



# CMSI-4H4CVL

HDBaseT™ 4×4 HDMI Matrix over CAT5e/6/7



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	27/05/13	Preliminary Release
RDV2	04/06/13	RS-232 & Telnet's SetIP Command
RDV3	25/07/13	Power Adaptor & Remote Control
VS1	04/12/13	Updated text



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## 1. INTRODUCTION

The HDBase™ 4 by 4 HDMI Matrix over CAT5e/6/7 supports the transmission of video (resolutions up to 1080p Full HD and 1920x1200@60Hz) and multi-channel digital audio from four high definition sources to four outputs over a single CAT5e/6/7 cable (up to 60m) for each output. It supports high resolution digital audio formats such as LPCM 7.1CH, Dolby TrueHD, Dolby Digital Plus and DTS-HD Master Audio as well as 3D content that can be displayed when connecting a 3D TV and 3D source. It also has the added benefit of control via IR, RS-232, Telnet or Web GUI.

## 2. APPLICATIONS

- HDMI Matrix System
- Video/TV wall display and control
- Security surveillance and control
- Commercial advertising, display and control
- University lecture hall, display and control
- Retail sales and demonstration

## 3. PACKAGE CONTENTS

- 1×HDBase™ 4 by 4 HDMI over CAT5e/6/7 Matrix
- 1×IR Extender
- 1×IR Blaster
- 1×IR Remote Control
- 1×24V/2.7A DC Power Adaptor
- Operation Manual

## 4. SYSTEM REQUIREMENTS

- HDMI equipped source devices, connect with HDMI cables or DVI equipped source, connect with DVI to HDMI cables
- HDMI equipped displays (TVs or monitors) or HDMI equipped AV receivers, connect with HDMI cables
- Industry standard CAT5e/6/7 cables
- HDBaseT™ Receivers

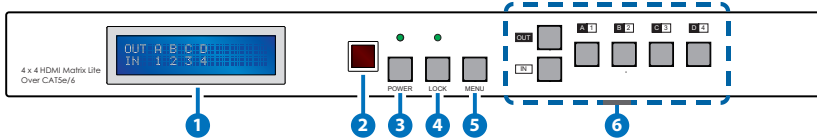
## 5. FEATURES

- HDMI, HDCP1.1 and DVI compliant
- Supports HDMI 3D features
- Supports resolutions VGA~WUXGA and 480i~1080p dependent upon the output display's EDID settings
- Supports distances up to 60 meters through CAT5e/6/7 cables
- Supports 3D signal display dependent upon the output display EDID settings
- Supports HDMI input up to 15 meters at 8-bit resolution or 10 meters at 12-bit resolution
- Supports bi-directional IR from input and output locations
- Supports RS-232, remote control, on-panel control and IP Control (Telnet & Web GUI)
- 1 U size design
- Supports external and internal EDID settings
- Supports LPCM 7.1CH, Dolby TrueHD, Dolby Digital Plus and DTS-HD Master Audio transmission

*Note: Do not connect the CONTROL port to CAT outputs of this device or to CAT inputs or receiver. Doing so may damage the unit.*

## 6. OPERATION CONTROLS AND FUNCTIONS

### 6.1 Front Panel



- 1 LCM:** Displays the setting information of each input and output setting.
- 2 IR:** IR Receiver window (accepts the remote control signal of this device only).
- 3 POWER:** Press this button to power the device on/off. The LED will illuminate green when the power is on, red when it is in 'Standby' mode.
- 4 LOCK:** Press this button to lock all the buttons on the panel; press again to unlock. The LED will illuminate when locked.
- 5 MENU:** Press this button to access the LCM menu system, from here EDID settings can be managed and IP system settings are displayed.
- 6 A~D/1~4 and OUT/IN:** Press the OUT or IN button to select the output or input mode and then press the required number button to make the selection accordingly.

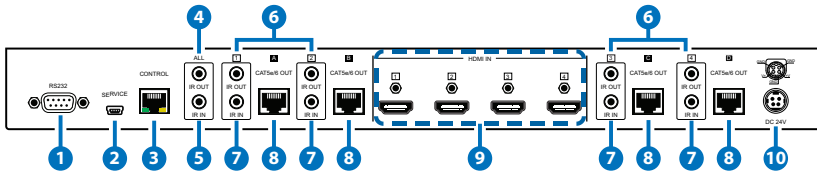
For example, if outputs A~B need to be set to input 1 and outputs C~D need to be set to input 2, then the following sequence of button presses need to be performed:

Press: OUT→A→B→IN→1→MENU,  
and then press: OUT→C→D→IN→2→MENU.

*Note: If the MENU button is not pressed the selection will not be changed.*



## 6.2 Rear Panel

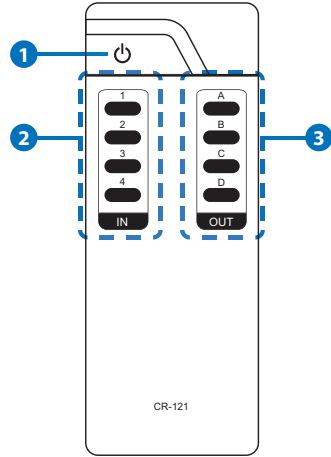


- 1 **RS-232:** Connect to a PC or control system with D-Sub 9-pin cable for control of the matrix via RS-232 commands (please refer to Section 6.6 for a list of commands).
- 2 **SERVICE:** Manufacturer use only.
- 3 **CONTROL:** This port is the link for Telnet or Web GUI controls, connect to an active Ethernet link with an RJ45 terminated cable (for further details, please refer to section 6.8 & 6.9).  
**Warning: Please do not connect this port directly to the PC/Laptop as the Telnet function will not work.**
- 4 **ALL IR OUT:** Connect to the IR blaster for IR signal transmission to the source devices. Place the IR blaster in direct line-of-sight of the equipment to be controlled. All signals received from the display side will be relayed to the source devices.
- 5 **ALL IR IN:** Connect to the IR extender for IR signal reception. Ensure that the remote being used is within the direct line-of-sight of the IR extender. It will transmit all signals received through the IR ALL OUT.
- 6 **IR OUT 1~4:** Connect to the IR blasters for IR signal transmission. Place the IR blaster in direct line-of-sight of the equipment to be controlled. It will transmit the IR signal received from the receiver side according to the selected input.
- 7 **IR IN 1~4:** Connect to the IR extenders for IR signal reception. Ensure that the remote being used is within the direct line-of-sight of the IR extender. It will send out the IR signal received to the selected IR OUT (A-D).
- 8 **CAT5e/6 OUT A~D:** Connect the CAT outputs to the CAT input port of the receiver units with a single CAT5e/6/7 cable for HDMI Audio/ Video and IR control signal transmission.
- 9 **HDMI IN 1~4:** Connect to the HDMI input source devices such as a DVD player or a Set-top Box with HDMI cable or DVI to HDMI cable.
- 10 **DC 24V:** Plug the 24 V DC power supply into the unit and connect the adaptor to an AC outlet.

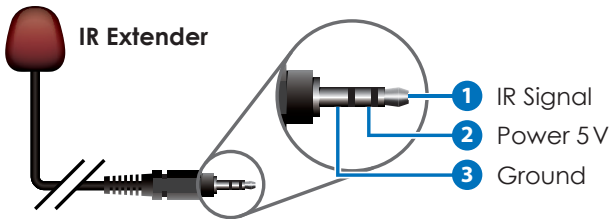
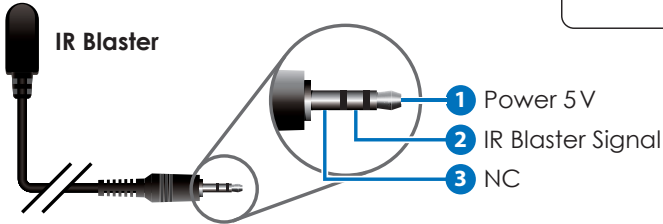
**Warning: Please do not connect the CAT5e/6/7 output to the receiver's LAN port.**

### 6.3 Remote Control

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



### 6.4 IR Cable Pin Assignment



## 6.5 RS-232 Pin Assignment

HDMI MATRIX	
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: 19200 bps

Data Bit: 8-bit

Parity: None

Stop Bit: 1-bit

Flow Control: None

## 6.6 RS-232 and Telnet Commands

COMMAND	DESCRIPTION
<b>help</b>	Display all available commands
<b>A1~A4</b>	Switch Output A to 1~4
<b>B1~B4</b>	Switch Output B to 1~4
<b>C1~C4</b>	Switch Output C to 1~4
<b>D1~D4</b>	Switch Output D to 1~4
<b>AB...1~AB...4</b>	Switch Output ABCD to 1~4 at the same time
<b>SETIP &lt;IP&gt; &lt;SubNet&gt; &lt;GW&gt;</b>	Setting IP. SubNet. GateWay<Static IP>
<b>RSTIP</b>	IP configuration was reset to factory defaults<DHCP>
<b>IPCONFIG</b>	Display the current IP config
<b>P0</b>	Power Off
<b>P1</b>	Power On
<b>I1~I4</b>	Switch all the output to 1~4
<b>ST</b>	Display the current matrix state and firmware version
<b>RS</b>	System Reset to H4
<b>EM</b>	Setting EDID MODE. 1-STD 2-TV.
<b>?</b>	Display all available commands
<b>QUIT</b>	Exit (Telnet only)

*Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive.*

## 6.7 Telnet Control

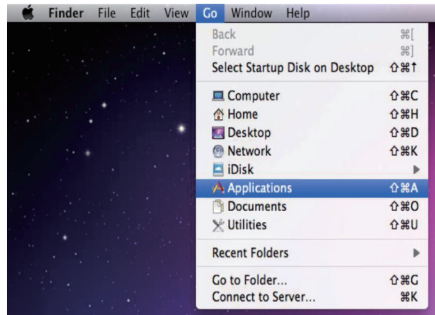
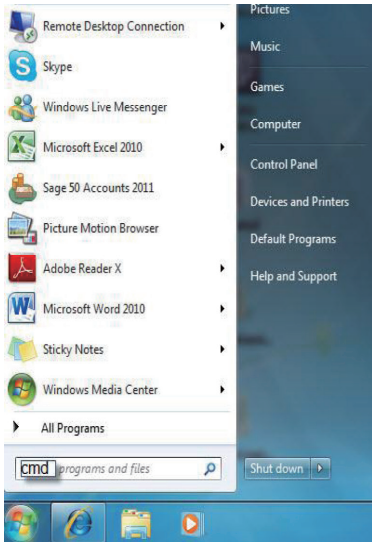
Before attempting to use the telnet control, please ensure that both the Matrix (via the 'LAN /CONTROL' port) and the PC/Laptop are connected to the active networks.

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

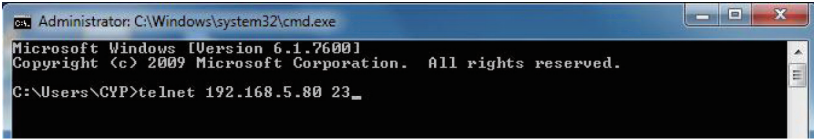
See below for reference.



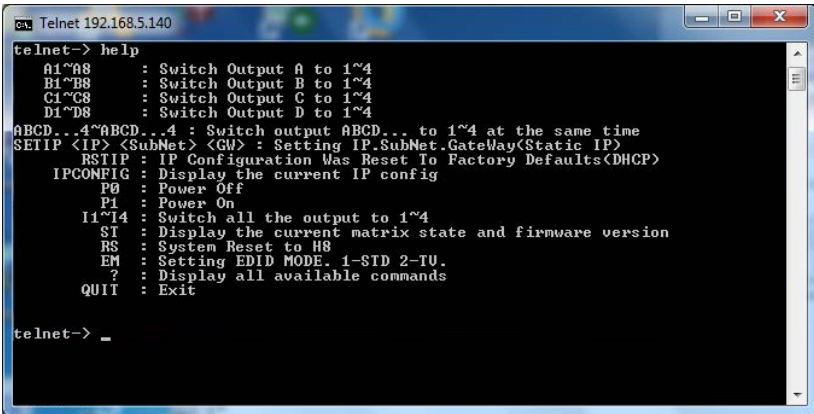


Once in the command line interface (CLI) type "telnet", then the IP address of the unit and "23", then hit enter.

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



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

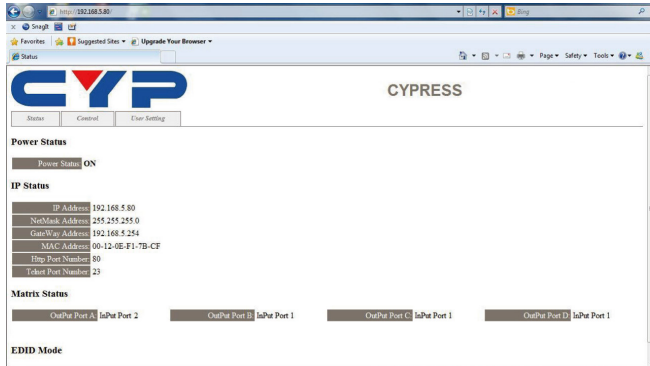


Type "IPCONFIG" To show all IP configurations. To reset the IP, type "RSTIP" and to use a set static IP, type "SETIP" (For a full list of commands, see Section 6.7).

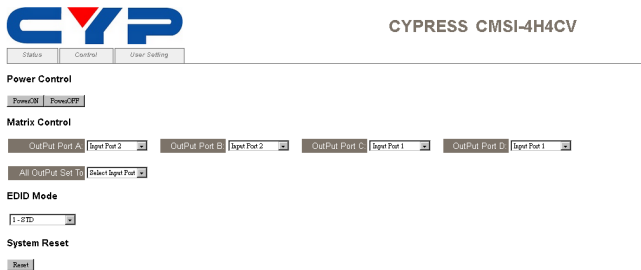
**Note:** Any commands will not be executed unless followed by a carriage return. Commands are case-insensitive. If the IP is changed then the IP Address required for Telnet access will also change accordingly.

## 6.8 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.

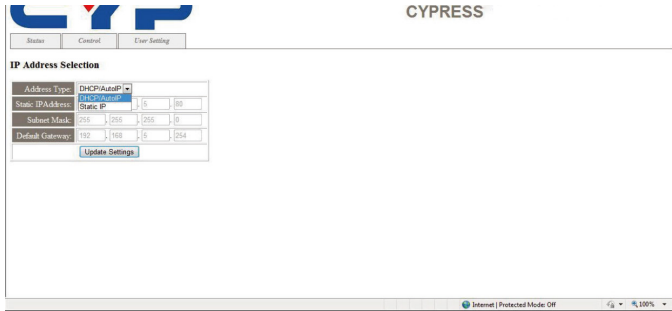


Click on the 'Control' tab to control power, input/output ports, EDID and reset mode.



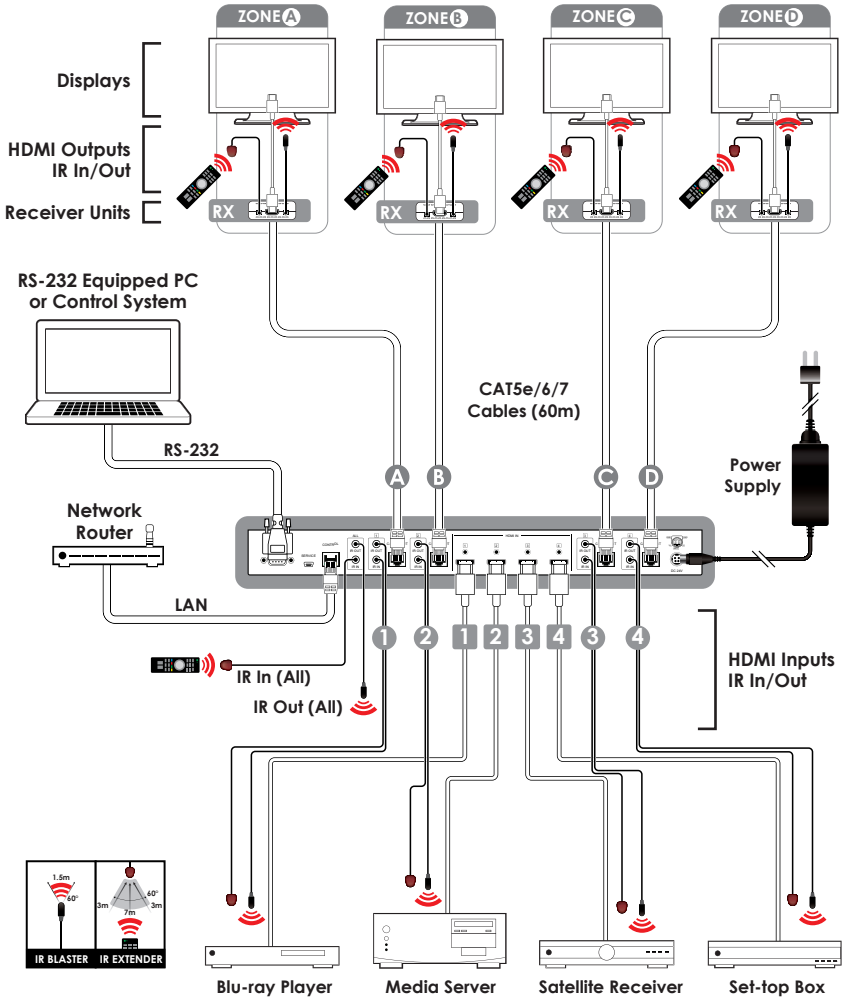


Clicking on the 'User Setting' tab allows you to reset the IP configuration. The system will ask for a reboot of the device every time any of the settings are changed. The IP address needed to access the Web GUI control will also need to be changed accordingly on the web address entry bar.





## 7. CONNECTION DIAGRAM





## 8. SPECIFICATIONS

### 8.1 Technical Specifications

<b>Video Bandwidth</b>	225 MHz/6.75 Gbps
<b>Input Ports</b>	4×HDMI, 5×IR Extender, 1×RS-232, 1×RJ-45 (Control), 1×Mini USB Type B (For firmware updated only)
<b>Output Ports</b>	4×CAT5e/6/7, 5×IR Blaster
<b>ESD Protection</b>	Human-body Model: ± 8kV (Air-gap discharge) ± 4kV (Contact discharge)
<b>Power Supply</b>	24 V/2.7 A DC (US/EU standards, CE/FCC/UL certified)
<b>Dimensions</b>	436 mm (W)×255 mm (D)×48 mm (H)
<b>Weight</b>	3234 g
<b>Chassis Material</b>	Metal
<b>Silkscreen Color</b>	Black
<b>Operating Temperature</b>	0 °C~40 °C/32 °F~104 °F
<b>Storage Temperature</b>	-20 °C~60 °C/-4 °F~140 °F
<b>Relative Humidity</b>	20~90% RH (non-condensing)
<b>Power Consumption</b>	35 W

## 8.2 CAT5e/6/7 Cable Specification

CABLE TYPE	RANGE	PIXEL CLOCK RATE	VIDEO DATA RATE	SUPPORTED VIDEO
<b>CAT5e/6/7</b>	70 m	≤225 MHz	≤5.3 Gbps (HD Video)	Up to 1080p, 60 Hz, 36 bits 3D (data rates lower than 5.3 Gbps or below 225 MHz TMDS clock).

## 9. ACRONYMS

ACRONYM	COMPLETE TERM
<b>CLI</b>	Command Line Interface
<b>DTS</b>	Digital Theater System
<b>DVI</b>	Digital Visual Interface
<b>EDID</b>	Extended Display Identification Data
<b>GUI</b>	Graphical User Interface
<b>HDCP</b>	High-bandwidth Digital Content Protection
<b>HDMI</b>	High-Definition Multimedia Interface
<b>HDTV</b>	High-Definition Television
<b>LCM</b>	Liquid Crystal Module
<b>USB</b>	Universal Serial Bus
<b>VGA</b>	Video Graphics Array
<b>WUXGA</b>	Widescreen Ultra Extended Graphics Array











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