

# HD-44 ▶

## 4x4 HDMI Matrix Switcher

### INSTRUCTION MANUAL



**HDMI**<sup>™</sup>  
HIGH-DEFINITION MULTIMEDIA INTERFACE





## SAFETY INFORMATION



1. To ensure the best results from this product, please read this manual and all other documentation before operating your equipment. Retain all documentation for future reference.
2. Follow all instructions printed on unit chassis for proper operation.
3. To reduce the risk of fire, do not spill water or other liquids into or on the unit, or operate the unit while standing in liquid.
4. Make sure power outlets conform to the power requirements listed on the back of the unit. Keep unit protected from rain, water and excessive moisture.
5. Do not attempt to clean the unit with chemical solvents or aerosol cleaners, as this may damage the unit. Dust with a clean dry cloth.
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. Do not force switched or external connections in any way. They should all connect easily, without needing to be forced.
8. 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.
9. AC 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.
10. Turn power off and disconnect unit from AC current before making connections.
11. Never hold a power switch in the "ON" position.
12. This unit should be installed in a cool dry place, away from sources of excessive heat, vibration, dust, moisture and cold. Do not use the unit near stoves, heat registers, radiators, or other heat producing devices.
13. 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 dust and matter.
14. To reduce the risk of electric shock, do not remove the cover. There are no user serviceable parts inside. Refer all servicing to qualified service personnel. There are no user serviceable parts inside.
15. When moving the unit, disconnect input ports first, then remove the power cable; finally, disconnect the interconnecting cables to other devices.
16. Do not drive the inputs with a signal level greater than that required to drive equipment to full output.
17. The equipment power cord should be unplugged from the outlet when left unused for a long period of time.
18. 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.
19. Service Information Equipment should be serviced by qualified 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.

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## ▶ INTRODUCTION

The HD-44 is high-performance 4x4 matrix routing switcher for HDMI signals. This switcher supports data rates up to 2.25 Gbps, enabling 1080p HDMI formats and UXGA/WUXGA/DVI resolution to any HD display. High Definition Digital signals can be selected and distributed to any 4 outputs simultaneously. The Switcher is certified as being fully HDMI and HDCP compliant, with RoHS, CE, FCC certification. Support high resolution HDMI sources routed to HDMI displays, monitors, projector or audio receivers. The EDID can be selected between seven (7) different modes. Control is provided via Front panel push buttons, IR remote or via RS-232. An RS-232 Windows GUI interface is provided for matrix routing.

The HD-44 is a 4x4 HDMI Matrix Switcher featuring 4 inputs and pre-emphasized 4 outputs. Full support HDMI / HDCP compliant.

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

Support Seven Control Function Keys :  
ALL >OFF >PREV >PLAY>SAVE >LOCK >EDID

EDID support :

- INTERNAL modes: Auto, 1080p-2CH, 1080p- 5.1, 1080p-7.1, 1080i-2CH, 720p-2CH

## ▶ PACKAGE CONTENTS

Before attempting to use this unit, please check the packaging and make sure the following items are contained in the shipping carton:

- Main console unit
- Operating Instructions
- IR Remote Controller
- 19 inch Ear mount bracket (Part # 1 U-440L)
- IR Extender receiver (HD-100)
- CD Contents: This manual, Windows GUI
- RS-232 Cable
- Power Supply 12VDC, 3A Universal Type 50/60Hz, 100-230 VAC

## ▶ SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply. Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.

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# FEATURES & SPECIFICATIONS

## FEATURES

- Support 4 x HDMI digital source devices matrix switched to 4 x HDMI devices.
- HDMI digital video w/ embedded audio, DVI format and HDCP compliant
- Seven (7) function key control and worldwide EDID modes for HDTV resolutions.
- Link speeds of up to 2.25 Gbps (link clock rate of 225 Mhz), for 3D formats.
- Wide range of HD resolutions from PC XGA to WUXGA 1920x1200 and HDTV/DTV resolutions 480i/480p, 576i/576p, 720p, 1080i & 1080p
- Compatible with all HDMI source devices, PC monitors, Plasma HD display, HDTV and audio receivers/amplifiers.
- Digital Video TMDS formats
- Support IR Remote and IR Extender with distance up to ~ 1000ft (300M) Maximum.
- Various User Interface control:
  - Windows based GUI control via RS-232 port
  - Front Panel push button
  - IR wireless remote control
  - Third party RS-232 controller (via simple ASCII)
- Front panel buttons: ALL/OFF/PREV/PLAY/SAVE/EDID/LOCK
- Automatic scanning input & output status
- Desktop with optional rack mount via included 19 inch bracket.
- EDID configuration via Internal modes.
- Consumer Electronic Control (CEC) switch all open or OFF

The Switcher will remember that last state during a power cycle. When power is removed and resorted, the last configuration will be invoked.

## SPECIFICATIONS

- **Type of Switcher:** HDMI 4 x 4 Matrix Routing 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:** (HDMI only) DTS-HD Master Audio, Dolby True -HD & Dolby Digital Plus
- **Video input interface:**
  - RGB/YCBCR : 24/30/36-bits
  - YCBCR : 8/10/12/16/20/24-bits
  - Double data rate interface for RGB/YCBCR: 12/15/18-bits
- **Controls:** IR, IR EXT, Select & function buttons on the front panel & RS-232
- **Data Rates:** 2.25 Gbps
- **IR Extender Distance:** ~1000 feet /300 meters maximum.
- **Infrared frequency:** 38KHz
- **Safety Approvals:** CE, FCC, RoHS (2002/95/EC).
- **Dimensions (WxDxH):** 19" x 9.85" x 1.75" (482mm x 250mm x 44mm) \*with rack mount
- **Power Supply:** DC12V / 3A (consumption 2580mA Maximum) Universal world wide Type 50/60Hz, 100~230 VAC
- **Product Weight:** 2.50 Kgs / 5.50 lbs

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

# EDID FUNCTION

## EDID FUNCTION FOR HDMI MATRIX SWITCHER

### To view the current EDID status:

**Step 1.** Press EDID button; the button will flash blue and the display will show the current EDID Status.

**Step 2.** Press EDID button to exit.

### To change the current EDID status:

#### Method 1

**Step 1.** Press EDID button; the button will flash blue and the display will show the current EDID Status.

**Step 2.** Press the Input (source) button (bottom row) to select EDID mode.

Repeatedly depressing the Source 1 button will cycle up thru the options.

Repeatedly depressing the Source 2 button will cycle down thru the options.

The options are sequential and require repeated depressing of the button to cycle thru the options.

Options are:

<b>Auto</b>	Display = Auto <Default>
<b>1080p/2CH</b>	Display: 1080p-2ch
<b>1080p/5.1</b>	Display: 1080p-51
<b>1080p/7.1</b>	Display: 1080p-71
<b>1080i/2CH</b>	Display: 1080i-2ch
<b>720p/2CH</b>	Display :720p-2ch

***All Outputs will be set to the highest common resolution of all connected display devices.***

#### Example for single source:

Destination> press #1 and then Source> press #1

Destination device #1 will set to the highest common resolution of source #1

#### Example for multiple sources

Destination device #1, #2, #3 will be set to the highest common resolution available and source device #1 will output this same resolution.

**Step 3.** Press the **DEMO** button to set **EDID** mode. **The switcher will return to operation mode.**

#### Method 2

In some cases, the display screen maybe dark, or no picture, distorted color or without sound. This is caused by import ability of the EDID.

#### Some causes of this are:

1. Destination resolution 480p EDID. Source is 1080p or 720p
2. Destination resolution 1080p EDID. Source is 480p, 720p or 1080p
3. Either Source or destination has no EDID code, or firmware is older version; in this event, you can manually link source EDID to destination EDID.

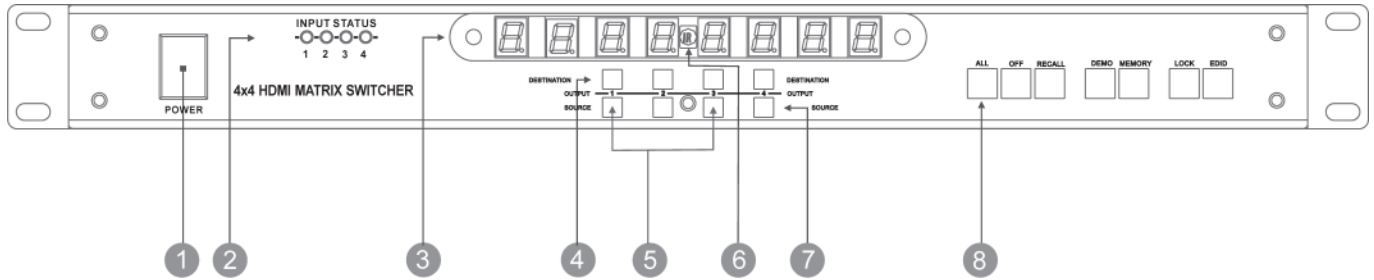
**Step 1.** Press EDID button; the button will flash blue and the display will show the current EDID Status.

**Step 2.** Press Output button 1 thru 8 destination row on the affected display.

**Step 3.** Press DEMO to save setting and return switcher to regular operating mode.

# FRONT PANEL

## FRONT PANEL



### 1 POWER 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. The Switcher will remember that last state during a power cycle. When power is removed and resorted, the last configuration will be evoked.

### 2 INPUT STATUS DISPLAY

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

### 3 OUTPUT STATUS DISPLAY

Each Output (destination) Channel shows which input (source) is assigned.

### 4 DESTINATION SELECT BUTTONS

Separate outputs 1 thru 4 select buttons are provided for each destination assignment. Routing can be Source to Destination or one source to multiple destinations. Example : Press Destination 1,3 then press Source 2 will route Input 2 to Output 1,3 respectfully.

### 5 EDID MODE SELECT BUTTONS

Used to select EDID mode using buttons 1 thru 7

### 6 IR SENSOR

The IR sensor receives IR commands from the supplied remote controller or third party IR emitter.

### 7 SOURCE SELECT BUTTONS

Separate inputs 1 thru 4 select buttons are provided each source selection.

### 8 FUNCTION KEY - ALL

Disables (mute) video on all destinations OR Selects the same source to all destinations.

Option 1

- Press **ALL** followed by **OFF** button. The display will show " 0 " indicating all destinations have no videoselected.

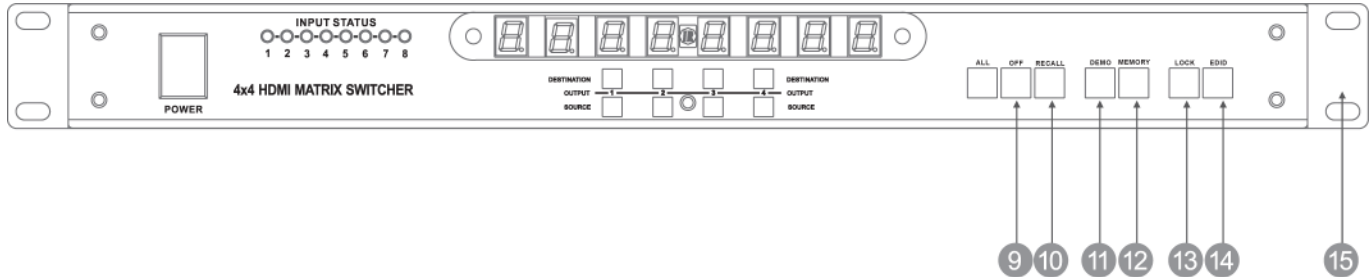
Option 2

- Press **ALL** followed by Source 1 thru 4. The display will show the Source selected.

- Press **DEMO** The pre-set source selection will be assigned all destinations.

# FRONT PANEL

## FRONT PANEL



### 9 FUNCTION KEY - OFF

Disables (mute) video to selected channels. Either destinations.

- Press **OFF** button followed by any Destination channel.
- Press 1 thru 4 output destination. The display will show " 0 " for the selected channel indicating no video selected.

### 10 FUNCTION KEY - RECALL ( preview )

The system will show previously stored presets, up to a total of 8.

Presets are stored in local memory using Source keys 1 thru 4 or Destination keys 1 thru 4 as the memory preset location.

- Configure desired matrices.
- Press **RECALL** button.
- Press 1 thru 4 on either Source or Destination row.
- Press **DEMO** The pre-set configuration will execute.

Operation completes.

*Operation will abort if no keys are pressed with 5 seconds.*

### 11 FUNCTION KEY - DEMO

The system will execute a previously stored preset.

- Press **ALL, OFF** or **RECALL** button.
- Press 1 thru 8 on either Source or Destination row.
- Press **DEMO** The pre-set configuration will execute.

### 12 FUNCTION KEY - MEMORY

The system will **SAVE** current configuration into memory.

- Press **MEMORY** to store memory location.
- Press 1 thru 4 on either Source or Destination row.

### 13 FUNCTION KEY - LOCK

- Press and hold **LOCK** button for two seconds lockout the front panel.
- Press and hold **LOCK** button for two seconds to enable the front panel.

### 14 FUNCTION KEY - EDID

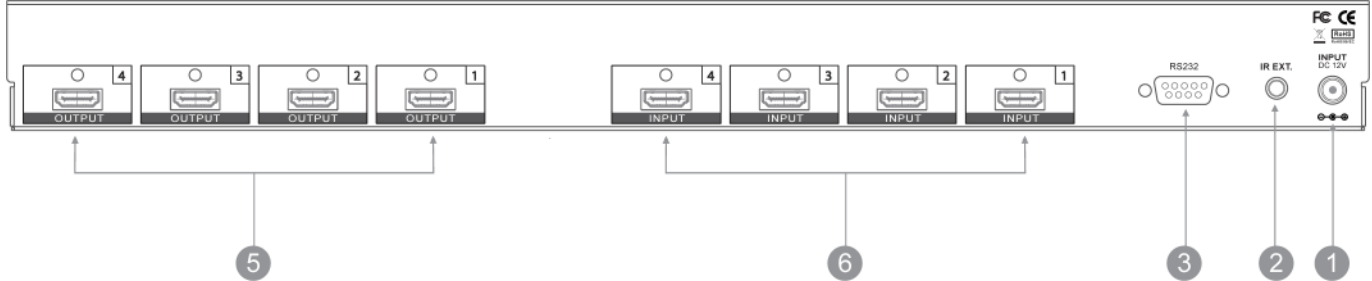
- Press **EDID** to select new EDID mode or select destination row 1 thru 4 for LINK source EDID again.

### 15 19 INCH EAR MOUNT PAIR

Converts desktop to 19 inch rack mount. Bracket (part # 1 U-440L) INCLUDED.  
Image shows rack mount bracket attached.

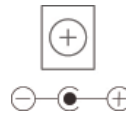
# REAR PANEL

## REAR PANEL



### 1 DC POWER INLET

The Switcher is fitted with a DC power plug input connector. Ensure that the used is of an approved type and is of sufficient current carrying connector capacity with the correct voltage and connector polarity. 12Volt~ DC power supply 3A Max (Center pin positive).



Power Jack:  
DC Jack - Inner OD  $\varnothing$  2.1mm (+ )  
Outside OD  $\varnothing$  5.5mm (GND)  
Power input - 12VDC, 3A

### 2 IR EXTENDER CONTROL

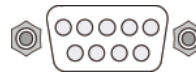
Support one of IR Extender  
Extend distance maximum 300Meters / ~1000 feet  
When you plug the External IR extender into the switcher, the front panel IR receiver remains active.



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

### 3 RS-232 CONNECTION

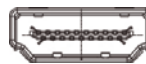
RS-232 control port to allow for interfacing to a PC, Such as a computer or touch panel control, to the switcher via this DB-9pin Female connector for serial RS-232 control.



Remote port :  
DB-9pin Female connector

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

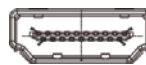
Connect a signal link of HDMI direct digital video/audio to this Female HDMI connector. This connector supports HDMI digital video/audio and DVI digital video sources.  
HDMI Digital Video/Audio, Connector with fix screw  
Input 1 ~ Input 4



HDMI digital video/audio connector:  
HDMI Female connector.  
Note: With the proper adapters, the switcher can be used with DVI digital video signals HDCP compliant. DVI does not support audio.

### 6 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.  
HDMI Dig~1 Video/Audio, Connector with fix screw  
Output 1 ~ Output 4



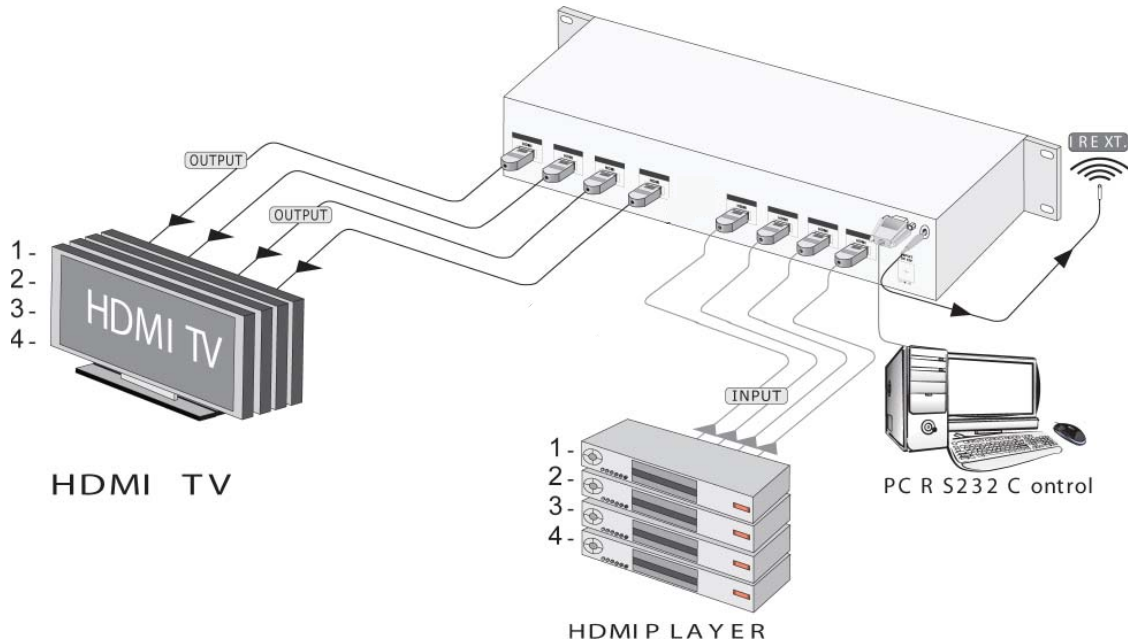
HDMI digital video/audio connector:  
HDMI Female connector.  
Note: With the proper adapters, the switcher can be used with DVI digital video signals HDCP compliant. DVI does not support audio.



# TYPICAL APPLICATION

## INSTALLING DIAGRAM

### 4x4 HDMI MATRIX SWITCHER HD-44



## CONNECTION PORTS:

### CONTROL PORTS :

1. IR EXTEND - External IR receiver
2. RS-232 - PC RS-232 Series port

### INPUTS PORT SIGNALS:

1. HDMI (HDCP Compliant)
2. HDMI (HDCP Compliant)
3. HDMI (HDCP Compliant)
4. HDMI (HDCP Compliant)

### OUTPUT PORT SIGNALS:

1. HDMI (HDCP Compliant)
2. HDMI (HDCP Compliant)
3. HDMI (HDCP Compliant)
4. HDMI (HDCP Compliant)

### DC POWER INPUT:

SUPPORT DC12V POWER INPUT

**HD-44 SUPPORT FOUR HDMI INPUTS TO FOUR HDMI MATRIX OUTPUTS  
SUPPORT IR EXTENDER & RS-232 CONTROLS.**

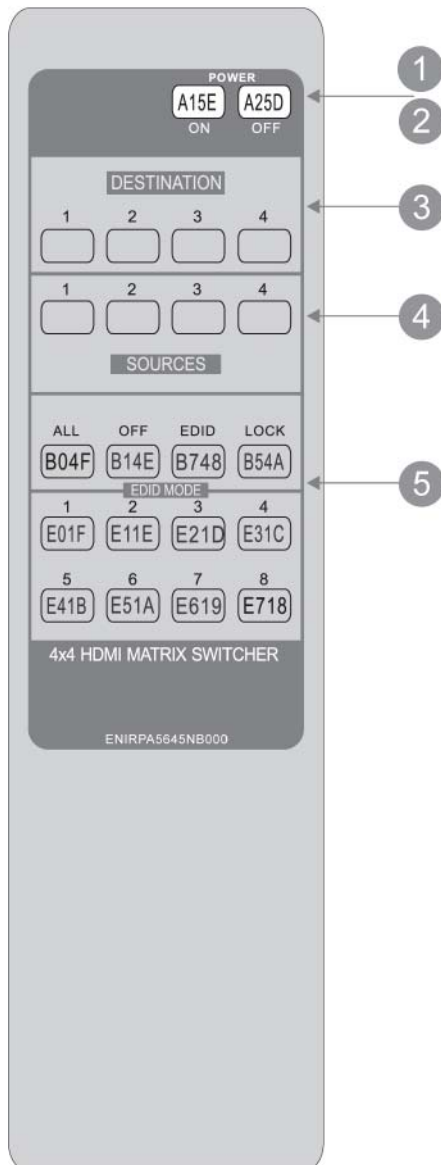
# REMOTE CONTROL

Before making any connections to the switcher. 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 switcher will return to its last used setting before powered down.

## IR REMOTE CONTROL KEY

IR REMOTE : SW-5645



### 1 2 SWITCH POWER ON or OFF

Controller with a separate power ON and OFF

### 3 DESTINATION : 1 thru 4 OUTPUT SELECTION

Press the destination button to select the output display channel.

### 4 SOURCE : 1 thru 4 INPUT SOURCE SELECTION

Press input 1~ 4 sources with selection button

### 5 FUNCTION KEY

- ALL - function selection button
- OFF - function selection button
- EDID - function selection button
- LOCK - function selection button
- ENTER - function selection button
- MEMORY - function selection button
- RECALL - function selection button

## IR REMOTE CUSTOM AND DATA CODES (NEC Standard)

### HOW TO SETUP IR CODES:

CUSTOM CODE : 1CE3  
 POWER ON : 1CE3 A15E  
 POWER OFF : 1CE3 A25D

### FUNCTION KEY

FUNCTION KEY  
 ALL : 1CE3 B04F      OFF : 1CE3 B14E  
 EDID : 1CE3 B748      LOCK : 1CE3 B54A

### TV- # INPUT / AV - # OUTPUT

**DESTINATION # 1**  
**SOURCE # 1 : 1CE3 11EE**  
**SOURCE # 2 : 1CE3 12ED**  
**SOURCE # 3 : 1CE3 13EC**  
**SOURCE # 4 : 1CE3 14EB**

**DESTINATION #2 : 1CE3 2 0DF**  
**DESTINATION # 3 : 1CE3 3 0CF**

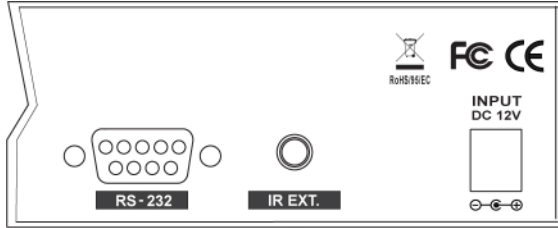
**DESTINATION # 1**  
**SOURCE # 1 : 1CE3 0 1FE**  
**SOURCE # 2 : 1CE3 0 2FD**  
**SOURCE # 3 : 1CE3 0 3FC**  
**SOURCE # 4 : 1CE3 0 4FB**

### EDI D MODE

1 # Auto mode : 1CE3 E01F  
 2 # 1080p-2CH mode : 1CE3 E11E  
 3 # 1080p-5.1CH mode : 1CE3 E21D  
 4 # 1080p-7.1CH mode : 1CE3 E31C  
 5 # 1080i - 2CH mode : 1CE3 E41B  
 6 # 720p-2CH mode : 1CE3 E51A  
 7 # EXTERNAL mode : 1CE3 E619  
 8 # RESERVE : 1CE3 E718

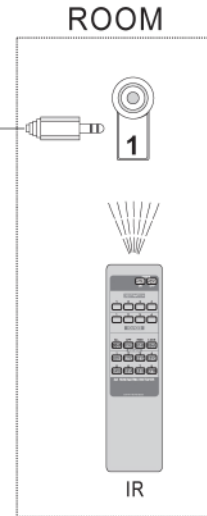
# IR EXTENDER

## REAR PANEL IR EXTENDER PORT



HD-44  
IR Extender to a Room  
IR part number : SD-44

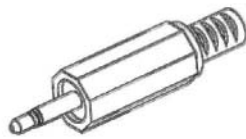
## IR EXTENDER CONNECTION



\*\*\* When you plug the External IR extender into the switcher, the front panel IR receiver remains active. \*\*\*

## IR EXTENDER PACKAGE

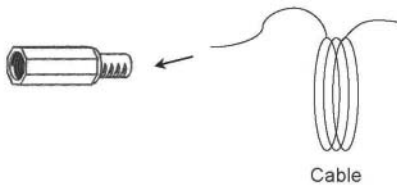
### HOW TO SETUP THE IR EXTENDER COMPONENTS



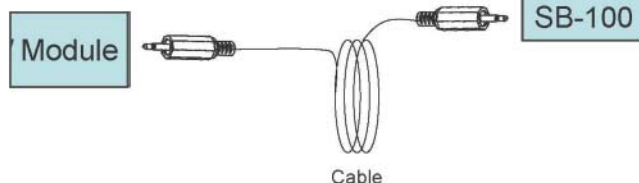
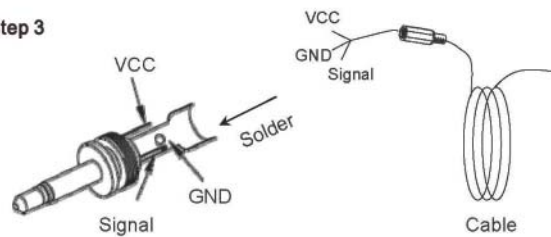
Step 1



Step 2

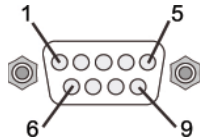


Step 3



# RS-232 SERIAL INTERFACE

RS-232 SERIAL INTERFACE CONNECT a PC or CONTROL SYSTEM. VERSION COMPATIBLE V1.0 & V1.5



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

## RS-232

The 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 BN1.

When the unit recognizes a complete command n will perform the requested action -there is no delimiter character required.

Ø = the number

0 = the letter

## COMMANDS ( RS-232 Control driver V1.0 )

To Switch Inputs to Outputs

SBIØXØY - Where X is Input Number (1-8) and Y is Output Number (1-8)

Unit will respond with

SBUDØXØY - Where X is Input Number (1-8) and Y is Output Number (1-8)


Example : Send Input 4 to Output 3

SBIØ4Ø3 - Send

SBUDØ4Ø3 - Rcvd

# RS-232 SERIAL COMMANDS

## MORE STUFF

 **Note:** Turning the unit System Power 011 via RS-232 will extinguish the LED channel display leaving only the Power SW~ LED on. The Video and Audio outputs will also mute. While the unit is turned 011 by RS-232 it will continue to accept and act upon switching commands. For example, if the unit is in the off mode (via RS-232) 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 channel display 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

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

SBSYSMLK - When front panel is locked, changes can only be made by RS-232

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

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

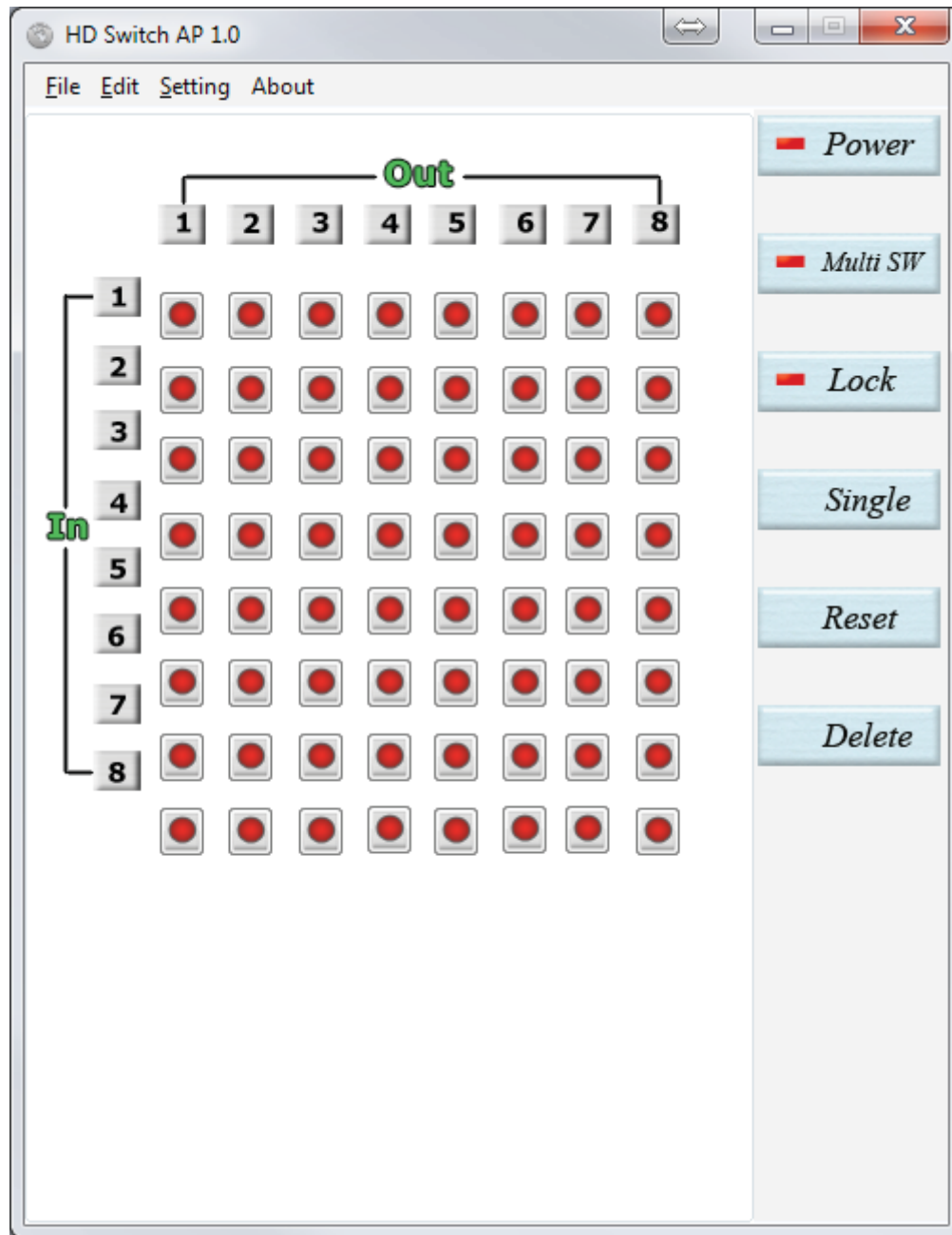
SBRSTACK -Rcvd

# GUI INTERFACE



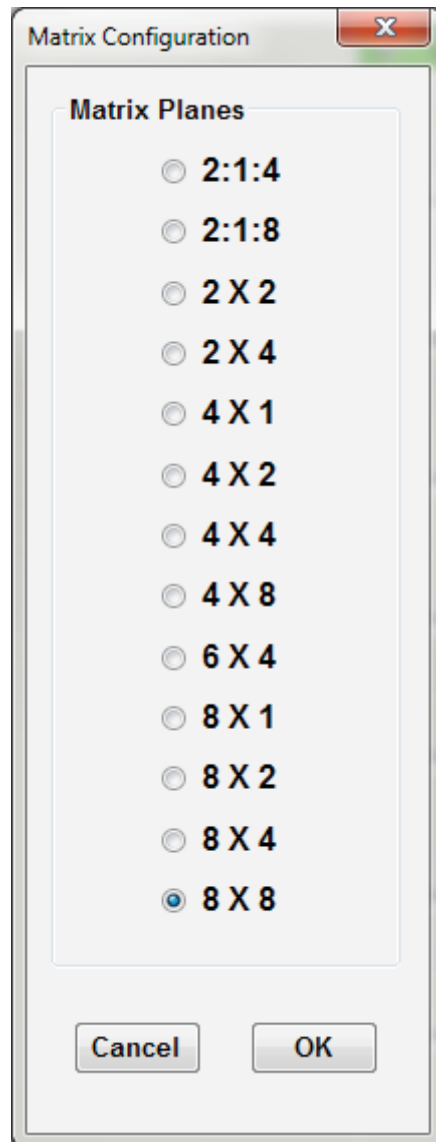
1A: Supports routing using Lines

# GUI INTERFACE



1B: Supports routing using Cross points

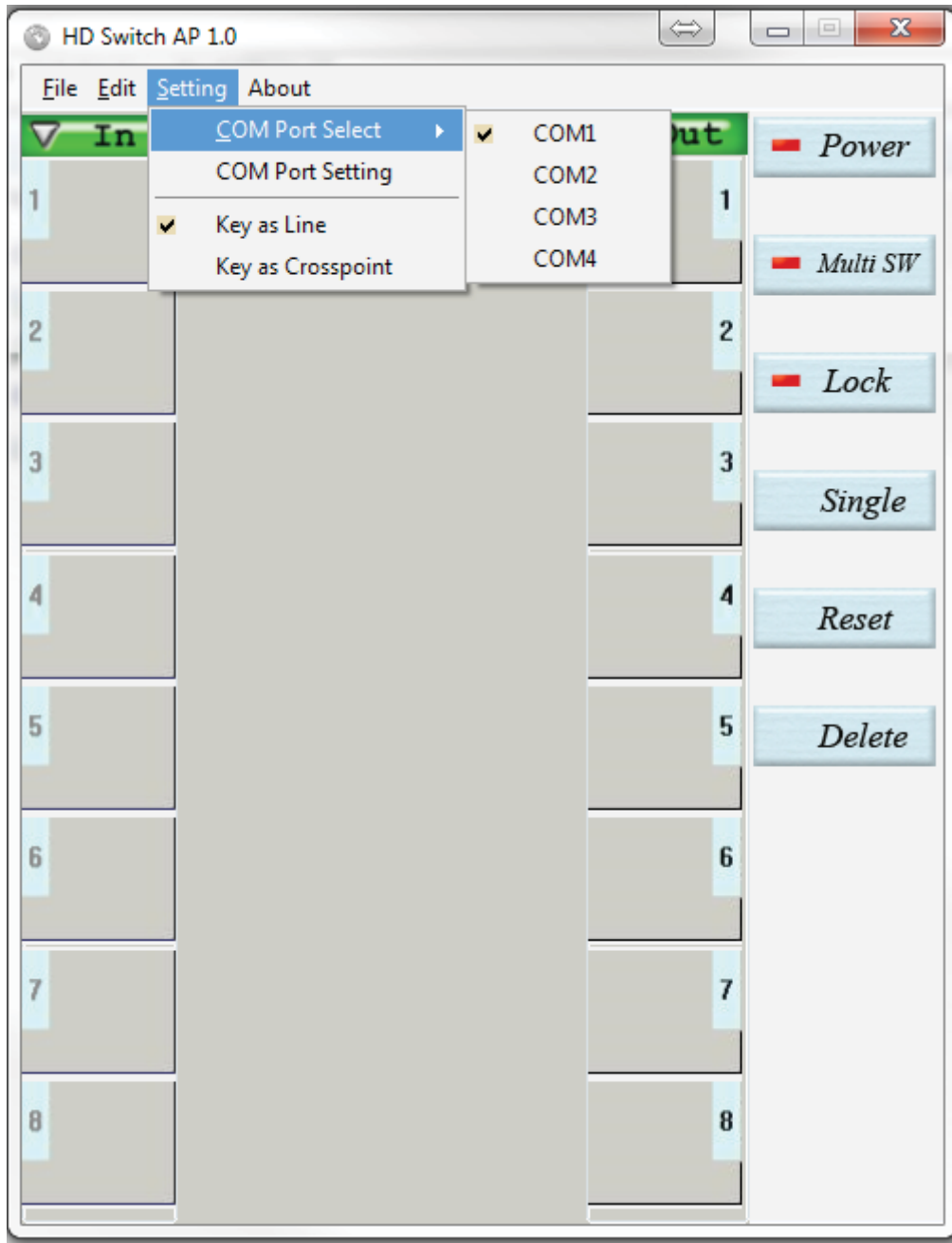
# GUI INTERFACE



2: Select different matrix sizes



# GUI INTERFACE



3: Support COM ports 1 thru 4

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