User Manual

v1.0.1

Contents

Overview

This product is a fixed 2RU 10x7 fast seamless switching matrix with multi-format video connections and easy-to-use audio DSP. It builds in 4K60 scaler on all video outputs, and features seamless transition when switching video inputs. It supports flexible video connection for both local and remote applications, include USB-C, HDBaseT 3.0, and NHD-500 AV over IP. The USB-C input is fully featured, which supports 4K60, USB 3.1 gen1, 1G network and PD 3.0 USB host charging up to 60watts. The HDBaseT3.0 input and outputs are built-in with VS3000 technology to extend 4K60 plus USB2.0 and control signals up to 330ft/100m over a single Cat 6a or above. The NetworkHD uses Wyrestorm NHD-500 technology to transmit 4K60 plus USB2.0 and control signals over a single 1Gbps IT network. The NetworkHD capabilities are introduced to help spill-over applications between different rooms, especially more than 330ft/100m by connecting via network switch.

The matrix features multiple audio inputs and outputs, analog and digital, and easy-to-use audio DSP to facilitate installation. It includes analog microphone inputs, Dante 4x4 digital inputs and outputs, USB audio and line audio outputs. It also supports to convert DSP audio to USB and feed to host PC for conferencing applications.

The matrix is also integration friendly with flexible control options, including front panel buttons, RS-232 and LAN control (Telnet & Web UI). And it supports Wyrestorm Sigma cloud connection and control for reboot, firmware upgrade and other features.

The matrix is designed for professional markets, such as corporate training rooms, hotel meeting rooms, and university classrooms.

Features

- Inputs and outputs support resolutions up to 4K@60Hz 4:4:4 8bit.
- Supports HDCP 2.3 and backward compatible.
- All outputs support free scaler from 480p to 2160p, which include HDMI, HDBaseT 3.0 and NHD-500. It provides fast seamless transition without seeing black screen.
- Full-featured USB-C input port, supports 4K@60Hz, USB 3.1 gen1, 1G network, and PD 3.0 charging up to 60 watts.
- HDBaseT 3.0 capabilities:
  - All HDBaseT 3.0 ports support A/V, control signals, USB 2.0 up to 300Mbps and PoE (PSE) functions;
  - All HDBaseT 3.0 ports are built-in with VS3000, to extend bundled signals up to 100m/330ft over a single Cat6a or above cable.
- The NHD-500 capabilities:
  - All NHD-500 ports support A/V, control signals, USB 2.0 for spill-over applications
  - NHD-500 supports to transmit 4K60 for 330ft/100m over a single Cat 6a cable, or even longer via 1Gbps network switch.
- Supports USB host switching and USB device extension:
  - Switching USB hosts include 1x USB3.0 type-C port, 2x local USB3.0 type-B ports, 1x HDBT input port and 1x NHD 500 input port associated USB connection;
  - USB devices include 4x local USB3.0 type-A ports, 2x HDBT OUT ports and 1x NHD 500 output port associated USB connections;
- Versatile audio inputs and outputs:

- Supports 2x Mic inputs, and 1x LINE input;
- Supports 1x USB audio input and 1x USB audio output, with 48KHz sampling frequency;
- Dante 4x4 with various sampling rates;
- HDMI audio de-embedding with sampling frequency up to 192KHz;
- Supports 2x Balanced audio outputs, and each of them has an independent mixer, and supports ducking.

- Audio DSP built-in, include gain control, high/low pass filters, compressor, expander, ducker, EQ, and volume control etc.
- Built-in 4-channel speaker outputs up to 4x 30watts@4ohm
- Supports RS-232 routing from matrix to extended outputs.
- Multiple control options, including front panel buttons, RS-232 and LAN (Web UI &Telnet).
- Sigma Cloud built-in.

Package Contents

- 1 x MX-1007-HYB Matrix
- 1 x AC Power Cord with US Pins
- 1 x AC Power Cord with EU Pins
- 1 x AC Power Cord with AU Pins
- 1 x AC Power Cord with UK Pins
- 1 x USB-C Cable (L = 2m)
- 3 x Phoenix Male Connector (3.5mm, 3 Pins)
- 4 x Phoenix Male Connector (3.5mm, 5 Pins)
- 2 x Phoenix Male Connector (5.08mm, 1 Pins)
- 1 x Phoenix Male Connector (3.5mm, 6 Pins)
- 2 x Mounting Brackets (2U, with Screws)
- 1 x Quick Start Guide

Specifications

Technical

Input/Output Ports	1 x USB-C IN, 7 x HDMI IN, 1 x HDBT IN, 1 x NHD 500 IN, 2 x HDBT OUT, 4 x HDMI OUT, 1 x NHD 500 OUT, 2 x MIC IN, 1 x LINE IN, 2 x LINE OUT, 2 x AMP OUT, 2 x USB HOST, 4 x USB DEVICE, 2 x ETHERNET, 1 x RS-232, 2 x RELAY, 1 x GPIO, 1 x Dante (RJ45 port), 1 x AC 100~240V 50/60Hz, 1 x RESET
Input/Output Video Type	4K@60Hz 4:4:4 8bit, HDCP 2.3
Input Resolution Supported	VESA: 800x600[8], 1024x768[8], 1280x768[8], 1280x800[8], 1280x960[8], 1280x1024[8],1360x768[8], 1366x768[8], 1440x900[8], 1600x900[8], 1600x1200[8], 1680x1050[8],1920x1200[8]

	SMPTE: 720x576P[6], 1280x720P[6,7,8], 1920x1080P[2,5,6,7,8], 3840x2160[2,3,5,6,8], 4096x2160[2,3,5,6,8] 2 = at 24 Hz, 3 = at 25 Hz, 5 = at 30 Hz, 6 = at 50 Hz, 7 = at 59.94 Hz, 8 = 60 Hz
Output Resolution Supported	3840x2160[8], 3840x2160[6], 3840x2160[5], 3840x2160[3], 3840x2160[2], 1920x1200[8], 1920x1080[8], 1920x1080[6], 1680x1050[8], 1600x1200[8], 1600x900[8], 1440x900[8], 1366x768[8], 1360x768[8], 1280x1024[8], 1280x960[8], 1280x800[8], 1280x768[8], 1280x720[8], 1280x720[6], 1024x768[8], 800x600[8] 2 = at 24 Hz, 3 = at 25 Hz, 5 = at 30 Hz, 6 = at 50 Hz, 7 = at 59.94 Hz, 8 = 60 Hz
Audio Format	USB-C/HDMI/HDBT/NHD/MIC IN/LINE IN/LINE OUT/AMP OUT: PCM 2.0
Maximum Data Rate	HDMI: 18Gbps USB-C: 5Gbps (per lane)
Control Method	Front panel buttons, RS232, LAN (Telnet API & Web UI)

General

Operating Temperature/RH	0°C ~ 45°C (32°F ~ 113°F)
Storage Temperature/RH	-20°C ~ 70°C (-4°F ~ 158°F)
Humidity	10% ~ 90%, non-condensing
ESD Protection	Human-body model: ±8kV (air-gap discharge)/ ±4kV (contact discharge)
Power Supply	AC 100~240V 50/60Hz
Power Consumption (max)	242.5W
Dimensions (W x H x D)	440mm x 88mm x 362mm/17.32” x 3.46” x 14.25” (Without mounting brackets)
Weight	8.68kg/19.14lbs
Rack Space Required	2U

Transmission Distance

Note:

- Straight-through category cable wired to T568B standard is recommended.
- For max HDMI 2.0 resolution recommended cable is: Cat 6a U/FTP or F/FTP.

Cat 5e/6	70m/230ft	4K@60Hz 4:2:0 36bpp 4K@30Hz 1080P@60Hz
Cat 5e/6	40m/131ft	4K@60Hz 4:4:4 24bpp

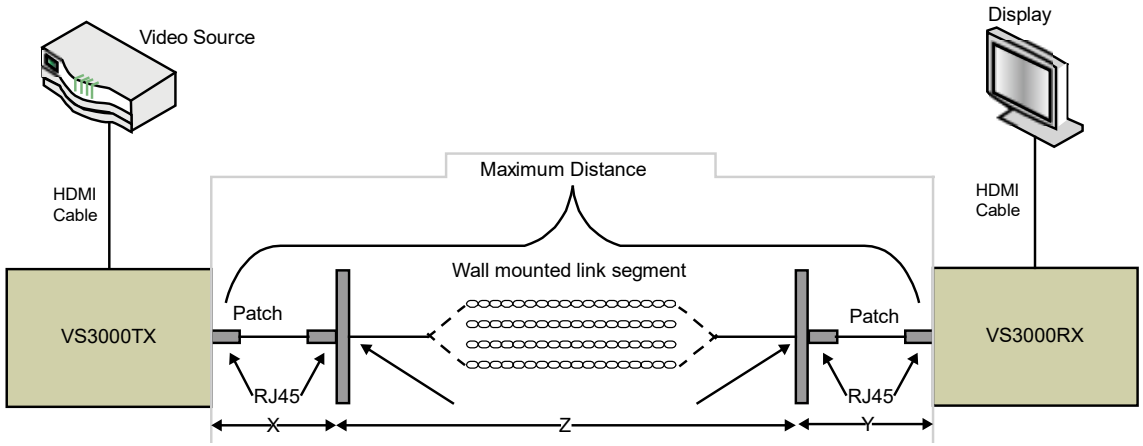
		4K@60Hz 4:2:2 36bpp
Cat 6a (U/FTP)	100m/330ft	4K@60Hz 4K@30Hz 1080P@60Hz

Use Patches

Note:

Patches may be used in the installation, and the patches will obviously affect the transmission distance. Limits and distances are as follows:

- Support up to 2 patch cables, each not exceeding 5m.
- Patches must be installed on both ends of the device, refer to the following pictures:



The standard specifies the following lengths for the three-segment cable installation:

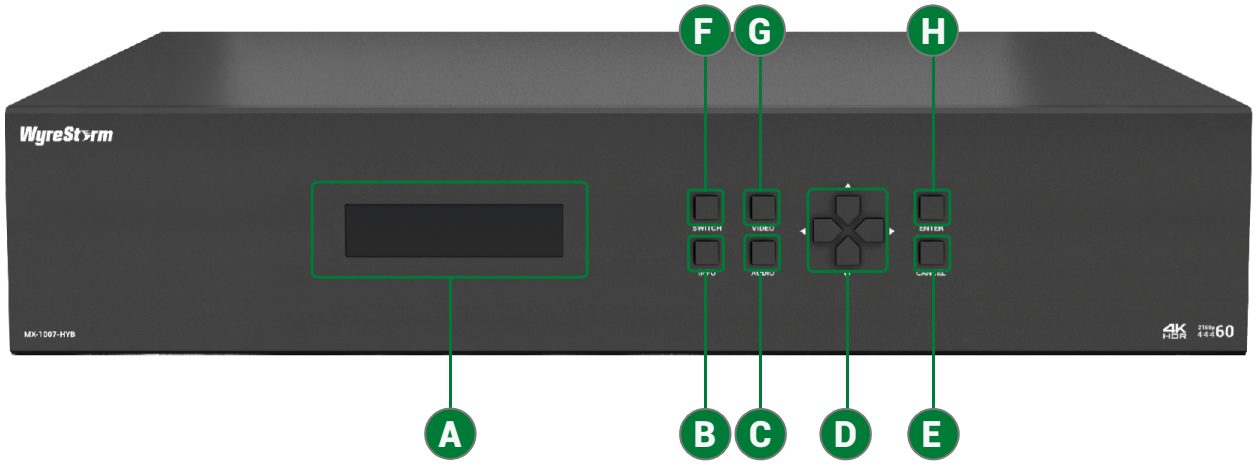
- X = Left-side patch cable length ≤ 5 [meter]
- Y = Right-side patch cable length ≤ 5 [meter]
- Z = Wall segment ≤ Maximum Distance – X – Y [meter]

Cat 5e/6	70m/230ft (with Patches)	4K@60Hz 4:2:0 36bpp 4K@30Hz 1080P@60Hz
Cat 5e/6	30m/100ft (with Patches)	4K@60Hz 4:4:4 24bpp 4K@60Hz 4:2:2 36bpp
Cat 6a (U/FTP)	70m/230ft (with Patches)	4K@60Hz 4:4:4 24bpp 4K@60Hz 4:2:2 36bpp
Cat 6a (U/FTP)	100m/330ft (with Patches)	4K@60Hz 4:2:0 36bpp 4K@30Hz 1080P@60Hz

Cat 6a or above (for NHD IN/OUT)	100m/330ft or more when connected with an Ethernet switcher	4K@60Hz 4:4:4 24bpp
HDMI	Input/Output: 15m/49ft	1080P@60Hz
	Input/Output: 10m/33ft	4K@30Hz 4:4:4 24bpp
	Input/Output: 5m/16ft	4K@60Hz 4:4:4 24bpp
USB Type-C	2m/7ft	4K@60Hz 4:4:4 24bpp

Panel Description

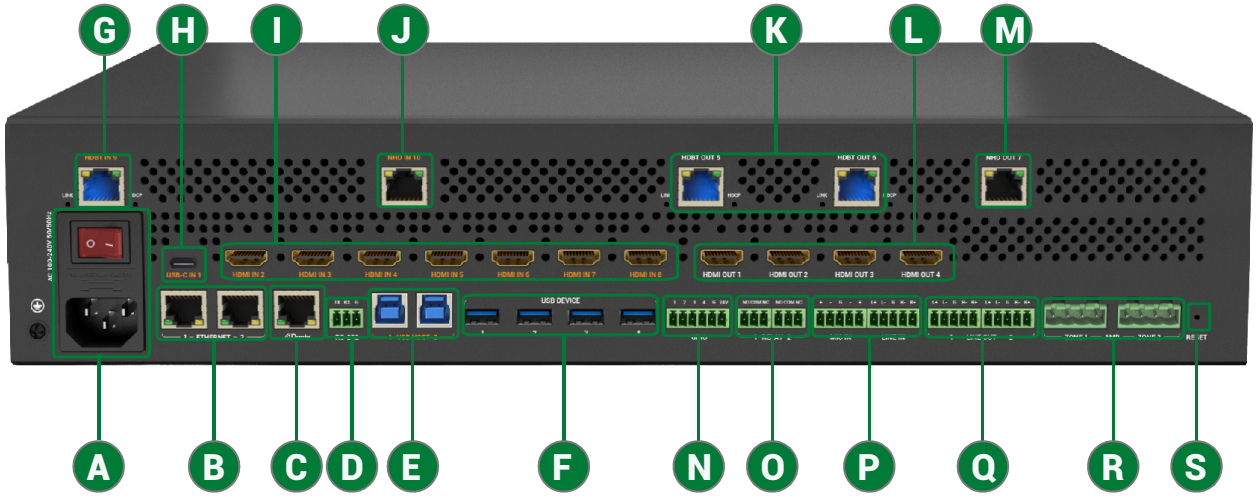
Front Panel



A	**LCD Indicator**	Display the information of the button operation.
B	**INFO Button**	Press the button, the LCD indicator window will display the device's information, including IP address, Fan speed, Mac address, firmware version and temperature.
C	**AUDIO Button**	Press the button, enter the volume adjustment mode.
D	**Selection Buttons**	• INFO: Press the four selection buttons to flip the page to display the information. • AUDIO: Press the left/right button to switch audio output channels. Press the up/down button to increase volume / decrease volume. • SWITCH: Press the left/right button to switch output. Press the up/down button to select input for the selected output. • VIDEO: Press the left/right button to switch input port. Press the up/down button to flip the page to display the video information.
E	**ENTER/CANCEL Button**	• ENTER: Press the button to perform the switching operation. • CANCEL: Press the button to cancel the operation or exit the current mode.

F	**SWITCH Button**	Press the button to enter input channel switch mode.
G	**VIDEO Button**	Press the button, the LCD indicator window will display the video information of selected input port, including resolution, color space, and HDCP.

Rear Panel



A	**AC 100~240V 50/60Hz Port and Power Button**	• AC 100~240V 50/60Hz Port: Connect to the power source via the provided AC power cable. • Power Button: Press the button to power on/off the device.
B	**ETHERNET 1&2**	Connect to the network, for web UI control, or telnet control.
C	**Dante**	RJ 45 port. Connect to the network for Dante audio connection.
D	**RS-232**	Connect to a RS-232 enabled control device for API control or RS-232 routing.
E	**USB Host (1&2)**	USB 3.0 Type-B port. Connect to USB host devices.
F	**USB DEVICE 1~4**	USB 3.0 Type-A port. Connect to USB devices.
G	**HDBT 3.0 IN 9**	Connect to an HDBT transmitter (such as SW-120-TX3 or SW-120-TX3-US).
H	**USB-C IN 1**	USB 3.0 Type-C port. Connect to a laptop with USB type-C port. It supports three functions: • The port supports audio, video, and USB 3.0/2.0 signals transmission, maximum 5Gbps data rate; • The port supports PD 3.0, and can supply up to 60W power for the

		connected device; • The port supports 1G network connection, the laptop connected with the port can access the ethernet the matrix connected; The following cable are recommended to use: USB Type-C to Type-C cable (USB 3.0 or above)
I	**HDMI IN 2~8**	Connect to HDMI sources.
J	**NHD 500 IN 10**	Connect to a NHD 500 transmitter (such as NHD-500-TX) or ethernet switch.
K	**HDBT 3.0 OUT 5&6**	Connect to HDBT receivers (such as RX3-100).
L	**HDMI OUT 1~4**	Connect to HDMI displays.
M	**NDH 500 OUT 7**	Connect to a NHD 500 receiver or Ethernet switch.
N	**GPIO**	Connect to GPIO devices. Support connecting to four GPIO devices.
O	**RELAY**	Connect to relay devices for relay control.
P	**MIC IN 1 & 2 & LINE IN**	• MIC IN 1 & 2: Connect to microphones. • LINE IN: Connect to line out device.
Q	**LINE OUT 1 & 2**	Connect to audio receivers.
R	**AMP OUT**	Connect to speakers.
S	**RESET**	Use a needle to press the hole: • Less than 5s: Nothing will happen. • More than 5s but less than 15s: Reset the IP mode of the device to DHCP, and reset the login password of telnet and web UI to defaults. The default login password of telnet is “wyrestorm”, and the default login password of web UI is “admin”. • More than 15s: Reset the device to factory defaults.

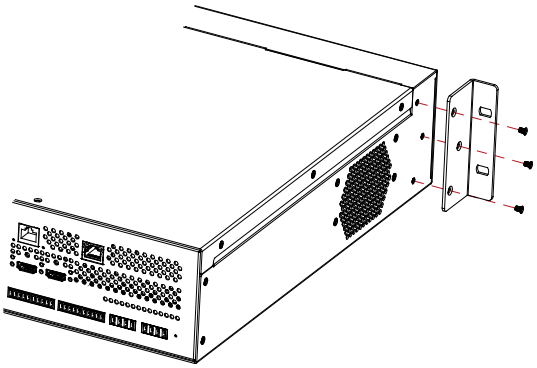
Installation

Note: Before installation, please ensure the matrix is disconnected from the power supply.

The matrix occupies 2U space and can be placed on a solid and stable surface or installed on a standard equipment rack.

To install the matrix on an equipment rack:

1. Position and install the mounting brackets provided to the front panel.

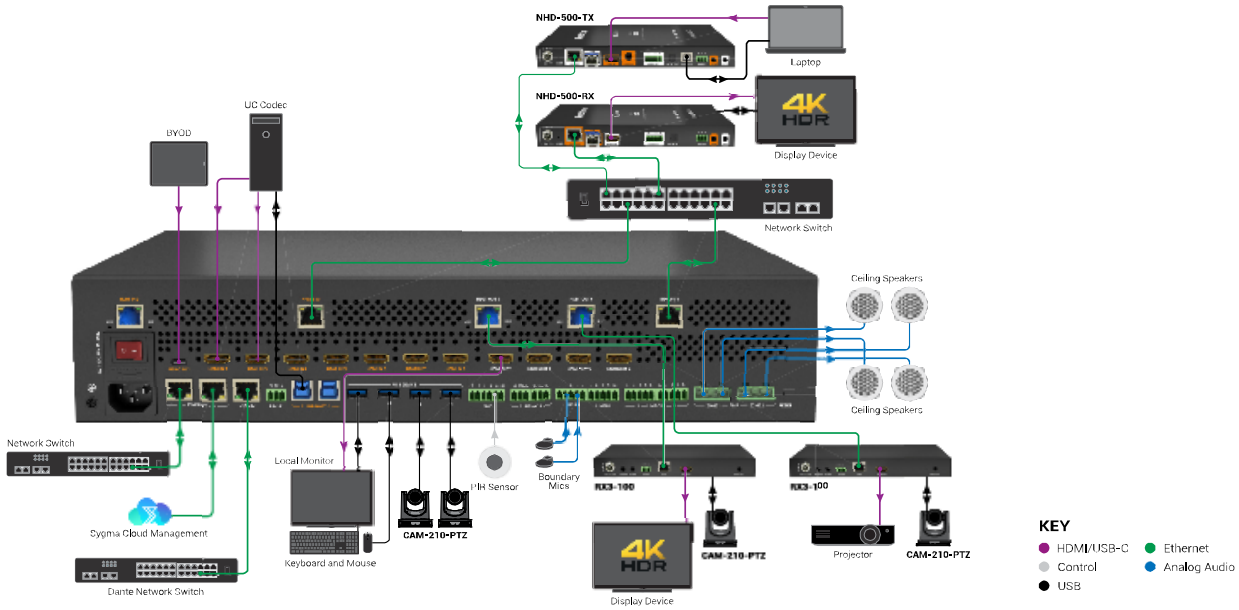


2. Install the matrix in the mounting rack by using the mounting screws to affix the matrix to the rack.

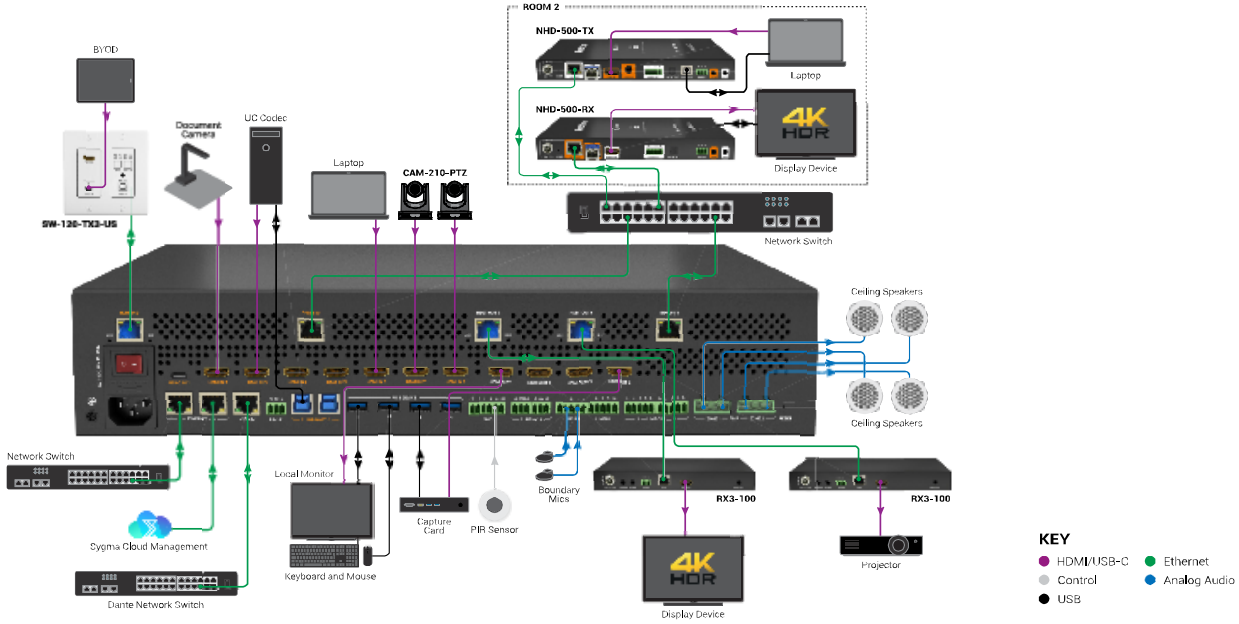
Wiring Diagram

Note: To prevent remote users from hearing feedback audio, during configuration, it is advisable to avoid selecting the USB IN as the input for the USB OUT audio channel.

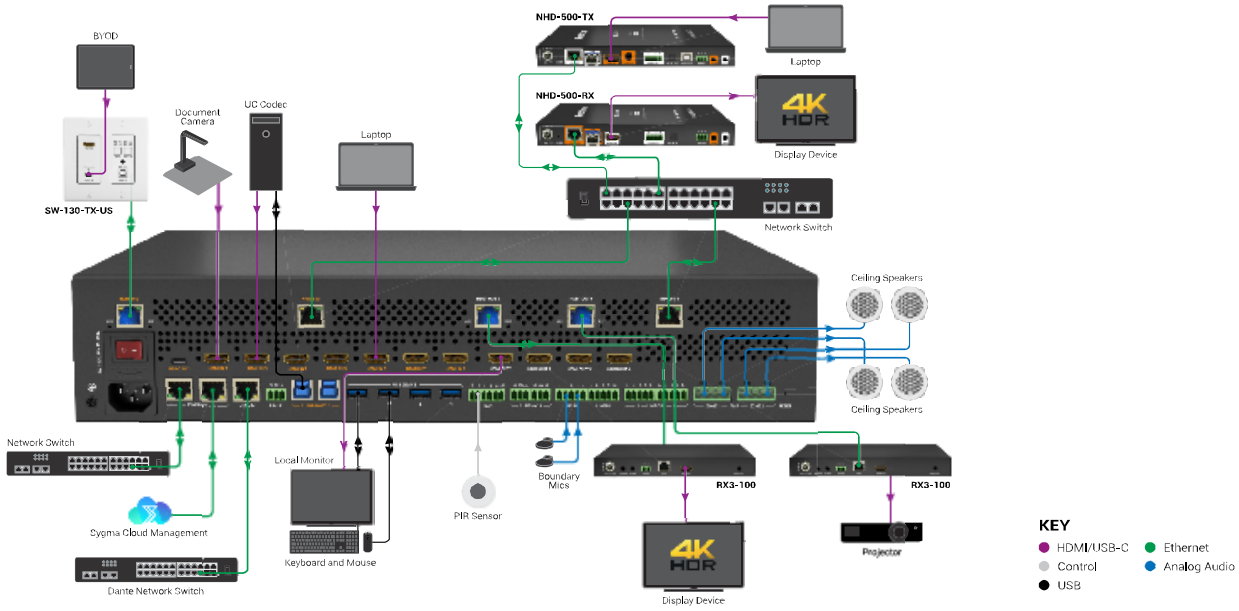
Wiring 1:



Wiring 2:



Wiring 3:



Pinout Introduction

Relay

The matrix equips two relay ports.

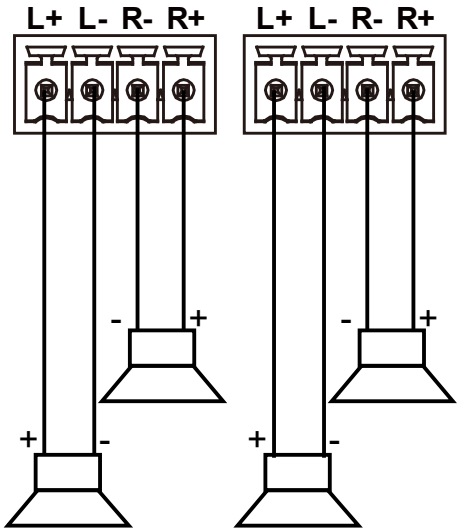
- NO: Normally open;
- NC: Normally closed;
- COM: Common connector.

Note: Relay port configuration, please refer to "Web UI Control" section

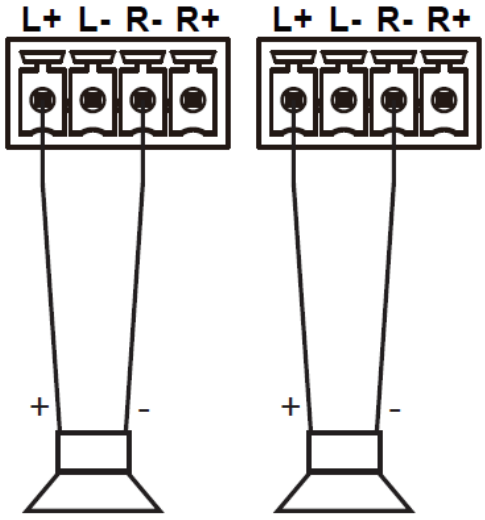
AMP

The matrix equips two AMP ports, and supports connecting with 4 x 15watts 8Ω speakers, or 4 x 30watts 4Ω speakers, and supports connecting with 2 x 30watts 8Ω speakers, or 2 x 60watts 4Ω speakers.

1) Connecting with 4 x 15watts 8Ω speakers, or 4 x 30watts 4Ω speakers



2) Connecting with 2 x 30watts 8Ω speakers, or 2 x 60watts 4Ω speakers



Control of the Matrix

The matrix can be controlled through Front Panel, RS-232, LAN (Web UI or Telnet).

Front Panel Control

Basic switch of input sources to output displays, audio volume adjustment, and information obtain can be achieved by using front panel controls.

Power on the matrix, the LCD indicator window will display "Starting", and wait until the window display the matrix's model and IP address, which indicates the matrix is ready to operate.

1. Switch input sources for the output
    1) Press "SWITCH" button to enter switch mode.
    2) Press the Left (◀) or Right (▶) button to select output channel. The ">" icon will move to the output port number users select currently.
    3) Press the Up (▲) or Down (▼) button to select input channel.
    4) Press "ENTER" button to confirm the selection or press "CANCEL" to exit the mode and return to the main page.

2. Adjust volume of audio outputs
    1) Press "AUDIO" to enter volume adjustment mode.
    2) Press the Left (◀) or Right (▶) button to select audio output channel.
    3) Press the Up (▲) or Down (▼) button to adjust volume of the selected channel.
    4) Press "CANCEL" to exit the mode and return the main page.

3. Get device's information or video information

1) Press “INFO” button to enter device’s information display mode or press “VIDEO” button to enter video information display mode.

2) Press the Left (◀) or Right (▶) button to flip the page to display the video information in video information display mode or flip to display the device’s information in device’s information display mode.

3) Press the Up (▲) or Down (▼) button to select input port to get its video information in video information display mode, or flip the page to display the device’s information in device’s information display mode.

4) Press “CANCLE” to exit the current mode and return the main page.

Command Control

Advanced users may need to control the device via API commands. API commands can be obtained from the separate document "*API Command Set_MX-1007-HBY*".

Two methods are provided for controlling this device through API commands:

1. RS-232.

Connect a control PC to the RS-232 port of the device. Before sending API commands to control the device, ensure the serial ports between this device and PC are configured correctly. A professional RS-232 serial interface software (e.g., Serial Assist) may be needed as well.

Baud Rate	9600 bps
Data bits	8 bits
Parity	None
Stop bits	1 bit
Flow control	None

Note:

- When the matrix is used with SW-120-TX3/SW-120-TX3-US/ RX3-100 for RS-232 passing-through, the baud rate should be set to 115200.
- If users want to control the display connected with the receiver through RS-232 port, the corresponding baud rate needs to be set through the receiver.

2. Telnet.

Connect a control PC to the LAN port of the device. Before you intend to control the device through telnet API, you shall establish connection between this device and your computer.

The form of the command for telnet connection is below:

telnet ip (port)

- *ip*: The device’s IP address.
- *port*: The device’s port number, this is non-required for some Telnet control tools. Default setting is 23.

For example, if the device’s IP address is 192.168.11.143, the command for telnet connection shall be the following:

telnet 192.168.11.143

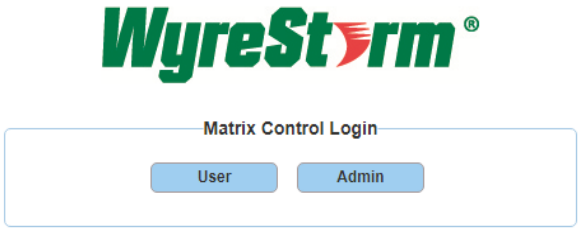
Web UI Control

The Web UI designed for the matrix allows basic controls and advanced settings of the matrix and can be accessed through a browser with latest version, e.g., Chrome, Safari, Firefox, Opera, IE10+, etc.

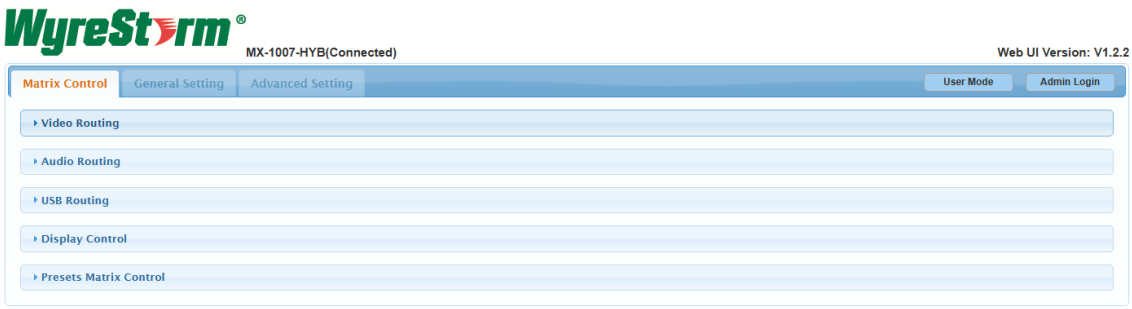
The default IP mode of the matrix is DHCP. If the device is not connected to DHCP server, it will generate a local 169.254.xxx.xxx IP address. Default login password for Web UI is "admin".

To get access to Web UI

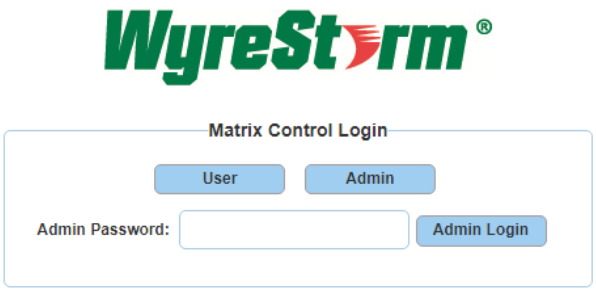
1. Connect the any of the two ETHERNET ports of the matrix to the ethernet switch with DHCP server, and connect the PC to the same ethernet switch. If connect one ETHERNET port to the PC directly, please set the PC to the same segment with the device.
2. Get the IP address through checking the LED indicator window on front panel, using the "SmartSetGUI" tool on PC or sending command "*GET IPADDR<CR><LF>*".
3. Input the IP address obtained in the last step in your browser and press "Enter" key on keyboard. The following page can be access in:



- To implement basic video and audio control of the matrix, click "User" to login as User. When login as User, no password is required. In this mode, only the submenus in Matrix Control tab can be set.

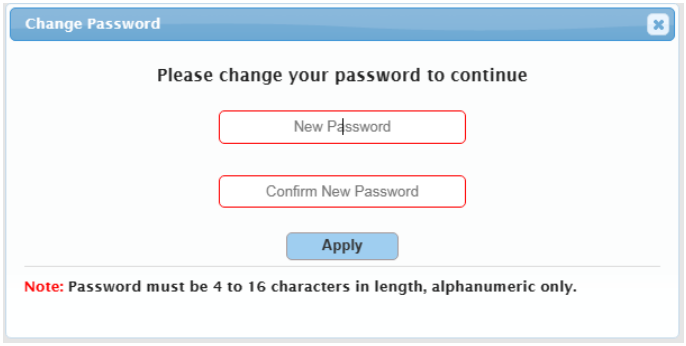


- If advanced setting is required, click "Admin", and enter the password to login as Admin.

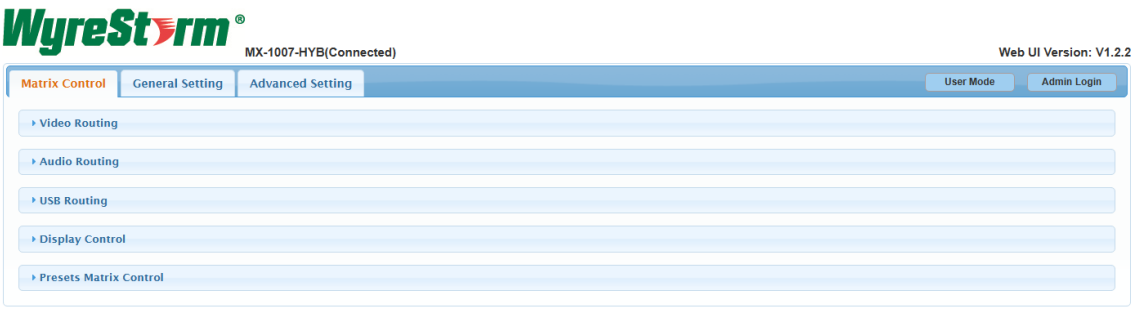


The default password is "admin". When login web UI first time, after clicking "Admin Login", users will enter the

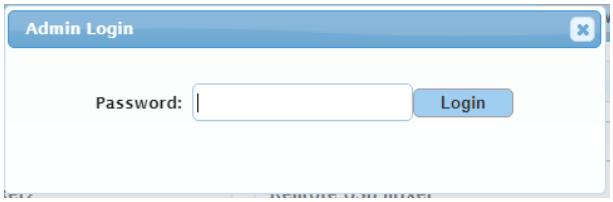
following window to change login password. Input new password and click “Apply” to enter the main page.



Note: The new password must be 4 to 16 characters in length, alphanumeric only.



- In User mode, users can also click “Admin Login” on the upper right corner, then input the password enter Matrix Control, General Setting and Advanced Setting pages. The default password is “admin”. When login the admin mode first time, users also need to change login password firstly. The operations are same with logging through the home page.

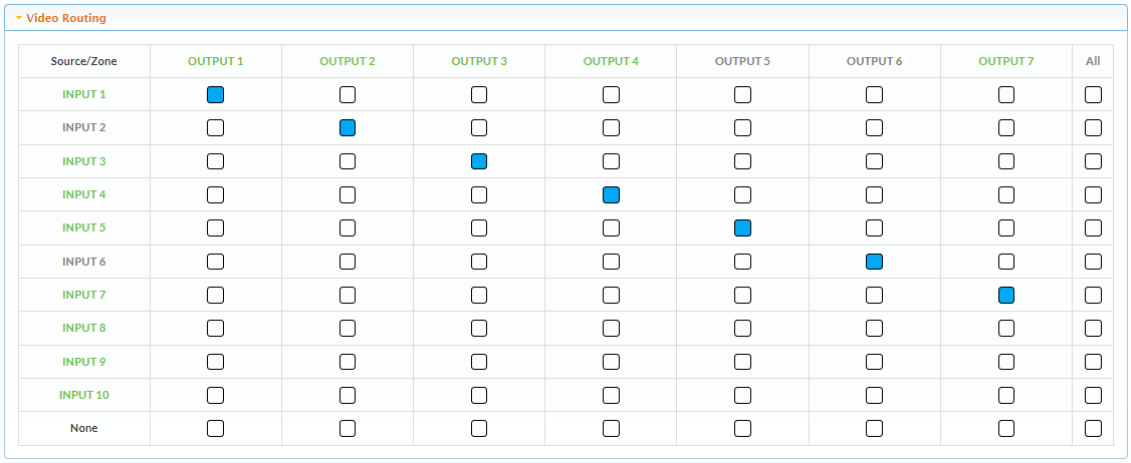


The main page includes three tabs: Matrix Control, General Setting and Advanced Setting.

Web UI Introduction

1. Matrix Control

1) Video Routing



This section manages distribution of input video sources to output displays and shows the connection status of the inputs and outputs.

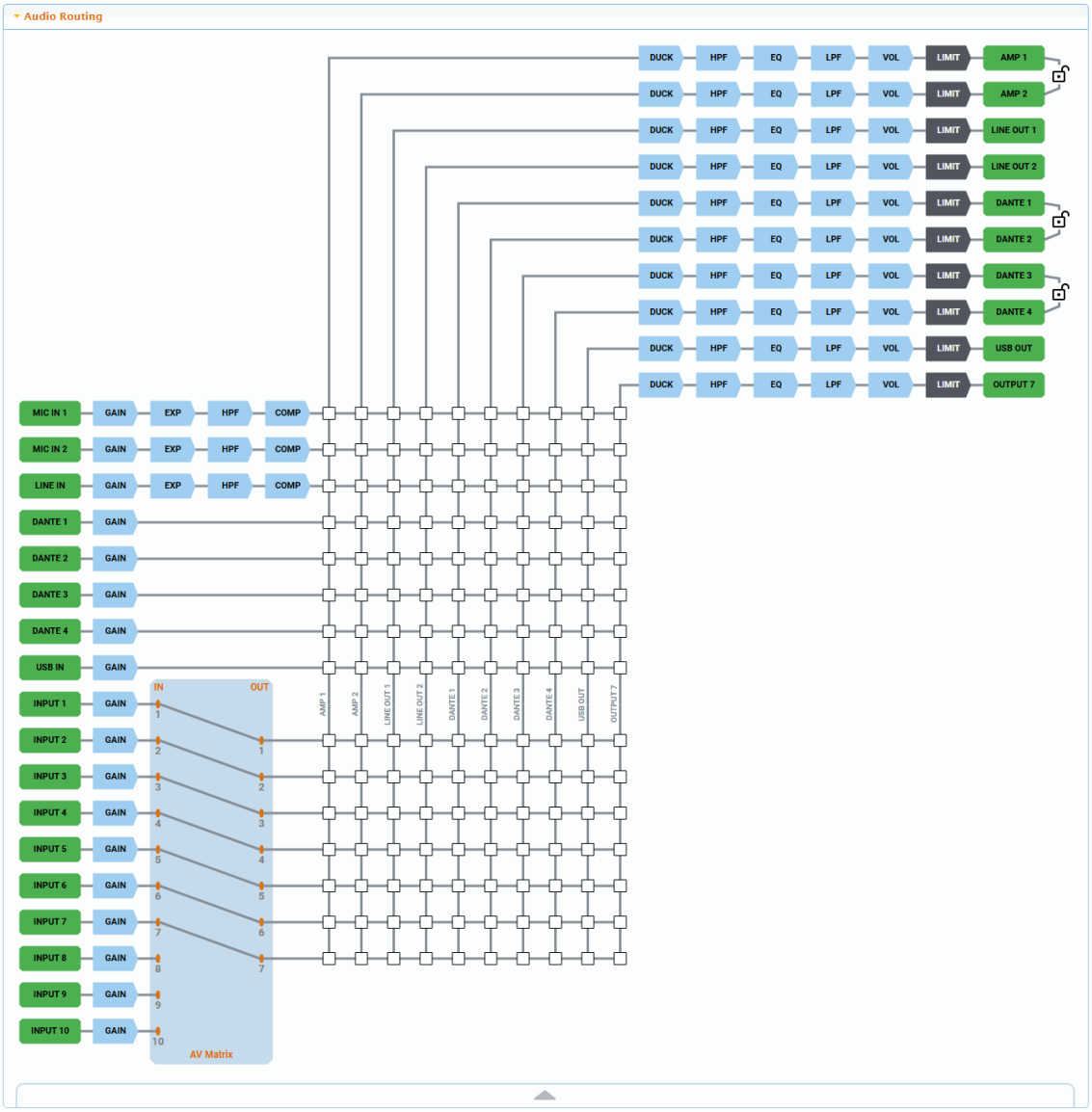
The green names of inputs and outputs indicate that the corresponding input and output ports are connected to active sources and active displays. The grey names of inputs and outputs indicate that the corresponding input and output ports aren't connected with active sources and active displays.

Click the button in the table to select the input for the output display (button turns from white to blue once selection is done).

- All: Click to route one input to all outputs.
- None: None input is routed to the output (or the output is turned off).

By default, Video Input 1 routes to Output 1…Video Input 6 routes to Output 6, Video Input 7 routes to Output 7.

2) Audio Routing



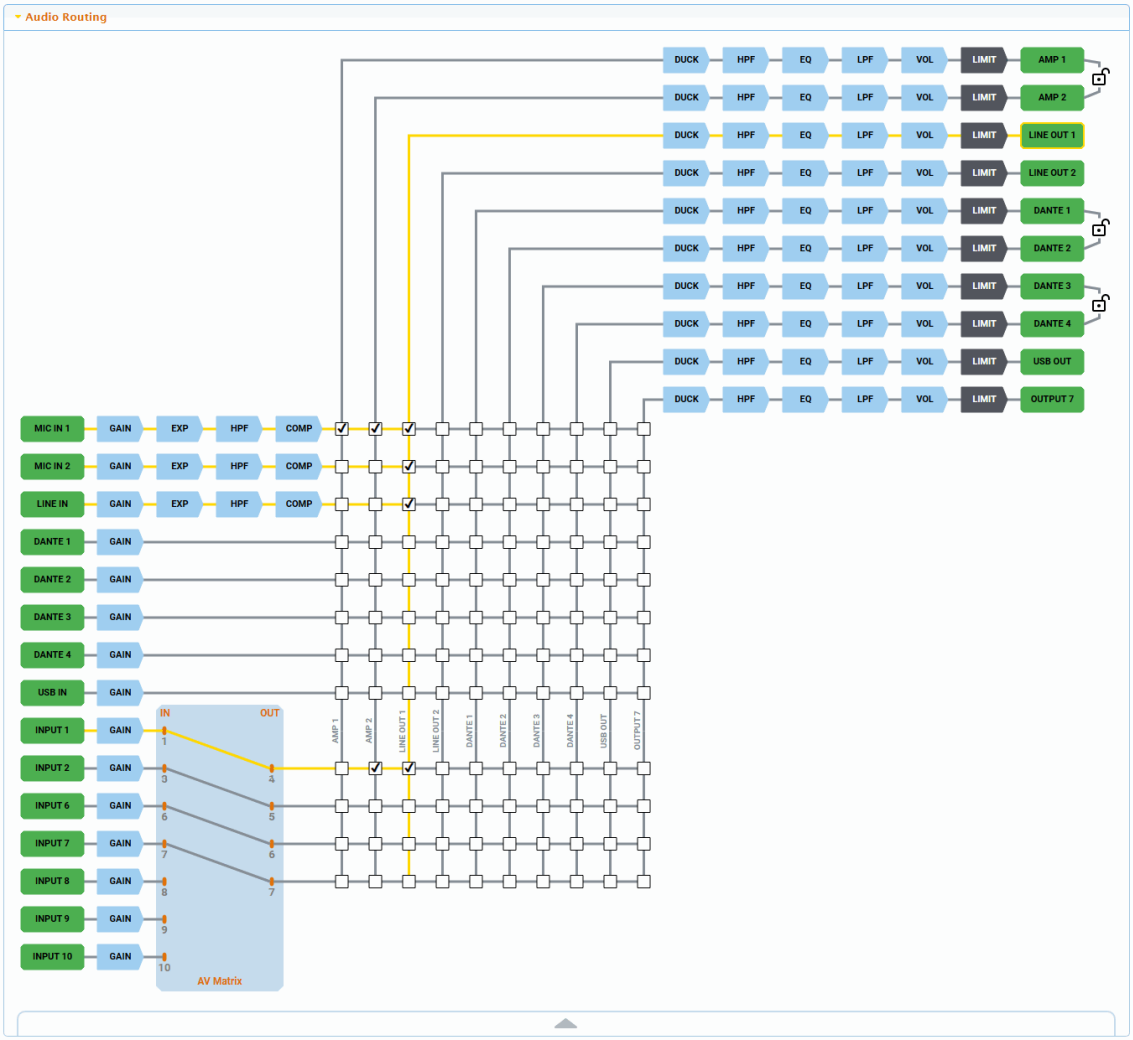
This section allows users to set audio routing and configure audio DSP.

Note: To prevent remote users from hearing feedback audio, during configuration, it is advisable to avoid selecting the USB IN as the input for the USB OUT audio channel.

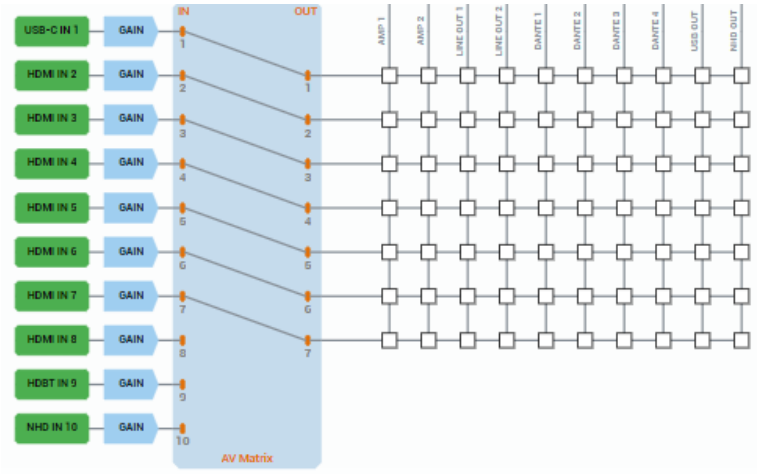
Click the box at the intersection of an audio input and output to select this audio input as the source for this audio output. One audio output can select multiple audio inputs and one audio input can be selected for multiple outputs.

Clicking an IN or OUT button, highlights the routing path, and the IN/OUT button will have a light orange frame.

Click the blue box labeled with the audio DSP name to enter the setup page (the selected button will have a light orange frame, and the corresponding in and out routing path is highlighted) for that specific audio DSP.



The light blue zone shows the input and output distribution according video routing. When select audio source here, it indicates that select the de-embedded audio from the source the corresponding output routed.

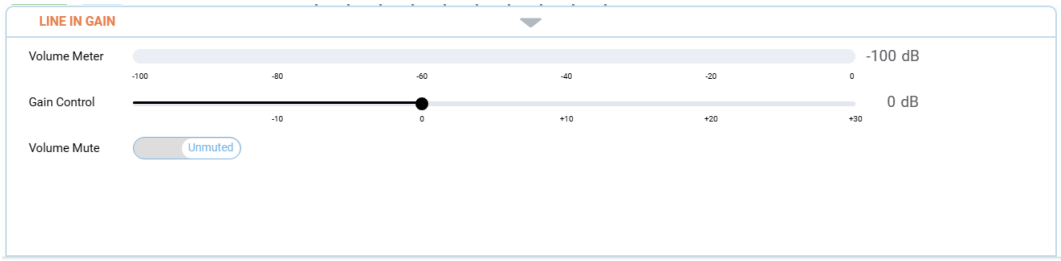


DSP configurations for inputs:

- GAIN (For MIC IN 1~2):

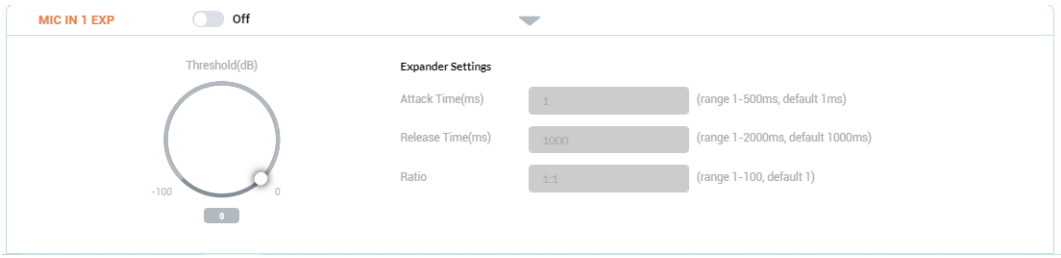
  - Volume Meter: Display the active audio level of the corresponding audio input in real-time.
  - Gain Control: Use the slider to adjust the audio gain. The default value is 0dB; Range: 0~+80dB.
  - Volume Mute: Click to set the corresponding audio to mute/unmute. Default setting: Unmuted.
  - Phantom 48V: Set the phantom 48V to on/off. When set it to enable, please ensure a phantom microphone is connected to the corresponding mic in port to avoid a damage to the microphone. Both the default setting of MIC IN 1 and MIC IN 2 Phantom Power Control are "Off".

- GAIN (For LINE IN, DANTE 1~4, de-embedded audio from USB-C IN, HDMI IN 2~8, HDBT IN 9 and NHD IN 10):



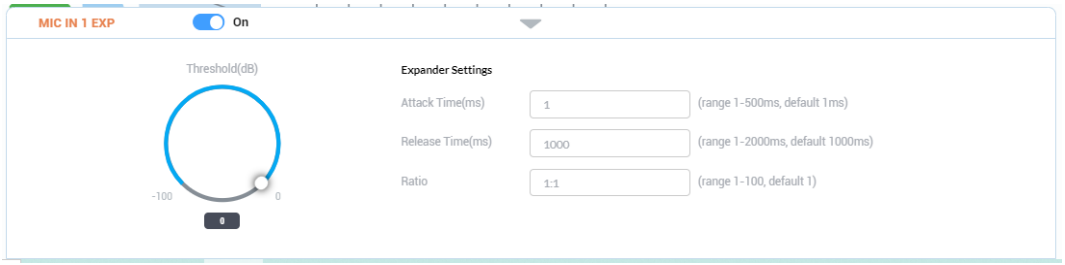
  - Volume Meter: Display the active audio level of the corresponding audio input in real-time.
  - Gain Control: Use the slider to adjust the audio gain. The default value is 0dB; Range: -20dB~+30dB.
  - Volume Mute: Click to set the corresponding audio to mute/unmute. Default setting: Unmuted.

- EXP (Expander for MIC IN 1~2 and LINE IN): To increase the difference in loudness between the quieter and louder sounds. When the Expand module is used, the quiet sounds (usually background noises) become quieter while the loud sounds become louder. The levels of audio signals that fall below the set threshold level are reduced.



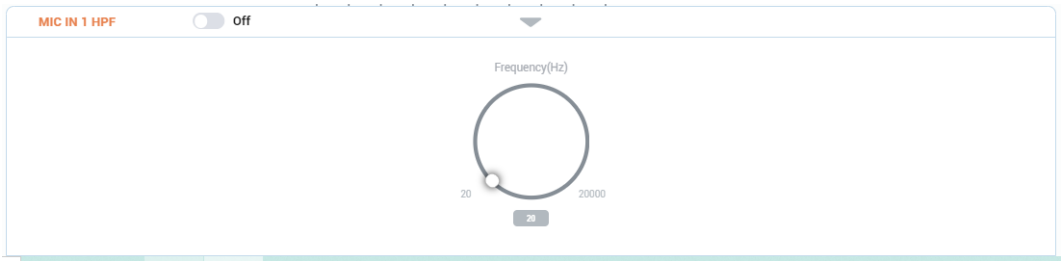
  On/Off: Click to set EXP of the corresponding audio input to on/off. Default setting: Off.

  When set the EXP to On:



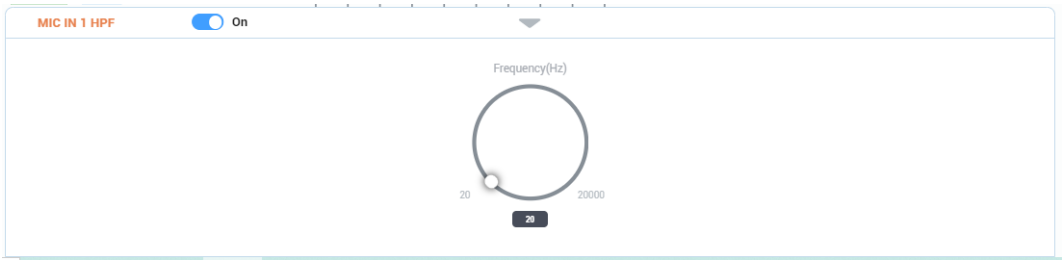
- ➢ Threshold (dB): Adjust the slider or input the value to set the threshold. Decreases the volume of audio signals that are below the threshold level. Default setting: 0dB.
- ➢ Expander Settings:
  - ✓ Attack Time (ms): Input the attack time. Set the response speed of the expander to signal levels above the threshold. Default setting: 1ms; Range: 1~500ms
  - ✓ Release Time (ms): Input the release time. Set the response speed of the expander to signal levels below the threshold. Default setting: 1000ms; Range: 1~2000ms
  - ✓ Ratio: Input the ratio to set the amount to which the volume is decreased. The higher the ratio the more the audio level below the threshold is lowered. Default setting: 1; Range: 1~100.

- HPF (High pass filter for MIC IN 1~2 and LINE IN): Use the HPF module to cut off low frequencies and let higher frequencies pass.



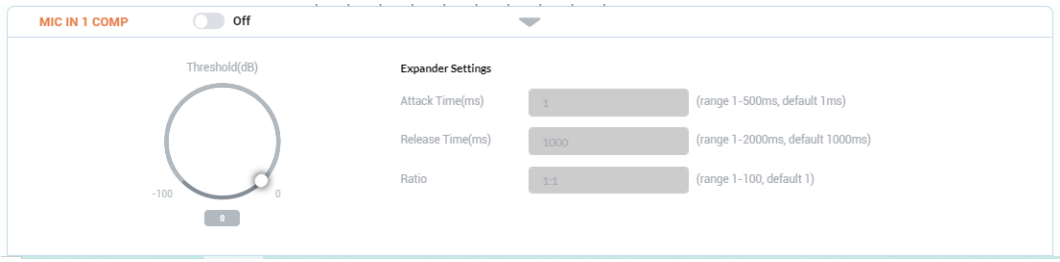
On/Off: Click to set HPF of the corresponding audio input to on/off. Default setting: Off.

When the HPF is set to on:



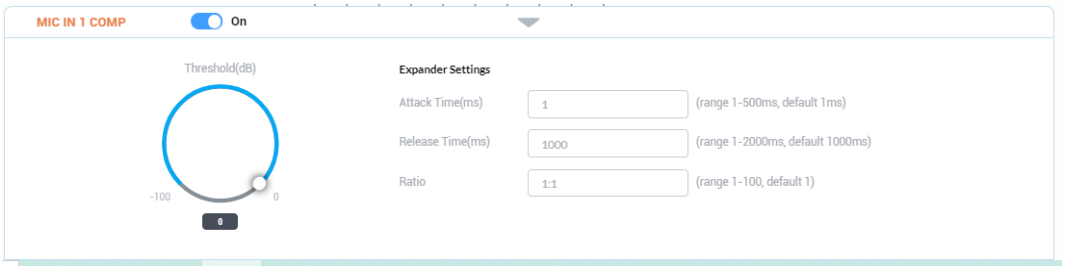
Frequency (Hz): Adjust the knob slider or input the value to set the cut-off frequency. Frequencies under the cut-off frequency are attenuated. Default setting: 20Hz.

- COMP (Compressor for MIC IN 1~2 and LINE IN): To reduce the signal dynamic range which is the difference between the loudest and quieter sounds.



On/Off: Click to set COMP of the corresponding audio input to on/off. Default setting: Off.

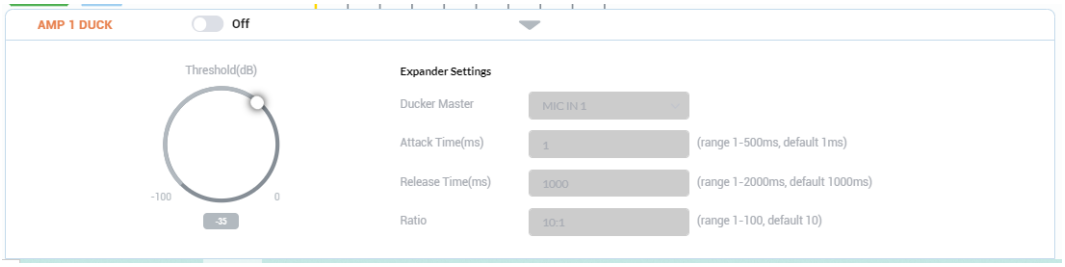
When set the COMP to on:



- Threshold (dB): Adjust the knob slider or input the value to set the threshold. The threshold is the level that the signal needs to rise above for the compressor to begin working. If a signal is too low or does not cross the threshold, the compressor allows the signal to pass through unchanged. Default setting: 0dB.
- Expander Settings:
  - ✓ Attack Time (ms): Input the attack time. The attack time is the response speed of the compression to signal levels above the threshold. Default setting: 1ms; Range: 1~500ms.
  - ✓ Release Time (ms): Input the release time. The release time is the response speed of the compressor to signal levels above the threshold. Default setting: 1000ms; Range: 1~2000ms.
  - ✓ Ratio: Input the ratio value to set the amount to which the volume is decreased. Default setting: 1; Range: 0~100.

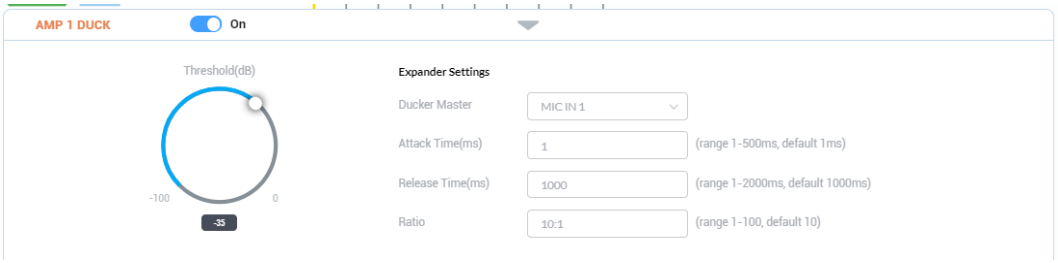
Output DSP configurations:

- DUCK: When multiple audio outputs are present, the selected primary audio needs to play, and the ducking function will automatically reduce the volume of other audio signals.



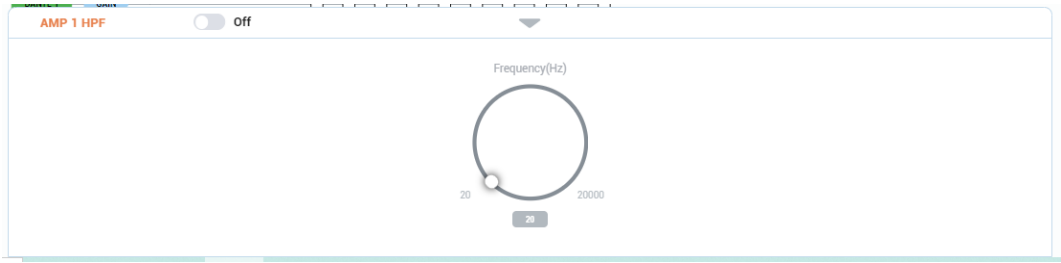
On/Off: Set Ducking to on/off. Default setting: off.

When set DUCK to on:



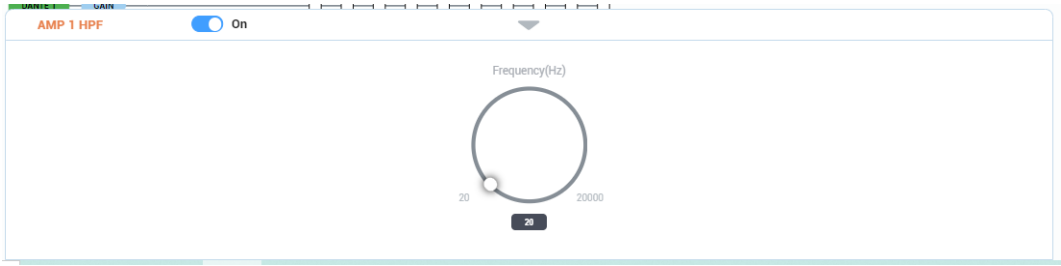
- ➢ Threshold (dB): Use the knob slider, or enter the value to specify the volume threshold for ducking to occur. The lower the value is set, the easier the ducking is triggered. Default setting is -35dB.
- ➢ Ducker Settings:
  - ✓ Ducker Master: Click to select the master input source from the drop-down menu for triggering ducking. When the selected input source reaches the ducking trigger, other inputs are ducked.
  - ✓ Attack Time (ms): Input the time to set the time it takes to lower the volume to the Ducking Depth after the Ducking Trigger threshold is met. Default setting: 1ms; Range: 1~500ms.
  - ✓ Release Time (ms): Input the time to set the time it takes to return to the regular volume from Ducking Depth. When the release time times out, the ducking audio's volume comes back up to its normal volume. Default setting: 1000ms; Range:1~2000ms.
  - ✓ Ratio: Input the ratio value to set the volume reduction ratio. The lower the value is set, the lower the volume of the specified audio input is when ducking is triggered. Default setting is 10.

- HPF(High pass filter): Use the HPF module to cut off low frequencies and let higher frequencies pass.



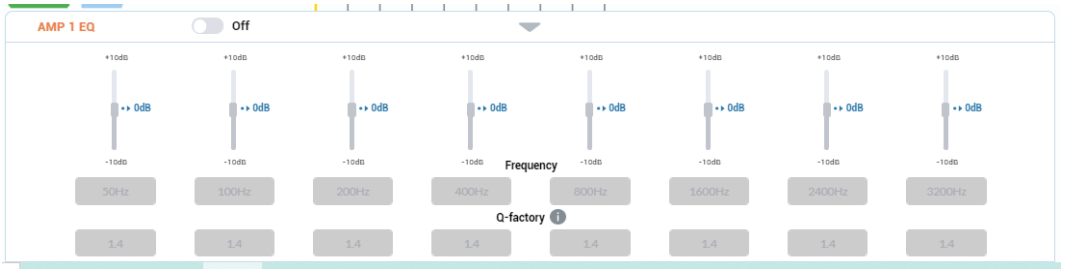
On/Off: Set HPF function to on/off. Default setting: off.

When it is set to on:



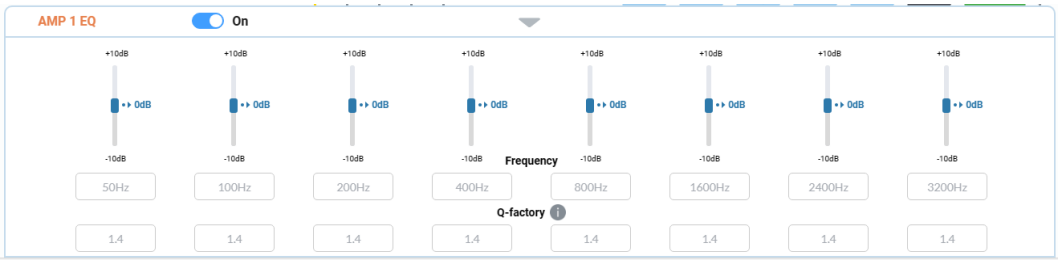
Frequency (Hz): Use the knob slider or input the value to set the cut-off frequency. Frequencies under the cut-off frequency are attenuated. Default setting: 20Hz.

- EQ (Equalizer): To change the balance of different frequency components in the audio signal.



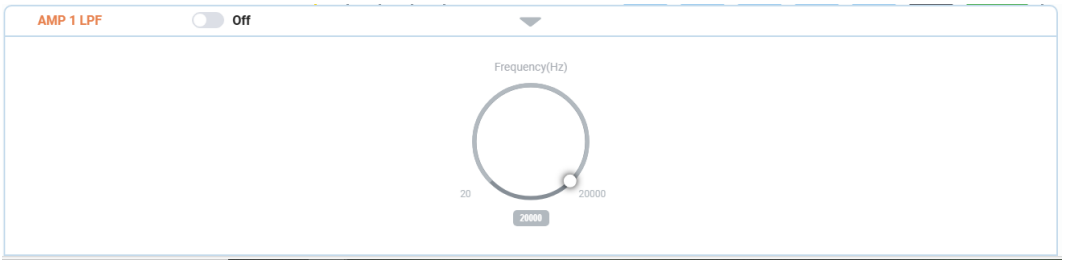
On/Off: Set EQ function to on/off. Default setting: off.

When set it to on:



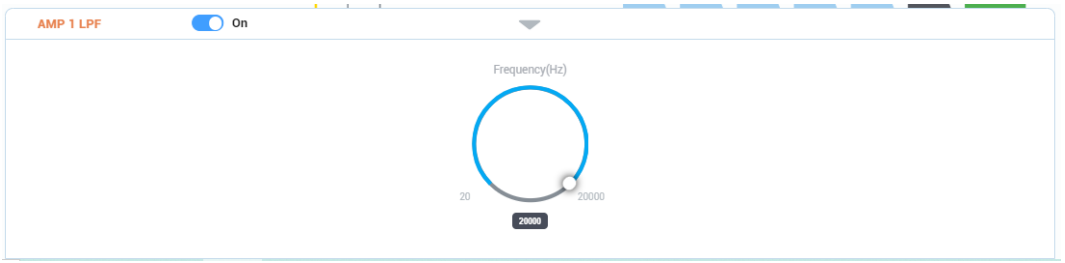
- Frequency: Use the slider bars above the frequencies to adjust the audio amplitude in different frequencies. Default setting: 0dB; Range: -10dB ~ 10dB.
- Q-factory: Input the Q-factor value in each frequency. When boosting or cutting a particular frequency, the Q-factor represents the width of the frequency range that is affected. Default setting: 1.4; Range: 0~16.

- LPF(Low pass filter): To cut off high frequencies and let lower frequencies pass.



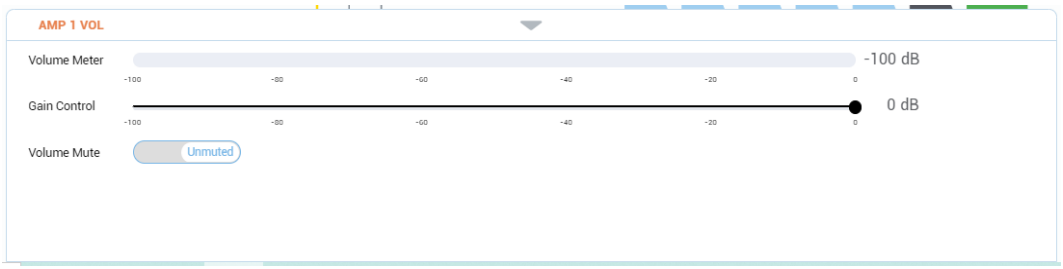
On/Off: Set the LPF function to on/off. Default Setting: Off.

When set it to on:



Frequency (Hz): Use the knob slider or input the value to adjust the frequency. Default setting: 20000Hz.

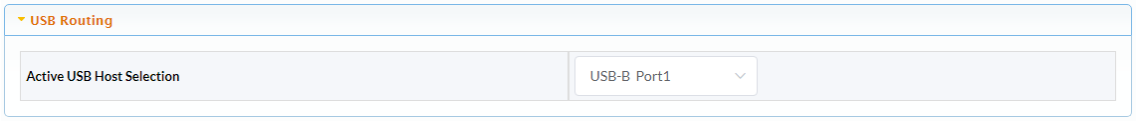
- VOL (Volume):



  - ➢ Volume Meter: Display the corresponding output audio intensity of the corresponding audio input in real-time.
  - ➢ Gain Control: Use the slider to set the gain of the corresponding audio output. Default setting: 0dB.
  - ➢ Volume Mute: Click to set the corresponding audio output to mute/unmute. Default setting: Unmuted.

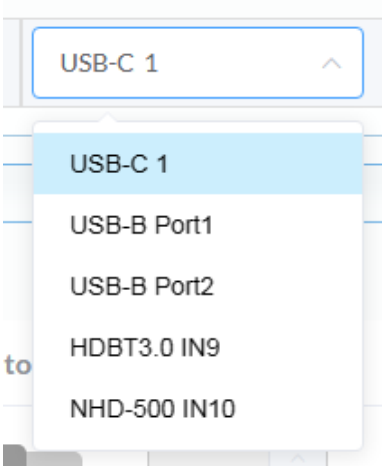
- (unlink) / (link): Click to set the corresponding two outputs to link or unlink. Default setting: Unlink.
  - ➢ For AMP OUT 1 and AMP OUT 2: When set them to link, select the same input source(s) simultaneously.
  - ➢ For DANTE OUT 1 and DANTE OUT 2, or DANTE OUT 3 and DANTE OUT 4: When set them to link, select the same input source(s) simultaneously, and the DSP configurations will be synchronous.

3) USB Routing



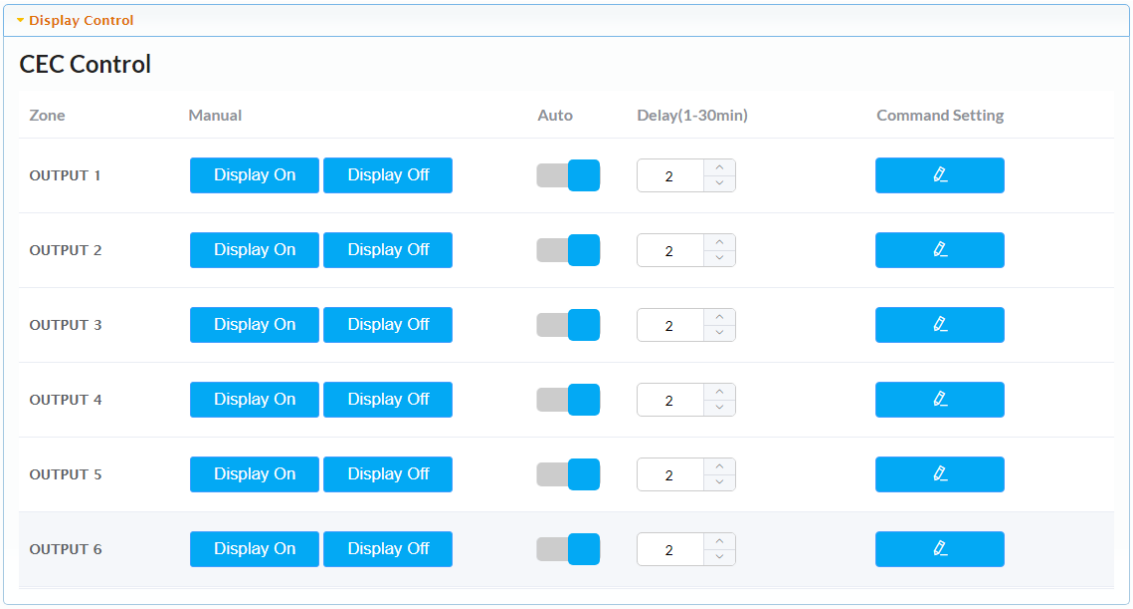
This section allows users to select USB host all the USB devices (including the local USB devices and remote USB devices (connected with HDBT receivers or NHD 500 receivers) connected.

Active USB Host Selection: Select the USB Host from the drop-menu. The default setting is USB-B Port1.

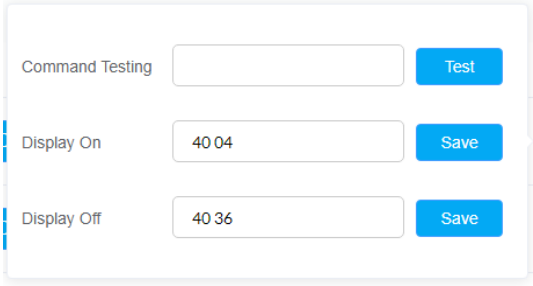


For example, when select USB-B Port1, all USB devices the matrix connected and the remote receivers connected are connected with USB-B Port 1.

4) Display Control



- Display On: Click to send the saved Display On command to the connected CEC-enabled display to power on it immediately.
- Display Off: Click to send the saved Display Off command to the connected CEC-enabled display to power off it immediately.
- Auto On/Off: Click to enable or disable the CEC Auto Control. By default, the auto CEC control is ON.
- Delay Time (1~30min): click the up/down arrow to set the time for the display to power off automatically when no signal is present. For example, if Auto control is set as on and the time is set to 2 minutes, the output display will power off automatically when there's no signal at the display for 2 minutes.
- Command Setting: Click "" to enter the following window to do command testing, set and save commands of Display On/Off.

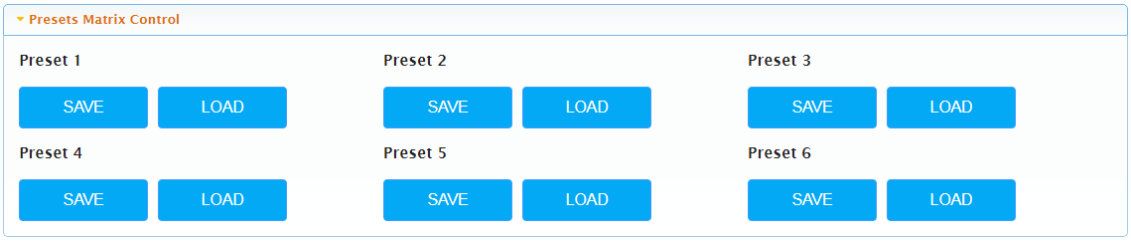


➢ Command Testing: Input a Display on/off command, and then click "Send" to send it to the selected output to test if it takes effects.

➢ Display On/Off: Input the corresponding CEC command, then click "Save" to save it.

Note: If users want to change CEC commands, please refer to the CEC specification document.

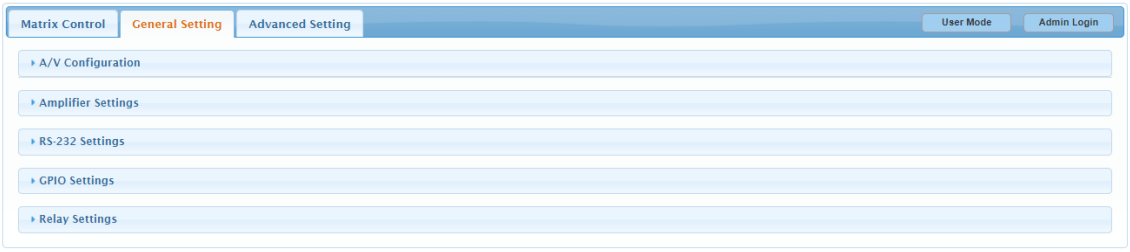
5) Presets Matrix Control



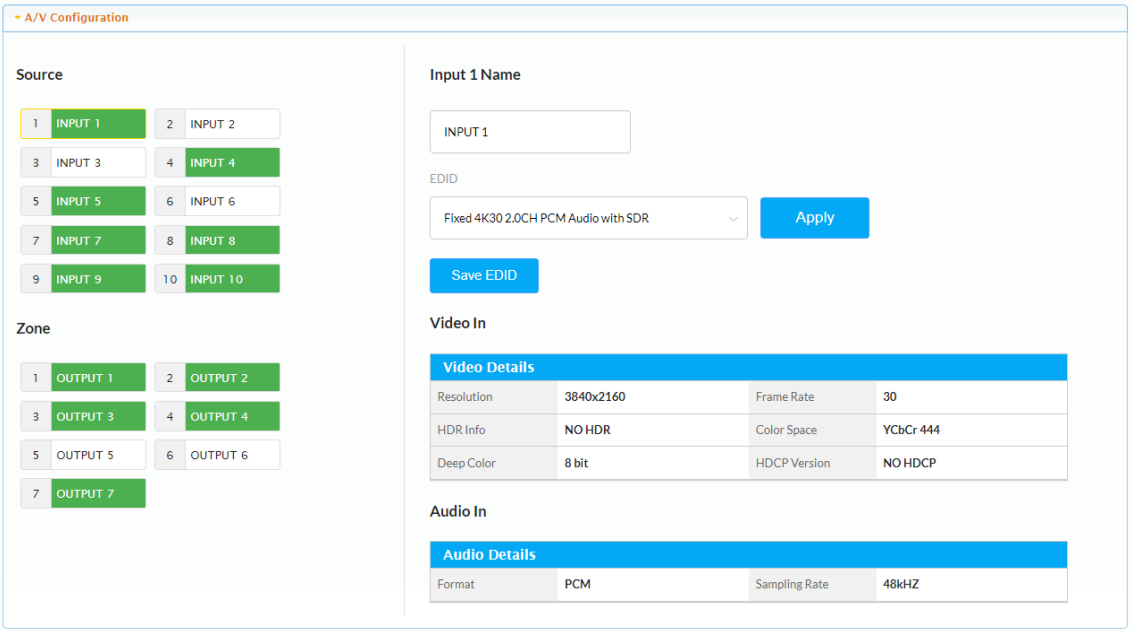
This section saves/loads the matrix control settings to or from the Matrix.

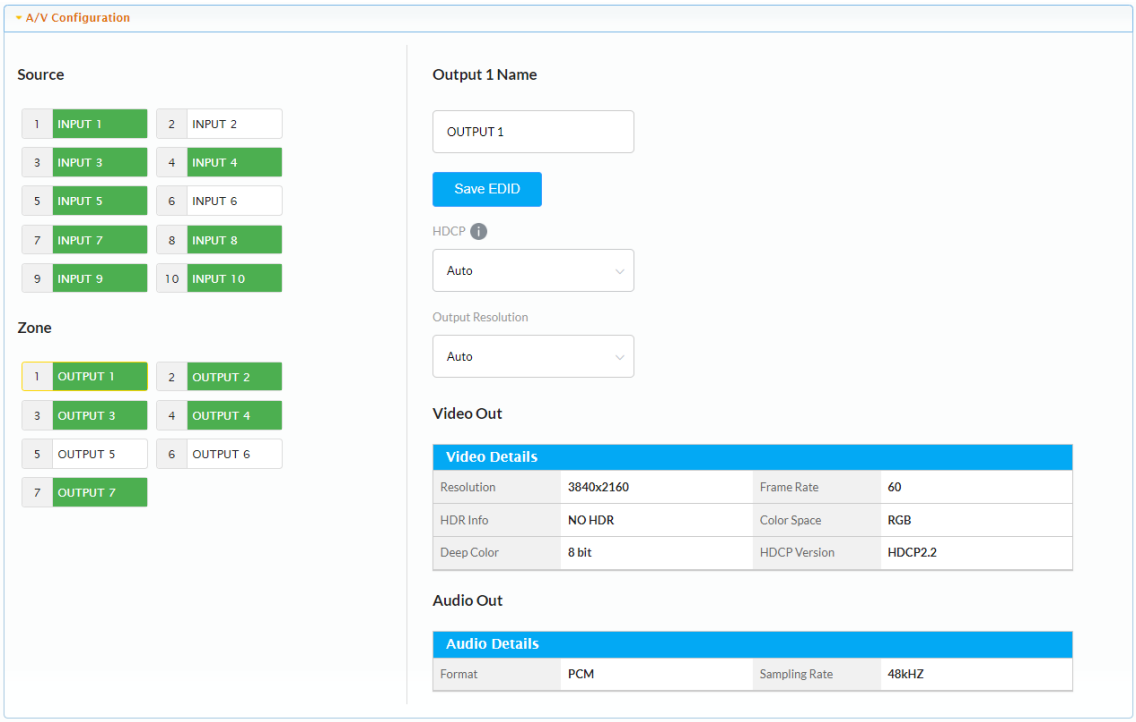
- Save: Save the selection settings to the matrix.
- Load: Load the saved preset file from the matrix.

2. General Setting



1) A/V Configuration





This section allows users to set name, EDID, HDCP and get video and audio information of each input source, and set name, save EDID, select HDCP, output resolution, and get output video and audio information.

- Source/Zone: Select an input/output to set (the button will have an orange frame when the selection is done).
  - ➢ Green button: Indicates the corresponding input/output port is connected to active source/display.
  - ➢ White button: Indicates the corresponding input/output port isn't connected with active source/display.
- Input (1~10) / Output (1~7) Name: Input a new name for the selected input/output.
- EDID (for input 1-9): Select EDID for the corresponding input port, and click "Apply" to take effect. The default EDID of input 2-9 is Fixed 4K60 2.0CH PCM Audio with SDR, and the default EDID of the input 1 is Fixed 4K30 2.0CH PCM Audio with SDR.

  EDID Selection includes:

  Copy form HDMI Output 1;

  Copy form HDMI Output 2;

  Copy form HDMI Output 3;

  Copy form HDMI Output 4;

  Copy form HDMI Output 5;

  Copy form HDMI Output 6;

  Copy form HDMI Output 7;

  Fixed 4K60 2.0CH PCM Audio with HDR;

  Fixed 4K60 2.0CH PCM Audio with SDR;

  Fixed 4K30 2.0CH PCM Audio with HDR;

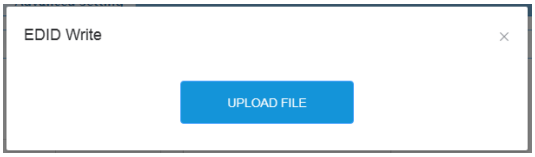
  Fixed 4K30 2.0CH PCM Audio with SDR;

Fixed 1080p@60Hz 2.0CH PCM Audio with HDR;

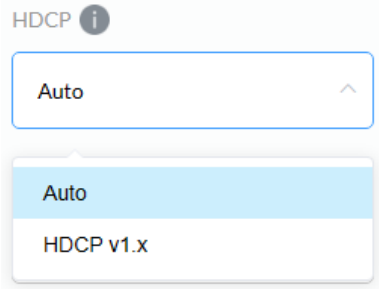
Fixed 1080p@60Hz 2.0CH PCM Audio with HDR;

EDID Write.

When select EDID Write, users can click “UPLOAD FILE” in the popped window to select an EDID file from the local PC to write to the corresponding port.

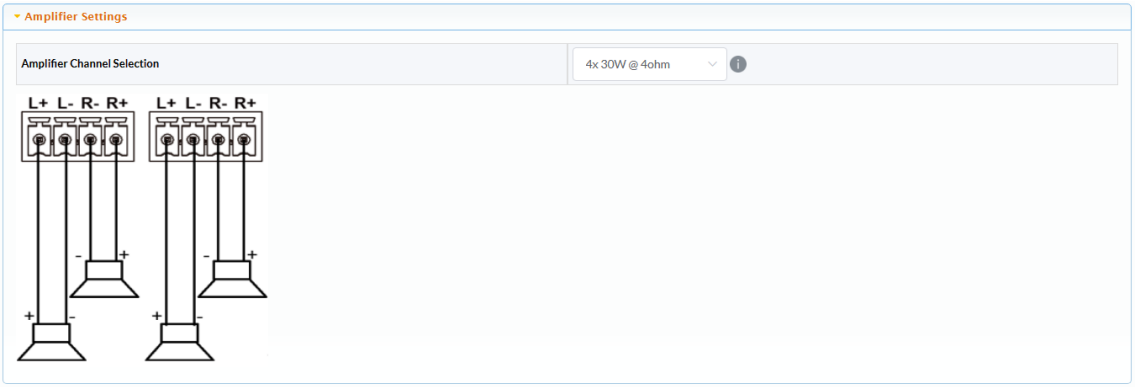


- Save EDID: Click to save the EDID information of the select input/output as a bin file to local PC.
- HDCP (ON/OFF) (for input 2~9): Click to enable/disable HDCP encryption of each input port, the default setting is “ON”.
- HDCP (for output 1~7): Select HDCP support for the selected output port from the drop-down menu (Auto, HDCP v1.X). By default, Output HDCP Support is “Auto”, follow the input HDCP. For example, input HDCP is HDCP 2.2, output HDCP is also HDCP 2.2. When set it to HDCP v1.X, it means the HDCP of the output is set to HDCP 1.4.



- Output Resolution: Select output resolution for the selected output port. The default setting is “AUTO”.
- Video In/Audio In (for input 1~10): Shows the video and audio information of the selected input.
- Video Out/Audio Out (for input 1~10): Shows the video and audio information of the selected input.

2) Amplifier Settings

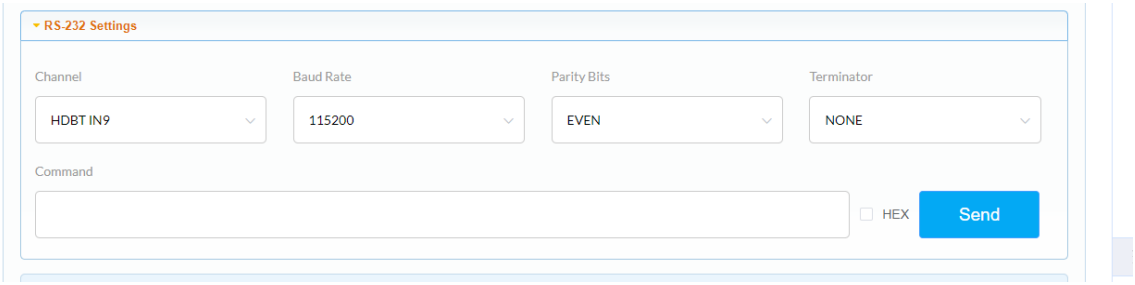


This section allows users set amplifier channel. The matrix supports two amplifier channel modes: 4 x 30W@4ohm and 2 x 60W@4ohm. The default setting is “4 x 30W@4ohm”.

When set it to 4 x 30W@4ohm, the AMP out ports can be connected to 4 x 15W 8Ω speakers or 4 x 30W 4Ω speakers, and when set it to 2 x 60 W@4ohm, the AMP out ports can be connected to 2 x 30W 8Ω speakers, or 2 x 60W 4Ω speakers.

See “Pinout Introduction” section to get detail connection information.

3) RS-232 Settings



This section allows users to set parameters for RS-232 routing (from matrix LAN port to HDBT and NHD ports).

- Channel: Select remote RS-232 gateway port.
- Baud Rate: Select baud rate for the selected RS-232 port.
- Parity Bits: Select parity bits for the selected RS-232 port.
- Terminator: If commands in string format require a terminator, choose the appropriate terminator from the drop-down menu. The command in hex format doesn’t require for a terminator.

  Explanation of the terminator:

  \r: Carriage Return<CR>

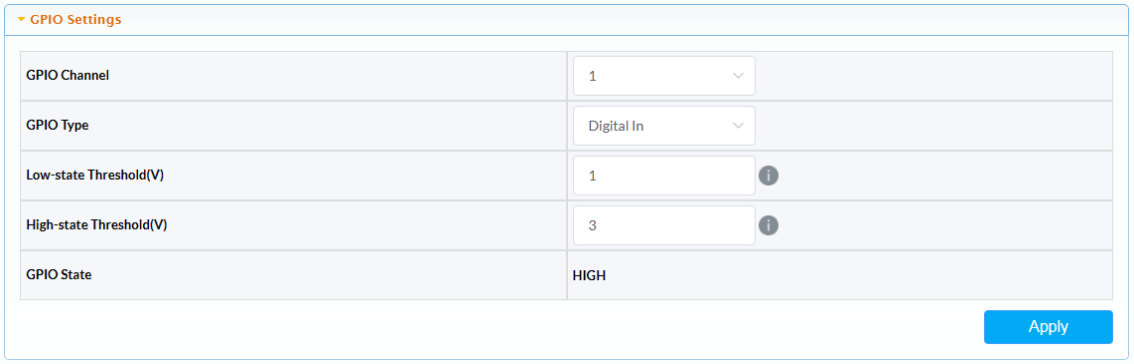
  \n: Line Feed <LF>

  \r\n: Carriage Return + Line Feed <CR><LF>

  none: No terminator required.
- Command: Input command to control third-party device connected with the remote receiver RS-232 port. If the command input is only available in Hex format, click the Hex checkbox and input the Hex command, then click the “SEND” button.

Note: The entered commands will only be sent to remote transmitter or receiver connected 3rd-party device. It needs to be supported by the 3rd-party device.

4) GPIO Settings



This section allows users to set GPIO pins.

- GPIO Channel: Select the port number from the drop-down menu to configure.
- GPIO Type: Select the GPIO trigger type from the drop-down menu between Digital In and Digital Out.

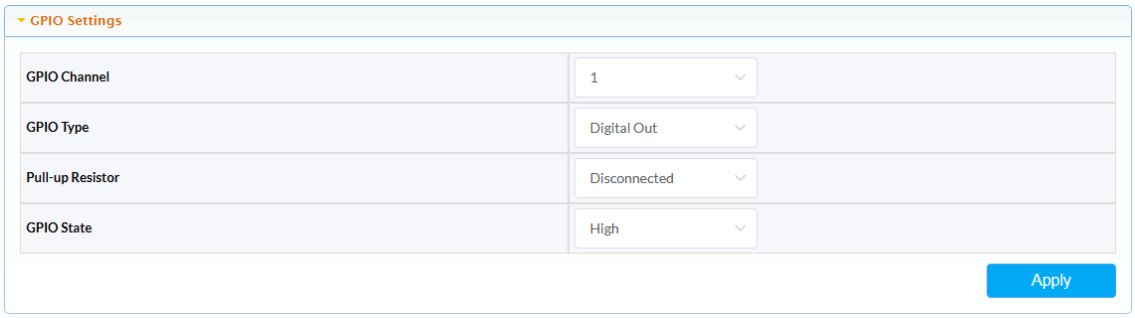
  When select Digital In (default):

  ➢ Low-state Threshold (V): Define the low detect voltage threshold (the range is 1 to 22V).

  ➢ High state Threshold (V): Define the high detect voltage threshold (the range is 2 to 23V).

  This mode reads the digital input of an external sensor device that is connected to the GPIO port, and detects High (upon passing Max threshold from Low state) or Low (upon passing Min threshold from High state) port states according to the user defined voltage threshold levels.
- GPIO State: If the detected result is less than the low-state threshold users set, it wills display "LOW" here, and if the result is more than the high-state threshold users set, it will display "HIGH" here.

  When select Digital Out:

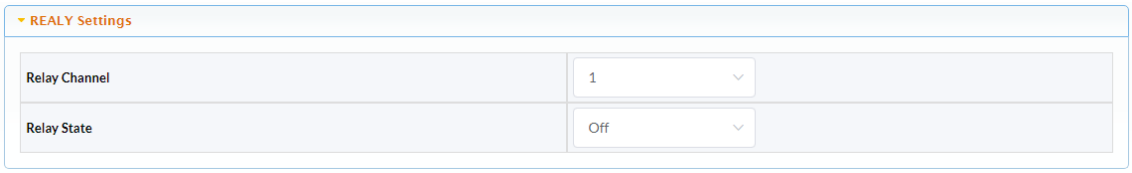


  ➢ Pull-up Resistor: Set Pull-up Resistor to "Connected" / "Disconnected".

  ➢ GPIO State: Set GPIO state to "High" or "Low".

  When set the GPIO State to "High", and set Pull-up Resistor to "Connected", the matrix supplies an internal 5V Pull-up resistor. While set Pull-up Resistor to "Disconnected", the pull-up voltage is determined by the external connected pull-up resistor. When GPIO state is set to "Low", it will output low level.
- Apply: Click to confirm the settings.

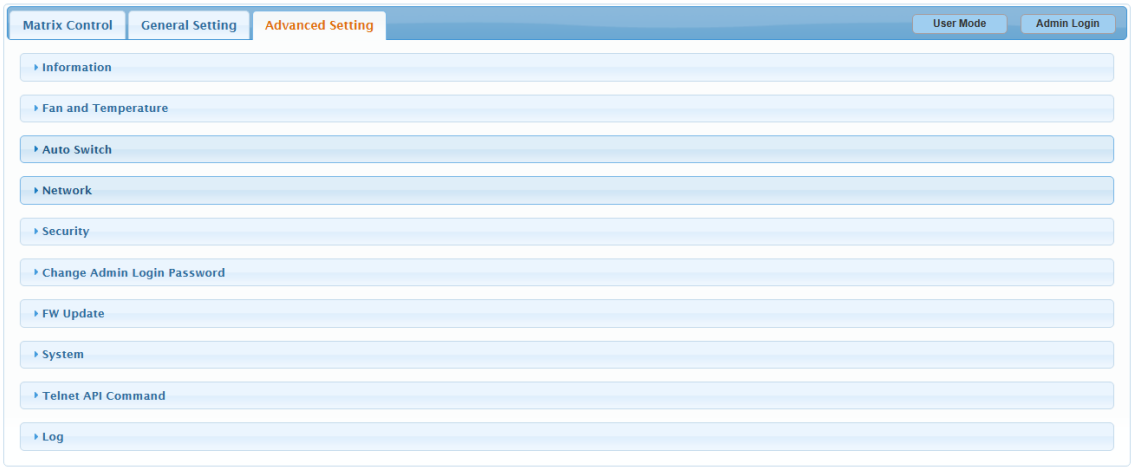
5) Relay Settings



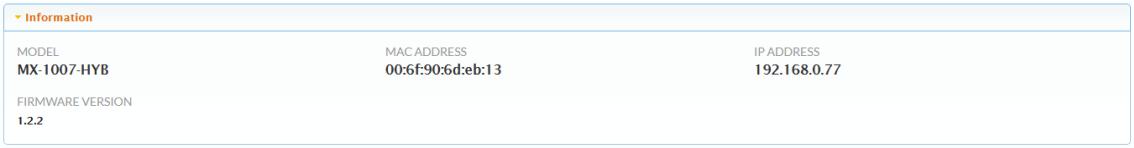
This section allows users to configure relay ports.

- Relay Channel: Select relay channel between 1 and 2.
- Relay State: Set relay state from the drop-down menu. When it is set to "On", NO and COM pins of the selected relay port are connected, and NC and COM pins of the selected are disconnected. When it is set to "Off", NC and COM pins of the selected relay port are connected, and NO and COM pins of the selected relay port are disconnected.

3. Advanced Setting

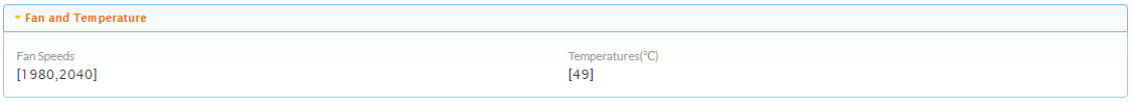


1) Information



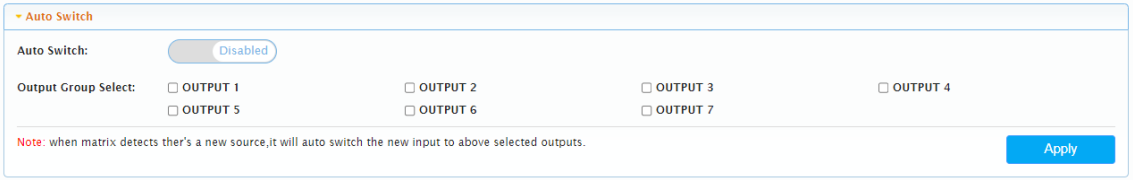
This section shows the device's information, including Model, Mac address, IP address and firmware version.

2) Fan and Temperature



This section shows the device's fan speed and temperature.

3) Auto Switch



This section allows users to set output group, and set auto switch function to enable/disable of the selected output group.

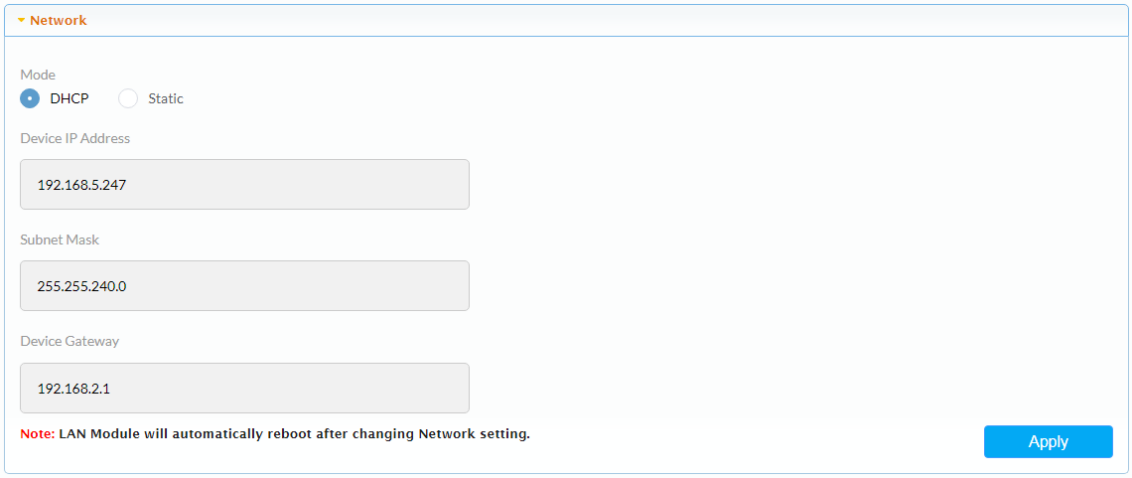
- Auto Switch: Click to set the auto switch function of the selected output group to enable/disable. Default setting: Disabled.
- Output Group Select: Check the box before the corresponding output to set them as a group. Default setting: Unchecked (all outputs are not grouped).
- Apply: Click to perform the grouping.

For example:

Check the OUTPUT 1 and OUTPUT 2 as a group, and set the Auto Switch function to Enabled, when a new source is inserted, OUPTUT 1 and OUTPUT 2 will automatically switch to the source.

Note: Other outputs not grouped are not affected by this function, and switched in original way.

4) Network



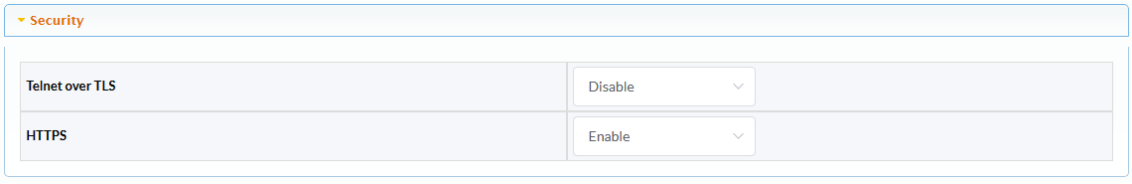
Network is used to set between the static and dynamic IP address.

- DHCP: When enabled, the IP address of the Matrix is assigned automatically by the DHCP server connected.
- Static: When enabled, set up the IP address manually.
- Apply: Click to enable the network setting.

Note:

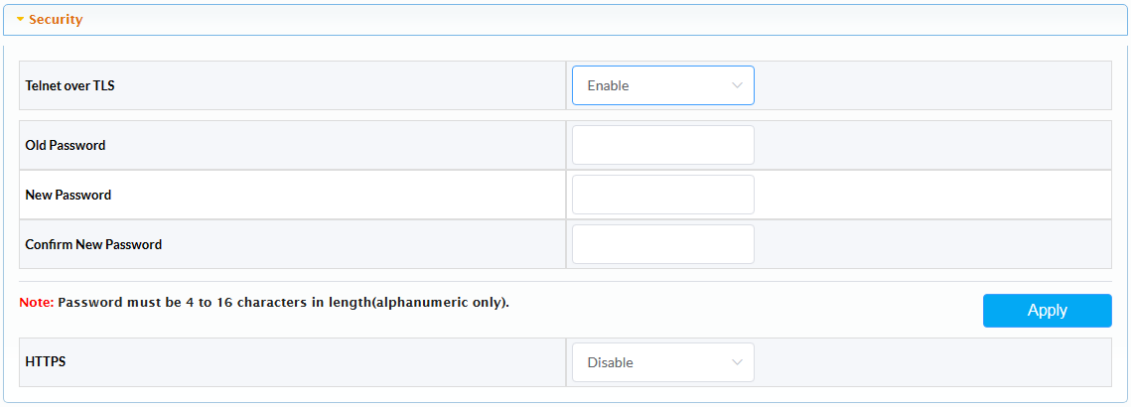
- When "Static" is selected, please ensure your PC is in the same network segment as the Matrix, i.e., the IP address of your PC should be set as 192.168.xxx.xxx.
- Please wait for 2-3 minutes for the Matrix's LAN module to reboot and reconnect after the network setting is changed.

5) Security



- Telnet over TLS (Disable/Enable): Set TLS (Transport Layer Security) to enable or disable, when it is set to enable, users can change the TelnetS login password. The default setting is “Disable”. The default user name and password for logging in the Telnet is “admin” and “wyrestorm”.

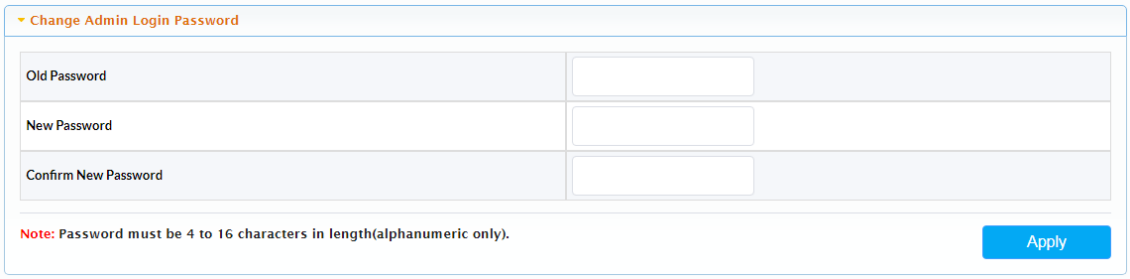
Note: The password must be 4 to 16 characters in length, and alphanumeric only.



- HTTPS (Enable/Disable): Set HTTPS to "Enable" or "Disable". The default setting is "Enable". HTTPS (Enable): Https is mandatory supported. HTTPS is a secure version of the HTTP protocol that builds an SSL encryption layer over HTTP and encrypts the transmitted data.

  HTTP network protocol is the most widely used hypertext transfer protocol, this method allows a third-party to listen in and eavesdrop on the transferred information. To ensure the secure data transmission, the HTTP can be disabled, and the all the information can be transferred via HTTPS. HTTPS protocol encrypts the clear text, so it becomes incomprehensible for a third-party and keeps the data secure.

6) Change Admin Login Password

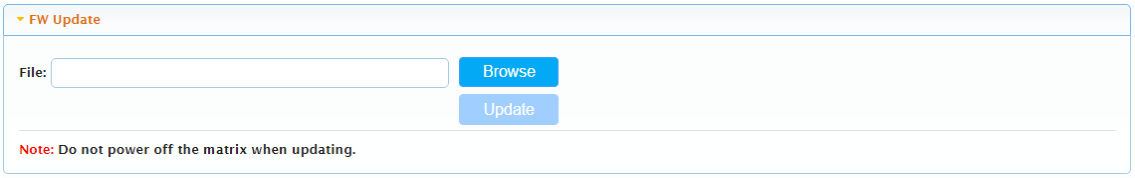


This section allows users to change admin password. The default password is "admin".

- Apply: Click to perform the change.

Note: Password must be 4 to 16 characters in length (alphanumeric only).

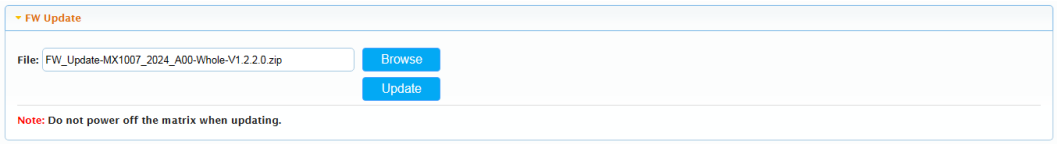
7) FW Update



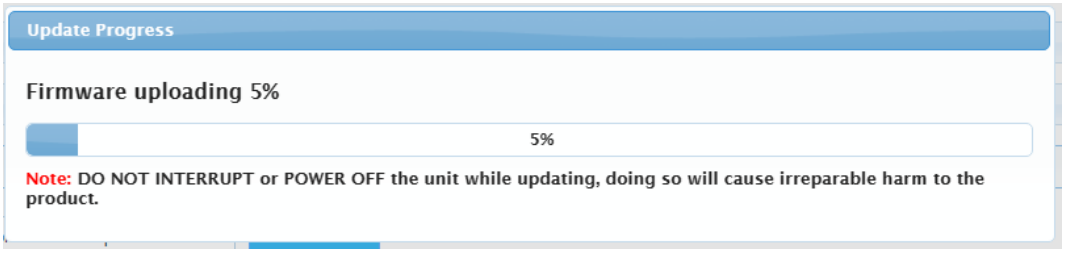
This section allows users to update firmware.

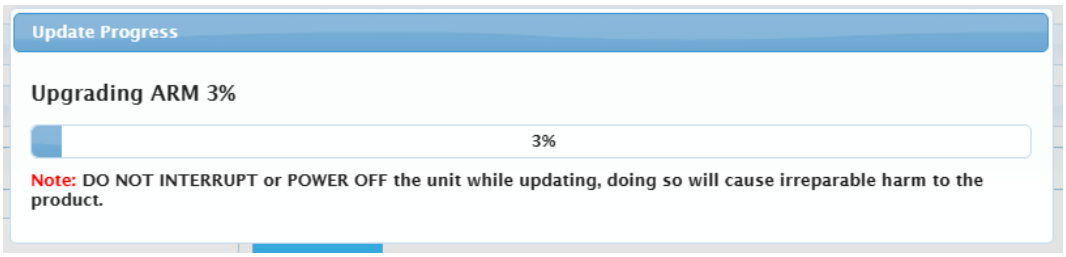
To update Firmware:

1. Click "Browse" for the update file.

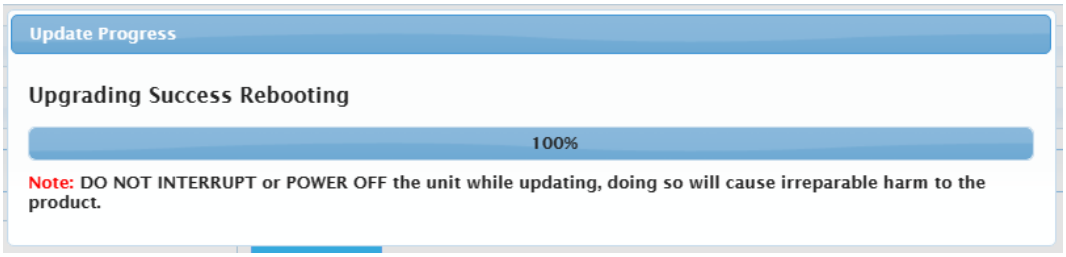


2. Click “Update” to proceed.



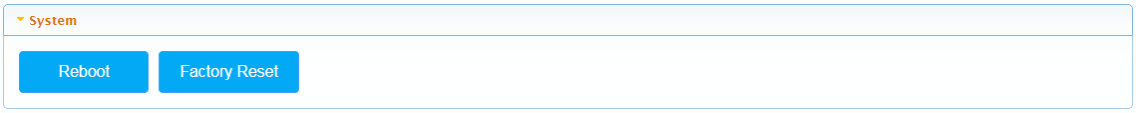


3. The matrix will reboot automatically after upgrading is completed.



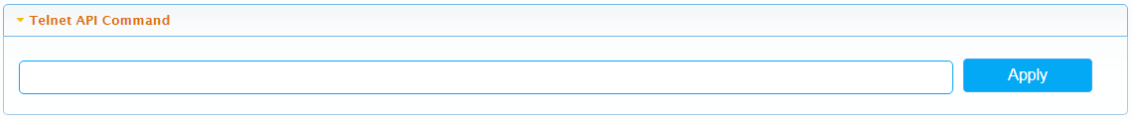
Note: Do not interrupt or power off the matrix during the upgrading.

8) System



- Reboot: Click to reboot the device, and wait 2 minutes to re-access Web UI by refreshing the browser.
- Factory Reset: Click to reset the device to factory defaults, and wait 2 minutes to re-access Web UI by refreshing the browser.

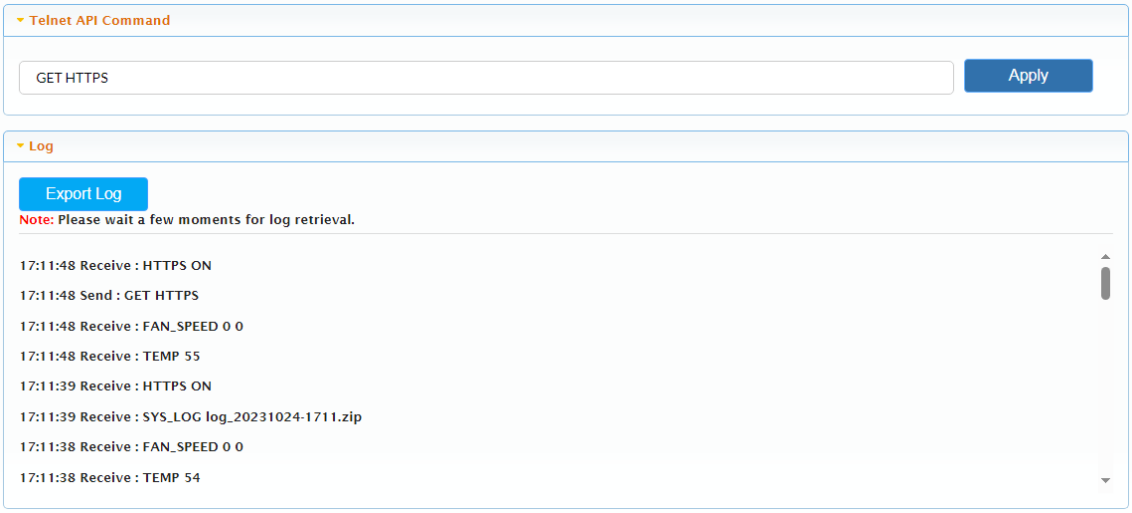
9) Telnet API



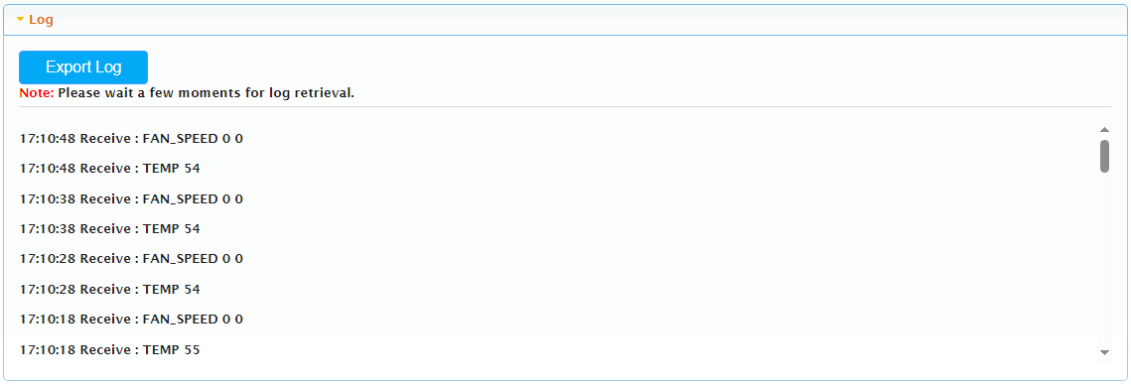
This section allows users to input and send API commands to the matrix. The return value will be display in “Log” part.

Apply: Click “Apply” to send the input command to the matrix.

For example:



10) Log



This section shows the operation log and commands return.

Export Log: Click to export the log file to local PC.