

AV OVER IP · JPEG2000 4K60 1GBE ENCODER WALL-PLATE

BLU-JP1G-WPHC-ENC

JPEG2000 4K60 AVoIP 1GbE Encoder (Wall-plate) with KVM

A 2-gang wall-plate encoder built on JPEG2000 technology, with HDMI and USB-C dual inputs at up to 4K60 4:4:4, USB 2.0/KVM, bi-directional RS-232, and PoE — extending signal up to 328ft/100m over a single CAT6/6A/7 cable.



4K60 4:4:4

HDMI 2.0B / HDCP 2.2

18Gbps

VIDEO BANDWIDTH

328ft/100m

OVER CAT6/6A/7

HDMI + USB-C

DUAL INPUT, AUTO SWITCH

USB 2.0 / KVM

+ POE, RS-232

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01 Introduction

What the BLU-JP1G-WPHC-ENC does.

This 4K60 AV over IP 1GbE Encoder (Wall-plate) is based on JPEG2000 technology, and uses ASPEED AST1530 for image codec and low-latency KVM applications. It features HDMI and USB-C dual input, with a video resolution of up to 4K60 4:4:4. This product supports audio embedding and de-embedding function, as well as USB 2.0/KVM/Camera, 1G Ethernet, bi-directional RS-232 (pass-through & Guest mode) and PoE function. Guest mode controls of RS-232 and CEC are supported. Dante AV-A mode is supported if the product is license activated.

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, and can realize intelligent networking based on Gigabit Ethernet Switch.

02 Features

- HDCP 2.2 and DP 1.2 compliant
- Support 18Gbps video bandwidth
- Input and output video resolution is up to 4K60 4:4:4, as specified in HDMI 2.0b
- Signal transmission distance can be extended up to 328ft/100m via CAT6/6A/7 cable
- Transmit video, analog audio, RS-232, CEC and USB signal over Ethernet
- Support USB 2.0 and KVM function
- US 2-Gang wall-plate
- With HDMI and USB-C dual inputs, supporting auto switching (switch to the corresponding signal input channel automatically when the signal source is connected and detected) and manual switching modes
- The USB-C 1 port supports video/audio/USB data transmission and power charging to USB-C source device by USB-C adapter connected to the USB-C 2 port
- Audio embedding and de-embedding are supported
- 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
- Built-in MJPEG Substream for video real-time preview on portable devices
- Support 1G Ethernet Switch, router and hub devices transmission
- Standard PoE (802.3at PD device) or local 12V power supply
- Built-in web page configuration and control, Telnet and SSH as well
- Support HDR10, Dolby Vision, HLG bypass
- 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
- Flexible control via Web GUI/TCP/RS-232 and third-party central control
- Smart networking design for easy and flexible installation

03 Package Contents

- | | |
|---|---|
| 1 | 1 × BLU-JP1G-WPHC-ENC JPEG2000 4K60 AV over IP 1GbE Encoder Wall-plate |
| 2 | 3 × 3pin-3.5mm Phoenix Connector (Male) |
| 3 | 1 × 12V/2.5A Multinational Power Supply (with 2pin-3.5mm Phoenix Connector) |
| 4 | 1 × User Manual |

04 Specifications

Technical, connection, audio parameters, power and mechanical figures.

TECHNICAL	
HDCP Compliant	HDCP 2.2
Video Bandwidth	18Gbps
Input/Output Video Resolution	Up to 4K60 4:4:4 (HDMI 2.0b)
Color Space	RGB, YCbCr 4:4:4 / 4:2:2, YUV 4:2:0
Color Depth	Input: 8/10/12-bit, 8-bit (4K60Hz 4:4:4) Output: 8-bit
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
HDMI Compliant	HDMI 2.0b
Video Compression Standard	JPEG2000
Video Network Bandwidth	1G
Video Resolution (full list)	640x480p60, 800x600p60, 1024x768p60, 1280x1024p60, 1360x768p60, 1440x900p60, 1440x1050p60, 1600x1200p60, 480i59.94, 480p59.94, 576i50, 576p50, 720p50/59.94/60, 1080i50/59.94/60, 1080p23.98/24/25/29.97/30/50/59.94/60, 2160p23.98/24/25/29.97/30/50/59.94/60, 4096x2160p23.98/24/25/29.97/30/50/59.94/60
Transmission Distance	100m (CAT6/6A/7)
USB Bandwidth	480Mbps
Output Video Resolution	Depends on the optional decoder
ESD Protection	IEC 61000-4-2: ±15kV (Air-gap discharge) & ±8kV (Contact discharge)

ANALOG INPUT/OUTPUT AUDIO PARAMETERS	
Frequency Response	(+0.5dB, -1dB) 20Hz ~ 20kHz
Audio S/N Ratio	>90dB @ HDMI 0dB, 1kHz A-weighted
Line Input/Output Level (Max)	1V _{rms} / 1V _{rms}
Input/Output Impedance	>=10k ohms / 330 ohms
Audio Output Sync Delay	TBD
Audio THD+N	<0.05% @ HDMI 0dB, 1KHz

CONNECTION	
Encoder – Input	1x HDMI IN [HDMI Type A, 19-pin female] 2x USB-C IN [USB Type C, 24-pin female] 1x AUDIO IN [3pin-3.5mm Phoenix connector]
Encoder – Output	1x AUDIO OUT [3pin-3.5mm Phoenix connector]
Encoder – Control	1x RS-232 [3pin-3.5mm Phoenix connector] 1x LAN (PoE) [RJ45 jack] 1x USB 2.0 HOST [USB Type B, 4-pin female] 2x USB 2.0 DEVICE [USB Type-A, 4-pin female]
Decoder – Input	1x SPDIF IN [Optical audio connector] 1x L/R AUDIO IN [3-pin 3.81mm Phoenix connector]
Decoder – Output	1x HDMI OUT [Type A, 19-pin female] 1x L/R AUDIO OUT [3-pin 3.81mm Phoenix connector]
Decoder – Control	1x RS-232 [3.81mm Phoenix connector] 1x LAN (PoE) [RJ45 jack] 1x FIBER [Optical fiber slot] 2x USB 1.1 DEVICE [Type-A, 4-pin female] 2x USB 2.0 DEVICE [Type-A, 4-pin female] 2x RELAYS [3.81mm Phoenix connector] 2x DIGITAL IO [3.81mm Phoenix connector] 1x IR IN [3.5mm audio jack] 1x IR OUT [3.5mm audio jack]
Note	Decoder can work with any decoder of the same series.

POWER & MECHANICAL	
Power Supply	Input: AC100-240V 50/60Hz · Output: DC 12V/2.5A (US/EU standards, CE/FCC/UL certified)
Power Consumption	Encoder: 12W (Max.) · Decoder: 7.08W (Max.)
Operating Temperature	32-104°F / 0-40°C
Storage Temperature	-4-140°F / -20-60°C
Operating Humidity	20% - 80% (relative humidity, no condensing)
Storage Humidity	10% - 90% (relative humidity, no condensing)
Weight	Encoder: 350g · Decoder: 626g
Dimensions	Encoder: 115.9mm [W] x 114.3mm [H] x 44.25mm [D] Decoder: 204mm [W] x 136mm [D] x 25.5mm [H]
Housing	Encoder: Aluminum panel + Iron case · Decoder: Metal enclosure
Color	Encoder: White panel + Black case · Decoder: Black

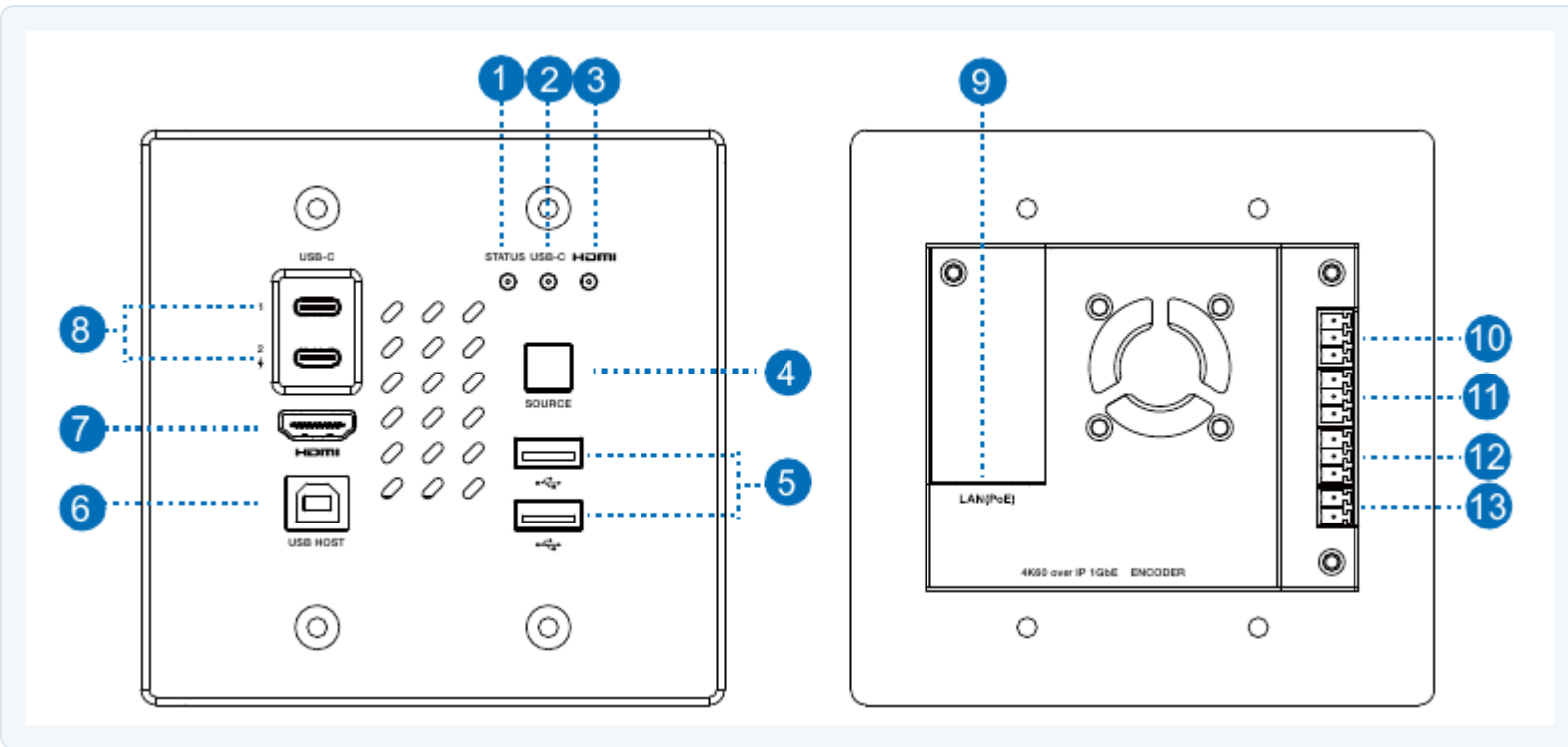
RECOMMENDED HDMI CABLE LENGTH

	4K60	4K30	1080P60
HDMI Cable Length (IN/OUT)	16ft/5M	32ft/10M	50ft/15M

The use of a “Premium High Speed HDMI” cable is highly recommended.

05 Operation Controls & Functions

5.1 Encoder Panel

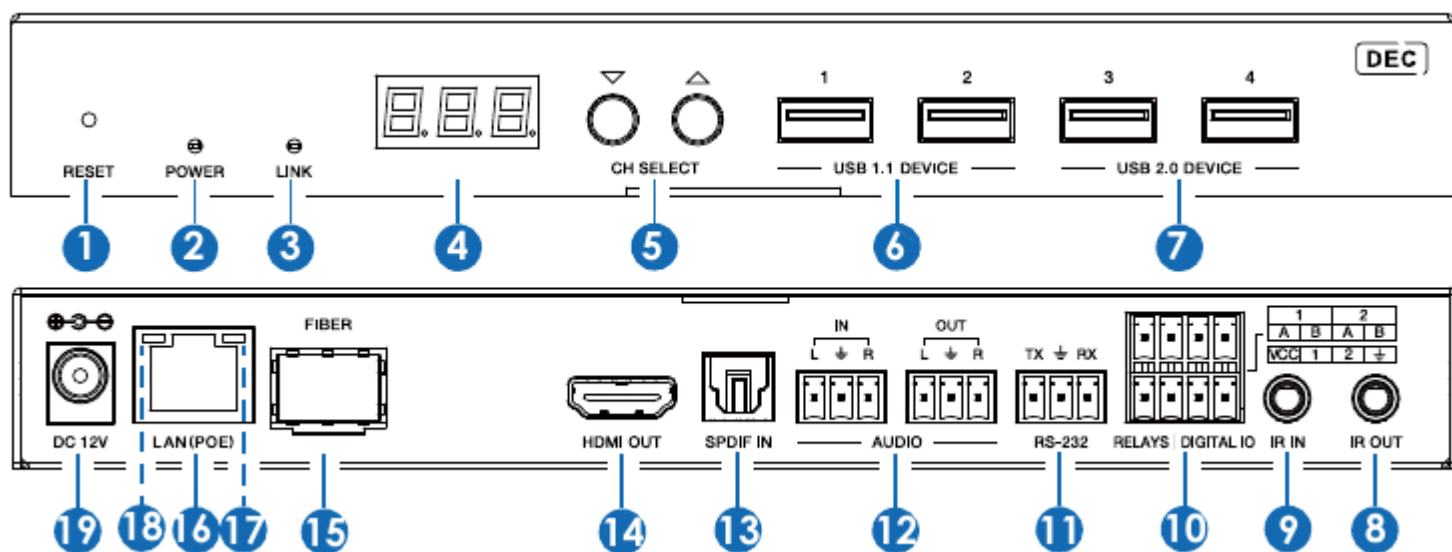


1	STATUS LED (Green)	Connection status indicator light. - Light on: Encoder and Decoder are connected through the LAN(PoE) port, and there is video signal transmitted to the Decoder. - Light flashes: Encoder and Decoder are connected through the LAN(PoE) port, but there is no video signal transmitted to the Decoder. - Light off: Encoder and Decoder are not connected through the LAN(PoE) port.
2	USB-C LED (Green)	USB-C input status indicator light. - Light flashes: The USB-C port is selected as the signal input channel, and the signal source device is connected, but there is no video signal input. - Light on: The USB-C port is selected as the signal input channel, the signal source device is connected, and there is video signal input.
3	HDMI LED (Green)	HDMI input status indicator light. - Light flashes: The HDMI port is selected as the signal input channel, and the signal source device is connected, but there is no video signal input. - Light on: The HDMI port is selected as the signal input channel, the signal source device is connected, and there is video signal input.
4	SOURCE button	- Short press to switch the input signal source (HDMI/USB-C) - Press and hold the button for 5 seconds to restore the unit to factory default settings (The STATUS, USB-C and HDMI LEDs will simultaneously light off/on, quickly flash 3 times to indicate the resetting). Note: The USB-C 1 port and HDMI port support auto signal detection and switching as default.
5	USB-A port	Two USB 2.0 DEVICE ports, connected to USB 2.0 devices. For local DC power supply, the output power of this port is 5V/0.6A; for PoE power supply, the output power is 5V/0.2A.
6	USB-B port	USB 2.0 HOST port, connected to PC. For the HOST of USB-B/USB-C port, users can select AUTO (default)/USB-B/USB-C via API commands.
7	HDMI port	HDMI signal input port, supporting 4K60 4:4:4/HDR. Connect to an HDMI source device such as Blu-ray Player or Set-top box with an HDMI cable.
8	USB-C 1/2 port	USB-C 1 port: Support 4K60 audio/video and USB 2.0 signals transmission, and charging the external device (The USB-C 2 port must be connected to the power supply). USB-C 2 port: USB-C power input port, only supporting USB Type C PD power input. Connect this port to the USB-C power adapter to charge the device connected to the USB-C 1 port.
9	LAN(PoE) port	1G network port, supporting PoE power supply from the Switch, adaptive PoE or PoE+.
10	AUDIO IN port	Analog audio input port, used for analog audio embedding, supporting unbalanced audio input, with a maximum support of 1Vrms. Unbalanced connection method: L-, GND, R
11	AUDIO OUT port	Analog audio output port, used to output the PCM audio de-embedded from the HDMI input (default), or loop output the embedded audio from the AUDIO IN port, supporting unbalanced audio output, with a maximum support of 1Vrms.

		Unbalanced connection method: L-, GND, R
12	RS-232 port	RS-232 serial port, connected to PC or control system for RS-232 signal pass-through or local serial port control.
13	DC 12V port	The device can be powered via two methods: • Local DC 12V/2.5A power supply (with the priority) • PoE from the Network Switch. Device acts as PD mode. When the Switch supports PoE function, DC power supply is not needed. Note: When USB device ports connect heavy power load devices, DC power supply is preferred.

5.2 Decoder Panel

The optional decoder can work with any decoder of the same bluKnot JPEG2000 AV-over-IP series.



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 video signal transmitted from the Encoder. - Light flashes: Encoder and Decoder are connected through the LAN(POE) port, but there is no video signal transmitted from the Encoder. - Light off: Encoder and Decoder are not connected through the LAN(POE) port.
4	LED screen	Shows the selected Encoder ID as default. Displays the corresponding options of configuration functions during setting Decoder configurations.
5	CH SELECT	Used to set Decoder ID and other settings.
6	USB 1.1 DEVICE	Connect to USB 1.1 devices, such as Keyboard or Mouse.
7	USB 2.0 DEVICE	Connect to USB 2.0 devices, such as USB flash disk or USB Camera.
8	IR OUT	IR signal output port. The IR level can be set to 5V or 12V (default) through the panel buttons.
9	IR IN	IR signal input port. The IR level can be set to 5V or 12V (default) through the panel buttons.
10	RELAYS / DIGITAL IO	VCC: Power output (12V or 5V configurable), maximum to 12V@50mA, 5V@100mA loading. The default output is 12V. RELAYS: 2 channel low-voltage relay ports, each group is independent and isolated, maximum to 1A 30VDC loading. Contacts are disconnected by default. DIGITAL IO: 2 channel GPIO ports, for digital level signal output control or input detection (up to 12V level detection). The output control mode (default mode, low level as default output) or input detection mode is configurable. The DIGITAL IO internal pull-up voltage follows the VCC. Output control mode: (a) The maximum withstand sink current is 50mA when outputting low level. (b) When VCC is 5V and high level is output, the maximum current driving capacity is 2mA. (c) When VCC is 12V and high level is output, the maximum current driving capacity is 5mA. Input detection mode: (a) When VCC is 5V, DIGITAL IO is pulled up to 5V internally through a 2.2K ohm resistor. (b) When VCC is 12V, DIGITAL IO is pulled up to 12V internally through a 2.2K ohm resistor.
11	RS-232	RS-232 serial port, supporting RS-232 command pass-through and local serial port control.
12	AUDIO IN/OUT	AUDIO IN: Analog audio input port, the audio can be transmitted to Encoder AUDIO OUT in unicast mode (point-to-point direct connection). AUDIO OUT: Analog audio output port. It outputs the same audio of that on HDMI OUT in case audio format is LPCM.
13	SPDIF IN	S/PDIF signal input port.
14	HDMI OUT	HDMI signal output port, connected to an HDMI display device such as TV or monitor.
15	FIBER	Connect with optical fiber module, and receive signals from the Encoder with an optical fiber cable directly or through a Switch.

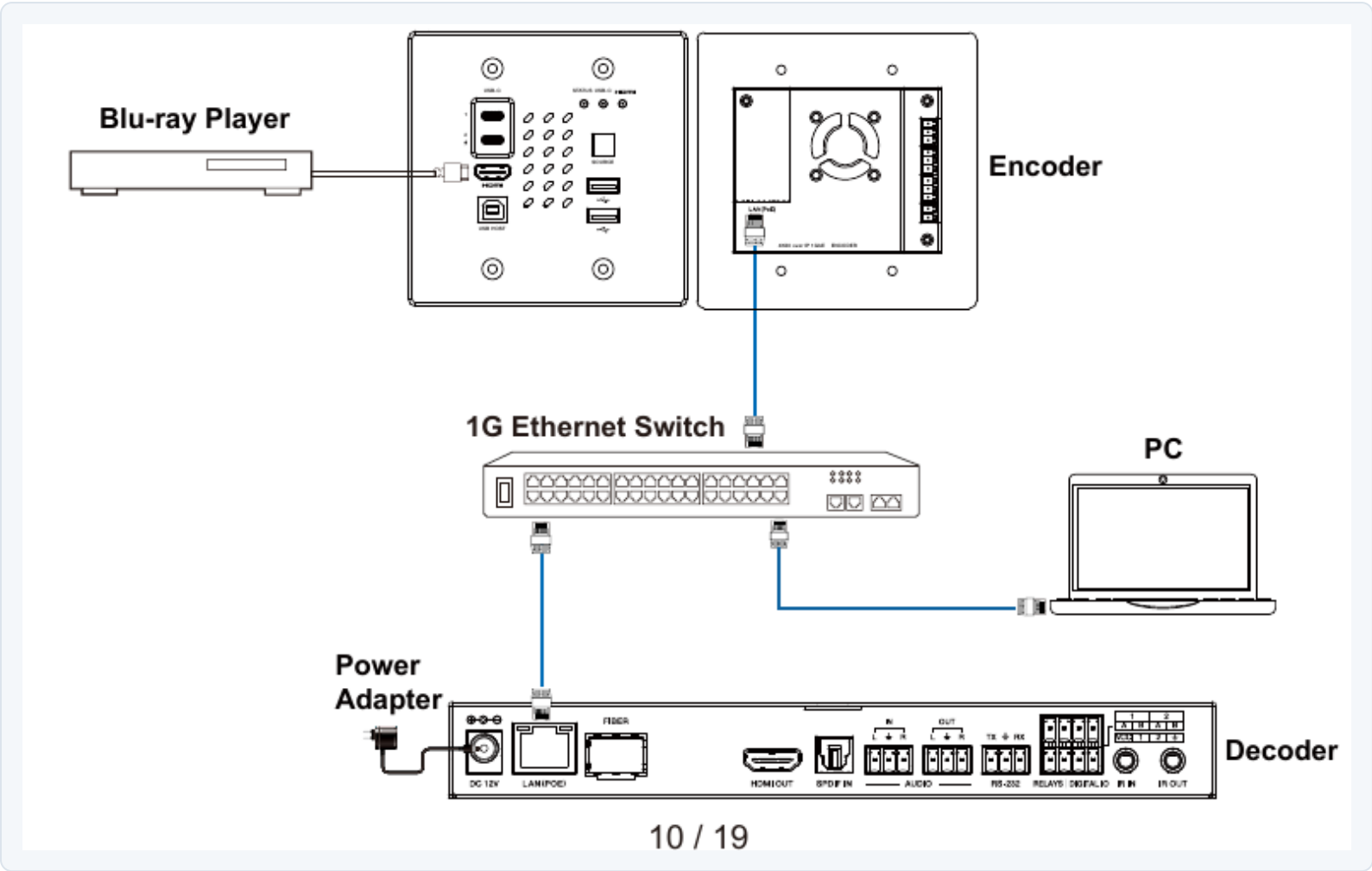
16	LAN (POE)	1G LAN port, connect network Switch to form a distributed system. Note: When network switch delivers PoE power supply, DC 12V adapter doesn't need to apply on the unit.
17	Data Signal Indicator lamp (Yellow)	• Light flashing: There is data transmission. • Light off: There is no data transmission.
18	Link Signal Indicator lamp (Green)	• Light on: The network cable is connected normally. • Light off: The network cable is not connected well.
19	DC 12V	The device can be powered via two methods: • Local DC 12V/2.5A power supply • PoE from the Network Switch. Device acts as PD mode. When the Switch supports PoE function, DC power supply is not needed.

06 MJPEG Substream Operation Introduction

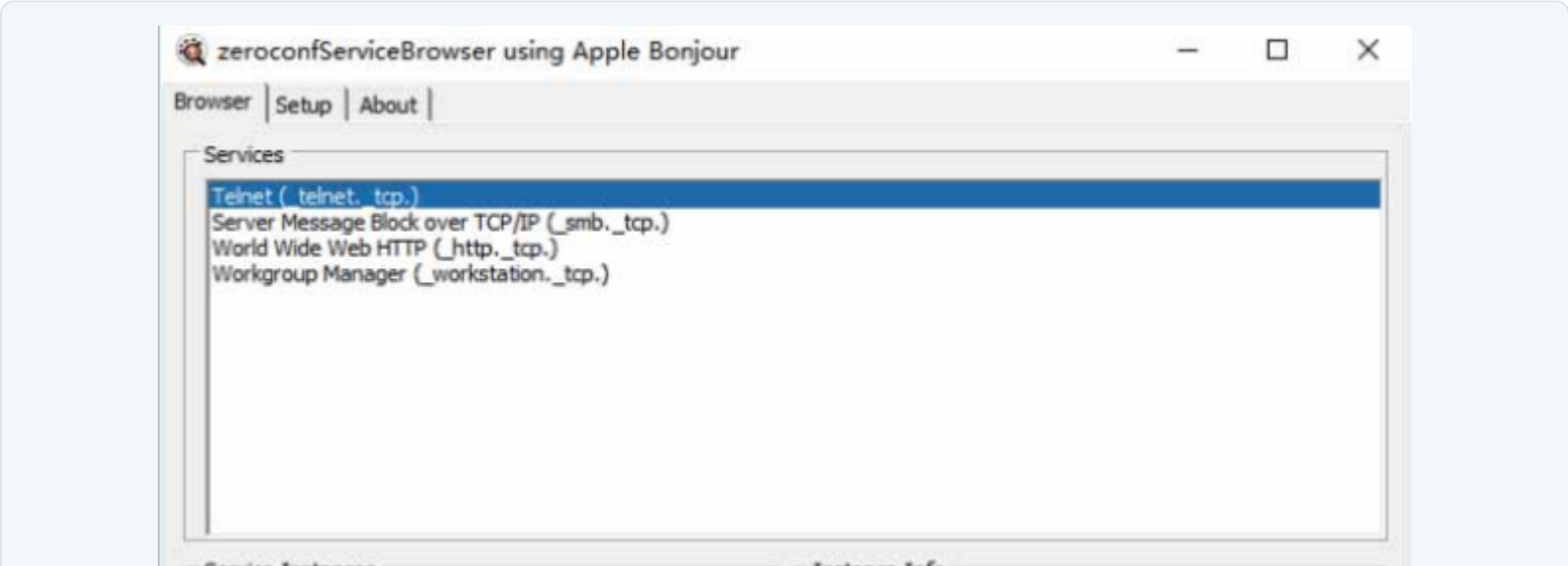
6.1 MJPEG Substream Preview/Configuration via Web Page

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 Switch, then connect an HDMI source device and power supply. The connection diagram is shown below.

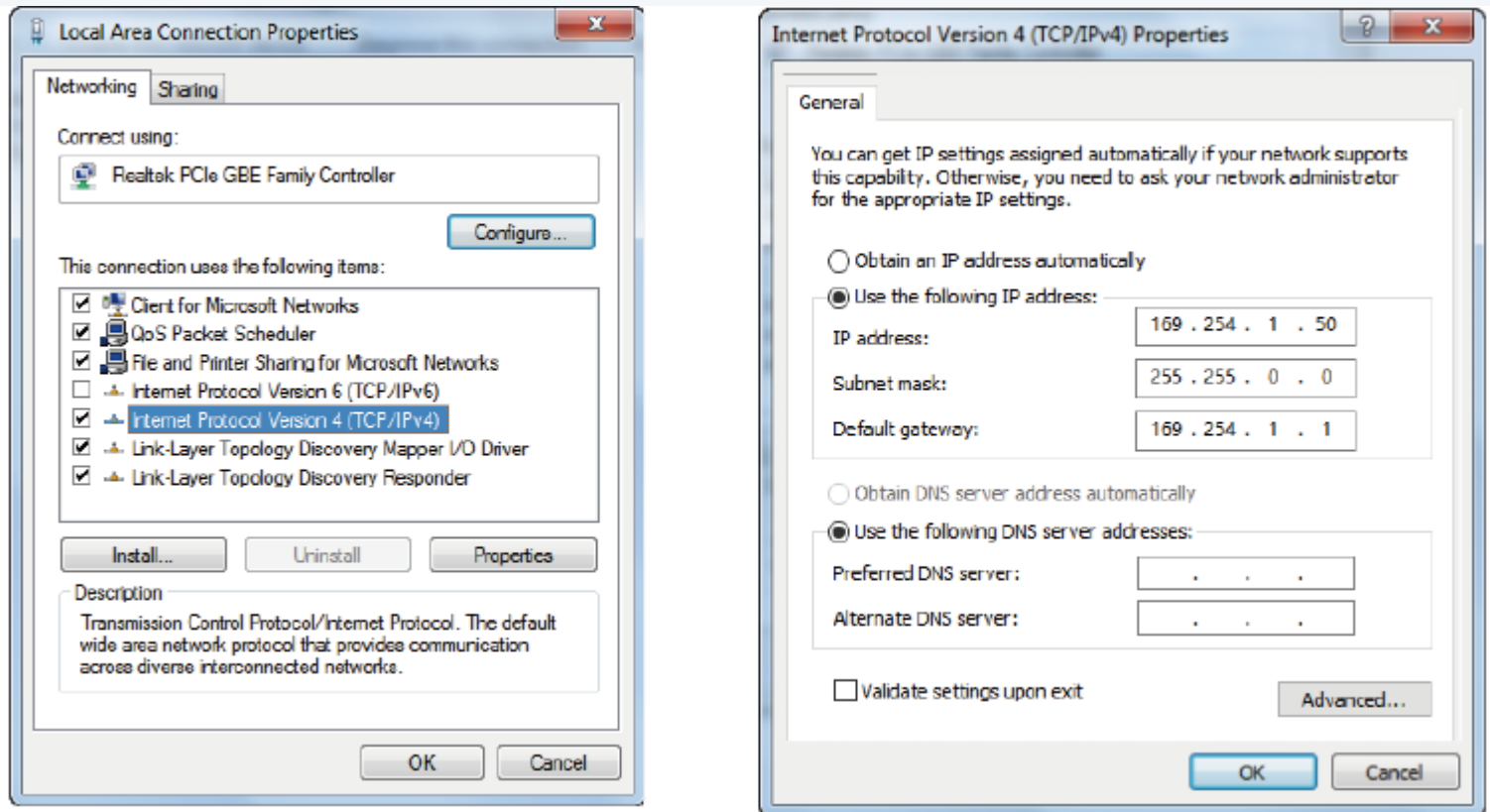


Step 2: Install a bonjour protocol checking tool (such as zeroconfServiceBrowser) on PC to find the IP address of the Encoder/Decoder. Take zeroconfServiceBrowser as an example. After opening the software, you can select “Workgroup Manager” in Services of Browser, select the Host name in Service-Instances, and find the IP address in the Address item of Instance-Info.



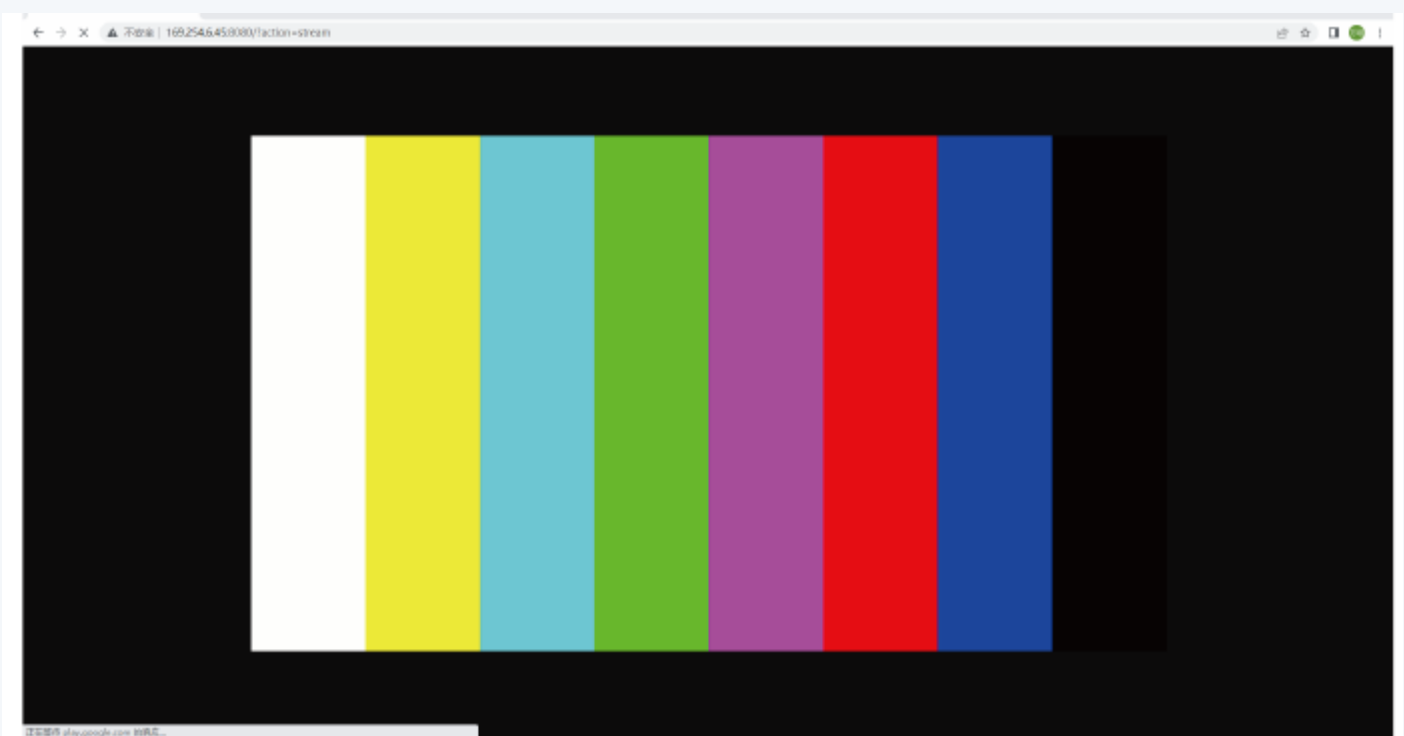
Notes: (1) The window in the lower left corner displays the Host names of all devices in the current network. (2) The window in the lower right corner displays the Host name, IP address and Port number of the device. (3) The Host name of Encoder starts with AST-ENC; the Host name of Decoder starts with 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.



Windows Local Area Connection & TCP/IPv4 Properties

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 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
```

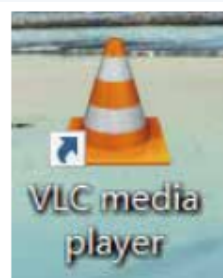
- **WIDTH:** [Optional] image width. In pixels. 'x' means no change. Default is 640.
- **HEIGHT:** [Optional] image height. In pixels. 'x' means no change. Default is 360.
- **FRAMERATE:** [Optional] frame rate of sub-stream. Unit: fps (frame per second). 'x' means no change. Default is 30.
- **BW:** [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 than 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 below.

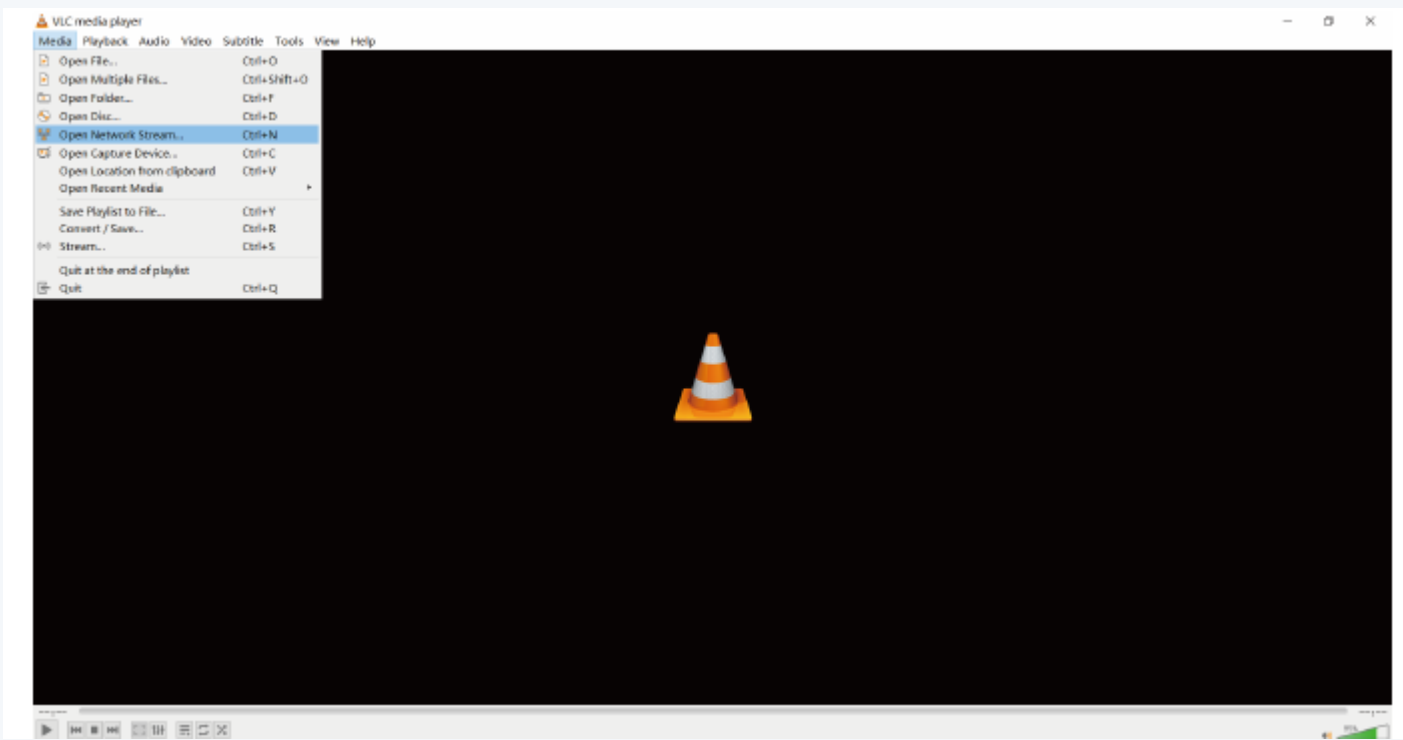


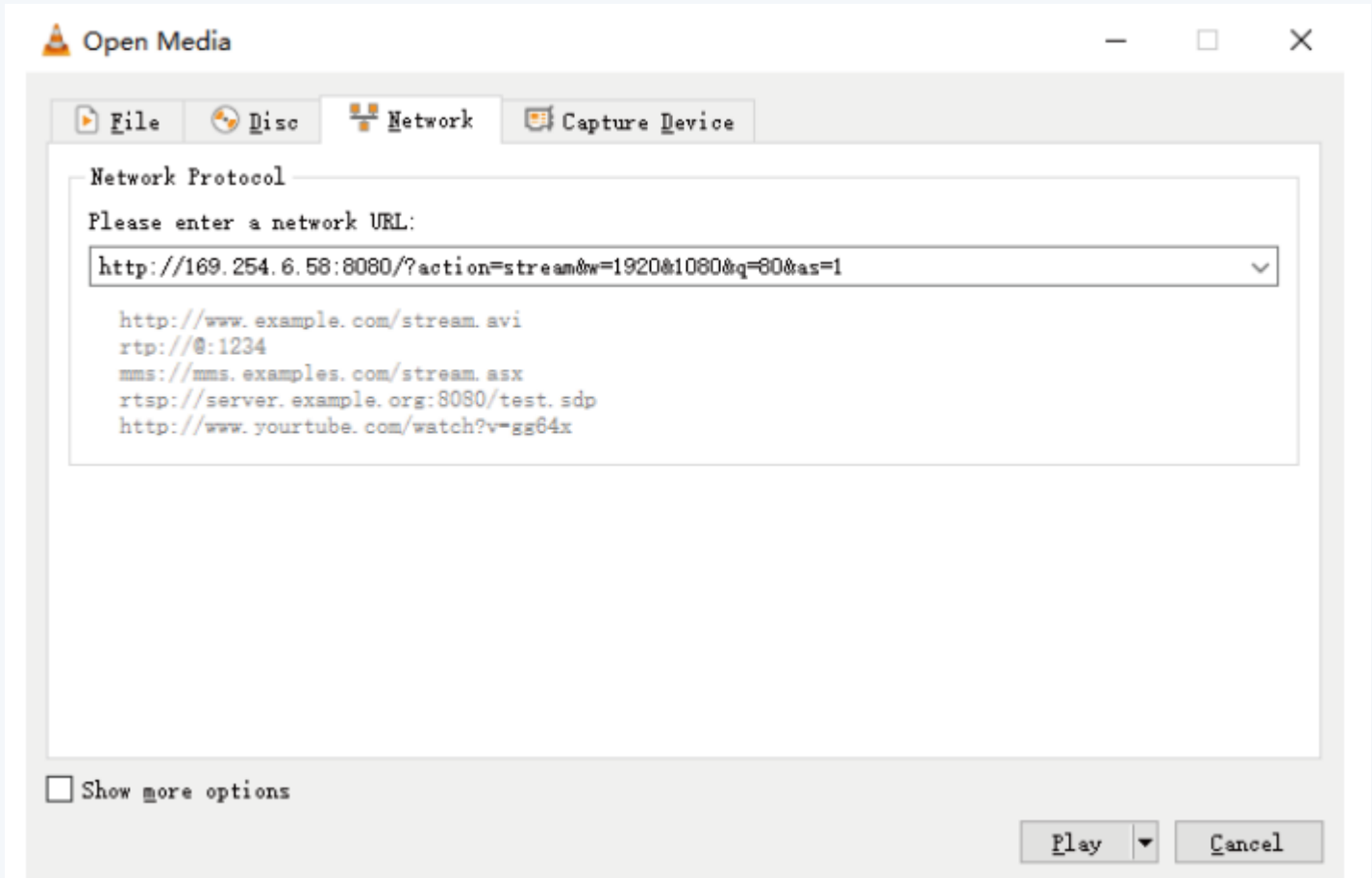
6.2 VLC Media Player Instruction

Firstly, perform steps 1~3 as described in Chapter 6.1, then open the VLC media player on PC.

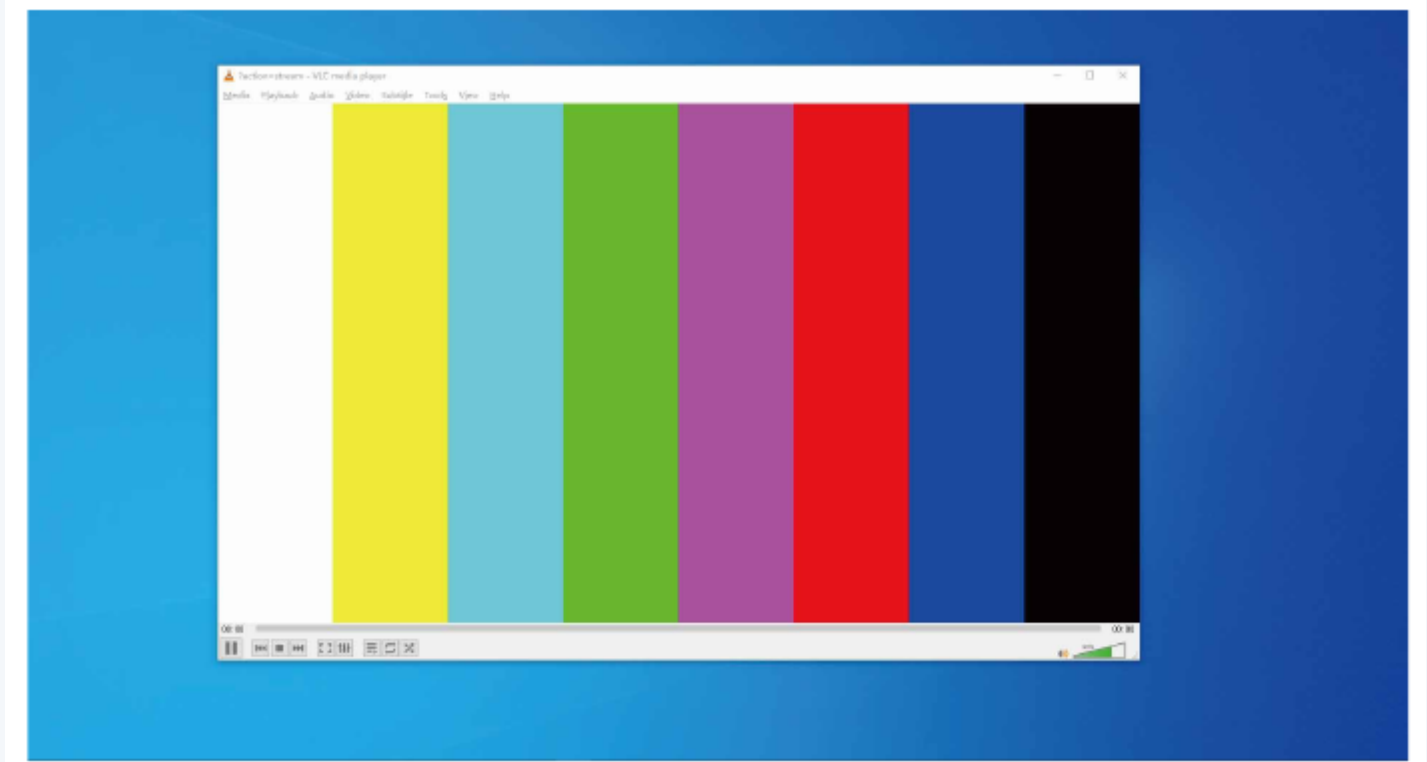


Click “Media > Open Network Stream”. After clicking the option, the following page will appear.

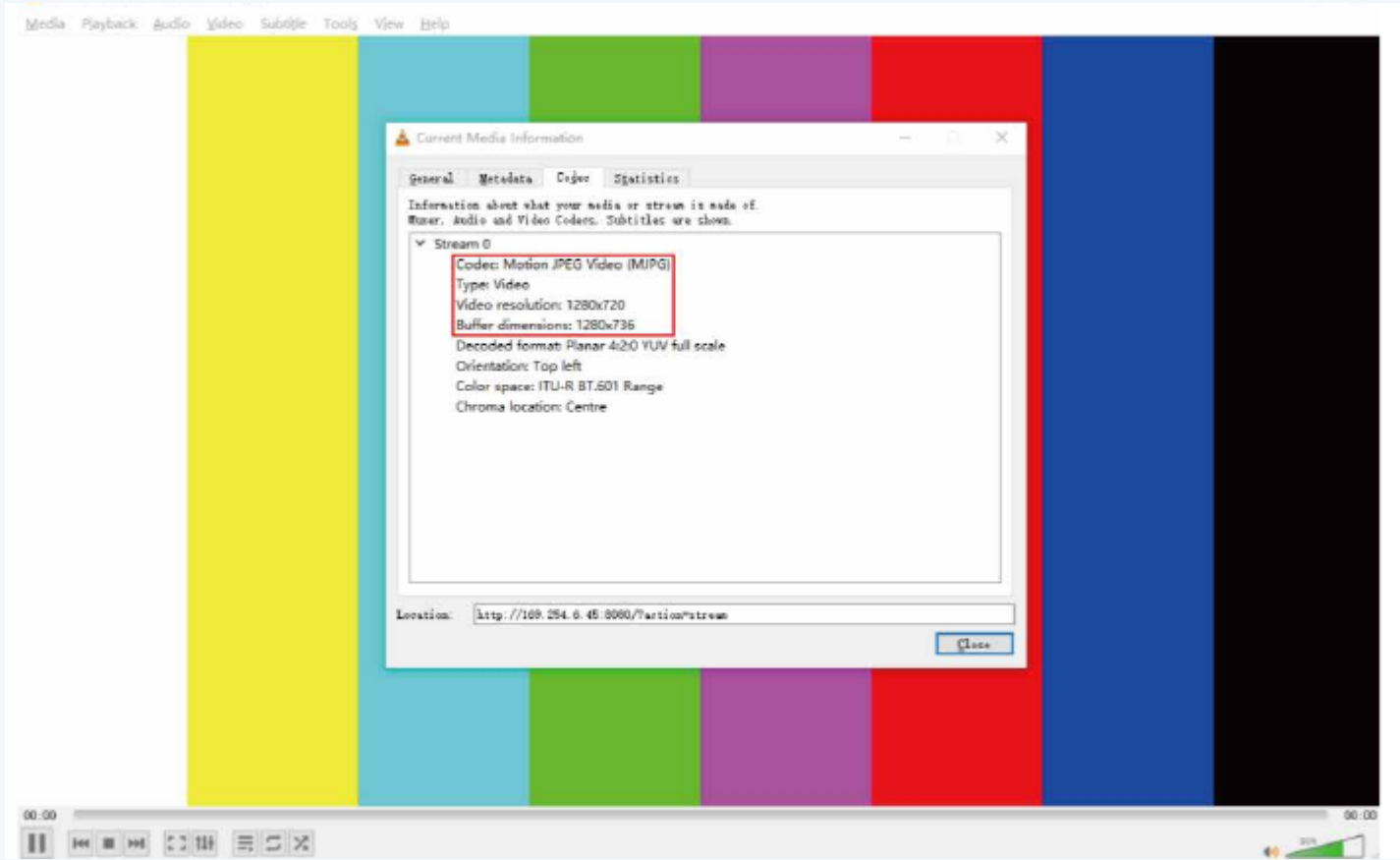




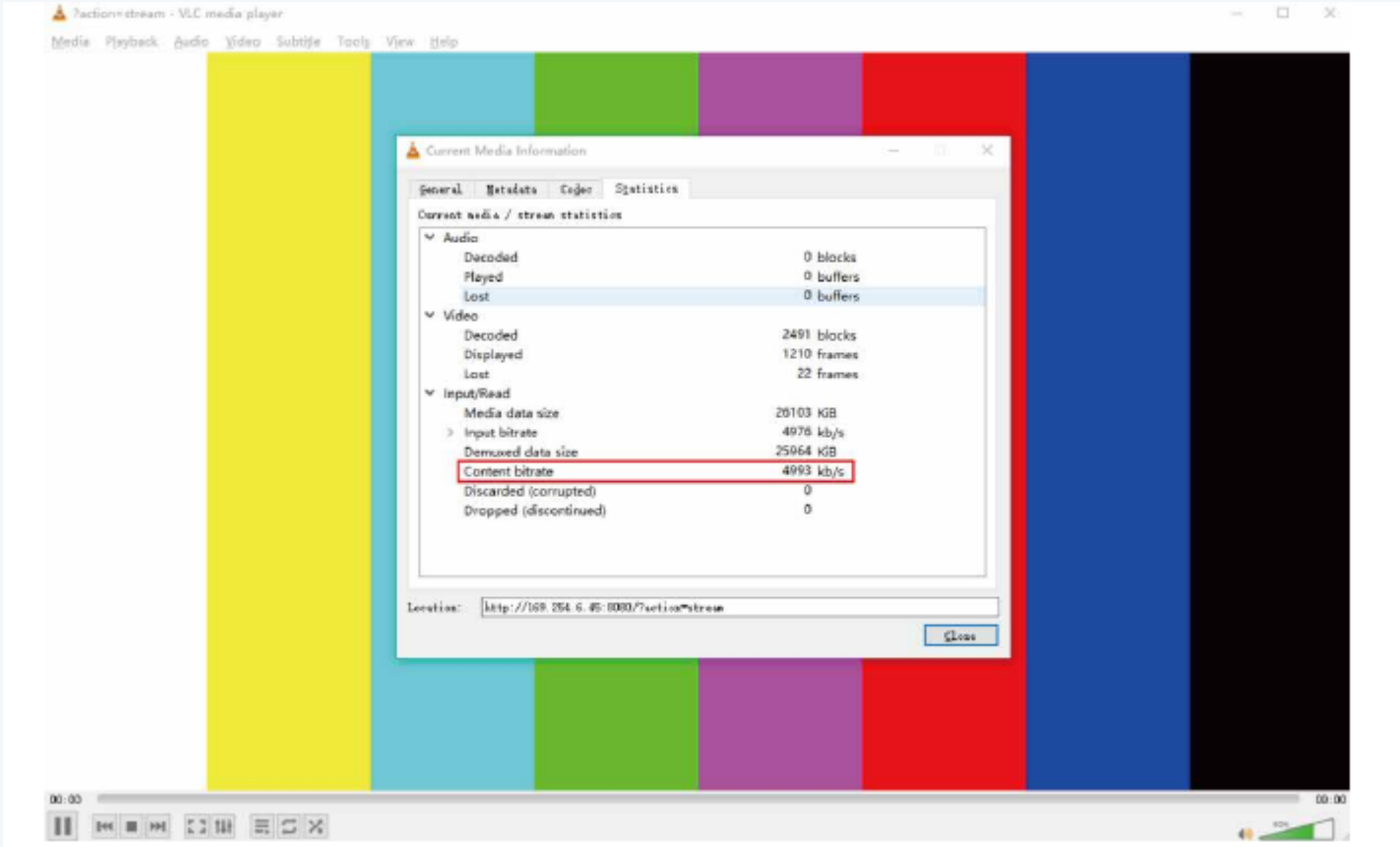
Enter the MJPEG Substream network URL, then click “Play”



Choose “Tools > Codec information”, a pop-up window will display and show Stream information, as shown below.



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



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

07 Switch Model

A network Switch used to set up the system should support the following features.

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

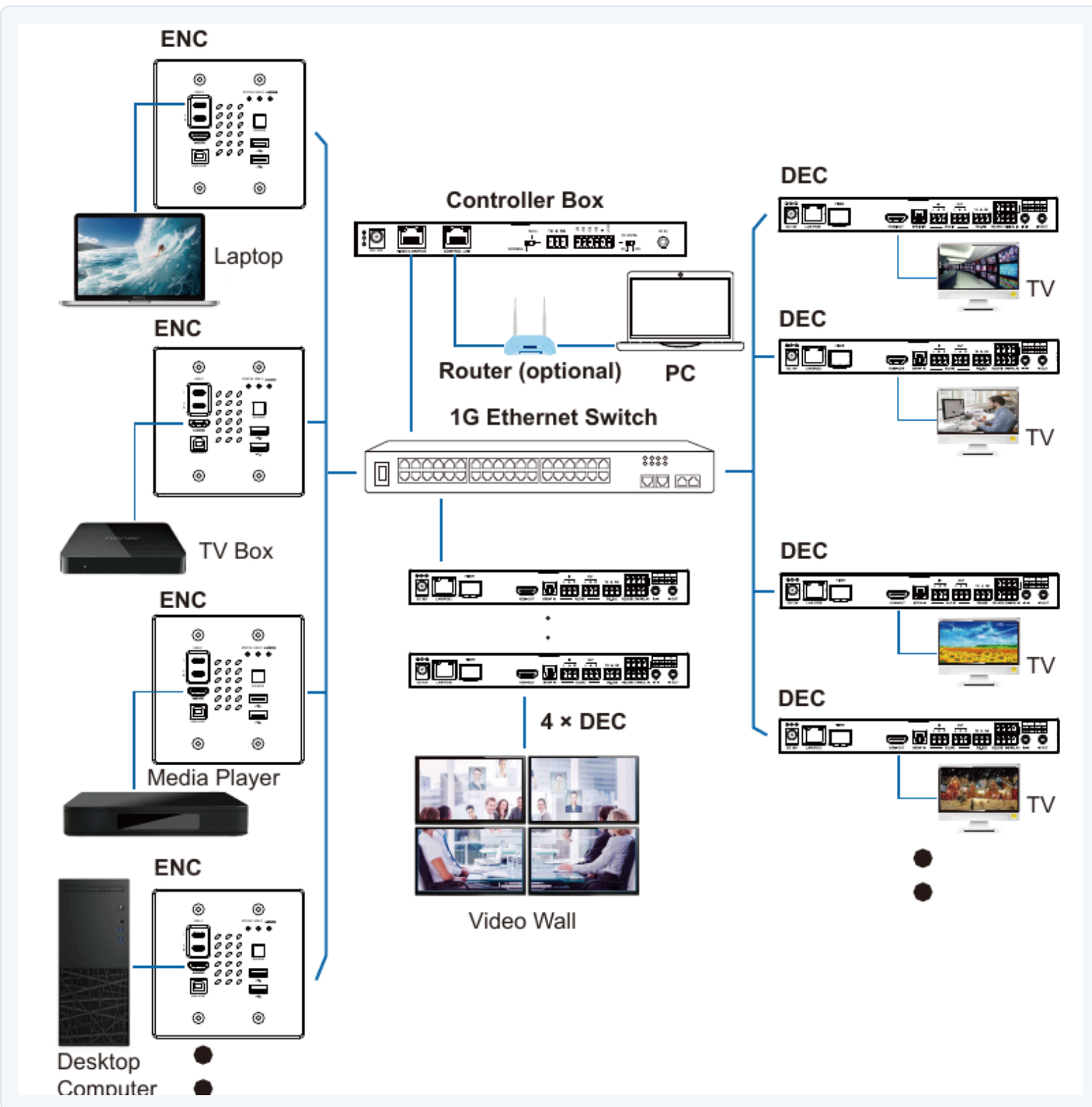
RECOMMENDED SWITCH MODELS	
MANUFACTURER	MODEL NUMBER
CISCO	CISCO SG500
CISCO	CATALYST series
HUAWEI	S5720S-28X-PWR-LI-AC
ZyXEL	GS2210
LUXUL	AMS-4424P

08 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”.

09 Application Example

Multiple sources encoded at the wall plate, distributed over 1G Ethernet, decoded to a video wall and individual displays.



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