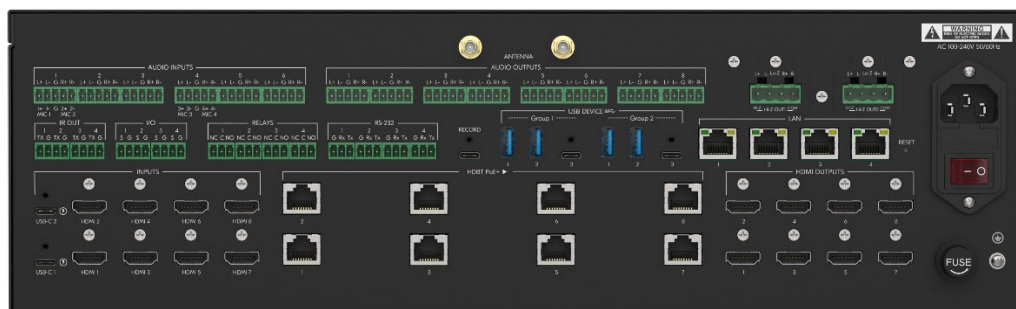




USER MANUAL

MODEL:

MTX3-88-PR-PRO
8x8 4K60 All-in-one-Matrix



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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/MTX3-88-PR-PRO to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

Achieving Best Performance

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).
- Do not secure the cables in tight bundles or roll the slack into tight coils.
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality.
- Position your Kramer **MTX3-88-PR-PRO** 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 is located on the bottom of the unit.
- This equipment is not suitable for use in locations where children are likely to be present.
 - Replacement of a battery with an incorrect type that can defeat a safeguard (for example, in the case of some lithium battery types);
 - Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, that can result in an explosion;
 - Leaving a battery in an extremely high temperature surrounding environment that can result in an explosion or the leakage of flammable liquid or gas; and
 - A battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas.

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/il/quality/environment.

Overview

Congratulations on purchasing your Kramer **MTX3-88-PR-PRO** 8x8 4K60 All-in-one Matrix.

The MTX3-88-PR-PRO is a high-performance video processing and fast-switching scaling matrix, with coupled AV + USB routing of eight USB-C, HDMI, and air-casting inputs, eight interchangeable HDBaseT 3.0 input or output ports, and eight HDMI outputs, for local and remote content sharing and multi-view presentations. Matrix has integrated audio DSP and rich set of analog and digital interfaces, audio and AV streaming, dual USB devices groups, for high-quality audio-visual experience during hybrid sessions in large spaces and divisible halls. The matrix provides an abundant set of integrated capabilities applicable for numerous different deployment scenarios.

Exceptional Quality

- **Premium All-in-one Matrix** — High-resolution scaling matrix with multi-signal routing of wired and wireless user interfaces, support for dual-screen USB-C, and advanced video processing for multi-view and video-wall presentations. The rich set of analog and Dante audio interfaces is mixed and processed by the integrated DSP for clear sound distribution to room deployed speakers. The unit includes built-in IP-based control capabilities, and AV streaming for content distribution and recording with enterprise-grade IT-networking and security. Integrated within a single product positions the matrix as premium, corner stone solution, delivering the highest quality of deployment and service experience to system integrators and IT managers, and premium operation to end users.
- **Fast <1sec AV Routing** — Clean and instantaneous input switching , with smooth and uninterrupted video transitions, greatly enhancing end-users' presentation experience.
- **Hybrid-meeting Collaborative Sessions** — Controllable coupled routing of AV and USB host inputs, either locally or remotely connected, for concurrent connection with local and remote AV outputs and room USB devices. Along with dual USB device groups, and controllable connectivity of remote USB hosts and devices, collaborative hybrid sessions are adaptable to demands in large and divisible spaces by sharing both space and online session peripherals.
- **BYOD Ease and Convenience** — Connect any DP-Alt-Mode-capable USB-C device as an AV presentation source and share content of single or dual screens, while providing the connected device with USB and Ethernet connection, and up to 60 watts of power, via a single USB-C cable connection only.
- **Convenient air-casting of any BYOD portable** via matrix integrated wireless connectivity and popular content sharing applications, further increasing the ease of any BYOD connectivity by guests and end-users.
- **Powerful Multi-view and Video-wall Matrix** — High-resolution video processing matrix, for flexible matrix-integrated multi-view and video-wall content presentations. Simultaneous multi-content sharing via multi-view presentation layouts, each window content from different input on multiple matrix local and remote outputs, with their mirroring on associated displays. In parallel, video-wall layouts from any input on multiple matrix local and remote outputs. Configurable presets drive end-user control simplicity and convenient presentation views adaptation to session content sharing needs.
- **High-Performance Scaling Experience** — Built-in high-resolution scaling technology for

optimal up or down image scaling and video processing delivering an exceptional end-user presentation experience.

Advanced and User-friendly Operation

- **Configurable Direction Extension Links** — Dual-role HDBaseT links are flexibly and independently set as either input (receive-side) or output (transmit-side) allowing adaptability to customer and space solution distribution needs.
- **Open Standard Streaming and Recording** — Supporting content sharing between enterprise worldwide sites, and recording in on-prem or cloud-based content management servers, via popular open standard H264/5 streaming over IT LAN and WAN networks

Flexible Connectivity

- **Feature Rich Audio Matrix** — Simplifying audio deployment significantly with flexible analog, power-amplified, digital, or IP-streamed connectivity to microphones and speakers featuring any-to-any audio routing.
- **Integrated studio-grade, high-performance DSP (Digital Signal Processor) audio system** with Acoustic Echo Cancellation (AEC), feedback cancellation, format conversion, mixing, ducking, and advanced filtering—ensuring echo-free, noise-free, crystal-clear audio across all input and output signals
- **Intelligent Solution and Room Control** — The matrix may be intuitively integrated with a Kramer Control controller to further enhance and simplify the user experience. Deploying the matrix with Kramer Control substantially reduces deployment and operation complexity and costs.

Standard Enterprise-Grade Secured Operation — Standard IT-grade authentication for secured IT LAN connectivity, and secured web-UI browsing and communication, with OWASP-10 (Open Web Application Security Project) penetration protection certification. This ensures secured remote end-user communication, customer operation, and matrix management.

- **Comprehensive Management** — Local front-panel button operation, remote and secured management via an integrated user-friendly web-UI server, and via remote IP-driven API control and management communication, offering flexible service options and ensure lasting, field proven deployment.
- **Easy and Elegant Installation** — This All-in-one, integrated device features single cable connectivity for all eight HDBaseT ports, each delivering PoE power to paired endpoints. It significantly reduces space requirements and simplifies wiring, mounting, integration, and overall deployment costs.

Typical Applications

MTX3-88-PR-PRO is ideal for the following typical applications:

- Enterprise divisible conference halls, boardrooms, and large training centers.
- Education lecture halls and auditoriums.
- Governmental large facilities, such as court rooms and visitor centers.
- Any fast-switching content sharing and hybrid sessions in large-space facilities.

Controlling your **MTX3-88-PR-PRO**

Control your **MTX3-88-PR-PRO** directly via the front panel push buttons, or:

- Via the IP commands transmitted by a controller and touch screen system, or a browser using built-in user-friendly Web pages.
- By RS-232 serial commands transmitted, for example, by a touch screen system, PC, or a serial controller.

Defining MTX3-88-PR-PRO

This section defines **MTX3-88-PR-PRO**.

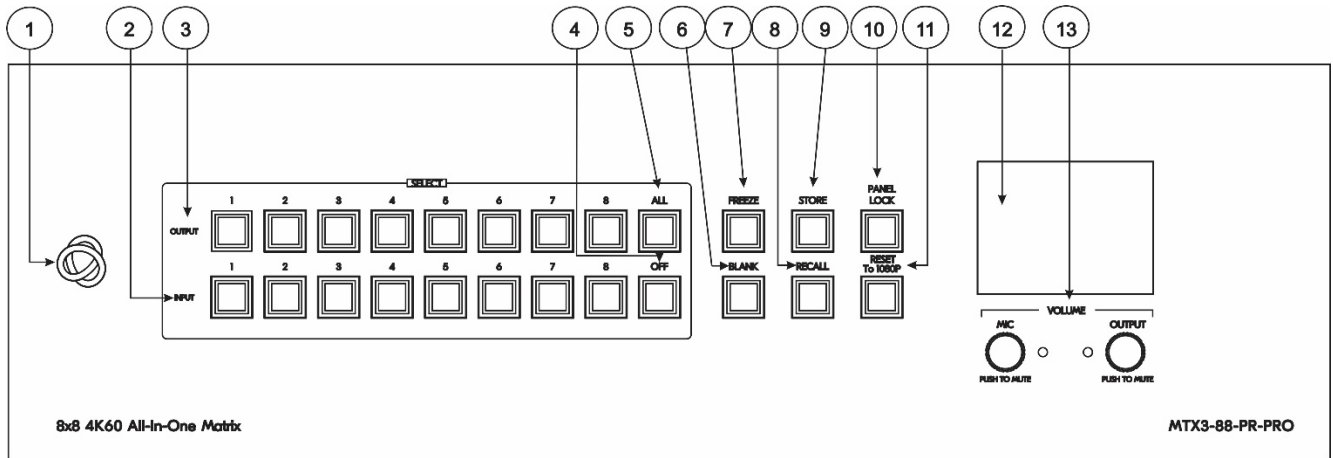


Figure 1: MTX3-88-PR-PRO 8x8 4K60 All-in-one-Matrix Front Pane

#	Feature	Function		
①	LED (behind the Kramer logo)	LED Device & Networking Status	Indicates	Screen Displayed Text (12)
		Dark	Power Off	--
		Lights red	Powering On	Restart
		Lights white	Power On	Active
			FW background download	Firmware download
			No IP address acquired	No active IP address
			A network has been detected and has a valid IP address	IP address acquired
			A device identification command was sent (Flag me)	Flag me is activated
②	INPUT SELECT Buttons (1 to 8)		Standby	Power-save stand-by
			IP fallback address / Network Issue	Fallback IP address is active; or network issue.
③	OUTPUT SELECT Buttons (1 to 8)	Press to select an output to which the input is routed.		
④	ALL Button	Press followed by an input button to connect the selected input to all outputs. For example, press ALL and then press IN 2: Input 2 is routed to all outputs.		
⑤	OFF Button	Press after pressing an output button to turn off the selected output. To turn off all the outputs, press ALL followed by OFF.		
⑥	BLANK Button	Press after pressing an OUT button (1~ 8) to toggle blanking for that output. The BLANK button lights if the output corresponding to the pressed-OUT button is blanked.		

#	Feature	Function	
⑦	FREEZE Button	Press after pressing an OUT button (1-8) to toggle freezing that output. The FREEZE button lights if the output corresponding to the pressed output button is frozen.	
⑧	RECALL Button	Press the RECALL button followed by pressing an OUT button (1-8) to recall the settings saved in the memory denoted by the OUT button number.	
⑨	STORE Button	Press the STORE button followed by pressing an OUT button (1-8) to store the settings. The current status (routing, audio and video settings, USB status and more) are saved in the memory denoted by the OUT button number.  Saved presets include routing status, audio and video settings and USB configurations.	
⑩	PANEL LOCK Button	Press and hold to toggle the locking/releasing of the front panel buttons.	
⑪	RESET To 1080P Button	Press and hold button for about 3 seconds to set the resolution on all outputs to 1080p.	
⑫	LCD Display	Shows the connection and device status.	
⑬	VOLUME	Name	Function
		MIC Knob	Turn clockwise/counterclockwise to increase/decrease the volume of all microphone inputs. Press to toggle muting/unmuting the microphones. When MUTED, the MIC LED lights red.
		MIC LED	Lit when the mic is muted
		OUTPUT Knob	Turn clockwise/counterclockwise to increase/decrease the volume of all outputs.  Includes analog and Dante but does not affect HDMI/HDBT outputs. Press to toggle muting/unmuting the audio outputs. When MUTED, the OUTPUT LED lights red.
		OUTPUT LED	Lit when the output is muted.

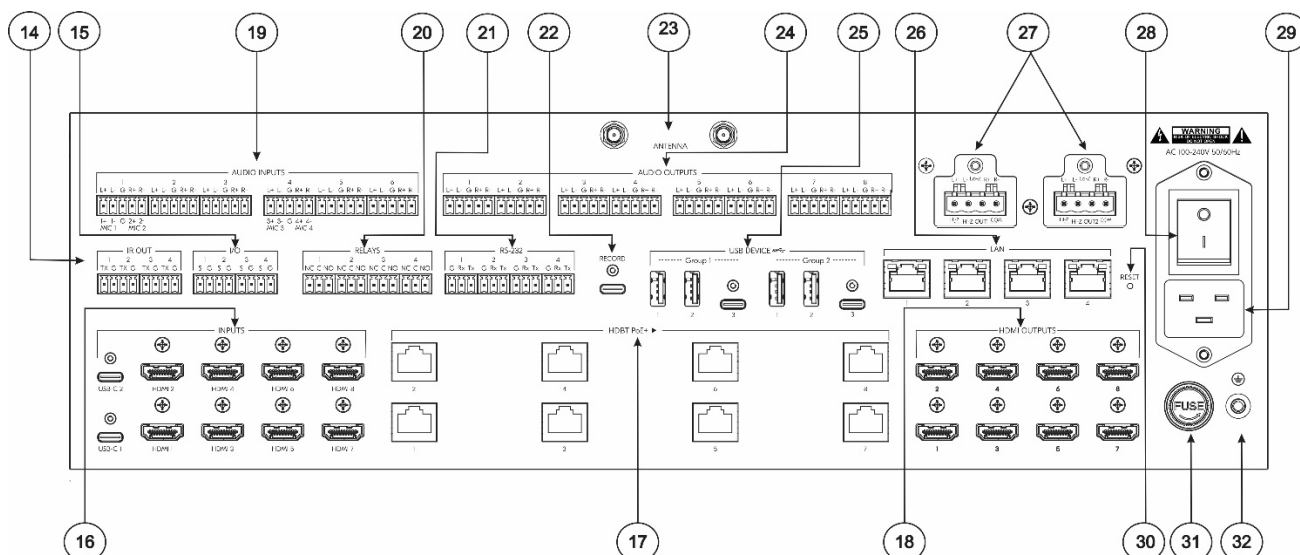


Figure 2: MTX3-88-PR-PRO 8x8 4K60 All-in-one-Matrix Rear Panel

#	Feature		Function
14	IR OUT 2-pin Terminal Block Connectors (1 to 4)		For controlling IR-controlled devices (for example, connect to IR emitter cables to control a TV monitor).
15	I/O 2-pin Terminal Block Connectors (1 to 4)		Connect to: - Input-triggering devices (for example, remote buttons or occupancy sensors), OR - Output-triggered devices (for example, remote alarm LED indication, blinds and lights, etc.). Each GPIO port may be configured as a digital input, a digital output or an analog input.
16	INPUTS	USB-C Connectors (1&2)	Connect to USB-C AV sources: - that support DisplayPort Alternate Mode, for example, a laptop) to share content. - to communicate with the USB devices (for example, a PTZ camera) that are connected to the device, - to connect to the LAN - to charge the connected sources (that support USB Power Delivery 2.0).
		HDMI Connectors (1-8)	Connect to an HDMI sources.
17	HDBT PoE+ RJ-45 Connectors (1 to 4)		Connect to PoE-accepting HDBT transmitters or receivers.
18	HDMI OUTPUTS Connectors (1 to 8)		Connect to HDMI acceptors.
19	AUDIO INPUTS	AUDIO 5-pin Terminal Block (1 to 6)	Connect to balanced stereo audio sources.
		MIC 3-pin Terminal Block (Mic 1 to Mic 4)	If configured as mic inputs, these ports may be connected to dynamic or condenser (with 48V phantom power) microphones.  GND is common for MIC 1&2 and MIC 3&4.
20	RELAYS 3-pin Terminal Block Connectors (1 to 4)		Connect to relay-controlled devices (for example, a projector screen).

#	Feature			Function
②1	RS-232 3-pin Terminal Block Connectors (1 to 4)			Connect to RS-232 controllers or RS-232 controlled devices (for example, a PTZ USB camera) to be controlled via an IP-connected controller (for example, SL-240C), or for extension to an HDBT device. RS-232 Port 1 can be configured for control of MTX3-88-PR-PRO.
②2	RECORD			Connect to an audio USB host (for example, a PC USB device port), for recording or monitoring the audio output.
②3	ANTENNA			Connect to antennas (included), with or without coax cables.
②4	AUDIO OUTPUTS 5-pin Terminal Block Connector (1 to 8)			Connect to balanced stereo audio acceptors.
②5	USB DEVICE	Group 1	USB 3.2 Type A Ports (1&2)	Connect to USB devices using type A connector.
			USB 3.2 Type-C Port (3)	Connect to USB devices using type C connector.
		Group 2	USB 3.2 Type A Ports (1&2)	Connect to USB devices using type A connector.
			USB 3.2 Type-C Port (3)	Connect to USB devices using type C connector.
②6	LAN RJ-45 Connector (1 to 4)			Connect to the LAN. LAN 1 is designated for device management and control. Other LAN ports are for all other IP services.
②7	Speaker Out			Outputs four selected audio signals in four channels. - For Lo-Z: connect stereo output to Lo-Z speakers: L+ and L- to the left speaker; R+R- to the right speaker. - For Hi-Z (70V or 100V): connect Hi-Z and COM to mono Hi-Z speakers.
②8	Mains Power Switch			Switch to turn the device On or Off.
②9	AC Socket (Mains power)			Connect to AC power
③0	RESET Button			Press to reboot or reset device to factory default. - To reboot the device, press and hold for 5 seconds. - To reset to factory default settings, press and hold continuously during the power-up cycle.
③1	FUSE (Mains power)			Fuse for protecting the device.
③2	GND			Connect to grounding wire (optional).

Mounting MTX3-88-PR-PRO

This section provides instructions for mounting **MTX3-88-PR-PRO**. Before installing, verify that the environment is within the recommended range:



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

**Caution:**

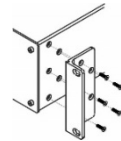
- Mount **MTX3-88-PR-PRO** before connecting any cables or power.

**Warning:**

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

Mount MTX3-88-PR-PRO in a rack:

- To rack mount the machine, attach both rack ears (by removing the screws from each side of the machine and replacing those screws through the rack ears) or place the machine on a table.

**Antenna Installation:****Caution:**

- Coax cable bending radius should be greater than 5cm.

Connecting MTX3-88-PR-PRO



Always switch off the power to each device before connecting it to your **MTX3-88-PR-PRO**. After connecting your **MTX3-88-PR-PRO**, connect its power and then switch on the power to each device.

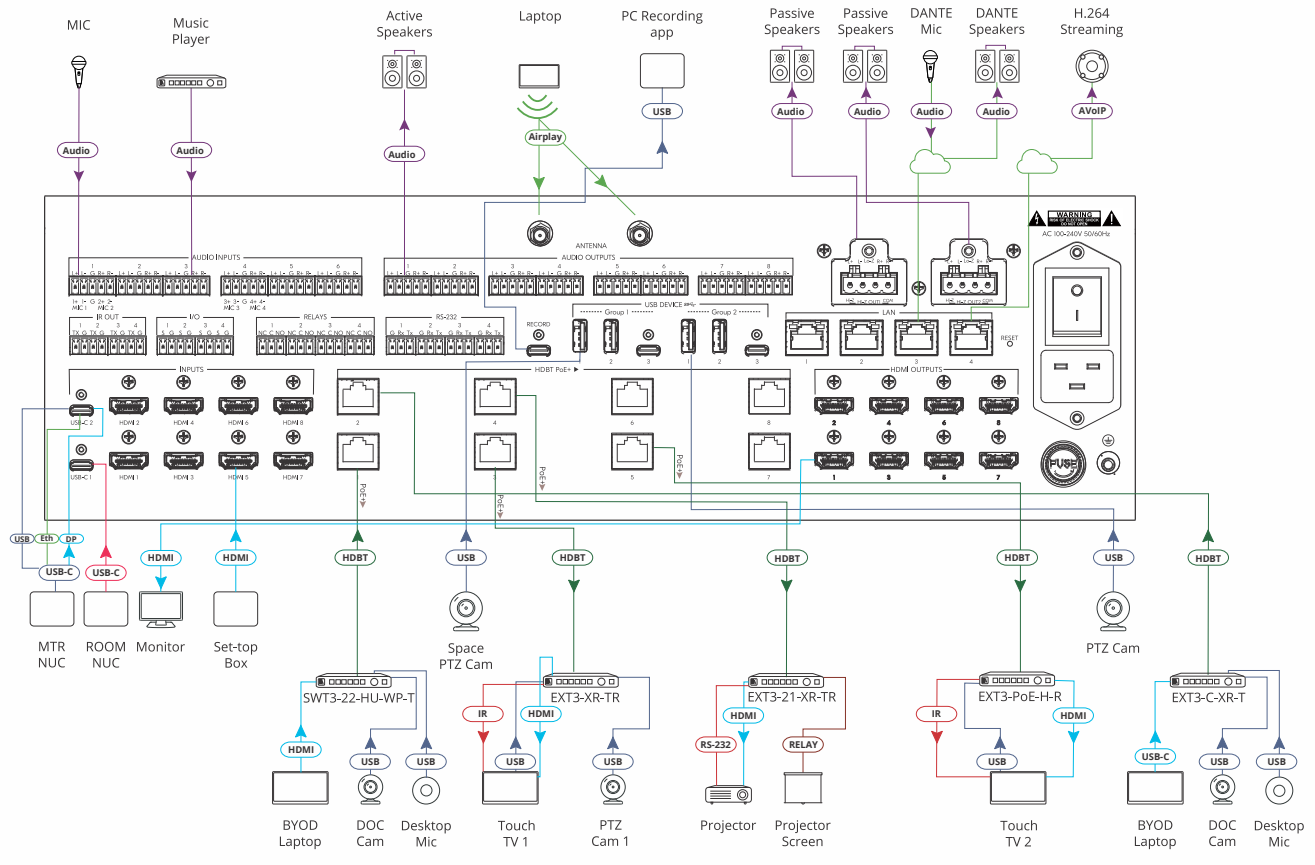


Figure 3: Connecting to the MTX3-88-PR-PRO Rear Panel

To connect **MTX3-88-PR-PRO** as illustrated in the example in [Figure 3](#):

1. Connect to HDBT PoE input port 1&2 (17) an HDBT transmitter (for example, SWT3-22-HU-WP-T or SWT3-3-HU-TR HDBT Transmitters).



USB devices that consume power greater than the power supplied by connected port (see Technical Specifications), should be powered by an external power supply.

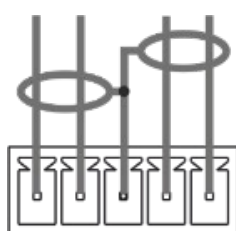
- On the **SWT3-22-HU-WP-T**:
 - Connect a USB-C source (for example, a laptop that supports Display Port Alternate Mode) to the USB-C IN connector.
 - Connect an HDMI source (for example, a document camera) to an HDMI acceptor.
 - Connect a USB device (for example, a desktop mic).
- On the **EXT3-C-XR-TR**:
 - Connect a USB-C source (for example, a laptop that supports Display Port Alternate Mode) to the USB-C IN connector.

- Connect an HDMI source (for example, a document camera) to an HDMI acceptor.
 - Connect a USB device (for example, a desktop mic).
2. Connect to HDBT output ports 3, 4 & 5 (17) to HDBT acceptors (for example, EXT3-21-XR-TR, EXT3-PoE-H-R, EXT3-XR-TR HDBT Receivers).
 - Connect an HDMI acceptor (for example, a Touch TV or a Projector) to the HDMI OUT connector.
 - Connect the touch TV to a USB device port.
 - Connect an HDMI source (for example, a PTZ camera) to the HDMI IN connector.
 - To control the touch TV via IR, connect IR OUT 3.5mm mini jack to an IR emitter cable and attach the cable emitter side to the IR sensor of the touch TV.
 - To serially control the PTZ camera and Projector, connect the RS-232 3-pin terminal block connector to the PTZ camera and projector.
 - To control the Projector screen, connect the Relay 3-pin terminal block connector to the screen.
 - On the EXT3-PoE-H-R:
 - Connect an HDMI acceptor (for example, a Touch TV) to the HDMI OUT connector.
 - Connect the touch TV to a USB device port.
 2. Connect a USB source (for example, a PTZ camera) to Group 1 (25) and a second USB device to group 2 (25).
 3. Connect a USB-C source (for example an MTR NUC or a Room NUC) to the USB-C IN connectors (16).
 4. Connect to HDMI input connectors 1-8 (16) to HDMI sources (for example an STB).
 6. Connect to AUDIO OUT 5-pin terminal block connectors 1-8 (24) to balanced stereo audio acceptors (for example, Kramer active speakers).
 7. Connect analog audio balanced mono and stereo sources (for example, a microphone and a music player) to the MIC and/or AUDIO IN 3-pin/6-pin terminal block connectors (19).
 8. Connect the power-amplified audio speaker Hi-Z OUT or Lo-Z OUT 4-pin terminal block connectors (27) to passive speakers as follows:
 - For Hi-Z connection:
 - Connect Hi-Z and COM terminal blocks to the + and – terminals of a mono speaker (for example, the Galil 8-C ceiling speakers, daisy chained).
 - For Lo-Z connection:
 - Connect the L+ and L- connectors to the left-side speaker and the R+ and R- connectors to the right-side.

9. Connect an audio USB recording device (for example a PC with a recording application) to the RECORD USB-C connector (22).
10. Connect the wireless antennas (included) directly, or via coax cables, to the Antenna connector (23), for portable (such as laptop) air-casting source connection.
11. Connect the LAN RJ-45 connectors (26) to the available IT IP network ports.
12. Connect the power to the mains electricity (not shown in [Figure 3](#)).

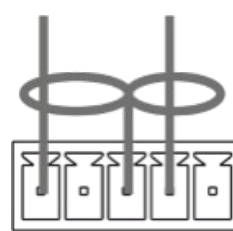
Connecting the Audio Line to a Balanced/Unbalanced Stereo Audio Acceptor

The following are the pinouts for connecting the output to a balanced or unbalanced stereo audio acceptor:



L+ L- G R+ R-

Figure 4: Connecting to a Balanced Stereo Audio Acceptor



L+ L- G R+ R-

Figure 5: Connecting to an Unbalanced Stereo Audio Acceptor

Connecting a Balanced/Unbalanced Stereo Audio Source to the Balanced Input

The following are the pinouts for connecting a balanced or unbalanced stereo audio source to the balanced input:

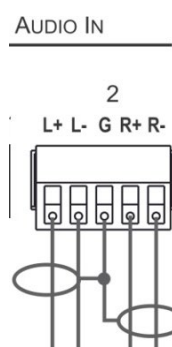


Figure 6: Connecting a balanced stereo audio source to the balanced input

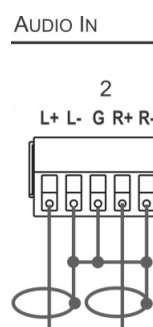


Figure 7: Connecting an unbalanced stereo audio source to the balanced input

Connecting to MTX3-88-PR-PRO via RS-232

You can connect to **MTX3-88-PR-PRO** via an RS-232 connection using, for example, a PC.

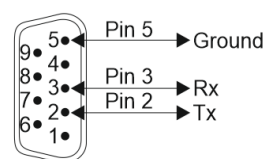
MTX3-88-PR-PRO features an RS-232 3-pin terminal block connector allowing the RS-232 to control **MTX3-88-PR-PRO**.

Connect the RS-232 terminal block on the rear panel of **MTX3-88-PR-PRO** to a PC/controller, as follows:

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

- Pin 2 to the TX pin on the **MTX3-88-PR-PRO** RS-232 terminal block
- Pin 3 to the RX pin on the **MTX3-88-PR-PRO** RS-232 terminal block
- Pin 5 to the G pin on the **MTX3-88-PR-PRO** RS-232 terminal block

RS-232 Device



MTX3-88-PR-PRO



Operating and Controlling the MTX3-88-PR-PRO

Principles of Operation

This section covers the following topics:

- [Routing Operation](#)
- [Matrix Auto Switching Clusters](#)
- [Splash Screen & Overlay](#)
- [Air Casting Presentation](#)
- [Recording via H.264/4 Streaming](#)
- [Advanced Audio Optimization Using the integrated audio DSP processing, the sound can be enhanced](#)
- [Presets](#)
- [Controlling via Built-in IP Gateway](#)
- [Secured IT-grade Networking](#)
- [Diagnostics](#)

Routing Operation

AV Routing

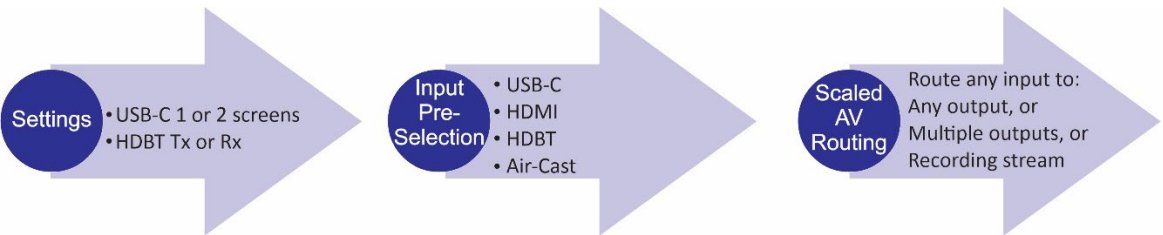


Figure 8: AV Routing Highlights

The table below shows for each input port, the AV input types available for selection, and the additional optional selections when USB-C ports are set to dual-screens.

Table 1: MTX3-88-PR-PRO AV Inputs

AV Input Port #	AV Available Selections	When USB-C is set to dual-screen
1	USB-C, HDMI, or HDBT	USB-C 1 Screen 1
2	USB-C, HDMI, or HDBT	USB-C 2 Screen 1
3	HDMI, or HDBT	N/A
4	HDMI, or HDBT	N/A
5	HDMI, or HDBT	N/A

AV Input Port #	AV Available Selections	When USB-C is set to dual-screen
6	HDMI, or HDBT	N/A
7	USB-C, HDMI, or HDBT	USB-C 1 Screen 2
8	HDMI, or HDBT	USB-C 2 Screen 2
9	Air-cast	N/A

USB Routing

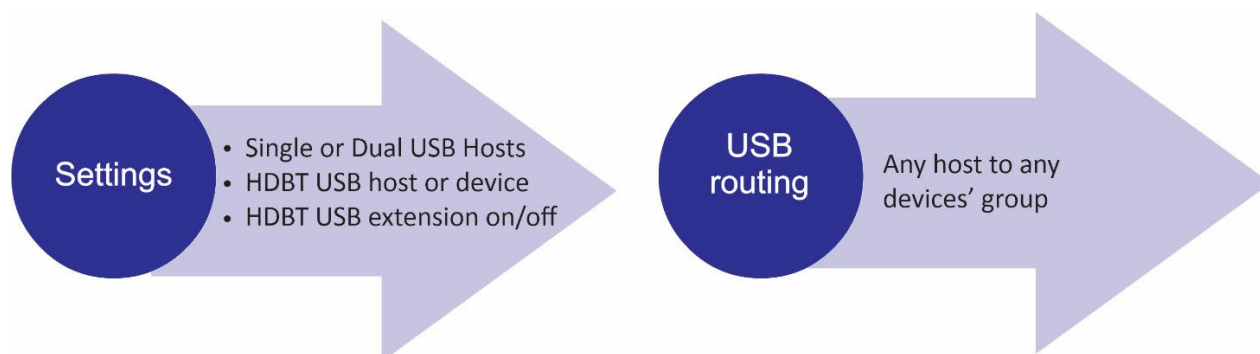


Figure 9: USB Routing Highlights

User can set the following USB features:

- Dual USB Hosts: Two different laptops/desktops can operate simultaneously as active USB hosts with different USB device groups.
- HDBT USB host or device: Set the role of remote USB peripheral, connected to the paired HDBT end-point, as either USB host (such as laptop) or USB device (such as USB camera).
- HDBT USB extension on/off: Enable (or disable) USB extension over the HDBT port to connect local and remote USB peripherals.

Audio Processing and Routing

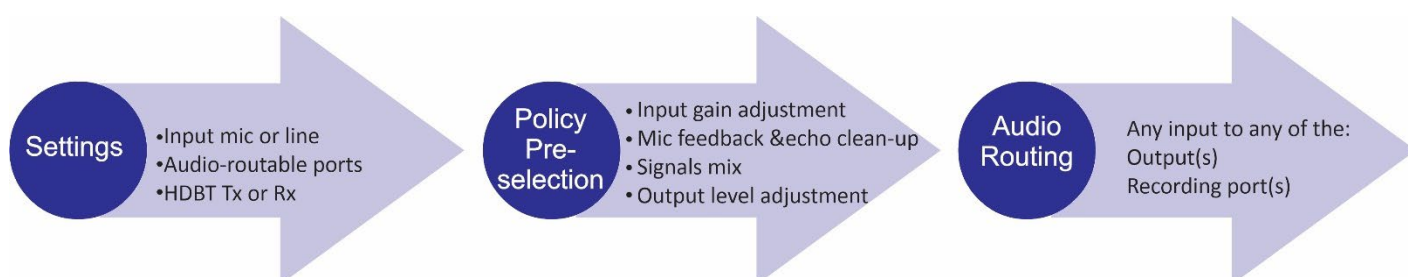


Figure 10: Audio Routing Highlights

Set the desired sound processing and mixing, by the integrated audio DSP, for:

- Microphone input signals
- Analog audio line input and output signals
- Speaker output signals (MTX3-88-PR-PRO PRO model only)
- Digital AV extracted and inserted audio signals
- Dante audio input and output streams

- Digital USB hosts audio signals



Various audio processing configurations can be stored by presets, for their later convenient implementation later, via control or web-UI, by end user operation.

Route any of the processed audio input signals, or mixed audio signals, to any available audio output, multiple outputs, and/or panel USB-C recording port (for sound signal recording, or quality monitoring purposes).

RS-232 & IR Routing

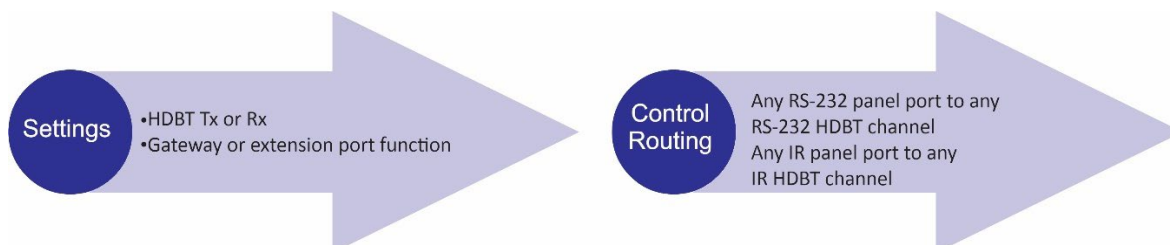


Figure 11: RS-232 and IR Routing

The matrix configurable working modes are:

- RS-232: Extension, Gateway, Control (port 1 only).
- IR: Extension, Gateway.

For Gateway operation mode description, see [Setting Control Gateway Properties](#) on Page [87](#)



RS-232 control mode is used for serial device control and service of MTX3-88-PR-PRO..

Multi View Routing

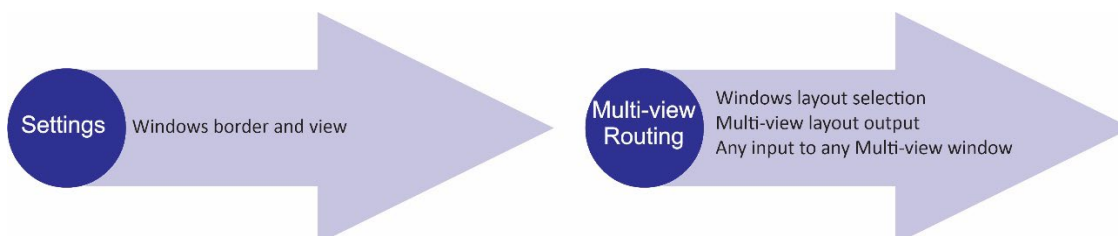


Figure 12: Multi-View Routing

The unit supports multi-viewing (simultaneously displaying two inputs on an output), and up to 4 outputs can be set up independently in this multi-view configuration. When an output is defined as a multi-viewer, it is paired with a second output – which mirrors the multi-view.

The user can set the viewing attributes of the multi-view windows, select the active multi-view windows layout, and route multiple input signals to layout windows.

Multi-view windows layouts, on each matrix outputs pair, are according to the table below:

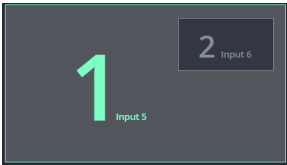
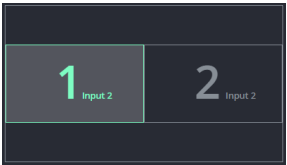
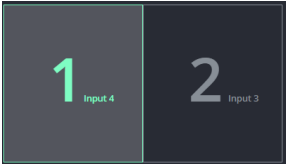
Function Name and Description	Multi-View Outputs	Displayed Multi-View Windows Layout Output
PIP (Picture-In-Picture) mode Two input signals are displayed simultaneously, one as a full-sized (parent) picture and the second as a small (daughter) picture insert. The daughter window is an overlay in the upper right-hand corner of the screen. Note: The pictures maintain their aspect ratio in this mode.	If an output is configured as a multi-view output, it is paired as follows: • Output 1: Mirrored on Output 3 • Output 2: Mirrored on Output 4 • Output 5: Mirrored on Output 7 • Output 6: Mirrored on Output 8	
PBP (Picture-By-Picture) mode Two input signals are displayed simultaneously as small, side-by-side, same-sized windows. Note: The pictures maintain their aspect ratio in this mode.		
SPLIT (Split Screen) mode Two input signals are displayed simultaneously in a side-by-side layout, each horizontally compressed to fit within half the screen while maintaining full vertical resolution. Note: The pictures do not maintain their aspect ratio in this mode.		

Table 2: Multi-view Windows Layouts

Video Wall routing

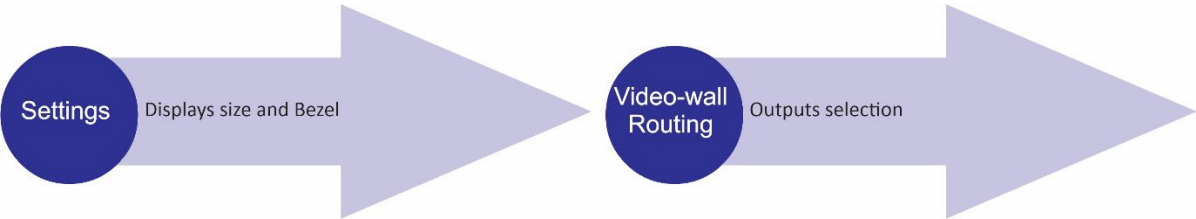


Figure 13: Video-Wall Routing

The matrix supports 2x2 video wall views. Video wall view A is connected to outputs 1-4 ports and video wall view B is connected to output 5-8 ports.

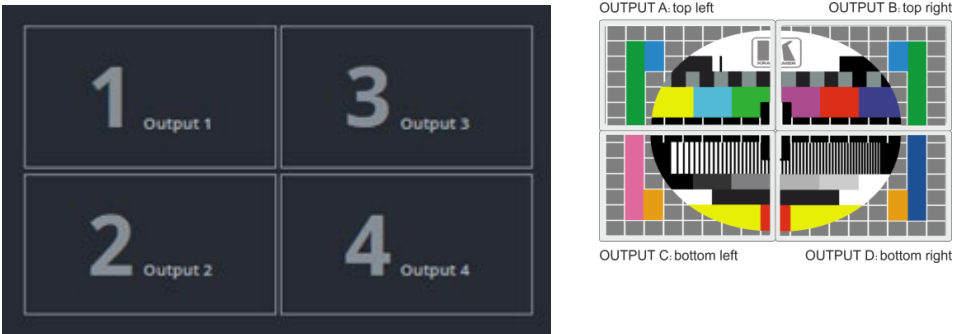


Figure 14: Video-Wall Routing

Matrix Auto Switching Clusters

In order to support deployment in multiple spaces, matrix switcher-clusters can be configured. Each cluster can operate independently according to its user-defined auto-switching policy:

- **Manual** (Default): Manually switch the inputs to the outputs.
- **Last Connected** - The matrix auto-switches to the last input connected to it, and – upon loss of the currently selected input – automatically reverts back to the previously selected input.
- **Auto-scan** – The matrix scans for a valid input signal upon loss of the current input. The scanning always starts at Input 1, scanning as follows: Input 1 → Input 2 → ... → Input 8 → Air-Cast → Input 1 → (repeat)



- The auto-switching delay depends on the configurable signal-lost timeout.
- In both Last Connected and Auto-scan modes, manually selecting an input (using the front panel buttons, remote control, or web UI routing) overrides automatic selection.

Splash Screen & Overlay

MTX3-88-PR allows the user to display predefined images upon AV signal loss. The user can upload pictures to the unit, and select from a wide range of preloaded images, when and how the desired splash screen should appear, or create special text to appear, while adjusting text, size, alignment & color.

Air Casting Presentation

MTX3-88-PR-PRO allows for easy collaboration, allowing anyone in the room to wirelessly share and present content from a portable device, such as laptop, tablet, or mobile phone. Air-casting supports Miracast, Airplay and Chromecast market standard services, widely available on Windows, iOS and Android portables.

Recording via H.264/4 Streaming

Using the standard H.264/5 IP streaming and control or web-UI routing, MTX3-88-PR-PRO allows the user to record meetings content on any standard-complying onsite recording device (such as NVR), or cloud-based content management application.

Advanced Audio Optimization Using the integrated audio DSP processing, the sound can be enhanced using:

- **Acoustic Echo Cancellation (AEC)** – Filtering and cancelling acoustic echoes in the room, enabling participants to talk and listen at the same time without cutting each other off. This feature overcomes the problem in meeting rooms where audio played through loudspeakers is picked up by the room microphones and transmitted back to remote participants, so people hear their own voices with a delay!
- **Advanced Feedback Suppression (AFS)** – Auto-suppression and elimination of feedback howling caused by a microphone picking up the sound from a speaker in the room and re-amplifying it through the system.
- **Microphone Ducking** – Upon detection of speech from the microphone, the system reduces

the volume of the selected (background) audio input and mixes it with the microphone signal. When the microphone signal stops, the background audio returns to its original level.

Presets

MTX3-88-PR-PRO offers presets for storing up to 48 matrix configurations, allowing users to save and recall settings tailored to various operational scenarios.

Preset types are:

- Global – The preset includes all the matrix settings.
- Partial – The preset includes only specifically selected settings, leaving all other settings unchanged. Available partial preset types are:
 - AV routing
 - Audio processing
 - Multi view
 - Video wall



Front panel preset selection buttons are available for their associated partial list of presets 1-8.

Controlling via Built-in IP Gateway

Local and remote connected devices can be controlled and remote IP connected clients can communicate via LAN with the MTX3-88- PR matrix built-in control gateway:

- Send and receive RS-232 commands via RS-232 panel ports and HDBT channels
- Send CEC commands, and receive responses, via HDMI ports and HDBT channels
- Send IR (Infrared) commands via IR panel ports and HDBT channels
- Open and close panel relay ports
- Send and detect digital and analog control signals to GPIO ports

Secured IT-grade Networking

Adhering to standard 802.1x IT authentication and OWASP penetration certification, the All-In-One matrix can connect securely to an IT network. Matrix settings allows for VLAN tagging and COS classification of matrix, and its connected users and devices, network and streaming traffic, ensuring its secured IT network traversing and proper IT LAN operation

Diagnostics

MTX3-88-PR-PRO offers a variety of very valuable diagnostics intended to monitor and trouble-shoot many aspects of your switcher and solution:

- Status – View device heat level, fan speed, and status of all AV inputs and outputs
- Connections – View all details of active network connection
- Test patterns – Tools to aid configuring the video output ports

Operating the Device using the Device Panel Buttons

Perform the following actions using the front and rear panel buttons:

[Routing an INPUT to an OUTPUT in Matrix Mode](#)

[Viewing the AV Routing Statuses](#)

[Routing All Outputs to a Single Input](#)

[Storing and Recalling a Preset](#)

[Freezing the Image on an Output](#)

[Blanking the Image on an Output](#)

[Locking/Unlocking Control Panel Buttons](#)

[Resetting the Device Resolution \(to XGA/1080p\)](#)

[Adjusting Volume / Muting Microphones Inputs](#)

[Adjusting volume / Muting Audio Outputs](#)

Routing an INPUT to an OUTPUT in Matrix Mode

Any of the 8 inputs can be switched to any of the 8 outputs. Switching is immediate and seamless.

To switch an input to an output via the front panel buttons:

Pressing an OUTPUT button followed by an INPUT button on the front panel will switch that input to the selected output. The INPUT and OUTPUT buttons will light, and the LED screen will display them in the same color).

Viewing the AV Routing Statuses

To view which input is routed to which output and vice versa via the front panel buttons:

- To see which outputs an input is routed to, press that INPUT button. For about 10 seconds, the INPUT button will blink and the buttons of all OUTPUTs routed from this input will light.
- To see which input is routed to an output, press that OUTPUT button. For about 10 seconds, the OUTPUT button will blink and the button of the INPUT routed to this output will light.

Note: After pressing an INPUT or OUTPUT button, the LED screen will display the routing status of all 8 outputs. It does this by using a distinct color for each output, with the input shown in the same color as the output it is routed to.

Viewing the IP Status

Press and hold the ALL button for approx. 6 seconds and device properties (for example Gateway, Mask, Host) are displayed on the LED screen.

Routing All Outputs to a Single Input

To route all video outputs to a single input:

1. Press ALL. The ALL button blinks
2. Press the INPUT button.

All the outputs are routed to the selected input and the LED Display indicates the change.

Storing and Recalling a Preset

You can store up to 8 matrix configurations (presets) via the front-panel buttons, which can be recalled when needed.

Each operation preset stores:

- The AV Routing configuration.
- The matrix operation mode (matrix or multi-view operation modes).
- The saturation, contrast and brightness settings of the video outputs.
- The properties of the output display borders and labels.
- Audio output settings.

Storing an Operation Preset

You can store 8 operation presets via the front panel output selection buttons (1 to 8).

To store an operation preset:

1. Set the matrix to the desired operation preset configuration.
2. Press **STORE**. The STORE button lights.
3. Press an output button (1 to 8).

The current status (routing, audio and video settings, USB status and more) are saved in the memory denoted by the OUT button number.

The operation preset configuration is stored on the selected input button.

Recalling an Operation Preset

You can recall a stored preset via the front panel output selection buttons (1 to 8).

To recall an operation preset:

1. Press **RECALL**. The RECALL button lights.
2. Press an output selection button (1 to 8) to select the desired operation preset configuration.

The preset saved in the memory denoted by the OUT button number is recalled.

Freezing the Image on an Output

To Freeze an image on the output:

1. Press an output selection button (1 to 8) to select the desired operation preset configuration.
2. Press **FREEZE**. The **FREEZE** button lights, and that Output selection is frozen.



The FREEZE button toggles the FREEZE function, and the above steps assume that the output is not frozen. If the output is frozen (the FREEZE button is lit), the above steps will unfreeze the output.

3. Press the FREEZE button again to toggle freezing the output (unfreeze if it is frozen or freeze if it is not frozen)

Blanking the Image on an Output

To Blank an image on the output:

1. Press an output selection button (1 to 8) to select the desired operation preset configuration.
2. Press **BLANK**. The **BLANK** button lights and the Output selection is blanked.



The BLANK button toggles the BLANK function, and the above steps assume that the output is not blanked. If the output is blanked (the BLANK button is lit), the above steps will unblank the output.

3. Press the BLANK button again to toggle blanking the output (unblank if it is blanked or blank if it is not blanked).

Locking/Unlocking Control Panel Buttons

To lock control panel buttons:

Press **PANEL LOCK** for 3 seconds.

The PANEL LOCK button illuminates, and control panel buttons are no longer operational.

To unlock control panel buttons:

Press the illuminated PANEL LOCK button for 3 seconds.

The PANEL LOCK button is no longer illuminated, and control panel buttons are now operational.

Resetting the Device Resolution (to XGA/1080p)

To reset all output solutions:

- Press and hold the **RESET to 1080P** button for about 3 seconds to set all the output resolutions to 1080P.

Adjusting Volume / Muting Microphones Inputs

To adjust microphone input volume:

- Turn the **MIC** knob clockwise to increase the volume of all microphone inputs.

To mute/unmute microphone:

- Press the **MIC** knob to mute/unmute the associated analog audio inputs.
- When muted, MIC LED is lit red.

Adjusting volume / Muting Audio Outputs

To adjust output volume:

- Turn the **VOLUME** knob clockwise to increase the volume of all outputs inputs.



Outputs include analog and Dante outputs. They do not include HDMI/HDBT outputs.

To mute/unmute Volume:

- Press the **VOLUME** knob to mute/unmute the associated audio.
- When muted, VOLUME LED is lit red.

Operating via Ethernet

- [Connecting Ethernet Port Directly to a PC](#) on page [24](#).
- [Connecting Ethernet Port via a Network Switch](#) on page [27](#).
- [Configuring Ethernet Port](#) on page [27](#).
- [Discovering and acquiring IP address](#) on page [27](#).

You can connect to **MTX3-88-PR-PRO** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see [Connecting Ethernet Port Directly to a PC](#) on page [24](#)).
- Via a network switch or router, using a straight-through cable (see [Connecting Ethernet Port via a Network Switch](#) on page [27](#)).



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

Connecting Ethernet Port Directly to a PC

You can connect the Ethernet port of **MTX3-88-PR-PRO** directly to the Ethernet port on your PC using a crossover cable with RJ-45 connectors.



This type of connection is recommended for identifying **MTX3-88-PR-PRO** with the factory configured default IP address.

After connecting **MTX3-88-PR-PRO** 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 15).

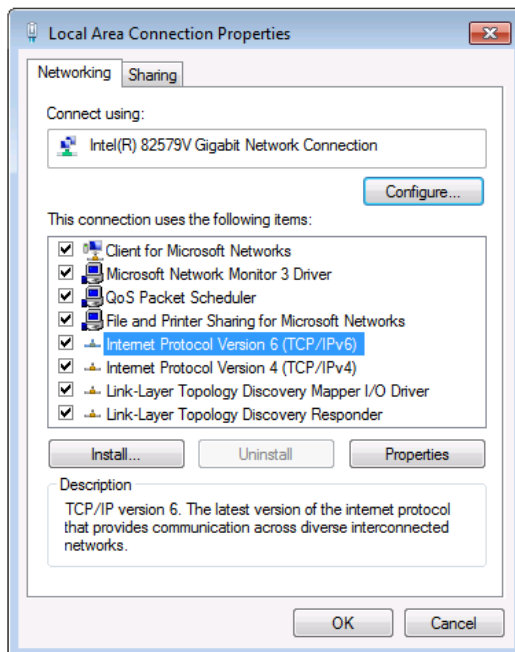


Figure 15: Local Area Connection Properties Window

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 16).

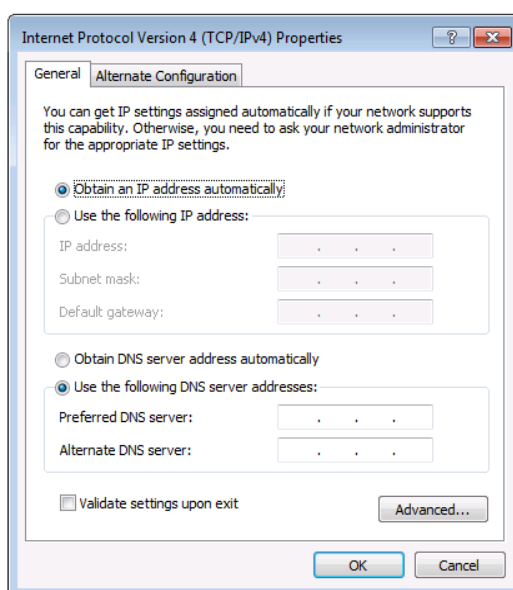


Figure 16: Internet Protocol Version 4 Properties Window

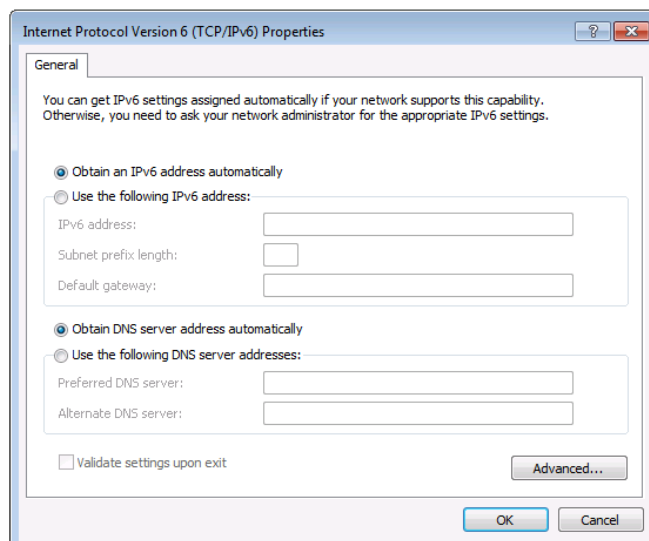


Figure 17: Internet Protocol Version 6 Properties Window

6. Select Use the following IP Address for static IP addressing and fill in the details as shown in (Figure 18).
For TCP/IPv4 you can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding default 192.168.1.39 fallback address) that is provided by your IT department.

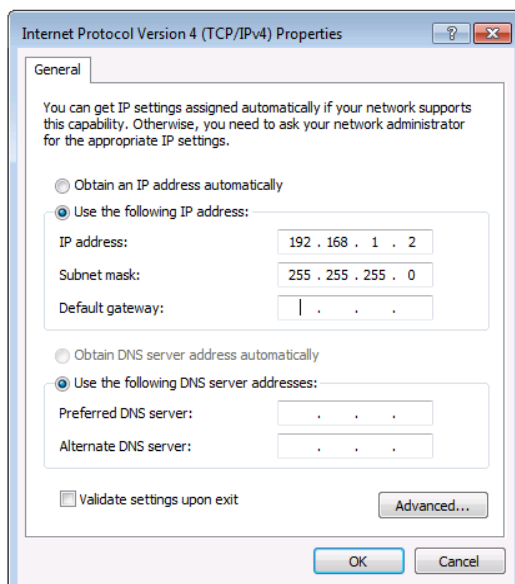


Figure 18: Internet Protocol Properties Window

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

Connecting Ethernet Port via a Network Switch

You can connect the Ethernet port of **MTX3-88-PR-PRO** to the Ethernet port on a network switch or router using a straight-through cable with RJ-45 connectors.

Configuring Ethernet Port

You can set the Ethernet parameters via the embedded Web pages.

Discovering and acquiring IP address

MTX3-88-PR-PRO includes IP address auto-acquiring policy via LAN-connected DHCP server by default.



Verify there is a DHCP server in the network so the device can obtain a valid IP address.

When no DHCP server is detected:

- A fallback static IP address of 192.168.1.39, and 255.255.255.0 subnet mask (class C), is assigned until an IP address is acquired via the DHCP server.
- When the fallback IP address is occupied, the assigned IP address is 192.168.1.40 secondary fallback address.
- When both fallback IP addresses are occupied, the device will be assigned another available free IP address, randomly obtained within the same network subnet.

For more information, refer to Product Page Technical Note in <http://www.kramerav.com/product/MTX3-88-PR-PRO>.

Accessing the Web UI

You can control the device via the Ethernet.

1. Connect the LAN 1 port of the device to a local area network.
2. Connect the PC to the same network as the device.
3. Press and hold the ALL button for ~5 seconds to retrieve the IP address viewed on the device LCD display.
4. Enter the device IP address in the browser and press Enter, to enter the Web UI page.

You can now access the Web UI via the ethernet.

Using Embedded Web Pages

MTX3-88-PR-PRO can be operated remotely using the embedded Web pages. The Web pages are accessed using a Web browser and an Ethernet connection.

Before attempting to connect:

- Perform the procedures in [Operating via Ethernet](#) on page [21](#).
- Ensure that your browser is supported.

The following operating systems and Web browsers are supported:

Operating Systems	Browser
Windows 7	Chrome
Windows 10	Edge
	Chrome
Mac	Safari
iOS	Safari
Android	N/A

-  If a web page does not update correctly, clear your Web browser's cache.
-  Check that Security/firewalls are not blocking HTTP traffic between the device and the user PC.

To access the web pages:

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

If security is enabled, the Login window appears.

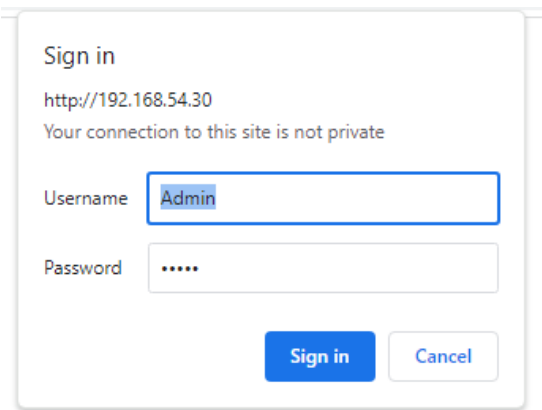


Figure 19: Embedded Web Pages Login Window

2. Enter the Username (default = Admin) and Password (default = Admin) and click **Sign in**. The default web page appears.

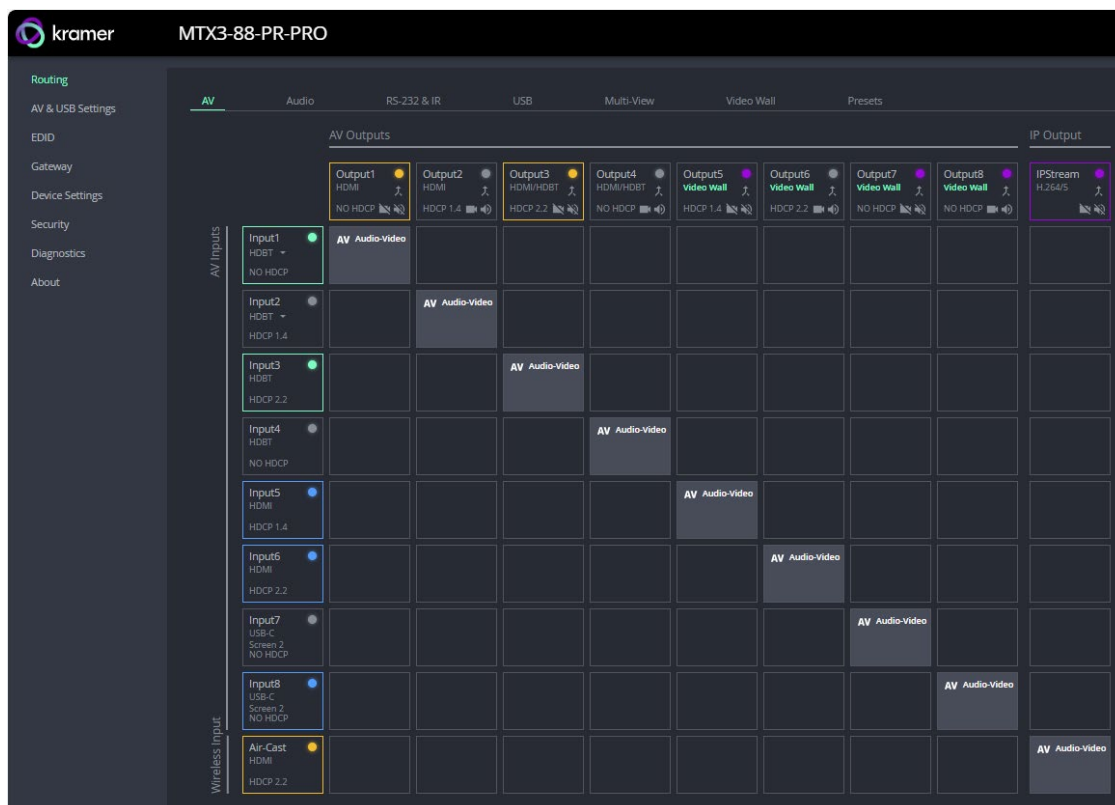


Figure 20: AV Landing Page

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

MTX3-88-PR-PRO web pages enable performing the following actions:

The Web pages allows users to control the matrix via the Ethernet.

[AV Routing](#)

[AV & USB Settings](#)

[Managing EDID](#)

[Setting Control Gateway Properties](#)

[Device Settings](#)

[Security](#)

[Diagnostics](#)

Routing

Routing is available for AV, Audio, RS-232 & IR, USB, Multi-View, Video Wall and Presets.

[AV Routing](#)

[Audio Routing](#)

[RS-232 & IR Routing](#)

[USB Routing](#)

[Multi-View Routing](#)

[Video Wall Routing](#)

[Presets](#)

Navigating to the Routing Tabs

The Routing tabs include AV, Audio, RS-232, USB, Multi-View, Video Wall and Presets.

 The example below shows how to navigate to the AV routing tab.

- 1. In the navigation pane, select **Routing**.
- 2. In the top menu, select **AV**.

The active operation mode is selected.

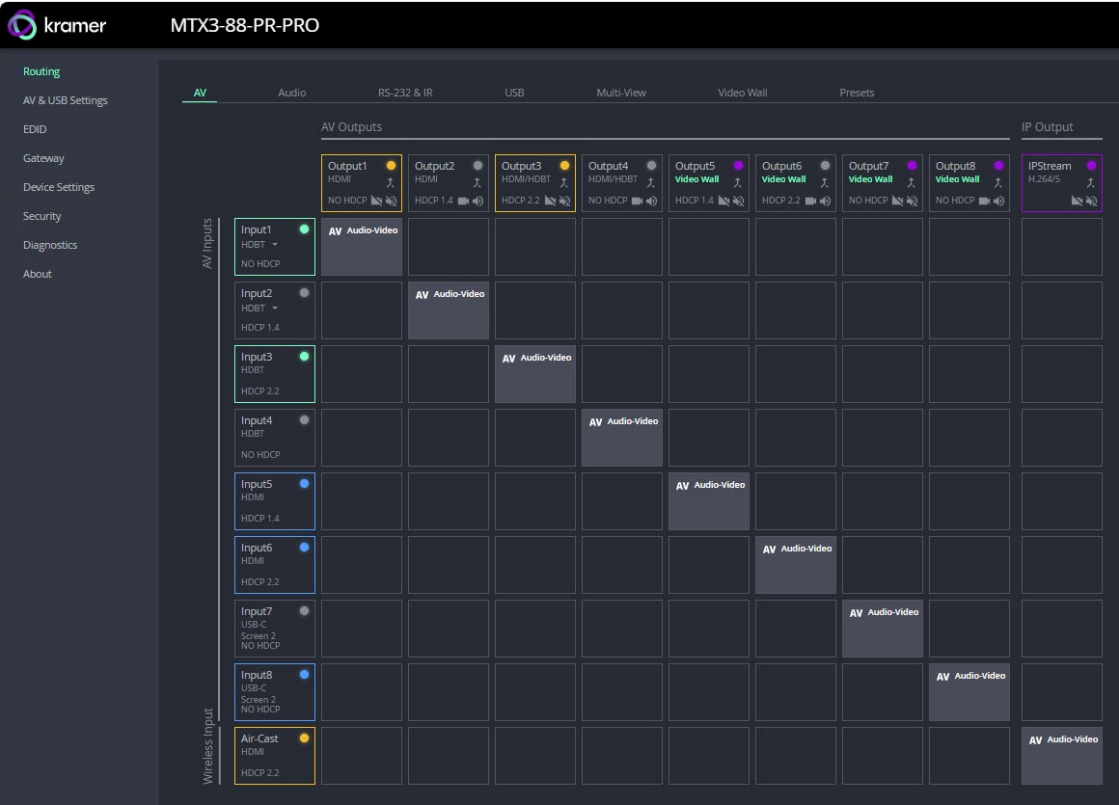


Figure 21: AV Routing Landing Page

AV Routing

This section allows users to route inputs to outputs, following port-related configuration.



- The flexible HDBT ports are viewed as either input or output ports depending on their related configuration.
 - Routed input content is displayed on the HDMI output, and – if configured as an output – mirrored on its associated HDBT port.
 - The pre-configured input port (e.g., HDMI input, USB-C input or an HDBT port configured as input), may be routed to any output port.
- When dual-screen is configured for USB-C, the second USB-C screen is available for routing as AV Input# 7 or 8. Refer to the table below.

AV-Routing Related Configuration

Setting HDBT direction as Tx or Rx

Each HDBT port can be configured either an input port or an output port (default).

For setting HDBT direction, refer to [HDBT Pre-Config](#) on Page [58](#)

Setting USB-C Input Screens

Each USB-C port can be configured to input either one screen or two screens.

Table 3: USB-C Port Selections Available Dependent on Port Configurations

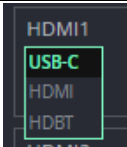
AV Input Port #	AV Available Selections	When USB-C is set to dual-screen
1	USB-C, HDMI, or HDBT	USB-C 1 Screen 1
2	USB-C, HDMI, or HDBT	USB-C 2 Screen 1
7	HDMI or HDBT	USB-C 1 Screen 2
8	HDMI or HDBT	USB-C 2 Screen 2

For setting USB-C input screens, refer to [AV & USB Settings](#) on [Page 53](#).

AV-Routing Input Pre-Selection

User can preselect the routable input(s) per table below.

Table 4: AV Routing Input Configuration(s) Table

AV Input Port #	Available Options	AV Input Configuration Drop-Down List
1 - 2	USB-C Screen 1, HDMI, HDBT	

1.

AV Input Port #	Available Options	AV Input Configuration Drop-Down List
3-6	HDMI, HDBT	HDMI3 HDMI HDBT
7-8	HDMI, USB-C Screen 2, HDBT	Input 7 HDMI HDBT
9	AIR-CAST	N/A

For each AV input port, click the drop-down list and select routable option.

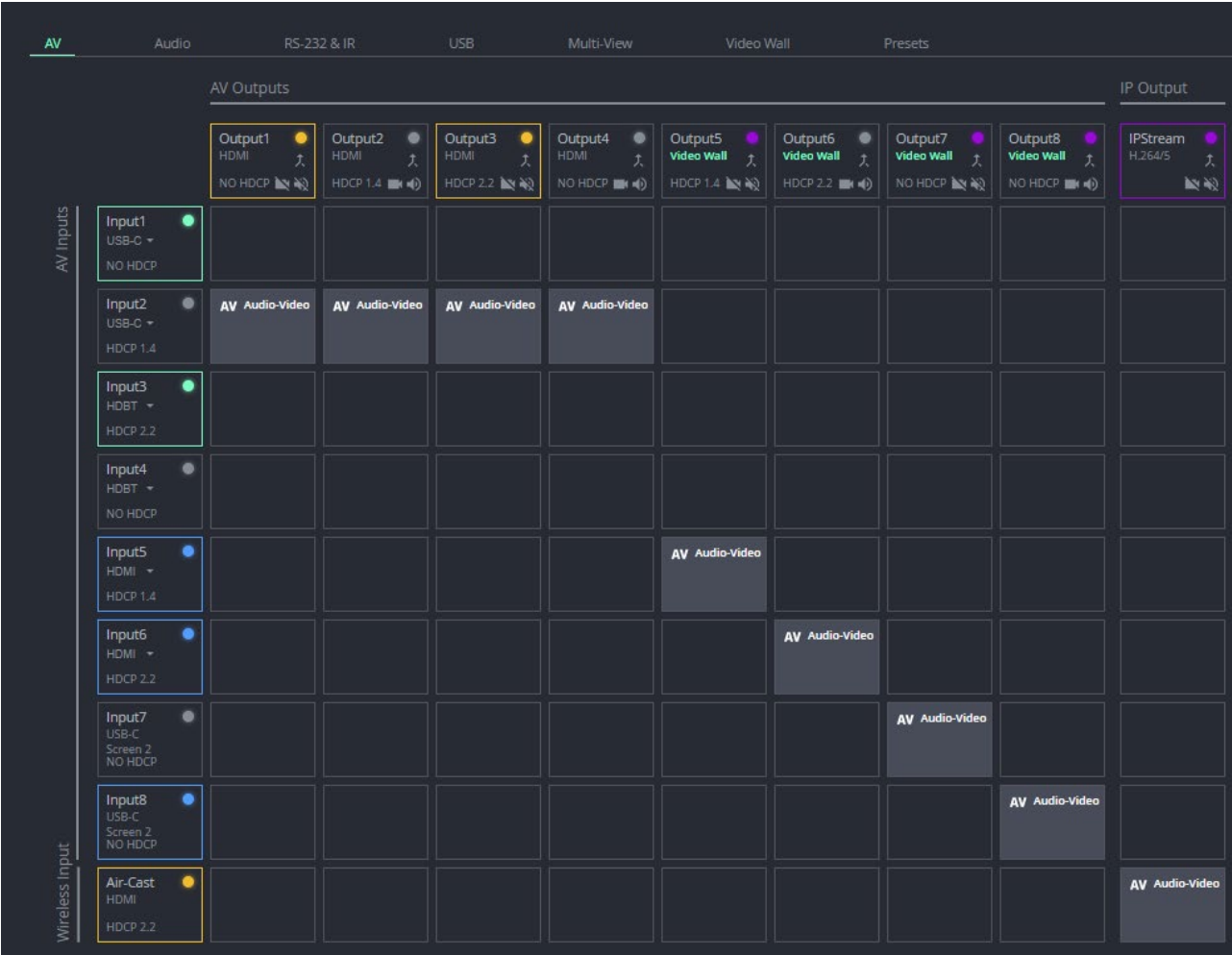


Figure 22: AV Routing Tab: Selecting Routable Option

All AV input routable options are selected.

AV Routing Operation

For the 8x8 AV Routing, the following actions can be performed:

Routing Inputs to Outputs

To route an input to an output:

1. Navigate to the AV Routing tab ([Navigating to the Routing Tabs](#) on Page 30).
2. Click a cross-point to route an input to an output.



- To select a cross-point, make sure to click the text within the square.

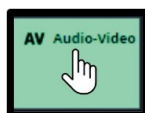


Figure 23: Click Text to Select Cross-Point

- A green light on a button indicates a connected source and acceptor pair.
- The grid view allows you to select the Input to Output connections (cross-points) using a simple grid.

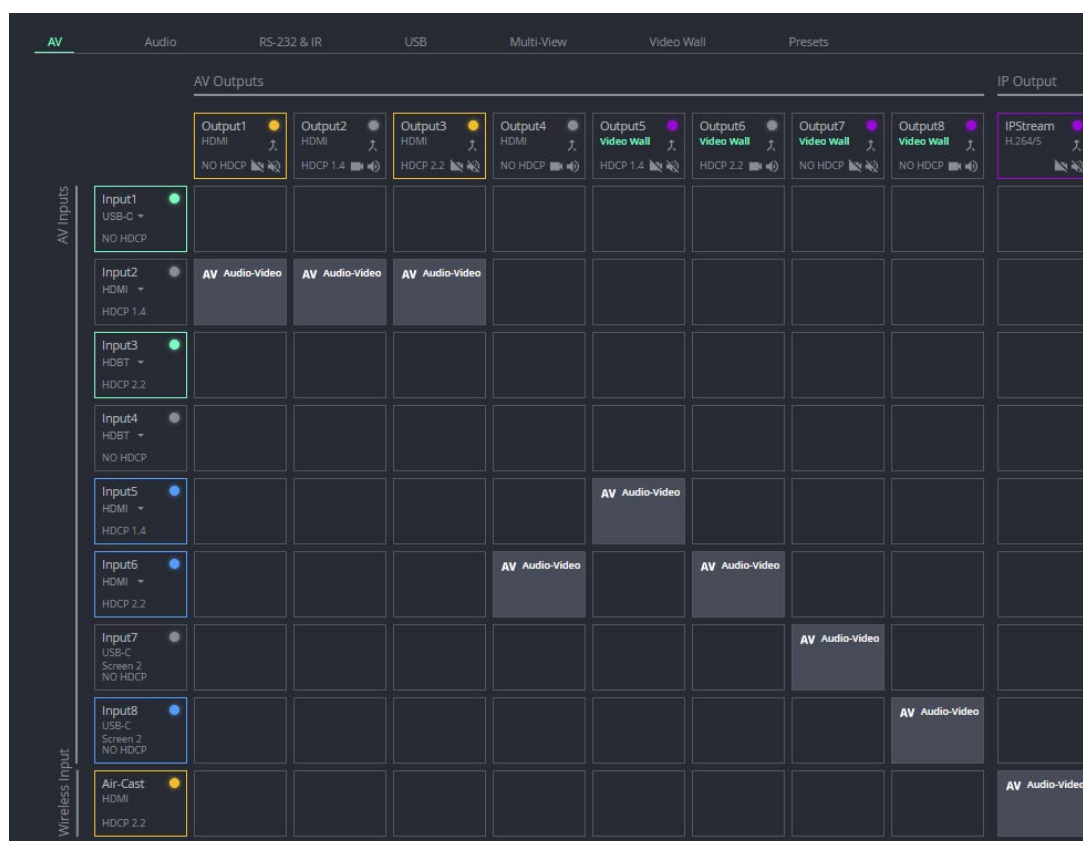


Figure 24: Matrix Routing Grid View

3. If required, do the following:
 - To switch from Audio Follows Video (enabled by default) to DSP Audio Insertion , set the mode to enabled in AV Settings on Page 53.
 - Click (on output port) to mute the video output signal. indication appears.
 - Click (on output port) to mute the audio output signal. indication appears.

Saving a Preset

To save the current routing configuration:

1. On the bottom of the AV grid, click **Save As a Preset**.

Figure 25: Save Selected Routing & Configuration as a Preset

2. Enter the following data:

- Slot: Select a preset number to save.
- Name: Enter a preset name.



The length must be 1-19 characters. This name can be changed in the Presets page. Refer to [Presets](#) on Page [51](#).

- AV only: Only save the AV routing scheme on the current Web UI page.



If the current preset has no other content saved, this option is selected by default.

- Global: Save the entire MTX3-88-PR-PRO configuration.



MTX3-88-PR-PRO will restart when a global preset is recalled.

3. Click:

- **Save Preset** to save the selected routing and configuration to the selected preset number. The following screen appears.

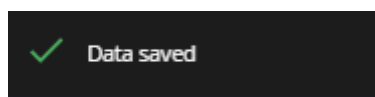


Figure 26: Selected Routing/Configuration Saved as a Preset

- **Cancel** to abort the operation.



To check, activate, delete and modify any existing preset, go to the Presets page. Refer to [Presets](#) on Page [51](#).

Audio Routing

This section allows users to route audio inputs to audio outputs, according to the port-related configuration. Multiple audio inputs can be selected for processing, mixing and handling, and routing to a single or multiple output ports.

The audio inputs and outputs ports are viewed depending on their related configuration.



- The input audio of the pre-selected AV input port (on AV routing tab), as viewed on the audio routing grid, is routable on audio matrix.
- Only audio input and output ports activated for routing (on audio pre-config tab) are viewed on the audio routing grid.

Audio-Routing Related Configuration

The audio inputs and audio outputs, routable on the routing grid, are configurable for routing on the AV & USB Settings>Audio-PreConfig tab.

Setting Analog Input Type

Some of the analog input ports are configurable as either microphone or line inputs.

For setting audio analog input port types, refer to [Audio Pre-Config](#) on Page [62](#).

Audio Ports Activation for Routing

Audio input and output ports are configurable. For activating audio ports refer to [Audio Pre-Config](#) on Page [62](#).

Audio DSP (Digital Signal Processing)

The audio input signals may be processed and mixed by the built-in audio DSP processor. The user can adjust the processing and mixing parameters.

For more information, refer to [Audio Processing](#) on Page [64](#).

Routing an audio input to an output

To route an audio input to an output:

- 1. Navigate to the AV Routing tab ([Navigating to the Routing Tabs](#) on Page 30).

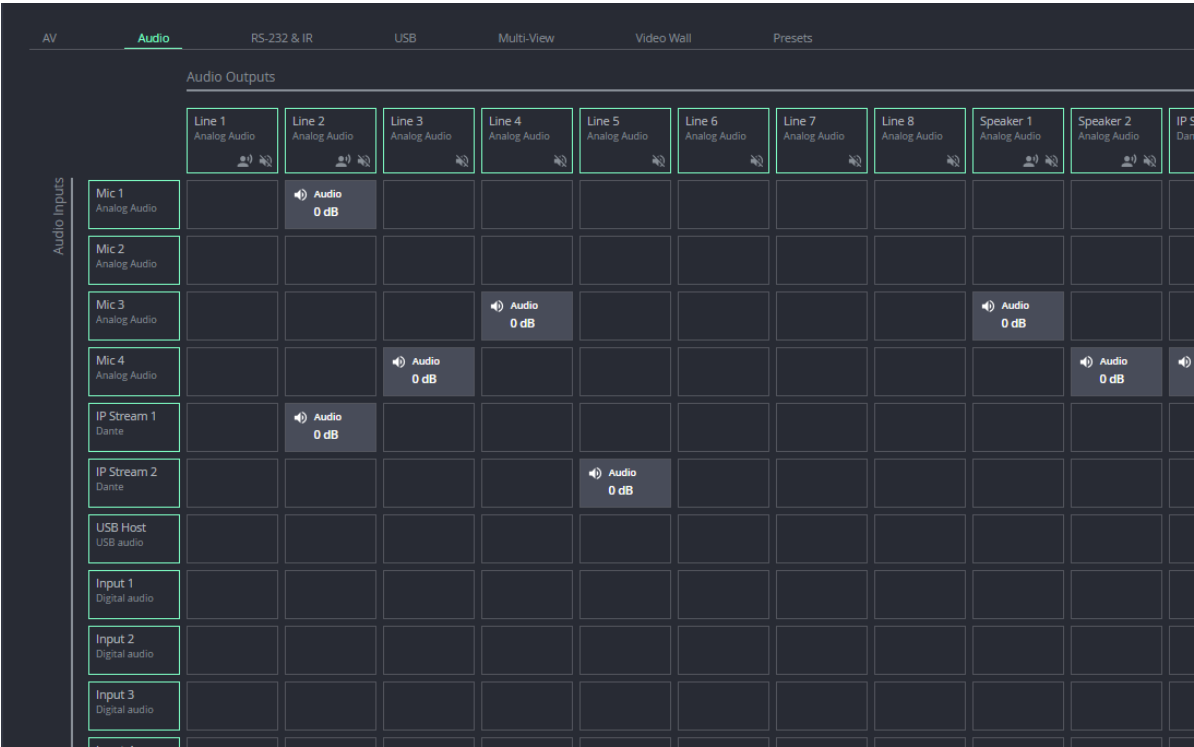


Figure 27: Audio Routing Input/Output Grid

- 2. Click a cross-point to route an input to an output.



- To select a cross-point, make sure to click the text within the square.

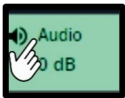


Figure 28: Click Text to Select Cross-Point

- A green light on a button indicates a connected source and acceptor pair.
- The grid view allows you to select the Audio Input to Output connections (crosspoints) using a simple grid.

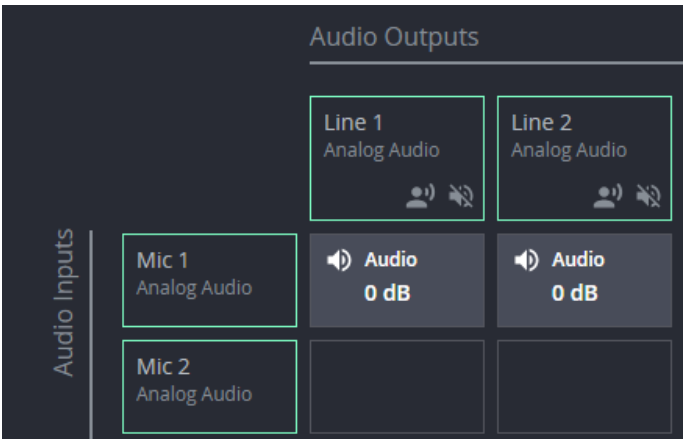


Figure 29: Audio Input is Set to Output

3. If required, perform the following:

- Click  (on output port) to mute the audio output signal.  indication appears.

The selected inputs are switched to the selected outputs

Adjusting the Audio Input Volume

To adjust the Audio Input Volume:

- Click  in the cross-point box. The Input Adjustment Volume window opens.



The default setting is 0dB.

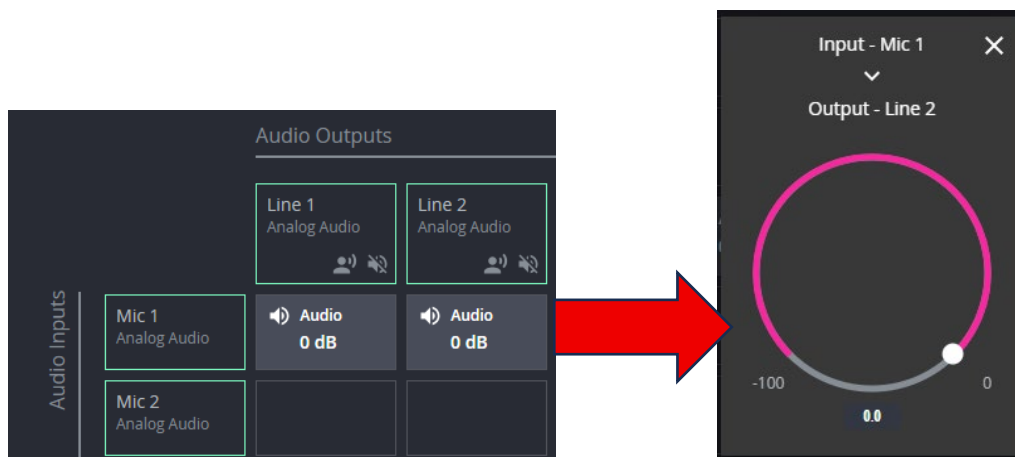


Figure 30: Input Volume Adjustment Window

- To set cross-point volume, adjust the knob, or click on the value, type your desired volume level with the keyboard, and press Enter.

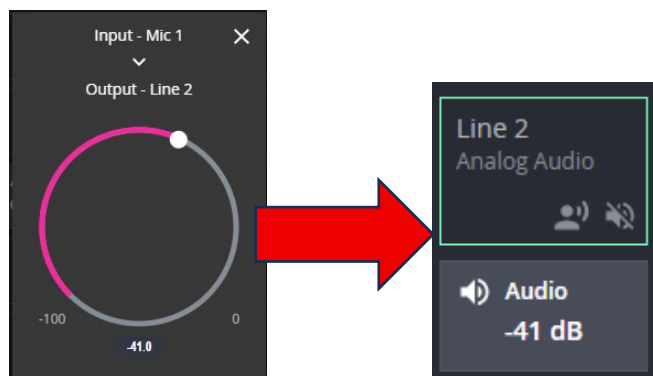


Figure 31: Input Volume Adjustment Set & displayed on Audio Routing Page

To reset to the default value, hold the CTRL key and click in the center of the knob.

Adjusting the Audio Output Ducking Volume

To adjust the Input Volume:

1. Click  in the audio output. The Talkover Ducking Configuration window opens.
2. Click  to enable the feature.



Figure 32: Talkover Ducking Configuration Window

3. The following ducking parameters are defined and may be adjusted:

- **Attack Time (ms):**

- The time taken to lower the volume to the Ducking Depth after the Ducking Trigger threshold is met.
- Use the knob (or click on the value, enter your desired value and click Enter) to adjust the **Attack Time**.
- The default setting is 80ms.

- **Hold Time (ms):**

- Specifies the time the ducking status lasts.
- Use the knob (or click on the value, enter your desired value and click Enter) to adjust the **Hold Time**.
- The default setting is 80ms.

- **Release Time (ms):**

- The time it takes to return from Ducking to the regular volume level.
- Use the knob (or click on the value, enter your desired value and click Enter) to adjust the **Release Time**.
- The default setting is 1000ms.

- **Trigger Threshold (dB):**

- The volume threshold where ducking will kick in. The lower the value, the easier the ducking is triggered.
- Use the knob (or click on the value, enter your desired value and click Enter) to adjust the **Trigger Threshold**.
- The default setting is -35dB.

- **Ducking Depth:**

- The volume reduction of the background (ducked) audio. The lower the value, the lower the volume of the background audio when ducking is triggered.
- Use the knob (or click on the value, enter your desired value and click Enter) to adjust the **Ducking Depth**.
- The default setting is -20dB.



The Mic inputs, Amp inputs and Dante inputs support ducking configuration.

Saving a Preset

To save the current configuration:

- If the selected preset already has saved content, the new routing/configuration content will overwrite the preset's settings.
- To check, activate, delete and modify any existing preset, go to the [Presets](#) on Page [51](#).

RS-232 & IR Routing

This section allows users to route RS-232 connections, and to route IR connections. The pairing can be done between local ports and HDBT ports, or between two HDBT ports. Pairing between two local ports is not supported.



- RS-232 and IR signal extension is only available on ports which are enabled for extension.

RS-232 & IR Related Configuration

Setting the RS-232 and IR ports for Extension

The mode for the local RS-232 ports, local IR ports and HDBT channels mode is set to extension function.

For further details regarding setting the mode for extension on the local RS-232 ports, the local IR ports and the local HDBT ports, refer to [Extending the RS-232 via HDBT](#) on Page [88](#).

Routing RS-232 and IR Extension

1. Navigate to the AV Routing tab ([Navigating to the Routing Tabs](#) on Page [30](#)).
2. Click one of the cross-points between inputs and outputs to route a paired connection for corresponding RS-232 and/or IR signals extension.



To select a cross-point, make sure to click the text within the square.



Figure 33: Click Text to Select Cross-Point

- Click RS-232 icon and/or IR icon to disable their associated signal extension (both enabled by default).



Figure 34:RS-232 & IR Routing Grid

RS-232 and IR extension paired connections are set.

USB Routing

This section allows users to route USB (local or remote) hosts to USB (local or remote) devices.

The ports are viewed depending on their related configuration.



- Local USB hosts/devices are connected to matrix USB panel ports
- Remote USB hosts/devices are connected to matrix HDBT transmitter/receiver USB ports.

USB-Routing Related Configuration

Setting a Single or Dual Active USB Host(s)

Number of matrix active USB hosts can be set to:

- A single active USB host (default), with single USB devices group
 - All USB devices – Routable to a single USB host
 - Local – USB 1-6 panel device ports
 - Remote – HDBT ports with USB set as device type
- Dual active USB host (available on MTX3-88-PR-PRO only), with dual USB devices groups
 - USB device Group 1 – Routable to USB host
 - Local – USB 1-3 (panel) device ports
 - Remote – Odd-numbered HDBT ports with USB set as device type
 - USB device Group 2 – Routable to USB host 2
 - Local – USB 4-6 panel device ports
 - Remote – Even-numbered HDBT ports with USB set as device type

For enabling dual USB active hosts, refer to [Configuring USB-C, Input and Air-Cast Input Settings](#) on Page [53](#).

Setting USB Type of HDBT Ports

User sets USB type of each HDBT port from the drop-down menu (Host/Device).

For selecting HDBT USB Type Host or Device, refer to [HDBT Pre-Config](#) on Page [58](#).

Enabling HDBT USB Extension

User can enable/disable the USB extension of each HDBT port (enabled by default).

When HDBT USB extension is enabled, the connected USB host/devices at the remote HDBT transmitter/receiver can be connected to the matrix routed host/devices.

For enabling HDBT USB Extension, refer to [HDBT Pre-Config](#) on Page [58](#).

USB-Routing Operation

Routing USB (local or remote) hosts to USB (local or remote) devices

To route a USB host to a USB Device:

1. Navigate to the AV Routing tab ([Navigating to the Routing Tabs](#) on Page 30).



The figure below will vary depending on USB-related pre-configurations: Dual active host, number of configured hosts (local vs. remote) and number of configured devices (local vs. remote).

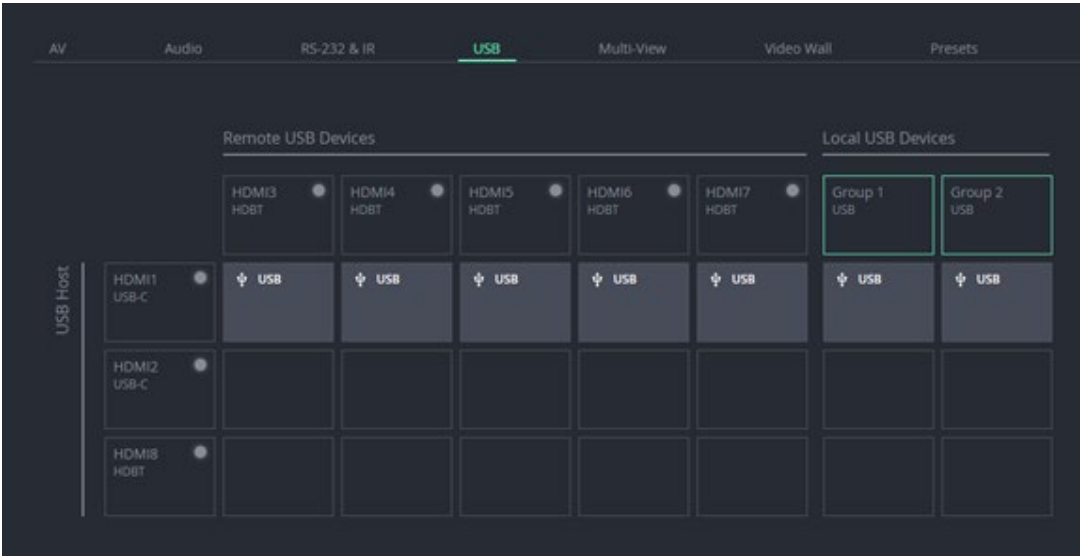


Figure 35:USB Host to Device Group Routing Grid when Dual Active Host is Disabled

2. Click a crosspoint ([Figure 35 – for single active host](#)) or two cross-points ([Figure 37 – for dual active host](#)) to route the selected host(s) to the selected device group(s).



- To select a cross-point, make sure to click the text within the square.



Figure 36: Click Text to Select Cross-Point

- A green light on a button indicates a connected source and acceptor pair.
- The grid view allows you to select the Input to Output connections (crosspoints) using a simple grid.

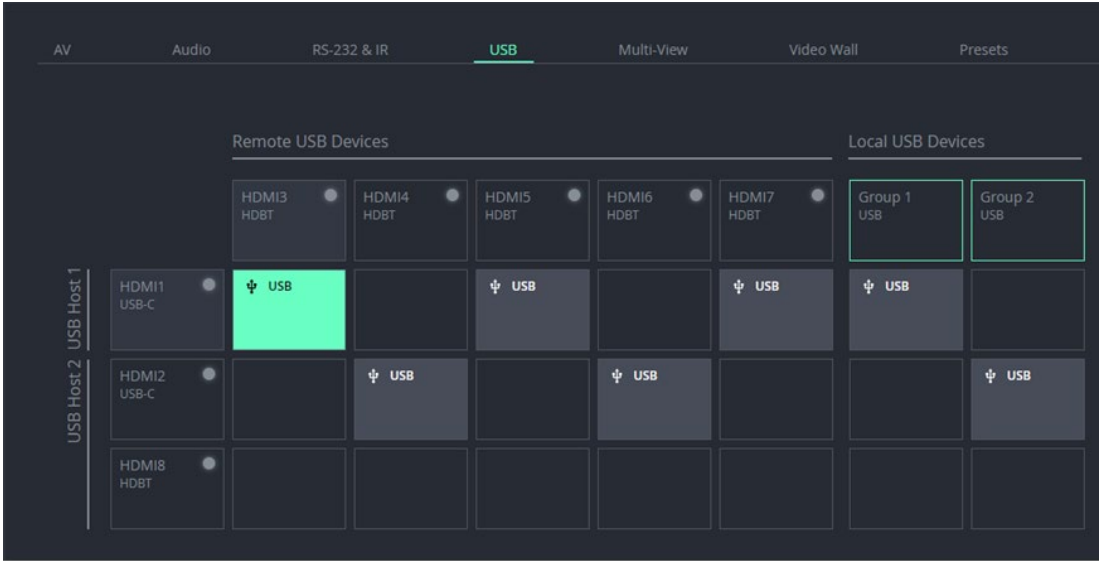


Figure 37:USB Host to Device Group Routing Grid when Dual Active Host is Enabled

The selected hosts are routed to the selected devices.

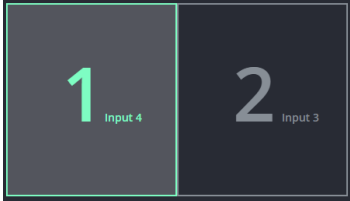
Multi-View Routing

This section allows users to select multi-view layouts, assigning 2 inputs to an output screen. In multi-view mode, the system operates with 4 mirrored output pairs, providing 4 independent outputs – each mirrored on a second output.

The unit supports 3 multi-view layouts – Picture-in-Picture, Picture-by-Picture and Split Screen. The multi-view layouts and output grouping are described in the Table below.

Table 5: Matrix Multi-View Layouts and Output Groups Table

Multi-view Layout	Layout Windows	Output Groups	Description
PIP (Picture in Picture)			The smaller window overlays the parent picture in the up-right corner. Both pictures maintain their aspect ratio.
PBP (Picture by Picture)		Output A: Mirrored on Output 1 and Output 3 Output B: Mirrored on Output 2 and Output 4	Windows 1 and 2 are displayed side by side, with black bars added above (and maintaining their original aspect ratio).

Multi-view Layout	Layout Windows	Output Groups	Description
SPLIT		Output C: Mirrored on Output 5 and Output 7 Output D: Mirrored on Output 6 and Output 8	Windows 1 and 2 are displayed side by side, stretched to fill the screen (without preserving their original aspect ratio).

Selecting and routing Multi-View Layout for Output Groups

1. Navigate to the AV Routing tab ([Navigating to the Routing Tabs](#) on Page 30).

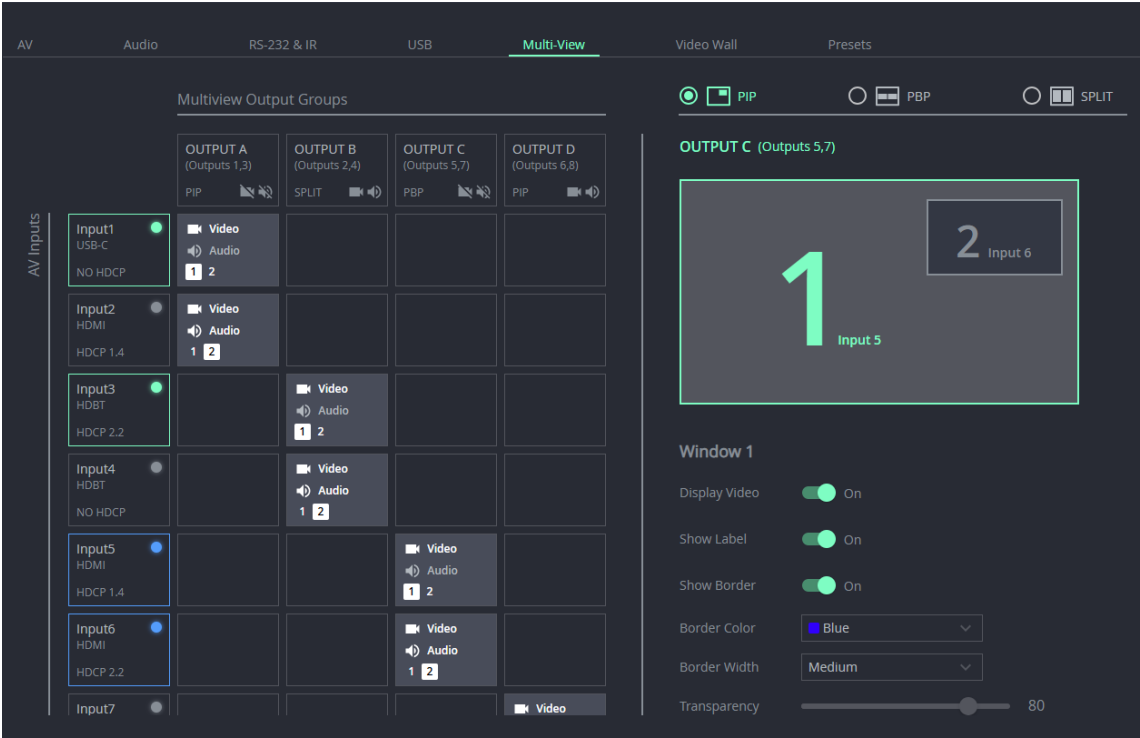


Figure 38: Multi-View Routing Grid

2. To select the multi-view layout:
- On the left-hand pane, select the output group (OUTPUT A, B, C or D).
 - On the right-hand pane, select the layout PIP, PBP or SPLIT).

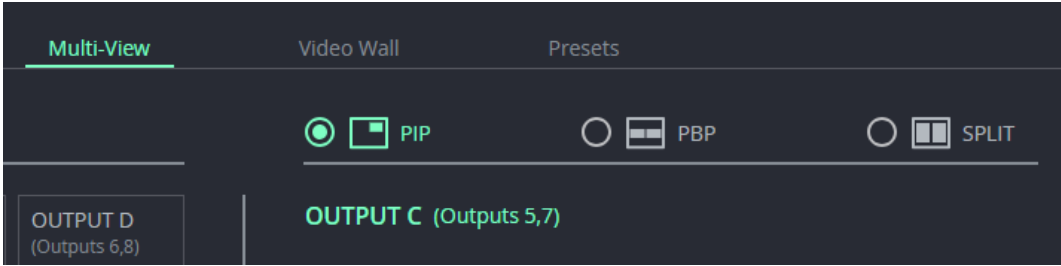


Figure 39: Selecting a Multi-view Layout

The multi-view output and its associated layout is now selected .



The examples below illustrate the method for a PIP multi-view layout but is applicable for all layouts

3. To route and configure the multi-view layout and windows:

To route the inputs (see [Figure 39: Selecting a Multi-view Layout](#)): On the left-hand pane, on the cross-point where the desired input intersects with the desired output group, click:

- “Video” to route the input to both windows.
- “1” to route to the Window 1.
- “2” to route to the Window2.

Click “Audio” in a selected cross-point to select that input as the audio source



To select a cross-point, make sure to click the text within the square.

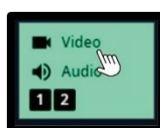


Figure 40: Click on the Text to Select Cross-Point

2. To configure the layout and windows:

- Select the output group on the left-hand pane
- In the right-hand pane, click the desired window (see [Figure 41: Select to Define Window 1 & Window 2](#)).

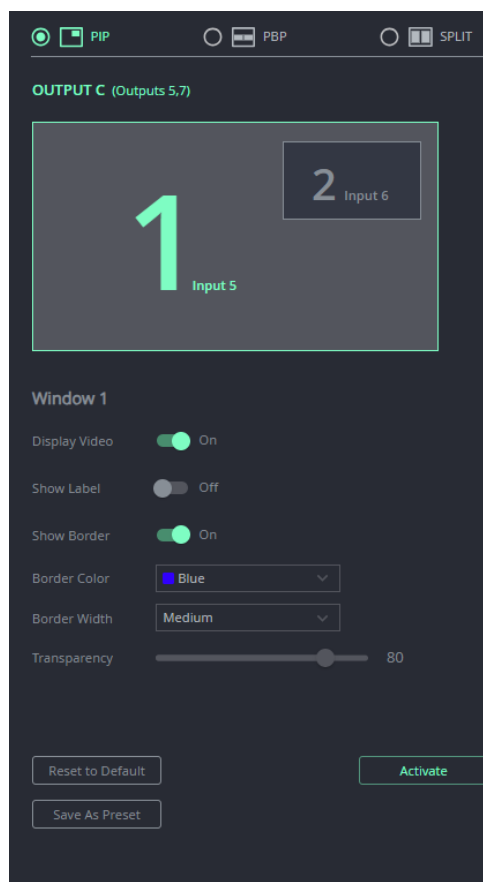


Figure 41: Select to Define Window 1 & Window 2

- In the right-hand pane, click the desired window (1 or 2).
 - The selected window is shaded gray.
 - The text (Window 1 or Window 2) appears beneath the shown layout.
 - All parameters for that window are ready for parameter settings.
 - **Display Video:** Set the video of the selected window to On/Off (Default: On).
 - A window set to Off shows a blank screen
 - **Show Label:** Set to On to show the label in the corresponding window. (Default: Off).
 - **Show Border:** Set to On to show the border of the corresponding window (Default: Off).
 - **Border Color:** Set the border color from the drop-down menu (Default: white).
 - **Border Width:** Set the border size from the drop-down menu (Default: Small).
 - **Transparency:** Use the slider to set the transparency percentage of the corresponding window (Default: 0).
 - Other optional multi-view actions:
 - **Reset to Default:** Click to reset the multi-view settings to factory default values.
 - **Save As Preset:** Click to save the current multi-view settings as a preset.
-  • If the selected preset already has saved content, the new routing/configuration content will overwrite the existing settings.
- To check, activate, delete and modify any existing preset, go to the [Presets](#) on Page [51](#).

3. Click **Activate** to enable multi-view displays.

All selected, routed and configured multi-view output groups are activated to the selected multi-view layouts.

- The output group border and name turns green.
- The associated multi-view layout name of the output group is displayed in green.

-  • Multi-view indication is shown on the AV routing grid for matrix outputs with active multi-view displays. See [Figure 39: Selecting a Multi-view Layout](#).
- Activated multi-view output groups are available for routing only in the **Multi-View** tab, not in the **AV** routing tab.

In the example below, OUTPUT A group is set to a PIP layout, its border is activated and PIP layout are displayed in green:

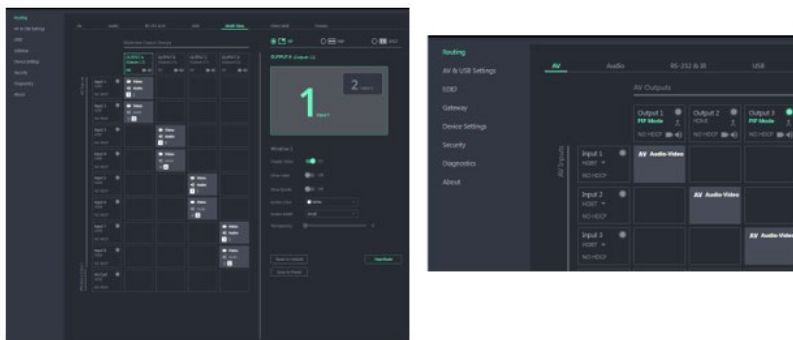


Figure 42: Multi-view indication (PIP Mode) is shown on the AV routing grid

4. Click **Deactivate** to exit the multi-view display for the corresponding output group(s).



When deactivate, the AV inputs and outputs are now available for routing in the AV routing tab.

Video Wall Routing

This section allows users to route inputs to video wall configurations.



Video-wall indication is shown on the AV routing grid for matrix outputs with active video-wall displays. See [Figure 46: Multi-View Indication is Shown on the AV Routing Grid.](#)

The matrix has up to two 2x2 video wall output groups:

- Video wall A group is connected to 1-4 output ports
- Video wall B group is connected to 5-8 output ports



In standard 8x8 matrix mode, the outputs are labeled OUTPUT 1 through OUTPUT 8. In Video Wall mode, two output “groups” are offered, OUTPUT A and OUTPUT B – each supporting a 2x2 video wall.

Routing and Configuring Video Wall Output Groups

- 1. Navigate to the AV Routing tab ([Navigating to the Routing Tabs](#) on Page [30](#)).

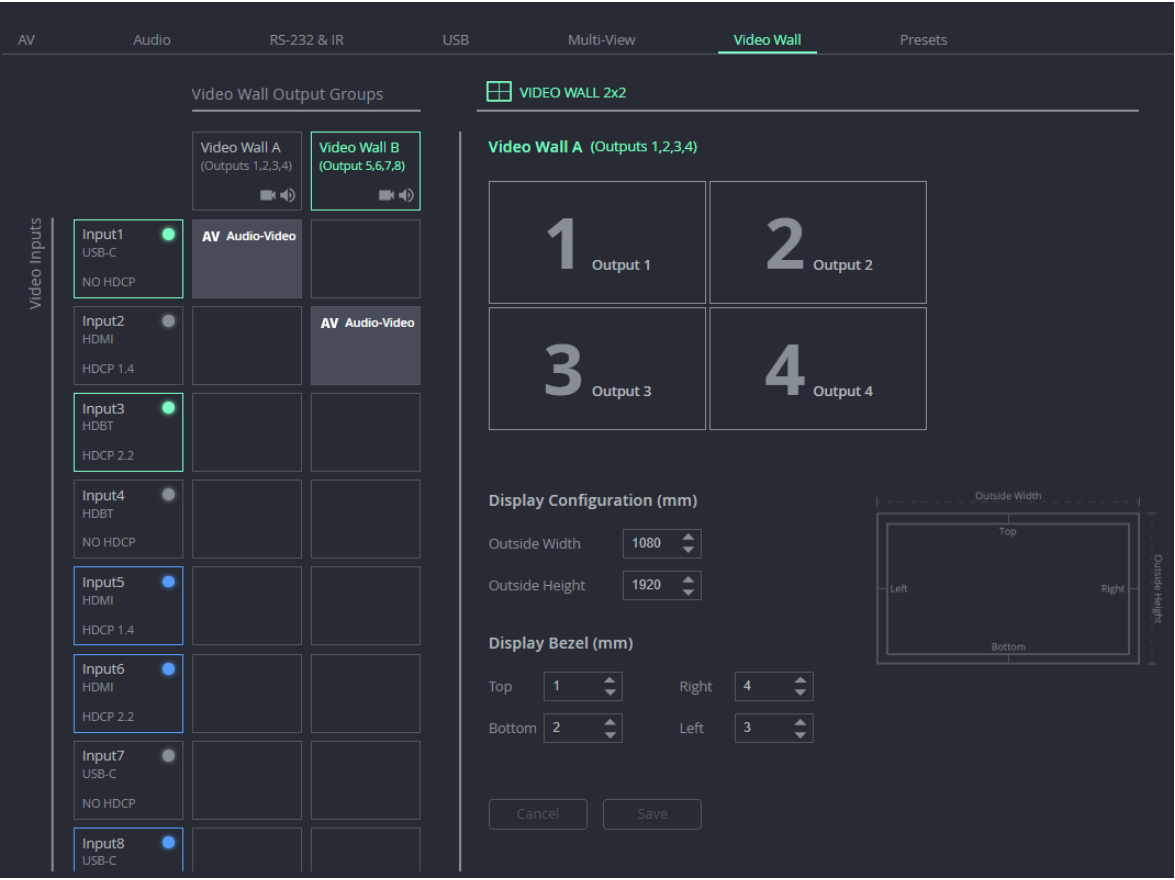


Figure 43: Video Wall Routing Grid

2. On the left-hand routing grid, click an input for routing to Video Wall A output group, and another input for Video Wall B.

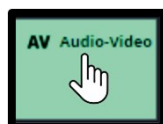


Figure 44: Click on the Text to Select Cross-Point

3. On the right hand pane, you can configure Video Walls output groups A and B.
 - Video Wall output group name (A or B) is displayed above the video-wall displays layout.

Figure 45: Configure Video Wall Group Output

All parameters for Video Wall Output Group (A or B) are ready for configuration:

- **Display Configuration (mm):** Set the outside Width and Height of the video-wall output display.
 - **Display Bezel (mm):** Set the bezel compensation parameters to correctly align the images across the display boundaries.
 - **Top/Bottom/Left/Right:** Set the bezel compensation to compensate for

the distances between the displays' frames and the gaps in-between them in top/bottom/left/right positions.

 The Set top / bottom value cannot be greater than outside display width value, and the set left/right value cannot be greater than outside display height value.

- Other optional multi-view actions:
 - **Reset to Default:** Click to reset the configurations to factory default values.
 - **Save As Preset:** Click to save the current Video Wall settings as a preset.

 • If the selected preset already has saved content, the new routing/configuration content will overwrite the existing settings.

• To check, activate, delete and modify any existing preset, go to the [Presets](#) on Page [51](#).

4. Click:

- **Save** to save configuration. A message appears indicating the operation was successful.
- **Cancel:** Click to abort the configuration.

5. Click **Activate** to enable video-wall displays. All selected, routed and configured video-wall output groups are activated.

- The output group border and name turns green.

 • Video Wall indication is shown on the AV routing grid for matrix outputs with active multi-view displays. See [Figure 42: Multi-view indication \(PIP Mode\) is shown on the AV routing grid Video Wall Routing Grid](#).

• Activated video wall output groups are available for routing only in the **Video Wall** tab, not in the **AV** routing tab.

In the example below, Video-Wall B is set, and activated output borders are displayed in green:

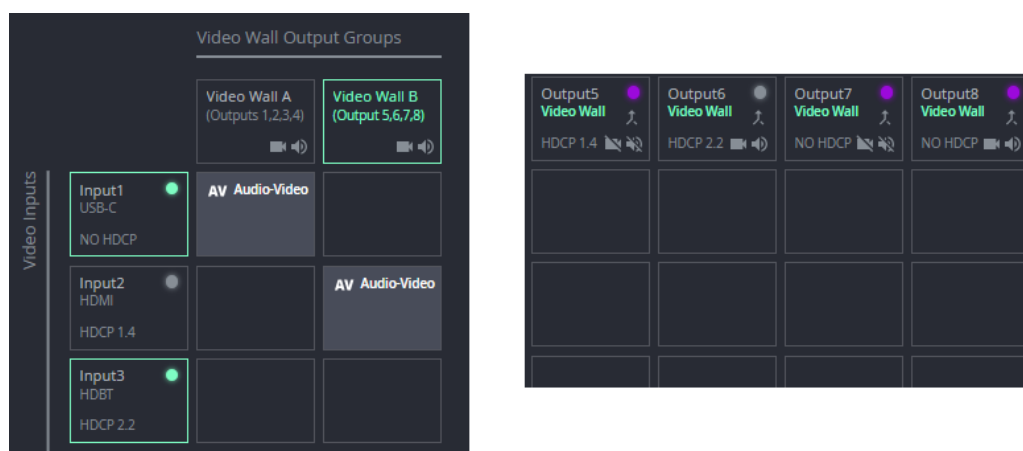


Figure 46: Multi-View Indication is Shown on the AV Routing Grid

6. Click **Deactivate** to exit video-wall display for the corresponding output group(s).



When deactivated, the AV inputs and outputs are now available for routing in the AV routing tab.

Presets

This section allows users to search, activate and delete saved presets, and modify preset names. For presets description see [Presets](#) on Page [20](#).

The Preset landing page appears blank unless the user has saved presets.

Viewing All Saved Presets

- **Type:** Displays the saved preset type:
 - Global – All matrix configuration and routing settings
 - MTX3-88-PR-PRO auto resets on a global reset activation.
 - Specific Routing – AV, Audio, Multi-View and Video Wall specific routing settings only.
- **Name:** Shows the saved preset name:
 - Empty' is shown for a preset with no set name.

	Type	Name
1	Multi-View preset	Preset 1
2	AV preset	Preset 2
3	Audio preset	Preset 3
4	Multi-View preset	Preset 4
5	Videowall preset	Preset 55
6		Empty

Figure 47: Viewing a Saved Preset

Saving a Preset

The user can save presets for AV, Audio, Multi-View and Video Wall routing. For further details, refer to [Saving a Preset](#) on Page [34](#).

Managing the Saved Presets

Searching a Saved Preset

To search a saved preset:

1. In the **Search...** text field, enter the Preset number or Preset Name.

The corresponding found preset is now displayed.

Activating a Saved Preset

To Activate a saved preset:

1. Hover over the desired saved preset row until Activate is displayed in green.
2. Click **Activate**.



Figure 48: Activating a Saved Preset

The Saved Preset is now activated.

Deleting a Saved Preset

To Delete a saved preset:

1. Hover over the desired saved preset row until Delete is displayed in green.
2. Click **Delete**.



Figure 49: Deleting a Saved Preset

The Saved Preset is now deleted.

Modifying the Name of a Saved Preset

To Modify a saved preset's name:

1. Hover over the desired saved preset row until  icon is displayed in green.



Figure 50: Modifying a Saved Preset Name

2. Click the  to display a text field box.
3. Enter the new name and click the  icon.
 - The name length must be 1-19 characters.



Figure 51: Saving a Modified Saved Preset

The Saved Preset name is now modified.

AV & USB Settings

This section allows users to route inputs to outputs, following port related configuration and input pre-selection.

Navigating to the AV & USB Settings AV Tab



- The AV & USB Settings tabs include AV, HDBT Pre-Config, Audio Pre-Config, Speaker, USB, Auto Switching, Overlay and Splash Screen.
- The example below shows how to navigate to the AV Settings tab.

1. In the navigation pane, select **AV & USB Settings**.
2. In the top menu bar, select **AV**.

The AV Settings page is now available.

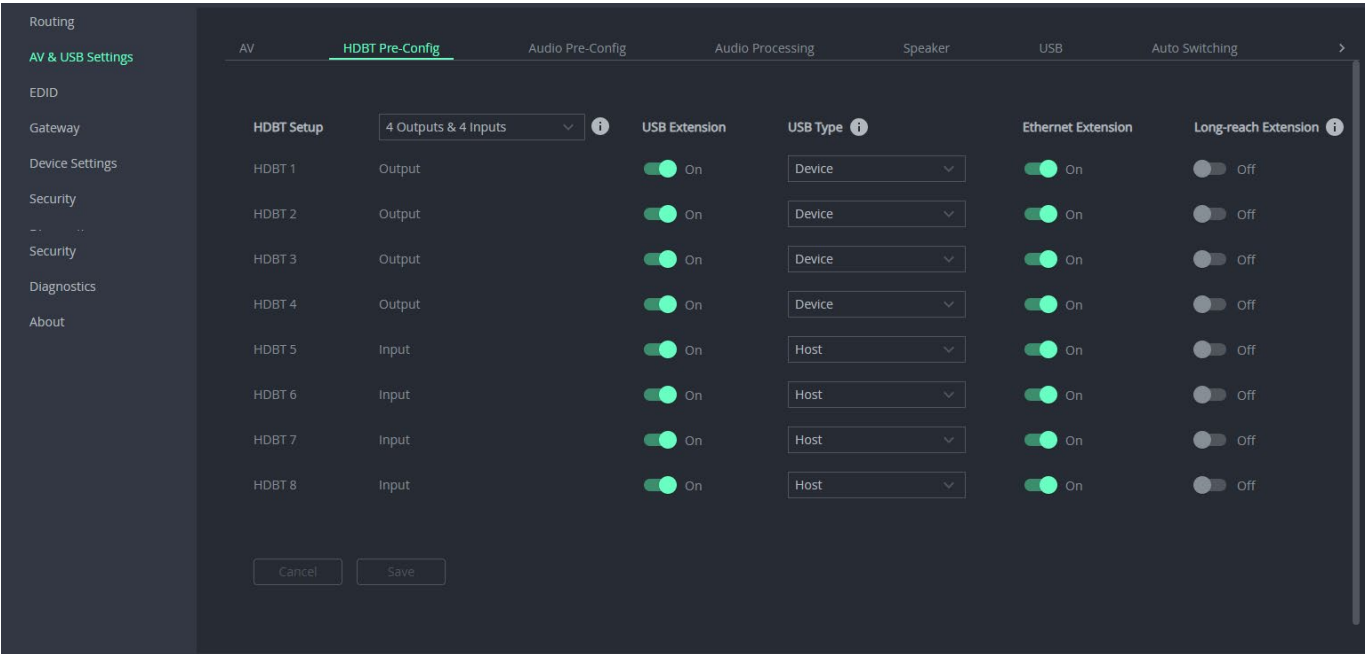


Figure 52: AV & USB Settings AV Landing Page

AV Settings

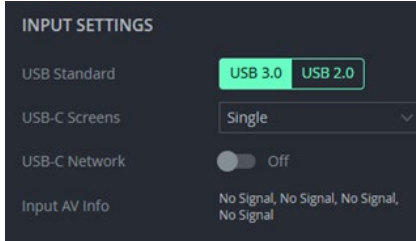
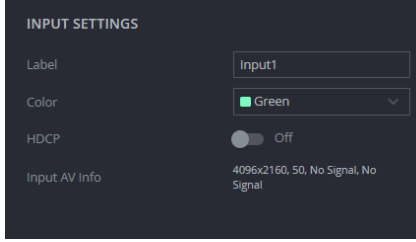
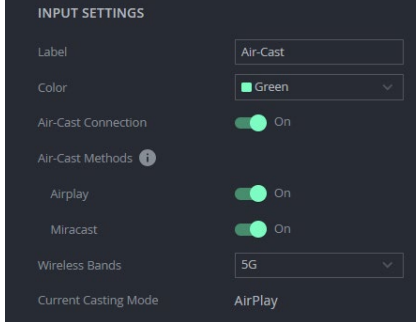
Configuring USB-C, Input and Air-Cast Input Settings

This section allows users to route inputs to outputs, following ports related configuration and inputs pre-selection.

To configure input settings:

1. Navigate to the AV & USB Settings tab (see [Navigating to the AV & USB Settings AV Tab](#) on Page [53](#)).
2. Click to select an input in the left navigation pane and configure, based on the table below:

Table 6: AV Settings

Port type	Settings Attribute Name	Description	Figure with Default Settings
USB- C 1/2	Label	Enter a label for the selected input port.	 Figure 53: USB-C Input Settings Page
	USB-C Standard	Select between USB 3.2 or 2.0. For more details, refer to Technical Specifications on Page 111 .	
	USB-C Screens	Single: Default Dual: USB-C ports supports 2-channel AV signals. Refer to Setting USB-C Input Screens on Page 31 .	
	USB-C Network	Off: Default Click to enable or disable USB-C network connection	
	Input AV Info	Shows information about the current input.	
Input 1-8	Label	Enter a label for the selected input port.	 Figure 54: Input1-8 Input Settings Page
	Color	Click to select the border and indicator color of the input ports in the Routing pages.	
	HDCP	Click to enable or disable HDCP on an input. When enabled (set to ON), the port supports HDCP encrypted content.	
	Input AV Info	Shows the current status of the input signal.	
Air- Cast	Label	Enter a label for the selected input port.	 Figure 55: Air-Cast Input Settings Page
	Color	Click to select the border and indicator color of the input ports in the AV Routing page.	
	Air-Cast Connection**	Click to set air-cast Connection to On/Off.	
	Air-Cast Methods (Protocol)	Click to set air-cast modes (Airplay, Miracast, Chromecast).	
	Wireless Bands	Set the wireless bands from the drop-down menu: 5G / 2.4G.	
	Current Casting Mode	Shows the current air-cast protocol.	
	Input AV Info	Shows the current casting mode.	

** When using Air-Cast connection, verify that the matrix and the BYOD devices are on the same network. For example:

- The LAN 2 port is set to be used for air-cast connection.
- Connect the LAN 2 port of the matrix and the laptop to the same network,
- Set the Air-cast connection to On
- Set Air-Cast mode from the following item to On

- Press “Win + K” buttons on the keyboard of the laptop.
- Select the matrix to connect:

Configuring HDMI and IP Stream Output Settings

To configure the output settings:

1. Navigate to the AV & USB Settings tab (see [Navigating to the AV & USB Settings AV Tab](#) on Page [53](#)).
2. Click to select an Output on the left-hand side of the navigation pane and configure, based on the table below:

Table 7: Output Settings

Port Type	Output Settings Name	Description	Figure
Output 1-8	Label	Enter a label for the selected output.	
	Color	Click to select the border and indicator color of the output ports in the Routing pages (Default color is green).	
	Resolution	Set the output resolution from the drop-down menu (Default: Native, automatically adapts to the display's resolution).	
	Aspect Ratio	Select the aspect ratio from the drop-down menu (Full or Best Fit) (Default setting: Full).	
	RGB Forcing	Click to set RGB forcing to On/Off (Default: Off).	
	Brightness	Use the slider to adjust the brightness of the output (Default: 50).	
	Contrast	Use the slider to adjust the contrast of the output (Default: 50).	
	Saturation	Use the slider to adjust the saturation of the output (Default: 50).	
	HDCP	Always On: HDCP is always enabled on the output Follow Input: The HDCP status of this output port follows that of the routed input. (Default: Always On)	
	Audio Select	DSP insertion: Enable DSP audio insertion. Audio Follow Video: Audio is routed from input to output, following the routing path of the video (Default: Audio Follow Video)	
	Audio Volume Control	Use the slider to set the output volume (Default: 0).	

Figure 56: USB-C Output Settings

	Audio Mute	Click to set the output audio to mute/unmute (Default: Unmuted).
	Output AV Info	Shows the current status of the output signal.

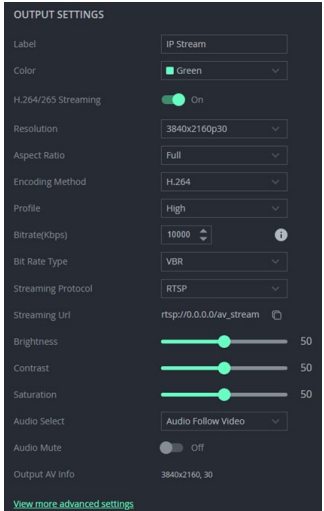
Port Type	Output Settings Name	Description	Figure
IP Stream	Label/Color/Resolution, Aspect Ratio, Brightness, Contrast, Saturation, Audio Select, Mute, Output AV Info	Same as Table 6: AV Settings: Input-1-8 .	
	H.264/H.265 Streaming	Set H.264/H.265 Streaming to enable/disable (Default: Off).	
	Profile	Set the H.264/H.265 profile from the drop-down menu. - H.264 supports: Baseline / Main / High (default). - H.265 supports: Main	
	Bitrate (Kbps)	Enter or click up/down arrow to set the transport bitrate (Default: 10000).	
	Bitrate Type	Click to select streaming bitrate type from the drop-down menu” CBR/VBR (Default: VBR).	
	Streaming Protocol	Shows the streaming protocol.	
	Streaming URL	Shows the streaming destination URL.	
		Click  to copy the current streaming URL.	

Figure 57: IP Stream Output Settings Page

Figure 57: IP Stream Output Settings Page

Configuring Advanced Output Settings

The user can configure additional settings for Outputs 1-8 and IP Stream.

To configure Advanced Output Settings:

1. Navigate to the AV & USB Settings tab (see [Navigating to the AV & USB Settings AV Tab](#) on Page [53](#)).
2. Scroll down to the bottom of the page and click **View more advanced settings**.
3. Click to select an Output in the left-hand side, and configure the output based on [Table 8: Advanced Setting Output Configurations](#) on Page [57](#).

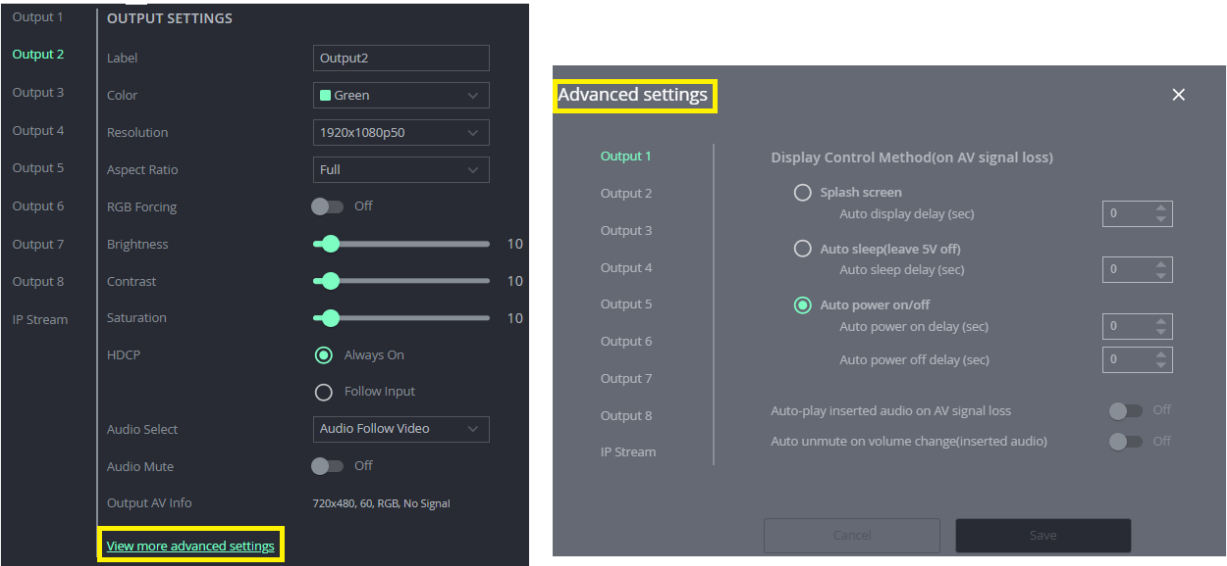


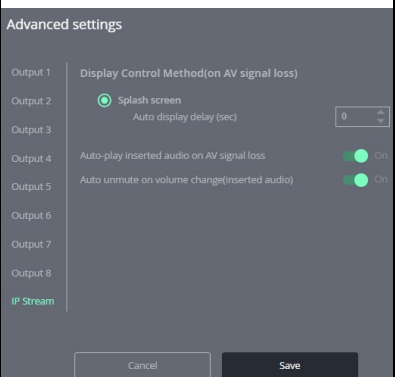
Figure 58: AV & USB Settings AV Landing Page>View Mode Advanced Settings

Table 8: Advanced Setting Output Configurations

Port Type	Display Control Method (on AV Signal Loss)		Description	Figure
	Splash Screen	(enabled by default)	When selected, the corresponding display will show the pre-selected splash screen (refer to Splash Screen on Page 84) when no signal is detected for this output.	
		Auto display delay (sec): (default: 60 sec)	Set the delay time after loss of the input signal before displaying the splash screen.	
	Auto sleep (leave 5V off)	(disabled by default)	When selected, the corresponding display will enter sleep mode when no active input is detected.	
		Auto sleep delay (sec) (default: 60 sec)	Set the delay time before the display enters auto sleep mode when no active signal is detected.	

Figure 59: IP Stream Output Settings Page

	Auto power on/off		When selected, the corresponding display will power On automatically when an active signal is detected, and power Off automatically when no active signal is detected.
		Auto power on delay (sec) (default: 0 sec)	Set the auto power On delay time for the device when an active signal is detected and transmitted to the display.
		Auto power off delay (sec) (default: 60 sec)	Set the auto power Off delay time when no active signal is detected.

Port Type	Display Control Method (on AV Signal Loss)	Description	Figure
Relevant for both Output 1-8 and IP Stream	Auto-play inserted audio on AV signal loss (enabled by default)	When enabled, the inserted audio signal will be automatically played upon loss of input AV signal.	 Figure 60: Advanced settings for IP Stream
	Auto unmute on volume change (inserted audio)	When enabled, an output audio which was muted will be unmuted if its volume is change.	

4. Click **Save/Cancel** to save/abort the configurations.

HDBT Pre-Config

This section allows users to set HDBT, USB extension, USB type, Ethernet and long-reach extension.

Configuring HDBT Extensions



The HDBT link is reset upon an HDBT direction change.

1. Navigate to the AV & USB Settings>HDBT Pre-Config tab (see [Navigating to the AV & USB Settings AV Tab](#) on Page [53](#)).

2. In the HDBT Setup drop-down box, select if the HDBT ports are to be configured as inputs or outputs (Default: HDBT 1-4 are outputs and HDBT 5 -8 are inputs).

To view the effect on AV routing, see [Configuring HDBT Extensions](#) on Page [58](#).

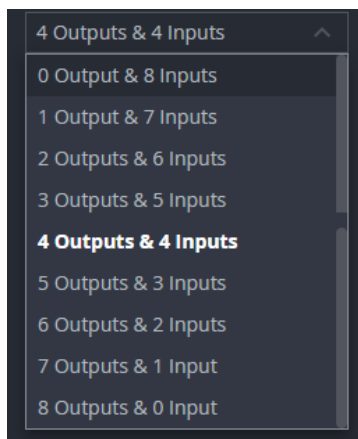


Figure 61: AV & USB Settings>Configuring HDBT Ports

3. Click **Save / Cancel** to save / abort the HDBT configurations.

HDBT Extension Configurations Effect on AV Routing Page

- In the AV Routing page, the selectable inputs are displayed according to the configuration in the HDBT-Pre-Config table.



Figure 62: AV Routing Selectable Inputs following HDBT Pre-Configuration

- The selectable inputs are displayed according to the configurations in HDBT Pre-Config table.

Setting HDBT USB Extension

USB enabled extension allows USB connection between HDBT remote USB peripherals (host and devices) and all local USB peripherals.

To Set the USB extension:

- Click to set the USB extension of each HDBT port (Default: On).

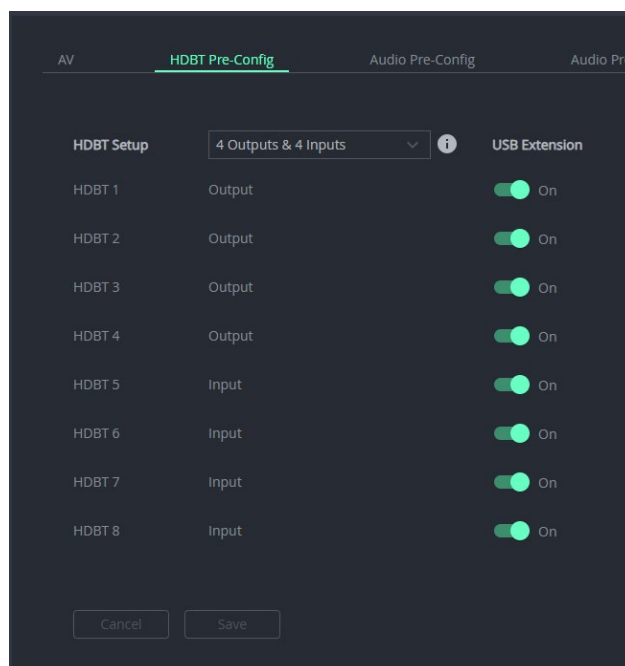


Figure 63: USB Extensions Enabled

2. Click **Save / Cancel** to save/abort the USB extension configurations.

Configuring HDBT USB Type (Host/Device)

 HDBT host side appears to the matrix as a connection to a PC/Laptop/NUC.

To configure HDBT USB type:

1. Set the USB type of each HDBT port from the drop-down box (Default: HDBT 1-4 Host / HDBT 5-8 Device).
2. Click **Save / Cancel** to save/abort the USB extension configurations.

 The USB Type configuration must not exceed 4 devices.

USB Type Configurations Effect on USB Routing Page

In the USB Routing page, all USB devices can be routed to ONE USB host.

- In the left-hand figure below, Inputs 1, 2, 4, 5, 7 & 8 are configured as Hosts, and Inputs 3, 6 are configured as Devices.
- As shown in the right-hand figure below, all USB devices can be routed to only ONE host.
 - MTX3-88-PR-PRO matrix, allows USB devices routing to dual USB hosts in parallel, by enabling Dual Active USB Host. Refer to [AV & USB Settings](#) on [Page 53](#).

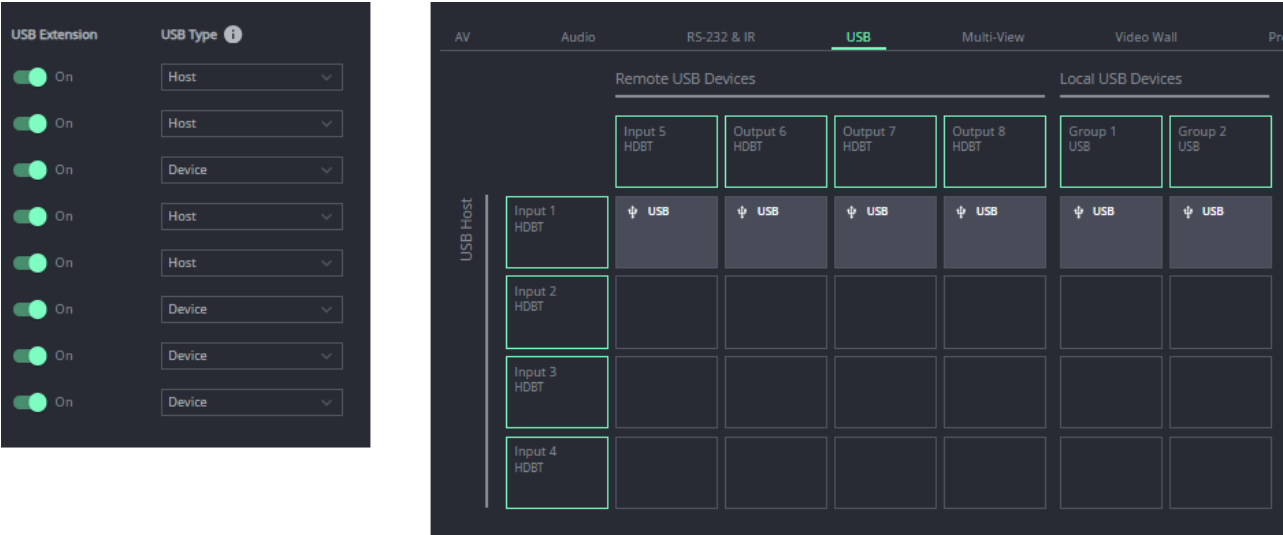


Figure 64: USB Type settings impact on USB Single Active USB Host

Configuring HDBT Ethernet Extension

To configure HDBT Ethernet extension:

- 1. Click **On** to enable the Ethernet extension of each HDBT port (Default: On). When set to on, the laptop connected with the remote HDBT transmitter/receiver has access to the matrix connected LAN.

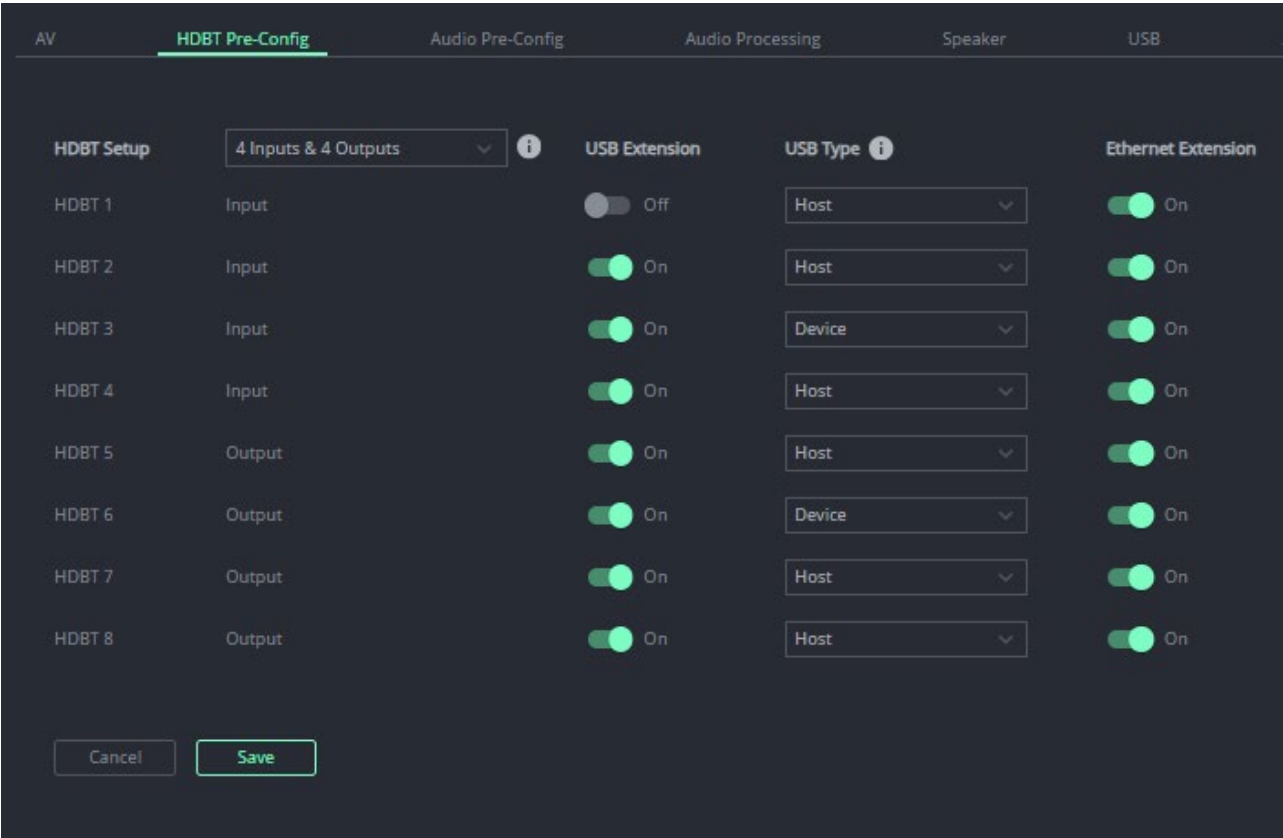


Figure 65: HDBT USB and Ethernet Extensions Enabled

- 2. Click **Save / Cancel** to save/abort the HDBT configurations.

Configuring Long-REACH Extension

To configure Long-REACH extension:

1. Click **On** to set Long-REACH extension of each HDBT port (Default setting: Off). When set to on, the HDBT ports can transmit 1080P AV signals longer distances.

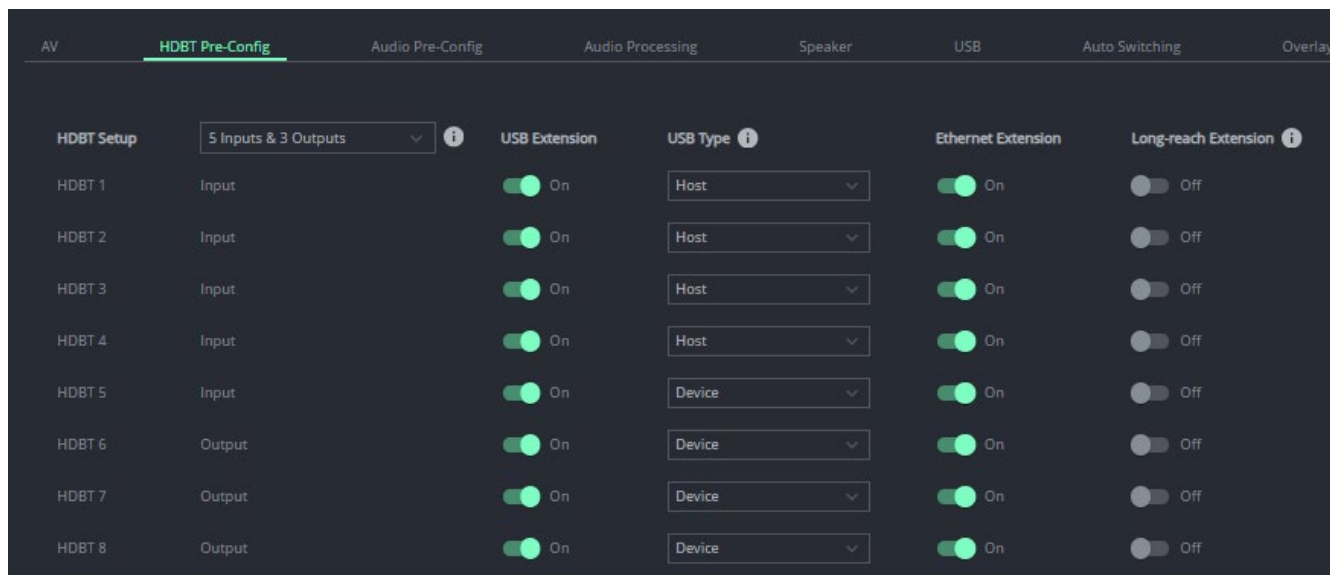


Figure 66: Long-REACH Extensions Disabled

2. Click Save / Cancel to save/abort the HDBT configurations.

Audio Pre-Config

This section allows users to select the active audio inputs and outputs for configuration and audio routing.



- Audio routing and pre-selection is carried out on audio ports selected as active on the Audio Pre-Config page, per the tables below, (see [Routing an audio input to an output](#) on Page 36).
- Audio processing and mixing are performed on the actively selected audio inputs/outputs in the Audio-Processing page. Refer to [Audio Processing](#) on Page 64.

Configuring Audio Pre-Config Inputs & Outputs

To configure Audio Pre-Config settings:

1. Navigate to the AV & USB Settings>Audio Pre-Config tab (see [Navigating to the AV & USB Settings AV Tab](#) on Page 53).

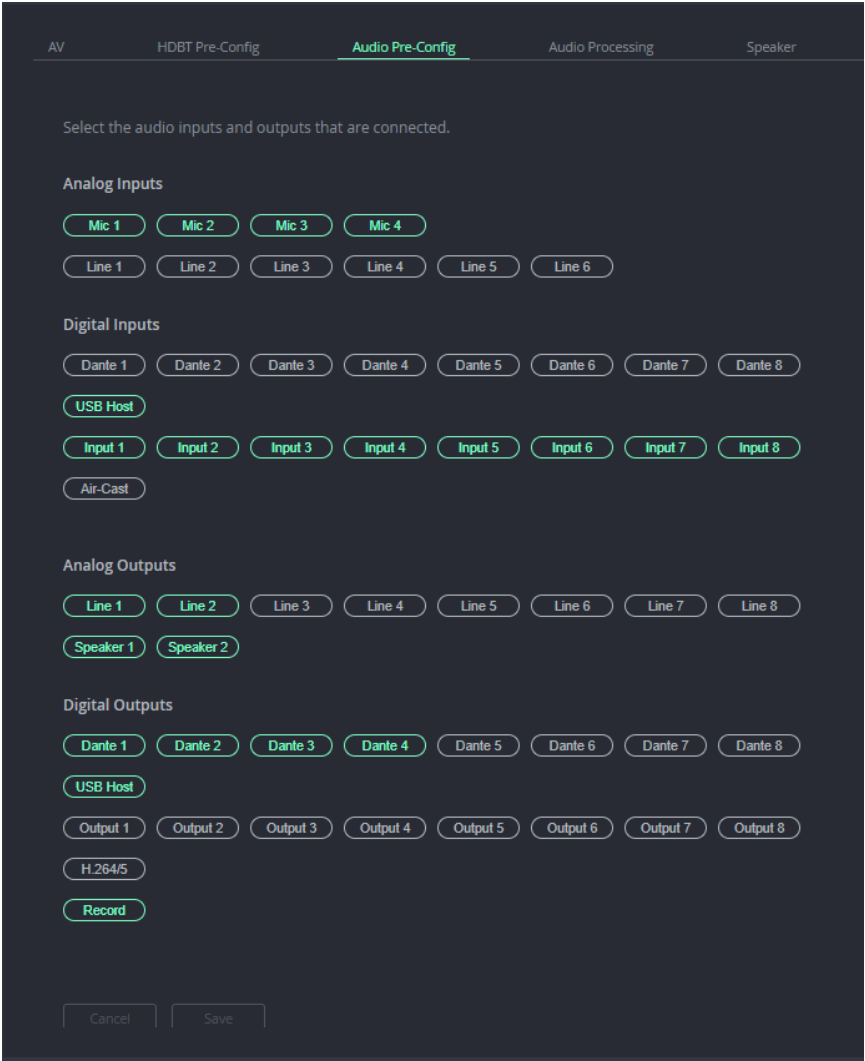


Figure 67: AV & USB Settings>Audio Pre-Config Page

2. Click the corresponding names of the audio inputs and audio outputs, to select the ports as active for audio routing, processing and configuring.
- Both the name and the border color change from white to green when the selection is done. Re-click to cancel the selection (name and border color change from green to white).

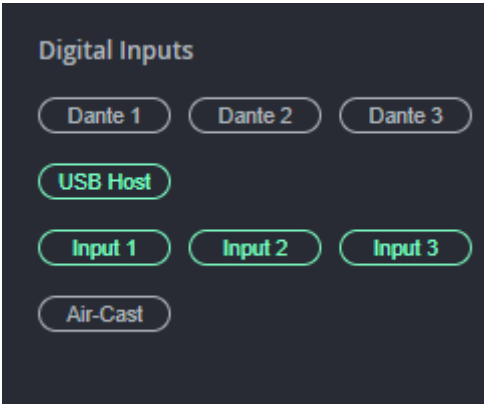


Figure 68: Selected & Non-Selected Audio inputs

a) User can select active input(s) per the table below:

Audio Input Type	Available Ports
------------------	-----------------

Analog	MIC 1-4
	Line 1-6
Digital	Dante 1-8
	USB Host 1 & 2
	Input 1-8
	Aircast 9

b) User can select active input(s) per the table below:

Audio Input Type	Available Ports
Analog	Line 1-8
	Speaker 1 & 2
Digital	Dante 1-8
	Output1-8
	H.264/5
	Record

3. Click **Save / Cancel** to save /abort the audio inputs and outputs selection.

Audio Processing

This section allows users to set audio processing functions on pre-selected, actively routable audio inputs, and view routable signals mixing.

Audio Signals Mixing

Viewing Mixed and Routed Signals

To view current audio signal mixing and routing connections:

1. Navigate to the AV & USB Settings>Audio Pre-Config tab (see [Navigating to the AV & USB Settings AV Tab](#) on Page 53).

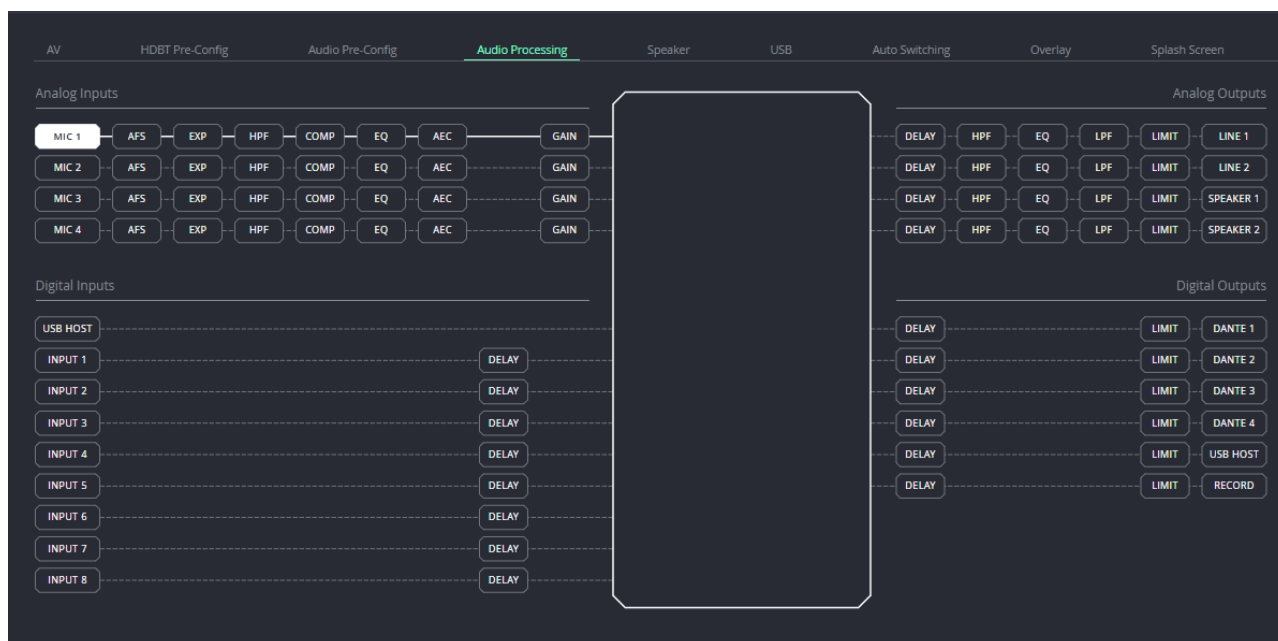


Figure 69: AV & USB Settings>Audio Processing Tab

2. Click an INPUT/OUTPUT button, or an audio processing function (**AFS** for example), to highlight the associated audio mixed and routed path, in the audio mixing zone.

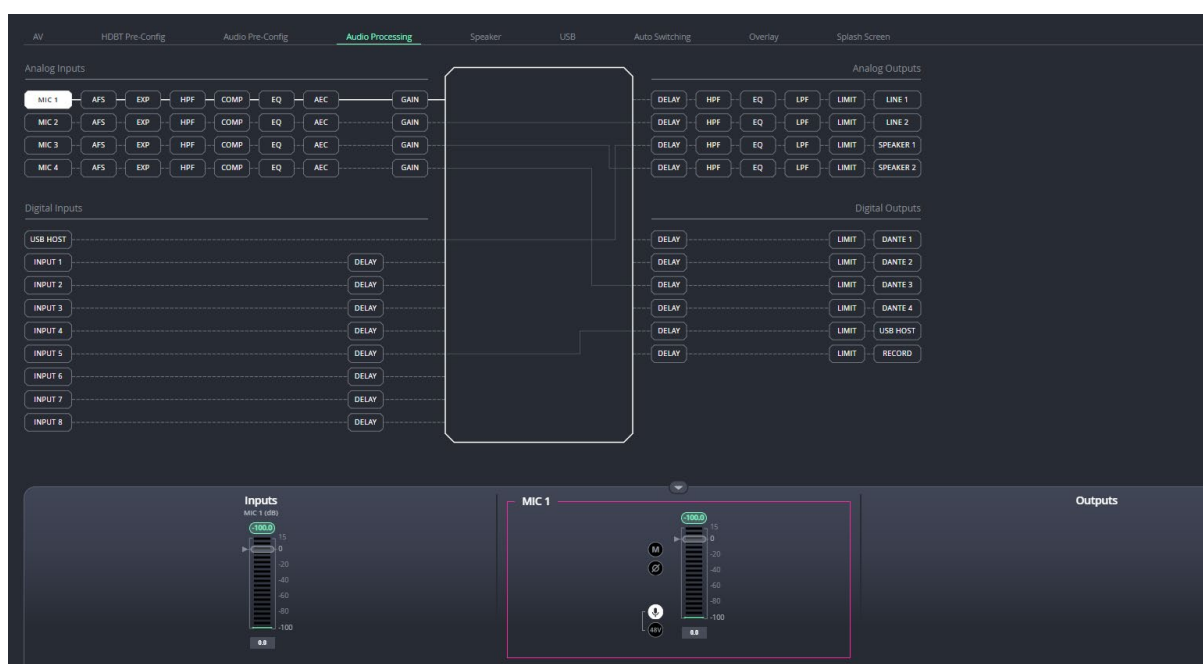


Figure 70: AV & USB Settings>Settings>Audio Processing Page: Highlighted Audio Routing Path

- To view the effect on AV routing, see [HDBT Extension Configurations Effect on AV Routing](#) on Page 59.

3. Click within the audio mixing zone to enter the Audio Routing page.

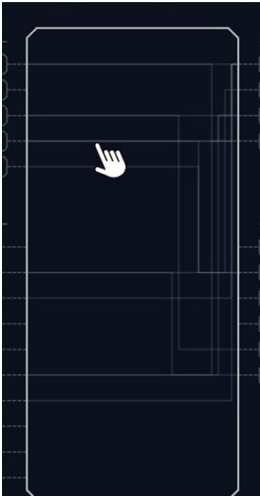


Figure 71: Click within Mixing Zone to Enter the Audio Routing Page

Audio Input Pre-mixing Processing Parameters

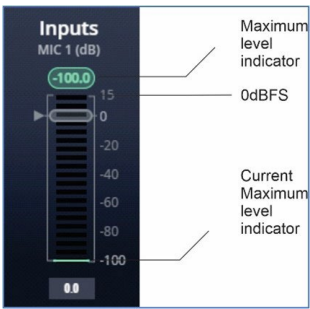
To view and adjust the audio processing functions of a highlighted mixed and routed audio connection:

- 1. Click an audio processing function to view and adjust the relevant processing parameters and attributes based on the various sections below.

Viewing Measured Signal Parameters and Attribute

 The audio signal and is measured in dBFS units (dB relative to full scale, the maximum value).

Table 9: Measured Signal Parameters and Attributes

Slide Name	Measured Attribute	Description	Figure
Level	Maximum level	Displays the highest registered level (RMS). Indicator changes only on higher level detection. Click indicator to reset the current maximum detected value.	 Figure 72: Level Measured Attributes
	0dBFS	Maximum level limit for incoming signal.  Signal levels higher than the system level are clipped.	
	Current maximum level	Displays the current maximum level. Indicator changes only on higher level detection.	

Slide Name	Measured Attribute	Description	Figure
Gain / Attenuation Fader	Maximum level	15dB is the maximum gain level.	Figure 73: Gain/ Attenuation Fader
	Unity gain	When volume fader is set to 0dB, input level is not changed.	
	Volume fader	Slide to increase/decrease the audio volume level.	
	Minimum level	-100dB is the maximum attenuation level.	
	Current fader position	Displays the value at the current fader position. Users can manually enter the volume level in this box and press enter to adjust to a specific volume level.	

Adjusting Signal Attributes

This section describes the input pre-matrix signal processing of the input audio signal.



The input fader always appears at the bottom of the page.

Table 10: Signal Attributes

Audio Input Type	Attributes Accessing Method	Function	Action
Analog	Click one input name in the Analog Inputs zone	Adjusting the audio input level	Move the fader
		Mute / unmute the audio input signal	Click /
		Inverse the signal polarity	Click
		Selecting a dynamic microphone (for mic in)	Click (default)
		Selecting a condenser microphone (for mic in) Selecting a condenser microphone enables 48V phantom powering. To avoid damaging the microphone, make sure that it is a condenser type prior to making this selection.	Click

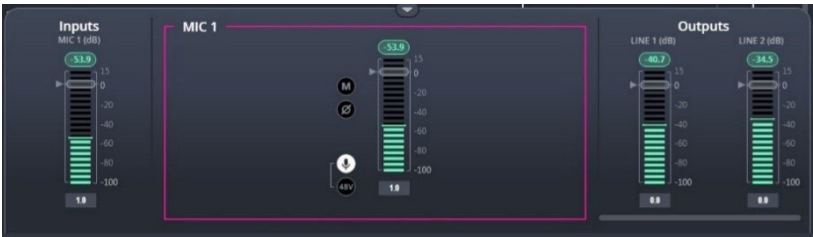


Figure 74: Click Analog Input Zone to Adjust Analog Input Parameters

Audio Input Type	Attributes Accessing Method	Function	Action
Digital	Click one input name in the Digital Inputs zone	Adjusting the audio input level	Same as above
		Mute / unmute the audio input signal	
		Inversing the signal polarity	
Press “Ctrl” on your keyboard and click inside any of the knobs to reset its value to the default setting.			

Figure 75: Click Digital Input Zone to Adjust Digital Input Parameters

Figure 75: Click Digital Input Zone to Adjust Digital Input Parameters

Adjusting AFS (Auto Feedback Suppression)

AFS is used to eliminate microphone feedback.

Click the **AFS** button, to adjust:

Table 11: Auto Feedback Suppression Adjustments

Attribute	Function	Action
AFS function	Turn ON/OFF	Click  / 
Bands (8)	Setting each band to Dynamic (Dyn) or Fixed (Fix) Application dependent	Click  / 
Threshold (dB)	Feedback suppression. Default: -50dB	Set the AFS activation threshold
Max Depth (dB)	Cut the depth per band. Default: -49dB	Set the cut depth

Notch Step Size (dB)	Decrease step (until max depth reach). Default: 9dB	Set the step size
----------------------	--	-------------------



Figure 76: Auto Feedback Suppression Adjusting

Adjusting the EXP (Expander)

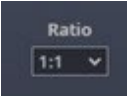
Expander is used to increase the loudness difference between the quieter and louder sound signals of the MIC and LINE inputs.

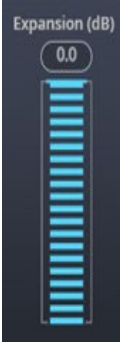
On active Expander:

- Quiet sound signals (typically background noises) become quieter, while loud sound signals become louder.
- The volume level is reduced for audio signals falling below the set threshold level.

Click the **EXP** button, to adjust:

Table 12: Expander Adjustments:

Attribute	Function	Action
EXP function	Turn ON/OFF	Click  / 
Threshold (dB)	Volume level reduction threshold. Default: 0dB	Set level threshold
Attack Time (ms)	Expander response speed to above-threshold signal levels. Default: 80ms	Set attack time
Release (ms)	Expander response speed to below-threshold signal levels. Default: 1000ms	Set release time
Ratio	Volume decrease ratio.  The higher the ratio, the more the volume lowering of below-threshold audio signals.	Click ratio drop-down box 

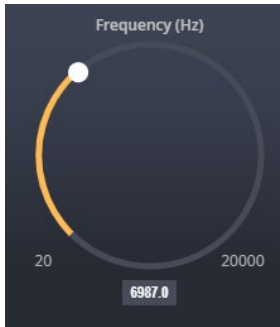
Expansion (dB)	Expansion level.	Set the expansion level 
 Figure 77: Expander Adjustments		

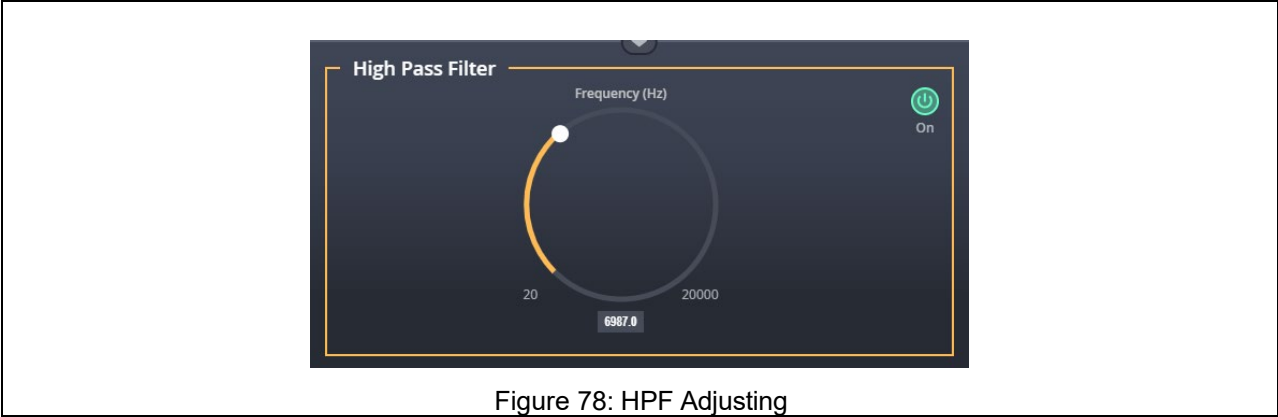
Adjusting HPF (High Pass Filter)

A High Pass Filter passes signals that are higher than the cut-off frequency threshold. Frequencies below the cut-off frequency threshold are attenuated.

HPF is used to cut off low frequencies and let higher frequencies pass for MIC and LINE inputs. Click the HPF button, to adjust:

Table 13: HPF Adjustments

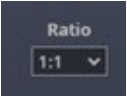
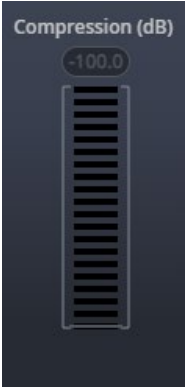
Attribute	Function	Action
HPF function	Turn ON/OFF	Click  / 
Threshold (Hz)	Cut-off frequency threshold. Default: 20Hz	



Adjusting COMP (Compressor)

Compressor is used to reduce the signal dynamic range between the loud and quiet sounds, such as the difference between a scream and a whisper, to enable a more natural sound.

Table 14: Compressor Adjustments

Attribute	Function	Action
COMP function	Turn ON/OFF	Click  / 
Threshold (dB)	High-level signal threshold. Compression applies to threshold crossing signals, while others pass-through unchanged. Default: 0dB	
Attack Time (ms)	Compressor response speed to above-threshold signal levels. Default: 80ms	
Release (ms)	Compressor response speed to below-threshold signal levels. Default: 1000ms	
Ratio	The amount of compression applied once the signal passes the threshold. Default: 1:1	Click ratio drop-down box 
Compression (dB)	Compression gain level. Gain compensates the compression resulted attenuation.	Set the compression gain level 

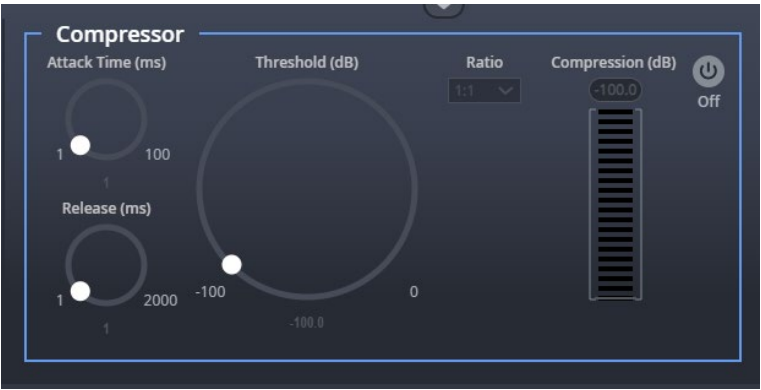


Figure 79: Compressor Adjusting

Adjusting EQ (Equalizer)

Equalizer is used to change the response to different frequency components in the audio signal.

Click the EQ button, to adjust:

Table 15: Equalizer Adjustments

Attribute	Function	Action
EQ function	Turning ON/OFF	Click  / 
Bands (4)	Setting each band to Dynamic (Dyn) or Fixed (Fix)  Application dependent	Click  / 
Level (dB)	The gain for the equalizing frequency band.	Set the level for this frequency band
Frequency (Hz)	The frequency that the EQ band affects.	Set the center frequency of the EQ band
Bandwidth (Oct)	The bandwidth around the EQ frequency.	Set EQ bandwidth



Figure 80: Equalizer Adjusting

Adjusting AEC (Acoustic Echo Cancellation)

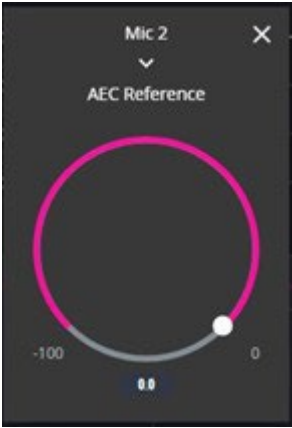
AEC learning filter algorithm removes the unwanted room echoes, such as echoes from room speakers.



- AEC can be activated on up to 2 audio inputs in parallel.
- Prior to AEC activation on a third audio input, one of the previously activated inputs must be deactivated.
- If you still wish to enable AEC on the current audio input, you must first turn off AEC on one of the previously enabled channels.

Click the **AEC** button to adjust:

Table 16: AEC Adjustments

Attribute	Function	Action
AEC function	Turn ON/OFF	Click  / 
Noise suppression for speech	Noise suppression	Click On/Off
Noise suppression for basic audio	Noise suppression	Click On/Off
AEC Reference (dB)	 AEC reference input. Default: USB Host - Other audio inputs can also be selected for audio mixing. - The reference input signal is used by the AEC algorithm to identify the expected echo and subtract it from the microphone signal. - The selected audio for mixing can be adjusted independently.	 Figure 81: AEC Reference - Click to select AEC reference input. - To remove the selected reference input, click  - Move the mouse to the value position of the set input signal. When the mouse converts to a hand icon, click to enter the following window, and use the knob slider to adjust the value.

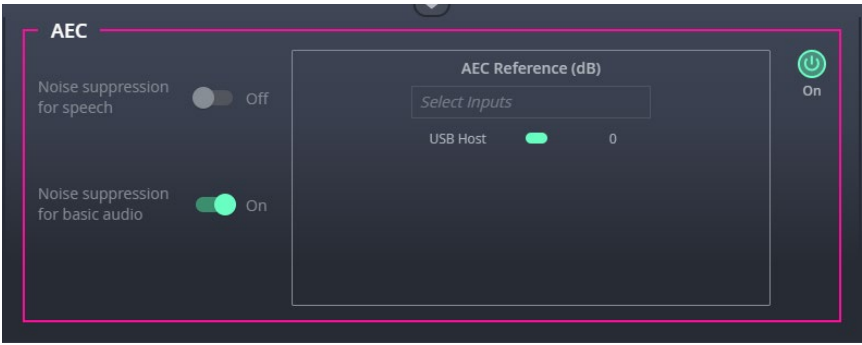


Figure 82: Acoustic Echo Cancellation Adjusting

Audio Output Post-Mixing Processing Functions

The device enables performing post-matrix signal processing to the outputs.

Adjusting Delay

Use the delay, for example, to accommodate the audio according to the listeners distance from the speakers.

Click the **DELAY** button, to adjust:

Table 17: Delay Adjustment Table

Attribute	Function	Action
DELAY function	Turning ON/OFF	Click  / 
Delay (ms)	Output signal delay. Delay time (in ms) is converted to distance information shown in meters, feet, and samples.	Use knob to adjust delay



Figure 83: Delay Adjusting

Adjusting HFS

Refer to [Adjusting HFS](#) on Page [74](#).

Adjusting EQ

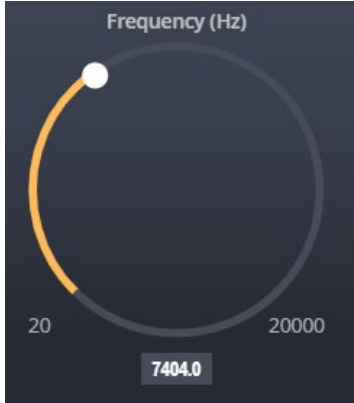
Refer to [Adjusting EQ \(Equalizer\)](#) on Page [72](#).

Adjusting LPF (Low Pass Filter)

LPF is used to cut off high frequencies and let lower frequencies pass through.

Click the **LPF** button, to adjust:

Table 18: LPF Adjustment Table

Attribute	Function	Action
LPF function	Turn ON/OFF	Click  / 
Threshold (Hz)	Cut-off frequency threshold. Default: 20000Hz	

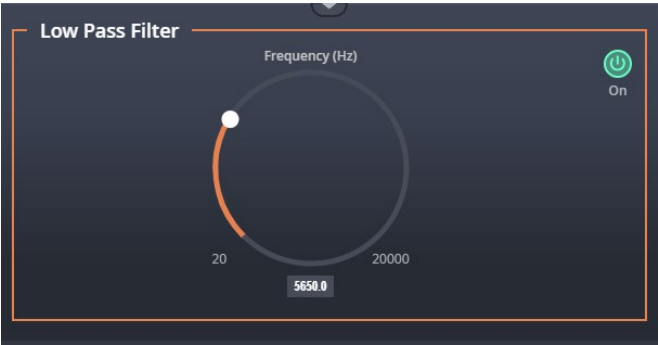


Figure 84: LPF Adjusting

Adjusting LIMIT (Limiter)

Use the limiter to attenuate audio peaks and keep the output level from exceeding a defined threshold.

 A limiter can boost the volume of a certain sound.

Click the **LIMIT** button, to adjust:

Table 19 LIMIT Adjustment Table

Attribute	Function	Action
LIMIT function	Turning ON/OFF	Click  / 
Threshold (dB)	Cut-off amplitude threshold.	Use knob to adjust threshold or enter the threshold value.



Figure 85: Limiter Adjusting

Speaker (Power Amplified Output) Configuration

This section allows users to set the speaker (power amplified) outputs.

Setting Speaker Outputs

To configure speaker outputs:

- 1. Navigate to the AV & USB Settings>Speaker tab (see [Navigating to the AV & USB Settings AV Tab](#) on Page 53).

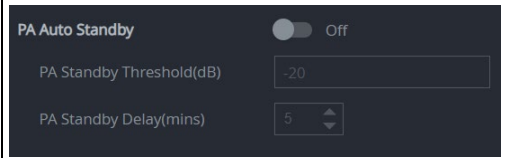
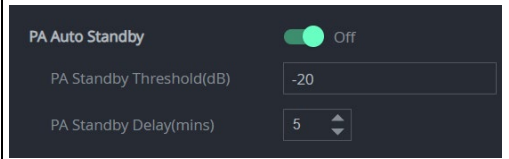


Figure 86: AV & USB Settings >Speaker Settings Page

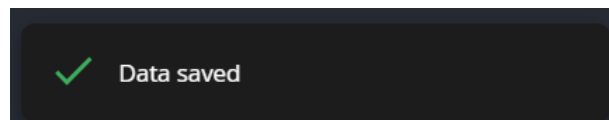
- 2. Click to select a speaker (1 or 2) in the left navigation pane and configure, based on the table below:

Table 20 Speaker Configuration Options

Speaker Port PA (Power Amplify) Z Level	Settings Attribute Name	Description	Figure with Default Settings
Lo-Z (default)	Select Lo-Z for low impedance. The L+ and L- terminals are connected to the left speaker, and the R+ and R- terminals are connected to the right speaker in this mode.		PA Z Level: Lo-Z Figure 87: Speaker Configuration Lo-Z Settings Pane
Hi-Z	Select Hi-Z for high impedance. Connect the Hi-Z terminal and the COM terminal to the mono Hi-Z speakers.		PA Z Level: Hi-Z PA Hi-Z Voltage(V): 70V PA Hi-Z Mono Selection: Stereo Down Mix Figure 88: Speaker Configuration Hi-Z Settings Pane
	PA Hi-Z Voltage (V)	Select: 70V, 100V. (Default: 70V)	

	PA Hi-Z Mono Selection	Left only: Use the left audio signal. Stereo Down Mix: Combine the stereo input signal to mono	
	PA Master Volume (dB)	Use the slider to adjust the speaker output master volume. Range: -100 ~ 15. (Default: 0)	 Figure 89: PA Master Volume Slider
	PA Auto Standby	ON: The output automatically enters standby mode when the detected signal level falls below the set threshold and the specified delay time has elapsed. (Default: Off)	 Figure 90: PA Auto Standby Set to OFF
	PA Standby Threshold (dB)	Auto-standby low-volume signal threshold: Range: -100 ~ 0 (Default: -70)	
	PA Standby Delay (minutes)	Auto-standby delay timeout: Options: 5, 10, 15 (Default: 10)	 Figure 91: PA Auto Standby Set to ON

3. Click Save / Cancel to save / cancel the configuration.



USB

This section allows users to:

- Set dual active USB host mode (for effect on USB routing, refer to [Setting a Single or Dual Active USB Host\(s\)](#) on Page 41, and
- For each USB device port, select whether the port should appear active or inactive to the connected USB peripheral (e.g., camera or soundbar) when the USB host is disconnected.

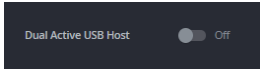
Setting Dual Active USB Host Mode

This section allows users to set the USB host groups.

1. Navigate to the AV & USB Settings>USB tab (see [Navigating to the AV & USB Settings AV Tab](#) on Page 53).
2. Click to set dual active USB Host mode to On/Off (default is Off).

The table below shows the various settings and their effects:

Table 21: Dual Active USB Host Modes

Feature	State	Description		Figure with Default Settings
Dual active USB Host	OFF	Single host (local USB-C hosts or HDBT remote USB hosts) can be connected to all USB devices.		 Figure 92: Dual Active USB Host Disabled
	ON	Two USB hosts can be connected to two group USB devices independently.	Group 1: • USB-C IN 1 (host only) • Local USB device group 1 (device only) • HDBT: 1/3/5/7 (host or device)	

Setting USB Host Auto-Disconnection on Inactive Host

To set USB Host Auto-Disconnection:

1. Navigate to the AV & USB Settings>USB tab (see [Navigating to the AV & USB Settings AV Tab](#) on Page 53).

2. For every device port – either local or remote (HDBT), when the USB host is disconnected, select whether the USB device connection is defined as Active or as Inactive (Inactive by default).

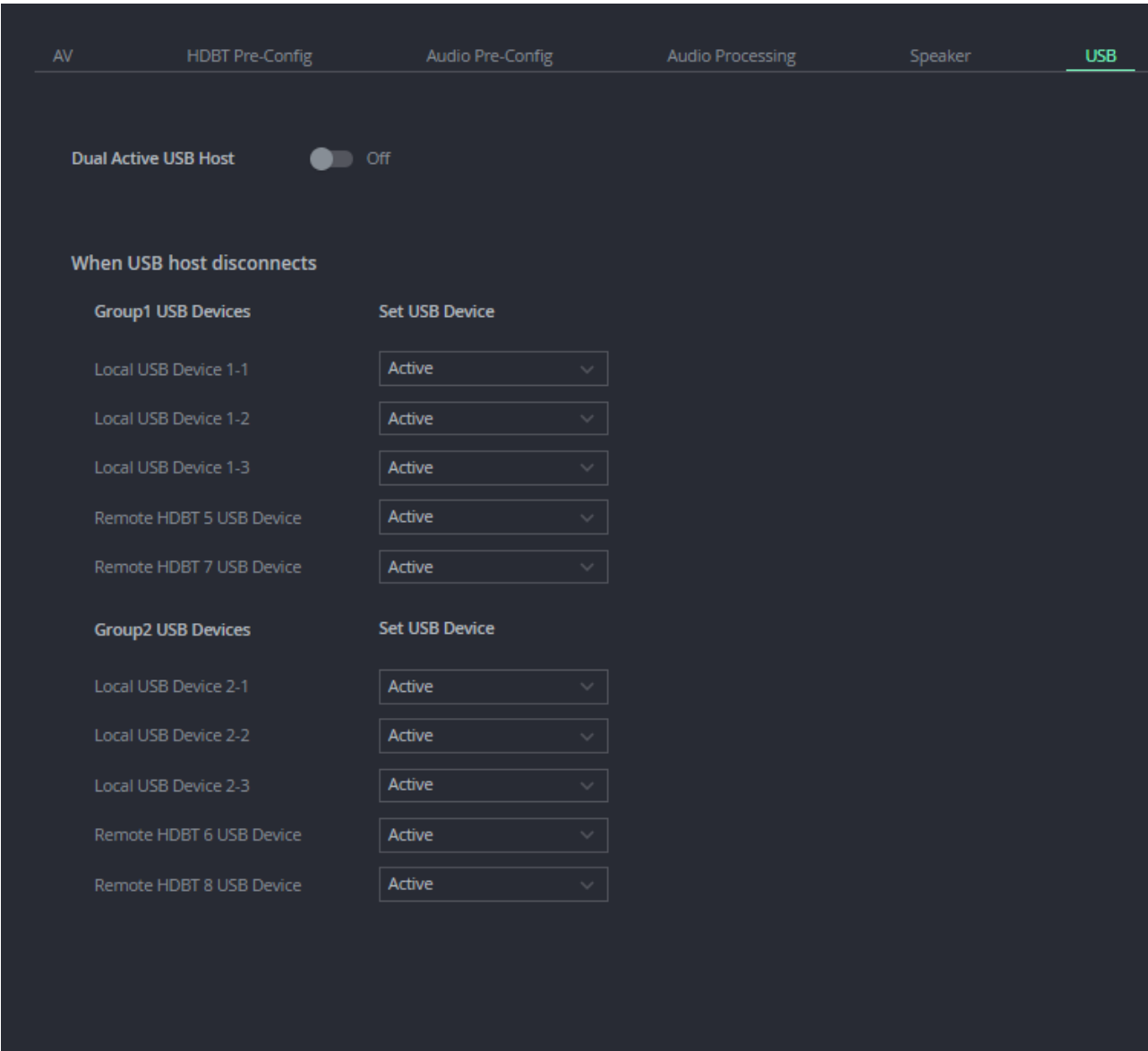


Figure 93: AV & USB Settings>USB Settings Page

Auto Switching

This section allows the user to set the attributes for auto-input switching, and to group inputs and outputs into “clusters”.

Settings the Auto Switching Mode

1. Navigate to the AV & USB Settings>USB tab (see [Navigating to the AV & USB Settings AV Tab](#) on Page [53](#)).

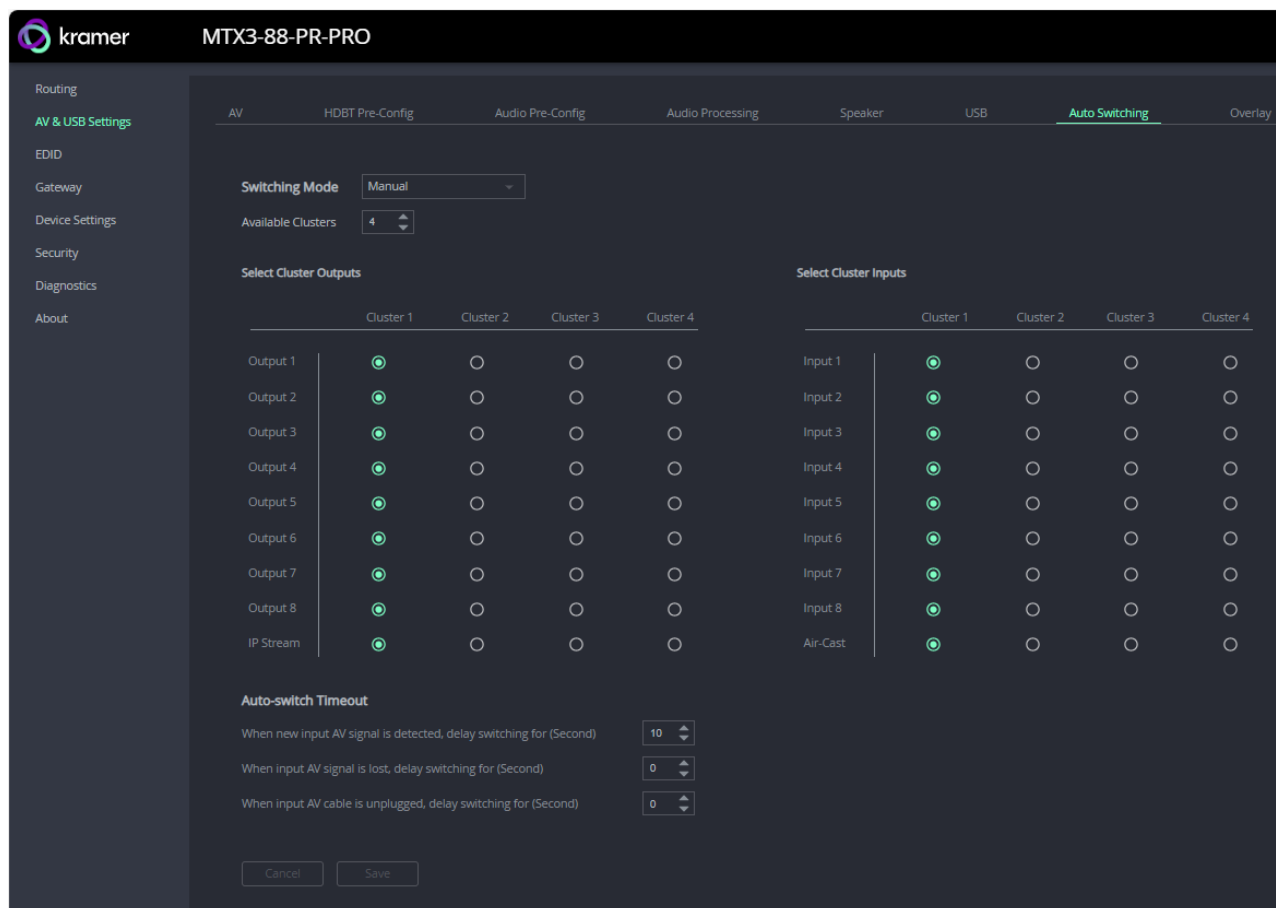


Figure 94: AV & USB Settings>Auto Switching Page

2. Next to the Switching Mode drop-down box, select the auto switching policy: **Manual**, **Last Connected** or **Priority**.

- **Manual** (Default): Users can switch input to output manually. The unit does not switch the sources automatically.
- **Auto Scan**: The matrix scans for a valid input signal upon loss of the current input. The scanning always starts at Input 1, scanning as follows: Input 1 → Input 2 → ... → Input 8 → Air-Cast → Input 1 → (repeat)
- **Last Connected**: Upon detecting a new input connection, the unit automatically switches to it. When the source is disconnected, it returns to the previously selected input.

3. Click **Save** / **Cancel** to save / abort the auto-switching configuration.

Setting the Number of Clusters (Virtual Switchers) and Input Priorities

1. Next to the Available Clusters selection box, click the up/down arrow to create input and output clusters.

- The number of input/output clusters changes accordingly.
- The device supports up to 4 clusters.
- Default setting: 4 clusters, all inputs and outputs are in Cluster 1.

2. Click the corresponding radio button(s) to assign outputs and inputs to a cluster.

Available Clusters 4

Select Cluster Outputs

Select Cluster Inputs

	Cluster 1	Cluster 2	Cluster 3	Cluster 4		Cluster 1	Cluster 2	Cluster 3	Cluster 4
Output 1	☒	☐	☐	☐	Input 1	☒	☐	☐	☐
Output 2	☐	☒	☐	☐	Input 2	☒	☐	☐	☐
Output 3	☐	☒	☐	☐	Input 3	☒	☐	☐	☐
Output 4	☒	☐	☐	☐	Input 4	☒	☐	☐	☐
Output 5	☒	☐	☐	☐	Input 5	☒	☐	☐	☐
Output 6	☒	☐	☐	☐	Input 6	☒	☐	☐	☐
Output 7	☒	☐	☐	☐	Input 7	☒	☐	☐	☐
Output 8	☒	☐	☐	☐	Input 8	☒	☐	☐	☐
IP Stream	☒	☐	☐	☐	Air-Cast	☒	☐	☐	☐

Figure 95: Inputs/Outputs Selected for each Cluster

Setting the Auto-Switch Timeout Period

1. To set the Auto-Switch Timeouts for the relevant switching modes (Priority & Last Connected), refer to the table below:

Table 22: Auto-Switch Timeout Modes

Timeout	Description	Figure with Default Timeouts
When new input AV signal is detected, delay switching for (second)	Click the Up/Down arrows to set the delay time before automatically switching to the new input.	Auto-switch Timeout When new input AV signal is detected, delay switching for (Second) 10 When input AV signal is lost, delay switching for (Second) 10 When input AV cable is unplugged, delay switching for (Second) 0 Figure 96: Select Input Priority
When input AV signal is lost, delay switching for (second)	Click the Up/Down arrows to set the delay time before automatically switching to the previously selected input.	
When input AV cable is unplugged, delay switching for (second)	Click the Up/Down arrows to set the delay time before automatically switching to the previous selected input.	

2. Click to **Save/Cancel** to Save/Abort the auto-switching configurations.

Overlay

This section allows the user to configure text overlay information on output displays.

- 1. Navigate to the AV & USB Settings>Overlay tab (see [Navigating to the AV & USB Settings AV Tab](#) on Page 53).

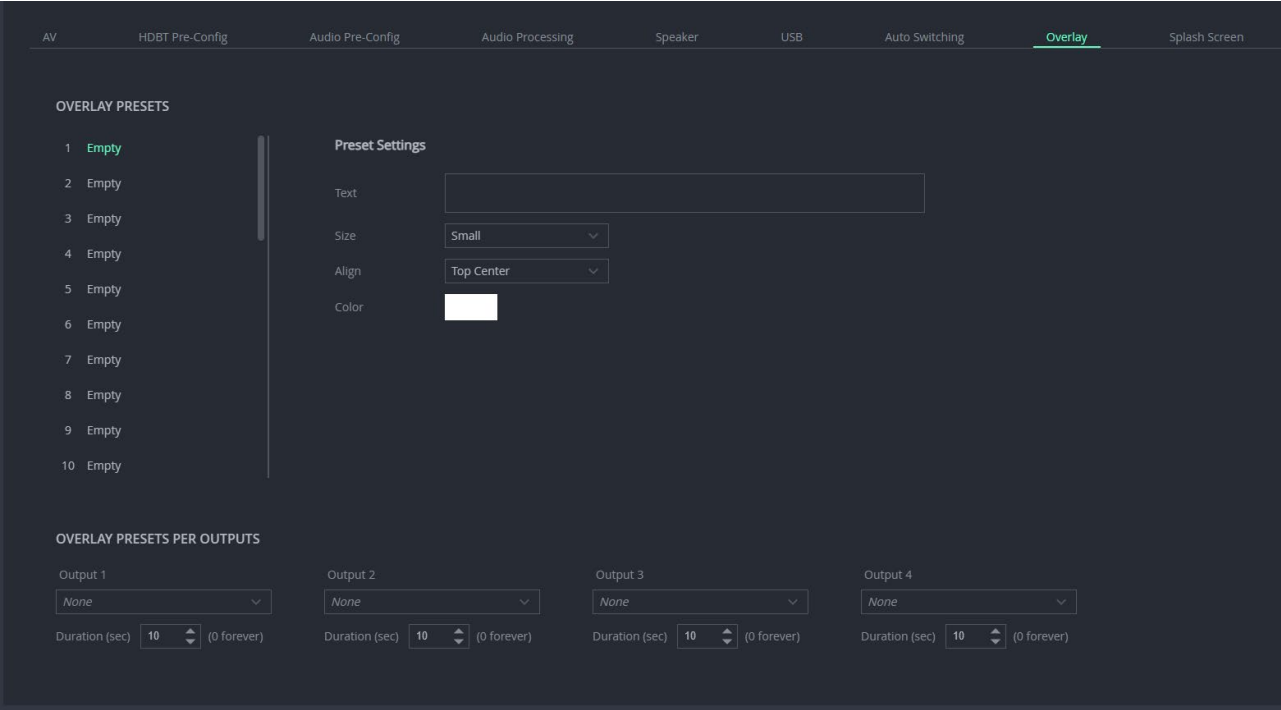


Figure 97: AV & USB Settings>Overlay Page

- 2. Click to select an overlay preset.

 - Hover over any overlay preset name and click  to rename.
 - The table below shows the various settings and their effects.

Table 23: Overlay Settings

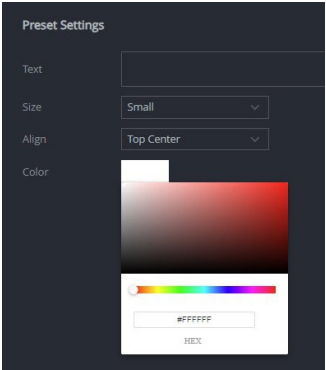
Timeout	Description		Figure with Default Timeouts
Preset Settings	Text	Enter the overlay text to be displayed.	
	Size	Select the font size of the overlay text from the drop-down menu (Small, Medium or Large).	
	Align	Select the position of the viewed overlay text from the drop-down menu	
	Color	Click to set the font color of the viewed overlay text	

Figure 98: Select Input Priority

3. Click the output (1-8 / H.264/5) to configure its overlay preset.

- The table below shows the various settings and their effects:

Table 24: Overlay Settings and Effects

Timeout	Description	Figure with Default Timeouts
Overlay Presets per Output	Output 1~8/H.264/265 Use the drop-down menu to choose an overlay preset for the selected output.	 Figure 99: Preset Settings
	Duration (sec): Enter or the click up/down arrows to set the time that the selected text overlay is displayed. Select 0 to display it indefinitely	

Splash Screen

This section allows the user to upload images to be used as splash screens on the output(s).

1. Navigate to the AV & USB Settings>Splash Screen tab (see [Navigating to the AV & USB Settings AV Tab](#) on Page 53).

2. To select a file from the library:

- Hover over the  icon of the relevant screen (1-27). It turns green.
 - Click  to delete the uploaded picture
- Click on the icon.
- Select the picture file to be uploaded from the connected PC library.
 - Click  to view the uploaded picture.



- Supported picture formats: png, jpg
- Maximum picture size: 4Mb
- Recommended aspect ratio: 16:9

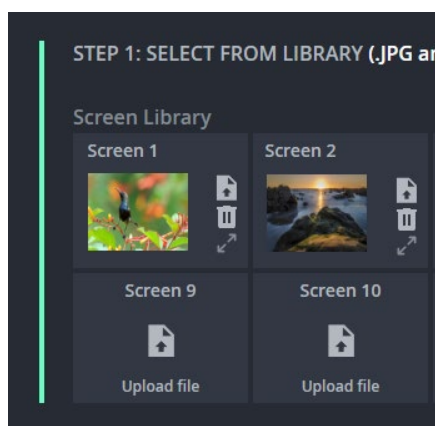


Figure 100: Select a File from the Library

3. To set the splash screen for displaying on an output:

a. Click the picture of the relevant screen ([Figure 101](#)). The border is highlighted in green.

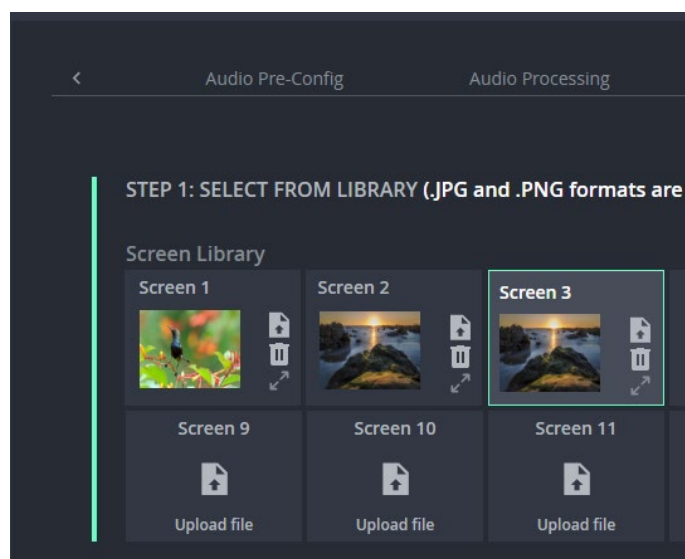


Figure 101: Select the Picture

b. Click the preset number (1, 2, 3) on one of the Output buttons ([Figure 102](#)). The border is highlighted in green.



- Each preset picture is displayed when no source is routed to the output. When the condition is met, the selected splash screen feature will be displayed
- Each output can support 3 splash screen pictures

- **Select all:** click this check box to select the same splash screen picture to all active outputs.
- Click the lock icon on the corresponding output: The output is locked and a splash screen cannot be set.

4. Click **Apply** to apply settings.

- The configured pictures will be displayed as thumbnails in the output area, as shown below.

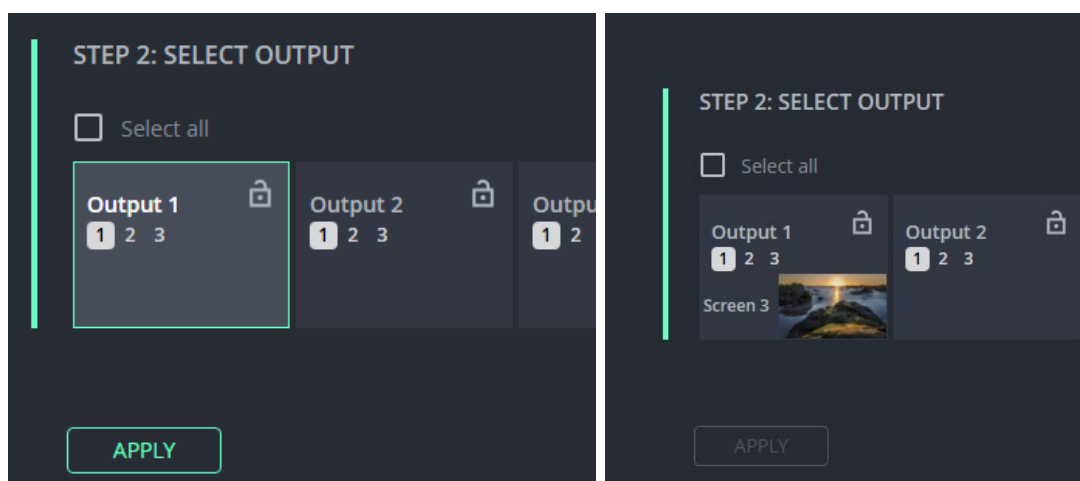


Figure 102: Lock the Output and View Thumbnail

Managing EDID

MTX3-88-PR-PRO enables you to individually configure and manage EDID settings for each of the 8 inputs.

To copy the EDID to the inputs:

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

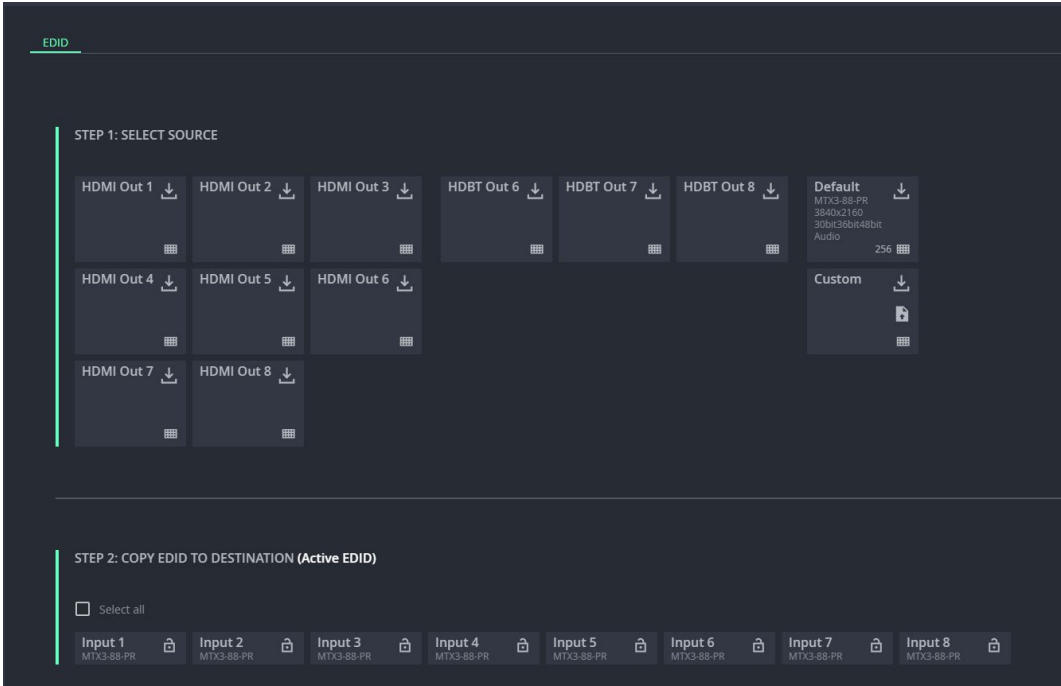


Figure 103: EDID Management Page

- 2. Under **STEP 1: SELECT SOURCE**, click the required EDID source from the outputs, inputs, default EDID or an uploaded EDID file from connected PC library of EDID files).

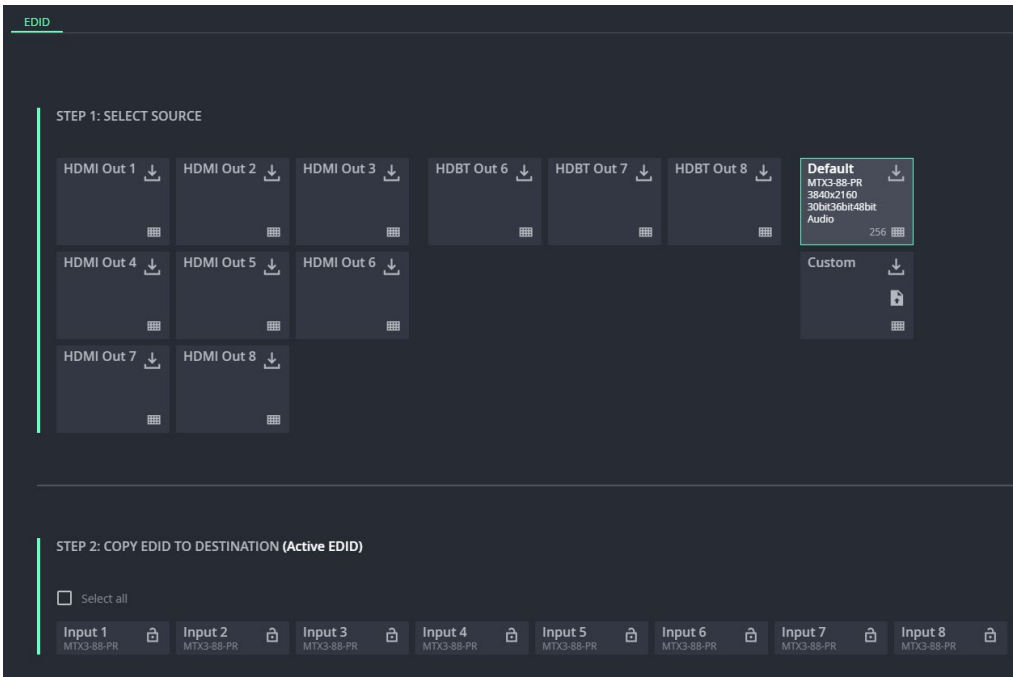


Figure 104: Selecting the EDID Source

3. Under **STEP 2: COPY EDID TO DESTINATIONS (Active EDID)**, click the input(s) to copy the selected EDID to.

The COPY EDID button is enabled.

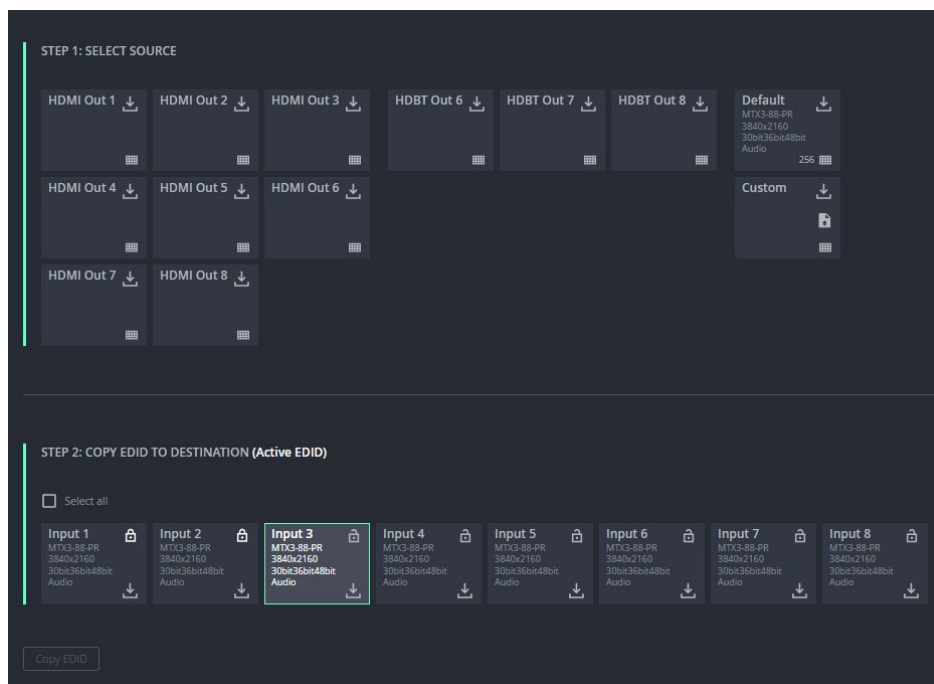


Figure 105: Selecting EDID Input Destinations

3. Click **COPY EDID**. After EDID is copied, a Data Saved message appears.
EDID is copied to the selected input/s.

Setting Control Gateway Properties

This section details the following:

[Setting the Serial Port Properties](#)

[Configuring the I/O \(GPIO\) Ports](#)

[Setting the Relay](#)

[Setting the IR Port Properties](#)

[CEC](#)

Setting the Serial Port Properties

The serial ports can be configured to support the following:

- RS-232 extension – From panel port, via HDBT RS-232 channel: To control a peripheral connected to the HDBT paired unit RS-232 port (or vice-versa).
- External peripheral serial control (via IP communication) – Remote IP control of a port connected peripheral, via device built-in control gateway.

- Device management and control – Control and service of the MTX3-88-PR-PRO using P3000 commands.



Applies to Port 1 only (its default configuration following factory reset).

MTX3-88-PR-PRO enables configuring the RS-232 port in one of the following ways:

[Extending the RS-232 via HDBT](#) on Page [88](#)

[Controlling Serially an External Device](#) on Page [88](#)

Extending the RS-232 via HDBT

Set the local RS-232 port for extension over HDBT (for example, to control a remote peripheral device).

To set the RS-232 extension mode:

1. Navigate to the **Gateway Settings>RS-232** tab.
2. Select an RS-232 port from the drop-down menu to set (Local Port 1-4, HDBT port 1-8).

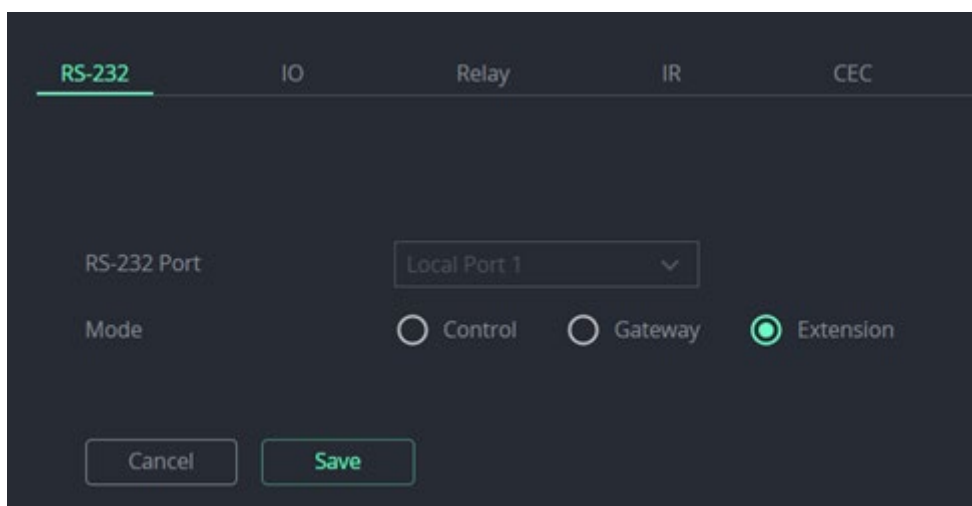


Figure 106: Gateway Settings>RS-232 Page

3. Select the mode to **Extension**:
4. Route, via the RS232/IR routing tab (see [RS-232 & IR Routing](#) on Page [39](#)), the assigned extension port

Controlling Serially an External Device

Control an external device via an IP-connected Controller.

To set the RS-232 port, or HDBT channel, to control an external device:

1. Navigate to the **Gateway Settings>RS-232** tab.
2. Select an **RS-232 Port** from the RS-232 Port or HDBT channel drop-down menu to set

3. Set the mode to **Gateway**.

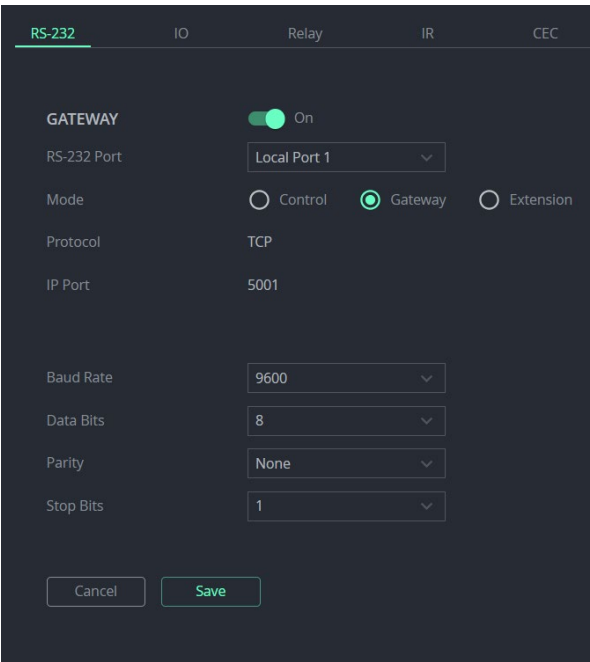


Figure 107: RS-232 as Gateway

4. Define the external device RS-232 settings (Parity, Data Bits, Baud Rate and Stop Bits).

5. Click **SAVE**.

RS-232 port/channel serially controls an external device.

Configuring the I/O (GPIO) Ports

The 4 I/O ports can control devices such as sensors, door locks, remote contact-closure buttons, audio volume and lighting control devices.

To configure an I/O port:

1. Navigate to the Gateway Settings>IO tab.

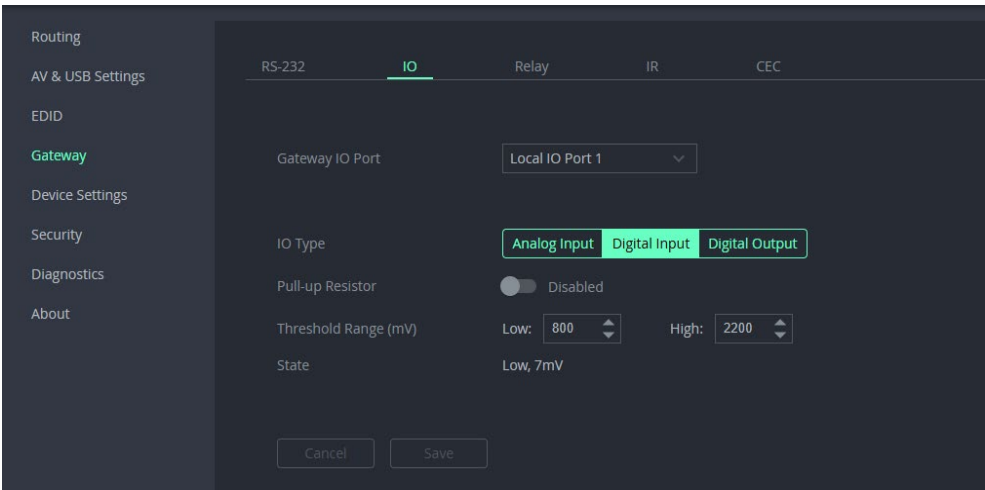


Figure 108: I/O Ports Settings Page

2. Select the I/O port to be configured.

3. Select one of the following I/O types:
- **Digital Input (default setting)** (see [Configuring a Digital Input I/O Type](#) on page 90).
 - **Digital Output** (see [Configuring a Digital Output I/O Type](#) on page 91).
 - **Configuring an Analog Input I/O Type** on page 92).



The settings available on the page change depending on which trigger type is selected.

4. Click **SAVE** after setting the selected I/O type.

Configuring a Digital Input I/O Type

The Digital Input trigger mode reads the digital input of an external sensor device that is connected to the I/O port. It detects High or Low states according to the user defined voltage threshold levels.

To configure a digital input I/O type:

1. On the GPIO page, select **Digital Input** next to I/O Type.
The Digital Input options appear (see figure above).
2. Select one of the following for the Pull-up resistor setting:
 - **Disabled** – Suitable, for example, for a high temperature alarm that exceeds the maximum voltage threshold. When the pull-up resistor is disabled, the port state is low and to be triggered it must be pulled high by the externally connected sensor.
 - **Enabled** – When the pull-up resistor is enabled, the port detects an open circuit as High, or a short to ground as Low. This is suitable, for example, for a pushbutton switch (connecting one terminal of the switch to ground, and the other to the input) or for an alarm closing a relay.
3. Set the Threshold VDC Low and High Range (threshold voltage at which the port changes state).

Low	The minimum value is 500mV, and the maximum value is 28000mV. The set value must be at least 800mV less than the High value	
High	Shows the state of the port. If the detected result is less than the low-state threshold users set, it will display “low”, and if the result is more than the high-state threshold users set, it will display “high”.	

The voltage measured on the the GPI port is displayed under these settings.4. Click **Read** to refresh port status information.

5. Click **SAVE**.

Digital input I/O type is configured.

Configuring a Digital Output I/O Type

To configure a digital output I/O type:

1. On the GPIO page, select Digital Output next to I/O type.
A warning message appears.

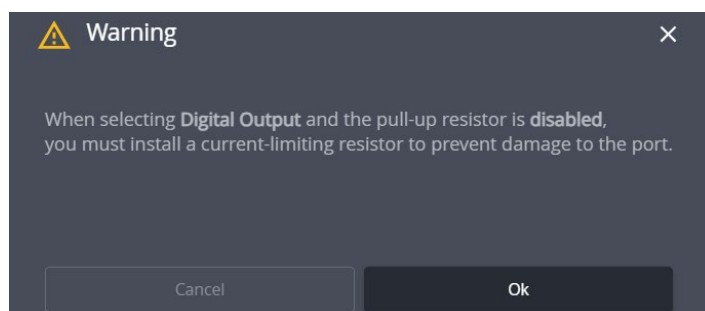


Figure 109: Digital Output Warning

2. Make sure to follow the instructions in this warning.
3. Click **OK**. The Digital Output options appear.

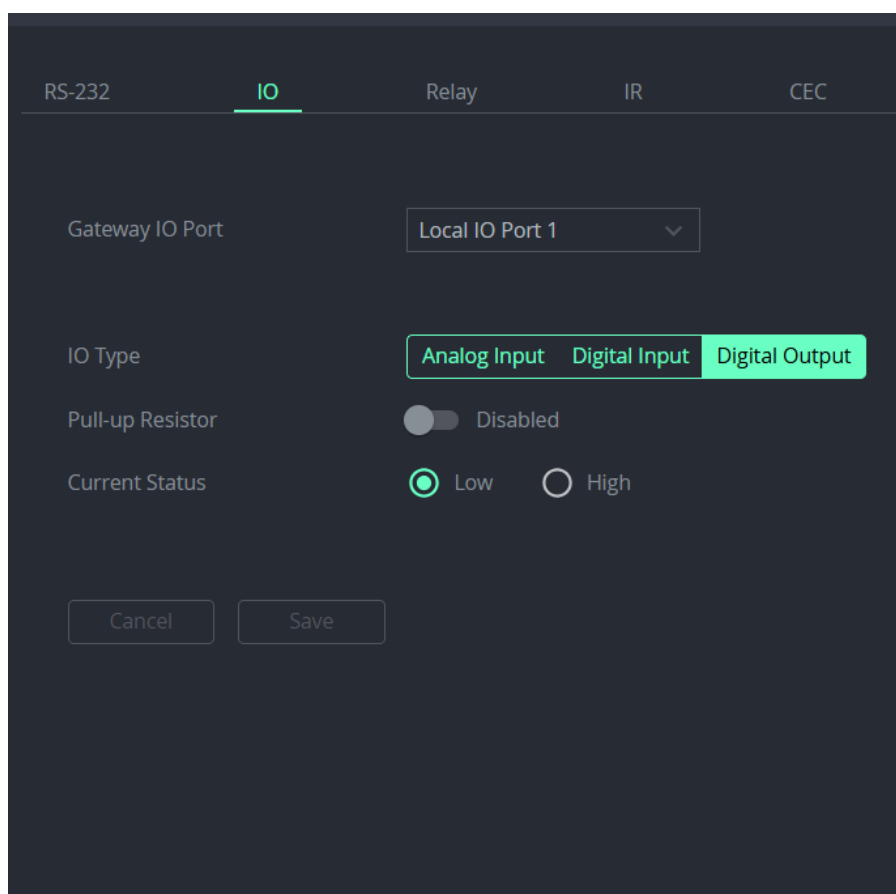


Figure 110: GPIO Settings Page – Digital Output I/O Type

4. Select one of the following for the Pull-up resistor setting:
 - Pullup resistor set to **Enabled**:
The port can be used for controlling devices that accept a TTL signal such as for powering LEDs. The voltage output is TTL positive logic: high: >2.4V; low: < 0.5V.

- Pullup resistor **Disabled**:

The port is used for controlling external devices such as room or light switches. The external source device determines the voltage output; the maximum voltage is 30V DC and the maximum current is 100mA.



Make sure that the current in this configuration does not exceed 100mA.

5. The Current Status switch may be used to manually change the GPIO output state.
6. Click **SAVE**.

Digital Output I/O type is configured.

Configuring an Analog Input I/O Type

When selectin the Analog Input I/O type, the port is triggered by an external analog device, such as a volume control device. The trigger is activated once when the detected voltage is within the 0 to 30V DC voltage range.

To configure an analog input I/O type:

1. On the GPIO page, select Analog Input next to I/O type.

The screenshot shows a web interface for configuring GPIO ports. At the top, there are tabs for RS-232, IO (selected), Relay, IR, and CEC. Below the tabs, there are several configuration options: 'Gateway IO Port' with a dropdown menu showing 'Local IO Port 1'; 'IO Type' with three buttons: 'Analog Input' (highlighted in green), 'Digital Input', and 'Digital Output'; 'Report Steps' with a numeric input field showing '8' and up/down arrows; and 'State' with 'Step: 0' and 'Voltage: 7mV'. At the bottom, there are 'Cancel' and 'Save' buttons.

Figure 111: GPIO Port Settings Page Analog Input

2. Enter or use the arrows to scroll to a value (1–100) for the Maximum reported steps. This value is the number of steps that the analog input signal is divided into. To calculate the voltage of each step, use the following formula:
Voltage of one step = 30V / number of steps.

The voltage measured on the GPI port is displayed under these settings.

3. Click **SAVE**.

Analog input I/O type is configured.

Setting the Relays

This section allows the users to set the Relay ports, using the Relay tab, to open or close a relay.

To set a Relay state:

1. Navigate to the **Gateway>Relay** tab. The Relays tab opens.

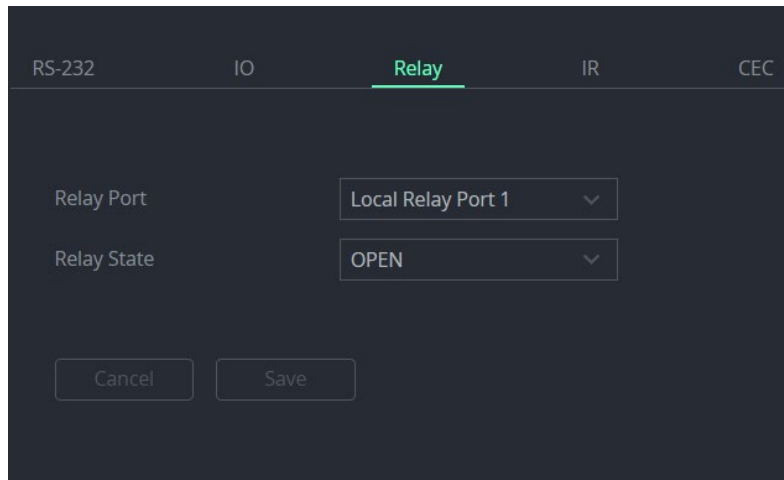


Figure 112: Relay Tab- Set the Relay Actions

2. Select the local Relay Port number:

- Relay port 1 - 4

3. Select the port Relay State:

- Open (default) or Close

4. Click **Save**.

The Relay ports are set.

Setting the IR Port Properties

This section allows the users to set the IR port gateway or extension configurations.

To set IR properties:

1. Navigate to the **Gateway>IR** tab. The IR tab opens.

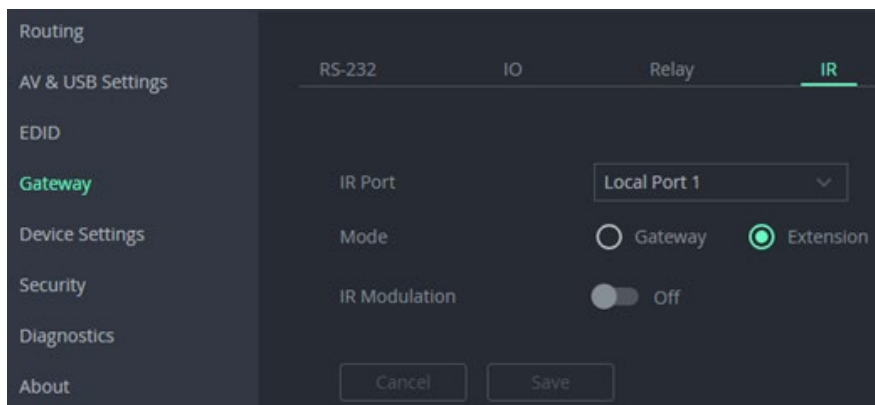


Figure 113: IR Tab – Set Signals Routing

2. Select an **IR Port** from the IR Port or HDBT channel drop-down menu to set.
3. Select Working Mode:
 - **Extension:** When selected (enabled by default), the IR port can be routed to the destination IR port or HDBT IR channel, in the RS-232 & IR Routing page (refer to [RS-232 & IR Routing](#) on Page 17).
 - **Gateway:** When selected, the routed function is disabled.
4. Optionally (typically for diagnostics purposes), you can manually enter an IR Command: Enter the IR pronto command text box to control the port-connected IR-enabled device. The IR command should be available from the controlled device's manual or supplier.
5. Click **Send** to send the command to the controlled device.
6. Click **Save** to save/cancel the configurations.

CEC

This section allows the users to set the CEC Gateway function.

To set CEC Gateway function:

1. Navigate to the **Gateway>CEC** tab. The CEC tab opens.

Figure 114: CEC Tab – Set Gateway Settings

2. Set the CEC **GATEWAY** function to On/Off (default: On). For more detail, refer to [Extending the RS-232 via HDBT](#) on Page 88).
3. **CEC Port:** Select an input/output port from the drop-down menu (HDMI Input 1-8, HDMI Output 1-8 & HDBT 1-8).
4. **CEC Command (HEX):** Optionally (typically for diagnostics purposes), you can manually enter the CEC command of the controlled device. THE CEC commands should be available from the controlled device's manual or supplier.
5. Click **Send** to send the command to CEC-controlled device.

6. Click **Save** to save/abort the configurations.

Device Settings

This section details the following actions:

[Device Profile and Maintenance](#)

[Settings Networking Properties](#)

[Upgrading Firmware](#)

[Setting the Time and Date](#)

Device Profile and Maintenance

Changing Device Name

MTX3-88-PR-PRO enables you to change the DNS name of the device.

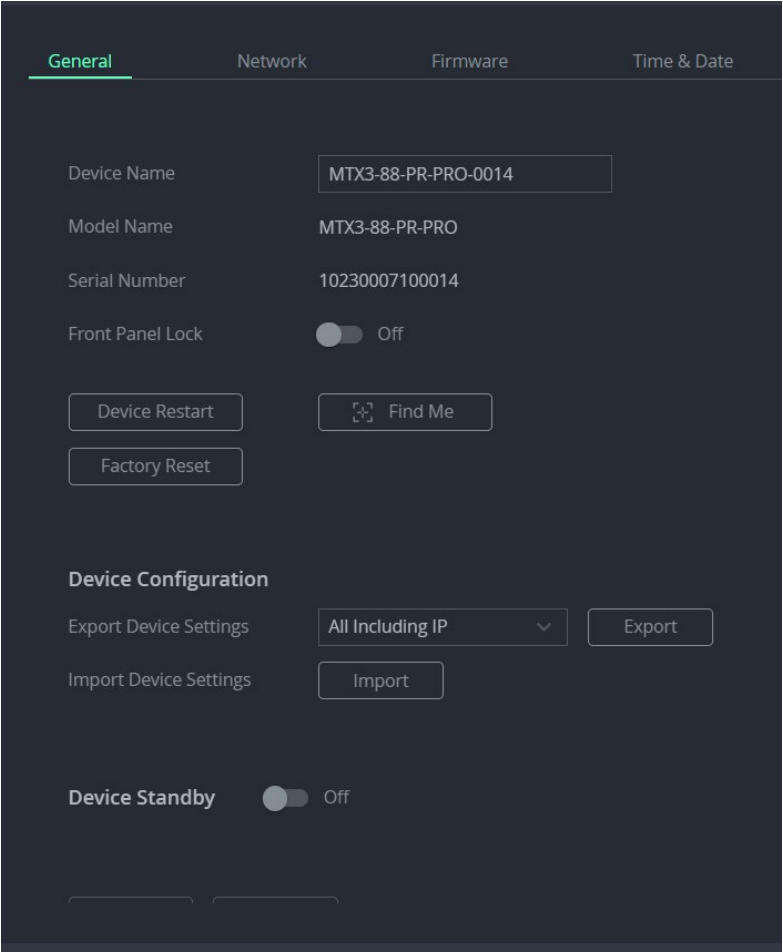


Figure 115: Device > General Page

- 2. Under General Preferences, change the device name and click **SAVE**.
The device name is changed.

Locking/Unlocking the Front Panel

To Lock/Unlock the front panel:

1. Go to the **Device Settings > General** page.
2. Click to lock/unlock the buttons located on the front panel.
3. Click **Save** to save the settings.

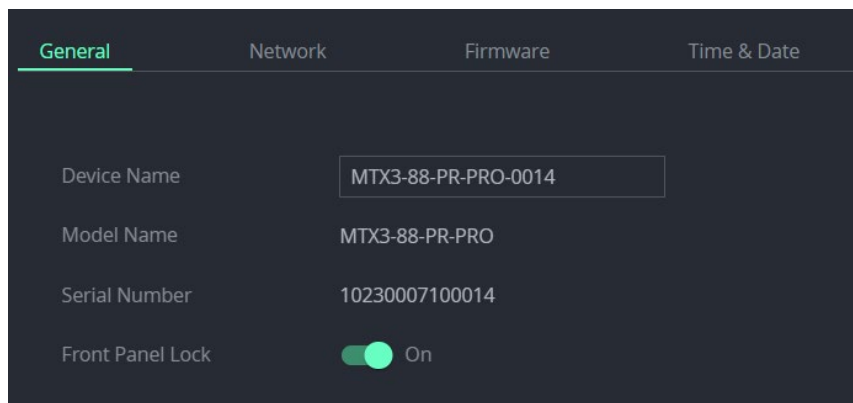


Figure 116: Device Settings> General Page: Setting Front Panel Lock

Restarting and Resetting the Device

Two types of resets can be performed:

- **Restart** – Reboots your device and keeps all your device settings, including the IP address and password.
- **Reset** – Reboots your device and restores all factory settings including input/output definitions, switching configuration, IP address and password (a DHCP-acquired IP address is retained).

To restart the device:

- Click **DEVICE RESTART** on the Device Settings > General page ([Figure 115: Device > General Page](#)).

To perform a factory reset on the device, use one of the following actions:

- Click **FACTORY RESET** on the **Device Settings> General** page ([Figure 115: Device > General Page](#)).
- Using protocol 3000 commands, send FACTORY command then RESET commands.
- On the rear panel, press and hold the RESET button while connecting the power for several seconds.

Identifying Your Device

To identify the device:

1. Go to the Device Settings > General page ([Figure 115: Device > General Page](#)).
2. Under Global System Settings, click Find Me to send Find Me command to the matrix.
The corresponding matrix will show find me information “Find me” on the LCD screen on the front panel.

The device is identified by the discovery system.

Exporting and Importing a Configuration File

MTX3-88-PR-PRO enables you to export and store (in the connected computer) a configuration file, that records all current device settings except the routing operation setup. The stored file can then be imported to the same or different MTX3-88-PR-PRO device to load the recorded settings, for configuration backup and/or solution-replication purposes.

Exporting a Configuration File

To export a configuration file of the current device settings:

1. Go to the **Device Settings > General** page ([Figure 115: Device > General Page](#)).
2. Under Device Configuration section, click to select the configuration from the drop-down menu to export:
 - All Including IP, or
 - All Excluding IP
3. Click **Export** and select the storage location on your computer to save the configuration file.

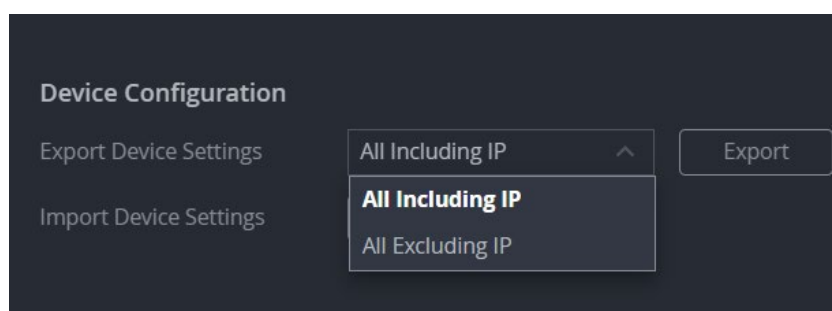


Figure 117: Device Settings> General Page: Exporting Configuration File(s)

The configuration file is exported and saved.

Importing a Configuration File

To import a configuration file of the current device settings:

1. Go to the Device Settings > General page ([Figure 115: Device > General Page](#)).
2. Under Device Configuration section, click **IMPORT**.
3. Select the relevant configuration file from your computer storage.

The configuration file is imported and the device restarts with the settings from the configuration file.

Setting the Device to Standby Mode

To set the device to standby mode:

1. Go to the Device Settings > General page ([Figure 115: Device > General Page](#)).
2. Click to set the device to Standby mode (On) or exit the standby mode (Off). Default setting: Off.



When the device is set to standby mode, all functions including front panel buttons and LCD will be shut down. Only the web UI and API commands can be used.

Settings Networking Properties

This section allows users to configure all four LAN ports.



By default, DHCP is set to on. The IP address shows the actual IP address acquired from the DHCP server, or the auto-acquired fallback IP address when there is no DHCP server detection.

Setting VLAN Tags

To configure VLAN Pass-Thru Settings:

1. Go to the **Device Settings > Network** page.

The screenshot shows the 'Network' tab in the 'Device Settings' menu. It includes a 'VLAN Pass-thru Setting' section with a text field for 'VLAN Tags' (example: 1-100, 201, 301) and an 'IP Address Settings' table.

Service Name	Port	802.1Q	VLAN Tag	DHCP	IP Address	Mask Address	Gateway Address	DNS Address
Control	Lan 1	Off	1	On	172.17.140.34	255.255.255.0	172.17.140.254	172.16.0.1
Air-Cast	Lan 2	Off	20	On	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0
H.264/5	Lan 2	Off	21	On	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0
Dante	Lan 2	Off	2	On	169.254.7.88	255.255.0.0	0.0.0.0	0.0.0.0
USB-C	Lan 4							
HDBT Network	Lan 4							

Below the table, there are fields for MAC addresses:

- Control Mac Address: 00-1D-56-0B-EC-49
- Air-Cast Mac Address: 00-1D-56-0B-EC-5A
- H.264/5 Mac Address: 3A-FB-91-05-62-40

Figure 118: Device Settings> Network Page

2. In the VLAN Tags text field, enter VLAN IDs VLAN passing-through from HDBT ports 1-8.



- Up to 100 VLAN IDs below 4000 are supported.
- IP traffic, of USB-C and HDBT LAN connections, is passing-through untagged.

3. Click **Save** to save configurations.

Configuring Network Settings

To configure network settings:

1. Go to the **Device Settings> Network page** (Figure above).
2. Change settings as needed for each of the service names:

Settings Attribute	Description	Figure with Default Settings														
Control	LAN 1 port connection is assigned for management and control IP traffic.  LAN 1 is the out-of-box default port for all matrix LAN traffic.	IP Address Settings <table><thead><tr><th>Service Name</th><th>Port</th></tr></thead><tbody><tr><td>Control</td><td>Lan 1</td></tr><tr><td>Air-Cast</td><td>Lan 2</td></tr><tr><td>H.264/5</td><td>Lan 2</td></tr><tr><td>Dante</td><td>Lan 2</td></tr><tr><td>USB-C</td><td>Lan 4</td></tr><tr><td>HDBT Network</td><td>Lan 4</td></tr></tbody></table> Figure 119: LAN Ports Default Settings	Service Name	Port	Control	Lan 1	Air-Cast	Lan 2	H.264/5	Lan 2	Dante	Lan 2	USB-C	Lan 4	HDBT Network	Lan 4
Service Name	Port															
Control	Lan 1															
Air-Cast	Lan 2															
H.264/5	Lan 2															
Dante	Lan 2															
USB-C	Lan 4															
HDBT Network	Lan 4															
Air-Cast	Click to select the LAN port assigned for the IP traffic of this service															
H.264/265																
Dante																
USB-C	Click to select the LAN port assigned for the passing-through IP traffic of this service															
HDBT Network																
802.1Q	Set secured LAN authentication On /Off for the IP traffic of this service. Default: On	802.1Q Off On On On VLAN Tag 1 20 21 2 Figure 120: 802.1Q and VLAN Tag Settings														
VLAN Tag	Set the VLAN ID for tagging the IP traffic of this service.															
DHCP	Set DHCP IP address resolution to On / Off (Static) for the IP traffic of this service. Default: On When set to Off, users must set an IP address for the corresponding Ports.															
IP Address	DHCP On: View the IP and DNS addresses assigned by DHCP server for the corresponding IP service. DHCP Off: Set the IP and DNS addresses for the corresponding															
Mask Address																

Gateway Address	IP service.
DNS Address	

DHCP	IP Address	Mask Address
☒ On	172.17.140.34	255.255.255.0
☒ On	0.0.0.0	0.0.0.0
☒ On	0.0.0.0	0.0.0.0
☒ On	169.254.7.88	255.255.0.0

DHCP	Gateway Address	DNS Address
☒ On	172.17.140.254	172.16.0.1
☒ On	0.0.0.0	0.0.0.0
☒ On	0.0.0.0	0.0.0.0
☒ On	0.0.0.0	0.0.0.0

Figure 121: Corresponding Ports
IP Addresses

3. View the MAC addresses for the corresponding IP service:

General

Network

Firmware

Time & Date

VLAN Pass-thru Setting

VLAN Tags ⓘ Example 1-100, 201, 301

IP Address Settings

Service Name	Port	802.1Q	VLAN Tag ⓘ	DHCP	IP Address	Mask Address	Gateway Address	DNS Address
Control	Lan 1	☐ Off	1	☒ On	172.17.140.34	255.255.255.0	172.17.140.254	172.16.0.1
Air-Cast	Lan 2	☐ Off	20	☒ On	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0
H.264/5	Lan 2	☐ Off	21	☒ On	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0
Dante	Lan 2	☐ Off	2	☒ On	169.254.7.88	255.255.0.0	0.0.0.0	0.0.0.0
USB-C	Lan 4							
HDBT Network	Lan 4							

Control Mac Address

00-1D-56-0B-EC-49

Air-Cast Mac Address

00-1D-56-0B-EC-5A

H.264/5 Mac Address

3A-FB-91-05-62-40

Figure 122: MAC IP Addresses

4. Click **Save** to save configurations.

Network settings are defined.

Upgrading Firmware

This section allows the users to upgrade and view the active FW and stored (stand-by) FW.

To View Active and Stored Firmware

- Go to the **Device Settings> Firmware** page.
- Under the Active and Stored Firmware section, view:
 - Active Firmware Upgrade Time
 - Active and Stored Firmware Versions

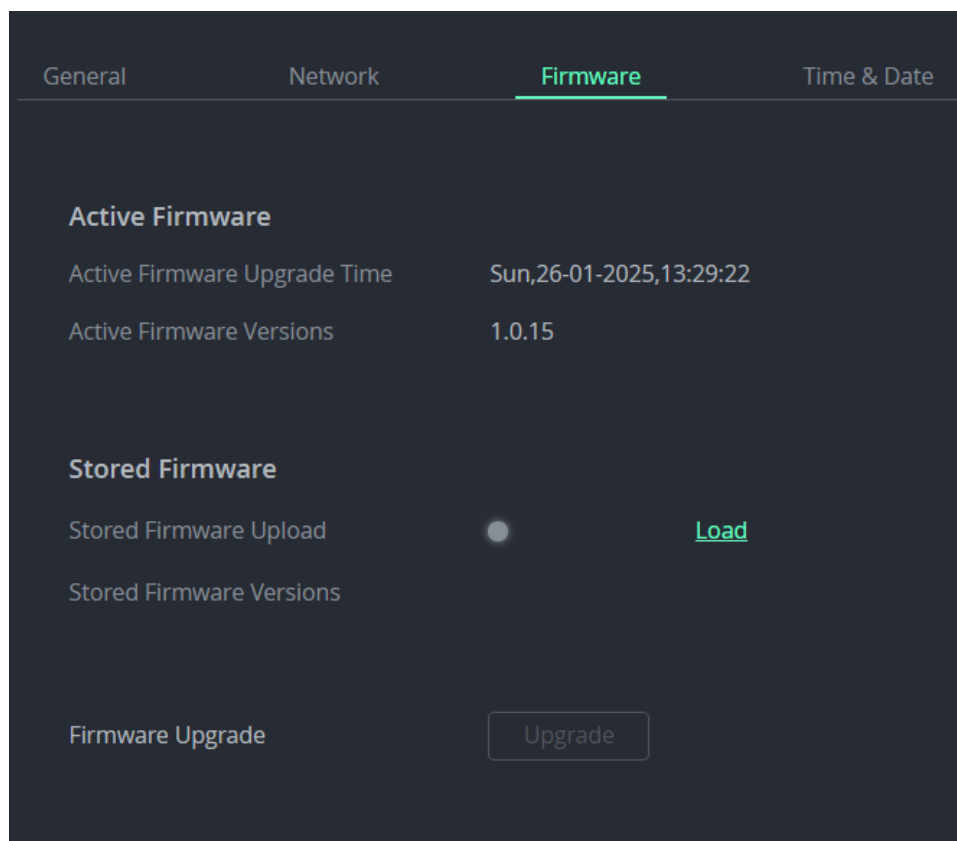


Figure 123: Device Settings> Firmware Page

To upgrade the device firmware

1. Go to the **Device Settings> Firmware** page (Figure above).
2. In the Stored Firmware Section:
 - Click **Load** to upload the relevant FW file from the connected PC library and follow the instructions. The upgrade takes approximately 30-60 seconds.
 - Stored Firmware Versions: Displays the uploaded and stored FW versions.
 - Firmware Upgrade: Click **Upgrade** the device and activate it with the stored FW (becoming the active firmware).



Do not power off the device during the upgrade process.

- During FW upgrade, the device continues to operate, but the device UI and protocol 3000 communication are inactive. When device restarts, the status LED is lit, and HDMI output signal is disconnected until restart completes.
- Firmware load and upgrade are independent actions. Typically, firmware load is done during working hours as background process with no effect on device service, while firmware upgrade is done on maintenance time-window to minimize impacts on users due to upgrade effects on device service.

Firmware is updated.

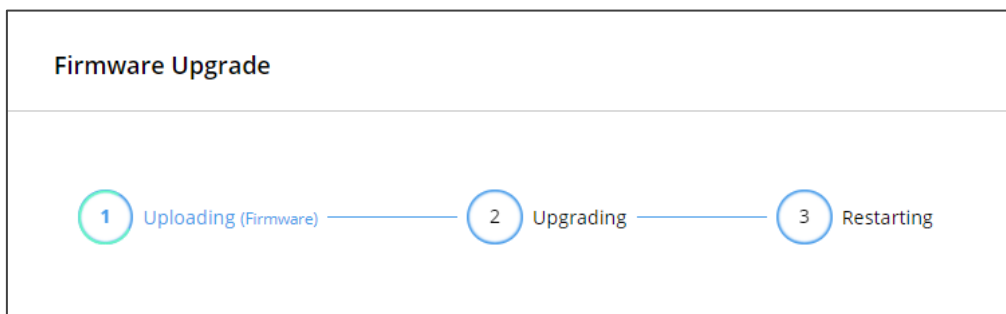


Figure 124: Firmware Upgrade Process

Setting the Time and Date

You can sync the device time and date to any server around the world.

To sync device time and date to a server:

1. Go to the Device Settings> Time & Date page.

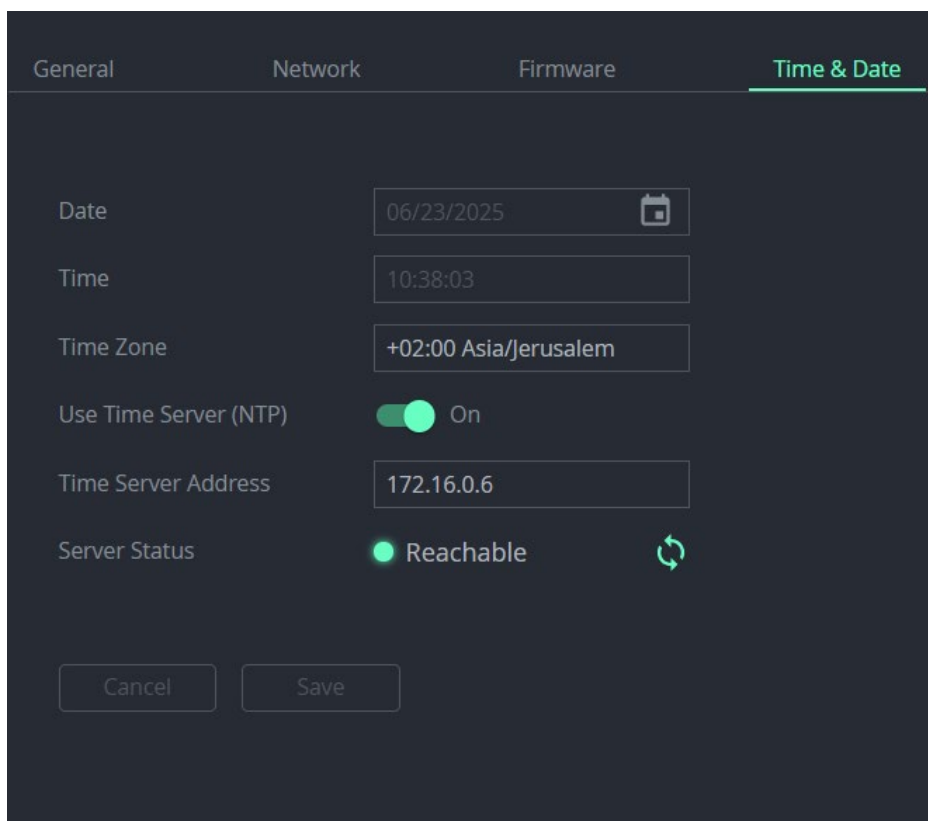


Figure 125: Device Settings > Time & Date Page

2. Set the Date and Time.

- The date will start from 01-01-1970 each time the device is booting if the NTP Time Server is not configured or not available.

3. Select the Time Zone. Default setting: 00:00 Etc/UTC.

4. In the Use Time Server (NTP) drop-down box, click:

- Disabled to disable the time server.
- Manual to enable time server (NTP).

5. If enabled, type in server information:

- Enter the time server address.
- Set sync frequency (every 0 to 23 days).

6. View Server Status for the time server status.

7. Click **SAVE** for any change.

The devices date and time are synchronized to the server address entered.

Security

The Security tab enables activating device security and defining logon authentication details. When device security is on, web page access requires authentication upon initial landing on operation page. The default password is Admin. By default, security is disabled.

This section details the following actions:

[Secured Web-UI Communication \(HTTPS\) Settings](#)

[Secured LAN Authentication \(802.1x\) Settings](#)

Setting Security Status to Off

To set security status to Off:

1. Go to the Security>Device Security page.

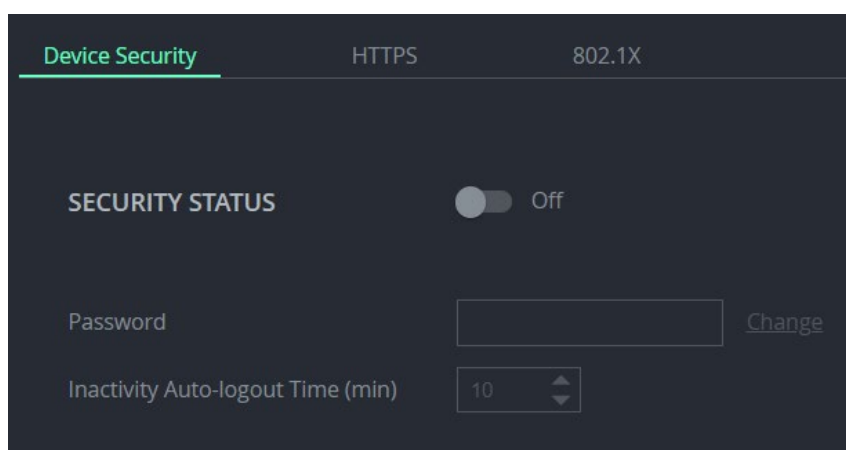


Figure 126: Security – Device Security Tab

2. Set **SECURITY STATUS** to **Off**. The Security Status window appears.

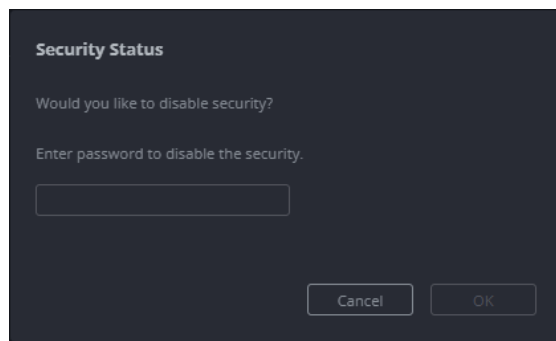


Figure 127: Security Status Message

3. Enter the current password.
4. Click **OK**.

Security status is set to Off.

Setting Security Status to On

To set security status to on:

1. Go to the Security >Device Security ([Figure 126](#)).
2. Set SECURITY STATUS to **On**.

Security status is set to On.

Setting Page's Inactivity Auto-Logout Time

To set inactivity auto-logout time:

1. Go to the Security >Device Security ([Figure 126](#)).
2. Click the Inactivity auto-logout(min) up/down arrows to set the time.
 - Range: 0-60
 - Do not exit page
3. Click **Save**.

Auto-logout time is set.

Changing Web Pages Access Password

To change the password for accessing the embedded web pages:

1. Go to the Security page ([Figure 126](#)).
2. Select the Device Security Tab. The Security settings appear ([Figure 126](#)).
3. Enter the Current Password and click **Change**. The new password settings appear.

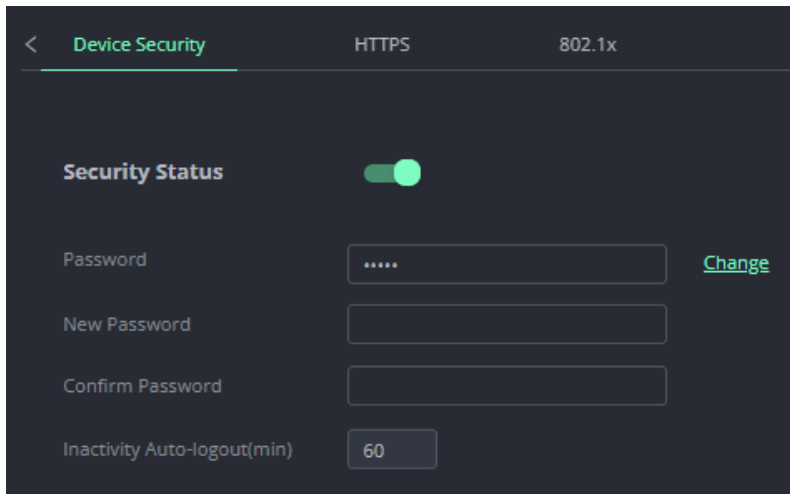


Figure 128: Device Settings – Changing the Password

4. Enter the new password and confirmation password and click **SAVE**.

The password is changed.

Secured Web-UI Communication (HTTPS) Settings

To configure HTTPS:

1. In the Navigation pane, click **Security**. The Device Security tab appears ([Figure 126](#)).
2. Select **HTTPS** tab.

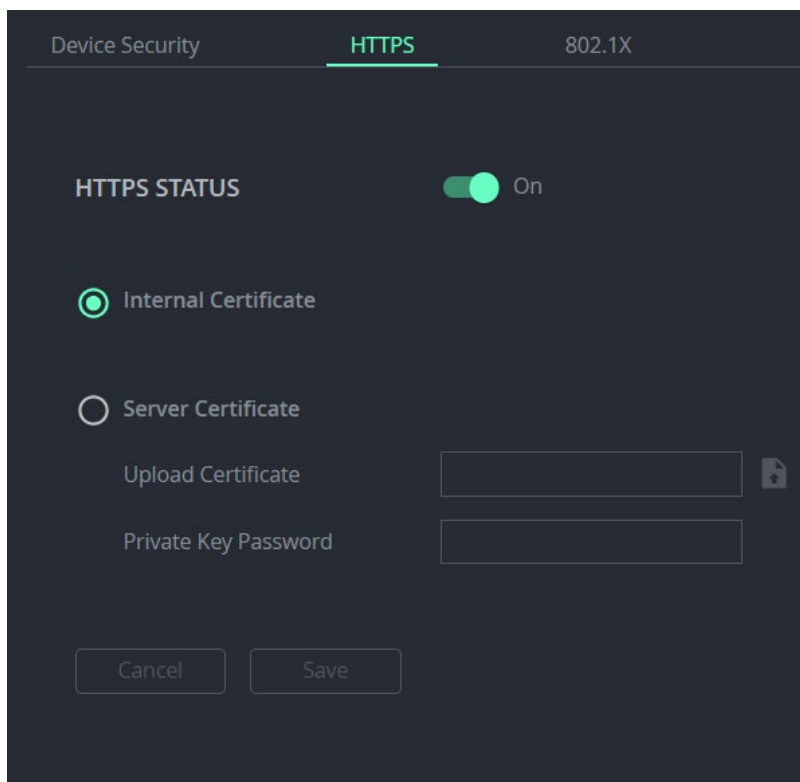


Figure 129: Security – HTTPS Tab

3. Enable HTTPS STATUS and select one of the following communication authentication methods:
 - **Internal Certificate** – To use the factory default certificate for authentication.
 - **Server Certificate** – To submit certificate from the server for authentication. To do so,

click to  upload the certificate. enter the private key password (assigned by the IT administrator) and click **Save**.

HTTPS is configured.

Secured LAN Authentication (802.1x) Settings

802.1x security standard supports IT networking authentication based on LAN port and MAC address.

To configure security:

1. In the Navigation pane, click **Security**. The Security settings tab in the Security page appears.
2. Select **802.1X** tab. The 802.1X settings tab appears ([Figure 126](#)).

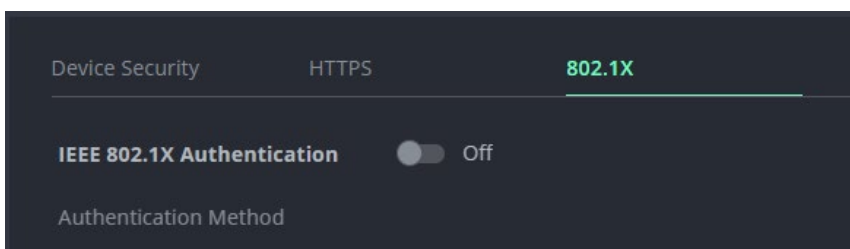


Figure 130: 802.1X Tab

3. For 802.1x authentication, click **ON** to enable 802.1x authentication service. 802.1x supports authentication based on port and MAC address.
4. When set to ON check one standard authentication method to set its security attributes.

PEAP-MSCHAP V2– Enter:

- Username - up to 24 alphanumeric characters, including “_” and “-” characters within the username, and
- Password - up to 24 ASCII characters

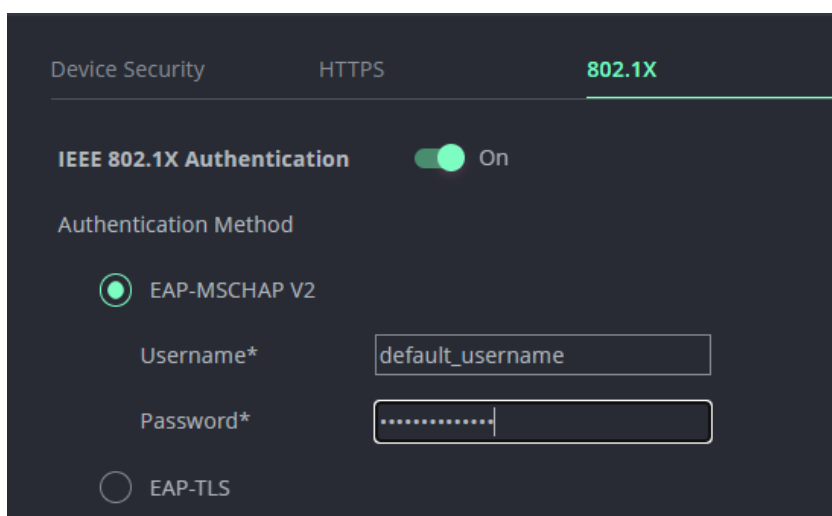
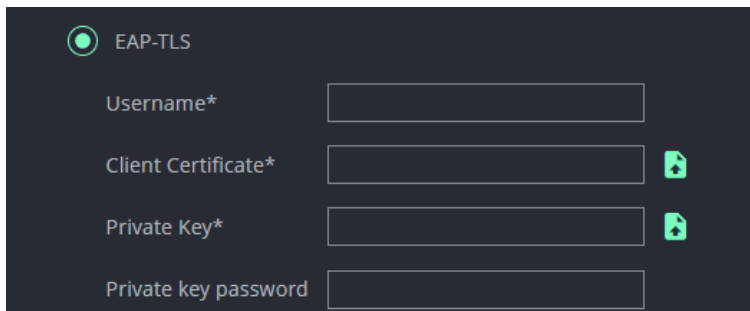


Figure 131: Security Tab – EAP-MSCHAP V2 Authentication

EAP-TLS – To submit certificate from the server for authentication:

- Enter Username,

- Click  to upload the certificates and keys,
- Enter the private key password (assigned by IT administrator),
- Set Server Certificate On.



The image shows a configuration form for EAP-TLS. At the top, 'EAP-TLS' is selected with a radio button. Below are four input fields: 'Username*', 'Client Certificate*', 'Private Key*', and 'Private key password'. The 'Client Certificate*' and 'Private Key*' fields have green upload icons to their right.

Figure 132: EAP-TLS – Certificates and Password

Server Certificate

CA Certificate – Upload certificate (PEM file) to the Radius server for authentication:

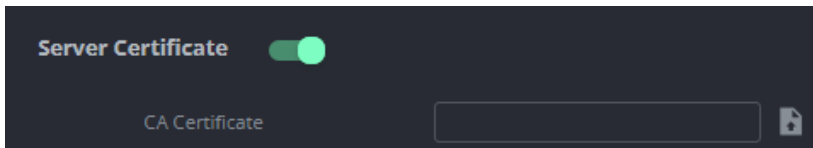


The RADIUS server is responsible for handling authentication requests from network access devices and verifying user credentials against a database

Server Certificate – Click to set server certificate to on/off. When it is set to on, users need to submit a CA certificate for authentication.

To submit a CA Certificate from the server:

1. Set Server Certificate On
2. Click  to upload the certificate

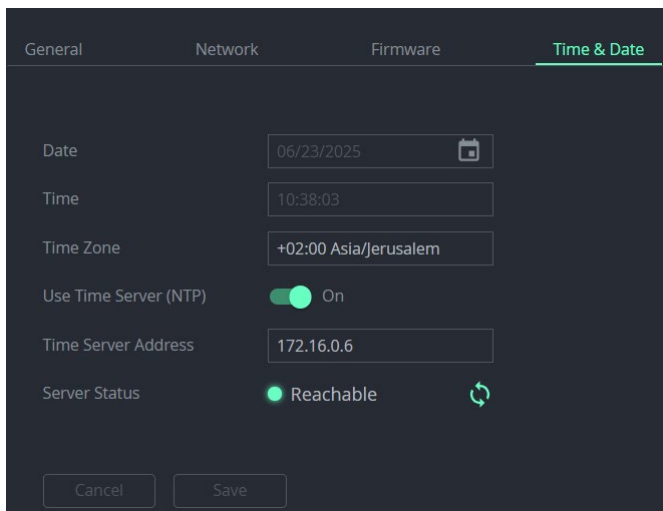


The image shows the 'Server Certificate' configuration section. A toggle switch for 'Server Certificate' is turned on (green). Below it is a 'CA Certificate' label and an input field with a green upload icon to its right.

Figure 133: CA – Certificate

3. Click **Save**.

802.1x authentication security is configured.



The image shows the 'Time & Date' configuration tab. It includes fields for 'Date' (06/23/2025), 'Time' (10:38:03), and 'Time Zone' (+02:00 Asia/Jerusalem). There is a toggle for 'Use Time Server (NTP)' which is turned on, and a 'Time Server Address' field (172.16.0.6). The 'Server Status' is shown as 'Reachable' with a green indicator and a refresh icon. At the bottom are 'Cancel' and 'Save' buttons.

Figure 134: Security Status Message

Diagnostics

Viewing the Device's Status

This section allows the user to view the system's temperature, fan speed and AV status.

To view status device:

- 1. Go to Diagnostics>Status page.

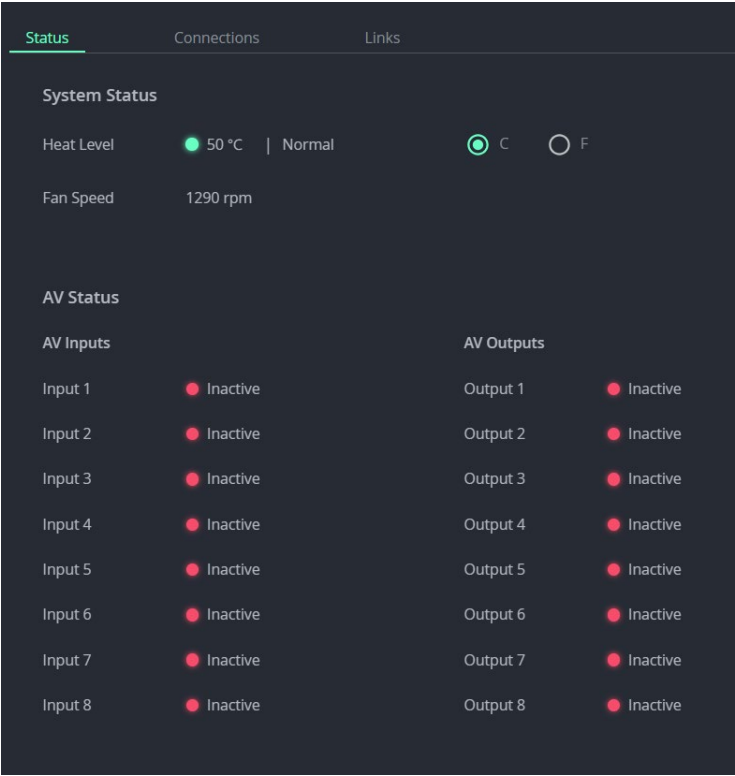


Figure 135: Diagnostics>Status Page

- 2. View the System status:
 - **Heat Level:** Select “C” (Celsius) or “F” (Fahrenheit) to change the temperature display unit (Default setting: C).
 - **Fan Speed**
- 3. View the system AV status:
 - **AV Status:** Displays the AV status of all input / output ports.
 - A red circle indicates the port has no active signal passing-through.
 - A green circle indicates the port has an active signal passing-through.

Viewing the Device's Connections

This section allows the user to view the IP client connections information, including connection protocol, IP client address, IP client port number and device port number.

To view the status Connection status:

- 1. Go to Diagnostics>Connections page.
- 2. View the IP client connections
- 3. Click  to refresh and view the connections information, click the icon.

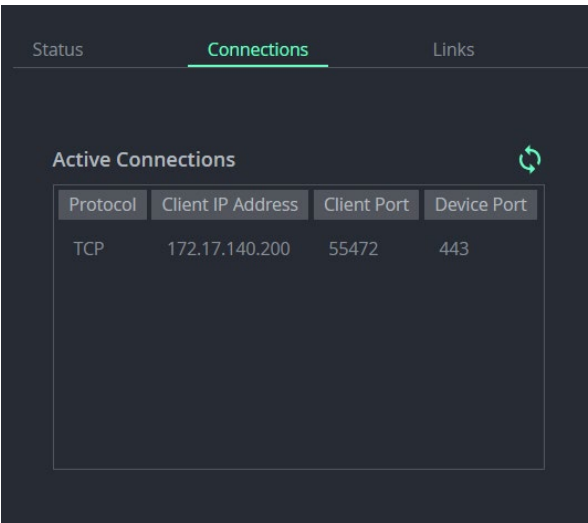


Figure 136: Diagnostics>Connections Page

Setting Test Patterns for Outputs

This section allows the user to set various test patterns for outputs.

To set test patterns:

- 1. Go to Diagnostics>Links page.
- 2. For each output (1~8), click the drop-down menu and select a test pattern.

The selected ports will output the test pattern images.

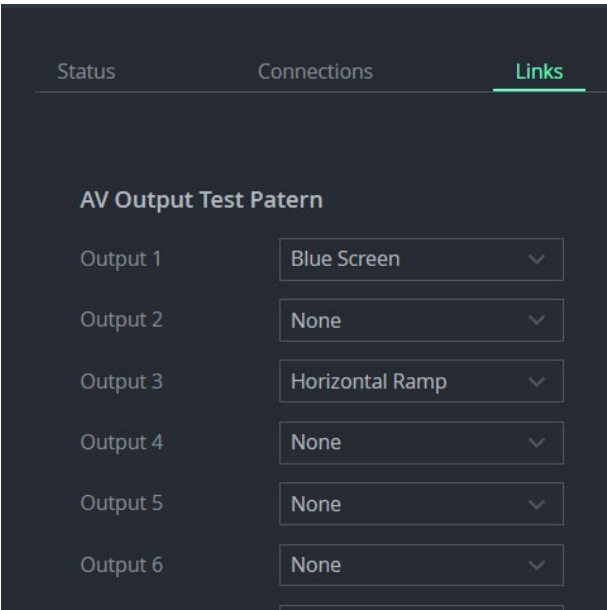


Figure 137: Diagnostics>Links Page

Upgrading the Firmware

Use the Kramer **K-UPLOAD** software to upgrade the firmware via ethernet. The device continues to operate and once FW upload complete, you are asked to Restart now or later.

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

Technical Specifications

Inputs	2 Full-featured USB-C	On USB type-C female connectors
	8 HDMI	On HDMI female connectors
	1 Air-cast Wi-Fi	On a 2xRF antenna female connectors
	4 Analog Mic or 2 Balanced Stereo Audio	On 3-pin terminal block connectors
	4 Analog Balanced Stereo Audio	On 5-pin terminal block connectors
Outputs	8 HDMI	On HDMI female connectors
	1 H.264/5 Encoder	On a USB type-C female connector for recording
	8 Analog Audio Balanced Stereo Line Level	On 5-pin terminal block connectors
	8 Dante Streaming Channels	On RJ-45 female connectors
	2 Power Amplifier Audio Stereo Line	On 4-pin large terminal block connectors Note: On MTX3-88-PR-PRO model only
	4 IR	On 2-pin terminal block connectors
Inputs/Outputs	8 Dante Streaming Channels	On an RJ-45 female connector
Interchangeable Inputs/Outputs	8 HDBT	On RJ-45 female connectors
Ports	3 1000BaseT Ethernet	On RJ-45 female connectors for LAN connection & extension
	1 100BaseT Ethernet	On an RJ-45 female connectors for LAN connection & management
	4 USB 3.2 Device	On USB type-A female connectors
	2 USB 3.2 Device	On USB type-C female connectors
	1 USB 2.0 Device	On a USB type-C female connector for monitoring & recording
	4 RS-232	On 3-pin terminal block connectors
	4 SPDT Relay	On 3-pin terminal block connectors
	4 GPIO	On 2-pin terminal block connectors
Video	Max Bandwidth	18Gbps (6Gbps per graphic channel)
	Max Resolution	4K@60Hz 4:4:4 24bpp resolution
	Content Protection	HDCP 2.3
	Compliance	HDMI 2.0b
Video Performance	Scaling	Up, down or cross-scaling
	Minimum Resolution	480p
	Max Resolution	4K@60Hz 4:4:4 24bpp resolution
	Max Switching Time	1sec
	Max Latency	2 video frames
Multi View	Window Layouts	PiP, Side-by-side, Split

Video Wall	Output Wall Layout	2x2
	Max Video Walls	2
USB-C	AV Compliance	MST DP 1.4a Alt Mode
	Max AV Resolution	4K60Hz 4:4:4 24bpp
	Max Input AV Streams	2
	USB Compliance	3.2 Gen 2
	Max USB 3.2 Data Rate	10Gbps
	Charging Compliance	PD 3.0
	Max Charging Power	60W per port
Extension line	Direction	Transmit or receive (per port)
	Reach	Up to 100m (330ft) Note: When using Kramer HDBaseT cables
	PoE+ Providing	30W per 802.3at Type 2
	Standards Compliance	HDBaseT 3.0
Extended USB	Max USB 2.0 Data Rate	480Mbps
	Max Transmitted Data Bandwidth	300Mbps
	Standards Compliance	USB 2.0 and 1.1
Extended Ethernet	Max Data Rate	1 Gbps
Extended RS-232	Baud Rate	1200 to 115200
Air-cast Wi-Fi	Max Resolution	4K@60Hz 4:2:0 resolution
	Max Antenna Coax Cable Reach	20m
	Max Air-cast Connection Reach	10m for device-connected antennas 5m for coax-connected antennas Note: At free line-of-sight connection
	Max Connection Time	3sec
	Max Presentation Latency	130msec
	Standards Compliance	802.11ac
	Radio Frequency Bands	5GHz
	Content Sharing Applications	Point-to-Point: Miracast IT Wi-Fi Access Point: Air-Play, Chromecast
Network Streamed Video	Max Resolution	4K@60Hz 4:2:0 resolution
	Max Latency	130msec
	Standards Compliance	H.264, H.265
Analog Audio Input	Impedance	Balanced: 20k Ω Unbalanced: 10k Ω
	Nominal Level	Balanced: +4dBu Unbalanced: -10dBV Note: Adjustable via input gain
	Max Level	>+21dBu Note: At rated THD+N
	CMRR	>70dB typical
	Input Gain Adjustment	-20dB to +10dB, in 0.5dB steps

Microphone Input	Signal Type	Balanced: Condenser (with phantom power) Unbalanced: Dynamic
	Impedance	Balanced: 20k Ω Unbalanced: 10k Ω
	Nominal Level	-60dBV Note: Adjustable via input gain
	Max Level	Condenser: -18dBu Dynamic: -36dBV
	Equivalent Input Noise	<-120dBV (1.0 μ Vrms) Note: At +40dB input gain
	CMRR	>70dB typical
	Input Gain Adjustment	-30dB to +24dB, in 0.5dB steps Note: Adjustable per input
	DC Phantom Power	+48 VDC, $\pm$ 10% Note: All inputs, switched on or off
Analog Audio Output	Impedance	Balanced: 100 Ω Unbalanced: 50 Ω
	Gain	Balanced: 0dB Unbalanced: -6dB
	Gain Error	$\pm$ 0.1dB Note: Channel to channel
	Max Level	Balanced: +21dBu Unbalanced: +15dBu
	Output Volume Range	-90dB to +10dB, in 0.5dB steps
	THD + Noise	<0.01%, 20Hz to 20kHz Note: At maximum level
	Frequency Response	20Hz to 20kHz, $\pm$ 0.1 dB
	Dynamic Range	102dB typical Note: 20Hz to 20kHz unweighted
	S/N Ratio	>90dB, 20Hz to 20kHz Note: At maximum balanced output (unweighted)
	Crosstalk	$\leq$ -90dB @ 20Hz to 20kHz Note: Fully loaded
Power Amplified Audio ^① On MTX3-88-PR-PRO model only	Number of amplifiers	2x 240W power amplifiers
	Amplifier Type	Class D
	Lo-Z Stereo Output Impedance	4 Ω or 8 Ω
	Hi-Z Mono Output Voltage	70V or 100V
	Port Output Power	Lo-Z: 2x120W @ 4 Ω or 8 Ω Hi-Z: 1x240W @ 70V or 100V
	Max Voltage Gain	26dB SE / 32dB BTL
	Dynamic Range	119dB
	Frequency Response	20Hz to 20kHz, $\pm$ 0.1 dB
	S/N Ratio	80dB — 10dBV, 20Hz to 20kHz
Network Streamed Audio	Stream Compliance	Dante or AES67
	Dante Sample Rates	44.1, 48 (default), 88.2, 96kHz
	AES67 Sample Rate	48kHz (default), 96kHz

Security	Web-UI Communication	HTTPS
	User Access	Multiple roles and credentials
	IT LAN Authentication	802.1x
	Penetration Protection Certification	OWASP-10
Power	Source	85-240V AC
	Max Consumption	1110W
	Max Power Providing Per HDMI Port	2.5W (5V@0.5A)
	Max PoE Providing Power Per HDBT Port	30W
	HDBT PoE Providing Compliance	802.3at, Type 2
	Max USB-C Charging Power Per USB-C Port	60W
	USB-C Charging Compliance	PD 3.0
	Max USB Device Per Port Charging Power	5W (5V@1A)
Environmental Conditions	Operating Temperature	0° to +40°C (32° to 104°F)
	Storage Temperature	-40° to +70°C (-40° to 158°F)
	Humidity	10% to 90%, RHL non-condensing
Regulatory Compliance	Safety	CE, FCC, UL
	Environmental	RoHs, WEEE
Enclosure	Size	19" 3U
	Type	Aluminum
	Cooling	Fan Ventilation
	Max Fan Noise	40dBA
General	Net Dimensions (W, D, H)	44cm x 38cm x 13.3cm (17.4" x 15" x 5.3")
Accessories	Included	2 Power cords, 1 multi-signal USB-C cable (1m), 2 antennas, 2 set of rack ears

Default Communication Parameters

RS-232	
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Example (Route video input 2 to the output):	#ROUTE_1,1,2<CR>
Ethernet	
To reset the IP settings to the factory reset values go to: Menu->Setup -> Factory Reset-> press Enter to confirm	
Fallback IP Address:	192.168.1.39
Fallback Subnet mask:	255.255.255.0
Fallback gateway:	192.168.0.1
Default username:	Admin
Default password:	Admin
Full Factory Reset	
P3K	Send FACTORY command then RESET
Embedded webpages	Go to: Device>General and click FACTORY RESET

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:**

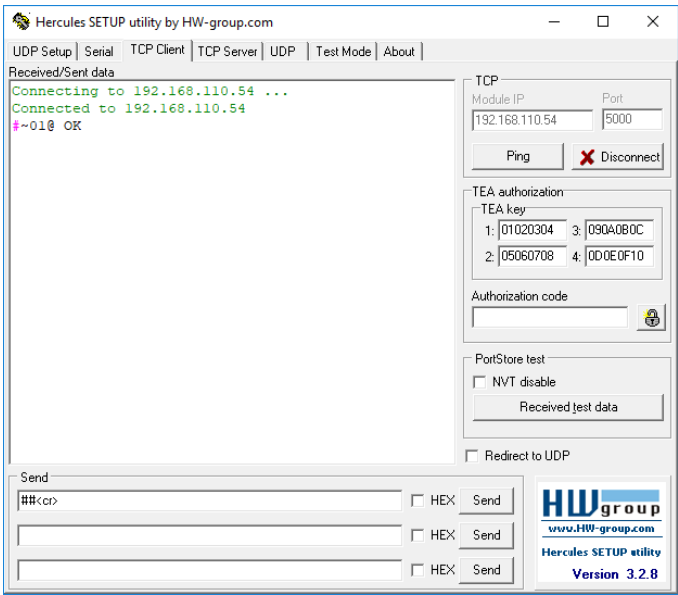
Prefix	Command Name	Constant (Space)	Parameter(s)	Suffix
#	Command	_	Parameter	<CR>

- **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 **MTX3-88-PR-PRO**. The following figure displays how the # command is framed using terminal communication software (such as Hercules):



Protocol 3000 Commands

Function	Description	Syntax	Parameters/Attributes	Example
System Commands				
BUILD-DATE?	Get device's build date.	Command: #BUILD-DATE?<CR> FEEDBACK: ~nn@BUILD-DATE date,time<CR><LF>	date – Format: YYYY/MM/DD where YYYY = Year MM = Month DD = Day time – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds	Command: #BUILD-DATE?<CR> FEEDBACK: ~nn@BUILD-DATE date,time<CR><LF>
FACTORY	Reset device to factory default configurations.	Command: #FACTORY<CR> FEEDBACK: ~nn@FACTORY OK<CR><LF>		Command: #FACTORY<CR> FEEDBACK: ~nn@FACTORY OK<CR><LF>
MODEL?	Get device model.	Command: #MODEL? <CR> Feedback: ~nn@MODEL model_name<CR><LF>	model_name – String of up to 19 printable ASCII chars	Command: #MODEL? <CR> Feedback: ~nn@MODEL MTX3-88-PR<CR><LF>

Function	Description	Syntax	Parameters/Attributes	Example
NAME	Set machine (DNS) name. The machine name is not the same as the model's name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).	Command: #NAME machine_name<CR> Feedback: ~nn@NAME machine_name<CR><LF>	machine_name – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Command: #NAME room-442<CR> Feedback: ~nn@NAME room-442<CR><LF> Description: Set the DNS name of the device to room-442.
NAME?	Get machine (DNS) name. The machine name is not same with the model's name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).	Command: #NAME? <CR> Feedback: ~nn@NAME machine_name<CR><LF>	machine_name – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Command: #NAME? <CR> Feedback: ~nn@NAME room-442<CR><LF> Description: Get the DNS name of the device.
NAME-RST	Reset machine (DNS) name to factory default. Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number.	Command: #NAME-RST<CR> Feedback: ~nn@NAME-RST OK<CR><LF>		Command: #NAME-RST KRAMER_0102<CR> Feedback: ~nn@NAME-RST OK<CR><LF> Description: Reset the machine name (S/N last digits are 0102).
VERSION?	Get firmware version.	Command: #VERSION?<CR> Feedback: ~nn@VERSION firmware_version<CR><LF>	firmware_version – XX.XX.XXXX where the digit groups are: major.minor.build version	Command: #VERSION?<CR> Feedback: ~nn@VERSION 1.0.1<CR><LF> Description: Get the device's firmware version.
RESET	Reset device.	Command: #RESET<CR> Feedback: ~nn@RESET OK<CR><LF>		Command: #RESET<CR> Feedback: ~nn@RESET OK<CR><LF> Description: Reset the device.
SN?	Get device's serial number.	Command: #SN?<CR> Feedback: ~nn@SN serial_number<CR><LF>	serial_number – 14 decimal digits, factory assigned	Command: #SN?<CR> Description: Get the device's serial number.

Function	Description	Syntax	Parameters/Attributes	Example
HW-VERSION?	Get hardware version.	Command: #HW-VERSION?<CR> Feedback: ~nn@HW-VERSION hardware_version<CR><LF>	hardware_version – XX.XX where the digit groups are: major.minor.build version	Command: #HW-VERSION?<CR> Feedback: ~nn@HW-VERSION 0.2<CR><LF> Description: Get hardware version.
HW-TEMP ?	Get device's heat.	Command: #HW-TEMP? region_id,mode<CR> Feedback: ~nn@HW-TEMP region_id, temperature<CR><LF>	region_id – ID of the region for which to get the temperature 0 – Region 0 mode – Celsius or Fahrenheit 0 – Celsius 1 – Fahrenheit temperature – Temperature of the HW region, rounded down to the closest integer	Command: #HW-TEMP? 0,0<CR> Feedback: ~nn@HW-TEMP 0,0,35<CR><LF> Description: Get temperature in Device.
FAN-SPEED?	Get device's fan speed.	Command: #FAN-SPEED?<CR> Feedback: ~nn@FAN-SPEED value<CR><LF>	value – fan speed	Command: #FAN-SPEED?<CR> Feedback: ~nn@FAN-SPEED 3600<CR><LF> Description: Get fan speed.
IDV	Set visual indication from device. NOTE: Using this command, some devices can light a sequence of buttons or LEDs to allow identification of a specific device from similar devices.	Command: #IDV<CR> Feedback: ~nn@IDV ok<CR><LF>		Command: #IDV<CR> Feedback: ~nn@IDV ok<CR><LF>
STANDBY	Set standby mode.	Command: #STANDBY value<CR> Feedback: ~nn@STANDBY value<CR><LF>	value – On/Off 0 – Off 1 – On	Command: #STANDBY 1<CR> Feedback: ~nn@STANDBY 1<CR><LF> Description: Set standby mode to on.
STANDBY ?	Get standby mode.	Command: #STANDBY?<CR> Feedback: ~nn@STANDBY value<CR><LF>	value – On/Off 0 – Off 1 – On	Command: #STANDBY?<CR> Feedback: ~nn@STANDBY 1<CR><LF> Description: Get standby mode, the result is on.

Function	Description	Syntax	Parameters/Attributes	Example
TIME	Set device's time and date.	Command: #TIME day_of_week,date,time<CR> Feedback: ~nn@TIME day_of_week,date,time<CR><LF>	day_of_week – options: SUN,MON,TUE,WED,THU,FRI,SAT date – format: DD-MM-YYYY time – format: hh:mm:ss Note: The year must be 4 digits The device does not validate the day of week from the date Time format – 24 hours Date format – Day, Month, Year	Command: #TIME MON,21-08-2023,15:00:00<<CR> Feedback: ~nn@TIME MON,21-08-2023,15:00:00<CR><LF> Description: Set device time to Monday, August 21, 2023 at 3:00pm
TIME?	Get device's time and date.	Command: #TIME?<CR> Feedback: ~nn@TIME day_of_week,date,time<CR><LF>	day_of_week – options: SUN,MON,TUE,WED,THU,FRI,SAT date – format: DD-MM-YYYY time – format: hh:mm:ss Note: The year must be 4 digits The device does not validate the day of week from the date Time format – 24 hours Date format – Day, Month, Year	Command: #TIME?<CR> Feedback: ~nn@TIME MON,21-08-2023,15:00:00<CR><LF>
TIME-SRV	Set time server.	Command: #TIME-SRV mode,time_server_ip,syn c_hour<CR> Feedback: ~nn@TIME-SRV mode,time_server_ip,syn c_hour,server_status<CR><LF>	mode – 0 (OFF), 1 (ON) time_server_ip – time server IP address or hostname. IP must be, in the following format: xxx.xxx.xxx.xxx sync_hour – not in use: 0 server_status – 0 (OFF), 1 (ON)	Command: #TIME-SRV 1,128.138.140.44,0<CR> Feedback: ~nn@TIME-SRV 1, 128.138.140.44,0,1<CR><LF> Description: Set time server with IP address of 128.138.140.44 to ON.
TIME-SRV ?	Get time server.	Command: #TIME-SRV?<CR> Feedback: ~nn@TIME-SRV mode,time_server_ip,syn c_hour,server_status<CR><LF>	mode – 0 (OFF), 1 (ON) time_server_ip – time server IP address or hostname. IP must be, in the following format: xxx.xxx.xxx.xxx sync_hour – not in use: 0 server_status – 0 (OFF), 1 (ON)	Command: #TIME-SRV?<CR> Feedback: ~nn@TIME-SRV 1, 128.138.140.44,0,1<CR><LF> Description: Get time server.
TIME-ZONE	Set the device's time zone.	Command: #TIME-ZONE timezone_str<CR> Feedback: ~nn@TIME-ZONE timezone_str<CR><LF>	timezone_str – A string that identifies the relevant time zone. Available time zone strings can be listed using the HTTP GET /api/v1/time/zoneinfo method.	Command: #TIME-ZONE Europe/London<CR> Feedback: ~nn@TIME-ZONE Europe/London<CR><LF> Description: Set time zone to London, England.

Function	Description	Syntax	Parameters/Attributes	Example
TIME-ZONE?	Get the device's time zone.	Command: #TIME-ZONE?<CR> Feedback: ~nn@TIME-ZONE timezone_str<CR><LF>	timezone_str – A string that identifies the relevant time zone. Available time zone strings can be listed using the HTTP GET /api/v1/time/zoneinfo method.	Command: #TIME-ZONE?<CR> Feedback: ~nn@TIME-ZONE Europe/London<CR><LF> Description: Get the device's time zone.
UPGRADE	Perform firmware upgrade.	Command: #UPGRADE<CR> Feedback: ~nn@UPGRADE ok<CR><LF>		Command: #UPGRADE<CR> Feedback: ~nn@UPGRADE ok<CR><LF>
UPG-TIME ?	Get the time of last upgrade	Command: #UPG-TIME?<CR> Feedback: ~nn@UPG-TIME day_of_week,date,time<CR><LF>	day_of_week – options: SUN,MON,TUE,WED,THU,FRI,SAT date – Format: DD-MM-YYYY where YYYY = Year MM = Month DD = Day time – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds	Command: #UPG-TIME?<CR> FEEDBACK: ~nn@UPG-TIME day_of_week,date,time<CR><LF>
X-PRST-STO	Store current changes into a preset (per type).	Command: #X-PRST-STO preset_id,preset_type,name<CR><CR> Feedback: ~nn@X-PRST-STO preset_id,preset_type,name<CR><LF>	preset_id – preset index 1 ~ 48 preset_type – 1- Global preset 2 -AV preset 3- Audio preset 4- Multi-View preset 5- Videowall preset name – the name of the preset (≤19 characters)	Command: #X-PRST-STO 1,1,Preset 1<CR> Feedback: #X-PRST-STO 1,1,Preset 1<CR><LF> Description: Store current AV configuration to Preset 1.
X-PRST-RCL	Recall saved preset list per type.	Command: #X-PRST-RCL preset_id,preset_type,name<CR> Feedback: ~nn@X-PRST-RCL preset_id,preset_type,name<CR><LF>	preset_id – preset index 1 ~ 48 preset_type – 1- Global preset 2 -AV preset 3- Audio preset 4- Multi-View preset 5- Videowall preset name – the name of the preset (≤19 characters)	Command: #X-PRST-RCL 1,1,Preset 1<CR> Feedback: ~nn@X-PRST-RCL 1,1,Preset 1<CR><LF> Description: Recall preset 1.
X-PRST-NAME	Set the name of a preset.	Command: #X-PRST-NAME preset_id,preset_type,name<CR> Feedback: ~nn@X-PRST-NAME preset_id,preset_type,name<CR><LF>	preset_id – preset index 1 ~ 48 preset_type – 1- Global preset 2 -AV preset 3- Audio preset 4- Multi-View preset 5- Videowall preset name – the name of the	Command: #X-PRST-NAME 1,1,Class Room 1<CR> Feedback: ~nn@X-PRST-NAME 1,1,Class Room 1<CR><LF> Description: Set the name of preset 1.

Function	Description	Syntax	Parameters/Attributes	Example
			preset (≤19 characters)	
X-PRST-NAME?	Get the name of a preset.	Command: #X-PRST-NAME? preset_id,preset_type<CR> Feedback: ~nn@X-PRST-NAME preset_id,preset_type,name<CR><LF>	preset_id – preset index 1 ~ 48 preset_type – 1- Global preset 2 -AV preset 3- Audio preset 4- Multi-View preset 5- Videowall preset name – the name of the preset(≤19 characters)	Command: #X-PRST-NAME? 1,1<CR> Feedback: ~nn@X-PRST-NAME 1,1,Class Room 1<CR><LF> Description: Get the name of preset 1.
X-PRST-DELETE	Get saved preset list.	Command: #X-PRST-DELETE preset_id,preset_type,name<CR> Feedback: ~nn@X-PRST-DELETE preset_id,preset_type,name<CR><LF>	preset_id – preset index 1 ~ 48 preset_type – 1- Global preset 2 -AV preset 3- Audio preset 4- Multi-View preset 5- Videowall preset name – the name of the preset (≤19 characters)	Command: #X-PRST-DELETE 1,1,Class Room 1<CR> Feedback: ~nn@X-PRST-DELETE 1,1,Empty<CR><LF> Description: Delete the Preset 1,and the name reset to Empty.
X-PRST-LIST?	Get saved preset list.	Command: #X-PRST-LIST? preset_id<CR> Feedback: ~nn@X-PRST-LIST [[preset_id1, preset_type1,name1],[preset_id2, preset_type2,name2..]<CR><LF>	preset_id – preset index 1 ~ 48	Command: #X-PRST-LIST?<CR> Description: Show preset 9 list.
X-LABEL	Set the port's label. Labels are used commonly by WEB pages.	Command: #X-LABEL <direction_type>. <port_format>. <port_index>, label_txt<CR> Feedback: ~nn@X-LABEL <direction_type>.<port_format>.<port_index>, label_txt<CR><LF>	The following attributes comprise the port ID: <direction_type> – Direction of the port: o IN o OUT <port_format> – Type of signal on the port: o HDMI o HDBT o ANALOG_AUDIO o AMPLIFIED_AUDIO o MIC o RS-232 o IR <port_index> – The port number as printed on the front or rear panel label_txt – ASCII characters	

Function	Description	Syntax	Parameters/Attributes	Example
X-LABEL?	Get the port's label. Labels are used commonly by WEB pages.	Command: #X-LABEL? <direction_type>.<port_format>.<port_index><CR> Feedback: ~nn@X-LABEL <direction_type>.<port_format>.<port_index>, label_txt<CR><LF>	The following attributes comprise the port ID: <direction_type> – Direction of the port: o IN o OUT <port_format> – Type of signal on the port: o HDMI o HDBT o ANALOG_AUDIO o AMPLIFIED_AUDIO o MIC o RS-232 o IR <port_index> – The port number as printed on the front or rear panel label_txt – ASCII characters	
X-COLOR	Set the port's label color. Colors are used commonly by WEB pages. Allow user to select the color of the frame (in Matrix page) add a line called "COLOR" underneath the LABEL with a color picker.	Command: #X-COLOR <direction_type>. <port_format>. <port_index>, color<CR> Feedback: ~nn@X-LABEL <direction_type>.<port_format>.<port_index>, color<CR><LF>	The following attributes comprise the port ID: <direction_type> – Direction of the port: o IN o OUT <port_format> – Type of signal on the port: o HDMI <port_index> – The port number as printed on the front or rear panel For the input stage 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 9 – USB-C IN1 10 – USB-C IN2 11 – Wireless For the output stage 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 color – user to select the color of the frame (in Matrix page) 1- Green - #69FFC3 (Default) 2- Blue - #399FFE 3- Yellow - #F9BB1C	Command: #X-COLOR IN. HDMI. 1, 69FF3<CR> Feedback: ~nn@#X-COLOR IN.HDMI.1,69FFC3<CR><LF>

Function	Description	Syntax	Parameters/Attributes	Example
			4- Orange - #FF6D1C 5- Coral - #FF0E9F 6- Purple -#9E00DD	
X-COLOR ?	Get the port label color. Colors are used commonly by WEB pages. Allow user to select the color of the frame (in Matrix page) add a line called "COLOR" underneath the LABEL with a color picker.	Command: #X-COLOR? <direction_type>.<port_format>.<port_index><CR> Feedback: ~nn@X-LABEL <direction_type>.<port_format>.<port_index>, color<CR><LF>	The following attributes comprise the port ID: <direction_type> – Direction of the port: o IN o OUT <port_format> – Type of signal on the port: o HDMI <port_index> – The port number as printed on the front or rear panel For the input stage 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 9 – USB-C IN1 10 – USB-C IN2 11 – Wireless For the output stage 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 color – user to select the color of the frame (in Matrix page) . 1- Green - #69FFC3 (Default) 2- Blue - #399FFE 3- Yellow - #F9BB1C 4- Orange - #FF6D1C 5- Coral - #FF0E9F 6- Purple -#9E00DD	Command: #X-COLOR? IN. HDMI. 1<CR> Feedback: ~nn@#X-COLOR IN.HDMI.1,69FFC3<CR><LF>
LOCK-FP	Lock the front panel.	Command: #LOCK-FP lock/unlock<CR> Feedback: ~nn@LOCK-FP lock/unlock<CR><LF>	Lock/Unlock – On/Off 0 – (Off) Unlocks Front Panel. 1 – (On) Locks Front Panel.	Command: #LOCK-FP 1<CR> Feedback: ~nn@LOCK-FP 1<CR><LF> Description: Locks Front Panel.
LOCK-FP?	Get the front panel lock state.	Command: #LOCK-FP?<CR> Feedback: ~nn@LOCK-FP lock/unlock<CR><LF>	Lock/Unlock – On/Off 0 – (Off) Unlocks Front Panel. 1 – (On) Locks Front Panel.	Command: #LOCK-FP?<CR> Feedback: ~nn@LOCK-FP 1<CR><LF>

Function	Description	Syntax	Parameters/Attributes	Example
				Description: Get the front panel lock state.
POWER-CONSUMPTION?	Get the power consumption of the device.	Command: #POWER-CONSUMPTION?<CR> Feedback: ~nn@POWER-CONSUMPTION value<CR><LF>	value – power consumption	Command: #POWER-CONSUMPTION?<CR> Feedback: ~nn@POWER-CONSUMPTION 100<CR><LF> Description: Get the power consumption of the device, and the power consumption is 100W.
Authentication Commands				
SECUR The permission system works only if security is enabled with the “SECUR” command.	Start/stop security.	Command: #SECUR security_state<CR> Feedback: ~nn@SECUR security_state<CR><LF>	security_state – Security state 0 – OFF (disables security) 1 – ON (enables security)	Command: #SECUR 0<CR> Feedback: ~nn@SECUR 0<CR><LF> Description: Enable the permission system.
SECUR?	Get current security state.	Command: #SECUR?<CR> Feedback: ~nn@SECUR security_state<CR><LF>	security_state – Security state 0 – OFF (disables security) 1 – ON (enables security)	Command: #SECUR?<CR> Feedback: ~nn@SECUR 0<CR><LF> Description: Get current security state.
802-1X-AUTH-STATE?	Get authentication status of IEEE 802.1X.	Command: #802-1X-AUTH-STATE? netw_id<CR> Feedback: ~nn@802-1X-AUTH-STATE? netw_id,mode<CR><LF>	netw_id – Network ID–the device network 0 – Service Port mode –authentication status of IEEE 802.1X 0 – off 1 – authentication success 2 – authentication failed 3 – authentication ongoing	Command: #802-1X-AUTH-STATE? 0<CR> Feedback: ~nn@802-1X-AUTH-STATE? 0,1<CR><LF> Description: Get Service port authentication status of IEEE 802.1X.
HTTP-AUTH-ENABLE	Start/stop HTTP/HTTPS communication security. NOTE: The HTTP/HTTPS permission works only if security is enabled with the “HTTP-AUTH-ENABLE” command.	Command: #HTTP-AUTH-ENABLE security_state,password<CR> Feedback: ~nn@HTTP-AUTH-ENABLE security_state,password<CR><LF>	security_state – Security state 0 – OFF (disables security) 1 – ON (enables security) password – password in uencode64 format, only if the password is valid, AUTH will be disabled otherwise reject the request. NOTE: It is only required when the security state is 0 for disabling the security.	Command: #HTTP-AUTH-ENABLE 0,dGVzdA==<CR> Feedback: ~nn@HTTP-AUTH-ENABLE 0,dGVzdA==<CR><LF> Description: Enable the permission system.

Function	Description	Syntax	Parameters/Attributes	Example
HTTP-AUTH-ENABLE?	Get HTTP/HTTPS security state.	Command: #HTTP-AUTH-ENABLE? <CR> Feedback: ~nn@HTTP-AUTH-ENABLE security_state,password<CR><LF>	security_state – Security state 0 – OFF (disables security) 1 – ON (enables security) password – password in uencode64 format, only if the password is valid, AUTH will be disabled otherwise reject the request. NOTE: It is only required when the security_state is 0 for disabling the security.	Command: #HTTP-AUTH-ENABLE?<CR> Feedback: ~nn@HTTP-AUTH-ENABLE 0,dGVzdA==<CR><LF> Description: Get current security state.
HTTP-LOGOUT-TIMEOUT	Set HTTP inactivity auto-logout time.	Command: #HTTP-LOGOUT-TIMEOUT time<CR> Feedback: ~nn@HTTP-LOGOUT-TIMEOUT time<CR><LF>	time – minutes of logout time	Command: #HTTP-LOGOUT-TIMEOUT 10<CR> Feedback: ~nn@HTTP-LOGOUT-TIMEOUT 10<CR><LF> Description: Set Inactivity auto-logout time to 10.
HTTP-LOGOUT-TIMEOUT?	Get HTTP inactivity auto-logout time.	Command: #HTTP-LOGOUT-TIMEOUT time<CR> Feedback: ~nn@HTTP-LOGOUT-TIMEOUT time<CR><LF>	time – minutes of logout time	Command: #HTTP-LOGOUT-TIMEOUT?<CR> Feedback: ~nn@HTTP-LOGOUT-TIMEOUT 10<CR><LF> Description: Get Inactivity auto-logout time.
HTTP-PASSWD	Set password for HTTP user login. The default password is "admin".	Command: #HTTP-PASSWD user_name,old_password,new_password<CR> Feedback: ~nn@HTTP-PASSWD user_name,new_password<CR><LF>	user – user name of login to set ('admin' support only). password – Password for the user, in uencode64 format. 8 to 24 characters (letters, numbers, and symbols without spaces or commas), at least including one number, one symbols without spaces or commas, one uppercase letter and one lowercase letter.	Command: #HTTP-PASSWD admin,33333,44444<CR> Feedback: ~nn@HTTP-PASSWD admin,44444<CR><LF> Description: Set the password for the admin protocol permission level to 44444.
HTTP-PASSWD?	Check password for HTTP user login. The default password is "admin".	Command: #HTTP-PASSWD? user_name,old_password<CR> Feedback: ~nn@HTTP-PASSWD user_name,old_password,result<CR><LF>	user – user name of login to set ('admin' support only). password – Password for the user, in uencode64 format. 8 to 24 characters (letters, numbers, and symbols without spaces or commas), at least including one number, one symbols without spaces or commas, one uppercase letter and one lowercase letter. result 0 - check failed 1 - check passed	Command: #HTTP-PASSWD? admin,44444<CR> Feedback: ~nn@HTTP-PASSWD admin,44444,1<CR><LF> Description: Check the password for the admin protocol permission level to 44444.

Function	Description	Syntax	Parameters/Attributes	Example
VLAN-TAG-ENABLE?	Get tagged/untagged traffic flows/ports.	Command: #VLAN-TAG-ENABLE? service_id<CR> Feedback: ~nn@VLAN-TAG-ENABLE service_id ,tagged_en<CR><LF>	service_id – ID of the service: 0 – Control 1 – Air-cast 2 – H.264/5 3 – Dante tagged_en – 0 – OFF (untagged) 1 – ON (tagged)	Command: #VLAN-TAG-ENABLE 0<CR> Feedback: ~nn@VLAN-TAG-ENABLE 0,1<CR><LF> Description: Get tagged/untagged on Control service.
VLAN-TAG	Set vlan tag ID of gateway port.	Command: #VLAN-TAG service_id ,tag_id<CR> Feedback: ~nn@VLAN-TAG service_id ,tag_id<CR><LF>	service_id – ID of the service: 0 – Control 1 – Air-cast 2 – H.264/5 3 – Dante tag_id – vlan tag (2 to 4000) 1 – No VLAN tag	Command: #VLAN-TAG 0,33<CR> Feedback: ~nn@VLAN-TAG 0,33<CR><LF> Description: Set Control service vlan tag to 33.
VLAN-TAG ?	Get vlan tag ID of gateway port.	Command: #VLAN-TAG? service_id <CR> Feedback: ~nn@VLAN-TAG service_id,tag_id<CR><LF>	service_id – ID of the service: 0 – Control 1 – Air-cast 2 – H.264/5 3 – Dante tag_id – vlan tag (2 to 4000) 1 – No VLAN tag	Command: #VLAN-TAG? 0<CR> Feedback: ~nn@VLAN-TAG 0,33<CR><LF> Description: Get Control service vlan tag.
VLAN-PASS	Set VLAN IDs that will pass-thru MTX3 to IT switch.	Command: #VLAN-PASS [tag_id,tag_id]<CR> Feedback: ~nn@VLAN-PASS [tag_id,tag_id]<CR><LF>	tag_id – vlan tag (2 to 4000) 1 – No VLAN tag	Command: #VLAN-PASS [200,201]<CR> Feedback: ~nn@VLAN-PASS [200,201]<CR><LF> Description: Set vlad id 200,201 that will pass-thru MTX3 to IT Switch.
VLAN-PASS?	Get VLAN IDs that will pass-thru MTX3 to IT switch.	Command: #VLAN-PASS?<CR> Feedback: ~nn@VLAN-PASS [tag_id,tag_id]<CR><LF>	tag_id – vlan tag (2 to 4000) 1 – No VLAN tag	Command: #VLAN-PASS? <CR> Feedback: ~nn@VLAN-PASS [200,201]<CR><LF> Description: Get vlad ids that will pass-thru MTX3 to IT Switch.
Communication Commands				
NET-SERVICE	Maps applicational service to specific network interface.	Command: #NET-SERVICE service_id,netw_id<CR> Feedback: ~nn@NET-SERVICE service_id,netw_id<CR><LF>	service_id – ID of the service: 1 – Air-cast 2 – H.264/5 3 – Dante 4 – USB_C 5 – HDBT netw_id – Network ID–the device network interface (if there are	Command: #NET-SERVICE 3,1<CR> Feedback: ~nn@NET-SERVICE 3,1<CR><LF> Description: Set Dante service to LAN-2.

Function	Description	Syntax	Parameters/Attributes	Example
			more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3.... 1 – LAN2 2 – LAN3 3 – LAN4	
NET-SERVICE?	Get applicational service to specific network interface mapping.	Command: #NET-SERVICE? service_id<CR> Feedback: ~nn@NET-SERVICE service_id,netw_id<CR> <LF>	service_id – ID of the service: 1 – Air-cast 2 – H.264/5 3 – Dante 4 – USB_C 5 – HDBT netw_id – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3.... 1 – LAN2 2 – LAN3 3 – LAN4	Command: #NET-SERVICE? 3<CR> Feedback: ~nn@NET-SERVICE 3,1<CR><LF> Description: Get Dante service to specific network interface mapping.
ETH-PORT?	Get Ethernet port protocol.	Command: #ETH-PORT? portType<CR> Feedback: ~nn@ETH-PORT portType,ETHPort<CR><LF>	portType – TCP/UDP ETHPort – TCP/UDP port number (0 – 65535)	Command: #ETH-PORT? 0<CR> Feedback: ~nn@ETH-PORT 0,12457<CR><LF> Description: Get the Ethernet port protocol for UDP.
NET-CONFIG	Set a network configuration. Parameters, [DNS1] and [DNS2] are optional. For Backward compatibility, the id parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port. If the gateway address is not compliant to the subnet mask used for the host IP, the command will return an error. Subnet and gateway compliancy specified by RFC950.	Command: #NET-CONFIG service_id,ip,net_mask,gateway,[DNS1],[DNS2]<CR> Feedback: ~nn@NET-CONFIG service_id,ip,net_mask,gateway<CR><LF>	service_id – ID of the service: 0 – Control 1 – Air-cast 2 – H.264/5 3 – Dante ip – Network IP net_mask – Network mask gateway – Network gateway	Command: #NET-CONFIG 0,192.168.113.10,255.255.0.0,192.168.0.1<CR> Feedback: ~nn@NET-CONFIG 0,192.168.113.10,255.255.0.0,192.168.0.1<CR><LF> Description: Set the device network parameters to IP address 192.168.113.10, net mask 255.255.0.0, and gateway 192.168.0.1

Function	Description	Syntax	Parameters/Attributes	Example
NET-CONFIG?	Get a network configuration.	Command: #NET-CONFIG? service_id<CR> Feedback: ~nn@NET-CONFIG service_id,ip,net_mask,gateway<CR><LF>	service_id – ID of the service: 0 – Control 1 – Air-cast 2 – H.264/5 3 – Dante ip – Network IP net_mask – Network mask gateway – Network gateway	Command: #NET-CONFIG? id<CR> Feedback: ~nn@NET-CONFIG 0,192.168.113.10,255.255.0.0,192.168.0.1<CR><LF> Description: Get network configuration.
NET-DHCP	Set DHCP mode. Only 1 is relevant for the mode value. To disable DHCP, the user must configure a static IP address for the device. Connecting Ethernet to devices with DHCP may take more time in some networks. To connect with a randomly assigned IP by DHCP, specify the device DNS name (if available) using the NAME command. You can also get an assigned IP by direct connection to USB or RS-232 protocol port, if available. For proper settings consult your network administrator. For Backward compatibility, the id parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	Command: #NET-DHCP service_id,mode<CR> Feedback: ~nn@NET-DHCP service_id,mode<CR><LF>	service_id – ID of the service: 0 – Control 1 – Air-cast 2 – H.264/5 3 – Dante mode – 1 – Try to use DHCP. (If unavailable, use the IP address set by the factory or the NET-IP command).	Command: #NET-DHCP 1,1<CR> Feedback: ~nn@NET-DHCP 1,1<CR><LF> Description: Enable DHCP mode for port 1, if available.

Function	Description	Syntax	Parameters/Attributes	Example
NET-DHCP?	Get DHCP mode. For Backward compatibility, the id parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	Command: #NET-DHCP? service_id<CR> Feedback: ~nn@NET-DHCP service_id,mode<CR><LF>F>	service_id – ID of the service: 0 – Control 1 – Air-cast 2 – H.264/5 3 – Dante mode – 1 – Try to use DHCP. (If unavailable, use the IP address set by the factory or the NET-IP command).	Command: #NET-DHCP? 1<CR> Feedback: ~nn@NET-DHCP 1,1<CR><LF> Description: Get DHCP mode for port 1.
NET-DNS?	Get DNS name server. There is no “Set” command. Use NET-CONFIG to set up network, including DNS name servers. If dns_id is out of the defined DNS range, Error Code #3 (ERR_PARAMETER_OUT_OF_RANGE) is returned. If no dns_id is defined, Error Code #3 is returned for any dns_id.	Command: #NET-DNS? dns_id<CR> Feedback: ~nn@NET-DNS dns_id,ip<CR><LF>	dns_id – ID of the DNS name server to retrieve, indexing starts at “0” ip – IP address of the DNS server	Command: #NET-DNS? <CR> Description: Get DNS name server.
NET-GATE?	Get gateway IP. <i>A network gateway connects the device via another network and maybe over the Internet. Be aware of security problems.</i>	Command: #NET-GATE? service_id<CR> Feedback: ~nn@NET-GATE service_id ip_address<CR><LF>	service_id – ID of the service: 0 – Control 1 – Air-cast 2 – H.264/5 3 – Dante ip_address – Format: xxx.xxx.xxx.xxx	Command: #NET-GATE? service_id<CR> Feedback: ~nn@NET-GATE 0,192.168.000.001<CR><LF> Description: Get the gateway IP address for control port.
NET-IP?	Get IP address.	Command: #NET-IP? service_id<CR> Feedback: ~nn@NET-IP service_id,ip_address<CR><LF>	service_id – ID of the service: 0 – Control 1 – Air-cast 2 – H.264/5 3 – Dante ip_address – Format: xxx.xxx.xxx.xxx	Command: #NET-IP? 0<CR> Feedback: ~nn@NET-IP 0,192.168.001.039<CR><LF> Description: Get the IP address:

Function	Description	Syntax	Parameters/Attributes	Example
NET-MAC ?	Get MAC address. For backward compatibility, the id parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	Command: #NET-MAC? service_id<CR> Feedback: ~nn@NET-MAC service_id,mac_address<CR><LF>	service_id – ID of the service: 0 – Control 1 – Air-cast 2 – H.264/5 mac_address – Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit	Command: #NET-MAC? id<CR> Feedback: NET-MAC 0, 00-1D-56-0B-1C-52[CR/LF]
NET-MASK ?	Get subnet mask.	Command: #NET-MASK? service_id<CR> Feedback: ~nn@NET-MASK service_id,net_mask<CR><LF>	service_id – ID of the service: 0 – Control 1 – Air-cast 2 – H.264/5 net_mask – Format: xxx.xxx.xxx.xxx	Command: #NET-MASK? 0<CR> Feedback: ~nn@NET-MASK 0,255.255.000.000<CR><LF> Description: Get the subnet mask.
NET-STAT ?	Get net connection list of this machine.	Command: #NET-STAT?<CR> Feedback: ~nn@NET-STAT [(<port_type>: <port_index>, <client_ip>:<client_port>) ,state],...<CR><LF>	port_type – TCP/UDP 0 – TCP 1 – UDP port_index - Device port client_ip – Dot-separated representation of the IP address client_port - Client port state – listen or established	Command: #NET-STAT?<CR> Feedback: ~nn@NETSTAT [(TCP:80,0.0.0.0:0),LISTEN],[TCP:5000,0.0.0.0:0), LISTEN], [(TCP:80,192.168.114.3:52400 ,ESTABLISHED],[TCP:5000, 192.168.1.100:51647) ,ESTAB LISHED]<CR><LF> Description: Get net connection list of this machine.
RS232-PORT	Set local RS232 port working mode.	Command: #RS232-PORT port_id,port_type<CR> Feedback: ~nn@RS232-PORT port_id,port_type<CR><LF>	port_id – 1 - Local RS-232 Port1 port_type – 0 – Control Port,use for control Matrix with P3000 API commands 1 – Extension Port,use for GW and Extension	Command: #RS232-PORT 1 0<CR> Feedback: ~nn@RS232-PORT 1 0<CR><LF> Description: Set the local RS-232 port1 to use for control Matrix with P3000 API commands.
RS232-PORT?	Get local RS232 port working mode.	Command: #RS232-PORT? port_id<CR> Feedback: ~nn@RS232-PORT port_id,port_type<CR><LF>	port_id – 1 - Local RS-232 Port1 port_type – 0 – Control Port,use for control Matrix with P3000 API commands 1 – Extension Port,use for GW and Extension	Command: #RS232-PORT? 1<CR> Feedback: ~nn@RS232-PORT 1 0<CR><LF> Description: Get the local RS-232 port1 working mode.

Function	Description	Syntax	Parameters/Attributes	Example
AV Commands				
SIGNAL?	Get input signal status.	Command: #SIGNAL? <direction_type>.<port_index>.<port_type><CR> Feedback: ~nn@SIGNAL <direction_type>.<port_index>.<port_type>,status<CR><LF>	<direction_type> – Direction of the port: o IN – Input o OUT – Output <port_index> – The port number as printed on the front or rear panel For the input stage 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 9 – Wireless For the output stage 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 <port_type> – For output differentiation o HDMI o HDBT status – Signal status according to signal validation: 0 – Off 1 – On	Command: #SIGNAL? IN.1.HDMI<CR> Feedback: ~nn@SIGNAL IN.1.HDMI,1<CR><LF> Description: Get the input signal status of IN 1.
AV-PORT-TYPE	Set port type for per video port.	Command: #AV-PORT-TYPE <direction_type>.<port_index>.<port_type><CR> Feedback: ~nn@AV-PORT-TYPE <direction_type>.<port_index>.<port_type><CR><LF>	<direction_type> - Direction of the port: o IN – Input o OUT – Output <port_index> – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 <port_type> – o HDMI o HDBT o USBC (only for input)	Command: #AV-PORT-TYPE IN.5.HDBT<CR> Feedback: ~nn@AV-PORT-TYPE IN.5.HDBT Description: set HDBT port for input port5.

Function	Description	Syntax	Parameters/Attributes	Example
AV-PORT-TYPE?	Get port type for per video port.	Command: #AV-PORT-TYPE? <direction_type>.<port_index><CR> Feedback: ~nn@AV-PORT-TYPE <direction_type>.<port_type>.<port_index> <CR><LF>	<direction_type> - Direction of the port: o IN – Input o OUT – Output <port_index> – The port number as printed on the front or rear panel 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 <port_type> – o HDMI o HDBT o USBC (only for input)	Command: #AV-PORT-TYPE? IN.5<CR> Feedback: ~nn@AV-PORT-TYPE IN.5.HDBT Description: Get port type for input port5.
USBC-DUAL-SCREEN N	Set dual-screen display for per USB_C port.	Command: #USBC-DUAL-SCREEN input_id,mode<CR> Feedback: ~nn@USBC-DUAL-SCREEN input_id,mode<CR><LF>	input_id – Input number 1 - USB-C IN1 2 - USB-C IN2 mode – dual-screen display mode 0 – dual-screen Off 1 – dual-screen On	Command: #USBC-DUAL-SCREEN 9,1<CR> Feedback: ~nn@USBC-DUAL-SCREEN 9,1<CR><LF> Description: Set dual-screen display on for per USB_C IN1.
USBC-DUAL-SCREEN?	Get dual-screen display for per USB_C port.	Command: #USBC-DUAL-SCREEN? input_id,mode<CR> Feedback: ~nn@USBC-DUAL-SCREEN input_id,mode<CR><LF>	input_id – Input number 1 - USB-C IN1 2 - USB-C IN2 mode – dual-screen display mode 0 – dual-screen Off 1 – dual-screen On	Command: #USBC-DUAL-SCREEN? 9<CR> Feedback: ~nn@USBC-DUAL-SCREEN 9,1<CR><LF> Description: Get dual-screen display on for per USB_C IN1
AV	Switch audio and video.	Command: #AV in>out_id, in>out_id, ...<CR> Feedback: ~nn@AV in>out_id, in>out_id, ...<CR><LF>	in – Number that indicates the specific input: 1 - N (N= the total number of inputs) 0 - disconnect output 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 9 – Wireless > – Connection character between in and out parameters out_id –Output number * – for all outputs 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4	Command: #AV 1>4<CR> Feedback: ~nn@AV 1>4<CR><LF> Description: Switch IN 1 to OUT 4.

Function	Description	Syntax	Parameters/Attributes	Example
			5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 9 - H264	
ROUTE	Set layer routing.	Command: #ROUTE layer,dest,src<CR> Feedback: ~nn@ROUTE layer,dest,src<CR><LF>	layer – Layer number: 1 – Video 3 – Data(RS232) 4 – IR dest – Destination: Video: 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 9 - H264 Data: (1 ~8 is available when it is set as output port) 1 – HDBT 1 RS-232 Port 2 – HDBT 2 RS-232 Port 8 – HDBT 8 RS-232 Port 9 – Local RS-232 Port1 10 – Local RS-232 Port2 11 – Local RS-232 Port3 12 – Local RS-232 Port4 IR: (1 ~8 is available when it is set as output port) 1 – HDBT 1 IR OUT Port 2 – HDBT 2 IR OUT Port 8 – HDBT 8 IR OUT Port 9 – Local IR OUT Port1 10 – Local IR OUT Port2 11 – Local IR OUT Port3 12 – Local IR OUT Port4 src – source ID: Video: 0 - disconnect output 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 9 – Wireless Data: (1 ~8 is available when it is set as input port) 1 – HDBT 1 RS-232 Port 2 – HDBT 2 RS-232 Port 8 – HDBT 8 RS-232 Port IR: 1 – HDBT 1 IR IN Port 2 – HDBT 2 IR IN Port 8 – HDBT 8 IR IN Port	Command: #ROUTE 1,*,2<CR> Feedback: ~nn@ROUTE 1,1,2<CR><LF> Description: Route the video from IN 2 to all the outputs.
ROUTE?	Get layer routing.	Command: ##ROUTE? layer,dest<CR> Feedback: ~nn@ROUTE layer,dest,src<CR><LF>		Command: #ROUTE? 1,2<CR> Feedback: ~nn@ROUTE 1,2,2<CR><LF> Description: Switch IN 1 to OUT 2

Function	Description	Syntax	Parameters/Attributes	Example
CPEDID	Copy EDID data from the output to the input.	Command: #CPEDID src_type,src_id,dst_type, dest_bitmap<CR> Feedback: ~nn@CPEDID src_type,src_id,dst_type, dest_bitmap<CR><LF>	src_type – EDID source type(usually output) 0 – Input 1 – Output 2 – Default EDID 3 – Custom EDID src_id – Number of chosen source stage 0 – Default EDID source 1 – Output 1 2 – Output 2 .. 8 – Output 8 11 – HDBT Output 1 12 – HDBT Output 2 .. 18 – HDBT Output 8 dst_type – EDID destination type(usually input) 0 – Input 1 – Output 2 – Default EDID 3 – Custom EDID dest_bitmap – Bitmap representing destination IDs. Format: XXXX...X, where X is hex digit. The binary form of every hex digit represents corresponding destinations. 0 – indicates that EDID data is not copied to this destination. 1 – indicates that EDID data is copied to this destination.	Command: #CPEDID 1,1,0,0x1<CR> Feedback: ~nn@CPEDID 1,1,0x1<CR><LF> Description: Copy the EDID data from the Output HDMI1 (EDID source) to the Input1
GEDID	Get EDID support on certain input/output.	Command: #GEDID? io_mode,in_index<CR> Feedback: Multi-line response: ~nn@GEDID io_mode, in_index, size<CR><LF> EDID_data<CR><LF> ~nn@GEDID io_mode, in_index OK<CR><LF>	io_mode – Input/Output 0 – Input 1 – Output 2 – Default EDID 3 – Custom EDID in_index – Number that indicates the specific input: 1-N (N= the total number of inputs) size – Size of data to be sent from device, 0 means no EDID support	Command: #GEDID? 1,1<CR> Description: Get EDID support information for output 1.

Function	Description	Syntax	Parameters/Attributes	Example
LDEDID	Write EDID data from external application to device. When the unit receives the LDEDID command it replies with READY and enters the special EDID packet wait mode. In this mode the unit can receive only packets and not regular protocol commands. If the unit does not receive correct packets for 30 seconds or is interrupted for more than 30 seconds before receiving all packets, it sends timeout error ~nn@LDEDID err01<CR><LF> and returns to the regular protocol mode. If the unit received data that is not a correct packet, it sends the corresponding error and returns to the regular protocol mode.	Command: Step 1: #LDEDID dst_type,dest_bitmask,size,safe_mode<CR> Response 1: ~nn@LDEDID dst_type,dest_bitmask,size,safe_mode READY<CR><LF> or ~nn@LDEDID ERR<CR><LF> Step 2: If ready was received, send EDID_DATA Response 2: ~nn@LDEDID dst_type,dest_bitmask,size,safe_mode OK<CR><LF> or ~nn@LDEDID ERRnn<CR><LF>	dst_type – EDID destination type (usually input) 0 – Input 1 – Output 2 – Default EDID 3 – Custom EDID dest_bitmask – Bitmap representing destination IDs. Format: 0x*****, where * is ASCII presentation of hex digit. The binary presentation of this number is a bit mask for destinations. Setting '1' means EDID data has to be copied to this destination edid_size – EDID data size safe_mode – Safe mode 0 – Device accepts the EDID as is without trying to adjust 1 – Device tries to adjust the EDID edid_data – Data in protocol packets	Command: #LDEDID 0,0x1,256,0<CR> Description: Write the EDID data from an external application to the HDMI In 1 input without adjustment attempts
EDID-AUDIO IO	Set audio capabilities for EDID.	Command: #EDID-AUDIO input_id,audio_format<CR> Feedback: ~nn@EDID-AUDIO input_id,audio_format<CR><LF>	The following attributes comprise the signal ID: input_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 Audio_format – Audio block added to EDID: 0 – Auto 1 – LPCM 2CH	Command: #EDID-AUDIO 1,1<CR> Feedback: ~nn@EDID-AUDIO 1,1<CR><LF> Description: Set Input 1 audio capabilities for EDID (LPCM 2CH)

Function	Description	Syntax	Parameters/Attributes	Example
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 signal ID: input_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 Audio_format – Audio block added to EDID: 0 – Auto 1 – LPCM 2CH	Command: #EDID-AUDIO? 1<CR> Feedback: ~nn@EDID-AUDIO 1,1<CR><LF> Description: Get HDMI IN 1 audio capabilities for EDID
LOCK-EDID	Lock last read EDID.	Command: #LOCK-EDID input_id,lock_mode<CR> Feedback: ~nn@LOCK-EDID input_id,lock_mode<CR><LF>	The following attributes comprise the signal ID: input_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 lock_mode – On/Off 0 – Off unlocks EDID. 1 – On locks EDID.	Command: #LOCK-EDID 1,1<CR> Feedback: ~nn@LOCK-EDID 1,1<CR><LF> Description: Lock the last read EDID from the Input 1.
LOCK-EDID?	Get EDID lock state.	Command: #LOCK-EDID? input_id<CR> Feedback: ~nn@LOCK-EDID input_id,lock_mode<CR><LF>	The following attributes comprise the signal ID: input_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 lock_mode – On/Off 0 – Off unlocks EDID. 1 – On locks EDID.	Command: #LOCK-EDID? 1<CR> Feedback: ~nn@LOCK-EDID 1,1<CR><LF> Description: Get EDID lock state for Input 1.

Function	Description	Syntax	Parameters/Attributes	Example
HDCP-MOD	Set HDCP mode. Set HDCP working mode on the device input or output: HDCP supported - HDCP_ON [default]. HDCP not supported - HDCP OFF.	Command: #HDCP-MOD <direction_type>.<port_index>,<mode><CR> Feedback: ~nn@HDCP-MOD <direction_type>.<port_index>,<mode><CR><LF>	<direction_type> – Direction of the port: o IN – Input o OUT – Output <port_index> – The port number as printed on the front or rear panel For the input stage 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 9 – Wireless For the output stage 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 mode – HDCP mode: 0 – HDCP Off 1 – HDCP On 2 – Follow Input 3 – Follow Output	Command: #HDCP-MOD IN.1,0<CR> Feedback: ~nn@HDCP-MOD IN.1,0<CR><LF> Description: Set the input HDCP-MODE of IN 1 to Off.
HDCP-MOD?	Get HDCP mode.	Command: #HDCP-MOD? <direction_type>.<port_index><CR> Feedback: ~nn@HDCP-MOD <direction_type>.<port_index>,<mode><CR><LF>	<direction_type> – Direction of the port: o IN – Input o OUT – Output <port_index> – The port number as printed on the front or rear panel For the input stage 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 9 – Wireless For the output stage 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 mode – HDCP mode: 0 – HDCP Off 1 – HDCP On	Command: #HDCP-MOD? IN.1<CR> Feedback: ~nn@HDCP-MOD IN.1,0<CR><LF> Description: Get the input HDCP-MODE of IN 1.

Function	Description	Syntax	Parameters/Attributes	Example
			2 – Follow Input 3 – Follow Output	
HDCP-STAT?	Get HDCP signal status. Output stage (1) – get the HDCP signal status of the sink device connected to the specified output. Input stage (0) – get the HDCP signal status of the source device connected to the specified input.	Command: #HDCP-STAT? stage,stage_id<CR> Feedback: ~nn@HDCP-STAT stage,stage_id,status<CR><LF>	stage – Input/Output 0 – Input 1 – Output stage_id – Number of chosen stage For the input stage 1 – Input 1 2 – Input 2 3 – Input 2 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 9 – Wireless For the output stage 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 status – Signal encryption status - valid values On/Off 0 – No HDCP Off 1 – HDCP 1.4 2 – HDCP 2.2	Command: #HDCP-STAT? 0,1<CR> Feedback: ~nn@HDCP-STAT 0,1,2<CR><LF> Description: Get the HDCP-STATUS of IN 1.
AV-SW-MODE	Set input auto-switch mode for per output.	Command: #AV-SW-MODE layer_type,out_index,connection_mode<CR> Feedback: ~nn@AV SW MODE layer_type,out_index,connection_mode<CR><LF>	layer_type – Number that indicates the signal type: 1 – Video 2 – Audio 3 – Data 4 – IR 5 – USB out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) connection_mode – Connection mode 0 – manual 1 – priority switch 2 – last connected switch	Command: #AV-SW-MODE 1,2,0<CR> Feedback: ~nn@AV-SW-MODE 1,2,0<CR> Description: Set input auto switch mode for video 1 to manual.
AV-SW-MODE?	Get input auto-switch mode for per output.	Command: #AV-SW-MODE? layer_type,out_index<CR> > Feedback: ~nn@AV SW MODE layer_type, out_index, connection_mode<CR><LF>	layer_type – Number that indicates the signal type: 1 – Video 2 – Audio 3 – Data 4 – IR 5 – USB out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) connection_mode –	Command: #AV-SW-MODE? 1,2<CR> Feedback: ~nn@AV-SW-MODE 1,2,0<CR> Description: Get the input audio switch mode for Video Out 2:

Function	Description	Syntax	Parameters/Attributes	Example
			Connection mode 0 – manual 1 – priority switch 2 – last connected switch	
AV-SW-GROUP	Set auto switching input signals group per output.	Command: #AV-SW-GROUP group,[OUT.<port_index> ,OUT.<port_index>,...],[I N.<port_index>,IN.<port_index>,...]<CR> Feedback: ~nn@AV-SW-GROUP group,[OUT.<port_index> ,OUT.<port_index>,...],[I N.<port_index>,IN.<port_index>,...]<CR><LF>	group – group number 1 ~ 4 <port_index> – The port number as printed on the front or rear panel For IN. 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 9 – Wireless For OUT. 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8	Command: #AV-SW-GROUP 1,[OUT.1,OUT.3,OUT.5],[IN.1,I N.3,IN9]<CR> Feedback: ~nn@AV-SW-GROUP 1,[OUT.1,OUT.3,OUT.5],[IN.1,I N.3,IN9]<CR> Description: Set input 1, input 3, and input 5 as auto switching input signals group 1 per output that out 1,out 3, and out5.
AV-SW-GROUP?	Get auto switching input signals group per output.	Command: #AV-SW-GROUP group?<CR> Feedback: ~nn@AV-SW-GROUP group,[OUT.<port_index> ,OUT.<port_index>,...],[I N.<port_index>,IN.<port_index>,...]<CR><LF>	group – group number 1 ~ 4 <port_index> – The port number as printed on the front or rear panel For IN. 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 9 – Wireless For OUT. 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8	Command: #AV-SW-GROUP? 1<CR> Feedback: ~nn@AV-SW-GROUP 1,[OUT.1,OUT.3,OUT.5],[IN.1,I N.3,IN9]<CR> Description: Get auto switching input signals group 1.
PRIORITY	Set input priority.	Command: #PRIORITY layer_type,priority_1,priority_2...priority_11<CR> Feedback: ~nn@PRIORITY layer_type,priority_1,priority_2...priority_11<CR><LF>	layer_type – Number that indicates the signal type: 1 – Video priority – Priority of inputs (1-11) 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5	Command: #PRIORITY 1,2,3,1,4,5,6,7,8,9,10,11<CR> Feedback: ~nn@PRIORITY 1,2,3,1,4,5,6,7,8,9,10,11<CR> Description: Set the video input priority of

Function	Description	Syntax	Parameters/Attributes	Example
			6 – Input 6 7 – Input 7 8 – Input 8 9 – Wireless	input 2 as the highest priority.
PRIORITY ?	Get input priority.	Command: #PRIORITY? layer_type<CR> Feedback: ~nn@PRIORITY layer_type,priority_1,priority_2...priority_11<CR><LF>	layer_type – Number that indicates the signal type: 1 – Video priority – Priority of inputs (1-11) 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 9 – Wireless	Command: #PRIORITY? 1<CR> Feedback: ~nn@PRIORITY 1,2,3,1,4,5,6,7,8,9,10,11<CR> Description: Get video input priority.
AV-SW-GROUP-NUM	Set the number of available auto switching groups.	Command: #AV-SW-GROUP-NUM num<CR> Feedback: ~nn@AV-SW-GROUP-NUM num<CR><LF>	num – available group 1 ~ 4	Command: #AV-SW-GROUP-NUM 2<CR> Feedback: ~nn@AV-SW-GROUP-NUM 2<CR> Description: Set 2 available auto switching groups.
AV-SW-GROUP-NUM?	Get the number of available auto switching groups.	Command: #AV-SW-GROUP-NUM? <CR> Feedback: ~nn@AV-SW-GROUP-NUM num<CR><LF>	num – available group 1 ~ 4	Command: #AV-SW-GROUP-NUM?<CR> Feedback: ~nn@PRIORITY 1,2,3,1,4,5,6,7,8,9,10,11<CR> Description: Get available auto switching groups.
AV-LINK?	Get av link status of all av ports	Command: #AV-LINK?<CR> Feedback: ~nn@AV-LINK [[<direction_type1>. <port_type1>.<port_index1>,status1], [<direction_type2>. <port_type2>.<port_index2>,status2], . . .]<CR><LF>	<direction_type> – Direction of the port: o IN – Input o OUT – Output <port_type> o HDMI o HDBT <port_index> – The port number as printed on the front or rear panel For the input stage 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 9 – Wireless For the output stage 1 – Output 1 2 – Output 2	Command: #AV-LINK?<CR> Feedback: ~nn@AV-LINK [[IN.HDMI.1,0],[IN.HDMI.2,0],[IN.HDBT.3,0],[IN.HDBT.4,0],[IN.HDMI.5,0],[IN.HDMI.6,0],[IN.HDMI.7,0],[IN.HDMI.8,0],[IN.HDMI.9,0],[OUT.HDMI.1,0],[OUT.HDMI.2,0],[OUT.HDMI.3,0],[OUT.HDMI.4,0],[OUT.HDMI.5,0],[OUT.HDMI.6,0],[OUT.HDMI.7,0],[OUT.HDMI.8,0],[OUT.HDMI.9,0]] Description: Get av link status of all av ports.

Function	Description	Syntax	Parameters/Attributes	Example
			3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 status – 0 – Disable(Disconnect) 1 – Inactive 2 – Active	
USBC-LANE-CFG	Set USB-C Lane Modes.	Command: #USBC-LANE-CFG port_id ,mode<CR> Feedback: ~nn@USBC-LANE-CFG port_id ,mode<CR><LF>	port_id – USB-C port Id for multi-port devices support (1...N) 1 – USB-C IN1 2 – USB-C IN2 mode –USB-C working mode: 1 – 2 Video (DP) Lanes + USB 3.x 2 – 4 Video (DP) Lanes + USB 2.0	Command: #USBC-LANE-CFG 2,2<CR> Feedback: ~nn@USBC-LANE-CFG 2,2<CR><LF> Description: Set USB-C IN 2 working on 4 Video (DP) Lanes + USB 2.0.
USBC-LANE-CFG?	Get USB-C Lane Modes	Command: #USBC-LANE-CFG? port_id<CR> Feedback: ~nn@USBC-LANE-CFG port_id ,mode<CR><LF>	port_id – USB-C port Id for multi-port devices support (1...N) 1 – USB-C IN1 2 – USB-C IN2 mode –USB-C working mode: 1 – 2 Video (DP) Lanes + USB 3.x 2 – 4 Video (DP) Lanes + USB 2.0	Command: #USBC-LANE-CFG? 2<CR> Feedback: ~nn@USBC-LANE-CFG 2,2<CR><LF> Description: Get USB-C IN 2 working mode.
GPIO & RELAY				
GPIO-CFG?	Get HW GPIO configuration.	Command: #GPIO-CFG? HwGpioNum<CR> Feedback: ~nn@GPIO-CFG HwGpioNum,HwGpioType,HwGpioDir,Pullup<CR><LF>	HwGpioNum – Hardware GPIO number (1 to 4) HwGpioType – Hardware GPIO type 0 – analog 1 – digital HwGpioDir – Hardware GPIO direction 0 – input 1 – output Pullup – Enable/Disable pull-up 0 – disable 1 – enable	Command: #GPIO-CFG? 1<CR> Feedback: ~nn@GPIO-CFG 1,1,1,1<CR><LF> Description: Get HW GPIO configuration.
GPIO-STATE	Set HW GPIO state. GPIO-STATE? can only be set in digital out mode and the answer is 0=Low, 1=High. In all other modes an error	Command: #GPIO-STATEV gpio_id,gpio_mode<CR> Feedback: ~nn@GPIO-STATEV gpio_id,gpio_mode<CR><LF>	gpio_id – Hardware GPIO number (1 to 4) gpio_mode – Hardware GPIO state 0 – Low 1 – High	Command: #GPIO-STATE 2,1<CR> Feedback: ~nn@GPIO-STATE 2,1<CR><LF> Description: Set GPIO 2 to High.

Function	Description	Syntax	Parameters/Attributes	Example
	message is sent. The device uses this command to notify the user of any change regarding the step and voltage in: In digital mode the answer is 0 (low), 1 (high). In analog mode the answer is 0 to 100.			
GPIO-STATE?	Get HW GPIO state. GPIO-STATE? can only be set in digital out mode and the answer is 0=Low, 1=High. In all other modes an error message is sent. The device uses this command to notify the user of any change regarding the step and voltage in: In digital mode the answer is 0 (low), 1 (high). In analog mode the answer is 0 to 100.	Command: #GPIO-CFG? HwGpioNum<CR> Feedback: ~nn@GPIO-CFG HwGpioNum,HwGpioType,HwGpioDir,Pullup<CR><LF>	gpio_id – Hardware GPIO number (1 to 4) gpio_mode – Hardware GPIO state 0 – Low 1 – High	Command: #GPIO-STATE? 2<CR> Feedback: ~nn@GPIO-STATE 2,1<CR><LF> Description: Get GPIO 2 state.
GPIO-STEP	Set HW GPIO step. In digital mode the response is 2. In analog mode the response is 1 to 100. In other modes an error is returned.	Command: #GPIO-STEP gpio_id,step_id<CR> Feedback: ~nn@GPIO-STEP gpio_id,step_id,currentstep<CR><LF>	HwGpioNum – Hardware GPIO number (1 to 4) step_id – The configuration step – See note in description. currentstep – The actual step depending on the measured voltage	Command: #GPIO-STEP 2,38<CR> Feedback: ~nn@GPIO-STEP 2,38,0.8<CR><LF> Description: Set GPIO 2 (set to Analog In) configuration step to 38mV.

Function	Description	Syntax	Parameters/Attributes	Example
GPIO-STEP?	Get HW GPIO step. In digital mode the response is 2. In analog mode the response is 1 to 100. In other modes an error is returned.	Command: #GPIO-STEP? gpio_id<CR> Feedback: ~nn@GPIO-STEP gpio_id,step_id,currentstep<CR><LF>	HwGpioNum – Hardware GPIO number (1 to 4) step_id – The configuration step – See note in description. currentstep – The actual step depending on the measured voltage	Command: #GPIO-STEP? 2<CR> Feedback: ~nn@GPIO-STEP 2,38,0.8<CR><LF> Description: Get GPIO 2 configuration step.
GPIO-THR	Set HW GPIO voltage levels.	Command: #GPIO-THR gpio_id,low_level,high_level<CR> Feedback: ~nn@GPIO-THR gpio_id,low_level,high_level<CR><LF>	gpio_id – Hardware GPIO number (1 to 4) low_level – Voltage 500 to 28000 millivolts high_level – Voltage 2000 to 30000 millivolts	Command: GPIO-THR 2,800,2200<CR> Feedback: ~nn@GPIO-THR 2,800,2200<CR><LF> Description: Set GPIO 2 to a low level of 800mV and a high level of 2200mV.
GPIO-THR?	Get HW GPIO voltage levels that were set.	Command: #GPIO-THR? gpio_id<CR> Feedback: ~nn@GPIO-THR gpio_id,low_level,high_level<CR><LF>	gpio_id – Hardware GPIO number (1 to 4) low_level – Voltage 500 to 28000 millivolts high_level – Voltage 2000 to 30000 millivolts	Command: #GPIO-THR? 2<CR> Feedback: ~nn@GPIO-THR 2,800,2200<CR><LF> Description: Get GPIO 2 voltage levels that were set.
GPIO-VOLT?	Get active voltage levels of HW GPIO. This command is not available in digital out mode.	Command: #GPIO-VOLT? gpio_id<CR> Feedback: ~nn@GPIO-VOLT gpio_id,voltage<CR><LF>	gpio_id – Hardware GPIO number (1 to 4) voltage – Voltage 0 to 30000 millivolts	Command: #GPIO-VOLT? 2<CR> Feedback: ~nn@GPIO-VOLT 2,2200<CR><LF> Description: Get active voltage levels of GPIO 2.
RELAY-STATE	Set relay state.	Command: #RELAY-STATE relay_id,state<CR> Feedback: ~nn@RELAY-STATE relay_id,state<CR><LF>	relay_id – Relay number (1-4) state – Relay state 0 – (open) 1 – (close)	Command: #RELAY-STATE 2,1<CR> Feedback: ~nn@RELAY-STATE 2,1<CR><LF> Description: Set relay 2 to closed.
RELAY-STATE?	Get relay state.	Command: #RELAY-STATE? relay_id<CR> Feedback: ~nn@RELAY-STATE relay_id,state<CR><LF>	relay_id – Relay number (1-4) state – Relay state 0 – (open) 1 – (close)	Command: #RELAY-STATE 2,1<CR> Feedback: ~nn@RELAY-STATE 2,1<CR><LF>

Function	Description	Syntax	Parameters/Attributes	Example
				Description: Get relay state.
GLOBAL-GW-ACTIVE	Set global activation state of the gateway device.	Command: #GLOBAL-GW-ACTIVE port_format,state<CR> Feedback: ~nn@GLOBAL-GW-ACTIVE port_format,state<CR><LF>	port_format – Type of signal on the port: o DATA o IR o CEC state – Global gateway activation state: OFF – gateway is deactivated ON – gateway is activated	Command: #GLOBAL-GW-ACTIVE data,on<CR> Feedback: ~nn@GLOBAL-GW-ACTIVE data,on<CR><LF> Description: Set the global state of the RS-232 gateway to active.
GLOBAL-GW-ACTIVE?	Get global gateway activation state.	Command: #GLOBAL-GW-ACTIVE? port_format<CR> Feedback: ~nn@GLOBAL-GW-ACTIVE port_format,state<CR><LF>	port_format – Type of signal on the port: o DATA o IR o CEC state – Global gateway activation state: OFF – gateway is deactivated ON – gateway is activated	Command: #GLOBAL-GW-ACTIVE? data<CR> Feedback: ~nn@GLOBAL-GW-ACTIVE data on<CR><LF> Description: Get the global state of the RS-232 gateway.
X-GW-PORT-ACTIVE	Set the gateway activation state per port.	Command: #X-GW-PORT-ACTIVE <direction_type>.<port_format>.<port_index>,state <CR> Feedback: ~nn@X-GW-PORT-ACTIVE <direction_type>.<port_format>.<port_index>,state <CR><LF>	The following attributes comprise the port ID: <direction_type> – Direction of the port: o IN o OUT o BOTH (For RS-232/IR) <port_format> – Type of signal on the port: o DATA o IR o CEC <port_index> – The port number as printed on the front or rear panel DATA (That is RS-232): 1 – HDBT 1 RS-232 Port (channel 1) 2 – HDBT 2 RS-232 Port (channel 1) 8 – HDBT 8 RS-232 Port (channel 1) 9 – Local RS-232 Port1 10 – Local RS-232 Port2 11 – Local RS-232 Port3 12 – Local RS-232 Port4 IR: 1 – HDBT 1 IR Port 2 – HDBT 2 IR Port 8 – HDBT 8 IR Port 9 – Local IR OUT Port1 10 – Local IR OUT Port2 11 – Local IR OUT Port3 12 – Local IR OUT Port4 CEC:	Command: #X-GW-PORT-ACTIVE both.ir.2,on<CR> Feedback: ~nn@X-GW-PORT-ACTIVE both.ir.2,on<CR><LF> Description: Set the gateway activation state to active for HDBT 2 IR Port.

Function	Description	Syntax	Parameters/Attributes	Example
			1 – IN1/OUT1 ... 8 – IN8/OUT8 state – Global gateway activation state: OFF – disabled ON – enabled	
X-GW-PORT-ACTIVE?	Get the gateway activation state per port.	Command: #X-GW-PORT-ACTIVE? <direction_type>.<port_format>.<port_index><CR> Feedback: ~nn@X-GW-PORT-ACTIVE <direction_type>.<port_format>.<port_index>,&br/> state<CR><LF>	The following attributes comprise the port ID: <direction_type> – Direction of the port: o IN o OUT o BOTH (For RS-232/IR) <port_format> – Type of signal on the port: o DATA o IR o CEC <port_index> – The port number as printed on the front or rear panel DATA (That is RS-232: 1 – HDBT 1 RS-232 Port 2 – HDBT 2 RS-232 Port 8 – HDBT 8 RS-232 Port 9 – Local RS-232 Port1 10 – Local RS-232 Port2 11 – Local RS-232 Port3 12 – Local RS-232 Port4 21 – HDBT 1 RS-232 Port (channel 2) 22 – HDBT 2 RS-232 Port (channel 2) 28 – HDBT 8 RS-232 Port(channel 2) IR: 1 – HDBT 1 IR OUT Port 2 – HDBT 2 IR OUT Port 8 – HDBT 8 IR OUT Port 9 – Local IR OUT Port1 10 – Local IR OUT Port2 11 – Local IR OUT Port3 12 – Local IR OUT Port4 CEC: 1 – IN1/OUT1 ... 8 – IN8/OUT8 state – Global gateway activation state: OFF – disabled ON – enabled	Command: #X-GW-PORT-ACTIVE? both.ir.2<CR> Feedback: ~nn@X-GW-PORT-ACTIVE both.ir.2,on<CR><LF> Description: Get the gateway activation state for IR input #2 on the gateway
UART-CH	Set uart channel selection for HDBT port	Command: #UART-CH port_id,ch_id<CR>	port_id – Number that indicates the specific HDBT port: 1 – HDBT 1 RS-232 Port 2 – HDBT 2 RS-232 Port	Command: #UART-CH 1,1<CR> Feedback: ~nn@UART-CH

Function	Description	Syntax	Parameters/Attributes	Example
		Feedback: ~nn@UART-CH port_id,ch_id<CR><LF>	 8 – HDBT 8 RS-232 Port ch_id – 1/2	1,1<CR><LF> Description: Set channel 1 for HDBT port uart.
UART-CH?	Get uart channel selection for HDBT port	Command: #UART-CH? port_id<CR> Feedback: ~nn@UART-CH port_id,ch_id<CR><LF>	port_id – Number that indicates the specific HDBT port: 1 – HDBT 1 RS-232 Port 2 – HDBT 2 RS-232 Port 8 – HDBT 8 RS-232 Port ch_id – 1/2	Command: #UART-CH? 1<CR> Feedback: ~nn@UART-CH 1,1<CR><LF> Description: Set channel 1 for HDBT port uart.
COM-ROUTE	Set tunneling port routing. <i>This command sets tunneling port routing. Every com port can send or receive data from the ETH port.</i> Set command can edit an existing configuration.	Command: #COM-ROUTE com_id,port_type,port_id,eth_rep_en,timeout<CR> Feedback: ~nn@COM-ROUTE com_id,port_type,port_id,eth_rep_en,timeout<CR><LF>	com_id – Number that indicates the specific aurt port: 1 – HDBT 1 RS-232 Port 2 – HDBT 2 RS-232 Port 8 – HDBT 8 RS-232 Port 9 – Local RS-232 Port1 10 – Local RS-232 Port2 11 – Local RS-232 Port3 12 – Local RS-232 Port4 port_type – TCP/UDP 0 – TCP 1 – UDP port_id – TCP/UDP port number eth_rep_en – Ethernet Reply 0 – COM port does not send replies to new clients 1 – COM port sends replies to new clients. timeout – Keep alive timeout in seconds (1 to 3600)	Command: #COM-ROUTE 1,0,5001,1,1<CR> Feedback: ~nn@COM-ROUTE 1,0,5001,1,1<CR><LF> Description: Set tunneling for TCP port 5001; where the COM port sends replies to new clients and the keep alive time is 1.
COM-ROUTE?	Get tunneling port routing. <i>This command sets tunneling port routing. Every com port can send or receive data from the ETH port.</i> Set command can edit an existing configuration.	Command: #COM-ROUTE? com_id<CR><CR> Feedback: ~nn@COM-ROUTE com_id,port_type,port_id,eth_rep_en,timeout<CR><LF>	com_id – Number that indicates the specific aurt port: 1 – HDBT 1 RS-232 Port 2 – HDBT 2 RS-232 Port 8 – HDBT 8 RS-232 Port 9 – Local RS-232 Port1 10 – Local RS-232 Port2 11 – Local RS-232 Port3 12 – Local RS-232 Port4 port_type – TCP/UDP 0 – TCP 1 – UDP port_id – TCP/UDP port number eth_rep_en – Ethernet Reply 0 – COM port does not send replies to new clients	Command: #COM-ROUTE? 1<CR> Feedback: ~nn@COM-ROUTE 1,0,5001,1,1<CR><LF>

Function	Description	Syntax	Parameters/Attributes	Example
			1 – COM port sends replies to new clients. timeout – Keep alive timeout in seconds (1 to 3600)	
UART	Set com port configuration.	Command: #UART com_id,baud_rate,data_bits,parity,stop_bits_mode<CR> Feedback: ~nn@UART com_id,baud_rate,data_bits,parity,stop_bits_mode<CR><LF>	com_id – Number that indicates the specific aurt port: 1 – HDBT 1 RS-232 Port 2 – HDBT 2 RS-232 Port 8 – HDBT 8 RS-232 Port 9 – Local RS-232 Port1 10 – Local RS-232 Port2 11 – Local RS-232 Port3 12 – Local RS-232 Port4 baud_rate – 115200 / 57600 / 38400 / 19200 / 14400 / 9600 / 4800 / 2400 / 1200 data_bits – 5-8 parity – Parity Type 0 – None 1 – Odd 2 – Even stop_bits_mode – 12	Command: #UART 12,9600,8,0,1<CR> or: #UART 12,9600,8,0,1,0,0<CR> Feedback: ~nn@UART 12,9600,8,0,1<CR><LF> Description: Set baud rate to 9600, data bits to 8, parity to none and stop bit to 1 for Local RS-232 Port4.
UART?	Get com port configuration.	Command: #UART? com_id<CR> Feedback: ~nn@UART com_id,baud_rate,data_bits,parity,stop_bits_mode<CR><LF>	com_id – Number that indicates the specific aurt port: 1 – HDBT 1 RS-232 Port 2 – HDBT 2 RS-232 Port 8 – HDBT 8 RS-232 Port 9 – Local RS-232 Port1 10 – Local RS-232 Port2 11 – Local RS-232 Port3 12 – Local RS-232 Port4 baud_rate – 115200 / 57600 / 38400 / 19200 / 14400 / 9600 / 4800 / 2400 / 1200 data_bits – 5-8 parity – Parity Type 0 – None 1 – Odd 2 – Even stop_bits_mode – 12	Command: #UART? 12<CR> Feedback: ~nn@UART 12,9600,8,0,1<CR><LF> Description: Get com port configuration for Local RS-232 Port4.
UART-SND	Send UART command to port.	Command: #UART-SND uart_index,sn_id,cmd_name,cmd_format,total_packages,package_id,<uart command...><CR> Feedback: ~nn@UART-SND uart_index,sn_id,cmd_name,uart_status<CR><LF>	uart_index – Number that indicates the specific uart port: 1 – HDBT 1 RS-232 Port 2 – HDBT 2 RS-232 Port 8 – HDBT 8 RS-232 Port 9 – Local RS-232 Port1 10 – Local RS-232 Port2 11 – Local RS-232 Port3 12 – Local RS-232 Port4 sn_id – Serial number of command,numeric string of up to 9 digits for flow control	Command: #UART-SND 1,1,poweron,1,1,1,1<CR> Feedback: ~nn@UART-SND 1,1,1,1,0<CR><LF> Description: Send IR command to IR Port 1.

Function	Description	Syntax	Parameters/Attributes	Example
			and response commands from device cmd_name – Command name (length limit 15 chars) cmd_format – the format of uart command is transmitted 0 – Hex 1 – String total_packages – Number of messages the original command was divided into, default = 1 package_id – Chunk serial number (only valid when Total_packages >1) uart command – Pronto format command (in HEX format, no leading zeros, no '0x' prefix) uart_status – uart Status 0 – Sent (no error) 1 – Stop 2 – Done 3 – Busy 4 – Wrong Parameter 5 – Nothing to Stop 6 – Start 7 – Timeout 8 – Error	
CEC-SND	Send CEC command to port.	Command: #CEC-SND port_mode,port_index,sn_id,cmd_name,cec_len,cec_command<CR> Feedback: ~nn@CEC-SND port_mode,port_index,sn_id, cmd_name,cec_mode<CR><LF>	port_mode – Input/Output 0 – Input 1 – HDMI Output 2 – HDBT Output port_index – CEC port transmitting the command (1 – number of ports) 1 – IN1/OUT1 .. 8 – IN8/ OUT8 sn_id – serial number of command,numeric string of up to 9 digits for flow control and response commands from device cmd_name – command name(free text) cec_len – 1–16 cec_command – CEC format command (in HEX format, no leading zeros, no '0x' prefix) cec_mode – CEC mode 0 – Sent 1 – Gateway disabled 2 – Inactive CEC-Master	Command: #CEC-SND 1,1,1,POWER ON,2,4004<CR> Feedback: ~nn@CEC-SND 1,1,1,POWER ON,2,0<CR><LF> Description: Send CEC command "Power on" to hdmi output 1 port.

[illegible]

Function	Description	Syntax	Parameters/Attributes	Example
IR-STOP	Send IR stop command to port.	Command: #IR-STOP ir_index,sn_id,cmd_name <CR> Feedback: ~nn@IR-STOP ir_index,sn_id,cmd_name ,ir_status<CR><LF>	ir_index – Number that indicates the specific ir port: 1 – HDBT 1 IR OUT Port 2 – HDBT 2 IR OUT Port 8 – HDBT 8 IR OUT Port 9 – Local IR OUT Port1 10 – Local IR OUT Port2 11 – Local IR OUT Port3 12 – Local IR OUT Port4 sn_id – Serial number of command for flow control and response commands from device cmd_name – Command name (length limit 15 chars) ir_status – IR Status 0 – Sent (no error) 1 – Stop 2 – Done 3 – Busy 4 – Wrong Parameter 5 – Nothing to Stop 6 – Start 7 – Timeout 8 – Error	Command: #IR-STOP 2,25,powertog<CR> Feedback: ~nn@IR-STOP 2,25,powertog,0<CR><LF> Description: Send IR stop command to IR Port 2,for PowerTog command with ID of 25.
IR-MODULATION	Set IR modulation for IR out port.	Command: #IR-MODULATION ir_index,state<CR> Feedback: ~nn@IR-MODULATION ir_index,state<CR><LF>	ir_index – Number that indicates the specific ir port: 1 – HDBT 1 IR OUT Port 2 – HDBT 2 IR OUT Port 8 – HDBT 8 IR OUT Port 9 – Local IR OUT Port1 10 – Local IR OUT Port2 11 – Local IR OUT Port3 12 – Local IR OUT Port4 state – ir modulation state: OFF ON	Command: #IR-MODULATION 2,ON<CR> Feedback: ~nn@IR-MODULATION 2,ON<CR><LF> Description: Set IR modulation to on for HDBT 2 IR Port.
IR-MODULATION?	Get IR modulation status	Command: #IR-MODULATION? ir_index<CR> Feedback: ~nn@IR-MODULATION ir_index,state<CR><LF>	ir_index – Number that indicates the specific ir port: 1 – HDBT 1 IR OUT Port 2 – HDBT 2 IR OUT Port 8 – HDBT 8 IR OUT Port 9 – Local IR OUT Port1 10 – Local IR OUT Port2 11 – Local IR OUT Port3 12 – Local IR OUT Port4 state – ir modulation state: OFF ON	Command: #IR-MODULATION? 2<CR> Feedback: ~nn@IR-MODULATION 2,ON<CR><LF> Description: Get IR modulation state for HDBT 2 IR Port.

Function	Description	Syntax	Parameters/Attributes	Example
HDBT-US B-CFG	Set HDBT USB Host/Device configuration.	Command: #HDBT-USB-CFG port_index, mode<CR> Feedback: ~nn@HDBT-USB-CFG port_index,mode<CR><LF>	port_index – The port number as printed on the front or rear panel 1 – HDBT 1 USB Port 2 – HDBT 2 USB Port 8 – HDBT 8 USB Port mode – USB hose or device: 0 – HOST 1 – Device	Command: #HDBT-USB-CFG 2,0<CR> Feedback: ~nn@HDBT-USB-CFG 2,0<CR><LF> Description: Set HDBT 2 as USB Host.
HDBT-US B-CFG?	Get HDBT USB Host/Device configuration.	Command: #HDBT-USB-CFG? port_index<CR> Feedback: ~nn@HDBT-USB-CFG port_index, mode<CR><LF>	port_index – The port number as printed on the front or rear panel 1 – HDBT 1 USB Port 2 – HDBT 2 USB Port 8 – HDBT 8 USB Port mode – USB hose or device: 0 – HOST 1 – Device	Command: #HDBT-USB-CFG? 2<CR> Feedback: ~nn@HDBT-USB-CFG 2,0<CR><LF> Description: Get HDBT 2 USB state.
USB_H-DUAL-ACTIVE	Set the dual USB Host activation state. (for USB routing, it supports single active host and dual active host modes. When dual host mode is active, it shows two hosts for routing in the diagram. USB host1 is from USB-C 1, HDBT 1,3,5,7, those singular ports.) For HDBT ports, when it is configured as host, it appears in the host list, otherwise it appears in the device list. For each active USB host, it only can select one host at same time. For instance, USB active host1 now selects USB-C 1 as host, then after click on INPUT 1 host, the USB-C 1 row will all be	Command: #USB_H-DUAL-ACTIVE state<CR> Feedback: ~nn@USB_H-DUAL-ACTIVE state<CR><LF>	state – dual USB Host state: 0 – disabled 1 – enabled	Command: #USB_H-DUAL-ACTIVE 1<CR> Feedback: ~nn@USB_H-DUAL-ACTIVE 1<CR><LF> Description: Set the dual USB Host activation enabled.

Function	Description	Syntax	Parameters/Attributes	Example
	disabled, and the INPUT 1 row will be enabled. 5, USB active host2 is similar to above 4.			
USB_H-DUAL-ACTIVE?	Get the dual USB Host activation state.	Command: #USB_H-DUAL-ACTIVE? <CR> Feedback: ~nn@USB_H-DUAL-ACTIVE state<CR><LF>	state – dual USB Host state: 0 – disabled 1 – enabled	Command: #USB_H-DUAL-ACTIVE? 2<CR> Feedback: ~nn@USB_H-DUAL-ACTIVE 2,1<CR><LF> Description: Get the dual USB Host activation.
USB_H-SELECT	Set USB Host port selection	Command: #USB_H-SELECT usbh_id,port_index<CR> Feedback: ~nn@USB_H-SELECT usbh_id,port_index<CR> <LF>	usbh_id – USB host id: 1 – USB host 1 2 – USB host 2 port_index – USB port id: 1 – HDBT 1 USB 2 – HDBT 2 USB 3 – HDBT 3 USB 4 – HDBT 4 USB 5 – HDBT 5 USB 6 – HDBT 6 USB 7 – HDBT 7 USB 8 – HDBT 8 USB 9 – USB_C 1 USB 10 – USB_C 2 USB	Command: #USB_H-SELECT 1,9<CR> Feedback: ~nn@USB_H-SELECT 1,9<CR><LF> Description: Set the USB Host1 select USB_C 1 port to connect to all usb device port.
USB_H-SELECT?	Get USB Host port selection	Command: #USB_H-SELECT? usbh_id<CR> Feedback: ~nn@USB_H-SELECT usbh_id,port_index<CR> <LF>	usbh_id – USB host id: 1 – USB host 1 2 – USB host 2 port_index – USB port id: 1 – HDBT 1 USB 2 – HDBT 2 USB 3 – HDBT 3 USB 4 – HDBT 4 USB 5 – HDBT 5 USB 6 – HDBT 6 USB 7 – HDBT 7 USB 8 – HDBT 8 USB 9 – USB_C 1 USB 10 – USB_C 2 USB	Command: #USB_H-SELECT? 1<CR> Feedback: ~nn@USB_H-SELECT 1,9<CR><LF> Description: Get the USB Host1 selection.

Function	Description	Syntax	Parameters/Attributes	Example
USB_DEVICE-ACTIVE	Set the USB Device activation state when USB host disconnects.	Command: #USB_DEVICE-ACTIVE usb_id,state<CR> Feedback: ~nn@USB_DEVICE-ACTIVE usb_id,state<CR><LF>	usb_id – USB device id: 1 – Remote HDBT 1 USB Device 2 – Remote HDBT 2 USB Device 3 – Remote HDBT 3 USB Device 4 – Remote HDBT 4 USB Device 5 – Remote HDBT 5 USB Device 6 – Remote HDBT 6 USB Device 7 – Remote HDBT 7 USB Device 8 – Remote HDBT 8 USB Device 9 – Local USB Device1-1 (Group 1 USB 1) 10– Local USB Device1-2 (Group 1 USB 2) 11 – Local USB Device1-3 (Group 1 USB 3) 12 – Local USB Device2-1 (Group 2 USB 1) 13 – Local USB Device2-2 (Group 2 USB 2) 14 – Local USB Device2-3 (Group 2 USB 3) state – USB Device activation state when USB host disconnects: 0 – disconnected 1 – active	Command: #USB_DEVICE-ACTIVE 9,0<CR> Feedback: ~nn@USB_DEVICE-ACTIVE 9,0<CR><LF> Description: Set the Local USB Device1-1 disconnected when USB host disconnects.
USB_DEVICE-ACTIVE?	Get the USB Device activation state when USB host disconnects.	Command: #USB_DEVICE-ACTIVE? usb_id<CR> Feedback: ~nn@USB_DEVICE-ACTIVE usb_id,state<CR><LF>	usb_id – USB device id: 1 – Remote HDBT 1 USB Device 2 – Remote HDBT 2 USB Device 3 – Remote HDBT 3 USB Device 4 – Remote HDBT 4 USB Device 5 – Remote HDBT 5 USB Device 6 – Remote HDBT 6 USB Device 7 – Remote HDBT 7 USB Device 8 – Remote HDBT 8 USB Device 9 – Local USB Device1-1 (Group 1 USB 1) 10– Local USB Device1-2 (Group 1 USB 2) 11 – Local USB Device1-3 (Group 1 USB 3) 12 – Local USB Device2-1 (Group 2 USB 1) 13 – Local USB Device2-2 (Group 2 USB 2) 14 – Local USB Device2-3 (Group 2 USB 3) state – USB Device activation state when USB	Command: #USB_DEVICE-ACTIVE? 9<CR> Feedback: ~nn@USB_DEVICE-ACTIVE 9,0<CR><LF> Description: Get the Local USB Device1-1 activation state when USB host disconnects.

Function	Description	Syntax	Parameters/Attributes	Example
			host disconnects: 0 – disconnected 1 – active	
HDBT-US B-EN	Set HDBT USB feature on/off.	Command: #HDBT-USB-EN port_index, state<CR> Feedback: ~nn@HDBT-USB-EN port_index,state<CR><LF> F>	port_index – The port number as printed on the front or rear panel 1 – HDBT 1 USB Port 2 – HDBT 2 USB Port 8 – HDBT 8 USB Port state – 0 – OFF 1 – ON	Command: #HDBT-USB-EN 2,0<CR> Feedback: ~nn@HDBT-USB-EN 2,0<CR><LF> Description: Set HDBT 2 USB feature off.
HDBT-US B-EN?	Get HDBT USB feature on/off.	Command: #HDBT-USB-EN? port_index<CR> Feedback: ~nn@HDBT-USB-EN port_index,state<CR><LF> F>	port_index – The port number as printed on the front or rear panel 1 – HDBT 1 USB Port 2 – HDBT 2 USB Port 8 – HDBT 8 USB Port state – 0 – OFF 1 – ON	Command: #HDBT-USB-EN? 2<CR> Feedback: ~nn@HDBT-USB-EN 2,1<CR><LF> Description: Get HDBT 2 USB feature state.
HDBT-ETH -EN	Set HDBT ethernet feature on/off.	Command: #HDBT-ETH-EN port_index, state<CR> Feedback: ~nn@HDBT-ETH-EN port_index,state<CR><LF> F>	port_index – The port number as printed on the front or rear panel 1 – HDBT 1 USB Port 2 – HDBT 2 USB Port 8 – HDBT 8 USB Port state – 0 – OFF 1 – ON	Command: #HDBT-ETH-EN 2,0<CR> Feedback: ~nn@HDBT-ETH-EN 2,0<CR><LF> Description: Set HDBT 2 ethernet feature off.
HDBT-ETH -EN?	Get HDBT ethernet feature on/off.	Command: #HDBT-ETH-EN? port_index<CR> Feedback: ~nn@HDBT-ETH-EN port_index,state<CR><LF> F>	port_index – The port number as printed on the front or rear panel 1 – HDBT 1 USB Port 2 – HDBT 2 USB Port 8 – HDBT 8 USB Port state – 0 – OFF 1 – ON	Command: #HDBT-ETH-EN? 2<CR> Feedback: ~nn@HDBT-ETH-EN 2,1<CR><LF> Description: Get HDBT 2 ethernet ethernet state.
HDBT-LO NG-REAC H	Set long reach mode for HDBT.	Command: #HDBT-LONG-REACH port_index, state<CR> Feedback: ~nn@HDBT-LONG-REA CH port_index,state<CR><LF> F>	port_index – The port number as printed on the front or rear panel 1 – HDBT 1 USB Port 2 – HDBT 2 USB Port 8 – HDBT 8 USB Port state – 0 – OFF 1 – ON	Command: #HDBT-LONG-REACH 2,1<CR> Feedback: ~nn@HDBT-LONG-REACH 2,1<CR><LF> Description: Set long reach for HDBT 2.
HDBT-LO NG-REAC H?	Get long reach mode for HDBT.	Command: #HDBT-LONG-REACH? port_index<CR> Feedback: ~nn@HDBT-LONG-REA CH	port_index – The port number as printed on the front or rear panel 1 – HDBT 1 USB Port 2 – HDBT 2 USB Port 8 – HDBT 8 USB Port	Command: #HDBT-LONG-REACH? 2<CR> Feedback: ~nn@HDBT-LONG-REACH 2,1<CR><LF>

Function	Description	Syntax	Parameters/Attributes	Example
		port_index,state<CR><LF>	state – 0 – OFF 1 – ON	Description: Get HDBT 2 lone reach state.
HDBT-TRX-CFG	Set HDBT transmitter and receiver configuration.	Command: #HDBT-TRX-CFG rx_num:tx_num<CR> Feedback: ~nn@HDBT-TRX-CFG rx_num:tx_num<CR><LF>	rn_num – The number of receivers/inputs 0 ~ 8 tx_num – The number of transmitters/outputs 0 ~ 8 0:8 – 0 Input & 8 Outputs 1:7 – 1 Input & 7 Outputs 2:6 – 2 Input & 6 Outputs 3:5 – 3 Input & 5 Outputs 4:4 – 4 Input & 4 Outputs 5:3 – 5 Input & 3 Outputs 6:2 – 6 Input & 2 Outputs 7:1 – 7 Input & 1 Outputs 8:0 – 8 Input & 0 Outputs	Command: #HDBT-TRX-CFG 4:4<CR> Feedback: ~nn@HDBT-TRX-CFG 4:4<CR><LF> Description: Set 4 Transmitter and 4 receiver configuration.
HDBT-TRX-CFG?	Get HDBT transmitter and receiver configuration.	Command: #HDBT-TRX-CFG?<CR> Feedback: ~nn@HDBT-TRX-CFG rx_num:tx_num<CR><LF>	rn_num – The number of receivers/inputs 0 ~ 8 tx_num – The number of transmitters/outputs 0 ~ 8 0:8 – 0 Input & 8 Outputs 1:7 – 1 Input & 7 Outputs 2:6 – 2 Input & 6 Outputs 3:5 – 3 Input & 5 Outputs 4:4 – 4 Input & 4 Outputs 5:3 – 5 Input & 3 Outputs 6:2 – 6 Input & 2 Outputs 7:1 – 7 Input & 1 Outputs 8:0 – 8 Input & 0 Outputs	Command: #HDBT-TRX-CFG?<CR> Feedback: ~nn@HDBT-TRX-CFG 4:4<CR><LF> Description: Get HDBT transmitter and receiver configuration.
Video Setting Commands				
VID-SW-EFFECT	Set switching effect for video matrix.	Command: #VID-SW-EFFECT mode<CR> Feedback: ~nn@VID-SW-EFFECT mode<CR><LF>	mode – Video transition effect when swithcing 0 – freeze (default) 1 – black	Command: #VID-SW-EFFECT 1<CR> Feedback: ~nn@VID-SW-EFFECT 1<CR><LF> Description: Set balck switching effect for video matrix.
VID-SW-EFFECT?	Get switching effect for video matrix.	Command: #VID-SW-EFFECT?<CR> Feedback: ~nn@VID-SW-EFFECT mode<CR><LF>	mode – Video transition effect when swithcing 0 – freeze (default) 1 – black	Command: #VID-SW-EFFECT?<CR> Feedback: ~nn@VID-SW-EFFECT 1<CR><LF> Description: Get switching effect for video matrix.
SDR-CONVERT	Set the “force SDR Dynamic Range” convert mode.	Command: #SDR-CONVERT out_index,mode<CR> Feedback: ~nn@#SDR-CONVERT out_index,mode<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) cs_mode – Index in resolution table 0 – Dynamic Range	Command: #SDR-CONVERT 1,1<CR> Feedback: ~nn@#SDR CONVERT 1,1<CR><LF>

Function	Description	Syntax	Parameters/Attributes	Example
		F>	passthrough source 1 – Enable “force SDR Dynamic Range” convert mode (default)	Description: Enable “force RGB color space” convert mode for output 1
SDR-CONVERT?	Get the “force SDR Dynamic Range ” convert mode status.	Command: #SDR-CONVERT? out_index<CR> Feedback: ~nn@#SDR-CONVERT out_index,mode<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) cs_mode – Index in resolution table 0 – Dynamic Range passthrough source 1 – Enable “force SDR Dynamic Range” convert mode (default)	Command: #SDR CONVERT? 1<CR> Feedback: ~nn@#SDR CONVERT 1,1<CR><LF> Description: Get the “force RGB color space” convert mode status for output 1
VID-FORMAT?	Get input/output video format.	Command: #VID-FORMAT? io_mode,io_index<CR> Feedback: ~nn@VID-FORMAT io_mode,io_index,resolution,cs_mode,dc_mode<CR><LF>	io_mode – Input/Output 0 – Input 1 – Output io_index – Number that indicates the specific input or output port: 1-N (N= the total number of input or output ports) resolution – Resolution index 0=No Signal 1=640x480p@59.94Hz/60Hz 2=720x480p@59.94Hz/60Hz ... cs_mode = Color space 0 – No Signal 1 – RGB 2 – Ycbcr 444 3 – Ycbcr 422 4 – Ycbcr 420 dc_mode = Deep Color 0 – No Signal 1 – 8 bit 2 – 10 bit 3 – 12 bit 4 – 16 bit	Command: #VID-FORMAT? 1,1,1,1<CR> Feedback: ~nn@VID-FORMAT 1,1,1,1<CR> <CR><LF> Description: Get HDMI output1 formate.
VID-RES	Set output resolution. “Set” command with is_native=ON sets native resolution on selected output (resolution index sent = 0). Device sends as answer actual VIC ID of native resolution.	Command: #VID-RES io_mode,io_index,is_native,resolution<CR> Feedback: ~nn@VID-RES io_mode,io_index,is_native,resolution<CR><LF>	io_mode – Input/Output 0 – Input 1 – Output io_index – Number that indicates the specific input or output port: 1-N (N= the total number of input or output ports) * – for all outputs is_native – Native resolution flag 0 – Off 1 – On resolution – Resolution index 0=No Signal (for input) / Native – EDID (for output) 1=640x480p@59.94Hz/60Hz	Command: #VID-RES 1,1,1,1<CR> Feedback: ~nn@VID-RES 1,1,1,1<CR><CR><LF> Description: Set output1 resolution is 640x480p@59.94Hz/60Hz

Function	Description	Syntax	Parameters/Attributes	Example
			2=720x480p@59.94Hz/60Hz 3=720x480p@59.94Hz/60Hz 4=1280x720p@59.94Hz/60H z 5=1920x1080i@59.94Hz/60 Hz 6=720(1440)x480i@59.94Hz /60Hz 7=720(1440)x480i@59.94Hz /60Hz 8=720(1440)x240p@59.94H z/60Hz 9=720(1440)x240p@59.94H z/60Hz 10=2880x480i@59.94Hz/60 Hz 11=2880x480i@59.94Hz/60 Hz 12=2880x240p@59.94Hz/60 Hz 13=2880x240p@59.94Hz/60 Hz 14=1440x480p@59.94Hz/60 Hz 15=1440x480p@59.94Hz/60 Hz 16=1920x1080p@59.94Hz/6 0Hz 17=720x576p@50Hz 18=720x576p@50Hz 19=1280x720p@50Hz 20=1920x1080i@50Hz 21=720(1440)x576i@50Hz 22=720(1440)x576i@50Hz 23=720(1440)x288p@50Hz 24=720(1440)x288p@50Hz 25=2880x576i@50Hz 26=2880x576i@50Hz 27=2880x288p@50Hz 28=2880x288p@50Hz 29=1440x576p@50Hz 30=1440x576p@50Hz 31=1920x1080p@50Hz 32=1920x1080p@23.97Hz/2 4Hz 33=1920x1080p@25Hz 34=1920x1080p@29.97Hz/3 0Hz 35=2880x480p@59.94Hz/60 Hz 36=2880x480p@59.94Hz/60 Hz 37=2880x576p@50Hz 38=2880x576p@50Hz 39=1920x1080i@50Hz 40=1920x1080i@100Hz 41=1280x720p@100Hz 42=720x576p@100Hz 43=720x576p@100Hz 44=720(1440)x576i@100Hz 45=720(1440)x576i@100Hz 46=1920x1080i@119.88/120 Hz 47=1280x720p@119.88/120 Hz 48=720x480p@119.88/120H z	

Function	Description	Syntax	Parameters/Attributes	Example
			49=720x480p@119.88/120Hz 50=720(1440)x480i@119.88/120Hz 51=720(1440)x480i@119.88/120Hz 52=720x576p@200Hz 53=720x576p@200Hz 54=720(1440)x576i@200Hz 55=720(1440)x576i@200Hz 56=720x480p@239.76/240Hz 57=720x480p@239.76/240Hz 58=720(1440)x480i@239.76/240Hz 59=720(1440)x480i@239.76/240Hz 60=1280x720p@23.97Hz/24Hz 61=1280x720p@25Hz 62=1280x720p@29.97Hz/30Hz 63=1920x1080p@119.88/120Hz 64=1920x1080p@100Hz 65=800x600p@60Hz 66=1024x768@60Hz 67=1280x768p@60Hz 68=1280x1024p@60Hz 69=1600x1200p@60Hz 70=1680x1050p@60Hz 71=1920x1200@60Hz 72=3840x2160p@24Hz 73=3840x2160p@25Hz 74=3840x2160p@30Hz 75=3840x2160p@50Hz 76=3840x2160p@60Hz 77=2560x1600@60Hz 78=2560x1440@60Hz 79=2560x1080@50Hz 80=2560x1080@60Hz 81=1280x800@60Hz 82=1360x768@60Hz 83=1400x1050@60Hz 84=1440x900@60Hz 85-100=(Reserved) 100=Custom resolution 1 101=Custom resolution 2 102=Custom resolution 3 103=Custom resolution 4 104=Custom resolution 5 104-254=(Reserved)	
VID-RES?	Get output resolution. <i>“Get” command with is_native=ON returns native resolution VIC, with is_native=OFF returns current resolution.</i>	Command: #VID-RES? io_mode,io_index,is_native<CR> Feedback: ~nn@VID-RES io_mode,io_index,is_native,resolution<CR><LF>	io_mode – Input/Output 0 – Input 1 – Output io_index – Number that indicates the specific input or output port: 1-N (N= the total number of input or output ports) is_native – Native resolution flag 0 – Off 1 – On	Command: #VID-RES? 1,1,1<CR> Feedback: ~nn@VID-RES 1,1,1,1<CR><CR><LF> Description: Get output1 resolution is 640x480p@59.94Hz/60Hz

Function	Description	Syntax	Parameters/Attributes	Example
			resolution – Resolution index 0=No Signal (for input) / Native – EDID (for output) 1=640x480p@59.94Hz/60Hz 2=720x480p@59.94Hz/60Hz 3=720x480p@59.94Hz/60Hz 4=1280x720p@59.94Hz/60Hz z 5=1920x1080i@59.94Hz/60Hz 6=720(1440)x480i@59.94Hz/60Hz 7=720(1440)x480i@59.94Hz/60Hz 8=720(1440)x240p@59.94Hz/60Hz 9=720(1440)x240p@59.94Hz/60Hz 10=2880x480i@59.94Hz/60Hz 11=2880x480i@59.94Hz/60Hz 12=2880x240p@59.94Hz/60Hz 13=2880x240p@59.94Hz/60Hz 14=1440x480p@59.94Hz/60Hz 15=1440x480p@59.94Hz/60Hz 16=1920x1080p@59.94Hz/60Hz 17=720x576p@50Hz 18=720x576p@50Hz 19=1280x720p@50Hz 20=1920x1080i@50Hz 21=720(1440)x576i@50Hz 22=720(1440)x576i@50Hz 23=720(1440)x288p@50Hz 24=720(1440)x288p@50Hz 25=2880x576i@50Hz 26=2880x576i@50Hz 27=2880x288p@50Hz 28=2880x288p@50Hz 29=1440x576p@50Hz 30=1440x576p@50Hz 31=1920x1080p@50Hz 32=1920x1080p@23.97Hz/24Hz 33=1920x1080p@25Hz 34=1920x1080p@29.97Hz/30Hz 35=2880x480p@59.94Hz/60Hz 36=2880x480p@59.94Hz/60Hz 37=2880x576p@50Hz 38=2880x576p@50Hz 39=1920x1080i@50Hz 40=1920x1080i@100Hz 41=1280x720p@100Hz 42=720x576p@100Hz 43=720x576p@100Hz 44=720(1440)x576i@100Hz 45=720(1440)x576i@100Hz	

Function	Description	Syntax	Parameters/Attributes	Example
			46=1920x1080i@119.88/120 Hz 47=1280x720p@119.88/120 Hz 48=720x480p@119.88/120 Hz 49=720x480p@119.88/120 Hz 50=720(1440)x480i@119.88/120 Hz 51=720(1440)x480i@119.88/120 Hz 52=720x576p@200 Hz 53=720x576p@200 Hz 54=720(1440)x576i@200 Hz 55=720(1440)x576i@200 Hz 56=720x480p@239.76/240 Hz 57=720x480p@239.76/240 Hz 58=720(1440)x480i@239.76/240 Hz 59=720(1440)x480i@239.76/240 Hz 60=1280x720p@23.97 Hz/24 Hz 61=1280x720p@25 Hz 62=1280x720p@29.97 Hz/30 Hz 63=1920x1080p@119.88/120 Hz 64=1920x1080p@100 Hz 65=800x600p@60 Hz 66=1024x768@60 Hz 67=1280x768p@60 Hz 68=1280x1024p@60 Hz 69=1600x1200p@60 Hz 70=1680x1050p@60 Hz 71=1920x1200@60 Hz 72=3840x2160p@24 Hz 73=3840x2160p@25 Hz 74=3840x2160p@30 Hz 75=3840x2160p@50 Hz 76=3840x2160p@60 Hz 77=2560x1600@60 Hz 78=2560x1440@60 Hz 79=2560x1080@50 Hz 80=2560x1080@60 Hz 81=1280x800@60 Hz 82=1360x768@60 Hz 83=1400x1050@60 Hz 84=1440x900@60 Hz 85-100=(Reserved) 100=Custom resolution 1 101=Custom resolution 2 102=Custom resolution 3 103=Custom resolution 4 104=Custom resolution 5 104-254=(Reserved)	
CS-CONVERT	Set the "force RGB color space" convert mode.	Command: #CS-CONVERT out_index,cs_mode<CR> Feedback: ~nn@#CS-CONVERT out_index,cs_mode<CR>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) cs_mode – Index in resolution table 0 – Color space follow	Command: #CS-CONVERT 1,1<CR> Feedback: ~nn@#CS-CONVERT 1,1<CR><LF>

Function	Description	Syntax	Parameters/Attributes	Example
		<LF>	sink(default) 1 – Enable “force RGB color space” convert mode	Description: Enable “force RGB color space” convert mode for output 1
CS-CONVERT?	Get the “force RGB color space” convert mode status.	Command: #CS-CONVERT? out_index<CR> Feedback: ~nn@#CS-CONVERT out_index,cs_mode<CR> <LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) cs_mode – Index in resolution table 0 – Color space pass (default) 1 – Enable “force RGB color space” convert mode	Command: #CS-CONVERT? 1<CR> Feedback: ~nn@#CS-CONVERT 1,1<CR><LF> Description: Get the “force RGB color space” convert mode status for output 1.
BRIGHTNESS	Set image brightness per output.	Command: #BRIGHTNESS out_index,value<CR> Feedback: ~nn@#BRIGHTNESS out_index,value<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) value – 0 ~100	Command: #BRIGHTNESS 1,50<CR> Feedback: ~nn@#BRIGHTNESS 1,50<CR><LF> Description: Set brightness for output 1 to 50.
BRIGHTNESS?	Get image brightness per output.	Command: #BRIGHTNESS? out_index<CR> Feedback: ~nn@#BRIGHTNESS out_index,value<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) value – 0 ~100	Command: #BRIGHTNESS? 1<CR> Feedback: ~nn@#BRIGHTNESS 1,50<CR><LF> Description: Get brightness for output 1 to 50.
CONTRAST	Set image contrast per output.	Command: #CONTRAST out_index,value<CR> Feedback: ~nn@#CONTRAST out_index,value<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) value – 0 ~100	Command: #CONTRAST 1,40<CR> Feedback: ~nn@#CONTRAST 1,40<CR><LF> Description: Set contrast for output 1 to 40.
CONTRAST?	Get image contrast per output.	Command: #CONTRAST? out_index<CR> Feedback: ~nn@#CONTRAST out_index,value<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) value – 0 ~100	Command: #CONTRAST? 1<CR> Feedback: ~nn@#CONTRAST 1,40<CR><LF> Description: Get contrast for output 1 to 40.

Function	Description	Syntax	Parameters/Attributes	Example
SATURATION	Set image saturation per output.	Command: #SATURATION out_index,value<CR> Feedback: ~nn@#SATURATION out_index,value<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) value – 0 ~100	Command: #SATURATION 1,40<CR> Feedback: ~nn@#SATURATION 1,40<CR><LF> Description: Set saturation for output 1 to 40.
SATURATION?	Get image saturation per output.	Command: #SATURATION? out_index<CR> Feedback: ~nn@#SATURATION out_index,value<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) value – 0 ~100	Command: #SATURATION? 1<CR> Feedback: ~nn@#SATURATION 1,40<CR><LF> Description: Get saturation for output 1 to 40.
VMUTE	Set enable/disable video on output.	Command: #VMUTE out_index,flag<CR> Feedback: ~nn@#VMUTE out_index,flag<CR><LF>	out_index – Number that indicates the specific output: * – for all outputs 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 9 - H264 flag – Video Mute 0 – Video enabled 1 – Video disabled	Command: #VMUTE 2,0<CR> Feedback: ~nn@#VMUTE 2,0<CR><LF> Description: Set video mute disable on output 2.
VMUTE?	Get video on output status.	Command: #VMUTE? out_index<CR> Feedback: ~nn@#VMUTE out_index,flag<CR><LF>	out_index – Number that indicates the specific output: * – for all outputs 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 9 - H264 flag – Video Mute 0 – Video enabled 1 – Video disabled	Command: #VMUTE? 2<CR> Feedback: ~nn@#VMUTE 2,0<CR><LF> Description: Get video on output status.
MUTE	Set audio mute.	Command: #MUTE out_index,mute_mode<CR> Feedback: ~nn@#MUTE out_index,mute_mode<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) mute_mode – On/Off 0 – Off 1 – On	Command: #MUTE 1,1<CR> Feedback: ~nn@#MUTE 1,1<CR><LF> Description: Set Output 1 to mute.

Function	Description	Syntax	Parameters/Attributes	Example
MUTE?	Get audio mute.	Command: #MUTE? out_index<CR> Feedback: ~nn@#MUTE out_index,mute_mode<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) mute_mode – On/Off 0 – Off 1 – On	Command: #MUTE? 1<CR> Feedback: ~nn@#MUTE 1,1<CR><LF> Description: Get mute status of output 1.
AUD-EMB	Set audio in video embedding status.	Command: #AUD-EMB out_index,emb_mode<CR> Feedback: ~nn@AUD-EMB out_index,emb_mode<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 9 – H264 emb_mode – On/Off 0 – Off (Audio follow video) 1 – On (DSP insertion)	Command: #AUD-EMB 1,1<CR> Feedback: ~nn@AUD-EMB 1,1<CR><LF> Description: Set Output 1 to mute.
AUD-EMB ?	Get audio in video embedding status.	Command: #AUD-EMB? out_index<CR> Feedback: ~nn@AUD-EMB out_index, emb_mode<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 9 – H264 emb_mode – On/Off 0 – Off (Audio follow video) 1 – On (DSP insertion)	Command: #AUD-EMB? 1<CR> Feedback: ~nn@#AUD-EMB 1,1<CR><LF> Description: Get audio embedded status of output 1.
X-PATTERN N	Set a pattern on a specific output signal.	Command: #X-PATTERN <direction_type>.<port_type>.<port_index>.<signal_type>.<index>,pattern_id<CR> Feedback: ~nn@X-PATTERN <direction_type>.<port_type>.<port_index>.<signal_type>.<index>,pattern_id<CR><LF>	The following attributes comprise the signal ID: <direction_type> – o OUT <port_type> – o HDMI o HDBT <port_index> – The port number as printed on the front or rear panel <signal_type> – o VIDEO <index> – Indicates a specific channel number when there are multiple channels of the same type pattern_id – 0 (pattern mode is OFF), if greater than 0, it is a pattern index number.	Command: #X-PATTERN OUT.HDMI.8.VIDEO.1,3<CR> Feedback: ~nn@X-PATTERN OUT.HDMI.8.VIDEO.1,3<CR> Description: Set video pattern 3 on HDMI OUT 8.

Function	Description	Syntax	Parameters/Attributes	Example
			0 – None 1 – Blue screen 2 – Horizontal Ramp 3 – Cross Hatch	
X-PATTERN?	Set a pattern on a specific output signal.	Command: #X-PATTERN? <direction_type>.<port_type>.<port_index>.<signal_type>.<index><CR> Feedback:	The following attributes comprise the signal ID: <direction_type> – o OUT <port_type> – o HDMI o HDBT <port_index> – The port number as printed on the front or rear panel <signal_type> – o VIDEO <index> – Indicates a specific channel number when there are multiple channels of the same type pattern_id – 0 (pattern mode is OFF), if greater than 0, it is a pattern index number. 0 – None 1 – Blue screen 2 – Horizontal Ramp 3 – Cross Hatch	Command: #X-PATTERN? OUT.HDMI.8.VIDEO.1<CR> Feedback: ~nn@X-PATTERN OUT.HDMI.8.VIDEO.1,3<CR> Description: Get the selected pattern on a specific output signal.
VFRZ	Set freeze on selected output.	Command: #VFRZ out_index, freeze_flag<CR> Feedback: ~nn@VFRZ out_index, freeze_flag<CR><LF>	out_index – Number that indicates the specific output: * – for all outputs 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 9 – H264 freeze_flag – On/Off 0 – Off 1 – On	Command: #VFRZ 1,1<CR> Feedback: ~nn@VFRZ 1,1<CR> Description: Set freeze on selected output.
VFRZ?	Get output freeze status.	Command: #VFRZ? out_index<CR> Feedback: ~nn@VFRZ out_index, freeze_flag<CR><LF>	out_index – Number that indicates the specific output: * – for all outputs 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 9 – H264 freeze_flag – On/Off 0 – Off 1 – On	Command: #VFRZ? 1<CR> Feedback: ~nn@VFRZ 1,1<CR> Description: Get freeze on selected output.

Function	Description	Syntax	Parameters/Attributes	Example
ASPECT-RATIO	Set aspect ratio for output.	Command: #ASPECT-RATIO out_index, mode<CR> Feedback: ~nn@ASPECT-RATIO out_index, mode<CR><LF>	out_index – Number that indicates the specific output: 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 9 - H264 mode – aspect ratio 1 – Full 2 – Best Fit Full stretches the source to fill the output, regardless of original aspect. Best Fit automatically sets the ratio based on the window's current source resolution.	Command: #ASPECT-RATIO 1,1<CR> Feedback: ~nn@ASPECT-RATIO 1,1<CR> Description: Set aspect ratio selected output.
ASPECT-RATIO?	Get aspect ratio for output.	Command: #ASPECT-RATIO? out_index<CR> Feedback: ~nn@ASPECT-RATIO out_index, mode<CR><LF>	out_index – Number that indicates the specific output: 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 9 - H264 mode – aspect ratio 1 – Full 2 – Best Fit Full stretches the source to fill the output, regardless of original aspect. Best Fit automatically sets the ratio based on the window's current source resolution.	Command: #ASPECT-RATIO? 1<CR> Feedback: ~nn@ASPECT-RATIO 1,1<CR> Description: Get aspect ratio selected output.
DISABLE-OUTPUT	Disable the TMDS signal on an individual output.	Command: #DISABLE-OUTPUT port_id, port_format, disable_state<CR> Feedback: ~nn@DISABLE-OUTPUT port_id, port_format, disable_state<CR><LF>	port_id - The port number as printed on the panel port_format -Type of signal on the port: HDMI HDBT disable_state - 0-output is enabled 1-output is disabled	Command: #DISABLE-OUTPUT port_id, port_format, disable_state<CR> Feedback: ~nn@DISABLE-OUTPUT port_id, port_format, disable_state<CR><LF>
DISABLE-OUTPUT?	Get if the TMDS signal on output status is enabled	Command: #DISABLE-OUTPUT? port_id, port_format<CR> Feedback: ~nn@DISABLE-OUTPUT port_id, port_format, disable_state<CR><LF>	port_id - The port number as printed on the panel port_format -Type of signal on the port: HDMI HDBT disable_state - 0-output is enabled	Command: #DISABLE-OUTPUT? 1,hdmi<CR> Feedback: ~nn@DISABLE-OUTPUT 1,hdmi,1<CR>

Function	Description	Syntax	Parameters/Attributes	Example
			1-output is disabled	
Wireless Commands				
AIRCAST-EN	Set Air-cast connection active.	Command: #AIRCAST-EN state<CR> Feedback: ~nn@AIRCAST-EN state<CR><LF>	state – 0 – OFF 1 – ON	Command: #AIRCAST-EN 0<CR> Feedback: ~nn@AIRCAST-EN 0<CR><LF> Description: Set Air-cast connection unactive.
AIRCAST-EN?	Get Air-cast connection active status.	Command: #AIRCAST-EN?<CR> Feedback: ~nn@AIRCAST-EN state<CR><LF>	state – 0 – OFF 1 – ON	Command: #AIRCAST-EN?<CR> Feedback: ~nn@AIRCAST-EN 0<CR><LF> Description: Get Air-cast connection active status.
AIRPLAY-EN	Set airplay connection active.	Command: #AIRPLAY-EN state<CR> Feedback: ~nn@AIRPLAY-EN state<CR><LF>	state – 0 – OFF 1 – ON	Command: #AIRPLAY-EN 0<CR> Feedback: ~nn@AIRPLAY-EN 0<CR><LF> Description: Set airplay connection unactive.
AIRPLAY-EN?	Get airplay connection active status.	Command: #AIRPLAY-EN?<CR> Feedback: ~nn@AIRPLAY-EN state<CR><LF>	state – 0 – OFF 1 – ON	Command: #AIRPLAY-EN?<CR> Feedback: ~nn@AIRPLAY-EN 0<CR><LF> Description: Get airplay connection active status.
MIRACAST-EN	Set miracast connection active.	Command: #MIRACAST-EN state<CR> Feedback: ~nn@MIRACAST-EN state<CR><LF>	state – 0 – OFF 1 – ON	Command: #MIRACAST-EN 0<CR> Feedback: ~nn@MIRACAST-EN 0<CR><LF> Description: Set miracast connection unactive.
MIRACAST-EN?	Get miracast connection active status.	Command: #MIRACAST-EN?<CR> Feedback: ~nn@MIRACAST-EN state<CR><LF>	state – 0 – OFF 1 – ON	Command: #MIRACAST-EN?<CR> Feedback: ~nn@MIRACAST-EN 0<CR><LF> Description: Get miracast connection active status.

Function	Description	Syntax	Parameters/Attributes	Example
CHROME CAST-EN	Set chromecast connection active.	Command: #CHROMECAST-EN state<CR> Feedback: ~nn@CHROMECAST-EN N state<CR><LF>	state – 0 – OFF 1 – ON	Command: #CHROMECAST-EN 0<CR> Feedback: ~nn@CHROMECAST-EN 0<CR><LF> Description: Set chromecast connection unactive.
CHROME CAST-EN?	Get chromecast connection active status.	Command: #CHROMECAST-EN?<CR> Feedback: ~nn@CHROMECAST-EN N state<CR><LF>	state – 0 – OFF 1 – ON	Command: #CHROMECAST-EN?<CR> Feedback: ~nn@CHROMECAST-EN 0<CR><LF> Description: Get chromecast connection active status.
WIRELESS- BANDS	Set wireless bands.	Command: #WIRELESS-BANDS bands<CR> Feedback: ~nn@WIRELESS-BANDS bands<CR><LF>	bands– 0 – 5G 1 – 2.4G	Command: #WIRELESS-BANDS 0<CR> Feedback: ~nn@ WIRELESS-BANDS 0<CR><LF> Description: Set wireless bands as 5G Hz.
WIRELESS- BANDS?	Get wireless bands.	Command: #WIRELESS-BANDS?<CR> Feedback: ~nn@WIRELESS-BANDS bands<CR><LF>	bands– 0 – 5G 1 – 2.4G	Command: #WIRELESS-BANDS?<CR> Feedback: ~nn@WIRELESS-BANDS 0<CR><LF> Description: Get wireless bands.
AIRCAST- MODE?	Get Air-cast casting mode.	Command: #AIRCAST-MODE?<CR> Feedback: ~nn@AIRCAST-MODE mode<CR><LF>	mode – wireless casting mode 0 – None 1 – AirPlay 2 – Miracast 3 – Chromecast	Command: #AIRCAST-MODE?<CR> Feedback: ~nn@AIRCAST-MODE 0<CR><LF> Description: Get Air-cast casting mode.
Streamer Commands				
ENCODER- EN	Set encoder active. <i>When this command was set off, H.264/265 will not appear in routing table</i>	Command: #ENCODER-EN state<CR> Feedback: ~nn@ENCODER-EN state<CR><LF>	state – 0 – OFF 1 – ON	Command: #ENCODER-EN 0<CR> Feedback: ~nn@ENCODER-EN 0<CR><LF> Description: Set encoder unactive.

Function	Description	Syntax	Parameters/Attributes	Example
ENCODER-EN?	Get encoder active status.	Command: #ENCODER-EN?<CR> Feedback: ~nn@ENCODER-EN state<CR><LF>	state – 0 – OFF 1 – ON	Command: #ENCODER-EN?<CR> Feedback: ~nn@ENCODER-EN 0<CR><LF> Description: Get encoder active status.
ENCODER-METHOD	Set current streaming method of encoder/decoder.	Command: #ENCODER-METHOD method<CR> Feedback: ~nn@ENCODER-METHOD method<CR><LF>	method – streaming method: 1 – H.264 2 – H.265	Command: #ENCODER-METHOD 2<CR> Feedback: ~nn@ENCODER-METHOD 2<CR><LF> Description: Set the streaming method to H.265.
ENCODER-METHOD?	Get current streaming method of encoder/decoder.	Command: #ENCODER-METHOD?<CR> Feedback: ~nn@ENCODER-METHOD method<CR><LF>	method – streaming method: 1 – H.264 2 – H.265	Command: #ENCODER-METHOD?<CR> Feedback: ~nn@ENCODER-METHOD 2<CR><LF> Description: Get current streaming method of encoder/decoder.
ENCODER-PROT	Set current streaming protocol of encoder/decoder.	Command: #ENCODER-PROT protocol<CR> Feedback: ~nn@ENCODER-PROT protocol<CR><LF>	protocol – Encoder/decoder streaming protocol 0 – Pure RTP 1 – RTSP 2 – RTP with TS 3 – RTMP	Command: #ENCODER-PROT 0<CR> Feedback: ~nn@ENCODER-PROT 0<CR><LF> Description: Set current streaming protocol of encoder/decoder.
ENCODER-PROT?	Get current streaming protocol of encoder/decoder.	Command: #ENCODER-PROT?<CR> Feedback: ~nn@ENCODER-PROT protocol<CR><LF>	protocol – Encoder/decoder streaming protocol 0 – Pure RTP 1 – RTSP 2 – RTP with TS 3 – RTMP	Command: #ENCODER-PROT?<CR> Feedback: ~nn@ENCODER-PROT 0<CR><LF> Description: Get current streaming protocol of encoder/decoder.
ENCODER-BIT-MODE	Set encoder rate control.	Command: #ENCODER-BIT-MODE mode<CR> Feedback: ~nn@ENCODER-BIT-MODE mode<CR><LF>	mode – rate control mode. 1 – CBR 2 – VBR	Command: #ENCODER-BIT-MODE 2<CR> Feedback: ~nn@ENCODER-BIT-MODE 2<CR><LF> Description: Set encoder rate control to VBR.

Function	Description	Syntax	Parameters/Attributes	Example
ENCODER-BIT-MODE?	Get encoder rate control.	Command: #ENCODER-BIT-MODE? <CR> Feedback: ~nn@ENCODER-BIT-MODE mode<CR><LF>	mode – rate control mode. 1 – CBR 2 – VBR	Command: #ENCODER-BIT-MODE?<CR> Feedback: ~nn@ENCODER-BIT-MODE 2<CR><LF> Description: Get encoder rate control.
ENCODER-BITRATE	Set encoder bitrate.	Command: #ENCODER-BITRATE value<CR> Feedback: ~nn@ENCODER-BITRATE value<CR><LF>	value – bitrate in kbps 2000 ~ 15000	Command: #ENCODER-BITRATE 2000<CR> Feedback: ~nn@ENCODER-BITRATE 2000<CR><LF> Description: Set encoder bitrate 2000 kbps.
ENCODER-BITRATE?	Get encoder bitrate.	Command: #ENCODER-BITRATE?<CR> Feedback: ~nn@ENCODER-BITRATE value<CR><LF>	value – bitrate in kbps 2000 ~ 15000	Command: #ENCODER-BITRATE?<CR> Feedback: ~nn@ENCODER-BITRATE 2000<CR><LF> Description: Get encoder bitrate.
ENCODER-URL?	Get streaming connection parameters. RTSP connection configuration is available only when RTSP Streaming Protocol is configured (See ENCODER-PROT command).	Command: #ENCODER-URL?<CR> Feedback: ~nn@ENCODER-URL rtsp://<ipaddress>/av_stream<CR><LF>	url – like: rtsp://192.168.8.128/av_stream	Command: #ENCODER-URL?<CR> Feedback: ~nn@ENCODER-URL rtsp://192.168.8.128/av_stream<CR><LF>
Video-wall & Multi-view Commands				
X-VIEW-MOD	Set view mode.	Command: #X-VIEW-MOD out_group,mode,active_state<CR> Feedback: ~nn@X-VIEW-MOD out_group,mode,active_state<CR><LF>	out_group – Number that indicates the specific output groups: For PIP/Split Screen/Side by Side 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 For Video wall 1 - Output 1&2&3&4 2 - Output 5&6&7&8 mode – View Modes 1 – PIP 7 – Split Screen 8 – Side by Side	Command: #X-VIEW-MOD 1,15,1<CR> Feedback: ~nn@X-VIEW-MOD 1,15,1<CR><LF> Description: Set view mode to a 2x2 grid video wall for out1 ~ out4.

Function	Description	Syntax	Parameters/Attributes	Example
			15 – Video wall active_state – 0 – Disable 1 – Enable	
X-VIEW-MOD?	Get view mode.	Command: #X-VIEW-MOD? port_index<CR> Feedback: ~nn@X-VIEW-MOD out_group,mode<CR><LF>	port_index – Number that indicates the specific output: 1-N (N= the total number of outputs) 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 out_group – Number that indicates the specific output groups: For PIP/Split Screen/Side by Side 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 For Video wall 1 - Output 1&2&3&4 2 - Output 5&6&7&8 mode – View Modes 0 – Matrix (Indep. switching) 1 – PIP 7 – Split Screen 8 – Side by Side 15 – Video wall	Command: #X-VIEW-MOD? 6<CR> Feedback: ~nn@X-VIEW-MOD 2,15<CR><LF> Description: Get view mode for out6.
WND-SRC	Set window source.	Command: #WND-SRC mode,layer_type,out_group,wind_id,in_index<CR> Feedback: ~nn@WND-SRC mode,layer_type,out_group,wind_id,in_index<CR><LF>	mode – the active mode: 1 – PIP 7 – Split Screen 8 – Side by Side 15 – Video wall Layer_type – 1 – Video 2 – Audio out_group – Number that indicates the specific output groups: For PIP/Split Screen/Side by Side 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 For Video wall	Command: #WND-SRC 1,1,1,1,2<CR> Feedback: ~nn@WND-SRC 1,1,1,1,2<CR><LF> Description: Set window HDMI 2 video source for Picture 1 in out1&2 groups PIP mode.

Function	Description	Syntax	Parameters/Attributes	Example
WND-SRC ?	Get window source.	Command: #WND-SRC mode,layer_type,out_group,wind_id,in_index<CR> Feedback: ~nn@WND-SRC mode,layer_type,out_group,wind_id,in_index<CR> <LF>	1 - Output 1&2&3&4 2 - Output 5&6&7&8 wind_id – Number that indicates the specific window (number of windows changes for each mode): 0 – All 1 – Picture 1 2 – Picture 2 In_index – 1 – Input 1 2 – Input 2 3 – Input 3 4 – Input 4 5 – Input 5 6 – Input 6 7 – Input 7 8 – Input 8 9 – Wireless	Command: #WND-SRC? 1,1,1,1<CR> Feedback: ~nn@WND-SRC 1,1,1,1,2<CR><LF> Description: Get window video source for Picture 1 in out1&2 groups PIP mode.
WND-ENABLE	Enable/disable window display video.	Command: #WND-ENABLE mode,out_group,wind_id,enable_state<CR> Feedback: ~nn@WND-ENABLE mode,out_group,wind_id,enable_state<CR><LF>	mode – the active mode: 1 – PIP 7 – Split Screen 8 – Side by Side out_group – 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 wind_id – 0 – All 1 – Picture 1 2 – Picture 2 enable_state – 0 – Disable 1 – Enable	Command: #WND-ENABLE 1,1,1,1<CR> Feedback: ~nn@WND-ENABLE 1,1,1,1<CR><LF> Description: Enable window display video in PIP mode:
WND-ENABLE?	Get window display status.	Command: #WND-ENABLE? mode,out_group,wind_id<CR> Feedback: ~nn@WND-ENABLE mode,out_group,wind_id,enable_state<CR><LF>	mode – the active mode: 1 – PIP 7 – Split Screen 8 – Side by Side out_group – 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 wind_id – Number that indicates the specific window (number of windows changes for each mode): 1 – Picture 1 2 – Picture 2 enable_state – 0 – Disable 1 – Enable	Command: #WND-ENABLE? 1,1,1<CR> Feedback: ~nn@WND-ENABLE 1,1,1,1<CR><LF>

Function	Description	Syntax	Parameters/Attributes	Example
WND-LABEL-ENABLE	Enable/disable window label.	Command: #WND-LABEL-ENABLE mode,out_group,wind_id, enable_state<CR> Feedback: ~nn@WND-LABEL-ENABLE mode,out_group,wind_id, enable_statet<CR><LF>	mode – the active mode: 1 – PIP 7 – Split Screen 8 – Side by Side out_group – 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 wind_id – Number that indicates the specific window (number of windows changes for each mode): 1 – Picture 1 2 – Picture 2 enable_state – 0 – Disable 1 – Enable	Command: #WND-LABEL-ENABLE 1,1,1,1<CR> Feedback: ~nn@WND-LABEL-ENABLE 1,1,1,1<CR><LF> Description: Enable window label in PIP mode:
WND-LABEL-ENABLE?	Get window label status.	Command: #WND-LABEL-ENABLE? mode,out_group,wind_id <CR> Feedback: ~nn@WND-LABEL-ENABLE mode,out_group,wind_id, enable_statet<CR><LF>	mode – the active mode: 1 – PIP 7 – Split Screen 8 – Side by Side out_group – 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 wind_id – Number that indicates the specific window (number of windows changes for each mode): 1 – Picture 1 2 – Picture 2 enable_state – 0 – Disable 1 – Enable	Command: #WND-LABEL-ENABLE? 1,1,1,1<CR> Feedback: ~nn@WND-LABEL-ENABLE 1,1,1,1<CR><LF>
WND-BORDER	Enable/disable window border.	Command: #WND-BORDER mode,out_group,wind_id, enable_state<CR> Feedback: ~nn@WND-BORDER mode,out_group,wind_id, enable_statet<CR><LF>	mode – the active mode: 1 – PIP 7 – Split Screen 8 – Side by Side out_group – 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 wind_id – Number that indicates the specific window (number of windows changes for each mode): 1 – Picture 1 2 – Picture 2 enable_state –	Command: #WND-BORDER 1,1,1,1<CR> Feedback: ~nn@WND-BORDER 1,1,1,1<CR><LF> Description: Enable/disable window border in matrix mode:

Function	Description	Syntax	Parameters/Attributes	Example
			0 – Disable 1 – Enable	
WND-BORDER?	Get window border status.	Command: #WND-BORDER? mode,out_group,wind_id <CR> Feedback: ~nn@WND-BORDER mode,out_group,wind_id, enable_statet<CR><LF>	mode – the active mode: 1 – PIP 7 – Split Screen 8 – Side by Side out_group – 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 wind_id – Number that indicates the specific window (number of windows changes for each mode): 1 – Picture 1 2 – Picture 2 enable_state – 0 – Disable 1 – Enable	Command: #WND-BORDER? 1,1,1<CR> Feedback: ~nn@WND-BORDER 1,1,1,1<CR><LF>
WND-COLOR	Set window border color intensity.	Command: #WND-COLOR mode,out_group,wind_id, color<CR> Feedback: ~nn@WND-COLOR mode,out_group,wind_id, color<CR><LF>	mode – the active mode: 1 – PIP 7 – Split Screen 8 – Side by Side out_group – 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 wind_id – Number that indicates the specific window (number of windows changes for each mode): 1 – Picture 1 2 – Picture 2 color – 0 – White 1 – Black 2 – Green 3 – Purple	Command: #WND-COLOR 1,1,1,1<CR> Feedback: ~nn@WND-COLOR 1,1,1,1<CR><LF> Description: Set black window border for Picture 1 in PIP mode.

Function	Description	Syntax	Parameters/Attributes	Example
			4 – Blue 5 – Red	
WND-COLOR?	Get window border color.	Command: #WND-COLOR? mode,out_group,wind_id <CR> Feedback: ~nn@WND-COLOR mode,out_group,wind_id, color<CR><LF>	mode – the active mode: 1 – PIP 7 – Split Screen 8 – Side by Side out_group – 1 - Output 1&2 2 - Output 3&4 3 - Output 5&6 4 - Output 7&8 wind_id – Number that indicates the specific window (number of windows changes for each mode): 1 – Picture 1 2 – Picture 2 color – 0 – White 1 – Black 2 – Green 3 – Purple 4 – Blue 5 – Red	Command: #WND-COLOR? 1,1,1<CR> Feedback: ~nn@WND-COLOR 1,1,1,0<CR><LF> Description: Get window border color for Picture 1 in PIP mode.
WND-WIDTH	Set window border width intensity.	Command: #WND-WIDTH mode,out_group,wind_id, width <CR> Feedback: ~nn@WND-WIDTH mode,out_group,wind_id, width<CR><LF>	mode – the active mode: 1 – PIP 7 – Split Screen 8 – Side by Side out_group – 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 wind_id – Number that indicates the specific window (number of windows changes for each mode): 1 – Picture 1 2 – Picture 2 width – 0 – small 1 – medium 2 – large	Command: #WND-WIDTH 1,1,1,1<CR> Feedback: ~nn@WND-WIDTH 1,1,1,1<CR><LF> Description: Set wide window width for Picture 1 in PIP mode.

Function	Description	Syntax	Parameters/Attributes	Example
WND-WIDTH?	Get window border width.	Command: #WND-WIDTH? mode,out_group,wind_id <CR> Feedback: ~nn@WND-WIDTH mode,out_group,wind_id, width<CR><LF>	mode – the active mode: 1 – PIP 7 – Split Screen 8 – Side by Side out_group – 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 wind_id – Number that indicates the specific window (number of windows changes for each mode): 1 – Picture 1 2 – Picture 2 width – 0 – small 1 – medium 2 – large	Command: #WND-WIDTH? 1,1,1<CR> Feedback: ~nn@WND-WIDTH 1,1,1,1<CR><LF> Description: Get window border wide for Picture 1 in PIP mode.
WND-TRANSP	Set window transparency.	Command: #WND-TRANSP mode,out_group,wind_id, transp<CR> Feedback: ~nn@#WND-TRANSP mode,out_group,wind_id, transp<CR><LF>	mode – the active mode: 1 – PIP out_group – 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 wind_id – Number that indicates the specific window (number of windows changes for each mode): 1 – Picture 1 2 – Picture 2 transp – 0 to100	Command: #WND-TRANSP 1,1,2,70<CR> Feedback: ~nn@WND-TRANSP 1,1,2,70<CR><LF> Description: Set window transparency for Picture 2 to 70.
WND-TRANSP?	Get window transparency.	Command: #WND-TRANSP? mode,out_group,wind_id <CR> Feedback: ~nn@#WND-TRANSP mode,out_group,wind_id, transp<CR><LF>	mode – the active mode: 1 – PIP out_group – 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 wind_id – Number that indicates the specific window (number of windows changes for each mode): 1 – Picture 1 2 – Picture 2 transp – 0 to100	Command: #WND-TRANSP? 1,1,2<CR> Feedback: ~nn@WND-TRANSP 1,1,2,70<CR><LF> Description: Get window transparency for video source for Picture 2 in quad mode.

Function	Description	Syntax	Parameters/Attributes	Example
WND-DEFAULT	Set window setting to default.	Command: #WND-default mode,out_group,wind_id <CR> Feedback: ~nn@WND-default mode,out_group,wind_id <CR><LF>	mode – the active mode: 1 – PIP 7 – Split Screen 8 – Side by Side 15 – Video wall out_group – 1 - Output 1&3 2 - Output 2&4 3 - Output 5&7 4 - Output 6&8 For Video wall 1 - Output 1&2&3&4 2 - Output 5&6&7&8 wind_id – Number that indicates the specific window (number of windows changes for each mode): 0 - All 1 – Picture 1 2 – Picture 2 3 – Picture 3 4 – Picture 4	Command: #WND-DEFAULT 1,1,1<CR> Feedback: ~nn@WND-DEFAULT 1,1,1<CR><LF>
VW-MONITOR	Set Video Wall bezel compensation.	Command: #VW-MONITOR out_group,mon_w,mon_h ,b_top,b_bottom,b_left,b_right<CR> Feedback: ~nn@VW-MONITOR out_group,mon_w,mon_h ,b_top,b_bottom,b_left,b_right<CR><LF>	out_group - Number that indicates the specific video wall: 1 - Output 1&2&3&4 2 - Output 5&6&7&8 mon_w – monitor out width, 0~10000 mon_h – monitor height, 0~10000 b_top – bezel top, 0~10000 b_bottom – bezel bottom, 0~10000 b_left – bezel left, 0~10000 b-right – bezel_right, 0~10000	Command: #VW-MONITOR 1,1080,1920,1,1,1,1<CR> Feedback: ~nn@VW-MONITOR 1,1080,1920,1,1,1,1<CR><LF> >
VW-MONITOR?	Get Video Wall bezel compensation.	Command: #VW-MONITOR? out_group<CR> Feedback: ~nn@VW-MONITOR out_group,mon_w,mon_h ,b_top,b_bottom,b_left,b_right<CR><LF>	out_group - Number that indicates the specific video wall: 1 - Output 1&2&3&4 2 - Output 5&6&7&8 mon_w – monitor out width, 0~10000 mon_h – monitor height, 0~10000 b_top – bezel top, 0~10000 b_bottom – bezel bottom, 0~10000	Command: #VW-MONITOR? 1<CR><CR> Feedback: ~nn@VW-MONITOR 1,1080,1920,1,1,1,1<CR><LF> >

Function	Description	Syntax	Parameters/Attributes	Example
			b_left – bezel left, 0~10000 b_right – bezel_right, 0~10000	
Screen & Overlay Commands				
LDSCREE N	Load screen image from the screen library to the output.	Command: #LDSCREEN src_id,[<direction_type1> .<dst_port1>.<dst_id1>,< direction_type2><dst_por t2>.<dst_id2>]<CR> Feedback: ~nn@LDSCREEN src_id,[<direction_type1> .<dst_port1>.<dst_id1>,< direction_type2><dst_por t2>.<dst_id2>]<CR><LF>	src_id – Number of chosen configurable screens 1 – Screens 1 2 – Screens 2 .. 32 – Screens 32 <direction_type1> OUT <dst_port> – Screens destination (output port) 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 <dst_id> – Screens destination (Storage screen id in each output) 1 ~ 3	Command: #LDSCREEN 1,[OUT.1.1, OUT.2.1]<CR> Feedback: ~nn@LDSCREEN [OUT.1.1, OUT.2.1]<CR><LF> Description: Load the screen 1 image from the screen library to the storage screen 1 of output 1 and the storage screen 1 of output 2.
LDSCREE N?	Retrieve the ID in the image library of the picture uploaded to a specific splash screen slot for a given output	Command: #LDSCREEN? <direction_type>.<port_in dex>.<screen_id><CR> Feedback: ~nn@LDSCREEN <direction_type>.<port_in dex>.<screen_id>,<pictur e_id><CR><LF>	src_id – Number of chosen configurable screens 1 – Screens 1 2 – Screens 2 .. 32 – Screens 32 <direction_type1> OUT <dst_port> – Screens destination (output port) 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 <dst_id> – Screens destination (Storage screen id in each output) 1 ~ 3	Command: #LDSCREEN? OUT.1.1<CR> Feedback: ~nn@LDSCREEN OUT.1.1,0<CR><LF> Description: Retrieve the ID in the image library of the picture uploaded to a specific splash screen slot for a given output.

Function	Description	Syntax	Parameters/Attributes	Example
RMSCREEN	Remove one image from the screen library	Command: #RMSCREEN <screen_id><CR> Feedback: ~nn@RMSCREEN <screen_id><CR><LF>	<screen_id> – the image id 1~32 -picture1~picture32	Command: #RMSCREEN 1<CR> Feedback: ~nn@RMSCREEN 1<CR><LF> Description: Retrieve screen 1 from the library.
SLEEP-SCREEN	Set sleep screen for the output.	Command: #SLEEP-SCREEN output_id, screen_id<CR> Feedback: ~nn@SLEEP-SCREEN output_id, screen_id<CR><LF>	output_id – Output number 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 dst_id – Screens destination (Storage screen id in each output) 1 – Screens 1 2 – Screens 2 3 – Screens 3	Command: #SLEEP-SCREEN 1,2<CR> Feedback: ~nn@SLEEP-SCREEN 1,2<CR><LF> Description: Set storage screen 1 of output 1 as output 1 sleep screen.
SLEEP-SCREEN?	Get sleep screen for the output.	Command: #SLEEP-SCREEN? output_id<CR> Feedback: ~nn@SLEEP-SCREEN output_id, screen_id<CR><LF>	output_id – Output number 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 dst_id – Screens destination (Storage screen id in each output) 1 – Screens 1 2 – Screens 2 3 – Screens 3	Command: #SLEEP-SCREEN? 1<CR> Feedback: ~nn@SLEEP-SCREEN 1,2<CR><LF> Description: Get output 1 sleep screen .
LOCK-SCREEN	Lock last load screen.	Command: #LOCK-SCREEN output_id,lock_mode<CR> Feedback: ~nn@LOCK-SCREEN output_id,lock_mode<CR><LF>	The following attributes comprise the signal ID: output_id – Output number 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7 8 – Output 8 lock_mode – On/Off 0 – Off unlocks screen. 1 – On locks screen.	Command: #LOCK-SCREEN 1,1<CR> Feedback: ~nn@LOCK-SCREEN 1,1<CR><LF> Description: Lock the last load screen for the output 1.
LOCK-SCREEN?	Get screen lock state.	Command: #LOCK-SCREEN? output_id<CR> Feedback: ~nn@LOCK-SCREEN output_id,lock_mode<CR><LF>	The following attributes comprise the signal ID: output_id – Output number 1 – Output 1 2 – Output 2 3 – Output 3 4 – Output 4 5 – Output 5 6 – Output 6 7 – Output 7	Command: #LOCK-SCREEN? 1<CR> Feedback: ~nn@LOCK-SCREEN 1,1<CR><LF> Description: Get screen lock state for Input

Function	Description	Syntax	Parameters/Attributes	Example
			8 – Output 8 lock_mode – On/Off 0 – Off unlocks screen. 1 – On locks screen.	1.
OVERLAY-ON	Set the overlay on for selected output.	Command: #OVERLAY-ON out_index,overlay_name <CR> Feedback: ~nn@OVERLAY-ON out_index,overlay_name <CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) overlay_name – the name of the preset overlay None – Turn Off the OSD	Command: #OVERLAY-ON 1,overlay#1<CR> Feedback: ~nn@OVERLAY-ON 1,overlay#1<CR><LF> Description: Set the overlay#1 to show on the output1.
OVERLAY-ON?	Get the overlay on for selected output.	Command: #OVERLAY-ON? out_index?<CR> Feedback: ~nn@OVERLAY-ON out_index,overlay_name <CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) overlay_name – On/Off None – Turn Off the OSD	Command: #OVERLAY-ON? 1<CR> Feedback: ~nn@OVERLAY-ON 1,None<CR><LF> Description: Get the OSD status of out1.
OVERLAY-DURATION N	Set the overlay duration for selected output.	Command: #OVERLAY-DURATION out_index,time<CR> Feedback: ~nn@OVERLAY-DURATION out_index,time<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) time – duration in seconds 0 - 99999 (0 forever)	Command: #OVERLAY-DURATION 1,1<CR> Feedback: ~nn@OVERLAY-DURATION 1,1<CR><LF> Description: Set the overlay to show for 1 seconds.
OVERLAY-DURATION?	Get the overlay duration for selected output.	Command: #OVERLAY-DURATION out_index?<CR> Feedback: ~nn@OVERLAY-DURATION out_index,time<CR><LF>	out_index – Number that indicates the specific output: 1-N (N= the total number of outputs) time – duration in seconds 0 - 99999 (0 forever)	Command: #OVERLAY-DURATION? 1<CR> Feedback: ~nn@OVERLAY-DURATION 1,1<CR><LF> Description: Get the overlay duration for output1.
Audio Setting Commands				
AUDIO-PORT-SELECT	Select audio port from selectable ports group as audio mixer.	Command: #AUDIO-PORT-SELECT [IN.<port_type>.<port_index>,IN.<port_type>.<port_index>,....],[OUT.<port_type>.<port_index>,OUT.<port_type>.<port_index>,....]<CR>	<port_type> – Type of signal on the port: o HDMI o ANALOG_AUDIO o AMPLIFIED_AUDIO o MIC o BYOD o USB_C o DANTE o UAC	Command: #AUDIO-PORT-SELECT [IN.MIC.1,IN.ANALOG_AUDIO.5],[OUT.AMPLIFIED_AUDIO.1,OUT.HDMI.1]<CR> Feedback: ~nn@AUDIO-PORT-SELECT [IN.MIC.1,IN.ANALOG_AUDIO

Function	Description	Syntax	Parameters/Attributes	Example
		Feedback: ~nn@AUDIO-PORT-SELECT [IN.<port_type>.<port_index>,IN.<port_type>.<port_index>,...],[OUT.<port_type>.<port_index>,OUT.<port_type>.<port_index>,...]<CR><LF>	o H264 <port_index> – The port number as printed on the front or rear panel For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 DANTE -- 1 to 8 UAC -- 1 to 2 USB_C-- 1 (RECORD) H264 -- 1	.5],[OUT.AMPLIFIED_AUDIO.1,OUT.HDMI.1]<CR><LF>
AUDIO-PORT-SELECT?	Get audio port of selectable ports group as audio mixer.	Command: #AUDIO-PORT-SELECT?<CR> Feedback: ~nn@AUDIO-PORT-SELECT [IN.<port_type>.<port_index>,IN.<port_type>.<port_index>,...],[OUT.<port_type>.<port_index>,OUT.<port_type>.<port_index>,...]<CR><LF>	For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 MIC-- 1 to 4 DANTE -- 1 to 8 USB_C-- 1 to 2 UAC-- 1 to 2 BYOD-- 1	Command: #AUDIO-PORT-SELECT?<CR> Feedback: ~nn@AUDIO-PORT-SELECT [IN.MIC.1,IN.ANALOG_AUDIO.5],[OUT.AMPLIFIED_AUDIO.1,OUT.HDMI.1]<CR><LF>
MIC-TYPE	Set microphone type. This command is valid when the audio in port was selected as Mic IN with "AUDIO-PORT-SELECT"	Command: #MIC-TYPE io_index,mic_type<CR> Feedback: ~nn@MIC-TYPE io_index,mic_type<CR><LF>	The following attributes comprise the port ID: io_index – The port number as printed on the front or rear panel 1 – Mic 1 2 – Mic 2 3 – Mic 2 4 – Mic 4 mic_type – Dynamic/Condenser (not case sensitive)	Command: #MIC-TYPE 3,condenser<CR> Feedback: ~nn@MIC-TYPE 3,condenser<CR><LF> Description: Set MIC 3 type to condenser.
MIC-TYPE?	Get microphone type. <i>This command is valid when the audio in port was selected as Mic IN with "AUDIO-PORT-SELECT"</i>	Command: #MIC-TYPE? io_index<CR> Feedback: ~nn@MIC-TYPE io_index,mic_type<CR><LF>	The following attributes comprise the port ID: io_index – The port number as printed on the front or rear panel 1 – Mic 1 2 – Mic 2 3 – Mic 2 4 – Mic 4 mic_type – Dynamic/Condenser (not case sensitive)	Command: #MIC-TYPE? 3<CR> Feedback: ~nn@MIC-TYPE 3,condenser<CR><LF> Description: Get MIC 3 type.
X-MIX-MUTE	Set DSP matrix crosspoint mute state.	Command: #X-MIX-MUTE OUT.<port_type>.<port_index>,IN.<port_type>.<port_index>,mute_state<CR> Feedback: ~nn@X-MIX-MUTE OUT.<port_type>.<port_index>,IN.<port_type>.<port_index>,mute_state<CR><LF>	<port_type> – o HDMI o ANALOG_AUDIO o AMPLIFIED_AUDIO o MIC o BYOD o USB_C o DANTE o UAC o H264 <port_index> – The port number as printed on the front or rear panel For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2	Command: #X-MIX-MUTE OUT.ANALOG_STEREO.1,IN.HDMI_AUDIO.1,ON<CR> Feedback: ~nn@X-MIX-MUTE OUT.ANALOG_STEREO.1,IN.HDMI_AUDIO.1,ON<CR><LF> Description: Mute analog audio output 1 and HDMI audio cross-point.

Function	Description	Syntax	Parameters/Attributes	Example
			DANTE -- 1 to 8 UAC -- 1 to 2 USB_C-- 1 (RECORD) H264 -- 1 AECREF -- 1 to 2 For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 MIC-- 1 to 4 DANTE -- 1 to 8 USB_C-- 1 to 2 UAC-- 1 to 2 BYOD—1 mute_state – o ON o OFF	
X-MIX-MUTE?	Get DSP matrix crosspoint mute state.	Command: #X-MIX-MUTE? OUT.<port_type>.<port_index>,IN.<port_type>.<port_index><CR> Feedback: ~nn@X-MIX-MUTE OUT.<port_type>.<port_index>,IN.<port_type>.<port_index>,mute_state<CR><LF>	<port_type> – o HDMI o ANALOG_AUDIO o AMPLIFIED_AUDIO o MIC o BYOD o USB_C o DANTE o UAC o H264 <port_index> – The port number as printed on the front or rear panel For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 DANTE -- 1 to 8 UAC -- 1 to 2 USB_C -- 1 (RECORD) H264 -- 1 AECREF -- 1 to 2 For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 MIC -- 1 to 4 DANTE -- 1 to 8 USB_C -- 1 to 2 UAC -- 1 to 2 BYOD —1 <signal_type> – o AUDIO mute_state – o ON o OFF	Command: #X-MIX-MUTE? OUT.ANALOG_STEREO.1,IN.HDMI_AUDIO.1<CR> Feedback: ~nn@X-MIX-MUTE OUT.ANALOG_STEREO.1,IN.HDMI_AUDIO.1,ON<CR><LF> > Description: Get analog audio output 1 and HDMI audio cross-point mute state.
X-MIX-LVL	Set DSP matrix crosspoint MIX level in dB.	Command: #X-MIX-LVL OUT.<port_type>.<port_index>,IN.<port_type>.<port_index>,<dB><CR> Feedback: ~nn@X-MIX-LVL OUT.<port_type>.<port_index>,<dB>	<port_type> – o HDMI o ANALOG_AUDIO o AMPLIFIED_AUDIO o MIC o BYOD o USB_C o DANTE o UAC o H264	Command: #X-MIX-LVL OUT.AMPLIFIED_AUDIO.1,IN.ANALOG_AUDIO.1,-25<CR> Feedback: ~nn@X-MIX-LVL OUT.AMPLIFIED_AUDIO.1,IN.ANALOG_AUDIO.1,

Function	Description	Syntax	Parameters/Attributes	Example
		<code>ndex>,IN.<port_type>.<p ort_index> ,dB<CR><LF></code>	<port_index> – The port number as printed on the front or rear panel For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 DANTE -- 1 to 8 UAC -- 1 to 2 USB_C -- 1 (RECORD) H264 -- 1 AECREF -- 1 to 2 For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 MIC -- 1 to 4 DANTE -- 1 to 8 USB_C -- 1 to 2 UAC-- 1 to 2 BYOD—1 dB --- audio level in dB - 100 to 0 dB	-25<CR><LF> Description: Set amplified audio output 1 and analog audio 1 cross-point level to -25dB.
X-MIX-LVL ?	Get DSP matrix crosspoint MIX level in dB.	Command: #X-MIX-LVL? OUT.<port_type>.<port_index>,IN.<port_type>.<p ort_index><CR> Feedback: ~nn@X-MIX-LVL OUT.<port_type>.<port_index>,IN.<port_type>.<p ort_index> ,dB<CR><LF>	<port_type> – - o HDMI - o ANALOG_AUDIO - o AMPLIFIED_AUDIO - o MIC - o BYOD - o USB_C - o DANTE - o UAC - o H264 <port_index> – The port number as printed on the front or rear panel For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 DANTE -- 1 to 8 UAC -- 1 to 2 USB_C-- 1 (RECORD) H264 -- 1 AECREF -- 1 to 2 For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 MIC -- 1 to 4 DANTE -- 1 to 8 USB_C -- 1 to 2 UAC -- 1 to 2 BYOD —1 dB --- audio level in dB - 100 to 0 dB	Command: #X-MIX-LVL? OUT.AMPLIFIED_AUDIO.1,IN .ANALOG_AUDIO.1<CR> Feedback: ~nn@X-MIX-LVL OUT.AMPLIFIED_AUDIO.1,IN .ANALOG_AUDIO.1, -25<CR><LF> Description: Get amplified audio output 1 and analog audio 1 cross-point level.
X-AUD-LVL	Set audio level of a specific signal.	Command: #X-AUD-LVL <direction_type>.<port_type>.<port_index>,audio_level<CR> Feedback: ~nn@X-AUD-LVL	The following attributes comprise the signal ID: ▪ <direction_type> – - o IN - o OUT ▪ <port_type> – - o HDMI	Command: #X-AUD-LVL IN.ANALOG_AUDIO.5,10<CR> Feedback: ~nn@X-AUD-LVL

Function	Description	Syntax	Parameters/Attributes	Example
		<code><direction_type>.<port_type>.<port_index>,audio_level<CR><LF></code>	- o ANALOG_AUDIO - o AMPLIFIED_AUDIO - o MIC - o BYOD - o USB_C - o DANTE - o UAC - o H264 ▪ <port_index> – The port number as printed on the front or rear panel For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 DANTE -- 1 to 8 UAC -- 1 to 2 USB_C-- 1 (RECORD) H264 -- 1 For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 MIC-- 1 to 4 DANTE -- 1 to 8 USB_C-- 1 to 2 UAC-- 1 to 2 BYOD—1 ▪ audio_level — [dB] -100 to +15 ++ (increase current value by 1dB); -- (decrease current value by 1dB)	IN.ANALOG_AUDIO.5,10<CR><LF> Description: Set the audio level of analog audio 5 input signal to 10.
X-AUD-LVL?	Get audio level of a specific signal.	Command: #X-AUD-LVL? <direction_type>.<port_type>.<port_index><CR> Feedback: ~nn@X-AUD-LVL <direction_type>.<port_type>.<port_index>,audio_level<CR><LF>	The following attributes comprise the signal ID: ▪ <direction_type> – - o IN - o OUT ▪ <port_type> – - o HDMI - o ANALOG_AUDIO - o AMPLIFIED_AUDIO - o MIC - o BYOD - o USB_C - o DANTE - o UAC - o H264 ▪ <port_index> – The port number as printed on the front or rear panel For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 DANTE -- 1 to 8 UAC -- 1 to 2 USB_C-- 1 (RECORD) H264 – 1 For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 DANTE -- 1 to 8	Command: #X-AUD-LVL? OUT.AMPLIFIED_AUDIO.1<CR> Feedback: ~nn@X-AUD-LVL OUT.AMPLIFIED_AUDIO.1,10<CR><LF> Description: Get the audio level of the AMPLIFIED AUDIO 1.

Function	Description	Syntax	Parameters/Attributes	Example
			USB_C-- 1 to 2 UAC-- 1 to 2 audio_level – [dB] -100 to +15	
X-AUD-GAIN	Set the analog input audio gain.	Command: #X-AUD-GAIN <direction_type>.<port_type>.<port_index>,<gain_level><CR> Feedback: ~nn@X-AUD-GAIN <direction_type>.<port_type>.<port_index>,<gain_level><CR><LF>	<direction_type> – o IN <port_type> – o ANALOG_AUDIO o MIC <port_index> – The port number as printed on the front or rear panel ANALOG_AUDIO -- 1 to 6 MIC -- 1 to 4 gain_level – [dB] -100 to +15	Command: #X-AUD-GAIN IN.MIC.1,10<CR> Feedback: ~nn@X-AUD-GAIN IN.MIC.1,10<CR><LF> Description: Set the mic input 1 audio gain to 10 dB.
X-AUD-GAIN?	Get the analog input audio gain.	Command: #X-AUD-GAIN? <direction_type>.<port_type>.<port_index><CR> Feedback: ~nn@X-AUD-GAIN <direction_type>.<port_type>.<port_index>,<gain_level><CR><LF>	<direction_type> – o IN <port_type> – o ANALOG_AUDIO o MIC <port_index> – The port number as printed on the front or rear panel ANALOG_AUDIO -- 1 to 6 MIC -- 1 to 4 gain_level – [dB] -100 to +15	Command: #X-AUD-GAIN? IN.MIC.1<CR> Feedback: ~nn@X-AUD-GAIN IN.MIC.1,10<CR><LF> Description: Set the mic input 1 audio gain to 10 dB.

Function	Description	Syntax	Parameters/Attributes	Example
X-MUTE	Set mute ON/OFF on a specific signal.	Command: #X-MUTE <direction_type>.<port_type>.<port_index>.<signal_type>,state<CR> Feedback: ~nn@X-MUTE <direction_type>.<port_type>.<port_index>.<signal_type>,state<CR><LF>	The following attributes comprise the signal ID: <direction_type> – - o IN - o OUT <port_type> – - o HDMI - o ANALOG_AUDIO - o AMPLIFIED_AUDIO - o MIC - o BYOD - o USB_C - o DANTE - o UAC - o H264 <port_index> – The port number as printed on the front or rear panel --- For AUDIO For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 DANTE -- 1 to 8 UAC -- 1 to 2 USB_C -- 1 (RECORD) H264 -- 1 ALL For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 MIC-- 1 to 4 DANTE -- 1 to 8 USB_C -- 1 to 2 UAC -- 1 to 2 BYOD —1 <signal_type> – - o VIDEO - o AUDIO state – On/Off 0 – Off 1 – On	Command: #X-MUTE OUT.HDMI.4.AUDIO,1<CR> Feedback: ~nn@X-MUTE OUT.HDMI.4.AUDIO,1<CR><LF> Description: Mute the video on HDMI OUT 4.
X-MUTE?	Get mute ON/OFF state on a specific signal.	Command: #X-MUTE? <direction_type>.<port_type>.<port_index>.<signal_type><CR> Feedback: ~nn@X-MUTE <direction_type>.<port_type>.<port_index>.<signal_type>,state<CR><LF>	The following attributes comprise the signal ID: <direction_type> – - o IN - o OUT <port_type> – - o HDMI - o ANALOG_AUDIO - o AMPLIFIED_AUDIO - o MIC - o BYOD - o USB_C - o DANTE - o UAC - o H264 <port_index> – The port number as printed on the front or rear panel	Command: #X-MUTE? OUT.HDMI.4.AUDIO<CR> Feedback: ~nn@X-MUTE OUT.HDMI.4.AUDIO.1<CR> Description: Get the mute ON/OFF state on a specific signal.

Function	Description	Syntax	Parameters/Attributes	Example
			--- For AUDIO For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 DANTE -- 1 to 8 UAC -- 1 to 2 USB_C-- 1 (RECORD) H264 -- 1 For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 MIC-- 1 to 4 DANTE -- 1 to 8 USB_C-- 1 to 2 UAC-- 1 to 2 BYOD—1 <signal_type> – o VIDEO o AUDIO state – OFF/ON (not case sensitive)	
AUD-HI-Z	Set Hi-Z state for amplified audio output.	Command: #AUD-HI-Z io_index, hi_z_mode, hi_z_volt<CR> Feedback: ~nn@AUD-HI-Z io_index, hi_z_mode, hi_z_volt<CR><LF>	io_index – Number that indicates the specific amplified output port: 1 - AMP1 2 - APM2 hi_z_mode – Hi-Z state 0 – Hi-Z state low 1 – Hi-Z state high hi_z_volt – Hi-Z volt level. 0 – 70 volt 1 – 100 volt 0xff – Ignore Optional, active only in high state	Command: #AUD-HI-Z 2,1,0<CR> Feedback: ~nn@AUD-HI-Z 2,1,0<CR><LF> Description: Set amplified output 2 to Hi-Z and 70V.
AUD-HI-Z?	Get Hi-Z/Lo-Z configuration for amplified audio output.	Command: #AUD-HI-Z? io_index<CR> Feedback: ~nn@AUD-HI-Z io_index, hi_z_mode, hi_z_volt<CR><LF>	io_index – Number that indicates the specific amplified output port: 1 - AMP1 2 - APM2 hi_z_mode – Hi-Z state 0 – Hi-Z state low 1 – Hi-Z state high hi_z_volt – Hi-Z volt level. 0 – 70 volt 1 – 100 volt 0xff – Ignore Optional, active only in high state	Command: #AUD-HI-Z? 2<CR> Feedback: ~nn@AUD-HI-Z 2,1,0<CR><LF> Description: Get amplified output 2 Hi-Z/lo-Z state.

Function	Description	Syntax	Parameters/Attributes	Example
AUD-MONO-MODE	Set output select state when audio in HI-Z mode only for amplified audio output. <i>These commands are active only when the state is HI-Z, otherwise an error is returned.</i>	Command: #AUD-MONO-MODE io_index, mono_mode<CR> Feedback: ~nn@AUD-MONO-MODE E io_index, mono_mode<CR><LF>	io_index – Number that indicates the specific amplified output port: 1 - AMP1 2 - APM2 mono_mode – The mono output mode 0 – output is "stereo mix to mono" – both left and right mix to one channel 1 – output is "left to mono" – duplicate left channel information to the right and play both	Command: #AUD-MONO-MODE 2,0<CR> Feedback: ~nn@AUD-MONO-MODE 2,0<CR><LF> Description: Set the amplified audio output 2 to mix to mono.
AUD-MONO-MODE?	Get output select state when audio in HI-Z mode only for amplified audio output. These commands are active only when the state is HI-Z, otherwise an error is returned.	Command: #AUD-MONO-MODE? io_index<CR> Feedback: ~nn@AUD-MONO-MODE E io_index, mono_mode<CR><LF>	io_index – Number that indicates the specific amplified output port: 1 - AMP1 2 - APM2 mono_mode – The mono output mode 0 – output is "stereo mix to mono" – both left and right mix to one channel 1 – output is "left to mono" – duplicate left channel information to the right and play both	Command: #AUD-MONO-MODE 2,0<CR> Feedback: ~nn@AUD-MONO-MODE 2,0<CR><LF> Description: Get the amplified audio output 2 mono mode.
AUD-STANDBY	Set standby mode for amplified audio output.	Command: #AUD-STANDBY io_index,standby_mode,thresholdDb,m_delay<CR> Feedback: ~nn@AUD-STANDBY io_index,standby_mode,thresholdDb,m_delay<CR><LF>	io_index – Number that indicates the specific amplified output port: 1 - AMP1 2 - APM2 standby_mode – Standby mode 0 – Off 1 – Delayed – auto mode thresholdDb – amplified input level indicating when a signal is not present, range -100 to 0dB m_delay – Time delay (5, 10, or 15min) moving to standby mode.	Command: #AUD-STANDBY 2,1,-80,10<CR> Feedback: ~nn@AUD-STANDBY 2,1,-80,10<CR><LF> Description: Set the amplified audio output 2 the standby delay time to 10 minutes.
AUD-STANDBY?	Get standby mode for amplified audio output.	Command: #AUD-STANDBY? io_index<CR> Feedback: ~nn@AUD-STANDBY? io_index,standby_mode,thresholdDb,m_delay<CR><LF>	io_index – Number that indicates the specific amplified output port: 1 - AMP1 2 - APM2 standby_mode – Standby mode 0 – Off 1 – Delayed – auto mode thresholdDb – amplified input level indicating when a signal is not present, range -100 to 0dB	Command: #AUD-STANDBY? 2<CR> Feedback: ~nn@AUD-STANDBY 2,1,-80,10<CR><LF> Description: Get the amplified audio output 2 the standby state.

Function	Description	Syntax	Parameters/Attributes	Example
			m_delay – Time delay (5, 10, or 15min) moving to standby mode.	
DSP-INVERT	Set DSP phase inversion state.	Command: #DSP-INVERT <direction_type>.<port_type>.<port_index>,value<CR> Feedback: ~nn@DSP-INVERT <direction_type>.<port_type>.<port_index>,value<CR><LF>	<direction_type> – o IN o OUT <port_type> – o HDMI o ANALOG_AUDIO o AMPLIFIED_AUDIO o MIC o BYOD o USB_C o DANTE o UAC o H264 <port_index> – The port number as printed on the front or rear panel For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 DANTE -- 1 to 8 UAC -- 1 to 2 USB_C-- 1 (RECORD) H264 – 1 For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 MIC-- 1 to 4 DANTE -- 1 to 8 USB_C-- 1 to 2 UAC-- 1 to 2 BYOD—1 value – 0– off 1 – on	Command: #DSP-INVERT IN.ANALOG_AUDIO.2,0<CR> Feedback: ~nn@DSP-INVERT IN.ANALOG_AUDIO.2,0<CR><LF> Description: Set phase inversion state input 2 to off.

Function	Description	Syntax	Parameters/Attributes	Example
DSP-INVERT?	Get DSP phase inversion state.	Command: #DSP-INVERT? <direction_type>.<port_type>.<port_index><CR> Feedback: ~nn@DSP-INVERT <direction_type>.<port_type>.<port_index>,value<CR><LF>	<direction_type> – o IN o OUT <port_type> – o HDMI o ANALOG_AUDIO o AMPLIFIED_AUDIO o MIC o BYOD o USB_C o DANTE o UAC o H264 <port_index> – The port number as printed on the front or rear panel For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 DANTE -- 1 to 8 UAC -- 1 to 2 USB_C -- 1 (RECORD) H264 -- 1 For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 MIC -- 1 to 4 DANTE -- 1 to 8 USB_C -- 1 to 2 UAC -- 1 to 2 BYOD —1 value – 0 – off 1 – on	Command: #DSP-INVERT? IN.ANALOG_AUDIO.2<CR> Feedback: ~nn@DSP-INVERT IN.ANALOG_AUDIO.2,0<CR><LF> Description: Get phase inversion state on input 2.

Function	Description	Syntax	Parameters/Attributes	Example
DSP-AFS	Set DSP Auto Feedback Suppression Module.	Command: #DSP-AFS field_id,<direction_type>. <port_type>.<port_index>, band,value<CR> Feedback: ~nn@DSP-AFS field_id,<direction_type>. <port_type>.<port_index>, band,value<CR><LF>	Field_id o Threshold o MaxDepth o NotchStep o level o freq o fix o Bypass <direction_type> – IN <port_type> – o MIC <port_index> – The port number as printed on the front or rear panel For MIC – 1 to 4 band – 0 to 8 // For Threshold/MaxDepth/NotchStep/Bypass, band = 0 value – For Threshold [dB] -60 to 0 For MaxDepth [dB] -1 to -256 For NotchStepSize [dB] 1 to 16 db For level [dB] 0 to 255 For freq [Hz] 20 to 20K For Fix[0/1] For bypass 0 – off 1 – on	Command: #DSP-AFS Threshold,IN.MIC.1,0,-20<CR> Feedback: ~nn#DSP-AFS Threshold,IN.MIC.1,0,-20<CR> Description: Note: for Threshold/MaxDepth/NotchStep/Bypass, band = 0; for level/freq/fix, the range of band is 1~8, 1~8 has its corresponding value of level/freq/fix respectively #DSP-AFS level, IN.MIC.1,1,20<CR>
DSP-AFS?	Get DSP Auto Feedback Suppression Module.	Command: #DSP-AFS? field_id,<direction_type>. <port_type>.<port_index>, band<CR> Feedback: ~nn@DSP-AFS field_id,<direction_type>. <port_type>.<port_index>, band,value<CR><LF>	Field_id o Threshold o MaxDepth o NotchStep o level o freq o fix o Bypass <direction_type> – IN <port_type> – o MIC <port_index> – The port number as printed on the front or rear panel For MIC – 1 to 4 band –	Command: #DSP-AFS? Threshold,IN.MIC.1,0<CR> Feedback: ~nn#DSP-AFS Threshold,IN.MIC.1,0,-20<CR> >

Function	Description	Syntax	Parameters/Attributes	Example
			0 to 8 // for Threshold/MaxDepth/NotchStep/Bypass , band = 0 value – For Threshold [dB] -60 to 0 For MaxDepth [dB] -1 to -256 For NotchStepSize [dB] 1 to 16 db For level [dB] 0 to 255 For freq [Hz] 20 to 20K For Fix[0/1] For bypass 0 – off 1 – on	
DSP-AEC	Set DSP AEC state.	Command: #DSP-AEC field_id,<direction_type>. <port_type>.<port_index>, aecmodel,value<CR> Feedback: ~nn@DSP-AEC field_id,<direction_type>. <port_type>.<port_index>, aecmodel,value<CR><LF>	Field_id o Denoise o Bypass <direction_type> – o IN <port_type> – o MIC o DANTE <port_index> – The port number as printed on the front or rear panel MIC-- 1 to 4 DANTE -- 1 to 8 aecmodel – 1 to 2 1 - AEC model 1 2 - AEC model 2 value – For denoise- 0 to 3 0 - Noise suppression off 1 - Noise suppression for basic audio on 2 - Noise suppression for speech on 3 - Noise suppression for basic audio and speech on For bypass 0 – off 1 – on	Command: #DSP-AEC Bypass,IN.MIC.2,1,0<CR> Feedback: ~nn@DSP-AEC Bypass,IN.MIC.2,1,0<CR><LF> > Description: Turn on AEC for Mic input 2.
DSP-AEC?	Get DSP AEC state.	Command: #DSP-AEC? field_id,<direction_type>. <port_type>.<port_index> ><CR> Feedback: ~nn@DSP-AEC field_id,<direction_type>. <port_type>.<port_index>, aecmodel,value<CR><LF>	Field_id o Denoise o Bypass <direction_type> – o IN <port_type> – o MIC o DANTE <port_index> – The port number as printed on the front or rear panel MIC-- 1 to 4	Command: #DSP-AEC? Bypass,IN.MIC.2,1,0<CR> Feedback: ~nn@DSP-AEC Bypass,IN.MIC.2,1,0<CR><LF> > Description: Turn on AEC for Mic input 2.

Function	Description	Syntax	Parameters/Attributes	Example
			DANTE -- 1 to 8 aecmodel – 1 to 2 1 - AEC model 1 2 - AEC model 2 value – For denoise- 0 to 3 0 - Noise suppression off 1 - Noise suppression for basic audio on 2 - Noise suppression for speech on 3 - Noise suppression for basic audio and speech on For bypass 0 – off 1 – on	
DSP-EXP	Set DSP expander.	Command: #DSP-EXP field_id,<direction_type>. <port_type>.<port_index>, value<CR> Feedback: ~nn@DSP-EXP field_id,<direction_type>. <port_type>.<port_index>, value<CR><LF>	Field_id o Attack o Release o Threshold o Ratio o Bypass <direction_type> – IN <port_type> – o ANALOG_AUDIO o MIC <port_index> – The port number as printed on the front or rear panel For ANALOG_AUDIO – 1 to 6 For MIC – 1 to 4 value – For attack [ms] 1 to 500 For release time [ms] 1 to 2000 For threshold [dB] -100 to 0 For ratio [1 to 100]:1 For bypass 0 – off 1 – on	Command: #DSP-EXP attack,IN.ANALOG_AUDIO.2, 50<CR> Feedback: ~nn@DSP-EXP attack,IN.ANALOG_AUDIO.2, 50<CR><LF> Description: Set attack time on input 2 to 50.

Function	Description	Syntax	Parameters/Attributes	Example
DSP-EXP?	Get DSP expander.	Command: #DSP-EXP? field_id,<direction_type>. <port_type>.<port_index><CR> Feedback: ~nn@DSP-EXP field_id,<direction_type>. <port_type>.<port_index>,<value><CR><LF>	Field_id - o Attack - o Release - o Threshold - o Ratio - o Expansion - o Bypass <direction_type> – IN <port_type> – - o ANALOG_AUDIO - o MIC <port_index> – The port number as printed on the front or rear panel For ANALOG_AUDIO – 1 to 6 For MIC – 1 to 4 value – - For attack [ms] 1 to 500 - For release time [ms] 1 to 2000 - For threshold [dB] -100 to 0 - For ratio [1 to 100]:1 - For expansion [dB] -100 to 0 - For bypass 0 – off 1 – on	Command: #DSP-EXP? attack,IN.ANALOG_AUDIO.2<CR> Feedback: ~nn@DSP-EXP attack,IN.ANALOG_AUDIO.2,50<CR><LF> Description: Get attack time on input 2.
DSP-HPF	Set DSP HPF.	Command: #DSP-HPF field_id,<direction_type>. <port_type>.<port_index>,<value><CR> Feedback: ~nn@DSP-HPF field_id,<direction_type>. <port_type>.<port_index>,<value><CR><LF>	Field_id - o freq - o bypass <direction_type> – - o IN - o OUT <port_type> – - o ANALOG_AUDIO - o MIC - o AMPLIFIED_AUDIO <port_index> – The port number as printed on the front or rear panel For OUT: ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 For IN: ANALOG_AUDIO -- 1 to 6 MIC -- 1 to 4 value – - For freq [Hz] 20 to 20K - For bypass 0 – off 1 – on	Command: #DSP-HPF bypass,IN.ANALOG_AUDIO.2,0<CR> Feedback: ~nn@DSP-HPF bypass,IN.ANALOG_AUDIO.2,0<CR><LF> Description: Set bypass status on input 2 to off. eg2: Set DSP HFP 200hz on analog audio input 2 when bypass is off. #DSP-HPF freq,IN.ANALOG_AUDIO.2,200

Function	Description	Syntax	Parameters/Attributes	Example
DSP-HPF?	Get DSP HPF.	Command: #DSP-HPF? field_id,<direction_type>. <port_type>.<port_index> ><CR> Feedback: ~nn@DSP-HPF field_id,<direction_type>. <port_type>.<port_index> >,value<CR><LF>	Field_id o freq o bypass <direction_type> – o IN o OUT <port_type> – o ANALOG_AUDIO o MIC o AMPLIFIED_AUDIO <port_index> – The port number as printed on the front or rear panel For OUT: ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 For IN: ANALOG_AUDIO -- 1 to 6 MIC-- 1 to 4 value – For freq [Hz] 20 to 20K For bypass 0 – off 1 – on	Command: #DSP-HPF? bypass,IN.ANALOG_AUDIO.2 <CR> Feedback: ~nn@DSP-HPF bypass,IN.ANALOG_AUDIO.2, 0<CR><LF> ~nn@DSP-HPF freq,IN.ANALOG_AUDIO.2,20 0 Description: Get HPF status on input 2.
DSP-COMP	Set DSP compressor values.		Field_id o Attack o Release o Threshold o Ratio o Bypass <direction_type> – IN <port_type> – o ANALOG_AUDIO o MIC <port_index> – The port number as printed on the front or rear panel For ANALOG_AUDIO – 1 to 6 For MIC – 1 to 4 value – For attack [ms] 1 to 500 For release time [ms] 1 to 2000 For threshold [dB] -100 to 0 For ratio [1 to 100]:1 For bypass [ms] 0– off 1 – on	Command: #DSP-COMP attack,IN.ANALOG_AUDIO.3, 15<CR> Feedback: ~nn@DSP-COMP attack,IN.ANALOG_AUDIO.3, 15<CR><LF> Description: Set compressor attack time on input 3 to 15ms.

Function	Description	Syntax	Parameters/Attributes	Example
DSP-COMP?	Get DSP compressor values.	Command: #DSP-COMP? field_id,<direction_type>. <port_type>.<port_index> > <CR> Feedback: ~nn@DSP-COMP field_id,<direction_type>. <port_type>.<port_index> >,value<CR><LF>	Field_id - o Attack - o Release - o Threshold - o Ratio - o Compression - o Bypass <direction_type> – IN <port_type> – - o ANALOG_AUDIO - o MIC <port_index> – The port number as printed on the front or rear panel For ANALOG_AUDIO – 1 to 6 For MIC – 1 to 4 value – - For attack [ms] 1 to 500 - For release time [ms] 1 to 2000 - For threshold [dB] -100 to 0 - For ratio [1 to 100]:1 - For compensation [dB] -100 to 0 - For bypass [ms] 0– off 1 – on	Command: #DSP-COMP? attack,IN.ANALOG_AUDIO.3<CR> Feedback: ~nn@DSP-COMP attack,IN.ANALOG_AUDIO.3, 15<CR><LF> Description: Get compressor attack time on input 3.
DSP-EQ	Set DSP equalizer.	Command: #DSP-EQ field_id,<direction_type>. <port_type>.<port_index> >,band,value<CR> Feedback: ~nn@DSP-EQ field_id,<direction_type>. <port_type>.<port_index> >,band,value<CR><LF>	Field_id - o level - o freq - o qfactor - o band-bypass <direction_type> – - o IN - o OUT <port_type> – - o ANALOG_AUDIO - o MIC - o AMPLIFIED_AUDIO <port_index> – The port number as printed on the front or rear panel For IN: For ANALOG_AUDIO – 1 to 6 For MIC – 1 to 4 For OUT: For ANALOG_AUDIO – 1 to 8 For AMPLIFIED_AUDIO -- 1 to 2 band – - For IN	Command: #DSP-EQ level,IN.ANALOG_AUDIO.2,1, 12<CR> Feedback: ~nn@DSP-EQ level,IN.ANALOG_AUDIO.2,1, 12<CR><LF> Description: Set EQ level on input 2 to 12. eg: #DSP-EQ band-bypass OUT.ANALOG_AUDIO.2,0,1-- 整个 EQ 模块设置 off, 即 Bypass 通道, 不经过 EQ 模块 #DSP-EQ band-bypass OUT.ANALOG_AUDIO.2,1,1-- 这个 EQ 模块在 ON 的情况下, 设置 band 1 为 Bypass

Function	Description	Syntax	Parameters/Attributes	Example
			1 to 4 For OUT 1 to 8 For bypass 0 – global bypass 1,2,3,4 – for each band value – For level [dB] -30 to 15 For freq [Hz] 20 to 20K For qfactor [Oct] 0.01 to 4 For bypass [ms] 0– global bypass 1,2,3,4,5,6,7,8 – for each band	
DSP-EQ?	Get DSP equalizer.	Command: #DSP-EQ? field_id,<direction_type>. <port_type>.<port_index> ><CR> Feedback: ~nn@DSP-EQ field_id,<direction_type>. <port_type>.<port_index> >,band,value<CR><LF>	Field_id o level o freq o qfactor o band-bypass <direction_type> – o IN o OUT <port_type> – o ANALOG_AUDIO o MIC o AMPLIFIED_AUDIO <port_index> – The port number as printed on the front or rear panel For IN: For ANALOG_AUDIO – 1 to 6 For MIC – 1 to 4 For OUT: For ANALOG_AUDIO – 1 to 8 For AMPLIFIED_AUDIO -- 1 to 2 band – For IN 1 to 4 For OUT 1 to 8 For bypass 0– global bypass 1,2,3,4 – for each band value – For level [dB] -30 to 15 For freq [Hz] 20 to 20K For qfactor [Oct] 0.01 to 4 For bypass [ms] 0– global bypass 1,2,3,4,5,6,7,8 – for each	Command: #DSP-EQ? band-bypass,IN.ANALOG_AUDIO.2,0<CR> Feedback: ~nn@DSP-EQ band-bypass,IN.ANALOG_STEREO.1,0,1 <CR><LF> Description: Get global bypass state for EQ on input 2:

Function	Description	Syntax	Parameters/Attributes	Example
			band	
DSP-DELAY	Set DSP delay.	Command: #DSP-DELAY field_id,<direction_type>. <port_type>.<port_index> > ,value<CR> Feedback: ~nn@#DSP-DELAY field_id,<direction_type>. <port_type>.<port_index> >,value<CR><LF>	Field_id o Delay o Bypass <direction_type> – o IN o OUT <port_type> – o HDMI o ANALOG_AUDIO o AMPLIFIED_AUDIO o MIC o BYOD o USB_C o DANTE o UAC o H264 <port_index> –The port number as printed on the front or rear panel For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 DANTE -- 1 to 8 UAC -- 1 to 2 USB_C-- 1 (RECORD) H264 -- 1 ALL For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 MIC-- 1 to 4 DANTE -- 1 to 8 USB_C-- 1 to 2 UAC-- 1 to 2 BYOD—1 value – For delay time [ms] 0 to 500 For bypass 0— off 1 – on	Command: #DSP-DELAY delay,OUT.ANALOG_AUDIO. 2,75<CR> Feedback: ~nn@DSP-DELAY delay,ANALOG_AUDIO.2,75<CR><LF> Description: Set delay time on ANALOG AUDIO OUT2 to 75.

Function	Description	Syntax	Parameters/Attributes	Example
DSP-DELAY?	Get DSP delay.	Command: #DSP-DELAY? field_id,<direction_type>. <port_type>.<port_index> ><CR> Feedback: ~nn@#DSP-DELAY field_id,<direction_type>. <port_type>.<port_index> >,value<CR><LF>	Field_id o Delay o Bypass <direction_type> – o IN o OUT <port_type> – o HDMI o ANALOG_AUDIO o AMPLIFIED_AUDIO o MIC o BYOD o USB_C o DANTE o UAC o H264 <port_index> – The port number as printed on the front or rear panel For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 DANTE -- 1 to 8 UAC -- 1 to 2 USB_C-- 1 (RECORD) H264 -- 1 ALL For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 MIC-- 1 to 4 DANTE -- 1 to 8 USB_C-- 1 to 2 UAC-- 1 to 2 BYOD—1 value – For delay time [ms] 0 to 500 For bypass 0— off 1 – on	Command: #DSP-DELAY? delay,OUT.ANALOG_AUDIO. 2<CR> Feedback: ~nn@DSP-DELAY delay,ANALOG_AUDIO.2,75<CR><LF> Description: Get delay time on ANALOG AUDIO OUT2.

Function	Description	Syntax	Parameters/Attributes	Example
DSP-LPF	Set DSP LPF.	Command: #DSP-LPF field_id,<direction_type>. <port_type>.<port_index>, >,value<CR> Feedback: ~nn@DSP-LPF field_id,<direction_type>. <port_type>.<port_index>, >,value<CR><LF>	Field_id o freq o bypass <direction_type> – o OUT <port_type> – o ANALOG_AUDIO o AMPLIFIED_AUDIO <port_index> – The port number as printed on the front or rear panel For ANALOG_AUDIO – 1 to 8 For AMPLIFIED_AUDIO -- 1 to 2 value – For freq [Hz] 20 to 20K For bypass 0– off 1 – on	Command: #DSP-LPF bypass,OUT.ANALOG_AUDIO .2,0<CR> Feedback: ~nn@DSP-LPF bypass,OUT.ANALOG_AUDIO .2,0<CR><LF> Description: Set bypass status on analog out 2 to off. eg2: Set DSP LFP 2000hz on analog out 2 when bypass is off. #DSP-LPF freq,OUT.ANALOG_AUDIO.2. 2000
DSP-LPF?	Get DSP LPF.	Command: #DSP-LPF? field_id,<direction_type>. <port_type>.<port_index> ><CR> Feedback: ~nn@DSP-LPF field_id,<direction_type>. <port_type>.<port_index> >,value<CR><LF>	Field_id o freq o bypass <direction_type> – o OUT <port_type> – o ANALOG_AUDIO o AMPLIFIED_AUDIO <port_index> – The port number as printed on the front or rear panel For ANALOG_AUDIO – 1 to 8 For AMPLIFIED_AUDIO -- 1 to 2 value – For freq [Hz] 20 to 20K For bypass 0– off 1 – on	Command: #DSP-LPF? bypass,OUT.ANALOG_AUDIO .2<CR> Feedback: ~nn@DSP-LPF bypass,OUT.ANALOG_AUDIO .2,0<CR><LF> ~nn@DSP-LPF freq,OUT.ANALOG_AUDIO.2, 2000 Description: Get HPF status analog out 2.
DSP-LIMITER	Set DSP limiter.	Command: #DSP-LIMITER field_id,<direction_type>. <port_type>.<port_index> >, >,value<CR> Feedback: ~nn@#DSP-LIMITER field_id,<direction_type>. <port_type>.<port_index>	Field_id o Threshold o Bypass <direction_type> – o OUT <port_type> – o HDMI o ANALOG_AUDIO o DANTE o AMPLIFIED_AUDIO	Command: #DSP-LIMITER bypass,OUT.ANALOG_STEREO.1 ,1<CR> Feedback: ~nn@DSP-LIMITER bypass,OUT.ANALOG_STEREO.1 ,1<CR><LF>

Function	Description	Syntax	Parameters/Attributes	Example
		> ,value<CR><LF>	- o USB_C - o UAC - o H264 <port_index> – The port number as printed on the front or rear panel For ANALOG_AUDIO – 1 to 8 For DANTE – 1 to 8 For AMPLIFIED_AUDIO -- 1 to 2 For USB_C-- 1 (RECORD) For HDMI -- 1 to 8 For UAC -- 1 to 2 For H264 – 1 <signal_type> – - o AUDIO <index> – 1 to 2 value – For threshold [dB] -100 to 0 For bypass [ms] 0– off 1 – on	Description: Set bypass status on output to ON.
DSP-LIMITER?	Get DSP limiter.	Command: #DSP-LIMITER? field_id,<direction_type>. <port_type>.<port_index> ><CR> Feedback: ~nn@#DSP-LIMITER field_id,<direction_type>. <port_type>.<port_index> >,value<CR><LF>	Field_id - o Threshold - o Bypass <direction_type> – - o OUT <port_type> – - o HDMI - o ANALOG_AUDIO - o DANTE - o AMPLIFIED_AUDIO - o USB_C - o UAC - o H264 <port_index> – The port number as printed on the front or rear panel For ANALOG_AUDIO – 1 to 8 For DANTE – 1 to 8 For AMPLIFIED_AUDIO -- 1 to 2 For USB_C-- 1 (RECORD) For HDMI -- 1 to 8 For UAC -- 1 to 2 For H264 – 1 <signal_type> – - o AUDIO <index> – 1 to 2 value – For threshold [dB] -100 to 0 For bypass [ms]	Command: #DSP-LIMITER? bypass,OUT.ANALOG_STEREO.1<CR> Feedback: ~nn@DSP-LIMITER bypass,OUT.ANALOG_STEREO.1 ,1<CR><LF> Description: Get bypass status on output.

Function	Description	Syntax	Parameters/Attributes	Example
			0 – off 1 – on	
DSP-DUCK	Set DSP duck.	Command: #DSP-DUCK field_id,<direction_type>. <port_type>.<port_index>, value<CR> Feedback: ~nn@DSP-DUCK field_id,<direction_type>. <port_type>.<port_index>, value<CR><LF>	Field_id - o Attack - o Hold - o Release - o Threshold - o Depth - o Enable - o Priority1 - o Priority2 <direction_type> – OUT <port_type> – - o ANALOG_AUDIO - o AMPLIFIED_AUDIO - o DANTE - o UAC <port_index> – The port number as printed on the front or rear panel For ANALOG_AUDIO – 1 to 2 For AMPLIFIED_AUDIO – 1 to 2 (APM1,AMP2) For DANTE – 1 For UAC – 1 (HOST1 HOST2) value – For attack [ms] 1~500ms, in 1ms steps For hold [ms] 1~500 ms, in 1ms steps For release time [ms] 1~2000ms, in 1ms steps For threshold [dB] -90~+10db, in 0.5dB step For Depth [dB] -40 to 0, in 1dB step For enable 0 – off 1 – on For Priority1/2 [audio input port] HDMI.1 to HDMI.8 ANALOG_AUDIO.1 to ANALOG_AUDIO.6 MIC.1 to MIC.4 DANTE.1 to DANTE.8 USB_C.1 to USB_C.2 UAC.1 to UAC.2 BYOD	Command: #DSP-DUCK bypass,OUT.AMPLIFIED_AUDIO.1,off<CR> Feedback: ~nn@DSP-DUCK bypass,OUT.AMPLIFIED_AUDIO.1,off<CR><LF> Description: Set duck function on for amplified audio output1. eg: Set MIC2 as the first priority duck source for the amplified audio output1. #DSP-DUCK Priority1,OUT.AMPLIFIED_AUDIO.1,MIC.2<CR>

Function	Description	Syntax	Parameters/Attributes	Example
DSP-DUCK?	Get DSP duck.	Command: #DSP-DUCK? field_id,<direction_type>. <port_type>.<port_index><CR> Feedback: ~nn@DSP-DUCK field_id,<direction_type>. <port_type>.<port_index>,<value><CR><LF>	Field_id - o Attack - o Hold - o Release - o Threshold - o Depth - o Enable - o Priority1 - o Priority2 <direction_type> – OUT <port_type> – - o ANALOG_AUDIO - o AMPLIFIED_AUDIO - o DANTE - o UAC <port_index> – The port number as printed on the front or rear panel For ANALOG_AUDIO – 1 to 2 For AMPLIFIED_AUDIO – 1 to 2 (APM1,AMP2) For DANTE – 1 For UAC – 1 (HOST1 HOST2) value – For attack [ms] 1~500ms, in 1ms steps For hold [ms] 1~500 ms, in 1ms steps For release time [ms] 1~2000ms, in 1ms steps For threshold [dB] -90~+10db, in 0.5dB step For Depth [dB] -40 to 0, in 1dB step For enable 0 – off 1 – on For Priority1/2 [audio input port] HDMI.1 to HDMI.8 ANALOG_AUDIO.1 to ANALOG_AUDIO.6 MIC.1 to MIC.4 DANTE.1 to DANTE.8 USB_C.1 to USB_C.2 UAC.1 to UAC.2 BYOD	Command: #DSP-DUCK? attack,OUT.AMPLIFIED_AUDIO 0.2<CR> Feedback: ~nn@DSP-DUCK attack,OUT.AMPLIFIED_AUDIO 0.2,50<CR><LF>

Function	Description	Syntax	Parameters/Attributes	Example
DSP-METER?	Read DSP meters.	Command: #DSP-METER? <direction_type>.<port_type>.<port_index>,type<CR> Feedback: ~nn@DSP-METER <direction_type>.<port_type>.<port_index>,type,value<CR><LF>	<direction_type> – o IN o OUT <port_type> – o HDMI o ANALOG_AUDIO o AMPLIFIED_AUDIO o MIC o BYOD o USB_C o DANTE o UAC o H264 <port_index> – The port number as printed on the front or rear panel For OUT: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 8 AMPLIFIED_AUDIO -- 1 to 2 DANTE -- 1 to 8 UAC -- 1 to 2 USB_C -- 1 (RECORD) H264 -- 1 For IN: HDMI -- 1 to 8 ANALOG_AUDIO -- 1 to 6 DANTE -- 1 to 8 USB_C -- 1 to 2 UAC -- 1 to 2 type – 1– Gain. 2 – Post-gain (for output only). 3– Expander (for input only). 4 – Compressor (for input only). 5 – Limiter (for output only). value – [dBFS]	

Result and Error Codes

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

- ~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_	1	Protocol

Error Name	Error Code	Description
ERR_COMMAND_NOT_AVAILABLE	2	Command not available
ERR_PARAMETER_OUT_OF_RANGE	3	Parameter out of range
ERR_UNAUTHORIZED_ACCESS	4	Unauthorized access
ERR_INTERNAL_FW_ERROR	5	Internal FW error
ERR_BUSY	6	Protocol busy
ERR_WRONG_CRC	7	Wrong CRC
ERR_TIMEOUT	8	Timeout
ERR_RESERVED	9	(Reserved)
ERR_FW_NOT_ENOUGH_SPACE	10	Not enough space for data (firmware, FPGA...)
ERR_FS_NOT_ENOUGH_SPACE	11	Not enough space – file system
ERR_FS_FILE_NOT_EXISTS	12	File does not exist
ERR_FS_FILE_CANT_CREATED	13	File can't be created
ERR_FS_FILE_CANT_OPEN	14	File can't open
ERR_FEATURE_NOT_SUPPORTED	15	Feature is not supported
ERR_RESERVED_2	16	(Reserved)
ERR_RESERVED_3	17	(Reserved)
ERR_RESERVED_4	18	(Reserved)
ERR_RESERVED_5	19	(Reserved)
ERR_RESERVED_6	20	(Reserved)
ERR_PACKET_CRC	21	Packet CRC error
ERR_PACKET_MISSED	22	Packet number isn't expected (missing packet)
ERR_PACKET_SIZE	23	Packet size is wrong
ERR_RESERVED_7	24	(Reserved)
ERR_RESERVED_8	25	(Reserved)
ERR_RESERVED_9	26	(Reserved)
ERR_RESERVED_10	27	(Reserved)
ERR_RESERVED_11	28	(Reserved)
ERR_RESERVED_12	29	(Reserved)
ERR_EDID_CORRUPTED	30	EDID corrupted
ERR_NON_LISTED	31	Device specific errors
ERR_SAME_CRC	32	File has the same CRC – not changed
ERR_WRONG_MODE	33	Wrong operation mode
ERR_NOT_CONFIGURED	34	Device/chip was not initialized



HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

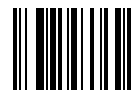


P/N:



2900-301663

Rev:



3



SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

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

We welcome your questions, comments, and feedback.

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