

# LBS-41H2

Link Bridge™ 4x1 HDMI 2.0 Switcher



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# **SAFETY INSTRUCTIONS AND COMPLIANCE DECLARATIONS**

PLEASE OBSERVE THE FOLLOWING SAFETY  
PRECAUTIONS

## **SURGE PROTECTION DEVICE RECOMMENDED**

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

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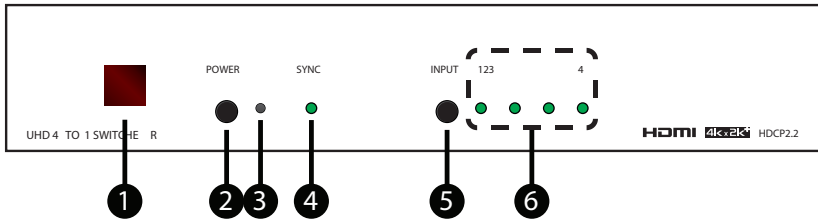
## 1.0 PRODUCT DESCRIPTION

### FEATURES

- An 4x1 (LBS-41H2) HDMI 2.0 switcher with HDCP 2.2 compliance
- Supports video resolutions up to 3840x2160@60Hz & 4096x2160@60Hz with 4:4:4 YUV and HDR format
- Supports pass-through of audio formats including LPCM 2.0~7.1, Dolby Digital, DTS, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos and DTS-HD Master Audio
- Supports configurable EDID management via pre-defined internal EDIDs and user-defined EDID selections
- Multiple control interfaces including RS-232, Telnet, WebGUI and IR remote

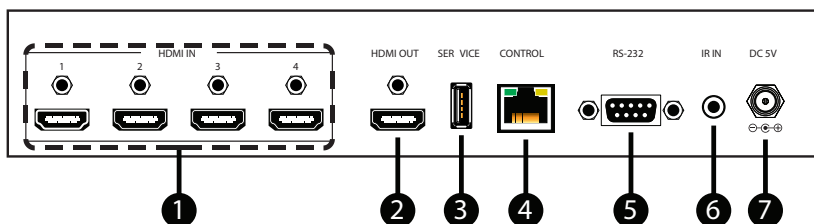
## 2.0 OPERATION CONTROLS AND FUNCTIONS

### 2.1 Front Panel



1. **IR WINDOW:** Accepts IR signals from the included IR remote for control of this unit only.
2. **POWER:** Press this button to power on the unit or place it into standby mode.  
*Note: Ethernet and RS-232 remain active while the unit is in stand by mode.*
3. **POWER LED:** The LED will illuminate RED to indicate the unit is receiving power but is in stand-by mode. It will illuminate GREEN to indicate that the unit has been turned on.
4. **SYNC LED:** This LED will illuminate GREEN when a stable connection with an output device is detected.
5. **INPUT:** Press this button to sequentially switch through the 4 available inputs.
6. **INPUT LED 1~4:** These LEDs will illuminate GREEN to indicate which of the 4 sources are currently selected.

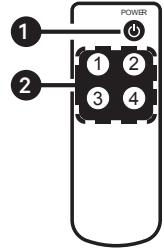
## 2.2 Rear Panel



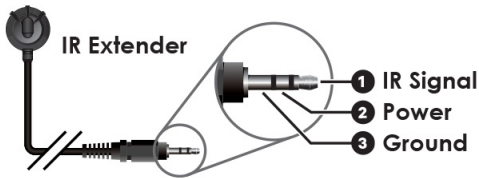
1. **HDMI IN 1~4:** Connect to HDMI source equipment such as a media player, game console or set-top box. DVI source equipment may be connected by using an HDMI to DVI adapter.
2. **HDMI OUT:** Connect to HDMI TVs, monitors or amplifiers for digital video and audio output. DVI display equipment may be connected by using an HDMI to DVI adapter.
3. **SERVICE:** This slot (USB 2.0) is reserved for firmware update use only.
4. **CONTROL:** Connect directly, or through a network switch, to your PC/laptop to control the unit via Telnet/WebGUI.
5. **RS-232:** Connect directly to your PC/laptop to send RS-232 commands to control the unit.
6. **IR IN:** Connect to the provided IR Extender to extend the IR control range of the unit. Ensure that the remote being used is within direct line-of-sight of the IR Extender.
7. **DC 5V:** Plug the 5V DC power adapter into the unit and connect it to an AC wall outlet for power.

### 3.0 REMOTE CONTROL

1. **POWER:** Press this button to power on the unit or place it into stand-by mode.
2. **INPUT 1~4:** Press 1 through 4 to select the input source.



#### 3.1 IR Cable Pin Assignments



### 4.0 RS-232 PIN ASSIGNMENT

UNIT			REMOTE SYSTEM	
Pin	Definition		Pin	Definition
1	NC		1	NC
2	TxD		2	RxD
3	RxD		3	TxD
4	NC	▶	4	NC
5	GND	◀	5	GND
6	NC		6	NC
7	NC		7	NC
8	NC		8	NC
9	NC		9	NC

**Baud Rates:** 115200bps  
**Data Bits:** 8  
**Parity Bits:** None  
**Stop Bit:** 1  
**Flow Control:** None



## 4.1 RS-232 AND TELNET COMMANDS

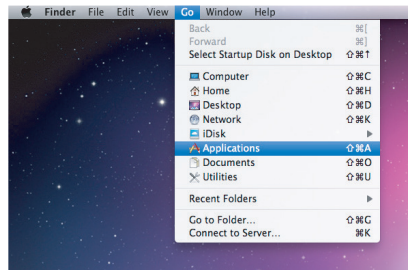
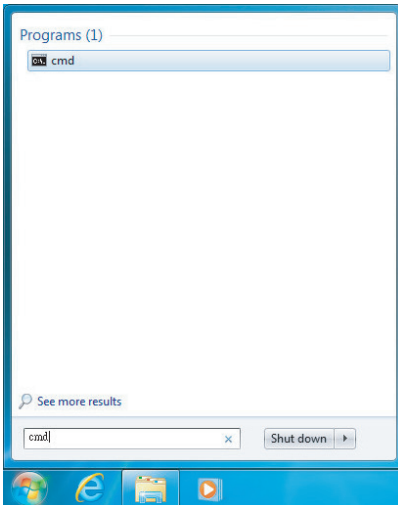
COMMAND	DESCRIPTION AND PARAMETERS
<b>HELP</b>	Displays all available commands.
<b>?</b>	Displays all available commands.
<b>P0</b>	Turn unit's power off. (Stand-by mode)
<b>P1</b>	Turn unit's power on.
<b>INNAME N1 N2</b>	Set the name of input N1 to N2. N1 = 1~4 [Input number] N2 = {name} [8 characters max]
<b>INNAME N1</b>	Show the input name of N1. N1 = 1~4 [Input number]
<b>INNAME</b>	Show the names of all inputs.
<b>OUTNAME N1</b>	Set the output name to N1. N1 = {name} [8 characters max]
<b>OUTNAME</b>	Show the current output name.
<b>OUT N1</b>	Set the input to be routed to the output. N1 = 1~4 [Input number]
<b>OUT</b>	Show the current input routing.
<b>SOURCEDET</b>	Show all source information.
<b>SINKINFO</b>	Show all sink information.
<b>HDCPIN N1 N2</b>	Set the HDCP mode for input N1. N1 = 1~4 [Input number] Available values for N2: 0 [Standard] 1 [Apple Mode]
<b>HDCPIN N1</b>	Show the HDCP settings for input N1. N1 = 1~4 [Input number]
<b>HDCPIN</b>	Show all current HDCP input settings.

COMMAND	DESCRIPTION AND PARAMETERS
<b>EDIDMODE N1</b>	Set the EDID mode.  Available values for N1: 0 [Appoint] 1 [All]
<b>EDIDMODE</b>	Show the current EDID mode setting.
<b>EDIDALL N1</b>	Set the EDID to use in "All" mode.  Available values for N1: 0 [SINK] 1 [720P] 2 [1080P] 3 [4K_3G] 4 [4K_Y420] 5 [4K_6G]
<b>EDIDALL</b>	Show the current EDID selection for "All" mode.
<b>EDIDIN N1 N2</b>	Set the EDID to use on input N1 in "Appoint" mode.  N1 = 1~4 [Input number]  Available values for N2: 0 [SINK] 1 [720P] 2 [1080P] 3 [4K_3G] 4 [4K_Y420] 5 [4K_6G]
<b>EDIDIN N1</b>	Show the current EDID selection for input N1 in "Appoint" mode.
<b>EDIDIN</b>	Show the current EDID selections for all inputs in "Appoint" mode.

COMMAND	DESCRIPTION AND PARAMETERS
<b>AUTO_SWITCH N1</b>	Enable or disable auto switching mode.  Available values for N1: 0 [Disabled] 1 [Enabled]
<b>AUTO_SWITCH</b>	Show current auto switching mode status.
<b>FADEFAULT</b>	Reset the unit to the factory defaults.
<b>REBOOT</b>	Reboot the unit.
<b>VER</b>	Show the unit's current firmware version.
<b>IPCONFIG</b>	Show the current IP configuration.
<b>SIPADDR N1</b>	Set the static IP Address.  N1 = X.X.X.X [X = 0~255]
<b>SNETMASK N1</b>	Set the Ethernet netmask.  N1 = X.X.X.X [X = 0~255]
<b>SGATEWAY N1</b>	Set the Ethernet gateway.  N1 = X.X.X.X [X = 0~255]
<b>HTTPPORT N1</b>	Set the HTTP port.  N1 = 0~65535
<b>TELNETPORT N1</b>	Set the Telnet port.  N1 = 0~65535
<b>IPMODE N1</b>	Set the current IP address mode.  Available values for N1: 0 [Static IP] 1 [DHCP]
<b>READMAC</b>	Show the unit's MAC address.
<b>UPDATE</b>	Update firmware.

## 4.2 TELNET CONTROL

Before attempting to use Telnet control, please ensure that both the unit and the PC/Laptop are connected to the same active networks. To access Telnet in Windows 7, click on the “Start” menu and type “cmd” in the search field, then press “Enter”. Under Windows XP go to the “Start” menu, click on “Run”, type “cmd” then press “Enter”. Under Mac OS X, go to “Go-Applications-Utilities-Terminal”. See below for reference.



Once in the CLI (Command Line Interface) type “Telnet” followed by the IP address of the unit and “23”, then hit “Enter”.

```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>telnet 192.168.1.50 23
```

This will connect us to the unit we wish to control. Type “help” to list the available commands.

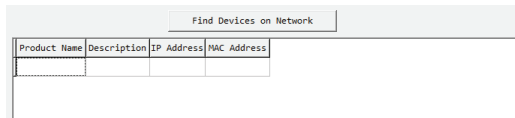
Notes:

- Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive.
- If the IP address is changed then the IP address required for Telnet access will also change accordingly.

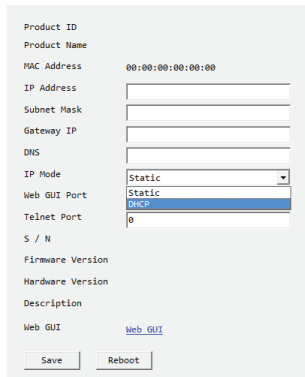
## 4.3 GUI CONTROL

### Device Discovery APP

Please obtain the “Device Discovery” software from your authorized dealer and save it in a directory where you can easily find it. Connect the unit and your PC/Laptop to the same active network and execute the “Device Discovery” software. Click on “Find Devices on Network” and a list of devices connected to the local network will show up indicating their current IP address. (The unit’s default IP address is 192.168.1.50)



By clicking on one of the listed devices you will be presented with the network details of that particular device.



The screenshot shows a network configuration page. The fields are as follows:

- Product ID: [Empty]
- Product Name: [Empty]
- MAC Address: 00:00:00:00:00:00
- IP Address: [Empty]
- Subnet Mask: [Empty]
- Gateway IP: [Empty]
- DNS: [Empty]
- IP Mode: Static (selected in dropdown)
- Web GUI Port: Static (selected in dropdown)
- Telnet Port: 0
- S / N: [Empty]
- Firmware Version: [Empty]
- Hardware Version: [Empty]
- Description: [Empty]
- Web GUI: [Web GUI](#)
- Buttons: Save, Reboot

- **IP Mode:** If you choose, you can alter the static IP network settings for the device, or switch the unit into DHCP mode to automatically obtain proper network settings from a local DHCP server. To switch to DHCP mode, please select DHCP from the IP mode drop-down, then click “Save” followed by “Reboot”.
- **WebGUI:** Once you are satisfied with the network settings, you may use them to connect via Telnet or WebGUI. The network information window provides a convenient link to launch the WebGUI directly.

## 4.4 WEBGUI CONTROL PAGE

All functions, including power, input selection, EDID management, HDCP management, port naming, Ethernet settings, and reset/ firmware functions, are presented on a single web page to allow for simple and intuitive operation. The individual functions will be explained in the following sections.

The screenshot displays the web GUI control page for the LBS-41H2 switcher, organized into several functional tabs:

- POWER:** A dropdown menu set to 'ON'.
- ROUTING:** An 'Output From:' dropdown menu set to 'INPUT1'.
- SOURCE DETECT:** Four checkboxes for INPUT1, INPUT2, INPUT3, and INPUT4, all currently set to 'OFF'.
- STATUS:** Displays 'HDMI OUT: INPUT1' and 'VERSION: V2.4', with 'RESET' and 'REBOOT' buttons.
- EDID:** 'Mode:' dropdown set to 'ALL' and 'EDID ALL:' dropdown set to '8/2D/PCM/1080p'.
- HDCP CONTROL:** Four dropdown menus for INPUT1, INPUT2, INPUT3, and INPUT4, all set to 'Standard'.
- FIRMWARE UPDATE:** 'BROWSE' and 'UPDATE' buttons.
- NAMING:** Input fields for INPUT1, INPUT2, INPUT3, INPUT4, and OUTPUT, with a 'SAVE' button.
- NETWORK SETTING:** Fields for MAC, IP Mode (STATIC), IP Address (192.168.1.50), Net Mask (255.255.255.0), Gateway (192.168.1.254), HTTP Port (80), and Telnet Port (23), with an 'APPLY' button.
- HDMI OUT INFO:** A summary of current settings: Type: HDMI, Manuf. Name: STD, Native Resolution: 1920x1080p, Color Depth: 8 10 12-Bits, 3D: YES, 4K2K: NO, Audio Format: PCM/BitStream.

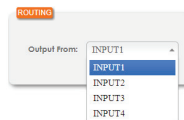
### 1. Power

The unit can be powered on or off (stand-by mode) from this tab.



### 2. Routing

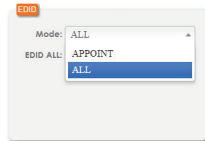
This tab allows for the selection of the input source. Four HDMI inputs are available for selection.



### 3. EDID

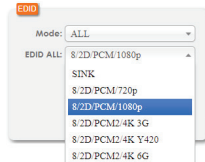
This tab controls EDID management for the unit. All inputs can share the same assigned EDID, or each input can have a discrete EDID assigned to it.

- **ALL:** Selecting the “ALL” mode will send the selected EDID to all inputs.
- **APPOINT:** Selecting the “APPOINT” mode allows for each input to have a different EDID assigned to it.



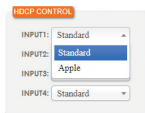
#### The available EDID options are:

- **SINK:** EDID is passed from the currently connected display
- **8/2D/PCM/720p:** 720p@60Hz, 8-bit & LPCM 2.0
- **8/2D/PCM/1080p:** 1080p@60Hz, 8-bit & LPCM 2.0
- **8/2D/PCM2/4K 3G:** 4K@30Hz, 8-bit & LPCM 2.0
- **8/2D/PCM2/4K Y420:** 4K@60Hz (4:2:0), 8-bit & LPCM 2.0
- **8/2D/PCM/4K 6G:** 4K@60Hz (4:4:4), 8-bit & LPCM 2.0



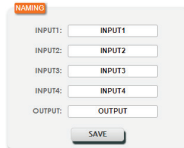
### 4. HDCP Control

This tab allows for the HDCP mode to be switched between “Standard” and “Apple” mode. “Apple” mode allows for the display of non-HDCP required content from Apple devices on non-HDCP displays. This setting can be assigned individually to each input.



## 5. Naming

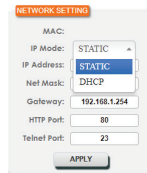
This tab allows for the renaming of the four HDMI input ports and the HDMI output port. Please click the “SAVE” button to store the changes.



The screenshot shows a configuration window titled "NAMING" with a light gray background. It contains five input fields, each with a label on the left and a text box on the right. The labels are "INPUT1:", "INPUT2:", "INPUT3:", "INPUT4:", and "OUTPUT:". The text boxes contain the words "INPUT1", "INPUT2", "INPUT3", "INPUT4", and "OUTPUT" respectively. At the bottom center of the window is a "SAVE" button.

## 6. Network Setting

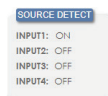
This tab provides control over the unit’s network settings. The IP mode can be set to “DHCP” for automatic IP configuration, if your local network supports it, or it can be placed in “Static” mode and the IP address, netmask and gateway can be defined manually. The HTTP and Telnet ports can also be changed from their defaults here.



The screenshot shows a configuration window titled "NETWORK SETTING" with a light gray background. It contains several fields: "MAC:" (empty), "IP Mode:" (a dropdown menu with "STATIC" selected), "IP Address:" (a dropdown menu with "STATIC" selected), "Net Mask:" (a dropdown menu with "DHCP" selected), "Gateway:" (a text box containing "192.168.1.254"), "HTTP Port:" (a text box containing "80"), and "Telnet Port:" (a text box containing "23"). At the bottom center is an "APPLY" button.

## 7. Source Detect

When a live input source is connected one of the 4 HDMI inputs the corresponding input port in this tab will display “ON”. If no source is detected on that input, it will display “OFF”.



The screenshot shows a configuration window titled "SOURCE DETECT" with a light gray background. It contains four lines of text: "INPUT1: ON", "INPUT2: OFF", "INPUT3: OFF", and "INPUT4: OFF".



## 8. Status

This tab displays the currently selected HDMI input source and the unit's firmware version as well as allowing for resetting or rebooting the unit.

- **RESET:** To perform a factory reset on the unit, please click the "RESET" button.
- **REBOOT:** To reboot the unit, please click "REBOOT" button.



## 9. Firmware Update

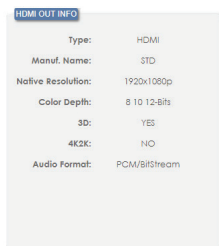
This tab provides a way to update the firmware of the unit.

- **BROWSE:** Click the "BROWSE" button to select the firmware update\*.bin file which is located on your local PC.
- **UPDATE:** Click the "UPDATE" button to begin the firmware update process.



## 10. HDMI Out Info

The HDMI output display's detected information is listed here, including type, manufacturer name, native resolution, color depth, 3D support, 4K support and audio format support.



## 5.0 SPECIFICATIONS

### SWITCHER

Array Size	4x1 (LBS-41H2)
Input	Four (4) HDMI 2.0 ports
Output	One (1) or Two (2) HDMI 2.0 ports
Control	LAN, RJ45 RS-232 (1), DB-9 IR
Service	USB, for firmware upgrade

### PHYSICAL

Dimension (WxDxH)	9.45" x 4.10" x 1.70"
Operating Temperature	0°C to 40°C
Storage Temperature	-20°C to 60°C
Power Supply	5V@2.6A

## 6.0 SERVICE PROCEDURE

### 6.1 REPLACEMENT POLICY

Standard products found defective on arrival (DOA) will be replaced, based on availability, within 24 to 48 hours anywhere in the U.S. Please call Customer Service at 800-214-0222 for information.

### 6.2 RETURN/REPAIR SERVICE

The LBS-41H2 System contains no user serviceable components. If you have a problem with your unit, please contact the Customer Service Department. To facilitate our return/ repair processing please contact Broadata Communications, Inc. to obtain a Return Material Authorization (RMA). Please include the following information:

- Product model number
- Serial Number
- Complete description of problem
- Hardware installation description

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e-mail: [CustomerService@Broadatacom.com](mailto:CustomerService@Broadatacom.com)  
Website: [www.broadatacom.com](http://www.broadatacom.com)

## **7.0 LIMITED WARRANTY**

Broaddata Communications, Inc. (BCI) warrants, for a period of one year from date of shipment, each product sold shall be free from defects in material and workmanship. BCI will correct, either by repair, or at BCI's election, by replacement, any said products that in our sole discretion prove to be defective and are returned to the manufacturing location within 30 days after such defect is ascertained. All warranties are limited to defects arising under normal use and do not include malfunctions or failure resulting from misuse, abuse, neglect, alterations, electrical power problems, usage not in accordance with product instructions, improper installation, or damage determined by BCI to have been caused by the Buyer or repair made by a third party. Limited warranties granted on products are to the initial customer end-user and are not transferable.

OUR LIABILITY UNDER THIS WARRANTY SHALL IN ANY CASE BE LIMITED TO THE INVOICE VALUE OF THE PRODUCT SOLD AND BCI SHALL NOT BE LIABLE TO ANYONE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES ARISING FROM THE USE OF ITS PRODUCTS OR THE SALE THEREOF. We make NO WARRANTY AS TO THE MERCHANTABILITY OF ANY GOODS, OR THAT THEY ARE FIT FOR ANY PARTICULAR PURPOSE OR END APPLICATION NOR DO WE MAKE ANY WARRANTY, EXPRESSED OR IMPLIED OTHER THAN AS STATED ABOVE.

## 8.0 APPENDIX - VIDEO SPECIFICATIONS

Supported PC Resolutions (Hz)	Input	Output
640 x 480@60/72/75	✓	✓
800 x 600@60/72/75	✓	✓
1024 x 768@60/70/75	✓	✓
1280 x 768@60	✓	✓
1280 x 1024@60	✓	✓
1360 x 768@60	✓	✓
1600 x 1200@60	✓	✓
1920 x 1200@60 (RB)	✓	✓

Supported TV Resolutions (Hz)	Input	Output
480i@60	✓	✓
576i@50	✓	✓
480p@60	✓	✓
576p@50	✓	✓
720p@50/60	✓	✓
1080i@50/60	✓	✓
1080p@24/25/30/50/60	✓	✓
3840x2160p@50/60 (4:2:0)	✓	✓
4096x2160p@50/60 (4:2:0)	✓	✓
3840x2160p@24/25/30/50/60	✓	✓
4096x2160p@24/50/60	✓	✓

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Website: [www.broadatacom.com](http://www.broadatacom.com)



6000-LBS41H2