

► SW41AB-8K

User Manual

Thank you for purchasing this product.

For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.



Surge protection device recommended

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

Safety And Performance Notice

Do not substitute or use any other power supply other than the enclosed unit, or a Blustream approved replacement.

Do not disassemble the unit for any reason. Doing so will void the manufacturer’s warranty.

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Introduction

The SW41AB-8K HDMI2.1 switcher integrates multiple source devices where the features and functionality of the HDMI2.1 chipset are being utilised for 8K 60Hz, and 4K 120Hz signals.

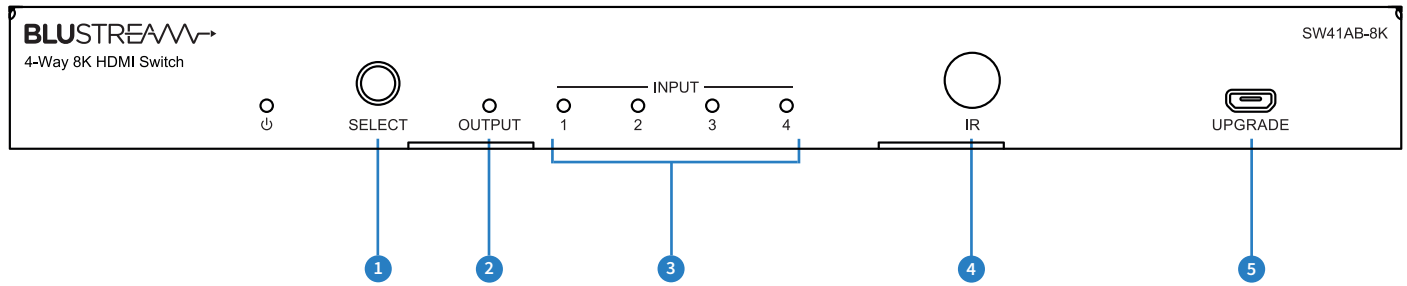
With selection of 4 x HDMI input sources, the SW41AB-8K can auto-switch based on detecting a 5V hot plug, or a new TMDS signal, RS-232, or manually using IR, or the front panel.

Analogue and optical digital (S/PDIF) audio breakout allows for audio integration. The SW41AB-8K is HDCP2.3 compliant and has advanced EDID management of source devices connected.

FEATURES:

- Features 4x HDMI 2.1 inputs that can be switched to a single HDMI output
- Supports HDMI 2.1 40Gbps specification including HDR
- Supports up to 8K60 YCbCr 4:2:0 10bit, 8K30 RGB/YCbCr 4:4:4 10bit or 4K120 RGB/YCbCr 4:4:4 10bit
- Supports ALLM (Auto Low Latency Mode) & VRR (Variable Refresh Rate)
- Supports all known HDMI audio formats including Dolby Atmos, Dolby TrueHD, Dolby Digital Plus and DTS-HD Master Audio transmission
- Auto HDMI source switching via 5V and / or TMDS signal sensing
- Manual HDMI source switching via front panel, IR and RS-232
- Audio breakout to analogue L/R audio and optical (S/PDIF) digital outputs concurrently
- 5V / 12V IR Compatible
- HDCP 2.3 compliant with advanced EDID management

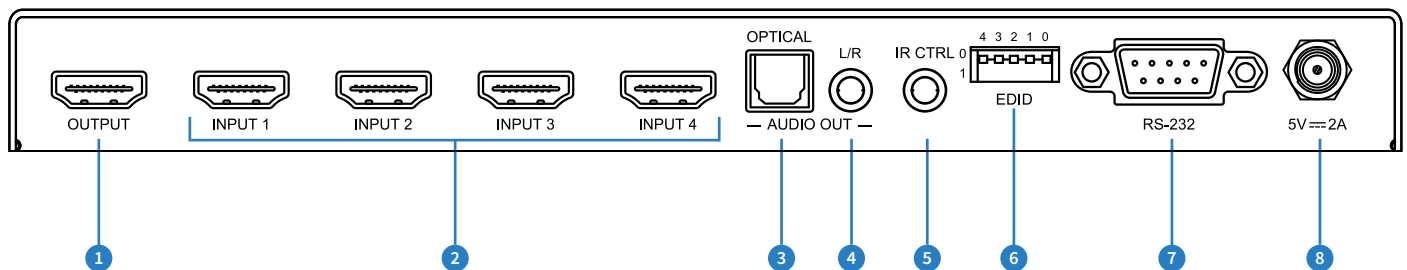
Front Panel



- 1 Select button - press to toggle between HDMI inputs (1 > 2 > 3 > 4 > 1...). Auto-switching function is enabled / disabled by pressing and holding the Select button for 5 seconds. Input light will flash 3 times to confirm switching function enabled / disabled
- 2 Output LED indicator - indicates if a display device is connected to the switches HDMI output
- 3 Input LED indicators - displays the HDMI input currently active
- 4 IR receiver window
- 5 Firmware upgrade port - Micro USB allows for firmware update of device

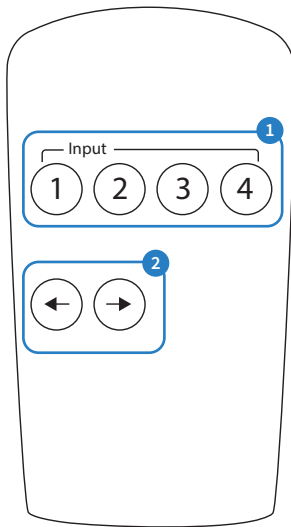


Rear Panel



- 1 HDMI output - connect to a HDMI display device
- 2 HDMI inputs - connect to HDMI source devices
- 3 Optical S/DIF Output - De-embed digital audio from the selected HDMI input
- 4 Analogue Audio Left/Right output (3.5mm stereo jack) - de-embedded from the selected HDMI input. Source input must be PCM 2 channel audio for the analogue output to work. The SW41AB-8K does not down-mix multi-channel audio signals
- 5 External IR port - connect supplied Blustream 5V IR receiver, or control processor to control the switcher
- 6 EDID DIP switches - see page 06
- 7 RS-232 port - for control of the switcher from a 3rd party control processor or PC
- 8 Power port - use supplied Blustream 5V/2A DC adaptor to power the switcher

Infrared Remote Control - REMSW41



- 1 Direct HDMI input selection buttons
- 2 Scroll through inputs - HDMI input 1 - 2 - 3 - 4 - 1...

Infrared (IR) Distribution

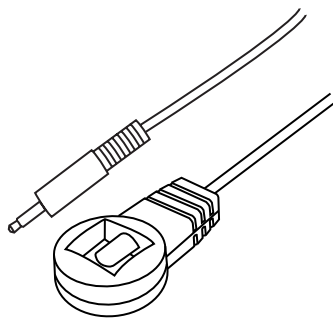
The Blustream range of HDMI products include multiple options for IR control.

IMPORTANT: Blustream Infrared products are all 5V and NOT compatible with alternative manufacturers Infrared solutions. When using third party 12V IR control solutions please use the Blustream IRCAB cable for IR conversion (12V to 5V) - sold separately.

Each Blustream HDMI product is supplied with the necessary IR hardware required:

IR Receiver - IRR

Blustream 5V IR receiver (supplied) to receive IR signal and control the SW41AB-8K

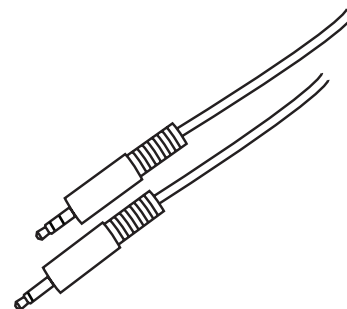


IR Control Cable - IRCAB

Blustream IR Control cable 3.5mm Mono to 3.5mm Stereo for linking third party control solutions to Blustream products.

Compatible with 12V IR third party products.

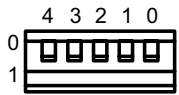
Note: Cable is directional as indicated - not supplied



EDID Control

EDID (Extended Display Identification Data) is a data structure that is used between a display and a source. This data is used by the source to find out what audio and video resolutions are supported by the display/s. By pre-determining the video resolution and audio format of the source and display devices, you can reduce the time needed for EDID hand shaking thus making power cycles quicker and more reliable.

Configuration of the EDID settings for the input can be achieved either via the EDID DIP switches on the rear of the splitter, or by using the RS-232 port and Blustream EDID API commands when in Software Control mode.

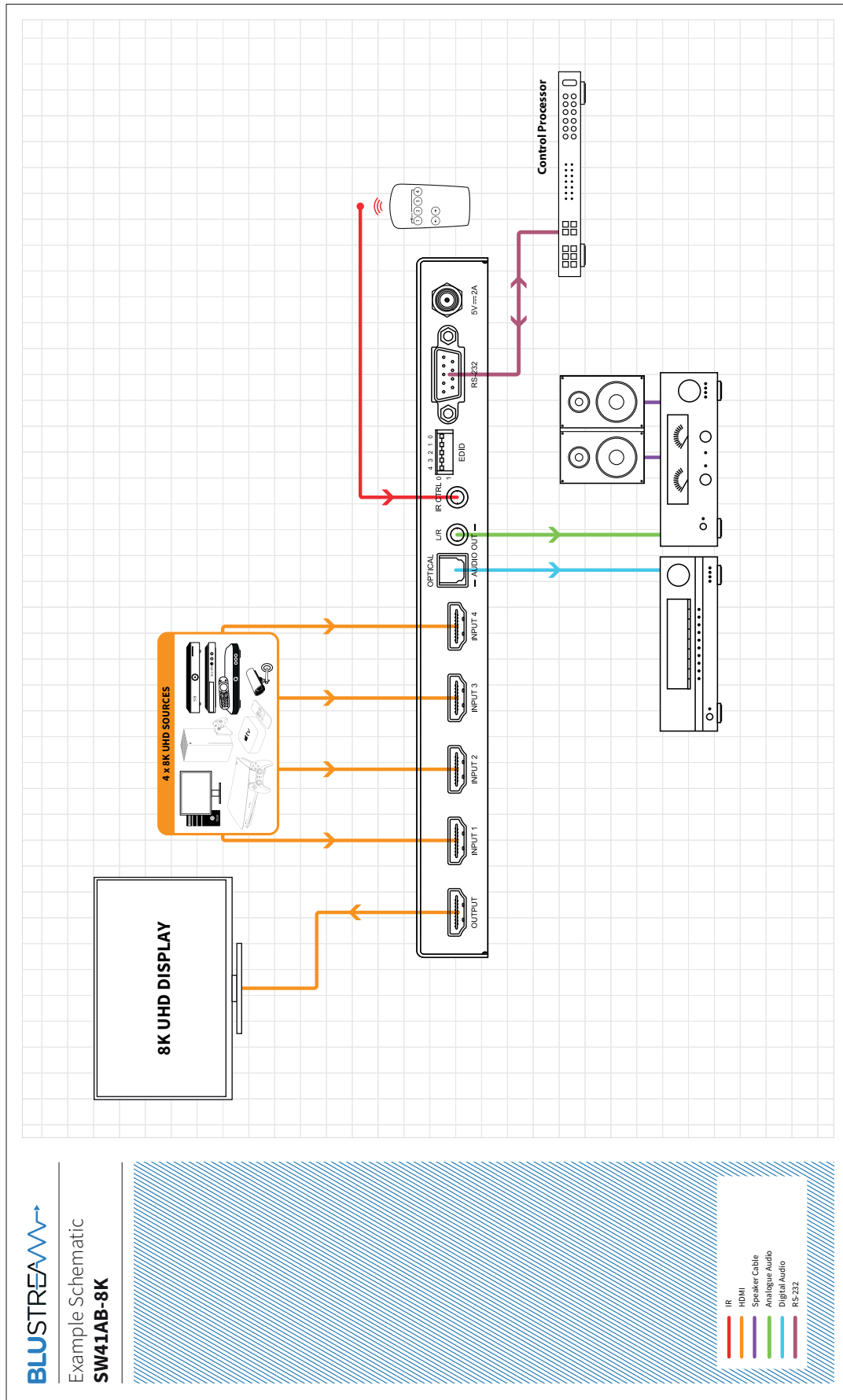


Dip-switch Position '0' = Off
 Dip-switch Position '1' = On



DIP ON ▼/OFF▲ SWITCHING POSITIONS					EDID TYPE
4	3	2	1	0	
Off	Off	Off	Off	Off	HDMI 1080p@60Hz, Audio 2ch PCM
Off	Off	Off	Off	On	HDMI 1080p@60Hz, Audio 5.1ch PCM/DTS/DOLBY
Off	Off	Off	On	Off	HDMI 1080p@60Hz, Audio 7.1ch PCM/DTS/DOLBY/HD
Off	Off	Off	On	On	HDMI 4K@30Hz 4:4:4, Audio 2ch PCM
Off	Off	On	Off	Off	HDMI 4K@30Hz 4:4:4, Audio 5.1ch PCM/DTS/DOLBY
Off	Off	On	Off	On	HDMI 4K@30Hz 4:4:4, Audio 7.1ch PCM/DTS/DOLBY/HD
Off	Off	On	On	Off	HDMI 4K@60Hz 4:2:0+4K@30Hz 4:4:4, Audio 2ch PCM
Off	Off	On	On	On	HDMI 4K@60Hz 4:2:0+4K@30Hz 4:4:4, Audio 5.1ch PCM/DTS/DOLBY
Off	On	Off	Off	Off	HDMI 4K@60Hz 4:2:0+4K@30Hz 4:4:4, Audio 7.1ch PCM/DTS/DOLBY/HD
Off	On	Off	Off	On	HDMI 4K@60Hz 4:4:4, 8-bit, Audio 2ch PCM
Off	On	Off	On	Off	HDMI 4K@60Hz 4:4:4, 8-bit, Audio 5.1ch PCM/DTS/DOLBY
Off	On	Off	On	On	HDMI 4K@60Hz 4:4:4, 8-bit, Audio 7.1ch PCM/DTS/DOLBY/HD
Off	On	On	Off	Off	HDMI 4K@60Hz 4:4:4, 10-bit HDR, Audio 2ch PCM
Off	On	On	Off	On	HDMI 4K@60Hz 4:4:4, 10-bit HDR, Audio 5.1ch PCM/DTS/DOLBY
Off	On	On	On	Off	HDMI 4K@60Hz 4:4:4, 12-bit HDR (Inc DV), Audio 7.1ch PCM/DTS/DOLBY/HD
Off	On	On	On	On	HDMI 4K@120Hz 4:4:4, 10-bit HDR, Audio 2ch PCM - Inc VRR
On	Off	Off	Off	Off	HDMI 4K@120Hz 4:4:4, 10-bit HDR, Audio 5.1ch PCM/DTS/DOLBY - Inc VRR
On	Off	Off	Off	On	HDMI 4K@120Hz 4:4:4, 10-bit HDR, Audio 7.1ch PCM/DTS/DOLBY/HD - Inc VRR
On	Off	Off	On	Off	HDMI 8K@30Hz 4:4:4, 10-bit HDR, Audio 2ch PCM - Inc VRR
On	Off	Off	On	On	HDMI 8K@30Hz 4:4:4, 10-bit HDR, Audio 5.1ch PCM/DTS/DOLBY - Inc VRR
On	Off	On	Off	Off	HDMI 8K@30Hz 4:4:4, 10-bit HDR, Audio 7.1ch PCM/DTS/DOLBY/HD - Inc VRR
On	Off	On	Off	On	HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, 10-bit HDR, Audio 2ch PCM - Inc VRR
On	Off	On	On	Off	HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, 10-bit HDR, Audio 5.1ch PCM/DTS/DOLBY - Inc VRR
On	Off	On	On	On	HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, 10-bit HDR, Audio 7.1ch PCM/DTS/DOLBY/HD - Inc VRR
On	On	Off	Off	Off	HDMI 4K@120Hz 4:4:4, 12-bit HDR (Inc DV), Audio 2ch PCM - Inc VRR
On	On	Off	Off	On	HDMI 4K@120Hz 4:4:4, 12-bit HDR (Inc DV), Audio 7.1ch PCM/DTS/DOLBY/HD - Inc VRR
On	On	Off	On	Off	HDMI 8K@30Hz 4:4:4, 12-bit HDR (Inc DV), Audio 2ch PCM - Inc VRR
On	On	Off	On	On	HDMI 8K@30Hz 4:4:4, 12-bit HDR (Inc DV), Audio 7.1ch PCM/DTS/DOLBY/HD - Inc VRR
On	On	On	Off	Off	HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, 12-bit HDR (Inc DV), Audio 2ch PCM - Inc VRR
On	On	On	Off	On	HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, 12-bit HDR (Inc DV), Audio 7.1ch PCM/DTS/DOLBY/HD - Inc VRR
On	On	On	On	Off	EDID Pass-through (Copy EDID from Output 1)
On	On	On	On	On	EDID Software control

Application Diagram



BLUSTREAM

Example Schematic
SW41AB-8K

- IR
- HDMI
- Speaker Cable
- Analogue Audio
- Digital Audio
- RS-232

RS-232 Control

The SW41AB-8K switch can be controlled via a 9-pin serial cable.

Details of RS-232 pin assignment and communication are below. Please note that depending on your control device serial port pin configuration you may require either a ‘Straight’ RS-232 cable or ‘Null-modem’ type.

RS-232 Settings

Baud Rate: 57600 bps

Data Bit: 8-bit

Parity: None

Stop Bit: 1-bit

Flow Control: None

BLUSTREAM RS-232		CONTROL SYSTEM	
PIN	Assignment	PIN	Assignment
1	NC	1	NC
2	Tx	2	Rx
3	Rx	3	Tx
4	NC	4	NC
5	GND	5	GND
6	NC	6	NC
7	NC	7	NC
8	NC	8	NC
9	NC	9	NC

Commonly Used Serial Commands

There are several commands that are commonly used for control and testing:

STATUS	Status will give feedback on switch such as zones on, type of connection etc
PON	Power on
POFF	Power off
OUT FRyy	(where ‘yy’ is the input)
<i>Example:</i>	<i>OUT FR02 (this would switch the output to source input 2)</i>

RS-232 Commands

RS-232 COMMAND	DESCRIPTION
?	Print Help Information
HELP	Print Help Information
STATUS	Print System Status and Port Status
PON	Power On, System Run On Normal State
POFF	Power Off, System Run On Power Save State
IR ON/OFF	Set System IR Control On Or Off
IR 5V	Set System IR Is 5V Power Supply Infrared Receiver
IR 12V	Set System IR Is 12V Power Supply Infrared Receiver
KEY ON/OFF	Set System KEY Control On Or Off
RESET	Reset System To Default Setting (Should Type “Yes” To Confirm, “No” To Discard)
OUT AUTO ON/OFF	Set Auto Switch Port On Or Off
OUT ON/OFF	Set Output Port On Or Off
OUT FR yy	Set Output from Input:yy yy=[01...04]: Select One Input Port
EDID xx CP	Set Input:xx EDID Copy From Output xx=00: Select All Input Port xx=[01...04]: Select One Input Port

RS-232 Commands Continued

RS-232 COMMAND	DESCRIPTION
EDID xx DF zz	xx=[01...04]: Select One Input Port
	xx=00: Select All INPUT Port
	zz=00: HDMI 1080p@60Hz, Audio 2CH PCM(Default)
	zz=01: HDMI 1080p@60Hz, Audio 5.1CH DTS/DOLBY
	zz=02: HDMI 1080p@60Hz, Audio 7.1CH DTS/DOLBY/HD
	zz=03: HDMI 1080i@60Hz, Audio 2CH PCM
	zz=04: HDMI 1080i@60Hz, Audio 5.1CH DTS/DOLBY
	zz=05: HDMI 1080i@60Hz, Audio 7.1CH DTS/DOLBY/HD
	zz=06: HDMI 1080p@60Hz/3D, Audio 2CH PCM
	zz=07: HDMI 1080p@60Hz/3D, Audio 5.1CH DTS/DOLBY
	zz=08: HDMI 1080p@60Hz/3D, Audio 7.1CH DTS/DOLBY/HD
	zz=09: HDMI 4K@30Hz 4:4:4, Audio 2CH PCM
	zz=10: HDMI 4K@30Hz 4:4:4, Audio 5.1CH DTS/DOLBY
	zz=11: HDMI 4K@30Hz 4:4:4, Audio 7.1CH DTS/DOLBY/HD
	zz=12: HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 2CH PCM
	zz=13: HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 5.1CH DTS/DOLBY
	zz=14: HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 7.1CH DTS/DOLBY/HD
	zz=15: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 2CH PCM
	zz=16: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 5.1CH DTS/DOLBY
	zz=17: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 7.1CH DTS/DOLBY/HD
	zz=18: HDMI 4K@60Hz 4:4:4, HDR 10-bit, Audio 2CH PCM
	zz=19: HDMI 4K@60Hz 4:4:4, HDR 10-bit, Audio 5.1CH DTS/DOLBY
	zz=20: HDMI 4K@60Hz 4:4:4, HDR 10-bit, Audio 7.1CH DTS/DOLBY/HD
	zz=21: HDMI 4K@60Hz 4:4:4, HDR 12-bit, Audio 2CH PCM
	zz=22: HDMI 4K@60Hz 4:4:4, HDR 12-bit, Audio 5.1CH DTS/DOLBY
	zz=23: HDMI 4K@60Hz 4:4:4, HDR 12-bit, Audio 7.1CH DTS/DOLBY/HD
	zz=24: HDMI 4K@60Hz 4:4:4, HDR 10-bit (Inc DV), Audio 2CH PCM
	zz=25: HDMI 4K@60Hz 4:4:4, HDR 10-bit (Inc DV), Audio 5.1CH DTS/DOLBY
	zz=26: HDMI 4K@60Hz 4:4:4, HDR 10-bit (Inc DV), Audio 7.1CH DTS/DOLBY/HD
	zz=27: HDMI 4K@60Hz 4:4:4, HDR 12-bit (Inc DV), Audio 2CH PCM
	zz=28: HDMI 4K@60Hz 4:4:4, HDR 12-bit (Inc DV), Audio 5.1CH DTS/DOLBY
	zz=29: HDMI 4K@60Hz 4:4:4, HDR 12-bit (Inc DV), Audio 7.1CH DTS/DOLBY/HD
	zz=30: HDMI 4K@120Hz 4:4:4, HDR 8-bit, Audio 2ch PCM - No VRR
	zz=31: HDMI 4K@120Hz 4:4:4, HDR 8-bit, Audio 5.1ch PCM/DTS/DOLBY - No VRR
	zz=32: HDMI 4K@120Hz 4:4:4, HDR 8-bit, Audio 7.1ch PCM/DTS/DOLBY/HD - No VRR
	zz=33: HDMI 4K@120Hz 4:4:4, HDR 10-bit, Audio 2ch PCM - No VRR
	zz=34: HDMI 4K@120Hz 4:4:4, HDR 10-bit, Audio 5.1ch PCM/DTS/DOLBY - No VRR
	zz=35: HDMI 4K@120Hz 4:4:4, HDR 10-bit, Audio 7.1ch PCM/DTS/DOLBY/HD - No VRR
	zz=36: HDMI 8K@30Hz 4:4:4, HDR 10-bit, Audio 2ch PCM - No VRR
	zz=37: HDMI 8K@30Hz 4:4:4, HDR 10-bit, Audio 5.1ch PCM/DTS/DOLBY - No VRR
	zz=38: HDMI 8K@30Hz 4:4:4, HDR 10-bit, Audio 7.1ch PCM/DTS/DOLBY/HD - No VRR
	zz=39: HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, HDR 10-bit, Audio 2ch PCM - No VRR
	zz=40: HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, HDR 10-bit, Audio 5.1ch PCM/DTS/DOLBY - No VRR
	zz=41: HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, HDR 10-bit, Audio 7.1ch PCM/DTS/DOLBY/HD - No VRR
	zz=42: HDMI 4K@120Hz 4:4:4, HDR 12-bit (inc DV), Audio 2ch PCM - No VRR
	zz=43: HDMI 4K@120Hz 4:4:4, HDR 12-bit (inc DV), Audio 5.1ch PCM/DTS/DOLBY - No VRR
	zz=44: HDMI 4K@120Hz 4:4:4, HDR 12-bit (inc DV), Audio 7.1ch PCM/DTS/DOLBY/HD - No VRR
	zz=45: HDMI 8K@30Hz 4:4:4, HDR 12-bit (inc DV), Audio 2ch PCM - No VRR
	zz=46: HDMI 8K@30Hz 4:4:4, HDR 12-bit (inc DV), Audio 5.1ch PCM/DTS/DOLBY - No VRR
	zz=47: HDMI 8K@30Hz 4:4:4, HDR 12-bit (inc DV), Audio 7.1ch PCM/DTS/DOLBY/HD - No VRR
	zz=48: HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, HDR 12-bit (inc DV), Audio 2ch PCM - No VRR
	zz=49: HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, HDR 12-bit (inc DV), Audio 5.1ch PCM/DTS/DOLBY - No VRR
	zz=50: HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, HDR 12-bit (inc DV), Audio 7.1ch PCM/DTS/DOLBY/HD - No VRR
	zz=51: HDMI 4K@120Hz 4:4:4, HDR 8-bit, Audio 2ch PCM - Inc VRR
	zz=52: HDMI 4K@120Hz 4:4:4, HDR 8-bit, Audio 5.1ch PCM/DTS/DOLBY - Inc VRR
	zz=53: HDMI 4K@120Hz 4:4:4, HDR 8-bit, Audio 7.1ch PCM/DTS/DOLBY/HD - Inc VRR
	zz=54: HDMI 4K@120Hz 4:4:4, HDR 10-bit, Audio 2ch PCM - Inc VRR
	zz=55: HDMI 4K@120Hz 4:4:4, HDR 10-bit, Audio 5.1ch PCM/DTS/DOLBY - Inc VRR
	zz=56: HDMI 4K@120Hz 4:4:4, HDR 10-bit, Audio 7.1ch PCM/DTS/DOLBY/HD - Inc VRR
	zz=57: HDMI 8K@30Hz 4:4:4, HDR 10-bit, Audio 2ch PCM - Inc VRR
	zz=58: HDMI 8K@30Hz 4:4:4, HDR 10-bit, Audio 5.1ch PCM/DTS/DOLBY - Inc VRR
	zz=59: HDMI 8K@30Hz 4:4:4, HDR 10-bit, Audio 7.1ch PCM/DTS/DOLBY/HD - Inc VRR
	zz=60: HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, HDR 10-bit, Audio 2ch PCM - Inc VRR
	zz=61: HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, HDR 10-bit, Audio 5.1ch PCM/DTS/DOLBY - Inc VRR
	zz=62: HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, HDR 10-bit, Audio 7.1ch PCM/DTS/DOLBY/HD - Inc VRR
	zz=63: HDMI 4K@120Hz 4:4:4, HDR 12-bit (inc DV), Audio 2ch PCM - Inc VRR
	zz=64: HDMI 4K@120Hz 4:4:4, HDR 12-bit (inc DV), Audio 5.1ch PCM/DTS/DOLBY - Inc VRR
	zz=65: HDMI 4K@120Hz 4:4:4, HDR 12-bit (inc DV), Audio 7.1ch PCM/DTS/DOLBY/HD - Inc VRR
	zz=66: HDMI 8K@30Hz 4:4:4, HDR 12-bit (inc DV), Audio 2ch PCM - Inc VRR
	zz=67: HDMI 8K@30Hz 4:4:4, HDR 12-bit (inc DV), Audio 5.1ch PCM/DTS/DOLBY - Inc VRR
	zz=68: HDMI 8K@30Hz 4:4:4, HDR 12-bit (inc DV), Audio 7.1ch PCM/DTS/DOLBY/HD - Inc VRR
	zz=69: HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, HDR 12-bit (inc DV), Audio 2ch PCM - Inc VRR
	zz=70: HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, HDR 12-bit (inc DV), Audio 5.1ch PCM/DTS/DOLBY - Inc VRR
	zz=71: HDMI 8K@60Hz 4:2:0+8K@30Hz 4:4:4, HDR 12-bit (inc DV), Audio 7.1ch PCM/DTS/DOLBY/HD - Inc VRR
	zz=72: DVI 1920x1080@60Hz, Audio None
	zz=73: DVI 1920x1200@60Hz, Audio None
	zz=74: HDMI 1920x1200@60Hz, Audio 2CH PCM/6CH PCM
zz=75: User EDID 1	
zz=76: User EDID 2	
zz=77: EDID pass-through (Copy from Sink 1)	

Certifications

FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION - changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CANADA, INDUSTRY CANADA (IC) NOTICES

This Class B digital apparatus complies with Canadian ICES-003.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

CORRECT DISPOSAL OF THIS PRODUCT

This marking indicates that this product should not be disposed with other household wastes. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.

Maintenance

Clean this unit with a soft, dry cloth. Never use alcohol, paint thinner, or benzene to clean this unit.

Components inside this unit are not user serviceable. Do not remove the protective cover from the unit. Removing any panel from this product will invalidate the manufacturers warranty.



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