



**4K UHD**  
HDCP 2.2



## OR-42-4K22

4 x 2 HDMI Matrix Switcher (4K, HDCP2.2, HDMI2.0)

**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	SUMMARY OF CHANGE
v1.00	28/10/2016	First release
v1.01	16/12/2016	Added IR Cable & DSub Pin Information

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## **1. INTRODUCTION**

This 4x2 HDMI Matrix Switcher is designed to enable the user to switch between any of the four connected HDMI sources to send video and audio to either of the two connected HDMI displays. This matrix switcher fully supports 4K resolutions and is HDMI2.0 and HDCP 2.2 compliant, ensuring maximum compatibility with the latest 4K UHD sources and displays.

The unit supports all the latest features of the HDMI2.0 specification such as 4K UHD resolutions (4K2K@60Hz - YUV4:4:4),HDR (High Dynamic Range), 'Deep Color', and High Definition audio. Control is via manual selection buttons, IR, RS-232, Telnet or Web GUI.

## **2. APPLICATIONS**

- ///** Entertainment Room & Home Theater
- ///** Show Room & Demo Room
- ///** Class room & Lecture Hall Presentations
- ///** Public Commercial Display

## **3. PACKAGE CONTENTS**

- ///** 1 x HDMI matrix unit
- ///** 1 x IR Extender with cable
- ///** 1 x 5V / 2.6A DC power adaptor
- ///** 1 x Remote control unit (model: CR-155)
- ///** 1 x Operation Manual

## **4. SYSTEM REQUIREMENTS**

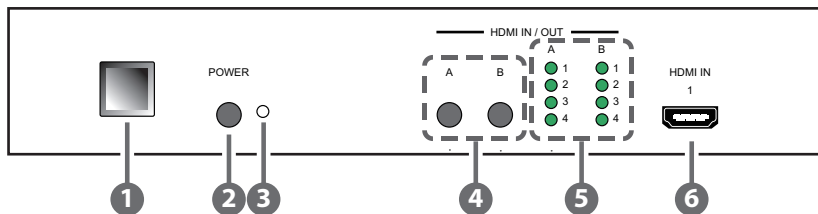
- ///** HDMI source equipment such as media players, video game consoles or set-top boxes.
- ///** HDMI receiving equipment such as HDTVs, monitors or audio amplifiers.
- ///** The use of "Premium High Speed HDMI" cables is highly recommended.

## 5. FEATURES

- /// HDMI2.0 and HDCP2.2 compliant
- /// Routes four HDMI sources to two HDMI displays
- /// Supports pass-through of HD audio formats: LPCM 2/5.1/7.1CH, Dolby Digital 2/5.1CH, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos and DTS-HD Master Audio
- /// 4K UHD resolutions (4K2K@60Hz - YUV4:4:4)
- /// Supports HDR (High Dynamic Range) and Deep Colour
- /// Advanced EDID management
- /// Control is via RS-232, remote control, on-panel control and IP Control (Telnet & Web GUI)

## 6. OPERATION CONTROLS AND FUNCTIONS

### 6.1 Front Panel

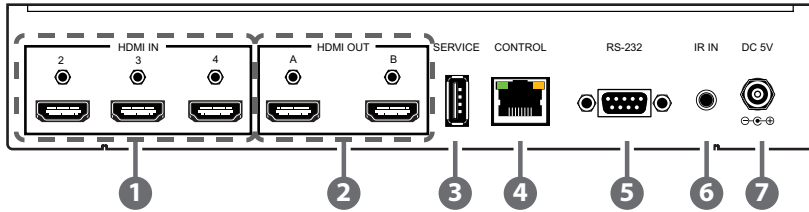


- 1 IR window:** Accepts IR signals from the included IR remote for control of this unit only.
- 2 POWER:** Press this button to power on the unit or place it into stand-by mode.

*Note: Ethernet and RS-232 remain active while the unit is in stand-by mode.*
- 3 Power indicator:** 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 routing buttons "A" & "B":** Press either of these buttons to sequentially switch through the available inputs for the associated output.
- 5 HDMI In indicator "1&2&3&4":** The LED in each column will illuminate GREEN to indicate which source is currently selected for each output
- 6 HDMI In:** 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.



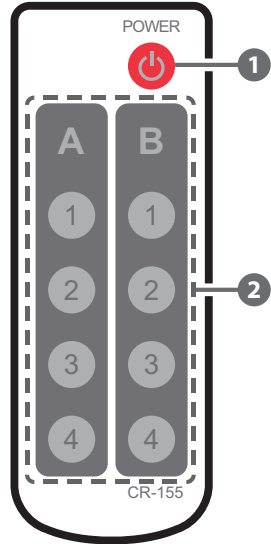
## 6.2 Rear Panel



- 1 HDMI In :** 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:** Connect to HDMI TVs, monitors or amplifiers for digital video and audio output. DVI sources 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. Please plug in a USB thumb drive containing the new firmware to update the unit.
- 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 Power key to turn on the device or set to standby mode.
- ② **OUTPUT A1~A4 & B1~B4:** Press these buttons to change the routing of output A/B.



## 6.4 WebGUI

### Install the IP Discovery Tool:

1. Please obtain the Device Discovery software from your authorized dealer or download it from our website and save it in a directory where you can easily find it.  
**Note:** *The unit's default IP address is 192.168.1.50*
2. 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.

Find Devices on Network			
Product Name	Description	IP Address	MAC Address

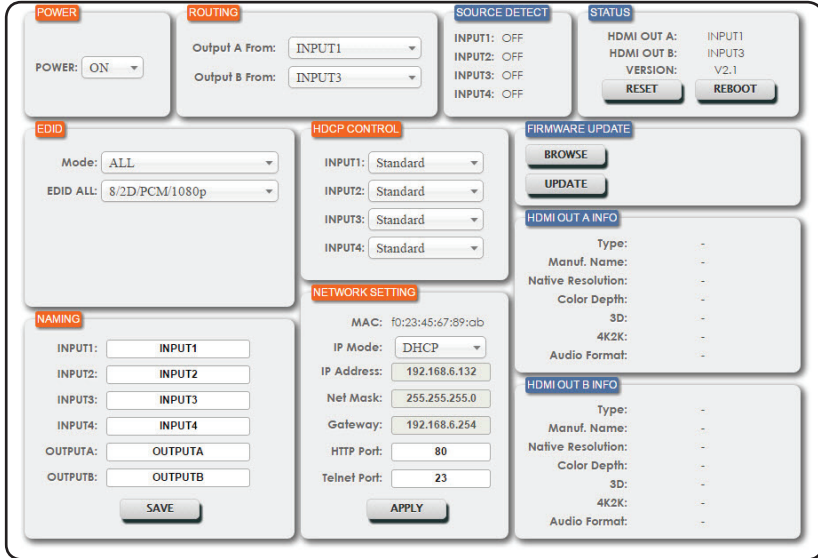
3. By clicking on one of the listed devices you will be presented with the network details of that particular device. If you choose, you can alter the static IP network settings for the device, or switch the unit into DHCP mode to automatically obtain proper network settings from a local DHCP server. To switch to DHCP mode, please select DHCP from the IP mode drop-down, then click "Save" followed by "Reboot".

MAC Address	00:00:00:00:00:00
IP Address	<input type="text"/>
Subnet Mask	<input type="text"/>
Gateway IP	<input type="text"/>
DNS	<input type="text"/>
IP Mode	Static <input type="button" value="v"/>
Web GUI Port	0 <input type="text"/>
Telnet Port	0 <input type="text"/>
S / N	
Firmware Version	
Hardware Version	

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.

### 6.4.1 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.



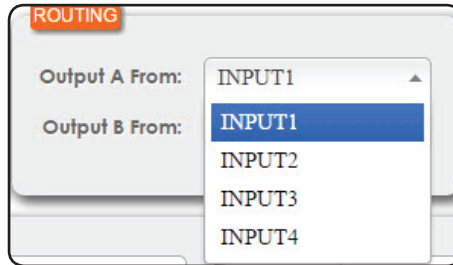
### 6.4.2 Power On/Off

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



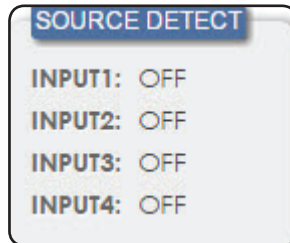
### 6.4.3 Routing

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



### 6.4.4 Source Detect

When a live input source is 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".



### 6.4.5 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.

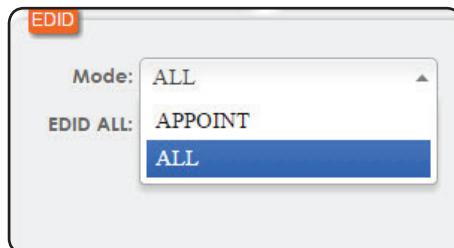
- 1) To perform a factory reset on the unit, please click the "RESET" button.
- 2) To reboot the unit, please click the "REBOOT" button.

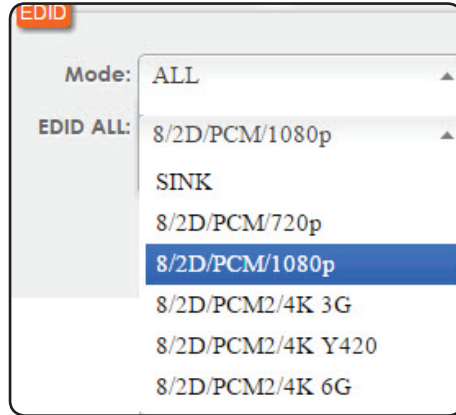


### 6.4.6 EDID

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.

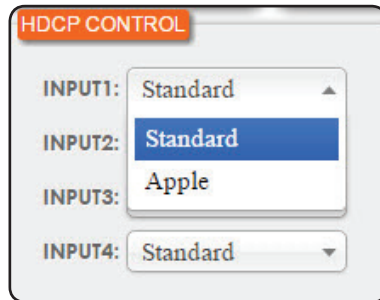
- 1) Selecting the "ALL" mode will send the selected EDID to all inputs.
- 2) Selecting the "APPOINT" mode allows each input to have a different EDID assigned to it.
- 3) The available EDID options include SINK A/SINK B (EDID is passed from one of the currently connected displays), 8/2D/PCM/720p, 8/2D/PCM/1080p, 8/2D/PCM2/4K 3G, 8/2D/PCM2/4K Y420 and 8/2D/PCM/4K 6G.





### 6.4.7 HDCP Control

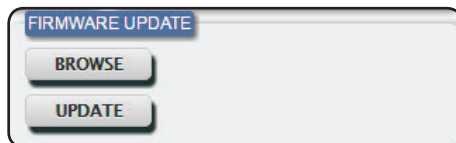
This tab allows for the HDCP mode to be switched between “Standard” and “Apple” mode. “Apple” mode allows for the display of non-HDCP required content from Apple devices on non-HDCP displays. This setting can be assigned individually to each input.



## 6.4.8 Firmware Update

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

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



## 6.4.9 HDMI Out A Info & HDMI Out B Info

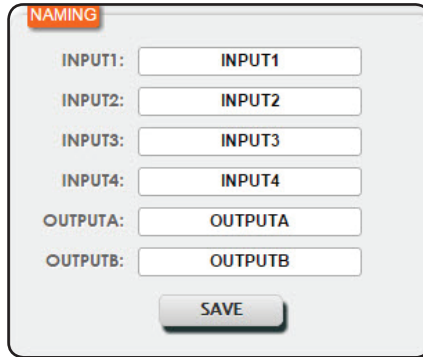
These tabs present the information detected from displays connected to HDMI outputs A & B, including type, manufacturer name, native resolution, color depth, 3D support, 4K support and audio format support.





### 6.4.10 Labelling

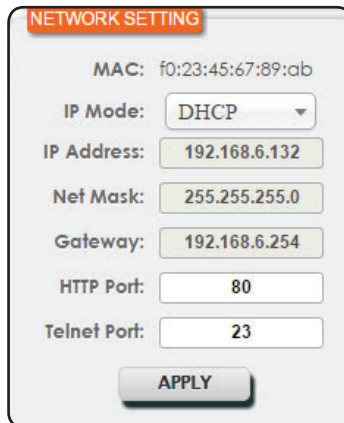
This tab allows for the labelling of the four HDMI input ports and the two HDMI output ports. Please click the “SAVE” button to store the changes.



The NAMING configuration screen features a title bar with the word "NAMING" in white text on an orange background. Below the title bar, there are six rows of labels and input fields: "INPUT1:" followed by a text box containing "INPUT1"; "INPUT2:" followed by a text box containing "INPUT2"; "INPUT3:" followed by a text box containing "INPUT3"; "INPUT4:" followed by a text box containing "INPUT4"; "OUTPUTA:" followed by a text box containing "OUTPUTA"; and "OUTPUTB:" followed by a text box containing "OUTPUTB". At the bottom center of the screen is a grey button with the word "SAVE" in white text.

### 6.4.11 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.



The NETWORK SETTING configuration screen features a title bar with the words "NETWORK SETTING" in white text on an orange background. Below the title bar, the MAC address is displayed as "MAC: f0:23:45:67:89:ab". The IP Mode is set to "DHCP" in a dropdown menu. The IP Address is "192.168.6.132", the Net Mask is "255.255.255.0", and the Gateway is "192.168.6.254". The HTTP Port is "80" and the Telnet Port is "23". At the bottom center of the screen is a grey button with the word "APPLY" in white text.

## 6.5 Telnet Control

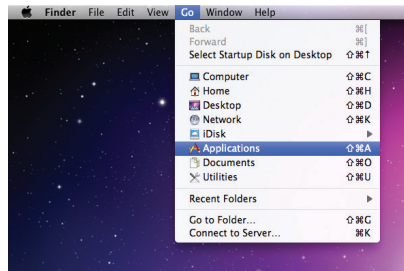
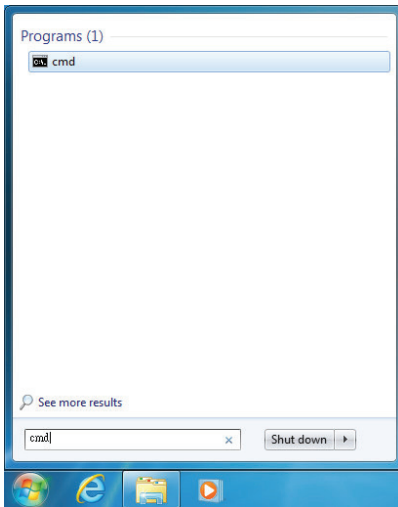
Before attempting to use telnet control, please ensure that both the unit and the PC/Laptop are connected to the same active networks.

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.XX.XX 23
```

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

```
Welcome to TELNET.  
?  
Command List  
-----  
HELP  
P0  
P1  
INNAME  
OUTNAME  
OUT  
SOURCEDET  
$INKINFO  
HDCPIN  
EDIDMODE  
EDIDALL  
EDIDIN  
FAEFAULT  
REBOOT  
UER  
IPCONFIG  
$IPADDR  
$NETMASK  
$GATEWAY  
HTTPPORT  
TELNETPORT  
IPMODE  
SETMAC  
READMAC  
UPDATE
```

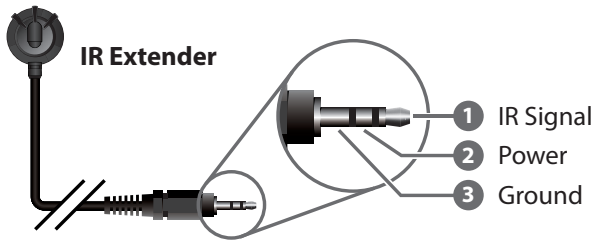
## 6.6 RS-232 Command

Command	Description	Parameter
<b>HELP/?</b>	List available commands	NONE
<b>P0</b>	POWER OFF	NONE
<b>P1</b>	POWER ON	NONE
<b>INNAME</b>	SET/SHOW ALL INPUT NAMEIN	NAME [1~4] [8 char]
<b>OUTNAME</b>	SET/SHOW HDMI OUTPUT NAME	OUTNAME [A/B] [8 char]
<b>A</b>	SET/SHOW OUTA SOURCE	A [1~4]
<b>B</b>	SET/SHOW OUTB SOURCE	B [1~4]
<b>OUT</b>	SET/SHOW OUTA/B SOURCE	OUT [1~4]
<b>SOURCEDET</b>	SHOW INPUT INFORMATION	NONE
<b>SINKINFO</b>	SHOW OUTPUT INFORMATION	NONE
<b>HDCPIN</b>	SET/SHOW INPUT HDCP STATUS	HDCPIN [1~4] [0:STANDARD/1:APPLE]
<b>EDIDMODE</b>	SET/SHOW EDID MODE TYPE	EDIDMODE [0:APPOINT/1:ALL]
<b>EDIDALL</b>	SET/SHOW EDID ALL CONTENT	EDIDALL [0~6] 0=OUTPUT A 1=OUTPUT B 2=8/2D/PCM/720P 3=8/2D/PCM/1080P 4=8/2D/PCM/4K2K_30 5=8/2D/PCM/4K2K_Y420 6=8/2D/PCM/4K2K_60
<b>EDIDIN</b>	SET/SHOW EDID INPUT CONTENT	EDIDIN [1~4] [0~6]
<b>FADEFAULT</b>	SET ALL CONFIGURATIONS TO FACTORY DEFAULT	NONE
<b>REBOOT</b>	REBOOT DEVICE	NONE
<b>VER</b>	DISPLAY FIRMWARE VERSION	NONE

Command	Description	Parameter
<b>IPCONFIG</b>	DISPLAY THE CURRENT IPCONFIG	NONE
<b>SIPADDR</b>	SET ETHERNET IP ADDRESS	SIPADDR X.X.X.X (X:0~255)
<b>SNETMASK</b>	SET ETHERNET NETMASK	SNETMASK X.X.X.X (X:0~255)
<b>SGATEWAY</b>	SET ETHERNET GATEWAY	SGATEWAY X.X.X.X (X:0~255)
<b>HTTPPORT</b>	SET HTTP PORT NUMBER	HTTPPORT N (N=0~65535)
<b>TELNETPORT</b>	SET TELNET PORT NUMBER	TELNETPORT N (N=0~65535)
<b>IPMODE</b>	SET IP MODE	IPMODE N (N=0-STATIC, 1-DHCP)
<b>SETMAC</b>	Write MAC Address to eeprom	NONE
<b>READMAC</b>	Read MAC Address from eeprom	NONE
<b>UPDATE</b>	UPDATE Firmware <MCU/VS/ ZVS>	
<b>HDCPDOWN(N)</b>	N=1 YES	

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

## 6.7 IR Cable Pin Assignment



## 6.8 RS-232 Pin Assignment

PIN	Assignment
1	NC
2	TxD/RxD
3	RxD/TxD
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC

Baud Rate: 115200 bps

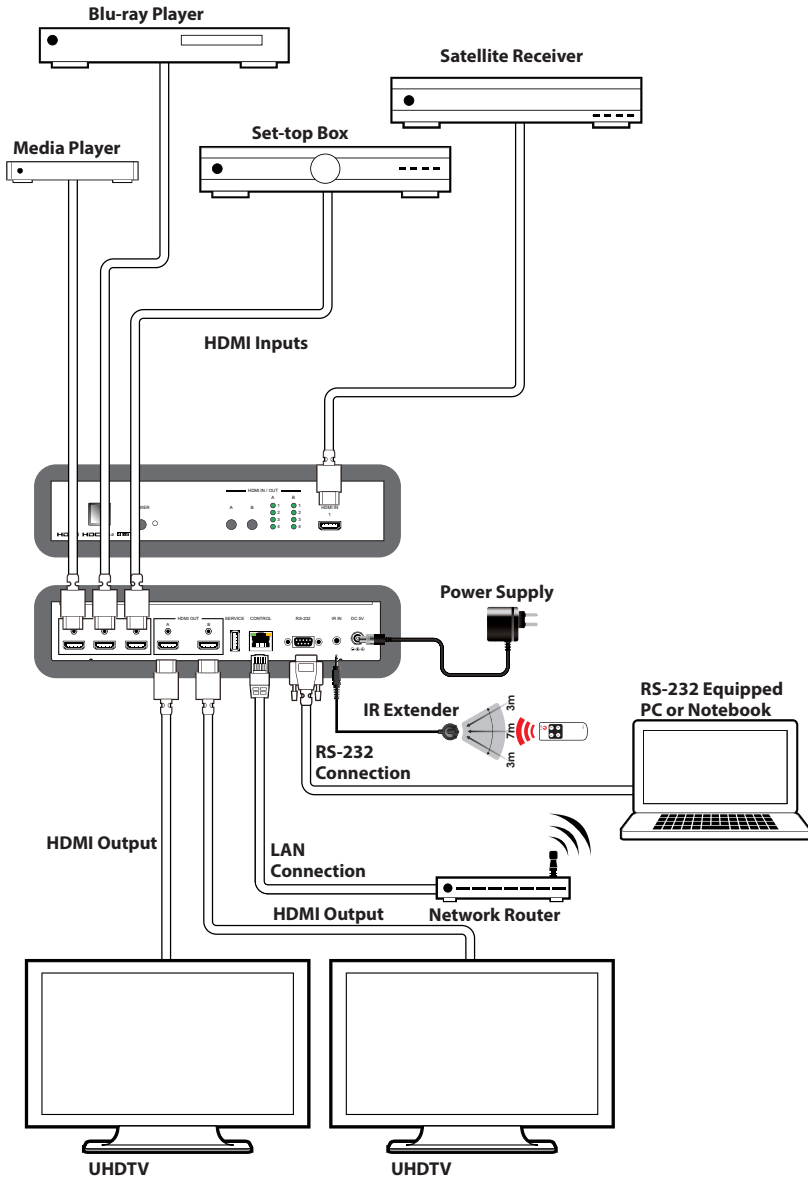
Data Bit: 8-bit

Parity: None

Stop Bit: 1-bit

Flow Control: None

## 7. CONNECTION DIAGRAM



## 8. SPECIFICATIONS

### 8.1 Technical Specifications

<b>Video Bandwidth</b>	600MHz/6Gbps
<b>Input Ports</b>	4 x HDMI 1 x IR In
<b>Output Ports</b>	2 x HDMI
<b>Others</b>	1 x Control 1 x Service 1 x RS232
<b>Supported Resolutions</b>	480i to 4K2K@24/50/60
<b>HDMI Sampling Rate</b>	32kHz ~ 192 kHz
<b>IR Frequency</b>	38kHz
<b>Baud Rate</b>	19200 bps
<b>Power Supply</b>	5V/2.6A DC (US/EU standards, CE/FCC/ UL certified)
<b>Chassis Material</b>	Metal
<b>Silkscreen Color</b>	Black
<b>Weight</b>	796g
<b>Dimensions</b>	240mm (W) x 43mm (H) x 104mm (D) / case only
<b>Power Consumption</b>	7.106W (1.10W at standby mode)



## 8.2 Support Timing Table

HDMI RESOLUTION	SUPPORTED
480i	✓
576i	✓
480p	✓
576p	✓
640x480	✓
720p @50&60	✓
800x600	✓
1080i @50&60	✓
1080p@24&50&60	✓
1024x768	✓
1366x768	✓
1280x1024	✓
1600x1200	✓
1920x1200	✓
3840x2160p@24&25&30&50&60(YUV444)	✓
3840x2160p@50&60(YUV420)	✓
4096x2160p@24&50&60(YUV444)	✓
4096x2160p@50& 60(YUV420)	✓

### 8.3 HDMI Cable Length

HDMI CABLE LENGTH (MAX)			
8-bit 1080p		12-bit 1080p	
Input	Output	Input	Output
10m	10m	10m	10m

HI SPEED 4K2K CABLE LENGTH (MAX)		
4K2K	HDMI In	HDMI Out
3840x2160p24	5m	5m
3840x2160p60	5m	5m





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