KRAMER

USER MANUAL

MODEL:

VS-44H2
4K 4x4 Matrix Switcher



Contents

Introduction **1**
Getting Started 1
Overview 2
Typical Applications 3
Defining VS-44H2 4K 4x4 Matrix Switcher **4**
Mounting VS-44H2 **6**
Connecting VS-44H2 **7**
Connecting to VS-44H2 via RS-232 8
Operating VS-44H2 Via Front Panel Buttons **9**
Switching Inputs to Outputs 10
Switching an Input to All the Outputs 10
Muting Outputs 10
Switching a Pattern to an Input 11
Storing and Recalling Presets 11
Locking and Unlocking Front Panel Buttons 12
Assigning EDID to Inputs 12
Operating via Ethernet 13
Using Embedded Webpages **16**
Browsing VS-44H2 Webpages 17
Defining Global Settings 18
Routing Inputs to Outputs 21
Defining HDMI Input Port Parameters 23
Defining HDMI Output Parameters 24
Managing EDID 27
Configuring Device Automation 32
Restarting and Resetting to Factory Default Parameters 33
Changing Device Name 35
Setting Authentication 36
Changing the Ethernet Settings 37
Performing Firmware Upgrade 39
Setting Date and Time 40
Viewing General Version Information 41
Upgrading Firmware **42**
Technical Specifications **43**
Default Communication Parameters 44
Default EDID 44
Protocol 3000 **46**
Understanding Protocol 3000 46
Protocol 3000 Commands 47
Result and Error Codes 62

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-44H2 to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

Achieving Best Performance

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).
- Do not secure the cables in tight bundles or roll the slack into tight coils.
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality.
- Position your Kramer **VS-44H2** 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 GPI\O 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.

Overview

Congratulations on purchasing your Kramer **VS-44H2 4K 4x4 Matrix Switcher**.

VS-44H2 is a high-performance 4x4 matrix switcher for 4K@60Hz (4:4:4) HDR signals. It reclocks and equalizes the signals and can route any one of 4 HDMI™, HDCP-compliant sources (selectable) to any or all outputs simultaneously.

VS-44H2 provides exceptional quality, and advanced and user-friendly operation.

Exceptional Quality

- High-Performance AV Matrix – Switches four 4K@60Hz (4:4:4), HDR, HDMI, HDCP (2.2/1.4)–compliant signals to four 4K@60Hz (4:4:4), HDR, HDMI, HDCP (2.2/1.4)–compliant outputs at up to 18G data rate, featuring Kramer re-Klocking™ and Equalization Technology that rebuilds the digital signal to travel longer distances.

  For optimum range and performance, use recommended Kramer cables.

- HDMI Support – Deep Color, 3D, up to 7.1 uncompressed audio channels as specified in HDMI 2.0.

Advanced and User-friendly Operation

- Quick Access to Common Configurations – Save up to 8 preset configurations.
- Simple and Powerful Maestro Room Automation – Intuitive user interface enables you to fully automate your meeting room elements. Configure lights, shades, devices and more to be activated by an extensive range of triggers, including scheduling, input/output connectivity, routing, and button pressing. By minimizing user intervention, Maestro room automation saves meeting prep time and minimizes human error before presentations.
- Smart Switching – Active source & acceptor detection. Automatic input selection based on priority selection or last connected input.
- Embedded Pattern Generator – With selectable patterns.

- Convenient Unit Control and Configuration Options – Local control via front panel switching, memory, lock and EDID buttons, and input/output LED display. Distance control via user-friendly embedded webpages via the Ethernet, Protocol 3000 API, and RS-232 serial commands transmitted by a PC, touch screen system or other serial controller.
- EDID Management – Individual EDID management per input. Captures and stores the EDID from a display device.
- Flexible Content Protection – Selectable HDCP per input.
- Cost–Effective Maintenance – Input selection indicators facilitate easy local maintenance and troubleshooting. Firmware upgrade via Ethernet.
- Easy Installation – 19" enclosure for rack mounting in a 1U rack space with included rack ears and universal 100–240V AC power supply.

Typical Applications

VS-44H2 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-44H2

Control your **VS-44H2** 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 webpages.

Defining VS-44H2 4K 4x4 Matrix Switcher

This section defines **VS-44H2**.

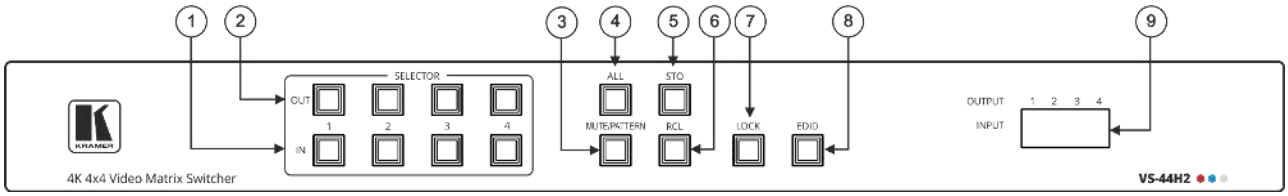


Figure 1: VS-44H2 4K 4x4 Matrix Switcher Front Panel

#	Feature	Function
1	IN Select Buttons (1 to 4)	Press to select the input to switch after selecting an output (also used for storing/recalling machine setups).
2	OUT Select Buttons (1 to 4)	Press to select an output to switch to followed by an input (also used for storing/recalling machine setups.
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 and video on a selected output. Press the selected output and then press MUTE.
4	ALL Button	Press followed by an input button to connect the selected input to all outputs. For example, press ALL and then Input button # 2 to connect input # 2 to all the outputs.
5	STO Button	Press STO followed by an IN or OUT (1 to 4) button to store the current switching configuration to the location corresponding to that INPUT number.
6	RCL Button	Press RCL followed by the corresponding IN or OUT (1 to 4) button to recall the preset switching configuration saved in that location.
7	LOCK Button	Press and hold to toggle between locking and releasing the front panel buttons.
8	EDID Button	Press to enter the EDID mode.
9	OUTPUT/INPUT 7-segment LED Display	Displays the input currently switched to the output which is marked above each input.

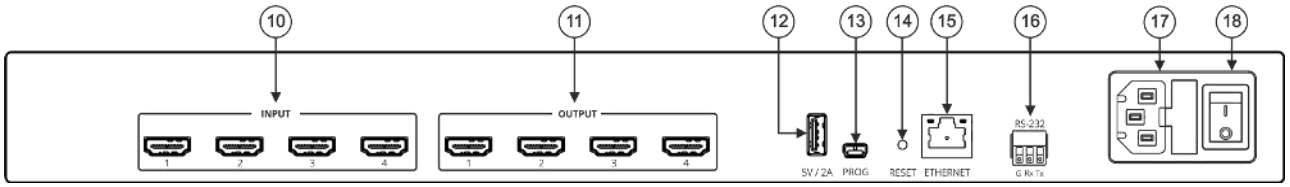


Figure 2: VS-44H2 4K 4x4 Matrix Switcher Rear Panel

#	Feature	Function
(10)	HDMI™ INPUT Connectors (1 to 4)	Connect to up to 4 HDMI sources.
(11)	HDMI OUTPUT Connectors (1 to 4)	Connect to up to 4 HDMI acceptors.
(12)	5V/2A USB Port	Use to charge a device.
(13)	PROG USB Mini Port	Connect to a PC/serial controller to control the device.
(14)	Reset Button	Press and hold for about 8 seconds to reset the configuration to its default parameters.
(15)	ETHERNET RJ-45 Connector	Connect to a PC via a LAN.
(16)	RS-232 9-pin D-sub Connector	Connect to a PC/serial controller to control the device.
(17)	Mains Power Connector Fuse	Plug in the power cord.
(18)	Power Illuminated Switch	Turn the device on and off.

Mounting VS-44H2

This section provides instructions for mounting **VS-44H2**. Before installing, verify that the environment is within the recommended range:

- Operation temperature – 0° to 40°C (32 to 104°F).
- Storage temperature – -40° to +70°C (-40 to +158°F).
- Humidity – 10% to 90%, RHL non-condensing.

Caution:

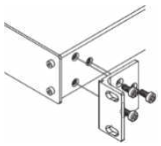
- Mount **VS-44H2** before connecting any cables or power.

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.

Mount VS-44H2 in a rack:

- Attach both rack ears by removing the screws from each side of the machine and replacing those screws through the rack ears.



Connecting VS-44H2

Always switch off the power to each device before connecting it to your **VS-44H2**. After connecting your **VS-44H2**, connect its power and then switch on the power to each device.

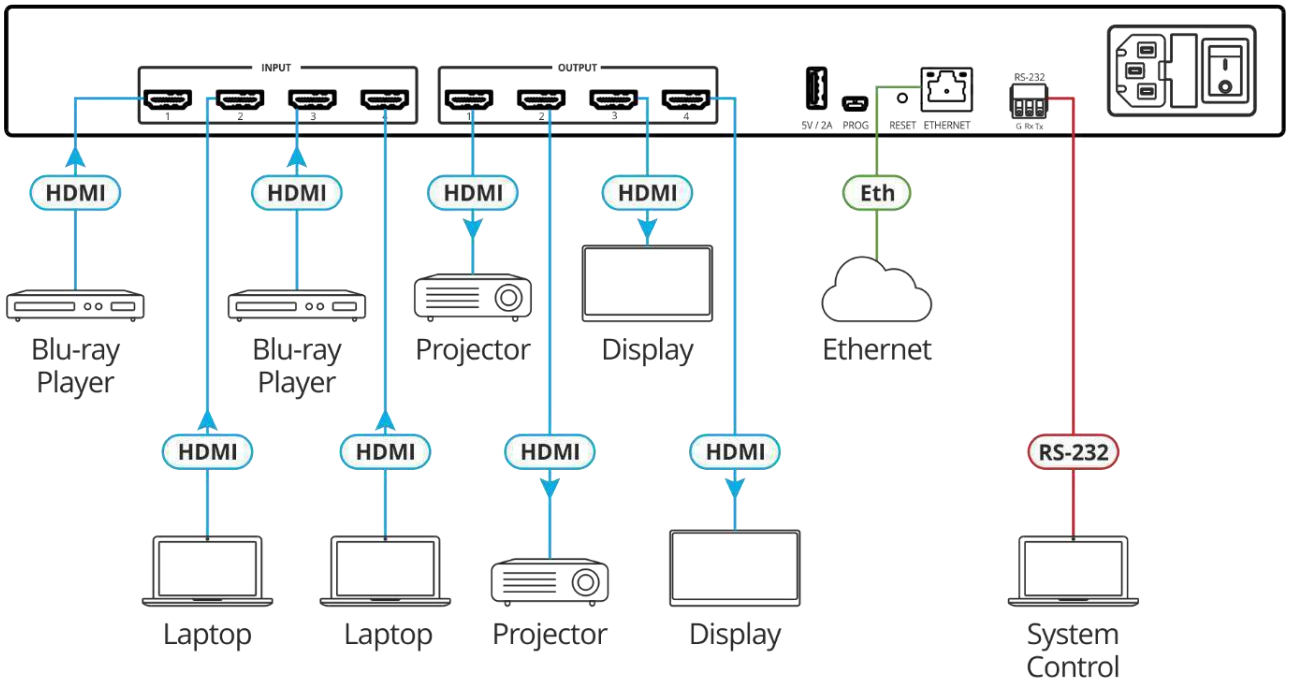


Figure 3: Connecting to the VS-44H2 Rear Panel

To connect VS-44H2 as illustrated in the example in Figure 3:

1. Connect up to four HDMI sources (for example, Blu-ray players and laptops) to the HDMI INPUT connectors (10).
2. Connect the HDMI OUTPUT connectors (11) to up to four HDMI acceptors (for example, projectors and displays).
3. Connect the power adapter to **VS-44H2** and to the mains electricity (not shown in Figure 3).
4. Connect the ETHERNET RJ-45 port (15) to the Network.
5. Connect the RS-232 port (16) to a controller (for example, a laptop).
6. Connect the power.

Connecting to VS-44H2 via RS-232

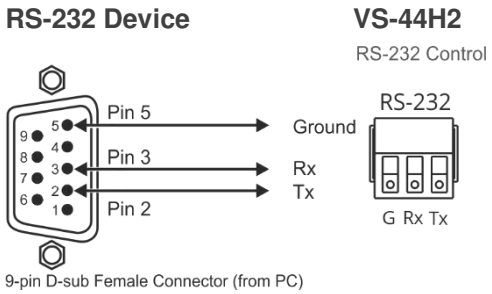
You can connect to **VS-44H2** via an RS-232 connection (13) using, for example, a PC.

VS-44H2 features an RS-232 3-pin terminal block connector allowing the RS-232 to control **VS-44H2**.

Connect the RS-232 terminal block on the rear panel of **VS-44H2** to a PC/controller, as follows:

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

- Pin 2 to the TX pin on the **VS-44H2** RS-232 terminal block
- Pin 3 to the RX pin on the **VS-44H2** RS-232 terminal block
- Pin 5 to the G pin on the **VS-44H2** RS-232 terminal block



Operating VS-44H2 Via Front Panel Buttons

Press the power switch (18) to power the device. During the 60-second initialization process:

- The 7-segment display LEDs (9) first display LOAD and then, towards the completion of the initialization process, flash a few times.
- All the front panel buttons illuminate for a few seconds.

Following initialization, the IN-OUT status is displayed on the 7-segment displays, and the front panel buttons are ready for normal operation.

You need to carry out all front panel button operations within 15 seconds otherwise that action times out if the operation is not carried out.

Any switching operation is performed by selecting the output (or all the outputs) first and then selecting the input.

An illuminated input button means that a valid input is connected to that input.

An illuminated output button means that a display is connected to that output.

VS-44H2 front panel buttons enable performing the following actions:

- Switching Inputs to Outputs on page 10.
- Switching an Input to All the Outputs on page 10.
- Muting Outputs on page 10.
- Switching a Pattern to an Input on page 11.
- Storing and Recalling Presets on page 11.
- Locking and Unlocking Front Panel Buttons on page 12.
- Assigning EDID to Inputs on page 12.
- Operating via Ethernet on page 13.

Switching Inputs to Outputs

VS-44H2 enables switching an input to one or more outputs via the front panel buttons. First an output is selected and then the input is selected to be switched to the selected output.

To switch an input to one or more outputs:

1. Press an OUT button (for example, press **OUT 1**). The selected OUT button, as well as the 7-segment display LED under the selected output, flash.
2. Press an IN button (for example, press **IN 3**) to choose the input to be switched to the selected output.
   The selected OUT button stops flashing and the 7-segment display under the selected output, displays the input number that is routed to that output.

Input 3 is routed to output 1.

In the same way, you can route the same input to another output or different inputs to different outputs.

Switching an Input to All the Outputs

VS-44H2 enables switching an input to all the outputs via the front panel buttons. Pressing **ALL** selects all the outputs.

To switch an input to all the outputs:

1. Press **ALL** (4). The ALL button flashes as well as all the 7-segment display LEDs.
2. Press an IN button (for example, press **IN 3**) to choose the input to be switched to all the outputs.
   The ALL button and the 7-segment display LEDs stop flashing. The 7-segment display shows the same input routed to all the outputs.

Input 3 is routed to all the outputs.

Muting Outputs

VS-44H2 enables muting an output, several outputs or all the outputs via the front panel buttons.

To mute an output:

1. Select an output to mute (to mute all outputs, press **ALL** on the front panel).
2. Press **MUTE/PATTERN** on the front panel.

The selected output/s is muted.

Switching a Pattern to an Input

VS-44H2 generates 4 embedded patterns. These patterns can be routed at a resolution of 480p to one output at a time. A pattern is selected by pressing inputs 1 to 4 when in the Pattern mode as follows:

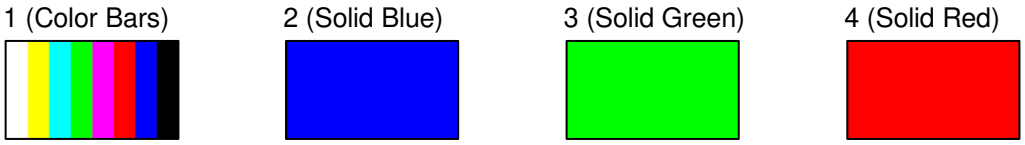


Figure 4: VS-44H2 Embedded Patterns

To route a pattern:

1. Press **MUTE/PATTERN** (3). The MUTE/PATTERN button flashes.
   - If there is currently no pattern routed to an output, all 4 inputs on the 7-segment display hyphens.
   - If a pattern is currently routed to an output, the pattern number is displayed under that output and the other inputs display a hyphen.
2. Select the output to which the pattern is routed.
3. Select the pattern (1 to 4) by pressing an input. The 7-segment display returns to normal operation mode and **"P"** under the selected output number indicates that a pattern is routed to that output.

A pattern is routed to the selected output.

Storing and Recalling Presets

You can store up to 8 presets. Each setup includes the device configuration, excluding Network settings, security configuration and Maestro configuration.

In Store-Recall mode, OUT 1 corresponds to setup 1, IN 1 corresponds to setup 5, and so on.

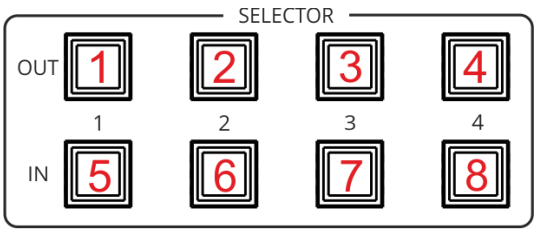


Figure 5: VS-44H2 4K 4x4 Matrix Switcher Front Panel

Storing Presets

To store a preset:

1. Press **STO** (5) on the front panel button. The STO button flashes.
2. Press an IN or OUT button (for example, IN 1).
   The selected button flashes until the current configuration is stored.

The current configuration is stored to preset 5.

Recalling Presets

To recall a preset:

1. Press **RCL** (6) on the front panel button.
   The **RCL** button flashes.
2. Press an IN or OUT button to recall the preset stored in that IN/OUT button.

The stored preset is recalled.

Locking and Unlocking Front Panel Buttons

VS-44H2 enables using the LOCK button to toggle between locking and unlocking the front panel buttons.

To lock or unlock the front panel buttons:

1. Press **LOCK** (7) for a few seconds on the front panel until it illuminates.
   Front panel buttons are locked.
2. Press **LOCK** (7) for a few seconds on the front panel button until it no longer illuminates.
   Front panel buttons are unlocked.

Front panel buttons are locked/unlocked

Assigning EDID to Inputs

VS-44H2 enables using the EDID button to assign EDID to a selected input.

To copy the EDID from a connected output to a selected input:

1. Press **EDID** (8) on the front panel button. The EDID button flashes and the 7-segment display shows the current EDID status (“d” for default or the number of the output source).
2. Press an input button (for example, IN 3 or press **ALL** for copying to all the inputs) to which you want to copy the EDID.
   All the selected buttons flash as well as the 7-segment display LEDs of the selected inputs.
3. Press an output button (for example, OUT 3) from which the EDID is copied.
4. Press **EDID** button. Wait a few seconds for the device to copy the EDID from the connected display.

EDID is copied from the connected output to the selected inputs.

To copy the default EDID:

1. Press and hold **EDID** until button illuminates.
   VS-44H2 enters the EDID mode and the 7-segment display shows the current EDID status.

2. Press an input button (or **ALL**).
   The selected input and 7-segment display LEDs of the selected inputs flash.
3. Press a disconnected output button.

Default EDID is copied to the selected inputs.

Operating via Ethernet

You can connect to **VS-44H2** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see Connecting Ethernet Port Directly to PC on page 13).
- Via a network hub, switch, or router, using a straight-through cable (see Connecting Ethernet Port via Network Hub on page 15).

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

Connecting Ethernet Port Directly to PC

You can connect the Ethernet port of **VS-44H2** directly to the Ethernet port on your PC using a crossover cable with RJ-45 connectors.

This type of connection is recommended for identifying **VS-44H2** with the factory configured default IP address.

After connecting **VS-44H2** to the Ethernet port, configure your PC as follows:

1. Click **Start** > **Control Panel** > **Network and Sharing Center**.
2. Click **Change Adapter Settings**.
3. Highlight the network adapter you want to use to connect to the device and click **Change settings of this connection**.
   The Local Area Connection Properties window for the selected network adapter appears as shown in Figure 6.

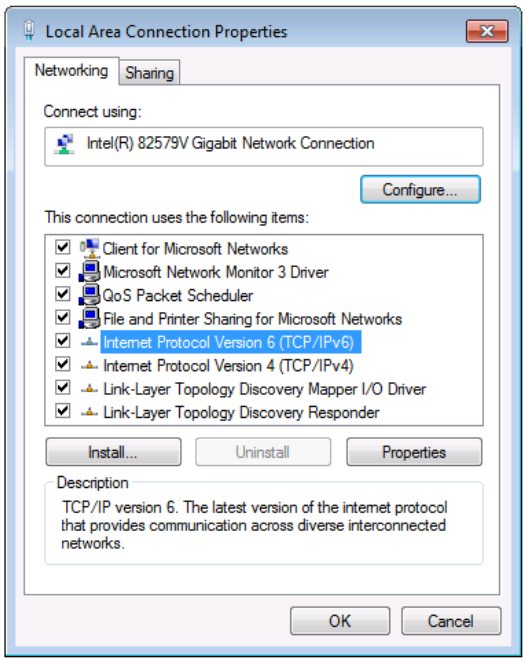


Figure 6: Local Area Connection Properties Window

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 7 or Figure 8.

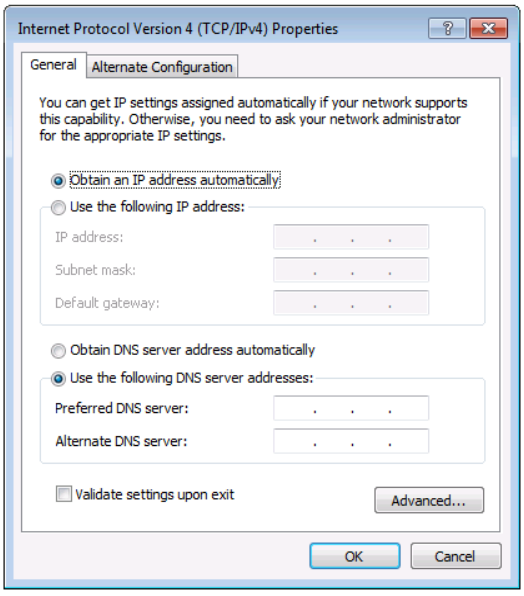


Figure 7: Internet Protocol Version 4 Properties Window

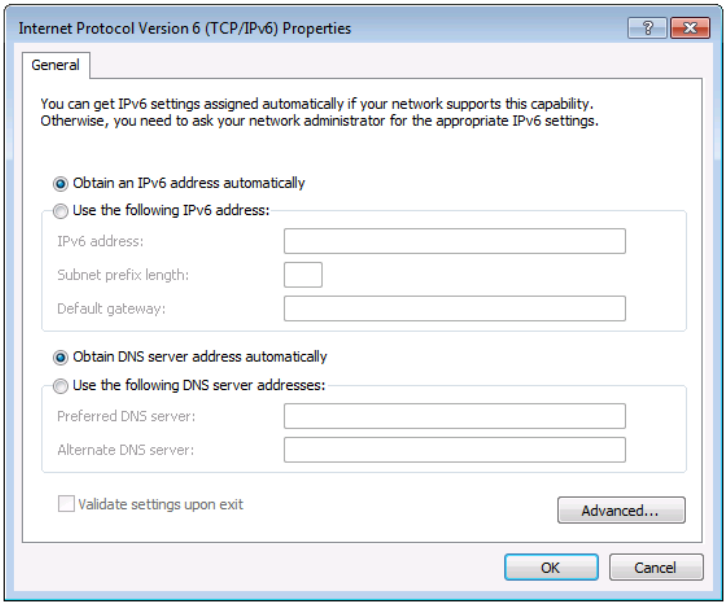


Figure 8: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in Figure 9.
   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.

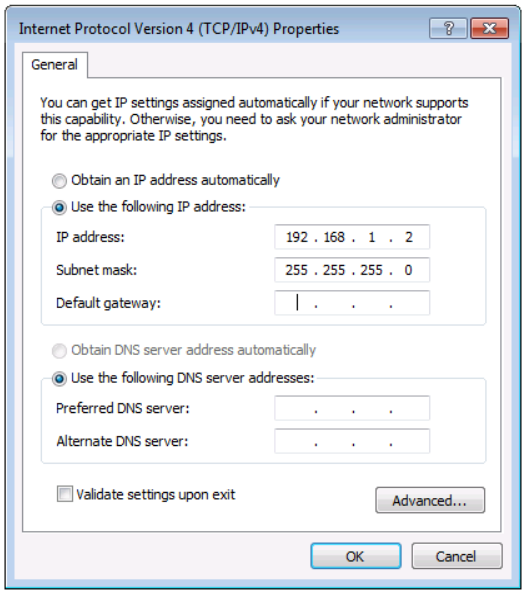


Figure 9: Internet Protocol Properties Window

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

Connecting Ethernet Port via Network Hub or Switch

You can connect the Ethernet port of **VS-44H2** to the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

Configuring Ethernet Port

You can set the Ethernet parameters via the embedded webpages.

Using Embedded Webpages

VS-44H2 enables you to configure settings via Ethernet using built-in, user-friendly webpages.



You can also configure **VS-44H2** via Protocol 3000 commands (see Protocol 3000 Commands on page 47).

VS-44H2 webpages enable performing the following:

- Browsing VS-44H2 Webpages on page 17.
- Defining Global Settings on page 18.
- Routing Inputs to Outputs on page 21.
- Defining HDMI Input Port Parameters on page 23.
- Defining HDMI Output Parameters on page 24.
- Managing EDID on page 27.
- Configuring Device Automation on page 32.
- Restarting and Resetting to Factory Default Parameters on page 33.
- Changing Device Name on page 35.
- Setting Authentication on page 36.
- Changing the Ethernet Settings on page 37.
- Performing Firmware Upgrade on page 39.
- Setting Date and Time on page 40.
- Viewing General Version Information on page 41.

Browsing VS-44H2 Webpages

If a webpage does not update correctly, clear your Web browser's cache.

To browse webpages:

1. Type the IP address of the device in the address bar of your internet browser (default is 192.168.1.39).

   By default, security is enabled. The Login window appears (to disable security, see Setting Authentication on page 36).

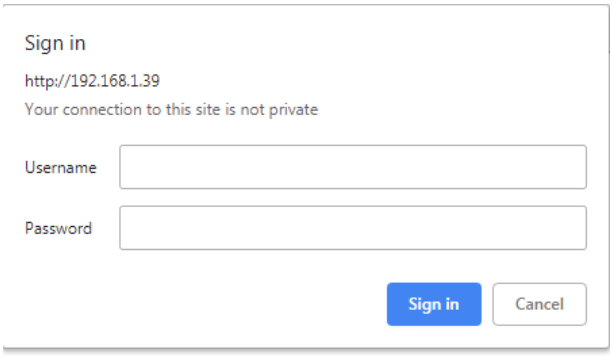


Figure 10: Embedded Webpages Login Window

2. Enter the Username (default is Admin) and Password (default is Admin) and click **Sign in**.

   The Routing Settings webpage appears.

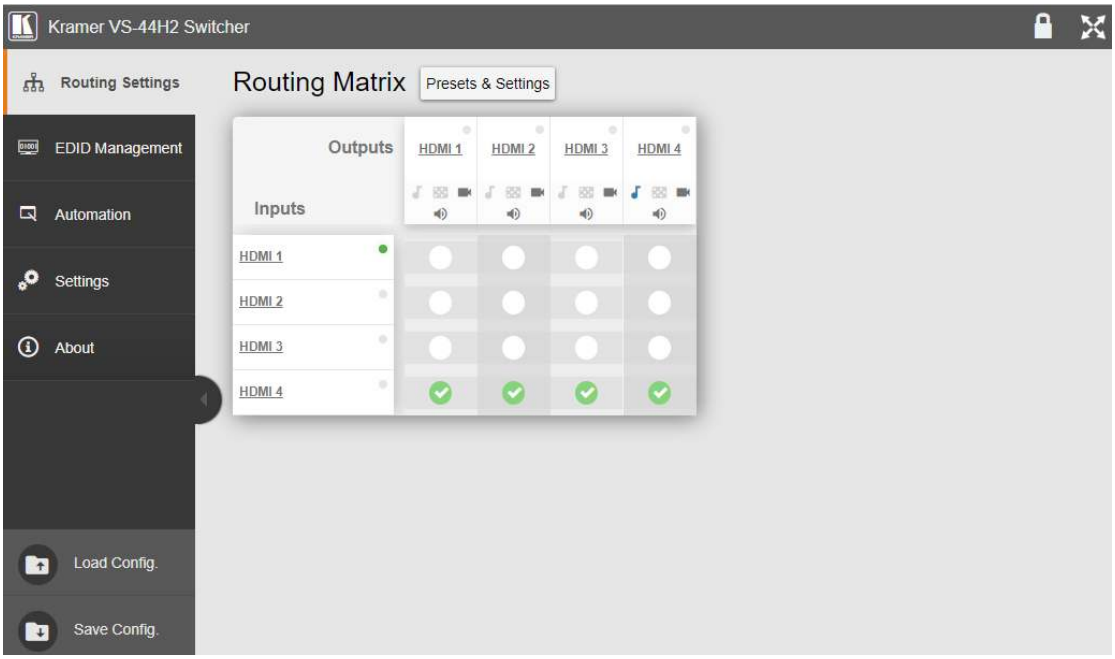


Figure 11: Routing Settings Page

3. Click the Navigation Pane on the left side of the screen to access the relevant webpage.

Click the arrow next to the navigation pane to hide/show the names of the pages.

Webpages can be accessed.

Defining Global Settings

VS-44H2 enables performing the following actions via the Presets & Settings page:

- Setting Video Timeouts on page 18.
- Saving and Loading Presets on page 20.

Setting Video Timeouts

VS-44H2 enables setting the video switching timeouts.

To set the video timeouts:

1. In the Navigation pane, click **Routing Settings**. The Routing Matrix page appears (see Figure 11).
2. Click **Presets & Settings** (next to Routing Matrix).
   The Auto-Switching Timeouts tab in the Global Settings window appears.

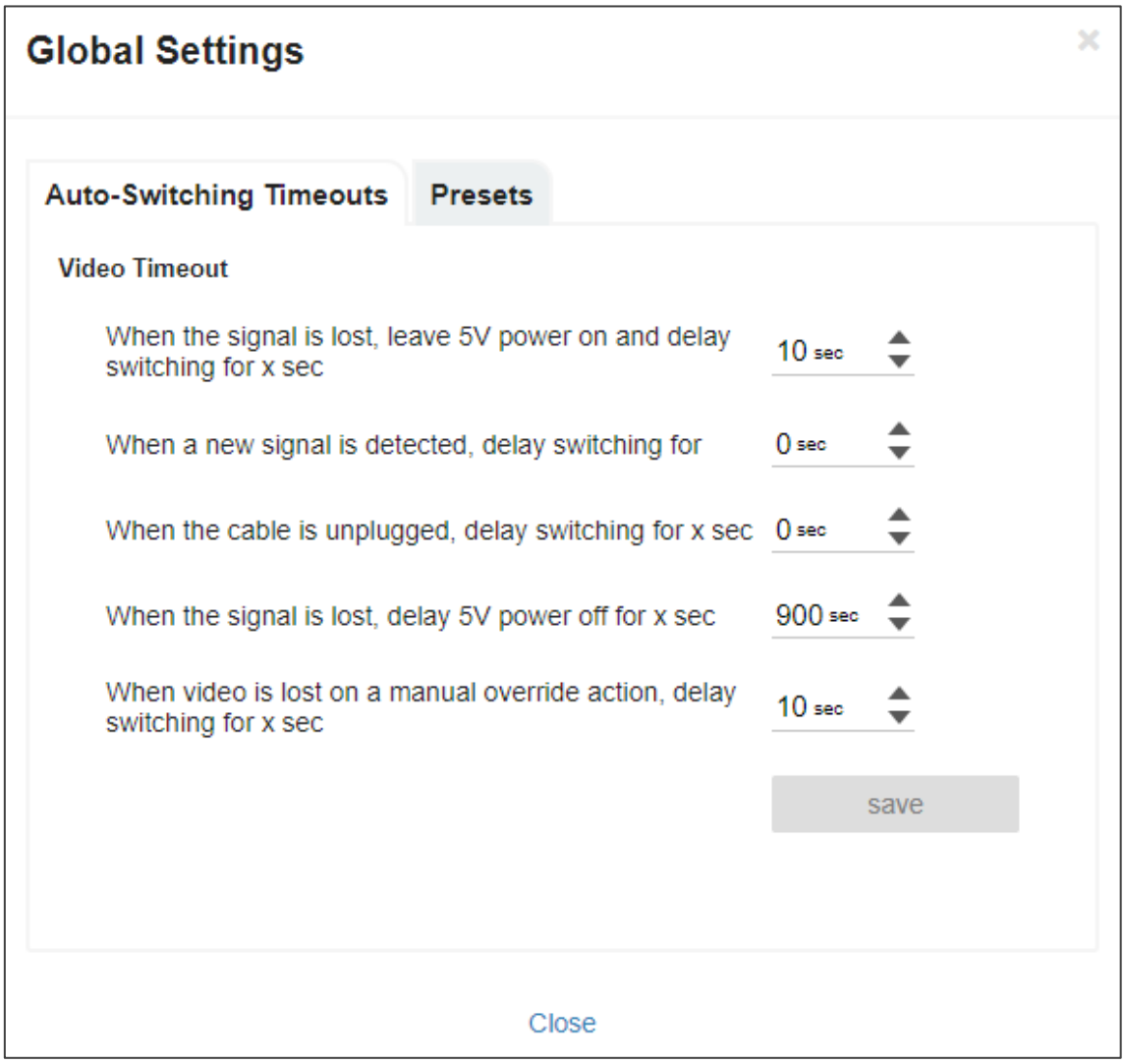


Figure 12: Global Settings Window – Auto-Switching Timeouts

3. Set the timeout in seconds for delaying:
   - Switching upon signal loss when 5V power is left on.
   - Switching when a new signal is detected.
   - Switching in case a cable is unplugged.
   - 5V power off when the signal is lost.
   - Switching to the last video input signal after the manual override video input signal is lost.



See table below for more detailed information.

4. Click **Close**.

Video timeouts are set.

The following table defines the timeout values and conditions:

Timeout	Description, Range (Default) and Conditions	
Signal Loss		
	Description:	When the signal is lost, leave 5V power on and delay switching for x seconds.
	Range (default):	5 to 90 seconds (10 by default).
	Conditions:	Signal Loss timeout ≥ 5 seconds. Signal Loss timeout < Output Inactivity. Signal Loss timeout < manual-override mode inactivity.
Signal Gain		
	Description:	When a new signal is detected, delay switching for x seconds.
	Range (default)	0 to 90 seconds (0 by default).
	Conditions	No conditions.
Input Unplug		
	Description:	When the cable is unplugged, delay switching for x seconds.
	Range (default)	0 to 90 seconds (0 by default).
	Conditions	Input Unplug timeout ≤ Output inactivity. Input unplug timeout ≤ manual-override mode inactivity.
Output Inactivity		
	Description:	When the signal is lost, delay 5V power off for x seconds.
	Range (default)	5 to 60000 seconds (900 by default).
	Conditions	Output Inactivity timeout > Input Unplug.
Manual-Override Mode Inactivity		
	Description:	When video is lost on a manual override action, delay switching for x seconds.
	Range (default)	5 to 90 seconds (10 by default).
	Conditions	Manual-Override Mode Inactivity timeout ≥ Signal Loss. Manual-Override Mode Inactivity timeout ≥ Input Unplug.

Saving and Loading Presets

A preset saves the device configuration, excluding Network settings, security configuration and Maestro configuration.

To save and load a preset:

1. In the Navigation pane, click **Routing Settings**. The Routing Matrix page appears.
2. Click **Presets & Settings** (next to Routing Matrix). The Global Settings window appears.
3. Click the **Presets** tab. The Presets tab appears:

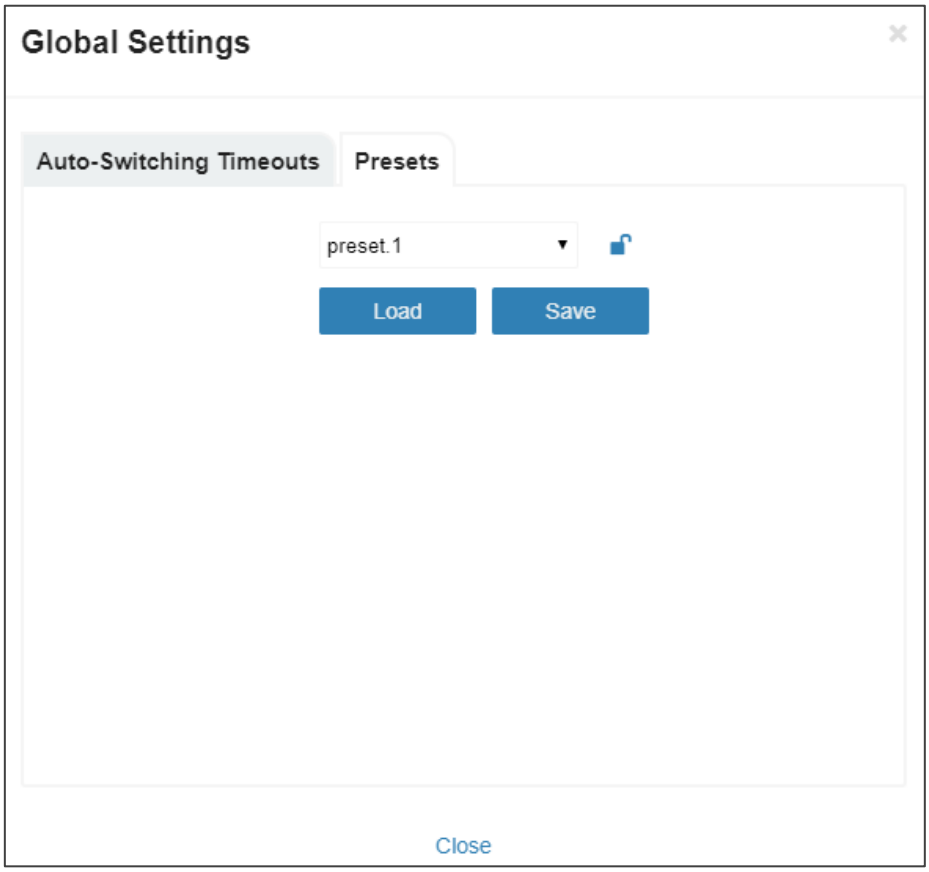


Figure 13: Global Settings Window – Presets Tab

4. Select a preset (from 1 to 8).
5. Do any of the following:
   - Click **Save** to save the current device configuration to a selected preset.
   - Click **Load** to load an existing preset.
   - Click the lock icon ( ) to lock a preset to the device.
6. Click **Close**.

Presets are defined.

Routing Inputs to Outputs

VS-44H2 enables routing an input signal to an output via the Routing Settings page This section describes how to basically route an A/V input to any of the outputs.

To define the signal type, see Setting HDMI Output Signals on page 22.

By default, input and output ports are set to audio-follow-video.

The Routing Matrix page displays the current routing status. For example, in Figure 14 the HDMI 1 input is currently routed to the HDMI 1 output as indicated by the green routing button ( ).

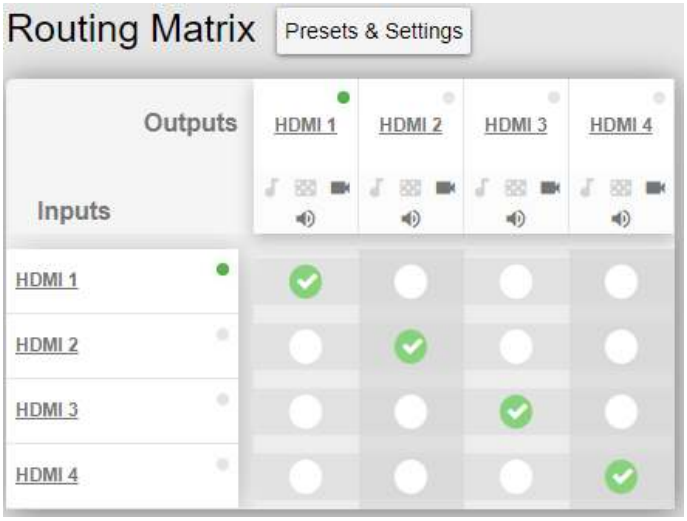


Figure 14: Routing Matrix Page – Input to Output Example

To route an input to an output:

1. In the Navigation pane, click **Routing Settings**. The Routing Settings page appears.
2. Click a white routing button within the matrix. For example, to route the HDMI 3 input to the HDMI 1 output, click the routing button connecting them in the matrix:

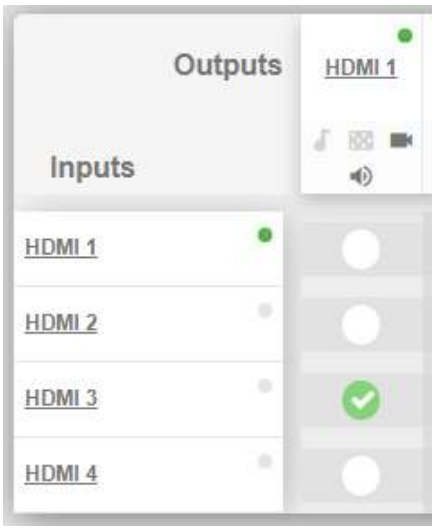


Figure 15: Routing Settings Page – Routing an Input to an Output

3. Hover over a port to view its OUT-IN switching status (HDMI 3 input is routed to HDMI 1 output):

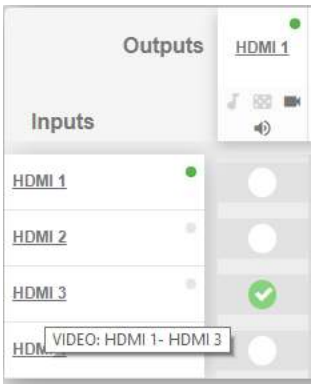


Figure 16: Routing Settings Page – Viewing the Switching Status

Input 3 is routed to output 1.

In the same way, you can route all the port types in the matrix if connected by a routing button.

Setting HDMI Output Signals

Use HDMI Output icons to determine the output signal type.

To Set an HDMI output signal:

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



Figure 17: Port Settings – HDMI Output Port Icons

2. The HDMI Output icons enable performing the following actions:
   - Enabling audio only mode ( ): only audio is routed through the output (a black pattern screen is displayed and 5V cut off is disabled).
   - Selecting a pattern to display on the output (or if a pattern is selected).

     If a pattern is selected on an output and an input is routed to that output, the pattern is disabled, and the routed video signal appears on the output.
   - Turning HDMI on or off (or).
   - Muting or unmuting the audio signal (or).

Output signals are set.

Defining HDMI Input Port Parameters

VS-44H2 enables setting any of the four input signal parameters via the embedded webpages.

To set an input port:

1. In the Navigation pane, click **Routing Settings**. The Routing Settings page appears.
2. Click an HDMI input (for example, HDMI 1).

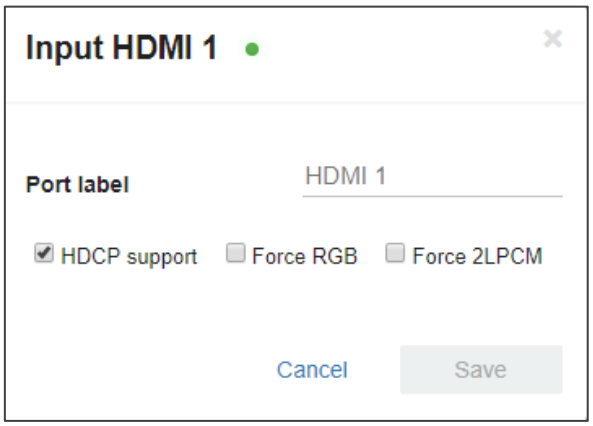


Figure 18: Routing Settings Page – HDMI Input Settings

3. perform the following actions, if required:
   - Enter a port label.
   - Check HDCP support.
   - Check force RGB and/or Force 2LPCM.
4. Click **Save**.

The HDMI input parameters are set.

Defining HDMI Output Parameters

VS-44H2 enables setting each of the four output signal parameters via the embedded webpages.

To set an output port:

1. In the Navigation pane, click **Routing Settings**. The Routing Settings page appears.
2. Click an HDMI output (for example, HDMI 1).

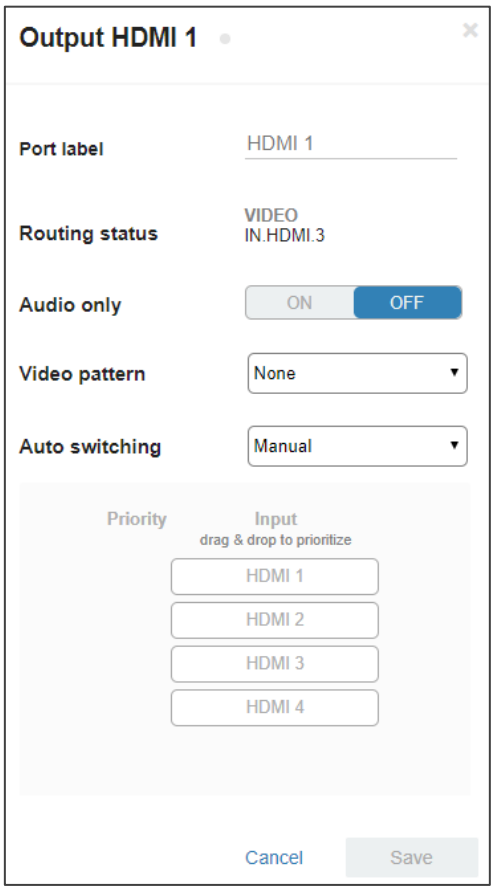


Figure 19: Routing Settings Page – HDMI Input Settings

3. Perform the following actions:
   - Enter a port label.
   - View the routing status.
   - Set routing to audio only.
   - Select a video pattern from the Video pattern drop-down box.
   - Select the switching mode from the Auto Switching drop-down box (Manual routing, Priority or Last Connected switching, see Setting Auto Switching Mode on page 25).
4. Click **Save**.

The HDMI output parameters are set.

Setting Auto Switching Mode

You can set auto switching to Manual routing (the default) or auto switching, which includes Priority or Last Connected routing.

In both Last Connected and Priority modes, when the input signal sync is lost (but the cable is not removed) there is a default delay (see Defining Global Settings on page 18) before another input is automatically selected. When an input cable is removed, there is a delay before automatic switching takes place.

In the Manual mode Video Lost timeouts are disabled.

To change Auto Switching mode:

1. In the Navigation pane, click Routing Settings. The Switching page appears.
2. Open a selected HDMI Output settings window (for example, the HDMI output).
3. Select an output and set the switching mode to **Manual**, **Priority** or **Last connected**:
   - In the Manual mode, 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 (you can remove an input from the priority list, see Removing and Adding an Input on page 27). The inputs in the list are then switched to the selected output according to the set priority:

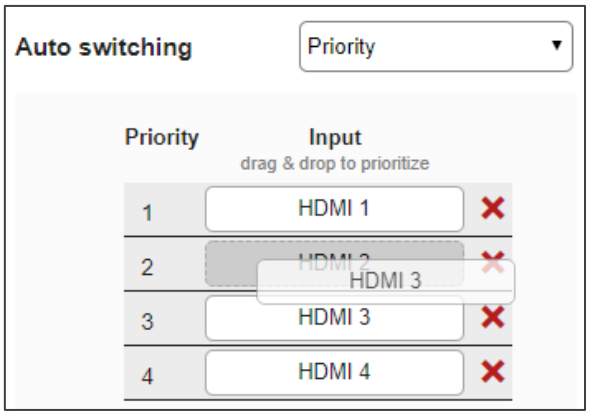


Figure 20: Auto Switching Mode – Setting Auto Switching Priority

- In the Last connected mode, the last connected input is switched to the selected output (you can remove an input from the priority list, see Removing and Adding an Input on page 27):

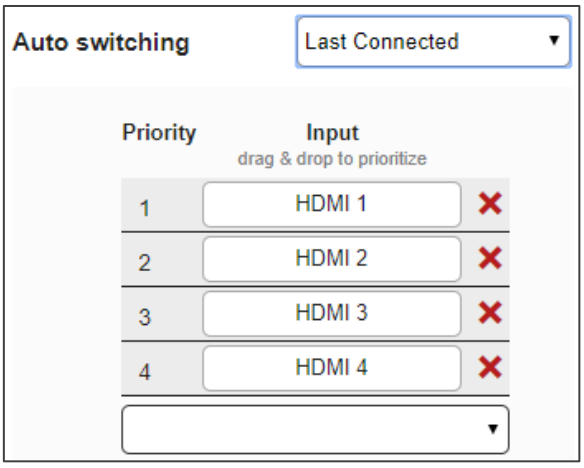


Figure 21: Auto Switching Mode – Last Connected Mode

4. Click **Save**.
   Priority and Last Connected settings are indicated in the Routing Settings page as follows:
   - The input priority-order appears. under the output (see HDMI 1 Figure 22).
   - Last Connected (**LC**) appears under output (see HDMI 2 in Figure 22).



Figure 22: Auto Switching Mode – Priorities List

Auto-switch settings are complete.

Removing and Adding an Input

VS-44H2 enables removing an input from the priority list when auto switching is set to the Priority or Last Connected switching modes.

To remove or add an input to the priority list:

1. In the Navigation pane, click Routing Settings. The Switching page appears.
2. Open a selected HDMI Output settings window (for example, the HDMI output).
3. Select an output and set the switching mode to **Priority** or **Last connected**.
4. Perform the following:
   - Remove an input by clicking X beside the input (for example, HDMI 1).
   - Add an input back by opening **the Add an input** drop-down box and select that input.

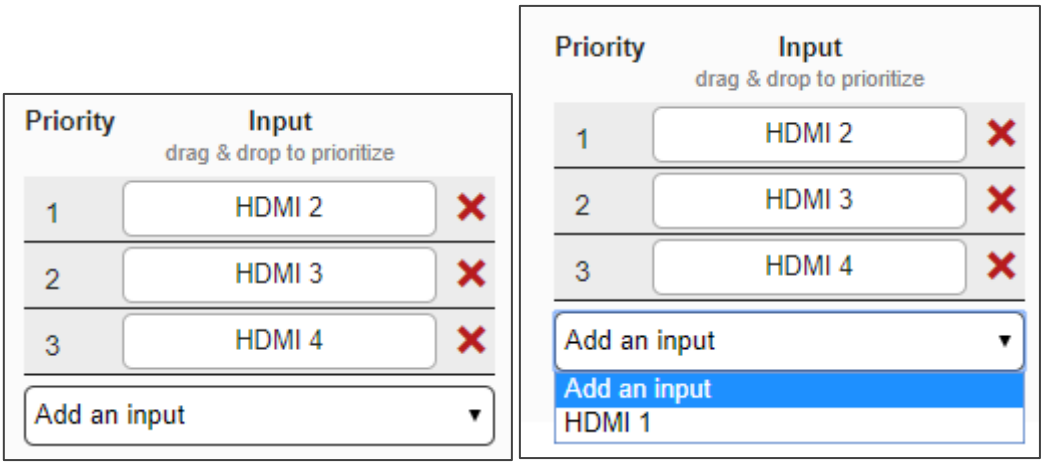


Figure 23: Deleting / Adding HDMI 1 from the Priority List

Managing EDID

You can copy EDID to any of the inputs in any of the following ways:

- Copying the EDID from an Output on page 28.
- Copying the EDID from an Input on page 30.
- Copying the Default EDID to an input on page 31.
- Loading a Customized EDID File on page 32.

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

View the currently selected EDID source Bytemap by clicking **Bytemap** on the right side.

Copying the EDID from an Output

VS-44H2 enables copying the EDID from a selected output.

To copy an EDID from an output to an input:

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

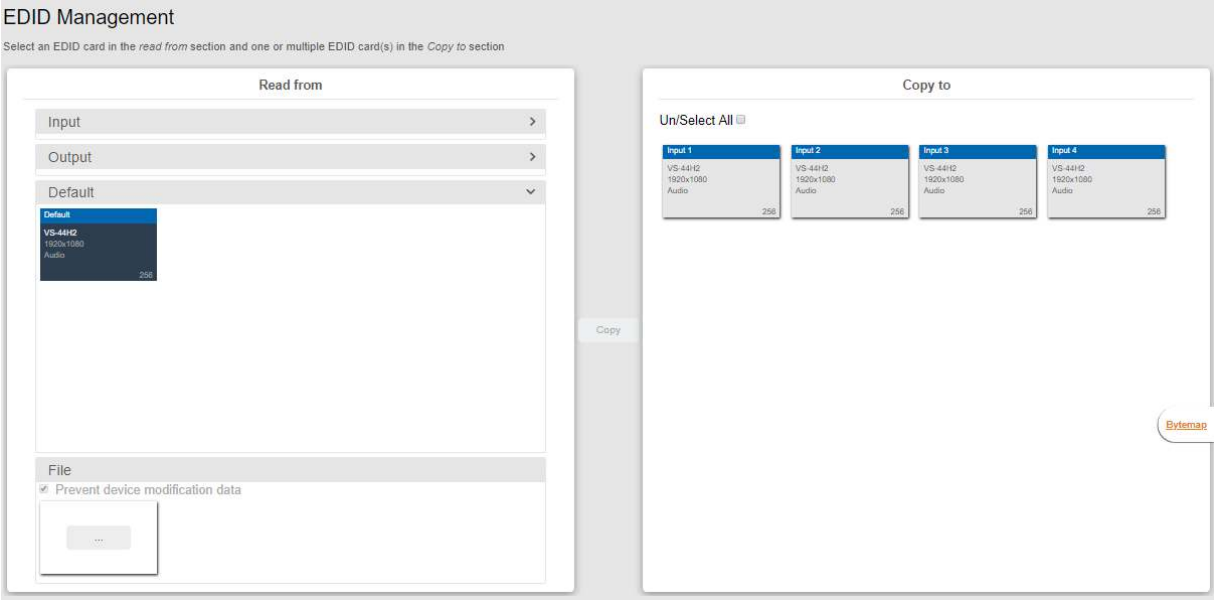


Figure 24: EDID Management Page

2. Select Read from **Output**.
3. Select an output (for example, Output 1).

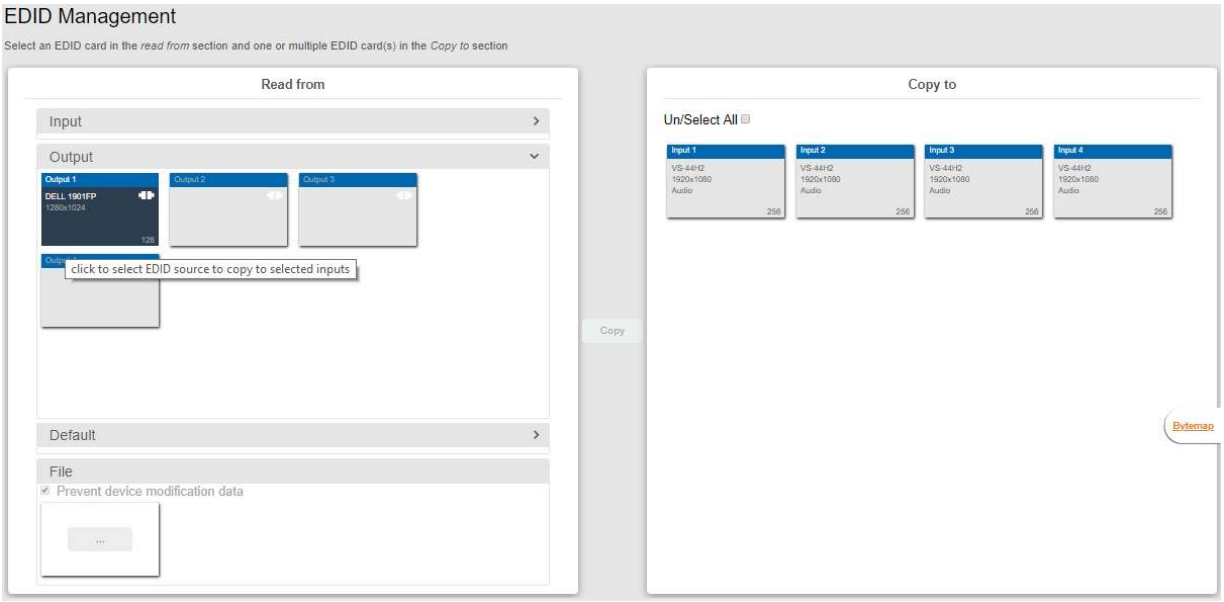


Figure 25: EDID Management Page – Reading EDID from an output

Make sure that that output is connected to an acceptor.

4. Select the input/s (or all the inputs) to which the EDID is to be copied (for example, Input 1 and Input 2).

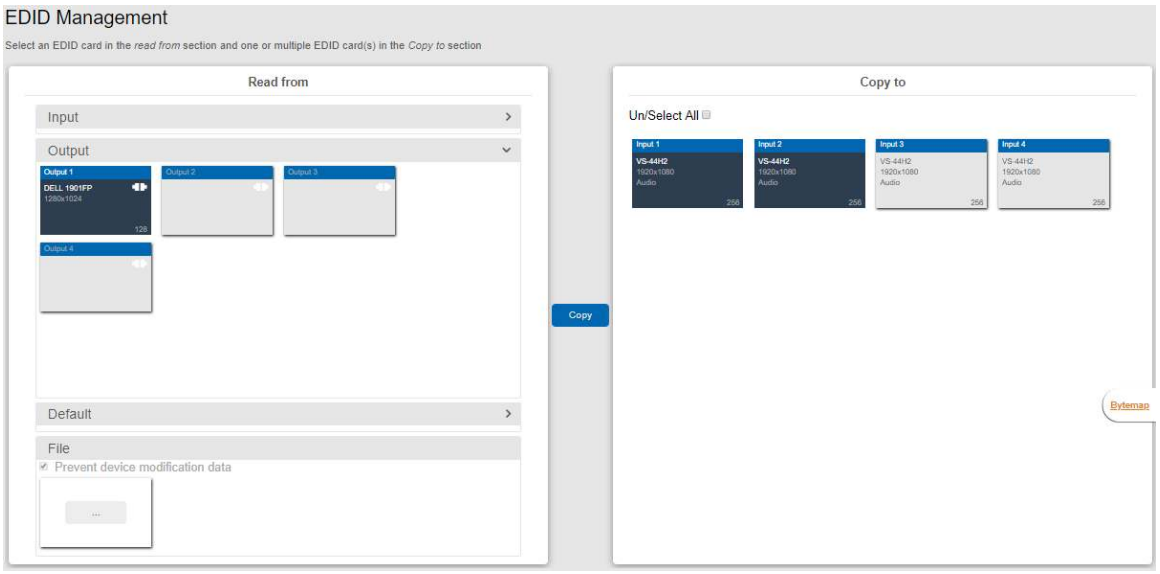


Figure 26: EDID Management Page – Select the Inputs (Copy To)

5. Click **COPY**.
   The Output 1 EDID is copied to the selected inputs.

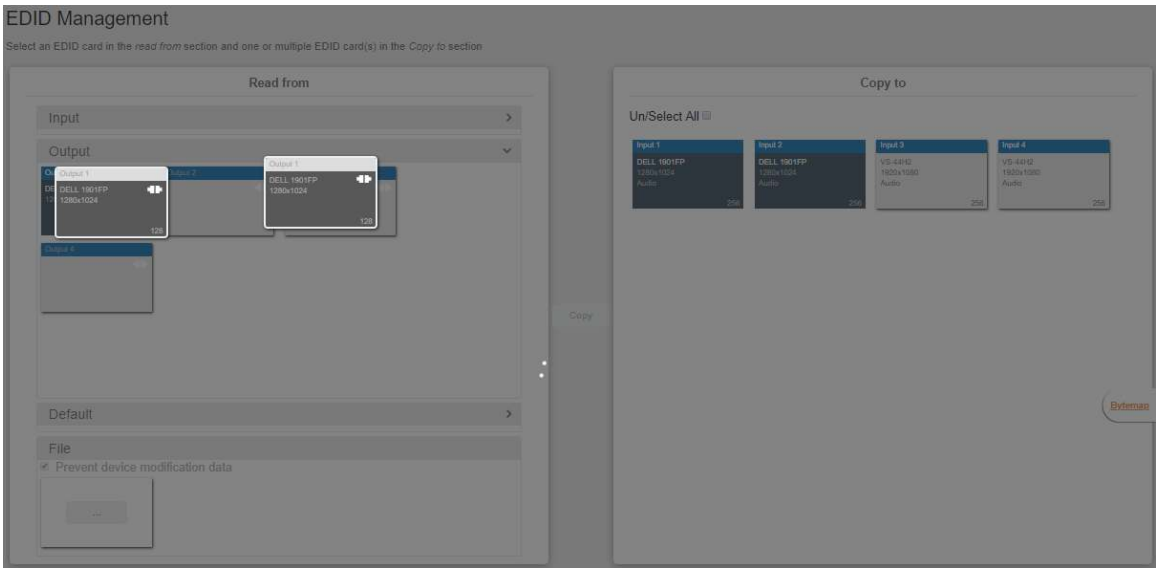


Figure 27: EDID Page – EDID Copied

The following message appears:

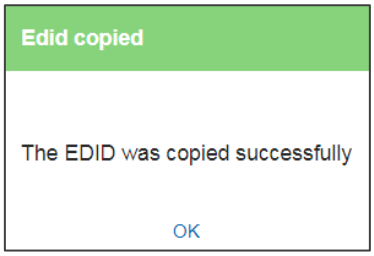


Figure 28: EDID Management Page – EDID Copy Success

6. Click **OK**.

EDID is copied from a selected output to the selected input/s.

Copying the EDID from an Input

VS-44H2 enables copying the EDID from a selected input.

To copy an EDID from an input to an input:

1. In the Navigation pane, click **EDID Management**. The EDID Management page appears (see Figure 24).
2. In the Read from area, select **Input**.
3. In the Copy to area, select an input as the EDID destination (for example, Input 1).

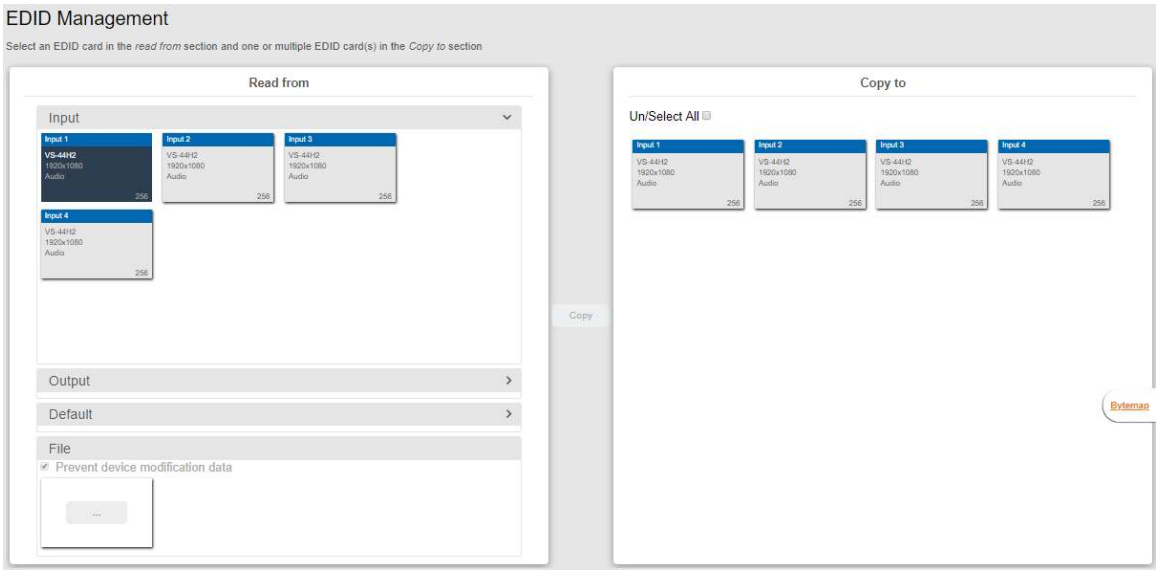


Figure 29: [Figure Caption]

4. Select the input/s to which the EDID is to be copied (for example, Input 1 and Input 3).

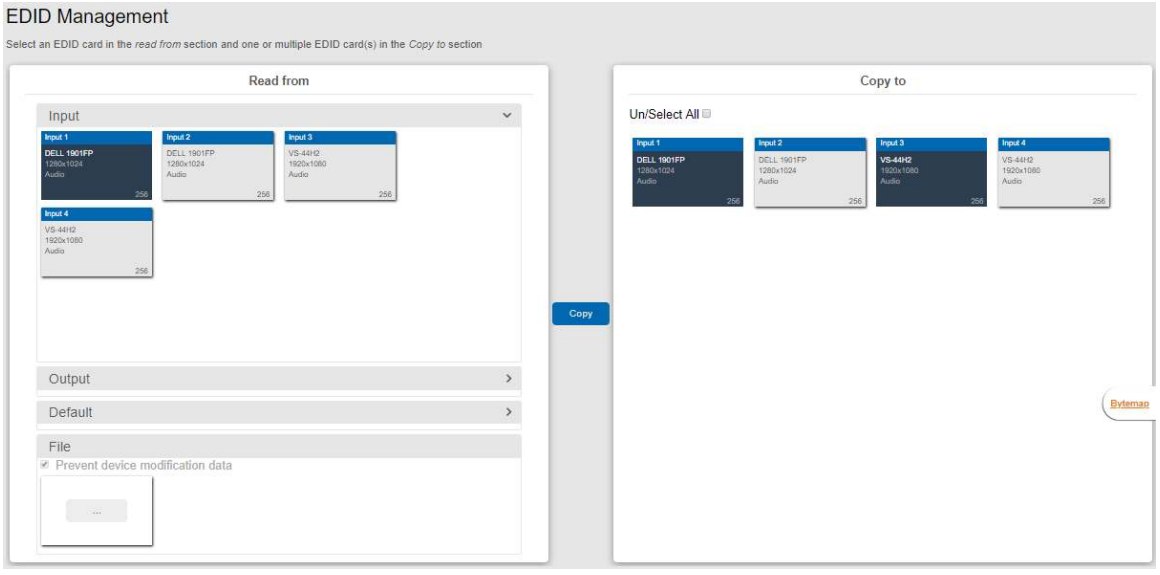


Figure 30: EDID Management Page – Select an EDID Input (Read From)

5. Click **COPY**.
   The Input 2 EDID is copied to the selected inputs.

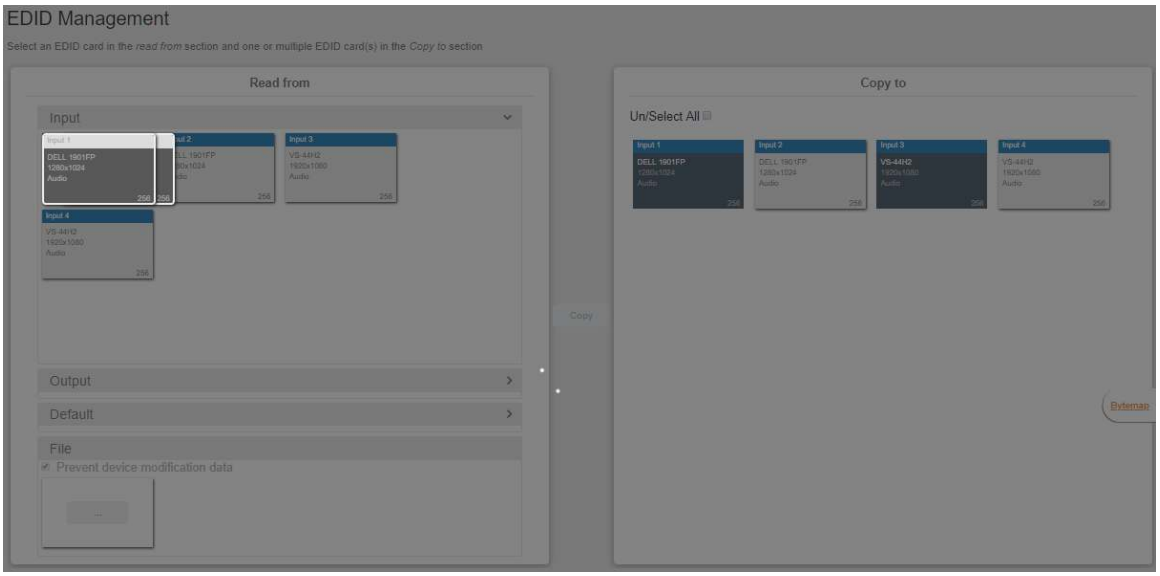


Figure 31: EDID Page – EDID Copied

The following message appears:

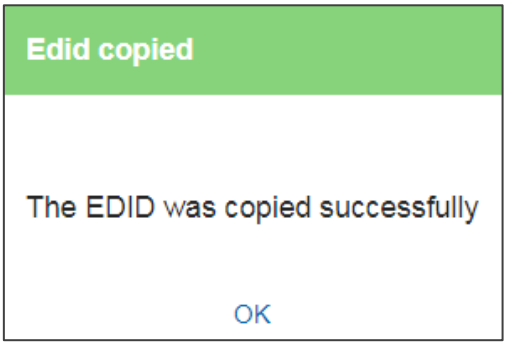


Figure 32: EDID Management Page – EDID Copy Success

6. Click **OK**.

EDID is copied from a selected input to the selected input/s.

Copying the Default EDID to an input

VS-44H2 enables copying the default EDID to a selected input.

To read the EDID from the default EDID:

1. In the Navigation pane, click **EDID**. The EDID Management page appears (see Figure 24).
2. Click **Default**.
3. Select the input/s (or all the inputs) to which the default EDID is to be copied.
4. Click **Copy** and follow the instructions on-screen.

Default EDID is copied to the input.

Loading a Customized EDID File

VS-44H2 enables uploading a customized EDID file to a selected input.

To load a customized EDID file:

1. In the Navigation pane, click **EDID**. The EDID Management page appears.
2. In the **File** area click **…**.
3. Select the EDID file.
4. Select the input/s (or all the inputs) to which the EDID is copied.
5. Click **Copy** and follow the instructions on-screen.

Custom EDID is copied to the input.

Configuring Device Automation

Use the Automation page to access Kramer Maestro V1.5 room automation. Maestro is a powerful tool that enables you to configure single-trigger room element automation scenarios without the need for complicated programming. To use room automation, you need to define triggers that, upon an event, will execute scripts which include a sequence of actions (commands, which can appear in different scenarios) that will be carried out via any defined ports.

Download the Kramer Maestro User Manual from the Kramer web site at www.kramerav.com/downloads/VS-44H2 to learn how to use Kramer Maestro.

Note that all the ports, actions and triggers that are relevant to **VS-44H2** are included in the Kramer Maestro, as well as ports, actions and triggers that are relevant to other Kramer devices.

The Panel tab in the Automation page is currently unavailable.

To access Kramer Maestro:

1. In the Navigation pane, click **Automation**. The Maestro page appears.

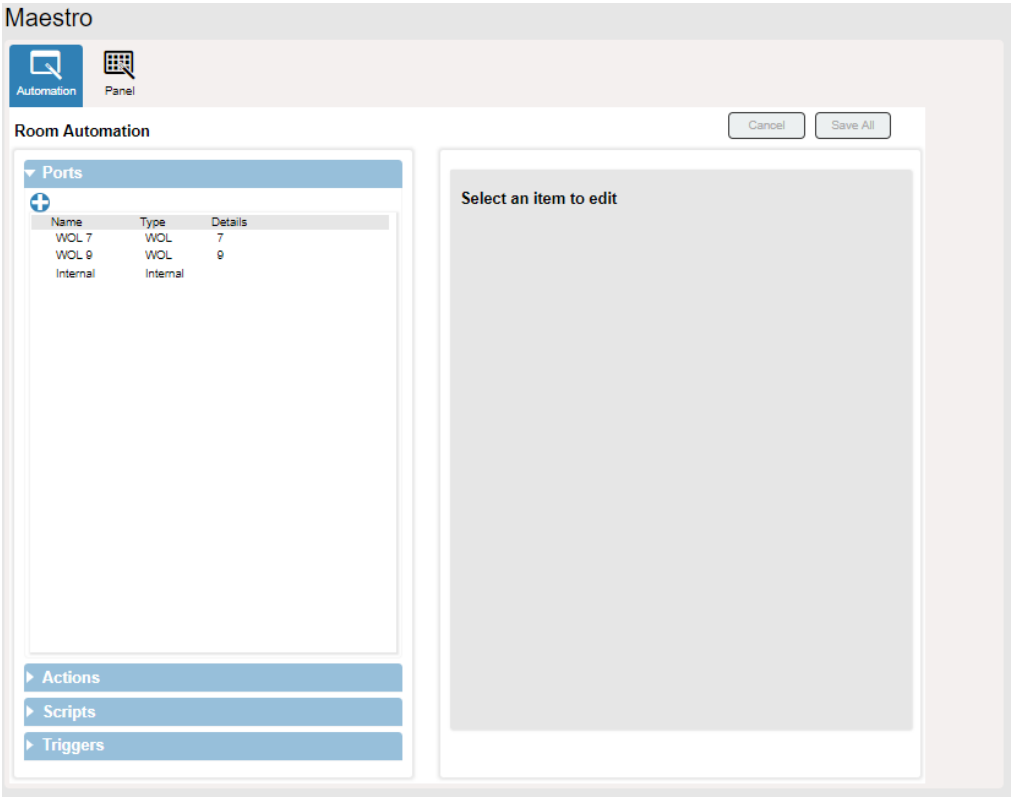


Figure 33: Automation Page

2. Configure the ports, actions, scripts and triggers as described in the Kramer Maestro User Manual.

Once the triggers are defined the trigger activates the scripts configured in the automation page. For example, when using the Scheduling trigger, you can activate a series of actions following a preset schedule.

Restarting and Resetting to Factory Default Parameters

Two types of reset can be performed:

- **Restart** – Reboots your device and keeps all your device settings, including the IP address and password.
- **Factory reset** – Reboots your device and restores all factory settings, including input/output definitions, switching configuration, IP address and password

To restart VS-44H2 or reset it to its factory default parameters:

1. In the Navigation pane, click **Settings**. The General tab in the Settings page appears:

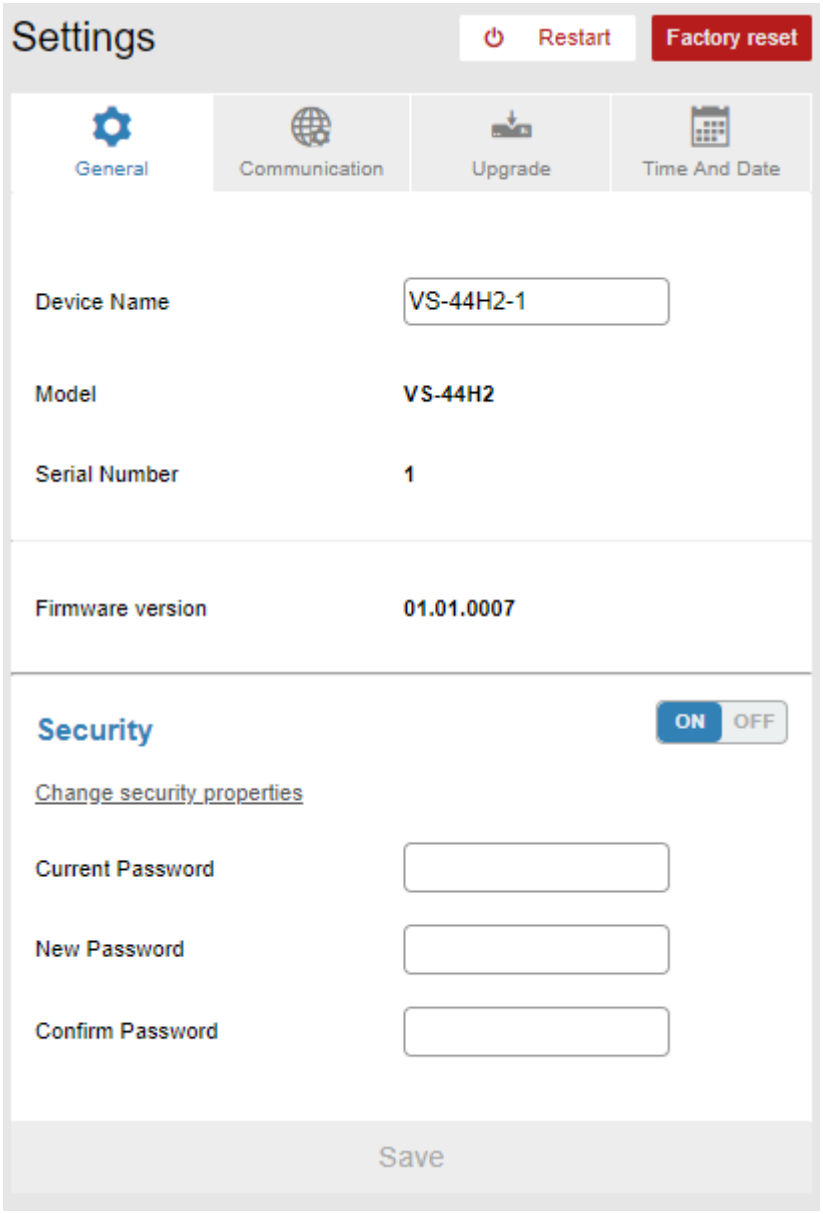


Figure 34: Settings Page

2. Do the following:
   - To restart the device:
     - Click **Restart**.
       the device restarts.

- To restart the device:
  - Click **Factory reset**. The following message appears:



Figure 35: Settings Page – Factory Reset Message

  - Click **Yes** and follow the online instructions.

Device is restarted/reset.

Changing Device Name

Customizing device name can help identify where the device is located in your installation.

To change the device name:

1. In the Navigation pane, click **Settings**. The General tab in the Settings page appears:
2. In the General tab, enter the device name.
3. Click **Save**.

Device name has changed.

Setting Authentication

By default, the webpages are secured (username and password are both: **Admin**) and require login credentials.

To access webpages without using the password:

1. In the Navigation pane, click **Settings**. The General tab in the Settings page appears (see Figure 34).
2. Click **OFF** next to Security.
   The following message appears:

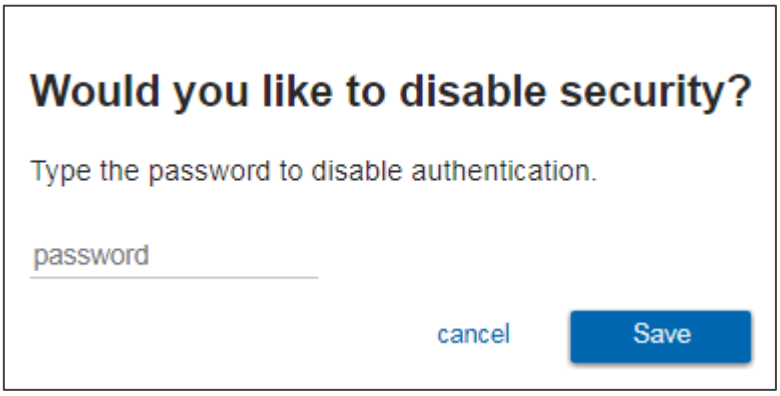


Figure 36: Authentication – Disabling Authentication

3. Enter the current password and click **Save**.
   The device settings page no longer shows the authentication details:

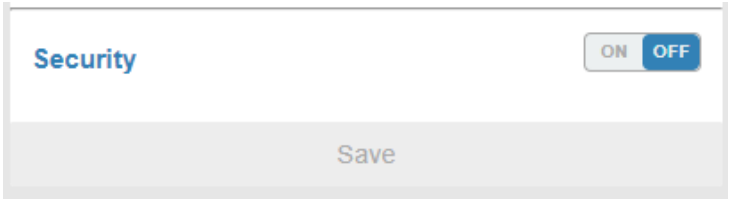


Figure 37: Authentication –Security Deactivated

Webpages are accessed without authentication.

To access webpages using the password:

1. In the Navigation pane, click **Settings**. The General tab in the Settings page appears (see Figure 34).
2. Click **ON** next to security. The following message appears:

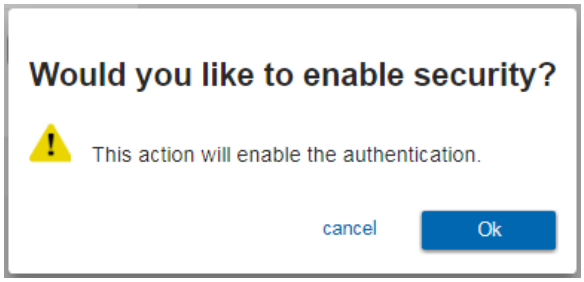


Figure 38: Authentication – Activating Security

3. Click **Ok** and add the password details.

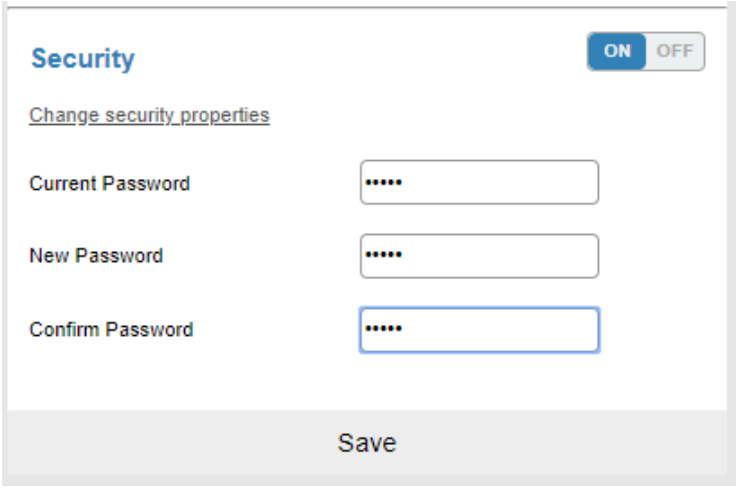


Figure 39: Settings Page – Security Activation Message

4. Click **Save**. The following message appears:

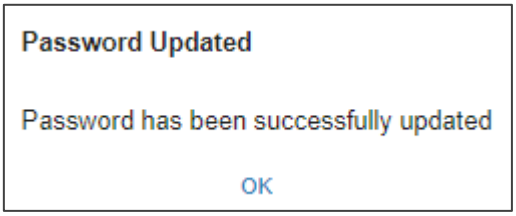


Figure 40: Settings Page – Password Updated

5. Click **OK**.

Webpages are accessed using authentication.

Changing the Ethernet Settings

The Communication tab shows the device details, such as IP Address, Mask, MAC address and so on, and enables changing them. You can perform the following actions:

- Changing Ethernet Settings when DHCP is OFF on page 37.
- Changing Ethernet Settings when DHCP is ON on page 38.

Changing Ethernet Settings when DHCP is OFF

By default, DHCP is set to OFF.

To define Ethernet parameters when DHCP is set to OFF:

1. In the Navigation pane, click **Settings**. The General tab in the Settings page appears (see Figure 34).

2. Select the Communication tab:

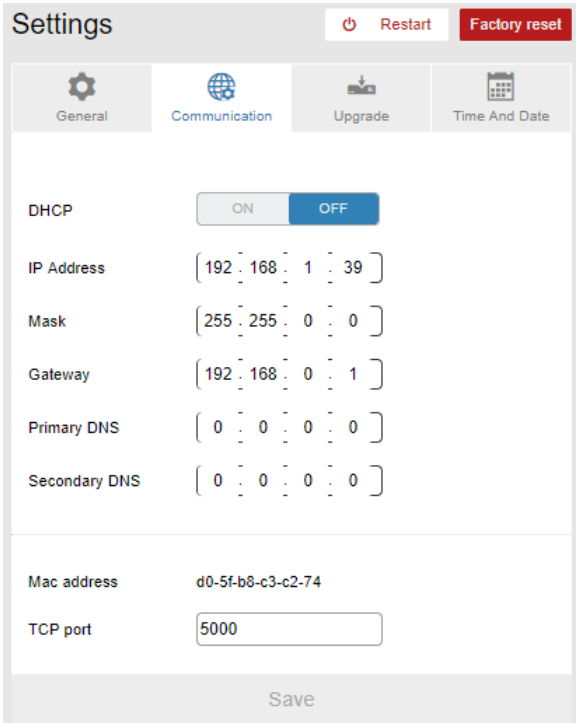


Figure 41: Settings Page – Communication Tab

3. Set DHCP to OFF (If not in the default state).
4. Change any of the parameters (IP Address, Netmask and/or Gateway) as required.
5. Change the TCP port number, if required.
6. Click **Save**.

After changing the IP address, reload the webpage with the new IP address.

If DHCP is checked, reload the webpage with the new IP address (see below).

Ethernet settings are defined.

Changing Ethernet Settings when DHCP is ON

For proper settings and before changing to DHCP, consult your Network administrator.

To define Ethernet parameters when DHCP is set to ON:

1. In the Navigation pane, click **Settings**. The General tab in the Settings page appears (see Figure 34).
2. Select the Communication tab (see Figure 41).
3. Take note of the Device Name (you will need it later).
4. Set DHCP to **ON**.
5. Click **Save**.
6. Type the device name in the address bar of your browser to reload the page.
   You can read the new IP address from the Network Settings page.

Ethernet settings are defined.

Performing Firmware Upgrade

VS-44H2 enables upgrading the firmware via the embedded webpages.

To perform firmware upgrade:

1. In the Navigation pane, click **Settings**. The General tab in the Settings page appears (see Figure 34).
2. Select the Upgrade tab.

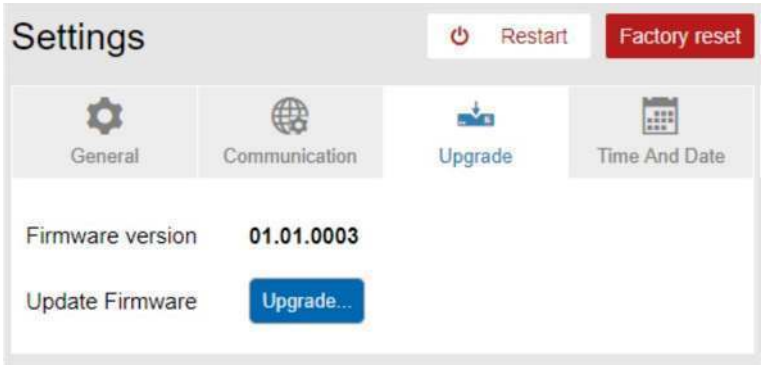


Figure 42: Upgrade Tab

3. Click **Upgrade** and select the new firmware file. The following message appears:

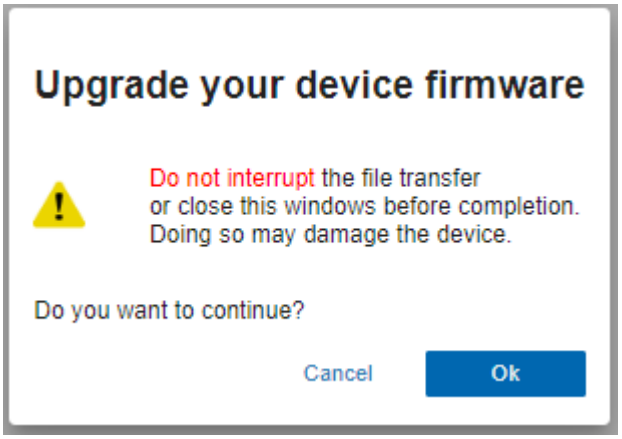


Figure 43: Upgrade Tab – Firmware Upgrade Message

4. Click **OK**.
   Wait for completion of the upgrade process:

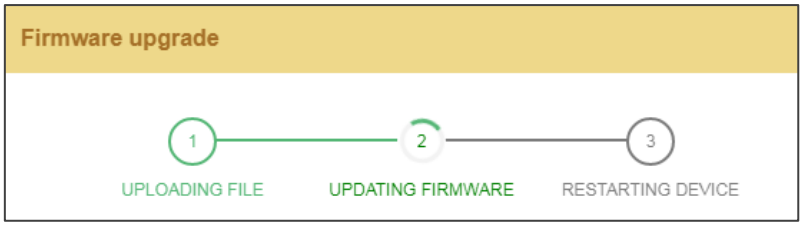


Figure 44: Upgrade Tab – Firmware Upgrade Process

5. Wait for the device to restart. The new firmware appears in the Upgrade tab.

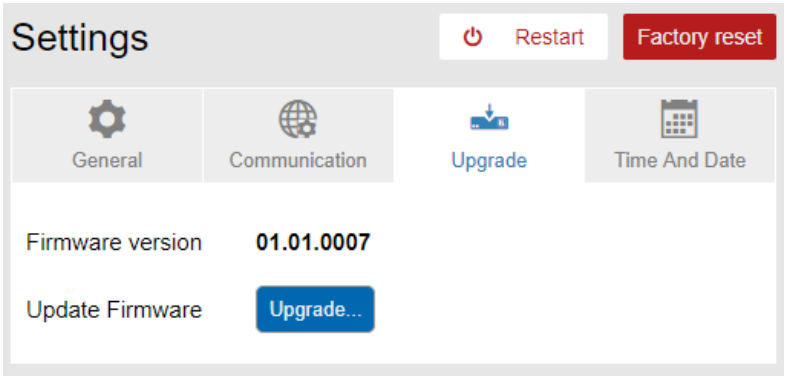


Figure 45: Upgrade Tab – Viewing the New Firmware Version

The new firmware is uploaded to the device.

Setting Date and Time

VS-44H2 enables setting the date and time via the embedded webpages.

To set the time and date:

1. in the Navigation Pane, click **Settings**. the General tab in the Settings page appears (see Figure 34).
2. Select the Time and Date tab.

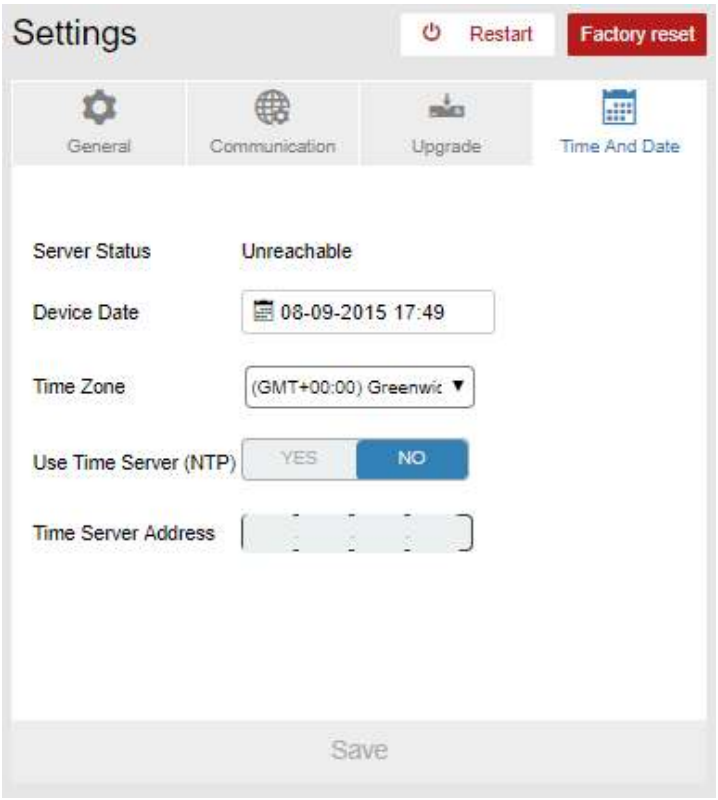


Figure 46: Time and Date

3. Set the following:
   - Device Date
   - Time Zone
4. If required, use time server (disables setting device date) and set the time server address.
5. Click **Save**.

Date and time are defined.

Viewing General Version Information

VS-44H2 About page enables viewing the webpage version and Kramer Electronics Ltd details.



Figure 47: About Page

Upgrading Firmware

Use the Kramer **K-UPLOAD** software to upgrade the firmware via the **VS-44H2** Ethernet port ⑮.

The latest version of **K-UPLOAD** and installation instructions can be downloaded from our website at: www.kramerav.com/support/product_downloads.asp.

Technical Specifications

Inputs	4 HDMI	On female HDMI connectors
Outputs	4 HDMI	On female HDMI connectors
Ports	USB	On a Mini–USB connector for device control
	RS-232	On a 3-pin terminal block connector for device control
	Ethernet	On an RJ-45 connector
	USB	On a USB–type A connector for powering an external device
Video	Max Resolution	4K@60Hz (4:4:4)
	HDMI Support	Deep Color, 3D, up to 7.1 uncompressed audio channels as specified in HDMI 2.0
	Compliance	HDCP 1.4 and 2.2
Controls	Front Panel	Input/output selection, mute, test patterns, EDID, front panel lock buttons. Input/output LCD display
	Rear Panel Ports	RS-232, USB and Ethernet.
Power	Consumption	22VA
	Source	100-240V AC, 50/60Hz
Environmental Conditions	Operating Temperature	0° to +40°C (32° to 104°F)
	Storage Temperature	-40° to +70°C (-40° to 158°F)
	Humidity	10% to 90%, RHL non-condensing
Regulatory Compliance	Safety	CE, FCC
	Environmental	RoHs, WEEE
Enclosure	Size	19” 1U
	Type	Aluminum
	Cooling	Convection Ventilation
General	Net Dimensions (W, D, H)	43.6cm x 23.7cm x 4.4cm (17.2" x 9.3" x 1.7")
	Shipping Dimensions (W, D, H)	55.2cm x 27.8cm x 10.5cm (21.7" x 10.9" x 4.1")
	Net Weight	1.4kg (3.1lbs) approx.
	Shipping Weight	2.2kg (4.9lbs) approx.
Accessories	Included	Power adapter cord
Specifications are subject to change without notice at www.kramerav.com		

Default Communication Parameters

RS-232	
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Example (route video HDMI IN 4 to video HDMI OUT 1):	"#X-ROUTE OUT.HDMI.1.VIDEO.1,IN.HDMI.4.VIDEO.1",0x0D
Ethernet	
To reset the IP settings to the factory reset values go to: Menu->Setup -> Factory Reset-> press Enter to confirm	
IP Address:	192.168.1.39
Subnet mask:	255.255.0.0
Default gateway:	192.168.0.1
Default TCP Port #:	5000
Default UDP Port #:	50000
Default username:	Admin
Default password:	Admin
Full Factory Reset	
Front panel:	There is no option for factory reset from front panel.
Protocol 3000:	"#factory" command.
Webpages:	Device Settings page, Soft Factory Reset resets all parameters to factory default except for network parameters.

Default EDID

```
Monitor
  Model name..... VS-44H2
  Manufacturer..... KMR
  Plug and Play ID..... KMR1200
  Serial number..... n/a
  Manufacture date..... 2017, ISO week 255
  Filter driver..... None
  ------------------------
  EDID revision..... 1.3
  Input signal type..... Digital
  Color bit depth..... Undefined
  Display type..... RGB color
  Screen size..... 520 x 320 mm (24.0 in)
  Power management..... Standby, Suspend, Active off/sleep
  Extension blocs..... 1 (CEA/CTA-EXT)
  ------------------------
  DDC/CI..... n/a

Color characteristics
  Default color space..... Non-sRGB
  Display gamma..... 2.20
  Red chromaticity..... Rx 0.674 - Ry 0.319
  Green chromaticity..... Gx 0.188 - Gy 0.706
  Blue chromaticity..... Bx 0.148 - By 0.064
  White point (default).... Wx 0.313 - Wy 0.329
  Additional descriptors... None

Timing characteristics
  Horizontal scan range.... 30-83kHz
  Vertical scan range..... 56-76Hz
  Video bandwidth..... 170MHz
  CVT standard..... Not supported
  GTF standard..... Not supported
  Additional descriptors... None
  Preferred timing..... Yes
  Native/preferred timing.. 1920x1080p at 60Hz (16:9)
    Modeline..... "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync

Standard timings supported
    720 x  400p at  70Hz - IBM VGA
    720 x  400p at  88Hz - IBM XGA2
    640 x  480p at  60Hz - IBM VGA
    640 x  480p at  67Hz - Apple Mac II
    640 x  480p at  72Hz - VESA
    640 x  480p at  75Hz - VESA
    800 x  600p at  56Hz - VESA
    800 x  600p at  60Hz - VESA
    800 x  600p at  72Hz - VESA
```

```
    800 x  600p at  75Hz - VESA
    832 x  624p at  75Hz - Apple Mac II
   1024 x  768i at  87Hz - IBM
   1024 x  768p at  60Hz - VESA
   1024 x  768p at  70Hz - VESA
   1024 x  768p at  75Hz - VESA
   1280 x 1024p at  75Hz - VESA
   1152 x  870p at  75Hz - Apple Mac II
   1280 x 1024p at  75Hz - VESA STD
   1280 x 1024p at  85Hz - VESA STD
   1600 x 1200p at  60Hz - VESA STD
   1024 x  768p at  85Hz - VESA STD
    800 x  600p at  85Hz - VESA STD
    640 x  480p at  85Hz - VESA STD
   1152 x  864p at  70Hz - VESA STD
   1280 x  960p at  60Hz - VESA STD

EIA/CEA/CTA-861 Information
  Revision number..... 3
  IT underscan..... Supported
  Basic audio..... Supported
  YCbCr 4:4:4..... Supported
  YCbCr 4:2:2..... Supported
  Native formats..... 1
  Detailed timing #1..... 1920x1080p at 60Hz (16:10)
    Modeline..... "1920x1080" 148.650 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync
  Detailed timing #2..... 1920x1080i at 60Hz (16:10)
    Modeline..... "1920x1080" 74.410 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
  Detailed timing #3..... 1280x720p at 60Hz (16:10)
    Modeline..... "1280x720" 74.410 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
  Detailed timing #4..... 720x480p at 60Hz (16:10)
    Modeline..... "720x480" 27.050 720 736 798 858 480 489 495 525 -hsync -vsync

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

CE video identifiers (VICs) - timing/formats supported
    1920 x 1080p at  60Hz - HDTV (16:9, 1:1) [Native]
    1920 x 1080i at  60Hz - HDTV (16:9, 1:1)
    1280 x  720p at  60Hz - HDTV (16:9, 1:1)
     720 x  480p at  60Hz - EDTV (16:9, 32:27)
     720 x  480p at  60Hz - EDTV (4:3, 8:9)
     720 x  480i at  60Hz - Doublescan (16:9, 32:27)
     720 x  576i at  50Hz - Doublescan (16:9, 64:45)
     640 x  480p at  60Hz - Default (4:3, 1:1)
    NB: NTSC refresh rate = (Hz*1000)/1001

CE vendor specific data (VSDB)
  IEEE registration number. 0x000C03
  CEC physical address..... 1.0.0.0
  Maximum TMDS clock..... 165MHz

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

Report information
  Date generated..... 9/7/2020
  Software revision..... 2.91.0.1043
  Data source..... File - NB: improperly installed
  Operating system..... 10.0.18363.2

Raw data
  00,FF,FF,FF,FF,FF,FF,00,2D,B2,00,12,00,00,00,00,FF,1B,01,03,80,34,20,78,EA,B3,25,AC,51,30,B4,26,
  10,50,54,FF,FF,80,81,8F,81,99,A9,40,61,59,45,59,31,59,71,4A,81,40,02,3A,80,18,71,38,2D,40,58,2C,
  45,00,A0,5A,00,00,00,1E,00,00,00,FD,00,38,4C,1E,53,11,00,0A,20,20,20,20,20,20,00,00,00,FC,00,56,
  53,2D,34,34,48,32,0A,20,20,20,20,20,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,01,48,
  02,03,1B,F1,23,09,07,07,48,90,05,04,03,02,07,16,01,65,03,0C,00,10,00,83,01,00,00,11,3A,80,18,71,
  38,2D,40,58,2C,45,00,07,44,21,00,00,1E,11,1D,80,18,71,1C,16,20,58,2C,25,00,07,44,21,00,00,9E,11,
  1D,00,72,51,D0,1E,20,6E,28,55,00,07,44,21,00,00,1E,91,0A,D0,8A,20,E0,2D,10,10,3E,96,00,07,44,21,
  00,00,18,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,13
```

Protocol 3000

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

Understanding Protocol 3000

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

- **Command format**:

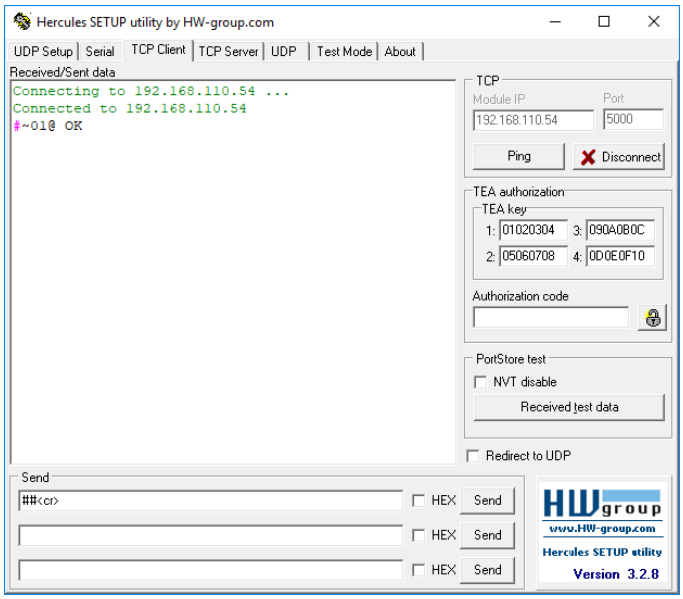
Prefix	Command Name	Constant (Space)	Parameter(s)	Suffix
#	Command	␣	Parameter	<CR>

- **Feedback format**:

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

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

The command framing varies according to how you interface with **VS-44H2**. The following figure displays how the # command is framed using terminal communication software (such as Hercules):



Protocol 3000 Commands

Function	Description	Syntax	Parameters/Attributes	Example
#	Protocol handshaking. ⓘ Validates the Protocol 3000 connection and gets the machine number. Step-in master products use this command to identify the availability of a device.	COMMAND #<CR> FEEDBACK ~nn@␣ok<CR><LF>		#<CR>
AV-SW-TIMEOUT	Set auto switching timeout.	COMMAND #AV-SW-TIMEOUT␣switching_mode,time_out<CR> FEEDBACK ~nn@AV-SW-TIMEOUT␣switching_mode,time_out<CR><LF>	switching_mode – Switching mode 0 – Video signal lost 1 – New video signal detected 2 – Audio signal lost 4 – Disable 5V on video output if no input signal detected 5 – Video cable unplugged 6 – Audio cable unplugged 7 – Video signal lost for signal routed as a result of a manual override action time_out – Timeout in seconds 0 - 60000	Set the auto switching timeout to 5 seconds in the event of 5V disable when no input signal is detected: #AV-SW-TIMEOUT␣4,5<CR>
AV-SW-TIMEOUT?	Get auto switching timeout.	COMMAND #AV-SW-TIMEOUT?␣switching_mode<CR> FEEDBACK ~nn@AV-SW-TIMEOUT␣switching_mode,time_out<CR><LF>	switching_mode – Switching mode 0 – Video signal lost 1 – New video signal detected 2 – Audio signal lost 4 – Disable 5V on video output if no input signal detected 5 – Video cable unplugged 6 – Audio cable unplugged 7 – Video signal lost for signal routed as a result of a manual override action time_out – Timeout in seconds 0 - 60000	Get the Disable 5V on video output if no input signal detected timeout: #AV-SW-TIMEOUT?␣4<CR>
CPEDID	Copy EDID data from the output to the input EEPROM. ⓘ 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 certain products Safe_mode is an optional parameter. See the HELP command for its availability.	COMMAND #CPEDID␣edid_io,src_id,edid_io,dest_bitmap<CR> or #CPEDID␣edid_io,src_id,edid_io,dest_bitmap,safe_mode<CR> FEEDBACK ~nn@CPEDID␣edid_io,src_id,edid_io,dest_bitmap<CR><LF> ~nn@CPEDID␣edid_io,src_id,edid_io,dest_bitmap,safe_mode<CR><LF>	edid_io – *EDID* source type (usually output) 0 – Input 1 – Output 2 – Default EDID 3 – Custom EDID src_id – Number of chosen source stage 0 – Default EDID source 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 edid_io – *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. 0 – indicates that EDID data is not copied to this destination. 1 – indicates that EDID data is copied to this destination. safe_mode – Safe mode 0 – device accepts the EDID as is without trying to adjust 1 – device tries to adjust the EDID (default value if no parameter is sent)	Copy the EDID data from the Output 1 (EDID source) to the Input: #CPEDID␣1,1,0,0x1<CR> Copy the EDID data from the default EDID source to the Input: #CPEDID␣2,0,0,0x1<CR>
DISPLAY?	Get output HPD status.	COMMAND #DISPLAY?␣out_index<CR> FEEDBACK ~nn@DISPLAY␣out_index,status<CR><LF>	out_index – Number that indicates the specific output: 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 status – HPD status according to signal validation 0 – Signal or sink is not valid 1 – Signal or sink is valid 2 – Sink and EDID is valid	Get the output HPD status of Output 1: #DISPLAY?␣1<CR>

Function	Description	Syntax	Parameters/Attributes	Example
EDID-AUDIO	Set audio capabilities for EDID.	**COMMAND** **#EDID-AUDIO**␣input_id,audio_format**<CR>** **FEEDBACK** **~nn@EDID-AUDIO**␣in_index,audio_format**<CR><LF>**	**input_id** – Number that indicates the specific input: 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 **audio_format** – Audio block added to EDID: 0 – Auto 1 – LPCM 2CH 2 – LPCM 6CH 3 – LPCM 8CH 4 – Bitstream 5 – HD	Set Input 1 audio capabilities for EDID to LPCM 6CH: **#EDID-AUDIO**␣1,2**<CR>**
EDID-AUDIO?	Get audio capabilities for EDID.	**COMMAND** **#EDID-AUDIO?**␣input_id**<CR>** **FEEDBACK** **~nn@EDID-AUDIO**␣␣input_id,audio_format**<CR><LF>**	**input_id** – Number that indicates the specific input: 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 **audio_format** – Audio block added to EDID: 0 – Auto 1 – LPCM 2CH 2 – LPCM 6CH 3 – LPCM 8CH 4 – Bitstream 5 – HD	Get Input 1 audio capabilities for EDID: **#EDID-AUDIO?**␣1**<CR>**
EDID-CS	Set EDID color space. ⓘ Set command might change the current EDID.	**COMMAND** **#EDID-CS**␣input_id,cs_mode**<CR>** **FEEDBACK** **~nn@EDID-CS**␣input_id,cs_mode**<CR><LF>**	The following attributes comprise the ID: **input_id** – Output number 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 **cs_mode** – Color space 0 – RGB 4 – Auto	Set Input 3 EDID color space to RGB: **#EDID-CS**␣3,1**<CR>**
EDID-CS?	Get EDID color space. ⓘ Get command might change the current EDID.	**COMMAND** **#EDID-CS?**␣input_id**<CR>** **FEEDBACK** **~nn@EDID-CS**␣input_id,cs_mode**<CR><LF>**	The following attributes comprise the ID: **input_id** – Output number 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 **cs_mode** – Color space 0 – RGB 4 – Auto	Get Input 2 EDID color space: **#EDID-CS?**␣3**<CR>**
EDID-DC	Force removal of deep color on EDID or leaving it as in the original EDID.	**COMMAND** **#EDID-DC**␣in_index,deep_color_state**<CR>** **FEEDBACK** Get: **~nn@EDID-DC**␣in_index,deep_color_state**<CR><LF>**	**in_index** – Number that indicates the specific input: 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 **deep_color_state** – 0 – Don't change 1 – Remove deep color	Remove deep color on input 2: **#EDID-DC**␣2,1**<CR>**
EDID-DC?	Get the input's deep color removal status.	**COMMAND** **#EDID-DC?**␣in_index**<CR>** **FEEDBACK** Get: **~nn@EDID-DC**␣in_index,deep_color_state**<CR><LF>**	**in_index** – Number that indicates the specific input: 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 **deep_color_state** – 0 – Don't change 1 – Remove deep color	Get Input 3 deep color removal status: **#EDID-DC**␣3,1**<CR>**
ETH-PORT	Set Ethernet port protocol. ⓘ If the port number you enter is already in use, an error is returned. The port number must be within the following range: 0-(2^16-1).	**COMMAND** **#ETH-PORT**␣port_type,port_id**<CR>** **FEEDBACK** **~nn@ETH-PORT**␣port_type,port_id**<CR><LF>**	**port_type** – TCP/UDP TCP UDP **port_id** – TCP/UDP port number (0 – 65535)	Set the Ethernet port protocol for TCP to port 12457: **#ETH-PORT**␣0,12457**<CR>**
ETH-PORT?	Get Ethernet port protocol.	**COMMAND** **#ETH-PORT?**␣port_type**<CR>** **FEEDBACK** **~nn@ETH-PORT**␣port_type,port_id**<CR><LF>**	**port_type** – TCP/UDP TCP UDP **port_id** – TCP / UDP port number (0 – 65535)	Get the Ethernet port protocol for UDP: **#ETH-PORT?**␣1**<CR>**
FACTORY	Reset device to factory default configuration. ⓘ This command deletes all user data from the device. The deletion can take some time. Your device may require powering off and powering on for the changes to take effect.	**COMMAND** **#FACTORY<CR>** **FEEDBACK** **~nn@FACTORY**␣ok**<CR><LF>**		Reset the device to factory default configuration: **#FACTORY<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
FEATURE-LIST?	Get feature state according to the feature ID.	**COMMAND** **#FEATURE-LIST?** feature_id**<CR>** **FEEDBACK** **~nn@FEATURE-LIST** feature_id,ir_state**<CR><LF>**	**feature_id** – Feature ID) 1 – Maestro 2 – Room controller 3 – Maestro panel **ir_state** – IR interface 0 – disable 1 – enable	Get the room controller feature state (for the room controller 1): **#FEATURE-LIST?** 1**<CR>**
HDCP-MOD	Set HDCP mode. ⓘ Set HDCP working mode on the device input: HDCP supported - HDCP_ON [default]. HDCP not supported - HDCP OFF. HDCP support changes following detected sink - MIRROR OUTPUT. When you define 3 as the mode, the HDCP status is defined according to the connected output in the following priority: OUT 1, OUT 2. If the connected display on OUT 2 supports HDCP, but OUT 1 does not, then HDCP is defined as not supported. If OUT 1 is not connected, then HDCP is defined by OUT 2.	**COMMAND** **#HDCP-MOD** in_index,mode**<CR>** **FEEDBACK** **~nn@HDCP-MOD** in_index,mode**<CR><LF>**	**in_index** – Number that indicates the specific input: 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 **mode** – HDCP mode: 0 – HDCP Off 1 – HDCP On	Set the input HDCP-MODE of Input 1 to Off: **#HDCP-MOD** 1,0**<CR>**
HDCP-MOD?	Get HDCP mode. ⓘ Set HDCP working mode on the device input: HDCP supported - HDCP_ON [default]. HDCP not supported - HDCP OFF. HDCP support changes following detected sink - MIRROR OUTPUT.	**COMMAND** **#HDCP-MOD?** in_index**<CR>** **FEEDBACK** **~nn@HDCP-MOD** in_index,mode**<CR><LF>**	**in_index** – Number that indicates the specific input: 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 **mode** – HDCP mode: 0 – HDCP Off 3 – HDCP defined according to the connected output	Get the input HDCP-MODE of Input 1: **#HDCP-MOD?** 1**<CR>**
HDCP-STAT?	Get HDCP signal status. ⓘ io_mode =1 – get the HDCP signal status of the sink device connected to the specified output. io_mode =0 – get the HDCP signal status of the source device connected to the specified input.	**COMMAND** **#HDCP-STAT?** io_mode,in_index**<CR>** **FEEDBACK** **~nn@HDCP-STAT** io_mode,in_index,status**<CR><LF>**	**io_mode** – Input/Output 0 – Input 1 – Output **in_index** – Number that indicates the specific input: 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 **status** – Signal encryption status - valid values On/Off 0 – HDCP Off 1 – HDCP On	Get the output HDCP-STATUS of Input 1: **#HDCP-STAT?** 0,1**<CR>**
HELP	Get command list or help for specific command.	**COMMAND** **#HELP<CR>** **#HELP** cmd_name**<CR>** **FEEDBACK** 1. Multi-line: **~nn@Device** cmd_name, cmd_name…**<CR><LF>** To get help for command use: HELP (COMMAND_NAME)<CR><LF> **~nn@HELP** cmd_name:**<CR><LF>** **description<CR><LF>** **USAGE:usage<CR><LF>**	**cmd_name** – Name of a specific command	Get the command list: **#HELP<CR>** To get help for AV-SW-TIMEOUT: HELP **av-sw-timeout**<CR>
LOCK-FP	Lock the front panel. ⓘ In NT-52N, this command includes the PortNumber (1-2) parameter.	**COMMAND** **#LOCK-FP** lock/unlock**<CR>** **FEEDBACK** **~nn@LOCK-FP** lock/unlock**<CR><LF>**	**lock/unlock** – On/Off 0 – Off unlocks front panel buttons 1 – On locks front panel bu	Unlock front panel: **#LOCK-FP** 0**<CR>**
LOCK-FP?	Get the front panel lock state. ⓘ In NT-52N, this command includes the PortNumber (1-2) parameter.	**COMMAND** **#LOCK-FP?** **<CR>** **FEEDBACK** **~nn@LOCK-FP** lock/unlock**<CR><LF>**	**lock/unlock** – On/Off 0 – Off unlocks front panel buttons 1 – On locks front panel buttons	Get the front panel lock state: **#LOCK-FP?<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
LOGIN	Set protocol permission. ⓘ The permission system works only if security is enabled with the "SECUR" command. LOGIN allows the user to run commands with an End User or Administrator permission level. When the permission system is enabled, LOGIN enables running commands with the User or Administrator permission level When set, login must be performed upon each connection It is not mandatory to enable the permission system in order to use the device In each device, some connections allow logging in to different levels. Some do not work with security at all. Connection may logout after timeout.	**COMMAND** **#LOGIN** login_level,password**<CR>** **FEEDBACK** **~nn@LOGIN** login_level,password ok**<CR><LF>** or **~nn@LOGIN** err 004**<CR><LF>** (if bad password entered)	**login_level** – Level of permissions required (User or Admin) **password** – Predefined password (by PASS command). Default password is an empty string	Set the protocol permission level to Admin (when the password defined in the PASS command is 33333): **#LOGIN** admin,33333**<CR>**
LOGIN?	Get current protocol permission level. ⓘ The permission system works only if security is enabled with the "SECUR" command. For devices that support security, LOGIN allows the user to run commands with an End User or Administrator permission level. In each device, some connections allow logging in to different levels. Some do not work with security at all. Connection may logout after timeout.	**COMMAND** **#LOGIN?** **<CR>** **FEEDBACK** **~nn@LOGIN** login_level**<CR><LF>**	**login_level** – Level of permissions required (User or Admin)	Get current protocol permission level: **#LOGIN?<CR>**
LOGOUT	Cancel current permission level. ⓘ Logs out from End User or Administrator permission levels to Not Secure.	**COMMAND** **#LOGOUT<CR>** **FEEDBACK** **~nn@LOGOUT** ok**<CR><LF>**		**#LOGOUT<CR>**
LOG-TAIL?	Get the last "n" lines of message logs. ⓘ Used for advanced troubleshooting. Helps find error root causes and gets details not displayed in the error code number.	**COMMAND** **#LOG-TAIL?** line_num**<CR>** **FEEDBACK** Get: **~nn@LOG-TAILnn<CR><LF>** **Line content #1<CR><LF>** **Line content #2<CR><LF>** Etc...	**line_num** – Optional, default *line_num* is 10	Get the last "2" lines of message logs: **#LOG-TAIL?** 2**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
MATRIX-STATUS?	Get routing status of all output ports. ⓘ This syntax uses the new convention of using brackets to define a list of fields "[ ]".	**COMMAND** **#MATRIX-STATUS?␣<CR>** **FEEDBACK** Multi-line: **~nn@MATRIX-STATUS␣**[[<direction_type1>.<port_format>.<port_index1>.<signal_type1>.<index1>,[[<direction_type2>.<port_format2>.<port_index2>.<signal_type2>.<index2>],..]**<CR><LF>**	The following attributes comprise the output signal ID (suffix 1) and input signal ID (suffix 2 or greater): ▪ **<direction_type>** – Direction of the port: o IN – Input o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type	Get the room controller current matrix state: **#MATRIX-STATUS?␣<CR>**
MODEL?	Get device model. ⓘ This command identifies equipment connected to **VS-44H2** and notifies of identity changes to the connected equipment. The Matrix saves this data in memory to answer REMOTE-INFO requests.	**COMMAND** **#MODEL?␣<CR>** **FEEDBACK** **~nn@MODEL␣**model_name**<CR><LF>**	**model_name** – String of up to 19 printable ASCII chars	Get the device model: **#MODEL?␣<CR>**
NAME	Set machine (DNS) name. ⓘ The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).	**COMMAND** **#NAME␣**machine_name**<CR>** **FEEDBACK** **~nn@NAME␣**machine_name**<CR><LF>**	**machine_name** – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Set the DNS name of the device to room-442: **#NAME␣**room-442**<CR>**
NAME?	Get machine (DNS) name. ⓘ The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).	**COMMAND** **#NAME?␣<CR>** **FEEDBACK** **~nn@NAME␣**machine_name**<CR><LF>**	**machine_name** – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Get the DNS name of the device: **#NAME?␣<CR>**
NAME-RST	Reset machine (DNS) name to factory default. ⓘ Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number.	**COMMAND** **#NAME-RST<CR>** **FEEDBACK** **~nn@NAME-RST␣**ok**<CR><LF>**		Reset the machine name (S/N last digits are 0102): **#NAME-RST␣**kramer_0102**<CR>**
NET-CONFIG	Set a network configuration. ⓘ Parameters **[DNS1]** and **[DNS2]** are optional. ⓘ For Backward compatibility, the **id** parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port. ⓘ If the gateway address is not compliant to the subnet mask used for the host IP, the command will return an error. Subnet and gateway compliancy specified by RFC950.	**COMMAND** **#NET-CONFIG␣**netw_id,net_ip,net_mask,gateway,[dns1],[dns2]**<CR>** **FEEDBACK** **~nn@NET-CONFIG␣**netw_id,net_ip,net_mask,gateway**<CR><LF>**	**netw_id** – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3…. **net_ip** – Network IP **net_mask** – Network mask **gateway** – Network gateway	Set the device network parameters to IP address 192.168.113.10, net mask 255.255.0.0, and gateway 192.168.0.1: **#NET-CONFIG␣**0,192.168.113.10,255.255.0.0,192.168.0.1**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
NET-CONFIG?	Get a network configuration.	**COMMAND** **#NET-CONFIG?** netw_id<CR> **FEEDBACK** **~nn@NET-CONFIG** netw_id,net_ip,net_mask,gateway<CR><LF>	**netw_id** – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3…. **net_ip** – Network IP **net_mask** – Network mask **gateway** – Network gateway	Get network configuration: **#NET-CONFIG?** id<CR>
NET-DHCP	Set DHCP mode. ⓘ Only 1 is relevant for the mode value. To disable DHCP, the user must configure a static IP address for the device. 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 **NAME** command. You can also get an assigned IP by direct connection to USB or RS-232 protocol port, if available. For proper settings consult your network administrator. ⓘ For Backward compatibility, the **id** parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	**COMMAND** **#NET-DHCP** netw_id,dhcp_state<CR> **FEEDBACK** **~nn@NET-DHCP** netw_id,dhcp_state<CR><LF>	**netw_id** – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3…. **dhcp_state** – 1 – Try to use DHCP. (If unavailable, use the IP address set by the factory or the net-ip command).	Enable DHCP mode for port 1, if available: **#NET-DHCP** 0,1<CR>
NET-DHCP?	Get DHCP mode. ⓘ For Backward compatibility, the **id** parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	**COMMAND** **#NET-DHCP?** netw_id<CR> **FEEDBACK** **~nn@NET-DHCP** netw_id,dhcp_mode<CR><LF>	**netw_id** – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3…. **dhcp_mode** – 0 – Do not use DHCP. Use the IP set by the factory or using the **net-ip** or **net-config** command. 1 – Try to use DHCP. If unavailable, use the IP set by the factory or using the **net-ip** or **net-config** command.	Get DHCP mode: **#NET-DHCP?** 0<CR>
NET-DNS?	Get DNS name server. ⓘ There is no "Set" command. Use NET-CONFIG to set up network, including DNS name servers. If dns_id is out of the defined DNS range, Error Code #3 (ERR_PARAMETER_OUT_OF_RANGE) is returned. If no dns_id is defined, Error Code #3 is returned for any dns_id.	**COMMAND** **#NET-DNS?** dns_id<CR> **FEEDBACK** **~nn@NET-DNS** dns_id,dns_ip<CR><LF>	**dns_id** – ID of the DNS name server to retrieve, indexing starts at "0" **dns_ip** – IP address of the DNS server	Get DNS name server: **#NET-DNS?** <CR>
NET-GATE	Set gateway IP. ⓘ A network gateway connects the device via another network and maybe over the Internet. Be careful of security issues. For proper settings consult your network administrator. Note that this command is DEPRECATED and is now replaced by **NET-CONFIG** command.	**COMMAND** **#NET-GATE** ip_address<CR> **FEEDBACK** **~nn@NET-GATE** ip_address<CR><LF>	**ip_address** – Format: xxx.xxx.xxx.xxx	Set the gateway IP address to 192.168.0.1: **#NET-GATE** 192.168.000.001<CR>

Function	Description	Syntax	Parameters/Attributes	Example
NET-GATE?	Get gateway IP. ⓘ A network gateway connects the device via another network and maybe over the Internet. Be aware of security problems. Note that this command is DEPRECATED and is now replaced by **NET-CONFIG** command.	**COMMAND** **#NET-GATE?␣<CR>** **FEEDBACK** **~nn@NET-GATE␣**ip_address**<CR><LF>**	**ip_address** – Format: xxx.xxx.xxx.xxx	Get the gateway IP address: **#NET-GATE?␣<CR>**
NET-IP	Set IP address. ⓘ For proper settings consult your network administrator. Note that this command is DEPRECATED and is now replaced by **NET-CONFIG** command.	**COMMAND** **#NET-IP␣**ip_address**<CR>** **FEEDBACK** **~nn@NET-IP␣**ip_address**<CR><LF>**	**ip_address** – Format: xxx.xxx.xxx.xxx	Set the IP address to 192.168.1.39: **#NET-IP␣**192.168.001.039**<CR>**
NET-IP?	Get IP address. ⓘ For proper settings consult your network administrator. Note that this command is DEPRECATED and is now replaced by **NET-CONFIG** command.	**COMMAND** **#NET-IP?␣<CR>** **FEEDBACK** **~nn@NET-IP␣**ip_address**<CR><LF>**	**ip_address** – Format: xxx.xxx.xxx.xxx	Get the IP address: **#NET-IP?␣<CR>**
NET-MAC?	Get MAC address. ⓘ For backward compatibility, the **id** parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	**COMMAND** **#NET-MAC?␣**id**<CR>** **FEEDBACK** **~nn@NET-MAC␣**id,mac_address**<CR><LF>**	**id** – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3…. **mac_address** – Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit	**#NET-MAC?␣**id**<CR>**
NET-MASK	Set subnet mask. ⓘ For proper settings consult your network administrator. Note that this command is DEPRECATED and is now replaced by **NET-CONFIG** command.	**COMMAND** **#NET-MASK␣**net_mask**<CR>** **FEEDBACK** **~nn@NET-MASK␣**net_mask**<CR><LF>**	**net_mask** – Format: xxx.xxx.xxx.xxx	Set the subnet mask to 255.255.0.0: **#NET-MASK␣**255.255.000.000**<CR>**
NET-MASK?	Get subnet mask. ⓘ For proper settings consult your network administrator. Note that this command is DEPRECATED and is now replaced by **NET-CONFIG** command.	**COMMAND** **#NET-MASK?␣<CR>** **FEEDBACK** **~nn@NET-MASK␣**net_mask**<CR><LF>**	**net_mask** – Format: xxx.xxx.xxx.xxx	Get the subnet mask: **#NET-MASK?<CR>**
PASS	Set password for login level. ⓘ The default password is an empty string.	**COMMAND** **#PASS␣**login_level,password**<CR>** **FEEDBACK** **~nn@PASS␣**login_level,password**<CR><LF>**	**login_level** – Level of login to set (End User or Administrator). **password** – Password for the *login_level*. Up to 15 printable ASCII chars	Set the password for the Admin protocol permission level to 33333: **#PASS␣**admin,33333**<CR>**
PASS?	Get password for login level. ⓘ The default password is an empty string.	**COMMAND** **#PASS?␣**login_level**<CR>** **FEEDBACK** **~nn@PASS␣**login_level,password**<CR><LF>**	**login_level** – Level of login to set (End User or Administrator). **password** – Password for the *login_level*. Up to 15 printable ASCII chars	Get the password for the Admin protocol permission level: **#PASS?␣**admin**<CR>**
PORTS-LIST?	Get the port list of this machine. ⓘ The response is returned in one line and terminated with<CR><LF>. The response format lists port IDs separated by commas. This is an Extended Protocol 3000 command.	**COMMAND** **#PORTS-LIST?␣<CR>** **FEEDBACK** **~nn@PORTS-LIST␣**[<direction_type>.<port_format>.<port_index>,..,]**<CR><LF>**	The following attributes comprise the port ID: ▪ **<direction_type>** – Direction of the port: ○ IN ○ OUT ▪ **<port_format>** – Type of signal on the port: ○ HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel: 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4	Get the ports list: **#PORTS-LIST?␣<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
PROT-VER?	Get device protocol version.	COMMAND #PROT-VER?␣<CR> FEEDBACK ~nn@PROT-VER␣3000:version<CR><LF>	version – XX.XX where X is a decimal digit	Get the device protocol version: #PROT-VER?␣<CR>
PRST-LOCK	Set a preset as read-only. ⓘ Prevents users from overriding the preset by mistake.	COMMAND #PRST-LOCK␣preset_index,mode<CR> FEEDBACK ~nn@PRST-LOCK␣preset_index,mode<CR><LF>	preset_index – Preset number 1 – Preset 1 2 – Preset 2 3 – Preset 3 4 – Preset 4 5 – Preset 5 6 – Preset 6 7 – Preset 7 8 – Preset 8 mode – On/Off	#PRST-LOCK␣2,on<CR> ~01@PRST-LOCK 2,ON #PRST-LOCK␣2<CR> ~01@PRST-LOCK 2,ON
PRST-LOCK?	Get the preset read-only status. ⓘ Prevents users from overriding the preset by mistake.	COMMAND #PRST-LOCK?␣preset_index<CR> FEEDBACK ~nn@PRST-LOCK␣preset_index,mode<CR><LF>	preset_index – Preset number 1 – Preset 1 2 – Preset 2 3 – Preset 3 4 – Preset 4 5 – Preset 5 6 – Preset 6 7 – Preset 7 8 – Preset 8 mode – On/Off	#PRST-LOCK?␣1<CR> ~01@PRST-LOCK 1,OFF #PRST-LOCK?␣2<CR> ~01@PRST-LOCK 2,OFF
PRST-LST?	Get saved preset list. ⓘ In most units, video and audio presets with the same number are stored and recalled together by commands #PRST-STO and #PRST-RCL.	COMMAND #PRST-LST?␣<CR> FEEDBACK ~nn@PRST-LST␣preset,preset,…<CR><LF>	preset – Preset number 1 – Preset 1 2 – Preset 2 3 – Preset 3 4 – Preset 4 5 – Preset 5 6 – Preset 6 7 – Preset 7 8 – Preset 8	Show preset list: #PRST-LST?<CR>
PRST-RCL	Recall saved preset list. ⓘ In most units, video and audio presets with the same number are stored and recalled together by commands #PRST-STO and #PRST-RCL.	COMMAND #PRST-RCL␣preset<CR> FEEDBACK ~nn@PRST-RCL␣preset<CR><LF>	preset – Preset number 1 – Preset 1 2 – Preset 2 3 – Preset 3 4 – Preset 4 5 – Preset 5 6 – Preset 6 7 – Preset 7 8 – Preset 8	Recall preset 1: #PRST-RCL␣1<CR>
PRST-STO	Store current connections, volumes and modes in preset. ⓘ In most units, video and audio presets with the same number are stored and recalled together by commands #PRST-STO and #PRST-RCL.	COMMAND #PRST-STO␣preset<CR> FEEDBACK ~nn@PRST-STO␣preset<CR><LF>	preset – Preset number 1 – Preset 1 2 – Preset 2 3 – Preset 3 4 – Preset 4 5 – Preset 5 6 – Preset 6 7 – Preset 7 8 – Preset 8	Store preset 1: #PRST-STO␣1<CR>
RESET	Reset device. ⓘ To avoid locking the port due to a USB bug in Windows, disconnect USB connections immediately after running this command. If the port was locked, disconnect and reconnect the cable to reopen the port.	COMMAND #RESET<CR> FEEDBACK ~nn@RESET␣ok<CR><LF>		Reset the device: #RESET<CR>
SECUR	Start/stop security. ⓘ The permission system works only if security is enabled with the "SECUR" command.	COMMAND #SECUR␣security_state<CR> FEEDBACK ~nn@SECUR␣security_state<CR><LF>	security_state – Security state 0 – OFF (disables security) 1 – ON (enables security)	Enable the permission system: #SECUR␣0<CR>
SECUR?	Get current security state. ⓘ The permission system works only if security is enabled with the "SECUR" command.	COMMAND #SECUR?␣<CR> FEEDBACK ~nn@SECUR␣security_state<CR><LF>	security_state – Security state 0 – OFF (disables security) 1 – ON (enables security)	Get current security state: #SECUR?␣<CR>
SIGNAL?	Get input signal status.	COMMAND #SIGNAL?␣in_index<CR> FEEDBACK ~nn@SIGNAL␣in_index,status<CR><LF>	in_index – Number that indicates the specific input: 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 status – Signal status according to signal validation: 0 – Off 1 – On	Get the input signal lock status of Input 1: #SIGNAL?␣1<CR>

Function	Description	Syntax	Parameters/Attributes	Example
SIGNALS-LIST?	Get signal ID list of this machine. ⓘ The response is returned in one line and terminated with<CR><LF>. The response format lists signal IDs separated by commas. This is an Extended Protocol 3000 command.	**COMMAND** **#SIGNALS-LIST?␣<CR><LF>** **FEEDBACK** **~nn@SIGNALS-LIST␣**[<direction_type>.<port_format>.<port_label>.<signal_type>.<index>,..,]**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: ○ IN – Input ○ OUT – Output ▪ **<port_format>** – Type of signal on the port: ○ HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 ▪ 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: ○ VIDEO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type	Get signal ID list: **#SIGNALS-LIST?␣<CR>**
SN?	Get device serial number.	**COMMAND** **#SN?␣<CR>** **FEEDBACK** **~nn@SN␣**serial_num**<CR><LF>**	**serial_num** – 14 decimal digits, factory assigned	Get the device serial number: **#SN?␣<CR>**
TIME?	Get device time and date. ⓘ The year must be 4 digits. The device does not validate the day of week from the date. Time format - 24 hours. Date format - Day, Month, Year.	**COMMAND** **#TIME?␣<CR>** **FEEDBACK** **~nn@TIME␣**day_of_week,date,data**<CR><LF>**	**day_of_week** – One of {SUN,MON,TUE,WED,THU,FRI,SAT} **date** – Format: YYYY/MM/DD where YYYY = Year MM = Month DD = Day **data** – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds	Get device time and date: **#TIME?<CR>**
TIME-LOC?	Get local time offset from UTC/GMT. ⓘ If the time server is configured, device time calculates by adding UTC_off to UTC time (that it got from the time server) + 1 hour if daylight savings time is in effect. TIME command sets the device time without considering these settings.	**COMMAND** **#TIME-LOC?␣<CR>** **FEEDBACK** **~nn@TIME-LOC␣**utc_off,dst_state**<CR><LF>**	**utc_off** – Offset of device time from UTC/GMT (without daylight time correction) **dst_state** – Daylight saving time state 0 – no daylight saving time 1 – daylight saving time	Get local time offset from UTC/GMT: **#TIME-LOC?<CR>**
TIME-SRV?	Get time server. ⓘ This command is needed for setting UDP timeout for the current client list.	**COMMAND** **#TIME-SRV?␣<CR>** **FEEDBACK** **~nn@TIME-SRV␣**mode,time_server_ip,sync_hour,server_status**<CR><LF>**	**mode** – On/Off 0 – Off 1 – On **time_server_ip** – Time server IP address **sync_hour** – Hour in day for time server sync **server_status** – On/Off 0 – Off 1 – On	Get time server: **#TIME-SRV?<CR>**
VERSION?	Get firmware version number.	**COMMAND** **#VERSION?␣<CR>** **FEEDBACK** **~nn@VERSION␣**firmware_version**<CR><LF>**	**firmware_version** – XX.XX.XXXX where the digit groups are: major.minor.build version	Get the device firmware version number: **#VERSION?␣<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
X-AUD-ONLY	Set audio only mode, where a black pattern is shown and Audio is played over HDMI. ⓘ This is an Extended Protocol 3000 command.	**COMMAND** **#X-AUD-ONLY␣**<direction_type>.<port_format>.<port_index>.<signal_type>.<index>,mode**<CR>** **FEEDBACK** **~nn@X-AUD-ONLY␣**<direction_type>.<port_format>.<port_index>.<signal_type>.<index>,mode**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o IN – Input o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO o AUDIO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type **mode** – OFF/ON (not case sensitive)	Set Output 3 to audio only: **#X-AUD-ONLY␣**out.hdmi.3.video.1,on**<CR>**
X-AUD-ONLY?	Get audio only mode. ⓘ This is an Extended Protocol 3000 command.	**COMMAND** **#X-AUD-ONLY?␣**<direction_type>.<port_format>.<port_index>.<signal_type>.<index>**<CR>** **FEEDBACK** **~nn@X-AUD-ONLY␣**<direction_type>.<port_format>.<port_index>.<signal_type>.<index>,mode**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o IN – Input o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO o AUDIO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type **mode** – OFF/ON (not case sensitive)	Get the audio only mode: **#X-AUD-ONLY?␣**out.hdmi.2.video.1**<CR>**
X-AV-SW-MODE	Set auto-switch mode per output. ⓘ This is an Extended Protocol 3000 command.	**COMMAND** **#X-AV-SW-MODE␣**<direction_type>.<port_format>.<port_index>.<signal_type>.<index>,connection_mode**<CR>** **FEEDBACK** **~nn@X-AV-SW-MODE␣**<direction_type>.<port_format>.<port_index>.<signal_type>.<index>,connection_mode**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel ▪ 1 – Input 1 ▪ 2 – Input 2 ▪ 3 – Input 3 ▪ 4 – Input 4 ▪ ▪ 1 – Output 1 ▪ 2 – Output 2 ▪ 3 – Output 3 ▪ 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type **connection_mode** – Connection mode 0 – manual 1 – priority 2 – last connected	Set auto switch mode for Output 1 (last connected): **#X-AV-SW-MODE␣**out.hdmi.1.video.1,2**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
X-AV-SW-MODE?	Get auto-switch mode. ⓘ This is an Extended Protocol 3000 command.	**COMMAND** **#X-AV-SW-MODE?**␣<direction_type>.<port_format>.<port_index>.<signal_type>.<index>**<CR>** **FEEDBACK** **~nn@X-AV-SW-MODE**␣<direction_type>.<port_format>.<port_index>.<signal_type>.<index>,connection_mode**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel ▪ 1 – Output 1 ▪ 2 – Output 2 ▪ 3 – Output 3 ▪ 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type **connection_mode** – Connection mode 0 – manual 1 – priority 2 – last connected	Get auto switch mode for Output 1: **#X-AV-SW-MODE?**␣out.hdmi.1.video.1**<CR>**
X-LABEL	Set the port label. ⓘ Labels are used commonly by webpages. This is an Extended Protocol 3000 command.	**COMMAND** **#X-LABEL**␣<direction_type>.<port_format>.<port_index>,label_txt**<CR>** **FEEDBACK** **~nn@X-LABEL**␣<direction_type>.<port_format>.<port_index>,label_txt**<CR><LF>**	The following attributes comprise the port ID: ▪ **<direction_type>** – Direction of the port: o IN o OUT ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 **label_txt** – ASCII characters without space	Set the port label for Input 1: **#X-LABEL**␣in.hdmi.1,dvd**<CR>**
X-LABEL?	Get the port label. ⓘ Labels are used commonly by webpages. This is an Extended Protocol 3000 command.	**COMMAND** **#X-LABEL?**␣<direction_type>.<port_format>.<port_index>**<CR>** **FEEDBACK** **~nn@X-LABEL**␣<direction_type>.<port_format>.<port_index>,label_txt**<CR><LF>**	The following attributes comprise the port ID: ▪ **<direction_type>** – Direction of the port: o IN o OUT ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 **label_txt** – ASCII characters without space	Get the port label for Output 4: **#X-LABEL?**␣out.hdmi.4**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
X-MTX-SET-INPUTS	Set auto switching input signals group per output. ⓘ The order of the inputs in the list is fixing implicitly the priority of each input in case the user choose later "Priority" auto switching strategy. The highest priority is 1, then 2 etc. in the decreasing order. X-MTX-SET-INPUTS can be used to define the Group list for "Priority" auto-switching strategy. X-MTX-SET-INPUTS override X-PRIORITY configuration. Auto switching group list is common for all Auto switching strategies (last connected/ priority). This syntax uses the new convention of using brackets to define a list of fields "[ ]". This is an Extended Protocol 3000 command.	**COMMAND** **#X-MTX-SET-INPUT**␣<direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>,..,]**<CR>** **FEEDBACK** **~nn@X-MTX-SET-INPUT**␣<direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>,..,]**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o IN – Input o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type	Set auto switching input signals group for Output 1. **#X-MTX-SET-INPUTS**␣out.hdmi.1.video.1,[in.hdmi.1.video.1,in.hdmi.2.video.1…]**<CR>**
X-MTX-SET-INPUTS?	Get auto switching input signals group per output. ⓘ The order of the inputs in the list is fixing implicitly the priority of each input in case the user choose later "Priority" auto switching strategy. The highest priority is 1, then 2 etc. in the decreasing order. X-MTX-SET-INPUTS can be used to define the Group list for "Priority" auto-switching strategy. X-MTX-SET-INPUTS override X-PRIORITY configuration. Auto switching group list is common for all Auto switching strategies (last connected/ priority). This syntax uses the new convention of using brackets to define a list of fields "[ ]". This is an Extended Protocol 3000 command.	**COMMAND** **#X-MTX-SET-INPUT?**␣<direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>**<CR>** **FEEDBACK** Get: **~nn@X-MTX-SET-INPUT**␣<direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>,..,]**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o IN – Input o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type	Get auto switching input signals group for Output 3. **#X-MTX-SET-INPUTS?**␣out.hdmi.3.video.1**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
X-MUTE	Set mute ON/OFF on a specific signal. ⓘ This command is designed to Mute a Signal. This means that it could be applicable on any type of signal. Could be audio, video and maybe IR, USB or data if this capability is supported by the product. This is an Extended Protocol 3000 command.	**COMMAND** **#X-MUTE**␣<direction_type>.<port_format>.<port_index>.<signal_type>.<index>,state**<CR>** **FEEDBACK** **~nn@X-MUTE**␣<direction_type>.<port_format>.<port_index>.<signal_type>.<index>,state**<CR><LF>**	The following attributes comprise the signal ID: ▪ <direction_type> – Direction of the port: o IN – Input o OUT – Output ▪ <port_format> – Type of signal on the port: o HDMI ▪ <port_index> – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 ▪ <signal_type> – Signal ID attribute: o VIDEO o AUDIO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type state – OFF/ON (not case sensitive)	Mute the video on Output 4: **#X-MUTE**␣out.hdmi.4.video.1,on**<CR>** The device accepts any parameter that is put in the command
X-MUTE?	Get mute ON/OFF state on a specific signal. ⓘ This command is designed to Mute a Signal. This means that it could be applicable on any type of signal. Could be audio, video and maybe IR, USB or data if this capability is supported by the product. This is an Extended Protocol 3000 command.	**COMMAND** **#X-MUTE?**␣<direction_type>.<port_format>.<port_index>.<signal_type>.<index>**<CR>** **FEEDBACK** **~nn@X-MUTE**␣<direction_type>.<port_format>.<port_index>.<signal_type>.<index>,state**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o IN – Input o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel ▪ **<signal_type>** – Signal ID attribute: o VIDEO o AUDIO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type **state** – OFF/ON (not case sensitive)	Get the mute ON/OFF state on Input 3: **#X-MUTE?**␣out.hdmi.4.video.1**<CR>**
X-PATTERN	Set a pattern on a specific output signal. ⓘ This command is designed to enable pattern on any signal. commonly pattern makes sense for video, but on some products audio pattern is also supported. In the future, data pattern will be also supported to generate some data on RS232 lines. This is an Extended Protocol 3000 command.	**COMMAND** **#X-PATTERN**␣<direction_type>.<port_format>.<port_index>.<signal_type>.<index>,pattern_id**<CR>** **FEEDBACK** **~nn@X-PATTERN**␣<direction_type>.<port_format>.<port_index>.<signal_type>.<index>,pattern_id**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type **pattern_id** – Pattern index number 0 – Pattern mode is OFF 1 – Color bar 2 – Blue screen 3 – Green screen 4 – Red screen Pattern index numbers can be retrieved using the command: #**x-patterns-list**?	Set video pattern 3 on Output 3 (enabled): **#X-PATTERN**␣out.hdmi.3.video.1,3**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
X-PATTERN?	Get selected pattern on a specific output signal. ⓘ This command is designed to enable pattern on any signal. commonly pattern makes sense for video, but on some products audio pattern is also supported. In the future, data pattern will be also supported to generate some data on RS232 lines. This is an Extended Protocol 3000 command.	**COMMAND** **#X-PATTERN?**␣<direction_type>.<port_format>.<port_index>.<signal_type>.<index>**<CR>** **FEEDBACK** **~nn@X-PATTERN**␣<direction_type>.<port_format>.<port_index>.<signal_type>.<index>,pattern_id**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type **pattern_id** – Pattern index number 0 – Pattern mode is OFF 1 – Color bar 2 – Blue screen 3 – Green screen 4 – Red screen Pattern list can be retrieved using the command: **#patterns-list?**	Get the selected pattern on a Output 1: **#X-PATTERN?**␣out.hdmi.1.video.1**<CR>**
X-PATTERNS-LIST?	Get pattern indexes available per signal ID and usable in the command X-PATTERN. ⓘ Not all products support patterns for all layers. This list can be usable into X-PATTERN. This is an Extended Protocol 3000 command.	**COMMAND** **#X-PATTERNS-LIST?**␣<direction_type>.<port_format>.<port_index>.<signal_type>.<index>**<CR>** **FEEDBACK** **~nn@X-PATTERNS-LIST**␣<direction_type>.<port_format>.<port_index>.<signal_type>.<index>,<pattern_id>**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type **pattern_id** – Pattern index number 0 – None 1 – Color bar 2 – Blue screen 3 – Green screen 4 – Red screen	Get the patterns list: **#X-PATTERNS-LIST?**␣out.hdmi.1.video.1**<CR>**
X-PRIORITY	Set auto switching input signals group & priorities per output. ⓘ The order of the inputs in the list is fixing the order to the priority. The highest priority is 1, then 2 etc.. X-PRIORITY is also defining implicitly the video inputs group list for Last-connected auto switching strategy. X-PRIORITY override X-MTX-SET-INPUTS configuration. Auto switching group list is common for all Auto switching strategies (last connected/ priority). This syntax uses the new convention of using brackets to define a list of fields "[ ]". This is an Extended Protocol 3000 command.	**COMMAND** **#X-PRIORITY**␣<direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>,..,]**<CR>** **FEEDBACK** **~nn@X-PRIORITY**␣<direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>,..,]**<CR><LF>**	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o IN – Input o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type	Set the auto switching input signals group & priorities per output: **#X-PRIORITY**␣out.hdmi.7.video.1,[in.hdmi.1.video.1,in.hdmi.2.video.1,in.hdmi.3.video.1]**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
X-PRIORITY?	Get auto switching input signals group priorities per output. The order of the inputs in the list is fixing the order to the priority. The highest priority is 1, then 2 etc.. X-PRIORITY is also defining implicitly the video inputs group list for Last-connected auto switching strategy. X-PRIORITY override X-MTX-SET-INPUTS configuration. Auto switching group list is common for all Auto switching strategies (last connected/ priority). This syntax uses the new convention of using brackets to define a list of fields "[ ]". This is an Extended Protocol 3000 command.	**COMMAND** **#X-PRIORITY?** <direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1><CR> **FEEDBACK** **~nn@X-PRIORITY** <direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>,..,]<CR><LF>	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o IN – Input o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type	Get the auto switching input signals group & priorities for Output 4: **#X-PRIORITY?** out.hdmi.4.video.1<CR>
X-ROUTE	Send routing command to matrix. It is recommended to use the command **#SIGNALS-LIST** to get the list of all signal IDs available in the system and which can be used in this command. Video 1 is the default port in this command and is implied even if not written: **#X-ROUTE** out.sdi.5,in.sdi.1<CR> is interpreted as: **#X-ROUTE** out.sdi.5.video.1,in.sdi.1.video.1<CR> This is an Extended Protocol 3000 command.	**COMMAND** **#X-ROUTE** <direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2><CR> **FEEDBACK** **~nn@X-ROUTE** <direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2><CR><LF>	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o IN – Input o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO o AUDIO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type	Route HDMI IN 2 to HDMI OUT 3: **#X-ROUTE** out.hdmi.3.video.1,in.hdmi.2.video.1<CR>
X-ROUTE?	Get routing status. It is recommended to use the command **#SIGNALS-LIST** to get the list of all signal IDs available in the system and which can be used in this command. **VIDEO.1** are the default **<signal_type>** and **<index>** in this command and are implied even if not written: **#X-ROUTE** out.sdi.5,in.sdi.1<CR> is interpreted as: **#X-ROUTE** out.sdi.5.video.1,in.sdi.1.video.1<CR> This is an Extended Protocol 3000 command.	**COMMAND** **#X-ROUTE?** <direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1><CR> **FEEDBACK** **~nn@X-ROUTE** <direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2><CR><LF>	The following attributes comprise the signal ID: ▪ **<direction_type>** – Direction of the port: o IN – Input o OUT – Output ▪ **<port_format>** – Type of signal on the port: o HDMI ▪ **<port_index>** – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 ▪ **<signal_type>** – Signal ID attribute: o VIDEO o AUDIO ▪ **<index>** – Indicates a specific channel number when there are multiple channels of the same type	Get the routing status: **#X-ROUTE?** out.hdmi.5.video.1<CR>

Result and Error Codes

Syntax

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

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

Error Codes

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

The warranty obligations of Kramer Electronics Inc. ("Kramer Electronics") for this product are limited to the terms set forth below:

What is Covered

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

What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product. Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

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

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

Who is Covered

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

What Kramer Electronics Will Do

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

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

What Kramer Electronics Will Not Do Under This Limited Warranty

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

How to Obtain a Remedy Under This Limited Warranty

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

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Other Conditions

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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 or contact a Kramer Electronics office from the list at the end of this document.

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

KRAMER

P/N: 2900-300654 Rev: 1

SAFETY WARNING
Disconnect the unit from the power supply before opening and servicing

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

We welcome your questions, comments, and feedback.

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