



Hall Technologies • 1234 Lakeshore Dr Suite #150 Coppell, TX 75019 • halltechav.com

HSM-44-UHD

4K 4X4 HDMI Matrix Switch

USER MANUAL

August 4, 2023



Important Safety Instructions



1. Do not expose this apparatus to rain, moisture, dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.



2. Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Ensure the unit is well ventilated.



3. To prevent risk of electric shock or fire hazard due to overheating, do not obstruct the unit's ventilation openings with newspapers, tablecloths, curtains, and similar items.



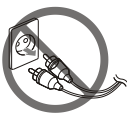
4. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.



5. Do not place sources of naked flames, such as lighted candles, on the unit.



6. Clean this apparatus only with dry cloth.



7. Unplug this apparatus during lightning storms or when unused for long periods of time.



8. Protect the power cord from being walked on or pinched particularly at plugs.



9. Only use attachments / accessories specified by the manufacturer.

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Introduction

OVERVIEW

As a member of Genesis Digital Matrix™ series of switchers, the HSM-44-UHD matrix provides exceptional quality, intuitive operation and powerful control methods that are hallmarks of Hall Technologies video matrix switches.

The 4K matrix is a 4x4 cross-point switch in a compact 1-RU enclosure.

The HSM-44-UHD supports HDMI resolutions up to 4K @ 60 Hz 4:4:4. It also supports HDCP 2.2 and 1.4, 3D, deep-color and PCM, Dolby, DTS, and HD audio standards. The matrix intelligently calculates EDID for each input based on the EDID of the connected sinks.

Users can save and recall multiple matrix routing configuration PRESETs. HDMI outputs can also be blanked. The matrix includes a two-line character LCD on its front panel to display the current video routing and to facilitate creating or recalling presets.

The HSM-44-UHD matrix is ideal for conference rooms, multimedia presentations, digital signage, houses of worship, and many other settings.

FEATURES

- Supports HDCP 2.2 and 4K UHD.
- Simultaneous HDMI on each output
- Intuitive front panel control with two-line LCD
- Analog and Digital Extracted Audio Outputs
- Save and Recall Presets of commonly used routing patterns.
- HDMI video output can be blanked or un-blanked.
- Controlled via: Front Panel, RS-232, IP (Telnet), and IR
- Internal Universal Power Supply with standard IEC C14 connector
- 1-RU rack mountable metal enclosure

Package Contents

1x Model HSM-44-UHD

1x External Universal Power Supply

1x IR Remote

2x Rack mounting brackets with (6) screws

1x IR Detector (for use with IR Remote)

1x 3 Pin screw-terminal (for use with RS-232 connector) (1) User's Manual Card

Operation


General Operation

Front Panel Operations

The front panel can be used for the following purposes:

- View current input/output routings (ties) on LCD.
- Make new ties either starting from input or output.
- Lock or unlock the front panel.

All the front panel buttons have built-in LEDs to help with their operation.

The LOCK  button is used to enable or disable the keys on the front panel and IR remote control.

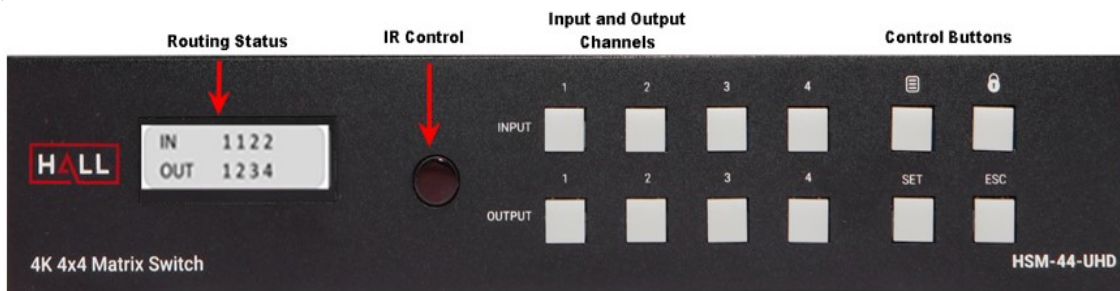
Locking the front panel is intended to prevent inadvertent actions for example, if the buttons are pressed unintentionally. Note that when the front panel is locked, the IR remote function is also locked, the other means to control the matrix (RS-232, Telnet or WebGUI) are still functional.

Lock the front panel by pressing the LOCK button for 3 Seconds. The display will show 'Panel Locked!' and the LOCK button LED will turn on.

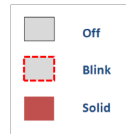
Unlock the front panel by pressing the LOCK button for 3 Seconds. The display will show 'Panel Unlocked!' and the LOCK button LED will turn off.

Attempting to control the matrix with the buttons or IR remote control while the unit is 'Locked', results in the LCD displaying 'Panel Locked!'.

Note that the IR Remote Control POWER control will still function even if the system is Locked.



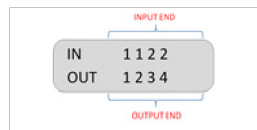
The front panel pushbuttons have built-in LEDs which represent the buttons state. Button LEDs can be off, blinking or on (solid).



Front panel button LED states

Reading the LCD routing configuration

Routing information is displayed on the LCD. The 'IN' row on the LCD changes to represent the current routing status. The 'OUT' values are fixed or show an output as blank by displaying an 'x' in that position.



In the above example, the routing configuration can be understood from the output end as follows:

Output 1 is tied to Input 1

Output 2 is tied to Input 1

Output 3 is tied to Input 2.

Output 4 is tied to Input 2.

Turning the unit on and off

The system can be turned on and off via the IR Remote Control, RS-232 or Telnet.

Making AV Routing or "Ties" from the Front Panel

Users can initiate "ties" either from the HDMI OUTPUT or INPUT point of view. For most users it is more logical to initiate ties starting with the OUTPUT.

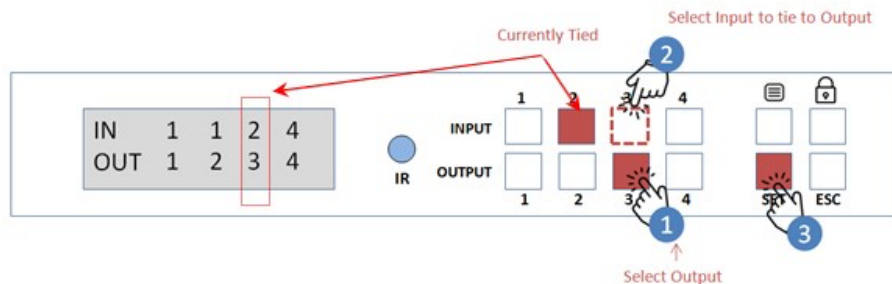
Think of it as: "I want OUTPUT 1 to get its video from INPUT 2".

Making a tie starting from the OUTPUT

To tie an output to an input, use the following steps:

1. Press the desired output button. The button for the currently tied INPUT will light up.
2. Press the input button you want to tie to. This selected input button will start blinking. The blinking button designates it as a “desired” choice; the actual tie is not made until the SET button is pressed.
3. Press the SET button. If you do not press the SET button with ~5 seconds, the process will time out and the button LEDs go out.

Example: Route output 3 to input 3 (when currently tied to Input #2)

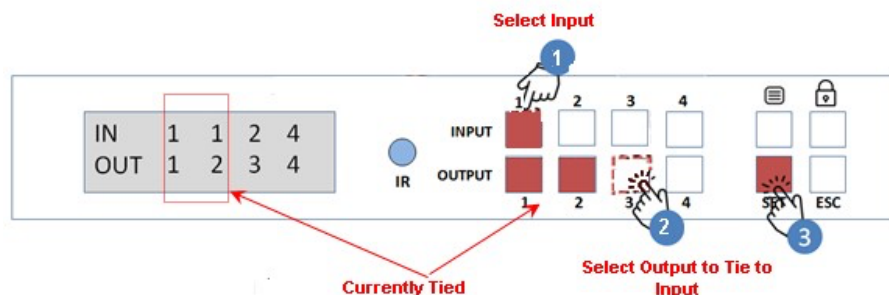


Making a tie starting from input

Routing from the input end is like the above, but an input can be routed to multiple outputs all at one time.

1. Press one of the input buttons. That button LED will light up solid along with ALL the outputs currently routed from that input.
2. Select all the outputs you wish to route to. There can be multiple desired outputs, and all will be blinking until the SET button is pressed. To remove an output, press the blinking output again.
3. Press SET to apply the changes.

Example: Route Input 1 to Output 1, 2 and 3



Blanking Outputs

Any HDMI output can be 'blanked' using either the WebGUI, RS-232 or Telnet commands.

Presets (Memorized Routing Patterns)

Recalling Presets

Preset routing configurations can be selected by using the IR Remote control, RS- 232 or WebGUI.

Editing Presets.

Preset routing configurations can be created by using RS-232 or the WebGUI.

IR Remote Control

The IR Remote included allows for changing current selected video ties and selecting previously configured presets.

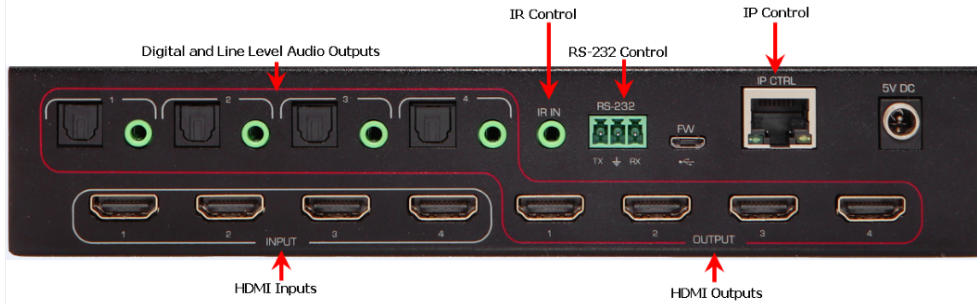
Press any INPUT # button on the desired OUTPUT row to route the video from that INPUT to the selected OUTPUT.

Press any of the buttons on the PRESET row to select that recall that previous configuration.

IR Remote Button Codes		
Button ID	Device Code	Button Code
POWER	0x0000	0x14
OUTPUT 1 - INPUT 1	0x0000	0x09
OUTPUT 1 - INPUT 2	0x0000	0x1D
OUTPUT 1 - INPUT 3	0x0000	0x1F
OUTPUT 1 - INPUT 4	0x0000	0x0D
OUTPUT 2 - INPUT 1	0x0000	0x17
OUTPUT 2 - INPUT 2	0x0000	0x12
OUTPUT 2 - INPUT 3	0x0000	0x59
OUTPUT 2 - INPUT 4	0x0000	0x08
OUTPUT 3 - INPUT 1	0x0000	0x5E
OUTPUT 3 - INPUT 2	0x0000	0x06
OUTPUT 3 - INPUT 3	0x0000	0x05
OUTPUT 3 - INPUT 4	0x0000	0x03
OUTPUT 4 - INPUT 1	0x0000	0x18
OUTPUT 4 - INPUT 2	0x0000	0x44
OUTPUT 4 - INPUT 3	0x0000	0x0F
OUTPUT 4 - INPUT 4	0x0000	0x51
PRESET 1	0x0000	0x53
PRESET 2	0x0000	0x52
PRESET 3	0x0000	0x01
PRESET 4	0x0000	0x45



Rear Panel



Rear Panel

HDMI Inputs: Connect to HDMI sources.

HDMI Outputs: Connect to HDMI displays.

Digital/Line Audio Outputs: Connect to external sound system.

Control Inputs:

The IP CTRL port connects to a user's network LAN. It is used to control the matrix using Telnet or to access the internal WebGUI.

The RS-232 terminal block connects to external serial control systems (115.2k baud).

The IR IN port connects to the supplied IR Detector cable if the matrix switcher does not have a direct line of sight of the IR remote.

EDID Management

The HSM-44-UHD gives users the flexibility to configure the EDID for each input. The source for the EDID data associated with each input can be from one of 5 standard built-in choices or copied from any of the TVs connected to a particular output.

By default, the EDID for all inputs are set to 4Kx2K@30 video with 2-channel audio.

EDID Configuration

Via RS-232, Telnet or WebGUI, the user can specify an EDID table and load it into any selected input port on the matrix. HSM-44-UHD comes with 5 common EDIDs saved in its internal memory, or you can copy the EDID of any of the devices connected to outputs.

Note to change an Input to 'Copy from Output x', you must have a SINK device connected at the time of configuration. The SINK can be changed later, but it must be connected during configuration for the change to become valid.

Index	EDID Description
1	1080p Video, 2 Ch Audio
2	1080p Video, 5.1 Ch Audio
3	4kx2k@30Hz Video, 2 Ch Audio
4	4kx2k@60Hz Video, [4:4:4] 2.0 Ch Audio
5	4kx2k@60Hz Video, [4:4:4] 5.1 Ch Audio
6	Copy from Output 1
7	Copy from Output 2
8	Copy from Output 3
9	Copy from Output 4

Network Setting

As shipped from the factory (or after a factory default), the HSM-44-UHD IP address is set for static IP address of 192.168.1.50.

To change the IP address or to switch to DHCP, you must use either RS-232 or Telnet. For example, to change the IP address via RS-232:

- Connect a PC with Terminal-Emulator software to the RS-232 port.
- The DHCPn command can be used to change the DHCP setting.

Serial & Telnet Commands

Telnet port is **6324**, RS-232 port settings are: Baud rate: 115200, Parity: None, Stop: 1-bit

- Commands are in ASCII format.
- Commands are case in-sensitive.
- Use a single <CR> character to terminate each command.
- Responses from the matrix are terminated with <CR><LF>.
- Other than Power command (PW1), the matrix must be powered on.
- Unknown commands respond with "INVALID COMMAND"<CR><LF>.
- After plugging power to the matrix, you must wait ~45 seconds for it to fully boot up before sending any commands.
- Command characters should be sent continuously without pauses. If you pause for more than 5 seconds, the command will automatically terminate.
- When the front panel buttons are used, some serial responses will be sent out the RS-232 port.



Command	Description	Response
DN	Query Device Name	HSM-44-UHD
DN[16 Characters]	Set Device Name	Device name set
CVn,m n= Output [1-4] m= Input [1-4] or m=x to blank the specified Output	Connect output <i>n</i> to input <i>m</i>	CVn,m
CV*,m m= Input [1-4] m=x to blank all the Outputs	Connect all outputs to input <i>m</i>	CV1,m CV2,m CV3,m CV4,m
CVn n= Output [1-4]	Query output routing	CVn,m n= Output [1-4] m= Input [1-4] m=x means blanked

CV	Query all the outputs	CV1,m CV2,m CV3,m CV4,m m= Input [1-4]
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Command	Description	Response
HSM	Reboot the system	FW Version:?.?? CV1,? CV2,? CV3,? CV4,? LK? IP ????.????.????.??? MAC ??-??-??-??-??-?? DHCP? ? represents the value of the setting being displayed
LKn n = 0 Lock OFF n = 1 Lock ON	Lock Front Panel	LKn n = 0 Lock OFF n = 1 Lock ON
LK	Lock Status Query	LKn n = 0 Lock OFF n = 1 Lock ON
ESn,m n = Input # [1-4] m = EDID Index 0 0 1080p/60Hz, 2.0 ch 1 1 1080p/60Hz, 5.1 ch 2 2 4Kx2K/30Hz, 2.0 ch 3 3 4Kx2K /30Hz, 5.1 ch 4 4 4Kx2K /60Hz, [4:4:4] 2.0 ch 5 5 4Kx2K /60Hz, [4:4:4] 5.1 ch 6 6 Copy from Output 1 7 7 Copy from Output 2 8 8 Copy from Output 3 9 9 Copy from Output 4 10	Set EDID for a particular input to <i>n</i> (<i>default is 2</i>)	ESn,m m = Input # [1-4] n = EDID Index [1-9]
MAC	MAC Address Query	MAC xx.xx.xx.xx.xx.xx.xx
IP	IP Address Query	IP xxx.xxx.xxx.xxx

IP xxx.xxx.xxx.xxx	Assign Static IP Address (DHCP must be off)	IP xxx.xxx.xxx.xxx
SN	Subnet Mask Query	SN xxx.xxx.xxx.xxx
SN xxx.xxx.xxx.xxx	Assign Static Subnet Address (DHCP must be off)	SN xxx.xxx.xxx.xxx
GW	GATEWAY Address Query	GW xxx.xxx.xxx.xxx
Command	Description	Response
GW xxx.xxx.xxx.xxx	Assign Static Gateway Address (DHCP must be off)	GW xxx.xxx.xxx.xxx
DHCPn n = 0 (DHCP off) n = 1 (DHCP on)	Enable DHCP	DHCP0 or DHCP1
DHCP	DHCP Status Query	DHCPn n = 0 (DHCP off) n = 1 (DHCP on)
FW	Firmware Version Query	FW Version:x.xx
RB	Reboot the system	As shown in the “HSM” Response
FD	Restore factory defaults Note: Resets all parameters including network settings	As shown in the “HSM” Response
PSx	Saves the current configuration to the preset specified	PSx X = Preset # [1-4]

x=Preset # [1 to 4]		
PSx=1,m/2,m/3,m/4,m x = Preset # m=Input #[1-4] or m=x (to blank the output)	Define and save a Preset	PSx=1,m/2,m/3,m/4,m x = Preset # m = Input # [1-4]
PRx x=Preset # [1 to 4]	Preset Recall	CV1,? CV2,? CV3,? CV4,?

Troubleshooting

There are no field serviceable parts or circuits in the device. If you think the device is malfunctioning (or have no connectivity), please try to use the following methods for troubleshooting:

- Try Rebooting the device by cycling the input power.
- Restore factory defaults (FD command) using the RS-232, Telnet or WebGUI interface.

Contacting Hall Technologies

If you determine that your Matrix Switch is malfunctioning, do not attempt to repair the unit.

Instead contact Hall Technologies Technical Support at 800-959-6439 or via email at support@halltechav.com.

To return the unit to Hall Technologies you must first get a Return Authorization (RMA) number.

Package the unit carefully, if returning.

We recommend using the original container the product came in.

Specifications

SPECS	
Video Input Ports	(4) HDMI 2.0
Video Output Ports	(4) HDMI 2.0
HDCP	HDCP 2.2 and HDCP 1.4
HDMI Bandwidth	Up to 4Kx3K @ 60 Hz (4:4:4 3840x2160 @ 60 Hz)
HD Resolutions	1080p @ 60 Hz
PC Resolutions	RGB, YCbCr 4:4:4; YCbCr 4:2:2, YCbCr 4:2:0
Audio Output Ports	30/36/48
Control	Single link to 340 MHz (10.2 Gbps)
Baud Rate	115200 bps
Power Supply	110-240 vAC External (US/EU standards/ CE/FCC/UL certified) 5V 4A
Power Consumption	12.5 W (max) / 4.0 W
Housing Color	Mental Enclosure Black
ESD Protection	32to122°F(0to50°C) 10-90%, non-condensing
Operating Temperature	32to122°F(0to50°C) 10-90%, non-condensing
Storage Temperature	-40 to +158 degrees F (-40 to +70 degrees C)
Dimensions	Device (including protrusions): 8.50" (216 mm) W x 5.00" (127 mm) D x 1.75" (45 mm) H Shipping: 11.1" (280 mm) W x 9.25" (235 mm) D x 3.23" (82 mm) H
Weight	Device: 2.05 lbs. (0.93 kg) Shipping: 4.25 lbs. (1.92 kg)
EMI/EMC	CE, FCC Class B
MTBF	90,000 hours
Warranty	3 Years



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