PRESTEL

Prestel IPN-4KJ2000PTX-S
IPN-4KJ2000PRX-S

4K60 over IP 1GbE with Video Wall Processing

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

Table of Contents

1. Introduction

This product is based on JPEG2000 technology. It features a Copper port. Encoder input supports up to 4K60 4:4:4, audio embedding or extracting. Decoder output supports up to 4K60 4:4:4, audio extracting. The product supports 1G Ethernet, bidirectional RS-232 and IR (pass-through & Guest). Guest mode controls of RS-232, IR, CEC are supported. Dante AV-A mode is supported if the product is license activated. Besides, the product can be powered using either PoE from any PoE network Switch or via a local 12V power supply input.
Built-in MJPEG Substream which supports plenty API commands to achieve flexible configurations is useful for 3rd party control Apps to preview video content.
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

- ☆ HDCP 2.2 compliant
- ☆ Support 18Gbps video bandwidth
- ☆ Input and output video resolution is up to 4K60 4:4:4, as specified in HDMI 2.0b
- ☆ Support HDR10, Dolby Vision, HLG audio
- ☆ Signal transmission distance can be extended up to 328ft / 100m via CAT6/6A/7 cable
- ☆ Transmit video, analog audio, IR , RS-232 and CEC over Ethernet
- ☆ HDMI audio formats support LPCM 7.1ch, Dolby Digital/Plus/EX, Dolby True HD, DTS-HD Master Audio
- ☆ Dante AV-A mode is supported if license activated
- ☆ 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
- ☆ Support MJPEG Substream real-time preview
- ☆ 1G Ethernet Switch
- ☆ Support PoE function (802.3af PD devices)
- ☆ Flexible control via Web GUI/TCP/RS-232/IR/APP and the third-party central control
- ☆ Smart networking design for easy and flexible installation

3. Package Contents

Qty	Item
1	4K60 over IP 1GbE Encoder
1	IR Receiver cable (1.5 meters)
1	IR Blaster cable (1.5 meters)
3	3-pin 3.81mm Phoenix connector
2	Mounting ear
4	Machine screw (KM3*4)
1	User manual
1	12V/2.5A locking power adapter (optional)

or

Qty	Item
1	4K60 over IP 1GbE Decoder
1	IR Receiver cable (1.5 meters)
1	IR Blaster cable (1.5 meters)
3	3-pin 3.81mm Phoenix connector
2	Mounting ear
4	Machine screw (KM3*4)
1	User manual
1	12V/2.5A locking power adapter (optional)

4. Specifications

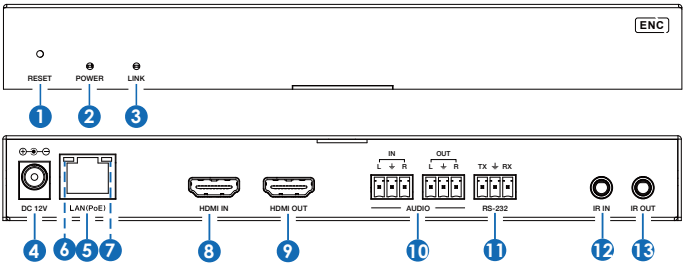
Technical	
HDMI Compliant	HDMI 2.0b
HDCP Compliant	HDCP 2.2
Video Bandwidth	18Gbps
Video Compression Standard	JPEG2000
Video Network Bandwidth	1G
Video Resolution	Up to 4K@60Hz 4:4:4
Color Depth	Input: 8/10/12-bit (1080p@60Hz) Output: 8-bit
Color Space	RGB, YCbCr 4:4:4 / 4:2:2 / 4:2:0
Audio Formats	**HDMI IN/OUT:** LPCM 2.0/5.1/7.1CH, Dolby Digital/Plus/EX, Dolby True HD, DTS, DTS-96/24, DTS-EX DSD, DTS High Res, DTS-HD Master **Analog Audio IN/OUT:** LPCM 2.0 192Khz
Transmission Distance	100M CAT6/6A/7
IR Level	Default 12V, optional 5V
IR Frequency	Wideband 20K - 60KHz

ESD Protection	IEC 61000-4-2: ±15KV (Air-gap discharge) & ±8KV (Contact discharge)
Connection	
Encoder	Input: 1 x HDMI IN [Type A, 19-pin female] 1 x L/R AUDIO IN [3-pin 3.81mm Phoenix connector] Output: 1 x HDMI OUT [Type A, 19-pin female] 1 x L/R AUDIO OUT [3-pin 3.81mm Phoenix connector] Control: 1 x RS-232 [3-pin 3.81mm Phoenix connector] 1 x LAN (PoE) [RJ45 jack] 1 x IR IN [3.5mm audio jack, 5V/12V IR] 1 x IR OUT [3.5mm audio jack, 5V/12V IR]
Decoder	Output: 1 x HDMI OUT [Type A, 19-pin female] 1 x L/R AUDIO OUT [3-pin 3.81mm Phoenix connector] Control: 1 x RS-232 [3-pin 3.81mm Phoenix connector] 1 x LAN (PoE) [RJ45 jack] 1 x IR IN [3.5mm audio jack, 5V/12V IR] 1 x IR OUT [3.5mm audio jack, 5V/12V IR]
Mechanical	
Housing	Metal enclosure
Color	Black
Dimensions	Encoder/Decoder: 204mm [W] x 136mm [D] x 25.5mm [H]
Weight	Encoder: 616g, Decoder: 609g
Power Supply	Input: AC100 - 240V 50/60Hz, Output: DC 12V/2.5A (US/EU standards, CE/FCC/UL certified)
Power Consumption	Encoder: 7.68W, Decoder: 6.36W (Max.)
Operating Temperature	14°F ~ 113°F / -10°C ~ 45°C
Storage Temperature	-4°F ~ 140°F / -20°C ~ 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

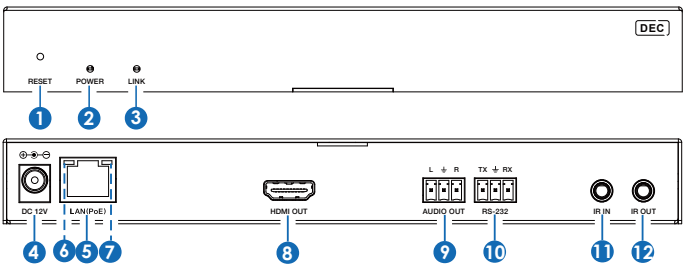
5.1 Encoder Panel



No.	Name	Function Description
1	RESET	After powering on the device, press and hold the RESET button until the POWER LED and LINK LED flash at the same time, release the button to reset the device to factory settings.
2	POWER LED (Red)	▪ Light on: The system is powered on (with POE or DC power supply). ▪ Light off: The system is powered off (without POE or DC power supply).
3	LINK LED (Green)	Connection status LED. ▪ Light on: Encoder and Decoder are connected through the LAN (PoE) port, and there is audio/video signal transmitted to the Decoder. ▪ Light flashes: Encoder and Decoder are connected through the LAN (PoE) port, but there is no audio/video signal transmitted to the Decoder. ▪ Light off: Encoder and Decoder are not connected through the LAN (PoE) port.
4	DC 12V	The device can be powered via two methods: ▪ Local DC 12V/2.5A power supply ▪ POE from Network Switch. Device acts as PD mode. When the Switch supports PoE function, DC power supply is not needed.
5	LAN (PoE)	1G LAN port, connected with a network Switch to form a distributed system. *Note: When the network Switch delivers PoE power supply, DC 12V adapter doesn't need to apply on the unit.*

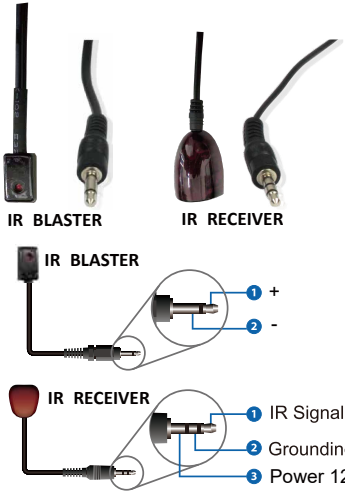
No.	Name	Function Description
6	Link Signal Indicator lamp (Green)	▪ Light on: The network cable is connected normally. ▪ Light off: The network cable is not connected well.
7	Data Signal Indicator lamp (Yellow)	▪ Light flashing: There is data transmission. ▪ Light off: There is no data transmission.
8	HDMI IN	HDMI signal input port, connected to an HDMI source device such as Blu-ray Player or Set-top box with an HDMI cable.
9	HDMI OUT	HDMI local loop output port, connected to an HDMI display device such as TV or monitor.
10	AUDIO IN/OUT	AUDIO IN: Analog audio input port, the audio can be embedded into the HDMI signal for pass-through over to HDMI output and audio out on Decoder, or be loopout by the AUDIO OUT port on Encoder. AUDIO OUT: Analog audio output port. It can output the audio extracted from the HDMI IN port (in case of LPCM) . Also it can output the audio transmitted from the AUDIO IN port of the Decoder in unicast mode (point-to-point direct connection).
11	RS-232	RS-232 serial port, supporting RS-232 command pass-through and local serial port control.
12	IR IN	IR signal input port. The IR level can be set to 5V or 12V (default) through the Web UI.
13	IR OUT	IR signal output port. The IR level can be set to 5V or 12V (default) through the Web UI.

5.2 Decoder Panel



No.	Name	Function Description
1	RESET	After powering on the device, press and hold the RESET button until the POWER LED and LINK LED flash at the same time, release the button to reset the device to factory settings.
2	POWER LED (Red)	▪ Light on: The system is powered on (with PoE or DC power supply). ▪ Light off: The system is powered off (without PoE or DC power supply).
3	LINK LED (Green)	Connection status LED. ▪ Light on: Encoder and Decoder are connected through the LAN (PoE) port, and there is audio/video signal transmitted to the Decoder. ▪ Light flashes: Encoder and Decoder are connected through the LAN (PoE) port, but there is no audio/video signal transmitted to the Decoder. ▪ Light off: Encoder and Decoder are not connected through the LAN (PoE) port.
4	DC 12V	The device can be powered via two methods: ▪ Local DC 12V/2.5A power supply ▪ PoE from Network Switch. Device acts as PD mode. When the Switch supports PoE function, DC power supply is not needed.
5	LAN (PoE)	1G LAN port, connected with a network Switch to form a distributed system. *Note: When the network Switch delivers PoE power supply, DC 12V adapter doesn't need to apply on the unit.*
6	Link Signal Indicator lamp (Green)	▪ Light on: The network cable is connected normally. ▪ Light off: The network cable is not connected well.
7	Data Signal Indicator lamp (Yellow)	▪ Light flashing: There is data transmission. ▪ Light off: There is no data transmission.
8	HDMI OUT	HDMI signal output port, connected to an HDMI display device such as TV or monitor.
9	AUDIO OUT	Analog audio output port. It outputs the same audio of that on HDMI OUT in case audio format is LPCM.
10	RS-232	RS-232 serial port, supporting RS-232 command pass-through and local serial port control.
11	IR IN	IR signal input port. The IR level can be set to 5V or 12V (default) through the Web UI.
12	IR OUT	IR signal output port. The IR level can be set to 5V or 12V (default) through the Web UI.

5.3 IR Pin Definition

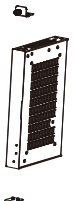


6. Rack Mounting Instruction

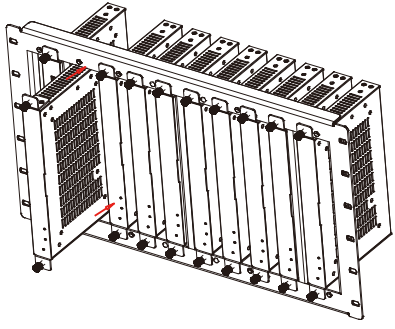
6.1 6U V2 Rack Mounting

This product can be mounted in a standard 6U V2 rack (Please contact your supplier for 6U V2 rack sale). The mounting steps are as follows:

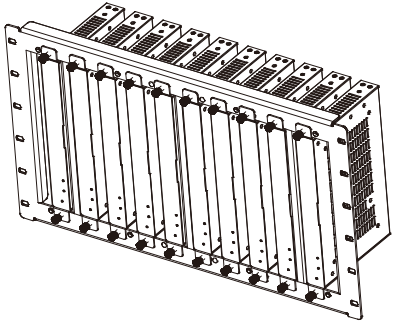
Step 1: Use included screws to fix two mounting ears on the product, as shown in the figure below:



Step 2: Insert the product with mounting ears into a 6U V2 rack (6/8/10 units can be installed vertically), as shown in the figure below:



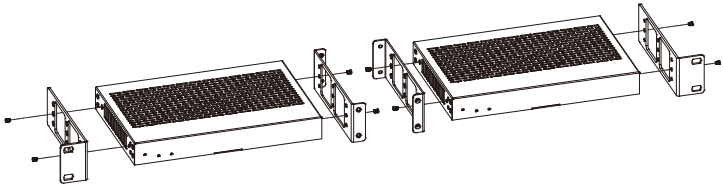
Step 3: Use screws to fix mounting ears on the rack to complete the mounting, as shown in the figure below:



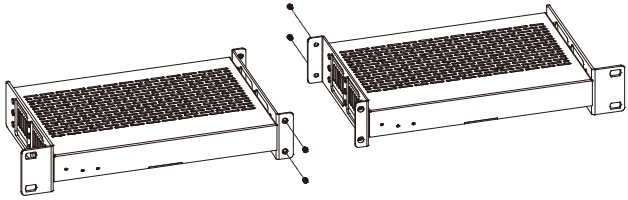
6.2 1U V2 Rack Mounting

This product also can be mounted in a standard 1U V2 rack (2 units can be installed horizontally). The mounting steps are as follows:

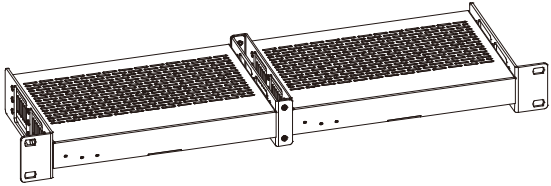
Step 1: Use included screws to fix two 1U V2 rack brackets on two products respectively, as shown in the figure below:



Step 2: Use screws to fix two 1U V2 rack brackets together, as shown in the figure below:



Step 3: Fasten screws between two 1U V2 rack brackets, so that two products are mounted in a 1U V2 rack, as shown in the figure below:

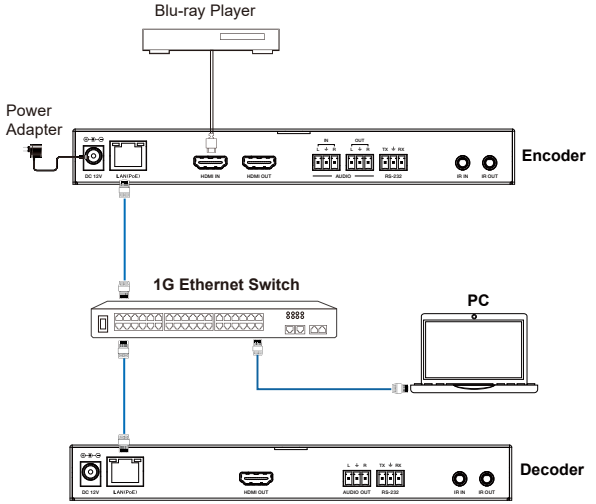


7. MJPEG Substream Operation Introduction

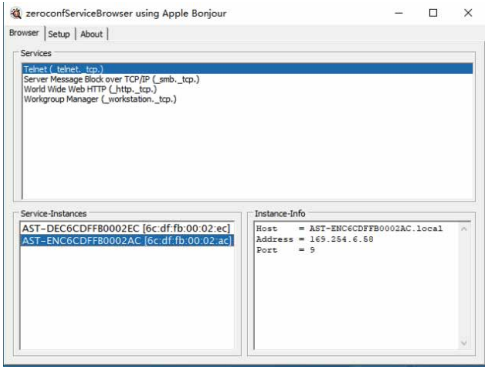
7.1 MJPEG Substream Preview/Configuration via Web Page

The product supports playing MJPEG Substream on computer through the corresponding software such as **VLC media player**, simultaneously you can access the Web page to configure the MJPEG Substream.
Follow the steps below to preview and configure the MJPEG Substream.

Step 1: Connect the Encoder, Decoder and PC to the same Switcher, then connect an HDMI source device and power supply. The connection diagram is shown as below.



Step 2: Install a bonjour protocol checking tool (such as zeroconfService Browser) on PC to find the IP address of the Encoder/Decoder.
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.



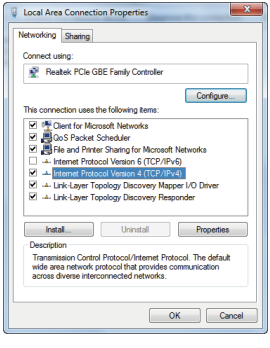
Note:

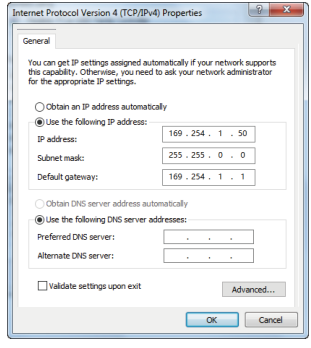
(1) The window in the lower left corner displays the Host names of all devices in the current network.

(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.

Step 3: Set the PC's IP address to the same network segment with IP address of the Encoder/Decoder found in step 2.





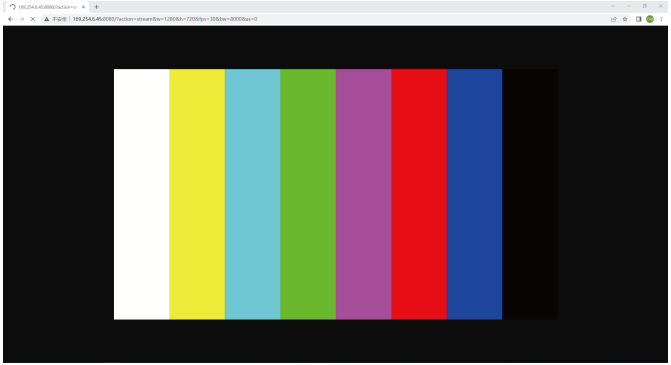
Step 4: According to the IP address of the Encoder/Decoder found through the bonjour protocol checking tool, input “http://IP:PORT/?action=stream” into the web browser on PC. The MJPEG Substream will be displayed with the default resolution, as shown in the figure below.

Step 5: Change the resolution of the obtained Encoder/Decoder IP address in the following format.

http://IP:PORT/?action=stream&w=x&h=x&fps=x&bw=x&as=x&mq=x

- IP: The IP address of the device obtained by step 2. The default IP address range is 169.254.xxx.xxx.
- PORT: The listening port number of sub-stream web CGI server. The value is 8080.
- WIDTH: [Optional] image width. In pixels. ‘x’ means no change. The default value is 640.
- HEIGHT: [Optional] image height. In pixels. ‘x’ means no change. The default value is 360.
- FRAMERATE: [Optional] frame rate of sub-stream. Unit: fps (frame per second). ‘x’ means no change. The default value is 30.
- BW: [Optional] maximum bandwidth of sub-stream traffic. Unit: Kbps (Kbits per second). ‘x’ means no change. Default is 8000 (8Mbps).
- AS: [Optional] aspect ratio configuration. ‘x’ means no change. Default is 0.
- 0: extend to what “WIDTH” and “HEIGHT” configured
- 1: [A1 only] keep original aspect ratio and place in the center of output (letterboxing or pillarboxing)
- MINQ: [Optional] minimum image quality number. Range: 10, 20, …, 90, 100, higher setting means better image quality. ‘x’ means no change. Default value is 10. Limit driver auto bandwidth control’s minimum quality number. If quality lower then MINQ value, the driver will drop frame by returning 0 size file.

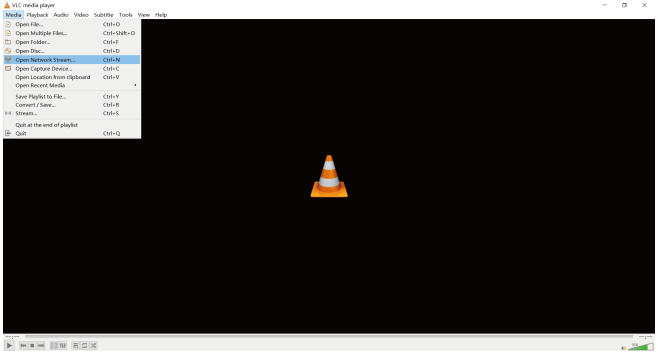
After changing, input the new Encoder/Decoder IP address into the web browser on PC, the MJPEG Substream will be displayed with the desired resolution, as shown in the figure below.



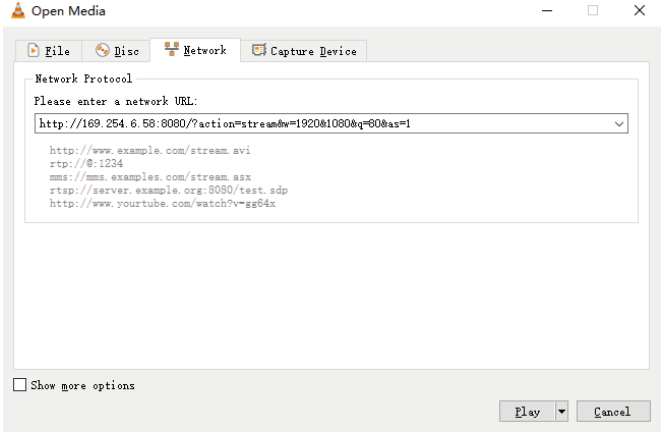
7.2 VLC Media Player Instruction

Firstly, perform the step 1~3 as described in Chapter 7.1, then open the VLC media player on PC. Please see the following icon.

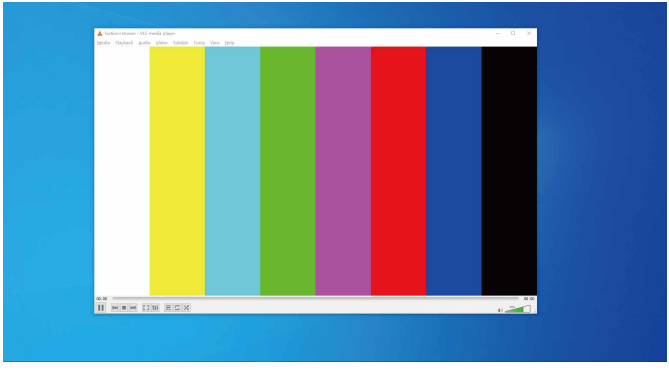
Click “Media > Open Network Stream”



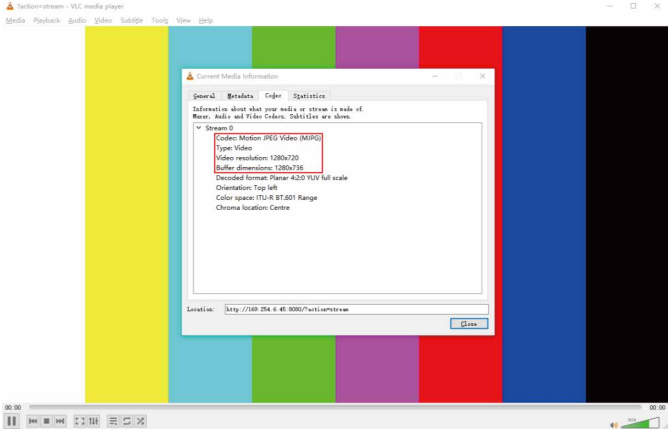
After clicking the “Open Network Stream” option, the following page will appear.



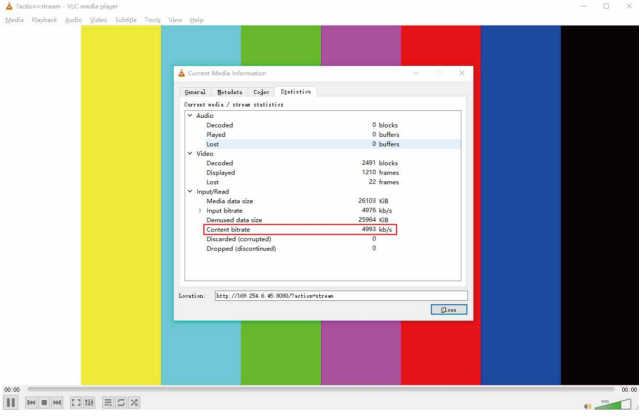
Enter the MJPEG Substream network URL, then click “**Play**” button.



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.

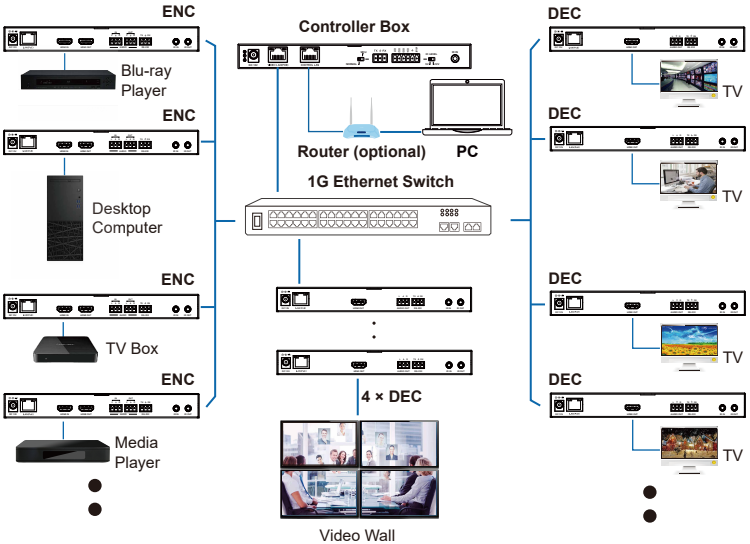
The following Switch models are highly recommended.

Manufacturer	Model Number
CISCO	CISCO SG500
CISCO	CATALYST series
HUAWEI	S5720S-28X-PWR-LI-AC
ZyXEL	GS2210
LUXUL	AMS-4424P

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



HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

Notes:
(1) The Controller has two LAN ports, one is Video LAN and the other one is Control LAN. The purpose of designing Controller with two LAN ports is to isolate audio/video (AV) network from control network. So to make AV network as an independent network which can not be accessed from control network directly, it's for bringing network security and avoiding AV network traffic flowing into the network in which the controls and managements are for the IP system.
The strongly recommended system setup is connecting Video LAN and Encoders/Decoders in a network Switch, connecting Control LAN and PC in another network Switch. The controls from Control LAN can be achieved by Web GUI/Telnet or SSH login/API commands, all these controls can be bridged by the Controller and applied onto Video LAN. The two LANs are isolated.
For simple usage, you can only connect all Encoders/Decoders and Video LAN and PC RJ-45 port into a single network, and let the Control LAN port not-connected (floating), as Video LAN also supports Web GUI/Telnet or SSH login/API commands controls, this seems "convenient" for general use scenarios, but this is only suggested for system in which there is no network isolation requirement or network traffic non-sensitive.
Only Control LAN connected while Video LAN floating, this is not allowed.
(2) 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 an optional DHCP server (e.g. network router) is recommended in the system.
(3) If there is no DHCP server in the system, 192.168.6.100 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 192.168.6.88.
(4) You can access the Web GUI by inputting URL "http://controller.local" or the Control LAN port IP address 192.168.6.100 (in case of no optional router) on your computer's browser.
(5) No need to care about settings of Video LAN port of the Controller Box, as they are managed by Controller automatically (Default).
(6) When the Network Switch does not support POE, the Encoder, Decoder and Controller Box should be powered by DC power adapter.