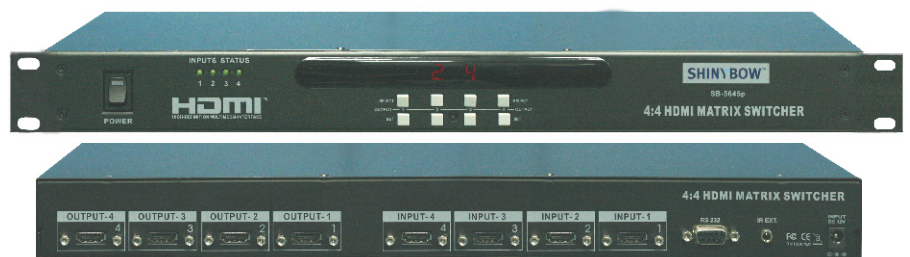


# *Instruction Manual*



## MODEL : SB-5645 4:4 HDMI Matrix Switcher

### *HDMI Matrix Switcher Series*

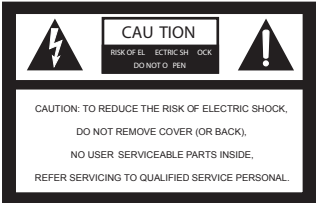


Thank you for purchasing the SB-5645 HDMI Matrix Switcher. You will find this unit easy to install and highly reliable but it is essential that you read this manual thoroughly before attempting to use 4x4 HDMI Matrix switcher.



# SAFETY INFORMATION



1. Save the carton and packing material even if the equipment has arrived in good condition. Should you ever need to ship the unit, use only the original factory packing.
2. Read all documentation before operating your equipment. Retain all documentation for future reference.
3. Follow all instructions printed on unit chassis for proper operation.
4. Do not spill water or other liquids into or on the unit, or operate the unit while standing in liquid.
5. Make sure power outlets conform to the power requirements listed on the back of the unit.
6. Do not use the unit if the electrical power cord is frayed or broken. The power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.
7. Always operate the unit with the AC ground wire connected to the electrical system ground. Precautions should be taken so that the means of grounding of a piece of equipment is not defeated.
8. Mains voltage must be correct and the same as that printed on the rear of the unit. Damage caused by connection to improper AC voltage is not covered by any warranty.
9. Power down & disconnect unit from mains voltage before making connections.
10. Never hold a power switch in the " ON " position.
11. Do not use the unit near stoves, heat registers, radiators, or other heat Producing devices.
12. Do not block fan intake or exhaust ports. Do not operate equipment on a surface or in an environment which may impede the normal flow of air around the unit, such as a bed, rug, carpet, or completely enclosed rack. If the unit is used in an extremely dusty or smoky environment, the unit should be Periodically " blown free " of foreign matter.
13. Do not remove the cover. Removing the cover will expose you to potentially dangerous voltages. There are no user serviceable parts inside.
14. Do not drive the inputs with a signal level greater than that required to drive equipment to full output.
15. Non-use periods. The power cord of equipment should be unplugged from the outlet when left unused for a long period of time.
16. Service Information Equipment should be serviced by qualifier service personnel when:
  - A. The power supply cord or the plug has been damaged.
  - B. Objects have fallen, or liquid has been spilled into the equipment.
  - C. The equipment has been exposed to rain
  - D. The equipment does not appear to operate normally, or exhibits a marked change in performance
  - E. The equipment has been dropped, or the enclosure damaged.

 <p><b>CAUTION</b> RISK OF ELECTRIC SHOCK DO NOT OPEN</p> <p>CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONAL.</p>	 <p>This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the products enclosure that enclosure tha may be of sufficientmagnitude to constitute a risk of electric shock to persons.</p>
<p><b>WARNING!</b> TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.</p>	 <p>Caution: To prevent electric shock do not use this (polarised) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure. To prevent electric shock, match wide blade of plug to wide slot, fully insert.</p>

# INTRODUCTION AND TABLE OF CONTENTS

## INSTRUCTION

The SB-5645 is a 4:4 HDMI Matrix Switcher featuring 4 inputs and pre-emphasized 4 outputs.

- > 4 inputs as following :
  - 4 x HDMI (Digital Video/Audio)
- > 4 matrix outputs as following :
  - 4 x HDMI (Digital Video/Audio)

Automatic input/output HD signals detection :

- > PC monitor from VGA To UXGA
- > HDMI 480i To 1080p
- > DVI 480i ~ 1080p

This switcher supports full data rates and enabling input HDMI 480p, 720p or 1080i/p formats. PC resolution (1600 x 1200HD) is ideally suitable for high Definition LCD Television, HDTV, STB, DVD Plasma display, Projector or Monitor applications.

Control is provided via Front panel buttons with LED readout, IR remote controller, or RS-232..

A RS-232 interface is provided for interfacing with a third party controller.

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REMOTE CONTROL	6
IR EXTENDER	7
RS-232 SERIAL INTERFACE	8
RS-232 SERIAL COMMANDS	9
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## PACKAGE CONTENTS

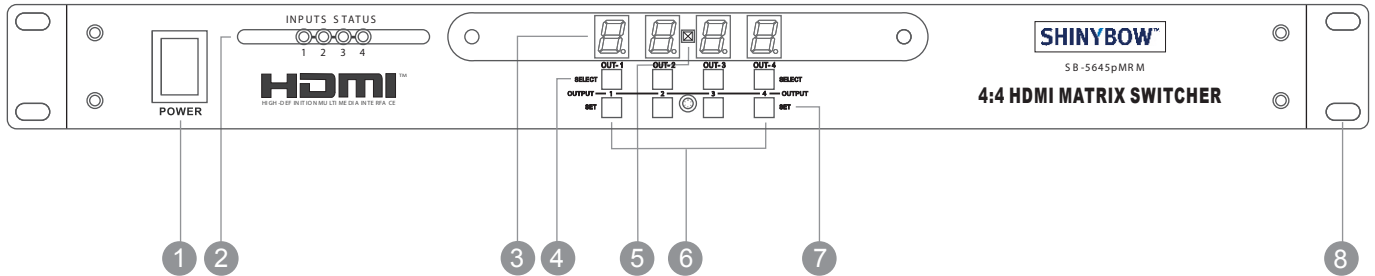
1. Main console unit
2. Operating Instructions
3. IR Remote Controller (SW-5645P)
4. 19 inch Ear mount pair
5. IR Extender receiver (SB-100)
6. RS232 package (RS232 DVD Drive & RS232 Cable)
7. Power Supply 12VDC, Universal Type 50/60Hz, 100~230 VAC

## SHINYBOW WARRANTY

SHINYBOW Technology warrants this product against defects in materials and workman ship for a period of 1 year from the date of purchase. Should this product, in SHINYBOW Technology,s opinion, Prove defective within this warranty period, SHINYBOW Technology, at its option, repair this product without charge, to whatever extent it shall deem necessary to restore said product to proper operation condition. This warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, and abnormal operating condition or non-SHINYBOW Technology authorized modification to the product. If repairs are necessary under the warranty policy, the original purchaser must return the product to local distributor, freight prepaid. After repairs are complete, the product will be returned.

# FRONT PANEL

## FRONT PANEL



### 1 POWER ON SWITCH

The power switch turns the unit on and off.  
The LED will illuminate red to indicate that the switcher is ON and is receiving power

### 2 INPUT SOURCES STATUS DISPLAY

Input sources 1 to 4 LED illuminates blue to indicate that a video source is present on that input.

### 3 OUTPUT SOURCES STATUS DISPLAY

Output Channel show by LED display.

### 4 SOURCES SELECT BUTTONS

A separate output 1~4 source select buttons are provided for each destination.  
Select sources are 1-HDMI, 2-HDMI, 3-HDMI 4-HDMI.

### 5 IR SENSOR

The IR sensor receives IR commands from the supplied remote controller.

### 6 SOURCES & SETUP BUTTONS

Setup the input 1 ~ 4 channel

### 7 SOURCE CHANNEL SETUP BUTTONS

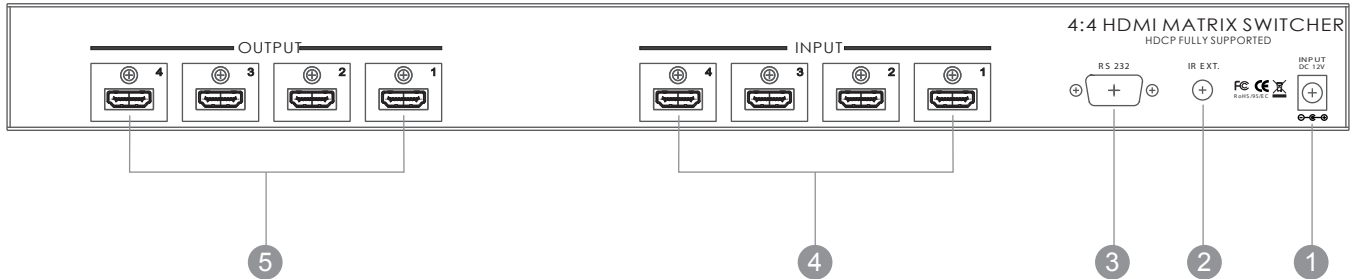
Output Channels selection and setup buttons

### 8 19 INCH EAR MOUNT PAIR

19 inch case Ear Mount pair

# REAR PANEL

## REAR PANEL



### 1 DC POWER INLET

The SB-5645 is fitted with a DC power plug-park input connector. Please ensure that the plug-park used is of an approved type and is of sufficient current carrying capacity with the correct voltage and connector polarity. 12Volt DC power supply 2A Max.



Power Jack:  
DC Jack - inner OD  $\varnothing$  2.1mm (+)  
Outside OD  $\varnothing$  5.5mm (GND)  
Power input - 12VDC, 2A

### 2 IR EXTENDER CONTROL

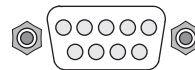
Support one of IR Extender  
Extend distance maximum 300Meters



IR Extender Jack:  
Female Jack - inner OD  $\varnothing$  3.5 mm

### 3 RS 232 CONNECTION

RS 232 control port to allow for interfacing to a PC, Such as a computer or touch panel control, to the SB-5645 switcher via this DB-9pin Female connector for serial RS-232 control.

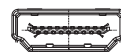


Remote port :  
DB-9pin Female connector

### 4 INPUTS- 1,2,3 & 4 HDMI

Connect a signal link of HDMI direct digital video/audio to this Female HDMI connector. This connector supports HDMI digital video/audio and DVI digital video sources.

Input 1 - HDMI Digital Video/Audio, Connector with fix screw  
Input 2 - HDMI Digital Video/Audio, Connector with fix screw  
Input 3 - HDMI Digital Video/Audio, Connector with fix screw  
Input 4 - HDMI Digital Video/Audio, Connector with fix screw



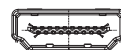
HDMI digital video/audio connector:  
HDMI Female connector.

Note:  
With the proper adapters, the SB-5645 can be used with DVI digital video signals HDCP compliant.

### 5 OUTPUTS- 1,2,3 & 4 HDMI

Connect a signal link of HDMI direct digital video/audio to this Female HDMI connector. This connector supports HDMI digital video/audio and DVI digital video sources.

Output 1 - HDMI Digital Video/Audio, Connector with fix screw  
Output 2 - HDMI Digital Video/Audio, Connector with fix screw  
Output 3 - HDMI Digital Video/Audio, Connector with fix screw  
Output 4 - HDMI Digital Video/Audio, Connector with fix screw



HDMI digital video/audio connector:  
HDMI Female connector.

Note:  
With the proper adapters, the SB-5645 can be used with DVI digital video signals HDCP compliant.

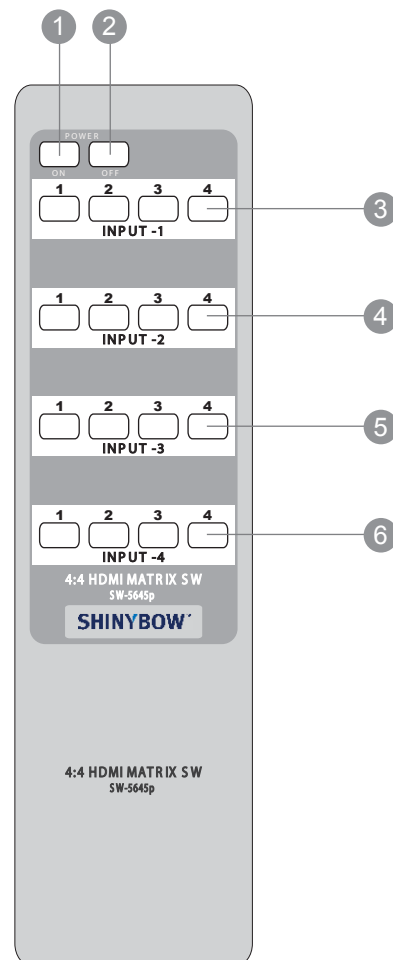
# REMOTE CONTROL

Before making any connections to the SB-5645. Observe the following:

- > Ensure the mains voltage supply matches the label on the supplied plug-Pack (+/- 10%)
- > Ensure that the power switch is OFF
- > Ensure that all system grounds (earth) are connected to a common point.
- > Avoid powering equipment within a system from multiple power sources that may be separated by large distances
- > Connect all audio video sources and destination equipment
- > power up all source and destination audio-visual sources
- > For each destination output select the appropriate input source by using The front panel input 1~4 select buttons. The supplied IR remote control. Or through the RS 232 serial communications port.
- > Upon power up the SB-5645 will return to its last used setting before Powered down.

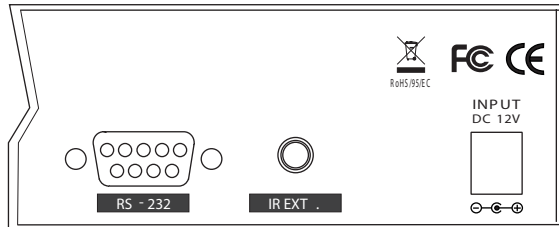
## REMOTE CONTROL

- 1** **2** **SWITCH POWER ON or OFF**  
Controller with a separate power ON and OFF
- 3** **PORT- 1 INPUT SOURCES SELECTION**  
INPUT-1 Select input 1, 2, 3 & 4 sources with selection button
- 4** **PORT- 2 INPUT SOURCES SELECTION**  
INPUT-2 Select input 1, 2, 3 & 4 sources with selection button
- 5** **PORT- 3 INPUT SOURCES SELECTION**  
INPUT-3 Select input 1, 2, 3 & 4 sources with selection button
- 6** **PORT- 4 INPUT SOURCES SELECTION**  
INPUT-4 Select input 1, 2, 3 & 4 sources with selection button

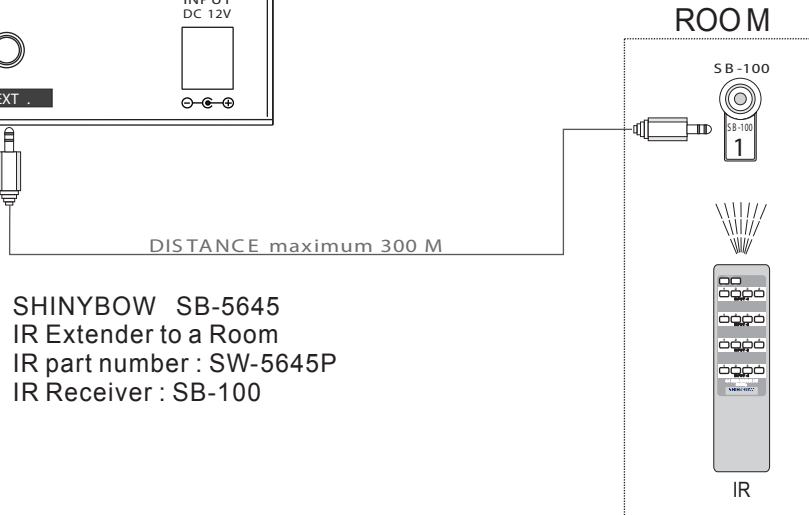


# IR EXTENDER

## REAR PANEL IR EXTENDER PORT

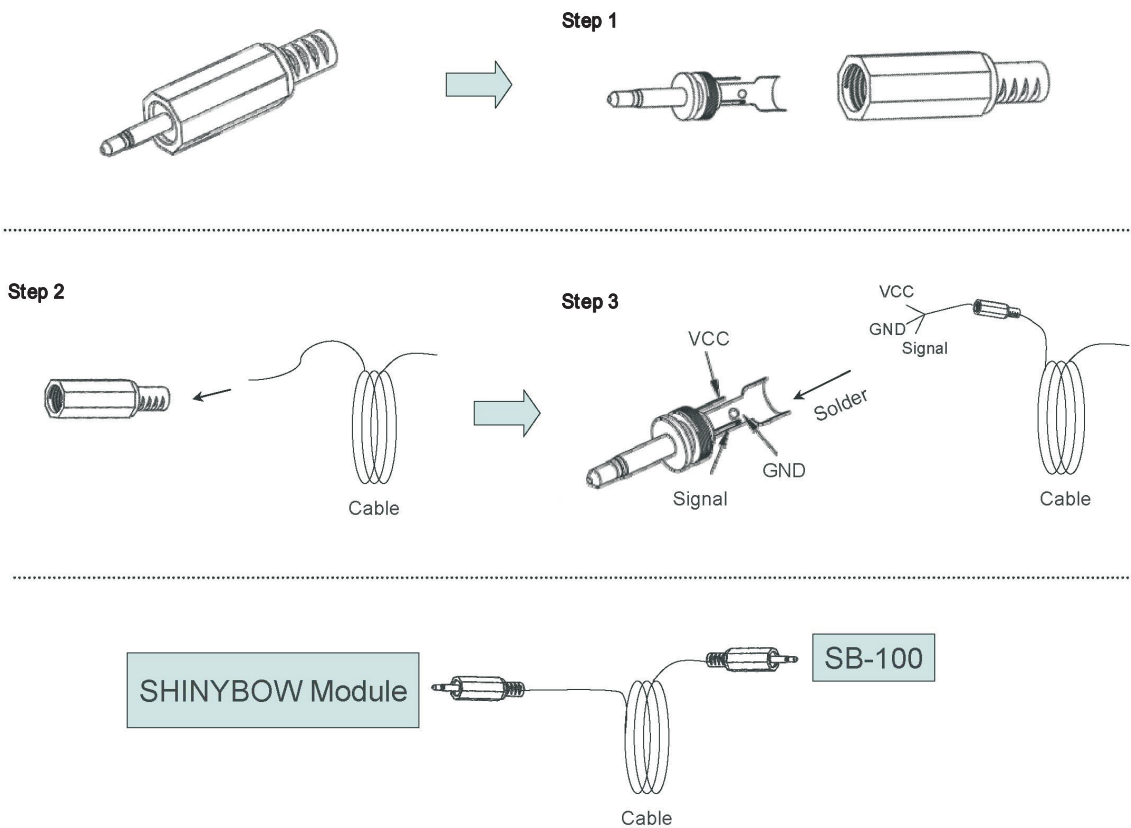


## IR EXTENDER CONNECTION



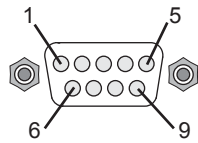
## IR EXTENDER PACKAGE :

## HOW TO SETUP THE IR EXTENDER COMPONENTS



# RS-232 SERIAL INTERFACE

## RS-232 SERIAL INTERFACE CONNECT a PC or CONTROL SYSTEM



### RS-232 SERIAL INTERFACE

Pin	RS-232	Definition
1	-----	Not used
2	TX	Transmitter
3	RX	Receiver
4	-----	Not used
5	GND	Ground
6	-----	Not used
7	-----	Not used
8	-----	Not used
9	-----	Not used

## RS232

The Shinybow switcher can be controlled via the RS-232 serial control port to allow for interfacing to a PC, or similar third party control system.

The serial communication parameters are 9600 baud, 8 bit, No Parity and 1 stop bit - this is often referred to as 9600 8N1. When the unit recognises a complete command it will perform the requested action - there is no delimiter character required.

The unit does not send out a message when a value is changed from the front panel or by IR control. If the unit needs to be controlled via the front panel in addition to the RS232 control, you should regularly poll the unit status to ensure the control system accurately reflects the current settings.

## COMMANDS

### To Switch Inputs to Outputs

`SBI0X0Y` - Where X is Output Number (1-4) and Y is Number (1-4)

Unit will respond with

`SBUD0XOY` - Where X is Output Number (1-4) and Y is Input Number (1-4)

Example : Send Input 4 to Output 3

`SBI04O03` -Send

`SBUD04O3` -Rcvd



# RS-232 SERIAL COMMANDS

## MORE STUFF FOR SB-5645

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**Note:** Turning the unit System Power Off over RS232 will distinguish the LED display leaving only the Power Switch LED on. The Video and Audio outputs will also mute. While the unit is turned off by RS232 it will continue to accept and act upon switching commands. For example, if the unit is in the off mode (via RS232) and you send a command to switch an input to an output, that route will complete and the video and audio will now appear on that channel only. The front panel LED for that particular output will also show the input selected (for that single output channel only). The remaining LED's will remain off and video and audio outputs muted. The unit will still return status and change messages in response to commands sent while in Power Off state. A hard reset command (SBALLRST) will return the unit to normal operation and also unlock the front panel.

Power Off mode.

SBSYSMOF - Put system into Standby (Soft Power Off)  
SBSYSMON - Bring unit out of Standby (Soft Power On)

Unit will respond with

SBALOFAK - Unit is in Standby  
SBALONAK - Unit is no longer in Standby

Example : Put Unit in Standby (Soft Power)

SBSYSMOF -Send  
SBALOFAK -Rcvd

## FRONT PANEL LOCK

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**Note :** Hard resetting the unit will unlock the Front Panel controls.

SBSYSMLK - When front panel is locked, changes can only be made by RS232

SBSYSMUK - Front Panel Unlock

Unit will respond with

SBSYSLOK - Front Panel has been Locked  
SBSYSULK - Front Panel has been Unlocked

Example : Lock Front Panel Buttons

SBSYSMLK -Send  
SBSYSLOK -Rcvd

## UNIT RESET

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SBALLRST - Reset every output to Input 1

Unit will respond with

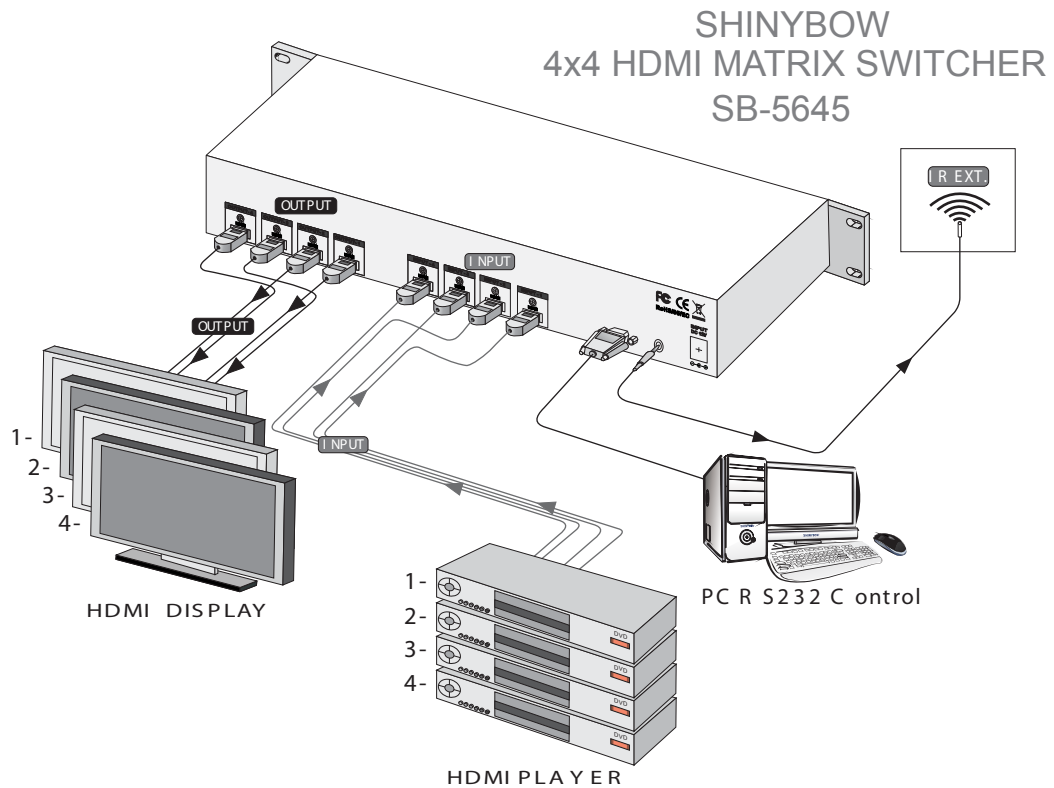
SBRSTACK - Unit has reset each Output to Input 1

Example : Reset all outputs to Input 1

SBALLRST -Send  
SBRSTACK -Rcvd

---

# TYPICAL APPLICATION



## INSTALLING

### CONTROL PORTS :

1. IR EXTENDED - IR Extend with Distance 300M Maximum
2. RS-232 - PC RS-232 Series port

### INPUTS PORT SIGNALS :

1. HDMI - HDMI connector with fix screw
2. HDMI - HDMI connector with fix screw
3. HDMI - HDMI connector with fix screw
4. HDMI - HDMI connector with fix screw

### OUTPUT PORT SIGNALS :

1. HDMI - HDMI connector with fix screw
2. HDMI - HDMI connector with fix screw
3. HDMI - HDMI connector with fix screw
4. HDMI - HDMI connector with fix screw

SB-5645 SUPPORT FOUR HDMI INPUTS TO FOUR HDMI MATRIX OUTPUTS  
SUPPORT IR & IR EXTENDER PORTS.

# FEATURES & SPECIFICATIONS

## FEATURES

1. Supports 4x HDMI digital A/V devices independently switched to 4x HDMI monitors
2. HDMI digital video/audio format, DVI format and HDCP compliant
3. Support HDMI/DVI high definition resolutions 408p, 720p, 1080i/1080p
4. Supporting link speeds of up to 2.25 Gbps (link clock rate of 225 MHZ)
5. Supports wide range of PC resolutions from XGA to UXGA 1600x1200 and HDTV/DTV resolutions 480i/480p, 576i/576p, 720p, 1080i & 1080p
6. Compatible with all HDMI devices, PC monitors, Plasma TV display and HDTV
7. Supported Digital Video TMDS formats in Deep Color 12bits
8. Support IR Remote and IR Extender with distance 300M Maximum.
9. Various User Interface control:
  - Attached Window based control software for Desktop or NB control by RS232 port
  - Manual controlled by Front Panel button
  - IR remote control
10. Automatically scanning input status by LED on front panel

## SPECIFICATIONS

Type of Switcher:	4 in To 4 out, HDMI Matrix Switcher
Input Signals:	Video (TMDS) 0.5~1.0Vpp, DDC 5Vpp
Signal Supports :	HDMI Standard, DVI and HDCP Compliant
Video Supported:	1080p HDMI formats and DVI UXGA 1600x1200 HD resolutions.
Audio Supported:	DTS-HD Master Audio, Dolby True -HD & Dolby Digital Plus
Various video input interface supporting digital video standards such as:	<ul style="list-style-type: none"><li>• RGB/YCbCr : 24/30/36-bits</li><li>• YCbCr : 8/10/12/16/20/24-bits</li><li>• Double data rate interface for RGB/YCbCr : 12/15/18-bits</li></ul>
Controls:	IR, IR EXT, Select buttons on the front panel & RS232
Data Rates:	250Mbps to 2. 25Gbps.
IR Extender Distance:	300 meters maximum.
Infrared frequency:	38KHz.
Safety Approvals:	CE, FCC, RoHS(2002/95/EC).
Dimensions (LWH):	19" x 7.87" x 1.75" (482mm x 200mm x 44mm)
Power Supply:	DC12V / 2A (consumption 1.6A Max) Use Universal Switch Type 50/60Hz,100~230 VAC
Shipping Weight :	2.25 Kgs / 3.75 lb

As product improvements are continuous, specifications are subject to change and without notice.