SY-UHDVGA-4K22

UHD+ 2x1 HDMI/VGA to HDMI Scaler

OPERATION MANUAL

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![CYP logo]

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.

- Please completely disconnect the power when the unit is not in use to avoid wasting electricity.

VERSION HISTORY

REV.	DATE	SUMMARY OF CHANGE
RDV1	2019/04/30	Preliminary release

CONTENTS

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1. INTRODUCTION

This compact, yet versatile, 4K UHD HDMI/VGA to HDMI Switching Scaler accepts a wide range of resolutions from 480i up to 1080p/WUXGA over the VGA input and up to 4K@60Hz (4:4:4) on the HDMI input. With the use of the 3.5mm audio input, stereo audio may be embedded with either source as well. Scaled HDMI output resolutions are available up to 4K@60Hz (4:4:4). Integrated EDID management options allow for control over the way connected sources detect the unit. The included automatic source detection and switching feature allows the unit to switch automatically to the most recently connected source, or to switch to the alternate input if the current one becomes disconnected. The Auto Adjustment function, activated by a button on the unit, can automatically adjust the image position of the VGA source if necessary.

This unit is an ideal device for integrating previously incompatible sources and displays, or for providing a flexible auto-detection input point for a small boardroom or huddle space. This unit is controllable via front panel buttons and RS-232.

2. APPLICATIONS

/// Huddle Rooms & Small Boardrooms

/// Entertainment Rooms & Home Theaters

/// Lecture Hall Presentations

/// Public Commercial Displays

/// A/V Equipment and Control Rooms

3. PACKAGE CONTENTS

/// 1× 2×1 HDMI/VGA to HDMI Scaler

/// 1× 5V/2.6A DC Power Adapter

/// 1× 3-pin terminal block

/// 1× Shockproof Feet (Set of 4)

/// 1× Operation Manual

4. SYSTEM REQUIREMENTS

/// HDMI source equipment such as a media player, video game console or set-top box.

/// VGA source equipment such as a PC, laptop or set-top box.

/// HDMI receiving equipment such as an HDTV, monitor or audio amplifier.

/// The use of Premium High Speed HDMI cables is highly ecommended.

5. FEATURES

/// HDMI 2.0 and DVI 1.0 compliant

/// HDCP 1.x and 2.2 compliant

/// Switchable HDMI input and VGA input with a 3.5mm mini-jack audio input

/// 1 HDMI output

/// Supports up to 4K UHD (18Gbps, 4K@50/60Hz 4:4:4, 8-bit) video input and output over HDMI

/// Supports up to 1080p or WUXGA (1920x120060Hz RB) video input over VGA

/// Supports Deep Colour input up to 12-bit (HDMI only)

/// Supports 2 channel LPCM digital audio input and output

/// Analogue stereo audio may be embedded with either input

/// Automatic input detection with output at the (EDID indicated) preferred resolution of the connected HDMI display (NATIVE output mode) by default

/// Comprehensive output picture adjustments via RS-232 (contrast, brightness, hue, saturation, sharpness, RGB (colour tone) level and aspect ratio)

/// Controllable via front panel buttons and RS-232

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel
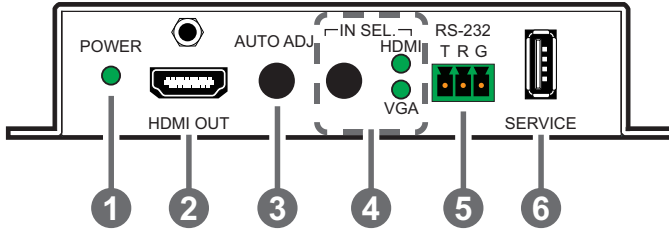
1 **POWER LED:** This LED will illuminate to indicate the unit is on and receiving power.

2 **HDMI OUT Port:** Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.

3 **AUTO ADJ. Button:** Press this button to activate the Auto Adjust function for VGA sources.

Note: The Auto Adjust function requires a VGA source with a bright, edge-to-edge, image to accurately judge the dimensions of the signal.

4 **IN SEL. Button & LEDs:** Press this button to toggle between the available inputs. The LED will illuminate to indicate which source is currently selected.

5 **RS-232 Terminal Block:** Connect directly to a PC, laptop, or other serial control device with a 3-pin adapter cable to send RS-232 commands to control the unit.

6 **SERVICE Port:** This port is reserved for firmware update use only.

6.2 Rear Panel
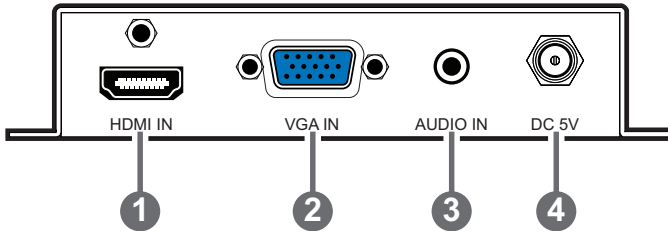
1 **HDMI IN Port:** Connect to HDMI source equipment such as a media player, game console or set-top box.

2 **VGA IN Port:** Connect to VGA source equipment such as a PC or laptop.

3 **AUDIO IN Port:** Connect to the stereo analogue output of a device such as an audio player or PC.

Note: By default, analogue audio is embedded with the VGA input.

4 **DC 5V Port:** Plug the 5V DC power adapter into this port and connect it to an AC wall outlet for power.

6.3 RS-232 Pinout and Defaults

SERIAL PORT DEFAULT SETTINGS	
Baud Rate	19200
Data Bits	8
Parity Bits	None
Stop Bits	1
Flow Control	None

3-pin Terminal Block

1 GND
2 RxD
3 TxD
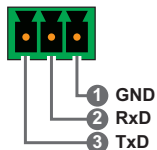
6.4 RS-232 Commands

COMMAND
Description and Parameters
help↵
Show the full command list.
?↵
Show the full command list.
help N1↵
Show help details about command N1.
N1 = {Command name}
get fw ver↵
Show the unit's current firmware version.
get model type↵
Show the unit's product type.
set factory default↵
Reset the unit to the factory defaults.

COMMAND
Description and Parameters

set uart 1 baudrate N1↵

Set the baud rate of the RS-232 port.

Available values for **N1**:
1	[4800 baud]
2	[9600 baud]
3	[19200 baud]
4	[38400 baud]
5	[57600 baud]
6	[115200 baud]

set uart 1 stop bit N1↵

Set the number of stop bits for the RS-232 port.

N1 = 1 ~2   [Stop bits]

get uart 1 stop bit↵

Show the current number of stop bits of the RS-232 port.

set uart 1 data bit N1↵

Set the data bits for the RS-232 port.

N1 = 5 ~ 8   [Data bits]

get uart 1 data bit↵

Show the current number of data bits of the specified RS-232 port.

set uart 1 parity N1↵

Set the parity of the RS-232 port.

Available values for N1:
0	[None]
1	[Odd]
2	[Even]
3	[Disable]

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COMMAND
Description and Parameters
get uart 1 parity↵
Show the current parity setting of the RS-232 port.
set out A route N1↵
Route the specified input to the HDMI output.
Available values for **N1**:
1   [HDMI input]
2   [VGA input]
get out A route↵
Show the current input routed to the HDMI output.
set out auto mode N1↵
Set the auto switching/scanning behavior of the unit.
Available values for **N1**:
0   [Off]
1   [Auto Switch]
2   [Auto Scan]
get out auto mode↵
Show the current auto switching/scanning mode of the unit.
get out auto mode list↵
List all available auto mode options.
get in N1 sync status↵
Show the current sync state of the specified input.
Available values for **N1**:
1   [HDMI input]
2   [VGA input]
get out A sync status↵
Show the current sync state of the HDMI output.

COMMAND

Description and Parameters

get in N1 timing string↵

Show the index number and description of the current resolution detected on the specified input.

Available values for **N1**:

1	[HDMI input]
2	[VGA input]

set automation event N1 uart A N2↵

Enable or disable the specified Automation Event's RS-232 response.

Available values for **N1**:

0	[Power on]
1	[Out A source active]
2	[Out A source lost]

Available values for **N2**:

ON	[Enabled]
OFF	[Disabled]

get automation event N1 uart A↵

Show the current state of the specified Automation Event's RS 232 response.

Available values for **N1**:

0	[Power on]
1	[Out A source active]
2	[Out A source lost]

COMMAND
Description and Parameters

set automation event N1 uart A command N2↵

Set the RS-232 command string to send when the specified Automation Event is activated.

Available values for **N1**:

0	[Power on]
1	[Out A source active]
2	[Out A source lost]

N2 = {ASCII command string}

get automation event N1 uart A command↵

Show the RS-232 command string to be sent when the specified Automation Event is activated.

Available values for **N1**:

0	[Power on]
1	[Out A source active]
2	[Out A source lost]

set automation event N1 uart A delay N2↵

Set the delay time that the specified Automation Event must continue to be true before sending the defined RS-232 command.

Available values for **N1**:

0	[Power on]
1	[Out A source active]
2	[Out A source lost]
N2 = 0 ~ 240	[Delay in seconds]

COMMAND
Description and Parameters

get automation event N1 uart A delay↵

Show the delay time for the specified Automation Event's RS 232 response.

Available values for **N1**:

0	[Power on]
1	[Out A source active]
2	[Out A source lost]

set automation event N1 uart A wait N2↵

Set the length of time to wait after an Automation Event's RS 232 response has been activated before ANY other Automation Event can be detected.

Available values for **N1**:

0	[Power on]
1	[Out A source active]
2	[Out A source lost]
N2 = 0 ~ 240	[Wait in seconds]

get automation event N1 uart A wait↵

Show the wait time for the specified Automation Event's RS 232 response.

Available values for **N1**:

0	[Power on]
1	[Out A source active]
2	[Out A source lost]

CYP///

COMMAND
Description and Parameters

set out A timing N1↵

Set the output resolution to use on the HDMI output.

Available values for **N1**:

0	[Native]
1	[640x480p60]
2	[800x600p60]
3	[1024x768p60]
4	[1280x768p60]
5	[1280x800p60]
6	[1280x1024p60]
7	[1360x768p60]
8	[1400x1050p60]
9	[1440x900p60]
10	[1600x1200p60]
11	[1680x1050p60]
12	[1920x1200p60 RB]
13	[2560x1600p60 RB]
14	[1920x1080p60]
15	[1280x720p60]
16	[2048x1080p50]
17	[2048x1080p60]
18	[2560x1440p60 RB]
19	[720x480p60]
20	[1280x720p60]
21	[1920x1080p60]
22	[720x576p50]
23	[1280x720p50]
24	[1920x1080p50]
25	[1920x1080p24]
26	[1920x1080p25]
27	[1920x1080p30]

COMMAND	
Description and Parameters	
28	[2560x1080p50]
29	[2560x1080p60]
30	[3840x2160p24]
31	[3840x2160p25]
32	[3840x2160p30]
33	[3840x2160p50]
34	[3840x2160p60]
35	[4096x2160p24]
36	[4096x2160p25]
37	[4096x2160p30]
38	[4096x2160p50]
39	[4096x2160p60]

get out A timing↵

Show the current resolution used by the HDMI output.

set out A contrast N1↵

Set the contrast level of the HDMI output.

N1 = 0 ~ 60   [Contrast]

get out A contrast↵

Show the current contrast level of the HDMI output.

set out A brightness N1↵

Set the brightness level of the HDMI output.

N1 = 0 ~ 60   [Brightness]

get out A brightness↵

Show the current brightness level of the HDMI output.

set out A saturation N1↵

Set the saturation level of the HDMI output.

N1 = 0 ~ 60   [Saturation]

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COMMAND
Description and Parameters
get out A saturation↵
Show the current saturation level of the HDMI output.
set out A hue N1↵
Set the hue value of the HDMI output.
N1 = 0 ~ 60   [Hue]
get out A hue↵
Show the current hue value of the HDMI output.
set out A sharpness N1↵
Set the sharpness level of the HDMI output.
N1 = 0 ~ 60   [Sharpness]
get out A sharpness↵
Show the current sharpness level of the HDMI output.
set out A nr N1↵
Set the amount of noise reduction to apply to the HDMI output's source.
N1 = 0 ~ 4   [Noise reduction]
get out A nr↵
Show the current amount of noise reduction applied to the HDMI output's source.

COMMAND
Description and Parameters

set out A aspect ratio N1↵

Set the aspect ratio of the video shown on the HDMI output.

Available values for **N1**:

0	[Overscan]
1	[Full]
2	[Best fit]
3	[Pan scan]
4	[Letterbox]
5	[Under 2]
6	[Under 1]
7	[Follow In]

get out A aspect ratio↵

Show the currently set aspect ratio for the video shown on the HDMI output.

get out aspect ratio list↵

List all available aspect ratio options.

set out A auto sync off N1↵

Enable or disable the Auto Sync Off function on the HDMI output and set the timeout length.

Available values for **N1**:

0	[Disabled]
1 ~ 250	[Enabled with timeout in seconds]

get out A auto sync off↵

Show the current Auto Sync Off settings for the HDMI output.

set out A r gain N1↵

Set the HDMI output's red gain level.

N1 = 0 ~ 1023	[Red gain]

CYP///

COMMAND
Description and Parameters
get out A r gain↵
Show the HDMI output's current red gain level.
set out A g gain N1↵
Set the HDMI output's green gain level.
N1 = 0 ~ 1023   [Green gain]
get out A g gain↵
Show the HDMI output's current green gain level.
set out A b gain N1↵
Set the HDMI output's blue gain level.
N1 = 0 ~ 1023   [Blue gain]
get out A b gain↵
Show the HDMI output's current blue gain level.
set in 2 phase N1↵
Set the PC phase value for the VGA input.
N1 = 0 ~ 250   [PC phase]
get in 2 phase↵
Show the current PC phase value for the VGA input.
set in 2 clock N1↵
Set the PC clock value for the VGA input.
N1 = 0 ~ 250   [PC clock]
get in 2 clock↵
Show the current PC clock value for the VGA input.

COMMAND
Description and Parameters

set in 2 hposition N1↵

Set the PC horizontal position for the VGA input.

N1 = 0 ~ 250   [Horizontal position]

get in 2 hposition↵

Show the current PC horizontal position for the VGA input.

set in 2 vposition N1↵

Set the PC vertical position for the VGA input.

N1 = 0 ~ 250   [Vertical position]

get in 2 vposition↵

Show the current PC vertical position for the VGA input.

set out A osd info display N1↵

Enable or disable the info OSD for the HDMI output.

Available values for **N1**:
ON   [Enabled]
OFF   [Disabled]

get out A osd info display↵

Show the current info OSD state for the HDMI output.

set out A osd info timeout N1↵

Set the info OSD's timeout value for the HDMI output.

N1 = 0 ~ 100   [Seconds]

get out A osd info timeout↵

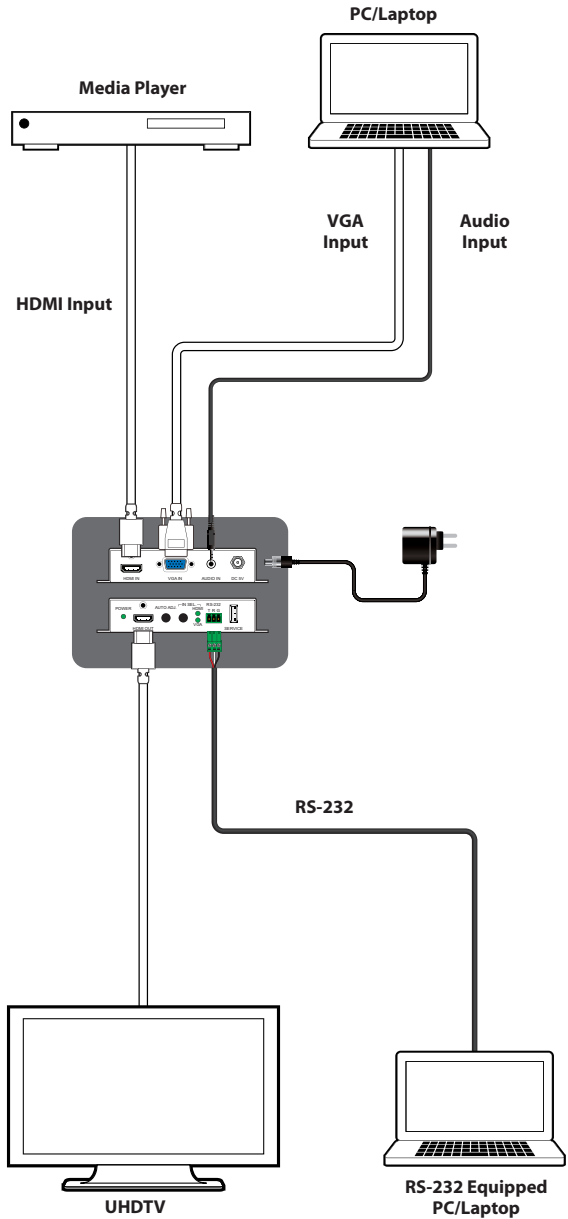Show the current info OSD's timeout value for the HDMI output.

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COMMAND
Description and Parameters

set audio out A mute N1 ↵

Enable or disable muting the HDMI output's.

Available values for **N1**:
OFF	[Unmuted]
ON	[Muted]

get audio out A mute ↵

Show the current mute state of the HDMI output's audio.

set audio out A route N1 ↵

Route the specified audio input to the HDMI output.

Available values for **N1**:
1	[Auto]
2	[Analogue audio]

get audio out A route ↵

Show the current audio input routed to the HDMI output.

set audio out A volume N1 ↵

Set the volume level of the HDMI output's audio.

N1 = 0 ~ 100   [Volume level]

get audio out A volume ↵

Show the current volume level of the HDMI output's audio.

get audio in type list ↵

List all available audio input sources.

COMMAND
Description and Parameters

set in 1 edid N1↵

Set the EDID to use with the HDMI input.

Available values for **N1**:
1	[FHD 2CH]
2	[UHD 2CH]
3	[UHD+ 2CH]
4	[Output A]
5	[Output A (Auto updating)]

get in 1 edid↵

Show the EDID currently being used by the HDMI input.

get in edid list↵

List all available EDID selections.

set in 1 hdcp mode N1↵

Set the HDCP behavior of the HDMI input.

Available values for **N1**:
0	[Disabled]
1	[Follow source]
2	[Follow display]

get in edid list↵

List all available EDID selections.

set in 1 hdcp mode N1↵

Set the HDCP behavior of the HDMI input.

Available values for **N1**:
0	[Disabled]
1	[Follow source]
2	[Follow display]

COMMAND
Description and Parameters

get in 1 hdcp mode↵

Show the current HDCP behavior used by the HDMI input.

get in 1 hdcp status↵

Show the current HDCP status of the HDMI input.

get out A hdcp status↵

Show the current HDCP status of the HDMI output.

get out A hdcp ability↵

Show the HDCP compliance level of the display device connected to the HDMI output.

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

7. CONNECTION DIAGRAM

PC/Laptop

Media Player

VGA Input

Audio Input

HDMI Input

HDMI IN   VGA IN   AUDIO IN   DC 5V

POWER   AUTO ADJ.   IR SEL.   RS-232   SERVICE
HDMI OUT   HDMI VGA

RS-232

UHDTV

RS-232 Equipped PC/Laptop

8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	18Gbps
VGA Bandwidth	165MHz
Input Ports	1×HDMI (Type-A)
	1×VGA (HD-15)
	1×Stereo Audio (3.5mm)
Output Port	1×HDMI (Type-A)
Control Port	1×RS-232 (3-pin Terminal Block)
Service Port	1×USB 2.0 (Type A)
Baud Rate	19200
Power Supply	5V/2.6A DC
	(US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge)
	±4kV (Contact Discharge)
Dimensions (W×H×D)	108mm×24mm×75mm [Case Only]
	110mm×25mm×75mm [All Inclusive]
Weight	244g
Chassis Material	Metal (Steel)
Chassis 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	6.29W

8.2 Video Specifications

Supported Resolutions (Hz)	Input		Output
	HDMI	VGA	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	✓	✓	✓
1920×1080p@24/25/30	✓	✓	✓

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

8.3 Audio Specifications

8.3.1 Digital Audio

HDMI Input/Output	
LPCM	
Max Channels	2 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	None

8.3.2 Analogue Audio

Analogue Input	
Max Audio Level	2Vrms
Impedance	40kΩ
Type	Unbalanced

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
VGA Cable				
VGA Input	1.5m	1.5m	✕	

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 (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 (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
ADC	Analogue-to-Digital Converter
AV	Audio/Video
AVLC	Adaptive Visually Lossless Compression
AVR	Audio/Video Receiver or Recorder
CEC	Consumer Electronics Control
CLI	Command-Line Interface
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
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
OSD	On-Screen Display
SDTV	Standard-Definition Television
UHD	Ultra-High-Definition
UHD+	Ultra-High-Definition Plus
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