



USER MANUAL

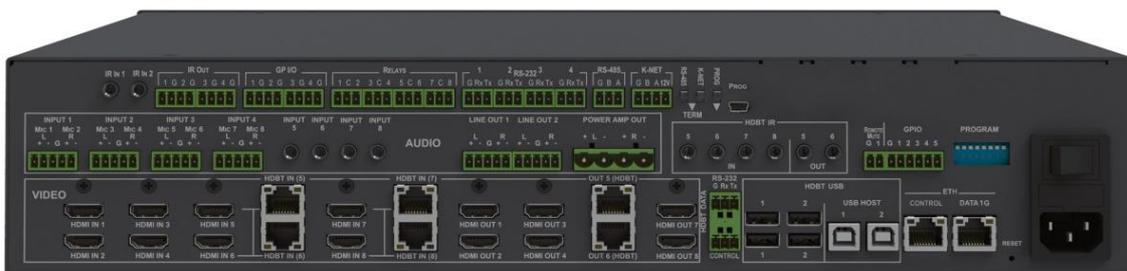
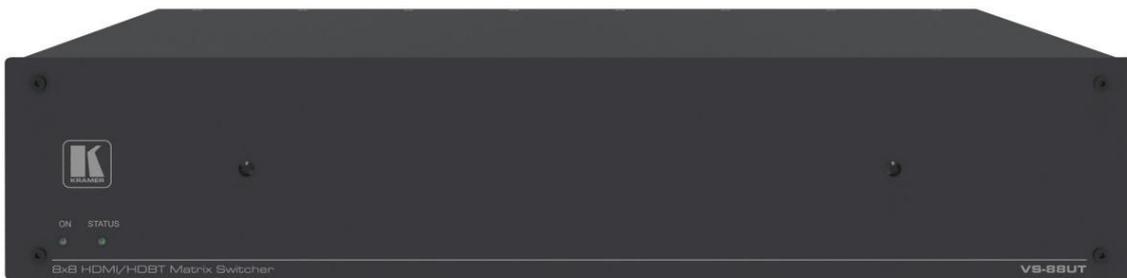
MODELS:

VS-88UT

8x8 HDMI/HDBT Matrix Switcher

VS-84UT

8x4 HDMI/HDBT Matrix Switcher



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Introduction

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

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-88UT or www.kramerav.com/downloads/VS-84UT to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

Achieving the Best Performance

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

Safety Instructions



Caution:

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



Warning:

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

Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at www.kramerav.com/support/recycling.

Overview

Congratulations on purchasing your Kramer **VS-88UT 8x8 HDMI/HDBT Matrix Switcher** and/or **VS-84UT 8x4 HDMI/HDBT Matrix Switcher**.



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

VS-88UT is a high-performance 4K@60Hz (4:2:0) Audio-Video presentation system with integrated range extension and an integrated control system master. The unit switches the video, embeds the audio and outputs the signal to both HDMI™ and HDBaseT 2.0 with USB extension and PoE. Outstanding audio support includes balanced stereo audio, unbalanced stereo audio and de-embedded audio sources that output to embedded audio, balanced stereo audio as well as a power amplified audio output.

VS-88UT includes a master room controller that can operate over Ethernet (LAN) with control ports that include: one bidirectional RS-485, four RS-232, four IR, four GPI/O, and eight relays to control a wide variety of AV devices. It includes a KNET™ connector interface that enables access to the master controller from auxiliary room controllers such as control keypads. The unit can also provide power to auxiliary room controllers via the KNET™ connectors. The **VS-88UT** includes an Ethernet gateway to control and manage remote I/O ports.

The **VS-88UT** provides exceptional quality, advanced and user-friendly operation, and flexible control.

Exceptional Quality

- Max. Data Rate – 10.2Gbps (3.4Gbps per graphic channel).
- Max. Resolution – 4K@60Hz (4:2:0).
- Audio Level control.
- HDMI, HDCP and DVI compliance.
- HDBaseT certified – V2.0 support.
- HDBaseT Extension Reach – Up to 100m at 4K @60Hz (4:2:0), up to 130m (430ft) at full HD (1080p @60Hz 36bpp), up to 180m (590ft) at ultra-mode and full HD (1080p @60Hz 24bpp).
- USB Support – USB 1.1 and USB 2.0 (up to 127Mbps) channelled through HDBaseT.

- HDMI Support – Deep color, 3D, 7.1 PCM as specified in HDMI 2.0.
- Kramer reKlocking™ and equalization technology – Rebuilds the digital signal to travel longer distances.

Advanced and User-friendly Operation

- Advanced EDID management per input.
- Active source and acceptor detection.
- Control options – RS-232 serial commands transmitted by a PC, touch screen system or other serial controller, Ethernet port via LAN.
- Simple and Powerful Maestro 1.5 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.
- Kramer K-Config™ Compatible – Windows®-based control program for easy configuration and upload to room controller over customer IP network.
- Kramer Network Compatible – Remote control and management over customer IP network.
- Programmable Step-In over HDMI and HDBT – When used in conjunction with compatible step-in devices, such as the **SID-X3N** and **DIP-31** (using an HDMI cable that supports HEC, the HDMI Ethernet Channel).
- Simultaneous IP control communication – With up to 15 IP control clients.
- Auto-switching and auto-scanning of inputs.
- Audio breakaway and AFV (audio-follow-video) operation support.
- Global mute for both video and audio outputs – Allowing easy integration of the audio system with a public announcement audio system in case of an emergency event.
- Firmware Upgrade – Ethernet-based, via a user-friendly software upgrade tool.
- Kramer protocol 3000 support.
- Advanced EDID management per input.
- Includes non-volatile memory that retains the last settings after switching the power off and then on again.

Flexible Connectivity

- For **VS-88UT**:
 - 4 HDMI and 4 HDMI/HDBT (selectable) inputs.
 - 4 balanced stereo audio inputs or 8 microphone inputs (selectable) as well as 4 unbalanced stereo inputs.
 - 6 HDMI and 2 HDBT outputs.
 - 6 IR ports for HDBT tunneling.

- For **VS-84UT**:
 - 6 HDMI and 2 HDBT inputs.
 - 4 balanced stereo audio inputs or 8 microphone inputs (selectable) as well as 4 unbalanced stereo inputs.
 - 2 HDMI and 2 HDBT outputs.
 - 4 IR ports for HDBT tunneling.
- 2 line-out balanced stereo audio outputs and one audio amplified output.
- 2 USB type-A hubs and 2 USB Type-B ports.
- 1 Ethernet port – Connects to control gateways for I/O port extending, and controls IP-enabled controlled devices.
- 1G Ethernet port – For tunneling data via HDBT ports.
- 1 K-NET™ connector – Carrying both power and control communication; connects to room control system, either master room controller, or auxiliary control keypads.
- 1 RS-485 and 2 RS-232 bidirectional control ports – Control devices via bidirectional serial control protocols.
- 4 IR emitter control ports – Control devices via IR control protocols.
- 4 GPI/O control ports – Control devices via general purpose I/O ports, individually configurable as digital input, digital output or analog input interface for controlling sensors, door-locks, audio volume and light dim level, or lighting control devices.
- 8 Relay control ports – Control devices via relay contact closure, such as scrolling up and down screens, drapes, shades, and blinds.
- IR Sensor and IR input ports – Learn commands from IR remotes.

Typical Applications

The **VS-88UT** is ideal for the following typical applications:

- Projection systems in conference rooms, boardrooms, hotels and churches.
- Divisible conference rooms in hotels.
- Classroom, lecture theatres and education applications.

Controlling your VS-88UT

Control your **VS-88UT** via:

- By RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller (see [Connecting to VS-88UT via RS-232](#) on page [16](#)).
- Ethernet using built-in user-friendly Web pages (see [Using the Web Pages](#) on page [19](#)).

Defining the VS-88UT and VS-84UT

This section defines the VS-88UT and VS-84UT.

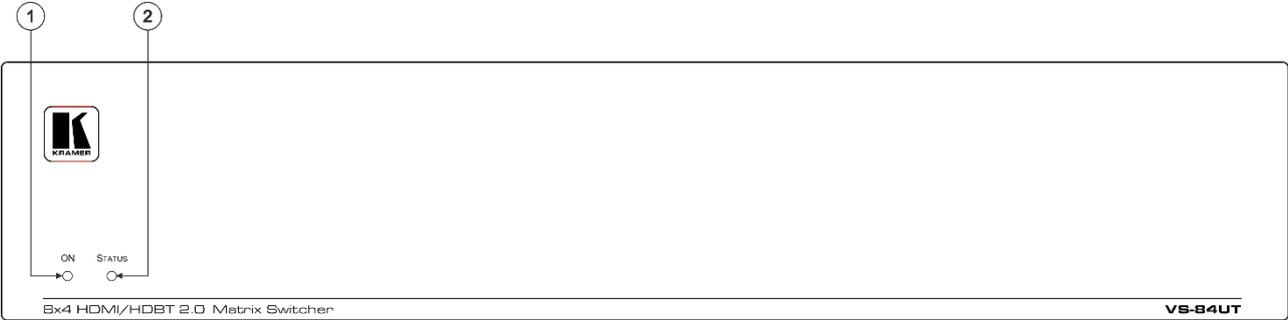


Figure 1: VS-84UT 8x4 HDMI/HDBT Matrix Switcher Front Panel

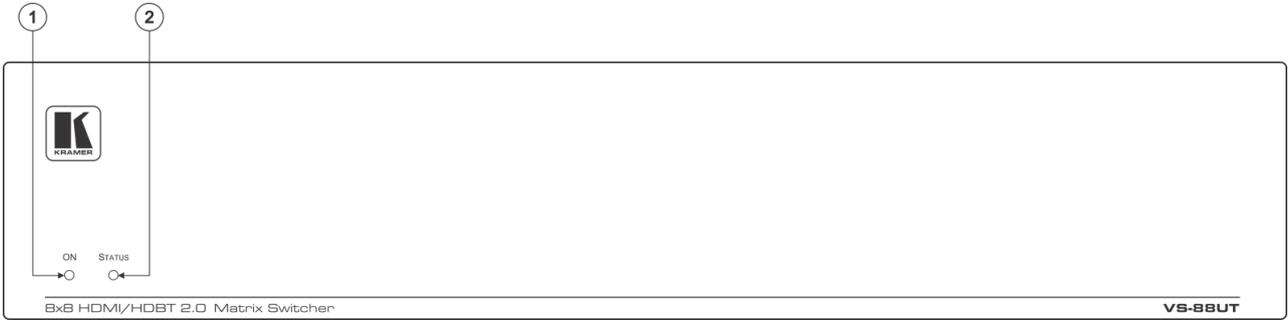


Figure 2: VS-88UT 8x8 HDMI/HDBT Matrix Switcher Front Panel

#	Feature	Function
①	ON LED	Lights when receiving power.
②	STATUS LED	Multi-color LED lights upon startup, flashes green upon boot and lights green when ready to use. The LED lights red to indicate internal errors.

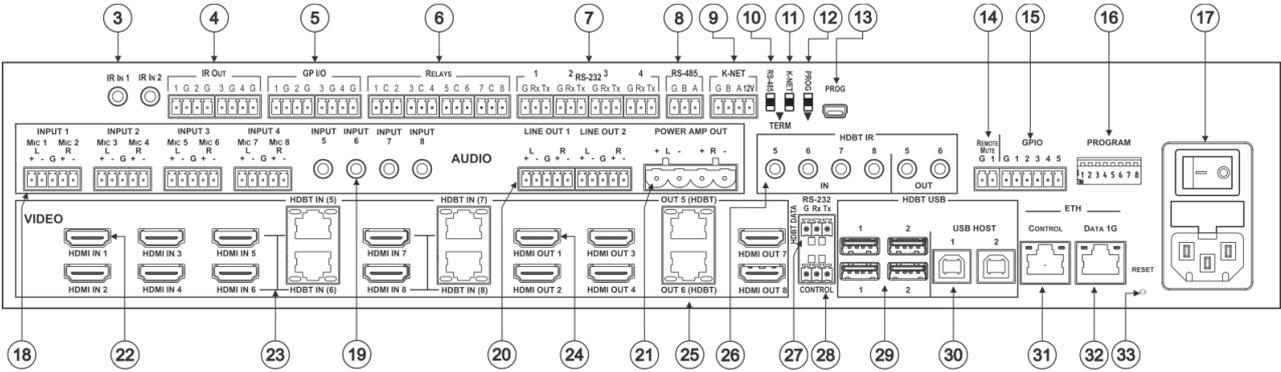


Figure 3: VS-88UT 8x8 HDMI/HDBT Matrix Switcher Rear Panel

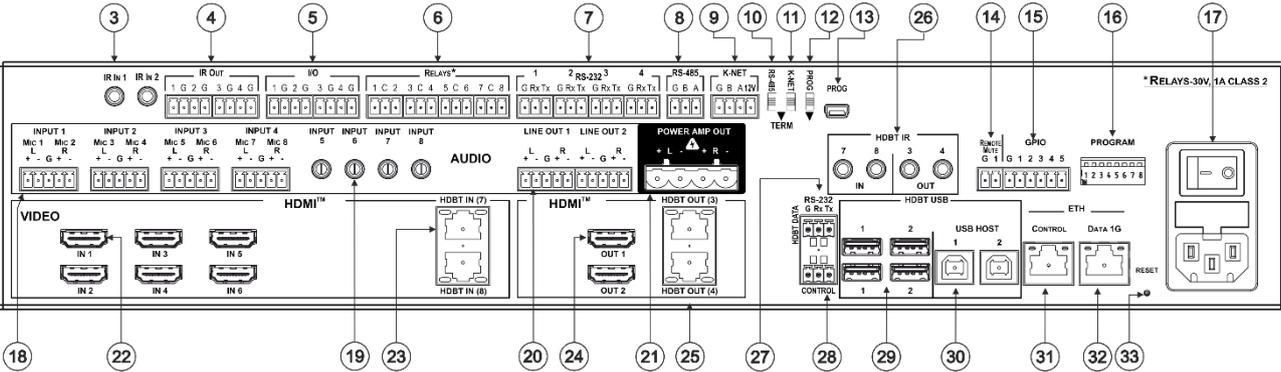


Figure 4: VS-84UT 8x4 HDMI/HDBT Matrix Switcher Rear Panel

#	Feature	Function
Room Controller Functionality		
3	IR IN 1 3.5mm Mini Jack	Connect to an external IR receiver (1 and 2).
4	IR OUT Terminal Block Connectors	Connect to IR emitter cables (from 1 to 4).
5	GPI/O Terminal Block Connectors	Connect to various analog and digital sensors (from 1 to 4).
6	RELAYS Terminal Block Connectors	Connect to low-voltage relay-driven devices (from 1 to 8).
7	RS-232 Terminal Block Connectors	Connect to RS-232 controlled devices (from 1 to 4).
8	RS-485 Terminal Block Connector	Connect to the RS-485 port on a switcher or PC. Pins B (-) and A (+) are for RS-485; Pin G may be connected to the shield (if required).
9	K-NET Terminal Block Connector	Use with the K-Config control system. PIN GND is for the Ground connection; PIN B (-) and PIN A (+) are for RS-485, and PIN +12V is for powering other devices.
10	RS-485 TERM Switch	Slide down for RS-485 termination with 120Ω; slide up for no RS-485 line termination. The first and the last units on the RS-485 line should be terminated (ON). Other units should not be terminated (OFF).
11	K-NET TERM Switch	Use with the K-Config control system. Slide down (in the direction of the arrow) for K-NET termination; slide up for bus to not be terminated. The last physical device on a K-NET bus must be terminated.
12	PROG Switch	For factory use only.
13	PROG Mini USB Connector	For factory use only.

#	Feature	Function	
Matrix Functionality			
⑭	REMOTE MUTE 2-pin Terminal Block Connector	Remote switch to mute all video and audio signals. Enables easy integration of the audio system with a PA system, usually used for alarms or other public audio messages.	
⑮	GPIO 5-pin Terminal Block Connectors	For future use.	
⑯	PROGRAM DIP-switches	For future use.	
⑰	Power Connector with Switch and Fuse	AC connector, enabling power supply to the unit. Power switch for turning the unit on or off.	
⑱	AUDIO	INPUT (MIC/line) 5-pin Terminal Block Connectors	Connect to stereo audio balanced sources (from 1 to 4) and/or microphone inputs (from 1 to 8).
⑲		INPUT 3.5mm Mini Jack	Connect to an unbalanced audio source (from 5 to 8).
⑳		LINE OUT 5-pin Terminal Block Connectors	Connect to a stereo balanced audio acceptor (1 and 2).
㉑		POWER AMP OUT 4-pin Terminal Block Connectors	Connect to a pair of loudspeakers.
㉒	VIDEO	HDMI IN Connector	VS-88UT: connect to an HDMI source (from 1 to 4). VS-84UT: connect to an HDMI source (from 1 to 6).
㉓		HDMI IN—HDBT IN Connectors	VS-88UT: connect a source to the HDMI IN 5 and/or HDMI IN 6 inputs, or connect a transmitter to the HDBT IN (5) and/or HDBT IN (6) inputs. The same applies to the HDMI IN 7/8 and HDBT IN (7)/(8) pairs. For each input pair (HDMI or HDBT), only one type of connector can be enabled (via the Routing Settings Web page); by default, the HDBT pair is active. The HDBT Transmitter (for example, the Kramer TP-590Txr) can pass audio and video signals as well as USB, Ethernet, power and serial commands.
		HDBT IN Connectors	VS-84UT: connect to an HDBT transmitter (from (7) to (8)).
㉔		HDMI OUT Connectors	VS-88UT: connect to an HDMI acceptor (1, 2, 3, 4, 7 and 8). VS-84UT: connect to an HDMI acceptor (1 to 2).
㉕		OUT (HDBT) Connectors	VS-88UT: connect OUT 5 and/or OUT 6 to HDBT receivers (for example, the Kramer TP-590Rxr) to pass audio and video signals as well as USB, Ethernet, power and serial commands.
		HDBT OUT Connectors	VS-84UT: connect to HDBT receivers (for example, the Kramer TP-590Rxr) to pass audio and video signals as well as USB, Ethernet, power and serial commands.
㉖	HDBT IR 3.5mm Mini Jack	IN	VS-88UT: connect to an external IR sensor to send IR signals (5, 6, 7 and 8) via HDBT inputs 5, 6, 7 and 8 respectively. VS-84UT: connect to an external IR sensor to send IR signals (7 and 8) via HDBT inputs 7 and 8 respectively.
		OUT	VS-88UT: connect to an external IR emitter to receive IR signals (5 and 6) via HDBT outputs 5 and 6, respectively. VS-84UT: connect to an external IR emitter to receive IR signals (3 and 4) via HDBT outputs 3 and 4, respectively.
㉗	RS-232 HDBT DATA Terminal Block Connectors (G, Rx, Tx)	Connect to the PC or the remote controller and pass data between this RS-232 port and the HDBT OUT ports or one of the HDBT IN ports.	
㉘	RS-232 CONTROL Port Terminal Block Connectors (G, Rx, Tx)	Connect to the PC or the remote controller to control the VS-88UT via Protocol 3000 commands.	

#	Feature	Function	
②9	HDBT USB Device Port Pairs	Connect up to two USB clients to each pair (1 and 2) to pass data via the HDBT inputs or outputs.	
③0	HDBT USB HOST Ports	Connect to a USB host (1 and 2) to pass data via the HDBT inputs or outputs.	
③1	ETH RJ-45 Ports	CONTROL	Connect to the PC or other controller through computer networking.
③2		DATA 1G	Connect to the PC or other controller via the Ethernet to pass data between HDBT ports and the controller.
③3	RESET Recessed Button	Press briefly to restart the system. Press for about 5 seconds to reset settings to factory default values and then restart the system.	

Mounting VS-88UT

This section provides instructions for mounting **VS-88UT**. Before installing, verify that the environment is within the recommended range:



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



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

**Caution:**

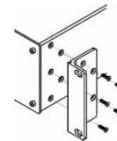
- Mount **VS-88UT** before connecting any cables or power.

**Warning:**

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

To mount the VS-88UT on a rack

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



For more information go to www.kramerav.com/downloads/VS-88UT

Connecting VS-88UT and VS-84UT

This section describes how to:

- [Connect the VS-88UT Matrix Ports](#) on page [10](#).
- [Connect the VS-84UT Matrix Ports](#) on page [12](#).
- [Connect the Controller Ports](#) on page [14](#).
- [Connecting the Audio Inputs and Outputs](#) on page [15](#).
- [Connecting to VS-88UT via RS-232](#) on page [16](#).
- [Connecting VS-88UT via the Ethernet Port](#) on page [16](#).



Always switch off the power to each device before connecting it to your **VS-88UT**. After connecting your **VS-88UT**, connect its power and then switch on the power to each device.



Note that not all the ports are connected in the following example.

Connect the VS-88UT Matrix Ports

To connect the VS-88UT Matrix as illustrated in the example in [Figure 5](#):

1. Connect the HDMI and HDBT sources:
 - An HDMI source (for example, a laptop) to the HDMI 1 IN connector [\(22\)](#).
 - An HDMI source (for example, a Blu-ray player) to the HDMI 4 IN connector [\(22\)](#).
 - An HDMI source (for example, a Blu-ray player) to the HDMI IN 8 HDMI connector [\(23\)](#).
 - A transmitter (for example, the Kramer **TP-590Txr**) to the HDBT IN (8) RJ-45 port [\(23\)](#).



You can enable one of each HDMI and HDBT input pair (5, 6, 7 and 8) via the embedded web pages (see [Setting Input HDBT/HDMI or HDBT Input Port Parameters](#) on page [39](#)).

2. Connect the audio sources:
 - An audio source (for example, the laptop audio output signal) to the AUDIO INPUT 1 balanced stereo analog audio 5-pin terminal block connector (1 to 4) [\(18\)](#).
 - A microphone to the AUDIO MIC 4 balanced audio 3-pin terminal block connector (1 to 8) [\(18\)](#).



You can connect each AUDIO analog input 5-pin terminal block connector to either a balanced stereo audio analog source or to up to two microphones via the web pages (see [Setting Analog Audio Input Port Parameters](#) on page [46](#)).

- An audio source (for example, an MP3 player) to the AUDIO INPUT 5 analog audio 3.5mm mini jack connector (5 to 8) (19).
3. Connect the HDMI and HDBT outputs:
 - The HDMI OUT 3 HDMI connector (1 to 4, 7 and 8) (24), to an HDMI acceptor (for example, a display).
 - The OUT 6 (HDBT) RJ-45 port (5 to 6) (25) to a receiver (for example, the Kramer **TP-590Rxr**).
 4. Connect the audio outputs:
 - The AUDIO LINE OUT (1 to 2) Terminal Block connector (16) to a balanced audio acceptor (for example, active speakers).
 - The POWER AMP OUT block connector (21) to a pair of loudspeakers, by connecting the left loudspeaker to the “L+” and the “L-” terminal block connectors, and the right loudspeaker to the “R+” and the “R-” terminal block connectors.



Do not ground the loudspeakers.

5. Connect the IR ports:
 - HDBT IR IN 8 (5 to 8) 3.5mm mini jack (26) to a room controller (for example, the Kramer **RC-74DL**) to control a peripheral device, such as Blu-ray player that connects to the transmitter that is connected to HDBT IN (8).
 - HDBT IR OUT 6 (5 to 6) 3.5mm mini jack (26) to an IR controlled device (for example, a Blu-ray player) so that it can be controlled by a controller that is connected to a receiver that connects to the OUT 6 (HDBT) port.
6. Connect the USB ports:
 - A keyboard and a mouse to HDBT USB 2 ports (29).
The USB signal passes via HDBT IN to a transmitter (for example TP-590Txr) where a laptop can be controlled.
 - A laptop to USB HOST 1 port (30).
A receiver (for example **TP-590Rxr**) connected to HDBT OUT controls this connected laptop.
7. Connect RS-232 3-pin terminal blocks:
 - RS-232 HDBT DATA (27) – Connect to a laptop to control peripheral devices that are connected to transmitters/receivers that connect to the HDBT IN / HDBT OUT ports.
 - RS-232 CONTROL (28) – Connect to a laptop to control **VS-88UT**.
8. Connect ETH ports:
 - CONTROL (31) – Connect to a laptop to control **VS-88UT**.
 - DATA 1G (32) – Connect to the Ethernet to pass data via the cloud.

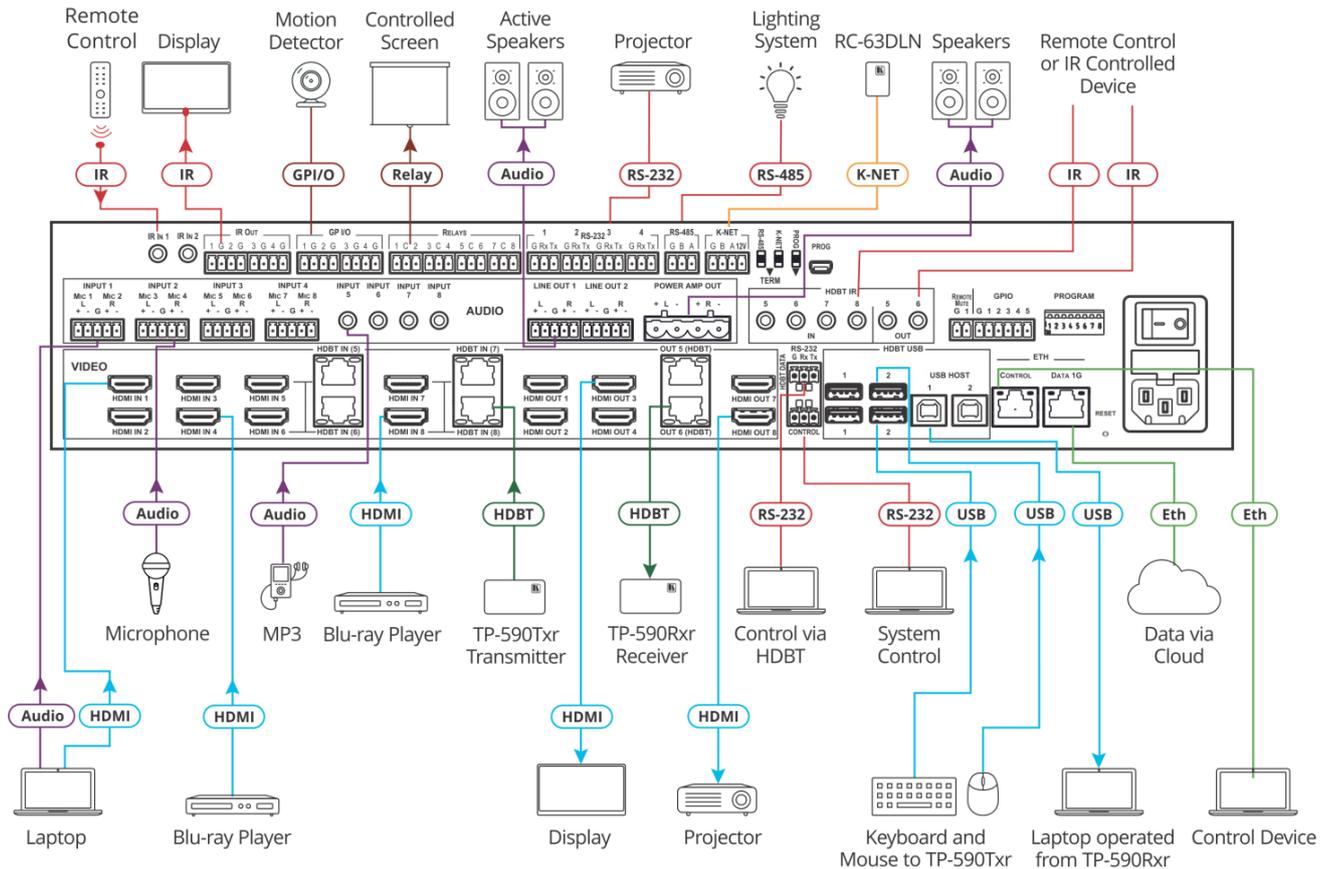


Figure 5: Connecting to the VS-88UT Rear Panel

Connect the VS-84UT Matrix Ports

To connect the VS-84UT Matrix as illustrated in the example in [Figure 6](#):

1. Connect the HDMI and HDBT sources:
 - An HDMI source (for example, a laptop) to the HDMI 1 IN connector (22).
 - An HDMI source (for example, a Blu-ray player) to the HDMI 6 IN connector (22).
 - A transmitter (for example, the Kramer **TP-590Txr**) to the HDBT IN (8) RJ-45 port (23).
2. Connect the audio sources:
 - An audio source (for example, the laptop audio output signal) to the AUDIO INPUT 1 balanced stereo analog audio 5-pin terminal block connector (1 to 4) (18).
 - A microphone to the AUDIO MIC 6 balanced audio 3-pin terminal block connector (1 to 8) (18).

 You can connect each AUDIO analog input 5-pin terminal block connector to either a balanced stereo audio analog source or to up to two microphones via the web pages (see [Setting Analog Audio Input Port Parameters](#) on page 46).

 - An audio source (for example, an MP3 player) to the AUDIO INPUT 5 analog audio 3.5mm mini jack connector (5 to 8) (19).
3. Connect the HDMI and HDBT outputs:

- The HDMI OUT 1 HDMI connector (1 to 2) (24), to an HDMI acceptor (for example, a display).
 - The HDBT OUT (4) RJ-45 port (3 to 4) (25) to a receiver (for example, the Kramer **TP-590Rxr**).
4. Connect the audio outputs:
- The AUDIO LINE OUT (1 to 2) Terminal Block connector (16) to a balanced audio acceptor (for example, active speakers).
 - The POWER AMP OUT block connector (21) to a pair of loudspeakers, by connecting the left loudspeaker to the “L+” and the “L-” terminal block connectors, and the right loudspeaker to the “R+” and the “R-” terminal block connectors.



Do not ground the loudspeakers.

5. Connect the IR ports:
- HDBT IR IN 8 (7 to 8) 3.5mm mini jack (26) to a room controller (for example, the Kramer **RC-74DL**) to control a peripheral device, such as Blu-ray player that connects to the transmitter that is connected to HDBT IN (8).
 - HDBT IR OUT 4 (3 to 4) 3.5mm mini jack (26) to an IR controlled device (for example, a Blu-ray player) So that it can be controlled by a controller that is connected to a receiver that connects to the HDBT OUT (4) port.
6. Connect the USB ports:
- A keyboard and a mouse to HDBT USB 2 ports (29).
The USB signal passes via HDBT IN to a transmitter (for example TP-590Txr) where a laptop can be controlled.
 - A laptop to USB HOST 1 port (30).
A receiver (for example **TP-590Rxr**) connected to HDBT OUT controls this connected laptop.
7. Connect RS-232 3-pin terminal blocks:
- RS-232 HDBT DATA (27) – Connect to a laptop to control peripheral devices that are connected to transmitters/receivers that connect to the HDBT IN / HDBT OUT ports.
 - RS-232 CONTROL (28) – Connect to a laptop to control **VS-84UT**.
8. Connect ETH ports:
- CONTROL (31) – Connect to a laptop to control **VS-84UT**.
 - DATA 1G (32) – Connect to the Ethernet to pass data via the cloud.

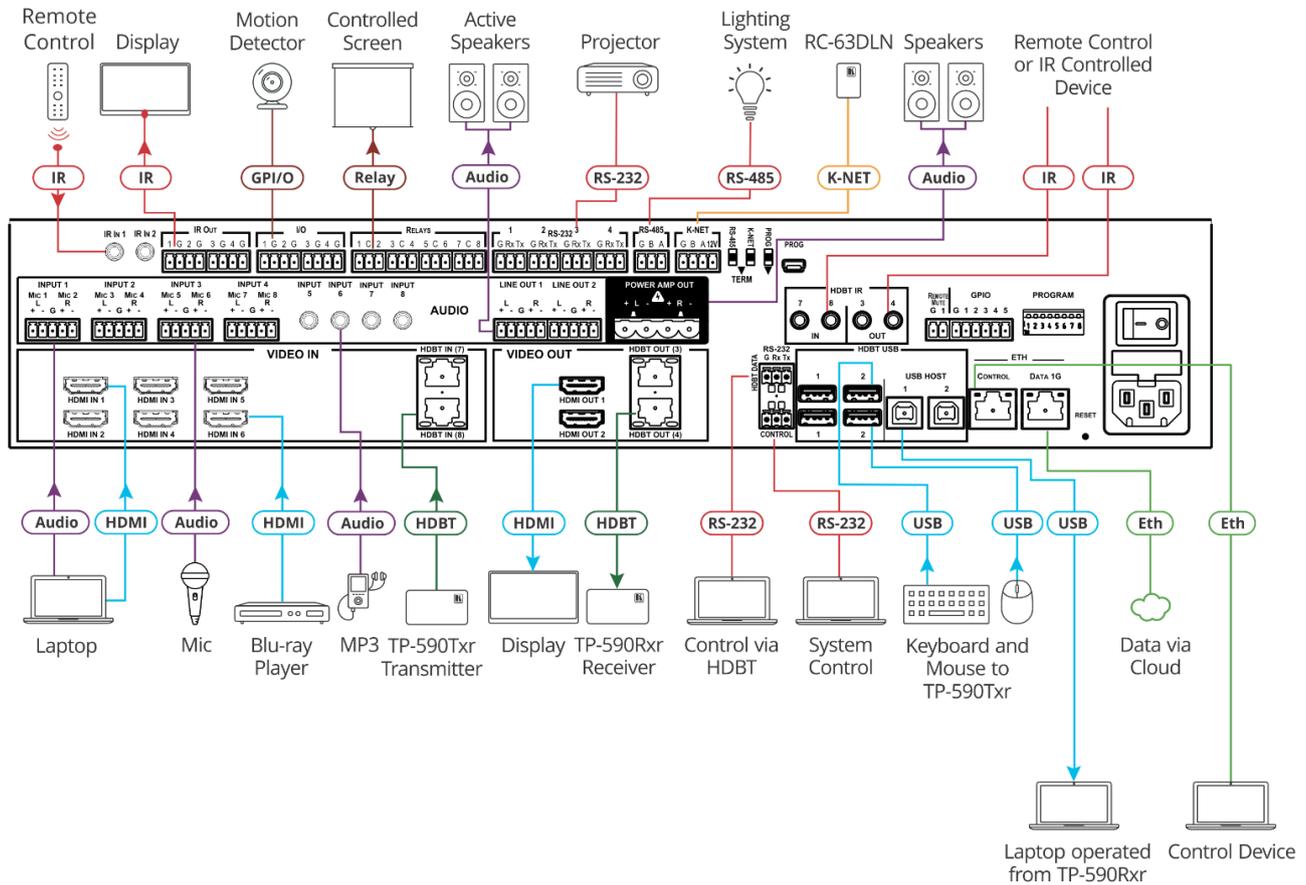


Figure 6: Connecting to the VS-84UT Rear Panel

Connect the Controller Ports

To connect the VS-88UT/VS-84UT Controller as illustrated in the example in [Figure 5](#)/[Figure 6](#):

1. Connect an IR sensor to IR IN 1 3.5mm mini jack (1 to 2) ③.
For example, point an IR remote controller to the IR sensor to control a device that is connected to a controller port.
2. Connect the IR OUT 2-pin terminal block connector (1 to 4) ④ to an IR emitter and attach the emitter to a controlled device (for example, a display).
3. Connect the GPIO 2-pin terminal block connector (1 to 4) ⑤ to an input/output device (for example, a motion detector).
4. Connect the RELAY 2-pin terminal block connector (1 to 8) ⑥ to a relay port (for example, a controlled screen).
5. Connect the RS-232 3-pin terminal block connector (1 to 4) ⑦ to a serially controlled device (for example, a projector).
6. Connect the RS-485 3-pin terminal block connector ⑧ to a controlled system (for example, a lighting system).
7. Connect the K-NET 4-pin terminal block connector ⑨ to a room controller (for example, the Kramer **RC-63DLN**).
The room controller is powered via the 12V pin.

8. Set the TERM switches:
 - RS-485 TERM (10) – Slide down for termination.
The first and the last units on the RS-485 line should be terminated (ON). Other units should not be terminated (OFF).
 - K-NET TERM (11) – Slide down for K-NET termination.
The last physical device on a K-NET bus must be terminated.
9. Connect the power cord (17).
We recommend that you use only the power cord that is supplied with this machine.

Connecting the Audio Inputs and Outputs

The following are the pinouts for connecting balanced or unbalanced stereo audio sources to the audio inputs:

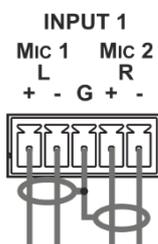


Figure 7: Connecting a Balanced Stereo Audio Source to the Input

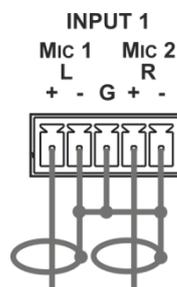


Figure 8: Connecting an Unbalanced Stereo Audio Source to the Input

The following are the pinouts for connecting the audio outputs to balanced or unbalanced stereo audio acceptors:

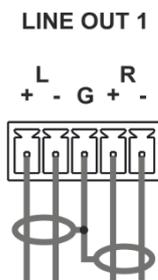


Figure 9: Connecting the Output to a Balanced Stereo Audio Acceptor

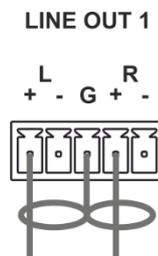


Figure 10: Connecting the Output to an Unbalanced Stereo Audio Acceptor

Connecting to VS-88UT via RS-232

You can connect to the VS-88UT via an RS-232 connection ⁽²⁸⁾ using, for example, a PC.

Connect the RS-232 terminal block on the rear panel of the VS-88UT to a PC/controller, as follows (see [Figure 11](#)):

- TX pin to Pin 2
- RX pin to Pin 3
- GND pin to Pin 5

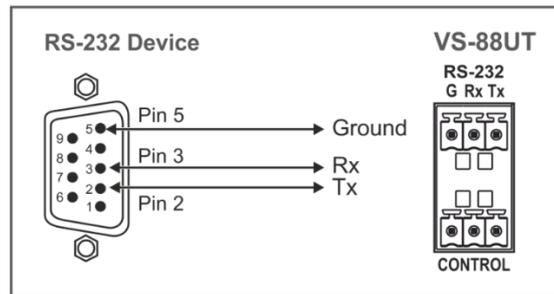


Figure 11: RS-232 Connection

Connecting VS-88UT via the Ethernet Port

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

- Directly to the PC using a crossover cable (see [Connecting the Ethernet Port Directly to a PC](#) on page 16).
- Via a network hub, switch, or router, using a straight-through cable (see [Connecting the Ethernet Port via a Network Hub or Switch](#) on page 18).



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

Connecting the Ethernet Port Directly to a PC

You can connect the Ethernet port of the VS-88UT directly to the Ethernet port on your PC using a crossover cable with RJ-45 connectors.



This type of connection is recommended for identifying the VS-88UT with the factory configured default IP address.

After connecting the VS-88UT 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 12](#).

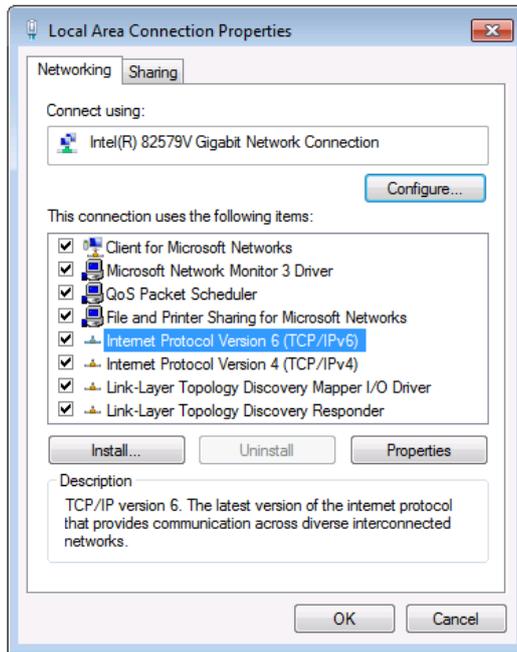


Figure 12: Local Area Connection Properties Window

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 13](#) or [Figure 14](#).

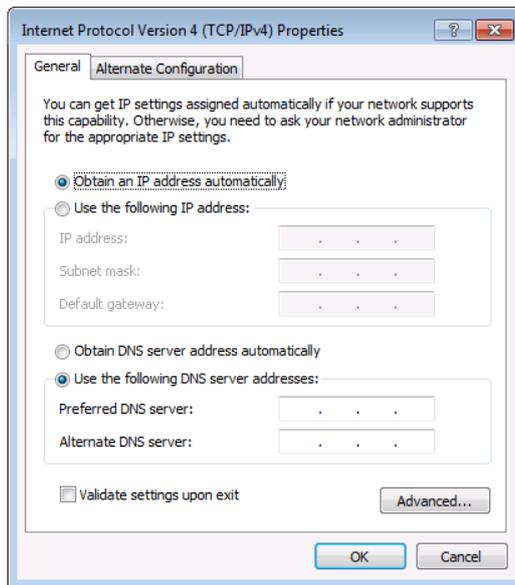


Figure 13: Internet Protocol Version 4 Properties Window

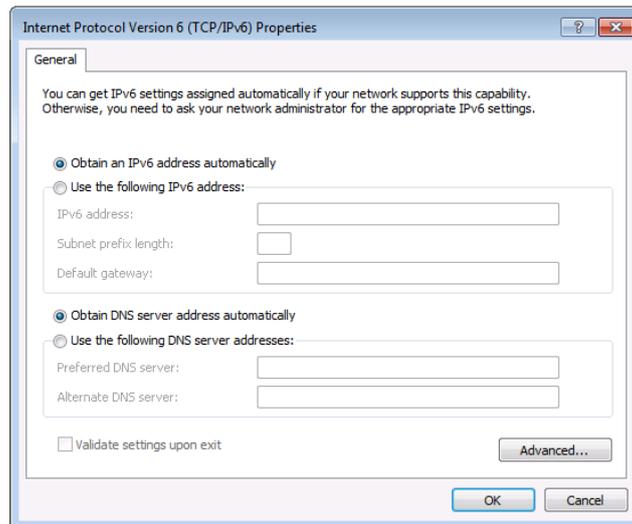


Figure 14: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in [Figure 15](#).

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.

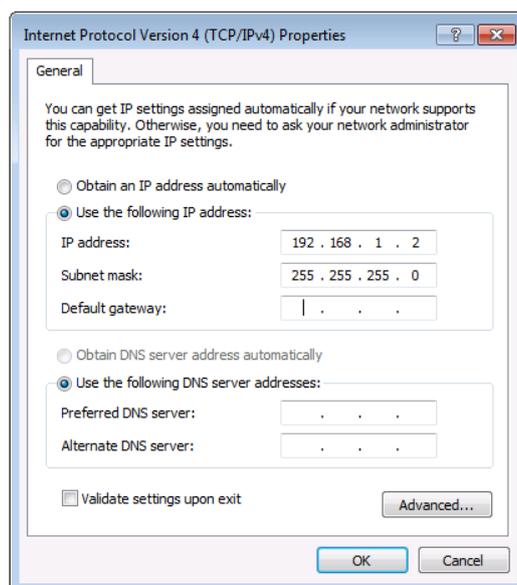


Figure 15: Internet Protocol Properties Window

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

Connecting the Ethernet Port via a Network Hub or Switch

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

Control Configuration via the Ethernet Port

To control several units via Ethernet, connect the Master unit (Device 1) via the Ethernet port to the Ethernet port of your PC. Use your PC provide initial configuration of the settings (see [Connecting VS-88UT via the Ethernet Port](#) on page 16).

Using the Web Pages

The Web pages let you control the **VS-88UT** via the Ethernet.

Before attempting to connect:

- Perform the procedures in (see [Connecting VS-88UT via the Ethernet Port](#) on page [16](#)).
- Ensure that your browser is supported.

The supported operating systems and Web browsers are specified in the [Technical Specifications](#) on page [86](#).



The **VS-88UT** and **VS-84UT** have different input and output numbers but their web pages are similar. Differences in functionality are described in the following sections.

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

- [Globally Muting video and audio signals](#) on page [22](#).
- [Defining Global Settings](#) on page [23](#).
- [Routing VS-88UT Ports](#) on page [29](#).
- [Managing EDID](#) on page [60](#).
- [Controlling Devices via the Controller](#) on page [64](#).
- [Configuring Device Automation](#) on page [76](#).
- [Changing the Device Settings](#) on page [78](#).
- [Viewing the About Page](#) on page [85](#).

To browse the VS-88UT Web pages:

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



Figure 16: Using the Embedded Web pages – Default IP Address

The Authentication window appears: Admin

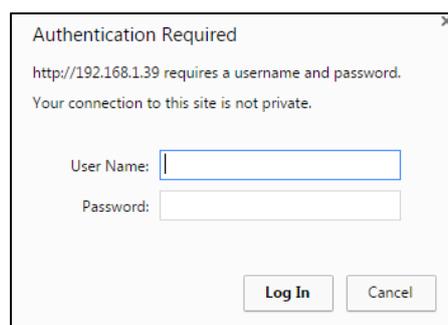


Figure 17: Using the Embedded Web Pages – Authentication Window

- 3. Enter the **User Name** and **Password** (Admin, Admin by-default) and click **OK**.
The Routing Settings page appears.

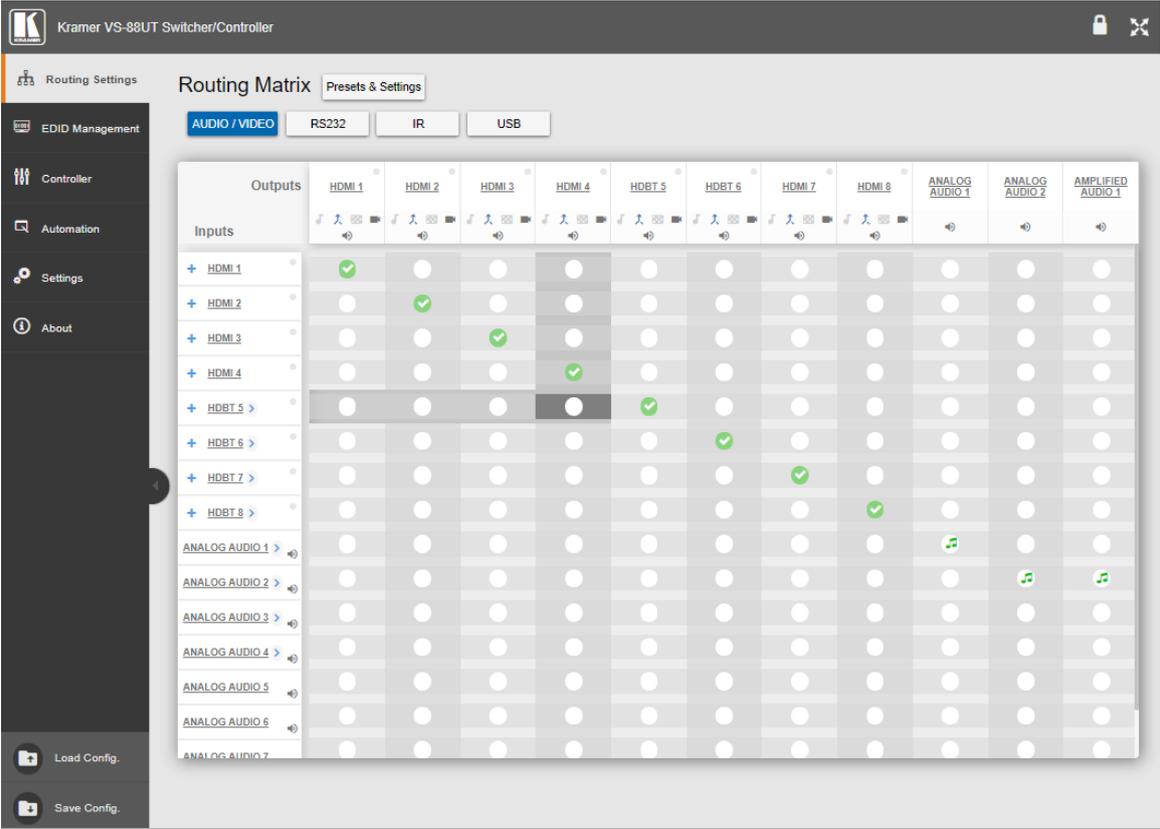


Figure 18: VS-88UT Routing Settings Page with Navigation List on Left

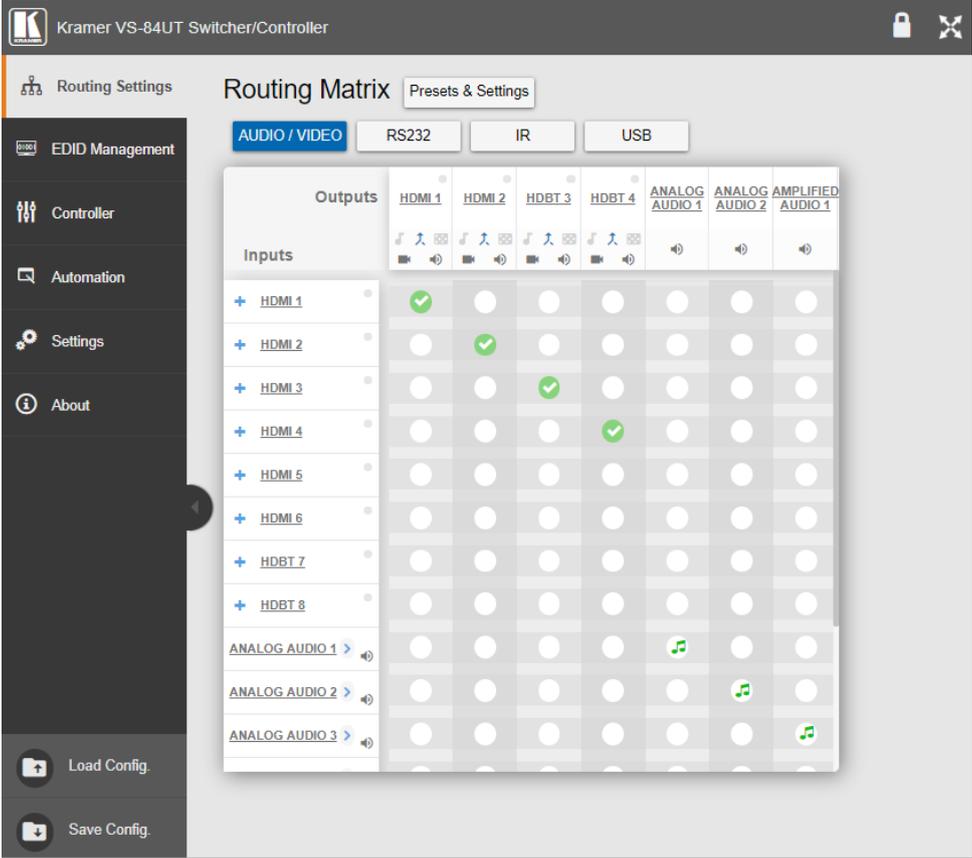


Figure 19: VS-84UT Routing Settings Page with Navigation List on Left

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

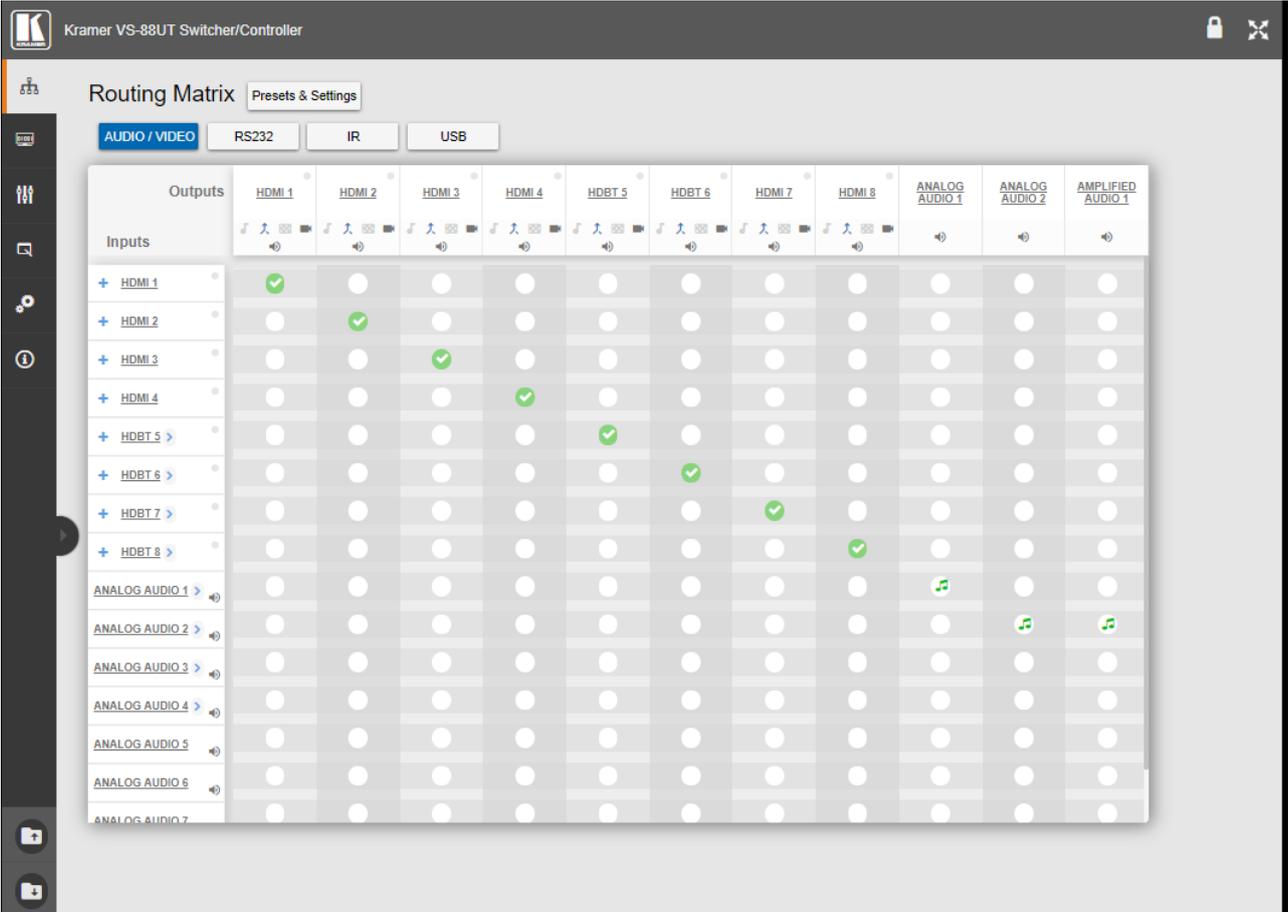


Figure 20: Routing Settings Page – Navigation List Hidden

Globally Muting video and audio signals

The Global Mute system is a unique feature that mutes all the video and audio signals to enable easy integration of the audio system with public alarm systems used for alarms or other public messages.

When global mute is triggered via the “REMOTE MUTE” terminal block port ⁽¹⁴⁾, all HDMI/HDBT and analog outputs are globally muted and a warning note immediately appears on the web pages heading:



Figure 21: Global Mute Warning

This warning note notifies the administrator that the system is muted due to a REMOTE MUTE trigger. This trigger is indicated by the warning sign only and does not affect the display of mute icons in the Routing Settings page. Mute icons (🔊 or 🔇) on the outputs, that were set before the REMOTE MUTE was triggered, remain unchanged during the REMOTE MUTE mode and after it ceases.

When the REMOTE MUTE mode is over, the system returns to normal operation and the warning note disappears.

Defining Global Settings

Use the **Presets & Settings** page to set video timeouts, define ports, configure PoE on HDBT, ports and save and load presets.

To set the video timeouts:

1. In the Navigation pane, click **Routing Settings**. The Routing Matrix page appears (see [Figure 18](#)).
2. Click **Presets & Settings** (next to Routing Matrix)).
The Global Settings window appears:

The screenshot shows a window titled "Global Settings" with a close button (X) in the top right corner. Below the title bar are four tabs: "Auto-Switching Timeouts", "Switchable Ports", "PoE", and "Presets". The "Auto-Switching Timeouts" tab is selected and highlighted. Under this tab, the section "Video Timeout" contains five rows of settings, each with a descriptive text and a numeric value with a "sec" unit and a spinner control:

- When the signal is lost, leave 5V power on and delay switching for x sec: 10 sec
- When a new signal is detected, delay switching for: 0 sec
- When the cable is unplugged, delay switching for x sec: 0 sec
- When the signal is lost, delay 5V power off for x sec: 900 sec
- When video is lost on a manual override action, delay switching for x sec: 10 sec

At the bottom right of the settings area is a "save" button. Below the entire settings area is a "Close" button.

Figure 22: Global Settings Window – Auto-Switching Timeouts

3. Click the **Auto-Switching Timeouts** tab.
4. 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.

5. Click **Close**.

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 \geq 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 \leq Output inactivity Input unplug timeout \leq 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 \geq Signal Loss Manual-Override Mode Inactivity timeout \geq Input Unplug

To set the switchable ports:

1. In the Navigation pane, click **Routing Settings**. The Routing Matrix page appears.
2. Click **Global Settings** (on the top left side).
The Global Settings window appears.
3. Click **Switchable Ports** tab.
The Switchable Ports tab appears.

4. Do the following

- **VS-88UT:** For video input ports 5 to 8, select either the **HDBT** or **HDMI** input and for audio input ports 1 to 4, select either **ANALOG** or **MIC** input. The changes are immediately reflected the **Routing Settings** page.

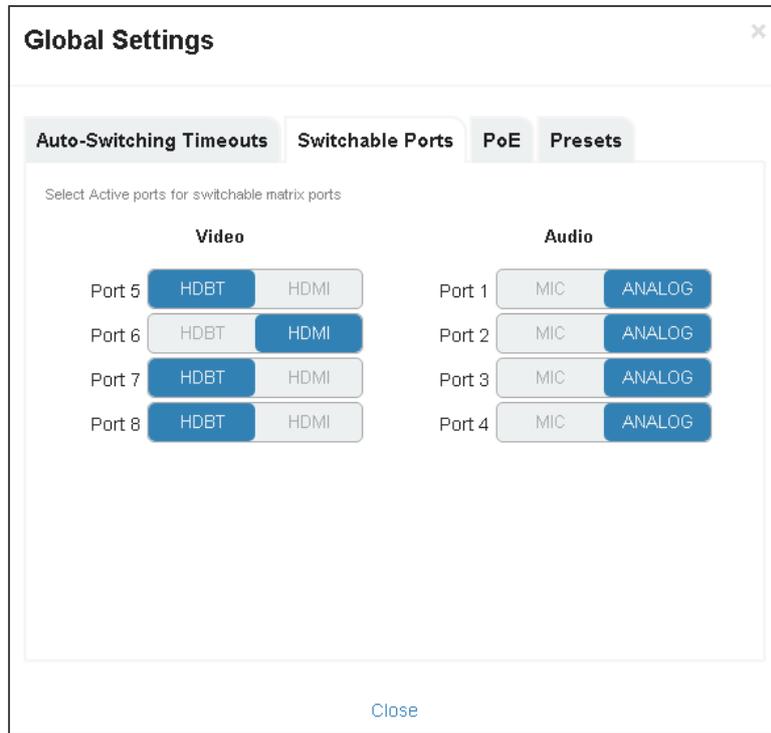


Figure 23: VS-88UT Global Settings Window – Switchable Ports Tab

- **VS-84UT:** For audio input ports 1 to 4, select either **ANALOG** or **MIC** input. The changes are immediately reflected the **Routing Settings** page.

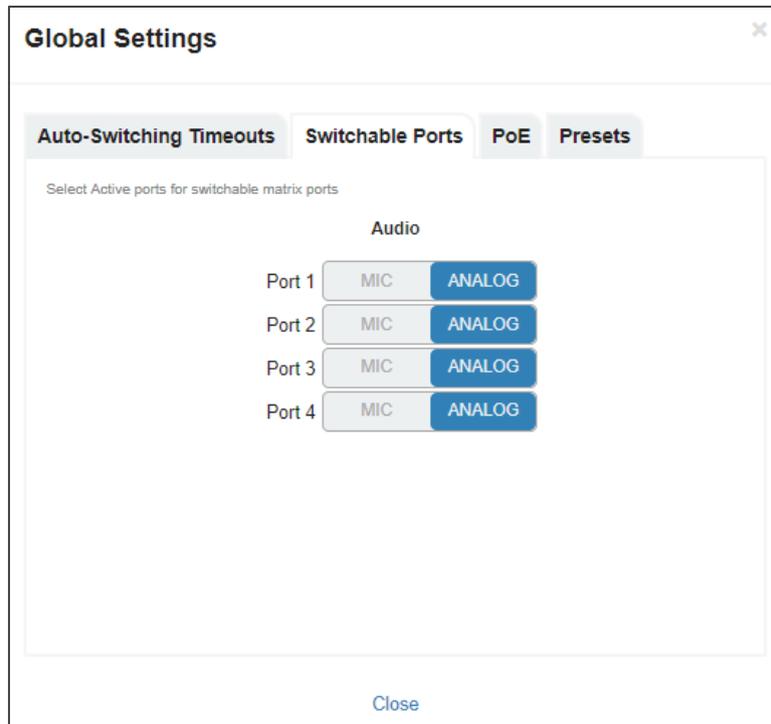


Figure 24: VS-88UT Global Settings Window – Switchable Ports Tab

5. Click **Close**.

To set configure PoE power support on HDBT ports:

1. In the Navigation pane, click **Routing Settings**. The Routing Matrix page appears.
2. Click **Global Settings** (on the top left side). The Global Settings window appears.
3. Click the **PoE** tab. The PoE configuration tab appears.
4. Do the following:
 - **VS-88UT**: Click one radio button on each PO line to select the ports supporting PoE. You can select one port on each PO line (for example HDBT 5 input for PO line 1 and HDBT 6 input for PO line 2).

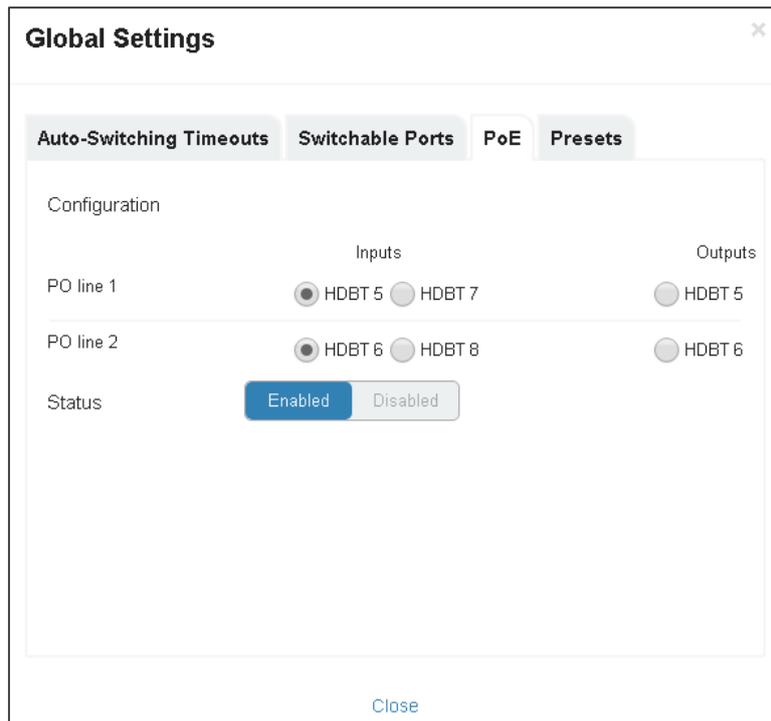


Figure 25: VS-88UT Global Settings Window – HDBT POE Support Tab

- **VS-84UT:** Click one radio button on each PO line to select the ports supporting PoE. You can select one port on each PO line (for example HDBT 7 input for PO line 1 and HDBT 4 output for PO line 2).

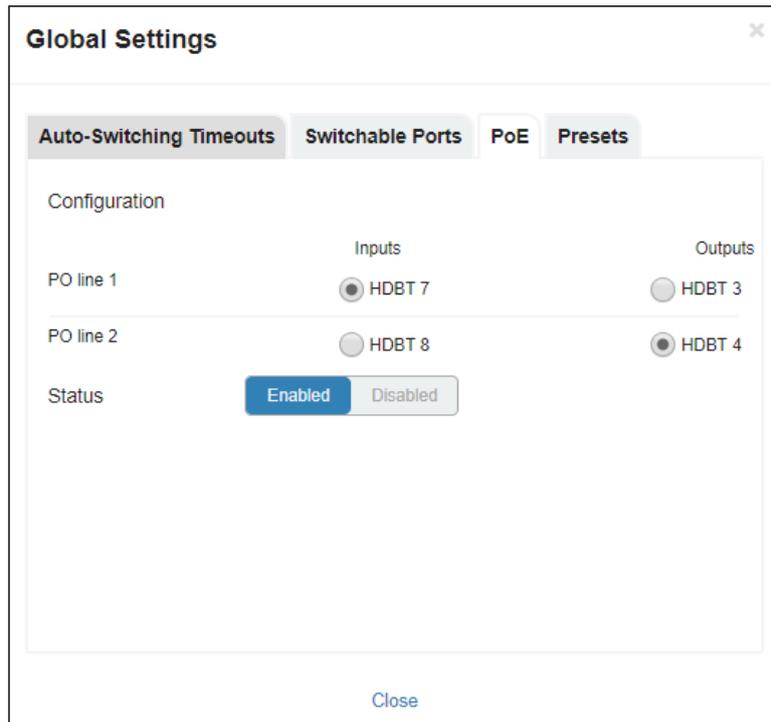


Figure 26: VS-84UT Global Settings Window – HDBT POE Support Tab

5. Enable or disable HDBT PoE support.



PoE status is displayed in the HDBT settings page (see [Changing HDBT/HDMI and HDBT Port Settings on page 41](#)).

6. Click **Close**.

To load or save a preset (the current device settings):

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

1. In the Navigation pane, click **Routing Settings**. The Routing Matrix page appears.
2. Click **Global Settings** (on the top left side). The Global Settings window appears.
3. Click the **Presets** tab. The Presets tab appears:

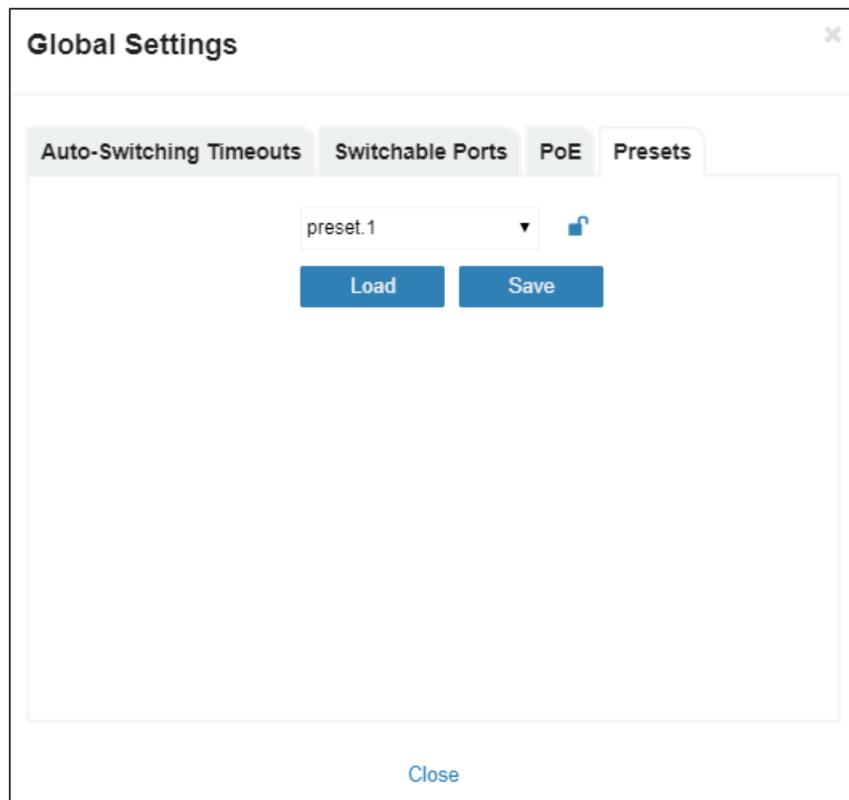


Figure 27: Global Settings Window – Presets Tab

4. Select a preset (from 1 to 8)
5. Do any of the following:
 - To save a preset, click **Save**.
 - To load an existing preset, click **Load**.

Routing VS-88UT Ports

This section describes how to basically route an A/V input to any of the outputs.

 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 28](#) the HDMI 4 input is currently routed to the HDMI 1 output as indicated by the green routing button (✔).

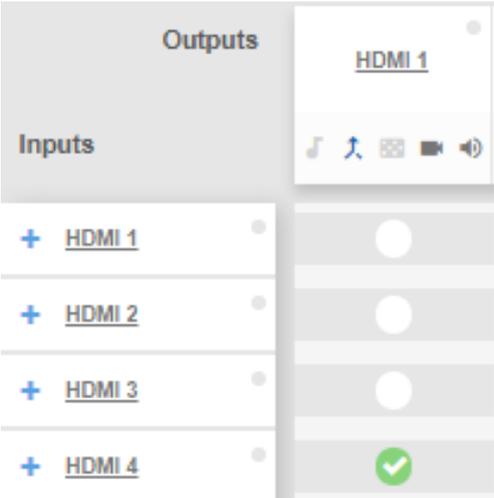


Figure 28: Routing Settings Page – Input to Output Example

To route an input to an output, 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:

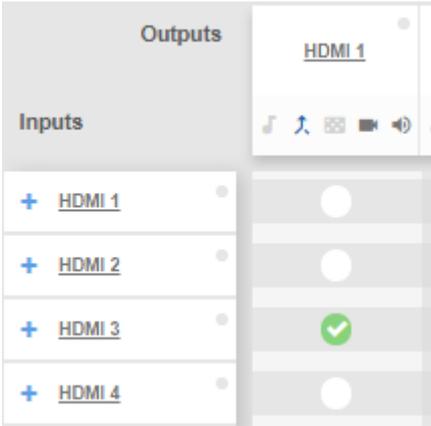


Figure 29: Routing Settings Page – Routing an Input to an Output

Hover over a port to view its switching status (HDMI 3 audio and video inputs are routed to HDMI 1 and HDMI 2 outputs):

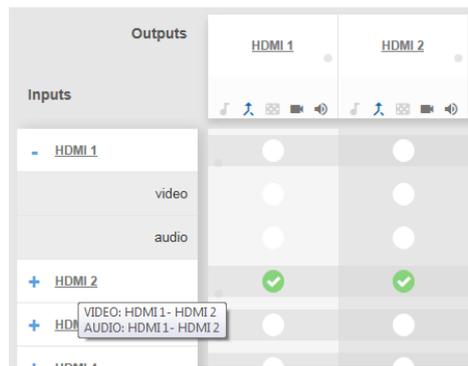


Figure 30: Routing Settings Page – Viewing the Switching Status

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

To define each of the ports in the matrix and perform advanced routing operations, see [Defining Port Settings](#) on page 30.

Defining Port Settings

This section describes how to route the ports (audio, video, RS-232, IR and USB) in the matrix and define the port settings.

The Routing Settings page enables the following:

- [Setting Input HDMI Port Parameters](#) on page 31.
- [Setting Input HDBT/HDMI or HDBT Input Port Parameters](#) on page 39.
- [Setting Analog Audio Input Port Parameters](#) on page 46.
- [Setting the HDMI and HDBT Output Parameters](#) on page 51.
- [Setting Analog and Amplified Audio Output Parameters](#) on page 55.
- [Setting and Routing the RS-232 Ports](#) on page 56.
- [Setting and Routing IR Ports](#) on page 58.
- [Setting and Routing the USB Ports](#) on page 58.



While almost all the **VS-88UT** port settings examples also apply to **VS-84UT** (even though the number of inputs and outputs may be different) there are some exceptions which are described separately throughout this section.

Setting Input HDMI Port Parameters



VS-88UT has four HDMI (1 to 4) inputs and VS-84UT has six HDMI (1 to 6) inputs (as well as two HDMI outputs).

The green indication indicates a valid signal on the input.

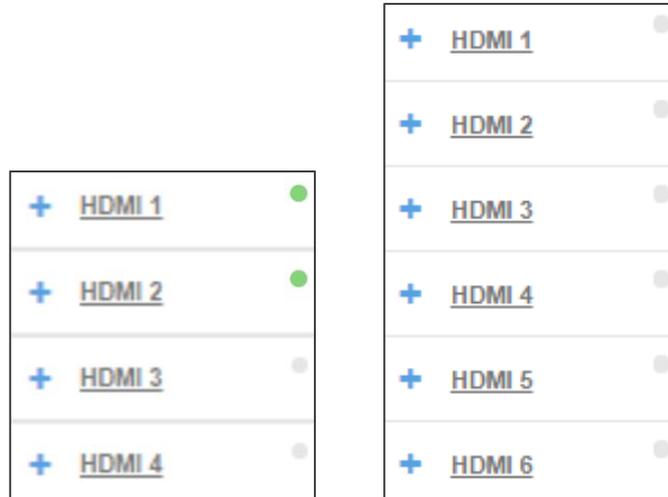


Figure 31: Port Settings – HDMI Input Ports

The following functions are available:

- [Viewing and Routing A/V Signals Separately](#) on page [32](#).
- [Routing A/V Signals in the Audio-Follow-Video and Breakaway Modes](#) on page [33](#).
- [Changing HDMI Input Port Settings](#) on page [35](#).
- [Selecting the HDMI Input Follower](#) on page [36](#).

Viewing and Routing A/V Signals Separately

To view the video and audio signals separately:

- Click **Routing Settings** page. The Routing Matrix page opens.
- Click **+** beside the input port name.
- The HDMI port line displays the status of each signal separately. The following example shows that the HDMI 1 input (both audio and video signals) is routed to output HDMI 1 and HDMI 2.

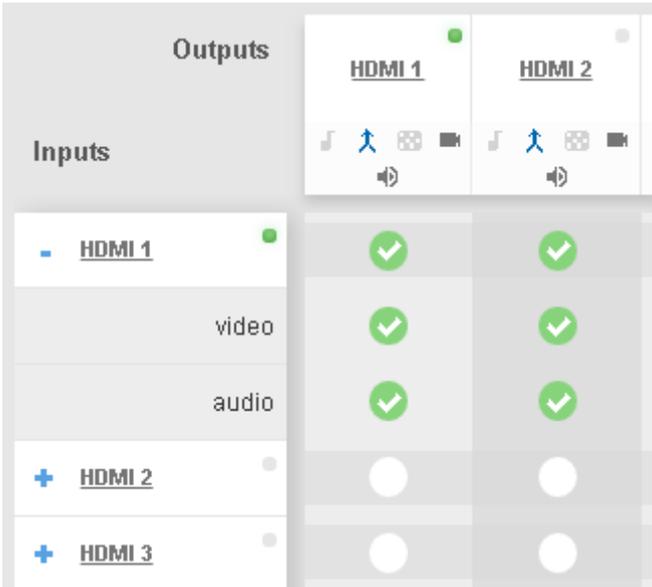


Figure 32: Routing Settings Page – HDMI Input Ports

- Click the HDMI 1 input audio button under output HDMI 3. The audio signal only is routed from HDMI 1 to HDMI 3

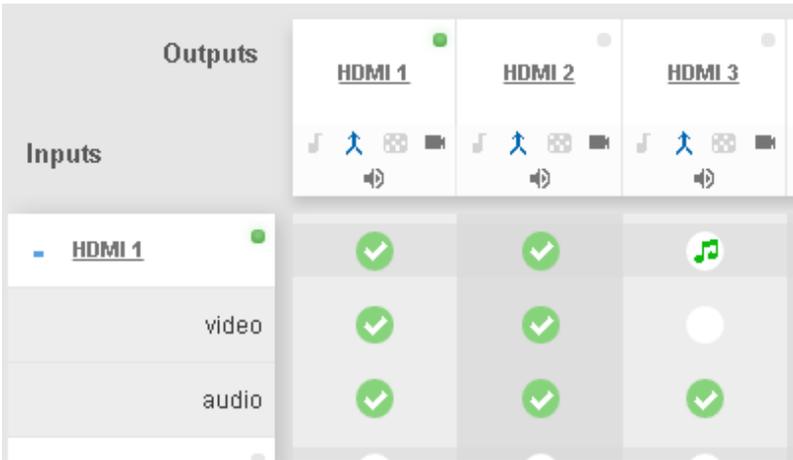


Figure 33: Routing Settings Page – Routing the audio signal only

- Click **-** to close the separate-signals view. The audio icon  appears under the HDMI 3 output.

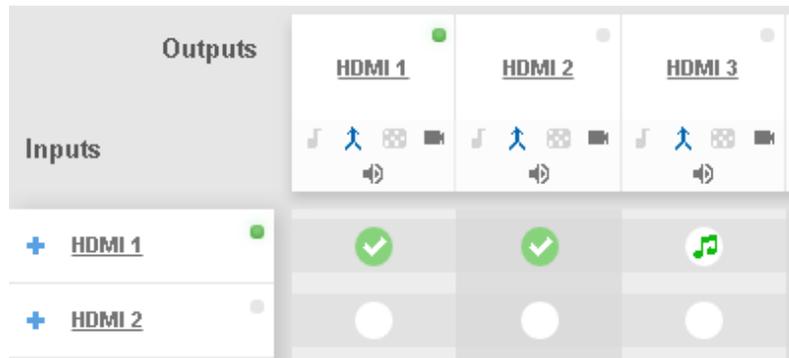


Figure 34: Routing Settings Page – Separate Audio Routing

Routing A/V Signals in the Audio-Follow-Video and Breakaway Modes

By default, all the outputs are set to the Audio-Follow-Video mode (AFV) mode . When routing an input to an output or only a video signal to an output, both audio and video signals appear on the output (see [Setting the HDMI and HDBT Output Parameters](#) on page 51).

Click the AFV icon to toggle between  (AFV) and  (Breakaway) modes.

To route an input to an output in the breakaway mode:

- Click **Routing Settings** page. The Routing Matrix page opens.
- Click  on an output (HDMI 3 in this example). The AFV icon is deselected and that output is now in the Breakaway mode.
- Click **+** beside the HDMI 1 input port name.
- Click Video Input 1 to output 3
The audio signal no longer follows the video signal, therefore when routing a video signal, the audio signal does not follow.

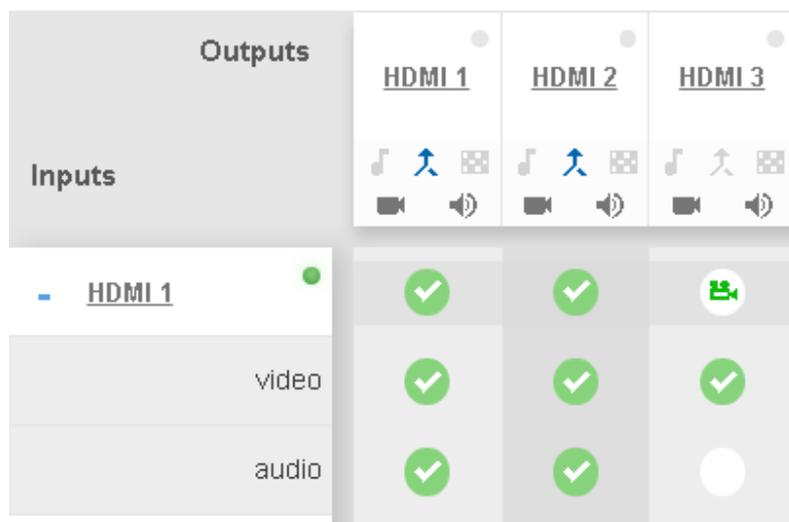


Figure 35: Routing Settings Page – Routing the Video Signal Only

- Click  to close the separate-signals view. The audio icon  appears under the HDMI 3 output.

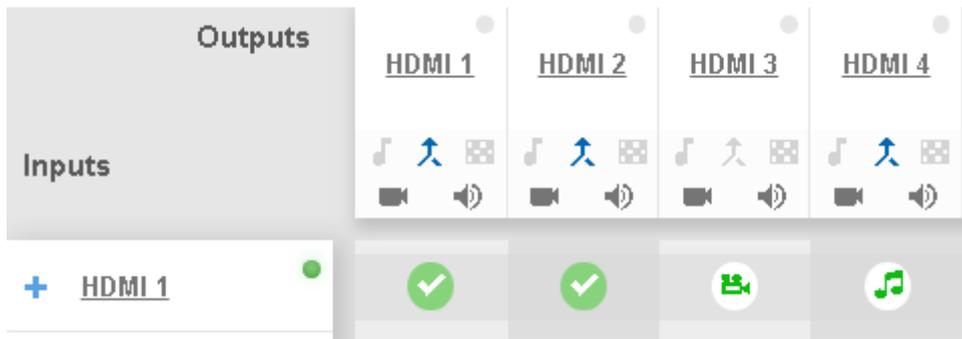


Figure 36: Routing Settings Page – Routing in the AFV Mode

Once you toggle  back to  (AFV) the audio signal is immediately routed to the HDMI 3 output.

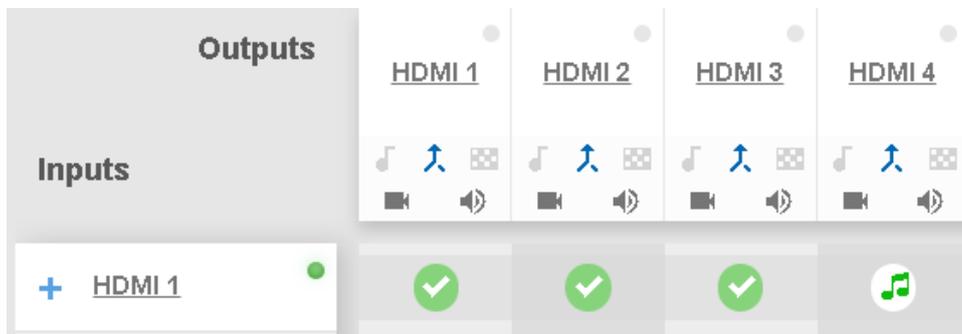


Figure 37: Routing Settings Page – Routing in the Breakaway Mode

In the breakaway mode you can also route the audio from one source and the video from another:

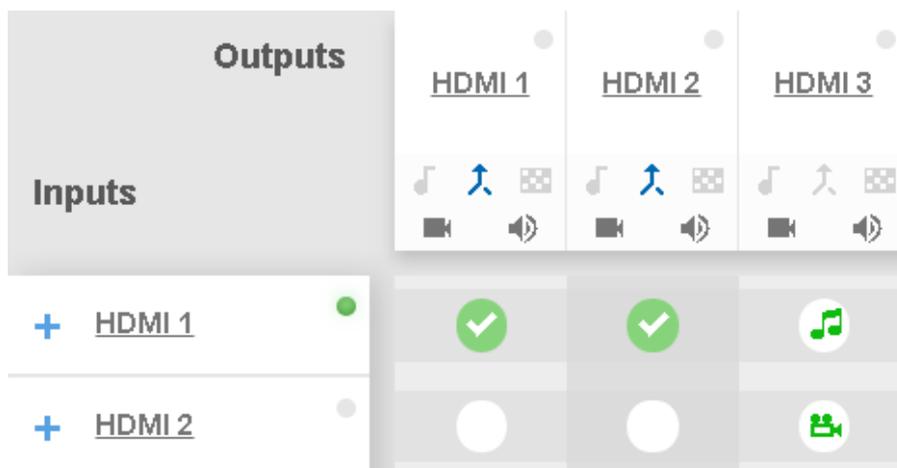


Figure 38: Routing Settings Page – Separate A/V Signal Sources in the Breakaway Mode

Once the AFV is back on, the input 2 audio signal follows the video signal.

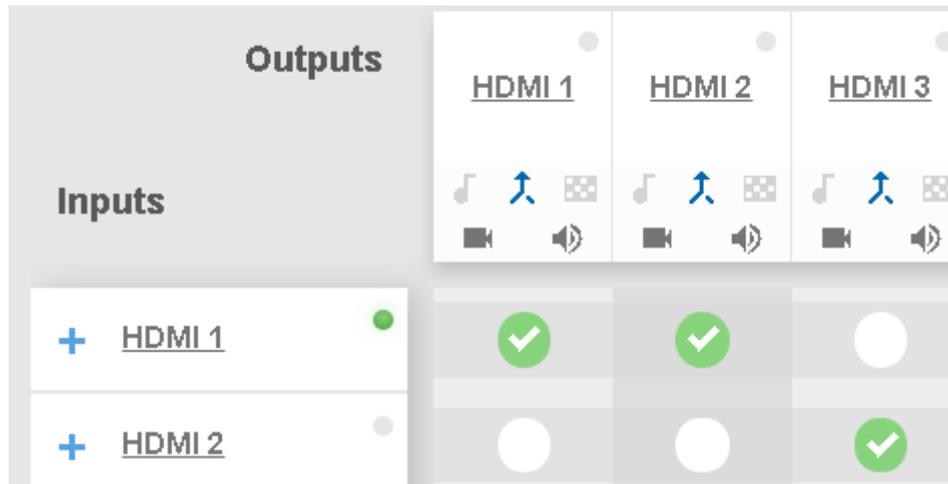


Figure 39: Routing Settings Page – A/V Signal Sources in the AFV Mode

Changing HDMI Input Port Settings

To define the HDMI port:

1. Click **Routing Settings** page. The Routing Matrix page opens.
2. Click **HDMI**.

The following window appears:



Figure 40: Routing Settings Page – Input HDMI Settings

3. Perform the following actions, as required:
 - Change the **Port Label** name.
 - View the **Routing Status**.
 - Check/uncheck **HDCP Support**.
 - Check/uncheck **Force RGB**.
 - Check/uncheck **Force 2LPCM**.
 - Open the **AUDIO** drop-down box and select the audio signal to follow the HDMI video signal (see [Selecting the HDMI Input Follower](#) on page 36).

- Set the Step-in outputs to which the video signal will be routed in case the step-in button is pressed on the is input.

4. Click **Save**.

Selecting the HDMI Input Follower

When selecting a follower to the input signal, this follower is routed together with the input signal, to the selected output. When routing HDMI signals, you can define the AUDIO signal to follow the video signal.



The follower signal is applied in the next routing step.

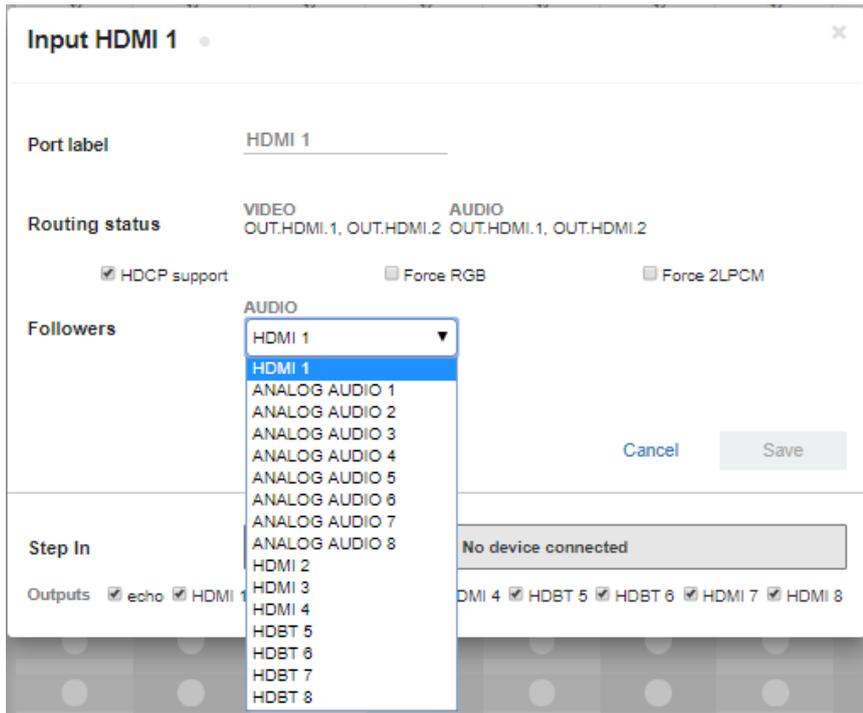


Figure 41: Routing Settings Page – HDMI 1 Input Audio Followers

For example, when routing input HDMI 1 to the HDMI 1 output, HDMI 1 audio is routed to the output.

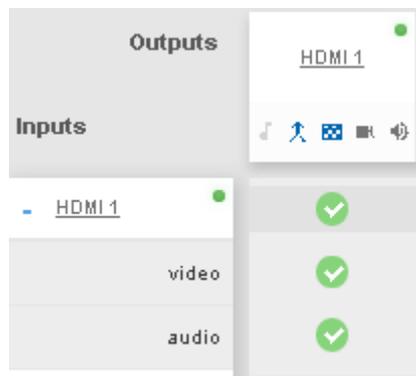


Figure 42: Routing Settings Page – Input HDMI 1 Routed to Output HDMI 1

Click the HDMI 1 output to see the settings page, and view the routing status:



Figure 43: Routing Settings Page – HDMI 1 Output Routing Status

The routing status fits the settings on the HDMI 1 input.

When setting the HDMI 1 output to the breakaway mode, upon the next routing step (for example, HDMI 2 routed to HDMI 1, the audio source remains HDMI 1 and the video source is HDMI 2

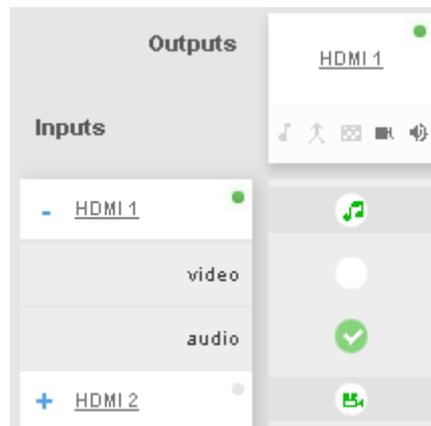


Figure 44: Routing Settings Page – HDMI 2 Input to HDMI 1 Routing Status

In the following example ANALOG AUDIO 2 is set as the audio follower for input HDMI 1:



Figure 45: Routing Settings Page – HDMI 1 Input, Analog Audio 2 Follows

In the AFV mode, whenever HDMI 1 is routed to an output the audio source will be ANALOG AUDIO 2:

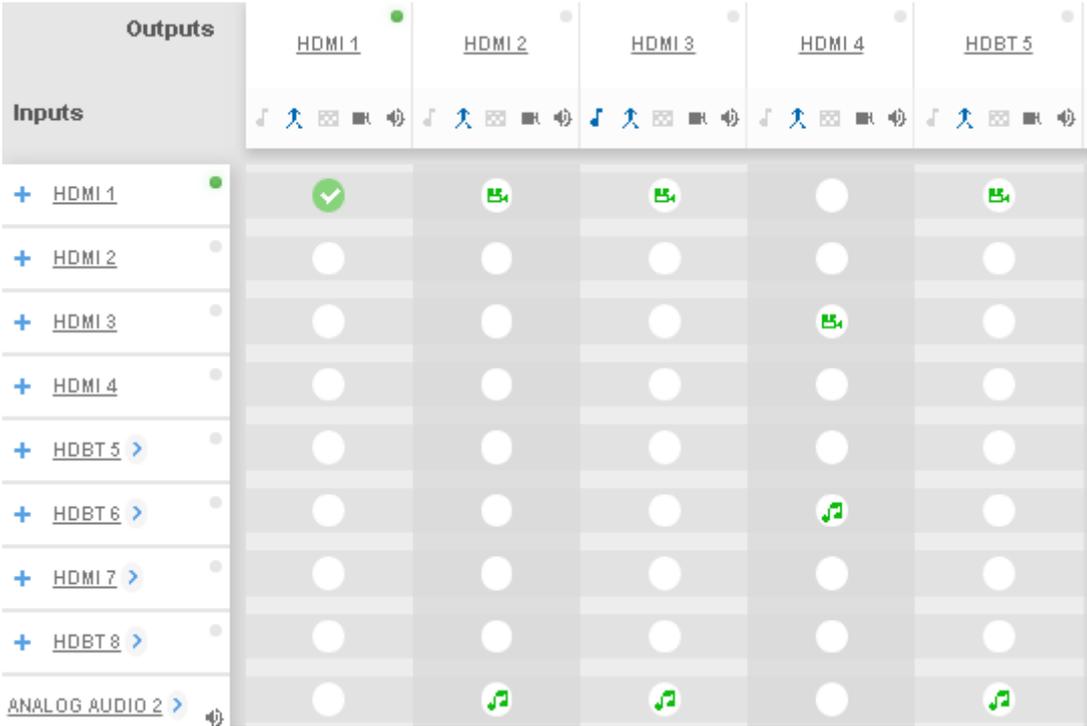


Figure 46: Routing Settings Page – Routing HDMI 1 Routed to Several Outputs

For the HDMI 1, HDMI 2, HDMI 3 and HDBT 5, ANALOG AUDIO 2 is the audio source.

Output Routing Status shows ANALOG AUDIO 2 as the source:

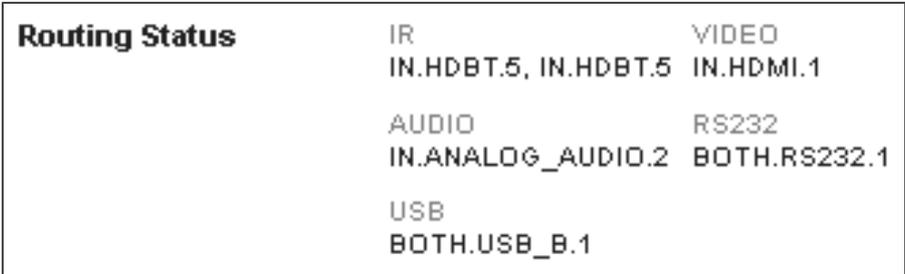


Figure 47: Routing Settings Page – HDBT 5 Output Routing Status



For HDBT outputs, the Routing Status shows other signal followers (for example, HDBT 5 input IR follows the video signal).

In the breakaway mode, when routing the HDMI 1 input to HDMI 2 output, ANALOG AUDIO 2 is still the audio source:

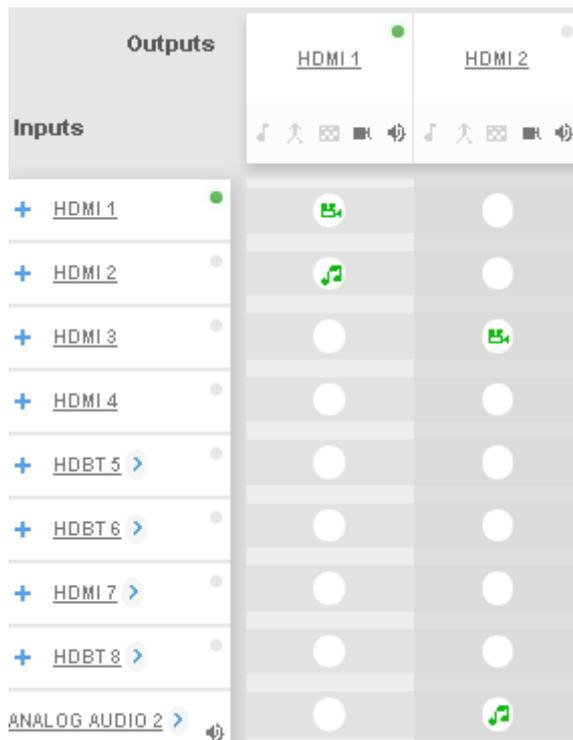


Figure 48: Routing Settings Page – HDBT 6 Output Routing Status

Click  to return to the AFV mode. When routing the HDMI 1 input to HDMI 2 output, the audio source is ANALOG AUDIO 2 once again.

Setting Input HDBT/HDMI or HDBT Input Port Parameters

The HDBT ports on each device have a slightly different function:

- **VS-88UT** has four ports that can be set as HDBT or HDMI inputs, see [VS-88UT only – Setting the Port to HDBT or HDMI](#) on page 40.
- **VS-84UT** has two dedicated HDBT ports (HDBT 7 and HDBT 8).

The green indication indicates a valid signal on the input.



Figure 49: Port Settings – HDBT Input Ports

The following functions are available:

- [VS-88UT only – Setting the Port to HDBT or HDMI](#) on page 40.
- [Viewing and Routing HDMI/HDBT and HDBT A/V Signals Separately](#) on page 40.
- [Changing HDBT/HDMI and HDBT Port Settings](#) on page 41.

VS-88UT only – Setting the Port to HDBT or HDMI

To set the port to HDBT or HDMI:

1. Click **Routing Settings** page. The Routing Matrix page opens.
2. Click > next to the port name.
3. Select the desired port:

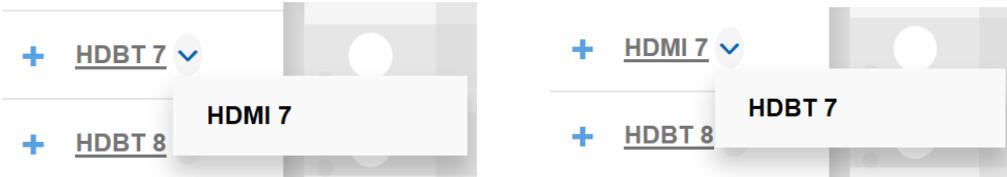


Figure 50: Port Settings – Selecting HDBT or HDMI Input Ports

Viewing and Routing HDMI/HDBT and HDBT A/V Signals Separately

To view the video and audio signals separately:

- Click **Routing Settings** page. The Routing Matrix page opens.
- Click + beside the port name.
- For VS-88UT, the HDMI/HDBT port line displays the status of each signal separately. The following example shows that the HDBT 8 input (both audio and video signals) is routed to HDMI 1 and HDMI 3 outputs.



Figure 51: VS-88UT Port Settings – HDBT Input Ports

- For VS-84UT, the HDBT port line displays the status of each signal separately. The following example shows that the HDBT 7 input (both audio and video signals) is routed to HDMI 1 and HDMI 2 outputs.

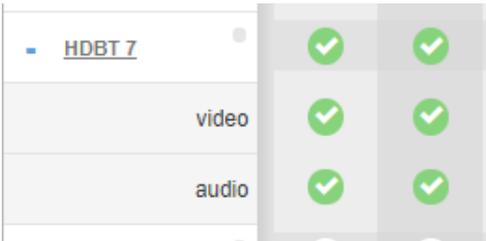


Figure 52: VS-84UT Port Settings – HDBT Input Ports

- Click - to close the separate-signals view.

Changing HDBT/HDMI and HDBT Port Settings

To define the HDBT/HDMI HDBT port:

1. Click **Routing Settings** page. The Routing Matrix page opens.
2. Click **HDBT** (HDMI is described in [Changing HDMI Input Port Settings](#) on page 35). The following window appears:

Figure 53: Routing Settings Page – Input HDBT Settings

Each setting retains the switching state (followers are specific for the HDMI and HDBT port).

3. Perform the following actions, as required:
 - Change the **Port Label** name.
 - View the **Routing Status**.
 - View the POE status (see [POE Status](#) on page 42).

- Check/uncheck **HDCP Support**.
- Check/uncheck **Force RGB**.
- Check/uncheck **Force 2LPCM**.
- Set **Extra Range** to ON or OFF.
- Select **Followers** drop-down boxes for AUDIO, RS-232, IR, and USB signals. The selected port signals will now follow the video signal (see [Selecting the HDBT Input Followers](#) on page 43).
- Set Step-In outputs to which the video signal will be routed in case the step-in button is pressed on this input (see [Setting the Step-in Status on the HDBT Ports](#) on page 57).

4. Click **Save**.

POE Status

POE on the HDBT ports is configured via global settings (see [Defining Global Settings](#) on page 23).



POE status appears on the HDBT settings page when the port is set to HDBT.

The following POE status messages appear:

POE is configured and enabled on this port.	<div style="border: 1px solid black; padding: 5px;"> POE status ON *Configured in Global Settings </div>
POE is configured on this port but is currently not active since PoE support in Global Settings is disabled	<div style="border: 1px solid black; padding: 5px;"> POE status ON but global configuration disabled *Configured in Global Settings </div>
POE is not configured on this port but can be configured via Global Settings.	<div style="border: 1px solid black; padding: 5px;"> POE status OFF *Configured in Global Settings </div>

Selecting the HDBT Input Followers

When selecting a follower to the input signal, this follower is routed together with the input signal, to the selected output. When routing HDBT signals, you can define AUDIO, RS-232, IR, and USB signals to follow the video signal.

 The follower signals are applied in the next routing step.

Followers	AUDIO	RS232
	HDBT 5 ▼	RS232 1 ▼
	IR	USB
	HDBT 5 ▼	USB Type- B1 ▼

Figure 54: Routing Settings Page – Input HDBT 5 Followers Settings

For example, when routing input HDBT 5 to the HDBT 6 output, HDBT 5 audio is routed to the output.

Outputs	HDMI 1	HDMI 2	HDMI 3	HDMI 4	HDBT 5	HDBT 6
Inputs						
+ HDMI 3						
+ HDMI 4						
+ HDBT 5 >						

Figure 55: Routing Settings Page – Input HDBT 5 Routed to Output HDBT 6

Click the HDBT 6 output to see the settings page, and view the routing status:

Routing Status	IR	VIDEO	AUDIO
	IN.HDBT.5, IN.HDBT.5	IN.HDBT.5	IN.HDBT.5
	RS232	USB	
	BOTH.RS232.1	BOTH.USB_B.1	

Figure 56: Routing Settings Page – HDBT 6 Output Routing Status

The routing status fits the settings on the HDBT 5 input.

 When routing in the AFV mode, all the followers, follow the video routing.

When setting the HDBT 6 output to the breakaway mode, upon the next routing step (for example, HDBT 6 routed to HDBT 6, the routing status will remain the same (except for the video signal):

Routing Status	IR	VIDEO	AUDIO
	IN.HDBT.5, IN.HDBT.5	IN.HDBT.6	IN.HDBT.5
	RS232	USB	
	BOTH.RS232.1	BOTH.USB_B.1	

Figure 57: Routing Settings Page – HDBT 6 Input to HDBT 6 Output Routing Status

In the following example MIC 1 is set as the audio follower for input HDBT 5:

Followers	AUDIO	RS232
	MIC 1	RS232 1
	IR	USB
	HDBT 5	USB Type- B1

Figure 58: Routing Settings Page – HDBT 5 Input, MIC 1 Audio follows

In the AFV mode, whenever HDBT 5 is routed to an output (for example, HDBT 5) the audio source will be MIC 1:

Outputs	HDMI 1	HDMI 2	HDMI 3	HDMI 4	HDBT 5
Inputs					
+ HDBT 5 >	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
+ HDBT 6 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
+ HDMI 7 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
+ HDBT 8 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANALOG AUDIO 2 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANALOG AUDIO 4 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANALOG AUDIO 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANALOG AUDIO 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANALOG AUDIO 7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANALOG AUDIO 8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MIC 1 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Figure 59: Routing Settings Page –Routing HDBT 5 Input to HDBT 6 Output

The HDBT 5 output routing status shows MIC 1 as the source:

Routing Status	IR	VIDEO	AUDIO
	IN.HDBT.5, IN.HDBT.5	IN.HDBT.5	IN.MIC.1
	RS232	USB	
	BOTH.RS232.1	BOTH.USB_B.1	

Figure 60: Routing Settings Page – HDBT 6 Output Routing Status

In the breakaway mode, when routing the HDBT 6 input to HDBT 5 output MIC 1 is still the audio source:

Outputs	HDMI 1	HDMI 2	HDMI 3	HDMI 4	HDBT 5
Inputs					
+ HDBT 5 >	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
+ HDBT 6 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
+ HDMI 7 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
+ HDBT 8 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANALOG AUDIO 2 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANALOG AUDIO 4 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANALOG AUDIO 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANALOG AUDIO 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANALOG AUDIO 7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANALOG AUDIO 8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MIC 1 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Figure 61: Routing Settings Page – HDBT 6 Output Routing Status

Then, when setting HDBT 7 input as audio source, MIC 1 is no longer the audio source:

Outputs	HDMI 1	HDMI 2	HDMI 3	HDMI 4	HDBT 5
Inputs					
+ HDBT 5 >	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
+ HDBT 6 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
- HDMI 7 >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
video	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
audio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Figure 62: Routing Settings Page – HDBT 5 Output in the Breakaway Mode

Click to return to the AFV mode. When routing the HDBT 5 input to HDBT 5 output, the audio source is MIC 1 once again.

Setting Analog Audio Input Port Parameters

VS-88UT has eight stereo analog audio inputs: 1 to 4 are balanced inputs and 5 to 8 are unbalanced inputs.

Each of the balanced analog inputs (1 to 4) can also function as microphone inputs (MIC 1 to MIC 8); inputs 5 to 8 function as unbalanced analog inputs.

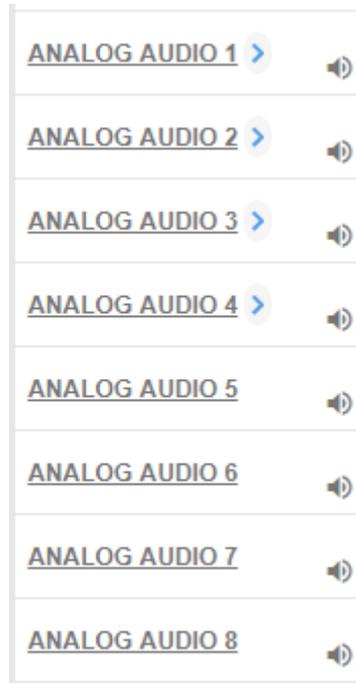


Figure 63: Port Settings – Analog Audio Input Ports

The following functions are available:

- [Setting the Input Volume](#) on page [47](#).
- [Changing the Analog Audio Port Settings](#) on page [47](#).
- [Setting the Port to Analog Input or Two Microphones](#) on page [48](#).
- [Changing the Microphone Port Settings](#) on page [50](#).

Setting the Input Volume

To set the input volume:

1. Click  .
The volume slider window appears.
2. Set the volume (set to 0dB by default).

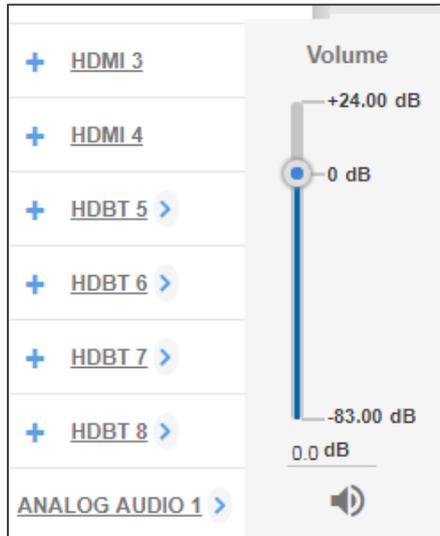


Figure 64: Port Settings –Setting Analog Audio Level

3. If required, click  to mute the input.

Changing the Analog Audio Port Settings

To set the ANALOG AUDIO Port

1. Click **ANALOG AUDIO**.
The following window appears:

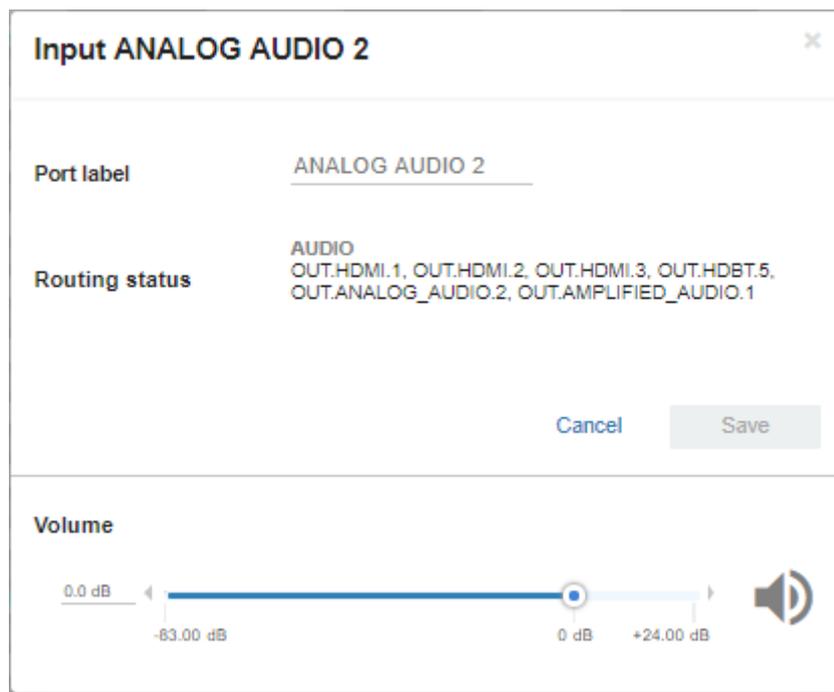


Figure 65: Routing Settings Page – Input ANALOG AUDIO Settings

2. Perform the following actions, as required:
 - Change the **Port Label** name.
 - View the **Routing Status**.
 - Set the **Volume**.
3. Click **Save**.

Setting the Port to Analog Input or Two Microphones

To set a port to function as an analog input or as two microphone inputs:

1. Click > next to the port name.
2. Set ANALOG AUDIO 1 (for example) to MIC 1 MIC 2 desired port.

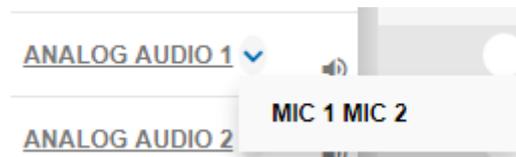


Figure 66: Port Settings – Selecting Analog Audio or Mic Input Ports

The ANALOG AUDIO 1 is replaced by MIC 1 and MIC 2 ports:



Figure 67: Port Settings – Setting MIC Ports

In the same way ANALOG AUDIO 2 (MIC 3 and MIC 4), ANALOG AUDIO 3 (MIC 5 and MIC 6) and ANALOG AUDIO 4 (MIC 7 and MIC 8) can interchange.

To set a MIC port to function as an analog input:

- 1. Click > next to one of the MIC ports.
- 2. Set MIC 1 (for example) to ANALOG AUDIO 1.

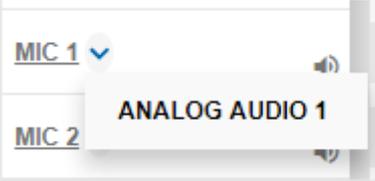


Figure 68: Port Settings – Selecting MIC to ANALOG AUDIO

ANALOG AUDIO 1 is restored:

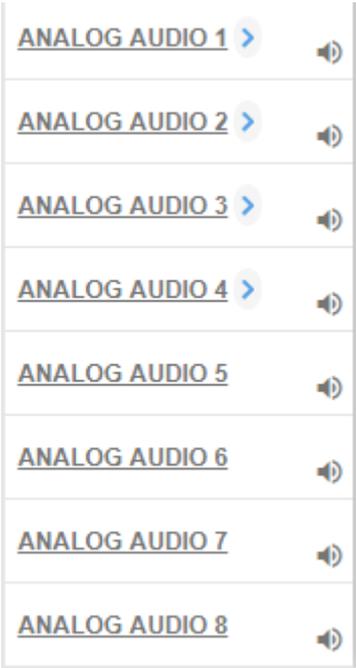


Figure 69: Port Settings – Setting MIC Ports

Changing the Microphone Port Settings

To change the MIC Port settings:

1. Click **MIC**.

The following window appears:

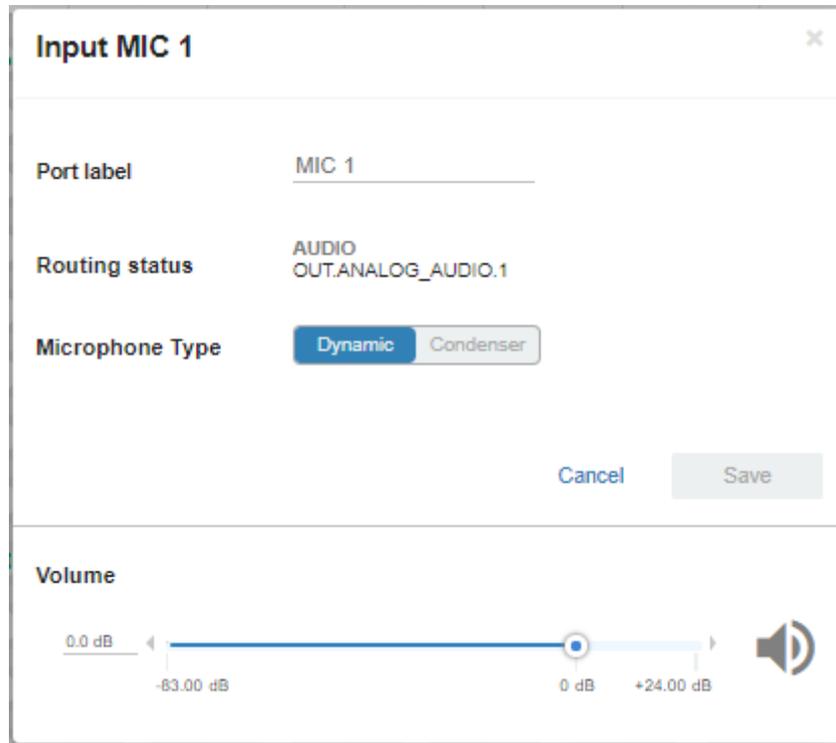


Figure 70: Routing Settings Page – Input MIC Settings

Each setting (ANALOG or MIC) retains the switching state (followers are specific for the defined port).

2. Perform the following actions, as required:
 - Change the **Port Label** name.
 - View the **Routing Status**.
 - Set the **Microphone Type** to Dynamic or Condenser.
 - Set Microphone **Volume**.
3. Click **Save**.

Setting the HDMI and HDBT Output Parameters

- i** VS-88UT has six HDMI outputs (1 to 4 and 7 to 8) and two HDBT outputs (5 to 6); VS-84UT has two HDMI outputs (1 to 2) and two HDBT (3 to 4) outputs.

The green indication indicates a valid signal on the output.

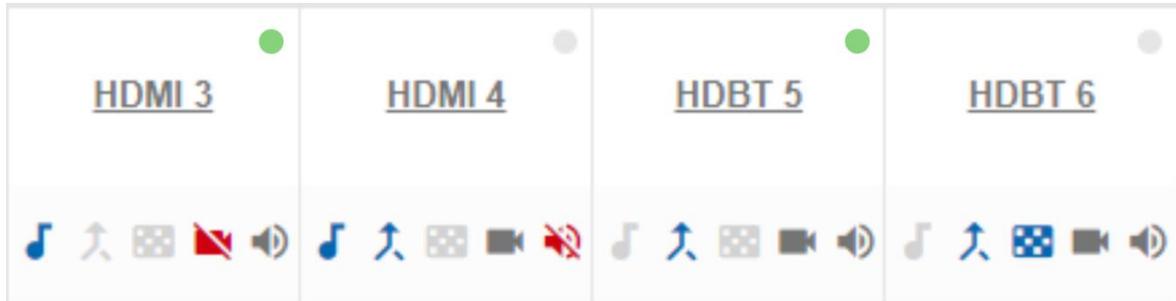


Figure 71: Port Settings – HDMI and HDBT Output Ports

The HDMI 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).
- Enabling/Disabling audio follow video (👤): both audio and video are routed through the output.
- Select a pattern to display on the output (🎲 or 🎲 if a pattern is selected).

- i** 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.

- Turn HDMI on or off (📺 or 📺).
- Mute or unmute the audio signal (🔊 or 🔊).

The following functions are available:

- [Changing the HDMI Output Port Settings](#) on page [52](#).
- [Changing the HDBT Output Port Settings](#) on page [53](#).

Changing the HDMI Output Port Settings

To set the HDMI output port:

1. Click **HDMI**.

The following window appears:

Priority	Input	drag & drop to prioritize
1	HDMI 1	X
2	HDMI 2	X
3	HDMI 3	X
4	HDMI 4	X

Figure 72: Routing Settings Page – Output HDMI Settings (Scroll down to view all inputs)

2. Perform the following actions, as required:
 - Change the **Port Label** name.
 - View the **Routing Status**.
 - Set **AFV** to **ON** or **OFF**.
 - Set **Audio only** to ON or OFF.
 - Select a **Video Pattern**.
 - Open the **Auto Switching** drop-down box and select Manual, Priority or Last Connected switching, see [Auto Switching Feature](#) on page [54](#).
3. Click **Save**.

Changing the HDBT Output Port Settings

To set the HDBT output port:

1. Click **HDBT**.

The following window appears:

Output HDBT 5

Port label: HDBT 5

Routing status: VIDEO (IN.HDBT.6), AUDIO (IN.HDBT.6), RS232 (IN.HDBT.5), IR (IN.HDBT.5), USB (IN.HDBT.5)

POE status: OFF
*Configured in Global Settings

AFV: ON

Audio only: OFF

Video pattern: None

Auto switching: Manual

Priority	Input
1	HDMI 1
2	HDMI 2

Cancel Save

Figure 73: Routing Settings Page – HDBT Output Settings (Scroll down to view all inputs)

2. Perform the following actions, as required:
 - Change the **Port Label** name.
 - View the **Routing Status**.
 - View the POE status (see [POE Status](#) on page 42).
 - Set AFV to ON or OFF.
 - Set **Audio only** to ON or OFF.
 - Check/uncheck **AFV**.
 - Select a **Video Pattern**.
 - Open the **Auto Switching** drop-down box and select Manual, Priority or Last Connected switching, see [Auto Switching Feature](#) on page 54.
3. Click **Save**.

Auto Switching Feature

For HDMI and HDBT outputs set **Auto Switching** to **Manual** (the default), **Priority** or **Last Connected**.



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 23) 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 use Auto Switching:

1. Open the HDMI/HDBT settings window.
2. If Auto Switching is set to Priority or Last Connected, you can do the following:
 - Drag and drop an input to set the priority order:

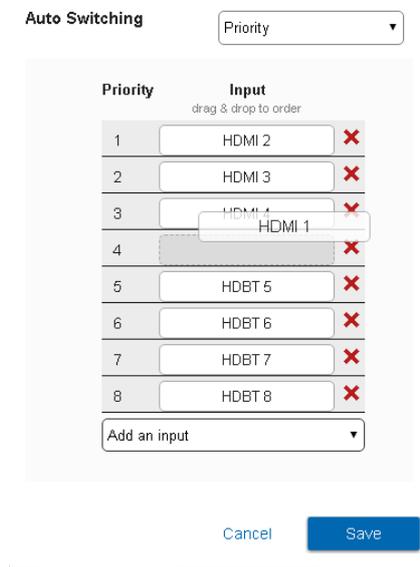


Figure 74: Routing Settings Page –Priority Setup

- Delete input/s to exclude them from the priority list.
To add a deleted input, click **Add an Input** drop-down list and select the input/s.

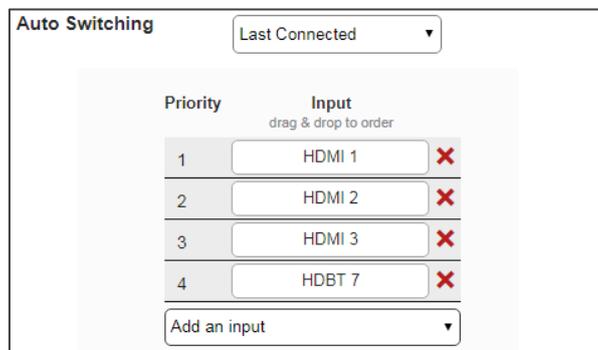


Figure 75: Routing Settings Page – HDMI/HDBT Priority List

3. Click **Save**.

Priority and Last Connected settings are indicated in the **Routing Settings** page as follows:

- The priority order numbers appear under output HDBT 6.
- Last Connected (**LC**) appears under outputs HDMI 3 and HDBT 5 (where input HDMI 3 was removed from the Last Connected list)



Figure 76: Routing Settings Page – Using Auto Switching

Setting Analog and Amplified Audio Output Parameters

VS-88UT has two analog (1 to 2) outputs and one amplified audio output.



Figure 77: Port Settings – Audio Outputs

To set an audio output:

1. Click the audio icon (🔊).
2. Use the slider to set the audio volume, or click the 🔊 below to mute the audio output.

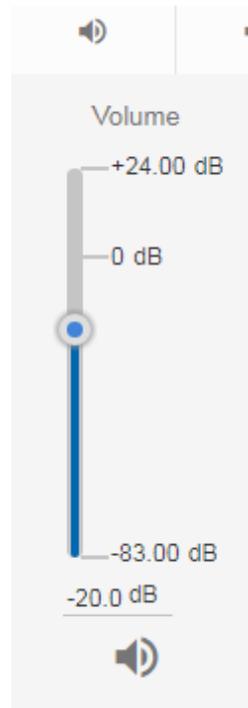


Figure 78: Audio Settings

Setting RS-232 and Step-in Routing

You can set HDBT ports to either RS-232 data tunneling or Step-in modes via the RS-232 Routing Matrix page.

Setting and Routing the RS-232 Ports

RS-232 commands can be routed between HDBT inputs, HDBT outputs and the RS-232 DATA port (27).

To route RS-232 signals:

1. Click **Routing Settings** page. The Routing Matrix page opens.
2. Click **RS232**. The RS-232 Routing page appears.
3. Click a white routing button within the matrix. For example:
 - To route RS-232 signals between input HDBT 7 and RS-232 DATA, click the routing button connecting them in the matrix.
 - To tunnel RS-232 signals between HDBT 6 and HDBT 5, click the routing button connecting them in the matrix.

Outputs		HDBT 5	HDBT 6	RS-232-DATA RS232 1	STEPIN 5	STEPIN 6	STEPIN 7	STEPIN 8
Inputs	HDBT 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	HDBT 6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	HDBT 7	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	HDBT 8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	RS-232-DATA RS232 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 79: Routing Settings Page – RS-232 Routing

Click **RS-232 1** on Inputs or Outputs to view the RS-232 routing status and change the port label (see also [Changing HDMI Input Port Settings](#) on page 35 and [Changing the HDBT Output Port Settings](#) on page 53).

Setting the Step-in Status on the HDBT Ports

You can activate the Step-in mode for each of the HDBT input ports on the **VS-88UT** so that input signals from Step-in compatible switchers that are connected to the HDBT input ports on the device can be routed to the outputs by pressing the STEP-IN button on the switchers.

To activate Step-in on the HDBT input ports:

1. Click **Routing Settings** page. The Routing Matrix page opens.
2. Click **RS232**. The RS-232 Routing page appears.
3. Click a white routing button within the matrix to activate Step-in.
 - For example, to activate the HDBT 8 input, click the routing button connecting STEPIN 8 and the HDBT8 in the matrix.
4. Click **HDBT 8** to open the HDBT 8 settings page and select the outputs to which the input signal will be routed (see [Changing HDBT/HDMI and HDBT Port Settings](#) on page 41).

Setting and Routing IR Ports

IR commands can be routed between HDBT inputs, HDBT outputs, IR inputs (5 to 6) and IR outputs (5 to 8).

To route IR commands, click a white routing button within the matrix. For example, to route IR commands between input HDBT 6 and HDBT 5, click the routing button connecting them in the matrix:

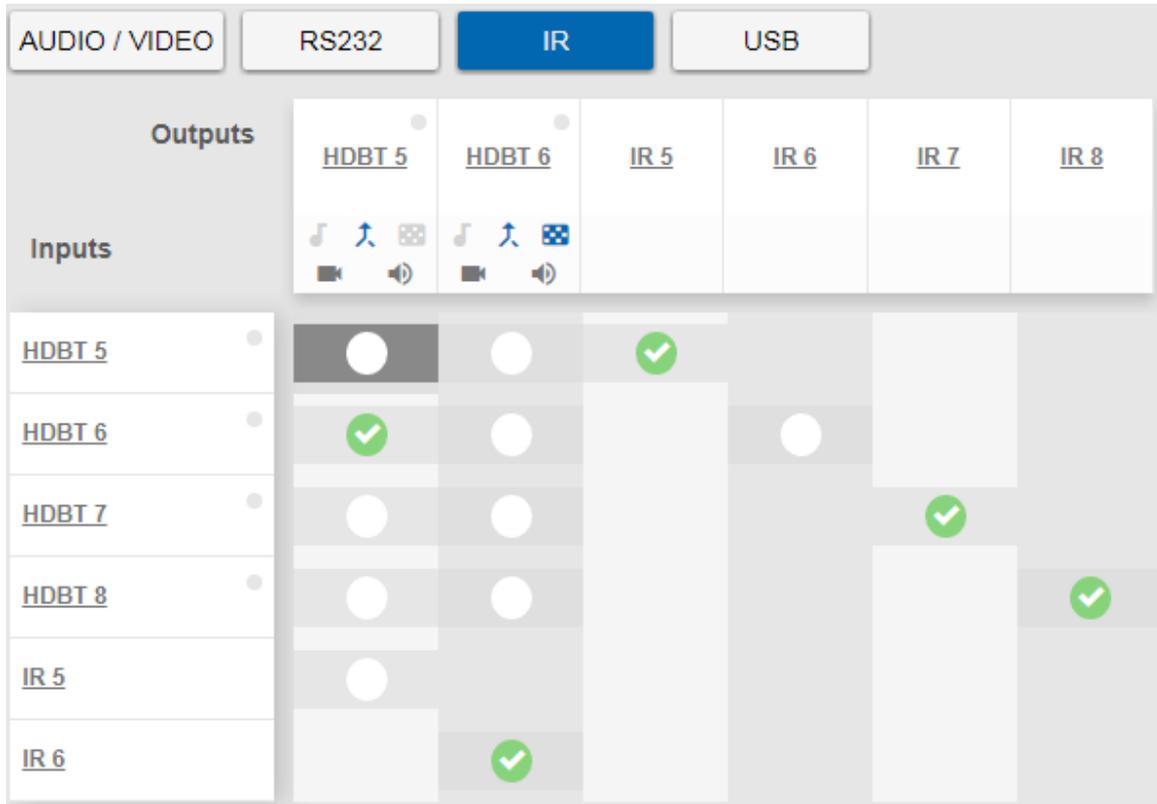


Figure 80: Routing Settings Page – IR Routing



IR 5 to IR 8 (in the Outputs row) enable connecting an external IR sensor/emitter to send/receive IR signals (5, 6, 7 and 8) via HDBT inputs 5, 6, 7 and 8 respectively.

IR 5 and IR 6 (in the Inputs column) enable connecting an external IR sensor/emitter to send/receive IR signals (5 and 6) via HDBT outputs 5 and 6, respectively.

Click IR inputs or outputs to view the IR routing status and change the port label (see also [Changing HDMI Input Port Settings](#) on page 35 and [Changing the HDBT Output Port Settings](#) on page 53).

Setting and Routing the USB Ports

USB data can be routed between HDBT inputs, HDBT outputs and the USB Type-A hubs ⁽²⁹⁾ and USB-Type-B ports ⁽³⁰⁾.

To route USB data:

- Click a white routing button within the matrix. For example, to route USB data between input HDBT 6 and USB Type-A1 hub, click the routing button connecting them in the matrix:

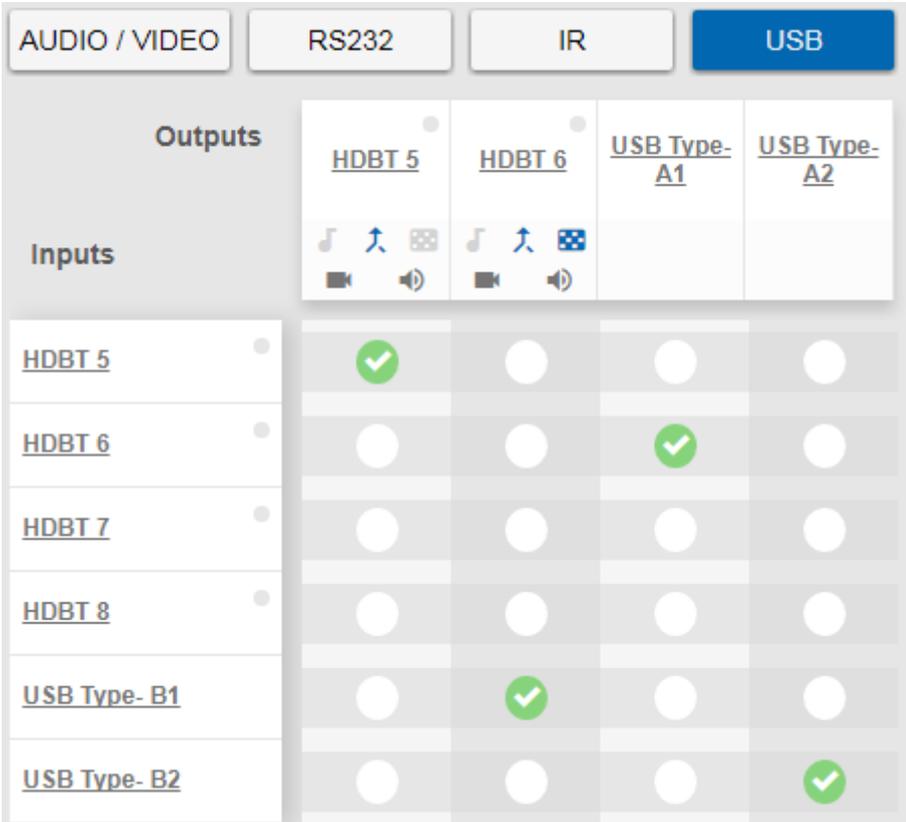


Figure 81: Routing Settings Page – USB Routing

Click an input, output or USB heading to view the USB routing status and other settings.

Click USB Type B on inputs or USB Type A on outputs to view the USB routing status and change the port label (see also [Changing HDMI Input Port Settings](#) on page 35 and [Changing the HDBT Output Port Settings](#) on page 53).

Managing EDID

The EDID page lets you read the EDID from:

- Any of the inputs.
- Any of the outputs.
- The default EDID.

You can also load a customized EDID file from your PC.

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.

To copy an EDID from an output to an input:

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

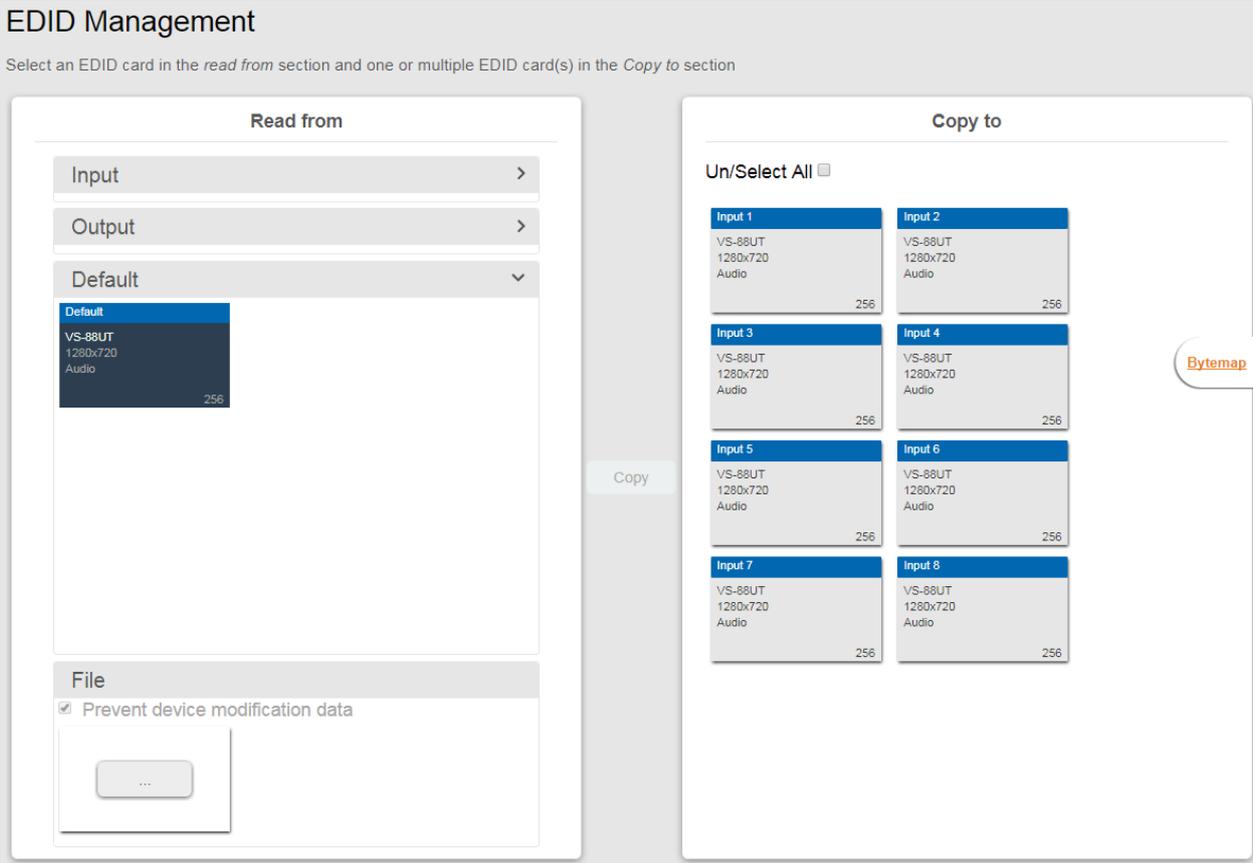


Figure 82: EDID Management Page

2. Select the EDID source (for example, one of the inputs).



If you are reading EDID from an output, make sure that that output is connected to an acceptor.

EDID Management

Select an EDID card in the *read from* section and one or multiple EDID card(s) in the *Copy to* section

Read from

Input

Input 1
VS-88UT
1280x720
Audio
256

Input 2
VS-88UT
1280x720
Audio
256

Input 3
VS-88UT
1280x720
Audio
256

Input 4
VS-88UT
1280x720
Audio
256

Input 5
VS-88UT
1280x720
Audio
256

Input 6
VS-88UT
1280x720
Audio
256

Output >

Default >

File

Prevent device modification data

...

Copy to

Un/Select All

Input 1
VS-88UT
1280x720
Audio
256

Input 2
VS-88UT
1280x720
Audio
256

Input 3
VS-88UT
1280x720
Audio
256

Input 4
VS-88UT
1280x720
Audio
256

Input 5
VS-88UT
1280x720
Audio
256

Input 6
VS-88UT
1280x720
Audio
256

Input 7
VS-88UT
1280x720
Audio
256

Input 8
VS-88UT
1280x720
Audio
256

Copy

Bytemap

Figure 83: EDID Management Page – Select an EDID Input (Read From)

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

EDID Management

Select an EDID card in the *read from* section and one or multiple EDID card(s) in the *Copy to* section

Read from

Input

Input 1
VS-88UT
1280x720
Audio
256

Input 2
VS-88UT
1280x720
Audio
256

Input 3
VS-88UT
1280x720
Audio
256

Input 4
VS-88UT
1280x720
Audio
256

Input 5
VS-88UT
1280x720
Audio
256

Input 6
VS-88UT
1280x720
Audio
256

Output >

Default >

File

Prevent device modification data

...

Copy to

Un/Select All

Input 1
VS-88UT
1280x720
Audio
256

Input 2
VS-88UT
1280x720
Audio
256

Input 3
VS-88UT
1280x720
Audio
256

Input 4
VS-88UT
1280x720
Audio
256

Input 5
VS-88UT
1280x720
Audio
256

Input 6
VS-88UT
1280x720
Audio
256

Input 7
VS-88UT
1280x720
Audio
256

Input 8
VS-88UT
1280x720
Audio
256

Copy

Bytemap

Figure 84: EDID Management Page – Select the Inputs (Copy To)

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

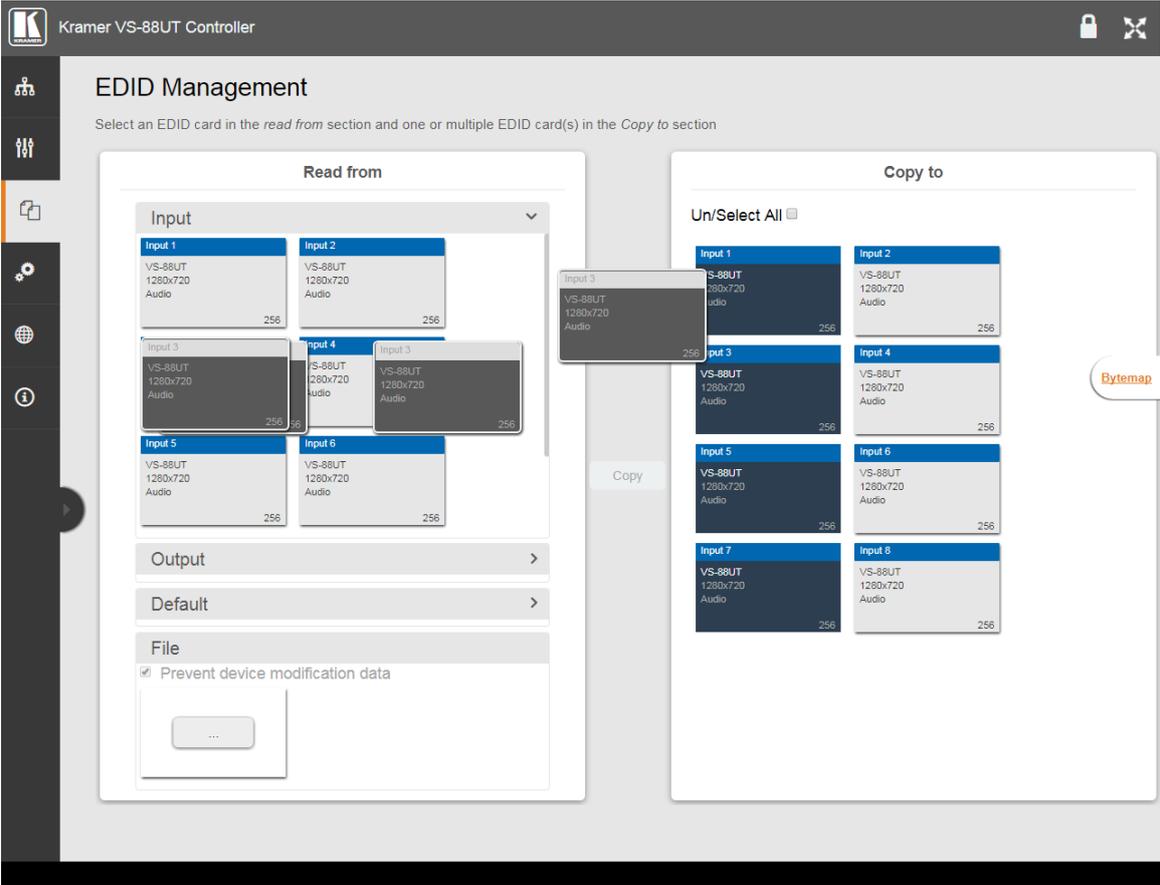


Figure 85: EDID Page – EDID Copied

The following message appears:

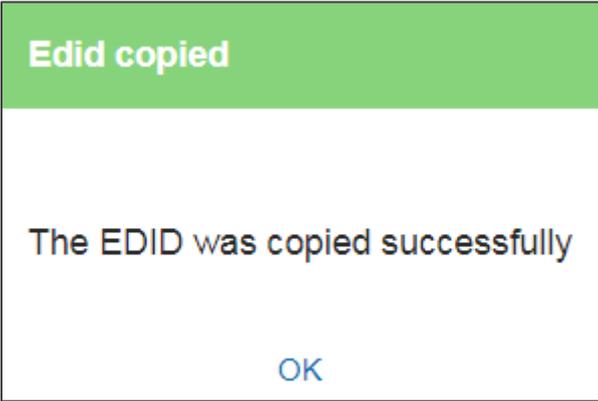


Figure 86: EDID Management Page – EDID Copy Success

- 5. Click **OK**.

To read the EDID from the default EDID:

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

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.

Controlling Devices via the Controller

You can control a large number of peripheral devices via the **VS-88UT** room controller section (VS-88UT-RC) via Kramer **K-Config 3**. See [Room Controller Functionality](#) on page [6](#).

Use the **Controller** page to:

- [Controlling Devices via the Controller](#) on page [64](#).
- [Activating Macros](#) on page [72](#).
- [Scheduling Macros](#) on page [73](#).
- [Setting the Date and Time](#) on page [75](#).

By default, the Controller page is empty, since a configuration is not yet synced to the device.

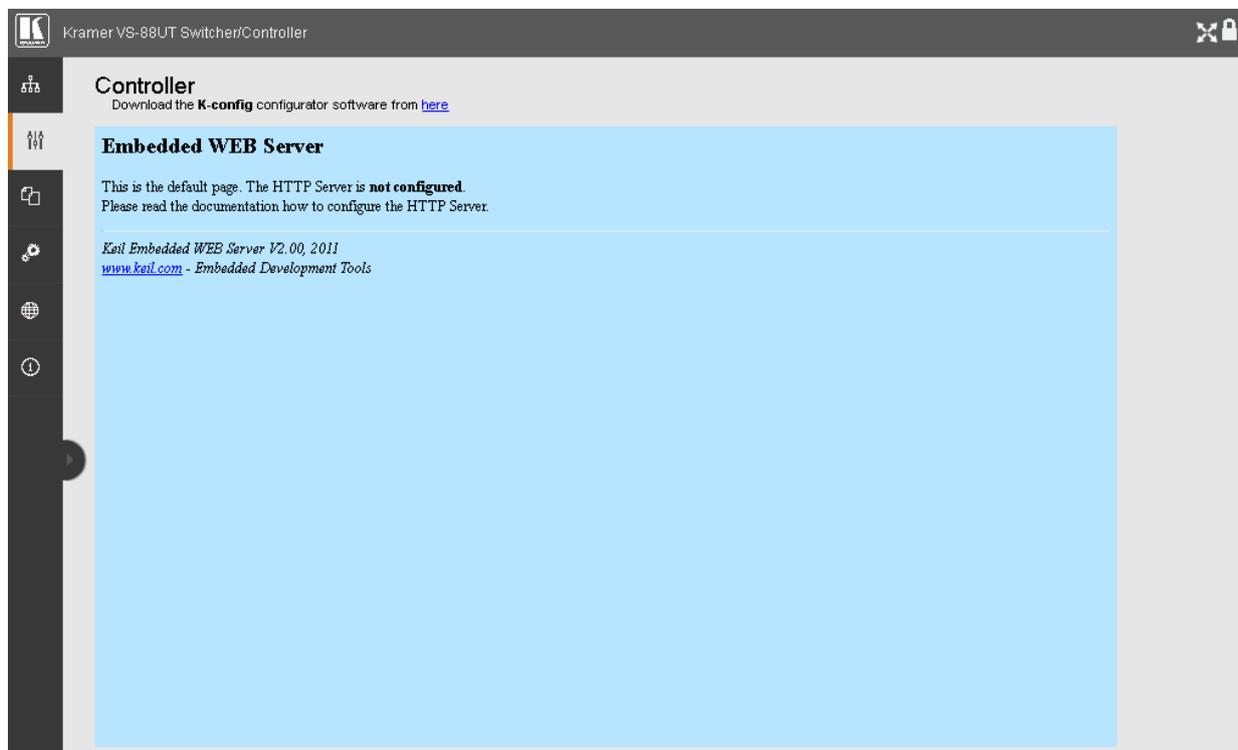


Figure 87: Controller Page – Default Page

To activate the Controller page:

- Click **here** to download K-Config 3.
- Create a room controller configuration via K-Config 3 and then sync the configuration to the device (see [Room Controller Configuration via K-Config 3](#) on page [65](#)).

Room Controller Configuration via K-Config 3

Download the latest version of **K-Config 3** from our website at www.kramerav.com/downloads/VS-88UT.

-  If you are new to **K-Config 3**, go to www.kramerav.com/downloads/VS-88UT to download the **K-Config 3** user manual.
-  In order to access **K-Config 3** via the Controller page, connect it to the network via TCP connection.

To create the room controller configuration:

1. In **K-CONFIG**, select VS-88UT-RC as the master device.

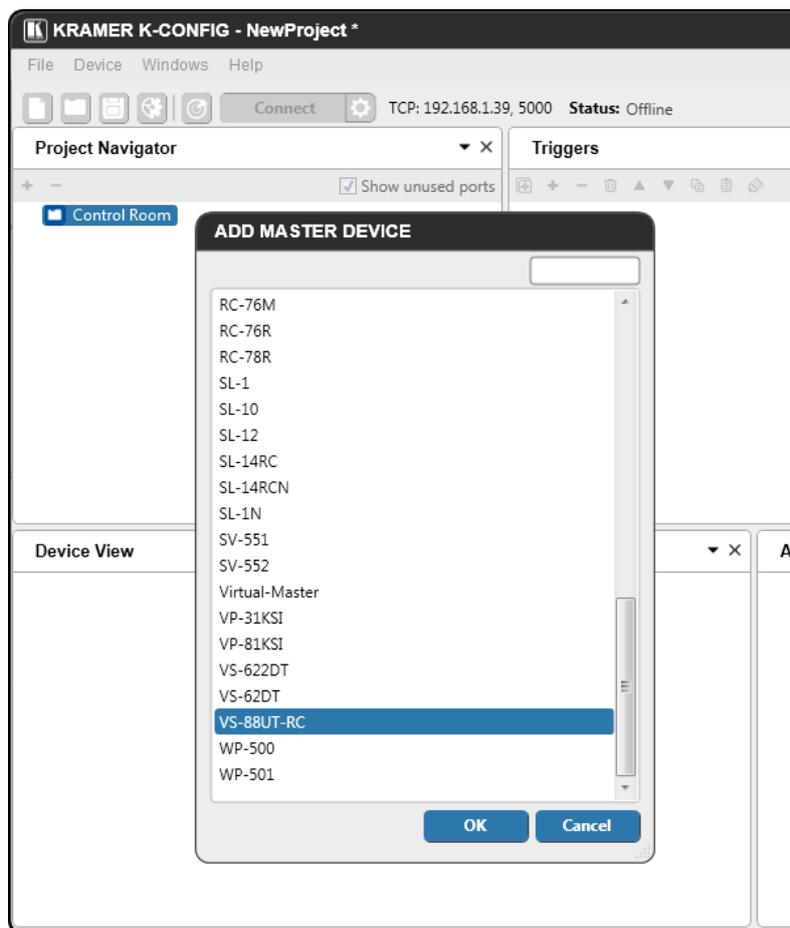


Figure 88: Controller Page – Select Master Device via K-CONFIG

2. Click **OK**.
VS-88UT-RC is added as the Master controller with all its physical ports and virtual Ethernet ports.
3. Configure the ports and add peripheral devices, commands and macros as needed.
4. Save the project in **K-CONFIG**.
5. In the **Windows** menu, select **Web Settings** and make sure that **Upload Web Access Pages to Device** is checked.

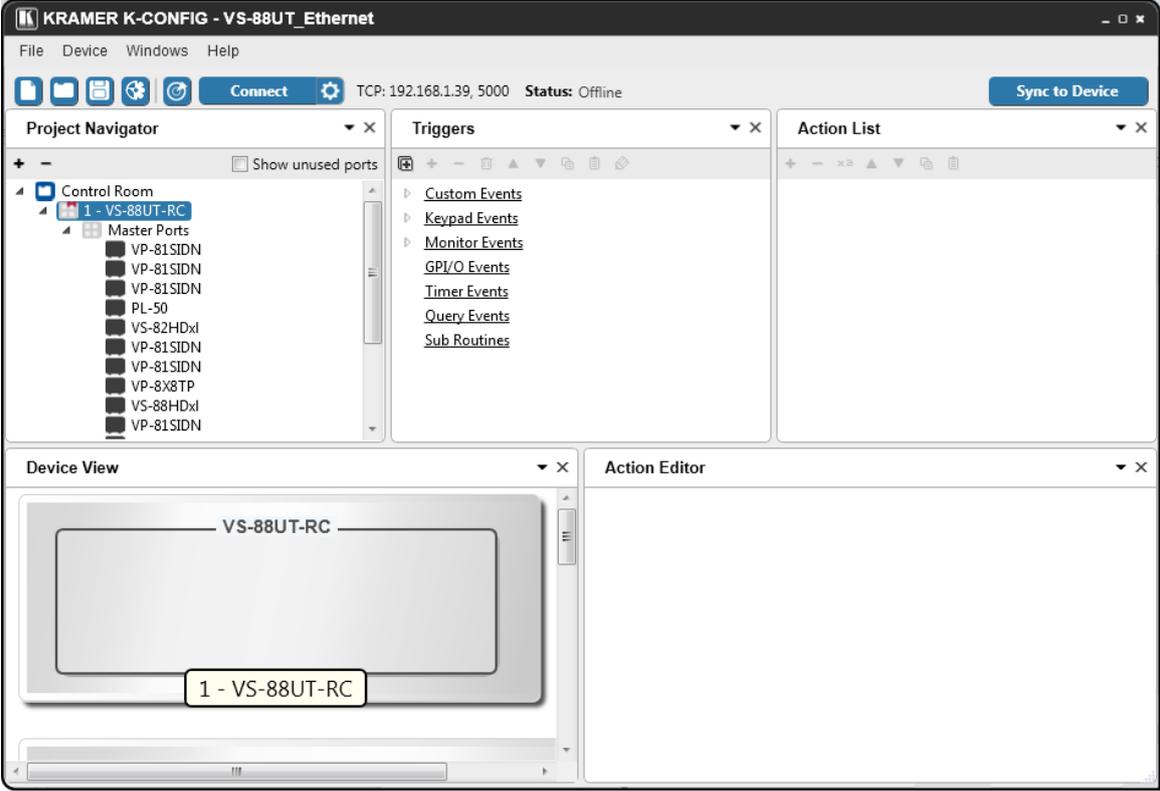


Figure 89: Controller Page – K-CONFIG Project

- 6. Connect the **VS-88UT** to your PC (via Ethernet).
- 7. Click **Connect** in **K-CONFIG**.
The following message appears:

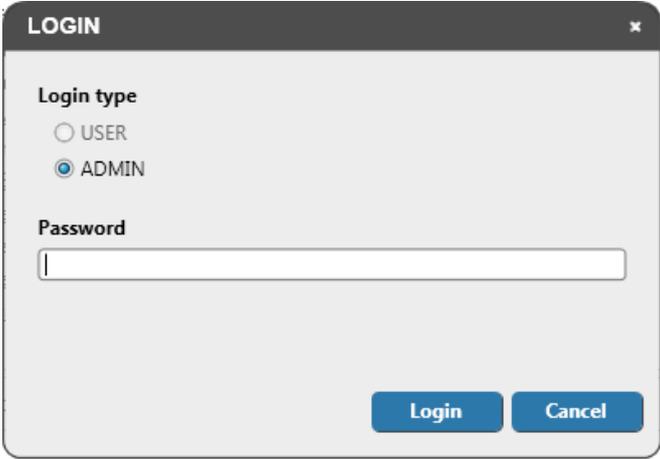


Figure 90: Controller Page – Login

- 8. Type-in the **VS-88UT** webpage password for ADMIN (Admin, by-default).
- 9. Click **Login**.
K-CONFIG status displays **Online**.
- 10. Click **Sync to Device**.
The following message appears:

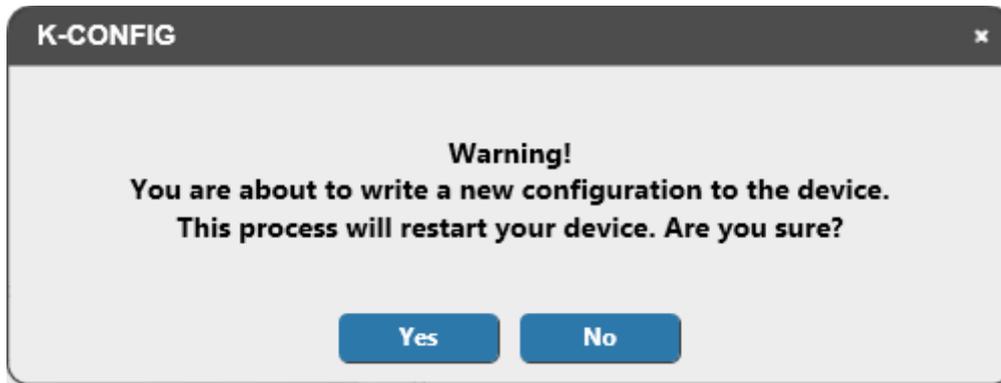


Figure 91: Controller Page – Writing to the Device

11. Click **Yes**.



This process may take a few minutes to complete.

12. Refresh the **VS-88UT** webpage.

13. In the Navigation pane, click **Controller**. The Log in window appears:

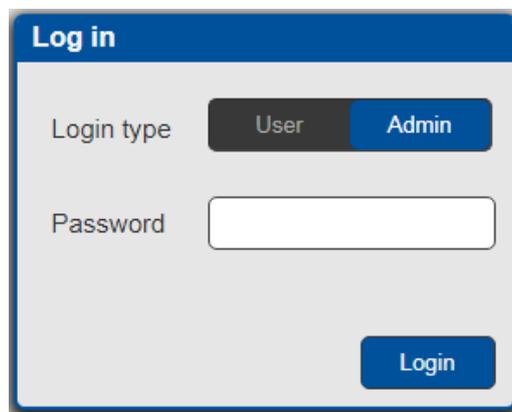


Figure 92: Controller Page – Log In Window

14. Set the Login type (**Admin** or **User**). For Admin, enter the password (Admin, by default).

15. Click **Login**.

The **Controller** page appears (see [Figure 93](#)).



If the Controller page does not load correctly (see [Figure 87](#)), you need to delete cached images and files and the refresh the Controller page.

Controlling Devices

Devices that are connected to the **VS-88UT** room controller area are controlled via the **Controller** page once the configuration is uploaded.

The device menu enables:

- [Controlling a Peripheral Device](#) on page [68](#).
- [Controlling an Auxiliary Device](#) on page [70](#).
- [Controlling a Virtual Device](#) on page [71](#).

3. Click a device to control it, for example, **VS-81SIDN**:

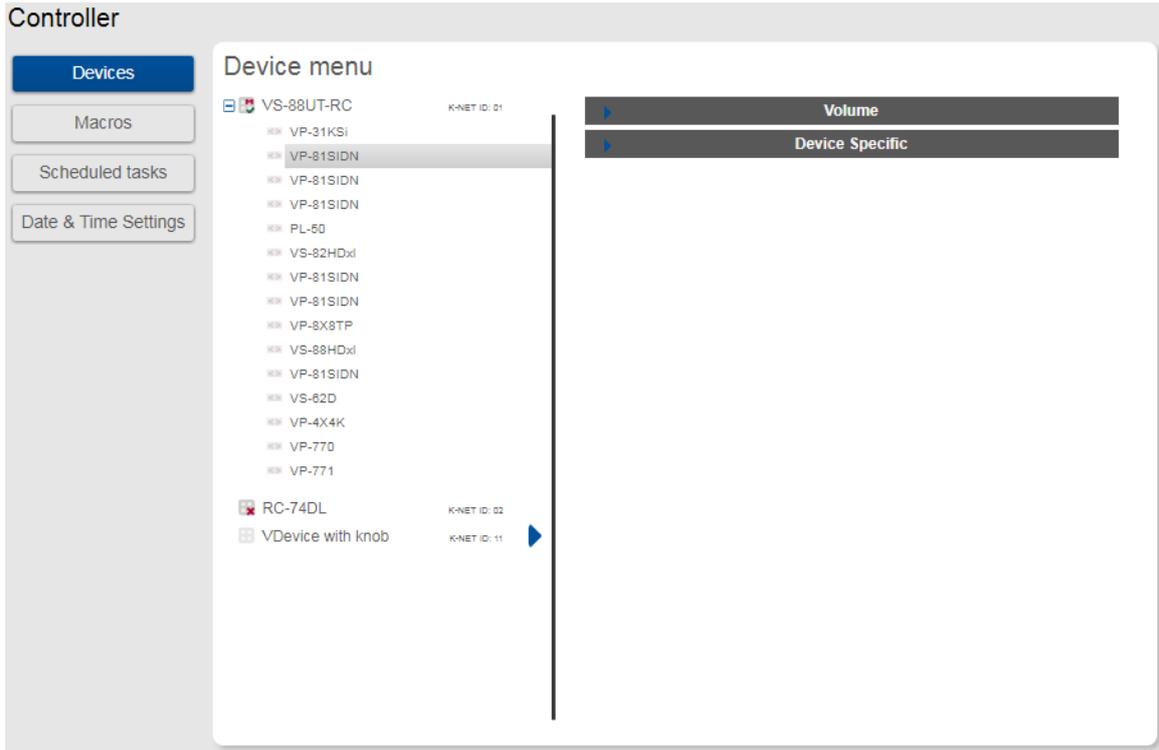


Figure 95: Controller Page – Controlling a Peripheral Device

4. Expand the command types:

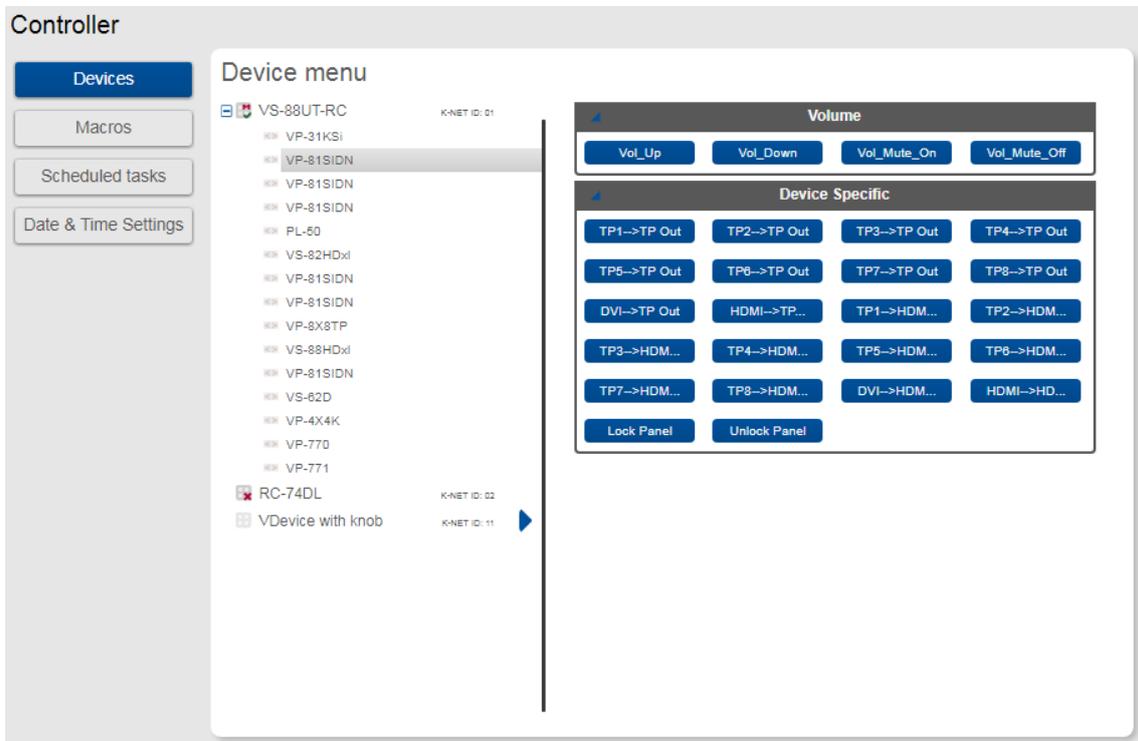


Figure 96: Controller Page –Peripheral Device Available Commands

The list of all the configured commands appears on the right-side of the page.

5. Click a command button.

The selected command is performed on the peripheral device.

Controlling an Auxiliary Device

To control an auxiliary device:

1. In the Controller page, click **Devices**.
2. Click an Auxiliary device (**RC-74DL**).
The Device menu appears:

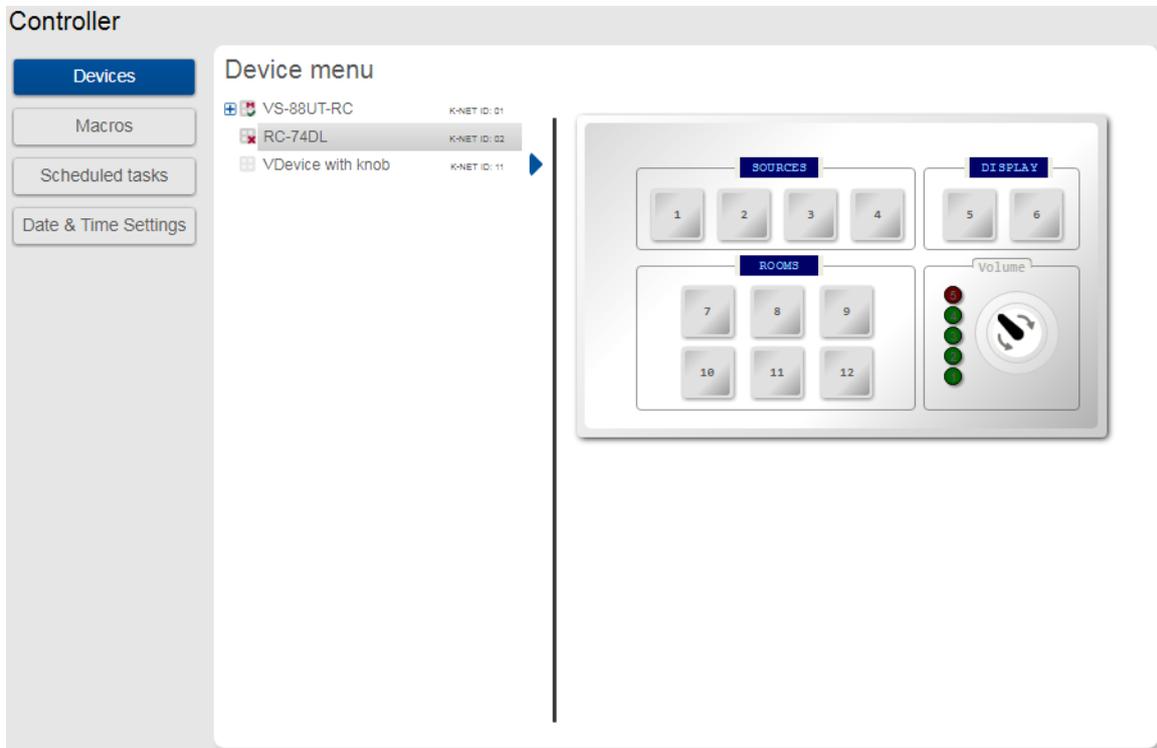


Figure 97: Controller Page – Controlling an Auxiliary Device

3. Click a room-controller device-button.
The action list (as defined by **K-Config 3**) is performed.

Controlling a Virtual Device

To control a virtual device:

1. In the Controller page, click **Devices**.
The Device menu appears:
2. Click a virtual device on the list (for example, VDevice with Knob).
The virtual device appears:

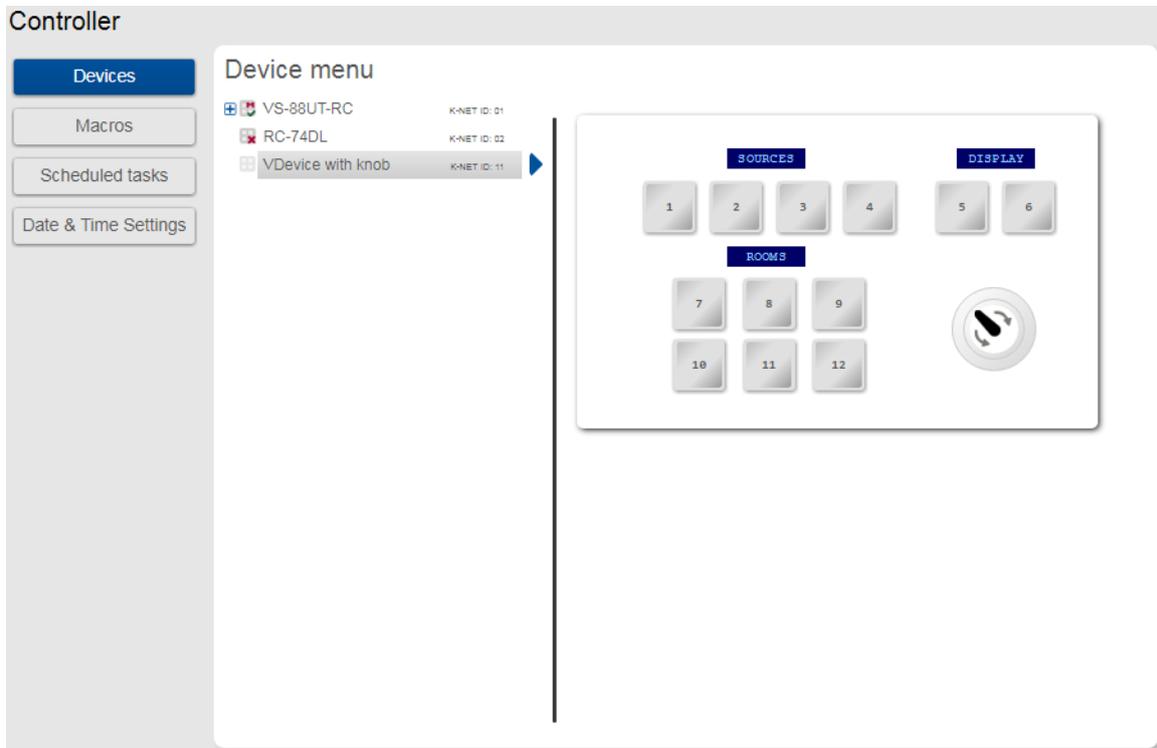


Figure 98: Controller Page – Controlling a Virtual Device

3. Click a room-controller device-button.
The action list (as defined by **K-Config 3**) is performed.
4. If desired, click the blue arrow next to the virtual device for a full-page view (enables a clearer view when the virtual device includes several sets of device controllers).

Activating Macros

Macros include **All Off** and **All On** buttons (configured in **K-CONFIG**) to easily activate or deactivate the controlled room with the press of a button.

1. In the Controller page click **Macros**.

The Macros window appears:

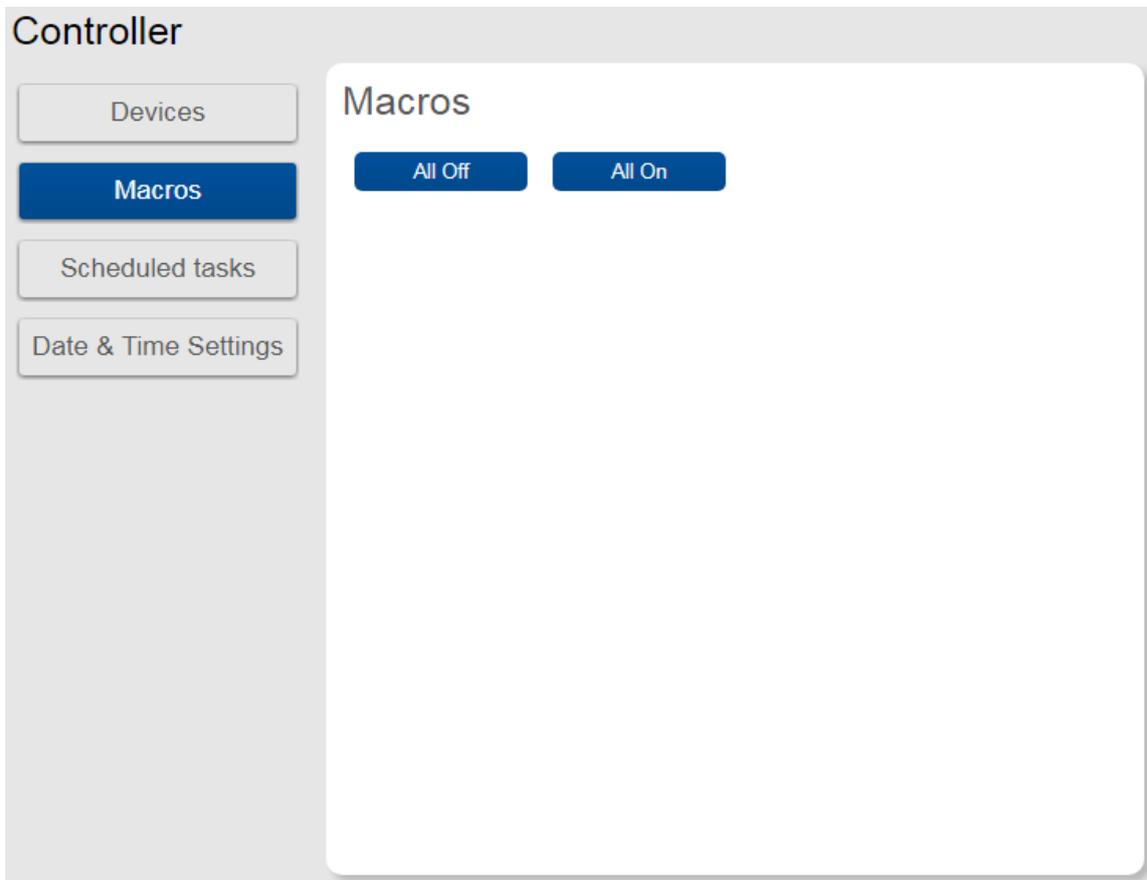


Figure 99: Controller Page – Macros Window

2. Click **All On** or **All Off** as required.

Scheduling Macros

Scheduled tasks lets you schedule **All on/All Off** macros throughout the week.

- 1. In the Controller page click **Scheduled Tasks**.
The Scheduled Tasks window appears:

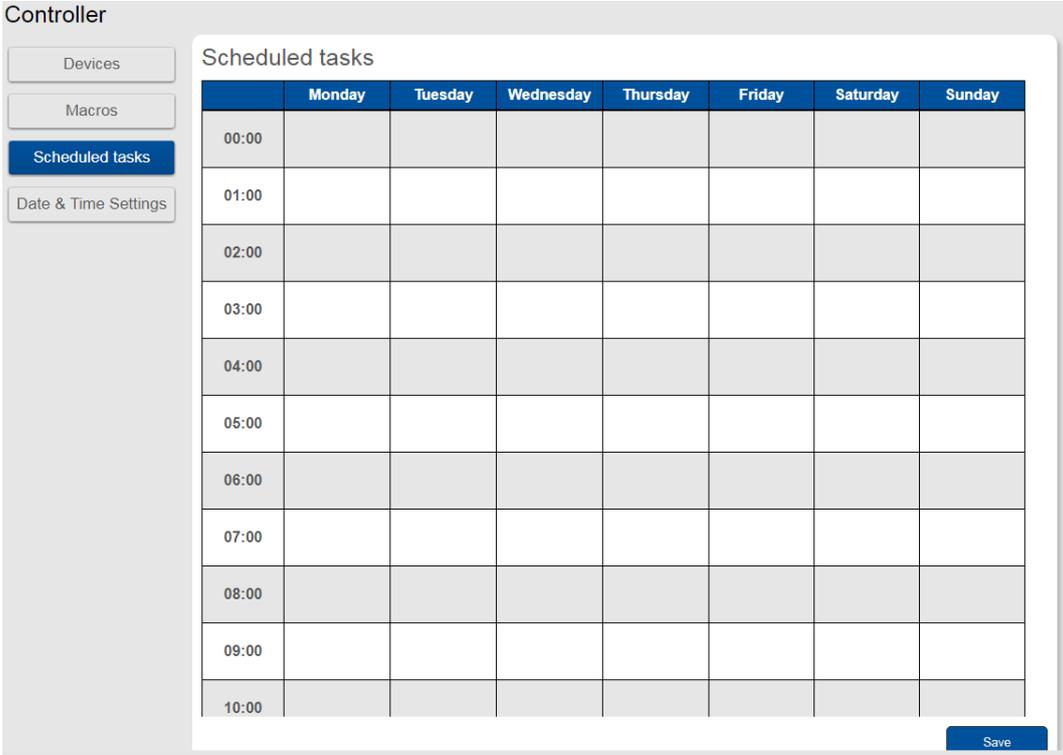


Figure 100: Controller Page – Scheduled Tasks

- 2. Hover over a day and time

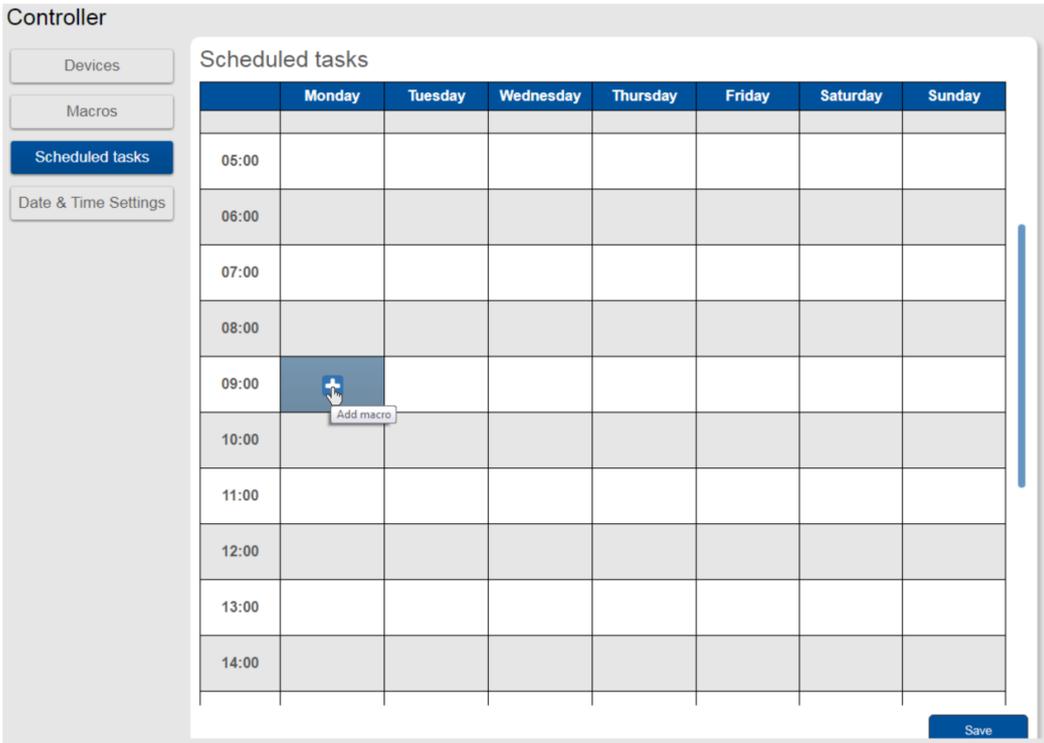


Figure 101: Controller Page – Selecting a Day and Time

- 3. Click **+**.
The Add Macro window appears:

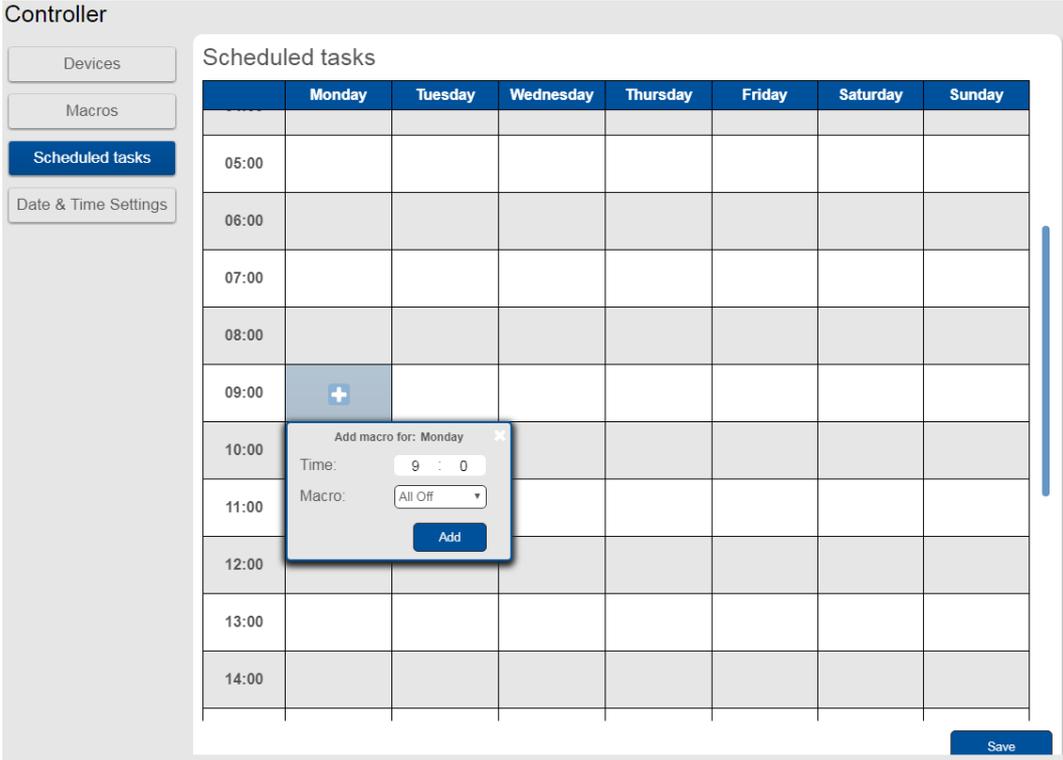


Figure 102: Controller Page – Adding a Scheduled Task

- 4. Select a Macro (All On or All Off), set the exact activation time and click **Add**.
The scheduled macro appears in the table:

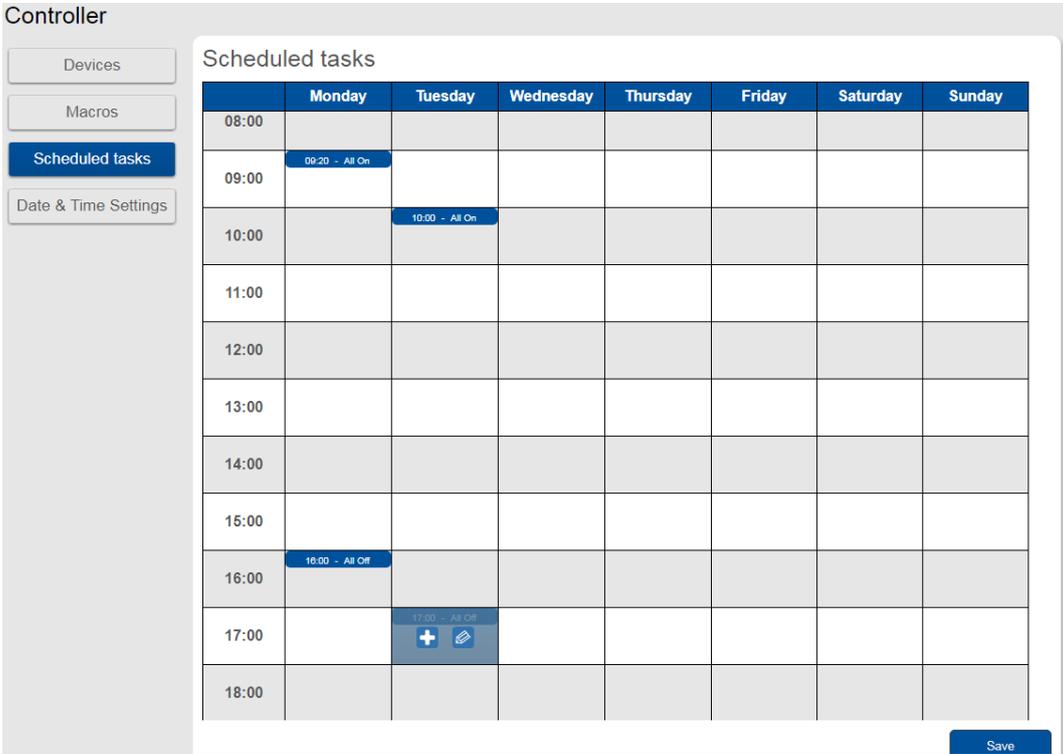


Figure 103: Controller Page – Scheduled Task Added

Setting the Date and Time

Set the date and time in one of the following methods:

- Manually
- From a PC clock
- From a server address by clicking the IP address of the clock source, the time zone and checking DST if you are on Daylight Saving Time.

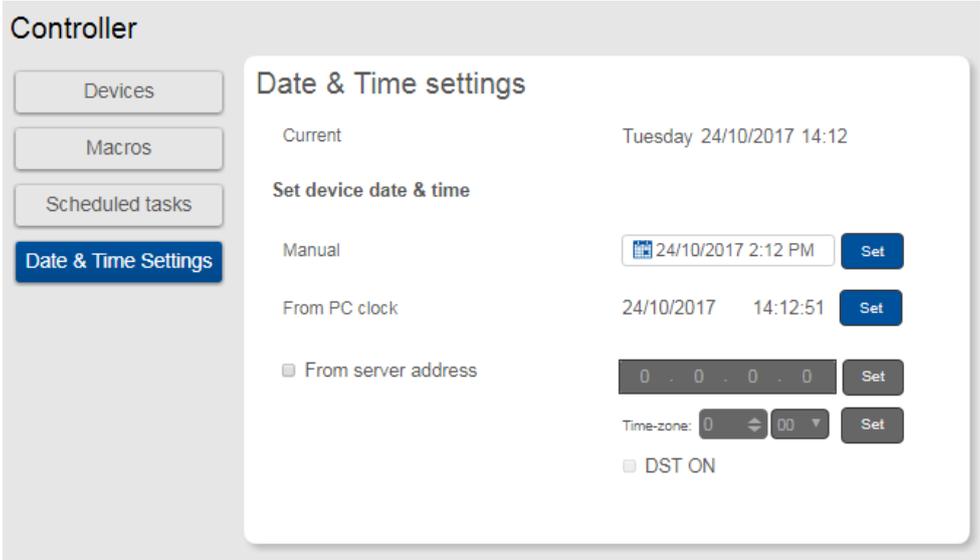


Figure 104: Controller Page – Date and Time Settings

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-88UT to learn how to use Kramer Maestro.

 Note that all the ports, actions and triggers that are relevant to **VS-88UT** 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.

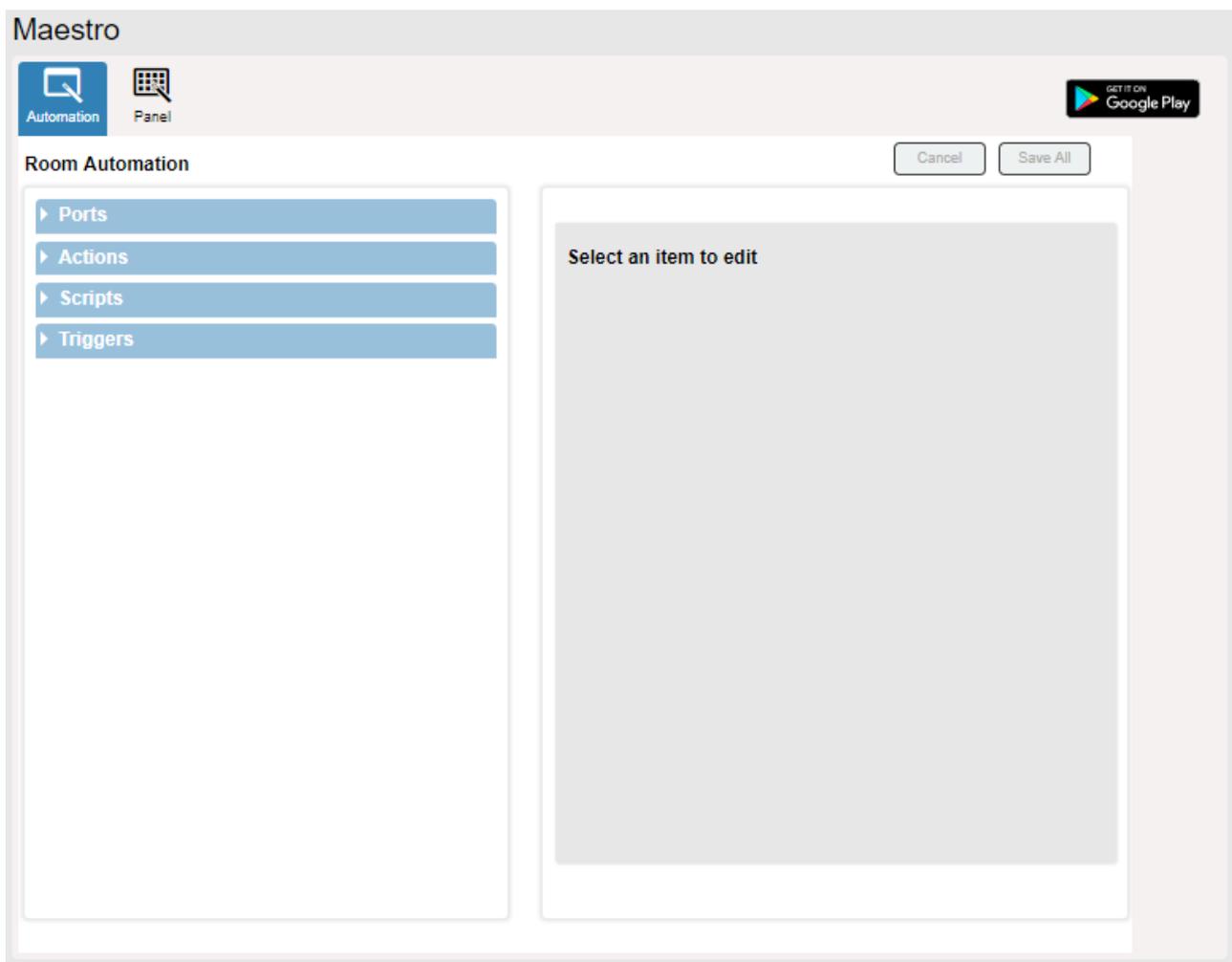


Figure 105: Automation Page

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.

Changing the Device Settings

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

- Clicking Restart to restart the device.
- [Resetting to Factory Default Parameters](#) on page [78](#).
- Changing the Device Name by typing the new name and saving it.
- [Performing Firmware Upgrade](#) on page [83](#).
- [Setting the Date and Time on page 84](#).

Resetting to Factory Default Parameters

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

The screenshot shows the 'Settings' web page for a VS-88UT device. At the top right, there are two buttons: 'Restart' (with a power icon) and 'Factory reset' (in a red box). Below these are four tabs: 'General' (selected, with a gear icon), 'Communication' (with a globe icon), 'Upgrade' (with a download icon), and 'Time And Date' (with a calendar icon). The 'General' tab contains the following information:

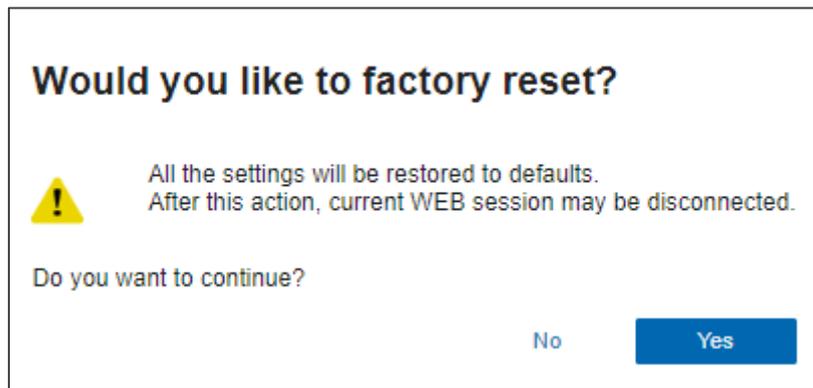
Device Name	<input type="text" value="VS-88UT-1"/>
Model	VS-88UT
Firmware version	02.01.0007

Below this is the 'Security' section, which has a toggle switch set to 'ON'. Underneath the toggle is a link 'Change security properties'. There are three password input fields labeled 'Current Password', 'New Password', and 'Confirm Password'. At the bottom of the page is a 'Save' button.

Figure 106: Settings Page

2. Click **Factory reset**.

The following message appears:



Would you like to factory reset?

 All the settings will be restored to defaults.
After this action, current WEB session may be disconnected.

Do you want to continue?

No

Figure 107: Settings Page – Factory Reset Message

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

Setting Authentication

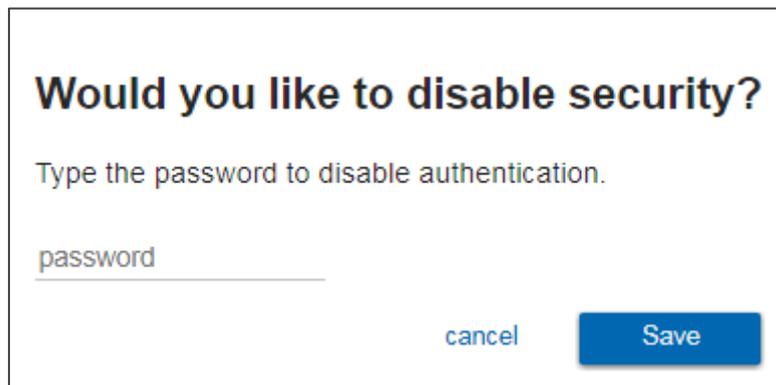


By default, the Web pages are secured (username and password are both: **Admin**).

To access web pages without using the password:

1. In the Navigation pane, click **Settings**. The General tab in the Settings page appears:
2. Slide the Security switch to **OFF**.

The following message appears:



Would you like to disable security?

Type the password to disable authentication.

password _____

cancel

Figure 108: Password Settings Page – Disabling Authentication

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

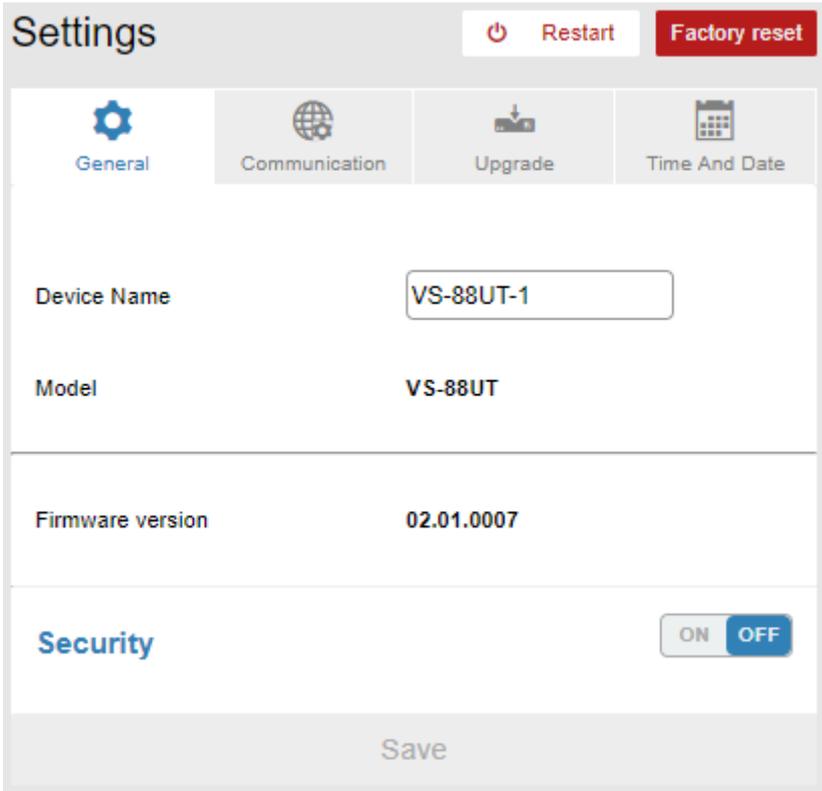


Figure 109: Password Settings Page –Security Deactivated

To access Web pages using the password:

- 1. In the Navigation pane, click **Settings**. The General tab in the Settings page appears:
- 2. Slide the security switch to **ON**. The following message appears:

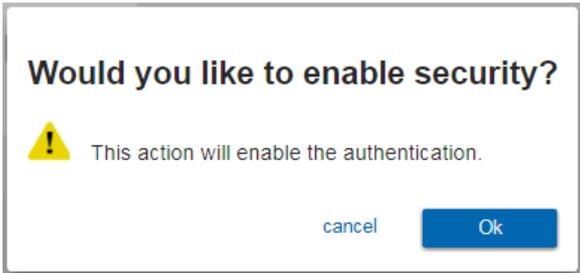


Figure 110: Password Settings Page – Activating Security

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

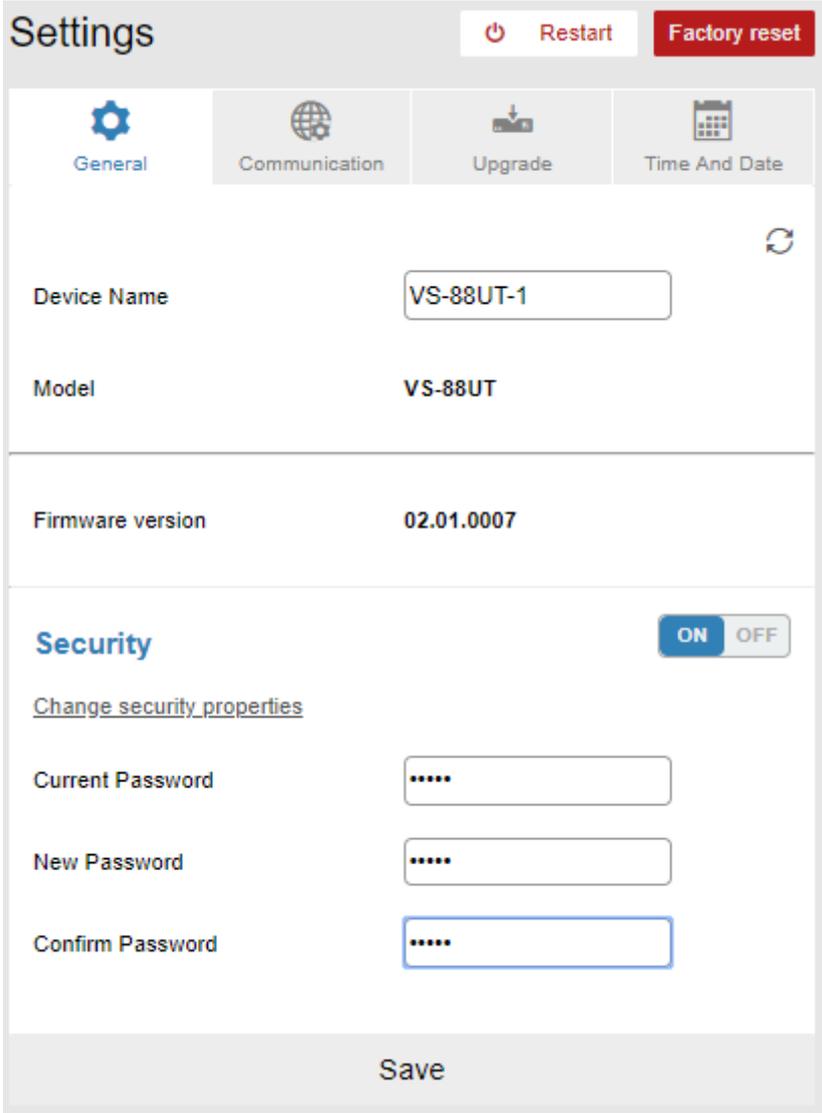


Figure 111: Settings Page – Security Activation Message

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

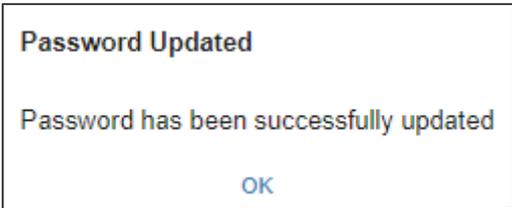


Figure 112: Settings Page – Password Updated

5. Click **OK**.

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.

To change the Ethernet settings:

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

The screenshot shows the 'Settings' page with the 'Communication' tab selected. The interface includes a top navigation bar with 'Restart' and 'Factory reset' buttons. Below the navigation bar are four tabs: 'General', 'Communication', 'Upgrade', and 'Time And Date'. The 'Communication' tab is active, displaying the following settings:

- DHCP:** A toggle switch set to 'OFF'.
- IP Address:** A text input field containing '192 . 168 . 1 . 39'.
- Mask:** A text input field containing '255 . 255 . 0 . 0'.
- Gateway:** A text input field containing '192 . 168 . 0 . 1'.
- Primary DNS:** A text input field containing '0 . 0 . 0 . 0'.
- Secondary DNS:** A text input field containing '0 . 0 . 0 . 0'.
- Mac address:** A text input field containing 'ec-24-b8-d1-5f-b6'.
- TCP port:** A text input field containing '5000'.

At the bottom of the page, there is a 'Save' button.

Figure 113: Settings Page – Communication Tab

3. If DHCP is set to OFF, change any of the parameters (IP Address, Netmask and/or Gateway).
4. If required, change the TCP port number.
5. Click **Save**.



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

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

To set parameters when DHCP is set to ON:

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

Performing Firmware Upgrade

To perform firmware upgrade:

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

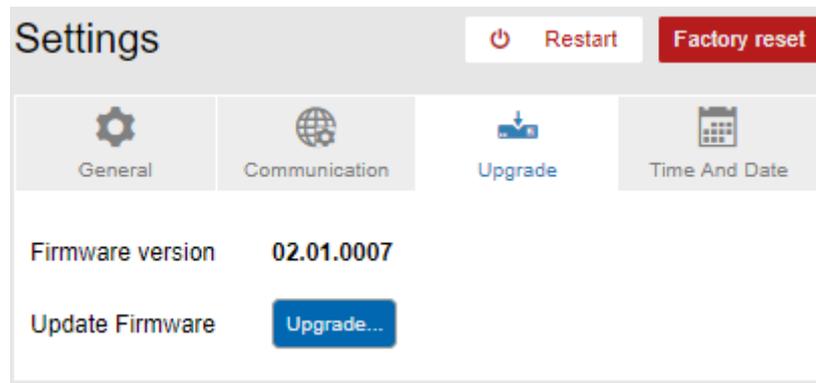


Figure 114: [Figure Caption]

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

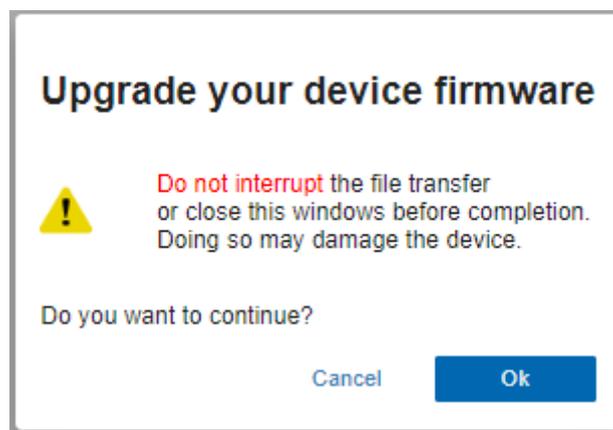


Figure 115: Device Settings Page – Firmware Upgrade Message

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

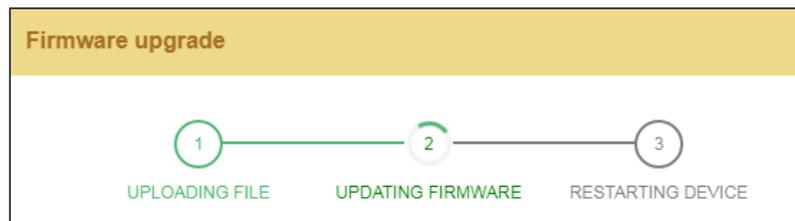


Figure 116: Device Settings Page – Firmware Upgrade Process

- Wait for the device to restart.

Setting the Date and Time

To set the time and date:

- In the Navigation pane, click **Settings**. The General tab in the Settings page appears.
- Select the Time and Date tab.

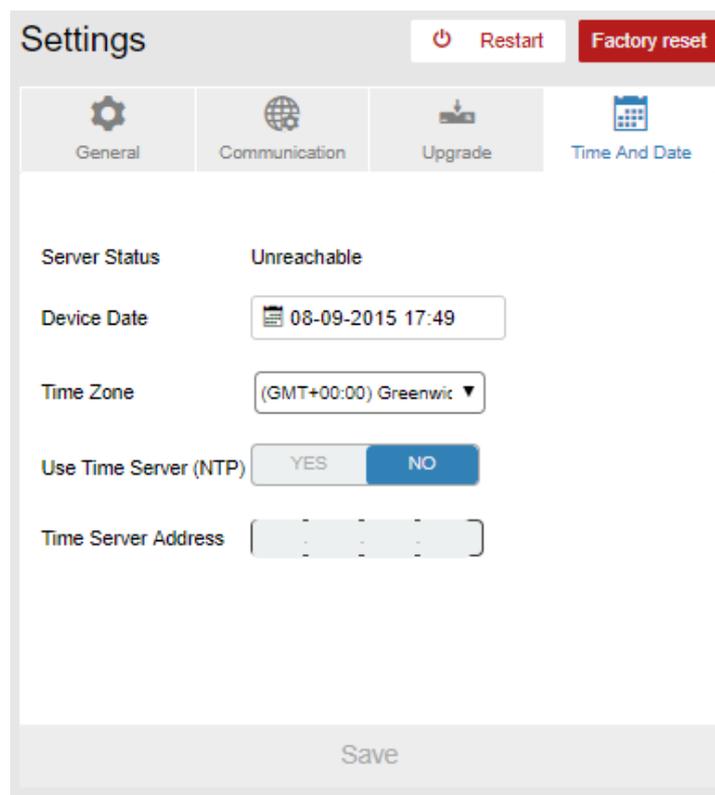


Figure 117: Time and Date

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

Viewing the About Page

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

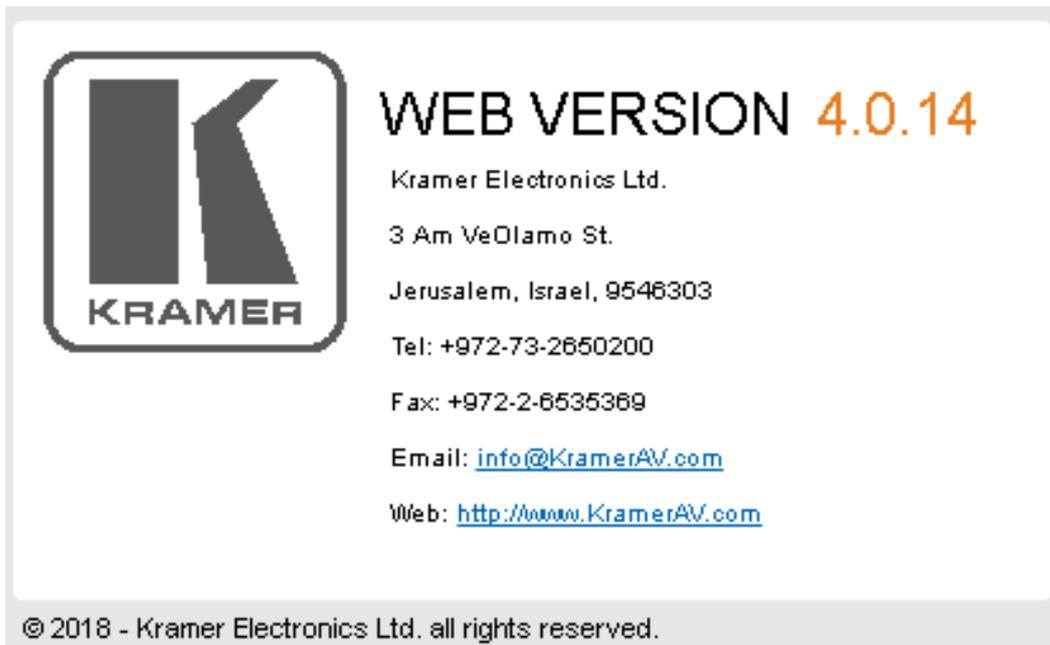


Figure 118: About Page

Technical Specifications

Inputs	Matrix	
	VS-88UT	
	4 HDMI	On female HDMI connectors
	4 HDBT/4 HDMI (Selectable)	On RJ-45/female HDMI connectors
	4 Unbalanced Stereo Audio	On 3.5mm mini jacks
	4 Balanced Stereo Audio/8 Balanced Mic (Selectable)	On 5-pin/3-pin terminal block connectors
	4 IR	On 3.5mm mini jacks for IR tunneling via HDBT
	VS-84UT	
	6 HDMI	On female HDMI connectors
	2 HDBT	On RJ-45 connectors
	4 Unbalanced Stereo Audio	On 3.5mm mini jacks
	4 Balanced Stereo Audio/8 Balanced Mic (Selectable)	On 5-pin/3-pin terminal block connectors
	2 IR	On 3.5mm mini jacks for IR tunneling via HDBT
	Controller	
	2 IR	On 3.5mm mini jacks
	Outputs	Matrix
VS-88UT		
6 HDMI		On female HDMI connectors
2 HDBT		On RJ-45 female connectors
2 Balanced Stereo Audio		On 5-pin terminal block connectors
1 Stereo Speaker Output, 2x50W into 4Ω		On a 4-pin terminal block connector
2 IR		On 3.5mm mini jacks for IR tunneling via HDBT
VS-84UT		
2 HDMI		On female HDMI connectors
2 HDBT		On RJ-45 female connectors
2 Balanced Stereo Audio		On 5-pin terminal block connectors
1 Stereo Speaker Output, 2x50W into 4Ω		On a 4-pin terminal block connector
2 IR		On 3.5mm mini jacks for IR tunneling via HDBT
Ports		Matrix
	1 RS-232	On a 3-pin terminal block for serial tunneling via HDBT
	1 RS-232	On a 3-pin terminal block for device control
	4 USB (2+2)	On female USB-A connectors for USB link extension
	2 USB	On female USB-B connectors for USB link extension
	ETH Control	On a RJ-45 female connector
	ETH Data 1G	On an RJ-45 female connector
	1 100BaseT Ethernet	On an RJ-45 female connector for device control and LAN extension

Ports	Controller	
	1 K-NET 5mm Mini-jack (For Learning).	On a 4-pin terminal block connector
	1 RS-485	On a 3-pin terminal block connector
	4 RS-232	On 3-pin terminal block connectors
	8 Relays	On 2-pin terminal block connectors (36V AC or DC, 2A, 60VAC maximum on non-inductive load)
	4 GPI/O	On 2-pin terminal blocks
	1 Mini USB	Connector for programming services
Extension Reach	4K @60Hz (4:2:0)	Up to 100m (330ft)
	Full HD (1080p @60Hz 36bpp)	Up to 130m (430ft)
	HDBaseT Ultra Mode and Full HD (1080p @60Hz 24bpp)	Up to 180m (590ft)
	Compliance	HDBaseT 2.0
Controls	ON	LED indicator
	STATUS	LED indicator
	Controller	
	K-NET Termination	Switch (down for termination)
	RS-485 Terminator	Switch (down for termination)
	PROG	Switch (down for programming)
Video	Max Bandwidth	10.2Gbps (3.4Gbps per graphic channel)
	Max Resolution	4K @60Hz (4:2:0) 24bpp resolution
	Compliance	HDMI and HDCP 1.4
Analog Audio	Max Level	1 Vrms
	THD + NOISE	0.03% @1kHz at nominal level
Extended USB	Host Compliance	1.1 and 2.0
	Max Extended Line Rate Bandwidth	127Mbps (out of max 480 USB)
	Max Devices	7
	Max Hubs	2
	Max Ports per Hub	8
Extended Ethernet	Max Transmission Bandwidth	100Mbps
Extended RS-232	Baud Rate	300 to 57600
Control RS-232	Baud Rate	115200
Supported PC Web Browsers	Windows 7 and Higher	Internet Explorer (32/64 bit) version 10 Firefox version 30 Chrome version 35
	MAC	Chrome version 35 Firefox version 30 Safari version 7
	Optimal Resolution	1920x1080
	Minimal Resolution	1024 x 768
Power	Consumption	VS-88UT: 250VA VS-84UT: 200VA
	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, UL
	Environmental	RoHs, WEEE
Enclosure	Size	19", 19", 2U, rack mountable
	Type	Aluminum
	Cooling	Fan ventilation
General	Net Dimensions (W, D, H)	43.7cm x 30.6cm x 8.8cm (17.2" x 12" x 3.5")
	Shipping Dimensions (W, D, H)	52.6cm x 47.5cm x 18.4cm (20.7" x 18.7" x 7.2")
	Net Weight	3.9kg (8.6lbs)
	Shipping Weight	5.4kg (11.9lbs) approx.
Accessories	Included	Power cord
	Optional	For optimum range and performance use the recommended USB, Ethernet, serial and IR Kramer cables available at www.kramerav.com/product/VS-88UT
Specifications are subject to change without notice at www.kramerav.com		

Default Communication Parameters

RS-232			
Protocol 3000			
Baud Rate:	115200	Stop Bits:	1
Data Bits:	8	Parity:	None
Example (Set the volume on analog audio input 5 to 10dB):	#X-AUD-LVL IN.ANALOG_AUDIO.5.AUDIO.1,10		
TCP/IP Parameters			
IP Address:	192.168.1.39	UDP Port #:	50000
Subnet mask:	255.255.000.000	Maximum UDP Connections:	Unlimited
Default gateway:	192.168.0.1	Maximum TCP Connections:	70 (Web client not connected)
TCP Port #:	5000	Maximum TCP Connections:	10 (Web client connected)
Full Factory Reset			
Protocol 3000	Use "#FACTORY" command and use "#RESET" to restore the factory default values.		

Protocol 3000

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

Understanding Protocol 3000

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

- **Command format:**

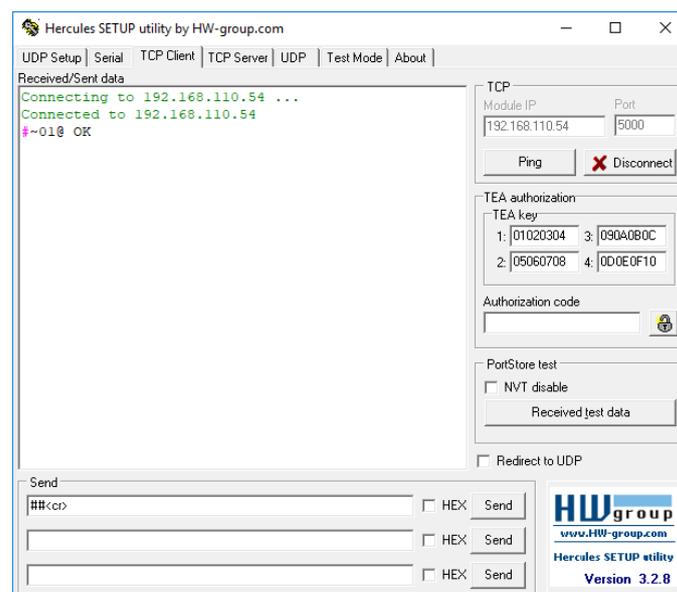
Prefix	Command Name	Constant (Space)	Parameter(s)	Suffix
#	Command	_	Parameter	<CR>

- **Feedback format:**

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

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

The command framing varies according to how you interface with the **VS-88UT**. The following figure displays how the # command is framed using terminal communication software (such as Hercules):



Protocol 3000 Commands



This table describes the VS-88UT protocol commands. Note that this protocol is the same for VS-84UT except for the number of inputs and outputs. For example, in the Display command output can be set from 1 to 8 for VS-88UT and from 1 to 4 for VS-84UT.

Function	Description	Syntax	Parameters/Attributes	Example
#	<p>Protocol handshaking.</p> <p>① Validates the Protocol 3000 connection and gets the machine number.</p> <p>Step-in master products use this command to identify the availability of a device.</p>	<p>COMMAND</p> <p>#<CR></p> <p>FEEDBACK</p> <p>~nn@_OK<CR><LF></p>		#<CR>
AV-SW-TIMEOUT	Set auto switching timeout.	<p>COMMAND</p> <p>#AV-SW-TIMEOUT_<u>action</u>,<u>time_out</u><CR></p> <p>FEEDBACK</p> <p>~nn@AV-SW-TIMEOUT_<u>action</u>,<u>time_out</u><CR><LF></p>	<p>action –</p> <ul style="list-style-type: none"> 0 – Video signal lost. 1 – New video signal detected. 4 – Disable 5V on video output if no input signal detected 5 – Video cable unplugged. 7 – Video signal lost for signal routed as a result of a manual override action. <p>time_out – Timeout in seconds 0 - 60000</p>	Set the auto switching timeout to 5 seconds in the event of 5V disable when no input signal is detected: #AV-SW-TIMEOUT_ <u>4</u> , <u>5</u> <CR>
AV-SW-TIMEOUT?	Get auto switching timeout.	<p>COMMAND</p> <p>#AV-SW-TIMEOUT?_<u>action</u><CR></p> <p>FEEDBACK</p> <p>~nn@AV-SW-TIMEOUT_<u>action</u>,<u>time_out</u><CR><LF></p>	<p>action –</p> <ul style="list-style-type: none"> 0 – Video signal lost. 1 – New video signal detected. 4 – Disable 5V on video output if no input signal detected 5 – Video cable unplugged. 7 – Video signal lost for signal routed as a result of a manual override action. <p>time_out – Timeout in seconds</p>	Get the Disable 5V on video output if no input signal detected timeout: #AV-SW-TIMEOUT?_ <u>d</u> <CR>
BUILD-DATE?	Get device build date.	<p>COMMAND</p> <p>#BUILD-DATE?_<u>date</u><CR></p> <p>FEEDBACK</p> <p>~nn@BUILD-DATE_<u>date</u>,<u>time</u><CR><LF></p>	<p>date – Format: YYYY/MM/DD where YYYY = Year MM = Month DD = Day</p> <p>time – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds</p>	Get the device build date: #BUILD-DATE?<CR>
CPEDID	<p>Copy EDID data from the output to the input EEPROM.</p> <p>① Destination bitmap size depends on device properties (for 64 inputs it is a 64-bit word).</p> <p>Example: bitmap 0x0013 means inputs 1,2 and 5 are loaded with the new EDID.</p> <p>In certain products Safe_mode is an optional parameter. See the HELP command for its availability.</p>	<p>COMMAND</p> <p>#CPEDID_<u>src_type</u>,<u>src_id</u>,<u>dst_type</u>,<u>dest_bitmap</u><CR></p> <p>or</p> <p>#CPEDID_<u>src_type</u>,<u>src_id</u>,<u>dst_type</u>,<u>dest_bitmap</u>,<u>safe_mode</u><CR></p> <p>FEEDBACK</p> <p>~nn@CPEDID_<u>src_stg</u>,<u>src_id</u>,<u>dst_type</u>,<u>dest_bitmap</u><CR><LF></p> <p>~nn@CPEDID_<u>src_stg</u>,<u>src_id</u>,<u>st_type</u>,<u>dest_bitmap</u>,<u>safe_mode</u><CR><LF></p>	<p>src_type – EDID source type (usually output)</p> <ul style="list-style-type: none"> 0 – Input 1 – Output 2 – Default EDID 3 – Custom EDID <p>src_id – Number of chosen source stage</p> <ul style="list-style-type: none"> 0 – Default EDID source 1 – Output 1 2 – Output 2 <p>dst_type – EDID destination type (usually input)</p> <ul style="list-style-type: none"> 0 – Input <p>dest_bitmap – Bitmap representing destination IDs. Format: XXXX...X, where X is hex digit. The binary form of every hex digit represents corresponding destinations.</p> <ul style="list-style-type: none"> 0 – indicates that EDID data is not copied to this destination. 1 – indicates that EDID data is copied to this destination. <p>safe_mode –</p> <ul style="list-style-type: none"> 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_ <u>1</u> , <u>1</u> , <u>0</u> , <u>0x1</u> <CR>
DISPLAY?	Get output HPD status.	<p>COMMAND</p> <p>#DISPLAY?_<u>out_id</u><CR></p> <p>FEEDBACK</p> <p>~nn@DISPLAY_<u>out_id</u>,<u>status</u><CR><LF></p>	<p>out_id – Output number</p> <ul style="list-style-type: none"> 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 <p>status – HPD status according to signal validation</p> <ul style="list-style-type: none"> 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?_ <u>1</u> <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 _{<direction_type>} .<port_type>.<port_index>.<signal_type>.<index>,audio_format<CR><LF>	The following attributes comprise the signal ID: input_id – Output number 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 Audio_format – Audio block added to EDID: 0 – Auto 1 – LPCM 2CH	Set HDMI IN 1 audio capabilities for EDID (LPCM 2CH): #EDID-AUDIO _{1,1} <CR>
EDID-AUDIO?	Get audio capabilities for EDID.	COMMAND #EDID-AUDIO?_input_id<CR> FEEDBACK ~nn@EDID-AUDIO _{input_id} ,audio_format<CR><LF>	The following attributes comprise the input ID: input_id – Output number 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 Audio_format – Audio block added to EDID: 0 – Auto 1 – LPCM 2CH	Get HDMI IN 1 audio capabilities for EDID: #EDID-AUDIO?_1<CR>
EDID-CS	Set EDID color space. <i>i</i> Set command might change the current EDID.	COMMAND #EDID-CS _{input_id} ,ColSpace<CR> FEEDBACK ~nn@EDID-CS _{id} ,ColSpace<CR><LF>	The following attributes comprise the ID: input_id – Output number 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 ColSpace – Color space 0 – RGB 4 – Auto	Set HDMI IN 3 EDID color space to Auto (enabled): #EDID-CS _{3,0} <CR>
EDID-CS?	Get EDID color space. <i>i</i> Get command might change the current EDID.	COMMAND #EDID-CS?_id<CR> FEEDBACK ~nn@EDID-CS _{id} ,ColSpace<CR><LF>	The following attributes comprise the ID: input_id – Output number 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 ColSpace – Color space 0 – RGB 4 – Auto	Get EDID color space: #EDID-CS?_3<CR>
ETH-PORT	Set Ethernet port protocol. <i>i</i> 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 _{portType} ,ETHPort<CR> FEEDBACK ~nn@ETH-PORT _{portType} ,ETHPort<CR><LF>	portType – TCP/UDP ETHPort – 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?_portType<CR> FEEDBACK ~nn@ETH-PORT _{portType} ,ETHPort<CR><LF>	portType – TCP/UDP 0 – TCP 1 – UDP ETHPort – TCP / UDP port number (0 – 65535)	Get the Ethernet port protocol for UDP: #ETH-PORT?_1<CR>
FACTORY	Reset device to factory default configuration. <i>i</i> 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>
FEATURE-LIST?	Get feature state according to the feature ID.	COMMAND #FEATURE-LIST?_id<CR> FEEDBACK ~nn@FEATURE-LIST _{id} ,enable<CR><LF>	id – Feature ID) 1 – Maestro 2 – Room controller 3 – Maestro panel enable – 0 – disable 1 – enable	Get the room controller feature state (for the room controller 1): #FEATURE-LIST?_1<CR>

Function	Description	Syntax	Parameters/Attributes	Example
GLOBAL-MUTE	<p>EMERGENCY mode: mute all the VIDEO/AUDIO outputs.</p> <p>i This command is designed to be triggered by the REMOTE MUTE Terminal Block GPIO port localized on the REAR Panel in case of emergency event in which is the customer is interested by muting all Video /Audio outputs. This state is not persistent and is not saved after power cycle. The REMOTE MUTE trigger needs to last at least 0.5 sec in order to trigger a global system mute.</p>	<p>COMMAND #GLOBAL-MUTE_ state<CR></p> <p>FEEDBACK ~nn@GLOBAL-MUTE_ state<CR><LF></p>	state – OFF/ON (not case sensitive)	Set GLOBAL-MUTE On: #GLOBAL-MUTE_ ON<CR>
GLOBAL-MUTE?	<p>Gets the remote mute ON/OFF state.</p> <p>i This command is designed to be triggered by the REMOTE MUTE Terminal Block GPIO port localized on the REAR Panel in case of emergency event in which is the customer is interested by muting all Video /Audio outputs. This state is not persistent and is not saved after power cycle. The REMOTE MUTE trigger needs to last at least 0.5 sec in order to trigger a global system mute.</p>	<p>COMMAND #GLOBAL-MUTE?_<CR></p> <p>FEEDBACK ~nn@GLOBAL-MUTE_ state<CR><LF></p>	state – OFF/ON (not case sensitive)	Get GLOBAL-MUTE state: #GLOBAL-MUTE?_<CR>
GLOBAL-POE	<p>Set global power over Ethernet ON/OFF.</p> <p>i This is an Extended Protocol 3000 command.</p>	<p>COMMAND #GLOBAL-POE_ state<CR></p> <p>FEEDBACK Get: ~nn@GLOBAL-POE_ state<CR><LF></p>	state – On/Off (not case sensitive)	Set the power over Ethernet global state to on: #GLOBAL-POE_ ON<CR>
GLOBAL-POE?	<p>Get power over Ethernet state.</p> <p>i This is an Extended Protocol 3000 command.</p>	<p>COMMAND #GLOBAL-POE?_<CR></p> <p>FEEDBACK Get: ~nn@GLOBAL-POE_ state<CR><LF></p>	state – On/Off (not case sensitive)	Get the power over Ethernet state: #GLOBAL-POE?_<CR>
HDCP-MOD	<p>Set HDCP mode.</p> <p>i Set HDCP working mode on the device input:</p> <p>HDCP supported - HDCP_ON [default].</p> <p>HDCP not supported - HDCP OFF.</p> <p>HDCP support changes following detected sink - MIRROR OUTPUT.</p> <p>When you define 3 as the mode, the HDCP status is defined according to the connected output in the following priority: OUT 1, OUT 2. If the connected display on OUT 2 supports HDCP, but OUT 1 does not, then HDCP is defined as not supported. If OUT 1 is not connected, then HDCP is defined by OUT 2.</p>	<p>COMMAND #HDCP-MOD_ inp_id,mode<CR></p> <p>FEEDBACK ~nn@HDCP-MOD_ inp_id,mode<CR><LF></p>	<p>input_id – Output number</p> <p>1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8</p> <p>mode – HDCP mode: 0 – HDCP Off 1 – HDCP On</p>	Set the input HDCP-MODE of IN 1 to Off: #HDCP-MOD_ 1,0<CR>
HDCP-MOD?	<p>Get HDCP mode.</p> <p>i Set HDCP working mode on the device input:</p> <p>HDCP supported - HDCP_ON [default].</p> <p>HDCP not supported - HDCP OFF.</p> <p>HDCP support changes following detected sink - MIRROR OUTPUT.</p>	<p>COMMAND #HDCP-MOD?_ inp_id<CR></p> <p>FEEDBACK ~nn@HDCP-MOD_ inp_id,mode<CR><LF></p>	<p>input_id – Output number</p> <p>1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8</p> <p>mode – HDCP mode: 0 – HDCP Off 1 – HDCP On</p>	Get the input HDCP-MODE of IN 1 HDMI: #HDCP-MOD?_ 1,<CR>

Function	Description	Syntax	Parameters/Attributes	Example
HDCP-STAT?	<p>Get HDCP signal status.</p> <p>① Output stage (1) – get the HDCP signal status of the sink device connected to the specified output.</p> <p>Input stage (0) – get the HDCP signal status of the source device connected to the specified input.</p>	<p>COMMAND</p> <pre>#HDCP-STAT?_stage,stage_id<CR></pre> <p>FEEDBACK</p> <pre>~nn@HDCP-STAT_stage,stage_id,status<CR><LF></pre>	<p>stage – Input/Output</p> <ul style="list-style-type: none"> 0 – Input 1 – Output <p>stage_id – Number of chosen stage for the input stage</p> <ul style="list-style-type: none"> 1 – Input 1 2 – Input 2 3 – Input 2 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 <p>For the output stage</p> <ul style="list-style-type: none"> 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 <p>status – Signal encryption status - valid values On/Off</p> <ul style="list-style-type: none"> 0 – HDCP Off 1 – HDCP On 	<p>Get the output HDCP-STATUS of IN 1:</p> <pre>#HDCP-STAT?_0,1<CR></pre>
HELP	<p>Get command list or help for specific command.</p>	<p>COMMAND</p> <pre>#HELP<CR></pre> <p>FEEDBACK</p> <pre>#HELP_command_name<CR></pre> <p>FEEDBACK</p> <pre>1. Multi-line:~nn@Device_command,_command...<CR><LF></pre> <p>To get help for command use: HELP (COMMAND_NAME)<CR><LF></p> <pre>~nn@HELP_command:<CR><LF></pre> <pre>description<CR><LF></pre> <pre>USAGE: usage<CR><LF></pre>	<p>command – Name of a specific command</p>	<p>Get the command list:</p> <pre>#HELP<CR></pre> <p>To get help for AV-SW-TIMEOUT:</p> <pre>HELP_AV-SW-TIMEOUT<CR></pre>
LOG-TAIL?	<p>Get the last "n" lines of message logs.</p> <p>① Used for advanced troubleshooting. Helps find error root causes and gets details not displayed in the error code number.</p>	<p>COMMAND</p> <pre>#LOG-TAIL?_line_num<CR></pre> <p>FEEDBACK</p> <pre>Get:~nn@LOG-TAILnn<CR><LF></pre> <pre>Line content #1<CR><LF></pre> <pre>Line content #2<CR><LF></pre> <pre>Etc...</pre>	<p>Line_num – Optional, default line_num is 10</p>	<p>Get the last "2" lines of message logs:</p> <pre>#LOG-TAIL?_2<CR></pre>
MATRIX-STATUS?	<p>Get routing status of all output ports.</p> <p>① This syntax uses the new convention of using brackets to define a list of fields "[]".</p>	<p>COMMAND</p> <pre>#MATRIX-STATUS?_<CR></pre> <p>FEEDBACK</p> <pre>Multi-line:~nn@MATRIX-STATUS_[[<direction_type>.<port_type>.<port_index1>.<signal_type>.<index1>,[[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>],...]<CR><LF></pre>	<p>The following attributes comprise the output signal ID (suffix 1) and input signal ID (suffix 2 or greater):</p> <ul style="list-style-type: none"> ▪ <direction_type> – IN ▪ <port_type> – <ul style="list-style-type: none"> o HDMI o HDBT o ANALOG_AUDIO o AMPLIFIED_AUDIO o MIC o RS-232 o IR o USB_A o USB_B ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> o VIDEO o AUDIO o RS232 o IR o USB_A o USB_B ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type 	<p>Get the room controller current matrix state:</p> <pre>#MATRIX-STATUS?_<CR></pre>
MODEL?	<p>Get device model.</p> <p>① This command identifies equipment connected to VS-88UT and notifies of identity changes to the connected equipment. The Matrix saves this data in memory to answer REMOTE-INFO requests.</p>	<p>COMMAND</p> <pre>#MODEL?_<CR></pre> <p>FEEDBACK</p> <pre>~nn@MODEL_model_name<CR><LF></pre>	<p>model_name – String of up to 19 printable ASCII chars</p>	<p>Get the device model:</p> <pre>#MODEL?_<CR></pre>

Function	Description	Syntax	Parameters/Attributes	Example
NAME	<p>Set machine (DNS) name.</p> <p>① 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).</p>	<p>COMMAND</p> <pre>#NAME machine_name<CR></pre> <p>FEEDBACK</p> <pre>~nn@NAME machine_name<CR><LF></pre>	<p>machine_name – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)</p>	<p>Set the DNS name of the device to room-442:</p> <pre>#NAME room-442<CR></pre>
NAME?	<p>Get machine (DNS) name.</p> <p>① 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).</p>	<p>COMMAND</p> <pre>#NAME?_<CR></pre> <p>FEEDBACK</p> <pre>~nn@NAME machine_name<CR><LF></pre>	<p>machine_name – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)</p>	<p>Get the DNS name of the device:</p> <pre>#NAME?_<CR></pre>
NAME-RST	<p>Reset machine (DNS) name to factory default.</p> <p>① Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number.</p>	<p>COMMAND</p> <pre>#NAME-RST<CR></pre> <p>FEEDBACK</p> <pre>~nn@NAME-RST OK<CR><LF></pre>		<p>Reset the machine name (S/N last digits are 0102):</p> <pre>#NAME-RST KRAMER_0102<CR></pre>
NET-CONFIG	<p>Set a network configuration.</p> <p>① Parameters, [DNS1] and [DNS2] are optional.</p> <p>② 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.</p> <p>③ 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.</p>	<p>COMMAND</p> <pre>#NET-CONFIG id,ip,net_mask,gateway,[DNS1],[DNS2]<CR></pre> <p>FEEDBACK</p> <pre>~nn@NET-CONFIG id,ip,net_mask,gateway<CR><LF></pre>	<p>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....</p> <p>ip – Network IP</p> <p>net_mask – Network mask</p> <p>gateway – Network gateway</p>	<p>Set the device network parameters to IP address 192.168.113.10, net mask 255.255.0.0, and gateway 192.168.0.1:</p> <pre>#NET-CONFIG 0,192.168.113.10,255.255.0.0,192.168.0.1<CR></pre>
NET-CONFIG?	<p>Get a network configuration.</p>	<p>COMMAND</p> <pre>#NET-CONFIG? id<CR></pre> <p>FEEDBACK</p> <pre>~nn@NET-CONFIG id,ip,net_mask,gateway<CR><LF></pre>	<p>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....</p> <p>ip – Network IP</p> <p>net_mask – Network mask</p> <p>gateway – Network gateway</p>	<p>Get network configuration:</p> <pre>#NET-CONFIG? id<CR></pre>
NET-DHCP	<p>Set DHCP mode.</p> <p>① Only 1 is relevant for the mode value. To disable DHCP, the user must configure a static IP address for the device.</p> <p>Connecting Ethernet to devices with DHCP may take more time in some networks.</p> <p>To connect with a randomly assigned IP by DHCP, specify the device DNS name (if available) using the NAME command. You can also get an assigned IP by direct connection to USB or RS-232 protocol port, if available.</p> <p>For proper settings consult your network administrator.</p> <p>② 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.</p>	<p>COMMAND</p> <pre>#NET-DHCP id,mode<CR></pre> <p>FEEDBACK</p> <pre>~nn@NET-DHCP id,mode<CR><LF></pre>	<p>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....</p> <p>mode –</p> <p>1 – Try to use DHCP. (If unavailable, use the IP address set by the factory or the NET-IP command).</p>	<p>Enable DHCP mode for port 1, if available:</p> <pre>#NET-DHCP 1,1<CR></pre>

Function	Description	Syntax	Parameters/Attributes	Example
NET-DHCP?	Get DHCP mode. ① 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?_id<CR> FEEDBACK ~nn@NET-DHCP_id,mode<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.... 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 for port 1: #NET-DHCP?_1<CR>
NET-DNS?	Get DNS name server. ① 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,ip<CR><LF>	dns_id – ID of the DNS name server to retrieve, indexing starts at "0" Iip – IP address of the DNS server	Get DNS name server: #NET-DNS?_<CR>
NET-GATE	Set gateway IP. ① 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.	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>
NET-GATE?	Get gateway IP. ① A network gateway connects the device via another network and maybe over the Internet. Be aware of security problems.	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. ① For proper settings consult your network administrator.	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.	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. ① 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. ① For proper settings consult your network administrator.	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.	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. ① 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. ① 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>

Function	Description	Syntax	Parameters/Attributes	Example
PORTS-LIST?	<p>Get the port list of this machine.</p> <p>i The response is returned in one line and terminated with <code><CR><LF></code>.</p> <p>The response format lists port IDs separated by commas.</p> <p>This is an Extended Protocol 3000 command.</p>	COMMAND <code>#PORTS-LIST?_<CR></code> FEEDBACK <code>~nn@PORTS-LIST_[<direction_type>.<port_type>.<port_index>,...]<CR><LF></code>	<p>The following attributes comprise the port ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ○ BOTH ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ STEPIN ○ MIC ○ RS-232 ○ IR ○ USB_A ○ USB_B ▪ <port_index> – The port number as printed on the rear panel 	<p>Get the ports list:</p> <code>#PORTS-LIST?_<CR></code>
PROT-VER?	<p>Get device protocol version.</p>	COMMAND <code>#PROT-VER?_<CR></code> FEEDBACK <code>~nn@PROT-VER_3000:version<CR><LF></code>	version – XX.XX where X is a decimal digit	<p>Get the device protocol version:</p> <code>#PROT-VER?_<CR></code>
RESET	<p>Reset device.</p> <p>i 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.</p>	COMMAND <code>#RESET<CR></code> FEEDBACK <code>~nn@RESET_OK<CR><LF></code>		<p>Reset the device:</p> <code>#RESET<CR></code>
SIGNAL?	<p>Get input signal status.</p>	COMMAND <code>#SIGNAL?_inp_id<CR></code> FEEDBACK <code>~nn@SIGNAL_inp_id,status<CR><LF></code>	inp_id – Input number 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 status – Signal status according to signal validation: 0 – Off 1 – On	<p>Get the input signal status of IN 1:</p> <code>#SIGNAL?_1<CR></code>
SIGNALS-LIST?	<p>Get signal ID list of this machine.</p> <p>i The response is returned in one line and terminated with <code><CR><LF></code>.</p> <p>The response format lists signal IDs separated by commas.</p> <p>This is an Extended Protocol 3000 command.</p>	COMMAND <code>#SIGNALS-LIST?_<CR><LF></code> FEEDBACK <code>~nn@SIGNALS-LIST_[<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,...]<CR><LF></code>	<p>The following attributes comprise the signal ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ○ BOTH ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ STEPIN ○ MIC ○ RS-232 ○ IR ○ USB_A ○ USB_B ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ○ AUDIO ○ RS232 ○ IR ○ USB ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type 	<p>Get signal ID list:</p> <code>#SIGNALS-LIST?_<CR></code>
SN?	<p>Get device serial number.</p>	COMMAND <code>#SN?_<CR></code> FEEDBACK <code>~nn@SN_serial_number<CR><LF></code>	serial_number – 14 decimal digits, factory assigned	<p>Get the device serial number:</p> <code>#SN?_<CR></code>
VERSION?	<p>Get firmware version number.</p>	COMMAND <code>#VERSION?_<CR></code> FEEDBACK <code>~nn@VERSION_firmware_version<CR><LF></code>	firmware_version – XX.XX.XXXX where the digit groups are: major.minor.build version	<p>Get the device firmware version number:</p> <code>#VERSION?_<CR></code>

Function	Description	Syntax	Parameters/Attributes	Example
X-AFV	Set output audio follow video mode. ⓘ This is an Extended Protocol 3000 command.	COMMAND #X-AFV<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,mode<CR> FEEDBACK ~nn@X-AFV<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,mode<CR><LF>	The following attributes comprise the signal ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type mode – OFF/ON, (not case sensitive)	Set the HDMI output 1 to audio follow video mode: #X-AFV_OUT.HDMI.1.VIDEO.1,ON<CR>
X-AFV?	Get output audio follow video mode. ⓘ This is an Extended Protocol 3000 command.	COMMAND #X-AFV?<direction_type>.<port_type>.<port_index>.<signal_type>.<index><CR> FEEDBACK ~nn@X-AFV<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,mode<CR><LF>	The following attributes comprise the signal ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type mode – OFF/ON, (not case sensitive)	Get the output audio follow video mode: #X-AFV?_OUT.HDMI.1.VIDEO.1<CR>
X-AUD-LVL	Set audio level of a specific signal. ⓘ This is an Extended Protocol 3000 command.	COMMAND #X-AUD-LVL<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,audio_level<CR> FEEDBACK ~nn@X-AUD-LVL<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,audio_level<CR><LF>	The following attributes comprise the signal ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ MIC ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ AUDIO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type audio_level – Audio level in dB (range between -83 to +24) depending of the ability of the product	Set the audio level of analog audio 5 input signal to 10: #X-AUD-LVL_IN.ANALOG_AUDIO.5.AUDIO.1,10<CR>
X-AUD-LVL?	Get audio level of a specific signal. ⓘ This is an Extended Protocol 3000 command.	COMMAND #X-AUD-LVL?<direction_type>.<port_type>.<port_index>.<signal_type>.<index><CR> FEEDBACK ~nn@X-AUD-LVL<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,audio_level<CR><LF>	The following attributes comprise the signal ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ MIC ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ AUDIO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type audio_level – Audio level in dB (range between -83 to +24) depending of the ability of the product	Get the audio level of the POWER AMP OUT signal: #X-AUD-LVL?_OUT.AMPLIFIED_AUDIO.1.AUDIO.1<CR>
X-AUD-LVL-RANGE?	Get the range of audio level in the product. ⓘ This is an Extended Protocol 3000 command.	COMMAND #X-AUD-LVL-RANGE?<direction_type>.<port_type>.<port_index>.<signal_type>.<index><CR> FEEDBACK ~nn@X-AUD-LVL-RANGE<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,audio_level_range<CR><LF>	The following attributes comprise the analog_output_id: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ MIC ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ AUDIO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type 	get the analog output 2 audio level range: #X-AUD-LVL-RANGE?_OUT.ANALOG_AUDIO.2.AUDIO.1<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_type>.<port_index>.<signal_type>.<index>,mode<CR> FEEDBACK ~nn@X-AUD-ONLY.<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,mode<CR><LF>	The following attributes comprise the signal ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ○ BOTH ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ MIC ○ RS-232 ○ IR ○ USB_A ○ USB_B ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ AUDIO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type mode – OFF/ON (not case sensitive)	Set HDMI OUT 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_type>.<port_index>.<signal_type>.<index><CR> FEEDBACK ~nn@X-AUD-ONLY.<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,mode<CR><LF>	The following attributes comprise the signal ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ○ BOTH ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ TOS ○ SPDIF ○ MIC ○ RS-232 ○ IR ○ USB_A ○ USB_B ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ○ AUDIO ○ ARC ○ RS232 ○ IR ○ USB ▪ <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_type>.<port_index>.<signal_type>.<index>,mode<CR> FEEDBACK ~nn@X-AV-SW-MODE.<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,mode<CR><LF>	The following attributes comprise the signal ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type mode – 0 – manual 1 – priority 2 – last connected	Set auto switch mode for HDMI OUT 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. ① This is an Extended Protocol 3000 command.	COMMAND #X-AV-SW-MODE?_<direction_type>.<port_type>.<port_index>.<signal_type>.<index><CR> FEEDBACK ~nn@X-AV-SW-MODE_<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,mode<CR><LF>	The following attributes comprise the signal ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type mode – 0 – manual 1 – priority 2 – last connected	Get auto switch mode for HDMI OUT 1: #X-AV-SW-MODE?_OUT.HDMI.1.VIDEO.1<CR>
X-LABEL	Set the port label. ① Labels are used commonly by WEB pages. This is an Extended Protocol 3000 command.	COMMAND #X-LABEL_<direction_type>.<port_type>.<port_index>,label_text<CR> FEEDBACK ~nn@X-LABEL_<direction_type>.<port_type>.<port_index>,label_text<CR><LF>	The following attributes comprise the port ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ MIC ▪ <port_index> – The port number as printed on the front or rear panel label_text – ASCII characters without space	Set the port label (for input 1): #X-LABEL_IN.HDMI.1,DVD<CR>
X-LABEL?	Get the port label. ① Labels are used commonly by WEB pages. This is an Extended Protocol 3000 command.	COMMAND #X-LABEL?_<direction_type>.<port_type>.<port_index><CR> FEEDBACK ~nn@X-LABEL_<direction_type>.<port_type>.<port_index>,label_text<CR><LF>	The following attributes comprise the port ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ MIC ▪ <port_index> – The port number as printed on the front or rear panel label_text – ASCII characters without space	Get the port label (for output 5): #X-LABEL?_OUT.HDMI.5<CR>
X-LONG-REACH	Set extra range (long reach) mode for HDBT ports. ① Some devices support extra range (long reach) mode, used in HDBT and SDI applications. Use the command #PORTS-LIST to list all port IDs available in the system. This is an Extended Protocol 3000 command.	COMMAND #X-LONG-REACH_<direction_type>.<port_type>.<port_index>,state<CR> FEEDBACK ~nn@X-LONG-REACH_<direction_type>.<port_type>.<port_index>,state<CR><LF>	The following attributes comprise the port ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel state – OFF/ON (not case sensitive)	Set extra range for HDBT IN 7: #X-LONG-REACH_IN.HDBT.7,On<CR>
X-LONG-REACH?	Get extra range (long reach) state configuration on any port. ① Some devices support extra range (long reach) mode, used in HDBT and SDI applications. Use the command #PORTS-LIST to list all port IDs available in the system. This is an Extended Protocol 3000 command.	COMMAND #X-LONG-REACH?_<direction_type>.<port_type>.<port_index><CR> FEEDBACK ~nn@X-LONG-REACH_<direction_type>.<port_type>.<port_index>,state<CR><LF>	The following attributes comprise the port ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel state – OFF/ON (not case sensitive)	Get the extra range (long reach) state configuration on any port: #X-LONG-REACH?_IN.HDBT.1<CR>

Function	Description	Syntax	Parameters/Attributes	Example
X-MIC-TYPE	Set microphone type.  This is an Extended Protocol 3000 command.	COMMAND <code>#X-MIC-TYPE_<direction_type>.<port_type>.<port_index>,mic_type<CR></code> FEEDBACK <code>~nn@X-MIC-TYPE_<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,mic_type<CR><LF></code>	The following attributes comprise the port ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ▪ <port_type> – <ul style="list-style-type: none"> ○ MIC ▪ <port_index> – The port number as printed on the front or rear panel 1 – Mic 1 2 – Mic 2 3 – Mic 2 4 – Mic 4 5 – Mic 5 6 – Mic 6 7 – Mic 7 8 – Mic 8 mic_type – Dynamic/Condenser (not case sensitive) 	Set MIC 3 type to condenser: <code>#X-MIC-TYPE_IN.MIC.3,condenser<CR></code>
X-MIC-TYPE?	Get microphone type.  This is an Extended Protocol 3000 command.	COMMAND <code>#X-MIC-TYPE?_<direction_type>.<port_type>.<port_index><CR></code> FEEDBACK <code>~nn@X-MIC-TYPE_<direction_type>.<port_type>.<port_index>,mic_type<CR><LF></code>	The following attributes comprise the port ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ▪ <port_type> – <ul style="list-style-type: none"> ○ MIC ▪ <port_index> – The port number as printed on the front or rear panel 1 – Mic 1 2 – Mic 2 3 – Mic 2 4 – Mic 4 5 – Mic 5 6 – Mic 6 7 – Mic 7 8 – Mic 8 mic_type – Dynamic/Condenser (not case sensitive) 	Get the microphone type: <code>#X-MIC-TYPE?_IN.MIC.1<CR></code>

X-MTX-SET-INPUTS	Set the 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 <code>#X-MTX-SET-INPUT_<direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>, .. ,]<CR></code> FEEDBACK <code>~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></code>	The following attributes comprise the port ID: <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN – Input ○ OUT – Output ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – Signal ID attribute: <ul style="list-style-type: none"> ○ AUDIO ○ VIDEO ○ DANTE ○ SPDIF ○ MIC ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ HDMI ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type 	#X-MTX-SET-INPUTS_<direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>, .. ,]<CR> <code>-01@X-MTX-SET-INPUTS_OUT.HDMI.1.VIDEO.1,[IN.HDMI.1.VIDEO.1,IN.HDMI.3.VIDEO.1]<CR><LF></code> <code>#X-MTX-SET-INPUTS_<direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>, .. ,]<CR></code> <code>-01@X-MTX-SET-INPUTS_OUT.HDMI.1.VIDEO.1,[IN.HDMI.1.VIDEO.1,IN.HDMI.3.VIDEO.1]<CR><LF></code>
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<p>X-MTX-SET-INPUTS?</p>	<p>Get the Auto Switching input signals group per output.</p> <p>i This is an Extended Protocol 3000 command.</p>	<p>COMMAND #X-MTX-SET-INPUT?<direction_type>. <port_type>. <port_index1>. <signal_type>. <index1><CR></p> <p>FEEDBACK Get: ~nn@X-MTX-SET-INPUT<direction_type>. <port_type>. <port_index1>. <signal_type>. <index1>. [<direction_type2>. <port_type2>. <port_index2>. <signal_type2>. <index2>,...]<CR><LF></p>	<p>The following attributes comprise the signal ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – Direction of the port <ul style="list-style-type: none"> ○ IN – Input ○ OUT – Output ○ BOTH – Bi-directional (e.g. for RS-232) ▪ <port_type> – Type of signal on the port: <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ TOS ○ SPDIF ○ MIC ○ RS-232 ○ IR ○ USB_A ○ USB_B ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – Signal ID attribute: <ul style="list-style-type: none"> ○ VIDEO ○ AUDIO ○ ARC ○ RS232 ○ IR ○ USB <p><index> – Indicates a specific channel number when there are multiple channels of the same type</p>	<pre>#X-MTX-SET-INPUTS<CR> ~01@X-MTX-SET-INPUTS OUT.HDMI.1.VIDEO.1.[IN.HDMI.1.VIDEO.1,IN.HDMI.3.VIDEO.1]<CR><LF> #X-MTX-SET-INPUTS<CR> ~01@X-MTX-SET-INPUTS OUT.HDMI.1.VIDEO.1.[IN.HDMI.1.VIDEO.1,IN.HDMI.3.VIDEO.1]<CR><LF></pre>
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<p>X-MUTE</p>	<p>Set mute ON/OFF on a specific signal.</p> <p>i 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.</p> <p>This is an Extended Protocol 3000 command.</p>	<p>COMMAND #X-MUTE<direction_type>. <port_type>. <port_index>. <signal_type>. <index>. state<CR></p> <p>FEEDBACK ~nn@X-MUTE<direction_type>. <port_type>. <port_index>. <signal_type>. <index>. state<CR><LF></p>	<p>The following attributes comprise the signal ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ○ BOTH ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ MIC ○ RS-232 ○ IR ○ USB_A ○ USB_B ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ○ AUDIO ○ RS232 ○ IR ○ USB ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type <p>state – OFF/ON (not case sensitive)</p>	<pre>#X-MUTE_OUT.HDMI.4.VIDEO.1,ON<CR></pre>
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X-MUTE?	<p>Get mute ON/OFF state on a specific signal.</p> <p>ⓘ 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.</p> <p>This is an Extended Protocol 3000 command.</p>	<p>COMMAND <code>#X-MUTE?,<direction_type>.<port_type>.<port_index>.<signal_type>.<index><CR></code></p> <p>FEEDBACK <code>~nn@X-MUTE,<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,state<CR><LF></code></p>	<p>The following attributes comprise the signal ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ○ BOTH ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ MIC ○ RS-232 ○ IR ○ USB_A ○ USB_B ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ○ AUDIO ○ RS232 ○ IR ○ USB ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type <p>state – OFF/ON (not case sensitive)</p>	<p>Get the mute ON/OFF state on a specific signal: <code>#X-MUTE?_OUT.HDMI.4.VIDEO.1<CR></code></p>
X-PATTERN	<p>Set a pattern on a specific output signal.</p> <p>ⓘ 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.</p> <p>This is an Extended Protocol 3000 command.</p>	<p>COMMAND <code>#X-PATTERN,<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,pattern_id<CR></code></p> <p>FEEDBACK <code>~nn@X-PATTERN,<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,pattern_id<CR><LF></code></p>	<p>The following attributes comprise the signal ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type <p>pattern_id – 0 (pattern mode is OFF), if greater then 0, it is a pattern index number.</p> <ul style="list-style-type: none"> 0 – None 1 – Black screen 2 – Blue screen 3 – White screen 4 – Four blue squares 5 – Vertical RGB colors bar 6 – Grey scale 7 – Split bar 8 – BW-12 (vertical mixed bar BW) 9 – Cross chess B&W 10 – Black squares chess 11 – V grey scale split bar <p>Pattern index numbers can be retrieved using the command: <code>#X-PATTERNS-LIST?</code></p>	<p>Set video pattern 3 on HDMI OUT 8 (enabled): <code>#X-PATTERN_OUT.HDMI.8.VIDEO.1,3<CR></code></p>

<p>X-PATTERN?</p>	<p>Get selected pattern on a specific output signal.</p> <p>① 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.</p> <p>This is an Extended Protocol 3000 command.</p>	<p>COMMAND <code>#X-PATTERN?_<direction_type>.<port_type>.<port_index>.<signal_type>.<index><CR></code></p> <p>FEEDBACK <code>~nn@X-PATTERN_<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,pattern_id<CR><LF></code></p>	<p>The following attributes comprise the signal ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type <p>pattern_id – 0 (pattern mode is OFF) numbers (pattern numbers according to what the X-PATTERNS-list command returns)</p> <ul style="list-style-type: none"> 0 – None 1 – Black screen 2 – Blue screen 3 – White screen 4 – Four blue squares 5 – Vertical RGB colors bar 6 – Grey scale 7 – Split bar 8 – BW-12 (vertical mixed bar BW) 9 – Cross chess B&W 10 – Black squares chess 11 – V grey scale split bar <p>Pattern list can be retrieved using the command: #PATTERNS-LIST?</p>	<p>Get the selected pattern on a specific output signal: <code>#X-PATTERN?_OUT.ANALOG_AUDIO.1.AUDIO.1<CR></code></p>
<p>X-PATTERNS-LIST?</p>	<p>Get pattern indexes available per signal ID and usable in the command X-PATTERN.</p> <p>① Not all products support patterns for all layers. This list can be usable into X-PATTERN.</p> <p>This is an Extended Protocol 3000 command.</p>	<p>COMMAND <code>#X-PATTERNS-LIST?_<direction_type>.<port_type>.<port_index>.<signal_type>.<index><CR></code></p> <p>FEEDBACK <code>~nn@X-PATTERNS-LIST_<direction_type>.<port_type>.<port_index>.<signal_type>.<index>,pattern_id<CR><LF></code></p>	<p>The following attributes comprise the signal ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type 	<p>Get the patterns list: <code>#X-PATTERN-LIST?_<CR></code></p>
<p>X-POE</p>	<p>Set power over Ethernet state per port.</p>	<p>COMMAND <code>#X-POE_<port_id>,state<CR></code></p> <p>FEEDBACK <code>~nn@X-POE_<port_id>,state<CR><LF></code></p>	<p>port_id – The following attributes comprise the port ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel <p>state – PoE state:</p> <ul style="list-style-type: none"> ○ OFF (PoE disabled) ○ ON (PoE enabled) 	<p>Enable PoE for HDBT input #5: <code>#X-POE_IN.HDBT.5,ON<CR></code></p>
<p>X-POE?</p>	<p>Get power over Ethernet state per port.</p>	<p>COMMAND <code>#X-POE?_<port_id><CR></code></p> <p>FEEDBACK <code>~nn@X-POE_<port_id>,state<CR><LF></code></p>	<p>port_id – The following attributes comprise the port ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel <p>state – PoE state:</p> <ul style="list-style-type: none"> ○ OFF (PoE disabled) ○ ON (PoE enabled) 	<p>Get the PoE state for HDBT input #5: <code>#X-POE?_IN.HDBT.5<CR></code></p>
<p>X-POE-GROUPS?</p>	<p>Get power over Ethernet state for all ports.</p>	<p>COMMAND <code>#X-POE-GROUPS?<CR></code></p> <p>FEEDBACK <code>~nn@X-POE_<port_id>,<state> , [<port_id>,<state>] , [<port_id>,<state>]...<CR><LF></code></p>	<p>port_id – The following attributes comprise the port ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel <p>state – PoE state:</p> <ul style="list-style-type: none"> ○ OFF (PoE disabled) ○ ON (PoE enabled) 	<p>Get the PoE state for all ports: <code>#X-POE-GROUPS?<CR></code></p>

X-PORT-SELECT	<p>Select ID from selectable ports group.</p> <p>① User may query group names using command: #X-PORT-SELECT-LIST?.</p> <p>① This command is designed to be used by machines and not by users. This command is used for feature auto-discovery mechanism.</p> <p>① This is an Extended Protocol 3000 command.</p>	<p>COMMAND</p> <pre>#X-PORT-SELECT_group_name,selected_id<CR></pre> <p>FEEDBACK</p> <pre>~nn@X-PORT-SELECT_group_name,selected_id,[option_id:[<direction_type>.<port_type>.<port_index>],...,<direction_type>.<port_type>.<port_index>],...,<direction_type>.<port_type>.<port_index>]]<CR><LF></pre>	<p>group_name – These are predefined groups names, related to a specific product. (e.g., IN.AUDIO.1 or IN.VIDEO.5)</p> <p>selected_id – Currently selected option ID.</p> <p>option_id – Each option has an ID. Only one option may be selected at the same time. When a specific option is selected, all related port-id members become selected and all port-id members from other, unselected options, become unselected. The following attributes comprise the port ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ MIC ▪ <port_index> – The port number as printed on the front or rear panel 	<p>Select ID 2 from selectable ports group:</p> <pre>#X-PORT-SELECT_IN.AUDIO.1,2<CR></pre>
X-PORT-SELECT?	<p>Get selected ID of selectable ports group.</p> <p>① User may query group names using command: #X-PORT-SELECT-LIST?.</p> <p>This command is designed to be used by machines and not by users. This command is used for feature auto-discovery mechanism.</p> <p>This is an Extended Protocol 3000 command.</p>	<p>COMMAND</p> <pre>#X-PORT-SELECT?_group_name<CR></pre> <p>FEEDBACK</p> <pre>~nn@X-PORT-SELECT_group_name,selected_id,[option_id:[<direction_type>.<port_type>.<port_index>],...,<direction_type>.<port_type>.<port_index>],...,<direction_type>.<port_type>.<port_index>]]<CR><LF></pre>	<p>group_name – These are predefined groups names, related to a specific product. (e.g., IN.AUDIO.1 or IN.VIDEO.5)</p> <p>selected_id – Currently selected option ID.</p> <p>option_id – Each option has an ID. Only one option may be selected at the same time. When a specific option is selected, all related port-id members become selected and all port-id members from other, unselected options, become unselected. The following attributes comprise the port ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ MIC ▪ <port_index> – The port number as printed on the front or rear panel 	<p>Get the selected ID of port ID "IN.AUDIO.1":</p> <pre>#X-PORT-SELECT?_IN.AUDIO.1,2<CR></pre>
X-PORT-SELECT-LIST?	<p>Get selected id of selectable ports groups of all available groups.</p> <p>① User may query group names using command: #X-PORT-SELECT-LIST?.</p> <p>This is an Extended Protocol 3000 command.</p>	<p>COMMAND</p> <pre>#X-PORT-SELECT-LIST?_<CR></pre> <p>FEEDBACK</p> <pre>~nn@X-PORT-SELECT-LIST?_[[group_name,selected_id,[option_id:[<direction_type>.<port_type>.<port_index>],...,<direction_type>.<port_type>.<port_index>],...,<direction_type>.<port_type>.<port_index>],...,<direction_type>.<port_type>.<port_index>]],...,[group_name,selected_id,[option_id:[<direction_type>.<port_type>.<port_index>],...,<direction_type>.<port_type>.<port_index>],...,<direction_type>.<port_type>.<port_index>]]]<CR><LF></pre>	<p>The following attributes comprise the port ID:</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ IN ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ MIC ▪ <port_index> – The port number as printed on the front or rear panel 	<p>Get the selected id of selectable ports groups of all available groups:</p> <pre>#X-PORT-SELECT-LIST?<CR></pre>
X-PRIORITY	<p>Set auto switching input signals group & priorities per output.</p> <p>① The order of the inputs in the list is fixing the order to the priority. The highest priority is 1, then 2 etc..</p> <p>X-PRIORITY is also defining implicitly the video inputs group list for Last-connected auto switching strategy.</p> <p>X-PRIORITY override X-MTX-SET-INPUTS configuration.</p> <p>Auto switching group list is common for all Auto switching strategies (last connected/ priority).</p> <p>This syntax uses the new convention of using brackets to define a list of fields "[]".</p> <p>This is an Extended Protocol 3000 command.</p>	<p>COMMAND</p> <pre>#X-PRIORITY_<direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>],...,<CR></pre> <p>FEEDBACK</p> <pre>~nn@X-PRIORITY_<direction_type1>.<port_type1>.<port_index1>.<signal_type1>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>],...,<CR><LF></pre>	<p>The following attributes comprise the output signal ID (suffix 1) and input signal ID (suffix 2):</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type 	<p>Set the auto switching input signals group & priorities per output:</p> <pre>#X-PRIORITY_OUT.HDMI.2.VIDEO.1,[IN.HDMI.1.VIDEO.1,IN.HDMI.2.VIDEO.1,IN.HDMI.3.VIDEO.1]<CR></pre>

<p>X-PRIORITY?</p>	<p>Get auto switching input signals group priorities per output.</p> <p>① The order of the inputs in the list is fixing the order to the priority. The highest priority is 1, then 2 etc..</p> <p>X-PRIORITY is also defining implicitly the video inputs group list for Last-connected auto switching strategy.</p> <p>X-PRIORITY override X-MTX-SET-INPUTS configuration.</p> <p>Auto switching group list is common for all Auto switching strategies (last connected/ priority).</p> <p>This syntax uses the new convention of using brackets to define a list of fields "[]".</p> <p>This is an Extended Protocol 3000 command.</p>	<p>COMMAND</p> <pre>#X-PRIORITY?_<direction_type>.<port_type>.<port_index1>.<signal_type1>.<index1><CR></pre> <p>FEEDBACK</p> <pre>~nn@X-PRIORITY_<direction_type>.<port_type>.<port_index1>.<signal_type1>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>,...]<CR><LF></pre>	<p>The following attributes comprise the output signal ID (suffix 1) and input signal ID (suffix 2):</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ OUT ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type 	<p>Get the auto switching input signals group & priorities per output:</p> <pre>#X-PRIORITY?_OUT.HDMI.2.VIDEO.1<CR></pre>
<p>X-ROUTE</p>	<p>Send routing command to matrix.</p> <p>① 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.</p> <p>Video 1 is the default port in this command and is implied even if not written:</p> <pre>#X-ROUTE_OUT.SDI.5,IN.SDI.1<CR></pre> <p>is interpreted as:</p> <pre>#X-ROUTE_OUT.SDI.5.VIDEO.1,IN.SDI.1.VIDEO.1<CR></pre> <p>This is an Extended Protocol 3000 command.</p>	<p>COMMAND</p> <pre>#X-ROUTE_<direction_type>.<port_type>.<port_index1>.<signal_type1>.<index1>,<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2><CR></pre> <p>FEEDBACK</p> <pre>~nn@X-ROUTE_<direction_type>.<port_type>.<port_index1>.<signal_type1>.<index1>,<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2><CR><LF></pre>	<p>The following attributes comprise the output signal ID (suffix 1) and input signal ID (suffix 2 or greater):</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ OUT ○ IN ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ MIC ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ○ AUDIO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type 	<p>Route HDMI IN 2 to HDMI OUT 3:</p> <pre>#X-ROUTE_OUT.HDMI.3.VIDEO.1,IN.HDMI.2.VIDEO.1<CR></pre>
<p>X-ROUTE?</p>	<p>Get routing status.</p> <p>① 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.</p> <p>VIDEO.1 are the default <signal_type> and <index> in this command and are implied even if not written:</p> <pre>#X-ROUTE_OUT.SDI.5,IN.SDI.1<CR></pre> <p>is interpreted as:</p> <pre>#X-ROUTE_OUT.SDI.5.VIDEO.1,IN.SDI.1.VIDEO.1<CR></pre> <p>This is an Extended Protocol 3000 command.</p>	<p>COMMAND</p> <pre>#X-ROUTE?_<direction_type>.<port_type>.<port_index1>.<signal_type1>.<index1><CR></pre> <p>FEEDBACK</p> <pre>~nn@X-ROUTE_<direction_type>.<port_type>.<port_index1>.<signal_type1>.<index1>,<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2><CR><LF></pre>	<p>The following attributes comprise the output signal ID (suffix 1) and input signal ID (suffix 2 or greater):</p> <ul style="list-style-type: none"> ▪ <direction_type> – <ul style="list-style-type: none"> ○ OUT ○ IN ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ MIC ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ○ AUDIO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type 	<p>Get the routing status:</p> <pre>#X-ROUTE?_OUT.HDMI.3.VIDEO.1<CR></pre>

X-SET-FOLLOWERS	<p>Set followers list for a given input signal.</p> <p>ⓘ This syntax uses the new convention of using brackets to define a list of fields "[]".</p> <p>This is an Extended Protocol 3000 command.</p>	<p>COMMAND</p> <pre>#X-SET-FOLLOWERS_<direction_type>.<port_type>.<port_index1>.<signal_type>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>,...]<CR></pre> <p>FEEDBACK</p> <pre>~nn@X-SET-FOLLOWERS_<direction_type>.<port_type>.<port_index1>.<signal_type>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>,...]<CR><LF></pre>	<p>The following attributes comprise the primary signal ID (suffix 1) and follower signal ID (suffix 2 or greater):</p> <ul style="list-style-type: none"> ▪ <direction_type> – IN <ul style="list-style-type: none"> ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ MIC ○ RS-232 ○ IR ○ USB_A ○ USB_B ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ○ AUDIO ○ RS232 ○ IR ○ USB ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type 	<p>Set HDMI 1 audio signal and HDBT 7 IR signal to follow HDBT IN 7:</p> <pre>#X-SET-FOLLOWERS_IN.HDBT.7.VIDEO.1,[IN.HDMI.1.AUDIO.1,IN.HDBT.7.IR.1]<CR></pre>
X-SET-FOLLOWERS?	<p>Get followers list of a given input signal.</p> <p>ⓘ This syntax uses the new convention of using brackets to define a list of fields "[]".</p> <p>This is an Extended Protocol 3000 command.</p>	<p>COMMAND</p> <pre>#X-SET-FOLLOWERS?_<direction_type>.<port_type>.<port_index>.<signal_type>.<index><CR></pre> <p>FEEDBACK</p> <pre>~nn@X-SET-FOLLOWERS_<direction_type>.<port_type>.<port_index1>.<signal_type>.<index1>,[<direction_type2>.<port_type2>.<port_index2>.<signal_type2>.<index2>,...]<CR><LF></pre>	<p>The following attributes comprise the primary signal ID (suffix 1) and follower signal ID (suffix 2 or greater):</p> <ul style="list-style-type: none"> ▪ <direction_type> – IN <ul style="list-style-type: none"> ▪ <port_type> – <ul style="list-style-type: none"> ○ HDMI ○ HDBT ○ ANALOG_AUDIO ○ AMPLIFIED_AUDIO ○ MIC ○ RS-232 ○ IR ○ USB_A ○ USB_B ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – <ul style="list-style-type: none"> ○ VIDEO ○ AUDIO ○ RS232 ○ IR ○ USB ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type 	<p>Get the followers list of a HDMI 2 input signal:</p> <pre>#X-SET-FOLLOWERS?_IN.HDMI.2.VIDEO.1<CR></pre>

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 – no changed
ERR_WRONG_MODE	33	Wrong operation mode
ERR_NOT_CONFIGURED	34	Device/chip was not initialized



P/N:



2900-300582

Rev:



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SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

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

We welcome your questions, comments, and feedback.

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