

# 8 × 8 HDMI Matrix Switcher



Model:

**MAX-HDMI88P**

# User Operation Guide

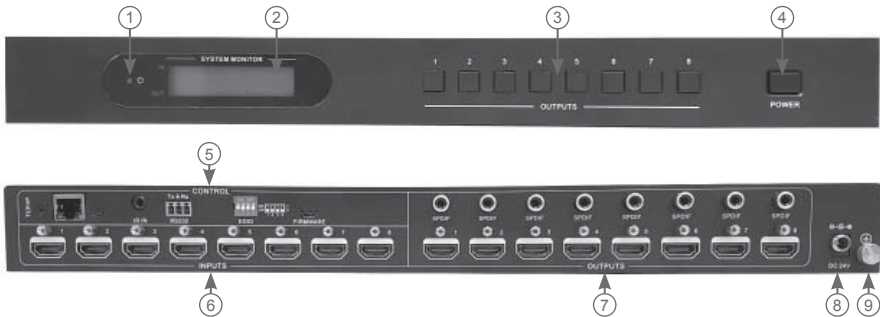
## PRODUCT DESCRIPTION

The ABtUS MAX-HDMI88P is a professional 8x8 HDMI Matrix Switcher that features up to 8 HDMI 1.4 & HDCP 1.4 compliant signal to output to 8 HDMI outputs each with de-embedded audio. It provides 8 audio ports for de-embedded HDMI audio output. It also include a powerful EDID management tool to ensure reliable AV distribution and routing.

## FEATURES

- 8x8 HDMI matrix with 8 de-embedded HDMI audio ports
- Support signal up to 4Kx2K@60Hz & 1080p 3D
- HDMI1.4 & HDCP1.4 compliant
- Transmit 4Kx2K@60Hz signal up to 15m
- SPDIF ports for de-embedded HDMI audio output
- EDID management

## PANEL DESCRIPTIONS



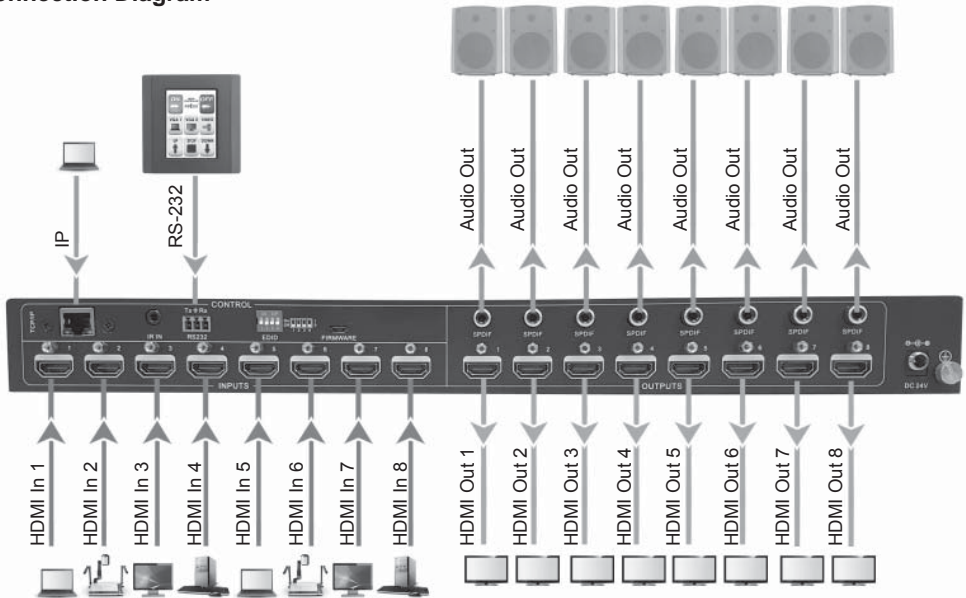
No.	Name	Description
1	Power Indicator	Illuminate red when power on; Turn green in standby mode; Blink red when upgrading
2	LCD Screen	Display real-time operation status.
3	OUTPUTS	Output selection buttons, toggle the buttons to switch input
4	Power Trigger	Press to power on/off the switcher
5	Control	<b>TCP/IP:</b> (optional) TCP/IP port for unit control <b>IR IN:</b> input port for IR control signal, connect with the IR receiver <b>RS232:</b> Serial control port, connect with control device <b>EDID Switcher:</b> 4-pin EDID DIP switchers to set EDID data, “1” stands for “On”, “0” stands for “Off”. Refer to “EDID Management” for more details. <b>Firmware:</b> Micro USB port for firmware upgrade
6	INPUTS	HDMI inputs ports, 8 in total, connect with HDMI sources
7	OUTPUTS	<b>SPDIF:</b> audio output ports for de-embedded HDMI audio, 8 in total <b>HDMI:</b> 8 in total, connect with HDMI displays
8	DC 24V	Connect with DC 24V power adaptor
9	Ground	Connect to ground

## SYSTEM CONNECTION

### Usage Precautions

1. System should be installed in a clean environment with controlled temperature and humidity
2. All of the power switchers, plug, sockets and power cords should be insulated.
3. All devices should be connected before power on

### Connection Diagram



### Connection Procedure

- Step1.** Connect HDMI sources (e.g DVD) to HDMI INPUTs with HDMI cables.
- Step2.** Connect HDMI displays (e.g HDTV) to HDMI OUTPUTs with HDMI cables.
- Step3.** Connect speakers / amplifiers to AUDIO OUTPUTs with audio cables.
- Step4.** Connect the RS232 ports of control device (e.g. a PC) and 8x8 HDMI Matrix Switcher to enable serial control
- Step5.** Connect the TCP/IP ports of control device (e.g. a PC) and 8x8 HDMI Matrix Switcher to enable serial control
- Step6.** Insert an IR receiver to the IR IN port to enable IR control
- Step7.** Plug a DC 24V power adapter to the power port of 8x8 HDMI Matrix Switcher.

- 1) When connecting to HDMI 1.4 sources, make sure the HDMI cable is compliant with HDMI 1.4 to ensure reliable transmission;
- 2) Connect amplifiers that are capable to decode HDMI audio to the SPDIF ports, or there will be no output on the amplifiers.

## SYSTEM CONNECTION

### System Applications

The 8×8 HDMI Matrix Switcher can be used in any installation that requires projecting multi source onto multiple display, monitoring, large screen displaying, conference system, television, education and bank securities institutions etc.

## SYSTEM OPERATIONS



### IR Control

Connect an IR receiver to the IR IN port of the switcher, users can control it through the included IR remote. Here is a brief introduction to the IR remote:

1. Standby: Enter/ exit stand by mode
2. INPUTS: Buttons for input selection
3. OUTPUTS: Buttons for output selection

I/O Switch Foramt: INPUT + OUTPUT

### RS232 Communication Commands

- 1) Case-sensitive
- 2) “[,]” in the commands are for easy recognition only and not necessary in real operations. Other symbols including “.”, “;”, “/”, “%”, “;”, “^”. are parts of the commands.
- 3) Feedbacks listed in the column “Feedback Example” are only for reference, feedbacks may vary according to the different operations.
- 4) Dial the EDID switcher to “1111” before sending commands pertaining to software EDID management (with grey background)

## SYSTEM OPERATIONS

Baud rate: 9600

Data bit: 8

Stop bit: 1

Parity bit: none

Command	Function	Feedback Example
<b>System Commands</b>		
/%Lock;	Lock the front panel buttons.	System Locked!
/%Unlock;	Unlock the front panel buttons.	System Unlock!
/^Version;	Inquire the firmware version	VX.X.X
/:MessageOff;	Turn off command feedback from the com port. It will only show simple words like "SWITCH OK!".	/:MessageOff;
/:MessageOn;	Turn on command feedback from the com port.	/:MessageOn;
/:FeedbackON;	Enable command feedback on LCD monitor on the front panel (default).	/:FeedbackON;
/:FeedbackOFF;	Disable command feedback on LCD monitor on the front panel (default).	/:FeedbackOFF;
<b>Operation Commands</b>		
Undo.	Cancel the previous operation.	Undo Ok!
Demo.	Switch to the "demo" mode, convert input and output in turn like 1B1, 1B2, ...8B7, 8B8, 1B1... and so on .The switching interval is 2 seconds. Switch to normal mode by pressing any front panel button or sending any other command	Demo Mode
[x]All.	Transfer signal from input x to all outputs	1 To All.

## SYSTEM OPERATIONS

Command	Function	Feedback Example
All#.	Transfer all inputs to corresponding outputs, like 1->1, 2->2...	All Through.
[x]#.	Transfer signal from input x to output x.	1 Through.
All@.	Switch on all outputs.	All Open.
[x]@.	Switch on output x.	1 Open.
All\$.	Switch off all outputs, but except coaxial outputs for digital audio	All Closed.
[x]\$.	Switch off output x.	1 Closed.
[x]B[y1],[y2],[y3].	Transfer AV signal from input x to output y1, y2, y3	1B2
BlackscreenON[x].	Switch on input x.	BlackscreenON1.
BlackscreenOFF[x].	Switch off input x.	BlackscreenOFF1.
Save[y].	Save the present operation status to preset command y, y=0~11.	Save To F1
Recall[y].	Recall preset command y, y=0~11.	Recall From F1
Clear[y].	Clear preset command y, y=0~11.	Clear F1
EDIDG[x].	Get EDID data from output x and display it on com port.	
EDIDM[X]B[y].	Enable input x to learn the EDID data from output y. If the EDID data is not available, the matrix will set it to initial EDID data.	EDIDM3B1
EDIDC[x]B[y].	Capture the EDID data of output x and save it as No.y EDID, y=1~10,12~14	EDIDC3B1
EDIDExtract[x][y].	Invoke No.y EDID data saved through COM port to input x, y=1~10,12~14	Pick up success
UpgradeSoftwareEDID[y].	Save the EDID data to No.y EDID, invoke the EDID by sending command EDIDExtract[x][y].	Please send the EDID file Upgrade success
EDIDUpgrade[x].	Upgrade the EDID data of input x (x=1~8: upgrade the EDID of single input; x=9: upgrade the EDID of all inputs) Send EDID file (.bin) within 10 seconds.	Please send the EDID file Upgrade success
UpgradeIntEDID[x].	Used for programing customized EDID data x=12~14, please refer to <b>4.2.4 EDID Management</b> for more details.	Please send the EDID file

## SYSTEM OPERATIONS

Command	Function	Feedback Example																						
EDID/[x]/[y].	Invoke embeded EDID data No.y to input x, y=1~10 <table border="1" style="margin-left: 20px;"> <thead> <tr> <th style="text-align: center;">y=1~10</th> <th style="text-align: center;">EDID information</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">1</td><td>720P 2D 5.1CH</td></tr> <tr><td style="text-align: center;">2</td><td>720P 3D 5.1CH</td></tr> <tr><td style="text-align: center;">3</td><td>720P 2D 2CH</td></tr> <tr><td style="text-align: center;">4</td><td>720P 3D 2CH</td></tr> <tr><td style="text-align: center;">5</td><td>1080P 3D 5.1CH</td></tr> <tr><td style="text-align: center;">6</td><td>1080P 2D 5.1CH</td></tr> <tr><td style="text-align: center;">7</td><td>1080P 3D 2CH</td></tr> <tr><td style="text-align: center;">8</td><td>1080P 2D 2CH</td></tr> <tr><td style="text-align: center;">9</td><td>2160P 2D 5.1CH</td></tr> <tr><td style="text-align: center;">10</td><td>2160P 2D 2CH</td></tr> </tbody> </table>	y=1~10	EDID information	1	720P 2D 5.1CH	2	720P 3D 5.1CH	3	720P 2D 2CH	4	720P 3D 2CH	5	1080P 3D 5.1CH	6	1080P 2D 5.1CH	7	1080P 3D 2CH	8	1080P 2D 2CH	9	2160P 2D 5.1CH	10	2160P 2D 2CH	EDID/8/3
y=1~10	EDID information																							
1	720P 2D 5.1CH																							
2	720P 3D 5.1CH																							
3	720P 2D 2CH																							
4	720P 3D 2CH																							
5	1080P 3D 5.1CH																							
6	1080P 2D 5.1CH																							
7	1080P 3D 2CH																							
8	1080P 2D 2CH																							
9	2160P 2D 5.1CH																							
10	2160P 2D 2CH																							
EDIDPCM[x].	Set the audio of input x to PCM in EDID database.	EDIDPCM1																						
EDIDH[x]B[y].	Copy the EDID data from output x to input y If the EDID data is available and the audio part supports not only PCM format, then force-set it to only support PCM. If the EDID data is not available, it will set to initial EDID.	EDIDH1B1																						
PWON.	Work normally.	PWON																						
STANDBY.	Enter standby mode. (Return to normal mode via front panel buttons/ any other command/ IR remote)	STANDBY																						
/%[x]:[y].	Manage HDCP status of outputs "x" stands for output port, can be 1~8 or ALL. When x=ALL, it means manage HDCP status of all outputs. "y" stands for HDCP status, can be 1 (with HDCP) or 0 (not with HDCP).	/%ALL:0.																						
%0801.	Enable auto HDCP management (HDCP Active)	%0801.																						

## SYSTEM OPERATIONS

Command	Function	Feedback Example
%0911.	Reset to factory default. Switch mode: all through; scene/ HDCP status remains the same. The customized EDID data will be deleted automatically.	Factory Default
DigitAudioON[x]	Enable the SPDIF audio output of output x. <ul style="list-style-type: none"> <li>● x=1~8, enable the SPDIF audio output of single output port.</li> <li>● x=9, enable the SPDIF audio output of all output ports.</li> </ul>	DigitAudio ON with Output 4
DigitAudioOFF[x].	Disable the SPDIF audio output of output x. <ul style="list-style-type: none"> <li>● x=1~8, disable the SPDIF audio output of single output port.</li> <li>● x=9, disable the SPDIF audio output of all output ports.</li> </ul>	DigitAudio OFF with Output 4
Inquiry Commands		
Status[x].	Check the input channel for output x	AV: 1->1
Status.	Check the input channel for all outputs	AV:1->1 ... AV: 8-> 8
%9961.	Return the keylock status.	System Unlock!/System Locked!
%9962.	Check the power status	PWON
%9963.	Check the audio format of EDID database for input x	IN1: PCM IN2: PCM ... IN8: PCM
%9964.	Check the IP and subnet mask of the switcher.	IP 192.168.0.178 SB 255.255.255.0 DHCP 0
%9971.	Inquire connection status for all inputs, N means there is no source, Y means there is connected source.	In     1 2 3 4 Connect N Y Y N In     5 6 7 8 Connect N Y Y N



## SYSTEM OPERATIONS

Command	Function	Feedback Example
%9972.	Inquire connection status for all outputs, N means there is no display, Y means there is connected display.	Out 1 2 3 4 Connect Y Y N N Out 5 6 7 8 Connect Y Y N N
%9973.	Check the inputs HDCP status, N means it's not with HDCP, Y means it's with HDCP.	In 1 2 3 4 HDCP N Y Y N In 5 6 7 8 HDCP N Y Y N
%9974.	Check the outputs HDCP status, N means it's not with HDCP, Y means it's with HDCP.	Out 1 2 3 4 HDCP N Y Y N Out 5 6 7 8 HDCP N Y Y N
%9975.	Check the I/O switch status.	In 1 2 3 4 Out 1 2 3 4 In 5 6 7 8 Out 5 6 7 8
%9977.	Check the status of digital audio of all outputs, N is for "off", Y is for "on".	Out 1 2 3 4 Audio N N Y Y Out 5 6 7 8 Audio N N Y Y

### EDID Management

8×8 HDMI Matrix Switcher provides with convenient EDID management to create effective communication between the display and sources.

In factory default status (Status: 0000) 8×8 HDMI Matrix Switcher pass through the signals directly, input & output device process the signal automatically. You can invoke other saved EDID data by adjusting the 4-pin EDID DIP switcher or sending corresponding RS232 command.

### VIA RS232 commands

Dial the switcher to "1111" to enable software EDID management.

#### → Invokeing embedded EDID data:

Send command "**EDID[X]B[y].**" to enable to enable input to invoke embedded EDID data of 8×8 HDMI Matrix Switcher. For example, send "**EDID[4]B[3]**", the INPUT device (4) will gain embedded EDID data is that 720P 2D 2CH.

#### → EDID copy:

Send command "EDIDM[X]B[y]." to enable input to copy the EDID data of a dsplay. For example, send "EDIDM[1]B[5]", the INPUT device (1) will gain EDID data from OUTPUT device (5)

## SYSTEM OPERATIONS

### → Program Customized EDID data:

Beside 10 kinds of embedded EDID, this product can program 3 kinds of customized EDID data.

1. The EDID dial switch should be make sure on the "1111" status.
2. Copy customized EDID data (.bin) to the contrl device (e.g. a PC)
3. Running the RS232 control software, and then send the command **EDIDUpgrade[X]**, **X is 12, 13, or 14, for example, send EDIDUpgrade[12]**.
4. According the prompt and send custom EDID data file.
5. When prompt " Update success, the custom EDID data are set successfully.
6. Send the command **EDID[1]B[12]**, the 1 input channel can invoke this new customized EDID data.

### → Via 4-pin EDID DIP switcher

Beside EDID can be managed via RS232 commands, 8×8 HDMI Matrix Switcher boasts a 4-pin EDID DIP switcher to manage EDID. Dial the switchers to invoke demands EDID data.

→ **Embedded EDID data:** 10 sets in total, the chart below illustrate the 10 Embedded EDID data.

→ **Custom EDID data:** max at 3 sets

The chart below shows switcher status for custom EDID No.12~14.

No.	Switcher Status	EDID information
<b>Embedded EDID data</b>		
1	0001	720P 2D 5.1CH
2	0010	720P 3D 5.1CH
3	0011	720P 2D 2CH
4	0100	720P 3D 2CH
5	0101	1080P 3D 5.1CH
6	0110	1080P 2D 5.1CH
7	0111	1080P 3D 2CH
8	1000	1080P 2D 2CH
9	1001	2160P 2D 5.1CH
10	1010	2160P 2D 2CH
<b>Custom EDID data</b>		
12	1100	Customizable
13	1101	Customizable
14	1110	Customizable

Note:

- 1) EDID information listed in the above chart is factory default data, Embedded EDID data can be updated by sending command **UpgradeIntEDID[x]**.
- 2) Embedded EDID data can also be invoked via command **EDID[x]/[y]**.

## SYSTEM OPERATIONS

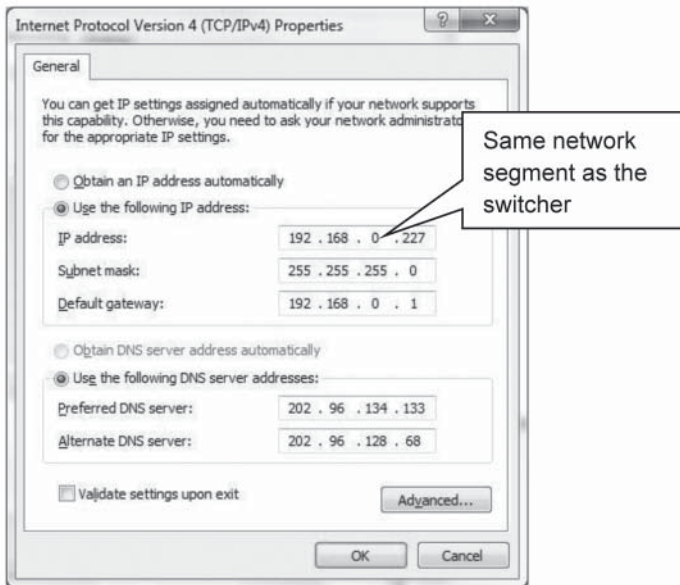
### TCP/IP Control

#### Control Modes

TCP/IP default IP address can be found on the back of the matrix, Gateway 192.168.0.1, and Serial Port is 4001. IP can be changed as you need, Serial Port cannot be changed.

- **Controlled by single PC**

Connect a computer to the TCP/IP port of the 8×8 HDMI Matrix Switcher, and set its network segment to the same as the default IP of the 8×8 HDMI Matrix Switcher.



**Figure 4-4 Modify the IP of PC**

- **Controlled by PC(s) in LAN**

The 8×8 HDMI Matrix Switcher can be connected with a router to make up a LAN with the PC(s), this make it able to be controlled in a LAN. When control, just make sure the 8×8 HDMI Matrix Switcher network segment is the same with the router. Please connect as the following figure for LAN control.

# User Operation Guide

## SYSTEM OPERATIONS

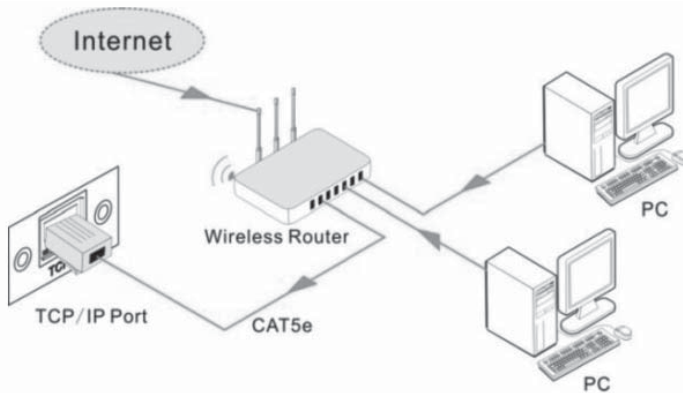


Figure 4-5 Connect to LAN

- Step1.** Connect the TCP/IP port of the 8×8 HDMI Matrix Switcher to Ethernet port of PC with twisted pair.
- Step2.** Set the PC's network segment to the same as the 8×8 HDMI Switcher. Do please remember the PC's original network segment.
- Step3.** Set the 8×8 HDMI Matrix Switcher network segment to the same as the router.
- Step4.** Set the PC's network segment to the original one.
- Step5.** Connect 8×8 HDMI Matrix Switcher and PC(s) to the router. In the same LAN, each PC is able to control the 8×8 HDMI Matrix Switcher asynchronously.

### Control 8×8 HDMI Matrix Switcher via web-based GUI

In addition to control 8×8 HDMI Switcher via communication software 8×8 The Matrix Switcher can be controlled via web-based GUI. It allows users to interact with the Matrix Switcher through graphical icons and visual indicators.

Type the IP address on the unit in your browser, it will enter the log-in interface shown as below:



Figure 4-8 Login GUI

## SYSTEM OPERATIONS

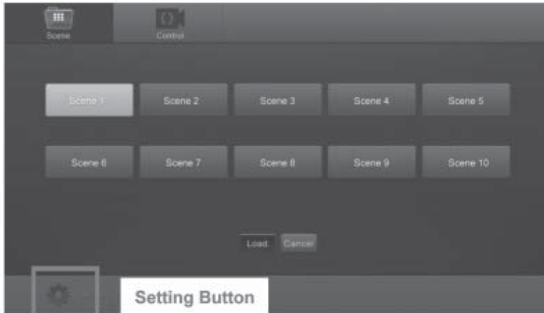


Figure 4-9 Scene Menu

All ten scenes are shown in the above interface.

Select a scene and then click “**Load**” can invoke the selected scene.

Click “**cancel**” to cancel current operation.

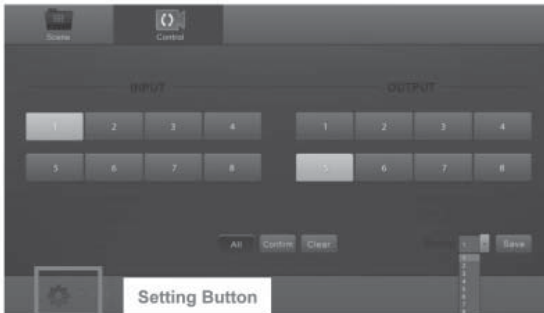


Figure 4-10 Control Menu

### Control Menu

Click “**cancel**” to enter following interface, it provide intuitive I/O connection switching.

Then button matrix displays every possible connection between every input and output; users can carry on the connections by clicking corresponding button.

Button 1~8 at the right-bottom corner provides quick saving and recall for overall connection status. For example:

- Step1:** Select button 1 at INPUT column
- Step2:** Select button 5 at OUTPUT column (If all OUTPUT ports in needed, you only need to click 'All'.)
- Step3:** Choose a scene that you want to save.
- Step4:** Click “**Confirm**” to save the setting or Click “**Clear**” to clear set up.

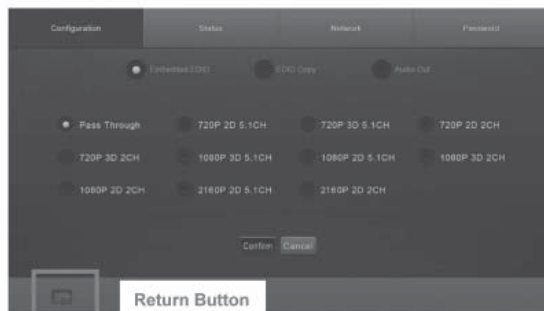


Figure 4-11 Embedded EDID

### Configuration Properties

#### 1. Configuration

- 1) Click setting button to enter configuration interfaces.

All embedded EDID of 8×8 HDMI Matrix Switcher are shown in the above interface. user can select EDID in accordance with actual needs.

- 2) Select 'EDID Copy' to enter the following interface:

# User Operation Guide

## SYSTEM OPERATIONS

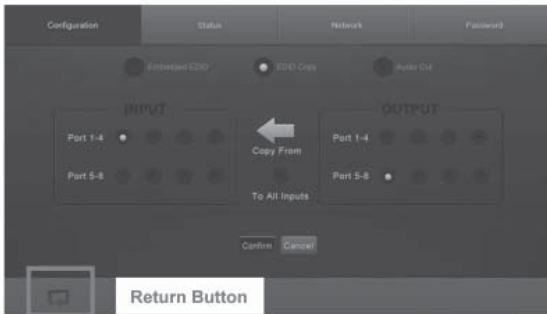


Figure 4-12 Copy EDID

The EDID of INPUT device can be gained from OUTPUT devices.

**Step1:** Select one OUTPUT device that you want to copy its EDID.

**Step2:** Select one or more input devices that need to gain EDID. When select to All inputs, all input devices will copy the EDID from output device.

**Step3:** Click “**Confirm**” to save the setting or Click “**Clear**” to cancel operation.

3) Select “**Audio Out**” to enter the following interface to turn on/off the Audio Output.

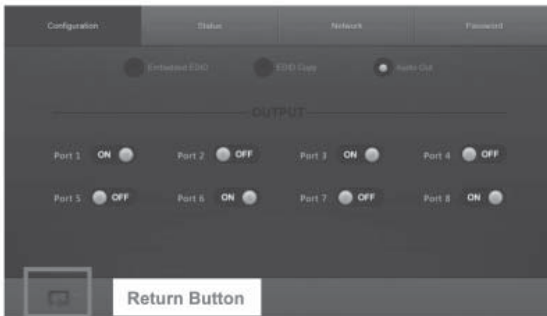


Figure 4-13 Audio EDID

## 2. Status

1) At the top of the interface, click “Status” to enter the following interface to modify the name and mode of this machine, and then they will be display in LCD screen.

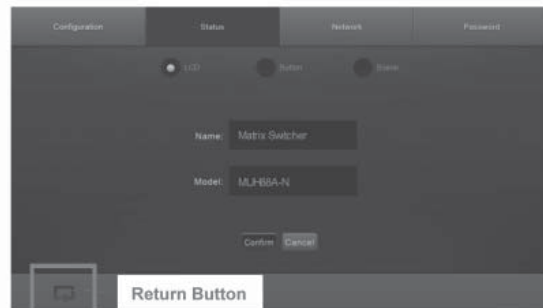


Figure 4-14 Status- LCD

2) Select “**Button**” to enter the following interface to modify the name of buttons.

## SYSTEM OPERATIONS

3) Select **“Scene”** to enter the following interface to modify the name of scenes.



Figure 4-15 Status- Button

### 3. Network

At the top of the interface, click **“Network”** to enter the following interface to inquire and configure network setting including MAC address, IP address, subnet mask, and Gateway

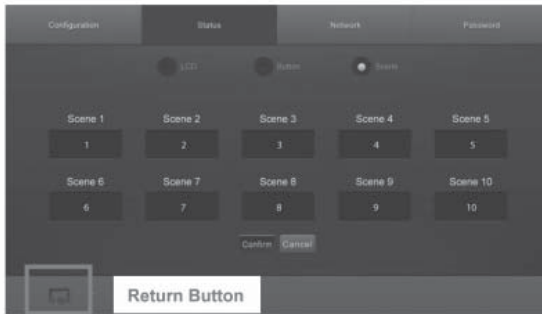


Figure 4-16 Status-Scene

### 5. Password

At the top of the interface, click **“Password”** to enter the following interface to inquire and modify the admin or user password.

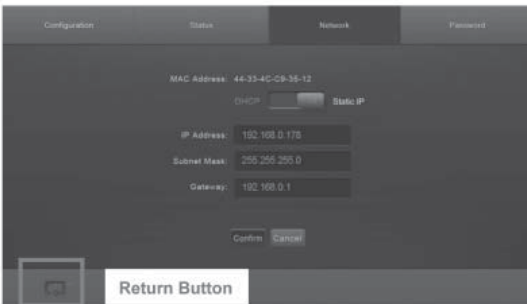


Figure 4-17 Network

# User Operation Guide

## SYSTEM OPERATIONS

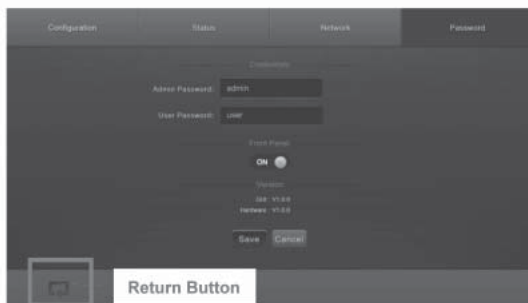


Figure 4-18 Password

In the above interface, turn on the Front Panel to lock all buttons of machine, they cannot be operated.

## SUPPORTED RESOLUTION

### Display Ratio

4K	4096×2160 (30,50,60Hz), 3840×2160 (24,25,30 50 60 Hz)
21:9	2560×1080 (60Hz)
16:9	1920×1080 (1080P 3D), 1600×900, 1366×768, 1280×720, 1024×576 (60Hz)
16:10	1920×1200, 1680×1050, 1440×900, 1360×768, 1280×800 (60Hz)
4:3	1600×1200, 1400×1050, 1280×1204, 1024×768, 800×600, 640×480 (60Hz)



## TROUBLESHOOTING & MAINTENANCE

Problems	Causes	Solutions
Color losing or no video signal output	The connecting cables may not be connected correctly or it may be broken.	Check whether the cables are connected correctly and in working condition.
	Fail 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.
	Fail or loose connection	Make sure the connection is good
	Input source is with HDCP while the HDCP compliance is switched off.	Send command <code>/%[x]:[1].</code> to change HDCP compliance status.
	The display doesn't support the input resolution.	Switch for another input source or enable the display to learn the EDID data of the input.
No output on the amplifiers connected to audio output ports	The amplifiers are not able to decode HDMI audio	Change for amplifiers that are capable to decode HDMI audio.
Cannot control the device via front panel buttons	Front panel buttons are locked.	Send command <code>/%Unlock;</code> to unlock
Cannot control the device via IR remote	The battery has run off.	Change for new battery.
	The IR remote is broken.	Send it to authorized dealer for repairing.
	Beyond the effective range of the IR signal or not pointing at the IR receiver	Adjust the distance and angle and point right at the IR receiver.
Power Indicator remains off when powered on	Fail or loose power connection	Check whether the cables are connected correctly
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.

# User Operation Guide

## TROUBLESHOOTING & MAINTENANCE

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.
Cannot control the device by control device (e.g. a PC) through RS232 port	Wrong connection	Check to ensure the connection between the control device and the unit
	Wrong RS232 communication parameters	Type in correct RS232 communication parameters: Baud rate:9600; Data bit: 8; Stop bit: 1; Parity bit: none
	Broken RS232 port	Send it to authorized dealer for checking.
Static becomes stronger when connecting the video connectors	Bad grounding	Check the grounding and make sure it is connected well.
Cannot control the device by RS232 / IR remote / front panel buttons	The device has already been broken.	Send it to authorized dealer for repairing.

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

## SPECIFICATIONS

<b>INPUT:</b>	8 × HDMI
<b>INPUT CONNECTOR:</b>	Female Type-A HDMI
<b>OUTPUT:</b>	8 × HDMI 8 × SPDIF audio
<b>OUTPUT CONNECTOR:</b>	Female Type-A HDMI 3.5mm RCA connector
<b>STANDARDS:</b>	HDMI1.4 & HDCP1.4
<b>CONTROL PORTS:</b>	1 × IR IN (3.5mm jack) 1 × TCP/IP (female RJ45) 1 × RS232 (3-pin pluggable terminal block)
<b>EDID MANAGEMENT:</b>	In-built EDID data and manual EDID management
<b>AUDIO SIGNAL:</b>	Dolby Digital, DTS, DTS-HD
<b>MAX RESOLUTION:</b>	4K × 2K, 1080P 3D
<b>TRANSMISSION DISTANCE:</b>	4Kx2K@60Hz ≤15m
<b>POWER SUPPLY:</b>	DC 24V 2.71A
<b>POWER CONSUMPTION:</b>	32W (Full Load) 2.2W (Standby)
<b>TEMPERATURE:</b>	0 ~ 50°C
<b>REFERENCE HUMIDITY:</b>	10% ~ 90%
<b>DIMENSION (L X W X H):</b>	437 × 44 × 235 mm
<b>WEIGHT:</b>	1.96 kg

