



4K UHD

HDCP 2.2



EL-31C-4K22

HDMI/Mini DisplayPort/USB Type-C to HDMI Switch

OPERATION MANUAL

HDMI®
HIGH-DEFINITION MULTIMEDIA INTERFACE

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Version 1.1

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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.

VERSION HISTORY

REV.	DATE	SUMMARY OF CHANGE
v1.00	2020/03/18	Preliminary release

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1. INTRODUCTION

This 3x1 Multi-Format to HDMI Switch is a 4K@60Hz (4:4:4) switch featuring USB Type-C, HDMI and Mini DisplayPort inputs which are automatically converted to a standard HDMI format for use with projectors or displays. This unit provides easy switching functionality with both a manual input selection button and an optional autosensing “last memory” feature which can automatically switch to a newly connected source or revert to the previous source, if the current one becomes disconnected, with no user intervention necessary. This switch is an ideal addition to any conference room, lecture hall or home entertainment setup with its portable and easy to install design. This unit is controllable via a single rear panel button.

2. APPLICATIONS

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

3. PACKAGE CONTENTS

- /// 1× HDMI/Mini DisplayPort/USB Type-C to HDMI Switch
- /// 1× 5V/1.2A DC Power Adapter
- /// 1× Operation Manual

4. SYSTEM REQUIREMENTS

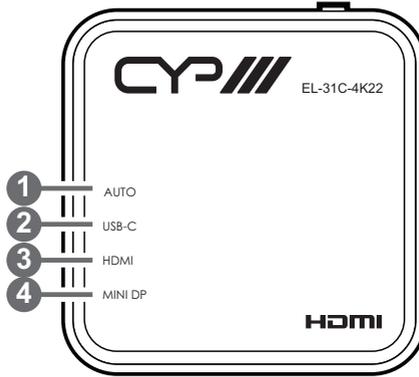
- /// HDMI, DisplayPort, or USB-C source equipment such as media players, video game consoles, set-top boxes or PCs.
- /// HDMI receiving equipment such as an HDTV, monitor or audio amplifier.
- /// The use of Premium High Speed HDMI cables is highly recommended.
- /// The use of 30AWG (Gen 2) USB Type-C cable is highly recommended.
- /// The use of DisplayPort 1.2 or higher spec cable is highly recommended.

5. FEATURES

- /// HDMI 2.0, DisplayPort 1.4, and DVI 1.0 compliant
- /// HDCP 1.x and 2.2 compliant
- /// 1 HDMI, 1 Mini DisplayPort, and 1 USB Type-C input
- /// 1 HDMI output
- /// Supports up to 4K UHD (18Gbps, 4K@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 auto-switch functionality with a “last memory” feature
- /// EDID bypass with an optimised algorithm to ensure optimal resolution and feature support
- /// Easy to read LEDs to indicate input selection and operational mode
- /// Powered via the Mini-USB port (1.2 amps required)
- /// Small and portable switch box design
- /// Controllable via a single rear panel button with LEDs

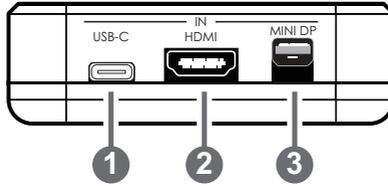
6. OPERATION CONTROLS AND FUNCTIONS

6.1 Top Panel



- 1 AUTO LED:** This LED will illuminate when the auto switch function is active.
- 2 USB-C LED:** This LED will illuminate blue when USB-C is the currently selected input. If the input has an active source, but is not currently selected, it will illuminate red. When no source is detected the LED will remain off.
- 3 HDMI LED:** This LED will illuminate blue when HDMI is the currently selected input. If the input has an active source, but is not currently selected, it will illuminate red. When no source is detected the LED will remain off.
- 4 MINI DP LED:** This LED will illuminate blue when Mini DisplayPort is the currently selected input. If the 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 Front Panel



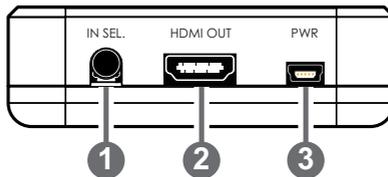
- 1 USB-C IN Port:** Connect to USB Type-C video source equipment such as a PC or laptop.

Note: Not all devices with USB Type-C ports can support video output. Please verify that the device supports video output from the USB Type-C port before connecting it.

- 2 HDMI IN Port:** Connect to HDMI source equipment such as a media player, game console, or set-top box.
- 3 MINI DP IN Port:** Connect to DisplayPort source equipment such as a PC or laptop.

Note: For 4K sources, use of cable that supports DisplayPort 1.2 or higher is strongly recommended.

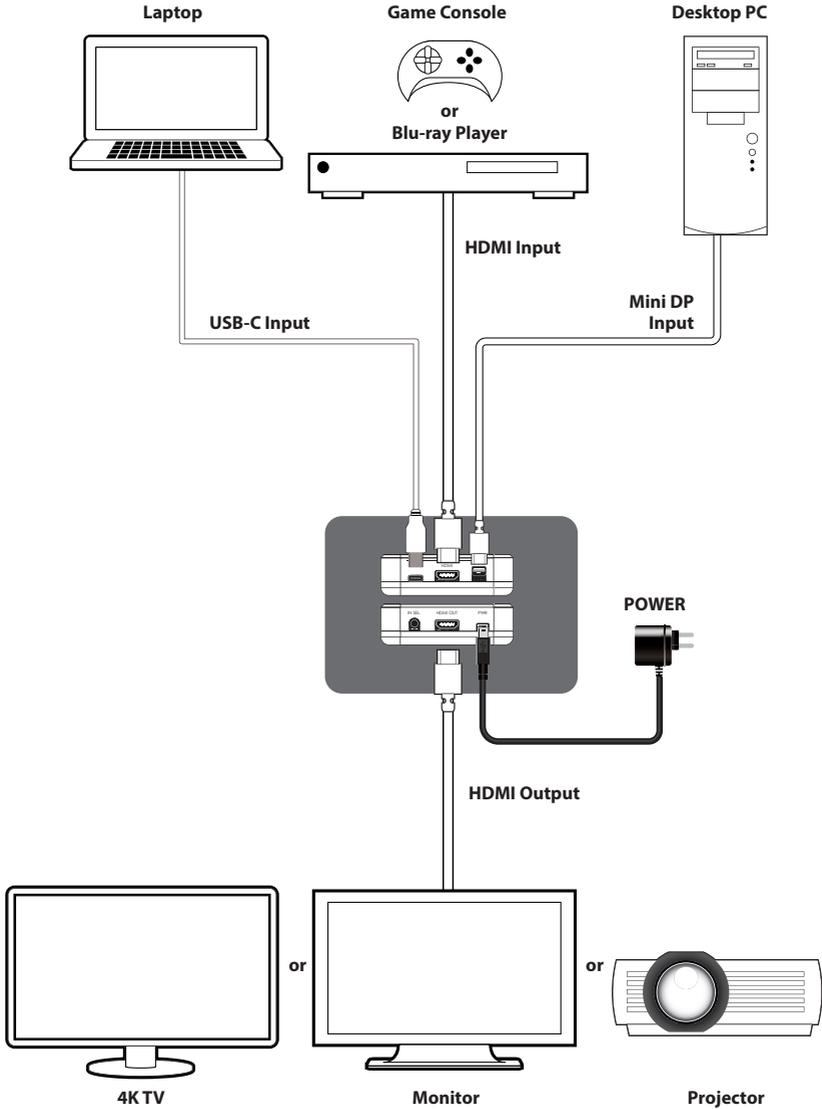
6.3 Rear Panel



- 1 IN SEL. Button:** Press this button to sequentially switch through the available inputs or select auto switch.
- 2 HDMI OUT Port:** Connect to HDMI source equipment such as a media player, game console, or set-top box.
- 3 PWR Port:** Connect the provided mini USB power adapter to this port and connect it to an AC wall outlet for power. This port is also used to perform firmware updates.

Note: USB power sources must provide a minimum of 1.2 Amps.

7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	18Gbps
DisplayPort Bandwidth	21.6Gbps
USB-C Bandwidth	21.6Gbps
Input Ports	1×HDMI (Type-A) 1×DisplayPort (mDP) 1×USB (Type-C)
Output Ports	1×HDMI (Type-A)
Service/Power Port	1×USB 2.0 (Mini-B)
Power Supply	5V/1.2A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	85mm×26mm×85mm [Case Only] 85mm×26mm×87mm [All Inclusive]
Weight	80g
Chassis Material	Plastic
Chassis Colour	White
Operating Temperature	0°C – 40°C/32°F – 104°F
Storage Temperature	-20°C – 60°C/-4°F – 140°F
Relative Humidity	20 – 90% RH (Non-condensing)
Power Consumption	4.3W

8.2 VIDEO SPECIFICATIONS

Supported Resolutions (Hz)	Input			Output
	HDMI	mDP	USB-C	HDMI
720×400p@70/85	✓	✓	✓	✓
640×480p@60/72/75/85	✓	✓	✓	✓
720×480i@60	✓	✓	✓	✓
720×480p@60	✓	✓	✓	✓
720×576i@50	✓	✓	✓	✓
720×576p@50	✓	✓	✓	✓
800×600p@56/60/72/75/85	✓	✓	✓	✓
848×480p@60	✓	✓	✓	✓
1024×768p@60/70/75/85	✓	✓	✓	✓
1152×864p@75	✓	✓	✓	✓
1280×720p@50/60	✓	✓	✓	✓
1280×768p@60/75/85	✓	✓	✓	✓
1280×800p@60/75/85	✓	✓	✓	✓
1280×960p@60/85	✓	✓	✓	✓
1280×1024p@60/75/85	✓	✓	✓	✓
1360×768p@60	✓	✓	✓	✓
1366×768p@60	✓	✓	✓	✓
1400×1050p@60	✓	✓	✓	✓
1440×900p@60/75	✓	✓	✓	✓
1600×900p@60RB	✓	✓	✓	✓
1600×1200p@60	✓	✓	✓	✓
1680×1050p@60	✓	✓	✓	✓
1920×1080i@50/60	✓	✓	✓	✓

Supported Resolutions (Hz)	Input			Output
	HDMI	mDP	USB-C	HDMI
1920x1080p@24/25/30	✓	✓	✓	✓
1920x1080p@50/60	✓	✓	✓	✓
1920x1200p@60RB	✓	✓	✓	✓
2560x1440p@60RB	✓	✓	✓	✓
2560x1600p@60RB	✓	✓	✓	✓
2048x1080p@24/25/30	✓	✓	✓	✓
2048x1080p@50/60	✓	✓	✓	✓
3840x2160p@24/25/30	✓	✓	✓	✓
3840x2160p@50/60 (4:2:0)	✓	✓	✓	✓
3840x2160p@24, HDR10	✓	✓	✓	✓
3840x2160p@50/60 (4:2:0), HDR10	✓	✓	✓	✓
3840x2160p@50/60	✓	✓	✓	✓
4096x2160p@24/25/30	✓	✓	✓	✓
4096x2160p@50/60 (4:2:0)	✓	✓	✓	✓
4096x2160p@24, HDR10	✓	✓	✓	✓
4096x2160p@50/60 (4:2:0), HDR10	✓	✓	✓	✓
4096x2160p@50/60	✓	✓	✓	✓

8.3 Audio Specifications

8.3.1 Digital Audio

HDMI/Mini DisplayPort/USB-C Input	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard & High-Definition
HDMI Output	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	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				
HDMI Input	15m	10m	5m	3m
HDMI Output	15m	10m	5m	3m
DisplayPort Cable				
Mini DisplayPort Input	3m			
USB-C Cable				
USB-C Input	2m		1m	

Note: When using 4K sources, cable quality can have a large impact on video stability. The use of Premium High Speed HDMI cable, 30AWG (Gen 2) USB-C cable, and DisplayPort 1.2 or higher spec cable is highly recommended.

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⁺ 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
AV	Audio/Video
CEC	Consumer Electronics Control
DP	DisplayPort
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
HD	High-Definition
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
HDTV	High-Definition Television
kHz	Kilohertz
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
mDP	Mini DisplayPort
MHz	Megahertz
4K UHD	4K Ultra-High-Definition (10.2Gbps max)
4K UHD⁺	4K Ultra-High-Definition (18Gbps max)
UHDTV	Ultra-High-Definition Television
USB	Universal Serial Bus
VGA	Video Graphics Array
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
XGA	Extended Graphics Array



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