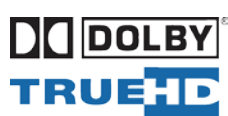


MA-5422H

4x2 HDMI 2.0a Matrix

User Manual



rev: 151210
Made in Taiwan



Safety and Notice

The **MA-5422H 4x2 HDMI 2.0a Matrix** has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the **MA-5422H** 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.



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INTRODUCTION

The **MA-5422H 4x2 HDMI 2.0a 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 remote 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

- HDMI 2.0a compliant
- Supports 4K2K@60 4:4:4 8bits
- Supports HDR*, which is 4K2K@60 4:2:0 10bits**
- HDCP 2.2 and 1.4 compliant
- Wide frequency range: 25MHz~600MHz
- Video bandwidth: 18Gbps
- Supports xvYCC, x.v.Color & Deep Color
- Supports Dolby Digital(+), DTS-HD and Dolby TrueHD audio
- 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 default HDMI EDID and learns the EDID from displays
- The matrix master can switch every output channel to any HDMI input by IR remote control, RS-232 control, IP control and web interface.
- Easy installation with rack-mounting and wall-mounting designs for master and receiver respectively
- Supports ARC from Output2



* HDR = High Dynamic Range.

** The video bandwidth of 4K2K@60 4:2:0 10bits (HDR) is 384MHz, and the 4K2K@60 4:4:4 8bits is 594MHz

PACKAGE CONTENTS

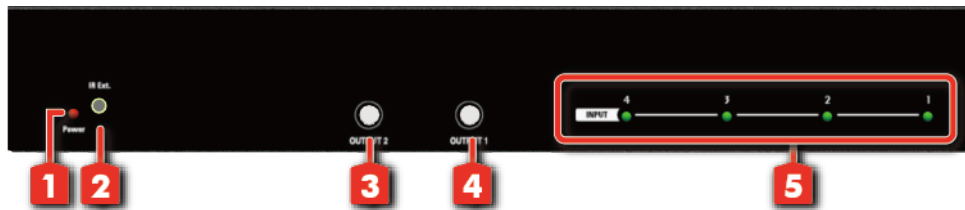
- 1x MA-5422H
- 1x IR receiver
- 1x Rack-mounting ear set
- 1x Installation software CD
- 1x DC 5V 4A
- 1x IR Remote control*
- 1x User Manual

SPECIFICATIONS

Model Name		MA-5422H
Technical		
Role of usage	True 4x2 matrix	
HDMI compliance	3D & 4K2K@60Hz	
HDCP compliance	Yes	
Video bandwidth	Single-link 594MHz [18 Gbps]	
Video support	Up to HDR 4K2K@60 (4:2:0 10bits) / 4K2K@60 (4:4:4 8bits)	
Audio support	Surround sound (up to 7.1ch) or stereo digital audio	
ESD protection	Human body model — ±15kV [air-gap discharge] & ±8kV [contact discharge]	
Input	4x HDMI / 1x RS-232 / 1x Ethernet	
Output	2x HDMI / 2x SPDIF / 2x RCA	
IR remote control	Electro-optical characteristics: $\pi = 25^\circ$ / Carrier frequency: 38kHz	
HDMI connector	Type A [19-pin female]	
RJ-45 connector	WE/SS 8P8C with 2 LED indicator	
RS-232 connector	DE-9 [9-pin D-sub female]	
Mechanical		
Housing	Metal enclosure	
Dimensions [L x W x H]	Model	290 x 71 x 43mm [11.4" x 2.8" x 1.7"]
	Package	376 x 240 x 112mm [1'2" x 9.4 x 4.4"]
	Carton	590 x 510 x 405mm [1'9" x 1'7" x 1'3"]
Weight	Model	792g [1.7 lbs]
	Package	1600g [3.5 lbs]
Fixedness	1RU rack-mount with ears and Wall hanging holes	
Power supply	5V 4A 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]	

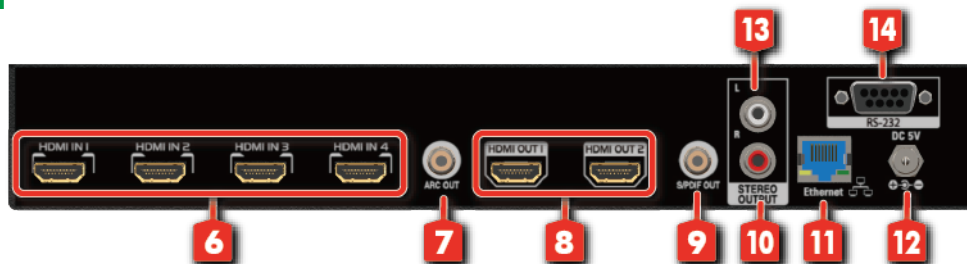
PANEL DESCRIPTIONS

Front Panel




1. **Power LED:** Power indicator LED
2. **System IR Receiver:** Ext. IR receiver
3. **Port 2 Channel Push Button:** Select input channel
4. **Port 1 Channel Push Button:** Select input channel
5. **Selected Source Status LED:** When users use port channel push button, the indicator LED will show the selected source

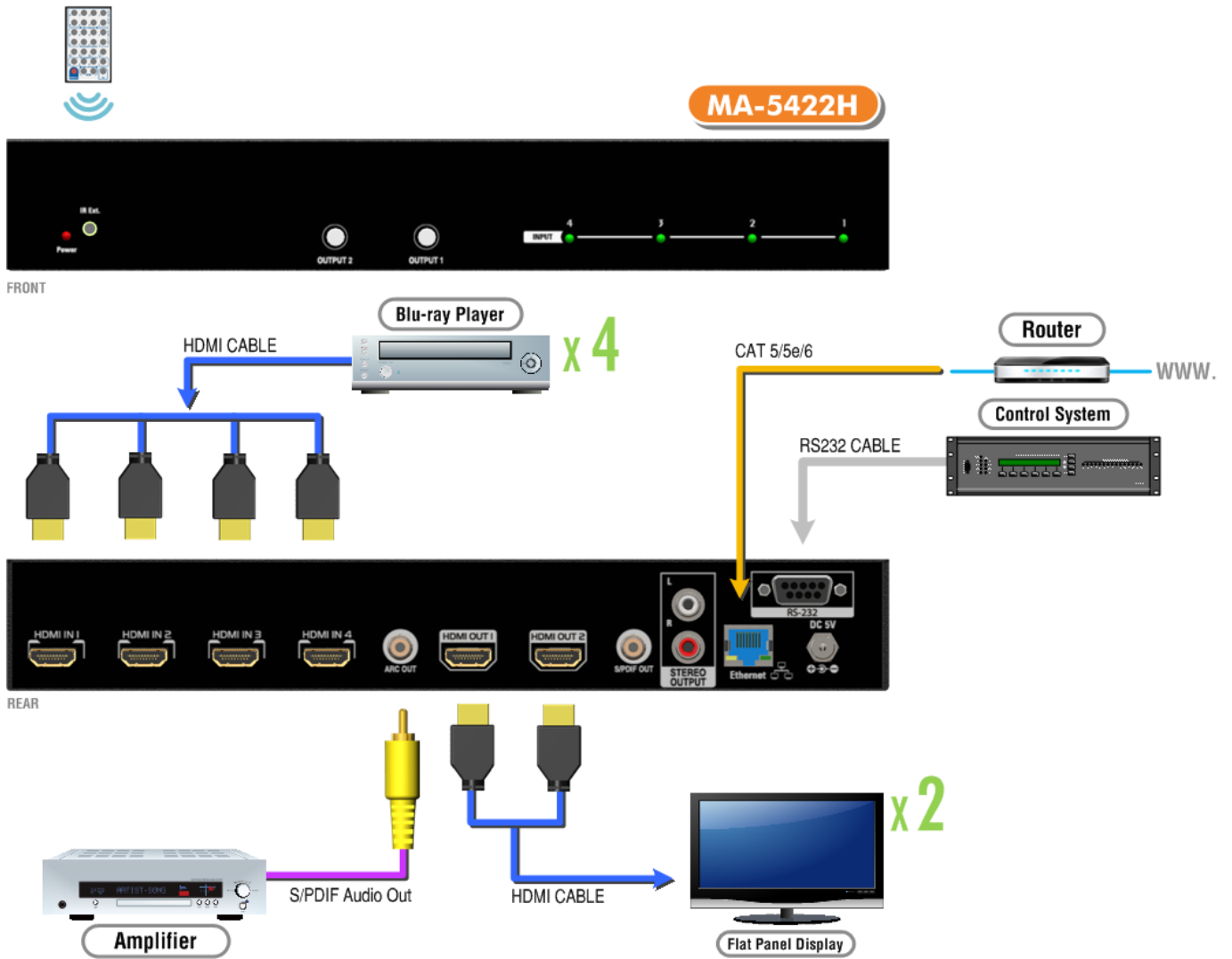
Rear Panel



6. **Input 1~4:** HDMI inputs
7. **S/PDIF Out [ARC][From the display connected to Output 2]:** Connect to an S/PDIF digital audio output
8. **Output 1~2:** HDMI output ports
9. **SPDIF Out [Follow Output 2]:** Connect to an S/PDIF digital audio output
10. **Stereo Out – R[Follow Output 2]:** Connect to an analog audio output
11. **Ethernet:** Ethernet control port
12. **+5V DC:** 5V 4A DC power jack
13. **Stereo Out – L[Follow Output 2]:** Connect to an analog audio output
14. **RS-232:** RS-232 control port

CONNECTION DIAGRAM

-  HDMI
-  CAT5/5e/6
-  AUDIO
-  RS-232



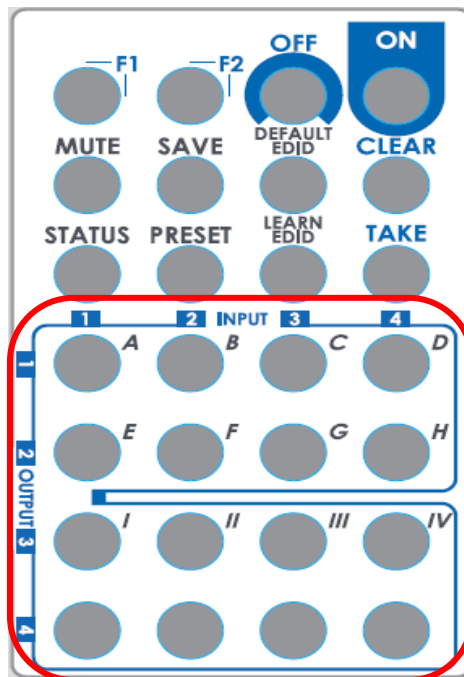
OPERATION APPROACH

Method A: Push-in Button

1. IN/OUT MAP

- 1) Use Port 1 or Port 2 Channel Push Button to select the source
- 2) Input1~4 can be selected in order

Method B: IR Remote Control

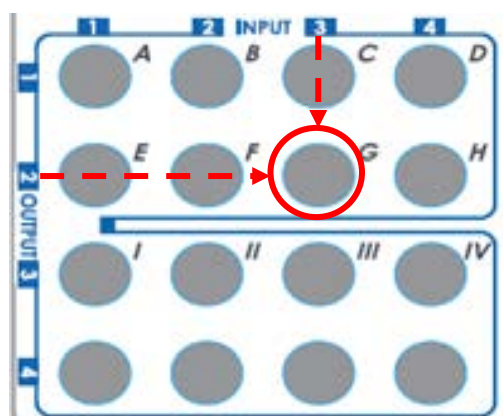


1. IN/OUT Switch

Push the button on the checkerboard to select Input & Output port.

Ex: Select Input 3 to Output 2

Push the red circle button as below to select Input 3 to Output 2



2. Function Key

Button	Function
OFF	Standby mode
ON	Power on the matrix switcher
MUTE	Turn off output's video and audio
STATUS	Preset output status
SAVE	Save current mapping mode
PRESET	Preset mapping mode
DEFAULT EDID	Begin default EDID selection
LEARN EDID	Begin EDID learning from one output
CLEAR	Clear the previous IR operation procedure
TAKE	Trigger the previous setting
F1	Reserved
F2	Reserved

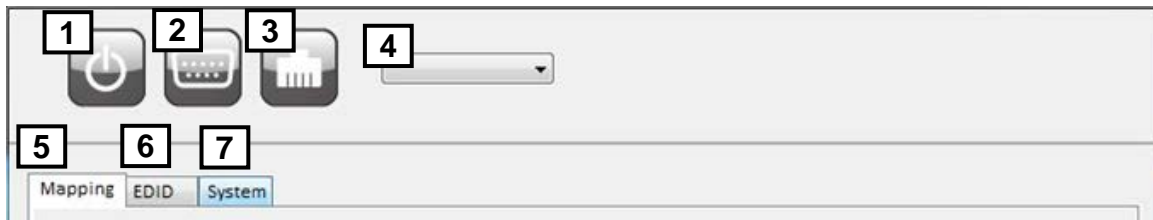
Operation	Procedure
Output Status Ex: Output 2 (Input 2)	Status + A~B(Output 1~2) + Take 1.Press "STATUS" button 2.Press number key "B" to select Output 2 3.Press "TAKE" button
Save Current Mapping Ex: Save current mapping to 5	Save + A~H(1-8 storage site) + Take 1.Press "SAVE" button 2.Press number key "E" to select the storage site 5 3.Press "TAKE" button
Preset Mapping Ex: Preset saved mapping from 5	Preset + A~H(1-8 storage site) + Take 1.Press "PRESET" button 2.Press number key "E" to select the storage site 5 3.Press "TAKE" button
Learn default EDID Ex: Default EDID 2 Input 3	Default EDID + A~H(1-8 default EDID) + I ~ IV(input 1~4) + Take 1.Press "DEFAULT EDID" button 2.Press number key "B" to select default EDID 2 3.Press number key " III" to select Input 3 4.Press "TAKE" button
Learn Output EDID Ex: Learn Output 2 Input 3	Learn + A~B(Output 1~2) + I ~IV(input 1~4) + Take 1.Press "LEARN" button 2.Press number key "B" to select Output 2 3. Press number key " III" to select Input 3 4.Press "TAKE" button
Mute Output Ex: Mute Output 2	Mute + A~B(Output 1~2) + Take 1. Press "MUTE" button 2. Press number key "B" to select Output 2 3.Press "TAKE" button

Method C: Software Control through RS-232 port / Ethernet port

1. System Requirement

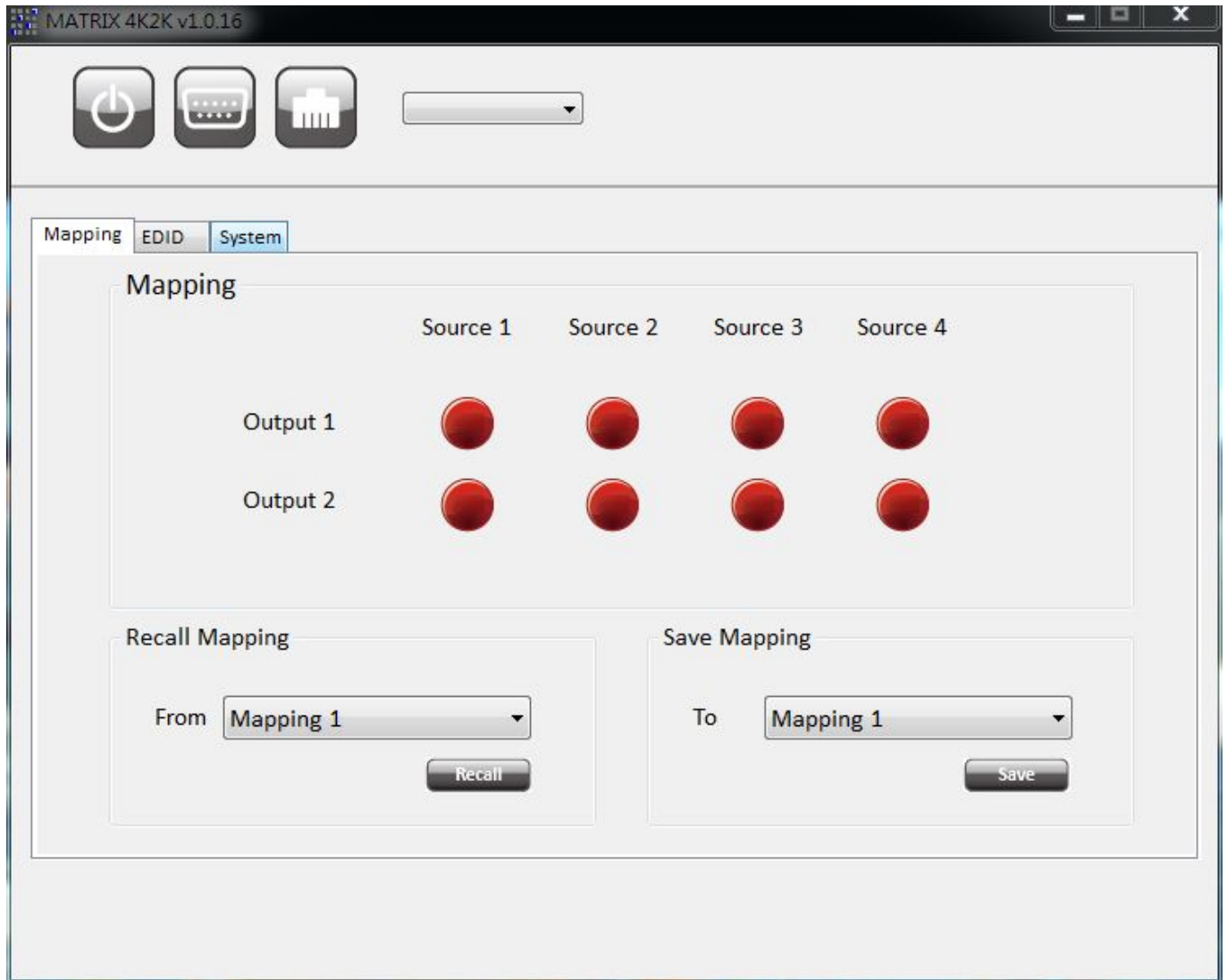
- 1) OS Information: MS WinXP/7
- 2) Baud rates: 9600
- 3) Software size: 3 MB
- 4) Minimum RAM requirement: 256 MB

Method D: Software Control through RS-232 port



1	Power ON/ Standby mode	5	I/O Routing Button
2	Control SW via RS-232	6	EDID Button
3	Control SW via Network	7	F/W Update & Default Reset Button
4	COM Port Selection		

1. I/O Routing Button



1) I/O Mapping:

- a) Click the button on the checkerboard to select Input & Output port

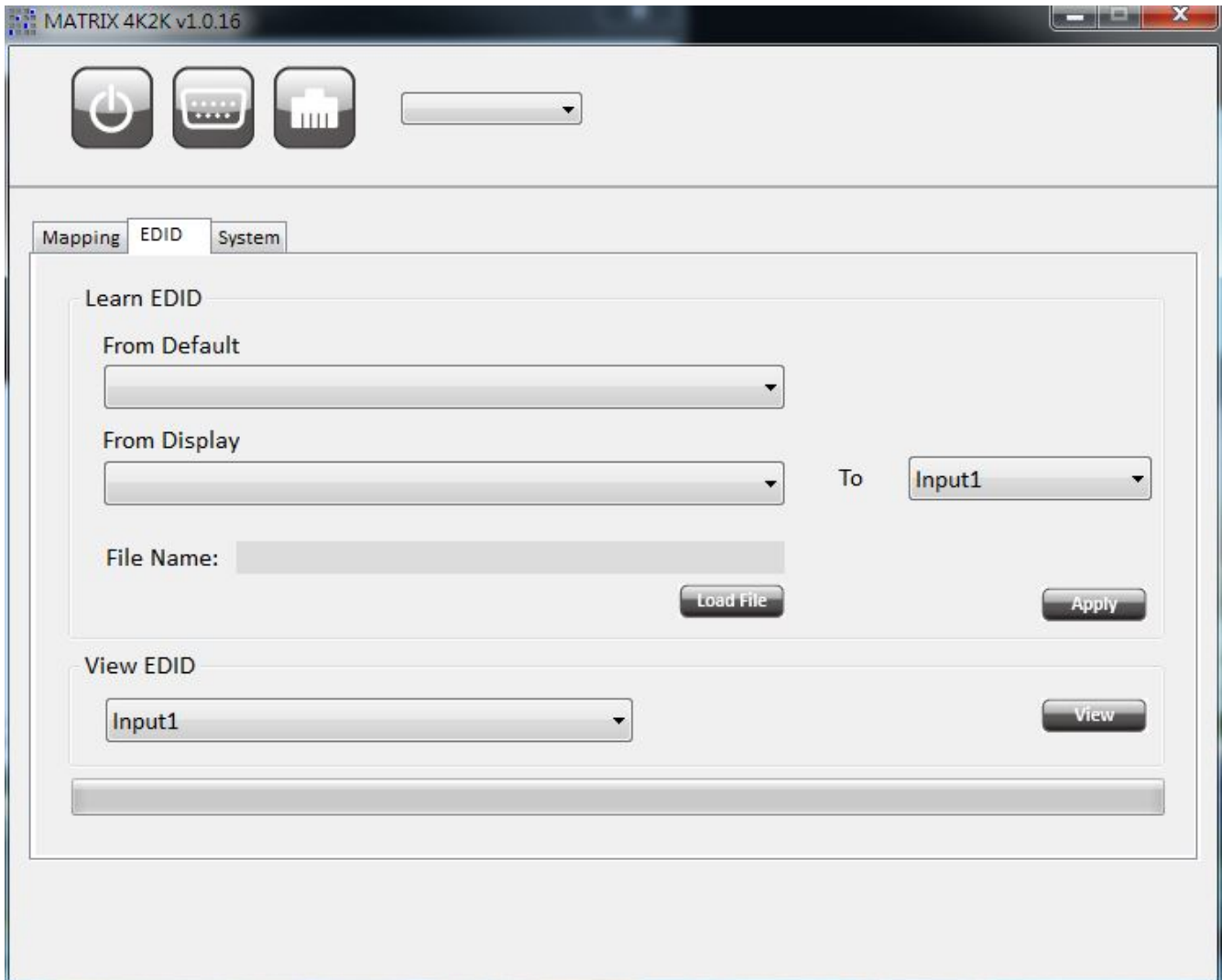
2) Recall Mapping:

- a) Select the stored Mapping(1-8)
- b) Click "Recall" button to recall previous mapping which are saved

3) Save Mapping:

- a) Select Mapping(1-8)
- b) Click "Save" button to save current mapping

2. EDID Button



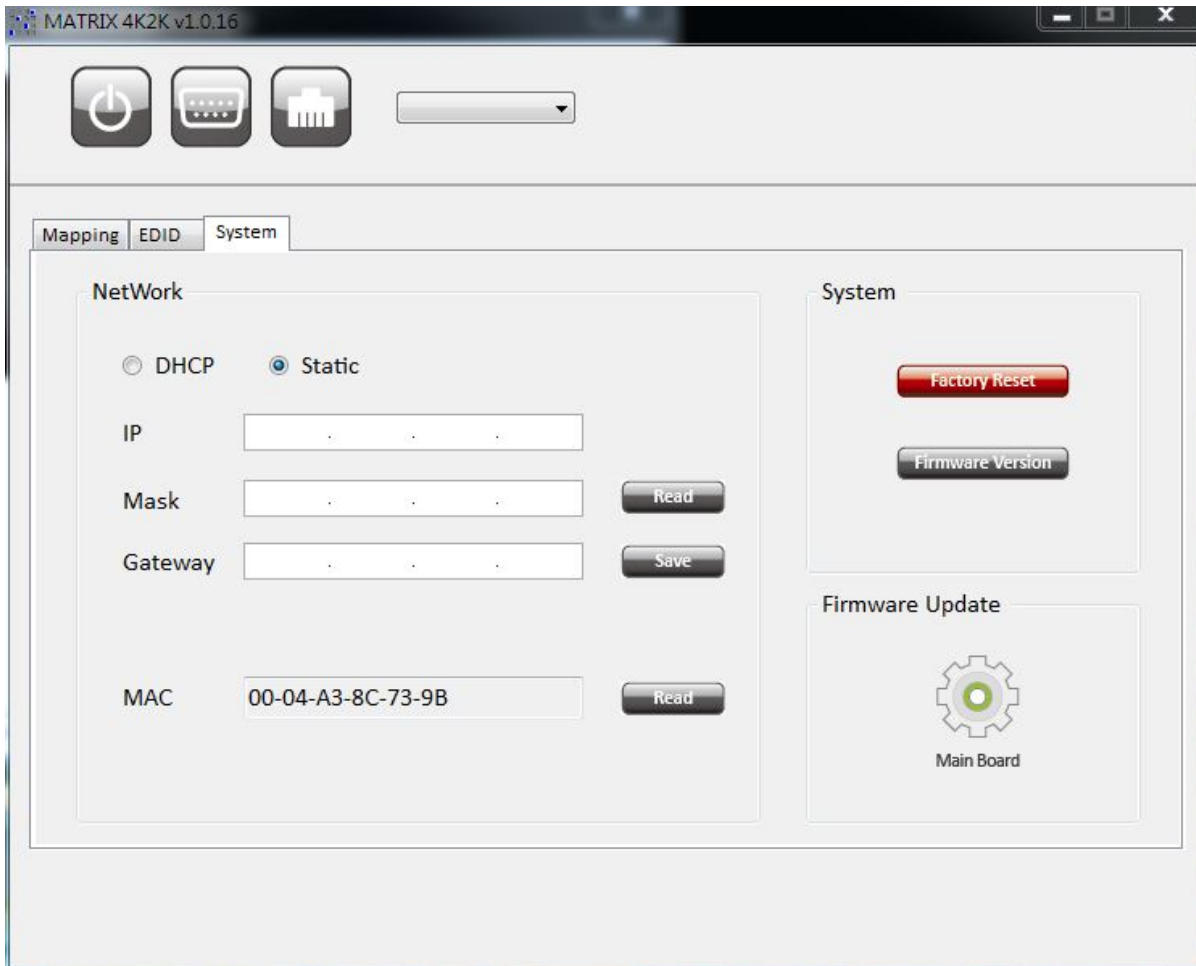
- 1) Learn EDID from Default to Input
 - a) Select Default EDID(1-8 Default EDID)
 - b) Select designated Input
 - c) Click "Apply" button to learn from default EDID

- 2) Learn EDID from Display to Input
 - a) Select output
 - b) Select designated Input
 - c) Click "Apply" button to learn from display EDID

- 3) Load EDID File to Input
 - a) Click "Load File" button to select the EDID file
 - b) Select designated Input
 - c) Click "Apply" button to load EDID File

- 4) View EDID
 - a) Select Input or HDMI output
 - b) Click "View" button to read and analyze the EDID

3. System Button



1) Network

a) DHCP mode

=> Click DHCP and then click the "Read" button to get the IP address Info

b) Static mode

=> Click Static and then key in the "IP", "MASK", "GATEWAY" info. After setting IP Address, please click "Save" to save IP address Info

c) "Save" button

=> Save the key- in IP address

d) "Read" button:

=> Read the IP address from the device

e) "MAC" button

=> Read the device's MAC address

*Note: The default IP address is 192.168.1.111

2) System

a) Factory Reset

b) Firmware Version

=> To get the F/W version information

3) Firmware Update

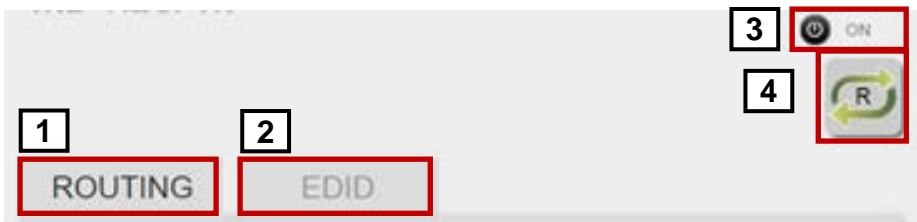
=> Firmware update Main Board

Method E: Web Interface Control

The default IP address: 192.168.1.111

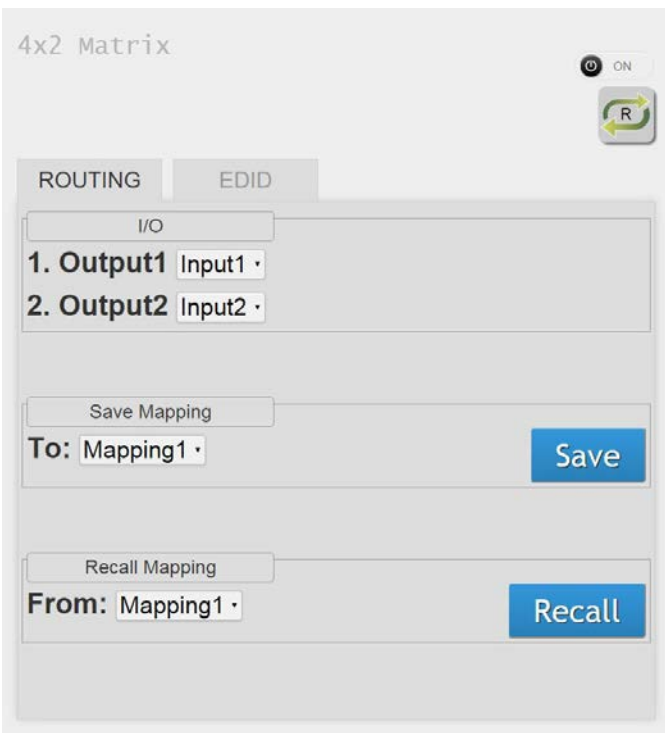
Account: admin

Password: matrix



1	I/O Routing Button
2	EDID Button
3	Power ON/ Standby mode
4	Refresh I/O Status

1. I/O Routing Button



- 1) I/O:
 - a) Switch the input for each output
- 2) Save Mapping:
 - a) Select Mapping(1-8)
 - b) Click "Save" button to save current mapping
- 3) Recall Mapping:
 - a) Select the stored Mapping(1-8)
 - b) Click "Recall" button to recall previous saved mapping

2. EDID Button

4x2 Matrix

ON

ROUTING EDID

Learn EDID From Default

From
1.Ultra-HD(4K2K@60) - 24bit 3D video & 7.1ch

To Input 1

Send

Learn EDID From Display

From 1.HDMI Output 1

To Input 1

Send

1) Learn EDID from Default

- a) Select Default EDID(1-8 Default EDID)
- b) Select Input
- c) Click "Send" button to learn default EDID

2) Learn EDID From Display

- a) Select output
- b) Select Input
- c) Click "Send" button to learn display EDID

3. Power ON/ Standby mode

4. Refresh I/O Status

The EDID learning function is to resolve audio and video playing issues at HDMI output port. 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 of playing the HDMI signals normally.

There are **THREE methods** to do EDID Learning as below,

1. IR Remote Control: Please refer to the **Operation Approach\ Method B: IR Remote Control**
2. Software Control: Please refer to the **Operation Approach\ Method C: Software Control through RS-232 port**
3. Web Interface Control: Please refer to the **Operation Approach\ Method D: Web Interface Control**

There are eight **embedded default EDID** as below,

1. Ultra-HD(4K2K@60) - 24bit 3D video & 7.1ch audio
2. Ultra-HD(4K2K@60) - 24bit 3D video & 2ch audio
3. Ultra-HD(4K2K@30) - 24bit 3D video & 7.1ch audio
4. Ultra-HD(4K2K@30) - 24bit 3D video & 2ch audio
5. Full-HD(1080p@60) - 36bit 3D video & 7.1ch audio
6. Full-HD(1080p@60) - 24bit 2D video & 7.1ch audio
7. Full-HD(1080p@60) - 24bit 2D video & 2ch audio
8. HD(1080p@30)(1080i@60)(720p@60) - 24bit 2D video & 2ch audio

Q Can every TV work with the HDMI matrix?

A Basically, the answer is YES. But if your TV can not support UltraHD, please refer the EDID LEARNING section to learn EDID from your TV.

Q What is EDID? Why do I need to learn EDID?

A EDID contains the whole information of the display such as the resolution and audio setting which this display can support. Therefore, based on the EDID information, media player will pick up the most suitable resolution and audio setting to the display. In order to faithfully transmit the EDID information from display to the media player, learning EDID from display to this device is necessary.

Q What should I do to learn EDID for the matrix?

A Due to the limitation of HDMI, the source device can only output one format of video and audio. In other words, the source device cannot output 720p and 1080p video at the same time, or output stereo and surround sound at the same time. Therefore, you may need to manually setup each HDMI input for desirable audio/video output format. The mechanism of EDID Learning is to pick up the HDMI display with the lowest capability among the ones you would use for this input source. For example, if user would like to play the Input-2 upon output-2, output-3 and output-4, and only output-3 cannot support 1080p [support up to 720p only], please learn the EDID from the display connected to the output-3 at the Input-2 port. Of course, if output-3 would get the HDMI signals from every HDMI input, please learn EDID information from output3 to all four HDMI inputs. For more information about EDID Learning, please refer to EDID LEARNING section.

Q My TV can support 1080p, but why there is no audio?

A The factory default EDID of this device is 1080p & 2ch audio. However, there would be a problem after you change to use 1080p & 7.1ch if the TV cannot support 7.1ch audio. Please use the default EDID, 1080p & 2ch audio.

Q When I set an audio amplifier (AV receiver) between TV and the matrix to extract 7.1ch audio, but why there is still no audio?

A Basically, the default EDID of the chosen input can support 7.1ch audio, but the problem is that the EDID of the amplifier still cannot match the default setting. Therefore, the best method is to learn EDID from the amplifier directly. Please refer to EDID LEARNING section and follow the steps to learn the EDID. When learning EDID from the amplifier, user just needs to connect the matrix and amplifier. **Please don't connect HDMI cable between amplifier and TV when the EDID learning is proceeding.**

Q When I play the same content upon multi-displays, why only the TV equipped with amplifier can have 7.1ch audio, and the others don't have 7.1ch audio even no stereo?

A Due to the limitation of HDMI, the source only can choose one video and one audio format to play, which can be either 1080p and 7.1ch or 1080p and stereo audio. It means when the user sets the matrix at 1080p and 7.1ch, the source will only play the content under this format. Therefore if the TV cannot decode 7.1ch audio, there is definitely no audio.

WARRANTY

The SELLER warrants the **MA-5422H 4x2 HDMI 2.0a Matrix** free from defects in the material and workmanship for 1 year from the date of purchase from the SELLER or an authorized dealer. Should this product fail to be in good working order within 1 year warranty period, The SELLER, at its option, repair or replace the unit, provided that the unit has not been subjected to accident, disaster, abuse or any unauthorized modifications including static discharge and power surge. This warranty is offered by the SELLER for its BUYER with direct transaction only. This warranty is void if the warranty seal on the metal housing is broken.

Unit that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for 90 days from the day of reshipment to the BUYER. If the unit is delivered by mail, customers agree to insure the unit or assume the risk of loss or damage in transit. Under no circumstances will a unit be accepted without a return authorization number.

The warranty is in lieu of all other warranties expressed or implied, including without limitations, any other implied warranty or fitness or merchantability for any particular purpose, all of which are expressly disclaimed.

Proof of sale may be required in order to claim warranty. Customers outside Taiwan are responsible for shipping charges to and from the SELLER. Cables and power adapters are limited to a 30 day warranty and must be free from any markings, scratches, and neatly coiled.

The content of this manual has been carefully checked and is believed to be accurate. However, The SELLER assumes no responsibility for any inaccuracies that may be contained in this manual. The SELLER will NOT be liable for direct, indirect, incidental, special, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. **Also, the technical information contained herein regarding the MA-5422H features and specifications is subject to change without further notice.**