HDCP2.2

4K2K

EL-41HP-4K22

4-Way Advanced HDMI Switcher (4K, HDCP2.2, HDMI2.0, IR, RS-232, IP, Web GUI)

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	21/11/2017	First release

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1. INTRODUCTION

This 4-Way HDMI Switcher is designed to enable the user to switch between any of the four connected HDMI sources to send video and audio to a single HDMI display. This 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 EL-41HP-4K22 supports all the latest features of the HDMI 2.0 specification such as 4K UHD resolutions (4K2K@60Hz - YUV4:4:4),HDR (High Dynamic Range), 'Deep Colour', and High Definition audio.

In addition, this switcher also features an Auto-Switching function which detects the last active input and switches to this input automatically for display. The management of source/sink configurations can be easily controlled via the on-board WebGUI LAN control, IR remote control and RS-232.

2. APPLICATIONS

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

3. PACKAGE CONTENTS

- 1×4 by 1 HDMI Switcher
- 1×Remote Control (CR-72)
- 1×IR Extender Cable
- 1×5V/2.6A DC Power Adaptor
- 1×Operation Manual

4. SYSTEM REQUIREMENTS

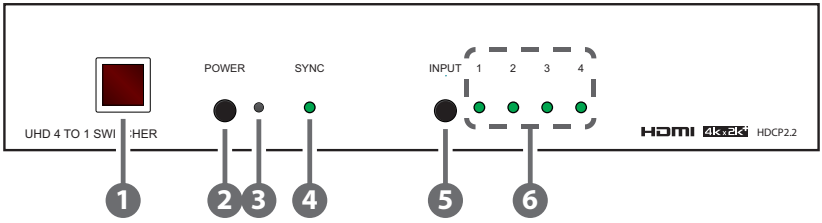
- HDMI source equipment such as media players, video game consoles or set-top boxes.
- HDMI receiving equipment such as HDTVs, monitors or audio amplifiers.

5. FEATURES

- HDMI 2.0 with 18Gbps 4K UHD support, single-link DVI 1.0 compliant
- HDCP 2.2 and 1.4 compliant
- 4 HDMI inputs and 1 HDMI output
- Supports HDTV resolutions up to 4K UHD (3840×2160@50/60Hz & 4096×2160@50/60Hz)
- Supports data rates up to 18Gbps and Deep Colour (16-bit) up to 1080p
- Supports pass-through of LPCM 7.1, Bitstream and HD Bitstream audio formats
- Remotely controllable via Ethernet (WebGUI & Telnet), RS-232 and IR remote

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel



2 **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.

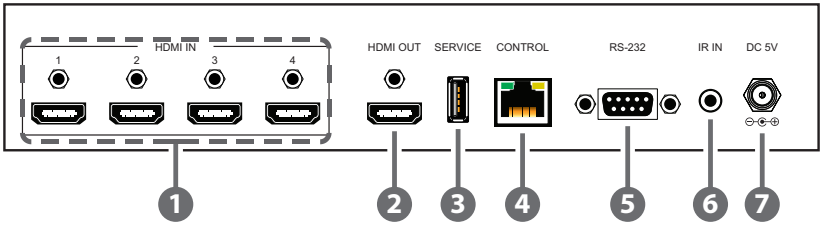
2 **POWER LED:** The LED will illuminate RED to indicate the unit is receiving power but is in stand-by mode. It will illuminate GREEN to indicate that the unit has been turned on.

2 **SYNC LED:** This LED will illuminate GREEN when a stable connection with an output device is detected.

2 **INPUT:** Press this button to sequentially switch through the 4 available inputs.

2 **INPUT LED 1~4:** These LEDs will illuminate GREEN to indicate which of the 4 sources are currently selected.

6.2 Rear Panel



2 **HDMI IN 1~4:** Connect to HDMI source equipment such as a media player, game console or set-top box. DVI source equipment may be connected by using an HDMI to DVI adapter.

2 **HDMI OUT:** Connect to HDMI TVs, monitors or amplifiers for digital video and audio output. DVI display equipment may be connected by using an HDMI to DVI adapter.

2 **SERVICE:** This slot (USB 2.0) is reserved for firmware update use only.

2 **CONTROL:** Connect directly, or through a network switch, to your PC/laptop to control the unit via Telnet/WebGUI.

2 **RS-232:** Connect directly to your PC/laptop to send RS-232 commands to control the unit.

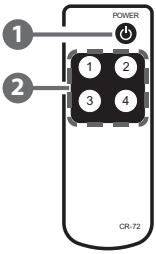
2 **IR IN:** Connect to the provided IR Extender to extend the IR control range of the unit. Ensure that the remote being used is within direct line-of-sight of the IR Extender.

2 **DC 5V:** Plug the 5V DC power adapter into the unit and connect it to an AC wall outlet for power.

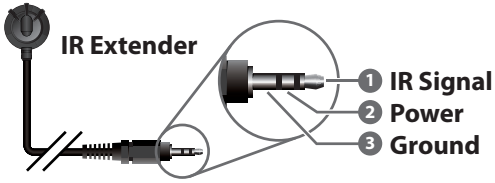
6.3 Remote Control

2 **POWER:** Press this button to power on the unit or place it into stand-by mode.

2 **INPUT 1~4:** Press 1 through 4 to select the input source.



6.4 IR Cable Pin Assignments



6.5 RS-232 Protocol

UNIT	
Pin	**Definition**
1	NC
2	TxD
3	RxD
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC

▶
◀

REMOTE SYSTEM	
Pin	**Definition**
1	NC
2	RxD
3	TxD
4	NC
5	GND
6	NC
7	NC
8	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
HELP	Displays all available commands.
?	Displays all available commands.
P0	Turn unit's power off. (Stand-by mode)
P1	Turn unit's power on.
INNAME N1 N2	Set the name of input N1 to N2. N1 = 1~4 [Input number] N2 = {name} [8 characters max]
INNAME N1	Show the input name of N1. N1 = 1~4 [Input number]
INNAME	Show the names of all inputs.
OUTNAME N1	Set the output name to N1. N1 = {name} [8 characters max]
OUTNAME	Show the current output name.
OUT N1	Set the input to be routed to the output. N1 = 1~4 [Input number]
OUT	Show the current input routing.
SOURCEDET	Show all source information.
SINKINFO	Show all sink information.
HDCPIN N1 N2	Set the HDCP mode for input N1. N1 = 1~4 [Input number] Available values for N2: 0 [Standard] 1 [Apple Mode]
HDCPIN N1	Show the HDCP settings for input N1. N1 = 1~4 [Input number]
HDCPIN	Show all current HDCP input settings.

COMMAND	DESCRIPTION AND PARAMETERS
EDIDMODE N1	Set the EDID mode. Available values for N1: 0 [Appoint] 1 [All]
EDIDMODE	Show the current EDID mode setting.
EDIDALL N1	Set the EDID to use in "All" mode. Available values for N1: 0 [SINK] 1 [720P] 2 [1080P] 3 [4K_3G] 4 [4K_Y420] 5 [4K_6G]
EDIDALL	Show the current EDID selection for "All" mode.
EDIDIN N1 N2	Set the EDID to use on input N1 in "Appoint" mode. N1 = 1~4 [Input number] Available values for N2: 0 [SINK] 1 [720P] 2 [1080P] 3 [4K_3G] 4 [4K_Y420] 5 [4K_6G]
EDIDIN N1	Show the current EDID selection for input N1 in "Appoint" mode.
EDIDIN	Show the current EDID selections for all inputs in "Appoint" mode.

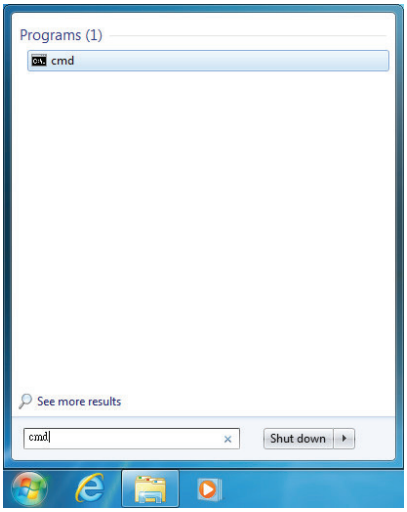
COMMAND	DESCRIPTION AND PARAMETERS
AUTO_SWITCH N1	Enable or disable auto switching mode. Available values for N1: 0 [Disabled] 1 [Enabled]
AUTO_SWITCH	Show current auto switching mode status.
FADEFAULT	Reset the unit to the factory defaults.
REBOOT	Reboot the unit.
VER	Show the unit's current firmware version.
IPCONFIG	Show the current IP configuration.
SIPADDR N1	Set the static IP Address. N1 = X.X.X.X [X = 0~255]
SNETMASK N1	Set the Ethernet netmask. N1 = X.X.X.X [X = 0~255]
SGATEWAY N1	Set the Ethernet gateway. N1 = X.X.X.X [X = 0~255]
HTTPPORT N1	Set the HTTP port. N1 = 0~65535
TELNETPORT N1	Set the Telnet port. N1 = 0~65535
IPMODE N1	Set the current IP address mode. Available values for N1: 0 [Static IP] 1 [DHCP]
READMAC	Show the unit's MAC address.
UPDATE	Update firmware.

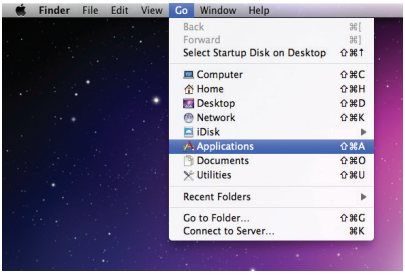
Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive.

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.

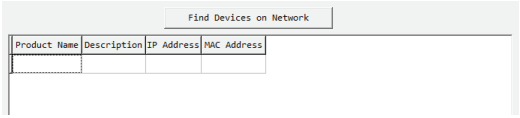
If the IP address is changed then the IP address required for Telnet access will also change accordingly.

6.8 WebGUI Control

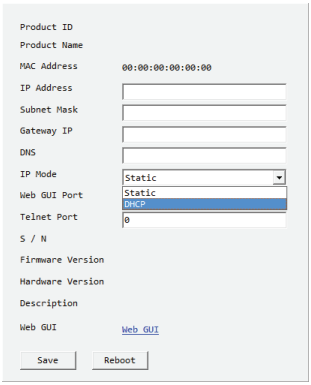
6.8.1 Device Discovery APP

Please obtain the "Device Discovery" software from your authorised 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)



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

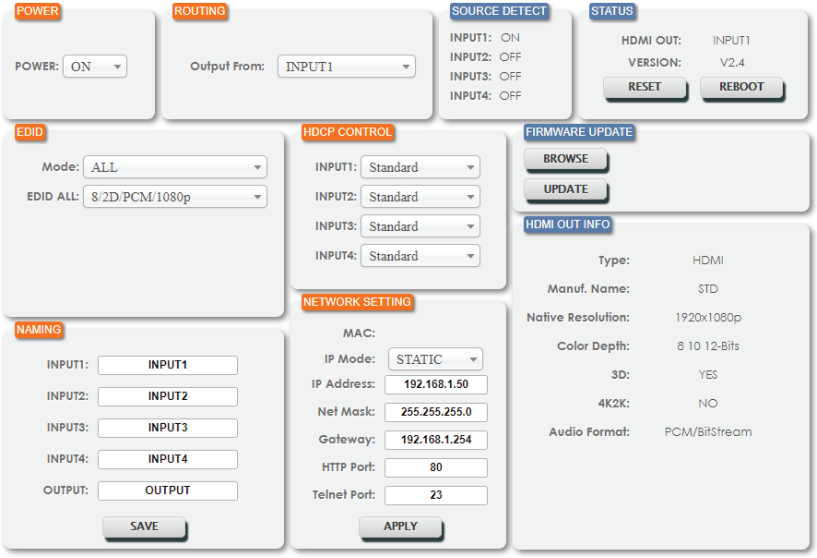


IP Mode: If you choose, you can alter the static IP network settings for the device, or switch the unit into DHCP mode to automatically obtain proper network settings from a local DHCP server. To switch to DHCP mode, please select DHCP from the IP mode drop-down, then click "Save" followed by "Reboot".

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, port naming, Ethernet settings, and reset/firmware functions, are presented on a single web page to allow for simple and intuitive operation. The individual functions will be explained in the following sections.

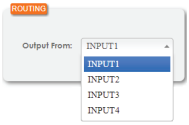


1. Power

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. Four HDMI inputs are available for selection.

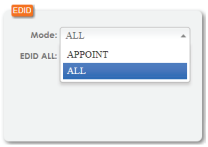


3. EDID

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: EDID is passed from the currently connected display

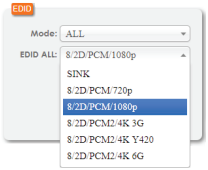
8/2D/PCM/720p: 720p@60Hz, 8-bit & LPCM 2.0

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

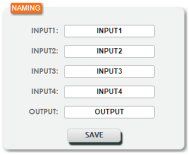


4. HDCP Control

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 devices on non-HDCP displays. This setting can be assigned individually to each input.

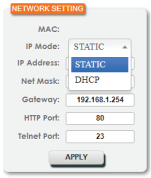
5. Naming

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



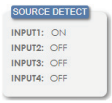
6. Network Setting

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 in "Static" mode and 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 connected one of the 4 HDMI inputs the corresponding input port 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 source and the unit's firmware version as well as allowing for resetting or rebooting the unit.

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

REBOOT: To reboot the unit, please click "REBOOT" button.

9. Firmware Update

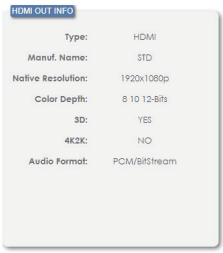
This tab provides a way to update the firmware of the unit.

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

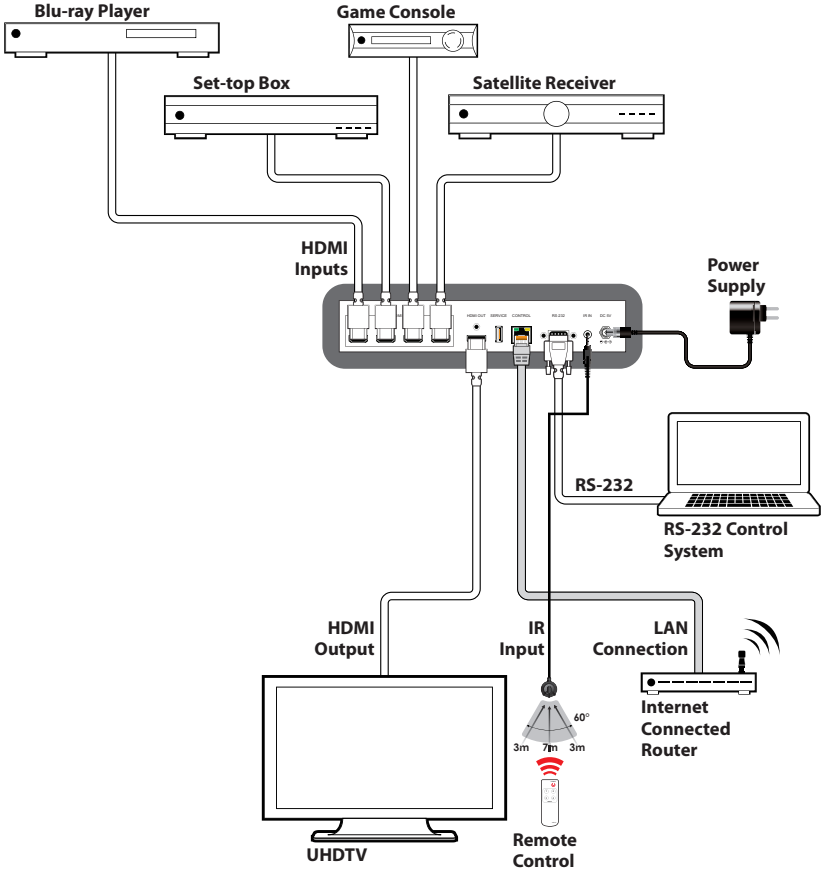
UPDATE: Click the "UPDATE" button to begin the firmware update process.

10. HDMI Out Info

The HDMI output display's detected information is listed here, including type, manufacturer name, native resolution, colour depth, 3D support, 4K support and audio format support.



7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

Video Bandwidth	600MHz/18Gbps
Input Ports	4×HDMI
Output Ports	1×HDMI
Control Interfaces	1×IR Extender (3.5mm) 1×RS-232 (9-pin D-sub) 1×IP Control (RJ45)
Supported Resolutions	480i@60Hz - 4K@60Hz (4:4:4, 8-bit) VGA@60Hz - WUXGA@60Hz (RB)
HDMI Cable Length	10m (1080p@60Hz, 12-bit) 5m (4K@60Hz, 4:4:4, 8-bit)
IR Frequency	30 - 50kHz (30 - 60kHz under ideal conditions)
Baud Rate	115200bps
Power Supply	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection	Human Body Model: ±12kV (Air Discharge) ±8kV (Contact Discharge)
Dimensions	240mm×43mm×104mm (W×H×D) [Case Only] 240mm×48mm×112mm (W×H×D) [All Inclusive]
Weight	850g
Chassis Material	Metal
Silkscreen Colour	Black
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	5.83W

8.2 Video Specifications

Supported PC Resolutions (Hz)	Input	Output
640×480@60/72/75	✓	✓
800×600@60/72/75	✓	✓
1024×768@60/70/75	✓	✓
1280×768@60	✓	✓
1280×1024@60	✓	✓
1360×768@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
CLI	Command Line Interface
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
GUI	Graphical User Interface
HD	High-Definition
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
HTTP	HyperText Transfer Protocol
IP	Internet Protocol
IR	Infrared
LAN	Local Area Network
LPCM	Linear Pulse-Code Modulation
PC	Personal Computer
UHD	Ultra-High-Definition
USB	Universal Serial Bus
VGA	Video Graphics Array (640×480@60Hz)
WUXGA	Wide Ultra Extended Graphics Array (1920×1200@60Hz)

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