NEXIS

4K over IP 1GbE with Video Wall Processing



User Manual

VER 1.1

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, lighting strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

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1. Introduction

This product is based on JPEG2000 technology. Encoder input supports up to 4K60, audio embedding or audio out. Decoder output supports up to 4K30, audio extracting or audio in transmitted to Encoder audio out. The product supports USB2.0/KVM, 1G Ethernet, bidirectional RS-232, two-way IR control and POE function. Guest mode control of RS-232, IR, CEC supported. Built-in secondary H.265 stream which supports plenty API commands to achieve flexible configurations is useful for 3rd party control Apps to preview video content. As the H.265 stream can be accessed in a different domain from JPEG2000 main stream via tagged its LAN ID, this makes it possible to isolate the network systems of main stream which works in Video LAN and secondary stream which works in Control LAN.
The system is based on Linux for software development, provides flexible control methods, that are based on the intelligent networking of 1G Ethernet Switch.

2. Features

- ☆ HDMI 2.0b, HDCP 2.2 compliant
- ☆ Support 18Gbps video bandwidth
- ☆ Input supports up to 4K60 4:4:4, output supports 4K30 4:4:4
- ☆ Transmit video, audio, IR , RS-232, CEC and USB signals over Ethernet
- ☆ Support unicast and multicast functions
- ☆ Support point-to-point, video matrix and video wall functions (video wall supports up to 9x9)
- ☆ Intelligent video wall class management makes it achievable of wall-in-wall or novel layout of wall configurations
- ☆ JPEG2000 Main Stream and standard H.265 codec Secondary Stream (SS)
- ☆ Support Secondary Stream VLAN tagging and parameters configuration
- ☆ Support 1G Ethernet Switch, router and hub device transmission
- ☆ Support POE function
- ☆ Flexible control through Web GUI/TCP/RS-232/IR and third-party controller
- ☆ HDMI audio formats: LPCM 2.0/5.1/7.1CH, Dolby Digital/Plus/EX, Dolby True HD, Dolby Atmos, DTS, DTS-96/24, DTS-EX DSD, DTS High Res, DTS-HD Master, DTS:X
- ☆ Smart networking design for easy and flexible installation.

3. Package Contents

Qty	Item
1	4K over IP 1GbE Encoder
1	IR Receiver cable (1.5 meters)
1	IR Blaster cable (1.5 meters)
3	3-pin 3.81mm Phoenix connectors
1	12V/1A Locking Power adapter
2	Mounting ears
4	Machine screws (KM3*4)
1	User Manual

or

Qty	Item
1	4K over IP 1GbE Decoder
1	IR Receiver cable (1.5 meters)
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3	3-pin 3.81mm Phoenix connectors
1	12V/1A Locking Power adapter
2	Mounting ears
4	Machine screws (KM3*4)
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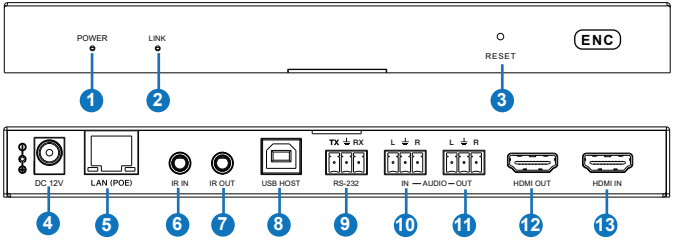
4. Specifications

Technical	
HDMI Compliant	HDMI 2.0b
HDCP Compliant	HDCP 2.2
Video Bandwidth	18Gbps
Video Compression Standard	JPEG2000
Video Network Bandwidth	1G
Video Resolution	480i ~1080p@50/60Hz, 4K@24/30Hz, support 4K@50/60Hz input
Color Depth	8/10/12-bit
Color Space	RGB, YCbCr 4:4:4 / 4:2:2, YUV 4:2:0
HDMI Audio Formats	LPCM 2.0/5.1/7.1CH, Dolby Digital/Plus/EX, Dolby True HD, Dolby Atmos, DTS, DTS-96/24, DTS-EX DSD, DTS High Res, DTS-HD Master, DTS:X
Transmission Distance	100M CAT5E/6/6A/7
IR Level	12Vp-p
IR Frequency	Wideband 20K - 60KHZ
ESD Protection	Human body model — ±8kV (Air-gap discharge) & ±4kV (Contact discharge)

Connection			
Encoder	Input: 1×HDMI Type A [19-pin male] 1x L/R Audio IN [3.81mm Phoenix connector] 1x IR IN [3.5mm Audio Jack] Output: 1×HDMI Type A [19-pin male] 1x L/R Audio OUT [3.81mm Phoenix connector] 1x IR OUT [3.5mm Audio Jack] Control: 1x RS-232 [3.81mm Phoenix connector] 1×LAN [RJ45 jack] 1×USB [USB TypeB]		
Decoder	Input: 1x IR IN [3.5mm Audio Jack] 1x L/R Audio IN [3.81mm Phoenix connector] Output: 1×HDMI Type A [19-pin male] 1x IR OUT [3.5mm Audio Jack] 1x L/R Audio OUT [3.81mm Phoenix connector] Control: 1×LAN [RJ45 jack] 2×USB1.1 [USB-A male] 2×USB2.0 [USB-A male] 1x RS-232 [3.81mm Phoenix connector]		
Mechanical			
Housing	Metal enclosure		
Color	Black		
Dimensions	204mm [W] x 100mm [D] x 21.5mm [H]		
Weight	TX:509g, RX:496g		
Power Supply	Input: AC100 - 240V 50/60Hz, Output: DC 12V/1A (US/EU standards, CE/FCC/UL certified)		
Power Consumption	Encoder: < 8W, Decoder: < 4W		
Operating Temperature	32 - 104°F / 0 - 40°C		
Storage Temperature	-4 - 140°F / -20 - 60°C		
Relative Humidity	20 - 90% RH (no condensing)		
Resolution / Cable Length	**4K60 - Feet / Meters**	**4K30 - Feet / Meters**	**1080P60 - Feet / Meters**
HDMI IN / OUT	16ft / 5M	32ft / 10M	50ft / 15M
The use of “Premium High Speed HDMI” cable is highly recommended.			

5. Operation Controls and Functions

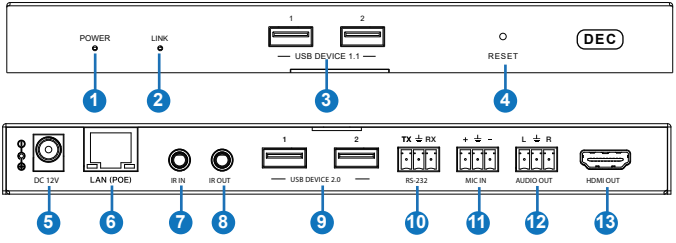
5.1 Encoder Panel



No.	Name	Function Description
1	POWER LED	When the power is connected normally, Red LED flashes: the system is booting Red LED illuminates: booting successfully
2	LINK LED	When the system starts up normally, Green LED flashes: no signal Green LED illuminates: signal input
3	RESET button	After powering on the device, press and hold the RESET button until the POWER LED and LINK LED flash simultaneously, release the button to reset the device to factory settings.
4	DC 12V	DC 12V power input interface.
5	LAN (POE)	1G LAN port, which can be connected to a third-party network Switch to form a distributed system. *Note: When network switch delivers POE power supply, DC 12V adapter doesn't need to apply on the unit.*
6	IR IN	12V IR signal input interface.
7	IR OUT	IR signal output interface.
8	USB HOST	USB-B connector for connecting a PC as KVM function.
9	RS-232	Bidirectional serial signal interface.
10	AUDIO IN	Analog audio input interface, which can be embedded into the HDMI stream for pass-through over to HDMI output and Audio out on Decoder, or be loopout by the AUDIO OUT port on Encoder.

11	AUDIO OUT	Analog audio output interface. It can output the audio extracted from the HDMI IN port or the audio from the local AUDIO IN port of the Encoder. Also it can output the audio transmitted from the AUDIO IN port of the Decoder in unicast mode.
12	HDMI OUT	HDMI loop out for display.
13	HDMI IN	HDMI signal input interface.

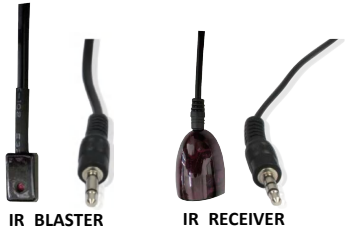
5.2 Decoder Panel

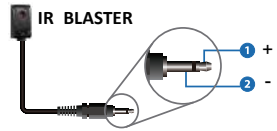


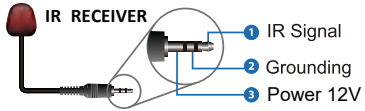
No.	Name	Function Description
1	POWER LED	When the power is connected normally, Red LED flashes: the system is booting Red LED illuminates: booting successfully
2	LINK LED	When the system starts up normally, Green LED flashes: no signal Green LED illuminates: signal input
3	USB DEVICE 1.1	Two USB1.1 device interface.
4	RESET button	After powering on the device, press and hold the RESET button until the POWER LED and LINK LED flash simultaneously, release the button to reset the device to factory settings.
5	DC 12V	DC 12V power input interface.
6	LAN (POE)	1G LAN port, which can be connected to a third-party network Switch to form a distributed system. *Note: When network switch delivers POE power supply, DC 12V adapter doesn't need to apply on the unit.*
7	IR IN	12V IR signal input interface.
8	IR OUT	IR signal output interface.

9	USB DEVICE 2.0	Two USB2.0 device interface.
10	RS-232	Bidirectional serial signal interface.
11	MIC IN	Microphone interface.
12	AUDIO OUT	Analog audio output interface. It outputs the same audio of it on HDMI OUT in case audio format is LPCM.
13	HDMI OUT	HDMI signal output interface.

5.3 IR Pin Definition





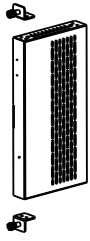


6. Rack Mounting Instruction

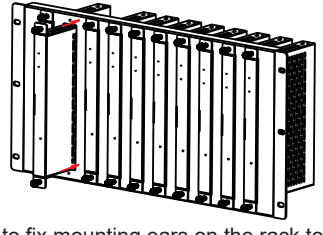
6.1 6U Rack Mounting

This product can be mounted in a standard 6U rack (Please contact your supplier for 6U rack sale). The mounting steps are as follows:

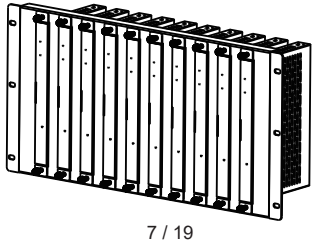
Step 1: Use included screws to fix two mounting ears on the product, as shown in the figure below:



Step 2: Insert the product with mounting ears into a 6U rack (up to 10 units can be installed vertically), as shown in the figure below:



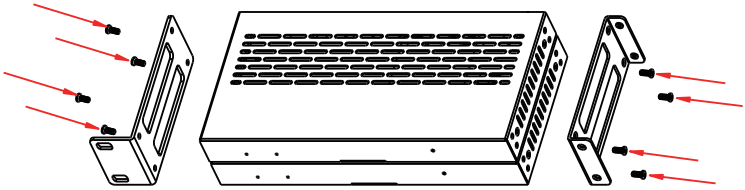
Step 3: Use screws to fix mounting ears on the rack to complete the mounting, as shown in the figure below:



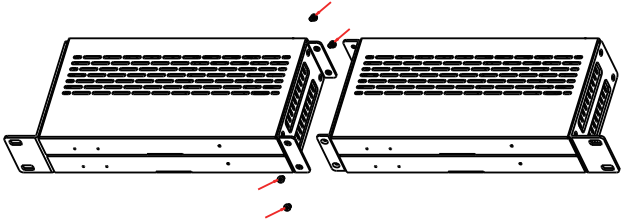
6.2 1U Rack Mounting

This product also can be mounted in a standard 1U rack (up to 4 units can be installed horizontally). The mounting steps are as follows:

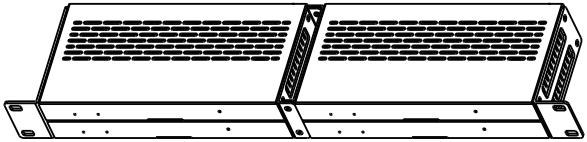
Step 1: Stack two products on top of each other, then use included screws to fix two 1U rack panels on the products, as shown in the figure below:



Step 2: Fix two 1U rack panels on another two stacked products in the same way, then use screws to fix two 1U rack panels together, as shown in the figure below:



Step 3: Fasten screws between two 1U rack panels, so that four products are mounted in a 1U rack, as shown in the figure below:

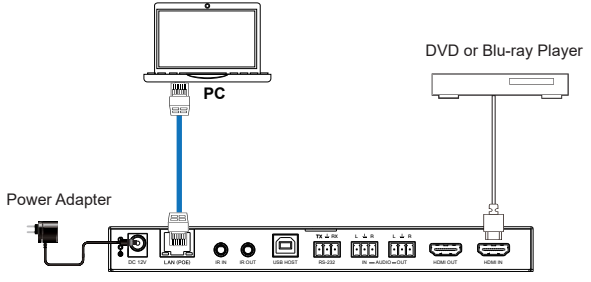


7. Preview Stream Introduction

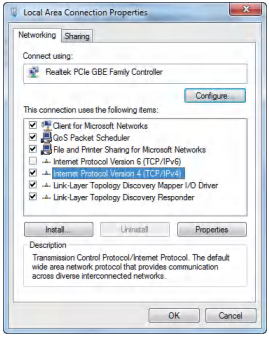
7.1 Connecting Web for Control

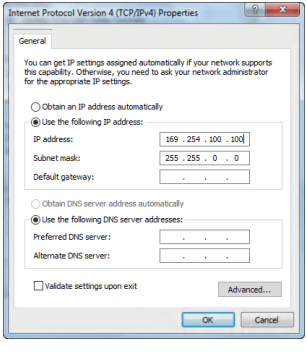
The product supports playing Secondary Stream on computer through the corresponding software such as **VLC media player**, simultaneously you can access the build-in Web GUI to configure the Secondary Stream. Follow the steps below to enter the Web GUI.

Step 1: Connect Encoder with a PC, HDMI source device and power supply. The connection diagram is shown as below.

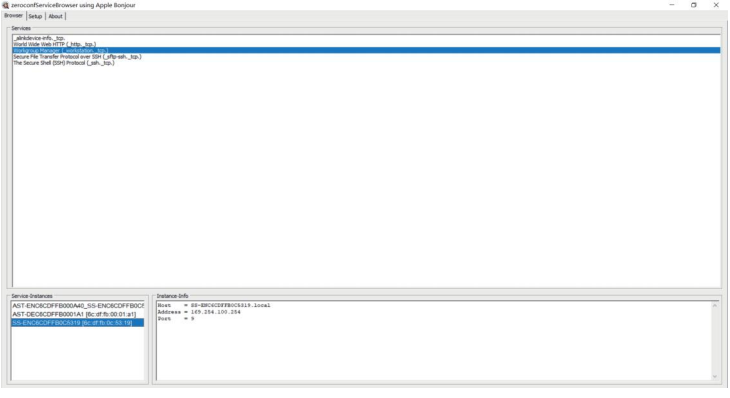


Step 2: Set the PC's IP address to be 169.254.100.100, and the Subnet mask to be 255.255.0.0.





Step 3: Install a bonjour protocol checking tool (such as zeroconfService Browser) on PC to find the IP address of the Encoder.
Take zeroconfServiceBrowser as an example. After opening the software, you can select “Workgroup Manager” in Services of Browser, select the Host name in Service-Instances, and find the IP address in the Address item in of Instance-Info.



Note:

(1) The window in the lower left corner displays the Host names of all devices in the current network. Because Encoder contains a Secondary Stream chip (SS), it will be displayed as two Host names with corresponding IP addresses.

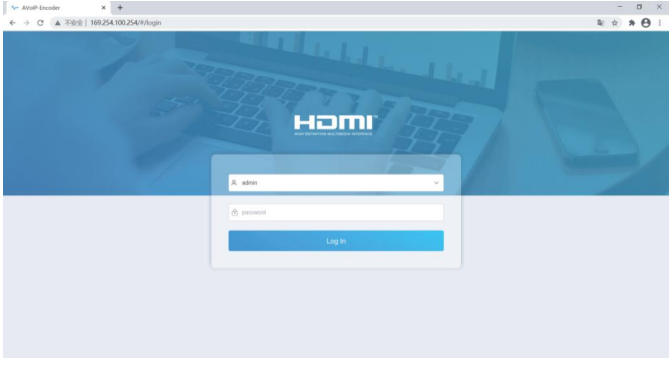
(2) The window in the lower right corner displays the Host name, IP address and Port number of the device.

(3) The Host name of Encoder starts with AST-ENC; the Host name of Decoder starts with AST-DEC; the Host name of Encoder Secondary Stream chip (SS) starts with SS-ENC.

(4) The Host name of Encoder contains the Host name of the Encoder Secondary Stream chip (SS).

Step 4: Set the PC's IP address to the same network segment with IP address of the Encoder Secondary Stream (SS). (If these two IP addresses are in the same network segment, you can skip this step.)

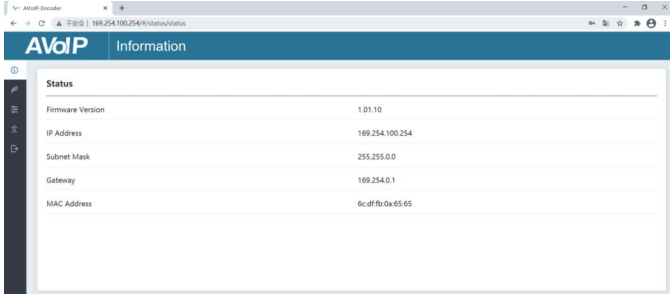
Step 5: Input the IP address of the Encoder Secondary Stream (SS) found through the bonjour protocol checking tool into the web browser on PC. The following login interface will appear.



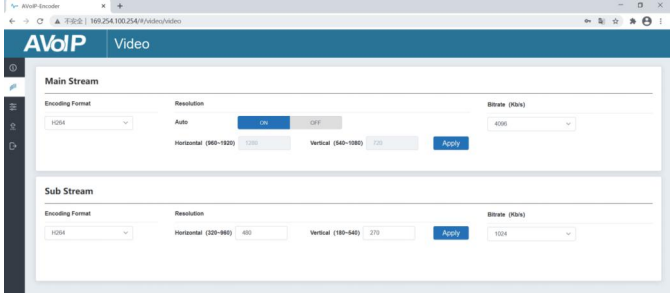
Please select the fixed user name "admin", and Input the default password "admin". Then click "Log In" to enter the Status page.

■ Status Page

The Status page provides basic information about the installed firmware version and the network settings.



■ Video Page

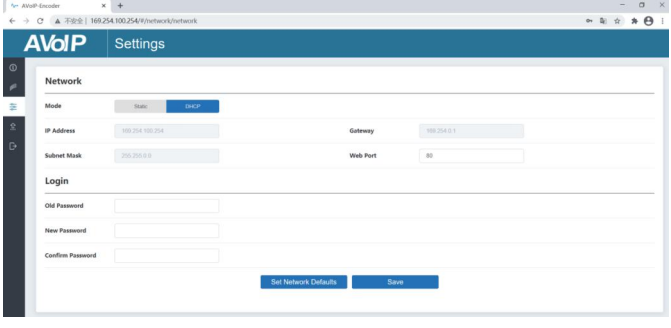


On the Video page, you can set the Main Stream and Sub Stream separately. Encoding Format can be set to H.265/H.264 according to the decoding protocol used in the 3rd party software which decodes the Secondary Stream. Pull the drop-down box to select it to take effect.

The Resolution of the Main Stream includes Auto, Horizontal and Vertical. If Auto is set to ON, the resolution will follow the input resolution. At this time, Horizontal and Vertical display the current input resolution and are grayed out

and cannot be set. If Auto is set to OFF, then Horizontal and Vertical can be set to the resolution of the Main Stream encoding. The horizontal range is 960~1920, the vertical range is 540~1080, and it needs to be an even number. Click the “Apply” button to take effect.
The Resolution of the Sub Stream includes Horizontal and Vertical. Horizontal and Vertical can be set to the resolution of the Sub Stream encoding. The horizontal range is 320~960, the vertical range is 180~540, and it needs to be an even number. Click the “Apply” button to take effect.
Bitrate is used to set the bit rate of the encoding.

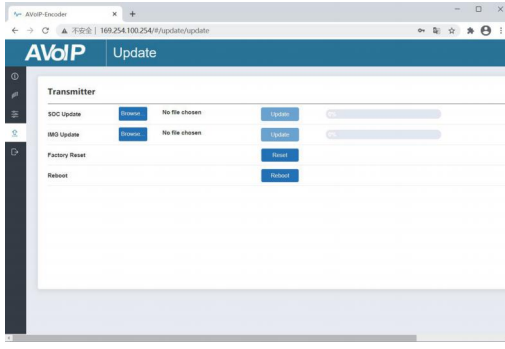
■ **Setting Page**



The Setting page includes two parts: Network and Login.
Network can be set to Static or DHCP. When set to Static, you can enter IP address, gateway and subnet mask; When set to DHCP, the IP address, gateway and subnet mask are grayed out and cannot be edited. A DHCP server (e.g. network router) which automatically assigns IP related settings should be installed in the system. Web Port is the port of the Web page. After setting, click “Save” to take effect. After setting the IP address, the page will automatically switch to the set IP address. Click “Set Network Defaults”, it will be restored to the default DHCP state.

The Web login password can be changed on the “Login” part. Enter the old password in “Old Password”, enter the new password in “New Password”, enter the new password again in “Confirm Password”, and click the “Save” button to take effect.

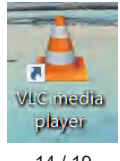
■ **Update Page**



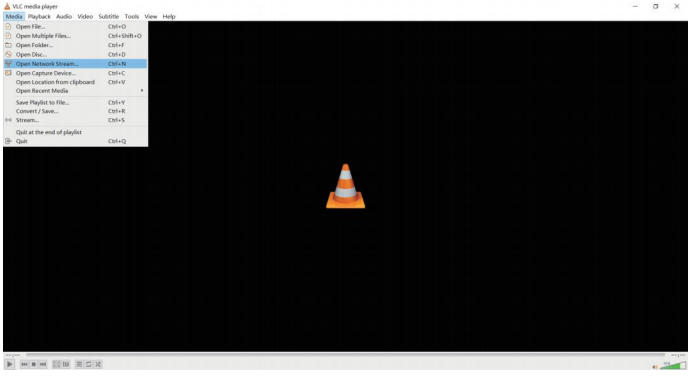
The SOC Update column is used to upgrade firmware. Click the “Browse” button to select the firmware, and then click “Update”. When the progress bar reaches 100%, the upgrade completes and the machine restarts automatically.
The IMG Update column is used to download the no-signal picture, click the “Browse” button to select the picture in jpg format (the resolution of the picture should be less than or equal to 1920x1080, and the width should be aligned with 8, the height should be aligned with 2, and the size of the picture should be less than 512kB), and then click “Update”. When the progress bar reaches 100%, the download completes, and the machine takes effect without rebooting.

7.2 VLC Media Player Instruction

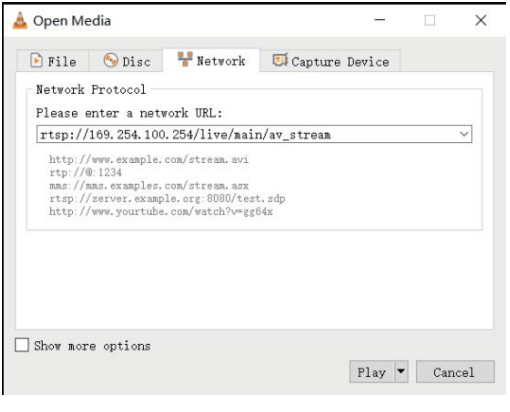
After the Web GUI is successfully connected, open the VLC media player on PC. Please see the following icon.



Click “Media > Open Network Stream”



After clicking the “Open Network Stream” option, the following page will appear.

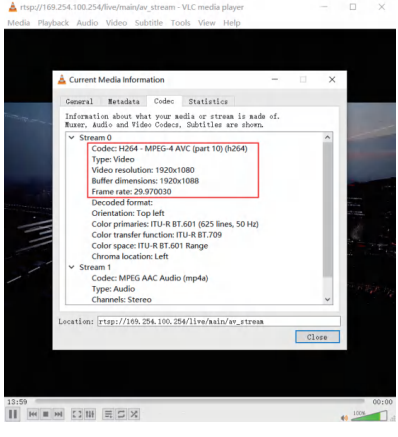


Enter a MainStream or SubStream network URL, then click “**Play**” button.

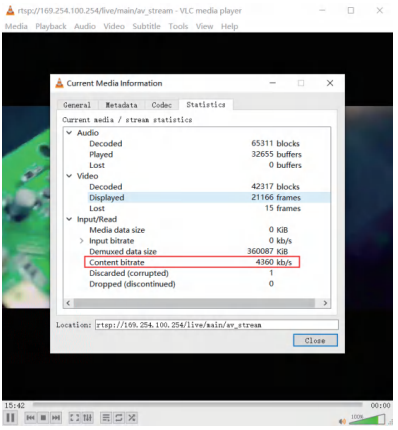
Stream	Network URL
MainStream	rtsp://169.254.100.254/live/main/av_stream
SubStream	rtsp://169.254.100.254/live/sub/av_stream.

Note: The default IP address of Secondary Stream is 169.254.100.254. When the IP address of the Encoder Secondary Stream (SS) found through the bonjour protocol checking tool is different from default IP address, please use it instead of the default IP address.

On the VLC media player, you can check Secondary Main Stream or Sub Stream settings that are configured on the “Video Page” (Please refer to “7.1 Connecting Web for Control” for details). Choose “**Tools>Codec information**”, a pop-up window will display and show you Stream information, as shown in the figure below.



Choose “**Tools>Codec information>Statistics**” to check current Bitrate. Please see the following picture.



Note: *The Bitrate is floating up and down when you check it. This is a normal phenomenon.*

8. Switch Model

A network Switch used to set up the system should support below features:

1. Type of layer 3/managed network Switch.
2. Gigabit bandwidth.
3. 8KB jumbo frame capability.
4. IGMP snooping.

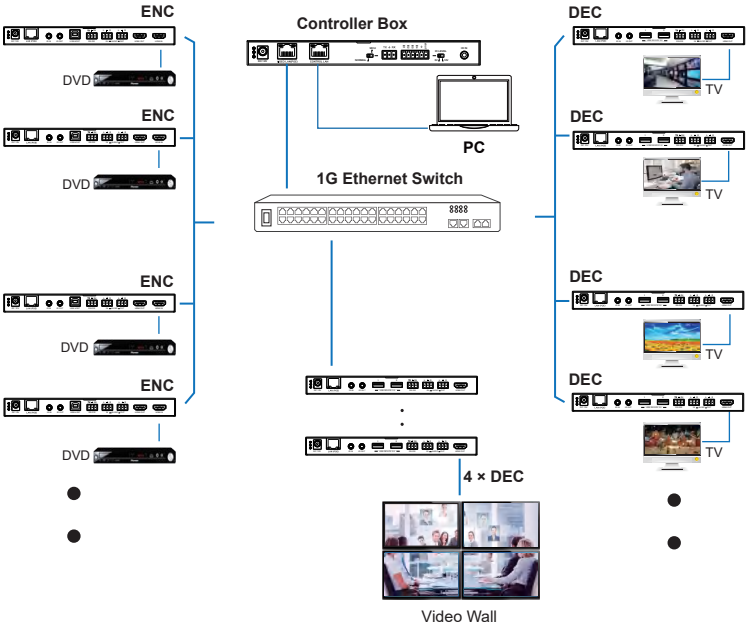
The following Switch models are highly recommended.

Manufacturer	Model Number
CISCO	CISCO SG500
CISCO	CATALYST series
HUAWEI	S5720S-28X-PWR-LI-AC

9. 4K over IP System Control

This product can be controlled by Controller Box or third-party controller. For details of 4K over IP system control, please refer to the user manual of “Video over IP Controller”.

10. Application Example



Note:

(1) For the default IP mode of Control LAN port of the Controller Box is DHCP, the PC also needs to be set to “Obtain an IP address automatically” mode, and a DHCP server (e.g. network router) is required in the system.

(2) If there is no DHCP server in the system, 192.168.0.225 will be used as the IP address of Control LAN port. You need to set the IP address of the PC to be in the same network segment. For example, set PC’s IP address as 192.168.0.88.

(3) You can access the Web GUI by inputting Control LAN port IP address (192.168.0.225) or URL "http://controller.local" on your computer's browser.

(4) No need to care about settings of Video LAN port of the Controller Box, they are managed by Controller automatically.

(5) When the Network Switch does not support PoE, the Encoder, Decoder and Controller Box should be powered by DC power adpater.

HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

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