



# CPLUS-V4H2HP

4K UHD+ 4x2 HDMI Matrix



## 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	29/06/16	Preliminary release
RDV2	03/16/17	Add RS232 baud rate
VS0	04/07/17	Updated text/diagrams



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## 1. INTRODUCTION

This 4×2 HDMI Matrix allows the customer to route up to four 18Gbps HDMI input signals to any of two 18Gbps HDMI outputs. This unit supports 4K@60Hz (4:4:4), 16-bit Deep Color, HDR (High Dynamic Range), HD audio formats and other features defined by the HDMI 2.0 specification. Five pre-defined internal EDIDs and two external EDID options are available for EDID management. The unit provides intuitive front panel controls as well as RS-232, Telnet, WebGUI and IR remote control options.

## 2. APPLICATIONS

- Entertainment Rooms & Home Theaters
- Classroom & Lecture Hall Presentations
- Showrooms & Demo Rooms
- Public Commercial Displays

## 3. PACKAGE CONTENTS

- 1×4 by 2 HDMI Matrix
- 1×Remote Control (CR-155)
- 1×IR Extender Cable
- 1×5V/2.6A DC Power Adaptor
- 1×Operation Manual

## 4. SYSTEM REQUIREMENTS

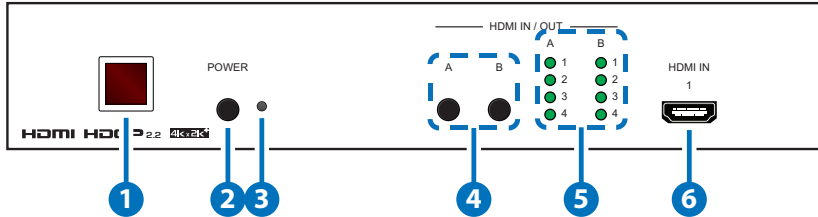
- HDMI source equipment such as media players, video game consoles or set-top boxes.
- HDMI receiving equipment such as HDTVs, monitors or audio amplifiers.
- The use of "Premium High Speed HDMI" cables is highly recommended.

## 5. FEATURES

- HDMI 2.0 and DVI 1.0 compliant
- HDCP 1.4 and 2.2 compliant
- Supports the matrix routing of four 18Gbps HDMI inputs to two 18Gbps HDMI outputs
- Supports resolutions up to 4096×2160@60Hz (4:4:4, 8-bit)
- Maximum data rate up to 18Gbps with Deep Color support up to 16-bit at 1080p
- Supports pass-through of LPCM 7.1, Bitstream and HD Bitstream audio formats
- Supports EDID management via five pre-defined internal EDIDs and two external EDID options
- Multiple control interfaces including RS-232, Telnet, WebGUI and IR remote

## 6. OPERATION CONTROLS AND FUNCTIONS

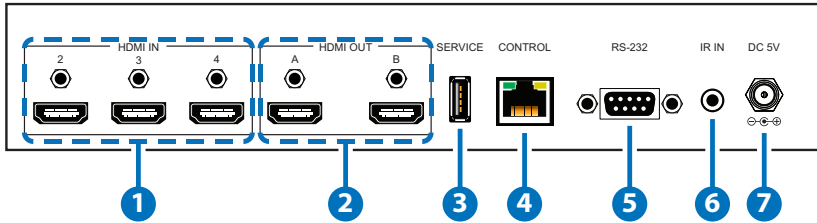
### 6.1 Front Panel



- 1 IR WINDOW:** Accepts IR signals from the included IR remote for control of this unit only.
- 2 POWER:** Press this button to power on the unit or place it into stand-by mode.  
*Note: Ethernet and RS-232 remain active while the unit is in stand-by mode.*
- 3 POWER LED:** This LED will illuminate GREEN to indicate the unit is on and receiving power. When the unit is in stand-by mode the LED will illuminate RED.
- 4 HDMI OUT A~B:** Press either of these buttons to sequentially switch through the available inputs for the associated output.
- 5 HDMI OUT LEDs 1~4:** The LED in each column will illuminate GREEN to indicate which source is currently selected for each output.
- 6 HDMI IN 1:** Connect to HDMI source equipment such as a media player, game console or set-top box. DVI sources are also supported with the use of an HDMI to DVI adapter.



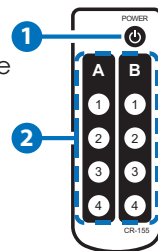
## 6.2 Rear Panel



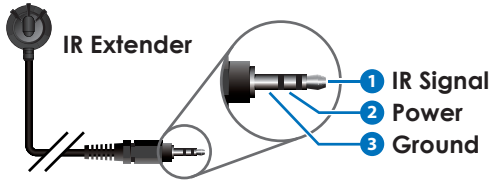
- 1 HDMI IN 2~4 :** Connect to HDMI source equipment such as a media player, game console or set-top box. DVI sources are also supported with the use of an HDMI to DVI adapter.
- 2 HDMI OUT A~B:** Connect to HDMI TVs, monitors or amplifiers for digital video and audio output. DVI displays are also supported with the use of an HDMI to DVI adapter.
- 3 SERVICE:** This slot (USB 2.0) is reserved for firmware update use only.
- 4 CONTROL:** Connect directly, or through a network switch, to your PC/laptop to control the unit via Telnet/WebGUI.
- 5 RS-232:** Connect directly to your PC/laptop to send RS-232 commands to control the unit.
- 6 IR IN:** Connect to the provided IR Extender to extend the IR control range of the unit. Ensure that the remote being used is within direct line-of-sight of the IR Extender.
- 7 DC 5V:** Plug the 5V DC power adapter into the unit and connect it to an AC wall outlet for power.

## 6.3 Remote Control

- 1 POWER:** Press this button to power on the unit or place it into stand-by mode.
- 2 A1~A4 & B1~B4:** Press these buttons to change the routing of outputs A & B.



## 6.4 IR Cable Pin Assignments



## 6.5 RS-232 Protocol

UNIT			REMOTE SYSTEM	
Pin	Definition		Pin	Definition
1	NC		1	NC
2	TxD		2	RxD
3	RxD	▶	3	TxD
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 Rates: 115200bps

Data Bits: 8

Parity Bits: None

Stop Bit: 1

Flow Control: None

## 6.6 RS-232 and Telnet Commands

COMMAND	DESCRIPTION AND PARAMETERS
<b>HELP</b>	Displays all available commands.
<b>?</b>	Displays all available commands.
<b>P0</b>	Turn unit's power off. (Stand-by mode)
<b>P1</b>	Turn unit's power on.
<b>INNAME N1 N2</b>	Set the name of input N1 to N2. N1 = 1~4 [Input number] N2 = {name} [8 characters max]
<b>INNAME N1</b>	Show the input name of N1. N1 = 1~4 [Input number]
<b>INNAME</b>	Show the names of all inputs.
<b>OUTNAME N1 N2</b>	Set the name of output N1 to N2. N1 = A~B [Output letter] N2 = {name} [8 characters max]
<b>OUTNAME N1</b>	Show the name of output N1. N1 = A~B [Output letter]
<b>OUTNAME</b>	Show the names of all outputs.
<b>A N1</b>	Set the input to be routed to output A. N1 = 1~4 [Input number]
<b>A</b>	Show the current input routing for output A.
<b>B N1</b>	Set the input to be routed to output B. N1 = 1~4 [Input number]
<b>B</b>	Show the current input routing for output B.
<b>OUT N1</b>	Set a single input to be routed to both outputs (A & B). N1 = 1~4 [Input number]

COMMAND	DESCRIPTION AND PARAMETERS
<b>OUT</b>	Show the current input routing for both outputs.
<b>SOURCEDET</b>	Show all source information.
<b>SINKINFO</b>	Show all sink information.
<b>HDCPIN N1 N2</b>	Set the HDCP mode for input N1. N1 = 1~4 [Input number] Available values for N2: 0 [Standard] 1 [Apple Mode]
<b>HDCPIN N1</b>	Show the HDCP settings for input N1. N1 = 1~4 [Input number]
<b>HDCPIN</b>	Show all current HDCP input settings.
<b>EDIDMODE N1</b>	Set the EDID mode. Available values for N1: 0 [Appoint] 1 [All]
<b>EDIDMODE</b>	Show the current EDID mode setting.
<b>EDIDALL N1</b>	Set the EDID to use in "All" mode. Available values for N1: 0 [SINK A] 1 [SINK B] 2 [720P] 3 [1080P] 4 [4K_3G] 5 [4K_Y420] 6 [4K_6G]
<b>EDIDALL</b>	Show the current EDID selection for "All" mode.

COMMAND	DESCRIPTION AND PARAMETERS
<b>EDIDIN N1 N2</b>	Set the EDID to use in "Appoint" mode. N1 = 1~4 [Input number] Available values for N2: 0 [SINK A] 1 [SINK B] 2 [720P] 3 [1080P] 4 [4K_3G] 5 [4K_Y420] 6 [4K_6G]
<b>EDIDIN N1</b>	Show the current EDID selection for input N1 in "Appoint" mode.
<b>EDIDIN</b>	Show the current EDID selections for all inputs in "Appoint" mode.
<b>FADEFAULT</b>	Reset the unit to the factory defaults.
<b>REBOOT</b>	Reboot the unit.
<b>VER</b>	Show the unit's current firmware version.
<b>IPCONFIG</b>	Show the current IP configuration.
<b>SIPADDR N1</b>	Set the static IP Address. N1 = X.X.X.X [X = 0~255]
<b>SNETMASK N1</b>	Set the Ethernet netmask. N1 = X.X.X.X [X = 0~255]
<b>SGATEWAY N1</b>	Set the Ethernet gateway. N1 = X.X.X.X [X = 0~255]
<b>HTTPPORT N1</b>	Set the HTTP port. N1 = 0~65535
<b>TELNETPORT N1</b>	Set the Telnet port. N1 = 0~65535



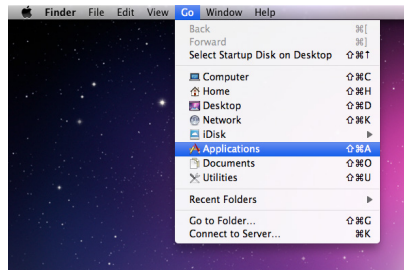
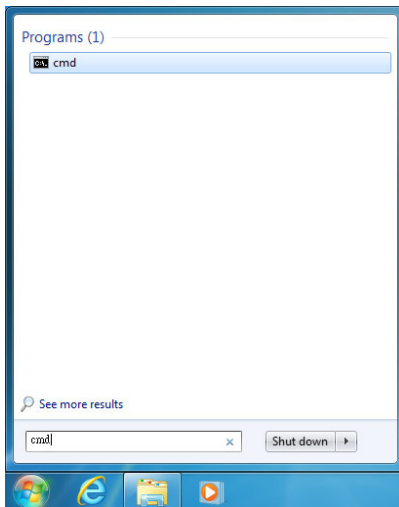
COMMAND	DESCRIPTION AND PARAMETERS
<b>IPMODE N1</b>	Set the current IP address mode. Available values for N1: 0 [Static IP] 1 [DHCP]
<b>READMAC</b>	Show the unit's MAC address.
<b>UPDATE</b>	Update firmware.

*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 Telnet control, please ensure that both the unit and the PC/Laptop are connected to the same active networks.

To access Telnet 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, click on “Run”, type “cmd” then press “Enter”. Under Mac OS X, go to “Go→Applications→Utilities→Terminal”. See below for reference.



Once in the CLI (Command Line Interface) type “Telnet” followed by the IP address of the unit and “23”, then hit “Enter”.

```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>telnet 192.168.1.50 23
```

This will connect us to the unit we wish to control. Type “help” to list the available commands.

Notes:

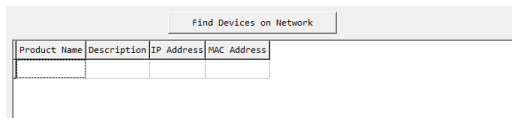
- Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive.
- If the IP address is changed then the IP address required for Telnet access will also change accordingly.

## 6.8 WebGUI Control

### 6.8.1 Device Discovery APP

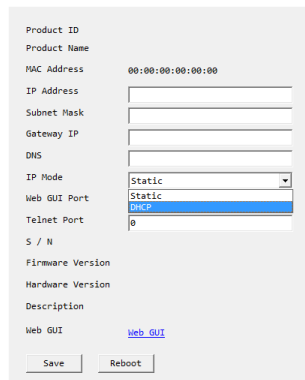
Please obtain the “Device Discovery” software from your authorized dealer and save it in a directory where you can easily find it.

Connect the unit and your PC/Laptop to the same active network and execute the “Device Discovery” software. Click on “Find Devices on Network” and a list of devices connected to the local network will show up indicating their current IP address. (The unit’s default IP address is 192.168.1.50)



Product Name	Description	IP Address	MAC Address

By clicking on one of the listed devices you will be presented with the network details of that particular device.



Product ID  
 Product Name  
 MAC Address 00:00:00:00:00:00  
 IP Address  
 Subnet Mask  
 Gateway IP  
 DNS  
 IP Mode Static  
 Web GUI Port Static  
 Telnet Port 0  
 S / N  
 Firmware Version  
 Hardware Version  
 Description  
 Web GUI [Web GUI](#)  
 Save Reboot

- **IP Mode:** If you choose, you can alter the static IP network settings for the device, or switch the unit into DHCP mode to automatically obtain proper network settings from a local DHCP server. To switch to DHCP mode, please select DHCP from the IP mode drop-down, then click “Save” followed by “Reboot”.
- **WebGUI:** Once you are satisfied with the network settings, you may use them to connect via Telnet or WebGUI. The network information window provides a convenient link to launch the WebGUI directly.



## 6.8.2 WebGUI Control Page

All functions, including power, input selection, EDID management, HDCP management, Ethernet settings, and reset/firmware functions, are presented on a single web page to allow for intuitive operation. The individual functions will be introduced in the following sections.

The screenshot displays the WebGUI Control Page with the following sections:

- POWER:** POWER: ON (dropdown)
- ROUTING:** Output A From: INPUT1 (dropdown), Output B From: INPUT2 (dropdown)
- SOURCE DETECT:** INPUT1: ON, INPUT2: OFF, INPUT3: OFF, INPUT4: OFF
- STATUS:** HDMI OUT A: INPUT1, HDMI OUT B: INPUT2, VERSION: V2.4, RESET, REBOOT buttons
- EDID:** Mode: ALL (dropdown), EDID ALL: 8/2D/PCM/1080p (dropdown)
- HDCP CONTROL:** INPUT1: Standard, INPUT2: Standard, INPUT3: Standard, INPUT4: Standard (dropdowns)
- FIRMWARE UPDATE:** BROWSE, UPDATE buttons
- NAMING:** INPUT1: INPUT1, INPUT2: INPUT2, INPUT3: INPUT3, INPUT4: INPUT4, OUTPUTA: OUTPUTA, OUTPUTB: OUTPUTB, SAVE button
- NETWORK SETTING:** MAC: (empty), IP Mode: STATIC (dropdown), IP Address: 192.168.1.50, Net Mask: 255.255.255.0, Gateway: 192.168.1.254, HTTP Port: 80, Telnet Port: 23, APPLY button
- HDMI OUT A INFO:** Type: HDMI, Manuf. Name: STD, Native Resolution: 1920x1080p, Color Depth: 8 10 12-Bits, 3D: YES, 4K2K: NO, Audio Format: PCM/BitStream
- HDMI OUT B INFO:** Type: -, Manuf. Name: -, Native Resolution: -, Color Depth: -, 3D: -, 4K2K: -, Audio Format: -

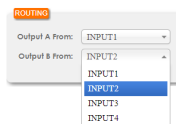
### 1. Power

The unit can be powered on or off (stand-by mode) from this tab.



### 2. Routing

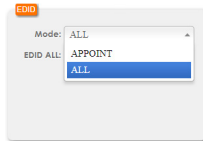
This tab allows for the selection of the input source for each output. Four HDMI inputs and two HDMI outputs are available for selection.



### 3. EDID

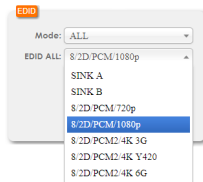
This tab controls EDID management for the unit. All inputs can share the same assigned EDID, or each input can have a discrete EDID assigned to it.

- **ALL:** Selecting the “ALL” mode will send the selected EDID to all inputs.
- **APPOINT:** Selecting the “APPOINT” mode allows for each input to have a different EDID assigned to it.



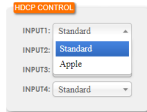
The available EDID options are:

- **SINK A:** EDID is passed from the currently connected display
- **SINK B:** EDID is passed from the currently connected display
- **8/2D/PCM/720p:** 720p@60Hz, 8-bit & LPCM 2.0
- **8/2D/PCM/1080p:** 1080p@60Hz, 8-bit & LPCM 2.0
- **8/2D/PCM2/4K 3G:** 4K@30Hz, 8-bit & LPCM 2.0
- **8/2D/PCM2/4K Y420:** 4K@60Hz (4:2:0), 8-bit & LPCM 2.0
- **8/2D/PCM/4K 6G:** 4K@60Hz (4:4:4), 8-bit & LPCM 2.0



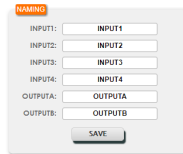
## 4. HDCP Control

This tab allows for the HDCP mode to be switched between “Standard” and “Apple” mode. “Apple” mode allows for the display of non-HDCP required content from Apple, and similar, devices on non-HDCP displays. This setting can be assigned individually to each input.



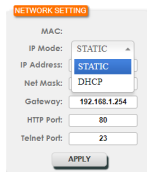
## 5. Naming

This tab allows for the renaming of the four HDMI input ports and the two HDMI output ports. Please click the “SAVE” button to store the changes.



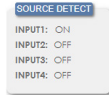
## 6. Network Setting

This tab provides control over the unit's network settings. The IP mode can be set to DHCP for automatic IP configuration, if your local network supports it, or it can be placed into STATIC mode. When in STATIC mode the IP address, netmask and gateway can be defined manually. The HTTP and Telnet ports can also be changed from their defaults here.



## 7. Source Detect

When a live input source is detected on one of the 4 HDMI inputs the corresponding input in this tab will display "ON". If no source is detected on that input, it will display "OFF".



## 8. Status

This tab displays the currently selected HDMI input sources for each output and the unit's firmware version. It also provides a way to reset or reboot the unit.

- **RESET:** To perform a factory reset on the unit, please click the "RESET" button.
- **REBOOT:** To reboot the unit, please click the "REBOOT" button.



## 9. Firmware Update

This tab provides a way to update the firmware of the unit.

- **BROWSE:** Click the "BROWSE" button to select the firmware update \*.bin file which is located on your local PC.
- **UPDATE:** Click the "UPDATE" button to begin the firmware update process.



## 10. HDMI Out A Info & HDMI Out B Info

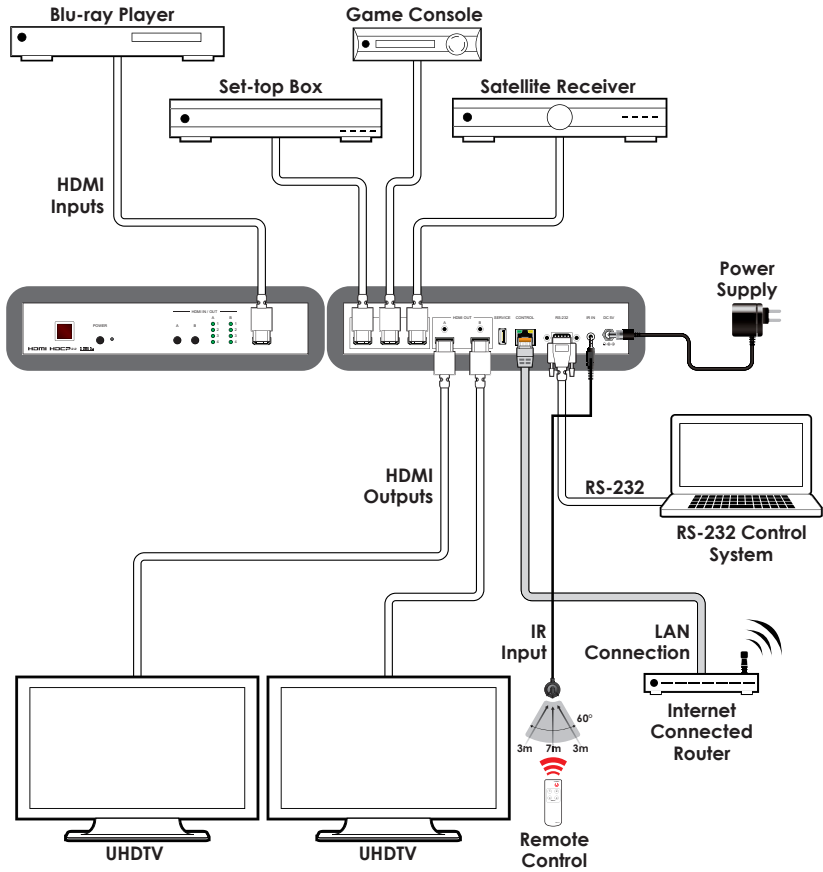
These tabs present the information detected from displays connected to HDMI outputs A & B, including type, manufacturer name, native resolution, color depth, 3D support, 4K support and audio format support.

HDMI OUT A INFO	
Type:	HDMI
Manuf. Name:	STD
Native Resolution:	1920x1080p
Color Depth:	8 10 12-bit
3D:	YES
4K2K:	NO
Audio Format:	PCM/Dolby/DTS

HDMI OUT B INFO	
Type:	-
Manuf. Name:	-
Native Resolution:	-
Color Depth:	-
3D:	-
4K2K:	-
Audio Format:	-

## 7. CONNECTION DIAGRAM



## 8. SPECIFICATIONS

### 8.1 Technical Specifications

<b>Video Bandwidth</b>	600MHz/18Gbps
<b>Input Ports</b>	4×HDMI
<b>Output Ports</b>	2×HDMI
<b>Control Interfaces</b>	1×IR Extender (3.5mm) 1×RS-232 (9-pin D-sub) 1×IP Control (RJ45)
<b>Supported Resolutions</b>	480i@60Hz - 4K@60Hz (4:4:4, 8-bit) VGA@60Hz - WUXGA@60Hz (RB)
<b>HDMI Cable Length</b>	10m (1080p@60Hz, 12-bit) 3m (4K@60Hz, 4:4:4, 8-bit)
<b>IR Frequency</b>	30 - 50kHz (30 - 60kHz under ideal conditions)
<b>Baud Rate</b>	115200bps
<b>Power Supply</b>	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
<b>ESD Protection</b>	Human Body Model: ±12kV (Air Discharge) ±8kV (Contact Discharge)
<b>Dimensions</b>	240mm×43mm×104mm (W×H×D) [Case Only] 240mm×48mm×112.2mm (W×H×D) [All Inclusive]
<b>Weight</b>	796g
<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



**Relative Humidity**            20 - 90% RH (Non-condensing)  
**Power Consumption**        7.106W

## 8.2 Video Specifications

Supported PC Resolutions (Hz)	Input	Output
640×480@60/72/75/85	✓	✓
800×600@56/60/72/75/85	✓	✓
1024×768@60/70/75/85	✓	✓
1280×1024@60	✓	✓
1366×768@60	✓	✓
1600×1200@60	✓	✓
1920×1200@60 (RB)	✓	✓

Supported TV Resolutions (Hz)	Input	Output
480i@60	✓	✓
576i@50	✓	✓
480p@60	✓	✓
576p@50	✓	✓
720p@50/60	✓	✓
1080i@50/60	✓	✓
1080p@24/25/30/50/60	✓	✓
3840×2160p@50/60 (4:2:0)	✓	✓
4096×2160p@50/60 (4:2:0)	✓	✓
3840×2160p@24/25/30/50/60	✓	✓
4096×2160p@24/50/60	✓	✓



## 9. ACRONYMS

ACRONYM	COMPLETE TERM
<b>CLI</b>	Command Line Interface
<b>DVI</b>	Digital Visual Interface
<b>EDID</b>	Extended Display Identification Data
<b>GUI</b>	Graphical User Interface
<b>HD</b>	High-Definition
<b>HDCP</b>	High-bandwidth Digital Content Protection
<b>HDMI</b>	High-Definition Multimedia Interface
<b>HDR</b>	High Dynamic Range
<b>HTTP</b>	HyperText Transfer Protocol
<b>IP</b>	Internet Protocol
<b>IR</b>	Infrared
<b>LAN</b>	Local Area Network
<b>LPCM</b>	Linear Pulse-Code Modulation
<b>PC</b>	Personal Computer
<b>UHD</b>	Ultra-High-Definition
<b>USB</b>	Universal Serial Bus
<b>VGA</b>	Video Graphics Array (640×480@60Hz)
<b>WUXGA</b>	Wide Ultra Extended Graphics Array (1920×1200@60Hz)







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