



**4K HDR**

**HDCP 2.2**

**HDMI**<sup>®</sup>  
HIGH-DEFINITION MULTIMEDIA INTERFACE



## **EL-31TT-4K22**

**3-Way HDMI Tabletop Switching Module Kit  
(4K, HDCP2.2 HDMI 2.0a)**

**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	15/04/2020	First release
V1.01	26/06/2020	Updated front cover image/Description

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## 1. INTRODUCTION

This UHD<sup>+</sup> 3×1 HDMI Switcher Table Box features three HDMI inputs and one HDMI output with manual or automatic source switching. Every input and output supports full bandwidth 4K@60Hz (4:4:4, 8-bit) HDMI 2.0 with HDCP 2.2 signals. Automatic source management allows for hands-free switching based on input signal and hot plug detection with a “Last Memory” switching feature upon signal loss. This switch is an ideal addition to any conference room, lecture hall or home entertainment setup with its portable and easy to install design. The table box is designed to be placed on a table, or mounted to any typical table edge using a clamp. Control is via a front panel button and RS-232.

## 2. APPLICATIONS

- /// Conference rooms and boardrooms
- /// Lecture halls, auditoriums and classrooms
- /// Household entertainment sharing and control
- /// Hotel event spaces

## 3. PACKAGE CONTENTS

- /// 1× UHD<sup>+</sup> 3×1 HDMI Switcher Table Box
- /// 1× 5V/1A DC Power Adapter (2-pin Terminal Block)
- /// 1× Operation Manual

## 4. SYSTEM REQUIREMENTS

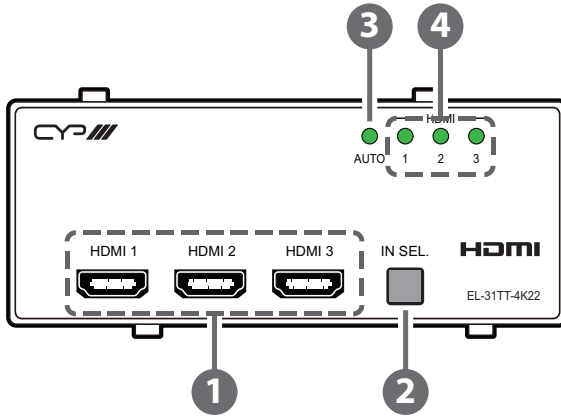
- /// HDMI source equipment such as media players, video game consoles or set-top boxes.
- /// HDMI receiving equipment such as an HDTV, monitor or audio amplifier.
- /// The use of Premium High Speed HDMI cables is highly recommended.

## 5. FEATURES

- /// HDMI 2.0 and DVI 1.0 compatible
- /// HDCP 1.x and HDCP 2.2 compliant
- /// 3 HDMI inputs, 1 HDMI output
- /// Supports up to 4K UHD<sup>+</sup> (18Gbps, 4K@50/60Hz 4:4:4, 8-bit) video input and output
- /// Supports Deep Colour input and output up to 12-bit
- /// Supports 10-bit and 12-bit HDR (High Dynamic Range) input/output
- /// Supports pass-through of many audio formats including 8 channel LPCM, Bitstream, and HD Bitstream
- /// Supports manual input selection or automatic input selection with hot plug detection and "Last Memory" feature
- /// Sophisticated EDID management ensures optimal compatibility
- /// LED indicators provide input selection as well as automatic switch status information
- /// Convenient table box design
- /// Control via front panel button and RS-232

## 6. OPERATION CONTROLS AND FUNCTIONS

### 6.1 Front Panel

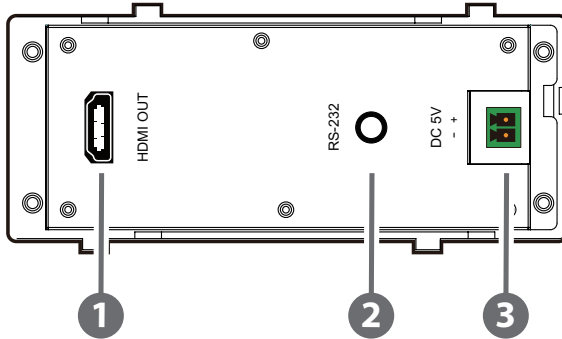


- 1 HDMI 1~3 Ports:** Connect to HDMI source equipment such as media players, game consoles or set-top boxes.
- 2 IN SEL. Button:** Press this button to sequentially switch through the available inputs or select auto switch. This button will also illuminate to indicate the unit is on and receiving power.

*Note: The sequence is: HDMI 1 > HDMI 2 > HDMI 3 > Auto > HDMI 1*
- 3 AUTO LED:** This LED will illuminate when the auto switch function is active. While active, the input source will be selected based on the most recently connected live source.
- 4 HDMI 1~3 LEDs:** The LED of the currently selected input will illuminate green. When an input has an active source, but is not currently selected, it will illuminate red. When no source is detected the LED will remain off.

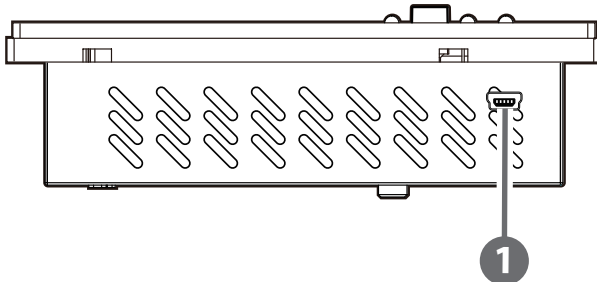


## 6.2 Rear Panel



- 1 HDMI OUT Port:** Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.
- 2 RS-232 Port:** Connect directly to a PC, laptop, or other serial control device with a 3.5mm mini-jack adapter cable to send RS-232 commands to control the unit.
- 3 DC 5V 2-pin Terminal Block:** Connect a 5V DC power adapter into this terminal block and connect it to an AC wall outlet for power.

## 6.3 Side Panel

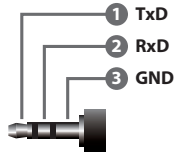


- 1 Micro USB Port:** This port is reserved for firmware update use only.

## 6.4 RS-232 Pinout and Defaults

Serial Port Default Settings	
<b>Baud Rate</b>	19200
<b>Data Bits</b>	8
<b>Parity Bits</b>	None
<b>Stop Bits</b>	1
<b>Flow Control</b>	None

3.5mm to DE-9  
Adapter Cable



## 6.5 Serial Commands

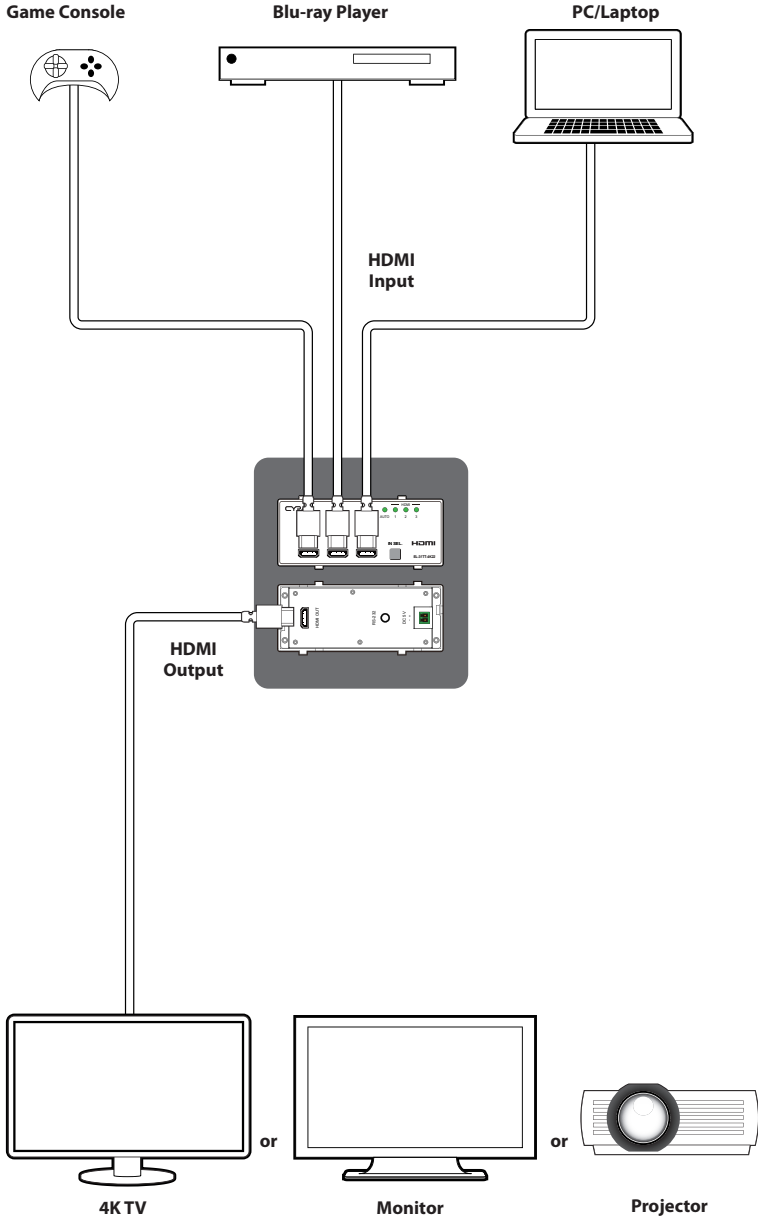
COMMAND	
Description and Parameters	
<b>?↵</b>	Show the full command list.
<b>help↵</b>	Show the full command list.
<b>set factory default↵</b>	Reset the unit to the factory defaults.
<b>get command ver↵</b>	Show the unit's current command version.
<b>get fw ver↵</b>	Show the unit's current firmware version.
<b>get model name↵</b>	Show the unit's model name.
<b>get model type↵</b>	Show the unit's product type.
<b>set out A route N1↵</b>	Route the specified input to the HDMI output. <b>N1</b> = 1~3 [HDMI input number]
<b>get out A route↵</b>	Show which input is currently routed to the HDMI output.
<b>set out auto mode N1↵</b>	Set the auto switching/scanning behavior of the unit. Available values for <b>N1</b> : 0 [Off] 1 [Auto switch]
<b>get out auto mode↵</b>	Show the current auto switching/scanning mode of the unit.

COMMAND																					
Description and Parameters																					
<b>get in type list</b> ↵	List the port type of all inputs on the unit.																				
<b>get out type list</b> ↵	List the port type of all outputs on the unit.																				
<b>get in port number</b> ↵	Show the total number of inputs on the unit.																				
<b>get out port number</b> ↵	Show the total number of outputs on the unit.																				
<b>set in N1 edid N2</b> ↵	<p>Set the EDID to use on the specified input.</p> <p><b>N1</b> = 1~3 [HDMI input number]</p> <p>Available values for <b>N2</b>:</p> <table border="0"> <tr> <td>1</td> <td>[Internal FHD, 2 channel audio]</td> </tr> <tr> <td>2</td> <td>[Internal FHD, multi-channel audio]</td> </tr> <tr> <td>3</td> <td>[Internal UHD, 2 channel audio]</td> </tr> <tr> <td>4</td> <td>[Internal UHD, multi-channel audio]</td> </tr> <tr> <td>5</td> <td>[Internal UHD+, 2 channel audio]</td> </tr> <tr> <td>6</td> <td>[Internal UHD+, multi-channel audio]</td> </tr> <tr> <td>7</td> <td>[User EDID 1]</td> </tr> <tr> <td>8</td> <td>[User EDID 2]</td> </tr> <tr> <td>9</td> <td>[User EDID 3]</td> </tr> <tr> <td>10</td> <td>[Copy output's EDID]</td> </tr> </table>	1	[Internal FHD, 2 channel audio]	2	[Internal FHD, multi-channel audio]	3	[Internal UHD, 2 channel audio]	4	[Internal UHD, multi-channel audio]	5	[Internal UHD+, 2 channel audio]	6	[Internal UHD+, multi-channel audio]	7	[User EDID 1]	8	[User EDID 2]	9	[User EDID 3]	10	[Copy output's EDID]
1	[Internal FHD, 2 channel audio]																				
2	[Internal FHD, multi-channel audio]																				
3	[Internal UHD, 2 channel audio]																				
4	[Internal UHD, multi-channel audio]																				
5	[Internal UHD+, 2 channel audio]																				
6	[Internal UHD+, multi-channel audio]																				
7	[User EDID 1]																				
8	[User EDID 2]																				
9	[User EDID 3]																				
10	[Copy output's EDID]																				
<b>get in N1 edid</b> ↵	<p>Show the EDID currently being used on the specified input.</p> <p><b>N1</b> = 1~3 [HDMI input number]</p>																				
<b>get in edid list</b> ↵	List all available EDID selections.																				

COMMAND	
Description and Parameters	
<b>set user N1 edid data N2 ↵</b>	
Upload a new EDID (in ASCII hex format) for use as the specified User EDID.	
<b>N1</b> = 1~3	[User EDID number]
<b>N2</b> = {Comma delimited hex pairs}	[EDID data]
<b>get user N1 edid data ↵</b>	
Show the current contents of the specified User EDID as HEX data.	
<b>N1</b> = 1~3	[User EDID number]

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

## 7. CONNECTION DIAGRAM



## 8. SPECIFICATIONS

### 8.1 Technical Specifications

<b>HDMI Bandwidth</b>	18Gbps
<b>Input Ports</b>	3×HDMI (Type-A)
<b>Output Port</b>	1×HDMI (Type-A)
<b>Control Port</b>	1×RS-232 (3.5mm)
<b>Service Port</b>	1×USB 2.0 (Mini B)
<b>Baud Rate</b>	19200
<b>Power Supply</b>	5V/1A DC (US/EU standards, CE/FCC/UL certified)
<b>ESD Protection (HBM)</b>	±8kV (Air Discharge) ±4kV (Contact Discharge)
<b>Dimensions (W×H×D)</b>	125mm×55mm×34mm [Case Only] 125mm×55mm×40mm [All Inclusive]
<b>Weight</b>	230g
<b>Chassis Material</b>	Metal (Aluminum)
<b>Chassis Colour</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>	2.53W

## 8.2 Video Specifications

Supported Resolutions (Hz)	Input	Output
	HDMI	HDMI
<b>720x400p@70/85</b>	✓	✓
<b>640x480p@60/72/75/85</b>	✓	✓
<b>720x480i@60</b>	✓	✓
<b>720x480p@60</b>	✓	✓
<b>720x576i@50</b>	✓	✓
<b>720x576p@50</b>	✓	✓
<b>800x600p@56/60/72/75/85</b>	✓	✓
<b>848x480p@60</b>	✓	✓
<b>1024x768p@60/70/75/85</b>	✓	✓
<b>1152x864p@75</b>	✓	✓
<b>1280x720p@50/60</b>	✓	✓
<b>1280x768p@60/75/85</b>	✓	✓
<b>1280x800p@60/75/85</b>	✓	✓
<b>1280x960p@60/85</b>	✓	✓
<b>1280x1024p@60/75/85</b>	✓	✓
<b>1360x768p@60</b>	✓	✓
<b>1366x768p@60</b>	✓	✓
<b>1400x1050p@60</b>	✓	✓
<b>1440x900p@60/75</b>	✓	✓
<b>1600x900p@60RB</b>	✓	✓
<b>1600x1200p@60</b>	✓	✓
<b>1680x1050p@60</b>	✓	✓
<b>1920x1080i@50/60</b>	✓	✓
<b>1920x1080p@24/25/30</b>	✓	✓



Supported Resolutions (Hz)	Input	Output
	HDMI	HDMI
<b>1920×1080p@50/60</b>	✓	✓
<b>1920×1200p@60RB</b>	✓	✓
<b>2560×1440p@60RB</b>	✓	✓
<b>2560×1600p@60RB</b>	✓	✓
<b>2048×1080p@24/25/30</b>	✓	✓
<b>2048×1080p@50/60</b>	✓	✓
<b>3840×2160p@24/25/30</b>	✓	✓
<b>3840×2160p@50/60 (4:2:0)</b>	✓	✓
<b>3840×2160p@24, HDR10</b>	✓	✓
<b>3840×2160p@50/60 (4:2:0),HDR10</b>	✓	✓
<b>3840×2160p@50/60</b>	✓	✓
<b>4096×2160p@24/25/30</b>	✓	✓
<b>4096×2160p@50/60 (4:2:0)</b>	✓	✓
<b>4096×2160p@24, HDR10</b>	✓	✓
<b>4096×2160p@50/60 (4:2:0), HDR10</b>	✓	✓
<b>4096×2160p@50/60</b>	✓	✓

## 8.3 Audio Specifications

### 8.3.1 Digital Audio

HDMI Input / Output	
LPCM	
<b>Max Channels</b>	8 Channels
<b>Sampling Rate (kHz)</b>	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
<b>Supported Formats</b>	Standard & High-Definition

## 8.4 Cable Specifications

Cable Length	1080p		4K30	4K60
	8-bit	12-bit	(4:4:4) 8-bit	(4:4:4) 8-bit
High Speed HDMI Cable				
<b>HDMI Input</b>	15m	10m	5m	3m
<b>HDMI Output</b>	15m	10m	5m	3m

### Bandwidth Category Examples:

#### 1080p (FHD Video)

- Up to 1080p@60Hz, 12-bit Colour
- Data rates lower than 5.3Gbps or below 225MHz TMDS clock

#### 4K30 (4K UHD Video)

- 4K@24/25/30Hz & 4K@50/60Hz (4:2:0), 8-bit Colour
- Data rates higher than 5.3Gbps or above 225MHz TMDS clock but below 10.2Gbps

#### 4K60 (4K UHD<sup>+</sup> Video)

- 4K@50/60Hz (4:4:4, 8-bit)
- 4K@50/60Hz (4:2:0, 10-bit HDR)
- Data rates higher than 10.2Gbps

## 9. ACRONYMS

ACRONYM	COMPLETE TERM
<b>ASCII</b>	American Standard Code for Information Interchange
<b>AV</b>	Audio/Video
<b>CEC</b>	Consumer Electronics Control
<b>CLI</b>	Command-Line Interface
<b>DVI</b>	Digital Visual Interface
<b>EDID</b>	Extended Display Identification Data
<b>HDCP</b>	High-bandwidth Digital Content Protection
<b>HDMI</b>	High-Definition Multimedia Interface
<b>HDR</b>	High Dynamic Range
<b>HDTV</b>	High-Definition Television
<b>LED</b>	Light-Emitting Diode
<b>LPCM</b>	Linear Pulse-Code Modulation
<b>4K UHD</b>	4K Ultra-High-Definition (10.2Gbps max)
<b>4K UHD<sup>+</sup></b>	4K Ultra-High-Definition (18Gbps max)
<b>UHDTV</b>	Ultra-High-Definition Television
<b>USB</b>	Universal Serial Bus



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