

HDMI Matrix over Single Coax with IR





P/N: AV-GM07Y3-S1



Safety and Notice

The AV-GM07Y3-S1 HDMI Matrix over Single Coax with IR has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the AV-GM07Y3-S1 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 AV-GM07Y3-S1 HDMI Matrix over Single Coax with IR boosts up your HDMI transmission range up to 120m (394ft) in HDTV 1080p format through single coaxial cable. AV-GM07Y3-S1 is easy to install and works perfectly with Belden 1694A coaxial cables. Other coaxial cables can also work with AV-GM07Y3-S1 and the transmission distance depends upon the quality and bandwidth of coaxial cables. In addition, AV-GM07Y3-S1 is also equipped with IR pass-through path. This bonus feature allows users to rely on the same coax cable to have IR control on IR equipped devices, such as TV and BD players, and AV-GM07Y3-S1 makes IR control possible through only single coax cable along with high quality HDMI A/V signals.

FEATURES

- Support HDMI
- HDCP compliant
- Single coaxial cable
- 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
- The matrix master can switch every output channels to any HDMI inputs by push-in button, IR remote control, RS-232 control, or Ethernet control
- Allows controlling local HDMI sources such as DVD and TiVo by attached IR extender from remote receiver to matrix master
- Allows to control matrix master through IR remote control at remote receiver's site
- Extends the transmission range up to 120m (394ft) from the HDMI sources under Full HD resolution (1080p60 24-bit color depth) through Belden 1694A coaxial cable.
- Easy installation with rack-mounting and wall-mounting designs for master and receiver respectively



The length depends on the characteristics and quality of the coax cables. Higher resolutions and longer transmission distances require low skew cables for best performance. Solid and shielded coax cable such as Belden 1694A with metal $75\Omega BNC$ connectors is recommended.

PACKAGE CONTENTS

- 1x AV-GM07Y3-S1
- 1x IR receiver

- 1x IR Remote control
- 1x IR blaster

• 1x Installation software CD

SPECIFICATIONS

Model N	Name	AV-GM07Y3-S1			
Technical		AV-GM07Y3-S1	AV-GM07Y3-S1-RX		
Role of usage	2	True 8x8 matrix switcher Transmitter [TX] Receiver [RX]			
HDMI compli	ance	HC)MI		
HDCP compli	ance	Ye	es		
Video bandw	idth	Single-link 225N	MHz [6.75Gbps]		
Video suppor	t	480i / 720p / 1080i / 1080p6	0 (Does NOT support 480p)		
Audio suppoi	rt	Surround sound (up to 7.1	ch) or stereo digital audio		
HDMI over Co transmission		Full HD [1080p 24-bit co	lor] – up to 120m [394ft]		
HDMI Equaliz	zation	Au	ito		
Input TMDS s	signal	1.2 Volts [pe	eak-to-peak]		
Input DDC sig	gnal	5 Volts [peak	-to-peak, TTL]		
ESD protection	on	[1] Human body — ±19kV [air-gap dis [2] Core chipset — ±4kV	[1] Human body — ±19kV [air-gap discharge] & ±12kV [contact discharge]		
PCB stack-up		4-layer board [impedance control — differential 100Ω; single 50Ω]	6-layer board [impedance control — differential 100Ω; single 50Ω]		
Input		8x HDMI / 1x RS-232 / 1x Ethernet 1x IR socket for IR receiver	1x BNC 1x IR socket for IR receiver		
Output		8x BNC 9x IR socket for IR blaster	1x HDMI 1x IR socket for IR blaster		
HDMI Input selection		Push-in button / IR remote control / RS-232 control / Ethernet control	IR remote control		
HDMI source control Controllable via IR pass-through from		n IR receiver at RX to IR blaster at TX			
IR remote co	ntrol	Electro-optical characteristics: 🛭 =	25° / Carrier frequency: 20-60kHz		
HDMI connec	ctor	Type A [19-	pin female]		
BNC connect	or	75Ω interlo	cking socket		
RS-232 conne	ector	DE-9 [9-pin D-sub female]	N/A		
3.5mm connector		3.5mm earphone jack for IR blaster and receiver			
Mechanical					
Housing		Metal enclosure			
	Model	440x162x44mm [17.3" x 6.4" x 1.7"] 85x38x21mm [3.3" x 1.5" x 0.8			
Dimensions [L x W x H]	Package	521 x 265 x 182mm [20.5" x 10.4" x 7.2"]			
	Carton	542 x 411 x 300mm [21.3" x 16.2" x 11.8"]			
Weight	Model	TBA			

Package	Tŧ	BA	
Fixedness	Interlocking power supply		
Power supply	12V 5A DC 5V 2A DC		
Power consumption	6 Watt [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

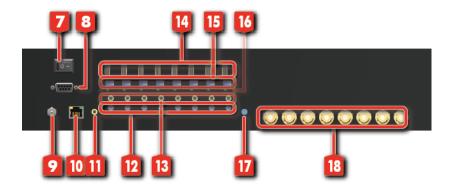
Transmitting unit ► AV-GM07Y3-S1-TX

Front Panel



- 1. Source Status: Input source indicator LED
- 2. IR SENSOR: IR sensor for receiving the IR commands from the IR remote
- 3. Output Push Button: Front panel push buttons used to select the number of display channel
- 4. 7-segment LED: LED display for output ports
- 5. 7-segment LED: LED display for input channels
- 6. Input Push Button: Front panel push buttons used to select the number of input source
- 7. Ext. IR: IR receiver

Rear Panel



7. ON-OFF: Power ON/OFF

8. RS-232: RS-232 control port

9. +12V DC: 12V DC power jack

10. Ethernet: Ethernet control port

11. System IR receiver: Ext. IR receiver

12.IR Blaster 1-8: 3.5mm IR blaster socket for individual HDMI source control

13.IR Receiver 1-8: Infrared 3.5mm socket for plugging in the extension cable of IR receiver

14. HDMI INPUT 1-8: HDMI inputs

15.SW 1-8: Dip Switch (see DIP Switch section)

16.SIGNAL LED

17.All IR Output: 3.5mm IR blaster socket for HDMI source control on all 8 inputs

18. COAX OUTPUT 1-8: BNC outputs for each output channel

Receiving unit ► AV-GM07Y3-S1-RX

Front Panel

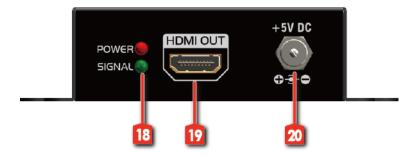


15.IR Blaster: Infrared 3.5mm socket for plugging in the extension cable of IR blaster

16.IR Receiver: Infrared 3.5mm socket for plugging in the extension cable of IR receiver

17.COAX IN: Connect to a high standard coaxial cable here

Rear Panel



18.POWER/SIGNAL LED: Red light - POWER; Green light - SIGNAL ACTIVE

19. HDMI OUT: Connects to a HDMI display with a HDMI male-male cable here

20.+5V DC: Connects to a 5V DC power supply unit

DIP SWITCH

SW1-SW8 for EDID/Audio

DIP Switch Position		Video Audio	Description	
Pin#1	Pin#2	video	Video Audio Descr	Description
OFF [^[]]	OFF [^[]]	Up to 1080p	Surround	Default Mode 1 1 – EDID up to 1080p video & surround sound audio output up to 7.1ch (DTS-HD Master & Dolby TrueHD)
OFF [^{1]}	ON [🏻]	Up to 1080p	Stereo <mark>2</mark>	Default Mode 2 – EDID up to 1080p video and stereo audio for basic compatibility among HDTVs
ON [🗆]	OFF [^[]]	Up to 720p/1080i	Stereo	Safe Mode 3 – EDID up to 720p/1080i video and stereo audio for basic compatibility among HDTVs
ON [🗆]	ON [🗆]	Bypass 4	Bypass <mark>4</mark>	EDID Learning Mode 5 – for learning EDID from the display while playing any received HDMI audio format

Note

- **1** Factory default setting of [SW1]-[SW8] is pin-1 at OFF [♠] & pin-2 at OFF [♠] for 1080p video and surround sound audio.
- 2 If the HDTV shows video but without audio, please try to set audio mode to stereo.
- If you encounter any unsolved audio/video output problem during system installation, please turn any [SW1]-[SW8] to pin-1 at ON [♣] & pin-2 at OFF [♠] for safe mode to select the system EDID up to 720p(1080i) video and stereo audio 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.
- To learn the EDID of HDMI display for respective HDMI source devices, please see the **[EDID Learning]** section in the next page for more information.

IR PASS-THROUGH

IR Extenders



IR Sockets

AV-GM07Y3-S1

All IR Out: The default location for IR blaster to transmit all IR command signals received from any of the four remote receivers to all of the HDMI sources.

IR BLASTER 1-8: IR blaster connected here can only transmit IR command signals from the remote receivers that are setting at respective input channel from 1 to 8.

System IR: Receives IR commands from remote control

<u>AV-GM07Y3-S1-RX</u>

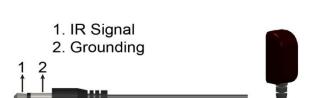
IR BLASTER: IR control on individual display device

IR RECEIVER: IR receiver connected here can receive all IR command signals from the IR remote controls of AV-GM07U3-S1 and all other HDMI source devices.

CAUTION!

Incorrect placement of IR Blaster and Receiver may result in the failure of the IR extenders. Please check carefully before plugging in the IR extender to the respective IR sockets. Warranty will not cover the damage.

Definition of IR Earphone Jack



IR Blaster

IR Receiver





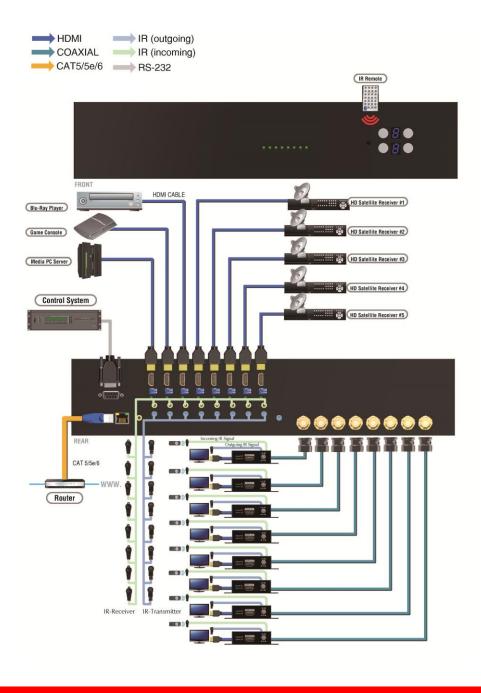


You can buy any IR extension cables in the market that are compatible to the definition of the IR sockets for the matrix if necessary for replacement use. However, IR cables longer than 2m (6-ft) may not work.

HARDWARE INSTALLATION

- 1. Connect all sources to HDMI Inputs on the 8x8 HDMI over Coax matrix master AV-GM07Y3-S1.
- 2. Connect each Coax output port on the AV-GM07Y3-S1 to respective Coax input on the remote receiver AV-GM07Y3-S1-RX.
- 3. Connect each HDMI output on receiver to HDMI displays.
- 4. Connect IR blaster to the AV-GM07Y3-S1 and direct the IR blaster to point towards the built-in IR receiver of the HDMI source devices.
- 5. Connect the +12V 5A DC power supply to the AV-GM07Y3-S1 and +5V 2A DC power supply to the receivers
- 6. Power on all HDMI sources and displays.

CONNECTION DIAGRAM



OPERATION APPROACH

Method A: Push-in Button



1. IN/OUT MAP

- 1) Use the "+"or "-" output push button to select the number of display
- 2) Use the "+"or "-" input push button to select the number of input source
 - "+": change selected input/output port in ascending order
 - "-": change selected input/output port in descending order

After you select the desired input/output port, the LED will blink twice and the setting will be effective

2. Save Mapping Mode

- 1) Keep pushing "output+ (save)" button until the output LED shows "d." to enter the Save Mapping Mode.
- 2) Use the "+"or "-" input push button to select the mapping configuration (1~8) which you want to save current input/output mapping
- 3) After you select the desired mapping configuration number, the LED will blink twice and the mapping setting will be saved
- 4) If you push the "output- (preset)" button before the mapping setting is saved, the LED will show "—""—"to quit the Save Mapping Mode

3. Preset Mapping Mode

- 1) Keep pushing "output- (preset)" button until the output LED shows "P." to enter the Preset Mapping Mode.
- 2) Use the "+"or "-" input push button to select the saved mapping configuration (1~8) which you want to recall
- 3) After you select the desired mapping configuration number, the LED will blink twice and the mapping setting will be effective
- 4) If you push the "output+ (save)"button before the mapping setting is effective, the LED will show "—""—"to quit the Preset Mapping Mode

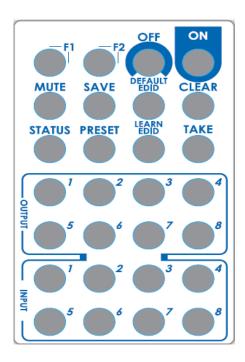
4. Learn Default EDID Mode

- 1) Set the respective Dip Switch SW1 SW8 up-and-down to stay at ON [] ON []
- 2) Push "input+(default)" button to select the input channel which you want to learn default EDID and then keep pushing "input+(default)" button when you select your desired input channel
- 3) Push the "+"or "-" output push button and then the LED will show "E""d" one time to enter Learn Default EDID Mode

- 4) Use "+"or "-" output push button to select the default EDID mode(1~8)
- 5) Release "input+(default)" button after selecting the desired default EDID mode, and then the LED will blink twice and the setting will be effective
- 6) It will quit the Learn Default EDID Mode if you push the "input- (learn)" button before the setting is effective
- 7) The LED will show "0""0" if the setting is success

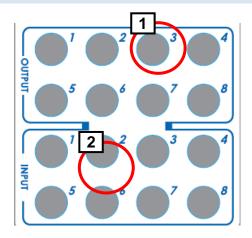
The LED will show "F""F" if the setting is failure

Method B: IR Remote Control



1. IN/OUT Switch

Operation	Procedure	7-Segment LED
IN/OUT Switch	Output Number (1~8) + Input Number (1~8)	
Ex: Input 2	1. Press output number key "3" to select Output 3	3
To Output 3	2. Press input number key "2" to select Input 2	3 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	Reserved
CLEAR	Clear the previous IR operation procedure
TAKE	Trigger the previous setting
F1	Reserved
F2	Reserved

rz ne	reserved				
Operation	Procedure	7-Segment LED			
Mute Output	Mute + Output Number (1~8) + Take				
	1. Press "MUTE" button	0			
Ex: Mute Output 3	2. Press output number key "3" to select Output 3	3			
	3.Press "TAKE" button	3			
Output Status	Status + Output Number (1~8) + Take				
	1.Press "STATUS" button	-			
Ex: Output 4 (Input 2)	2.Press output number key "4" to select Output 4	4			
	3.Press "TAKE" button	4 2			
Save Current Mapping	Save + Output Number (1-8 storage site) + Take				
	1.Press "SAVE" button	d -			
Ex: Save current mapping to 5	2.Press output number key "5" to select the storage site 5	d 5			
	3.Press "TAKE" button				
Preset Mapping	Preset + Output Number (1-8 storage site) + Take				
	1.Press "PRESET" button	P -			
Ex: Preset saved mapping from 5	2.Press output number key "5" to select the storage site 5	P 5			
	3.Press "TAKE" button				
Learn default EDID	Default EDID + Output Number (1-8 default EDID) + Input Number (input 1~8) + Take				
	1.Press "DEFAULT EDID" button	E d			
Ex: Default EDID 2	2.Press output number key "2" to select default EDID 2	2 d			
Input 3	3.Press input number key "3" to select Input 3	2 3			
	4.Press "TAKE" button	0 F 0 (success) F(fail)			

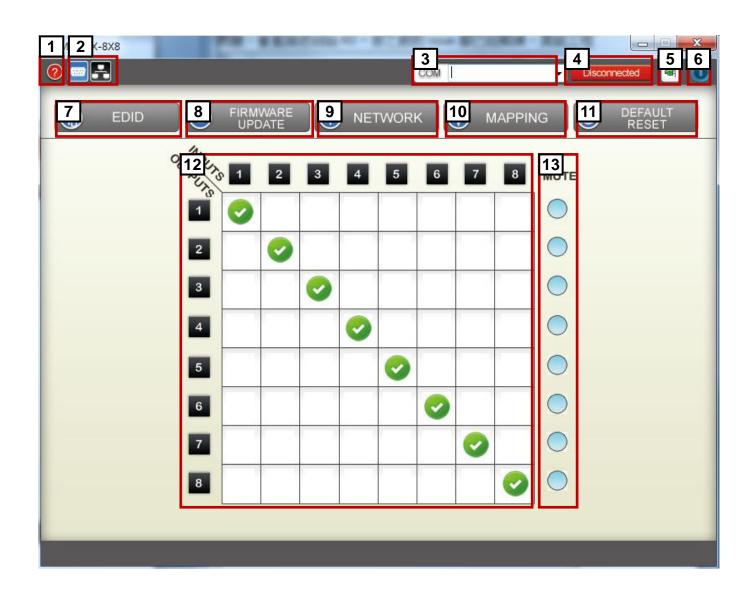
Method C: Software Control through RS-232 port

1. System Requirement

1) OS Information: MS WinXP/7

2) Baud rates: 96003) Software size: 3 MB

4) Minimum RAM requirement: 256 MB



1	FW/SW Version Button
2	RS-232/ IP Control Status
3	COM Port Selection
4	Connection Status
5	Connect/Disconnect Button
6	Power On/Off Button
7	EDID Button
8	Firmware Update Button
9	Network Button
10	Mapping Button
11	Default Reset Button
12	In/Out Switch Button

2. Step by step for connecting matrix and controller

Step1: Use RS-232 cable to connect the RS-232 port on matrix and controller

Step2: Open the software and then choose the correct com port

Step3: Click connection button "

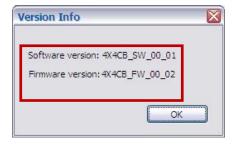
Step4: Make sure the connection status is on connected statu Connected



3. FW/SW Version Button

Click "

" button to show version information

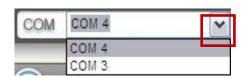


4. RS-232 / IP Control Status

- 1) This icon " will light when you use RS-232 control
- 2) This icon " will light when you use IP control

5. COM Port Selection

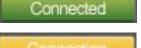
Click " button to select COM Port



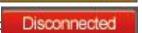
6. Connection Status



3) Connected Status:



4) Connecting Status:



5) Disconnected Status:

7. Connect/Disconnect Button

Click this button " to change connection status



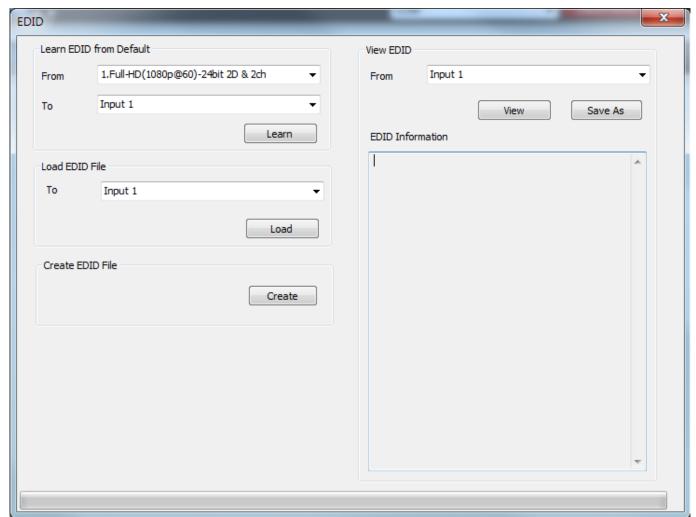
8. Power On/Off Button

Click this button to power on/off



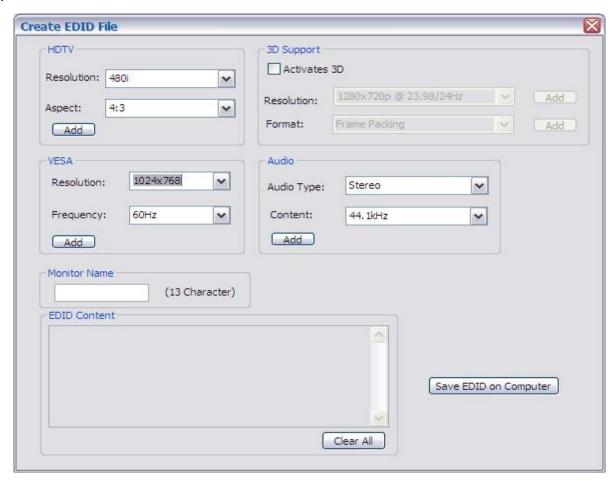
- " Power on status(Blue): Click this button to power off device(Standby Mode)
- " Power off status(Red): Click this button to power on device

9. EDID Button

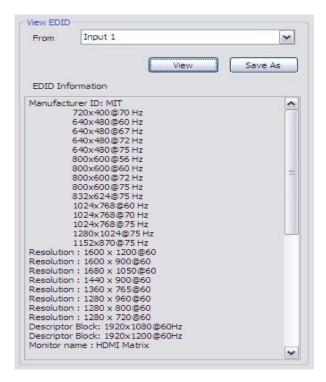


- 1) Learn EDID from Default
 - a) Select Default EDID(1-8 Default EDID)
- b) Select Input
- c) Click "Learn" button to learn default EDID

- 2) Load EDID File to Input
- a) Select Input
- b) Click "Load" button to select the EDID file
- 3) Create EDID File
 - a) Click "Create" button to create EDID file



- b) Select the EDID content
- c) Click "Save EDID on Computer" to save the generated EDID as a file
- 4) View EDID content
 - a) Select Input, HDMI output, or From File
 - b) Click "View" button to read the EDID and analysis



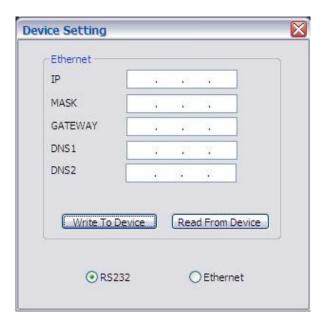
c) Click "Save As" to save the read EDID as a file on computer

10. Firmware Update Button



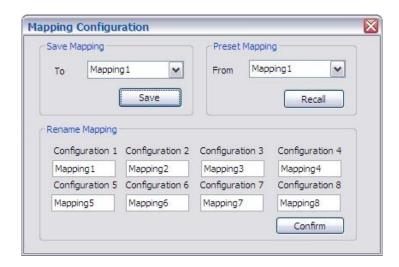
- 1) Click "Load File" to select the firmware file which you want to update
- 2) Click "Break" button
- 3) Quickly remove and reconnect the power input connector
- 4) Click "Start" button to begin the firmware update

11. Network Button



- 1) Click "Read From Device" to read the device IP address
- 2) Select "Ethernet" and then will be a pop-up windows
- 3) Key in the device IP address to the pop-up windows
- 4) Close the pop-up windows
- 5) Click the connected button to connect

12. Mapping Button



- 1) Save Mapping:
 - a) Select Mapping(1-8)
 - b) Click "Save" button to save current mapping
- 2) Preset Mapping:
 - a) Select Mapping(1-8)
- b) Click "Recall" button to recall previous mapping which are saved
- 3) Rename Mapping:
 - a) Rename the mapping(Mapping1-Mapping8)
 - b) Click "Confirm" button to confirm the change

13. Default Reset Button

Click this button to do factory default reset

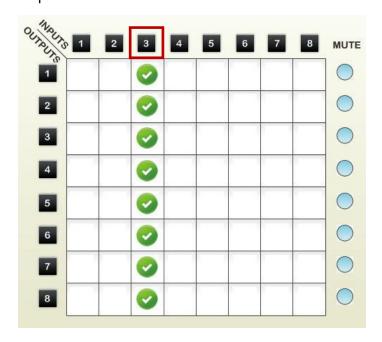
The default reset process will take about 80~90 seconds

14. In/Out Switch Button

Click the button on the checkerboard to select Input & Output port



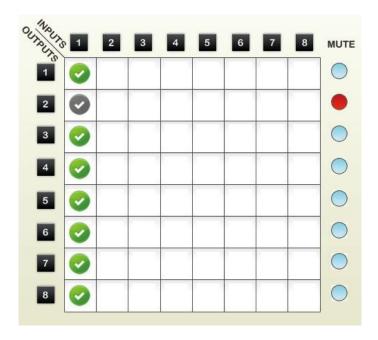
User can click the input number button to let all outputs select the same input Ex: All outputs select input 3



15. Mute Output Button

Click the circle button to turn off output's video and audio

Ex: Mute Output 2



EDID LEARNING

The EDID learning function is only necessary whenever you encounter any display on 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.

Note

SW1-SW8 Pin#1 and Pin#2 must be set "ON" & "ON" for EDID Learning Mode

DIP Switc	h Position	T7' 1 A 1'		D : 4:	
Pin 1	Pin 2	Video	Audio	Description	
ON [↓]	ON [↓]	Bypass	Bypass	EDID Learning – for learning EDID from the receiver	

Method 1: Learn Default EDID

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

- 1. Front Panel Push-in Button: Please refer to the **Operation Approach\ Method A: Push-in Button** (Page 9.)
- 2. IR Remote Control: Please refer to the **Operation Approach\ Method B: IR Remote Control** (Page 10. 11.)
- 3. Software Control: Please refer to the **Operation Approach\ Method C: Software Control through RS-232 port (Page 15.)**

There are eight embedded default EDID as below,

- 1. Full-HD(1080p@60)-24bit 2D & 2ch
- 2. Full-HD(1080p@60)-24bit 2D & 7.1ch
- 3. Full-HD(1080p@60)-24bit 3D & 2ch
- 4. Full-HD(1080p@60)-24bit 3D & 7.1ch
- 5. HD(1080i@60)(720p@60)-24bit 2D & 2ch

- 6. HD(1080i@60)(720p@60)-24bit 2D & 7.1ch
- 7. Full-HD(1080p@60)-36bit 2D & 2ch
- 8. Full-HD(1080p@60)-36bit 2D & 7.1ch

Method 2: Learn Display EDID

Please follow the below steps to learn display EDID

- 1. Connect the display with a HDMI cable to respective HDMI INPUT1 INPUT8 port
- 2. Recycle the AV-GM07Y3-S1 power and then the display EDID will be learned to respective HDMI INPUT1 INPUT8 port

EYE PATTERN





NOTICE

Since AV-GM07Y3-S1 is sensitive to the HDMI source's input jitters, the input HDMI signals with larger jitters will shorten the transmission distance hugely, especially for full HD 1080p@60!

- 1. The lab testing result shows that Belden 1694A coaxial cables can transmit HDMI signals up to 120m (394ft).
- 2. If your HDMI display has multiple HDMI inputs, it is found that the first HDMI input [HDMI input #1] generally can produce better transmission performance among all HDMI inputs.
- 3. Please noticed that audio must be 48KHz and 480p is not supported.

WARRANTY

The SELLER warrants the AV-GM07Y3-S1 HDMI Matrix over Single Coax with IR free from defects in the material and workmanship for 3 years from the date of purchase from the SELLER or an authorized dealer. Should this product fail to be in good working order within 3 years 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.

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Support
For more info or tech support
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April, 2018