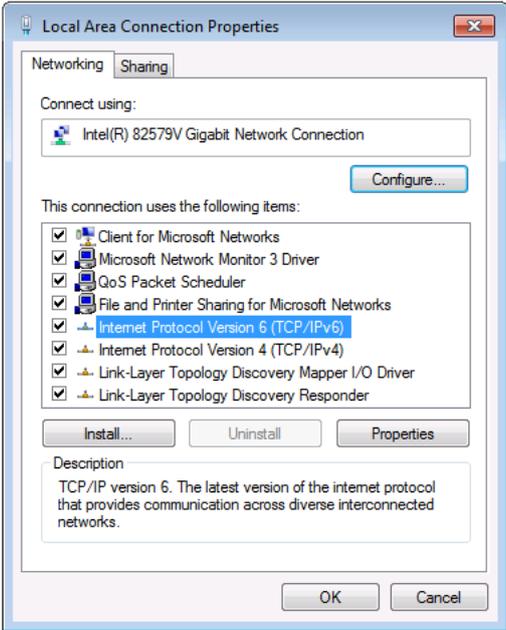


Figure 10: Local Area Connection Properties Window

- 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 11](#) or [Figure 12](#).

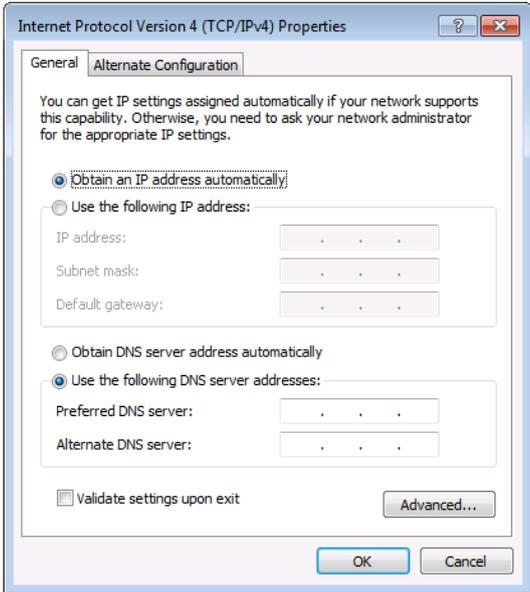


Figure 11: Internet Protocol Version 4 Properties Window

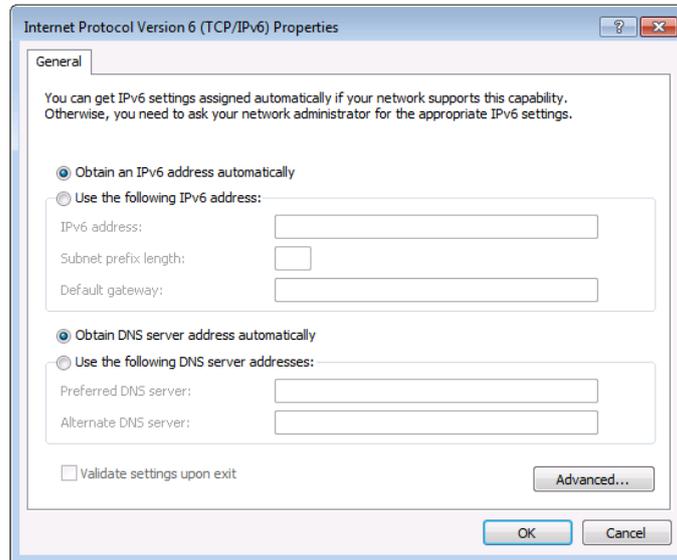


Figure 12: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in [Figure 13](#).

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

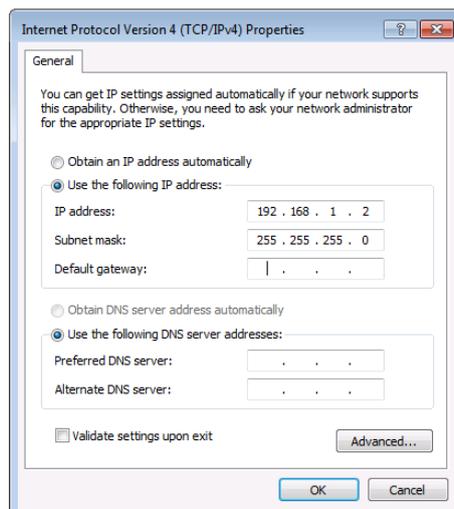


Figure 13: Internet Protocol Properties Window

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

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

You can connect the Ethernet port of the VS-88UHD to the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

## Control Configuration via the Ethernet Port

To control several units via Ethernet, connect the Master unit (Device 1) via the Ethernet port to the Ethernet port of your PC. Use your PC provide initial configuration of the settings (see [Connecting VS-88UHD via the ETHERNET Port](#) on page [Error! Unknown switch argument.](#)).

# Operating VS-88UHD via Front Panel Buttons

Press the power switch (23) to power the device. During the 10-second initialization process, the:

- 7-segment display LEDs (11) are on.
- All the front panel buttons illuminate.
- The FPGA/EPLD version (P), the firmware version (F) and the build version (b) appear in succession.

Following initialization, the front panel buttons and 7-segment display enter normal operation:

- The 7-segment display shows the video IN-OUT status.
- The current operation mode button illuminates (**VIDEO**, by default).
- An illuminated **IN (PATTERN)** button (1) indicates an active signal connected to the input.
- An illuminated **OUT (MUTE)** button (2) indicates that an acceptor is connected to the output.

The VS-88UHD front panel buttons enable performing the following functions:

- [Routing the Signals](#) on page [Error! Unknown switch argument.](#)
- [Storing and Recalling a Setup](#) on page [Error! Unknown switch argument.](#)
- [Setting the Switching Mode](#) on page [Error! Unknown switch argument.](#)
- [Setting the Switching Speed](#) on page [Error! Unknown switch argument.](#)
- [Setting HDCP](#) on page [Error! Unknown switch argument.](#)
- [Copying the EDID](#) on page [Error! Unknown switch argument.](#)

---

## Routing the Signals

You can switch the video and the embedded audio signals together (AFV), or switch them separately, via the following switching modes:

- [Switching the Video and the Audio Signal Simultaneously](#) on page [14](#).
- [Switching the Video Signal](#) on page [14](#).
- [Routing an Audio Input to the HDMI Output](#) on page [15](#).
- [Operating in ARC Mode](#) on page [16](#).
- [Muting/Unmuting an Output](#) on page [20](#).
- [Routing a Pattern to the Output](#) on page [20](#).

## Switching the Video and the Audio Signal Simultaneously

You can select the digital audio signal to switch to the output together with the video signal.

**To switch the audio and video signals together to an output:**

1. Press **D-AUDIO** and **VIDEO** simultaneously.  
The button illuminates and the 7-segment display <sup>(11)</sup> shows the current IN-OUT video status.
2. Press an **OUT (MUTE)** <sup>(2)</sup> button (1 to 8).  
The 7-segment display LED, under the selected output, flashes.



Press **ALL** <sup>(4)</sup> (instead of an output button) to route the selected input to all the outputs. All the 7-segment display LEDs flash.

3. Press an **IN (PATTERN)** button (1 to 8).  
The selected video and audio input is switched to the selected output (or to all the outputs if **ALL** was pressed instead) and the 7-segment display shows the current status.

## Switching the Video Signal

The **VIDEO** button on the **VS-88UHD** front panel enables video routing.

**To switch a video input to an output:**

1. Press **VIDEO** <sup>(8)</sup>.  
The button illuminates and the 7-segment display <sup>(11)</sup> shows the current IN-OUT video status.



On the front panel buttons:

- An illuminated input button means that an active signal is detected on that input.
- An illuminated output button means that a display is connected to that output.
- A flashing output button means that a non-HDCP display is connected to that output.

Note that in case an HDCP-encrypted input is routed through the matrix to a non-HDCP screen, the video will not be presented and the non-HDCP screen will turn black.

On the 7-segment display:

- A digit (from 1 to 8) shows the input number that is currently routed to the output.
- “P” under an output number indicates that a pattern is routed to that output.
- “0” under an output number indicates that the output is muted.

2. Press an **OUT (MUTE)** <sup>(2)</sup> button (1 to 8).  
The 7-segment display LED, under the selected output, flashes.



Press **ALL** <sup>(4)</sup> (instead of an output button) to route the selected input to all the outputs. All the 7-segment display LEDs flash.

3. Press an **IN (PATTERN)** button (1 to 8).  
The selected input is switched to the selected output (or to all the outputs if **ALL** was pressed instead) and the 7-segment display shows the current status.

## Routing an Audio Input to the HDMI Output

The **D-AUDIO** (7) button on the **VS-88UHD** front panel enables to route the HDMI embedded audio input signals (12) to the HDMI outputs (13).

Generally, digital routing is enabled by pressing **D-AUDIO**:

- When it is illuminated, the HDMI input embedded audio is the audio source.

**To switch an HDMI audio input to an output:**

1. Press **D-AUDIO** (7).

The button illuminates (HDMI audio input to HDMI output mode) and the 7-segment display (11) shows the current IN-OUT digital audio status.



On the front panel buttons:

- An illuminated input button means that an active digital audio signal is detected on that input that supports LPCM audio.
- A dark input button means that there is no active digital audio source on that input (or that the source is DVI).
- A flashing input button means that a Dolby digital audio, Dolby-TrueHD audio, or AC-3 audio signal from a DVD player is detected on that input.
- An illuminated output button means that a display that supports LPCM audio is connected to that output.
- A dark button means either that the display that is connected does not support audio or that a display is not connected at all.
- A flashing output button means that a display is connected that supports LPCM, Dolby digital, AC-3 and NLPCM audio.

On the 7-segment display:

- "0" under an output number indicates that the audio output is muted.
- "." under an output number indicates that the HDMI output port is in ARC mode.
- Any digit shows the HDMI audio input switching state.

2. While **D-AUDIO** is on, select an output button (for example, 6) and then an input button (for example, 5). HDMI audio input 5 is routed to HDMI audio output 6 and on the 7-segment display, INPUT 5 appears under OUTPUT 6.

When switching you can also press:

- An output button (1 to 8) and then **OUT (MUTE)** (2) to mute the selected output (turns 0).
- **ALL** (4) (instead of an output button) and then an input button to route the selected input to all the outputs.  
All the 7-segment display LEDs flash and then display the selected input.

## Operating in ARC Mode

In ARC mode you can route the audio signal of the connected output to an input that is connected to an audio system (for example, a power amplifier).

ARC (Audio Return Channel) can be set via the front panel buttons and the embedded webpages (see [Switching Audio in Breakaway Mode](#) on page [Error! Unknown switch argument.](#) and [Setting Inputs 1, 3, 5 and 7](#) on page [Error! Unknown switch argument.](#)).

The following table defines the number of ARC-enabled inputs per device:

Device Name	ARC-Enabled Inputs
VS-88UHD	1, 3, 5 and 7
VS-66UHD	1, 3, and 5
VS-84UHD	1, 3, 5 and 7
VS-48UHD	1 and 3

The following operations are required for setting the ARC mode

- Making sure that the acceptor on the output side has ARC capabilities (follow the manufacturer's instructions).
- [ARC-Enabling the outputs](#) on page [16](#).
- [Enabling the ARC Input](#) on page [17](#).
- [Routing the Output ARC Audio Signal to an Input](#) on page [18](#).

### ARC-Enabling the outputs

You can enable the input to accept the audio output signal, by ARC-enabling the outputs on the device via the embedded web pages (see [Switching Audio in Breakaway Mode](#) on page [Error! Unknown switch argument.](#) for further reference).



ARC outputs can be enabled or disabled at any time, whether a display is connected to the HDMI output or not.

#### To ARC-Enable an HDMI output:

1. In the Navigation pane, click **Switching**. The Switching page appears.
2. Select **Audio break away** tab.
3. Check the ARC check boxes (under the **Audio Outputs** column) to enable the device to accept audio signals from the selected outputs.  
When in the ARC mode, the output buttons of the selected outputs illuminate.

For example, Output 1, 6, 7 and 8 are checked, therefore they are ARC-enabled so they can receive ARC signals from their connected acceptors.

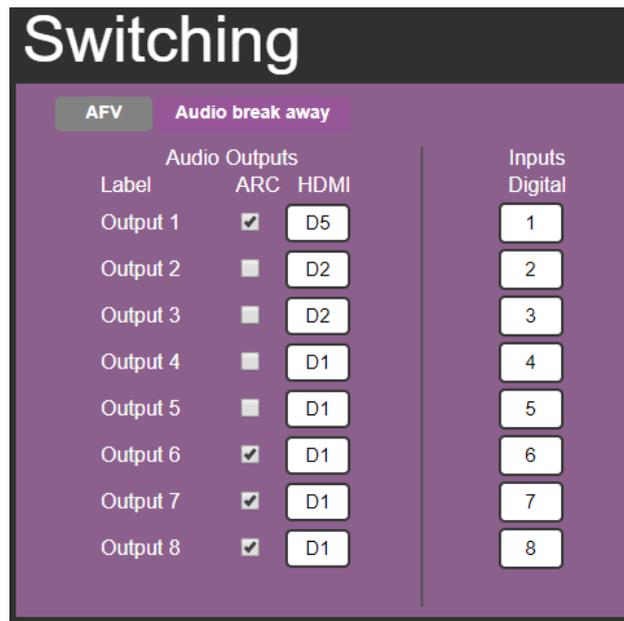


Figure 14: Switching Page –ARC-Enabled Outputs

### Enabling the ARC Input

Inputs 1, 3, 5 and 7 can be configured to accept ARC signals. When ARC-enabled you can select the audio output source (see [Setting Inputs 1, 3, 5 and 7](#) on page 32 for further reference).

#### To configure the ARC input:

1. In the Navigation pane, click **Switching**. The Switching page appears.
2. Click  on Input button 1, 3, 5 and/or 7. input settings window appears:

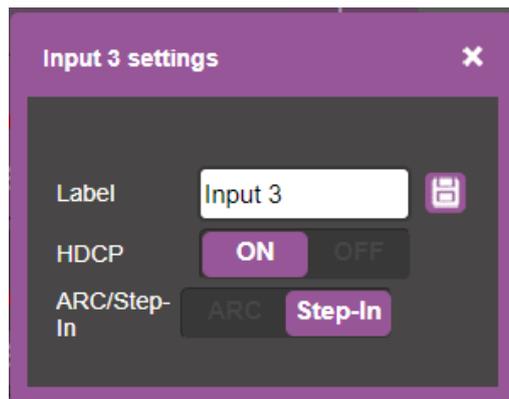


Figure 15: Switching Page – Input 3 Settings Window

3. Click **ARC** to set the input to ARC mode.

## Routing the Output ARC Audio Signal to an Input

After ARC-enabling both the input and the output, you can route the audio output to the input either via the embedded web pages or via the front panel buttons.

The following examples show how the output 6 ARC audio signal is routed to input 3, as illustrated in [Figure 16](#):

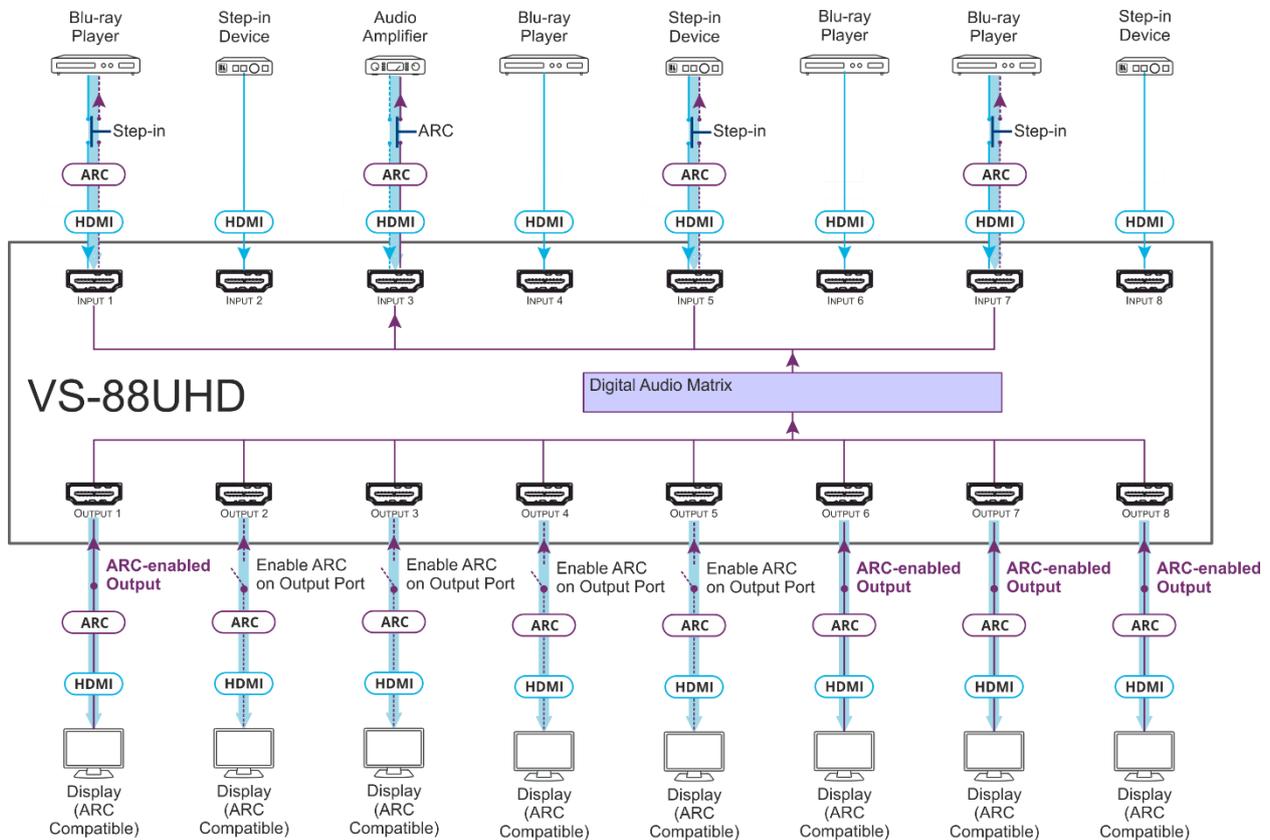


Figure 16: ARC Audio Routing Example

To route the audio signal from the output to the input via the embedded web pages:

1. In the Navigation pane, click **Switching**. The Switching page appears.
2. Click  on an Input button (for example, 3).  
 You can select 1, 3, 5 and/or 7.
3. In ARC mode click  (the settings button).  
 The input ARC Settings window appears (by-default the output source is set to output 1):

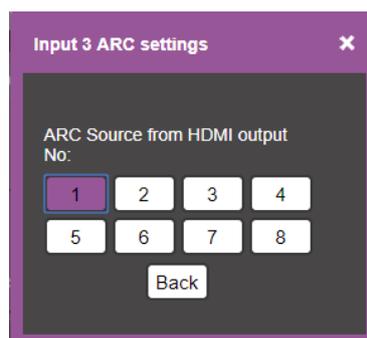


Figure 17: Input 3 ARC Settings

- Select the desired HDMI output (for example, 6).

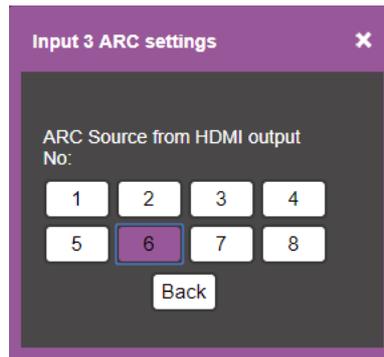


Figure 18: Select ARC Output Source

- Click **X** to close the window.

Output 6 is set to be the ARC source for input 3.

- i** Note that output 6 also needs to be checked in the Audio break away window for it to pass through to input 3 in this example.

#### To route the audio signal from the output to the input via the front panel buttons:

- Press **ARC** **6** until it illuminates, and the device enters ARC mode:

- i** On the front panel, an ARC enabled input button:
- Flashes when that input is set to ARC mode.
  - Illuminates when that button is not in ARC mode (and is set to Step-in mode).

On the front panel, an ARC enabled output button:

- illuminates when set to ARC mode.

- Press a flashing input button (for example, input 3)  
The corresponding 7-segment display LED flashes.
- Press an illuminated output button (for example, output 6).  
The flashing 7-segment display LED shows the selected input number and after selecting the HDMI audio OUT the port number appears (6).

- i** On the 7-segment display:
- “.” under an output number (when in D-AUDIO mode) indicates that arc is enabled on the corresponding output (outputs 1 and 6 to 8 in this example).
  - “0” under an output number indicates that the audio output is muted.

- i** Note that output 6 also needs to be checked in the Audio break away window for it to pass through to input 3 in this example.

HDMI OUT 8 ARC audio signal is routed to ARC input 3.

- Exit ARC mode by pressing **D-AUDIO** **7** or **VIDEO** **8** buttons.

## Muting/Unmuting an Output

You can mute/unmute an audio signal and a video signal separately.

### To mute/unmute an audio signal:

1. Press **A-AUDIO** or **D-AUDIO**.  
The buttons illuminate.
2. Press an **OUT (MUTE)** (2) button (1 to 8).

 Press **ALL** (4) (instead of an output button) to mute/unmute all the outputs. All the 7-segment display LEDs flash.

3. Press **MUTE/PATTERN** (3) to mute/unmute the output.  
The muted output appears as “0” on the 7-segment display.

### To mute/unmute a video signal:

1. Press **VIDEO**.  
The button illuminates and the 7-segment display (11) shows the current IN-OUT video status.
2. Press an **OUT (MUTE)** (2) button (1 to 8).  
The 7-segment display LED, under the selected output, flashes.

 Press **ALL** (4) (instead of an output button) to mute/unmute all the outputs. All the 7-segment display LEDs flash.

3. Press **MUTE/PATTERN** (3) to mute/unmute the output.  
The muted output appears as “0” on the 7-segment display.

## Routing a Pattern to the Output

The **UHD Matrix Switcher** generates 8 embedded patterns. These patterns can be routed at a resolution of 480p to any of the outputs:

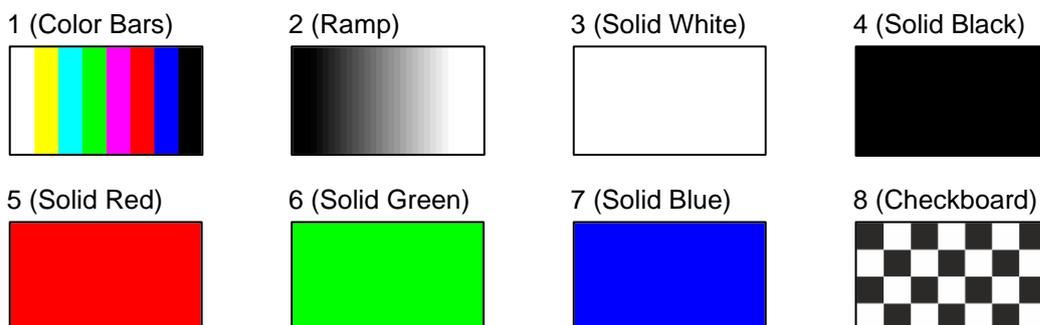


Figure 19: VS-88UHD and VS-84UHD Embedded Patterns

 Once a pattern is selected, that same pattern is routed to all the selected outputs.

## VS-88UHD and VS-84UHD

A pattern is selected by pressing inputs 1 to 8 when in the Pattern mode.

### To route a pattern on the VS-88UHD and VS-84UHD:

1. Press **MUTE/PATTERN** ③.



On the front panel buttons:

- An illuminated output button means that a display is connected on that output.
- An illuminated input button indicates the current pattern selected.

On the 7-segment display:

- “P” under an output number indicates that a pattern is routed to that output.
- “-” under an output number indicates that a video input is routed to that output.
- “0” under an output number indicates that the output is muted.

2. Press an **OUT (MUTE)** ② button (1 to 8/4).  
The 7-segment display LED, under the selected output, flashes.



Press **ALL** ④ (instead of an output button) to route a pattern to all the outputs. All the 7-segment display LEDs flash.

3. Press an input button to select a pattern (see [Figure 19](#)).  
The 7-segment display shows the new pattern status.



Press **VIDEO** or **D-AUDIO** to exit pattern mode.

## VS-48UHD

A pattern is selected by pressing inputs 1 to 4 when in the Pattern mode as follows:

- When **MUTE/PATTERN** ③ is illuminated, press IN1 for pattern 1, IN 2 for pattern 2, IN 3 for pattern 3 and IN 4 for pattern 4.
- When **MUTE/PATTERN** ③ flashes, press IN1 for pattern 5, IN 2 for pattern 6, IN 3 for pattern 7 and IN 4 for pattern 8.

### To route a pattern on the VS-48UHD:

1. Press **MUTE/PATTERN** ③.
  - Once: button illuminates, press IN 1 to IN 4 to select patterns 1 to 4.
  - Twice: button flashes, press IN 1 to IN 4 to select patterns 5 to 8.



On the front panel buttons:

- An illuminated output button means that a display is connected on that output.
- An illuminated input button indicates the current pattern selected.

On the 7-segment display:

- “P” under an output number indicates that a pattern is routed to that output.
- “-” under an output number indicates that a video input is routed to that output.
- “0” under an output number indicates that the output is muted.

2. Press an **OUT (MUTE)** ② button (1 to 8).

The 7-segment display LED, under the selected output, flashes.



Press **ALL** ④ (instead of an output button) to route a pattern to all the outputs. All the 7-segment display LEDs flash.

3. Press an input button to select a pattern (see [Figure 19](#)).

The 7-segment display shows the new pattern status.



Press **VIDEO** or **D-AUDIO** to exit pattern mode.

## VS-66UHD

A pattern is selected by pressing inputs 1 to 6 when in the Pattern mode as follows:

- When **MUTE/PATTERN** ③ is illuminated, press IN1 for pattern 1, IN 2 for pattern 2, IN 3 for pattern 3, IN 4 for pattern 4, IN 5 for pattern 5 and IN 6 for pattern 6.
- When **MUTE/PATTERN** ③ flashes, press IN1 for pattern 7 and IN 2 for pattern 8.

### To route a pattern on the VS-66UHD:

1. Press **MUTE/PATTERN** ③.

- Once: button illuminates, press IN 1 to IN 6 to select patterns 1 to 6.
- Twice: button flashes, press IN 1 to IN 2 to select patterns 7 to 8.



On the front panel buttons:

- An illuminated output button means that a display is connected on that output.
- An illuminated input button indicates the current pattern selected.

On the 7-segment display:

- “P” under an output number indicates that a pattern is routed to that output.
- “-” under an output number indicates that a video input is routed to that output.
- “0” under an output number indicates that the output is muted.

2. Press an **OUT (MUTE)** ② button (1 to 6).

The 7-segment display LED, under the selected output, flashes.



Press **ALL** ④ (instead of an output button) to route a pattern to all the outputs. All the 7-segment display LEDs flash.

3. Press an input button to select a pattern (see [Figure 19](#)).

The 7-segment display shows the new pattern status.



Press **VIDEO** or **D-AUDIO** to exit pattern mode.

## Storing and Recalling a Setup

The number of setups that the **UHD Matrix Switcher** is the sum of the inputs and outputs of the device. For example, **VS-66UHD**, **VS-84UHD** and **VS-48UHD** can store/recall up to 12 setups, while **VS-88UHD** stores/recalls up to 16 setups.

 **VS-66UHD**, **VS-84UHD** and **VS-48UHD** can store/recall up to 16 setups via the protocol commands (see [System Commands](#) on page 66).

Each setup includes the video and audio current switching state, the EDID, the ARC/audio mode, and the switch mode and speed.

In Store-Recall mode, OUT 1 corresponds to setup 1, IN 1 corresponds to setup 9, and so on.

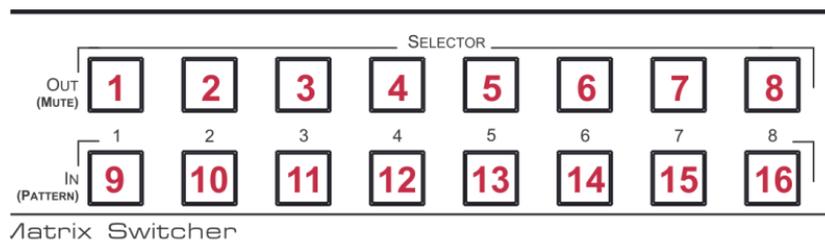


Figure 20: VS-88UHD 8x8 UHD Matrix Switcher Front Panel

### To store a setup:

1. Press **STO** .
 

The **STO** button illuminates.
2. Press an **IN** or an **OUT** button (from 1 to 8).
 

For example, when pressing IN 5, the current device state is stored to setup 13.
3. Press **STO**.
 

The current device state is stored to setup 13 and the **STO** button no longer illuminates.

### To recall a setup:

1. Press **RCL** .
 

The **RCL** button illuminates.
2. Press an **IN** or **OUT** button to recall the setup stored in that IN/OUT.
 

The selected button flashes.

 If a setup is stored in the selected setup button, the corresponding 7-segment display LED flashes. If nothing is stored the 7-segment LED is on.

3. Press **RCL**.
 

The recalled setup is applied and the **RCL** button no longer illuminates.

 Press **RCL** within 15 seconds to apply settings. Otherwise, action times out.

---

## Setting the Switching Mode

Set the following switching modes separately for each output:

- Manual mode (**IN 1**): inputs are switched to outputs via the front panel buttons.
- Priority mode (**IN 2**): the **VS-88UHD** switches the source with the highest priority to the output.
- Last connected mode (**IN 3**): the last detected active source is switched to the output.

**To select the switching mode:**

1. Press **RCL** and **MUTE/PATTERN** simultaneously. Both buttons illuminate.
2. Press an output button (or press **ALL**).  
The corresponding 7-segment display LEDs flash and **LOCK** button flashes.
3. Press **IN 1**, **IN 2** or **IN 3**.
4. Press **LOCK** to save the settings to that output and exit Switching mode.

---

## Setting the Switching Speed

Set the following switching speed modes separately for each output:

- Extra-Fast switch speed (**IN 1**).
- Fast switch speed (**IN 2**).
- Normal switch speed (**IN 3**).

**To select the switching speed:**

1. Press **STO** and **MUTE/PATTERN** simultaneously. Both buttons illuminate.  
The 7-segment display LEDs show the current switch speed for each port.
2. Press an output button (or press **ALL**).  
The corresponding 7-segment display LEDs flash and **LOCK** button flashes.
3. Press **IN 1**, **IN 2** or **IN 3**.
4. Press **LOCK** to save the settings and exit Speed mode.

---

## Setting HDCP

You can enable or disable HDCP for each of the HDMI inputs.

**To set HDCP on or off:**

1. Press and hold **EDID** and **RCL** until both buttons illuminate.  
The IN buttons indicate the HDCP status:
  - HDCP enabled (on): IN button is illuminated.
  - HDCP disabled (off): IN button is off.

2. Press one or more input buttons to change their status.  
The **LOCK** button flashes.
3. Press **LOCK** to save changes and exit the HDCP mode.

---

## Copying the EDID

You can copy the EDID to an input from a connected output or use the default EDID.

### To copy the EDID from a connected output:

1. Press and hold **EDID** and **STO** until both buttons illuminate.  
**VS-88UHD** enters the EDID mode and the 7-segment display shows the current EDID status:



On the front panel button:

Both input and output buttons are dark.

On the 7-segment display:

“**d**” under an output number indicates that the input port is set to the default EDID.

“**L**” under an output number indicates that the EDID was uploaded externally from a file via Web page.

A digit under an output number indicates the output from which the EDID was copied.

2. Press one or more input buttons (or **ALL**).  
The 7-segment display LEDs of the selected inputs flash.
3. Press the output button (with a connected display) corresponding to the output from which you want to copy the EDID.
4. Press **EDID**.  
Wait for about 5 seconds for the device to copy the EDID from the connected display.

### To copy the default EDID:

1. Press and hold **EDID** and **STO** until both buttons illuminate.  
**VS-88UHD** enters the EDID mode and the 7-segment display shows the current EDID status.
2. Press one or more input buttons (or **ALL**).  
The 7-segment display LEDs of the selected inputs flash.
3. Press a disconnected output button.
4. Press **EDID**.  
Wait for about 5 seconds for the device to copy the default EDID to the selected inputs.

# Firmware Upgrade

**You can upgrade the VS-88UHD via:**

- The Ethernet, using embedded Web pages.
- By USB or RS-232 using Kramer **K-UPLOAD** tool.



The latest firmware version and the latest version of **K-UPLOAD** and installation instructions can be downloaded from the Kramer Web site at [www.kramerav.com/downloads/VS-88UHD](http://www.kramerav.com/downloads/VS-88UHD).

# Using the Embedded Web Pages

The Web pages let you control the **VS-88UHD** via the Ethernet. The Web pages include all the OSD items and more and are accessed using a Web browser and an Ethernet connection.

Before attempting to connect:

- Perform the procedures described in [Connecting VS-88UHD via the ETHERNET Port](#) on page [Error! Unknown switch argument.](#)
- Ensure that your browser is supported.

The following operating systems and Web browsers are supported:

OS	Version	Browser
Windows	7	IE
		Firefox
		Chrome
		Safari
	10	IE
		Edge
		Firefox
		Chrome
Mac	10.11	Safari
iOS	10.3.2	Safari
Android	N/A	N/A

The **VS-88UHD** Web pages enable performing the following:

- [Switching and Setting the Ports](#) on page [Error! Unknown switch argument.](#)
- [Changing Device Settings and Upgrading the Firmware](#) on page [Error! Unknown switch argument.](#)
- [Managing Web Page Security](#) on page [Error! Unknown switch argument.](#)
- [Setting the Timeout](#) on page [Error! Unknown switch argument.](#)
- [If the video is lost when in the auto switching mode \(Priority or Last connected\) you can set the time the device waits before it switches to the next source.](#)
- [Setting Switching Modes](#) on page [Error! Unknown switch argument.](#)
- [Setting Step-in Devices](#) on page [Error! Unknown switch argument.](#)
- [Managing the EDID](#) on page [Error! Unknown switch argument.](#)
- [Viewing the About Page](#) on page [Error! Unknown switch argument.](#)

**To browse the VS-88UHD Web pages:**

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



The Authentication window appears (if set, security is enabled):

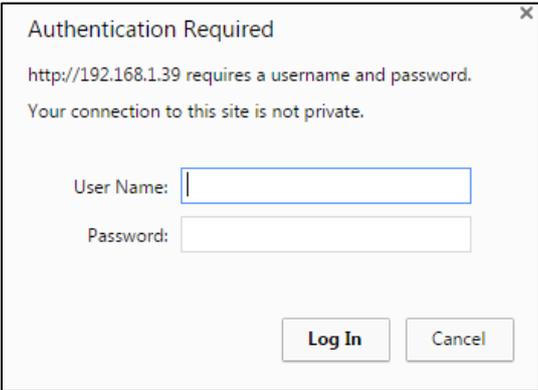


Figure 21: Using the Embedded Web Pages – the Authentication Window

- 3. Enter the **User Name** and **Password** and click **OK**.  
The Switching page appears:

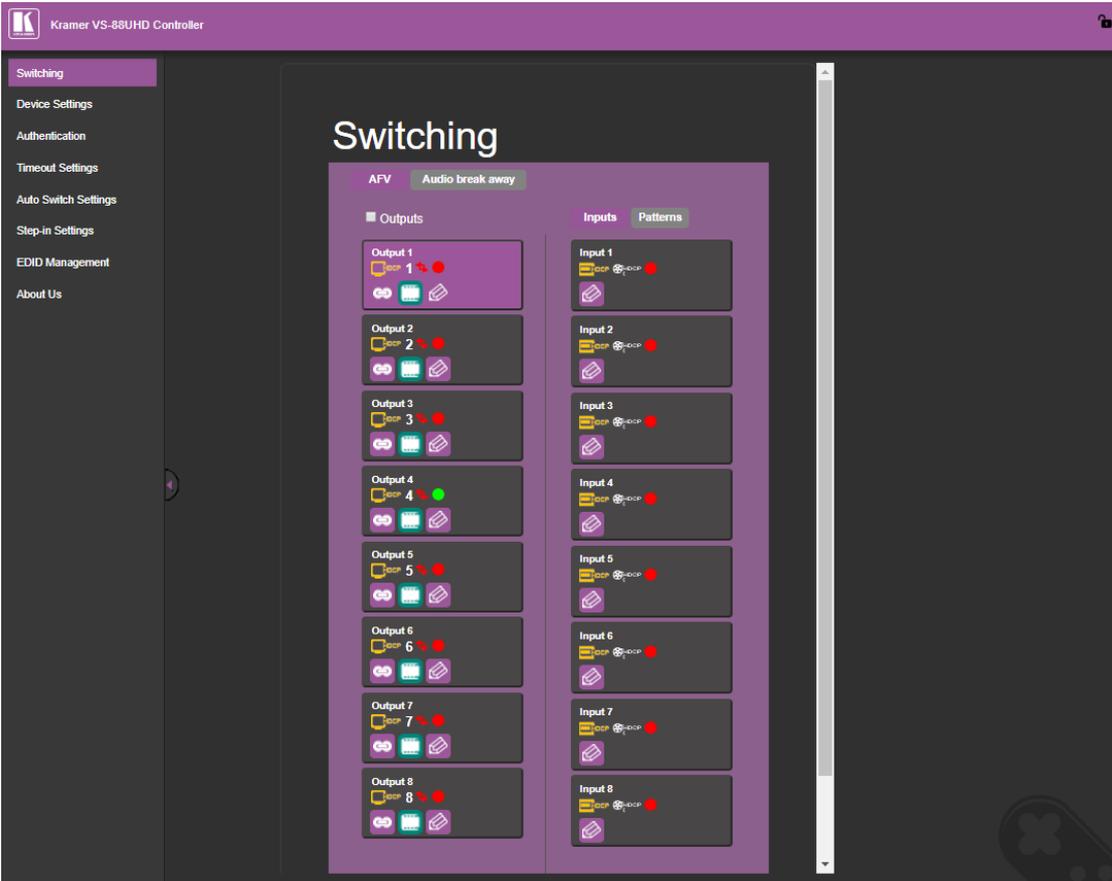


Figure 22: Switching Page with Navigation List on Left

- 4. Click the desired Web page or click the arrow to hide the navigation list.

## Switching and Setting the Ports

The Switching Web page enables performing the following functions:

- [Viewing and Adjusting the Output Settings](#) on page [Error! Unknown switch argument.](#)
- [Viewing and Adjusting the Input Settings](#) on page [Error! Unknown switch argument.](#)
- [Switching an input to an output](#) on page [Error! Unknown switch argument.](#)
- [Switching a Pattern to an Output](#) on page [Error! Unknown switch argument.](#)
- [Switching Audio in Breakaway Mode](#) on page [Error! Unknown switch argument.](#)

### Viewing and Adjusting the Output Settings

You can use the input/output buttons to view and adjust their status.

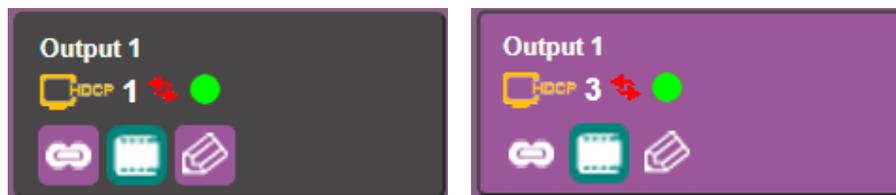


Figure 23: Switching Page – Output Button not selected and Selected

Each output button displays the:

- HDCP status – Output supports HDCP (🔒) or does not support HDCP (🔓).
- Output status – An acceptor is connected (🟢) or not connected (🔴) to the output.
- An input number indicating the input switched to the output (🔒 3 🟢), for example, Input 3 is switched to Output 1.
- Edit (📄) button for changing the:
  - Output name (Output 1).
  - Switching speed to normal (⚡), fast (⚡) or extra-fast (⚡).
- Video status – Click to change to mute (🔇) or unmute (🔊).
- Audio-follow-video status – Click to change to AFV (🔗) or audio breakaway (🔗).

To adjust the output settings:

1. In the Navigation pane, click **Switching**. The Switching page appears.
2. Select the **AFV** tab.



The adjustment sequence presented here is only an example. You can adjust the output settings in any other order.

3. Click . The output settings window appears:

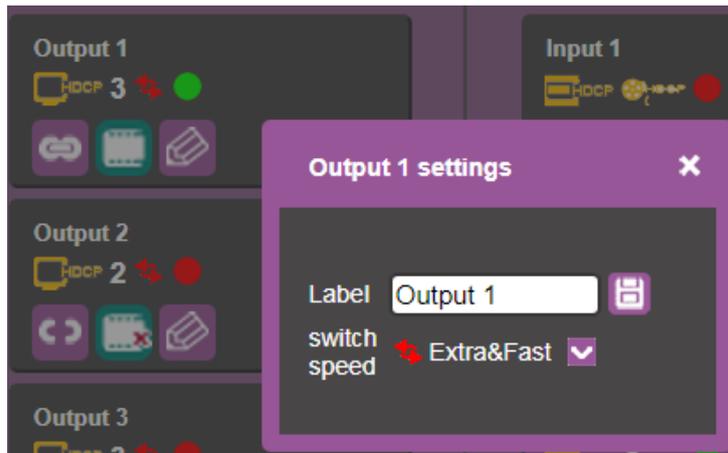


Figure 24: Switching Page – Editing the Output Button Settings

4. If required, type the label name in the **Label** text box and click .

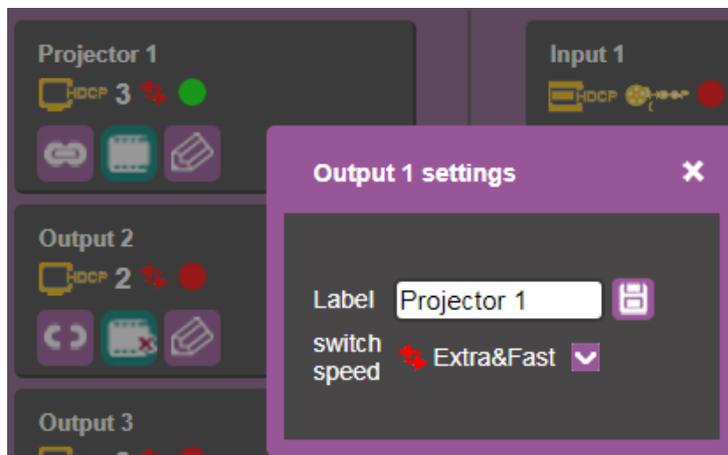


Figure 25: Switching Page – Changing the Output Label

5. Click **switch speed** dropdown box to set the switching speed (normal, fast or extra-fast).

6. Click  to mute or  to unmute the video signal.

7. To set the output to:

- AFV mode, click .
- Breakaway mode, click .

 indicates that the device is in the auto-switch mode and AFV status cannot be altered.



Setting the AFV mode icons to AFV or Breakaway modes reflects the next switching step and not the current status.

## Viewing and Adjusting the Input Settings

Use the **VS-88UHD** input buttons to view and adjust the status of that input/output.

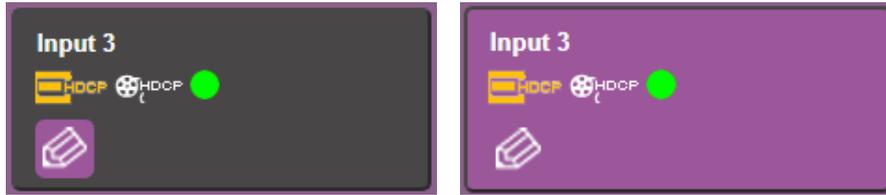


Figure 26: Switching Page – Input Button Not Selected and Selected

Each input button displays the:

- Input label.
- Input signal HDCP status – supports HDCP (HDCP icon) or does not support HDCP (HDCP icon).
- HDCP status – HDCP is enabled (HDCP icon) or disabled (HDCP icon).
- Input status – a source is connected (green circle) or not connected (red circle) to the input.

### Setting Inputs 2, 4, 6 and 8

Device Name	Relevant Inputs
VS-88UHD	2, 4, 6 and 8
VS-66UHD	2, 4, and 6
VS-84UHD	2, 4, 6 and 8
VS-48UHD	2 and 4

To adjust input 2, 4, 6 and 8 settings:

1. In the Navigation pane, click **Switching**. The Switching page appears.
2. Select the **AFV** tab. Verify that **Inputs** (and not **Patterns**) is selected.
3. Click . The input settings window appears:

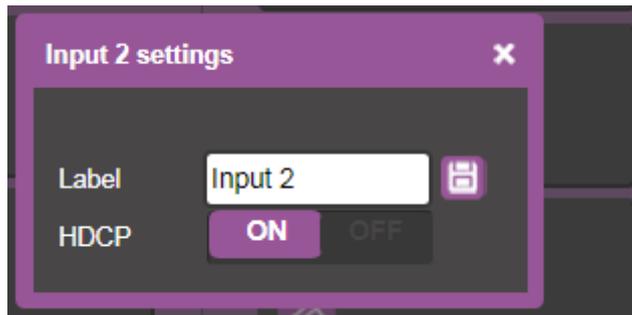


Figure 27: Switching Page – Input 2 Settings Window

4. If required, type the label name in the **Label** text box and click .
5. Set HDCP **ON** or **OFF**.

Setting Inputs 1, 3, 5 and 7

Device Name	Relevant Inputs
VS-88UHD	1, 3, 5 and 7
VS-66UHD	1, 3, and 5
VS-84UHD	1, 3, 5 and 7
VS-48UHD	1 and 3

To adjust input 1, 3, 5 and 7 settings:

1. In the Navigation pane, click **Switching**. The Switching page appears.
2. Select the **AFV** tab. Verify that **Inputs** (and not **Patterns**) is selected.
3. Click . The input settings window appears:

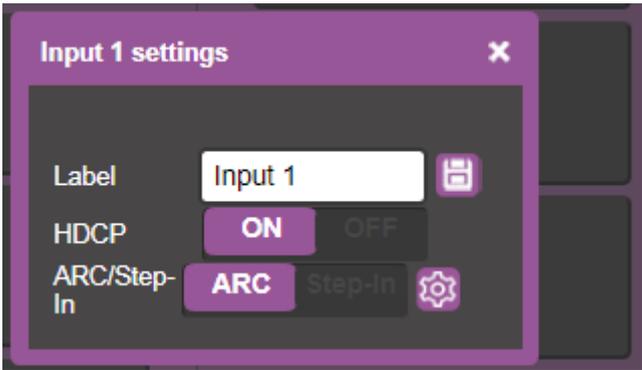


Figure 28: Switching Page – Input 1 Settings Window

4. If required, type the label name in the **Label** text box and click .
5. Set HDCP **ON** or **OFF**.
6. Click **ARC** to set the input to ARC mode or click **Step-in** to set input to step-in mode.
7. In ARC mode click the settings button ().  
The input ARC Settings window appears:

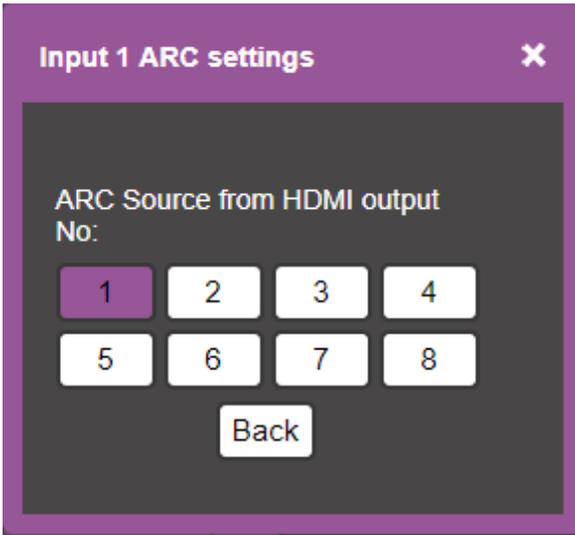


Figure 29: Switching Page – Input ARC Settings Window

8. Select an ARC source for input 1 from HDMI outputs 1 to 8.  
The selected output ARC signal routes its audio signal to HDMI input 1 (the default).

## Switching an input to an output

To move the image:

1. In the Navigation pane, click **Switching**. The Switching page appears.
2. Select the **AFV** tab.

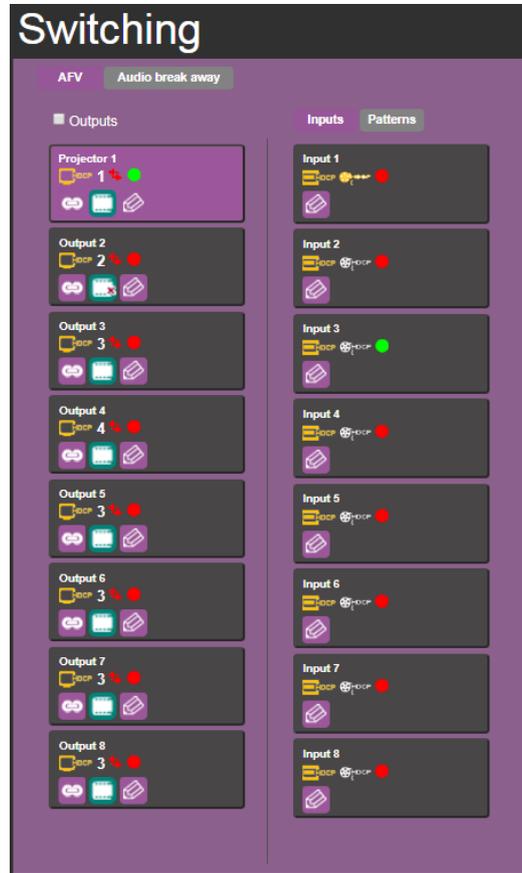


Figure 30: Switching Page – AFV Tab

3. Click an output button/s or check the **Outputs** box. The button turns purple.
4. Click an Input button. The input button turns purple.

The selected input is switched to the output.



Check the Outputs box ( Outputs) to select all the outputs. You can then select an input that will switch to all the outputs.

# Switching a Pattern to an Output

To switch a pattern to an output:

- 1. In the Navigation pane, click **Switching**. The Switching page appears.
- 2. Select the **AFV** tab. Verify that **Patterns** (and not **Inputs**) is selected. The list of patterns appears.
- 3. Select an output button/s or check the **Outputs** box.
- 4. Select a pattern.

The selected pattern is switched to the selected output/s (for example, pattern 4 is switched to outputs 1 and 2).



Figure 31: Switching Page – Switching a Pattern to an Output

## Switching Audio in Breakaway Mode

In Breakaway mode, the HDMI embedded audio is switched separately from the video signal.



The audio breakaway mode is enabled only when Auto Switch Setting is set to Manual mode.

You can switch a digital audio input to a digital audio output independently. If HDMI input port and HDMI output port ARC mode are enabled, you can switch a selected HDMI output port ARC to any HDMI input port ARC.

**To switch an audio input to an audio output in the Breakaway mode:**

1. In the Navigation pane, click **Switching**. The Switching page appears.
2. Select **Audio break away** tab.

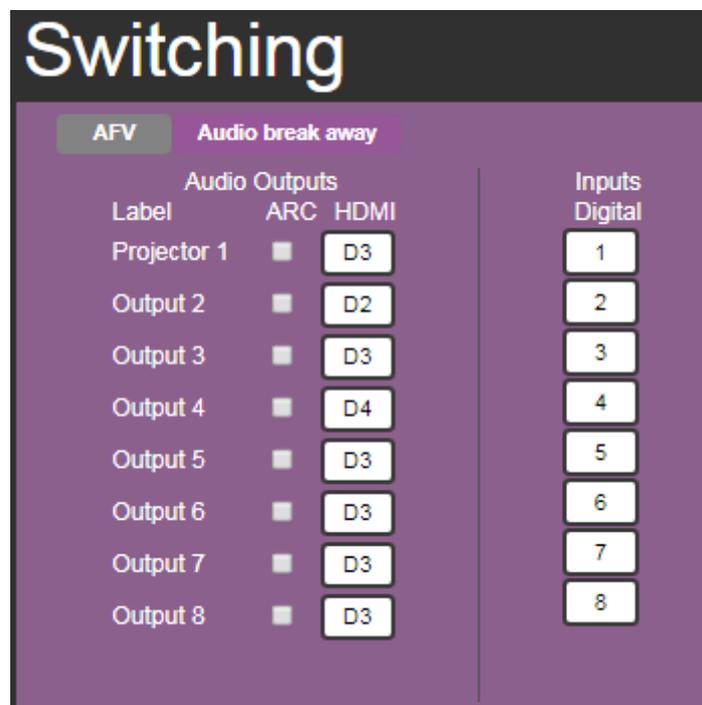


Figure 32: Switching Page – Breakaway Mode

3. Switch an input to a selected output. For example, switch digital input 6 to output 5:
  - Click an **HDMI** button (under the **Audio Outputs** column). The selected button turns purple with a blue frame .
  - Click a **Digital Input** button. The selected button turns purple with a blue frame .

Digital Output 5 is switched to D6.

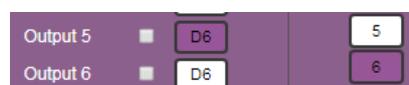


Figure 33: Switching Page – Switching Audio signals in the Breakaway Mode

### To switch ARC to an input:

1. In the Navigation pane, click **Switching**. The Switching page appears.
2. Select **Audio break away** tab.
3. Check the ARC check boxes to ARC-enable selected outputs (under the **Audio Outputs** column).

For example, Output 2 and 4 are checked, therefore ARC-enabled so they can be switched as ARC signals.



Make sure that the acceptor on the output side has ARC capabilities.

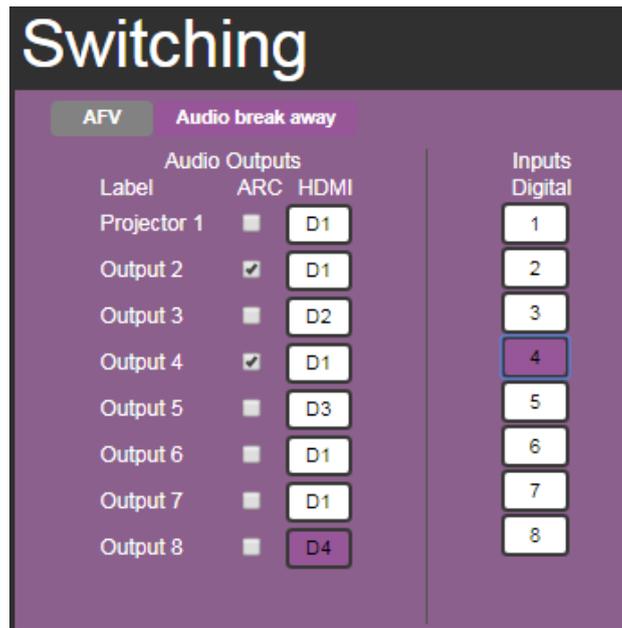


Figure 34: Switching Page – Output 2 and 4 ARC-Enabled

4. Select AFV tab.
5. Select an ARC-functioning input button (1, 3, 5 or 7).  
For example, Input 1.
6. Click on Input 1 and set to **ARC** mode. This input is now ARC-enabled.

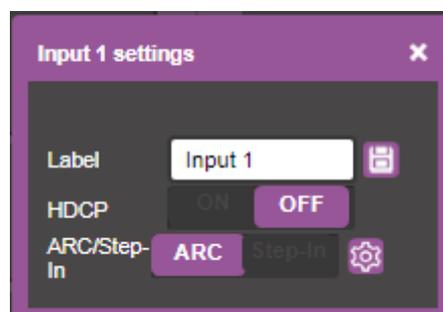


Figure 35: Switching Page – Output 1 Set to ARC Mode

7. Click  and set either Output 2 or Output 4 to set them as an ARC to Input 1.

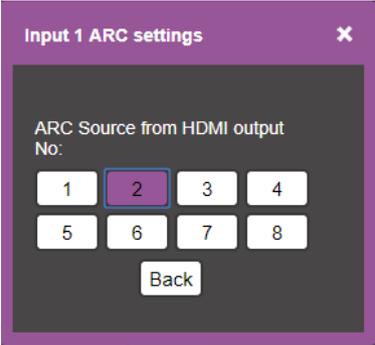


Figure 36: Switching Page – Routing Output 2 ARC to Input 1

Output 2 ARC is routed to Input 1.

## Changing Device Settings and Upgrading the Firmware

The Device Settings Web page shows the device details, such as name, MAC address and firmware version and also enables performing the following functions:

- [Changing the Ethernet Settings](#) on page [Error! Unknown switch argument.](#)
- [Performing a Factory Reset](#) on page [Error! Unknown switch argument.](#)
- [Performing Firmware Upgrade](#) on page [Error! Unknown switch argument.](#)

### Changing the Ethernet Settings

To change the Ethernet settings:

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

Figure 37: Device Settings Page

2. Uncheck/check the **DHCP** check box.
3. If DHCP is unchecked, change any of the parameters (IP Address, Netmask and/or Gateway).
4. Click **Save Changes**.



Note that:

After changing the IP number, reload the Web page with the new IP address.

After changing the Subnet mask you need to turn the **VS-88UHD** power off and then on again.

If DHCP is checked, reload the Web page with the new IP address.

## Performing a Factory Reset

To reset the device to its factory default values:

1. In the Navigation pane, click **Device Settings**. The Device Settings page appears ([Figure 37](#)).
2. Click **Reset**. The following window appears:

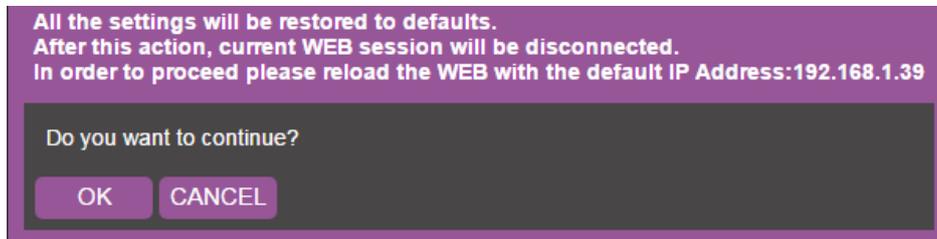


Figure 38: Device Settings Page – Factory Reset

3. Click **OK** to start factory reset and follow the instructions on-screen.

## Performing Firmware Upgrade

To perform firmware upgrade:

1. In the Navigation pane, click **Device Settings**. The Device Settings page appears ([Figure 37](#)).
2. Click **BROWSE** and select the new firmware file.
3. Click **START UPGRADE** and follow the instructions on-screen.



Do not power off your device while you are uploading a file to prevent the damage of the file.

## Managing Web Page Security

Use the Security page to set Web access permission:

### Setting Web Page Access Permission

To define access to the Web pages, in the Navigation pane, click **Authentication**. The Password Settings page appears displaying the current status (password protected or free access).

To access Web pages using the password:

1. Check the current security status.

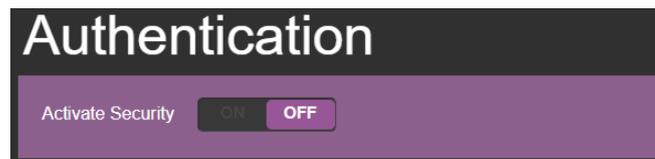


Figure 39: Password Settings Page – Security Deactivated

2. Set **Activate Security** to **ON** for Web page password protection and fill-in the Password (kept empty by default):



Figure 40: Password Settings Page – Entering the Password

3. Click **CONFIRM**.

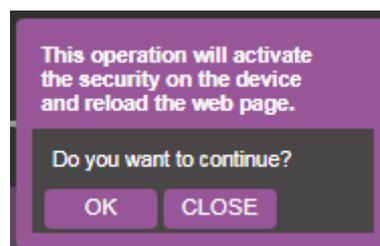


Figure 41: Password Settings Page – Security Activation Message

4. Click **OK**.

The connection is interrupted, and authentication is required to access Web pages.

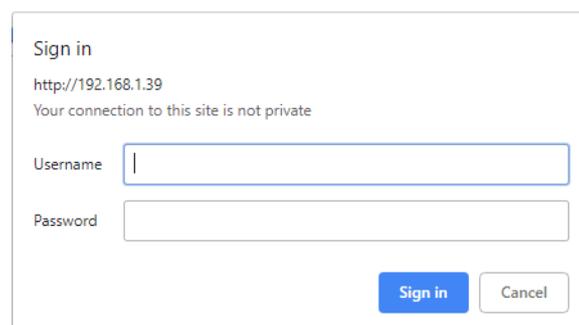
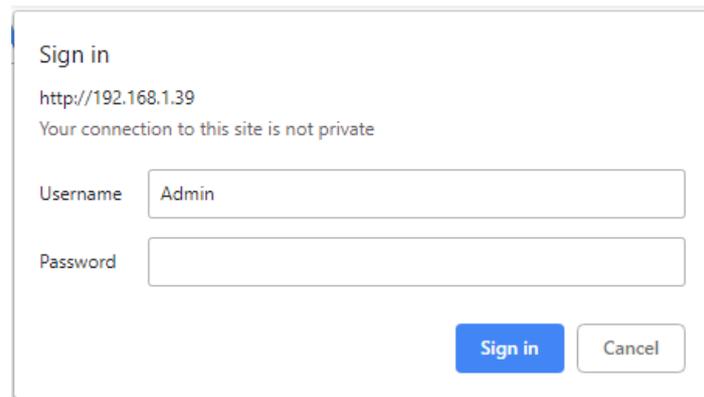


Figure 42: Password Settings Page – Security Log In

- 5. Type the User Name (Admin, by default) and Password (left empty by default).



Sign in

http://192.168.1.39

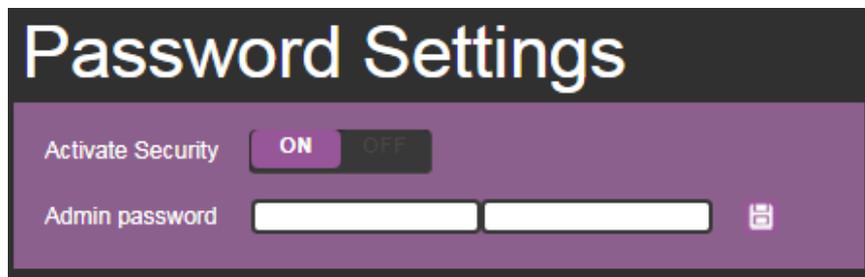
Your connection to this site is not private

Username

Password

Figure 43: Password Settings Page – Password Protection

6. Click **Sign In**.
7. Select **Password Settings** from the Navigation panel.



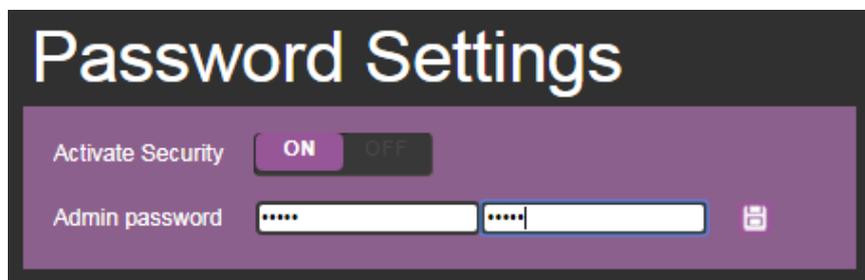
## Password Settings

Activate Security  ON  OFF

Admin password   

Figure 44: Password Settings Page – Setting the Admin Password

8. Type the new Admin password twice in both **Admin password** text boxes.



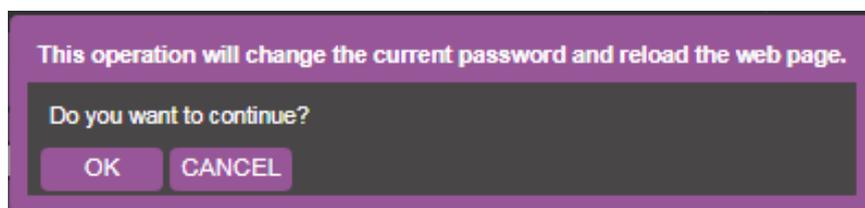
## Password Settings

Activate Security  ON  OFF

Admin password   

Figure 45: Password Settings Page – Entering the Admin Password

9. Click . The following message appears:



This operation will change the current password and reload the web page.

Do you want to continue?

Figure 46: Password Settings Page – Password Warning

10. Click **OK**.  
The page is reloaded and can be accessed by entering the password.  
The top right side of the Web page displays the security icon locked.

**To access Web pages without using the password:**

1. Check the current security settings.

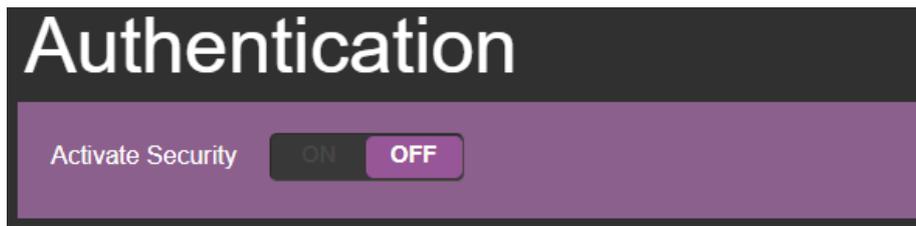


Figure 47: Password Settings Page – Password Protected

The Security icon (on the top right-side of the page) is unlocked:



Figure 48: Password Settings Page – Security is Off

2. Set **Activate Security** to **OFF**.  
The following message appears:

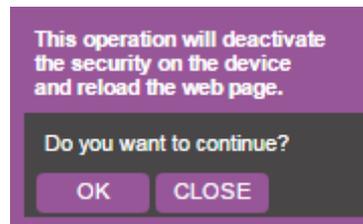


Figure 49: Password Settings Page – Deactivating the Security

3. Click **OK**.  
The Web page reloads.

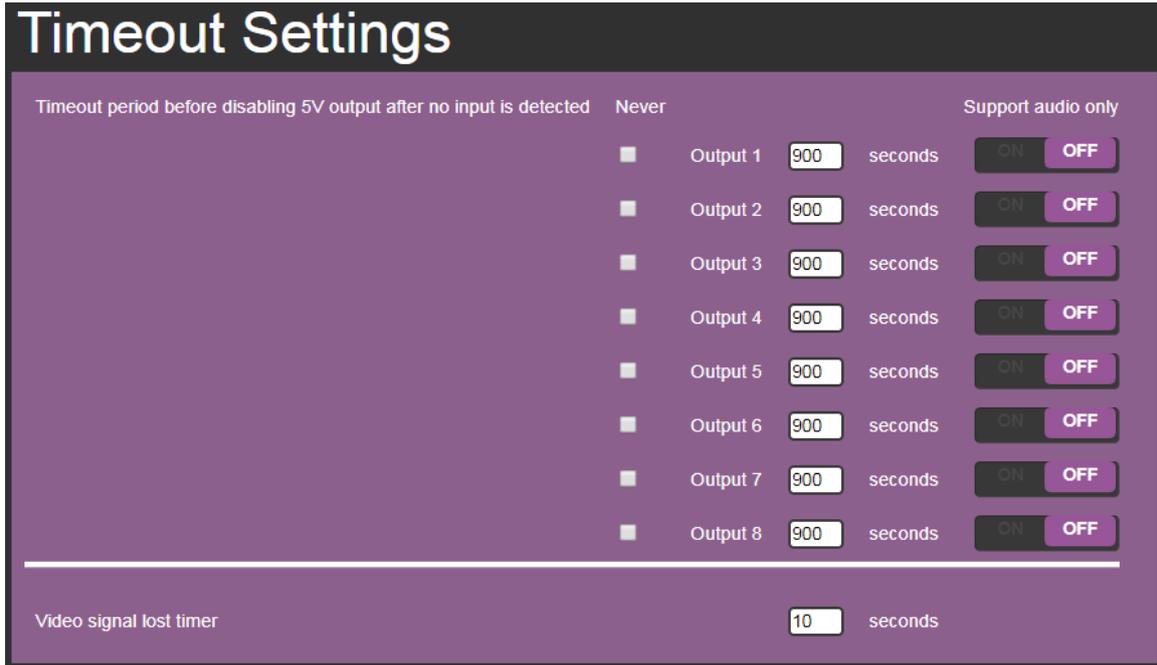
## Setting the Timeout

Use the **Timeout Settings** Web page to set the time delay to shut down if no input signal is detected for each output and also to set the auto switching time.

 Always set the 5V cut-off (Disable 5V) time delay to be longer than the video signal loss timer delay.

To set the timeout:

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



Timeout period before disabling 5V output after no input is detected

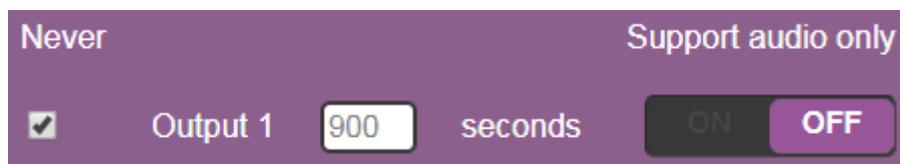
Never	Output	Delay	Unit	Support audio only
<input type="checkbox"/>	Output 1	900	seconds	ON OFF
<input type="checkbox"/>	Output 2	900	seconds	ON OFF
<input type="checkbox"/>	Output 3	900	seconds	ON OFF
<input type="checkbox"/>	Output 4	900	seconds	ON OFF
<input type="checkbox"/>	Output 5	900	seconds	ON OFF
<input type="checkbox"/>	Output 6	900	seconds	ON OFF
<input type="checkbox"/>	Output 7	900	seconds	ON OFF
<input type="checkbox"/>	Output 8	900	seconds	ON OFF

Video signal lost timer: 10 seconds

Figure 50: Timeout Settings Page

2. Set the specific output delay time.

 If you do not want a specific output to shut down if an input signal is not detected, check the **Never** box next to the desired output.



Never Support audio only

Output 1 900 seconds ON OFF

3. Set audio support **ON** if you want shutdown to occur only if an audio signal is lost.

 **Support audio only** can be used if the video and audio signals routed to an output, come from separate sources.

If **Support audio only** is set to:

**ON** – The audio signal routed to the output remains active when the video source (coming from a different input) is deactivated.

**OFF** – The audio signal routed to the output is deactivated together with the deactivation of the video source (coming from a different input).

**To set the video lost timer (when in auto-switching mode):**

1. In the Navigation pane, click **Timeout Settings**. The Timeout Settings page appears.
2. Set the video lost timer.



The adjustment sequence presented here is only an example. You can adjust the output settings in any other order.



If the video is lost when in the auto switching mode (Priority or Last connected) you can set the time the device waits before it switches to the next source.

---

## Setting Switching Modes

Use the **Auto Switch Settings** page to set the switching mode per output.



Setting to priority or last connected mode forces **VS-88UHD** to operate in AFV mode.

**To set the switching mode:**

1. In the Navigation pane, click **Auto Switch Settings**. The Auto Switch Settings page appears.

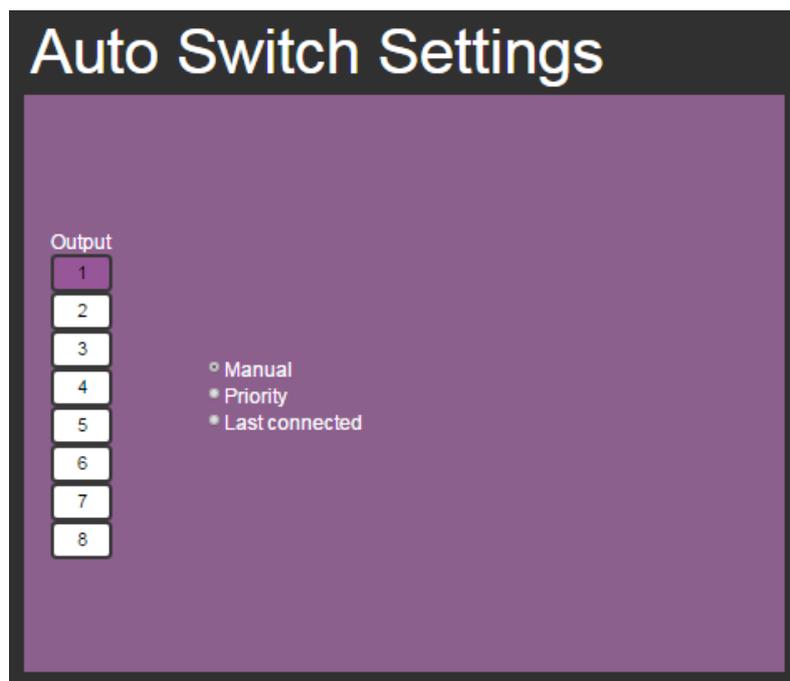


Figure 51: Auto Switch Settings Page

2. Select an output and set the switching mode to **Manual**, **Priority** or **Last connected**:
  - In the Manual mode (see [Figure 51](#)), the outputs are switched manually to the selected output.

- In the Priority mode, drag and drop the inputs from the highest to the lowest priority. The inputs are then switched according to the set priority to the selected output:

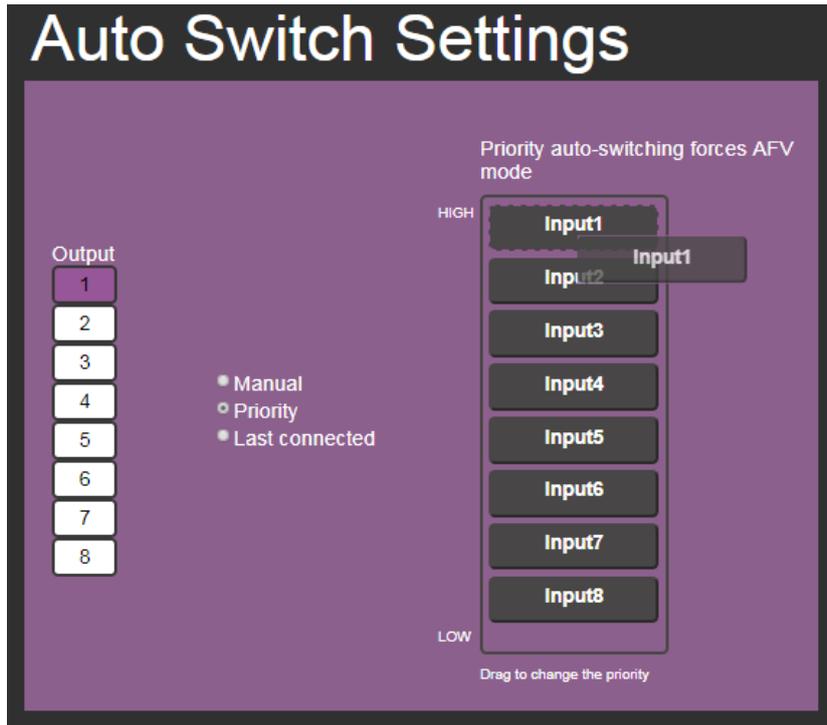


Figure 52: Auto Switch Settings Page – Setting the switching Priority

- In the Last connected mode, select the inputs that are included in the last connected scan that will be switched to the selected output:

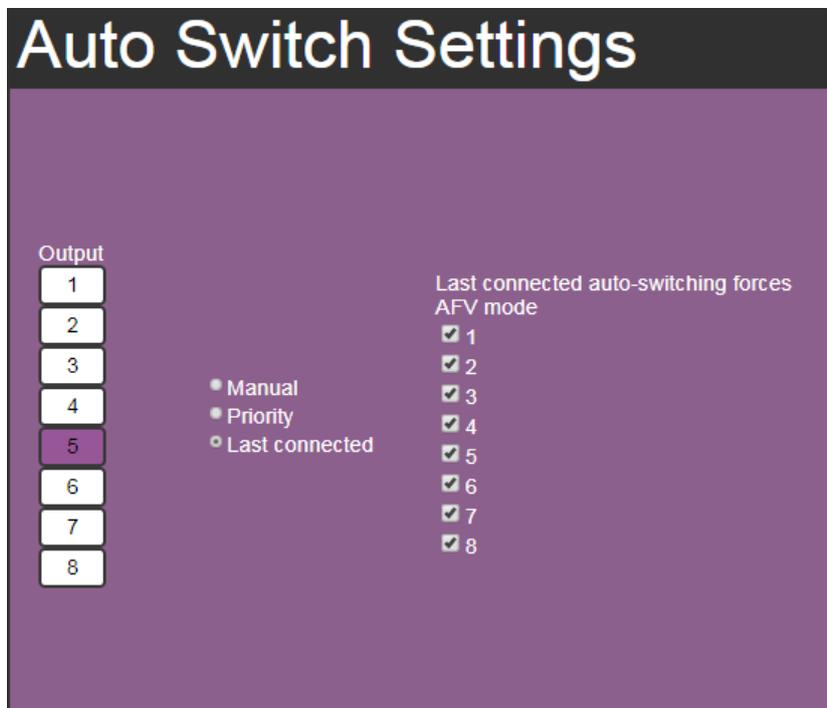


Figure 53: Auto Switch Settings Page – Last Connected Mode

## Setting Step-in Devices

Use the Step-In Settings page to manage Step-in devices (for example Kramer **DIP-30**).

If a step-in device is not connected to **VS-88UHD**, the following page appears:

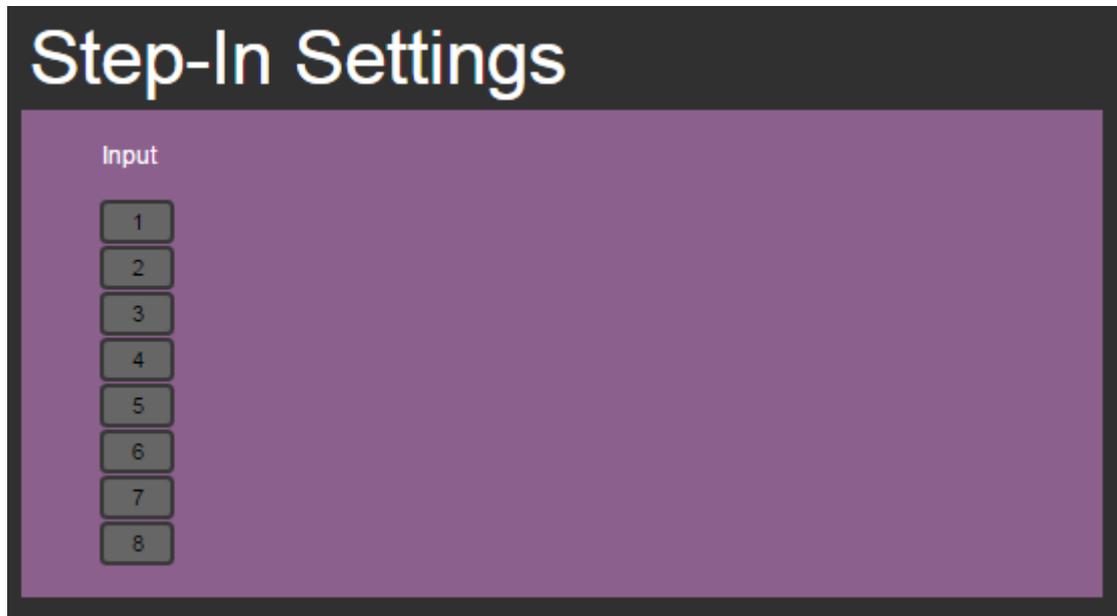


Figure 54: Step-In Settings Page (Step-in Device is not Connected)

To manage a step-in device:

1. Connect the HDMI output of a step-in device (for example **DIP-30**) to an HDMI input on the **VS-88UHD**.
2. In the Navigation pane, click **Step-in Settings**. The Step-in Settings page appears and the input button/s to which the step-in device/s is connected turn/s white.

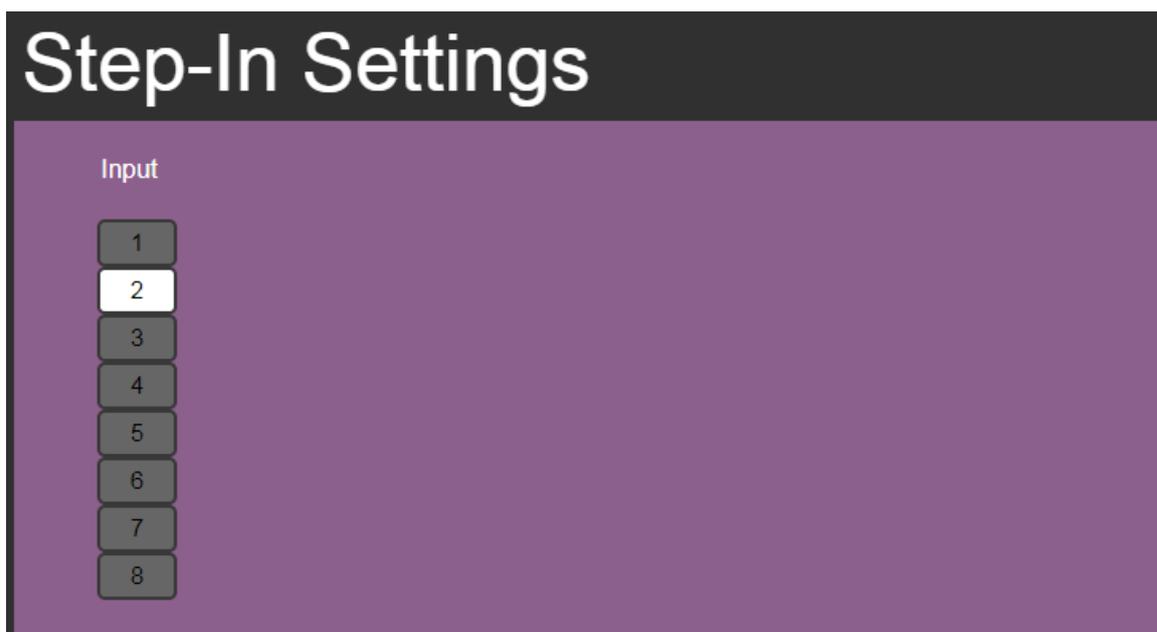


Figure 55: Step-In Settings Page – Displaying Step-In Inputs

- Click an active step-in input (button 2 in this example).  
The selected input button turns purple, the **DIP-30** Inputs list and the **VS-88UHD** outputs to which the **DIP-30** input is routed are displayed.

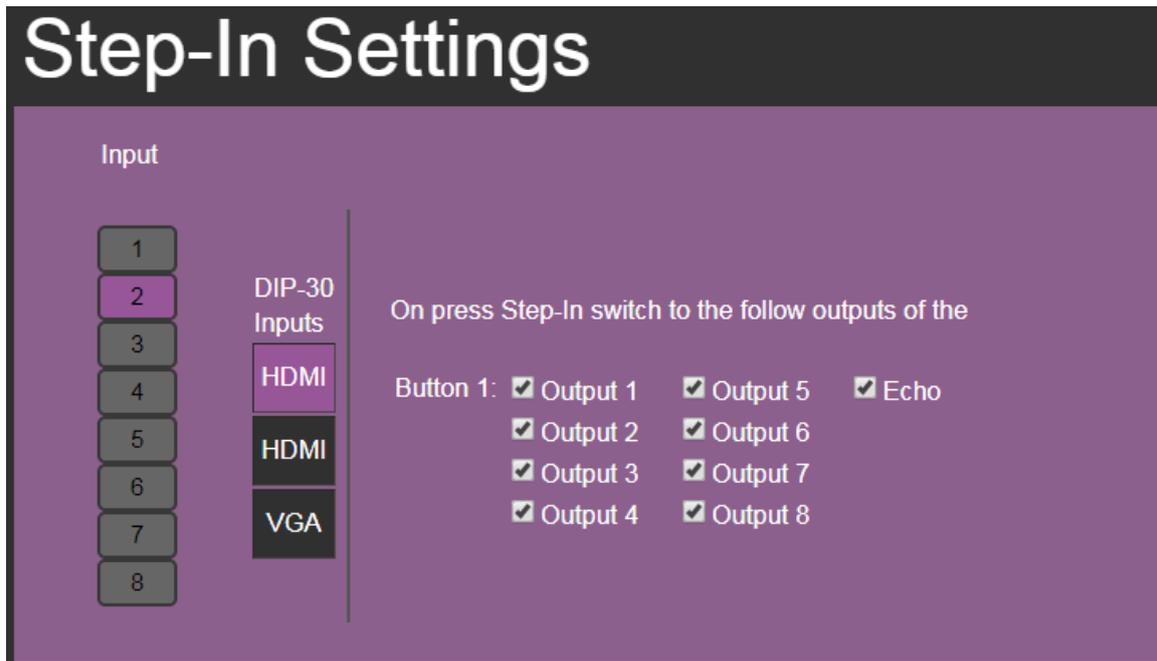


Figure 56: Step-In Settings Page – Step In Selected

- Select a **DIP-30** input (HDMI IN 1, HDMI IN 2 or VGA).  
The respective button on **DIP-30** illuminates.



You can also press an input button on the **DIP-30**. The selected input will be displayed on the Web page.

- Check the outputs to which the inputs will be routed.
- Press the **STEP-IN** button on **DIP-30**.  
The selected step-in button is routed to all the checked outputs.



Any time the output Step-in configuration changes, press the **STEP-IN** button on the Step-In device to update the configuration.



Selecting Echo sends an instruction via **VS-88UHD** RS-232 port.

## Managing the EDID

The EDID Management page lets you read the EDID from:

- Any of the outputs,
- The default EDID
- Any of the inputs,
- A file in your PC (Browse).

The selected EDID can be copied to the selected input/s.

**To copy an EDID from an output to an input:**

1. In the Navigation pane, click **EDID Management**. The EDID Management page appears.

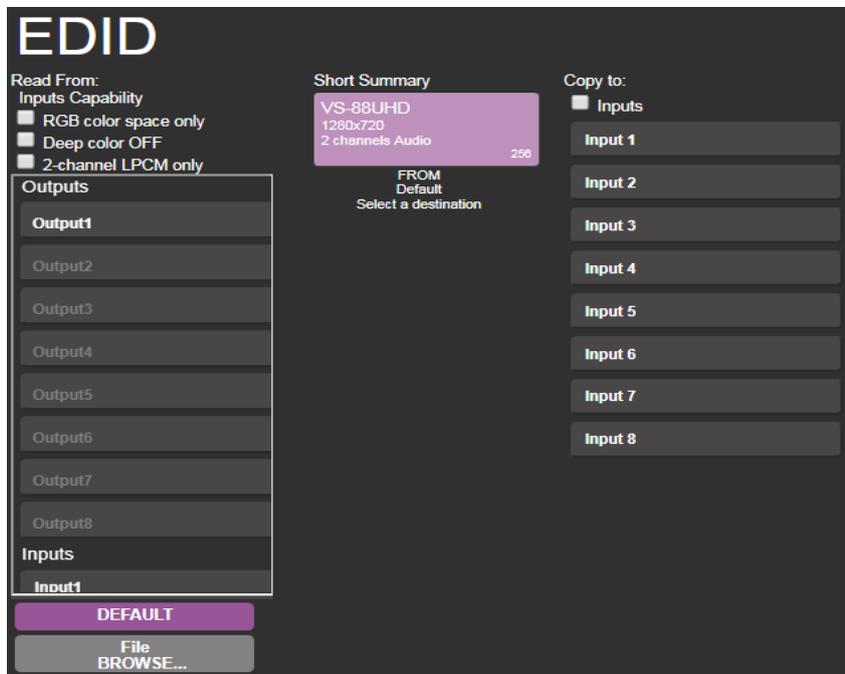


Figure 57: EDID Management Page – Select an EDID Source

2. Select the EDID source: a connected output.



When reading from an output, make sure that the output is connected to an acceptor.

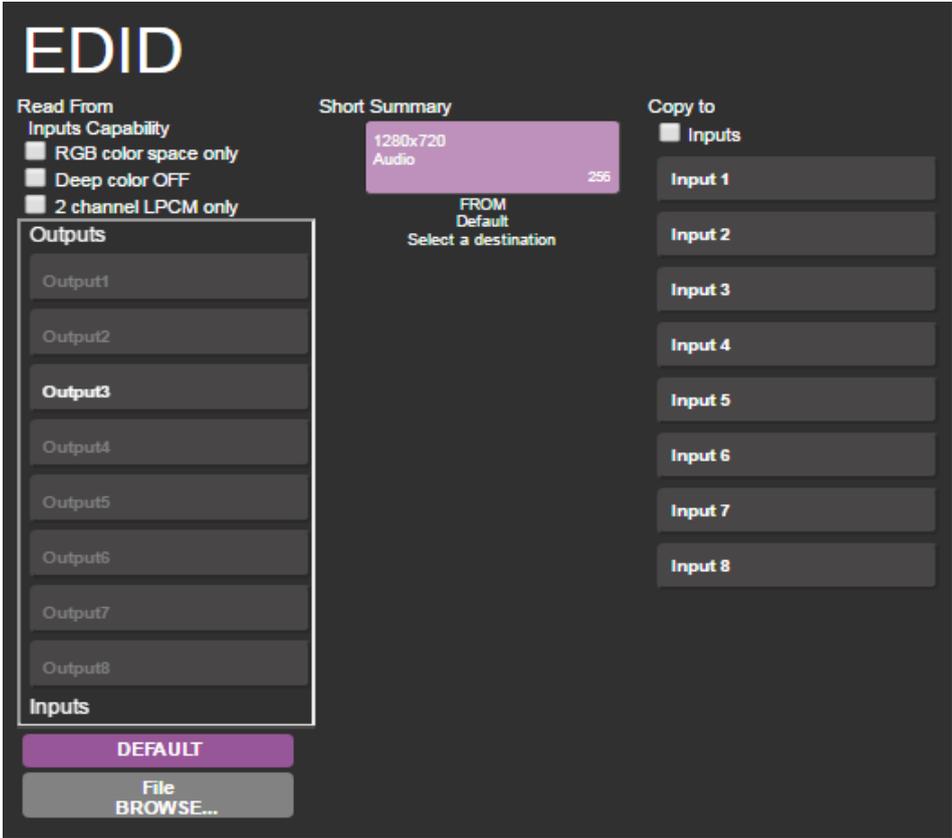


Figure 58: EDID Management Page – Select an EDID output

3. Select an input (or all the inputs) to which the EDID is copied.

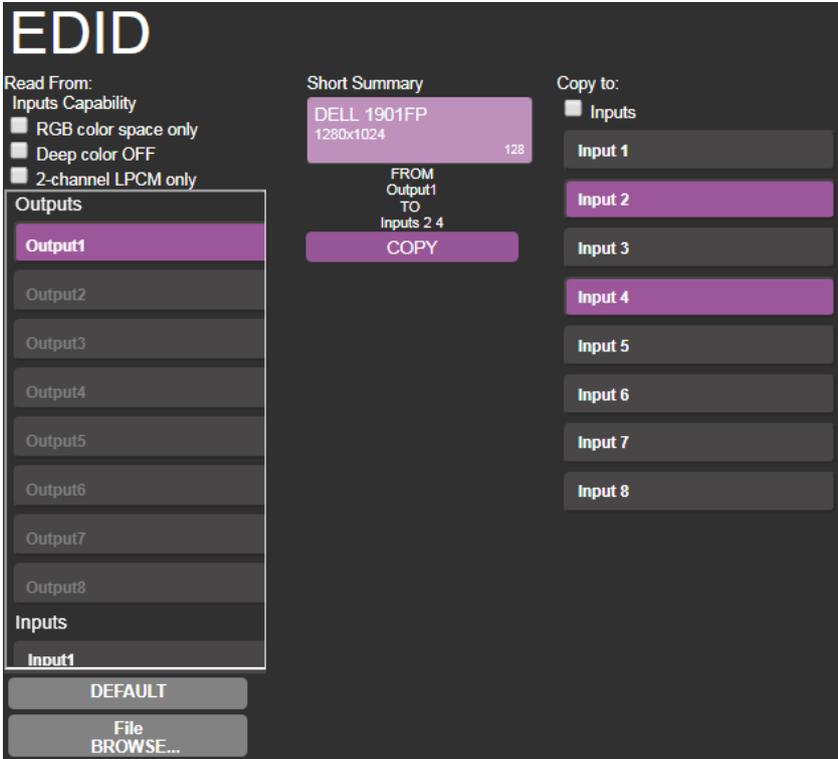


Figure 59: EDID Management Page – Select an Input

4. Click **COPY**.  
The EDID message appears.

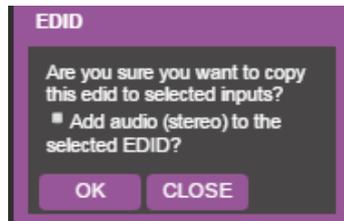


Figure 60: EDID Page –EDID Copy Message

5. Click **OK**. The following message appears:

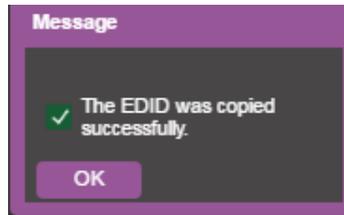


Figure 61: EDID Management Page – Loading the EDID from Output to Input

6. Click **OK**.

#### To read the EDID from the default EDID:

1. In the Navigation pane, click **EDID Management**. The EDID Management page appears.
2. Click **DEFAULT**.
3. Click **OK** and follow the instructions on-screen.

#### To read the EDID from an input to another input/s:

1. In the Navigation pane, click **EDID Management**. The EDID Management page appears.
2. Select an input from the list (on the left).

3. If required, check the options under Inputs **Capabilities**.

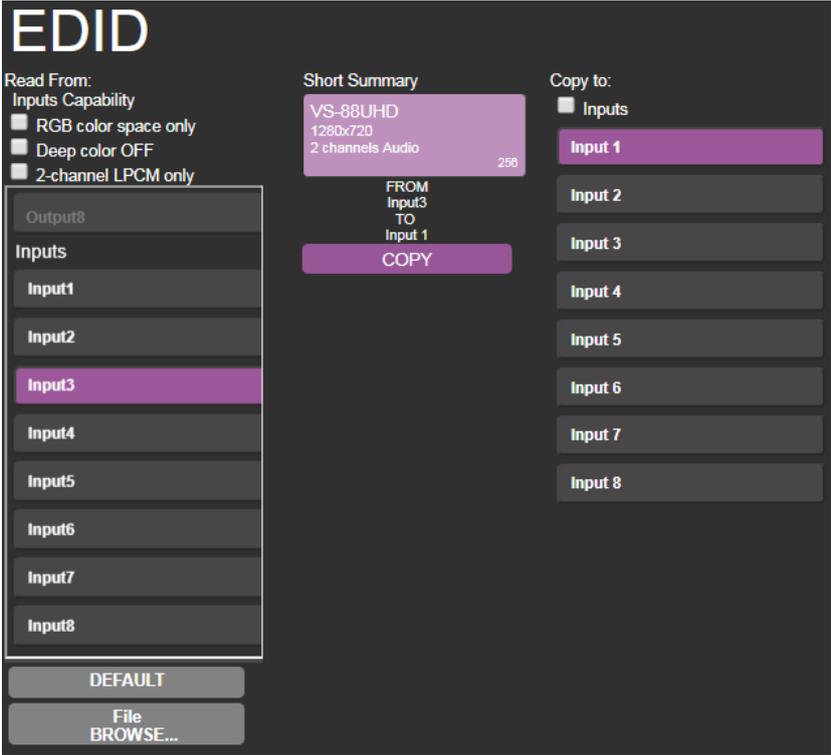


Figure 62: EDID Management Page – Loading the EDID from input to Input

4. Click **COPY** and follow the instructions on-screen.  
The EDID is loaded to the selected inputs.

To read the EDID from a file:

- 1. In the Navigation pane, click **EDID Management**. The EDID Management page appears.
- 2. Click **File BROWSE** and open the EDID file.

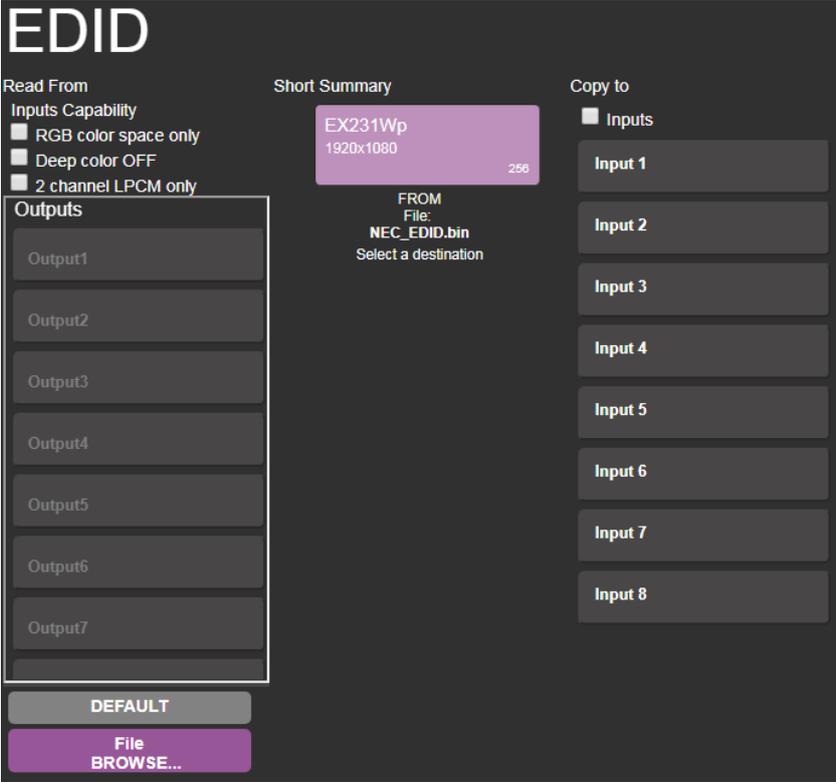


Figure 63: EDID Management Page – EDID Selected from a File

- 3. Select an input/s

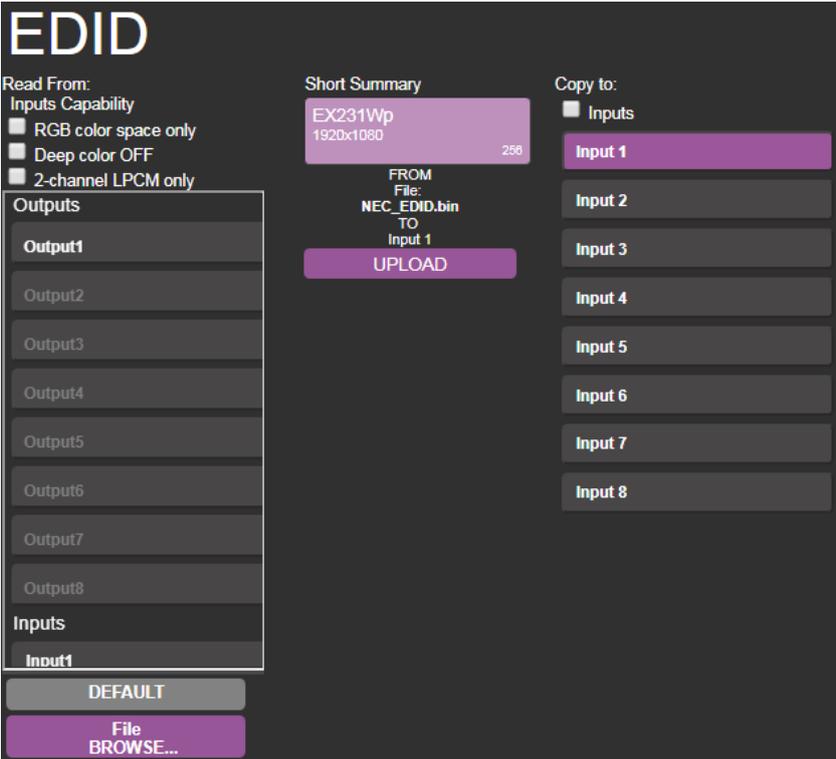


Figure 64: EDID Management Page – Loading the EDID from a File to the Input

- Click **UPLOAD**. The following message appears:

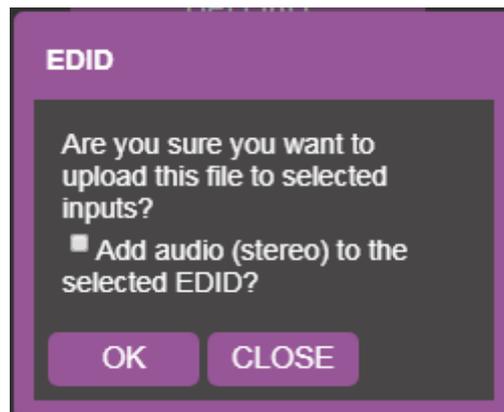


Figure 65: EDID Management Page – EDID Message

- Click **OK**.
- Follow the instructions on-screen.



When viewing the 7-segment display in the EDID mode, the input with EDID read from a file will display "L"

---

## Viewing the About Page

The **VS-88UHD** About page lets you view the Web page version and Kramer Electronics Ltd details.



Figure 66: About Page

# Technical Specifications

Inputs	<b>VS-88UHD:</b> 8 HDMI	On female HDMI connectors
	<b>VS-66UHD:</b> 6 HDMI	
	<b>VS-84UHD:</b> 8 HDMI	
	<b>VS-48UHD:</b> 4 HDMI	
Outputs	<b>VS-88UHD:</b> 8 HDMI	On female HDMI connectors
	<b>VS-66UHD:</b> 6 HDMI	
	<b>VS-84UHD:</b> 4 HDMI	
	<b>VS-48UHD:</b> 8 HDMI	
Ports	USB	On a female USB-A connector
	RS-232	On a 3-pin terminal block for serial link extension
	Ethernet	On an RJ-45 female connector for device control
	USB	On a female USB-A connector for powering another device
Video	Max. Resolution	4K@60Hz (4:2:0) and 4K@30Hz (4:4:4)
	Compliance	Supports HDMI 1.4 and HDCP 1.4
Control	Front Panel	Front panel buttons
		7-segment display
Power	Consumption	<b>VS-66UHD, VS-84UHD, VS-48UHD:</b> 42VA <b>VS-88UHD:</b> 50VA
	Source	100-240V AC, 50/60Hz
Regulatory Compliance	Safety	<b>VS-88UHD, VS-84UHD, VS-48UHD:</b> CE, FCC <b>VS-66UHD:</b> CE
	Environmental	RoHs, WEEE
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%, RH non-condensing
Enclosure	Size	19", 9.3", 1U, rack mountable
	Cooling	Fan ventilation
General	Net Dimensions (W, D, H)	43.6 cm x 23.7 cm x 4.4 cm (17.2" x 9.3" x 1.7")
	Shipping Dimensions (W, D, H)	52.5cm x 33cm x 10.7cm (20.7" x 13" x 4.2")
	Net Weight	<b>VS-66UHD, VS-84UHD, VS-48UHD:</b> 2.4kg (5.3lbs) approx. <b>VS-88UHD:</b> 2.6kg (5.7lbs) approx.
	Shipping Weight	<b>VS-66UHD, VS-84UHD, VS-48UHD:</b> 3.3kg (7.3lbs) approx. <b>VS-88UHD:</b> 3.6kg (7.9lbs) approx.
Accessories	Included	Rack ears, power cord
Specifications are subject to change without notice at <a href="http://www.kramerav.com">www.kramerav.com</a>		

## Default Communication Parameters

RS-232/Ethernet			
Baud Rate:	115,200	Parity:	None
Data Bits:	8	Command Format:	ASCII Protocol 3000
Stop Bits:	1		
Example (Route input 1 to output 1):			#VID1> 1<cr>
Ethernet Parameters			
IP Address:	192.168.1.39	Default TCP Port #:	5000
Subnet Mask:	255.255.0.0	Default UDP Port #:	50000
Default Gateway:	192.168.0.1	Number of TCP ports:	8
		Number of web clients:	5
Full Factory Reset			
Front Panel Buttons:	Power off the device, press and hold the LOCK, EDID and STO buttons simultaneously for about 3 seconds while powering the device, and then release. Until all front panel buttons illuminate		
Protocol 3000:	"#factory" command.		
Web Pages:	In the Device Settings page, click <b>Reset</b> .		

## Default Parameters

Parameter	Value
Protocol:	K3000
K3000 Model Name:	V, 'S', '-', '8', '8', 'U', 'H', 'D' "
K3000 Serial Number:	00000000000000
 Model name and serial number will not change back to the default status after a factory reset.	
TCP/IP address:	192.168.1.39
TCP/IP port:	5000
UDP port:	50000
Mask number:	255.255.0.0
Gateway number:	192.168.0.1
DHCP enable:	Disable (OFF)
EDID status:	Default, all input ports use the default EDID data.
Input port HDCP:	All ON, support HDCP.
Step-In button setting:	Default, all the output checked for an input.
Video status:	Output 1 to 8 route to input 1 to 8 separately.
All setups:	All empty. No preset status.
EDID data:	All input ports use the default EDID data.
V-mute:	Open the video.
Mute:	Open the audio.
Switch mode:	Manual.
Switch speed:	Extra-fast switch.
ARC or de-embedded:	De-embedded.
Video Priority settings	Lower input index has higher priority.
Auto Switching mode	Priority: Priority order is Highest for 1 and lowest for 8
Auto Switching settings	All video inputs are routed to each of the video outputs
Default switching mode - manual/auto	Manual, IN1 to OUT1, etc. for 2,3,4
Default EDID	Kramer default EDID with "monitor name"="VS-88UHD"
HDCP mode	ENABLED
Video Signal loss timeout (no 5V)	0
Video Signal loss timeout (5V is on)	10 sec
New video signal gain timeout	0
Audio Signal loss timeout (no 5V)	0
Audio Signal loss timeout (5V is on)	5 sec
New audio signal gain timeout	0
Output inactivity timeout	15 min
Apply switch mode configuration on startup	10

## Input or Output Resolutions

VS-88UHD, VS-66UHD, VS-84UHD, VS-48UHD support the following resolutions:

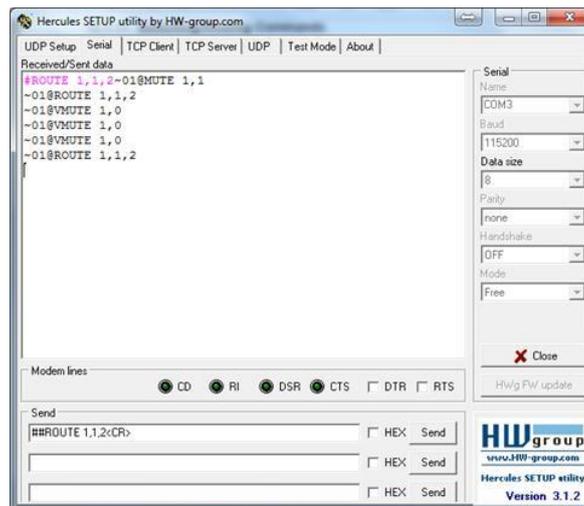
4096*2160P30	1080i60	1440*900P60rb	800*600P60
4096*2160P29	1080i59	1400*1050P75	800*600P56
4096*2160P25	1080i50	1400*1050P60	720*400P70
4096*2160P24	720P60	1400*1050P60rb	640*480P75
4096*2160P23	720P59	1366*768P60	640*480P72
3840*2160P30	720P50	1366*768P60rb	640*480P59
3840*2160P29	576P50	1360*768P60	680*480P60
3840*2160P25	576i50	1280*1024P60	1440*480i60
3840*2160P24	480P60	1280*960P60	1440*240P60
3840*2160P23	480P59	1280*768P60	1440*480P60
1080P60	480i60	1280*768P60rb	720*576P50
1080P59	480i59	1152*864P75	1440*576i50
1080P50	1920*1200P60rb	1024*768P75	1280*768P75
1080P30	1680*1050P60	1024*768P70	1280*800P60
1080P29	1680*1050P60rb	1024*768P60	1360*768P60
1080P25	1600*1200P60	848*480P60	1280*1024P75
1080P24	1600*900P60rb	800*600P75	
1080P23	1440*900P60	800*600P72	

# Protocol 3000

The **VS-88UHD 8x8 UHD Matrix Switcher** can be operated using the Kramer Protocol 3000 serial commands. The command framing varies according to how you interface with the **VS-88UHD**.

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

- Terminal communication software, such as Hercules:

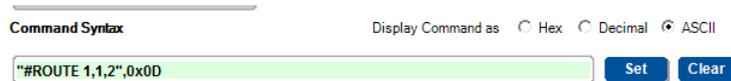


The framing of the command varies according to the terminal communication software.

- K-Touch Builder (Kramer software):



- K-Config (Kramer configuration software):



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

You can enter commands directly using terminal communication software (e.g., Hercules) by connecting a PC to the serial or Ethernet port on the **VS-88UHD**. To enter `CR` press the Enter key (`LF` is also sent but is ignored by the command parser).

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

For more information about Protocol 3000 commands, see:

- [Understanding Protocol 3000](#) on page [Error! Unknown switch argument.](#)
- [Kramer Protocol 3000 Syntax](#) on page [Error! Unknown switch argument.](#)
- [Protocol 3000 Commands](#) on page [Error! Unknown switch argument.](#)

---

## Understanding Protocol 3000

Protocol 3000 commands are structured according to the following:

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



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

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



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

## Kramer Protocol 3000 Syntax

The Kramer Protocol 3000 syntax uses the following delimiters:

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

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

The Protocol 3000 syntax is in the following format:

- **Host Message Format:**

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

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

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

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

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

- **Device Message Format:**

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

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

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

## Protocol 3000 Commands

This section includes the following commands:

- [Common Commands](#) on page [Error! Unknown switch argument..](#)
- [System Commands](#) on page [Error! Unknown switch argument..](#)
- [Authentication Commands](#) on page [Error! Unknown switch argument..](#)
- [EDID Handling Commands](#) on page [Error! Unknown switch argument..](#)
- [Switch Commands](#) on page [Error! Unknown switch argument..](#)
- [Switching Commands](#) on page [Error! Unknown switch argument..](#)
- [Communication Commands](#) on page [Error! Unknown switch argument..](#)

### Common Commands

Command	Description
#	Protocol handshaking (system mandatory)
BUILD-DATE	Get device build date (system mandatory)
FACTORY	Reset to factory default configuration
HELP	Get command list (system mandatory)
MODEL?	Get device model (system mandatory)
PROT-VER?	Get device protocol version (system mandatory)
RESET	Reset device (system mandatory)
SN?	Get device serial number (system mandatory)
VERSION?	Read device firmware version
IDV	Set visual indication from device
LOCK-FP	Lock/get front panel
NAME	Set/get machine (DNS) name
NAME-RST	Reset machine name to factory default (DNS)

#

Functions		Permission	Transparency
Set:	#	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Protocol handshaking	#CR	
Get:	-	-	
Response			
~nn@SPORCR LF			
Notes			
Validates the Protocol 3000 connection and gets the machine number. Step-in master products use this command to identify the availability of a device.			
K-Config Example			
"#", 0x0D			

**BUILD-DATE**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>BUILD-DATE?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device build date	# <b>BUILD-DATE?</b> <input type="checkbox"/> CR	
Response			
~nn@ <b>BUILD-DATE</b> <input type="checkbox"/> SPdate <input type="checkbox"/> SPtime <input type="checkbox"/> CR LF			
Parameters			
<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			
K-Config Example			
"#BUILD-DATE?", 0x0D			

**FACTORY**

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

**HELP**

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

**MODEL**

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

**PROT-VER**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>PROT-VER?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device protocol version	# <b>PROT-VER?</b> <input type="checkbox"/> CR	
Response			
~nn@ <b>PROT-VER</b> <input type="checkbox"/> SP3000:version <input type="checkbox"/> CR LF			
Parameters			
version - XX.XX where X is a decimal digit			
K-Config Example			
"#PROT-VER?", 0x0D			

**RESET**

Functions		Permission	Transparency
Set:	<b>RESET</b>	Administrator	Public
Get:	-	-	-
Description		Syntax	
Set:	Reset device	# <b>RESET</b> <input type="checkbox"/> CR	
Get:	-	-	
Response			
~nn@ <b>RESET</b> <input type="checkbox"/> SPOK <input type="checkbox"/> CR LF			
Notes			
To avoid locking the port due to a USB bug in Windows, disconnect USB connections immediately after running this command. If the port was locked, disconnect and reconnect the cable to reopen the port.			
K-Config Example			
"#RESET", 0x0D			

**SN?**

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

**VERSION?**

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

**IDV**

Functions		Permission	Transparency
Set:	<b>IDV</b>	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Set visual indication from device	# <b>IDV</b> <code>CR</code>	
Get:	-	-	
Response			
~ <code>nn</code> @ <b>IDV</b> <code>SP</code> OK <code>CR LF</code>			
Notes			
Using this command, some devices can light a sequence of buttons or LEDs to allow identification of a specific device from similar devices.			
K-Config Example			
`"#IDV",0x0D			

**LOCK-FP**

Functions		Permission	Transparency
Set:	<b>LOCK-FP</b>	End User	Public
Get:	<b>LOCK-FP?</b>	End User	Public
Description		Syntax	
Set:	Lock front panel	# <b>LOCK-FP</b> [SP] <i>lock_mode</i> [CR]	
Get:	Get front panel lock state	# <b>LOCK-FP?</b>	
Response			
~ <i>nn</i> @ <b>LOCK-FP</b> [SP] <i>lock_mode</i> [SP]OK[CR LF]			
Parameters			
<b>lock_mode</b> – 0 (Off, unlock the front panel buttons), 1 (On, lock the front panel buttons)			
K-Config Example			
Unlock front panel: `#LOCK-FP 0`,0x0D			

**NAME**

Functions		Permission	Transparency
Set:	<b>NAME</b>	Administrator	Public
Get:	<b>NAME?</b>	End User	Public
Description		Syntax	
Set:	Set machine (DNS) name	# <b>NAME</b> [SP] <i>machine_name</i> [CR]	
Get:	Get machine (DNS) name	# <b>NAME?</b> [CR]	
Response			
Set: ~ <i>nn</i> @ <b>NAME</b> [SP] <i>machine_name</i> [CR LF]			
Get: ~ <i>nn</i> @ <b>NAME</b> [SP] <i>machine_name</i> [CR LF]			
Parameters			
<i>machine_name</i> – String of up to 14 alpha-numeric characters (can include hyphens but not at the beginning or end)			
Notes			
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).			
K-Config Example			
Set the DNS name of the device to “room-442”: `#NAME room-442`,0x0D			

**NAME-RST**

Functions		Permission	Transparency
Set:	<b>NAME-RST</b>	Administrator	Public
Get:	-	-	-
Description		Syntax	
Set:	Reset machine (DNS) name to factory default	# <b>NAME-RST</b> [CR]	
Get:	-	-	
Response			
~ <i>nn</i> @ <b>NAME-RST</b> [SP]OK[CR LF]			
Notes			
Factory default of machine (DNS) name is “KRAMER_” + 4 last digits of device serial number.			
K-Config Example			
Reset the machine name (S/N last digits are 0102): `#NAME-RST KRAMER_0102`,0x0D			

## System Commands

Command	Description
SIGNAL	Get input signal lock status
PRST-VID?	Get video connections from saved preset
PRST-STO	Store current connections to preset
PRST-RCL	Recall saved preset list
PRST-LST	Get saved preset list
BAUD	Set/get protocol serial port baud rate
HDCP-STAT?	Get HDCP signal status
HDCP-MOD	Set/get HDCP mode
FPGA-VER?	Get current FPGA version

### SIGNAL

Functions		Permission	Transparency
Set:	-	-	-
Get	<b>SIGNAL?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get input signal lock status	# <b>SIGNAL?</b> [SP] <i>inp_id</i> [CR]	
Response			
~ <i>nn</i> @ <b>SIGNAL</b> [SP] <i>inp_id,status</i> [CR LF]			
Parameters			
<i>inp_id</i> – Input number: 1 (Input)			
<i>status</i> – Signal status according to signal validation: 0 (Off), 1 (On)			
Response Triggers			
After execution, a response is sent to the com port from which the Get was received.			
A response is sent after every change in input signal status from On to Off or from Off to On.			
K-Config Example			
Get the input signal lock status of IN 1: `#SIGNAL? 1",0x0D`			

**PRST-VID?**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>PRST-VID?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get video connections from saved preset	# <b>PRST-VID?</b> <b>SP</b> <i>preset</i> , <i>out</i> <b>CR</b> # <b>PRST-VID?</b> <b>SP</b> <i>preset</i> , * <b>CR</b>	
Response			
~ <b>nn</b> @ <b>PRST-VID</b> <b>SP</b> <i>preset</i> , <i>in</i> > <i>out</i> <b>CR</b> <b>LF</b>			
~ <b>nn</b> @ <b>PRST-VID</b> <b>SP</b> <i>preset</i> , <i>in</i> >1, <i>in</i> >2, <i>in</i> >3, ... <b>CR</b> <b>LF</b>			
Parameters			
<i>preset</i> – preset number <i>in</i> – input number or '0' if output disconnected > – connection character between in and out parameters <i>out</i> - output number or '*' for all outputs			
Notes			
In most units, video and audio presets with the same number are stored and recalled together by commands # <b>PRST-STO</b> and # <b>PRST-RCL</b> .			
Examples			
Store current audio and video connections, volumes and modes to preset 5	# <b>PRST-STO</b> 5 <b>CR</b>	~ <b>PRST-STO</b> 5 <b>CR</b> <b>LF</b>	
Recall audio and video connections from preset 3	# <b>PRCL</b> 3 <b>CR</b>	~ <b>PRST-RCL</b> 3 <b>CR</b> <b>LF</b>	
Show source of video output 2 from preset 3	# <b>PRST-VID?</b> 3, 2 <b>CR</b>	~ <b>PRST-VID</b> 3, 4>2 <b>CR</b> <b>LF</b>	
K-Config Example			
Get video connections from preset 3 for all outputs: `#PRST-VID? 3, *, 0x0D`			

**PRST-STO**

Functions		Permission	Transparency
Set:	<b>PRST-STO</b>	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Store current connections, volumes and modes in preset	# <b>PRST-STO</b> <b>SP</b> <i>preset</i> <b>CR</b>	
Get:	-	-	
Response			
~ <b>nn</b> @ <b>PRST-STO</b> <b>SP</b> <i>preset</i> <b>CR</b> <b>LF</b>			
Parameters			
<i>preset</i> – Preset number: 1 (OUT 1)... n (OUT n); n+1 (IN 1)...n+m (IN m); for VS-66UHD, VS-84UHD and VS-48UHD: 13, 14, 15, 16 for presets 13, 14, 15 and 16			
K-Config Example			
Store preset 1: `#PRST-STO 1`, 0x0D`			

**PRST-RCL**

Functions		Permission	Transparency
Set:	<b>PRST-RCL</b>	End User	Public
Get	-	-	-
Description		Syntax	
Set:	Recall saved preset list	# <b>PRST-RCL</b> [SP]preset[CR]	
Get:	-	-	
Response			
~nn@ <b>PRST-RCL</b> [SP]preset[CR LF]			
Parameters			
<i>preset</i> – Preset number: 1 (OUT 1)... n (OUT n); n+1 (IN 1)...n+m (IN m); for <b>VS-66UHD</b> , <b>VS-84UHD</b> and <b>VS-48UHD</b> : 13, 14, 15, 16 for presets 13, 14, 15 and 16			
K-Config Example			
Recall preset 1: "#PRST-RCL 1", 0x0D			

**PRST-LST**

Functions		Permission	Transparency
Set:	-		
Get	<b>PRST-LST?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Recall saved preset list	# <b>PRST-LST?</b> [CR]	
Response			
~nn@ <b>PRST-LST</b> [SP]preset,preset,...[CR LF]			
Parameters			
<i>preset</i> – Preset number			
Notes			
In most units, video and audio presets with the same number are stored and recalled together by commands # <b>PRST-STO</b> and # <b>PRST-RCL</b> .			
K-Config Example			
Show preset list: "#PRST-LST?", 0x0D			

**BAUD**

Functions		Permission	Transparency
Set:	<b>BAUD</b>	Administrator	Public
Get:	<b>BAUD?</b>	Administrator	Public
Description		Syntax	
Set:	Set protocol serial port baud rate	#BAUD[SP]baud_rate[CR]	
Get:	Get protocol serial port baud rate (for current baud rate)	#BAUD?[CR]	
Response			
~nn@BAUD[SP]baud_rate[CR LF]			
~nn@BAUD[SP]current_baud_rate[CR LF]			
Parameters			
<i>baud_rate</i> – 9600, 115200, else (New baud rate to set)			
<i>current_baud_rate</i> – 9600, 115200, else (Current protocol serial port baud rate)			
Notes			
The new defined baud rate is stored in the EEPROM and used when powering up			
Default baud rate is 115200 (on factory reset).			
Only works with devices supporting this command (if <b>ERR 002</b> is returned, the default baud rate is used).			
K-Config Example			
Set the baud rate to 9600:			
`#BAUD 9600`,0x0D			

**HDCCP-STAT**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>HDCCP-STAT?</b>	End User	Public
Description		Syntax	
Set:	None	-	
Get:	Get HDCCP signal status	#HDCCP-STAT?[SP]stage,stage_id[CR]	
Response			
~nn@HDCCP-STAT[SP]stage,stage_id,status[CR LF]			
Parameters			
<i>stage</i> – 0 (Input), 1 (Output)			
<i>stage_id</i> – For input stage: 1 (IN 1), 2 (IN 2), 3 (IN 3), 4 (IN 4), 5 (IN 5), 6 (IN 6), 7 (IN 7), 8 (IN 8), 0 (Output disconnected); For output stage 1 (OUT 1), 2 (OUT 2), 3 (OUT 3), 4 (OUT 4), 5 (OUT 5), 6 (OUT 6), 7 (OUT 7), 8 (OUT 8), * (All outputs)			
<i>status</i> – Signal encryption On/Off status: 0 (HDCCP Off), 1 (HDCCP On), 2 (Follow input), 3 (Mirror output (Mac mode))			
Response Triggers			
Response is sent to the com port from which the Set (before execution) / Get command was received.			
Response is sent to all com ports after execution if <b>HDCCP-STAT</b> was set by any other external control device (button press, device menu and similar) or HDCCP mode changed.			
Notes			
On output – sink status.			
On input – signal status.			
K-Config Example			
Get the output HDCCP-STATUS of IN 1 (HDCCP Off):			
`#HDCCP-STAT? 0,1`,0x0D			

**HDCP-MOD**

Functions		Permission	Transparency
Set:	<b>HDCP-MOD</b>	Administrator	Public
Get	<b>HDCP-MOD?</b>	End User	Public
Description		Syntax	
Set:	Set HDCP mode	# <b>HDCP-MOD</b> [SP] <i>inp_id</i> , <i>mode</i> CR	
Get:	Get HDCP mode	# <b>HDCP-MOD?</b> [SP] <i>inp_id</i> CR	
Response			
Set/get: ~ <i>nn</i> @ <b>HDCP-MOD</b> [SP] <i>inp_id</i> , <i>mode</i> CR LF			
Parameters			
<i>inp_id</i> – Input number: 1 (IN 1), 2 (IN 2), 3 (IN 3), 4 (IN 4), 5 (IN 5), 6 (IN 6), 7 (IN 7), 8 (IN 8)			
<i>mode</i> – HDCP mode: 0 (HDCP Off), 1 (HDCP On)			
Response Triggers			
Response is sent to the com port from which the Set (before execution) / Get command was received. Response is sent to all com ports after execution if <b>HDCP-MOD</b> was set by any other external control device (button press, device menu and similar) or HDCP mode changed.			
Notes			
Set HDCP working mode on the device input: <ul style="list-style-type: none"> <li>• HDCP supported – HDCP_ON (default).</li> <li>• HDCP not supported – HDCP OFF.</li> </ul> HDCP supports changes following a detected sink - MIRROR OUTPUT.			
K-Config Example			
Get the input HDCP-MODE of IN 1 (HDCP Off): `#HDCP-MOD? 1,0",0x0D			

**FPGA-VER**

Functions		Permission	Transparency
Set:	-	-	-
Get	<b>FPGA-VER?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get current FPGA version	# <b>FPGA-VER?</b> [SP] <i>id</i> CR	
Response			
~ <i>nn</i> @ <b>FPGA-VER</b> [SP] <i>id</i> , <i>expected_ver</i> , <i>actual_ver</i> CR LF			
Parameters			
<i>id</i> – FPGA ID			
<i>expected_ver</i> – Expected FPGA version for current firmware			
<i>actual_ver</i> – Actual FPGA version			
K-Config Example			
Get current FPGA version (1): `#FPGA-VER? 1",0x0D			

## Authentication Commands

Command	Description
LOGIN	Set/get protocol permission
LOGOUT	Cancel current permission level
PASS	Set/get password for login level
SECUR	Set/get current security state

### LOGIN

Functions	Permission	Transparency
Set: <b>LOGIN</b>	Not Secure	Public
Get: <b>LOGIN?</b>	Not Secure	Public
Description	Syntax	
Set: Set protocol permission	# <b>LOGIN</b> [SP] <i>login_level,password</i> [CR]	
Get: Get current protocol permission level	# <b>LOGIN?</b> [CR]	
Response		
Set: ~ <i>nn</i> @ <b>LOGIN</b> [SP] <i>login_level,password</i> [SP]OK[CR LF] or ~ <i>nn</i> @ <b>LOGIN</b> [SP]ERR[SP]004[CR LF] (if bad password entered)		
Get: ~ <i>nn</i> @ <b>LOGIN</b> [SP] <i>login_level</i> [CR LF]		
Parameters		
<i>login_level</i> – Level of permissions required: User, Admin <i>password</i> – Predefined password (by <b>PASS</b> command). Default password is an empty string		
Notes		
When the permission system is enabled, <b>LOGIN</b> enables running commands with the User or Administrator permission level. When set, login must be performed upon each connection. The permission system works only if security is enabled with the <b>SECUR</b> command. It is not mandatory to enable the permission system in order to use the device.		
K-Config Example		
Set the protocol permission level to Admin (when the password defined in the <b>PASS</b> command is 33333): `#LOGIN Admin,33333",0x0D`		

### LOGOUT

Functions	Permission	Transparency
Set: <b>LOGOUT</b>	Not Secure	Public
Get: -	-	-
Description	Syntax	
Set: Cancel current permission level	# <b>LOGOUT</b> [CR]	
Get: -	-	
Response		
~ <i>nn</i> @ <b>LOGOUT</b> [SP]OK[CR LF]		
Notes		
Logs out from User or Administrator permission levels.		
K-Config Example		
`#LOGOUT",0x0D`		

**PASS**

Functions		Permission	Transparency
Set:	<b>PASS</b>	Administrator	Public
Get:	<b>PASS?</b>	Administrator	Public
Description		Syntax	
Set:	Set password for login level	# <b>PASS</b> [SP]login_level,password[CR]	
Get:	Get password for login level	# <b>PASS?</b> [SP]login_level[CR]	
Response			
~nn@ <b>PASS</b> [SP]login_level,password[CR LF]			
Parameters			
login_level – Level of login to set: User, Admin password – Password for the login_level. Up to 15 printable ASCII chars.			
Notes			
The default password is an empty string.			
K-Config Example			
Set the password for the Admin protocol permission level to 33333: "#PASS Admin,33333",0x0D			

**SECUR**

Functions		Permission	Transparency
Set:	<b>SECUR</b>	Administrator	Public
Get:	<b>SECUR?</b>	Not Secure	Public
Description		Syntax	
Set:	Start/stop security	# <b>SECUR</b> [SP]security_mode[CR]	
Get:	Get current security state	# <b>SECUR?</b> [CR]	
Response			
~nn@ <b>SECUR</b> [SP]security_mode[CR LF]			
Parameters			
security_mode – 1 (On / enable security), 0 (Off / disable security)			
Notes			
The permission system works only if security is enabled with the SECUR command.			
K-Config Example			
Enable the permission system: "#SECUR 0",0x0D			

**EDID Handling Commands**

Additional EDID data functions can be performed via a compatible EDID management application, such as Kramer EDID Designer (see [www.kramerav.com/product/VS-88UHD](http://www.kramerav.com/product/VS-88UHD)).

Command	Description
CPEDID	Copy EDID data from the output to the input EEPROM

**CPEDID**

Functions		Permission	Transparency
Set:	CPEDID	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Copy EDID data from the output to the input EEPROM	# <b>CPEDID</b> [SP]src_type,src_id,dst_type,dest_bitmap[CR]	

Get:	-	-
<b>Response</b>		
~nn@CPEDIDSPsrc_type,src_id,dst_type,dest_bitmapCR LF		
<b>Parameters</b>		
src_type – EDID source type (usually output): 0 (Input) , 1 (Output), 2 (Default EDID)		
src_id – For input source: 1 (Input), for output source: 0 (Default EDID source), 1 (Output 1), 2 (Output 2)		
dst_type – EDID destination type (usually input): 0 (Input)		
dest_bitmap – bitmap representing destination IDs. Format: xxxx...x, where x is hex digit. The binary form of every hex digit represents corresponding destinations. Setting '1' indicates that EDID data is copied to this destination. Setting '0' indicates that EDID data is not copied to this destination.		
<b>Response Triggers</b>		
Response is sent to the com port from which the Set was received (before execution).		
<b>Notes</b>		
Destination bitmap size depends on device properties (for 64 inputs it is a 64-bit word)		
Example: bitmap 0x0013 means inputs 1, 2 and 5 are loaded with the new EDID.		
In this device, if the destination type is input (0), the bitmap size is 8 bit, for example bitmap 0x81 means the inputs 1 and 8 are loaded with the new EDID.		
<b>K-Config Example</b>		
Copy the EDID data from the Output 1 (EDID source) to the Input:		
`#CPEDID 1,1,0,0x1",0x0D		
Copy the EDID data from the default EDID source to the Input:		
`#CPEDID 2,0,0,0x1",0x0D		

## Switch Commands

Command	Description
AV	Switch audio and video
VID	Set video switch state
AUD	Switch audio only
DISPLAY?	Read if output is valid
INFO-IO?	Get number of inputs/outputs in the unit
INFO-PRST	Get maximum number of video/audio presets in the unit
PRST-AUD?	Get audio connections from saved preset

### AV

Functions		Permission	Transparency
Set:	<b>AV</b>	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Switch audio and video	#AVSPin>out, in>out,...CR	
Get:	-	-	
Response			
~nn@AVSPin>out, in>out,...CR LF			

Parameters
<p><i>in</i> – Input number: 1 (IN 1), 2 (IN 2), 3 (IN 3), 4 (IN 4), 5 (IN 5), 6 (IN 6), 7 (IN 7), 8 (IN 8), 0 (Output disconnected)            &gt; – Connection character between in and out parameters  <i>out</i> – Output number: 1 (OUT 1), 2 (OUT 2), 3 (OUT 3), 4 (OUT 4), 5 (OUT 5), 6 (OUT 6), 7 (OUT 7), 8 (OUT 8), * (All outputs)</p>
K-Config Example
<p>Switch IN 1 to OUT 4:            "#AV 1&gt;4",0x0D</p>

## VID

Functions	Permission	Transparency
Set: <b>VID</b>	End User	Public
Get: <b>VID?</b>	End User	Public
Description	Syntax	
Set: Set video switch state	#VID[SP] <i>in</i> > <i>out</i> [CR]	
Get: Get video switch state	#VID?[SP] <i>out</i> [CR]	
Response		
Set: ~nn@VID[SP] <i>in</i> > <i>out</i> [CR LF]		
Get: ~nn@VID[SP] <i>in</i> > <i>out</i> [CR LF]		
Parameters		
<p><i>in</i> – Input number: 1 (IN 1), 2 (IN 2), 3 (IN 3), 4 (IN 4), 5 (IN 5), 6 (IN 6), 7 (IN 7), 8 (IN 8), 9 (Pattern 1), 10 (Pattern 2), 11 (Pattern 3), 12 (Pattern 4), 13 (Pattern 5), 14 (Pattern 6), 15 (Pattern 7), 16 (Pattern 8), 0 (output disconnected)            &gt; – Connection character between IN and OUT parameters  <i>out</i> – Output number: 1 (OUT 1), 2 (OUT 2), 3 (OUT 3), 4 (OUT 4), 5 (OUT 5), 6 (OUT 6), 7 (OUT 7), 8 (OUT 8), * (All outputs)</p>		
K-Config Example		
<p>Switch IN 1 to OUT 3:            "#VID 1&gt;3",0x0D</p>		

## AUD

Functions	Permission	Transparency
Set: <b>AUD</b>	End User	Public
Get: <b>AUD?</b>	End User	Public
Description	Syntax	
Set: Set audio switch state	#AUD[SP] <i>in</i> > <i>out</i> , <i>in</i> > <i>out</i> ,...[CR]	
Get: Get audio switch state	#AUD?[SP] <i>out</i> [CR] #AUD?[SP]*[CR]	
Response		
Set: ~nn@AUD[SP] <i>in</i> > <i>out</i> [CR LF] ~nn@AUD[SP] <i>in</i> > <i>out</i> [CR LF]		
Get: ~nn@AUD[SP] <i>in</i> > <i>out</i> [CR LF] ~nn@AUD[SP] <i>in</i> >1, <i>in</i> >2,...[CR LF]		
Parameters		
<p><i>In</i> – Input number: 1 (HDMI IN 1), 2 (HDMI IN 2), 3 (HDMI IN 3), 4 (HDMI IN 4), 5 (HDMI IN 5), 6 (HDMI IN 6), 7 (HDMI IN 7), 8 (HDMI IN 8), 0 (Output disconnected)            &gt; – Connection character between in and out parameters  <i>out</i> – Output number: 1 (HDMI OUT 1), 2 (HDMI OUT 2), 3 (HDMI OUT 3), 4 (HDMI OUT 4), 5 (HDMI OUT 5), 6 (HDMI OUT 6), 7 (HDMI OUT 7), 8 (HDMI OUT 8), * (All outputs)</p>		
Notes		
When AFV switching mode is active, this command also switches video and unit replies with command ~AV.		

**K-Config Examples**

Switch embedded audio HDMI IN 1 to HDMI OUT 3:

`#AUD 1&gt;3",0x0D`

**DISPLAY**

Functions	Permission	Transparency
Set: -	-	-
Get: <b>DISPLAY?</b>	End User	Public
Description	Syntax	
Set: -	-	
Get: Get output HPD status	# <b>DISPLAY?</b> <u>SP</u> out_id <u>CR</u>	
Response		
~ <u>nn</u> @ <b>DISPLAY</b> <u>SP</u> out_id,status <u>CR LF</u>		
Parameters		
out_id – 1 (Output 1), 2 (Output 2) status – HPD status according to signal validation: 0 (Off), 1 (On), 2 (On and all parameters are stable and valid)		
Response Triggers		
A response is sent to the com port from which the Get was received, after command execution and: <ul style="list-style-type: none"> <li>• After every change in output HPD status from On to Off (0).</li> <li>• After every change in output HPD status from Off to On (1).</li> <li>• After every change in output HPD status form Off to On and all parameters (new EDID, etc.) are stable and valid (2).</li> </ul>		
K-Config Example		
Get the output HPD status of Output 1: `#DISPLAY? 1",0x0D`		

**INFO-IO**

Functions	Permission	Transparency
Set: -	-	-
Get: <b>INFO-IO?</b>	End User	Public
Description	Syntax	
Set: -	-	
Get: Get in/out count	# <b>INFO-IO?</b> <u>CR</u>	
Response		
~ <u>nn</u> @ <b>INFO-IO</b> <u>SP</u> IN <u>SP</u> inputs_count,OUT <u>SP</u> outputs_count <u>CR LF</u>		
Parameters		
inputs_count – 8 (Number of inputs in the unit) outputs_count – 8 (Number of outputs in the unit)		
K-Config Example		
Get inputs count: `#INFO-IO?",0x0D`		

**INFO-PRST**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>INFO-PRST?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get maximum preset count	# <b>INFO-PRST?</b> <code>CR</code>	
Response			
~ <code>nn</code> @ <b>INFO-PRST</b> <code>SP</code> <code>VID</code> <code>SP</code> <code>preset_video_count</code> , <code>AUD</code> <code>SP</code> <code>preset_audio_count</code> <code>CR LF</code>			
Parameters			
<code>preset_video_count</code> – Maximum number of video presets in the unit <code>preset_audio_count</code> – Maximum number of audio presets in the unit			
Notes			
In most units, video and audio presets with the same number are stored and recalled together by commands # <b>PRST-STO</b> and # <b>PRST-RCL</b> .			
K-Config Example			
Get number of video and audio presets: `#INFO-PRST?`,0x0D			

**PRST-AUD**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>PRST-AUD?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get audio connections from saved preset	# <b>PRST-AUD?</b> <code>SP</code> <code>preset,out</code> <code>CR</code> # <b>PRST-AUD?</b> <code>SP</code> <code>preset,*</code> <code>CR</code>	
Response			
~ <code>nn</code> @ <b>PRST-AUD</b> <code>SP</code> <code>preset, in&gt;out</code> <code>CR LF</code> ~ <code>nn</code> @ <b>PRST-AUD</b> <code>SP</code> <code>preset, in&gt;1, in&gt;2, in&gt;3,...</code> <code>CR LF</code>			
Parameters			
<code>preset</code> – Preset number <code>n</code> – Input number: 1 (IN 1), 2 (IN 2), 3 (IN 3), 4 (IN 4), 5 (IN 5), 6 (IN 6), 7 (IN 7), 8 (IN 8), 0 (Output disconnected) > – Connection character between in and out parameters <code>out</code> – Output number: 1 (OUT 1), 2 (OUT 2), 3 (OUT 3), 4 (OUT 4), 5 (OUT 5), 6 (OUT 6), 7 (OUT 7), 8 (OUT 8), * (All outputs)			
Notes			
In most units, video and audio presets with the same number are stored and recalled together by commands # <b>PRST-STO</b> and # <b>PRST-RCL</b> .			
K-Config Example			
Get audio connection IN 1 to OUT 3 from saved preset 1: `#PRST-AUD? 1",0x0D			

**Switching Commands**

Command	Description
---------	-------------

MTX-MODE	Set/get to auto-switch mode
VMUTE	Set/get video on output status
ROUTE	Set/get layer routing

## MTX-MODE

Functions		Permission	Transparency
Set:	<b>MTX-MODE</b>	End User	Public
Get:	<b>MTX-MODE?</b>	End User	Public
Description		Syntax	
Set:	Set auto-switch mode	# <b>MTX-MODE</b> [SP] <i>output_id,mode</i> [CR]	
Get :	Get auto-switch mode	# <b>MTX-MODE?</b> [SP] <i>output_id</i> [CR]	
Response			
~nn@ <b>MTX-MODE</b> [SP] <i>output_id,mode</i> [CR]			
Parameters			
<i>output_id</i> – 1 (OUT 1), 2 (OUT 2), 3 (OUT 3), 4 (OUT 4), 5 (OUT 5), 6 (OUT 6), 7 (OUT 7), 8 (OUT 8) <i>mode</i> – 0 (Manual), 1 (Auto priority) 2 (Auto last connected)			
Response Triggers			
After execution, a response is sent to the com port from which the Set/Get was received. After execution, a response is sent to all com ports if <b>MTX-MODE</b> was set by any other external control device (button press, WEB, device menu and similar).			
Notes			
Not recommended for new devices.			
K-Config Example			
Set output to last connected: `#MTX-MODE 1,2",0x0D			

## ROUTE

Functions		Permission	Transparency
Set:	<b>ROUTE</b>	End User	Public
Get:	<b>ROUTE?</b>	End User	Public
Description		Syntax	
Set:	Set layer routing	# <b>ROUTE</b> [SP] <i>layer,dest,src</i> [CR]	
Get:	Get layer routing	# <b>ROUTE?</b> [SP] <i>layer,dest</i> [CR]	
Response			
~nn@ <b>ROUTE</b> [SP] <i>layer,dest,src</i> [CR LF]			
Parameters			
<i>layer</i> – 1 (Video), 2 (Audio) <i>dest</i> – 1 (HDMI OUT 1), 2 (HDMI OUT 2), 3 (HDMI OUT 3), 4 (HDMI OUT 4), 5 (HDMI OUT 5), 6 (HDMI OUT 6), 7 (HDMI OUT 7), 8 (HDMI OUT 8), * (All outputs) <i>src</i> – 1 (HDMI IN 1), 2 (HDMI IN 2), 3 (HDMI IN 3), 4 (HDMI IN 4), 5 (HDMI IN 5), 6 (HDMI IN 6), 7 (HDMI IN 7), 8 (HDMI IN 8), 0 (Output disconnected)			
Notes			
The get command identifies input switching on Step-in clients. The set command is for remote input switching on Step-in clients (essentially via the web).			
K-Config Examples			
Route video HDMI IN 2 to video HDMI OUT 8: `#ROUTE 1,8,2",0x0D			

## VMUTE

Functions		Permission	Transparency
Set:	<b>VMUTE</b>	End User	Public
Get:	<b>VMUTE?</b>	End User	Public
Description		Syntax	
Set:	Set enable/disable video on output	# <b>VMUTE</b> [SP] <i>output_id,flag</i> [CR]	
Get:	Get video on output status	# <b>VMUTE?</b> [SP] <i>output_id</i> [SP] [CR]	
Response			
Set / Get: ~ <i>nn</i> @ <b>VMUTE</b> [SP] <i>output_id,flag</i> [CR LF]			
Parameters			
<i>output_id</i> - 1 (OUT 1), 2 (OUT 2), 3 (OUT 3), 4 (OUT 4), 5 (OUT 5), 6 (OUT 6), 7 (OUT 7), 8 (OUT 8) <i>flag</i> - 0 (Disable video on output), 1 (Enable video on output), 2 (Blank video)			
K-Config Example			
Disable the video output on OUT 2: `#VMUTE 2,0",0x0D`			

## Communication Commands

Command	Description
ETH-PORT	Set/get Ethernet port protocol
NET-DHCP	Set/get DHCP mode
NET-GATE	Set/get gateway IP
NET-IP	Set/get IP address
NET-MAC	Get MAC address
NET-MASK	Set/get subnet mask

## ETH-PORT

Functions		Permission	Transparency
Set:	<b>ETH-PORT</b>	Administrator	Public
Get:	<b>ETH-PORT?</b>	End User	Public
Description		Syntax	
Set:	Set Ethernet port protocol	# <b>ETH-PORT</b> [SP] <i>portType,ETHPort</i> [CR]	
Get:	Get Ethernet port protocol	# <b>ETH-PORT?</b> [SP] <i>portType</i> [CR]	
Response			
~ <i>nn</i> @ <b>ETH-PORT</b> [SP] <i>portType,ETHPort</i> [CR LF]			
Parameters			
<i>portType</i> - 0 (TCP), 1 (UDP) <i>ETHPort</i> - 0-65534 (TCP / UDP port number)			
Notes			
If the port number you enter is already in use, an error is returned. The port number must be within the following range: 2000-(2 <sup>16</sup> -1).			
K-Config Example			
Set the Ethernet port protocol for TCP to port 12457: `#ETH-PORT 0,12457",0x0D`			

## NET-DHCP

Functions		Permission	Transparency
Set:	<b>NET-DHCP</b>	Administrator	Public
Get:	<b>NET-DHCP?</b>	End User	Public
Description		Syntax	
Set:	Set DHCP mode	# <b>NET-DHCP</b> [SP] <i>mode</i> [CR]	

Get:	Get DHCP mode	#NET-DHCP? CR
<b>Response</b>		
~nn@NET-DHCP SP mode CR LF		
<b>Parameters</b>		
<i>mode</i> – 0 (Do not use DHCP. Use the IP address set by the factory or the <b>NET-IP</b> command), 1 (Try to use DHCP. If unavailable, use the IP address set by the factory or the <b>NET-IP</b> command)		
<b>Notes</b>		
Connecting Ethernet to devices with DHCP may take more time in some networks. To connect with a randomly assigned IP by DHCP, specify the device DNS name (if available) using the <b>NAME</b> command. You can also get an assigned IP by direct connection to USB or RS-232 protocol port if available. Consult your network administrator for correct settings.		
<b>K-Config Example</b>		
Enable DHCP mode, if available: "#NET-DHCP 1", 0x0D		

## NET-GATE

Functions		Permission	Transparency
Set:	<b>NET-GATE</b>	Administrator	Public
Get:	<b>NET-GATE?</b>	End User	Public
Description		Syntax	
Set:	Set gateway IP	#NET-GATE SP <i>ip_address</i> CR	
Get:	Get gateway IP	#NET-GATE? CR	
<b>Response</b>			
~nn@NET-GATE SP <i>ip_address</i> CR LF			
<b>Parameters</b>			
<i>ip_address</i> – Gateway IP address, in the following format: xxx.xxx.xxx.xxx			
<b>Notes</b>			
A network gateway connects the device via another network, possibly over the Internet. Be careful of security problems. Consult your network administrator for correct settings.			
<b>K-Config Example</b>			
Set the gateway IP address to 192.168.0.1: "#NET-GATE 192.168.000.001", 0x0D			

## NET-IP

Functions		Permission	Transparency
Set:	<b>NET-IP</b>	Administrator	Public
Get:	<b>NET-IP?</b>	End User	Public
Description		Syntax	
Set:	Set IP address	#NET-IP SP <i>ip_address</i> CR	
Get:	Get IP address	#NET-IP? CR	
<b>Response</b>			
~nn@NET-IP SP <i>ip_address</i> CR LF			
<b>Parameters</b>			
<i>ip_address</i> – IP address, in the following format: xxx.xxx.xxx.xxx			
<b>Notes</b>			
Consult your network administrator for correct settings.			
<b>K-Config Example</b>			
Set the IP address to 192.168.1.39: "#NET-IP 192.168.001.039", 0x0D			

**NET-MAC**

Functions		Permission	Transparency
Set:	-	-	-
Get:	<b>NET-MAC?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get MAC address	#NET-MAC? <input type="checkbox"/> CR	
Response			
~nn@NET-MAC <input type="checkbox"/> SPmac_addressCR LF			
Parameters			
<b>mac_address</b> – Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit			
K-Config Example			
"#NET-MAC?", 0x0D			

**NET-MASK**

Functions		Permission	Transparency
Set:	<b>NET-MASK</b>	Administrator	Public
Get:	<b>NET-MASK?</b>	End User	Public
Description		Syntax	
Set:	Set subnet mask	#NET-MASK <input type="checkbox"/> SPnet_maskCR	
Get:	Get subnet mask	#NET-MASK? <input type="checkbox"/> CR	
Response			
~nn@NET-MASK <input type="checkbox"/> SPnet_maskCR LF			
Parameters			
<i>net_mask</i> – format: xxx.xxx.xxx.xxx			
Response Triggers			
The subnet mask limits the Ethernet connection within the local network Consult your network administrator for correct settings			
K-Config Example			
Set the subnet mask to 255.255.0.0: "#NET-MASK 255.255.000.000", 0x0D			

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. All Kramer fiber optic cables, adapter-size fiber optic extenders, pluggable optical modules, active cables, cable retractors, all ring mounted adapters, all Kramer speakers and Kramer touch panels are 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.
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.

#### **Exclusive Remedy**

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF KRAMER ELECTRONICS CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN ALL IMPLIED WARRANTIES COVERING THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO THIS PRODUCT AS PROVIDED UNDER APPLICABLE LAW. IF ANY PRODUCT TO WHICH THIS LIMITED WARRANTY APPLIES IS A "CONSUMER PRODUCT" UNDER THE MAGNUSON-MOSS WARRANTY ACT (15 U.S.C.A. §2301, ET SEQ.) OR OTHER APPLICABLE LAW, THE FOREGOING DISCLAIMER OF IMPLIED WARRANTIES SHALL NOT APPLY TO YOU, AND ALL IMPLIED WARRANTIES ON THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE, SHALL APPLY AS PROVIDED UNDER APPLICABLE LAW.

#### **Other Conditions**

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

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

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



P/N:  2900-300629

Rev:  4



## SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

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

We welcome your questions, comments, and feedback.