



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

# SW-HD-4A

4x1 HDMI Switch

## USER MANUAL

August 3, 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.



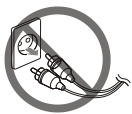
4. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.



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

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## OVERVIEW

The SW-HD-4A is a 4 input HDMI Switch with advanced switching technology enabling fast switching of four HDMI sources to a single HDMI output.

The switcher supports resolutions up to 4K60 4:4:4 (UHD), 3D, and 36-bit deep color video. Switching can be controlled via front panel buttons, IR remote control, RS-232, Telnet, or a built-in Web GUI.

EDID management is provided, whereby you can select the EDID table for all the inputs from a list of standard EDID's or copy the EDID from the connected display to all inputs. This can be done using the Web GUI or by sending RS-232 commands.

The SW-HD-4A provides a mini-USB port on the front for firmware upgrades. This USB connector also provides 500 mA of power and can be used to power external devices such as Google™ Chromecast or Amazon™ Fire T

## FEATURES

- Fast switching technology reduces switching time.
- Front panel LED indicators for status monitoring
- Supports resolutions up to 4K60 4:4:4.
- Supports 3D, HDR and deep color.
- Control via front panel, IR, RS-232, Telnet and Web GUI
- Includes IR remote control.
- Plug and play installation.
- HDMI 2.0, HDCP 2.2 and below, and DVI 1.0 compliant
- High-definition audio pass-through
- Analog Stereo and Digital multi-channel audio extraction
- EDID emulation or pass-through
- USB port can power external devices such as video players.

# Package Contents

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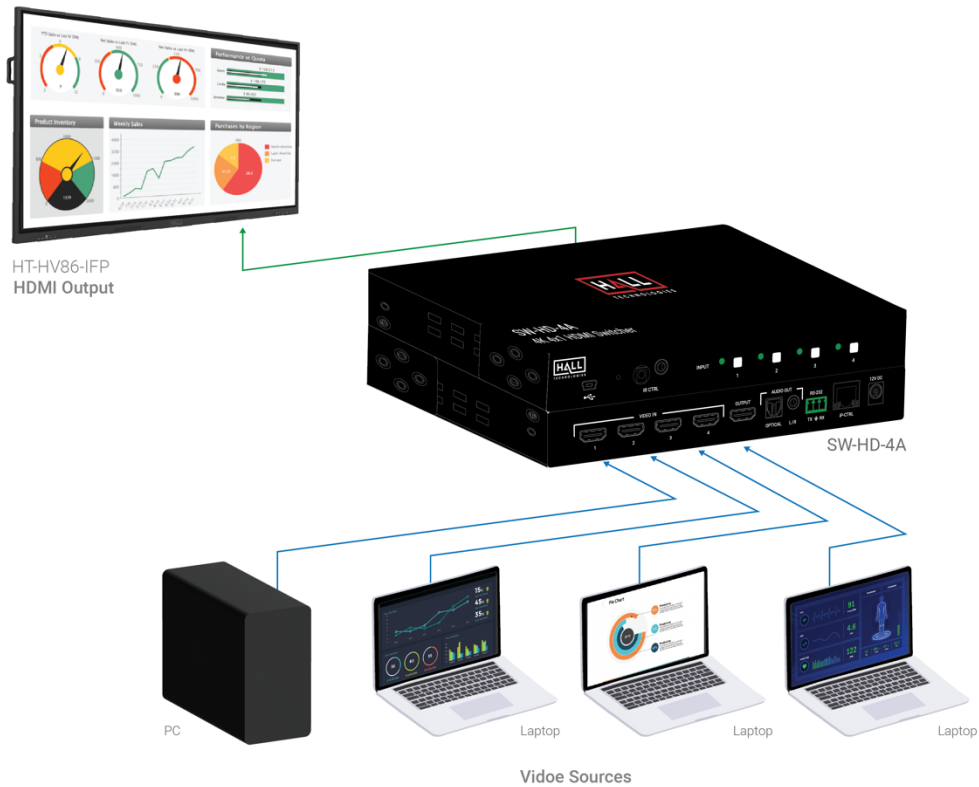


## GEM-EX-S

- 1x SW-HD-4A
- 1x Locking 12V DC Universal Power Supply
- 2x Mounting brackets.
- 4x Rubber Feet with adhesive
- 1x IR Remote Control
- 1x IR Remote Detector cable

# Installation

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## SW-HD-4A



No.	Name
1	Firmware Upgrade Port
2	IR Sensor
3	External IR Input
4	Source Selection Buttons
5	Selection Indicators
6	Video Inputs
7	Video Outputs
8	Extracted Audio
9	RS-232 Control Port
10	LAN Control Unit
11	Power Input

### Configuration

- Connect all video sources to the VIDEO IN connectors.
- Connect the display device to the OUTPUT connector.
- Connect the Power Supply to the power input.
- Connect any external controller or PC to the RS-232 terminal block, if required.
- Connect IP-CTRL port to compatible LAN network, if required.
- Connect IR detector to external IR CTRL port, if required.

# Operation

The unit can be controlled via front panel and via external control options like IR remote control, RS-232, Telnet and/or the Web GUI.

- Press the desired INPUT button switch to display the available video on the HDMI output.
- The illuminated LED shows which input is directed to the OUTPUT connector.
- Press and hold INPUT button #1 for 7 seconds, then release to factory reset the unit to default settings.
- Press and hold INPUT button #4 for 7 seconds to start cycling through each input at a 1-minute rate
- Press and hold INPUT button #4 for 11 seconds to stop cycling through each input.
- The USB port can be used for firmware upgrades or powering external devices.
- The IR remote control supplied with the unit can be used to select the desired HDMI INPUT, MUTE the HDMI OUTPUT audio or turn the system on or off (Unit will always be ON after a power cycle).



## RS-232 and Telnet Commands

- 115200 baud, No Parity, 1 Stop Bit
- Telnet operation is via port # 6324 of the IP address setting.
- All commands are in ASCII format.
- Commands are NOT case sensitive.
- Each command must be terminated by a single character <CR> (0x0D)
- Unknown commands respond with “INVALID COMMAND”
- All responses are terminated with <CR><LF> (0x0D, 0x0A)

Command	Response	Function												
DN	Query Device Name	SW-HD-4A												
SWn <b>Where:</b> n = HDMI Input[1 to 4]	Switch to HDMI source	SWn <b>Where:</b> N = HDMI Input[1 to 4]												
SW?	Query switch state	SWn <b>Where:</b> N = HDMI Input[1 to 4]												
EMn <b>Where:</b> <table border="1" style="display: inline-table; vertical-align: top;"> <tr> <th>n</th> <th>Mode</th> </tr> <tr> <td>0</td> <td>Pass-through</td> </tr> <tr> <td>1</td> <td>Static</td> </tr> </table>	n	Mode	0	Pass-through	1	Static	Set EDID Mode	EMn <b>Where:</b> <table border="1" style="display: inline-table; vertical-align: top;"> <tr> <th>n</th> <th>Mode</th> </tr> <tr> <td>0</td> <td>Pass-through</td> </tr> <tr> <td>1</td> <td>Static</td> </tr> </table>	n	Mode	0	Pass-through	1	Static
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<b>HDI?</b>	Query HDMI Input Status  THIS COMMAND NOT AVAILABLE IN TELNET SESSION	<b>HDIn,m</b> <b>Where:</b> n = HDMI Input [1 to 4]  m = HDMI State <table border="1"> <thead> <tr> <th>m</th> <th>State</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Source not Connected</td> </tr> <tr> <td>?</td> <td>State Unknown</td> </tr> <tr> <td>1</td> <td>Source Connected</td> </tr> <tr> <td>2</td> <td>HDCP1.4 Encrypted</td> </tr> <tr> <td>3</td> <td>HDCP2.2 Encrypted</td> </tr> </tbody> </table>	m	State	0	Source not Connected	?	State Unknown	1	Source Connected	2	HDCP1.4 Encrypted	3	HDCP2.2 Encrypted																								
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n	Mode							
0	Lock OFF							
1	Lock ON							
IPCONFIG	Show current IP, Subnet Mask and Gateway addresses  THIS COMMAND NOT AVAILABLE IN TELNET SESSION	IP : xxx.xxx.xxx.xxx MASK : xxx.xxx.xxx.xxx GATEWAY: xxx.xxx.xxx.xxx						
IP [IPv4 Address]	Set IP Address	xxx.xxx.xxx.xxx [IPv4 Address]						
IP?	Query IP Address	xxx.xxx.xxx.xxx [IPv4 Address]						
SN [IPv4 Address]	Set Subnet	xxx.xxx.xxx.xxx [IPv4 Address]						
SN?	Query subnet	xxx.xxx.xxx.xxx [IPv4 Address]						
GW [IPv4 Address]	Set Gateway	xxx.xxx.xxx.xxx [IPv4 Address]						
GW?	Query Gateway	xxx.xxx.xxx.xxx [IPv4 Address]						
FW	Query Firmware Version	V1.0						
FD	Factory Default	Factory Default SW-HD-4A V1.0						
REBOOT	Reboots the unit	REBOOT SW-HD-4A V1.0						
PWn  Where: n = 0 = Output Blanked, all LEDs off n = 1 = Output On, Selected input active	Simulates a power condition	PWn  Where: n = 0 = Output Blanked, all LEDs off n = 1 = Output On, Selected input active						

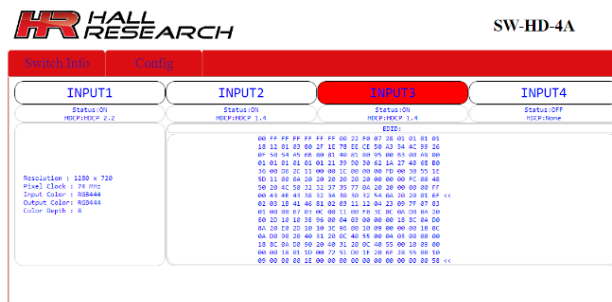
## Web GUI Operation

As shipped from the factory (or after factory default reset), the SW-HD-4A IP address is set for a **static IP address of 192.168.0.88** and a **static GW (Gateway) address of 192.168.0.1**.

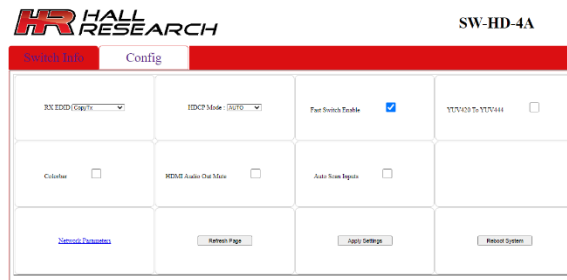
Use RS-232 terminal software to find the currently assigned IP and GW addresses (and to also set them as desired).

### SW-HD-4A internal Web pages (Web GUI)

- Access the SW-HD-4A Webpage with any compatible browser at the IP address found above. The browser will open with the devices Switch Info tab displayed. Click the tabs at the top of the screen to access the other tabs.
- Switch Info Tab



- INPUT 1 thru INPUT 4
    - Shows the currently selected HDMI input.
    - Click the desired INPUT button to select that HDMI input.
  - The following information is also shown.
    - HDMI Input Status (ON or OFF)
    - HDMI HDCP Input State (None, HDCP 1.4 or HDCP 2.2)
    - Resolution
    - Pixel Clock
    - Output Color Space
    - Color Bit Depth
    - EDID presented to the HDMI Input based on the configuration setting.
- CONFIG Tab



- RX EDID
  - Controls the EDID selection presented to each of the HDMI inputs.
- HDCP Mode
  - Controls the HDMI Output HDCP setting.
- Fast Switch Enable
  - Controls the Fast Switch configuration. This defaults to ON.
- YUV/420 to YUV/444
  - Controls whether the HDMI Input color space is converted to YUV/444 on the HDMI Output
- Color bar
  - Controls whether a Color Bar pattern is sent to the HDMI OUTPUT
- HDMI Audio Out Mute
  - Controls whether the HDMI OUTPUT Audio is muted or not.
- Auto Scan Inputs
  - Controls whether the HDMI Inputs are automatically switched at a 1-minute cycle rate.
- Network Parameters
  - Used to set the network IP, Subnet, and Gateway
- Refresh Page
  - Click this button to update the webpage settings.
- Apply Settings

- Click this button to apply any changes to the webpage settings.
- Reboot System
  - Reboots the system.

## Input Channel Scanning

The SW-HD-4A can automatically cycle through each of the connected HDMI Inputs.

In this mode, each HDMI Input is displayed for 1 minute before changing to the next HDMI input.

Auto-scan Mode can be enabled and disabled by external command (Web GUI), or via the front panel pushbuttons.

- To enable from front panel, press and hold INPUT#1 button for 7 seconds. After releasing the INPUT button, the scanning will start automatically.
- To disable from front panel, press and hold INPUT#1 button for 11 seconds. After releasing the INPUT button, the scanning will be stopped.
- To enable or disable from WebGUI, select, or deselect the “Auto Scan Inputs” option. Then select “Apply Settings” in Config tab.

### 4.4 Front Panel Lock

Front panel buttons of SW-HD-4A can be locked via the Web GUI, RS-232, or Telnet to prevent users from switching or changing modes.

When the front panel lock is enabled, attempts to change the input selection from the front panel will be ignored.

Note that changes via RS-232, Web GUI and IR Remote control still change the settings.

To re-enable the front panel buttons, send the un-lock or factory default command to the unit from the Web GUI, RS-232, or via Telnet.

## Factory Default

If the INPUT #4 button is pressed and held for 7 seconds when the unit is operational with the power already applied, the system parameters are reset to the FACTORY DEFAULT values.

## EDID Settings

The EDID settings can only be changed using RS-232, Telnet, or the Web GUI.

Two settings affect how the EDID is presented to the HDMI source devices. EMx and EDx.

- The default EDID mode (EM0) is to **pass** the EDID of the SINK connected to the HDMI OUTPUT to the HDMI INPUT connectors.
  - If the EDID mode is set to EM1, the static emulated EDID selected below is used.

- If there is no SINK device connected to the HDMI OUTPUT connector, an emulated EDID (EDx) is presented to the SOURCE device connected to the HDMI INPUT connectors.

The table below lists each of the emulated EDID tables available.

EDID Setting (EDx)	EDID	Description
0	4K2K@60 2 CH	Built-In EDID with Deep color, 2D3D/ PCM audio format / 4K2K native resolution
1	4K2K@60 AC3	Built-In EDID with Deep color, 2D3D/ AC3 Digital audio format / 4K2K native resolution
2	4K2K@60 4:2:0 2 CH	Built-In EDID with Deep color, 2D3D/ PCM audio format / 4K2K 4:2:0 native resolution
3	4K2K@60 4:2:0 AC3	Built-In EDID with Deep color, 2D3D/ AC3 Digital audio format / 4K2K 4:2:0 native resolution
4	1080P@60 2 CH	Built-In EDID with 8-bit color depth, 2D3D/ PCM audio format / 1080p native resolution
5	1080P@60 AC3	Built-In EDID with 8-bit color depth, 2D3D/ AC3 Digital audio format / 1080p native resolution
6	720P@60 2 CH	Built-In EDID with 8-bit color depth/ 2D3D/ PCM audio format/ 720p native resolution
7	720P@60 AC3	Built-In EDID with 8-bit color depth, 2D3D/ AC3 Digital audio format/ 720p native resolution

## Troubleshooting

There are no field serviceable parts or circuits in the device. Opening the unit will void the warranty.

## Contacting Hall Technologies

If you determine that the SW-HD-4A is malfunctioning, do not attempt to repair the unit instead, contact Hall Research Technical Support at 800-959-6439 or support@haltechav.com.

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.

## 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.

## Specifications

Video	
Video Resolution	HDTV signal 480i through 4K/60 4:4:4 DVI//PC signal VGA (640x480) thru WQXGA@30
Video Bandwidth	Up to 18 Gbps total
Audio Standards	LPCM 2/5.1/7.1 CH, Dolby Digital 2-5.1 CH, DTS 2-5.1 CH, Dolby TrueHD and DTS-HD Master Audio
Video Connectors	HDMI (4x INPUT, 1x OUTPUT)
Audio Connectors	3.5 mm Stereo Analog Optical SPDIF Digital (TOSLINK)
Other Signals	(1) RX, TX and GND on Terminal Strip RS-232 Baud Rate: 115200, N, 8, 1 USB-Mini for firmware update (1) RJ45 LAN
ESD Protection	Human Body model: 8 kV (air-gap discharge) 4 kV (contact discharge)

General	
Dimensions	Product: 7.96" (202 mm) W x 2.96" (75 mm) D x 1.15" (29 mm) H Shipping: 12" W x 10" D x 4" H
Weight	Product: 0.95 lbs (0.43 kg)

General	
	Shipping: 2.4 lbs (1.09 kg)
Enclosure	Metal
Operating Temperature	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, non-condensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, non-condensing
MTBF	90,000 hours calculated estimate
Warranty	3 years parts and labor
IR Remote Protocol	NEC or NEC Extended
IR Mute ON/OFF	0x00, 0xBF, 0x00, 0xFF
IR Power ON/OFF	0x00, 0xBF, 0x02, 0xFD
IR Input #1	0x00, 0xBF, 0x09, 0xF6
IR Input #2	0x00, 0xBF, 0x0D, 0xF2
IR Input #3	0x00, 0xBF, 0x11, 0xEE
IR Input #4	0x00, 0xBF, 0x15, 0xEA



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