

ASP-44™

4x4 HDMI 1.3c Matrix

User Manual



Manual Number: 100310





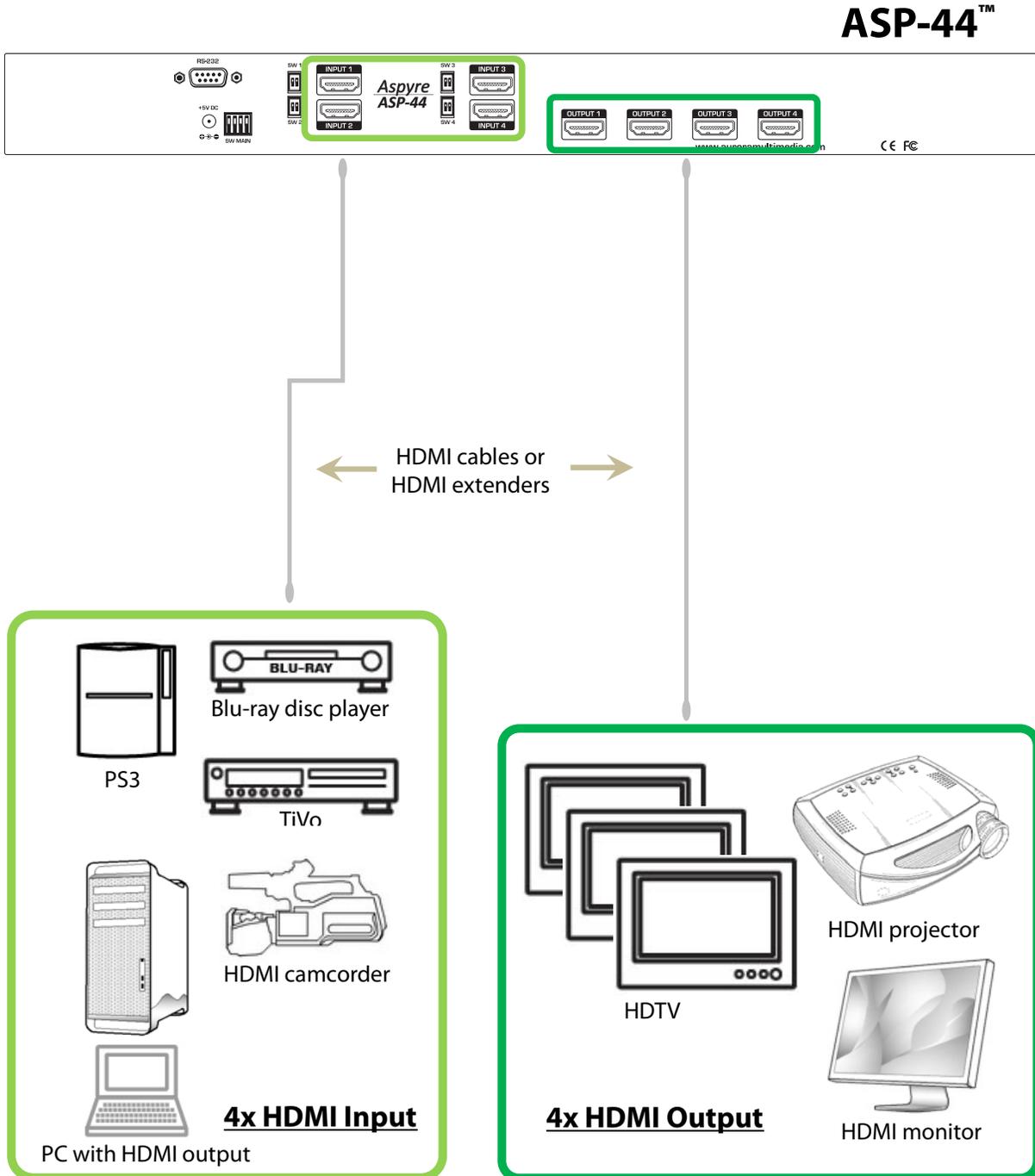
Safety and Notice

The **ASP-44™ 4x4 HDMI 1.3c Matrix** has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the ASP-44 should be used with care. Please read and follow the safety instructions to protect yourself from possible injury and to minimize the risk of damage to the unit.

- Follow all instructions and warnings marked on this unit.
- Do not attempt to service this unit yourself, except where explained in this manual.
- Provide proper ventilation and air circulation and do not use near water.
- Keep objects that might damage the device and assure that the placement of this unit is on a stable surface.
- Use only the power adapter and power cords and connection cables designed for this unit.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.

Introduction

The **ASP-44™** 4x4 HDMI 1.3c Matrix provides the most flexible and cost effective solution in the market to route high definition video sources plus multi-channel (up to 7.1 channel) digital audio from any of the four HDMI sources to the any four displays at the same time. This solution is well suited for use in home theater, conference room presentation systems, or other similar setting or application.



Features

- State-of-the-art Silicon Image (Founder of HDMI) chipset embedded for utmost compatibility and reliability
- HDMI 1.3c compliant
- HDCP compliant
- Allows any source to be displayed on multiple displays at the same time
- Allows any HDMI display to view any HDMI source at any time
- Supports 7.1 channel digital audio
- Supports default HDMI EDID and learns the EDID of displays if necessary
- The matrix master can switch every output channels to any HDMI inputs by push button, IR remote control, RS-232 control, or USB control
- Easy installation with rack-mounting designs
- Fast response time – 2~5 seconds for channel switch

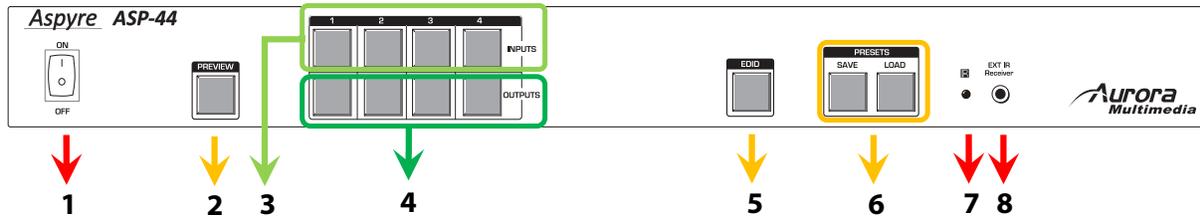
Specifications & Package Contents

Model Name		ASP-44™
Technical		
Role of usage	True 4x4 matrix	
HDMI compliance	HDMI 1.3c	
HDCP compliance	Yes	
Video bandwidth	Single-link 225MHz [6.75Gbps]	
Video support	480i / 480p / 720p / 1080i / 1080p60 8-12 bit color	
Audio support	Surround sound (up to 7.1ch) or stereo digital audio	
ESD protection	[1] Human body: ±19kV [air-gap discharge] & ±12kV [contact discharge] [2] Core chipset: ±8kV	
PCB stack-up	4-layer board [impedance control — differential 100Ω; single 50Ω]	
Input	4x HDMI + 1x RS-232 + 1x 3.5mm	
Output	4x HDMI	
HDMI input selection	Push button / IR remote / RS-232	
IR remote control	Electro-optical characteristics: $\tau = 25^\circ$; carrier frequency: 36-40kHz	
HDMI connector	Type A [19-pin female]	
RS-232 connector	DE-9 [9-pin D-sub female]	
3.5mm connector	IR socket for IR receiver	
DIP Switch	[SW1-SW4]: 2-pin for EDID & audio/video settings [SW Main]: 4-pin for normal operation or firmware update	
Mechanical		
Housing	Metal enclosure	
Dimensions [L x W x H]	Model	290 x 440 x 44mm [11.4" x 1'5" x 1.7"]
	Package	400 x 530 x 130mm [1'4" x 1'9" x 5"]
Weight	Model	1075g [2.4 lbs]
	Package	2090g [4.6 lbs]
Fixedness	1RU rack-mount with ears	
Power supply	5V 6A DC	
Power consumption	20 Watts [max]	
Operation temperature	0~40°C [32~104°F]	
Storage temperature	-20~60°C [-4~140°F]	
Relative humidity	20~90% RH [no condensation]	
Package Contents	1x ASP-44 2x 1RU rack-mount ear 1x IR remote control	1x Installation CD 1x 5V 6A in-line PSU with C5 power cord 1x User Manual

Panel Descriptions

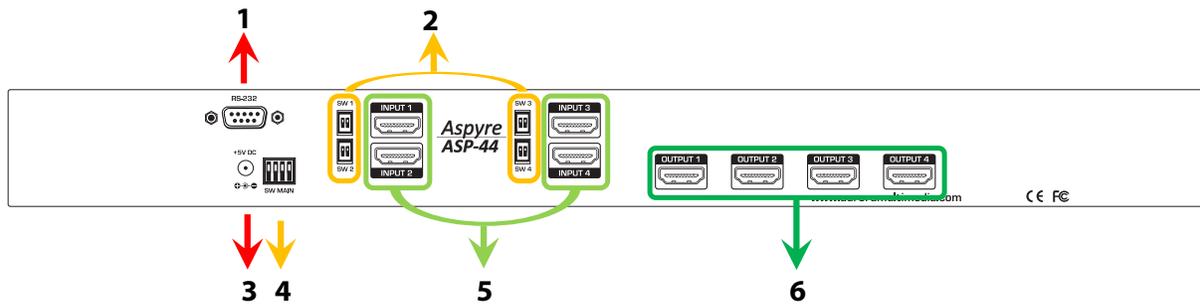
ASP-44™

Front Panel



1. **Power:** power on/off switch
2. **PREVIEW Button:** press **PREVIEW** to watch input/output mapping. This function is active when the button is bright
3. **INPUT Buttons:** press respective button to select input port 1 to 4
4. **OUTPUT Buttons:** press respective button to select output 1 to 4
5. **EDID Button:** press **EDID** button to enter EDID operation (for more detail please see EDID Learning section). This function is active when the button is bright
6. **PRESETS Buttons:** Save the current input/output mapping to presets or load one of the preset input/output mappings to current configuration by pressing **SAVE** or **LOAD** button respectively
7. **IR:** infrared sensor to receive any IR commands from the IR remote control
8. **EXT IR Receiver:** plug in an IR receiver here to receive any IR commands from the IR remote control

Rear Panel



1. **RS-232:** For channel control via RS-232 serial control port
2. **SW1 – SW4:** Two-pin DIP switch for manual EDID and audio/video settings (for more detail please see DIP Switch section)
3. **+5V DC:** Plug in the 5V 6A power supply unit with C5-type power cord to a power outlet
4. **SW Main:** Four-pin DIP switch for normal operation or firmware update (for more detail please see DIP Switch section)
5. **INPUT 1 – INPUT 4:** Four HDMI input ports that connect to HDMI source devices
6. **OUTPUT 1 – OUTPUT 4:** Four HDMI output ports that connect to HDMI displays

SW1-SW4 for EDID & audio/video settings

DIP Switch Position		Video	Audio	Description
Pin 1	Pin 2			
OFF [↑]	OFF [↑]	Up to 1080p	Surround ¹	Default Mode ² – Up to 1080p & surround sound audio output up to 7.1ch (DTS-HD Master & Dolby TrueHD)
OFF [↑]	ON [↓]	Up to 1080p	Stereo	Safe Mode ³ – Make the system output at 1080p video and stereo audio for basic compatibility among HDTVs
ON [↓]	OFF [↑]	Bypass ⁴	Bypass ⁴	EDID Learning Mode ⁵ – for learning EDID from the display while playing any received HDMI audio format
ON [↓]	ON [↓]	Bypass	Stereo	EDID Learning & Stereo Mode ⁵ – for learning EDID from the display while enforcing stereo output if any HDTV cannot play surround sound normally



Note

¹ If the HDTV shows video but without audio, please try to set audio mode to stereo.

² Factory default setting of [SW1]-[SW4] is pin 1 at OFF [↑] & pin 2 at OFF [↑] for 1080p and surround sound audio.

³ If you encounter any unsolved audio/video output problem during system installation, please turn any [SW1]-[SW4] to pin 1 at OFF [↑] & pin 2 at ON [↓] for safe mode to enforce the most compatible 1080p stereo output for system check. However, the safe mode cannot be initiated if your HDMI source is set to enforce 1080p output. In this case, please reconfigure your HDMI source to all resolution output for troubleshooting.

⁴ Bypass means the matrix will maintain playing the original format of HDMI signals in video and perhaps audio. By setting at this mode, the users may encounter compatibility issue among different kinds of HDMI sources and displays. If you cannot get the audio and/or video output normally at the system installation, please change the DIP switch setting to default mode or even safe mode to verify the functionality of the device.

⁵ To learn the EDID of the HDMI display for respective HDMI source devices, please see the [EDID Learning] section for more detail information.

SW Main for firmware update (for technical support only)

DIP Switch Position	Pin 1	Pin 2	Pin 3	Pin 4
Normal Operation Mode ⁶	OFF[↑]	OFF[↑]	ON[↓]	OFF[↑]
Firmware Update Mode ⁷	ON[↓]	ON[↓]	OFF[↑]	OFF[↑]



Note

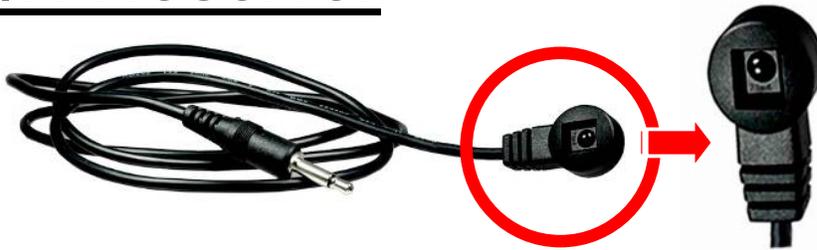
⁶ Factory default for SW Main is pin 1 at OFF [↑], pin 2 at OFF [↑], pin 3 at ON [↓], and pin 4 at OFF [↑]. PLEASE MAINTAIN THIS SETTING AT ANYTIME FOR REGULAR USE!

⁷ Sequence for firmware update:

WARNING! [Firmware update only can be done via RS-232 port and connection to PC set at COM1]

1. Power off the ASP-44. Execute the firmware update program on your PC via COM1 port connection to the RS-232 port of the ASP-44 using a straight through (pin-pin) cable.
2. Set the DIP switch of [SW Main] at right position for **Firmware Update Mode**.
3. Power on the ASP-44.
4. Turn off the ASP-44.
5. Set the DIP switch of [SW Main] at right position for **Normal Operation Mode**.
6. Power on the ASP-44.

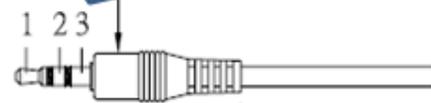
IR Receiver



IR Sockets

EXT IR Receiver: plug in the IR receiver to the IR socket on the front panel of the ASP-44 to receive all IR command signals from the IR remote control

1 = Power
2 = IR signal (38KHz)
3 = Grounding



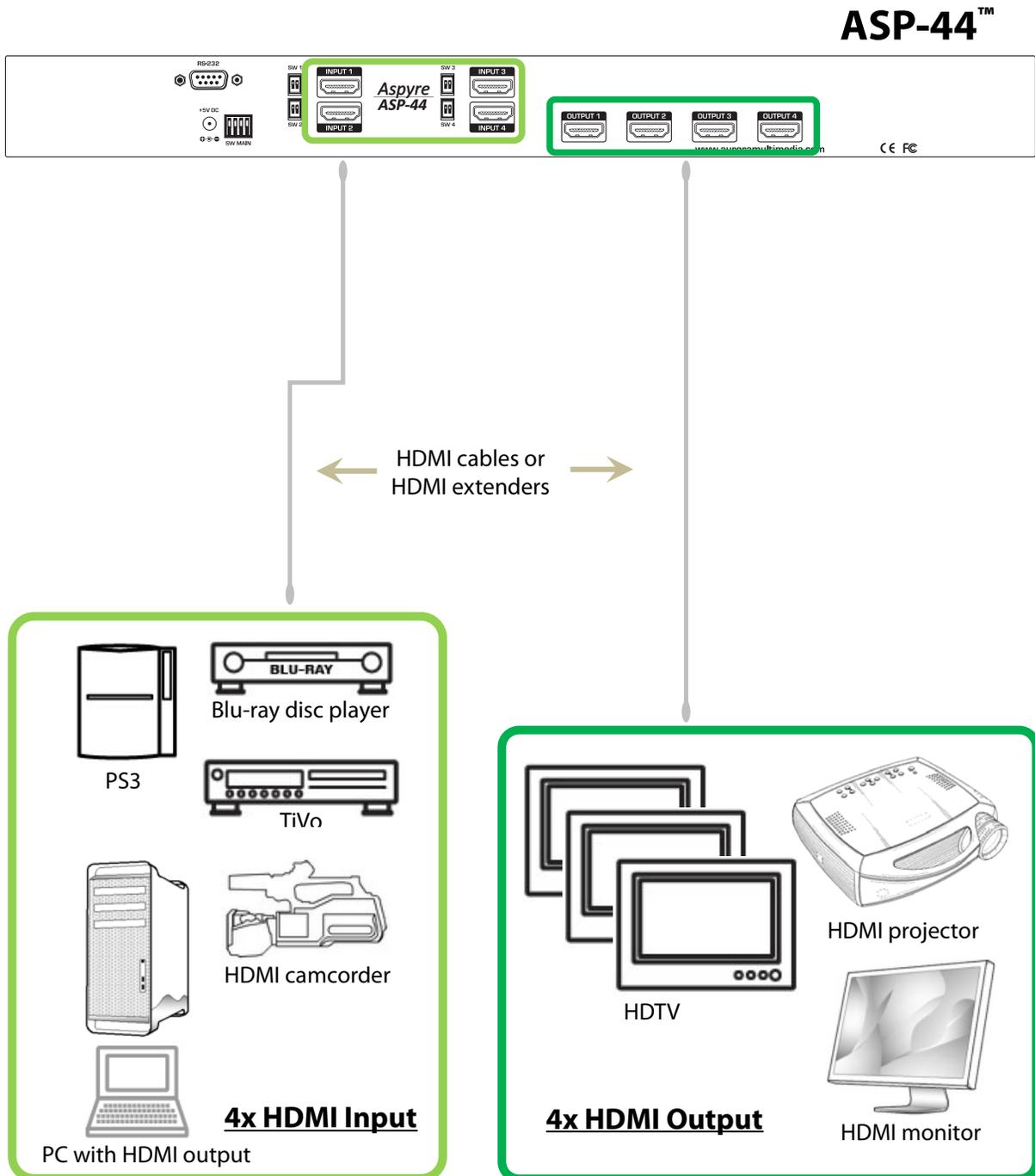
You can buy any IR receiving cable in the open market that is compatible to the definition of the IR sockets for the matrix if necessary for replacement use. However, in some cases, IR cables longer than 2m (6ft) may not work properly.

Supported IR Data Format

Data Format	Suitable	Not Recommended
NEC	✓	
RC5	✓	
TOSHIBA MICOM CODE	✓	
GRUNDIG CODE	✓	
SONY 12 BIT CODE	✓	
SONY 15 BIT CODE	✓	
SONY 20 BIT CODE	✓	
RCA CODE		✓
RCM CODE		✓
MATSUSHITA CODE		✓
MITSUBISHI CODE	✓	
ZENITH CODE	✓	
JVC CODE	✓	
M50560-001P	✓	
MN6125H	✓	
MN6125L	✓	
MN6014_C5D7	✓	
MN6014-C6D6	✓	
MC14457P	✓	
LC7464(AHEA)	✓	
GEMINI_CM	✓	

Hardware Installation

1. Connect all sources to HDMI Inputs on the ASP-44 via HDMI cables or extenders
2. Connect all outputs to HDMI displays via HDMI cables or extenders
3. Connect the 5V 6A power supply unit and C5 power cord between the ASP-44 and the power outlet.
4. Power on the ASP-44, all HDMI source devices, and all HDMI displays.

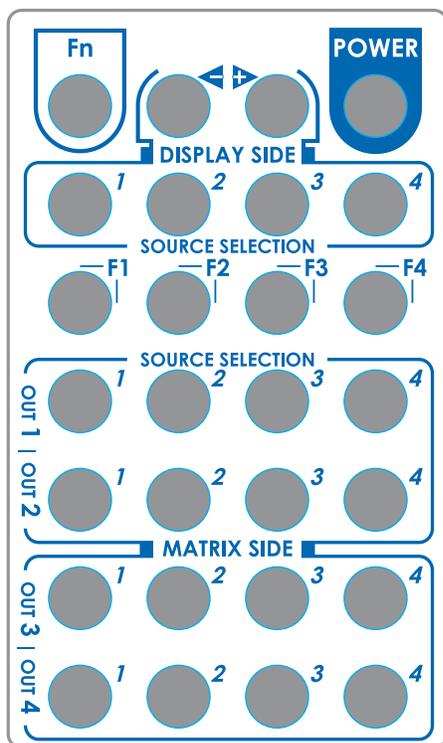


Source Side

Method A: Push input/output buttons

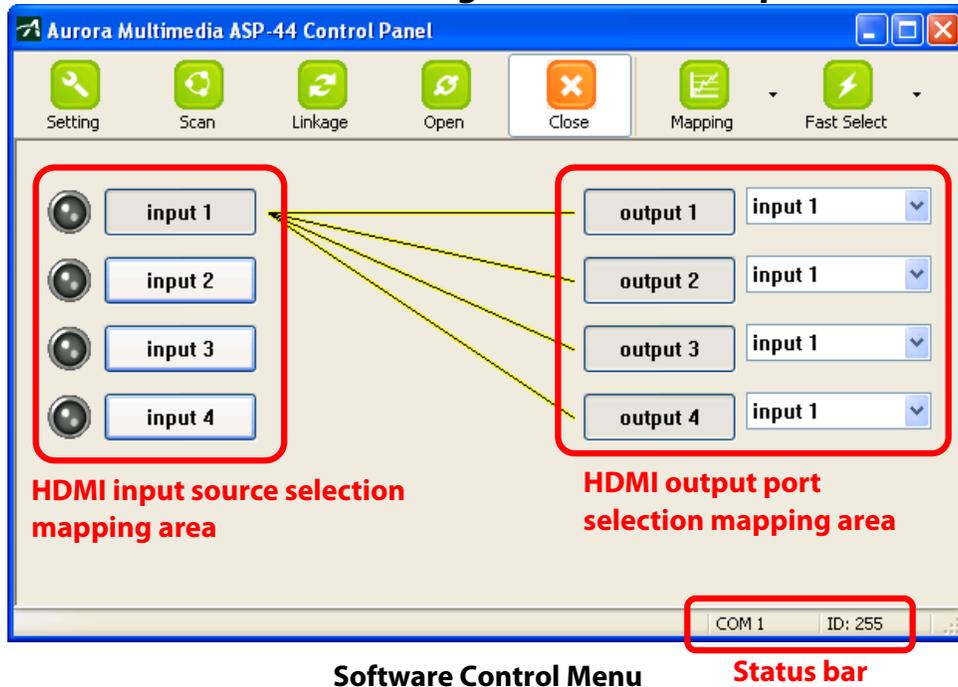
1. Press the **INPUT** button on the front panel to select input source port, which will be bright once selected.
2. Press the **OUTPUT** buttons on the front panel to select output display ports, which will be bright once selected, to display HDMI signal from selected input port.

Method B: IR Remote control



POWER	Power on/off
Fn	Function key
INPUT 1	HDMI input port 1
INPUT 2	HDMI input port 2
INPUT 3	HDMI input port 3
INPUT 4	HDMI input port 4
OUTPUT 1	HDMI output port 1
OUTPUT 2	HDMI output port 2
OUTPUT 3	HDMI output port 3
OUTPUT 4	HDMI output port 4

Method C: Software control through RS-232 or USB port



1. Setting button



Click **Get** button to read back device ID.

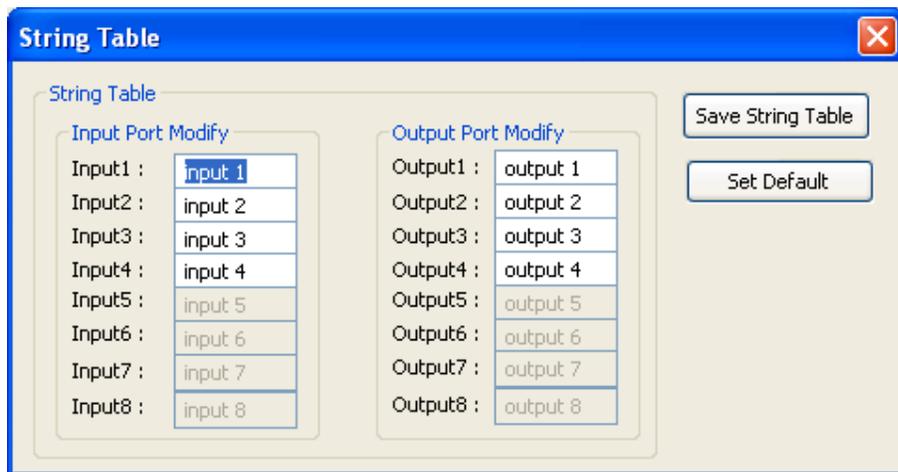
Click **Set** button to write device ID.

Click **Rename** to open the String Table.

In the String Table, assign the captions for each input and output port for easy recognition.

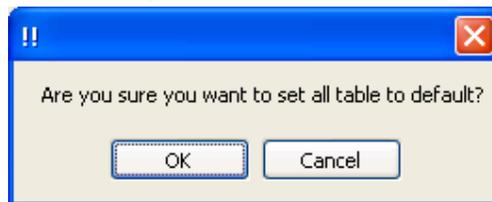
Example

Rename the Input1 to "Blu-ray player", Input2 to "Sat. receiver," input3 to "Game console," input4 to "AV receiver," and rename output1 to "Conf. RM1," output2 to "Conf. RM2," output3 to "Lobby," output4 to "Main projector," ... etc.



Click **Save String Table** to save the caption setting.

Click **Set Default** will pop up the confirmation message below for erasing the captions and reset the string table to default setting.



2. Scan button

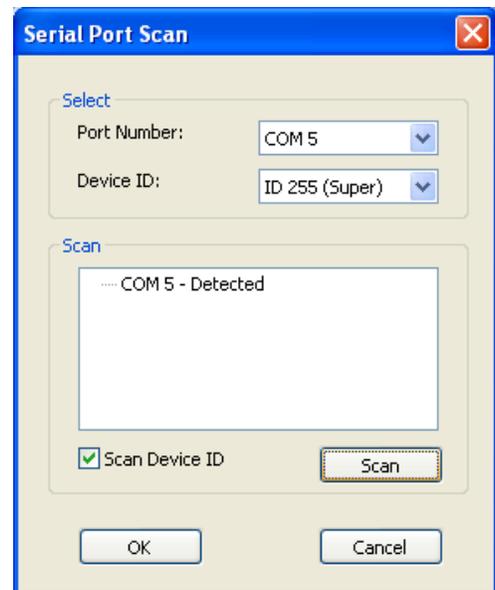
Serial Port Scan

Click **Scan**, the machine will scan the all com port and show them.

Select the RS232 serial port connected to the machine. And set device ID 255 is for all device.

Only the same device id or 255 can get the command you sent.

Click **OK** to get the new status from the machine you select.



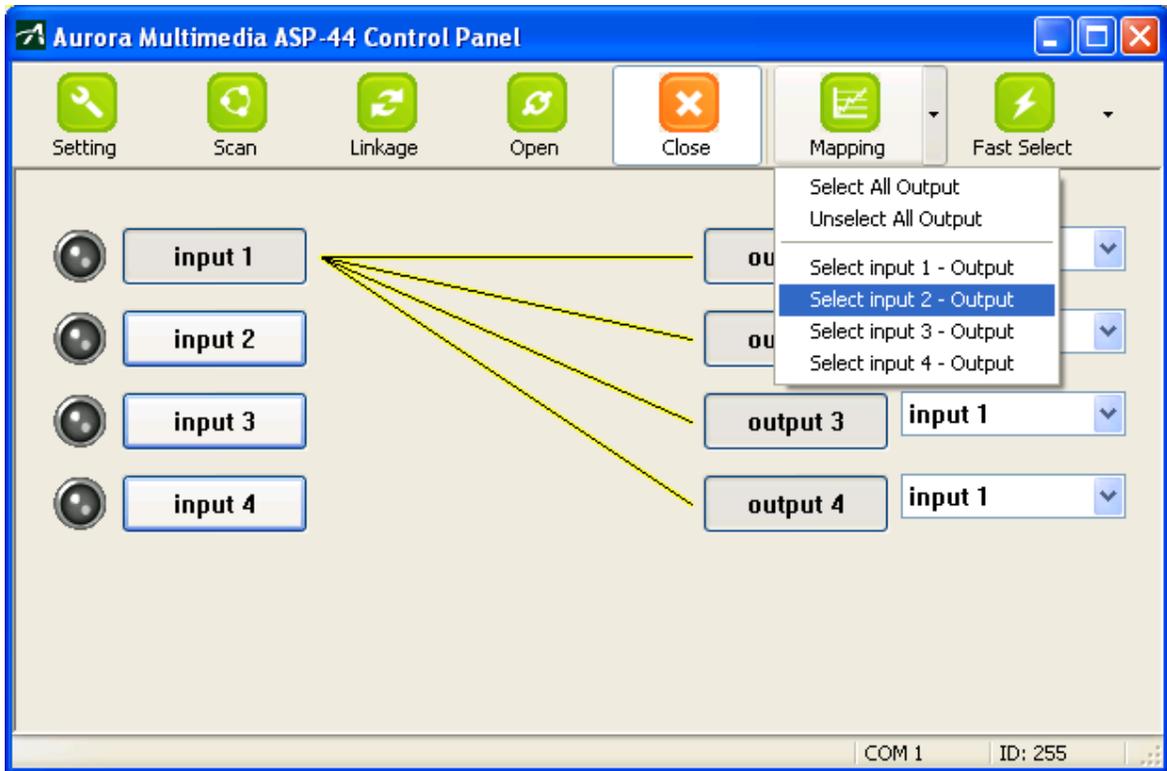
3. Linkage button

Click **Linkage** to read back all status.

4. Open/Close button

Click Open or Close to open / close designated COM port.

5. Mapping button



Select All Output

Select "set all output," then select the source on main menu. You can quickly set all output to the same source.

Unselect All Output

Release output selection.

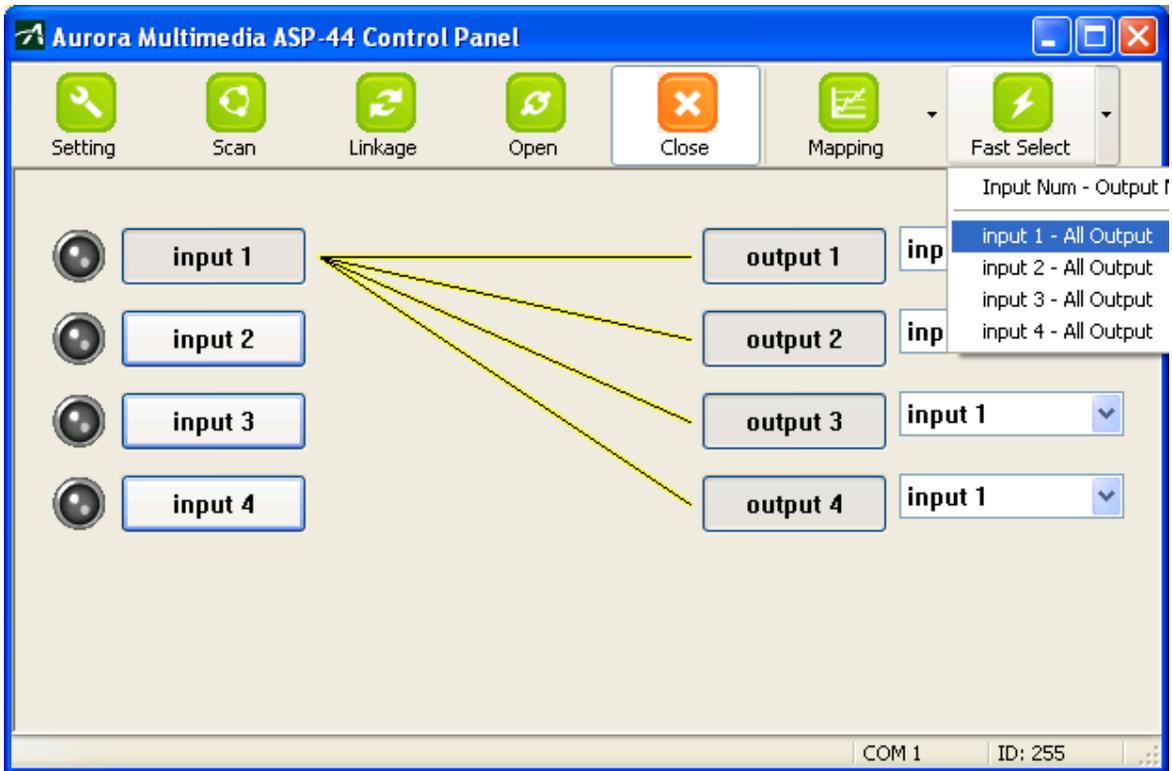
Select Input1~4-Output

Select Input Source. Then select the output port icon.

Example

Select input source 1. Then select output port 1 and port 2. The video and audio will be sent to port 1 and port 2.

6. Fast Select button:



Click **Fast Select** for quick setting

Input one ➔ Output Port one

Input two ➔ Output Port two

.....

Click **Fast Select** pull down menu

Select Input Num-Output Num

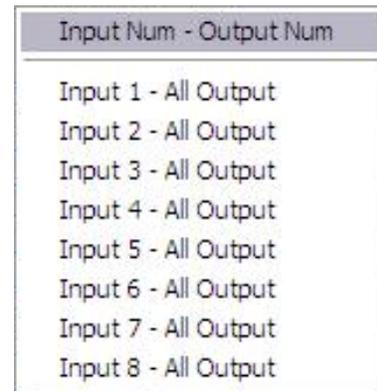
Input source #1 ➔ Output port #1

Input source #2 ➔ Output port #2

.....

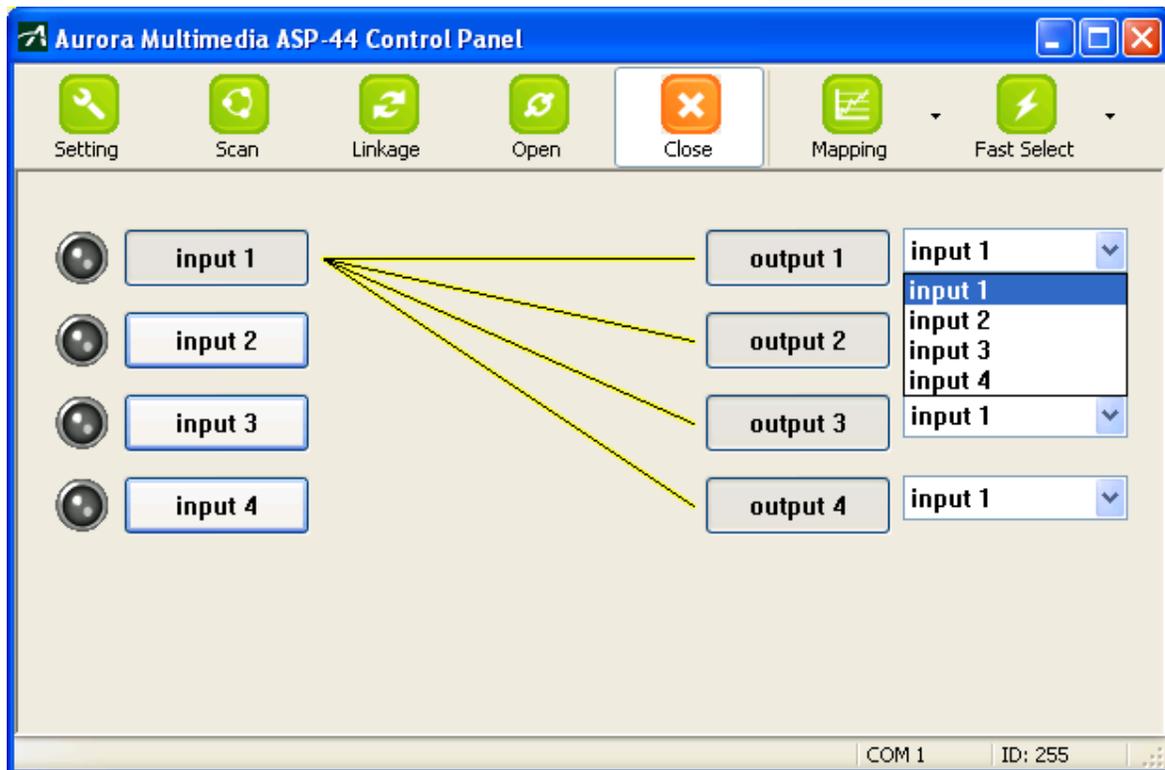
Select Input - All Output

Send the same source to all output



7. Output Port:

Pull down menu and select which source to be sent to this output port.

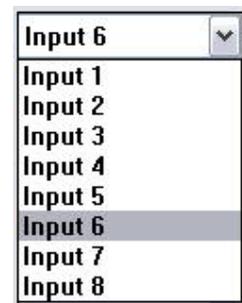


One by one setting

On main menu screen

First select input source. Then select the output ports which you want to send the video and audio from this source. When you select the input source, the source will change to gray. When you select the output port one by one, the selected output port will change to gray.

The linking line will change to yellow.



Group setting

First select output ports one by one. Then select the input source. The selected output ports change the setting at the same time.

By using Terminal

Baud rate: 9600
Data length: 8bit
Parity check: No
Stop bit: 1

RS-232 DB9 Pin Definition

Pin 2 Tx →, Pin 3 Rx ←, Pin 5 Ground

Command Set:

! is the start character to active a command

? is the start character to query status

~ is the start character of the response

/x0D (<cr> aka carriage return) is the end character

COMMAND	ACTION	COMMAND	ACTION	COMMAND	ACTION
!R	Change Route	?R	Query route	!P	Preset recall
VR	Firmware Version				

Examples:

To route input 1 to output 2, 3, 4, the command would look like: **!R1to2,3,4<cr>**

The response is **~R1to2,3,4<cr>**

A query could be **?R1<cr>**

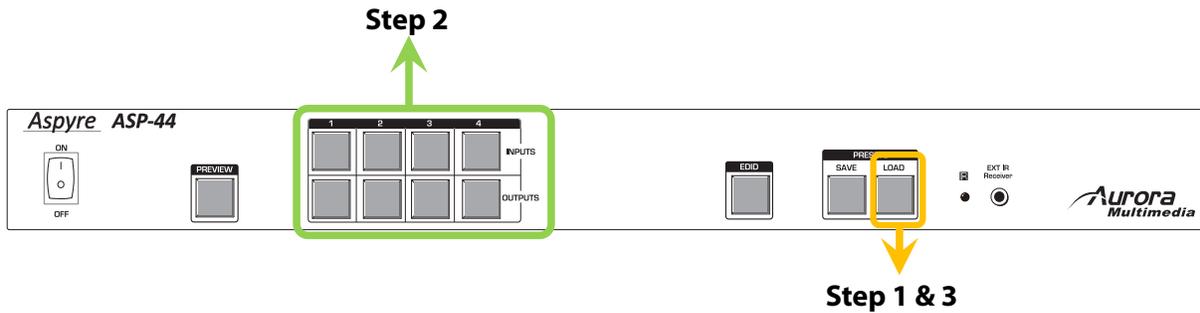
Example response would is **~R1to2,3,4<cr>**

To trigger a preset, the command would look like: **!P01<cr>**

The response is **~P01<cr>**

Method 4: Preset mappings

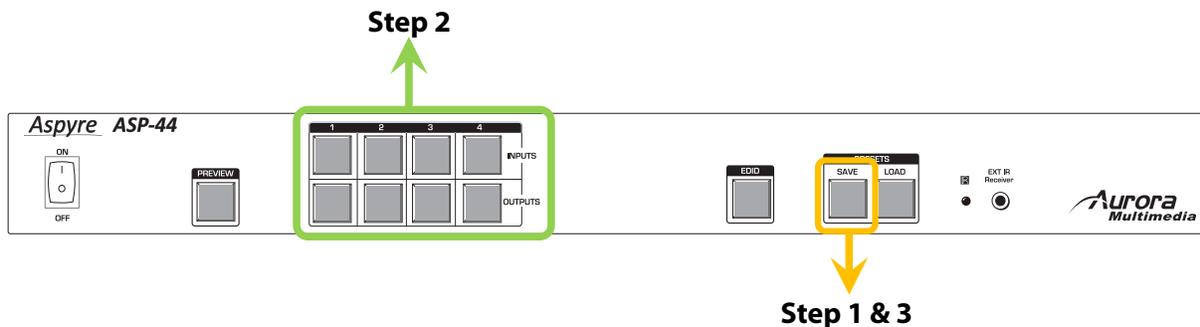
a. Load one of the presets



1. Press the **LOAD** button in the PRESETS menu on the front panel and the LED will turn on.
2. Select the preset profile number to load the corresponding mapping.
3. Press the **LOAD** button to execute the setting. After loading procedure, the LED will turn off.

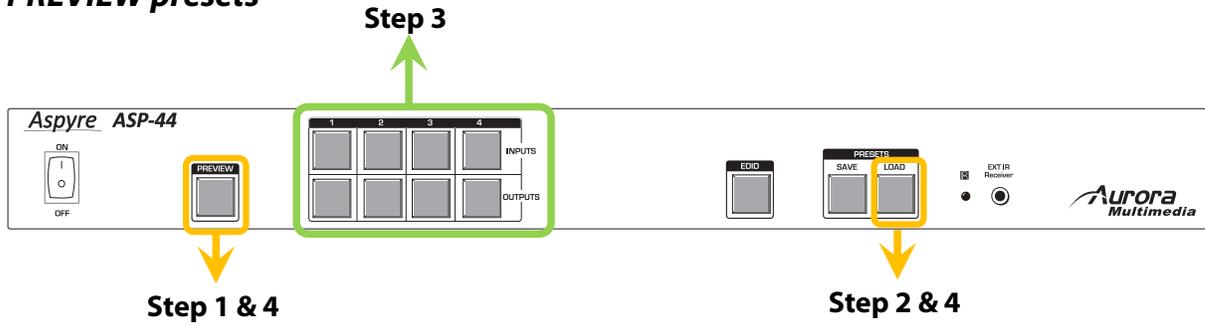
Input Port	Preset Profile Number	Output Port	Preset Profile Number
1	1	1	5
2	2	2	6
3	3	3	7
4	4	4	8

b. Save the current mapping configuration into presets



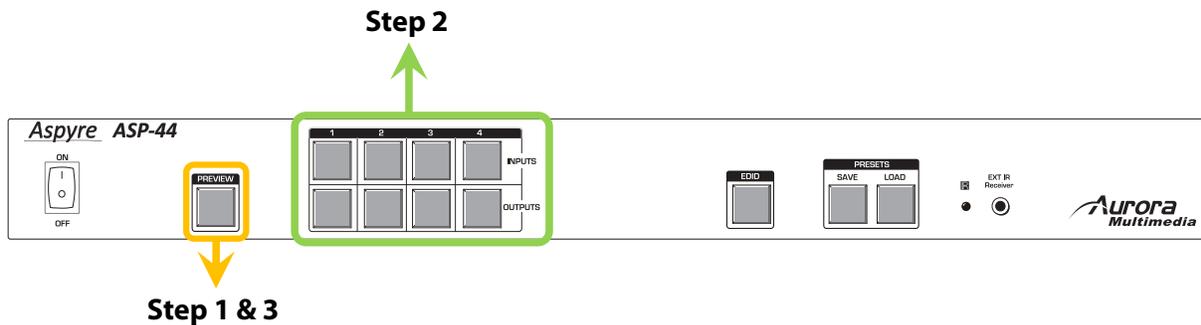
1. Press the **SAVE** button in the PRESETS menu on the front panel and the LED will turn on.
2. Select the preset profile number and save the current mapping profile to the memory.
3. Press the **SAVE** button to execute the setting. After loading procedure, the LED will turn off.

c. PREVIEW presets



1. Press the **PREVIEW** button on the front panel.
2. Press the **LOAD** button.
3. Select the preset profile number to load the corresponding mapping and press the respective button.
4. Press the **LOAD** button or **PREVIEW** button to escape PREVIEW presets state

d. PREVIEW INPUT/OUTPUT mapping status



1. Press the **PREVIEW** button on the front panel.
2. Check mapping by push **INPUTS** or **OUTPUTS** buttons.
3. Press the **PREVIEW** button to escape PREVIEW status.

EDID Learning

The EDID learning function is only necessary whenever you encounter any display connected to the HDMI output port that cannot play audio and video properly. Because the HDMI source devices and displays may have various level of capability in playing audio and video, the general principle is that the source device will output the lowest standards in audio format and video resolutions to be commonly acceptable among all HDMI displays. In this case, a 720p stereo HDMI signal output would be probably the safest choice. Nevertheless, the user can force the matrix to learn the EDID of the lowest capable HDMI display among others to make sure all displays are capable to play the HDMI signals normally by performing the procedures stated below.

 **SW1-SW4's Pin 1 must be set to "ON" and left there for EDID Learning Mode. Turning to "OFF" will return to factory defaults.**

DIP Switch Position	Description
Pin 1	
ON [↓]	EDID Learning – for learning EDID from the display

Method 1: Use the front panel on the master unit

Button	Function
OUTPUT 1-4	EDID will be read from display from the respective output port
INPUT 1-4	The EDID will be sent to the HDMI source connected to respective HDMI input port

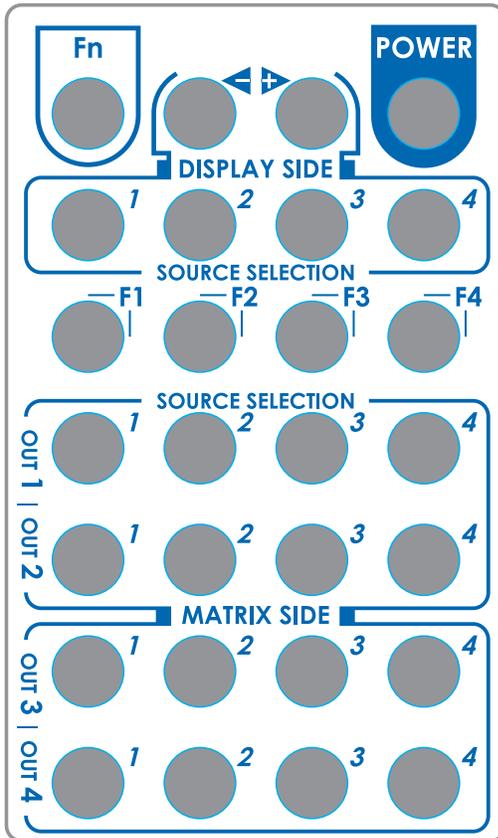
1. Push **EDID** button to enter EDID learning mode
2. Select one or multiple **INPUTS 1-4** buttons that you want those input ports to learn the EDID of the display from certain **OUTPUT** port. The input port is selected when the LED is on. Push the **INPUT** button again if you want to cancel this input port to learn EDID.
3. Select the HDMI display that you want the matrix to learn its EDID by push the **OUTPUT** button connected to this display.
4. Press the **EDID** button to initiate the EDID learning sequence. If the sequence is done successfully, the front panel will get back to normal operation mode. If the sequence is failed, the LED of the chosen input ports will flash then please try again.

Method 2: Manually connect HDMI displays to HDMI input ports

1. Power up the matrix. Connect the HDMI display that its EDID needs to be learned to any of the HDMI **INPUT1-INPUT4** port where your source device has trouble to show the picture normally.
2. To learn the display's EDID for source device connected to respective HDMI **INPUT1-INPUT4** port, pull both pins of respective DIP switch **SW1-SW4** up-and-down to stay at ON[↓]-ON[↓] and wait for about 5 seconds to complete the EDID learning process. You DON'T NEED to pull up the DIP switch again unless you want to learn another display's EDID by pulling both DIP switch pin 1 & pin 2 of **SW1-SW4** up-and-down one more time.
3. Repeat step1 & step2 if you want to learn the EDID of this HDMI display on any other HDMI input ports that have same trouble playing the audio/video properly.

IR Discrete Code

Default Custom Code — IR2 Code: 00 FF



Function 0x17	 0x0A	 0x0C	POWER 0x02
SOURCE SEL. 1 0x54	SOURCE SEL. 2 0x55	SOURCE SEL. 3 0x56	SOURCE SEL. 4 0x01
F1 0x57	F2 0x58	F3 0x59	F4 0x06
Output Port 1			
INPUT 1 0x18	INPUT 2 0x5B	INPUT 3 0x19	INPUT 4 0x07
Output Port 2			
INPUT 1 0x1B	INPUT 2 0x5A	INPUT 3 0x1A	INPUT 4 0x04
Output Port 3			
INPUT 1 0x0E	INPUT 2 0x0D	INPUT 3 0x12	INPUT 4 0x05
Output Port 4			
INPUT 1 0x1C	INPUT 2 0x1D	INPUT 3 0x1F	INPUT 4 0x1E

Custom Code — IR3 Code: 0x12 0x21

	Output 1	Output 2	Output 3	Output 4
Source 1	0xA1	0xB1	0xC1	0xD1
Source 2	0xA2	0xB2	0xC2	0xD2
Source 3	0xA3	0xB3	0xC3	0xD3
Source 4	0xA4	0xB4	0xC4	0xD4

Custom Code — IR4 Code: 0x13 0x31

	Output 1	Output 2	Output 3	Output 4
Source 1	0xAE	0xBE	0xCE	0xDE
Source 2	0xAD	0xBD	0xCD	0xDD
Source 3	0xAC	0xBC	0xCC	0xDC
Source 4	0xAB	0xBB	0xCB	0xDB

Note: Using terminal to set Custom Code

Example: Set custom code from 0x01 0xEE to 0x13 0x31

>>IR4 ---- command (using RS-232 terminal command mode)

>>IR4 ---- echo

For further information, please check the installation CD.

Command	Custom Code
IR2	0x00 0xFF
IR3	0x12 0x21
IR4	0x13 0x31

Limited Warranty

Aurora Multimedia Corp. ("Manufacturer") warrants that this product is free of defects in both materials and workmanship for a period of 3 years as defined herein for parts and labor from date of purchase. Motorized mechanical parts (Hard Drives, DVD, etc), mechanical parts (buttons, doors, etc), remotes and cables are covered for a period of 1 year. Batteries are not covered by this warranty. During the warranty period, and upon proof of purchase, the product will be repaired or replaced (with same or similar model) at our option without charge for parts or labor for the specified product warranty period.

This warranty shall not apply if any of the following:

- A) The product has been damaged by negligence, accident, lightning, water, act-of-God or mishandling; or,
- B) The product has not been operated in accordance with procedures specified in operating instructions; or,
- C) The product has been repaired and or altered by other than manufacturer or authorized service center; or,
- D) The product's original serial number has been modified or removed: or,
- E) External equipment other than supplied by manufacturer, in determination of manufacturer, shall have affected the performance, safety or reliability of the product.
- F) Part(s) are no longer available for product.

In the event that the product needs repair or replacement during the specified warranty period, product should be shipped back to Manufacturer at Purchaser's expense. Repaired or replaced product shall be returned to Purchaser by standard shipping methods at Manufacturer's discretion. Express shipping will be at the expense of the Purchaser. If Purchaser resides outside the contiguous US, return shipping shall be at Purchaser's expense.

No other warranty, express or implied other than Manufacturer's shall apply.

Manufacturer does not assume any responsibility for consequential damages, expenses or loss of revenue or property, inconvenience or interruption in operation experienced by the customer due to a malfunction of the purchased equipment. No warranty service performed on any product shall extend the applicable warranty period.

This warranty does not cover damage to the equipment during shipping and Manufacturer assumes no responsibility for such damage.

This product warranty extends to the original purchaser only and will be null and void upon any assignment or transfer.

Aurora Multimedia Corp.
205 Commercial Court, Morganville, NJ 07751
Phone: (732) 591-5800 Fax: (732) 591-5801
www.auroramultimedia.com