



CMSI-424L

4 x 4 HDMI Matrix over 4 CAT5e/6/7 with
2 HDMI outputs



Operation Manual

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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.

REVISION HISTORY

VERSION NO.	DATE DD/MM/YY	SUMMARY OF CHANGE
RDV1	13/09/12	Preliminary Release
RDV2	19/03/13	IR Accessories Numbers
RDV3	29/05/13	Add Web GUI function
RDV4	22/07/14	RS-232 & Telnet Command
RDV5	03/03/20	Modify Specifications

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1. INTRODUCTION

The 4x4 HDMI Matrix over 4 CAT5e/6/7 with 2 HDMI outputs supports resolutions up to 1080p Full HD and 1920x1200@60Hz with multichannel digital audio from up to four high definition sources to up to four CAT5e/6/7 output and 2 HDMI synchronized with 2 CAT5e/6/7 output ports. It supports digital audio formats such as LPCM 7.1CH, Dolby TrueHD, Dolby Digital Plus and DTS-HD Master Audio. Also, 3D content can be displayed when connecting a 3DTV and 3D source. The Matrix allows the connection of source equipment to output displays, over distances of up to 60 meters along with IR and RS-232(includes telnet) control.

2. APPLICATIONS

- HDMI System controls
- Video/TV wall display and control
- Security surveillance and control
- Commercial advertising, displaying and control
- Lecture room display and control
- Hyper market demonstration and control

3. PACKAGE CONTENTS

- 4x4 HDMI Matrix over 4 CAT5e/6/7 with 2 HDMI outputs x 1
- HDMI over CAT5e/6/7 Receivers (Optional)
- IR Extender x 1
- IR Blaster x 1
- 24V/2.7A DC adaptor x 1
- Remote control x 1
- Operation manual

4. SYSTEM REQUIREMENTS

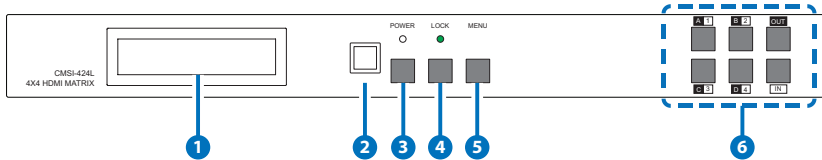
- Input source equipments with HDMI connection cables
- Industry CAT5e/6/7 cable.
- HDMI over CAT5e/6/7 receivers with industrial CAT5e/6/7 cables
- Output displays or audio receiver equipments with HDMI connection cables.

5. FEATURES

- HDMI, HDCP1.1 and DVI compliant
- Supports HDMI 3D features
- Supports resolutions to VGA ~ WUXGA and 480i~1080p follow by output display's EDID settings
- Supports extension up to 60 meters through CAT5e/6/7
- Supports 3D signal display follow by display TV's EDID
- Supports simultaneous HDMI output display on A and C CAT5e/6/7 output
- Supports HDMI input up to 15 meters with 8bits resolution or 10 meters with 12bits resolution
- Supports IR in/out from input and output locations
- Supports RS-232 (include Telnet), remote control and on panel controls
- 1U size design
- Supports external and internal EDID setting
- Supports LPCM 7.1CH, Dolby TrueHD, Dolby Digital Plus and DTS-HD Master Audio transmission

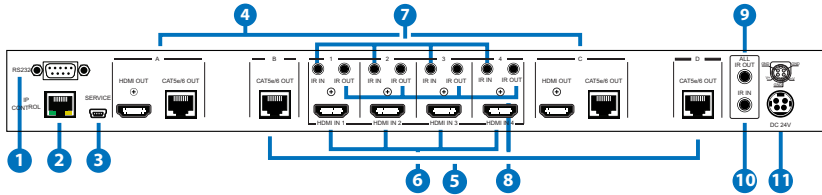
6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel



- 1 **LCM:** This monitor displays your setting information with each input and output selection.
- 2 **IR:** This IR window accepts the remote control signal of this device only.
- 3 **Power button LED:** Press this button to turn on the device and the green LED will illuminate when the power is on. When the LED illuminate in red it is in standby mode
- 4 **LOCK:** Press this button to lock all the buttons on the panel and the LED will illuminate. To unlock, just press it again.
- 5 **Menu:** Press this button once to select EDID setting from STD (internal) 1 or TV (external) 2 then press it again to confirm the selection. Press this button every to confirm the selection.
- 6 **1 ~4 /A ~ D & OUT/IN button:** Press OUT/IN button first to select the output/input then press the number button to make the selection accordingly. For example, output A ~ B wish to select input 1 and C ~ D wish to select input 2. Press Out →A→B →In→1→Menu, and then press Out →C→D→In→2→Menu. If the menu button is not press the selection will not be changed.

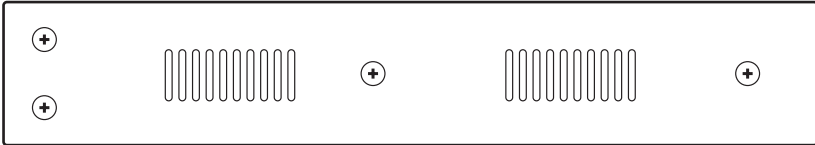
6.2 Rear Panel



- 1 **RS-232:** This slot is to connect with D-Sub 9pin cable from the PC/ NB device for RS-232 control.
- 2 **IP CONTROL:** This port is also the link for Telnet system. For non Ethernet version this port is the link for Telnet control, connect to an active Ethernet link with an RJ45 terminated cable (for details, please refer to section RS-232 & Telnet commands). Warning: Please do not connect this port directly to the PC/Laptop as the Telnet function will not work.
- 3 **SERVICE:** This slot is to connect with mini USB B type cable for firmware update only.
- 4 **HDMI OUT & CAT5e/6/7 OUT A/C:** These slots are to connect with HD TV/display for instant display. And the CAT5e/6/7 OUT can be connected from the HDMI over CAT5e/6/7 Receiver for signal extension up to 60m.
- 5 **CAT5e/6/7 OUT B/D:** This slot is to connect with HDMI over CAT5e/6/7 Receiver for signal extension up to 60m.
- 6 **HDMI IN 1~4:** These slots are to connect to input source equipment such as DVD player or Set-Up-Box with HDMI cable or DVI to HDMI converter cable for input signal sending.
- 7 **IR IN 1~4:** These slots are to connect with IR extender included in the package for IR signal receiving.
- 8 **IR OUT 1~4:** These slots are to connect with IR blaster included in the package for IR signal sending.
- 9 **ALL IR OUT:** This slot is to connect with the IR blaster included in the package for IR signal received from receiver sides and send to the source side.
- 10 **ALL IR IN:** This slot is to connect with the IR extender included in the package for IR signal receiving and send out to receiver sides.

- 11 **DC24V:** This slot is to plug the power cord with adaptor included in the package and then connect them with AC wall outlet for power supply.

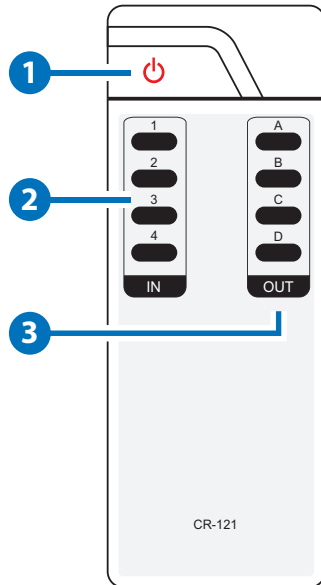
6.3 Side Panel



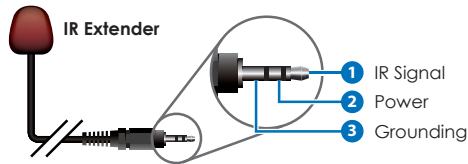
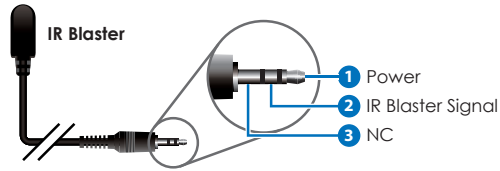
- 1 **Ventilator:** These are fan ventilator area, DO NOT block these area or cover it with any object.

6.4 Remote Control

- 1 **Power:**
Press this button to switch on the device or set it to standby mode.
- 2 **IN:**
Input ports selection 1~4.
- 3 **OUT:**
Output ports selection A~D.



6.5 IR Pin Assignment



6.6 RS-232 Protocols

CMSI-424L	
PIN	Assignment
1	NC
2	Tx
3	Rx
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC



Remote Control Console	
PIN	Assignment
1	NC
2	Rx
3	Tx
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC

Baud Rate: 19200bps

Data bit: 8 bits

Parity: None

Flow Control: None

Stop Bit: 1

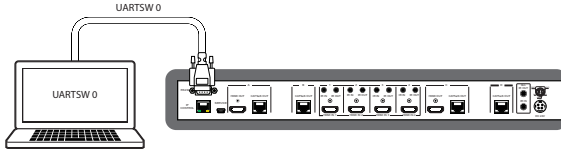
6.7 RS-232 & Telnet Commands

Command	Description
A1~A4	Switch output A to 1~4
B1~B4	Switch output B to 1~4
C1~C4	Switch output C to 1~4
D1~D4	Switch output D to 1~4
AB...1~CD...4	Switch output ABCD... to 1~4
SETIP<IP><SubNet><GW>	Setting IP. SubNet. GateWay (Static IP)
RSTIP	IP Configuration Was Reset to Factory Defaults <DHCP>
IPCONFIG	Display the current IP config
P0	POWER OFF
P1	POWER ON
I1~I4	switch all the output to 1~4
STORE	STORE current I/O position (01~04)
RECALL	RECALL the store I/O position (01~04)
SHOW	SHOW current port's I/O position (01~04)
NAME	NAME the stored port (01~04) no more than 8 charactors (ABCDEFGH)
IO	Mute all the output
ST	Display the current matrix status and F/W version
RS	System Reset to A1, B2, C3 & D4
EM	Setting EDID MODE. 1-STD 2-TV
?	Display all the available commands

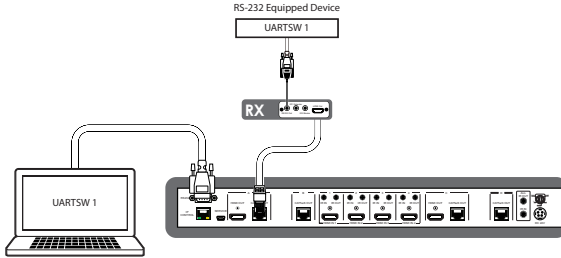
Command	Description
UARTBAUD?	Display baud rate setting 1~6 1: 9600bps 2: 14400bps 3: 19200bps 4: 38400bps 5: 57600bps 6: 115200bps
UARTBAUD1	Set output A's baud rate from 1~6
UARTBAUD2	Set output B's baud rate from 1~6
UARTBAUD3	Set output C's baud rate from 1~6
UARTBAUD4	Set output D's baud rate from 1~6
UARTSW?	Display output's UART status
UARTSW0	Switch to MCU. Restoring RS-232 control to the Receiver output back to Matrix.
UARTSW1	Switch RS-232 control to output A and allow Matrix to send commands to Receiver's connected RS-232 device.
UARTSW2	Switch RS-232 control to output B and allow Matrix to send commands to Receiver's connected RS-232 device.
UARTSW3	Switch RS-232 control to output C and allow Matrix to send commands to Receiver's connected RS-232 device.
UARTSW4	Switch RS-232 control to output D and allow Matrix to send commands to Receiver's connected RS-232 device.
Quit	Exit (for telnet only)

Note: All the commands will not be executed unless followed with a carriage return. All letters are case-insensitive.

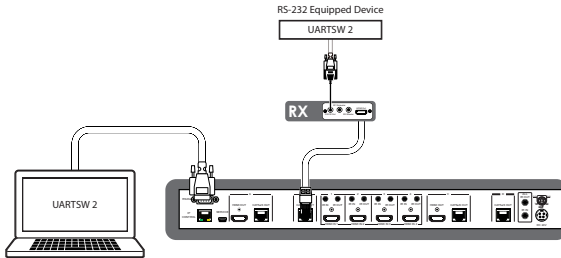
6.8 RS-232 UART Command Illustration Diagram



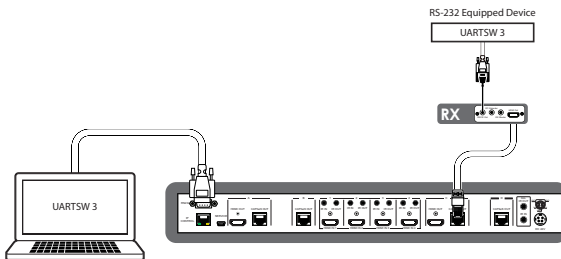
Note: This command allows RS-232 to control the Matrix.



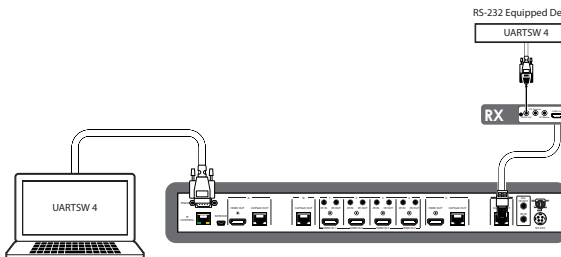
Note: This command allows RS-232 to control the RS-232 device connected to output A's Receiver.



Note: This command allows RS-232 to control the RS-232 device connected to output B's Receiver.



Note: This command allows RS-232 to control the RS-232 device connected to output C's Receiver.



Note: This command allows RS-232 to control the RS-232 device connected to output D's Receiver.

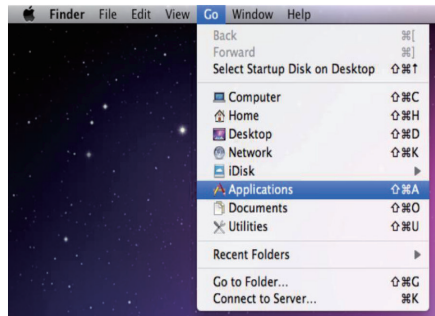
6.9 Telnet Control

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.

To access the telnet control in Windows 7, click on the 'Start' menu and type "cmd" in the Search field then press enter.

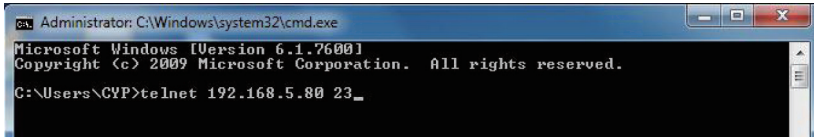
Under Windows XP go to the 'Start' menu and click on "Run", type "cmd" with then press enter.

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



Once in the command line interface (CLI) type "telnet", then the IP address of the unit and "23", then hit enter.

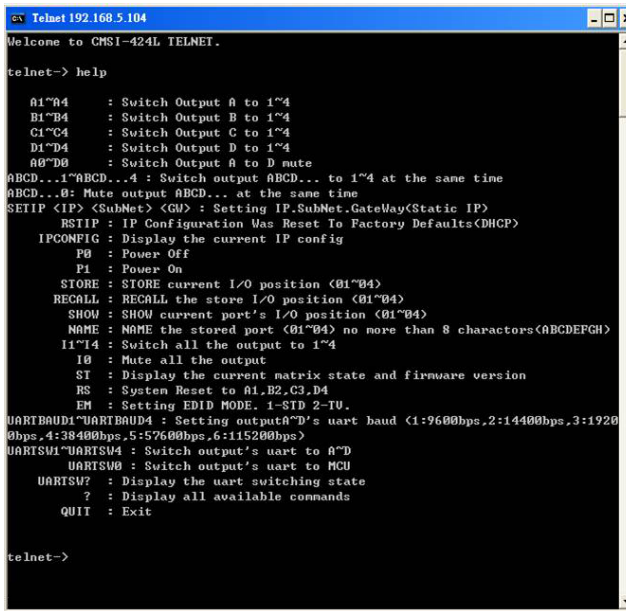
Note: The IP address of the Matrix can be displayed on the device's LCM monitor by pressing the Menu button twice.



```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\CYP>telnet 192.168.5.80 23_
```

This will bring us into the device which we wish to control. Type "HELP" to list the available commands.



```
Telnet 192.168.5.104
Welcome to CMSI-424L TELNET.

telnet-> help

A1~A4 : Switch Output A to 1~4
B1~B4 : Switch Output B to 1~4
C1~C4 : Switch Output C to 1~4
D1~D4 : Switch Output D to 1~4
A0~D0 : Switch Output A to D mute
ABCD...1~ABCD...4 : Switch output ABCD... to 1~4 at the same time
ABCD...0: Mute output ABCD... at the same time
SETIP <IP> <SubNet> <GW> : Setting IP.SubNet.GateWay<Static IP>
RSTIP : IP Configuration Was Reset To Factory Defaults<DHCP>
IPCONFIG : Display the current IP config
PO : Power OFF
PI : Power On
STORE : STORE current I/O position <01~04>
RECALL : RECALL the store I/O position <01~04>
SHOW : SHOW current port's I/O position <01~04>
NAME : NAME the stored port <01~04> no more than 8 characters<ABCDEFGH>
I1~I4 : Switch all the output to 1~4
IO : Mute all the output
SI : Display the current matrix state and firmware version
RS : System Reset to A1,B2,C3,D4
EM : Setting EDID MODE. 1-STD 2-TV.
UARTBAUD1~UARTBAUD4 : Setting outputA~D's uart baud (1:9600bps,2:14400bps,3:19200bps,4:38400bps,5:57600bps,6:115200bps)
UARTSW1~UARTSW4 : Switch output's uart to A~D
UARTSW0 : Switch output's uart to MCU
UARTSW? : Display the uart switching state
? : Display all available commands
QUIT : Exit

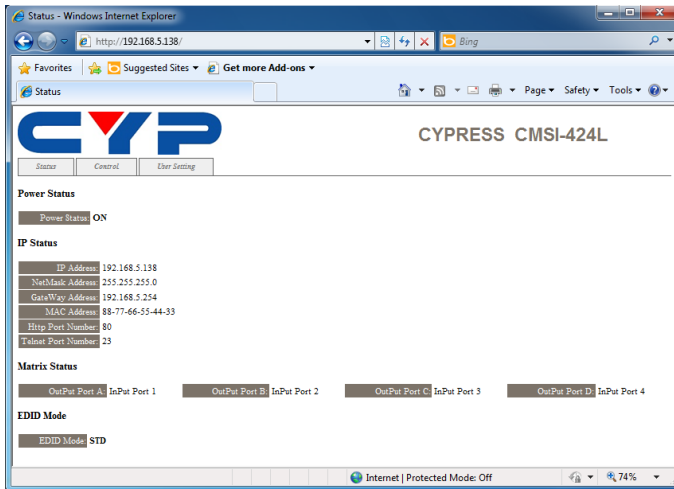
telnet->
```

Type "IPCONFIG" To show all IP configurations. To reset the IP, type "RSTIP" and to use a set static IP, type "SETIP" (For a full list of commands, see Section 6.7).

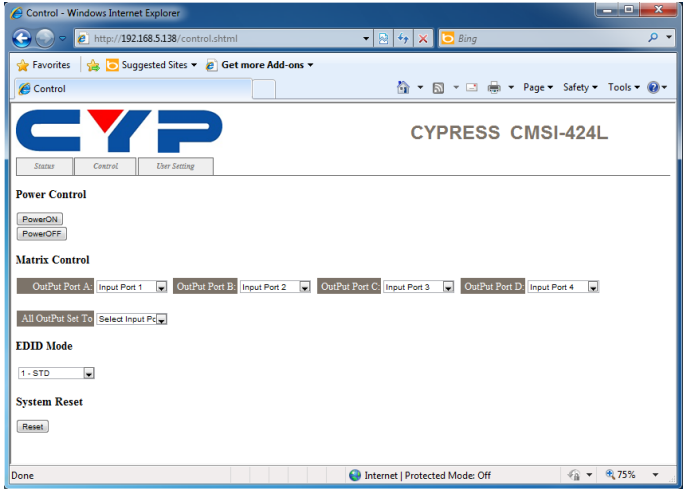
Note: Any commands will not be executed unless followed by a carriage return. Commands are case-insensitive. If the IP is changed then the IP Address required for Telnet access will also change accordingly.

6.10 Web GUI Control

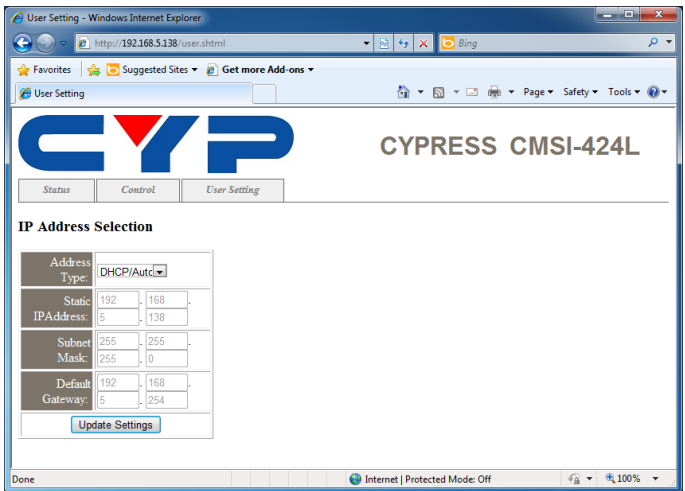
On a PC/Laptop that is connected to the same active network as the Matrix, open a web browser (suggest using Internet Explorer Browser ver.9 and above) and type device's IP address on the web address entry bar. The browser will display the device's status, control and User setting pages.



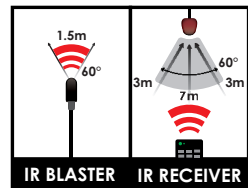
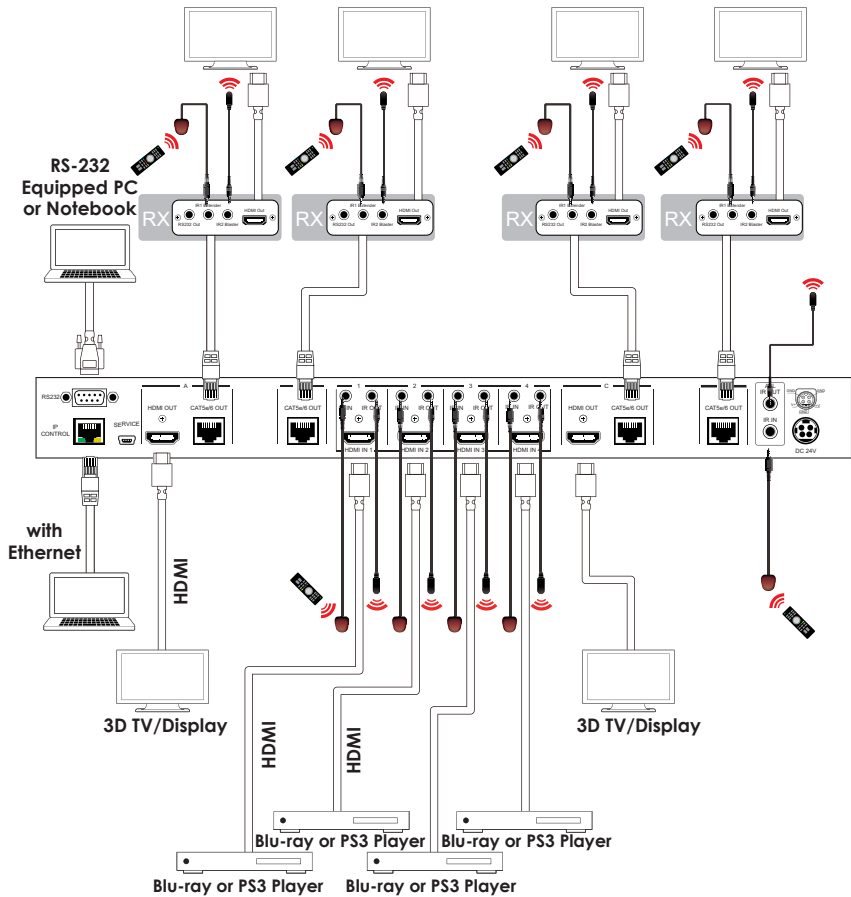
Click on the 'Control' tab to control power, input/output ports, EDID and reset mode.



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.



7. CONNECTION DIAGRAM





8. SPECIFICATIONS

Video Bandwidth	225 MHz/6.75Gbps
Input Ports	4 x HDMI, 5 x IR Extender, 1 x CONTROL 1 x RS-232, 1 x Mini USB B type(for firmware update only)
Output Ports	4 x CAT5e/6/7, 2 x HDMI, 5 x IR Blaster
ESD Protection	Human body model: ±8kV (air-gap discharge) ±4kV (contact discharge)
Power Supply	24V/2.7A DC (US/EU standards, CE/FCC/ UL certified)
Dimensions	436mm(W) x 255mm(D) x 48mm(H)
Weight	3372g
Chassis Material	Metal (Steel)
Silkscreen Color	Black
Operating Temperature	0°C ~ 40°C / 32 °F ~ 104 °F
Storage Temperature	-20°C ~ 60°C / -4 °F ~ 140 °F
Relative Humidity	20 ~ 90% RH (non-condensing)
Power Consumption	40W

9. ACRONYMS

ACRONYM	COMPLETE TERM
DTS	Digital Theater System
EDID	Extended Display Identification Data
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface



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