

USER MANUAL

MHD4K-44

4x4 HDMI 2.0 Matrix

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Version: MHD4K-44_2019V1.0



This product is a professional 4x4 HDMI 2.0 Matrix Switcher with built in Audio Matrix. It includes 4 HDMI inputs, 4 HDMI outputs and the last two outputs feature down-scaling, which is designed for switching two HDMI2.0 and HDCP2.3 compliant signals. It also features 4 SPDIF and 4 analog audio outputs for the 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

- 4x4 HDMI 2.0 Matrix Switcher.
- Supports 4K/60 4:4:4, HDR, HDCP2.3 compliant.
- Audio Matrix, audio out can de-embedded from any input or output.
- Individual volume adjustment on each L+R output.
- Supports 4K to 1080p down-scaling on outputs 3 & 4.
- HDMI out provides 2.5W to power Active Optical Cables (AoC).
- HDMI Output supports up to 5V500mA for AoC cables
- 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.

TABLE OF CONTENTS

Introduction	1
Product Introduction	1.1
Features	1.2
What's in the Box	1.3
Panel Description	2
Front Panel	2.1
Rear Panel	2.2
System Connection	3
Usage Precautions	3.1
System Diagram	3.2
Panel Control	4
I/O Connection Switching	4.1
I/O Connection Inquiry	4.2
LOCK Function	4.3
PRESET RECALL Function	4.4
CLEAR Button	4.5
IR Remote Control	5
GUI Control	6
Switching Tab	6.1
Audio Tab	6.2
Configuration Tab	6.3
CEC Tab	6.4
RS232 Tab	6.5
Interface Tab	6.6
Network Tab	6.7
Access Tab	6.8
GUI Upgrade	6.9
RS232 Control	7
RS232 Control Software	7.1
RS232 Control Commands	7.2
System Control	7.2.1
Control Management	7.2.2
Query Commands	7.2.3
Lock/Unlock Commands	7.2.4
Audio Commands	7.2.5
HDCP Compliance	7.2.6
EDID Management	7.2.7
CEC Control	7.2.8
Firmware Upgrade	8
Specifications	9
Troubleshooting & Maintenance	10

1. Introduction

1.1. Product Introduction

The MHD4K-44 is a professional 4x4 HDMI 2.0 Matrix Switcher with Audio Matrix. It includes 4 HDMI inputs, 4 HDMI outputs and the last two outputs feature a video down-scaling function, which is designed for switching two HDMI2.0 and HDCP2.3 compliant signals. It also features 4 SPDIF and 4 analog audio outputs for the audio matrix.

The matrix switcher features comprehensive EDID management and advanced HDCP handling 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

- 4x4 HDMI 2.0 Matrix Switcher.
- Supports 4K/60 4:4:4, supports HDR, HDCP2.3 compliant.
- Audio Matrix, audio out can de-embedded from any input or output.
- Individual volume adjustment on each L+R output.
- Supports 4K to 1080p down-scaling on up to 2 outputs.
- HDMI out provides 2.5W to power an Active Optical Cable (AoC).
- HDMI Output supports up to 5V500mA for an AoC cable
- Controllable by front panel, IR, RS232 and TCP/IP.

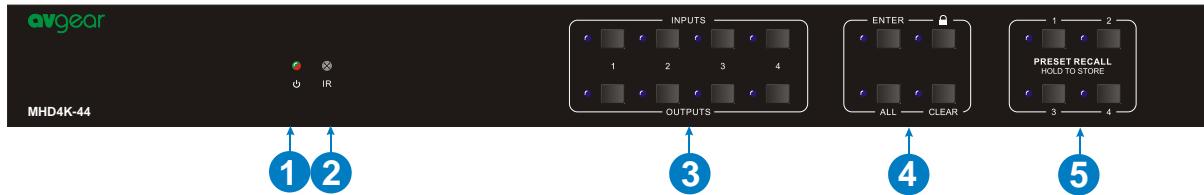
1.3. What's in the Box

- 1x MHD4K-44
- 2x Mounting Ears with 6 Screws
- 4x Plastic Cushions
- 1x IR Remote
- 1x IR Receiver
- 1x RS232 Cable (3-pin to DB9)
- 1x Power Adaptor (24V DC 1.25A)
- 1x User Manual

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 is 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 4 input selector buttons, press one of buttons to switch input source. Total 4 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



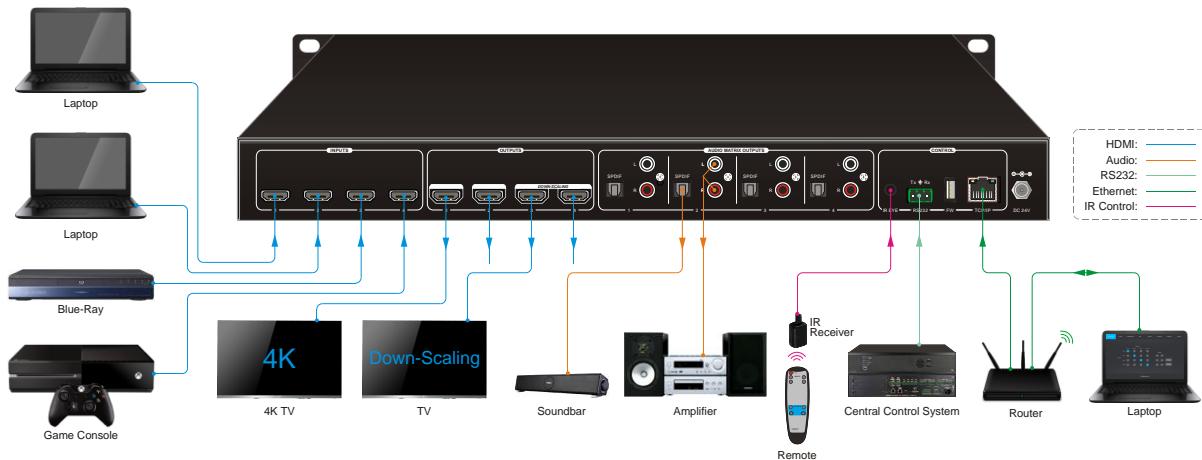
No.	Name	Description
①	INPUTS	HDMI input ports, 4 in total, connects with HDMI sources.
②	OUTPUTS	4 in total, connects with HDMI displays. The last two HDMI ports have a down-scaling function.
③	AUDIO MATRIX OUTPUTS	SPDIF : audio output ports for de-embedded HDMI audio, 4 in total. L&R (RCA) : audio output ports for de-embedded HDMI audio, 4 pairs in total.
④	IR EYE	Connects with an external IR receiver for using an IR remote to control the Matrix Switcher.
	RS232	3-pin terminal block to connect the RS232 control device (e.g. PC) or a device to be controlled by RS232 commands.
	FIREWARE	USB-A port for updating firmware.
	TCP/IP	RJ45 port to connect the control device (e.g. PC) to control the matrix by GUI.
⑤	DC 24V	Connect with 24VDC 1.25A power adaptor.

3. System Connection

3.1. Usage Precautions

- Make sure all components and accessories are 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 four input selection buttons and four 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 2~3 outputs:

Example: Input 1 to Output 2, Output 3, Output 4.

→ Press **INPUTS 1 + OUTPUTS 2, Output 3, Output 4 + ENTER** button.

3) To convert 1 input to 4 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 or 4 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.

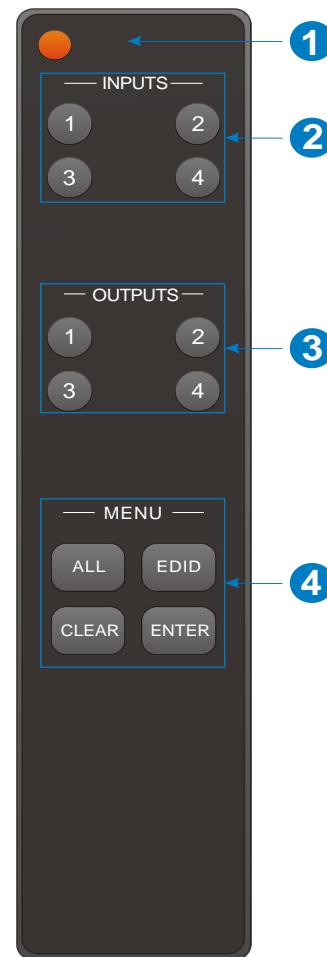
Example: Input 2 learns EDID data from output 4:

→ 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.**

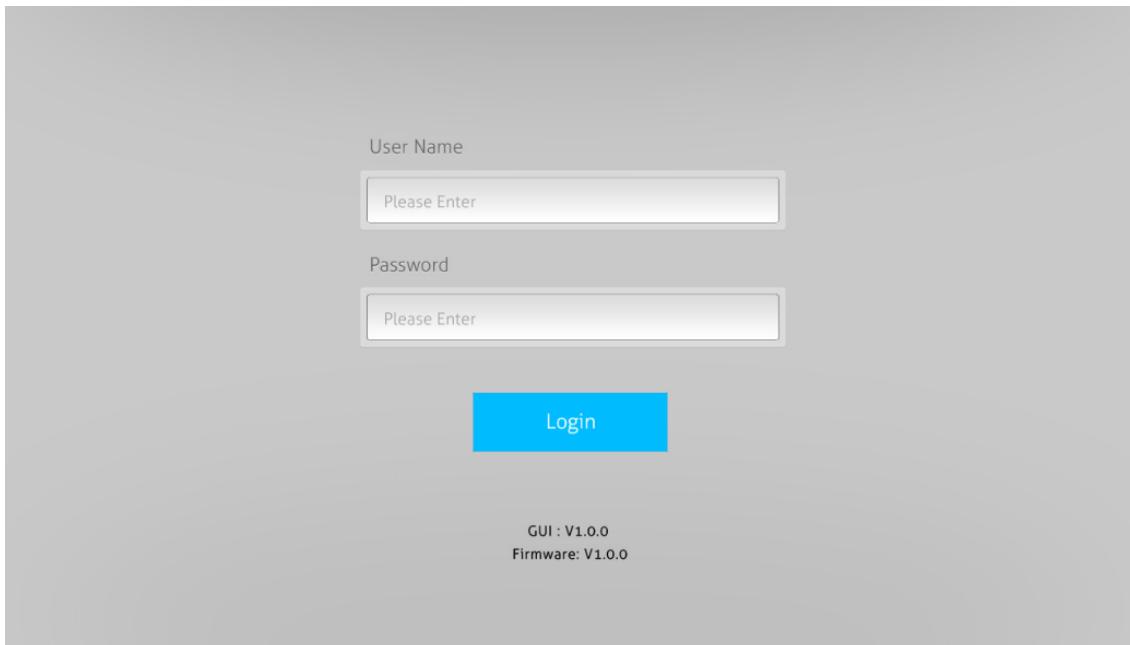
- **ENTER: Confirm operation.**

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:



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 4x4 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.

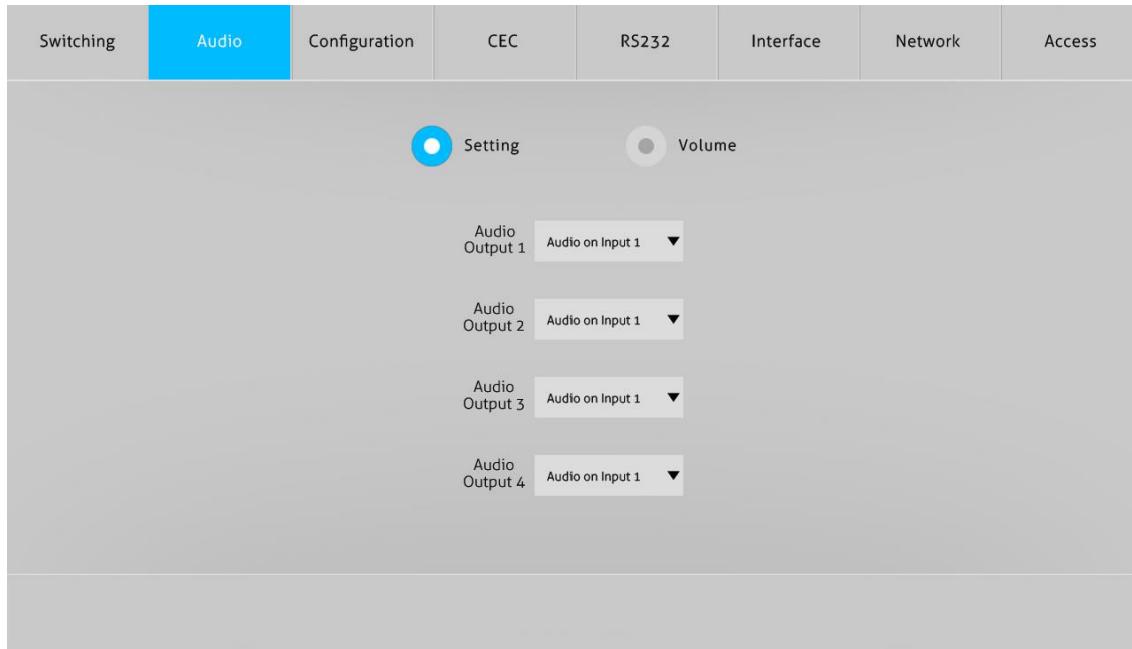
Use the 6 numbered buttons under scene area to save and load layout presets.

- 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

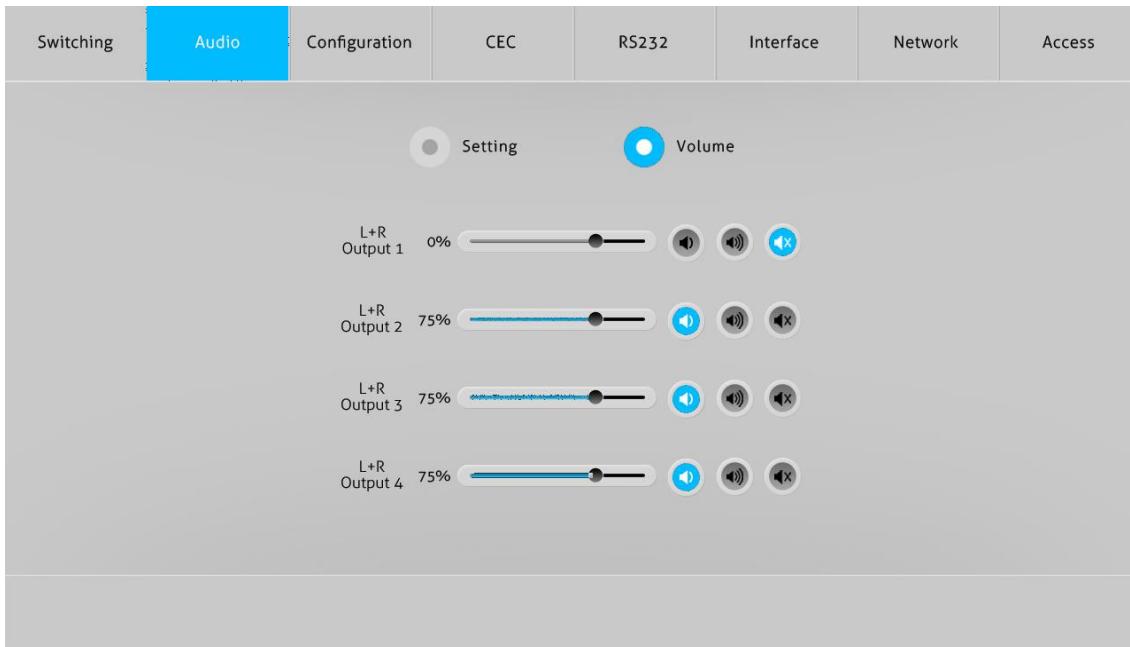
1) Audio Setting



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

Audio Output Ports	Audio Sources	
	Input Breakout	Output Breakout
SPDIF 1 & Analog 1	Audio on Input 1	Audio on Output 1
SPDIF 2 & Analog 2	Audio on Input 2	Audio on Output 2
SPDIF 3 & Analog 3	Audio on Input 3	Audio on Output 3
SPDIF 4 & Analog 4	Audio on Input 4	Audio on Output 4

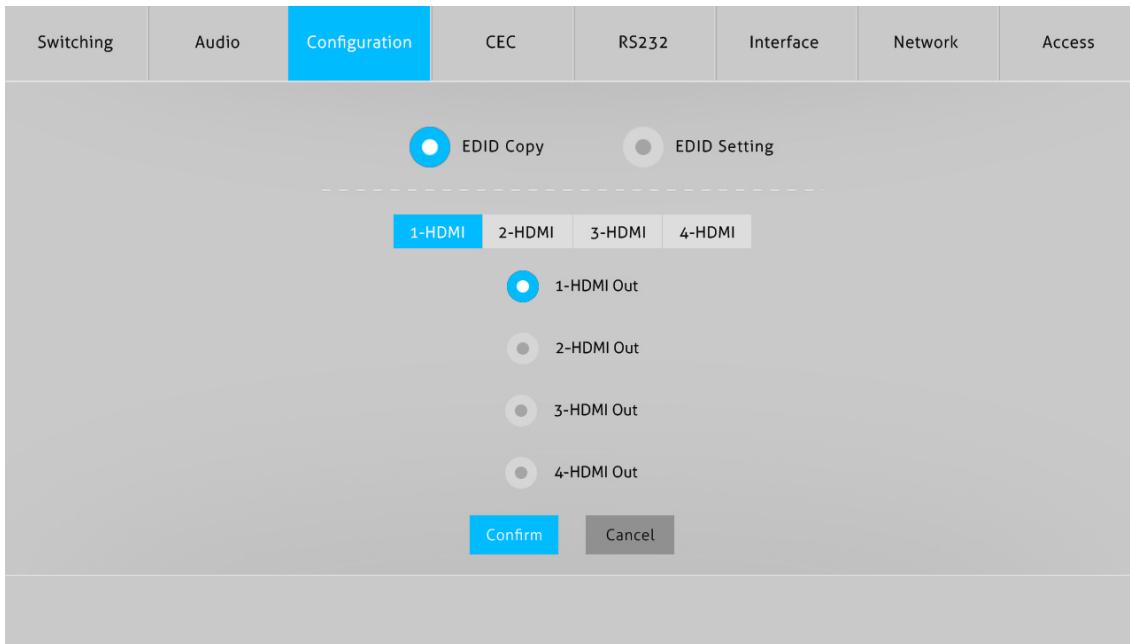
2) Audio Volume



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

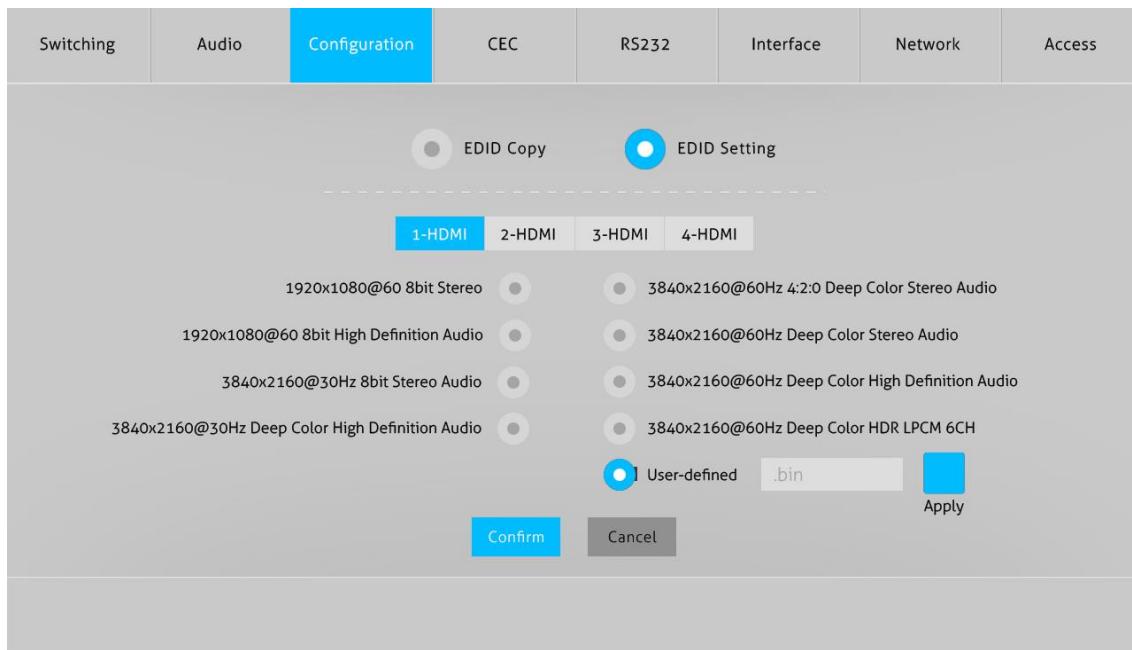
6.3. Configuration Tab

6.3.1 EDID Copy



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

6.3.2 EDID Setting

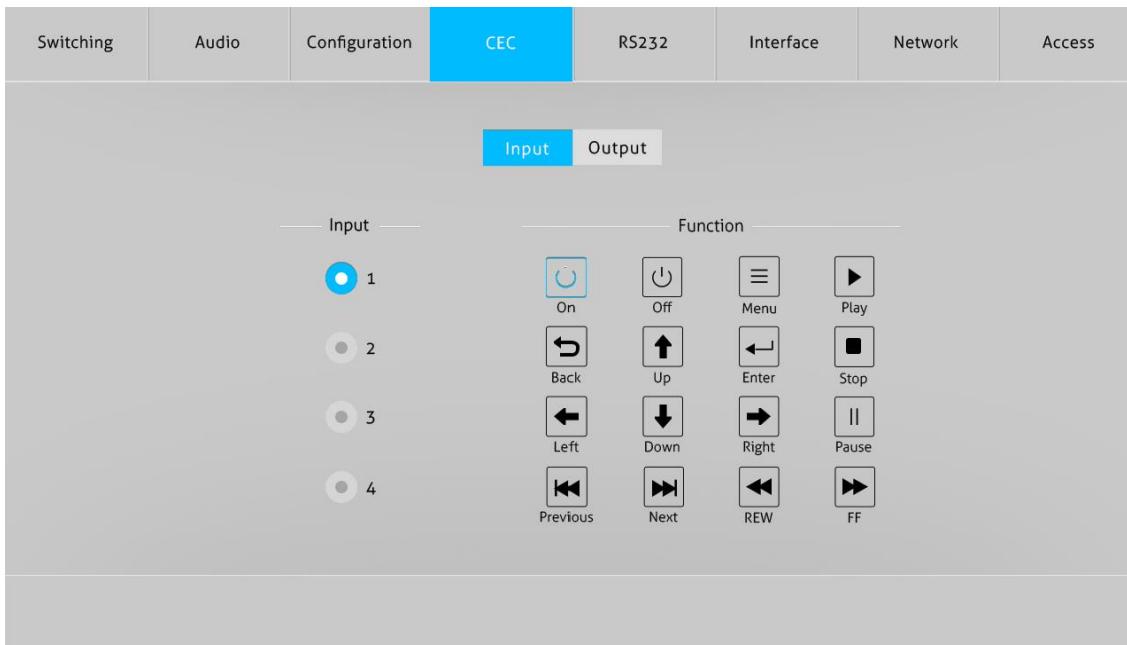


- Select the compatible built-in EDID for the selected input source.
- Upload user-defined EDID by the below steps:
 - 1) Prepare the EDID file (.bin) on the control PC.
 - 2) Select the **User-defined**.
 - 3) Click the box .bin, and then select the EDID file (.bin) according the tooltip.
 - 4) Click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

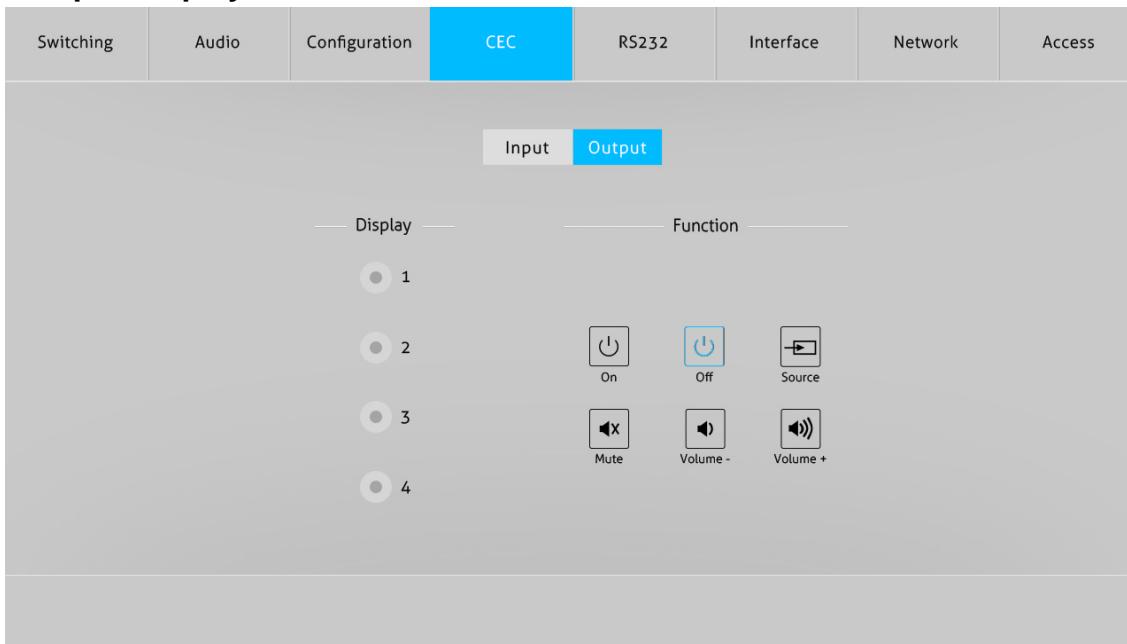
1) Input Source Device Control



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

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

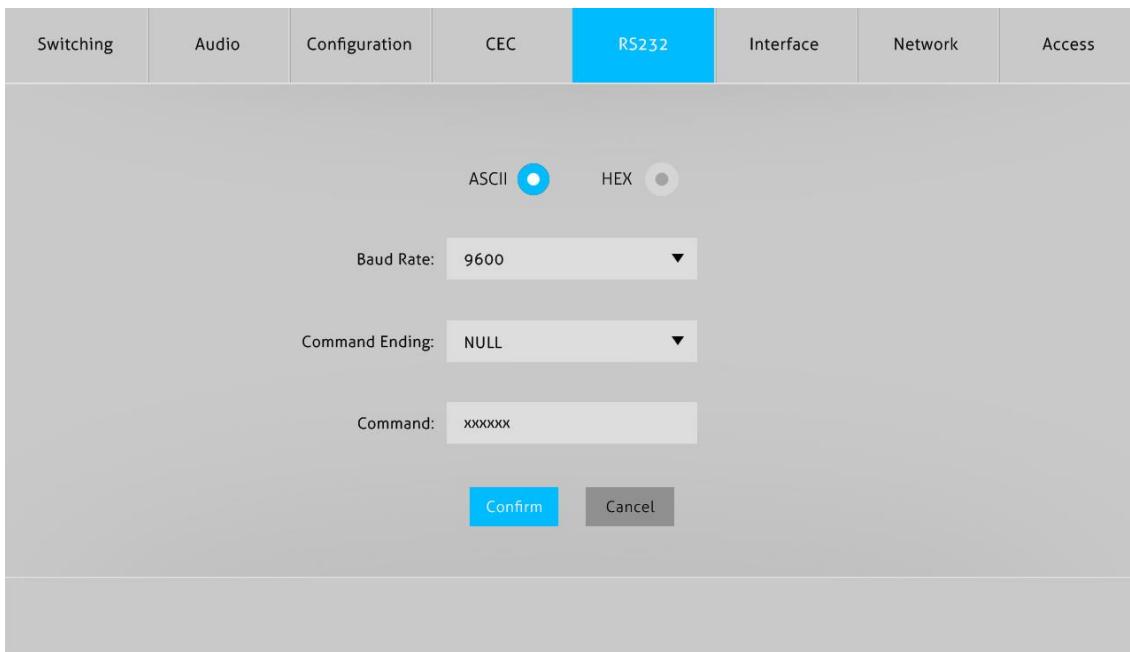
2) Output Display Device Control



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

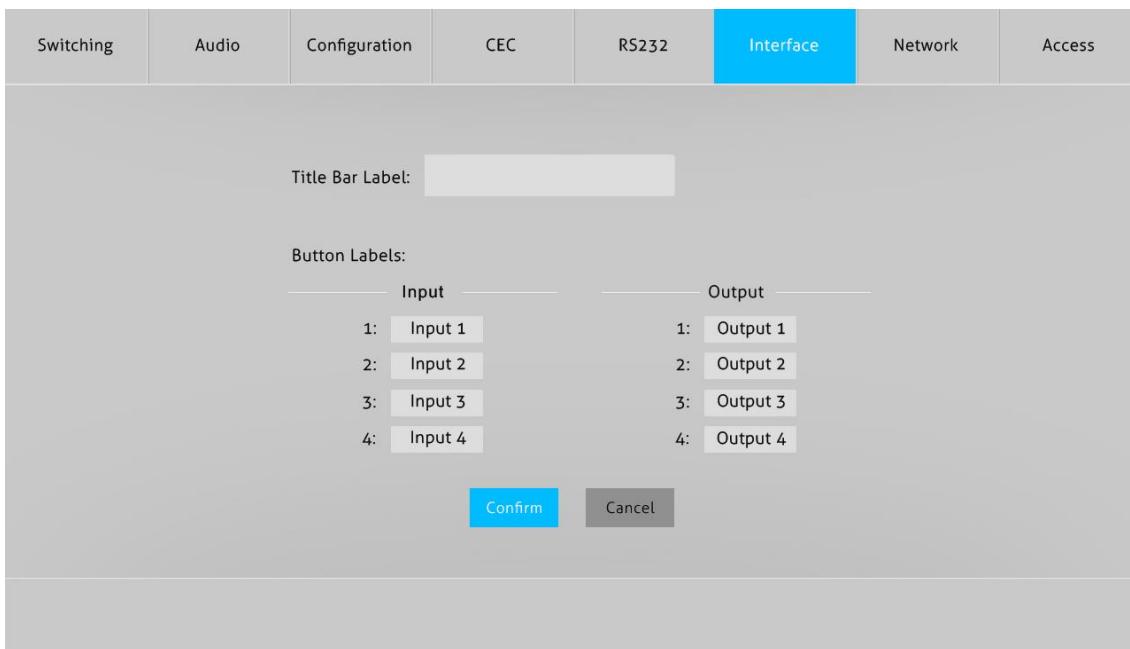
Note: It can not control two or more output devices simultaneously.

6.5. RS232 Tab



- 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



- 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: 192.168.0.178

Subnet Mask: 255.255.255.0

Gateway: 192.168.0.1

Confirm

- 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: admin **Confirm**

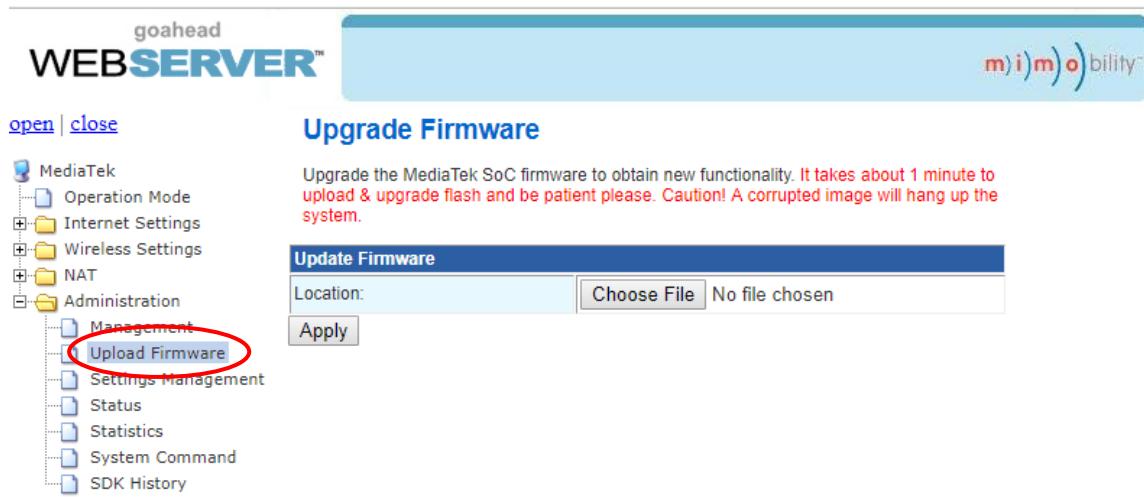
Front Panel Lock

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.

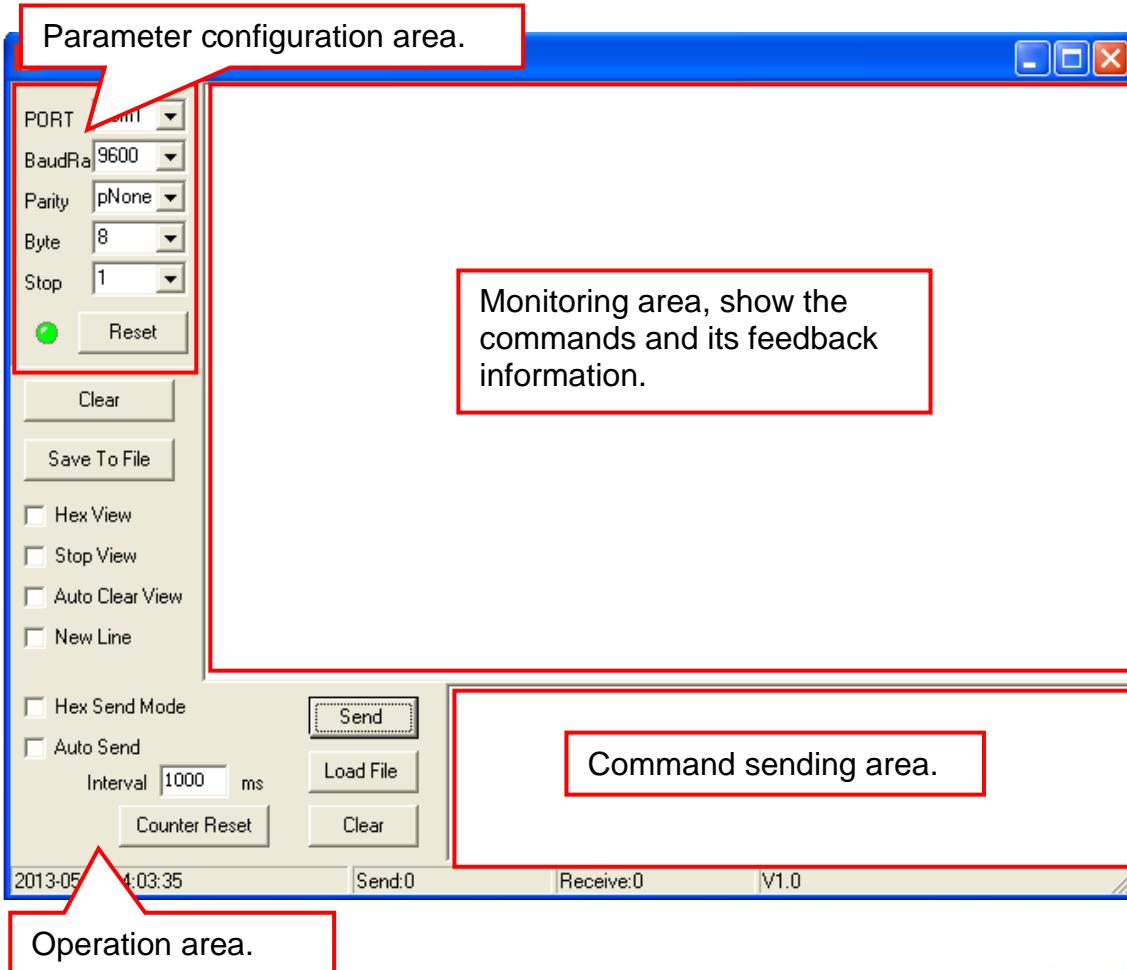
Basic Settings:

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!
PowerOFF.	Power off	Power OFF!
/*Name.	Query the name of matrix	MHD4K-44
/*Type.	Query the model of matrix	HDMI Matrix
/^Version.	Query the version of firmware	V1.0.0 CPLD:V1.0.0
RST.	Factory Default!	Factory Default!

7.2.2 Control Management

Command	Function	Feedback Example
DS[xx]ON.	Able output devices down-scaling function. [xx]=00~02, xx =01~02 is the corresponding number of output 3 or 4 port, if the xx =00, it means both output 3 and 4 ports.	HDMI OUT xx Down Scale ON!
DS[xx]OFF.	Disable output devices down-scaling function. [xx]=00~02,	HDMI OUT xx Down Scale OFF!

Command	Function	Feedback Example
	xx =01~02 is the corresponding number of output 3 or 4 port, if the xx =00, it means both output 3 and 4 ports.	
@OUT[xx].	Able HDMI 5V of output port. [xx]=00~04, xx =01~04 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!
\$OUT[xx].	Disable HDMI 5V of output port. [xx]=00~04, xx =01~04 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!
OUT[xx]:[YY].	Output port select input port. [xx]=00~04, xx =01~04 is the number of output port, if the xx =00, it means all output ports. [YY]=01~04, YY =01~04 is the number of input port.	Output 01 Switch To In 04!

7.2.3 Query Commands

Command	Function	Feedback Example
GetGuIP.	Query GUI IP	GUI_IP:192.168.0.178! !
SetGuIP:xxx.xxx.x xx.xxx.	Set GUI IP	SetGuIP:192.168.0.1 78!
Baudratexxxx/xxxx x/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: 4x4 HDMI Matrix MHD4K-44 V1.0.0 Power ON! Front Panel UnLock! Local RS232 Baudrate Is 9600! GUI_IP:192.168.0.178! !
STA_POUT.	Query 5V Status of output port.	Turn ON Output 01! Turn ON Output 02! Turn ON Output 03!

Command	Function	Feedback Example
		Turn ON Output 04!
STA_IN.	Query 5V Status of input port.	IN 1 2 3 4 LINK N N N N
STA_OUT.	Query HPD Status of output.	OUT 1 2 3 4 LINK N Y N N
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 03! Output 04 Switch To In 04!
STA_DS.	Query Down-scaling Status	HDMI OUT 03 Down Scale ON! HDMI OUT 04 Down Scale ON!
STA_HDCP.	Query current using HDCP model of all output ports. 01-04 represents output port 1-4.	OUT 01 HDCP BYPASS! OUT 02 HDCP BYPASS! OUT 03 HDCP BYPASS! OUT 04 HDCP BYPASS!
STA_AUDIO.	Query audio switch and volume status of analog audio.	AUDIO Out 01 Switch To Video In 01! AUDIO Out 02 Switch To Video In 02! AUDIO Out 03 Switch To Video In 03! AUDIO Out 04 Switch To Video In 04!
PresetSta[xx].	Query the preset [xx]=01~09, xx =01~09 is the number of preset	Preset 01 Sta: Out 01 In 01! Out 02 In 01! Out 03 In 01! Out 04 In 01!
PresetSave[xx].	Save the preset	Preset 01 Sta: Out 01 In 01! Out 02 In 01! Out 03 In 01! Out 04 In 01!
PresetRecall[xx].	Preset recall	Preset 02 Recall:

Command	Function	Feedback Example
		Output 01 Switch To In 02! Output 02 Switch To In 02! Output 03 Switch To In 02! Output 04 Switch To In 02!

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]=00~04 xx=01~04 is the number of the output port, if the xx=00, it means all output ports. [yy]=01~08 yy=01~04, it means de-embedded audio from HDMI1-4 input, if the yy=05~08, it means de-embedded audio from HDMI1-4 output.	AUDIO Out 01 Switch To Video In 04!
AVOLUME[xx]:[YY].	[xx]=00~04 xx=01~04 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 UnMute, [YY]==00-100 means setting volume	Analog Out 01 Volume 61! Analog Out 02 Volume 61! Analog Out 03 Volume 61! Analog Out 04 Volume 61!

7.2.6 HDCP Compliance

Command	Function	Feedback Example
HDCP[xx]ON.	Force able and output HDCP 1.4. [xx]=00~04, xx =01~04 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!
HDCP[xx]OFF.	Force disable the output HDCP. [xx] =00~04, xx =01~04 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!
HDCP[xx]MAT.	Output HDCP follows the display. [xx] =00~04, xx =01~04 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!
HDCP[xx]PAS.	Output HDCP follows the value and status of input source device. [xx] =00~04, xx =01~04 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!
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] =00~04, xx =01~04 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!

7.2.7 EDID Management

Command	Function	Feedback Example
EDIDMInit.	Restore the factory default EDID data for each input.	All Input EDID Set Default!
EDIDUpgrade[xx].	<p>Upgrade EDID via Serial Port</p> <ul style="list-style-type: none"> [xx]=00~04 xx=01~04 is the number of input port(able EDID user-defined for corresponding HDMI input), if the xx=00, it means all input ports(able EDID user-defined for all HDMI inputs). <p>Note: EDID user-defined can be used once, if switch to another EDID or exit, it will not be saved.</p> <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). <p>Note: It can user-defined only one built-in EDID, after finishing it, machine still use previous built-in EDID.</p> <ul style="list-style-type: none"> When received commands, machine will remind EDID file (.bin) to send within 10 seconds. 	Input XX/User Define EDID Upgrade OK By RS232 Or GUI!
EDID/[xx]/[yy].	<p>Input ports xx use built-in EDID yy</p> <p>[xx]=00~04 xx=01~04 is the number of the input port, if the xx=00, it means all input ports.</p> <p>[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.</p>	Input 03 EDID Upgrade OK By 01 Internal EDID!
EDIDGOUT[XX].	Read and print EDID of HDMI output, [XX]=01~04 is the number of the output port.	EDIDOUT04:
EDIDM[xx]B[yy].	Input port [yy] follows the EDID from	Input 01 EDID Upgrade

Command	Function	Feedback Example
	<p>output port [xx]. [xx]=01~04 xx =01~04 is the number of the output port. [yy]=00~04 yy=01~04 is the number of input port, if the yy=00, it means all input ports.</p>	OK By 04 EXT EDID!
/+[X]/[yy]:xxx.	<p>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.</p>	xxx.
EDIDSTA[xx].	<p>Query EDID status of Input port. [xx]=00~04, xx =01~04 is the number of input port, if the xx =00, it means all input ports.</p> <p>Note:</p> <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 has been 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 01 Internal EDID! Input 03 EDID From 01 Internal EDID! Input 04 EDID From 01 Internal 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 01~04. The HDMI output ports are 01~04.
- 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.	CECO04404441. CEC Output 05 Send Success!
CECO[AA][BB][CC]42.	Volume down.	CECO04404442. CEC Output 05 Send Success!
CECO[AA][BB][CC]43.	Mute	CECO04404443. 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	(4) HDMI
Video Input Connector	(4) Type-A female HDMI
Video input Video Resolution	Up to 4K@60Hz 4:4:4
Video Output	(4) HDMI
Video Output Connector	(4) Type-A female HDMI,
Video output Video Resolution	Up to 4K@60Hz 4:4:4
HDMI Output	Supports up to 5V500mA for 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	(4) Digital SPDIF audio
Output Connector	(4) Toslink connector
Digital SPDIF Audio Format	Supports PCM, Dolby Digital, DTS, DTS-HD
Frequency Response	20 Hz to 20 kHz, ±1dB
Max Output level	±0.05dBFS
THD+N	< 0.05%, 20 Hz – 20 kHz bandwidth, 1 kHz sine at 0 dBFS level (or max level)
SNR	> 90dB, 20Hz-20 kHz bandwidth
Crosstalk Isolation	< -70 dB, 10 kHz sine at 0dBFS level (or max level before clipping)
Noise	-90dB
Analog Audio Output	
Output	(4) Analog L/R Audio
Output Connector	(4) L&R (RCA)
Digital SPDIF Audio Format	PCM 2CH
Frequency Response	20 Hz to 20 kHz, ±1dB
Max output level	2.0 Vrms ± 0.5 dB. 2 V = 16 dB headroom above -10 dBV (316 mV) nominal consumer line level signal
THD+N	< 0.05%, 20 Hz – 20 kHz bandwidth, 1 kHz sine at 0 dBFS level (or max level)
SNR	> 80dB, 20Hz-20 kHz bandwidth
Crosstalk Isolation	< -80 dB, 10 kHz sine at 0 dBFS level (or max level)

	before clipping)
L-R Level deviation	< 0.05 dB, 1 kHz sine at 0 dBFS level (or max level before clipping)
Frequency Response Deviation	< ± 0.5dB 20Hz - 20KHz
Output Load Capability	1k ohm and higher (supports 10x paralleled 10k ohm loads)
Noise	-80dB
Control	
Control Port	(1) IR IN, (1) RS232, (1) FIRMWARE, (1) TCP/IP
Control Connector	(1) 3.5mm jack, (1) 3-pin terminal block, (1) USB-A, (1) RJ45,
General	
Transmission Distance	4K/60Hz/444 5m, 4K/60Hz/420 10m, 1080P 15m
Bandwidth	18Gbps
Operation Temperature	-5~ +55°C
Storage Temperature	-25 ~ +70°C
Relative Humility	10%-90%
External Power Supply	Input: AC 100~240V, 50/60Hz; Output: 24V DC 1.25A
Maximum Power Consumption	18.3W
Dimension (W*H*D)	436.4mm*44mm*236mm
Net Weight	2.6kg

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	No Support	N/A
8	3840x2160	30	4:2:2	No Support	N/A
9	3840x2160	24	4:2:2	No Support	N/A

Note: Only last two outputs (output 3 and output 4) 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 has 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 IN 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.	Replace with 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 authorised dealer or our technical support.