



HSM-04-04



HSM-04-02

Genesis Digital™ HDMI / DVI Matrix Switch Series

HSM-04-04	4x4 HDMI Matrix Switch with RS-232
HSM-I-04-04	4x4 HDMI Matrix Switch with RS-232 & IP
HSM-04-02	4x2 HDMI Matrix Switch with RS-232
HSM-I-04-02	4x2 HDMI Matrix Switch with RS-232 & IP

CUSTOMER
SUPPORT
INFORMATION

Order toll-free in the U.S. 800-959-6439
FREE technical support, Call **714-641-6607** or fax **714-641-6698**
Address: **Hall Research**, 1163 Warner Ave. Tustin, CA 92780
Web site: www.hallresearch.com E-mail: info@hallresearch.com

TRADEMARKS USED IN THIS MANUAL

Hall Research and its logo  are trademarks of Hall Research.

Any other trademarks mentioned in this manual are acknowledged as the property of the trademark owners.

FEDERAL COMMUNICATIONS COMMISSION

RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been designed to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are intended to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at their own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.




RoHS
Compliant

HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

Contents

1. Introduction	3
1.1 General.....	3
1.2 Features	4
2. Installation	5
2.1 Package Contents	5
2.2 Input and Output Connections	5
Table 1 – RS-232 Control Port Pin out.....	7
2.2 Connection Block Diagram.....	7
3. Configuration & Operation	8
3.1 Front-Panel Buttons and Indicators.....	8
3.2 Turning the unit on and off	8
3.3 Making AV Routings or “Ties” from Front Panel.....	9
3.4 Making AV Routings or “Ties” Using IR Remote	10
3.5 Saving Presets (routing patterns).....	10
3.6 Recalling Presets (routing patterns).....	10
4. Control Commands (RS-232 and IP)	11
4.1 Routing Functions	11
4.2 Preset Save and Recall Functions	12
4.3 Power Functions	12
4.4 Special Commands	12
4.5 Invalid Commands	13
5. IP Control Basics	14
5.1 Getting Device IP Address	15
5.2 Controlling the Matrix via Web Interface	15
5.3 IP Specific Serial Commands.....	20
6. Telnet Interface.....	21
6.1 Telnet Interface Commands	21
7. Troubleshooting.....	22
7.1 Contacting Hall Research	22
7.2 Shipping and Packaging	22
8. Specifications	23
Appendix 1 – Front Panel Quick Reference Guide	24
Appendix 2 – Command Summary.....	24

1. Introduction

1.1 General

Thank you for purchasing this professional quality and compact Genesis™ Matrix Switch from Hall Research. This User's Manual applies to both 4x2 and 4x4 HDMI Matrix Switchers.

As members of Hall's Genesis™ series, these matrices are synonymous with high performance, intuitive and powerful user interface, easy to use control command set, and unsurpassed reliability.

The Matrix switches are HDMI 1.3 compliant (and 1.4 for color-depth and 3D), support HDCP, deep color, multi-channel digital audio (up to 7.1 channels), and may be used with any combination of DVI (PC) or HDMI (HDTV) sources and displays.

The Matrix uses Silicon Image chipsets capable of color depth conversion independently for each output. This assures that the highest numbers of colors possible are displayed on each output. In other words if some outputs are connected to displays that only support HDMI 1.2 and others to 1.3, the unit will report as supporting HDMI 1.3 to each input source in order to receive the deepest color depth possible.

EDID management, fast switching, low profile (only 1 RU), PRESET Save and Recall functions, IR remote, and comprehensive front panel controls, make the Genesis Digital matrices ideal for home theater, conference room, multimedia presentation systems, and other similar settings.

The Matrix Switchers are optionally available with IP (LAN) port that allows control from any browser via HTTP web server (including web enabled smart phones) for control through other web appliances.

The web interface allows the user to assign custom names for each input, output, and preset pattern, making control over IP a snap.

1.2 Features

- Compatible with HDMI version 1.3, 1.4 (for color-depth and 3D), and DVI
- Supports a wide range of HDTV (HDMI) and PC (DVI) resolutions from 480i to 1080p and VGA to WUXGA
- Supports digital video formats in Deep Color 12bit
- Supports lossless digital audio: both 5.1 and 7.1 Dolby TrueHD, Dolby Digital Plus and DTS-HD Master Audio
- Powerful and intuitive front panel controls
- Preset Save and Recall of commonly used routing patterns
- EDID management prioritizes the highest capable displays (HDMI 1.3 takes precedence over 1.2 , and HDMI support supersedes DVI)
- Internal EDID emulation user selection option
- Output video signals are de-skewed and recreated with perfect timing and are jitter free.
- Includes IR remote control
- Front panel IR sensor and rear panel connector for optional IR detector cable (for instances where the unit is not in line of sight)
- Supports HDMI cables up to 15 meters (50 feet) long on its input, and drive cables to 15 meters on the outputs.
- Includes RS-232 port with Hall Research's Genesis Control Command Set (GCCS)
- Optional IP (LAN) port for browser control
- Optional IP (LAN) versions includes web-server with easy to use controls (customizable with user definable names for each input and output)
- 1RU high compact & rugged rack mountable metal enclosure
- Uses Silicon Image (founding member of HDMI) Chipsets
- Assembled in USA

2. Installation

2.1 Package Contents

Your package should contain the 1RU Matrix Switcher, a Universal power supply (5v DC @ 6A), an IEC320 Power Cord, an IR remote control, and a User's Manual.



Figure 1 – Power Supply and IR Remote



Notice

Use only regulated 5v DC supply (center positive) as supplied with the unit. Use of any other voltage will cause damage to the unit and **void the warranty**.

2.2 Input and Output Connections

The matrix is housed in a 1RU 19" wide rack mountable enclosure. All of I/O, control, and the power connections are on the rear of the unit.

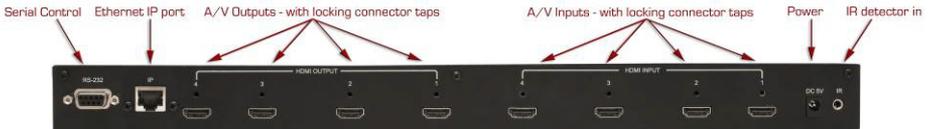


Figure 2 – Rear Panel Connections (for HSM-I-04-04)

- ❑ Using quality HDMI cables connect the inputs to video sources.
- ❑ If the sources are DVI (PC) then you will need either a DVI to HDMI adapter, or preferably, a DVI to HDMI Cable



Figure 3 –
Model C-HDMI-DVI-xM ($x = 2, 3$ or 5 meters)

- ❑ For a professional installation, we recommend using locking HDMI cables. The Matrix Switch has a tapped hole above each HDMI connector and the locking cables available from Hall Research come with screws and stand-offs for securing the cables in place so they don't accidentally get unplugged



Figure 4 –
Model C-HDMI-L-x
($x = 1.5, 3, 6, 10, 15, 25, 35$ or 50 ft)

- ❑ Next, connect the HDMI outputs to the displays.
- ❑ Plug the power supply to the unit. **Use only the supply that came with the unit**
- ❑ There is an IR remote detector (eye) on the front panel of the unit, however, if the unit is to be situated in a closet or enclosure, it may be necessary to use an IR detector cable and locate the "eye" somewhere more convenient. Hall Research can provide such a cable that will plug into a jack on the rear of the HSM matrix



Figure 5 -
Model CIR-DET-D1

If the matrix needs to be controlled via RS-232, plug the controller (or PC) to the DB9 Female port on the rear of the matrix. Make the connection to the PC's DB9 Male connector using a straight-through DB9 MF cable.

HSM Matrix			Remote Control Console	
PIN	Definition		PIN	Definition
1	NC	→ ←	1	NC
2	Tx		2	Rx
3	Rx		3	Tx
4	NC		4	NC
5	GND		5	GND
6	NC		6	NC
7	NC		7	NC
8	NC		8	NC
9	NC		9	NC

Table 1 – RS-232 Control Port Pin out

- ❑ The HSM matrices are available with IP network port (HSM-I- ...). On these units there is an RJ45 (10/100 Base-T) for connection to your Local Area Network (LAN). These units feature a user friendly and powerful built-in web-server that allows control of the matrix via any browser for control using web enabled controllers.

2.2 Connection Block Diagram



Figure 6 – Connection Block Diagram

3. Configuration & Operation

3.1 Front-Panel Buttons and Indicators

An image of the front panel for the 4x4 matrix is shown below. The 4x2 units have fewer OUTPUT buttons, but otherwise are the same.

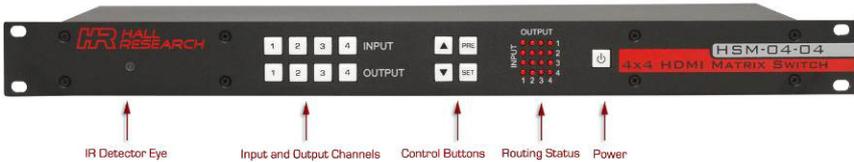


Figure 7 – HSM-04-04 front panel controls & indicators

The front panel can be used for the following purposes:

- Monitor & Control Power On/Off status
- View current Input/output routings (ties) on Routing Status LED Grid on the front panel
- Make new ties either starting from input or from output
- Recall preset patterns
- Save preset patterns

All of the front panel switches have built-in LEDs that help in the operation. Front panel functions are designed for maximum intuitiveness. With just a little practice, one can easily learn to monitor and control the matrix.

3.2 Turning the unit on and off

To turn the unit on, press the power button. The unit performs a simple LED test where all buttons and LED's are gradually turned on over a few seconds. Then the matrix will recall the last routing pattern prior to being shut -down and update the Routing Status LED Grid.

To turn the matrix off, press and hold the power button for 5 seconds. This is done to prevent accidentally turning off the unit if the power button is accidentally pressed.

3.3 Making AV Routings or “Ties” from Front Panel

To make the unit as convenient and intuitive as possible the HSM matrix allows you to make ties starting from the input channel's point of view or from the output.

3.3.1 Making a tie starting from the output

This is the most natural way of making connections since each output gets its signal from only one input.

- ❑ Note that once you start making selections from the front panel, if you do not hit any buttons for approximately 10 seconds, the system will exit this mode without any user interaction.
- ❑ First, press one of the output channel buttons. That output button will light up and the current input routed to that output will light up.
- ❑ At this point if you change your mind, and do not want to make any changes, just hit SET. If you want to change to another output channel, use either the up and down (▲▼) buttons to walk through other outputs ; or just select another output channel.
- ❑ To route the output to a different input than the one currently connected to, hit the “candidate” input channel number. This does not actually make the connection; the new input channel will be blinking. Again if you change your mind, either hit the same blinking button (it will stop blinking), or hit another input channel. When you are sure you have selected the input channel you desire, hit SET.

3.3.2 Making a tie starting from the input

The procedure is similar to the above but a particular input can be routed to more than one output.

- ❑ Press one of the input channel buttons. That button will light up and ALL the outputs routed from that input will light up.
- ❑ If you want to change to another input channel, use either the up and down (▲▼) buttons to walk through other inputs; or just select another input channel.
- ❑ To route the selected input to single or multiple outputs, press the output buttons. Again, these new outputs are only “candidates” (will be blinking) and will not be routed until you hit the SET button.

3.4 Making AV Routings or “Ties” Using IR Remote

The remote control is very simple; outputs are labeled as A-D and they correspond to 1-4 on the rear of the box. Press the input channel you want the output connected too.

Note that the IR remote makes connections as soon as you hit the button!

It takes about 1 to 2 seconds for the matrix to do the routing (HDCP handshake requires a little time), so if you are going to change more than one output, pause for moment between pressing the buttons!

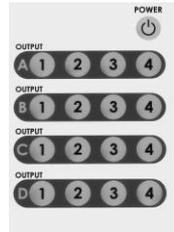


Figure 8 - IR

3.5 Saving Presets (routing patterns)

The number of presets accessible from the front panel is the same as the total # of input and output buttons. Therefore, each front panel button can memorize a pattern. For a 4x4 matrix, you can recall 8 presets and for a 4x2 you can recall 6 presets. However, through the IP or Serial port, the unit can store and recall 8 presets regardless of matrix configuration.

Current tie configurations can be saved as presets (1 through 8) for later recall.

To save the current AV routing pattern, press and hold the PRE button for 3 sec, the backlit LED will start flashing (this means that save function is activated). Press the desired input button to save the preset then press the SET button to complete the operation.

3.6 Recalling Presets (routing patterns)

Press and release the PRE (preset) button. The button will light up solid. Then press and release one of the channel buttons and hit SET.

4. Control Commands (RS-232 and IP)

The Genesis™ Matrices can be controlled via an external control system by using either the standard RS-232 or the optional IP port. Any program capable of standard serial communication in ASCII format is capable of working with the matrix. Most PCs with Windows™ OS have HyperTerminal™ or equivalent. There are also many free Terminal Emulator software programs available for download on the internet.

Note on RS-232 port availability on PC

Most PCs and notebooks do not come equipped with a serial RS-232 port. Therefore, for serial control from a PC you may need a USB to RS-232 converter. These are available from Hall Research (Model USB-RS232-1).

Figure 9 – USB to RS-232 Adapter



Use a DB9 Male-to-Female cable per Table 1 to connect the unit to the PC's serial port.

Use 9600 Baud, 8 bits, No Parity, 1 Stop bit, No flow control.

Upon power up, the Matrix will output a screen similar to below through its serial port. Special characters shown in <> brackets. <cr> is the carriage return character (0x0D), <lf> is the line feed character (0x0A)

<u>COMMAND</u>	<u>MEANING</u>
PW0<cr>	POWER IS OFF
CO1,1<cr>	INPUT 1 ROUTED TO OUTPUT 1
CO2,2<cr>	INPUT 2 ROUTED TO OUTPUT 2
CO3,3<cr>	INPUT 3 ROUTED TO OUTPUT 3
CO4,4<cr>	INPUT 4 ROUTED TO OUTPUT 4
HD1,0<cr>	NO VIDEO INPUT ON OUTPUT 1
HD2,0<cr>	NO VIDEO INPUT ON OUTPUT 2
HD3,0<cr>	NO VIDEO INPUT ON OUTPUT 3
HD4,0<cr>	NO VIDEO INPUT ON OUTPUT 4

4.1 Routing Functions

NOTE: HDMI Video and Audio always routed together.

Video routing commands specified are from the point of view of the output. The wildcard character "*" is acceptable for output (but not input). In addition, these commands can be used to monitor or query the status of system ties. Omitting the input channel will result in a response of the current routing for that output.

Important Note on Control Commands

Almost all commands issued to the Matrix will elicit a response from the Matrix once the command is accepted and execution completed. After issuing any command, you must wait for the matrix's response prior to sending another command. If you send another command prior to completion of the previous one, the matrix might ignore the 2nd command.

Notice about Additional Commands

HSM matrices equipped with IP Port have special Serial Commands to change IP address parameters.

Please refer to section 5.3 for IP specific serial commands.

Command: CO_n,m<cr> *stands for Connect Output n to input m*
Response: CO_n,m<cr>

Variations:

Command: CO_n <cr> *stands for Connect Output n Query*

Response: CO_n,m<cr>

Command: CO*,m<cr> *stands for Connect All Outputs to input m*

Response: CO1,m<cr>

CO2,m<cr>

CO3,m<cr> (for 4x4 matrices only)

CO4,m<cr> (for 4x4 matrices only)

4.2 Preset Save and Recall Functions

Command: PRx<cr> *stands for Preset Recall. x = preset 1~ 8*

Response: CO1, m₁<cr>

CO2, m₂<cr>

CO3, m₃<cr> (for 4x4 matrices only)

CO4, m₄<cr> (for 4x4 matrices only)

Command: PSx<cr> *stands for Preset Save. x = preset 1~ 8*

Response: None (the current tie pattern is saved in EEPROM)

4.3 Power Functions

Command: PW1<cr> *stands for Power On*

Response: PW1<space><cr>

CO1, m₁<cr>

CO2, m₂<cr>

CO3, m₃<cr> (Only for 4x4 matrices)

CO4, m₄<cr> (Only for 4x4 matrices)

Important Note on Power ON Command

This command can take up to 10 seconds to complete. Upon powering up the unit will recall the previous state of each output prior to powering off and restore each connection.

Command: PW0<cr> *stands for Power Off*

Response: PW0<cr>

Variation:

Command: PW<cr> *stands for Power Query*

Response: PWx<cr><lf> x=0 (off), or 1 (on)

4.4 Special Commands

Command: FB<cr> *stands for Firmware Boot*

Response: Depends on power state when the command was issued. This command is equivalent to unplugging the power supply and reconnecting it.

Command: HDm<cr> *stands for HDCP Status Query on input m*
Response: HDm,x<cr> x=0 (no video detected on input), x=1 (video detected on input without HDCP), x=2 (video detected on input with HDCP). This command is useful for several purposes. For example, if you do not have HDCP compliant displays on all outputs and you try to send an input with HDCP to an output display that is not HDCP compliant, you will not get an image. This command enables you to check the status of each input and only route content that can be displayed to those outputs. In addition, since this command detects presence of video on inputs, you can use it to check status of inputs and reroute outputs if there is no video on the input currently routed.

Command: EDx<cr> *stands for EDID Emulation. x=1 (default HDTV), x=0 (Fully Emulated Hall Research DVI)*

Response: EDx<cr>
 This command is used to change the way EDID is reported to the sources. The default setting is 1. In this mode, the EDID is algorithmically constructed based on the capabilities of all the LCD's connected at all outputs.

The special setting is 0. In this mode, the first 128 bytes of EDID table correspond to Hall Research canned emulation, in which most standard PC (both 4x3 and 16x9) resolutions are reported to all the inputs. This mode should be used if your inputs are from PC's DVI and you are having trouble getting the full complement of resolution choices.

Please note that after changing the EDID emulation mode you must either unplug and reconnect the unit, or issue a FB (firmware boot) command.

Variation: ED<cr>
 This command is used to query the current setting of the EDID Emulation setting

Command: ST<cr> *stands for Status Query*

Response: PW1<cr>
 CO1, m1<cr>
 CO2, m2<cr>
 CO3, m3<cr>
 CO4, m4<cr>
 HD1, x1<cr>
 HD2, x2<cr>
 HD3, x3<cr>
 HD4, x4<cr>

Command: FR<cr> *stands for Factory Reset*

Response: FR <cr>
 PW0 <cr>
 This command is used to clear all the preset ties in memory. It also connects all the outputs to the same input and powers the unit off. If your unit also has an IP interface, this command does not erase user defined names nor IP address assignments. Please see FD command in IP section which does the same but also restores the IP interface to factory default status.

4.5 Invalid Commands

Avoid using invalid commands! Lengthy garbage strings or irrelevant RS-232 data sent to the matrix can cause system crash. Wrong commands or those with syntax error will prompt the following response:
 INVALID COMMAND<cr>

5. IP Control Basics

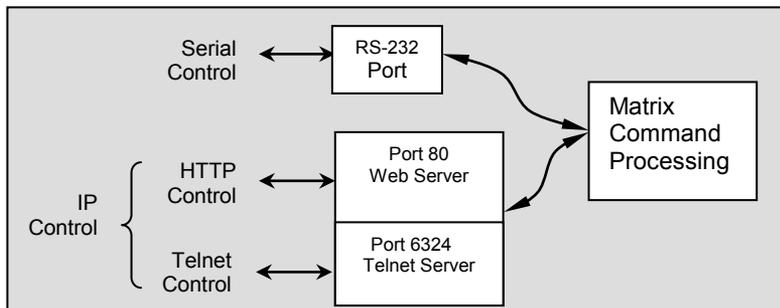


Figure 10 – IP Control Block Diagram

As shown in the figure above, the matrix can be controlled via RS232 Serial port or through an IP (Ethernet) port if equipped.

The IP interface features a built-in web server allowing web browsers running on different devices (computer, smart-phone, tablet) on the network to control and monitor matrix through HTTP protocol on port 80. (Section 5 will walk you through this HTTP based Web Interface).

The IP interface also supports telnet connection over port number 6324 to control and monitor matrix. (Section 6 describes the telnet-based interface)

The IP interface on every matrix shipped has a unique MAC-address, and must have a valid IP-address to function properly on your network.

Notice

As shipped from factory, DHCP is enabled. This means that the users DHCP router automatically assigns an IP address to the Matrix.

To find the IP address assigned to the matrix, use the DeviceFinder Software available free from Hall Research's website.

5.1 Getting Device IP Address

The HSM matrix comes preconfigured for DHCP, which means it will automatically obtain an IP address when it is connected to the users LAN network. It is recommended that you set a static IP on each system in order to guarantee it maintains the same address. In order to set a static IP, first discover what DHCP address was issued to the matrix and then login to the matrix web interface to reconfigure the settings. (see section 5.2 below)

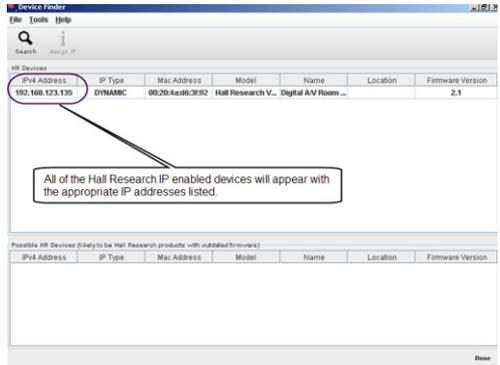


Figure 11- DeviceFinder

Download and install the Hall Research Device Finder utility.

Once installed, run the program and it will scan your LAN and locate any compatible Hall Research devices that are connected.

5.2 Controlling the Matrix via Web Interface

The Genesis Matrices with IP option have a powerful, yet easy to use IP based web interface to control and monitor matrix. Web browser application running on any device (Computer, Smart phone, iPad™) on the same network can use this interface.

When the matrix is shipped, it is configured with a dynamic IP address and when powered up on a compatible network, the end-users DHCP router will assign an IP address. You can find the matrices IP address on your network by using the Device Finder utility available free from the Hall Research website.

Once you have the correct IP address of your device from the Device Finder utility, open a compatible web browser and type <http://your.devices.ip.address> in the address bar and hit Enter.

The web page shown will automatically format the display for the browser it is running on. This means that on a Smart Phone the width and character sizes will be optimized so you do not have to deal with zooming and scrolling the screen to use the matrix.

Furthermore, all elements on the web page screen are automatically updated from server side. This means that if the video routing is altered by the front panel of the matrix or from another simultaneous LAN connection, your browsers screen will automatically reflect the change.



Figure 12 – Control via web Interface

The matrix web interface allows the user to change/monitor the matrix I/O ties, assign unique names to the inputs, outputs and presets as well as enable/disable password protected login or change the IP configuration, etc...

The Preset, Input and Output names are saved permanently in matrix until the user changes them. The matrix will also remember the I/O Presets when not powered.

The web interface is user friendly and easy to access. It consists of three tabs named Routing, Labels and Settings. Each tab and its features are explained in next sections.

5.2.1 Video Routing Tab

The routing tab allows the user to control the matrix I/O ties, save the current configuration as a preset, load existing presets and turn the matrix on or off.

Please refer to Figure 13 for a typical example screen of the routing tab, as it would appear on a Smart-Phone.



Figure 13- Video Routing Tab

Outputs Column

Displays the name for the selected matrix output. You cannot change the output names (labels) here. Labels can be changed using the Labels tab

Inputs Column

Two (for a 4x2 matrix) or four (for a 4x4 matrix) dropdown buttons allow the user to select the desired matrix input to tie to the respective matrix output. The also shows the current tie status and is updated in real time.

Recall Preset

Previously saved ties may be saved in the matrix and can be recalled for quick changes to the matrix. First, select the desired preset you want to load from the dropdown menu and then click the Recall Preset button to load an existing configuration from memory.

Save Preset

Select the preset name from the dropdown menu and Click Save Preset to save current tie pattern as a preset with that name.

ON/OFF

These buttons show the status of matrices power and can be used to turn it on and off. The button with red border is the current state and cannot be clicked. For example in figure 13 above, the matrix is ON and you can turn it off by clicking the OFF button.

5.2.2 Labels Tab

The user can assign descriptive names inputs, outputs and presets on this tab.

Label names are limited to 16 characters long including white space, and can have special symbols.

Apply Button

Click this button to save your changes after changing the names.

5.2.3 Settings Tab

Settings tab helps user to change IP address, enable/disable DHCP, enable/disable password, change current password and load factory default settings whenever necessary.

Name

User defined name for this matrix. The name can be sixteen (16) characters including any white space and special characters.

Location

User defined location of this matrix. Location can be twenty (20) characters long including white space and special characters.

IP

Displays the current IP address of this matrix and if DHCP is disabled, allows the user to enter a new IP address.

Subnet

Displays the current SUBNET MASK address of this matrix and if DHCP is disabled, allows the user to enter a new subnet mask.

Gateway

Displays the current GATEWAY address of this matrix and if DHCP is disabled, allows the user to enter a new gateway address.

The screenshot shows the 'Labels' tab in the HSM IP Manager software. The interface has a red header with the 'HALL RESEARCH HSM IP Manager' logo and three tabs: 'Video', 'Labels', and 'Settings'. The 'Labels' tab is active. Below the tabs, there are eight rows of input fields, each with a label and a text box: INPUT 1: VINPUT_1, INPUT 2: VINPUT_2, INPUT 3: VINPUT_3, INPUT 4: VINPUT_4, OUTPUT 1: VOUTPUT_1, OUTPUT 2: VOUTPUT_2, OUTPUT 3: VOUTPUT_3, OUTPUT 4: VOUTPUT_4, PRESET 1: PRESET_1, PRESET 2: PRESET_2, PRESET 3: PRESET_3, PRESET 4: PRESET_4, PRESET 5: PRESET_5, PRESET 6: PRESET_6, PRESET 7: PRESET_7, and PRESET 8: PRESET_8. At the bottom right, there is an 'Apply' button.

Figure 14- Labels Tab

The screenshot shows the 'Settings' tab in the HSM IP Manager software. The interface has a red header with the 'HALL RESEARCH HSM IP Manager' logo and three tabs: 'Video', 'Labels', and 'Settings'. The 'Settings' tab is active. Below the tabs, there are several settings: NAME: HSM Matrix, LOCATION: Hall Research, IP: 192.168.1.200, SUBNET: 255.255.255.0, and GATEWAY: 192.168.1.1. Below these are three radio button options: DHCP: Enable (selected) / Disable, LOGIN: Enable / Disable (selected), and TELNET: Enable (selected) / Disable. At the bottom, there are three buttons: 'Apply', 'Factory Reset', and 'Change Password?'.

Figure-15 Settings Tab

DHCP

Enables/ Disables DHCP. If enabled, the matrix is assigned an IP address from the user's compatible networks DHCP router. This is the factory default. If disabled, the matrix is assigned the IP address, subnet mask and gateway address supplied by the user.

Login

Enables/Disables the system login password. If enabled, the matrix will require a password in order to operate the controls. If disabled, the matrix requires no password to operate the controls. This is the factory default.

Telnet

Enables/Disables the telnet interface. See Section 6 for more details

Change Password?

Allow the user to change the existing system password. When clicked, a window will open for entering the new password. The password length is limited to eight (8) characters long.

Apply

The User must click this button after changing any field on settings tab to save the changes.

Factory Reset

This button restores the factory defaults to this matrix. Factory default will also wipe out saved presets.

Factory Default Settings for IP interface

Field	Value	GUI Tab
Power	Off	Routing
INPUT1	HDMI_In_1	Labels
INPUT2	HDMI_In_2	Labels
INPUT3	HDMI_In_3	Labels
INPUT4	HDMI_In_4	Labels
OUTPUT1	HDMI_Out_1	Labels
OUTPUT2	HDMI_Out_2	Labels
OUTPUT3	HDMI_Out_3	Labels
OUTPUT4	HDMI_Out_4	Labels
PRESET1	PRESET_1	Labels
PRESET2	PRESET_2	Labels
PRESET3	PRESET_3	Labels
PERSET4	PRESET_4	Labels
PRESET5	PRESET_5	Labels
PRESET6	PRESET_6	Labels
PRESET7	PRESET_7	Labels
PRESET8	PRESET_8	Labels
Name	HSM Matrix	Settings
Location	Hall Research	Settings
IP	Assigned by	Settings
Subnet	Based on IP	Settings
Gateway	Assigned by	Settings
DHCP	Enabled	Settings
Login	Disabled	Settings
Telnet	Enabled	Settings
Default	pass	Settings

5.3 IP Specific Serial Commands

The HSM matrix is equipped with a standard RS-232 interface, which allows the user to assign a static IP address. Please refer section 4 to connect a PC to Matrix over an RS-232 serial interface. Once you are connected use following commands to change the network settings or restore the factory defaults.

5.3.1 Changing the network settings of unit

Note: All commands are case sensitive

Command: IP<space><ip_address_value><cr>

Where ip_address_value stands for the desired IP address

Success Response: IP=<ip_address_value>

Error Response: "Err! IP Address is not valid" or "IP address not changed"

Command: SB<space><subnet_address_value><cr>

Where subnet_address_value stands for the desired subnet mask

Success Response: SUBNET=<subnet_address_value>

Error Response: "Err! SUBNET Address is not valid"

Command: GW<space><gateway_address_value><cr>

Where gateway_address_value stands for desired gateway address

Success Response: GATEWAY=<gateway_address_value>

Error Response: "Err! GATEWAY Address is not valid"

Notice

User MUST enter ALL THREE Commands mentioned above with the correct values and must get 'success response' for each in order to change the network settings. The following message confirms that user has received a 'success response' for all of the above commands and device is applying user settings:

"Applying settings to Matrix please wait"

If you did not receive the above message, reenter ALL THREE values again

WAIT until you see following Welcome message on Screen. It confirms that device has done with applying settings and serial interface is ready for other commands.

"Welcome to Hall Research HSM matrix"

5.3.2 Restoring factory defaults

Command: FD<cr>

Response: "Applying Factory Defaults To Matrix- Please Wait For Welcome Message."

This command loads factory defaults (for both IP interface and all routing memory including presets). This command is available only for units that have IP interface. With this command you don't need to use FR command since as part of the action it performs the FR function as well. Wait until you see following welcome message on terminal screen.

"Welcome to Hall Research HSM matrix serial interface.

Please refer to user manual for matrix serial commands."

6. Telnet Interface

The HSM telnet interface is an IP based command line interface to control and monitor the matrix. Only one (1) client is allowed to connect at a time through this interface and with every new connection, the old connection will be automatically closed. The Telnet connection timeout is set to infinity or until the user closes the current connection. The Telnet authentication required depends on authentication status of web interface. If telnet authentication is enabled, the password required will be same as what used for web interface. The user can also disable the telnet interface from the web interface.

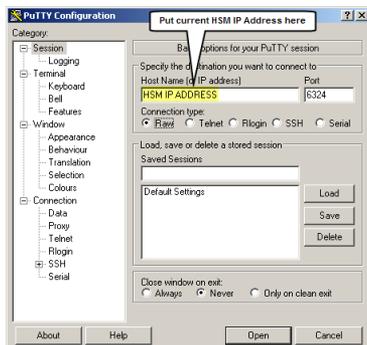


Figure-16 Putty client configuration

To use this interface, the user must open a TCP socket connection on port 6324 using a compatible telnet client to communicate with matrix. Figure-16 shows an example of using the PUTTY client on a Windows™ compatible PC. Mac and Linux users can use the default telnet client.

Note Regarding Telnet Port

The standard telnet port for the Matrix is 6324, however older units (shipped prior to 2012), may use port # 45454 instead

6.1 Telnet Interface Commands

Telnet interface uses same commands as HSM serial (RS232) interface as described section 4 above. The expected responses on the telnet interface are the same as serial interface.

Avoid Using Invalid Commands

If you are planning to control the Matrix via Telnet, please make sure that the controller does not send debug or other irrelevant communication to the Telnet port as this may hang up the Matrix

7. Troubleshooting

There are no field serviceable parts or circuits in the device. Opening the device will void the warranty. If you think the device is malfunctioning, please contact Hall Research.

7.1 Contacting Hall Research

If you determine that your Genesis™ Matrix is malfunctioning, do not attempt to repair the unit; instead, contact Hall Research Technical Support at 714-641-6607.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description.

7.2 Shipping and Packaging

If you need to transport or ship your unit:

- Package it carefully. We recommend that you use the original container.
- Before you ship the units back to Hall Research for repair or return, contact us to get a Return Authorization (RMA) number.

8. Specifications

Video

Standards	HDMI 1.3 (1.4 compliant for video color depth and 3D), DVI (single link)
Signal type	TMDS video, DDC EDID (0 to 5 v TTL)
Connectors	HDMI Type A (Female) with Locking
Video Data Rate	2.25 Gbps
Supported Colors	RGB, YCbCr 4:4:4, YCbCr 4:2:2, xvYCC
HDMI Cable Length	From source 15 m (50 ft) at any resolution or color depth, to display 15 m (50 ft) 1080p, or 7.5 m (25 ft) at deep color
HD Resolutions	480i, 480p, 576i, 576p, 720p, 1080i, 1080p 8 or 12 bits per channel (24 or 36 bits aggregate)
PC Resolutions	VGA through UXGA

Audio

Supported Formats	PCM2, PCM5.1, PCM7.1, Dolby5.1, DTS5.1, DD+, D-TrueHD, DTS-HD
-------------------	---------------------------------------------------------------

General

Power Supply	100 VAC to 240 VAC, 50-60 Hz, external; 5 VDC, 6 A, regulated
Nominal Power	Fully loaded, 17 watts max (3.4 amps @ 5v)
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, non-condensing Operating: +32 to +104 °F (0 to +40 °C) / 10% to 90%, non-condensing
Cooling	Convection
Mounting	Front panel 1RU 19" Rack mountable
Enclosure type	Metal
Dimensions	1.69" H x 17.3" W x 7.68" D - F/P Width is 19" (43 mm H x 440 mm W x 195 mm D)
Product weight	9 lb (4 kg)
Shipping weight	10 lb (4.5 kg)
Recommended cable	Locking High-Performance HDMI cables
Vibration	ISTA 1A in carton (International Safe Transit Association)
Safety	CE
EMI/EMC	CE, FCC Class A
MTBF	90,000 hours
Warranty	2 years parts and labor

Specifications are subject to change without notice

Appendix 1 – Front Panel Quick Reference Guide



Figure 17 – Control buttons on the front panel

Function	Procedure
View ties or Make ties	<input type="checkbox"/> Hit any of the INPUT or OUTPUT Buttons
Recall Presets	<input type="checkbox"/> To change ties, hit any INPUT or OUTPUT then hit SET <input type="checkbox"/> Hit PRE (button lights up)
Save Presets	<input type="checkbox"/> Hit any INPUT or OUTPUT button <input type="checkbox"/> Hold PRE until it starts blinking
Power ON/OFF	<input type="checkbox"/> Hit any INPUT or OUTPUT button <input type="checkbox"/> To turn on hit power button <input type="checkbox"/> To turn off Press and hold power button

Appendix 2 – Command Summary

Command	Function
PWx	Power on/off x=0 power off, 1 power on Omitting x will show current power status
CO _{n,m}	Connect Output n = output, m= input <input type="checkbox"/> Omitting ,m will show current connections
PRx	Preset Recall... x = preset # can be 1 to 8
PSx	Preset Save ... x = preset # can be 1 to 8
HD _n	Read Input Status, n = Input # Returns: 0 No Video
ED _n	EDID Management 0: DVI Emulated EDID
FB	Firmware Boot (Resets the entire system)
ST	Status Report
FD	Factory Reset for IP enabled matrices
FR	Factory Reset for Non-IP enabled matrices



© Copyright 2013. Hall Research, Inc.
All rights reserved.

CUSTOMER
SUPPORT
INFORMATION

Order toll-free in the U.S. 800-959-6439
FREE technical support, Call **714-641-6607** or fax **714-641-6698**
Mail order: **Hall Research**, 1163 Warner Ave. Tustin, CA 92780
Web site: www.hallresearch.com E-mail: info@hallresearch.com