CMSI-424L

HDBaseT™ 4×4 HDMI over CAT5e/6/7 Matrix with 2 Simultaneous 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 to 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 Accessaries Numbers
RDV3	29/05/13	Add WebGUI function
RDV4	22/07/14	RS-232 & Telnet Command
VS1	11/01/16	Updated Format/Diagrams

CONTENTS

1. INTRODUCTION

The HDBaseT™ Lite 4 by 4 HDMI Matrix over CAT5e/6/7 with two additional simultaneous HDMI outputs supports the transmission of video (resolutions up to 1080p Full HD and 1920×1200@60 Hz), multi-channel digital audio and control via IR, RS-232 or WebGUI/Telnet IP from four high definition sources to four HDBaseT outputs over a single CAT5e/6/7 cable (up to 60m) for each output. Output A and C have additional mirrored HDMI outputs.

It supports high resolution digital audio formats such as LPCM 7.1 CH, Dolby TrueHD, Dolby Digital Plus and DTS-HD Master Audio as well as 3D content that can be displayed when connecting a 3DTV and 3D source.

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
- Residential HDMI systems

3. PACKAGE CONTENTS
- 4 by 4 HDMI Matrix over 4 CAT5e/6/7 with 2 HDMI Outputs
- HDMI over CAT5e/6/7 Receivers (Optional)
- IR Extender Cable
- IR Blaster Cable
- 24V /2.7 A DC Adaptor
- Remote Control
- 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 (i.e. CH-514RXL)
- Network Router for IP control

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 CAT6/7 cables
- Supports 3D signal display dependent upon the output display's EDID settings
- Supports simultaneous HDMI and CAT 5e/6/7 display on outputs A and C
- 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 or WebGUI)
- 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: Do not connect the LAN port to CAT outputs of this device or to CAT inputs or receiver. Doing so may demage the unit.

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel
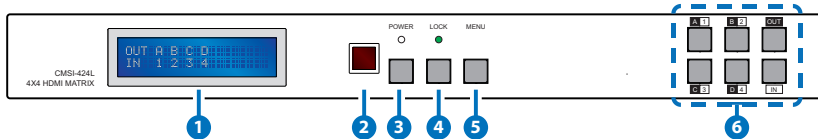
1 **LCM:** Displays the setting information of each input and output setting.

2 **IR Window:** 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 to access the menu system for EDID and IP settings, e.g. press once to select EDID setting from STD (internal) 1 or TV (external) 2 then press it again to confirm the selection. Press the the 'MENU' button to confirm the input or output selection.

6 **IN/OUT and 1~4/A~D:** Press the OUT button and then the number buttons to select the required output ports, and press IN button and then a single number button to select the required input source, finally press the MENU button to confirm the selection.
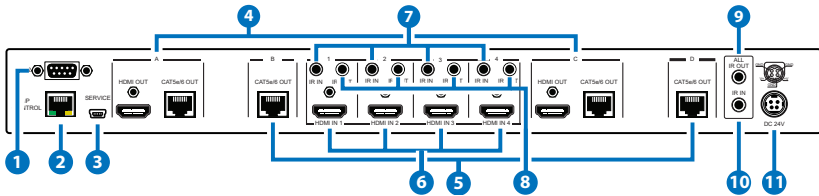
For example, if outputs A~B need to be set to input 1 and outputs C~D need to be set to input 2, then the following sequence of button presses need to be performed:

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 to control the unit with RS-232 commands.

2 IP CONTROL: Connect to an active network for Telnet/WebGUI control (refer to Sections 6.8 and 6.9)

Warning: Please do not connect this port directly to the PC/Laptop as the Telnet function will not work.

3 SERVICE: Manufacturer use only.

4 HDMI OUT and CAT5e/6/7 OUT A/C: Simultaneous HDMI and HDBaseT CAT5e/6/7 output. The HDMI output can be connected directly to a display or to a point-to-point transmitter/receiver set. Connect the CAT5e/6/7 output to a compatible receiver unit to extend the signal up to 60 m.

5 CAT5e/6/7 OUT B/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 control signal transmission.

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

6 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.

7 IR IN 1~4: Connect the IR receivers to the IR ouputs. Ensure that the remote being used is within the direct line-of-sight of the IR receiver. It will transmit the IR signal to the selected IR OUT output (from 1~4) and IR OUT ALL.

8 IR OUT 1~4: Connect the IR blasters to the IR outputs. Place the IR blaster in direct line-of-sight of the equipment to be controlled. It will transmit the signal as selected in the settings.

9 ALL IR OUT: Connect an IR blaster to this IR output. Place the IR blaster in direct line-of-sight of the equipment to be controlled. It will transmit all IR signals received from IR IN 1~4.

10 **ALL IR IN:** Connect an IR Receiver to this IR input. Ensure that the remote being used is within the direct line-of-sight of the IR receiver. It will transmit all IR signals received from IR IN 1-8 and IR IN ALL to IR OUT 1-4 and IR ALL OUT.

11 **DC 24V:** Connect the 24 V DC power supply to the unit and plug the adaptor into an AC outlet.

6.3 Side Panel
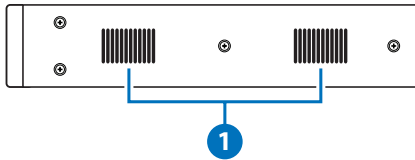
1 **Fan Ventilator:** These are fan ventilation areas, DO NOT block these areas or cover them with any object. Ensure there is adequate space around the unit for air to circulate.

6.4 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.

Note: IR Matrix control from Zones only require the user to select the desired input.
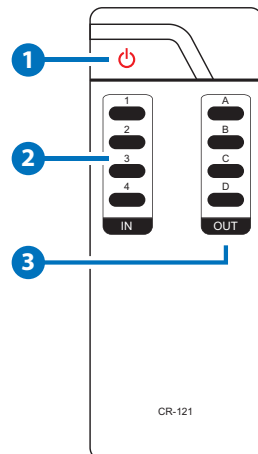
6.5 IR Cable Pin Assignment

IR Blaster

1. Power
2. IR Signal
3. NC

IR Extender

1. IR Signal
2. Power
3. Grounding
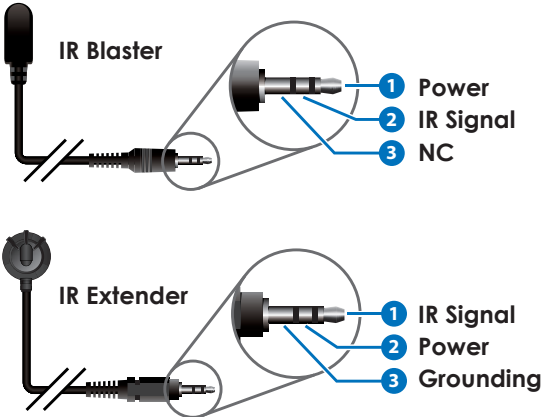
6.6 RS-232 Protocols

MATRIX	
PIN	**Assignment**
1	NC
2	TX
3	RX
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC

REMOTE CONTROL	
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 and Telnet Commands

COMMAND	DESCRIPTION
A1~A4	Set output A to input 1, 2, 3 or 4
B1~B4	Set output B to input 1, 2, 3 or 4
C1~C4	Set output C to input 1, 2, 3 or 4
D1~D4	Set output D to input 1, 2, 3 or 4
ABCD...1~ABCD...4	Set output A, B, C or D to input 1, 2, 3 or 4 simultaneously
ABCD...0	Mute output A, B, C or D simultaneously
SETIP <IP> <SubNet> <GW>	Set the IP, Subnet and Gateway configuration (Static IP)
RSTIP	Reset IP configuration to default values (DHCP)
IPCONFIG	Show the current IP configuration
P0	Power off
P1	Power on
STORE	Store the current input and output connections (01~04)
RECALL	Recall the stored input and output connections (01~04)
SHOW	Show the input and output of the sotred connections (01~04)
NAME	Name the stored input and output connections (N1=01~04) less than 8 characters (N2=A~H)
I1~I4	Set all outputs to input 1~4
I0	Mute all outputs
ST	Show the current matrix state and firmware version
RS	Reset the system to A1, B2, C3, D4

COMMAND	DESCRIPTION
EM	Set the EDID mode to 1 (STD) or 2 (TV)
UARTBAUD1~4	Set the UART Baud rate of output A, B, C or D to: 1=9600 bps 4=38400 bps 2=14400 bps 5=57600 bps 3=19200 bps 6=115200 bps
UARTSW1~4	Set the UART routing to output A, B, C or D and allow the matrix to send RS-232 commands to devices connected to the receivers
UARTSW0	Set the UART routing to MCU and restore RS-232 control of the Matrix
UARTSW?	Show the UART routing status
?	Show all available commands
Quit	Exit (Telnet only)

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

6.8 RS-232 UART Control
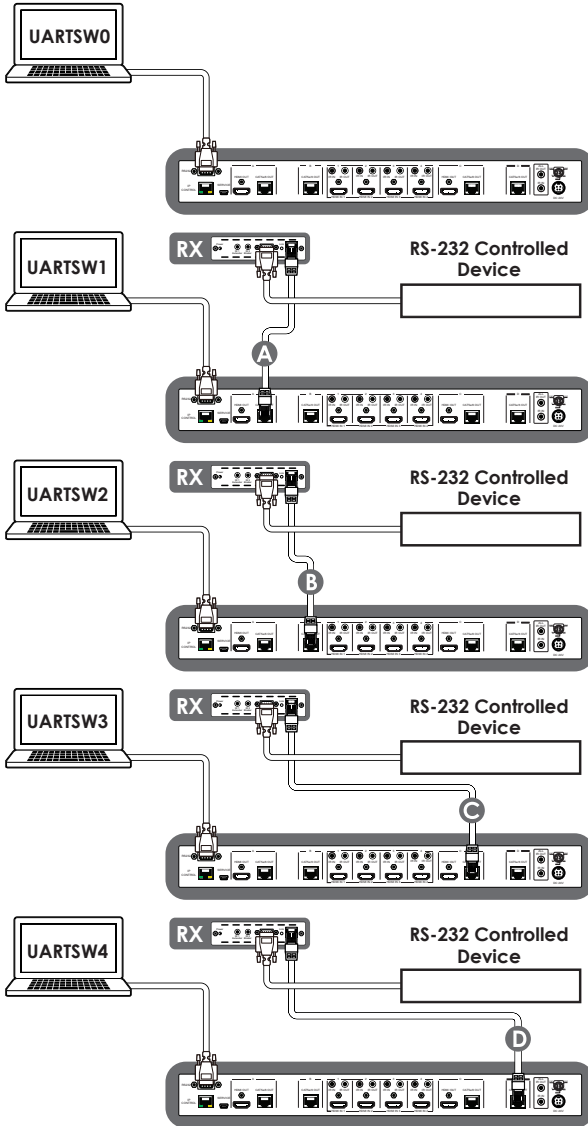
UARTSW0

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

UARTSW1

RX

RS-232 Controlled Device

Ⓐ

Note: This command allows RS-232 control of the device attached to RS-232 output of Receiver connected to Output A.

UARTSW2

RX

RS-232 Controlled Device

Ⓑ

Note: This command allows RS-232 control of the device attached to RS-232 output of Receiver connected to Output B.

UARTSW3

RX

RS-232 Controlled Device

Ⓒ

Note: This command allows RS-232 control of the device attached to RS-232 output of Receiver connected to Output C.

UARTSW4

**RX**

RS-232 Controlled Device

Ⓓ

Note: This command allows RS-232 control of the device attached to RS-232 output of Receiver connected to Output D.

6.9 Telnet Control

Before attempting to use the Telnet control, ensure that both the Matrix (via the LAN/Control port) and the PC/Laptop or control system being used are connected to the same active network.

To access the Telnet control in Windows 7, click on the 'Start' menu and type 'cmd' in the Search Field then press Enter (see below for reference). Under Windows XP, go to the 'Start' menu and click on 'Run', type 'cmd' then press Enter.

Under Mac OS X, go to the file menu then navigate to Go→Applications→Utilities→Terminal (see below for reference.)
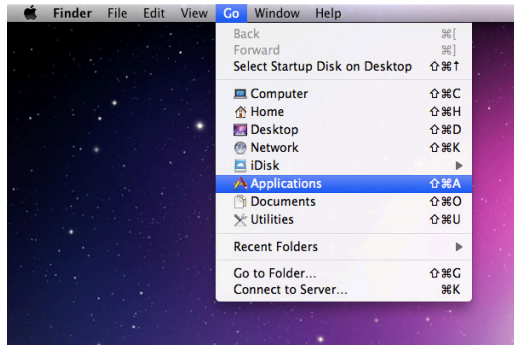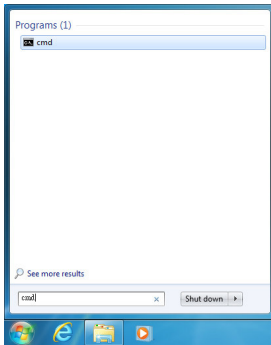
Once in the Command Line Interface (CLI) type 'telnet' along with the IP address of the unit you wish to control and '23' then hit Enter (see below for reference). This will bring us into the device which we wish to control.

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

Type 'HELP' to list the available commands (see below for reference).

```
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
          P0 : Power Off
          P1 : 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 charactors(ABCDEFGH)
      I1~I4 : Switch all the output to 1~4
          I0 : Mute all the output
          ST : 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,3:1920
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'.

Note:

1. *All commands will not be executed unless followed by a carriage return. Commands are case-insensitive.*

2. *If the IP is changed then the IP Address required for Telnet/ WebGUI access will also needs to be changed accordingly.*

6.10 WebGUI Control

On a PC/Laptop or control system 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, and the control and user settings pages.

Status	Control	User Setting

Power Status

Power Status:	ON

IP Status

IP Address:	192.168.5.138
NetMask Address:	255.255.255.0
GateWay Address:	192.168.5.254
MAC Address:	88-77-66-55-44-33
Http Port Number:	80
Telnet Port Number:	23

Matrix Status

OutPut Port A: InPut Port 1	OutPut Port B: InPut Port 2	OutPut Port C: InPut Port 3	OutPut Port D: InPut Port 4

EDID Mode

EDID Mode:	STD

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

Status	Control	User Setting

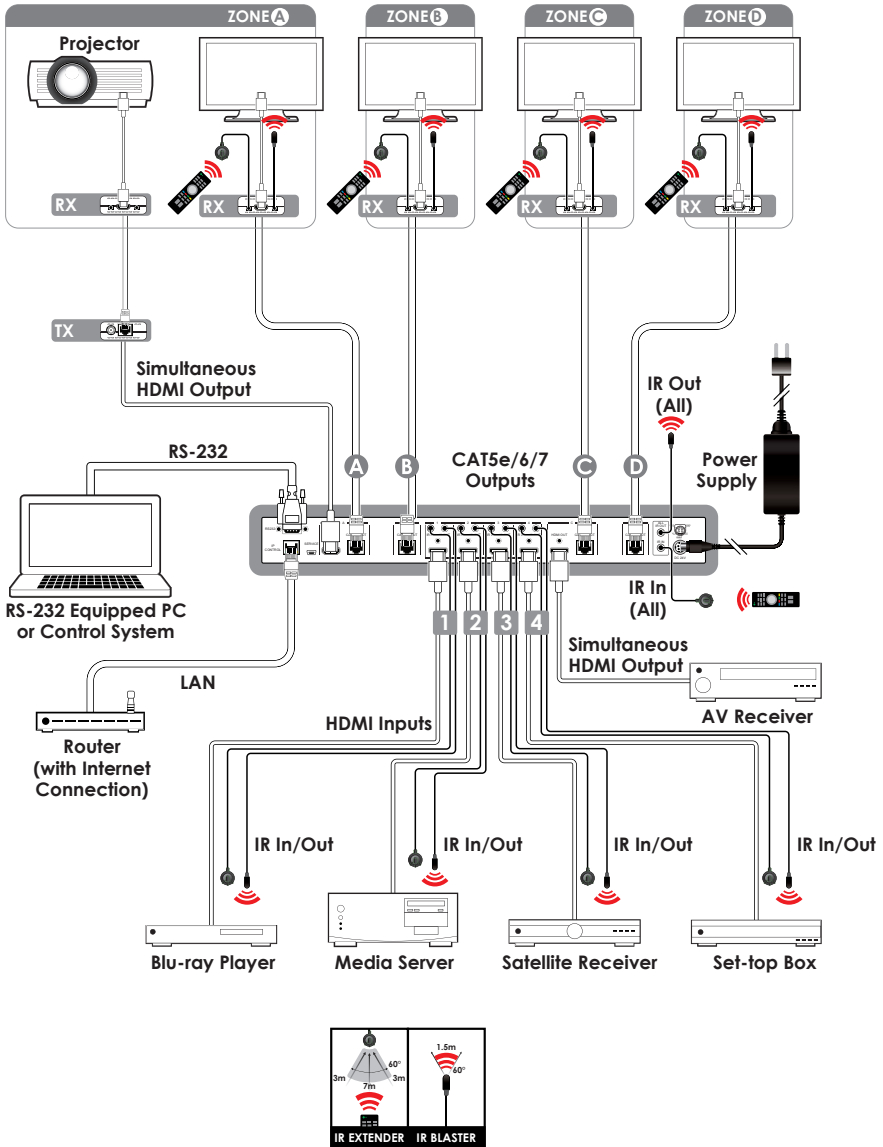**Power Control**

PowerON
PowerOFF

Matrix Control

OutPut Port A: Input Port 1	OutPut Port B: Input Port 2	OutPut Port C: Input Port 3	OutPut Port D: Input Port 4

All OutPut Set To Select Input Po

EDID Mode

1 - STD

System Reset

Reset

Click 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

IP Address Selection

Address Type:	DHCP/Auto ▼	
Static IPAddress:	192 . 5	168 . 138 .
Subnet Mask:	255 . 255	255 . 0 .
Default Gateway:	192 . 5	168 . 254 .
	Update Settings	

7. CONNECTION DIAGRAM

ZONE A — Projector

ZONE B

ZONE C

ZONE D

RX

TX

Simultaneous HDMI Output

RS-232

RS-232 Equipped PC or Control System

LAN

Router (with Internet Connection)

A B CAT5e/6/7 Outputs C D

IR Out (All)

Power Supply

IR In (All)

1 2 3 4

HDMI Inputs

Simultaneous HDMI Output

AV Receiver

IR In/Out

IR In/Out

IR In/Out

IR In/Out

Blu-ray Player

Media Server

Satellite Receiver

Set-top Box

3m 60° 3m
7m

1.5m 60°

IR EXTENDER IR BLASTER

8. SPECIFICATIONS

8.1 Technical Specifications

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

8.2 CAT5e/6/7 Cable Specifications

LENGTH	BANDWIDTH	DATA RATE	SUPPORTED VIDEO
Up to 60 m	Up to 225 MHz	Up to 5.3 Gbps	**HD Video** Up to 1080p@60 Hz/36-bit, 3D (data rate lower than 5.3 Gbps or bandwidth below 225 MHz).
Up to 35 m	Greater than 225 MHz	Greater than 5.3 Gbps	**Ultra HD Video** Up to 4K×2K@30 Hz.

9. ACRONYMS

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