

LBS-1616

LINK BRIDGE™ UNIVERSAL
16X16 OPTICAL/DVI/HDMI
MATRIX SWITCH



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SAFETY INSTRUCTIONS AND COMPLIANCE DECLARATIONS

PLEASE OBSERVE THE FOLLOWING SAFETY PRECAUTIONS AS OUR
PRODUCTS CONTAIN
CLASS I LASER PRODUCTS

WARNING

This product is a **CLASS I LASER PRODUCT** only when the units are connected with a fiber optical cable. Do not disconnect the fiber optic connector while the unit is powered up. Exposure to laser radiation is possible when the laser fiber optic connector is disconnected while the unit is powered up. It should be noted that when the fiber is disconnected, the product will have **CLASS IM INVISIBLE LASER RADIATION**.

Although the fiber optic connectors in this product emit only Class 1 energy that is below the levels considered to be hazardous, one should never stare directly into a fiber optic connector or an unconnected fiber end unless one can be certain that no exposure to laser energy could occur.



CAUTION

Only service personnel are intended to access the interior of the units. It should be cautioned that **CLASS 3 INVISIBLE LASER RADIATION WHEN OPEN, AVOID EXPOSURE TO THE BEAM**. The use of controls, making adjustments, or performing operations other than those specified may result in hazardous radiation exposure. This product has operating wavelengths at 778nm, 800nm with average -0.5dB to 0dBm optical power per wavelength, 825nm, 911nm, and 980nm. The laser is operated in pulse mode within 1 KHz frequency and ¼ duty cycle.

The following label or equivalent is located on the surface of laser products. This label indicates that the product is classified as a **CLASS 1 LASER PRODUCT**.



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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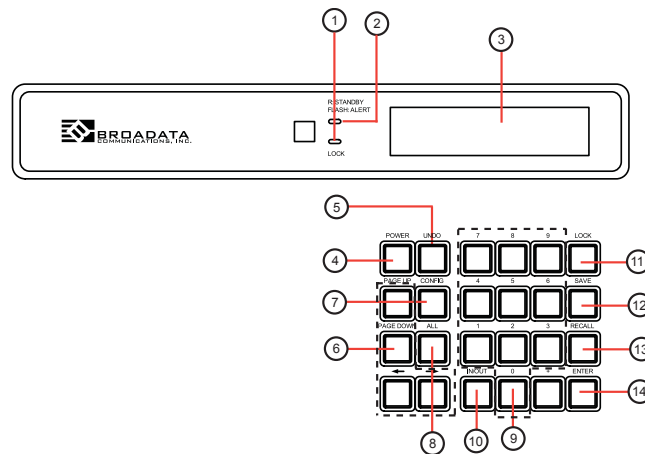
1.0 PRODUCT DESCRIPTION

The LBS Series is a high performance Link Bridge™ Universal Matrix Switcher System that provides up to 16x16 video switching for HDMI/DVI signals. It supports 12-bit deep color resolutions up to 1080p and 1920x1200@60Hz with multi-channel digital audio, such as LPCM 7.1CH, Dolby TrueHD, Dolby Digital Plus and DTS-HD. Standard versions of the LBS support all optical switching, or hybrid optical/electrical switching, for HDMI/DVI signals. When configured for optical switching, only one fiber is required per input or output port. In addition, the distance between the switch and HDMI/DVI devices can be up to 400m when connected by fiber cable. The I/O ports in the LBS can be configured in multiples of 8, thus supporting 8x8, 8x16, up to 16x16 matrix size. Appendix B describes the I/O cards available for LBS Universal Matrix Switcher. The LBS comes in a 3-RU packaging design, and has option for single or dual power supply.

The LBS supports jitter-free, high-quality HDMI/DVI Display with several EDID functions for independent display resolution at per-port basis. Types of switching control available: manual control panel, standard RS-232, or Ethernet Web GUI and Telnet control.

2.0 OPERATION CONTROLS AND FUNCTIONS

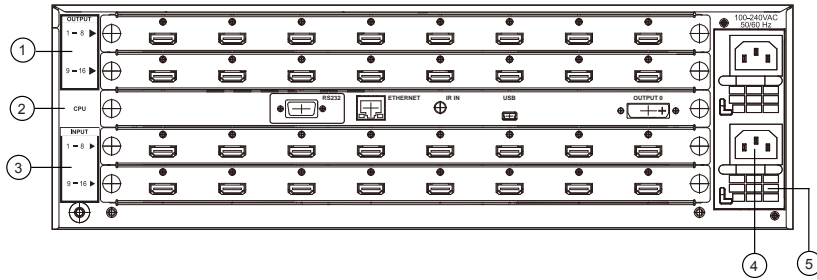
2.1 Front Panel



- 1 **LOCK LED:** This LED will illuminate when the on-panel key functions is set to lock.
- 2 **POWER LED:** This red LED will illuminate when the device is set to standby mode, when it is flashing it means the temperature inside is too high and air circulation is highly suggested.
- 3 **LCD:** Displays the setting information of each input and output and other setting information according to the selection.
- 4 **POWER:** Press this button to turn on the device or to set it to standby mode.
- 5 **UNDO:** Press this button to return back/exit the current selection.
- 6 **PAGE UP, PAGE DOWN, ◀, ▶:** Use these buttons to flip the LCD's page for displaying the current I/O status or when entering into the menu for detail selection.

- 7 **CONFIG:** Press this button to enter into the menu selections of
 - A. EDID Setting
 - Standard EDID: Use the built-in EDID which supports video up to 1080p@60/WUXGA@60Hz.
 - Auto EDID: based on the TV/Display's EDID of the lowest connected output port.
 - Manual EDID: Support independent EDID by assigning the selected input port to the selected output port.
 - B. IP Configuration
 - 1. IP address,
 - 2. Netmask,
 - 3. Gateway.
 - C. Temperature
 - T1, T2: these figures shows the temperature inside the device.
 - D. LCD Contrast Range from 1~4
- 8 **ALL:** Press this button to select all outputs to one input.
- 9 **0~9:** Press these numbers when selecting input output ports.
- 10 **IN/OUT:** Press this button to select input source to switch to output display. The sequence should be IN/OUT-number of input source-IN/OUT-number of output display-Enter. (This button works only under In/Out function)
- 11 **LOCK:** Press this button to lock all the function buttons on panel. To unlock, press and hold lock button for 4 seconds.
- 12 **SAVE:** Press this button to save the present setting of the I/O. There are 10 pre-sets available for saving.
- 13 **RECALL:** Press this button to recall from the saving settings of 1~10.
- 14 **ENTER:** Press this button every time to confirm the setting or the selection.

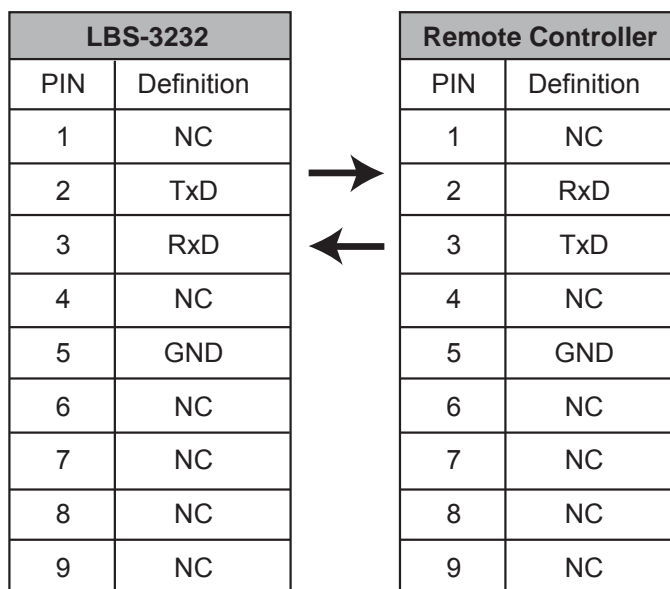
2.2 Rear Panel



- 1 **OUTPUT 1~16:** Connect HD/3D display TV/monitor with HDMI cables up to 16 displays.
- 2 **CPU**
 - a. USB: This port is reserved for firmware update only.
 - b. IR IN: Reserved.
 - c. ETHERNET: Connect to an active network line for LAN and Telnet/Web GUI control.
 - d. RS-232: Connect with D-Sub 9-pin cable from the PC/Control device for RS-232 control over the LBS-1616.
- 3 **INPUT 1~16:** Connect source equipment such as Blu-ray/PS3 players up to 16 devices with HDMI/optical cable.
- 4 **POWER & POWER Supply:** The device will automatically be placed on stand-by mode when the power supply is connected to AC power.
- 5 **Ventilation Fan:** This fan will automatically turn on when the device is switched ON. Do not block this port of the device or cover it with any object. Please allow adequate space around the unit for air circulation.

3.0 SWITCH CONTROL

3.1 RS-232 Pin Assignment



Default Port Settings
Baud Rate: 19.2K
Data Bits: 8
Parity Bits: None
Stop Bits: 1
Flow Control: None

3.2 RS-232 and Telnet Commands

Refer to Appendix A for full list of commands.

3.3 Telnet Control

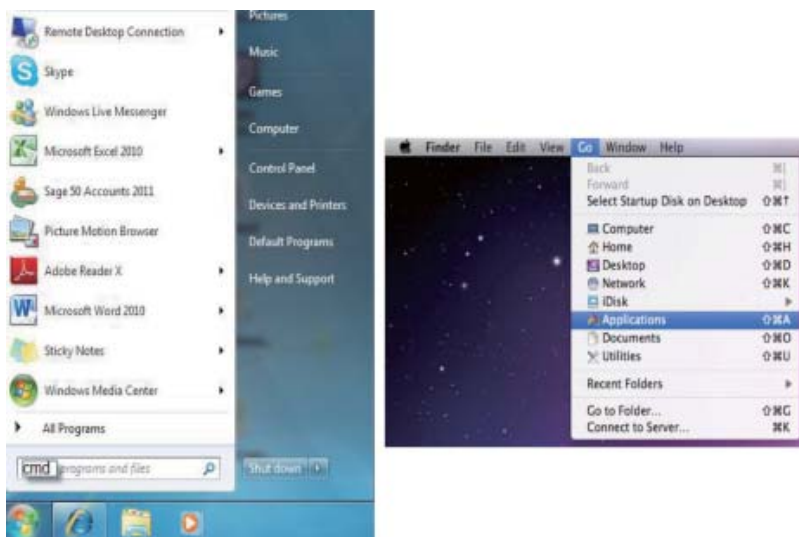
Before attempting to use the telnet control, please ensure that both the Matrix (via the 'LAN /CONTROL' port) and the PC/Laptop are connected to the active networks.

Note: Please do not connect both the Matrix and the PC/Laptop with a single CAT5e/6 cable together as it will not access the telnet function.

To access the telnet control 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 and click on "Run", type "cmd" with then press enter.

Under Mac OS X, go to Go-Applications-Utilities-Terminal. See below for reference.



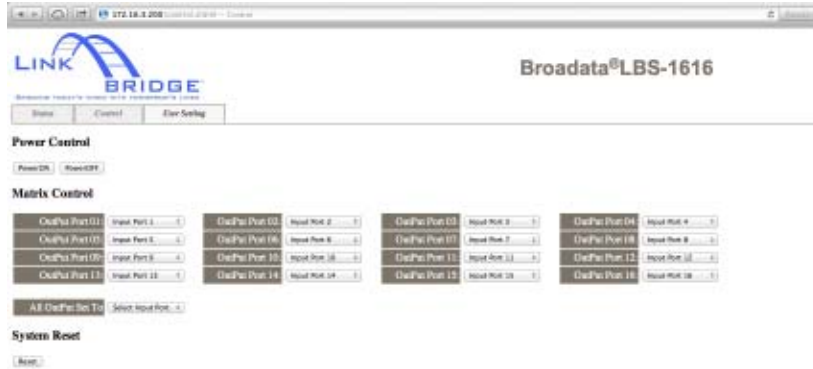
Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive. If the IP is changed then the IP Address required for Telnet access will also change accordingly.

3.4 Web GUI Control

On a PC/Laptop that is connected to the same active network as the Matrix, open a web browser and type device's IP address on the web address entry bar. The browser will display the device's status, control and User setting pages.



Click on the 'Control' tab to control power, input/output ports, EDID and reset mode.



Clicking on the 'User Setting' tab allows you to reset the IP configuration. The system will ask for a reboot of the device every time any of the settings are changed. The IP address needed to access the Web GUI control will also need to be changed accordingly on the web address entry bar.



4.0 SPECIFICATIONS

Matrix Switch

Array Size	Up to 16x16 (configurable by multiple of 8)
EDID Control	Built-in Internal Standard EDID

HDMI/DVI Ports*

Signal	Single Link DVI 1.1, HDMI 1.3
Resolution	Up to 1080p or 1920x1200@60Hz
Connector	DVI or HDMI Female Plugs
Protocol	EDID/DDC and HDCP Capable

HDBT Ports

Cable Type	CAT-5e/6 or higher
Connector	RJ-45

Fiber Ports

Fiber Type	Multimode 50um or 62.5um
Connector	SC
Protocol	EDID/DDC and HDCP Capable

Control

Manual	Panel Button
RS-232	DB-9, 19.2 kb/s
Ethernet	10/100Base-T for Web Browser, Telnet

Physical

Dimension (H x W x D)	5.25" x 19.0" x 13", Including chassis handle
Power Level	110 VAC~240VAC, 50/60Hz 450W (max.) with all optical ports 250W (max.) without optical ports
Operating Temperature	0 to +40°C
Humidity	0 to 90% RH, non-condensing

5.0 SERVICE PROCEDURE

5.1 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.

5.2 Return/Repair Service

The LBS-1616 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

Broadata Communications, Inc.
2545 West 237th Street, Suite K
Torrance, CA 90505
1-800-214-0222
(310) 530-1416
(310) 530-5958 (Facsimile)
e-mail: CustomerService@Broadatacom.com
Website: www.broadatacom.com

6.0 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.

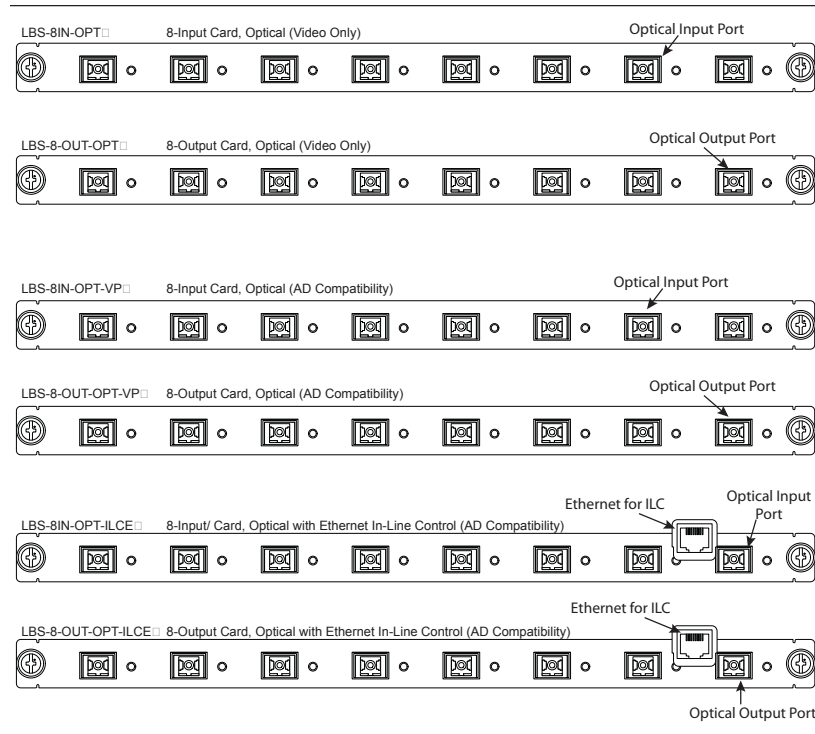
7.0 APPENDIX A

	LBS-1616 Serial Commands.	
	BCI Commands	Description
1	Px (x:0/1/?)	0=Power off,1=Power on,?=Return power status(0=OFF,1=ON)
2	RESET	System Reset.
3	ROUTE OUT xx IN yy(x:1~16,ALL;y:0~16)	Route Output x(0~16) to Input y(0~16)
4	HDCP xx y (x:1~16,ALL; y:1=Enable/0=Disable)	Set input HDCP Enable/Disable
5	SHOWHDCP	Show HDCP status of all inputs
6	MUTE x yy z(x:In/Out; y:0~16,ALL; z:1=On/0=Off)	Set video mute in Input/Output ports On/Off
7	STATUSMUTE x yy(x:In/Out; y:0~16, ALL)	Show video mute status of Input/Output ports
8	HPD xx y(x:1~16,ALL; y:1=High/0=Low)	Set Input HPD High/Low
9	STATUSHPD xx(x:1~16,ALL)	Show HPD status of input ports
10	SHOWTEMP	Show temperature sensor values T1, T2
11	STATUSROUTE x yy(x:In/Out; y:0~16,ALL)	Show Input/Output route status
12	STATUSEDIDMODE	Show all input EDID mode settings
13	STATUSEDIDPORT	Show all input EDID port assignments(Manual mode)
14	SETEDIDMODE xx y(x:1~16,ALL;y:1~3)	Set input EDID mode: 1=Internal/2=Auto/3=Manual
15	SETEDIDPORT xx yy(In x:1~16,ALL;Out y:0~16)	Set EDID of Input x to Out y(Manual mode)
16	ACTIVE x (x:In/Out)	Show all active Input/Output ports
17	INDETECT	Show all detected Input ports
18	OUTDETECT	Show all detected output ports
19	IRMASKOUT : x y z(x:SINK/SRC, y:1~16/ALL z:0/1)	Set output board IR mask

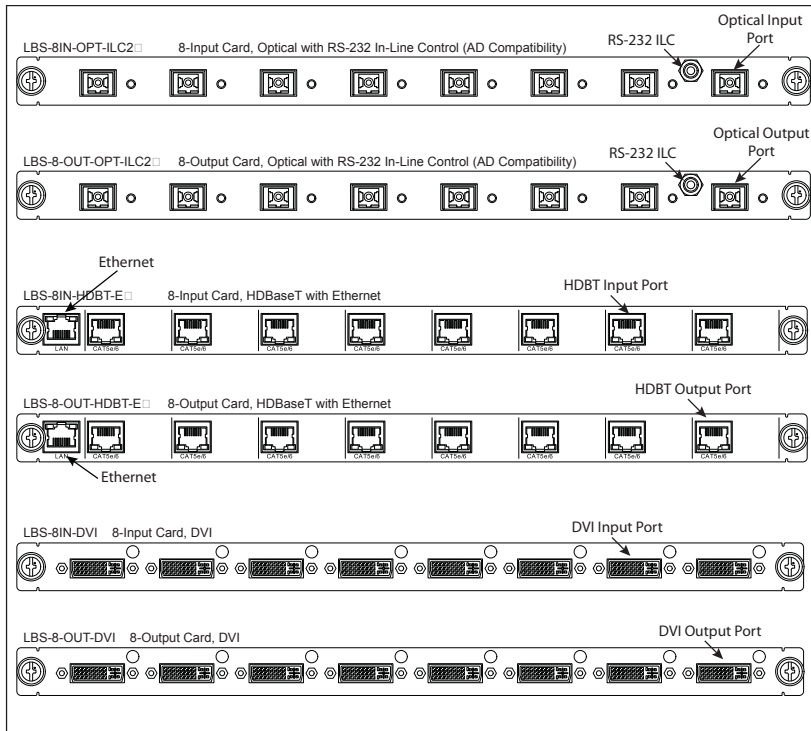
20	IRMASKCPU : x y z(x:SINK/SRC/OUT, y:1~16/ALL, z:0/1)	Set cpu board allout IR mask
21	SHOWIRMASKOUT : x y (x:SINK/SRC, y:1~16/ALL)	Show output board IR mask status
22	SHOWIRMASKCPU : x y (x:SINK/SRC/OUT, y:1~16/ALL)	Show CPU board IR mask status
23	UARTSTR x y "str"(x:In/Out y:1~16; str:char string)	Set character string to output on Out x UART
24	UARTBR x y z(x:In/Out y:1~16; z:baud rate)	Set output port UART baud rate. HDBaseT output board only
25	DHCPENABLE	Enable DHCP
26	IPCONFIG	Show current IP configuration
27	SETIP <IP> <SubNet> <GW>	Set IP addr,SbuNet mask,GateWay addr
28	RSTIP	Reset IP Configuration to factory defaults(Static IP)
29	SETIPADDR <IP>	Set IP address
30	SETSNMASK <SubNet>	Set subnet mask
31	SETGWADDR <GW>	Set Gateway address
16	GETIPADDR	Show current IP address
33	GETSNMASK	Show current Subnet mask
34	GETGWADDR	Show current Gateway address
35	SETCHSNUM x :(x: 0~7)	
36	REBOOT	System reboot
37	BUZZER x(x:1=On/0=Off)	Set alarm enable On/Off
38	Q	Show controller firmware version
39	SETVERBOSE x(x:1=Verbose/0=Non-Verbose)	Set Verbose mode ON/Off
40	GETVERBOSE	Show current response mode (Verbose/Non-verbose)

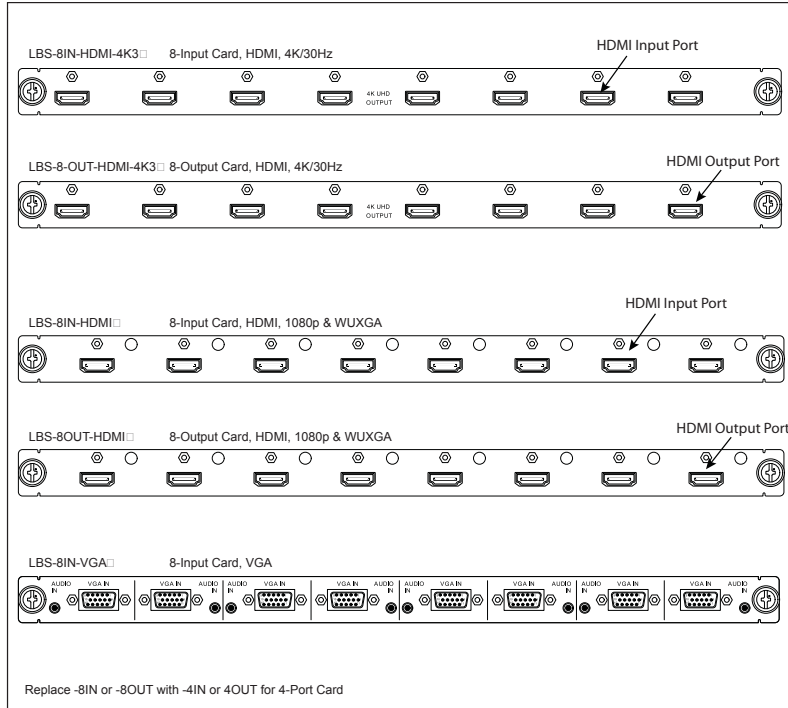
8.0 APPENDIX B

The following provides currently available LBS I/O cards and their description. Their panel drawings are also shown.



BCI LBS-16x16 User's Manual
 Link Bridge™ Universal 16x16 Optical/DVI/HDMI Matrix Switch





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