

USER MANUAL

MHD4K-88

8x8 HDMI 2.0 Matrix

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Version: MHD4K-88_2019V1.0



The product is a professional 8x8 HDMI 2.0 Matrix Switcher with Audio Matrix. It includes 8 HDMI inputs, 8 HDMI outputs and the last four outputs feature a down-scaling function, which is designed for switching four HDMI2.0 and HDCP2.3 compliant signals. It also features 8 SPDIF and 8 analog audio outputs for the built in audio matrix.

The matrix switcher features comprehensive EDID management and advanced HDCP handling to ensure maximum functionality with a wide range of video sources.

Features

- 8x8 HDMI 2.0 Matrix Switcher.
- Supports 4K/60 4:4:4, HDR, HDCP2.3 compliant.
- Audio Matrix, audio out can be de-embedded from any input or output.
- Individual volume adjustment on each L+R output.
- Supports 4K to 1080p down-scaling up to 4 outputs.
- HDMI out provides 2.5W to power Active Optical Cable (AOC).
- HDMI Output supports up to 5V500mA for an AOC cable
- Controllable by front panel, IR, RS232 and TCP/IP.

**PLEASE READ THIS PRODUCT MANUAL CAREFULLY
BEFORE USING THIS PRODUCT.**

This manual is only for operational instruction only, and not to be used for maintenance. The functions described in this version are current as at November 2019. Any changes of functions and operational parameters will be updated in future manual versions. Please refer to your dealer for the latest product details.

Version 1.0 6/11/19

SAFETY OPERATION GUIDE



To guarantee the reliable operation of the equipment and safety of the user, please abide by the following procedures in installation, use and maintenance:

1. The system must be earthed properly. Please do not use two blade plugs and ensure the alternating power supply ranges from 100v to 240v and from 50Hz to 60Hz.
2. Do not install the product in an environment where it will be exposed to extreme hot or cold temperatures.
3. This unit will generate heat during operation, please ensure that you allow adequate ventilation to ensure reliable operation.
4. Please disconnect the unit from mains power if it will be left unused for a long time.
5. Please DO NOT try to open the casing of the equipment, DO NOT attempt to repair the unit. Opening the unit will void the warranty. There are high voltage components in the unit and attempting to repair the unit could result in serious injury.
6. Do not allow the unit to come into contact with any liquid as that could result in personal injury and product failure.

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1. Introduction

1.1. Product Introduction

The MHD4K-88 is a professional 8x8 HDMI 2.0 Matrix Switcher with a built in Audio Matrix. It includes 8 HDMI inputs, 8 HDMI outputs and the last four outputs feature a down-scaling function, which is designed for switching four HDMI2.0 and HDCP2.3 compliant signals. It also features 8 SPDIF and 8 analog audio outputs for the audio matrix.

The matrix switcher features comprehensive EDID management and advanced HDCP handing to ensure maximum functionality with a wide range of video sources.

The matrix switcher not only supports bi-directional IR, RS232 extension but also has IR, RS232, and TCP/IP control options.

1.2. Features

- 8x8 HDMI 2.0 Matrix Switcher.
- Supports 4K/60 4:4:4, HDR, HDCP2.3 compliant.
- Audio Matrix, audio out can be de-embedded from any input or output.
- Individual volume adjustment on each L+R output.
- Supports 4K to 1080p down-scaling up to 4 outputs.
- HDMI out provides 2.5W to power an Active Optical Cable (AOC).
- HDMI Output support up to 5V500mA for an AOC cable
- Controllable by front panel, IR, RS232 and TCP/IP.

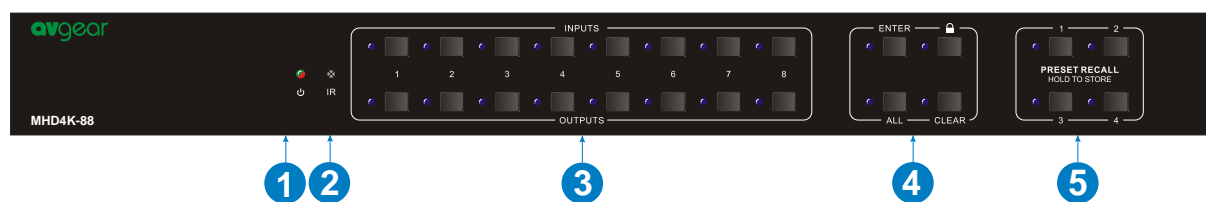
1.3. What's in the Box

- 1x MHD4K-88
- 6x Screws
- 1x RS232 cable (3-pin to DB9)
- 1x IR remote
- 1x User manual
- 2x Mounting ears
- 4x Plastic cushions
- 1x IR receiver
- 1x Power adaptor (DC 24V 2.71A)

Note: Please contact your distributor immediately if any damage or defect in the components is found.

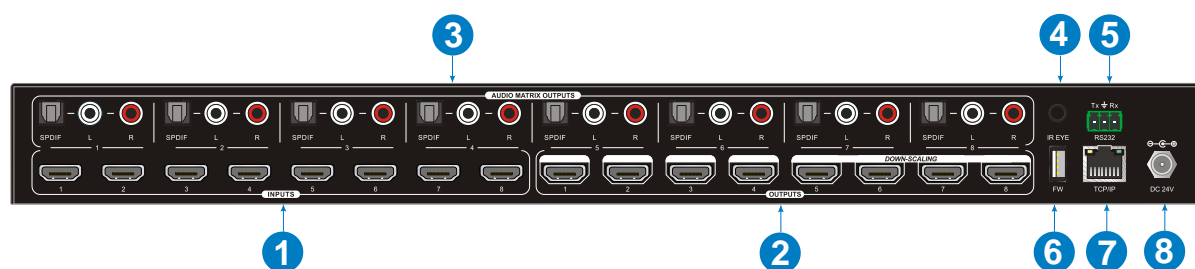
2. Panel Description

2.1. Front Panel



No.	Name	Description
①	Power Indicator	<ul style="list-style-type: none"> Illuminates green when device powered on. Turns red in standby mode.
②	IR sensor	Built-in IR sensor, receives IR signal sent from IR remote.
③	INPUT selector button OUTPUT selector button	<ul style="list-style-type: none"> Total 8 input selector buttons, press one of buttons to switch input source. Total 8 output selector buttons, press the buttons to select output channel.
④	ENTER button	Confirm operation.
	LOCK button	Press this button for 3 seconds to lock/unlock all front buttons.
	ALL button	Select all outputs to convert an input to all outputs: → Press INPUTS 1 + ALL + ENTER
	CLEAR button	Withdraw button.
⑤	PRESET RECALL HOLD TO STORE	<ul style="list-style-type: none"> Press and hold the button 1~4 to save the current switching status to the corresponding preset 1~4. Press the button 1~4 to recall the saved preset 1~4.

2.2. Rear Panel



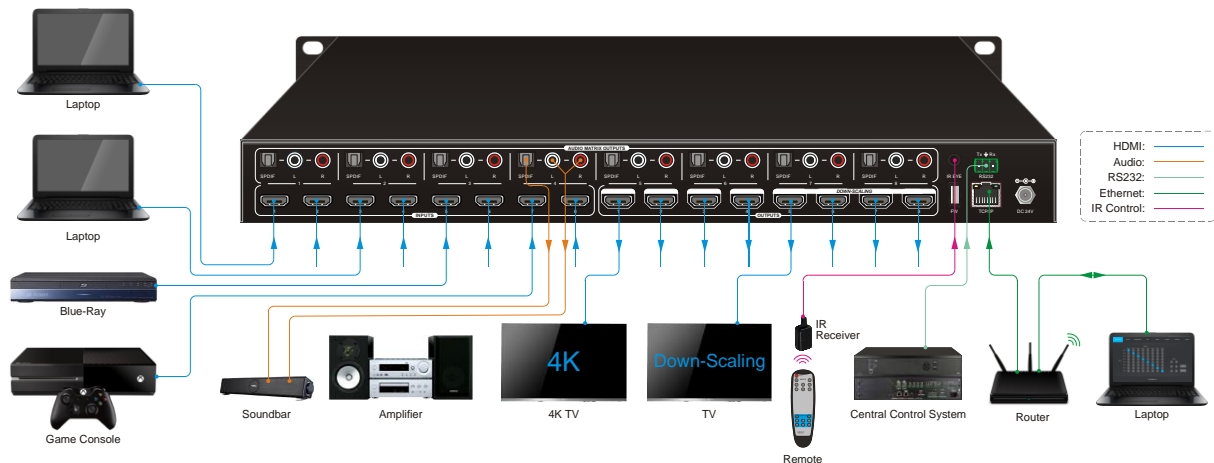
No.	Name	Description
①	INPUTS	HDMI input ports, 8 in total, connects with HDMI sources.
②	OUTPUTS	8 in total, connects with HDMI displays. The last four HDMI ports feature a down-scaling function.
③	AUDIO MATRIX OUTPUTS	SPDIF: Audio output ports for de-embedded HDMI audio, 8 in total. L&R (RCA): Audio output ports for de-embedded HDMI audio, 8 pairs in total.
④	IR EYE	Connects with external IR receiver for using the IR remote to control the Matrix Switcher.
⑤	RS232	3-pin terminal block to connect the RS232 control device (e.g. PC) or a device to be controlled by RS232 commands.
⑥	FIREWARE	USB-A port for updating firmware.
⑦	TCP/IP	RJ45 port to connect the control device (e.g. PC) to control the matrix by GUI.
⑧	DC 24V	Connect with 24VDC 2.71A power adaptor.

3. System Connection

3.1. Usage Precautions

- Make sure all components and accessories included before installation.
- System should be installed in a clean environment with proper temperature and humidity.
- All of the power switches, plugs, sockets, and power cords should be insulated and safe.
- All devices should be connected before power on.

3.2. System Diagram



4. Panel Control

4.1. I/O Connection Switching

The front panel features eight input selection buttons and eight output selection buttons for switching I/O connection.

1) To convert 1 input to 1 output:

Example: Input 1 to Output 3

→ Press **INPUTS 1 + OUTPUTS 3 + ENTER** button.

2) To convert 1 input to 2~7 outputs:

Example: Input 1 to Output 3, Output 6, Output 7.

→ Press **INPUTS 1 + OUTPUTS 3, Output 6, Output 7 + ENTER** button.

3) To convert 1 input to 8 outputs:

Example: Convert Input 2 to all outputs

→ Press **INPUTS 2 + ALL** button + **ENTER** button.

Note: Indicators of the pressed buttons will blink blue for three times if the conversion is done, then it will be off. If the conversion failed, they will be off immediately.

4.2. I/O Connection Inquiry

Press **OUTPUTS** button 1, 2, 3, 4,5,6,7 or 8 to inquiry its corresponding input, and then the indicator of the input button will turn blue.

4.3. LOCK Function

Long press the **LOCK** button for three seconds, all buttons on the front panel disable to work. And then long press the **LOCK** button for three seconds again or unlock on GUI control, the front panel button will unlock.

4.4. PRESET RECALL Function

Press and hold the **PRESET 1~4** at least three seconds to save the current switching status to the corresponding preset 1~4.

Press the **PRESET 1~4** to recall the saved preset 1~4.

Note: The matrix switcher supports six presets, but only preset 1~4 can be saved and recalled by button control. Please manage other preset by GUI control or RS232 control.

4.5. CLEAR Button

Please press the **CLEAR** button if want to withdraw an operation before the **ENTER** button comes into effect, meanwhile, the matrix will return to the previous status.

5. IR Remote Control

The Matrix Switcher features one built-in IR receiver to receive IR signal from IR remote to enable IR control. If the external IR receiver or other IR control device need to be used, the IR EYE port on rear panel can be connected.

① **Standby Button:** Press it to enter/ exit standby mode.

② **INPUTS:**

Input channel selection buttons, same with the corresponding front panel buttons

③ **OUTPUTS:**

Output channel selection buttons, same with the corresponding front panel buttons.

④ **Menu Buttons:**

- **ALL:** Select all inputs/outputs.

To convert an input to all outputs:

Example: Input 1 to all Outputs:

→ Press INPUTS 1 + ALL + ENTER

- **EDID management button:**

- 1) One input port follows the EDID data from one output port.

Example: Input 2 learns EDID data from output 4:

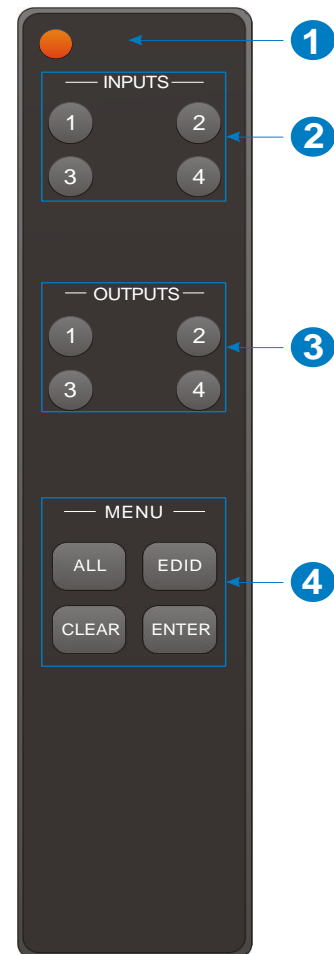
→ Press EDID + INPUTS 2 + OUTPUTS 4 + ENTER

- 2) All input ports learn EDID data from one output port.

Example: All input ports learn EDID data from output 3:

→ Press EDID + ALL + OUTPUTS 3 + ENTER

- **CLEAR:** Withdraw button.
- **ENTER:** Confirm operation.

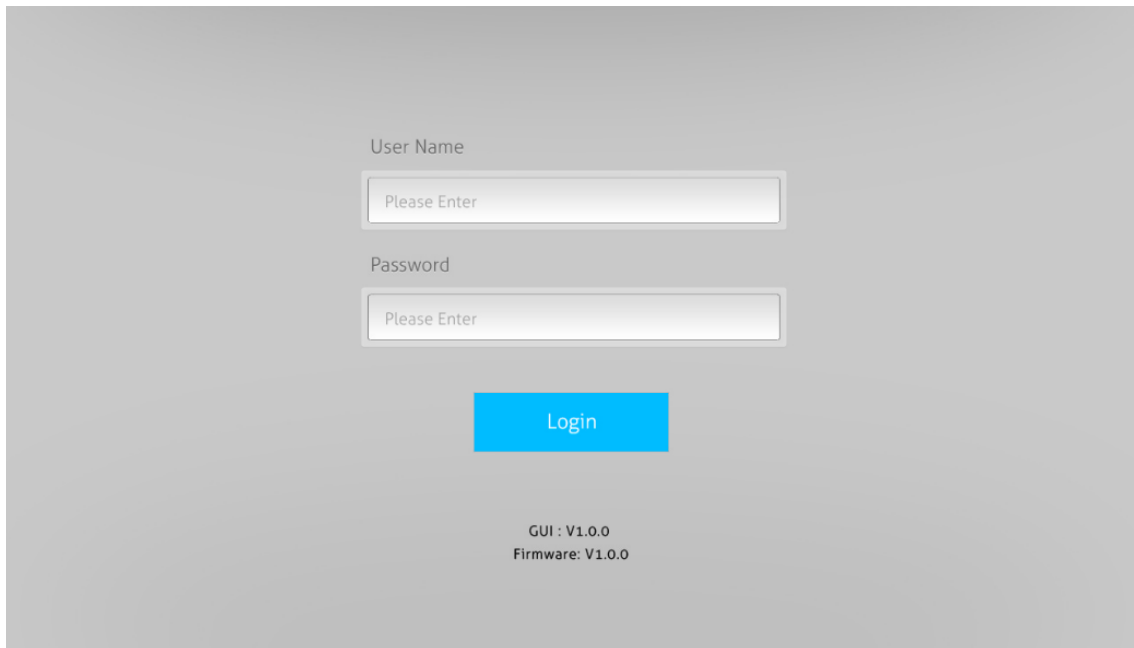


6. GUI Control

The matrix can be controlled via TCP/IP. The default IP settings are:

IP Address: 192.168.0.178
Subnet Mask: 255.255.255.0
Gateway: 192.168.0.1

Type **192.168.0.178** in the internet browser, it will enter the below log-in webpage:



User Name

Please Enter

Password

Please Enter

Login

GUI: V1.0.0
Firmware: V1.0.0

Username: admin

Password: admin

Type the user name and password, and then click **Login** to enter the section for video switching.

6.1. Switching Tab



Use the 8x8 button grid on the page to set which inputs are directed to which outputs. For example, clicking the button on the Input 1 row and Output 1 column, directs input 1 to output 1.

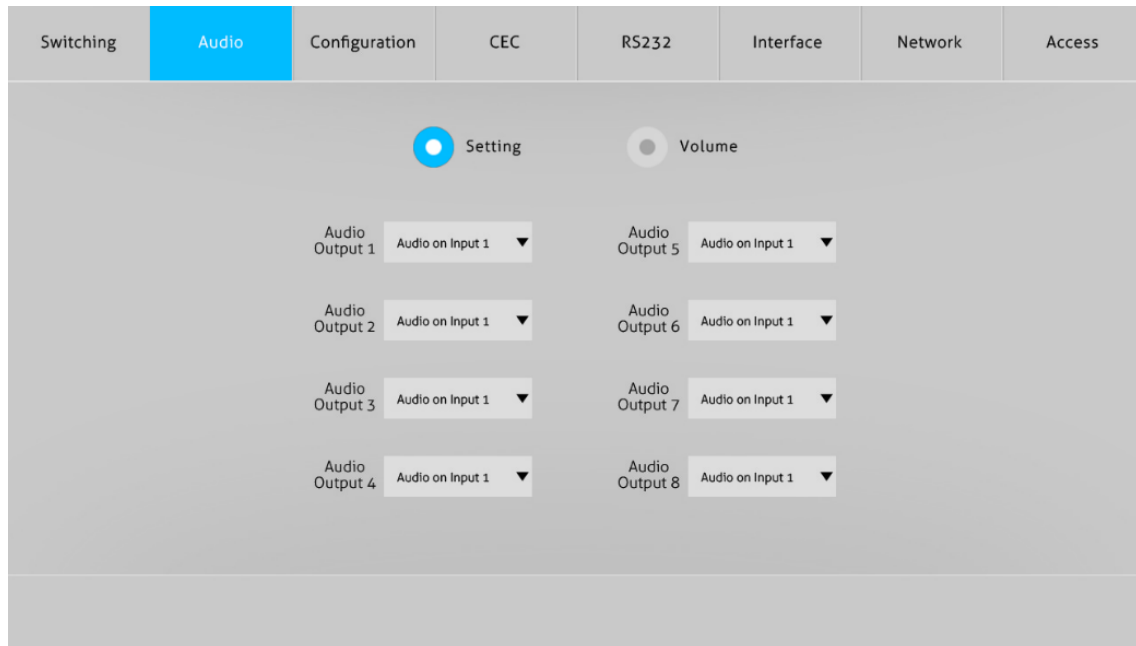
Use the 6 numbered buttons under scene area to save and load layout presets.

- To save a given layout, first click one of the numbered buttons, then click the **Save** button.
- To load a previously saved layout, first click one of the numbered buttons, then click the **Recall** button.



6.2. Audio Tab

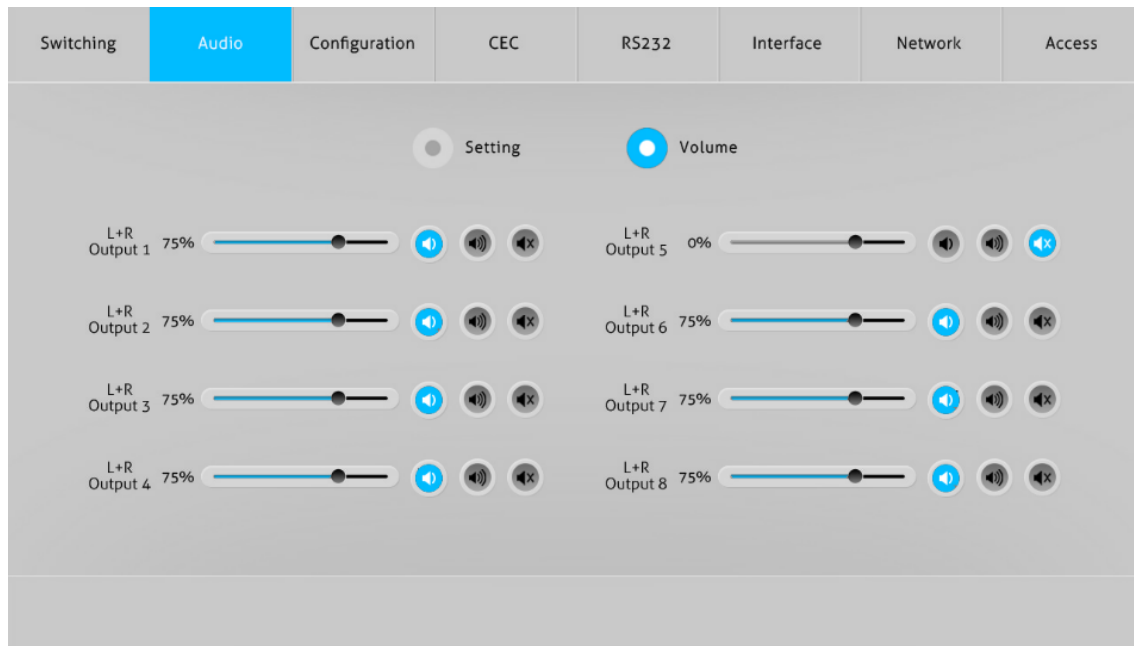
1) Audio Setting



- There are sixteen sources can be selected for eight digital SPDIF output ports.

Audio Output Ports	Audio Sources	
	Input Breakout	Output Breakout
SPDIF 1 & Analog 1	Audio on Input 1 Audio on Input 2 Audio on Input 3 Audio on Input 4 Audio on Input 5 Audio on Input 6 Audio on Input 7 Audio on Input 8	Audio on Output 1
SPDIF 2 & Analog 2		Audio on Output 2
SPDIF 3 & Analog 3		Audio on Output 3
SPDIF 4 & Analog 4		Audio on Output 4
SPDIF 5 & Analog 5		Audio on Output 5
SPDIF 6 & Analog 6		Audio on Output 6
SPDIF 7 & Analog 7		Audio on Output 7
SPDIF 8 & Analog 8		Audio on Output 8

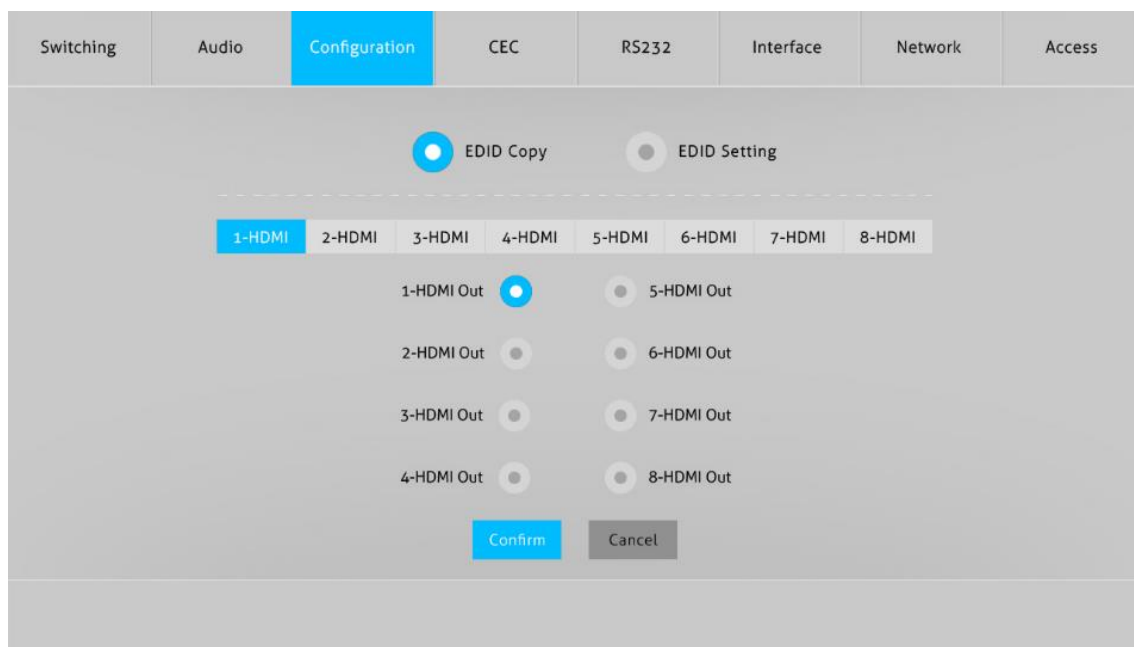
2) Audio Volume



- Eight pairs analog L/R audio to control their outputs volume.

6.3. Configuration Tab

6.3.1 EDID Copy



- Copy the EDID of the selected output device to one or more input source device.

6.3.2 EDID Setting

Switching Audio **Configuration** CEC RS232 Interface Network Access

☐ EDID Copy ☒ EDID Setting

1-HDMI 2-HDMI 3-HDMI 4-HDMI 5-HDMI 6-HDMI 7-HDMI 8-HDMI

1920x1080@60 8bit Stereo ☐ 3840x2160@60Hz 4:2:0 Deep Color Stereo Audio ☐

1920x1080@60 8bit High Definition Audio ☐ 3840x2160@60Hz Deep Color Stereo Audio ☐

3840x2160@30Hz 8bit Stereo Audio ☐ 3840x2160@60Hz Deep Color High Definition Audio ☐

3840x2160@30Hz Deep Color High Definition Audio ☐ 3840x2160@60Hz Deep Color HDR LPCM 6CH ☐

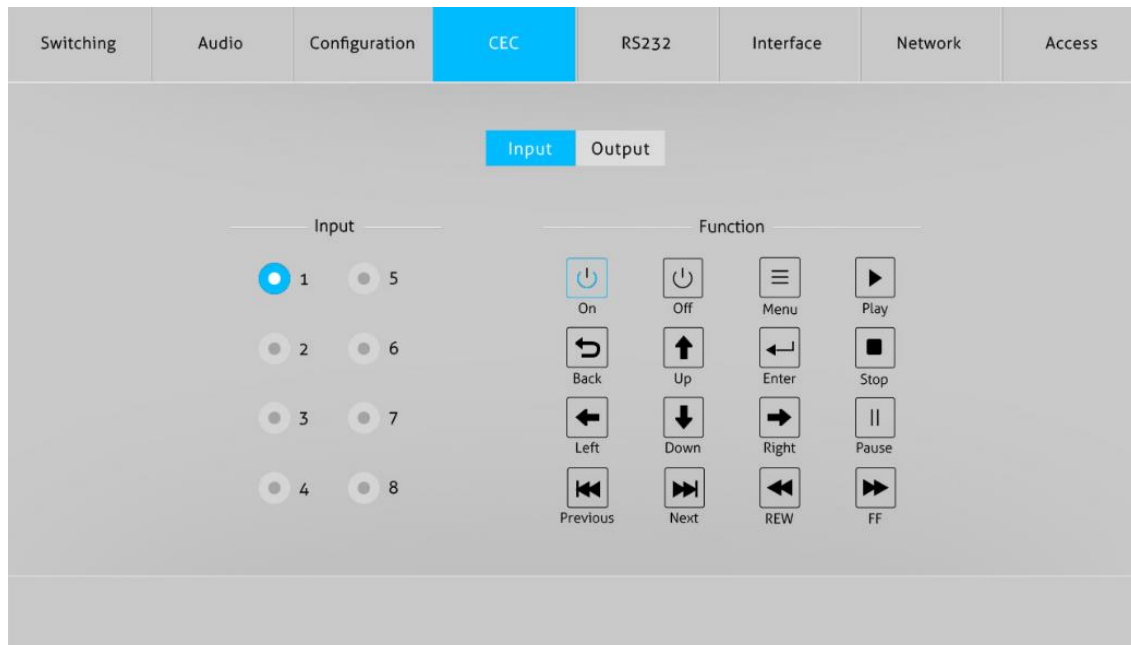
☒ User-defined .bin

- Select the compatible built-in EDID for the selected input source.
- Upload user-defined EDID by the below steps:
 - 1) Prepare the EDID file (.bin) on the control PC.
 - 2) Select the **User-defined**.
 - 3) Click the box , and then select the EDID file (.bin) according the tooltip.
 - 4) Click **Apply** to upload the user-defined EDID, and then click **Confirm** to save setting.

6.4. CEC Tab

If the input source devices, output display devices support CEC, they can be controlled via the following CEC interface.

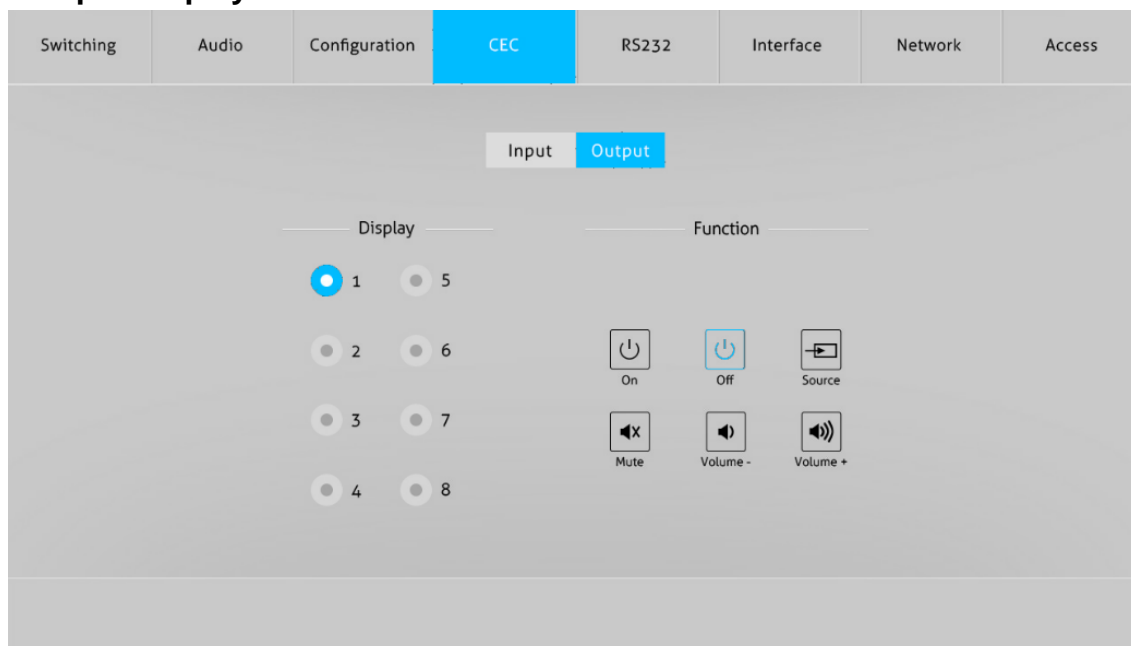
1) Input Source Device Control



- Select one input source device to be controlled, and then press function buttons.

Note: It cannot control two or more input source devices simultaneously.

2) Output Display Device Control



- Select one output device to be controlled, and then press function buttons.

Note: It can not control two or more output devices simultaneously.

6.5. RS232 Tab

The screenshot shows the RS232 configuration tab. At the top, there is a navigation bar with tabs: Switching, Audio, Configuration, CEC, RS232 (selected), Interface, Network, and Access. Below the navigation bar, the RS232 configuration options are displayed:

- Format:** ASCII (selected) and HEX (unselected).
- Baud Rate:** A dropdown menu showing 9600.
- Command Ending:** A dropdown menu showing NULL.
- Command:** A text input field containing xxxxxx.
- Buttons:** Confirm (blue) and Cancel (grey).

- ASCII or HEX command format can be selected.
- **Baud Rate:** Supports 2400, 4800, 9600, 19200, 38400, 57600 or 115200.
- **Command Ending:** NULL, CR, LF or CR+LF can be chosen.
- **Command:** Type the command in this box to control the third-party device which is connected to the RS232 port of the switcher.

6.6. Interface Tab

The screenshot shows the Interface configuration tab. At the top, there is a navigation bar with tabs: Switching, Audio, Configuration, CEC, RS232, Interface (selected), Network, and Access. Below the navigation bar, the Interface configuration options are displayed:

- Title Bar Label:** A text input field.
- Button Labels:** A section with two columns: Input and Output. Each column has 8 rows, numbered 1 to 8. Each row contains a label (e.g., Input 1, Output 1) and a corresponding button.
- Buttons:** Confirm (blue) and Cancel (grey).

- Modify the title bar label and the button labels.

6.7. Network Tab

Switching	Audio	Configuration	CEC	RS232	Interface	Network	Access
-----------	-------	---------------	-----	-------	-----------	---------	--------

MAC Address: 44-33-4C-C9-35-12

DHCP ☒ Static IP ☐

IP Address:

Subnet Mask:

Gateway:

- Static IP or Dynamic Host Configuration Protocol (DHCP).
- Modify the static IP Address, Subnet Mask, and Gateway.

6.8. Access Tab

Switching	Audio	Configuration	CEC	RS232	Interface	Network	Access
-----------	-------	---------------	-----	-------	-----------	---------	--------

Credentials

Password:

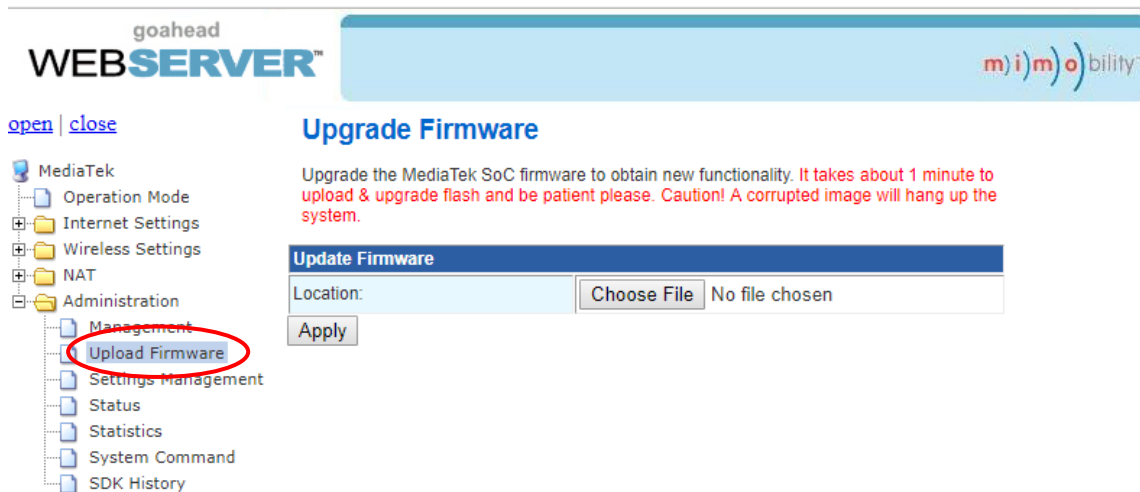
Front Panel Lock

ON ☒ OFF

- Modify the login password.
- Lock or unlock the front panel buttons.

6.9. GUI Upgrade

Web-based GUI for the product supports online update in <http://192.168.0.178:100>. First, the product is running. Type the username and password (the same as the GUI log-in settings, modified password will be available only after rebooting) to log in the configuration interface. After that, click **Administration** at the source Tab to get to **Upload Program** as shown below:



Select the desired update file and press **Apply**, it will start upgrading then. Last, check whether where a reminder is named check ok, if yes, the GUI was updated successfully, otherwise, the GUI updating is fail, and then follow the above steps to update again.

7. RS232 Control

Connect the RS232 port to control device (e.g. PC) with RS232 cable. The matrix can be controlled by sending RS232 commands.

7.1. RS232 Control Software

- **Installation:** Copy the control software file to the control PC.
- **Uninstallation:** Delete all the control software files in corresponding file path.

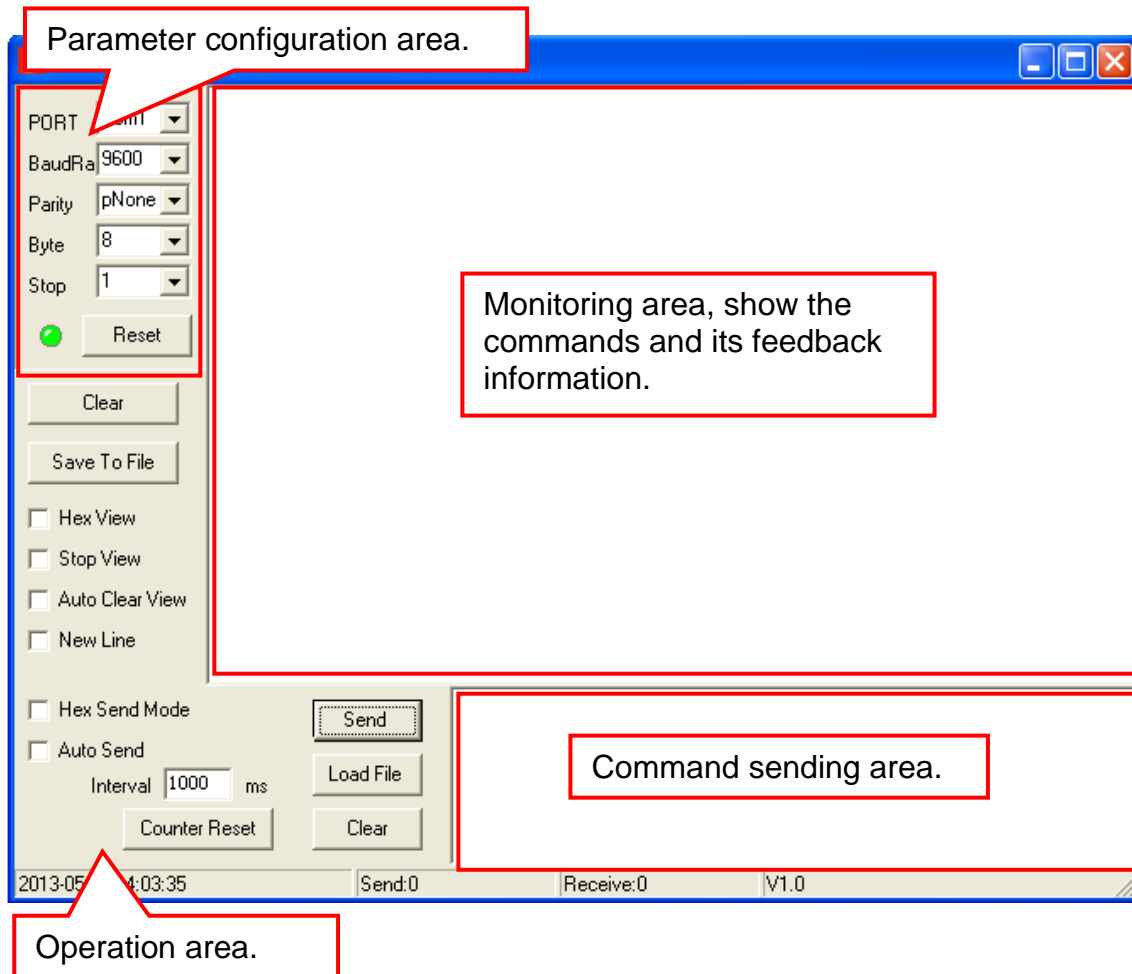
Basic Settings:

Connect the matrix with all input devices and output devices needed, then to connect it with a PC which is installed with RS232 control software. Double-click the software icon to run this software.

Here take the software **CommWatch.exe** as example:



The interface of the control software is shown below:



Please set the parameters of COM number, bound rate, data bit, stop bit and the parity bit correctly, and then you are able to send command in command sending area.

7.2. RS232 Control Commands

Communication protocol: RS232 Communication Protocol

Baud rate: 9600 **Data bit:** 8 **Stop bit:** 1 **Parity bit:** none

Note:

- Case-sensitive.
- “[”, “]” in the commands are for easy recognition only and not necessary in real operations. Other symbols including “.”, “,”, “/”, “%”, “:”, “^”. are parts of the commands.
- Feedbacks listed in the column “Feedback Example” are only for reference, feedbacks may vary according to different operations.

7.2.1 System Control

Command	Function	Feedback Example
PowerON.	Power on	Power ON! Front Panel Unlock!
PowerOFF.	Power off	Power OFF!
/ *Name.	Query the name of matrix	MHD4K-88
/ *Type.	Query the model of matrix	PTN
/ ^Version.	Query the version of firmware	V1.0.0 CPLD:V1.0.0
RST.	Reset to factory default.	Factory Default!

7.2.2 Control Management

Command	Function	Feedback Example
DS[xx]ON.	Able output devices down-scaling function. [xx]=00~04, xx =01~04 is the corresponding number of output 5,6,7 or 8 port, if the xx =00, it means all output 5~8 ports.	HDMI OUT 05 Down Scale ON! HDMI OUT 06 Down Scale ON! HDMI OUT 07 Down Scale ON! HDMI OUT 08 Down Scale ON!
DS[xx]OFF.	Disable output devices down-scaling	HDMI OUT 05 Down

Command	Function	Feedback Example
	function. [xx]=00~04, xx =01~04 is the corresponding number of output 5,6,7 or 8 port, if the xx =00, it means output 5~8 ports.	Scale OFF! HDMI OUT 06 Down Scale OFF! HDMI OUT 07 Down Scale OFF! HDMI OUT 08 Down Scale OFF!
OUT[xx]:[YY].	Output port select input port. [xx]=00~08, xx =01~08 is the number of output port, if the xx =00, it means all output ports. [YY]=01~08, YY =01~08 is the number of input port.	Output 01 Switch To In 01! Analog Out 01 Switch To Video Out 01! Analog Out 02 Switch To Video Out 01! Output 02 Switch To In 01! Output 03 Switch To In 01! Output 04 Switch To In 01! Output 05 Switch To In 01! Output 06 Switch To In 01! Output 07 Switch To In 01! Output 08 Switch To In 01!
@OUT[xx].	Able HDMI 5V of output port. [xx]=00~08, xx =01~08 is the number of output port, if the xx =00, it means all output ports.	Turn ON Output 01! Turn ON Output 02! Turn ON Output 03! Turn ON Output 04! Turn ON Output 05! Turn ON Output 06! Turn ON Output 07! Turn ON Output 08!
\$OUT[xx].	Disable HDMI 5V of output port. [xx]=00~08, xx =01~08 is the number of output port, if the xx =00, it means all output ports.	Turn OFF Output 01! Turn OFF Output 02! Turn OFF Output 03! Turn OFF Output 04! Turn OFF Output 05! Turn OFF Output 06! Turn OFF Output 07! Turn OFF Output 08!

7.2.3 Query Commands

Command	Function	Feedback Example
GetGuiIP.	Query GUI IP	GUI_IP:192.168.0.178!
SetGuiIP:xxx.xxx.xx.xxx.	Set GUI IP	SetGuiIP:192.168.0.178!
Baudratexxxx/xxxxx/xxxxxx.	Set the baud rate of local serial port	Set Local RS232 Baudrate Is xxxx/xxxxx/xxxxxx!
STA.	Query Status	GUI Or RS232 Query Status: PTN MHD4K-88 V1.0.0 Power ON! Front Panel UnLock! Local RS232 Baudrate Is 115200! GUI_IP:192.168.0.150!
STA_POUT.	Query 5V Status of output port.	Turn ON Output 01! Turn ON Output 02! Turn ON Output 03! Turn ON Output 04! Turn ON Output 05! Turn ON Output 06! Turn ON Output 07! Turn ON Output 08!
STA_IN.	Query 5V Status of input port.	IN 1 2 3 4 5 6 7 8 LINK Y Y Y N Y Y Y Y
STA_OUT.	Query HPD Status of output.	OUT 1 2 3 4 5 6 7 8 LINK Y N Y Y Y Y Y Y
STA_VIDEO.	Query the input source of output port.	Output 01 Switch To In 01! Output 02 Switch To In 02! Output 03 Switch To In 04! Output 04 Switch To In 01! Output 05 Switch To In 03!

Command	Function	Feedback Example
		Output 06 Switch To In 06! Output 07 Switch To In 04! Output 08 Switch To In 07!
STA_HDCP.	Query current using HDCP model of all output ports. 01-08 represents output port 1-8.	OUT 01 HDCP PASSIVE! OUT 02 HDCP PASSIVE! OUT 03 HDCP MAT DISPLAY! OUT 04 HDCP BYPASS! OUT 05 HDCP PASSIVE! OUT 06 HDCP PASSIVE! OUT 07 HDCP PASSIVE! OUT 08 HDCP PASSIVE!
STA_AUDIO.	Query audio switch and volume status of analog audio.	Audio Out 01 Switch To Video Out 05! Analog Out 01 Volume UnMute! Analog Out 01 Volume 50! Audio Out 02 Switch To Video Out 05! Analog Out 02 Volume Mute! Analog Out 02 Volume 32! ... Analog Out 08 Volume Mute! Analog Out 08 Volume 75!
PresetSta[xx].	Save the scene	Preset 09 Save Success! Preset 09 Sta: Out 01 In 01! Out 02 In 04! Out 03 In 05!

Command	Function	Feedback Example
		Out 04 In 04! Out 05 In 06! Out 06 In 03! Out 07 In 06! Out 08 In 08!
PresetRecall[xx].	Scene recall	Preset 09 Recall: Output 01 Switch To In 02! Output 02 Switch To In 02! Output 03 Switch To In 02! Output 04 Switch To In 02! Output 05 Switch To In 04! Audio Out 01 Switch To Video Out 05! Audio Out 02 Switch To Video Out 05! Audio Out 03 Switch To Video Out 05! Audio Out 04 Switch To Video Out 05! Audio Out 05 Switch To Video Out 05! Audio Out 06 Switch To Video Out 05! Audio Out 07 Switch To Video Out 05! Audio Out 08 Switch To Video Out 05! Output 06 Switch To In 04! Output 07 Switch To In 04! Output 08 Switch To In 04!

7.2.4 Lock/unlock Commands

Command	Function	Feedback Example
Lock.	Lock the front panel buttons.	Front Panel Locked!
Unlock.	Unlock the front panel buttons.	Front Panel UnLock!

7.2.5 Audio Commands

Command	Function	Feedback Example
AUDIO[xx]:[YY].	SPDIF OUT and ANALOG OUT(They are same input audio source at one group) select which input audio source. [xx]=00~08 xx=01~08 is the number of the output port, if the xx=00, it means all output ports. [yy]=01~16 yy=01~08, it means de-embedded audio from HDMI1-8 input, if the yy=09~16, it means de-embedded audio from HDMI1-8 output.	Audio Out 01 Switch To Video Out 05! Audio Out 02 Switch To Video Out 05! Audio Out 03 Switch To Video Out 05! Audio Out 04 Switch To Video Out 05! Audio Out 05 Switch To Video Out 05! Audio Out 06 Switch To Video Out 05! Audio Out 07 Switch To Video Out 05! Audio Out 08 Switch To Video Out 05!
AVOLUME[xx]:[YY].	[xx]=00~08 xx=01~08 is the number of the Analog output port, if the xx=00, it means all Analog output ports. [YY]=="V+" means volume up, [YY]=="V-" means volume down, [YY]=="MU" means Mute, [YY]=="UM" means <u>U</u> nMute, [YY]==00-100 means setting volume	1. Analog Out 01 Volume 55! 2. Analog Out 02 Volume 32! 3. Analog Out 01 Volume Mute! 4. Analog Out 01 Volume UnMute! 5. Analog Out 01 Volume 50!

7.2.6 HDCP Compliance

Command	Function	Feedback Example
HDCP[xx]ON.	Force able and output HDCP 1.4. [xx]=00~08, xx =01~08 is the number of output port, if the xx =00, it means all output ports.	OUT 01 HDCP ON! OUT 02 HDCP ON! OUT 03 HDCP ON! OUT 04 HDCP ON! OUT 05 HDCP ON! OUT 06 HDCP ON! OUT 07 HDCP ON! OUT 08 HDCP ON!
HDCP[xx]OFF.	Force disable the output HDCP. [xx] =00~08, xx =01~08 is the number of output port, if the xx =00, it means all output ports.	OUT 01 HDCP OFF! OUT 02 HDCP OFF! OUT 03 HDCP OFF! OUT 04 HDCP OFF!

Command	Function	Feedback Example
		OUT 05 HDCP OFF! OUT 06 HDCP OFF! OUT 07 HDCP OFF! OUT 08 HDCP OFF!
HDCP[xx]MAT.	Output HDCP follows the display. [xx] =00~08, xx =01~08 is the number of output port, if the xx =00, it means all output ports.	OUT 01 HDCP MAT Display! OUT 02 HDCP MAT Display! OUT 03 HDCP MAT Display! OUT 04 HDCP MAT Display! OUT 05 HDCP MAT Display! OUT 06 HDCP MAT Display! OUT 07 HDCP MAT Display! OUT 08 HDCP MAT Display!
HDCP[xx]PAS.	Output HDCP follows the value and status of input source device. [xx] =00~08, xx =01~08 is the number of output port, if the xx =00, it means all output ports.	OUT 01 HDCP PASSIVE! OUT 02 HDCP PASSIVE! OUT 03 HDCP PASSIVE! OUT 04 HDCP PASSIVE! OUT 05 HDCP PASSIVE! OUT 06 HDCP PASSIVE! OUT 07 HDCP PASSIVE! OUT 08 HDCP PASSIVE!
HDCP[xx]BYP.	Output HDCP follows input HDCP. Input has HDCP, output is HDCP1.4. Input doesn't have HDCP, output is without HDCP. [xx] =00~08, xx =01~08 is the number of output port, if the xx =00, it means all output ports.	OUT 01 HDCP BYPASS! OUT 02 HDCP BYPASS! OUT 03 HDCP BYPASS! OUT 04 HDCP BYPASS! OUT 05 HDCP

Command	Function	Feedback Example
		BYPASS! OUT 06 HDCP BYPASS! OUT 07 HDCP BYPASS! OUT 08 HDCP BYPASS!

7.2.7 EDID Management

Command	Function	Feedback Example
EDIDMInit.	Restore the factory default EDID data for each input.	All Input EDID Set Default! System Initialization..... PTN1111 MHD4K-88 V1.0.0 Power ON! Front Panel UnLock!
EDIDUpgrade[x x].	Upgrade EDID via Serial Port <ul style="list-style-type: none"> • [xx]=00~08 xx=01~08 is the number of the port(able EDID user-defined for corresponding HDMI input), if the xx=00, it means all ports(able EDID user-defined for all HDMI inputs). Note: EDID user-defined can be used once, if switch to another EDID or exit, it will not be saved. <ul style="list-style-type: none"> • [xx]=U. xx=U means user-defined for built-in EDID(It can be saved in machine for using at any time). Note: It can user-defined only one built-in EDID, after finishing it, machine still use previous built-in EDID. <ul style="list-style-type: none"> • When received commands, machine will remind EDID file (.bin) to send within 10 seconds. Note: In order to guarantee the data to be normal received, need to disconnect all HDBaset before sending the command(s)	File size: 256 Baud rate:115200bps Quired time: About 0 second Please wait... Send Completed ! User Define EDID Upgrade OK By RS232 Or GUI!
EDID/[xx]/[yy].	Input ports xx use built-in EDID yy [xx]=00~08	Input All EDID Upgrade OK By 09

Command	Function	Feedback Example
	xx=01~08 is the number of the input port, if the xx=00, it means all input ports. [yy]=01~09 yy=01~08, it means built-in EDID that can not be user-defined, if the yy=09, it means user-defined EDID.	Internal EDID!
EDIDGOUT[XX].	Read and print EDID of HDMI output, [XX]=01~08 is the number of the output port.	EDIDOUT04:
EDIDM[xx]B[yy].	Input port [yy] follows the EDID from output port [xx]. [xx]=01~08 xx =01~08 is the number of the output port. [yy]=00~08 yy=01~08 is the number of input port, if the yy=00, it means all input ports.	Input 06 EDID Upgrade OK By 01 EXT EDID!
/+[X]/[yy]:xxx.	Send serial data to local. [X]= 1--2400; 2--4800; 3--9600; 4--19200; 5--38400; 6--57600; 7--115200. [yy] means the output port that sent serial data, yy=01 means local output.	xxx.
EDIDSTA[xx].	Query EDID status of Input port. [xx]=00~08, xx =01~08 is the number of input port, if the xx =00, it means all input ports. Note: <ul style="list-style-type: none"> If built-in EDID09 is not user-defined, when querying it, the input port will use EDID6 Internal EDID instead. For example, send "EDID/03/09.", "EDIDSTA03.", and the result is "Input 03 EDID From 06 Internal EDID!". If built-in EDID09 is user-defined, when querying it, the input port will use the user-defined EDID. For example, send "EDID/03/09.", "EDIDSTA03.", and the result is "Input 03 EDID From User Define EDID!". If directly user-define the port EDID, when querying it, the input port will use the user-defined EDID. For example, send "EDIDSTA03.", and the result is "Input 3 EDID From User Define EDID!" 	Input 01 EDID From 01 Internal EDID! Input 02 EDID From 02 Internal EDID! Input 03 EDID From 03 Internal EDID! Input 04 EDID From 06 Internal EDID! Input 05 EDID From 06 Internal EDID! Input 06 EDID From 06 Internal EDID! Input 07 EDID From 06 Internal EDID! Input 08 EDID From User Define EDID!

7.2.8 CEC Control

If the input sources, HDBaseT output devices and local HDMI output devices are supports CEC, they can be controlled by sending the following command instead of IR remote.

CEC[I/O][AA][BB][CC][DD].

- The “[I]” represents the input port. The “[O]” represents the output port.
- The “[AA]” represents the port number. The HDMI input ports are 01~08. The HDMI output ports are 01~08.
- The “[AA]” is “FF” for sending command to all input or output ports.
- The “[BB]” represents the device type (e.g. TV: 40/20/80; Blu-ray DVD: 04/08).
- The “[CC]” represents the CEC function type (e.g. “44”: Remote control).
- The “[DD]” represents the specific command from the table below.

✓ Control the input source:

Command	Description	Command Example and Response
CECI[AA][BB][CC]00.	Confirm operation (Enter).	CECI02044400
		CEC Input 02 Send Success!
CECI[AA][BB][CC]01.	UP direction.	CECI01044401.
		CEC Input 01 Send Success!
CECI[AA][BB][CC]02.	DOWN direction.	CECI01044402.
		CEC Input 01 Send Success!
CECI[AA][BB][CC]03.	LEFT direction.	CECI03044403.
		CEC Input 03 Send Success!
CECI[AA][BB][CC]04.	RIGHT direction.	CECI03044404.
		CEC Input 03 Send Success!
CECI[AA][BB][CC]09.	Back to submenu.	CECI03044409.
		CEC Input 03 Send Success!
CECI[AA][BB][CC]0A.	Enter main menu.	CECI0304440A.
		CEC Input 03 Send Success!

CECI[AA][BB][CC]0D.	Exit menu.	CECI0204440D.
		CEC Input 02 Send Success!
CECI[AA][BB][CC]6D.	Power on.	CECI0204446D.
		CEC Input 02 Send Success!
CECI[AA][BB][CC]6C.	Power off.	CECI0204446C.
		CEC Input 02 Send Success!

✓ **Control the output display device:**

Command	Description	Command Example and Response
CECO[AA][BB][CC]41.	Volume up.	CECO05404441.
		CEC Output 05 Send Success!
CECO[AA][BB][CC]42.	Volume down.	CECO05404442.
		CEC Output 05 Send Success!
CECO[AA][BB][CC]43.	Mute	CECO05404443.
		CEC Output 05 Send Success!
CECO[AA][BB]04.	Power on.	CECO038004.
		CEC Output 03 Send Success!
CECO[AA][BB]36.	Power off.	CECO038036.
		CEC Output 03 Send Success!

8. Firmware Upgrade

Please follow the steps as below to upgrade firmware by the **FIRMWARE** port on the rear panel:

- 1) Prepare the latest upgrade file and rename it as "08010000.APP" on PC.
- 2) Power off the switcher, and connect the **FIRMWARE** port of switcher to the PC with USB cable.
- 3) Power on the switcher, and then the PC will automatically detect a U-disk named of "BOOTDISK".
- 4) Double-click the U-disk, a file named of "READY.TXT" would be showed.
- 5) Directly copy the latest upgrade file 08010000.APP (.bin) to the "BOOTDISK" U-disk.
- 6) Reopen the U-disk to check the filename "READY.TXT" whether automatically becomes "SUCCESS.TXT", if yes, the firmware was updated successfully, otherwise, the firmware updating is fail, the name of upgrade file (.bin) should be confirm again, and then follow the above steps to update again.
- 7) Remove the USB cable after firmware upgrade.
- 8) After firmware upgrade, the switcher should be restored to factory default by sending command.

9. Specifications

Video	
Video Input	(8) HDMI
Input Connector	(8) Type-A female HDMI
HDMI Input Resolution	Up to 4K@60Hz 4:4:4, HDR
Video Output	(8) HDMI
Output Connector	(8) Type-A female HDMI
HDMI Output Resolution	Up to 4K@60Hz 4:4:4, HDR10 and Dolby Vision
HDMI Output	Supports up to 5V500mA for an AoC cable
HDMI Version	Up to 2.0
HDCP Version	Up to 2.3
HDMI Audio Signal	LPCM 7.1 audio, Dolby Atmos®, Dolby® TrueHD, Dolby Digital® Plus, DTS:X™, and DTS-HD® Master Audio™ pass-through.
Digital Audio Output	
Output	(8) Digital SPDIF audio
Output Connector	(8) Toslink connector
Digital SPDIF Audio Format	Supports PCM, Dolby Digital, DTS, DTS-HD
Frequency Response	20Hz – 20KHz, ±1dB
Max Output Level	±0.05dBFS
THD+N	< 0.05%, 20 Hz – 20 kHz bandwidth, 1 kHz sine at 0dBFS level (or max level)
SNR	> 90dB, 20Hz-20KHz bandwidth
Crosstalk Isolation	< -70 dB, 10 kHz sine at 0 dBFS level (or max level before clipping)
Noise	-90dB
Analog Audio Output	
Output	(8) Analog L/R Audio
Output Connector	(8) L&R (RCA)
Digital SPDIF Audio Format	PCM 2CH
Frequency Response	20 Hz to 20 kHz, ±1dB
Max Output Level	2.0Vrms ± 0.5dB. 2 V = 16 dB headroom above -10dBV (316 mV) nominal consumer line level signal
THD+N	< 0.05%, 20 Hz – 20 kHz bandwidth, 1 kHz sine at 0dBFS level (or max level)
SNR	> 80dB, 20Hz-20 kHz bandwidth
Crosstalk Isolation	< -80 dB, 10 kHz sine at 0dBFS level (or max level before clipping)

L-R level deviation	< 0.05 dB, 1 kHz sine at 0dBFS level (or max level before clipping)
Output load capability	1kohm and higher (supports 10x paralleled 10kohm loads)
Noise	-80dB
Control	
Control port	(1) FIRWARE, (1) IR EYE, (1) RS232, (1) TCP/IP
Control Connector	(1) USB-A, (1) 3.5mm jack, (1) 3-pin terminal block, (1) RJ45,
General	
Transmission Distance	4K/60Hz/444 5m,4K/60Hz/420 10m,1080P 15m
Bandwidth	18Gbps
Operation Temperature	-5°C ~ +55°C
Storage Temperature	-25°C ~ +70°C
Relative Humidity	10% ~ 90%
External Power Supply	Input: AC 100V~240V, 50/60Hz; Output : 24V DC 2.71A
Power Consumption	24W
Dimension (W*H*D)	436.4mm*44mm*236mm
Net Weight	3kg

Video Resolution Down-scaling

The product supports video resolution down-scaling, the 4K input can be automatically degraded to 1080p output for compatibility with 1080p display, shown in the below chart.

#	Input			Output	
	Resolution	Refresh	Color Space	Downscale	1080p Specs
1	3840x2160	60	4:4:4	Support	1080p@60Hz 4:4:4
2	3840x2160	30	4:4:4	Support	1080p@30Hz 4:4:4
3	3840x2160	24	4:4:4	Support	1080p@24Hz 4:4:4
4	3840x2160	60	4:2:0	Support	1080p@60Hz 4:4:4
5	3840x2160	30	4:2:0	Support	1080p@30Hz 4:4:4
6	3840x2160	24	4:2:0	Support	1080p@24Hz 4:4:4
7	3840x2160	60	4:2:2	Not Support	N/A
8	3840x2160	30	4:2:2	Not Support	N/A
9	3840x2160	24	4:2:2	Not Support	N/A

Note: Only last four outputs (output 5, output 6, output 7 and output 8) have down-scaling function.

10. Troubleshooting & Maintenance

Problems	Potential Causes	Solutions
Color loss or no video signal output	The connecting cables may not be connected correctly or may be broken.	Check whether the cables are connected correctly and in working condition.
	Failed or loose connection.	Make sure the connection is good
No output image when switching	No signal at the input / output end.	Check with oscilloscope or multimeter if there is any signal at the input/ output end.
	Failed or loose connection.	Make sure the connection is good.
	Input source features HDCP while the HDCP compliance is switched off.	Send command /%[Y]/[X]:1. or change HDCP compliance status in GUI.
	The display doesn't support the input resolution.	Switch to another input source or enable the display to learn the EDID data of the input.
Cannot control the device via front panel buttons	Front panel buttons are locked.	Send command /%Unlock; or select unlock in GUI interface to unlock.
Cannot control the device via IR remote	The battery has run flat.	Replace the battery.
	The IR remote is broken.	Send it to an authorised dealer for repair.
	Beyond the effective range of the IR signal or not pointing at the IR receiver.	Adjust the distance and angle and point directly at the IR receiver.
	The IR receiver connected to IR EYE port is not with carrier.	Change for an IR receiver with carrier.
EDID management does not work normally	The HDMI cable is broken at the output end.	Change for another HDMI cable which is in good working condition.
There is a blank screen on the display when switching	The display does not support the resolution of the video source.	Switch again.
		Manage the EDID data manually to make the resolution of the video source automatically compliant with the output resolution.

Note: If your problem persists after following the above troubleshooting steps, seek further help from an authorised dealer or our technical support.