



# CMPRO-U4H4CVE

4K2K 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
VR0	17/09/14	Preliminary Release



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## 1. INTRODUCTION

The 4K2K 4 by 4 HDMI Matrix over CAT5e/6/7 supports the transmission of video (resolutions up to 4K2K Full HD), multi-channel digital audio and control via IR, RS-232, Telnet or WebGUI from four high definition sources to four outputs over a single CAT5e/6/7 cable (up to 100m) 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.

Additionally, the LAN connectivity will allow a 100BaseT network to be served to smart TVs or games consoles. The Power over Cable (PoC) function can power compatible Receivers, providing greater flexibility in installations.

## 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

- 4K2K 4×4 HDMI Matrix over CAT5e/6/7
- 1×IR Extender
- 1×IR Blaster
- 1×24V/3.75A DC Power Adaptor
- 1×Power Cord
- 1×IR Remote Control with battery
- 1x Right and Left Ear Rack Sets
- 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

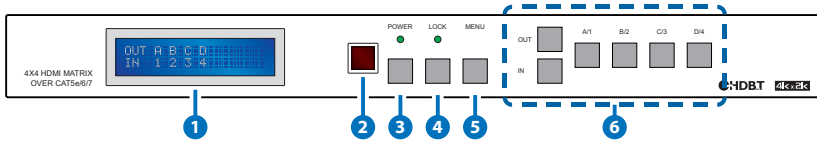
- HDMI, HDCP1.1 and DVI compliant
- Supports HDMI 3D features
- Supports resolutions VGA~WUXGA and 4K2K @50/60(YUV\_420) dependent upon the output display's EDID settings
- Supports distances up to 100 meters through CAT5e/6/7 cables
- Supports 3D signal display dependent upon the output display EDID settings
- Supports HDMI input/output up to 10 meters at 8-bit/12-bit resolution or 5 meters at 4K2K resolution
- Supports bi-directional IR from input and output locations
- Supports RS-232, remote control, on-panel control and IP Control (Telnet & Web GUI)
- 1U size design
- Supports external and internal EDID settings
- Supports LPCM 7.1CH, Dolby TrueHD, Dolby Digital Plus and DTS-HD Master Audio transmission

### **Note:**

1. Do not connect the LAN/CONTROL port to CAT outputs of this device.
2. Do not connect more than one Ethernet/network link within the Matrix system, doing so may trigger the device to shoot down.
3. The PoC function is designed for powering compatible receiver units only, non-PoC receivers will need their own power supply. Receivers of another brand may not be compatible.

## 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.

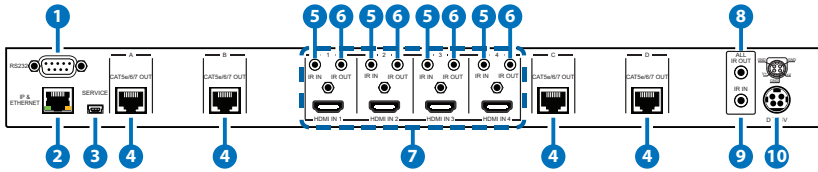
For example, if outputs A~B need to be set to input 1 and outputs C~D need to be set to input 2, then the following sequence of button presses need to be performed:

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.



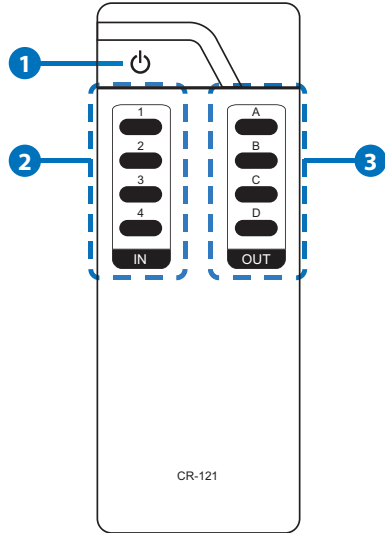
## 6.2 Rear Panel



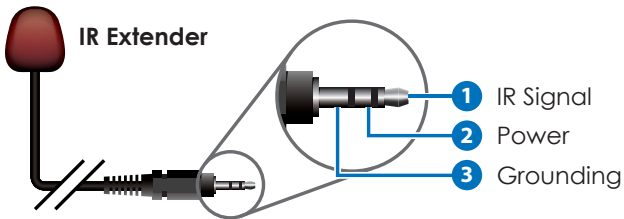
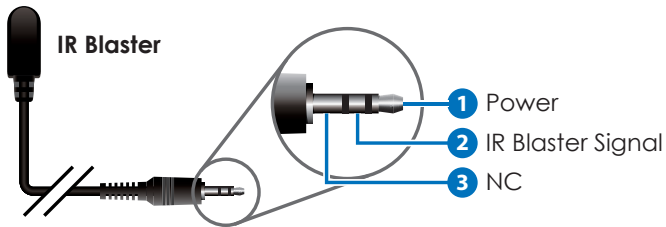
- 1 RS-232:** Connect to a PC or control system with D-Sub 9-pin cable for the transmission of RS-232 commands.
- 2 IP & ETHERNET:** This port is the link for Telnet or WebGUI controls, connect to an active Ethernet link with an RJ45 terminated cable (for further details, please refer to section 6.8 & 6.9).  
**Warning: Please do not connect more than one active Ethernet link within the Matrix system.**
- 3 SERVICE:** Manufacturer use only.
- 4 CAT5e/6/7 OUT A~D:** Connect from these CAT outputs to the CAT input port of the Receiver units with a single CAT5e/6/7 cable for HDMI Audio/Video and IR/RS-232 control signal transmission.  
**Warning: Please do not connect the CAT5e/6/7 cable into the Receiver's LAN port.**
- 5 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 for it will send out the IR signal to the selected Receiver's IR 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 for it will blaster out the IR signal received from the Receiver side choosen by input selection.
- 7 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.
- 8 ALL IR OUT:** Connect to the IR Blaster for IR signal transmission to the source side. Place the IR Blaster in direct line-of-sight of the equipment to be controlled for it will blaster out all signal received from the IR IN at the Receiver sides.
- 9 ALL IR IN:** Connect to the IR extender for IR signal reception. Ensure that remote being used is within the direct line-of-sight of the IR extender for it will send out the signal to all Receiver's IR OUT.
- 10 DC 24V:** Plug the 24 V DC power supply into the unit and connect the adaptor to an AC outlet.

### 6.3 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.



### 6.4 IR Cable Pin Assignment



## 6.5 RS-232 Pin Assignment

CMPRO-U4H4CVE			Remote Control Console	
PIN	Assignment		PIN	Assignment
1	NC		1	NC
2	Tx		2	Rx
3	Rx	→	3	Tx
4	NC		4	NC
5	GND	←	5	GND
6	NC		6	NC
7	NC		7	NC
8	NC		8	NC
9	NC		9	NC

Baud Rate: 19200 bps

Data Bit: 8-bit

Parity: None

Stop Bit: 1-bit

Flow Control: None

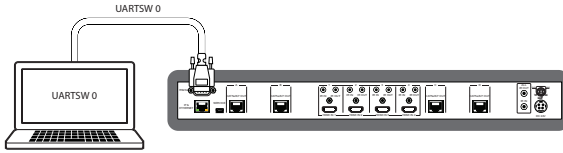
## 6.6 RS-232 and Telnet Commands

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>

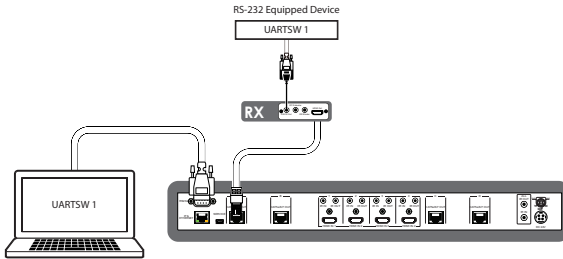
<b>RSTIP</b>	IP configuration was reset to factory defaults<DHCP>
<b>IPCONFIG</b>	Display the current IP config
<b>P0</b>	Power Off
<b>P1</b>	Power On
<b>STORE 01~04</b>	Store current I/O position (01~04)
<b>PRESET 01~04</b>	Recall the store I/O Position (01~04)
<b>SHOW 01~04</b>	Show current port's I/O position (01~04)
<b>NAME N1 N2</b>	Name the stored port N1(01~04) no more than 8 charactors, N2 (ABCDEFGH)
<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>UARTBAUD1~4</b>	Set output A~D's uart baud rate from 1~6 1: 9600bps 2: 14400bps 3: 19200bps 4: 38400bps 5: 57600bps 6: 115200bps
<b>UARTSW1~4</b>	Switch output's UART to A~D and allow Matrix to send commands to Receiver's connected RS-232 device.
<b>UARTSW0</b>	Switch output's UART to MCU. Restoring RS-232 control to the Receiver output back to Matrix.
<b>UARTBAUD?</b>	Display all the output's UART baud
<b>UARTSW?</b>	Display the UART switching state
<b>?</b>	Display all available commands
<b>QUIT</b>	Exit (Telnet only)

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

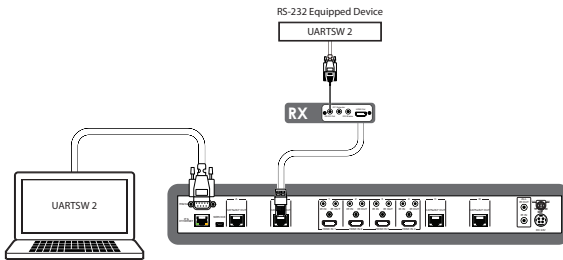
## 6.7 RS-232 UART Command Illustration Diagram



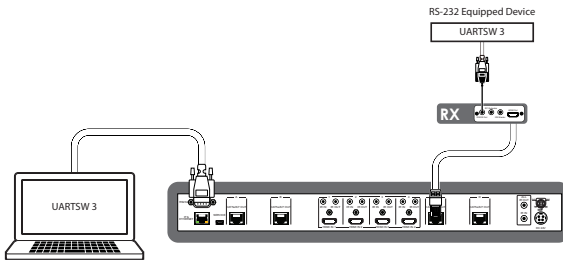
**Note:** This command allows RS-232 to control the Matrix.



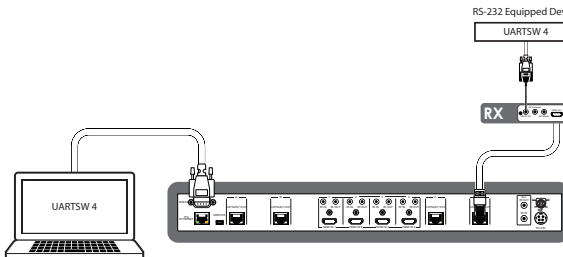
**Note:** This command allows RS-232 to control the RS-232 device connected to output A's Receiver.



**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.

## 6.8 Telnet Control

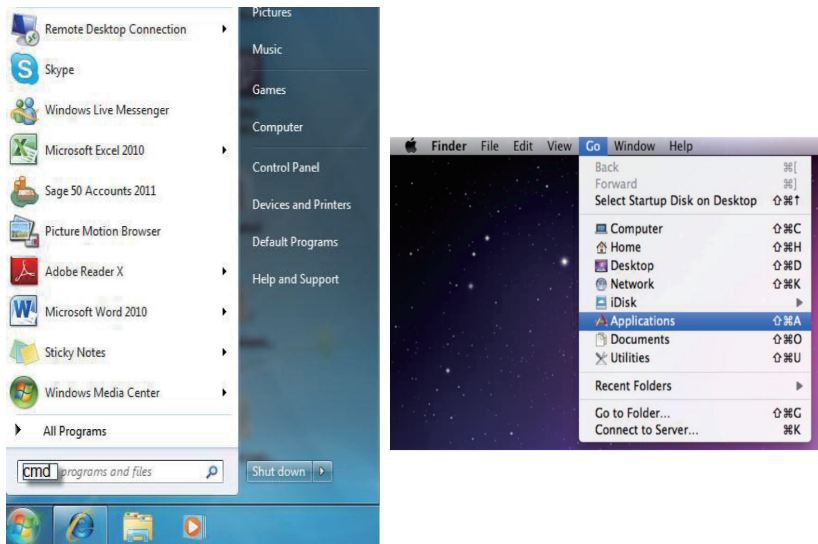
Before attempting to use the telnet control, please ensure that both the Matrix (via the 'LAN /CONTROL' port) and the PC/Laptop are connected to the active networks.

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.

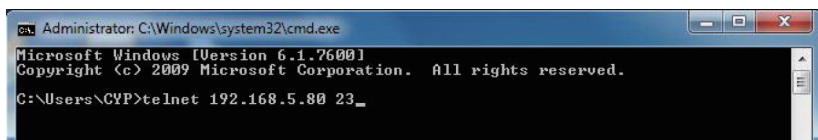
Under Mac OS X, go to Go→Applications→Utilities→Terminal

See below for reference.

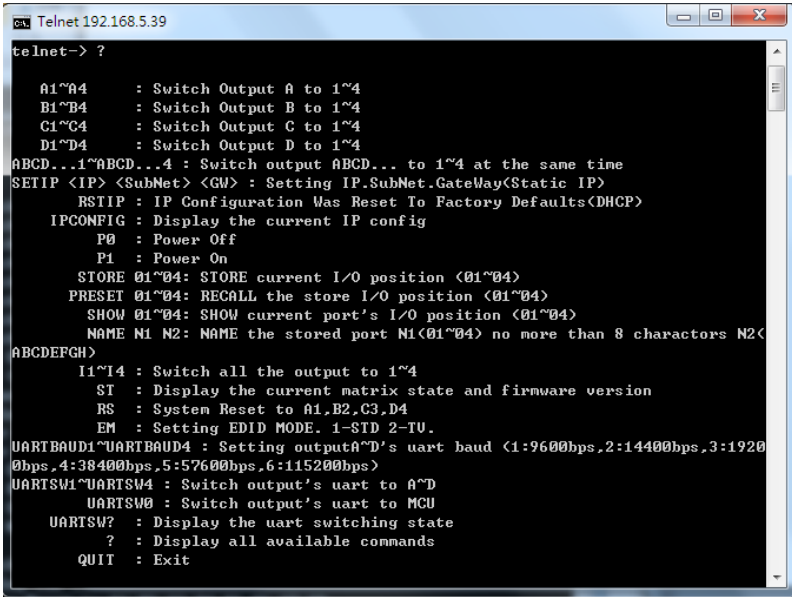


Once in the command line interface (CLI) type "telnet", then the IP address of the unit and "23", then hit enter.

**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.



```

Telnet 192.168.5.39
telnet-> ?

A1~04 : Switch Output A to 1~4
B1~04 : Switch Output B to 1~4
C1~04 : Switch Output C to 1~4
D1~04 : Switch Output D to 1~4
ABCD...1~04 : Switch output ABCD... to 1~4 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 01~04: STORE current I/O position <01~04>
PRESET 01~04: RECALL the store I/O position <01~04>
SHOW 01~04: SHOW current port's I/O position <01~04>
NAME N1 N2: NAME the stored port N1<01~04> no more than 8 charactors N2<
AB CDEFGH>
I1~I4 : Switch all the output to 1~4
ST : Display the current matrix state and firmware version
RS : System Reset to A1,B2,C3,D4
EM : Setting EDID MODE. 1-STD 2-IU.
UARTBAUD1~UARTBAUD4 : Setting outputA~D's uart baud <1:9600bps,2:14400bps,3:1920
0bps,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
  
```

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.

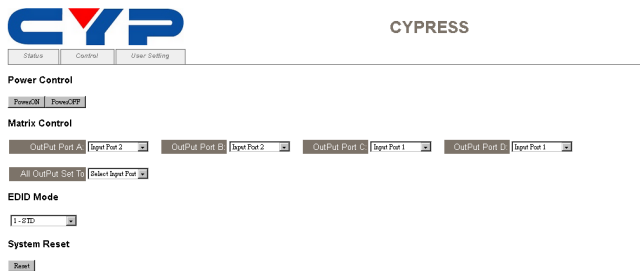


## 6.9 Web GUI Control

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.

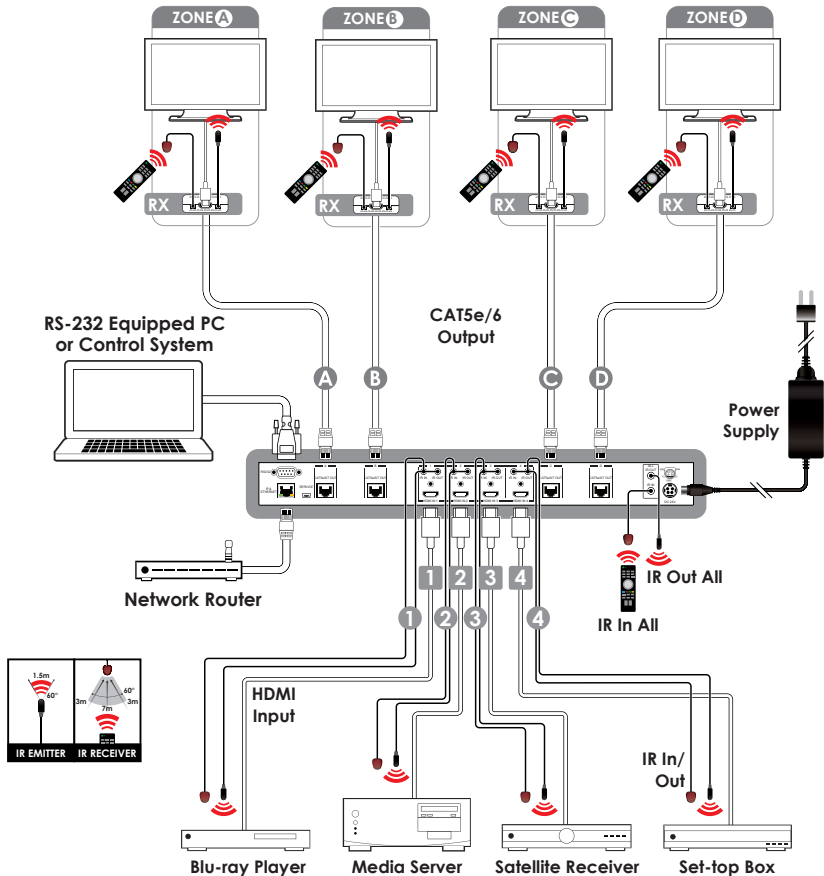


Clicking on the 'User Setting' tab allows you to reset the IP configuration. The system will ask for a reboot of the device every time any of the settings are changed. The IP address needed to access the WebGUI control will also need to be changed accordingly on the web address entry bar.



Status	Control	User Setting
<b>IP Address Selection</b>		
Address Type:	DHCP/AutoIP	
Static IP Address:	192	168
Subnet Mask:	255	255
Default Gateway:	192	168
<a href="#">Update Settings</a>		

## 7. CONNECTION DIAGRAM





## 8. SPECIFICATIONS

<b>Video Bandwidth</b>	340 MHz/10.2 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/3.75 A DC (US/EU standards, CE/FCC/UL certified)
<b>Dimensions</b>	436 mm (W)×249 mm (D)×44mm (H)/ Jacks Excluded 436 mm (W)×256.2 mm (D)×48 mm (H)/ Jacks Included
<b>Weight</b>	3352g
<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>	66 W

### 8.1 CAT5e/6/7 Cable Specification

Cable Type	Range	Pixel clock rate	Video Data Rate	Supported Video
CAT5e/6/ CAT 7	100 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).

## 8.2 Support Timing Chart

	INPUT	OUTPUT
640x480@60/72/75/85	✓	✓
800x600@56/60/72/75/85	✓	✓
1024x768@60/70/75/85	✓	✓
1280x720@60	✓	✓
1280x1024@60	✓	✓
1600x1200@60	✓	✓
1920x1200@60RB	✓	✓
3840x2160p@24/25/30	✓	✓
4096x2160p@24	✓	✓
4096x2160p@50/60(YUV_420)	✓	✓
480I/576I	✓	✓
480P/576P	✓	✓
720P@50/60	✓	✓
1080I@50/60	✓	✓
1080P@50/60	✓	✓
1080P@24/25/30	✓	✓

## 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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