H.264/H.265 4K60 4:4:4 AV over IP Transceiver with KVM and RS-232

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 4K@60 H.264/H.265 transceiver is an All-In-One AV over IP solution that supports 4:4:4 encoding and decoding for true color restoration. It supports fiber and copper, and supports automatic switching between two options, the copper has a higher priority. This product provides highest-quality and ultra-low latency audio/video extension over a standard 1G Network Switch, and the transmission distance is up to 328ft/100m. It supports seamless switching, video wall, multiview and KVM seat management functions. Flexible transceiver design (one box can be set to encoder or decoder) is much convenient in a real installation site and inventory control.

In encoder mode, it supports one HDMI™ 2.0 input and one HDMI™ loop out, with analog audio embedding/de-embedding function. In decoder mode, it supports one HDMI™ 2.0 decoding output, with analog audio de-embedding function. The encoder supports H.264 video preview stream.

The system is based on Linux for software development, providing flexible control methods. The best digital audio and video processing management solution is created using technologies such as audio and video processing, networking, visualization and centralized control, and full network distribution. It is committed to quickly establish a high-performance, reliable and easy-to-use visualization application platform for users. Based on distributed interconnection, a comprehensive visualization solution is built that integrates audio and video comprehensive management, matrix switching, splicing and fusion, window roaming, KVM collaborative management, PoE power supply application.

2. Features

☆ HDCP 2.2 compliant

☆ Support video resolution up to 4K60Hz (4:4:4), 18Gbps video bandwidth, as specified in HDMI™ 2.0b

☆ Audio formats support LPCM 2.0CH 48kHz

☆ 4:4:4 encoding and decoding for true color restoration

☆ Integrated design of encoder and decoder, supporting fiber and copper

☆ Support window roaming function: a unit as decoder can process up to 36 signals, enabling arbitrary windowing, roaming, overlaying, and splicing

☆ KVM seat management (one-to-one & one-to-many), supporting one person manages multiple PCs
☆ Universal H.264/265 protocol, supporting IPC access and seamless integration with security camera products
☆ Support high definition background image (both video and picture are available), as well as multi-screen splicing display
☆ Support scrolling subtitles and character overlay
☆ Support point-to-point signal extension
☆ Support signal distribution, multicast mode, matrix and video wall functions over a 1G Network Switch
☆ Support user rights management
☆ Flexible control via KVM, APP and Control Server (CTL500H or SVR9300AX2/AX3/AX5)
☆ Standard PoE supported (802.3at Class 3, PD mode)
☆ Encoder supports HDMI™ local loop out
☆ Encoder supports audio embedding and de-embedding function

3. Package Contents

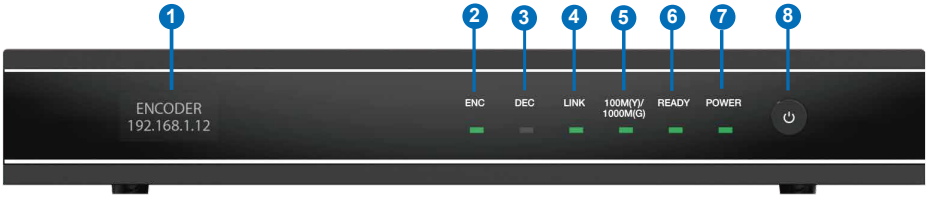
① 1x H.264/H.265 4K60 4:4:4 AV over IP Transceiver
② 2x 6pin-3.81mm Phoenix Connector (male)
③ 1x 3pin-3.81mm Phoenix Connector (male)
④ 1x 12V/2.5A Locking Power Supply
⑤ 2x Mounting Ear
⑥ 4x Machine Screw (M3*4)
⑦ 1x User Manual

4. Specifications

Technical	
HDMI™ Compliance	HDMI™ 2.0b
HDCP Compliance	HDCP 2.2
Video Compression Standard	H.264/H.265
Video Bandwidth	18Gbps
Network Port	1000M Base-T (supporting PoE)
Video Resolution	Up to 4K@60Hz 4:4:4 (**Note:** The decoder supports custom resolution output.)
Color Space	RGB 4:4:4, YCbCr 4:4:4, YCbCr 4:2:2, YCbCr 4:2:0
Color Depth	8/10/12bit
Encoding Sampling Rate	48KHz
HDMI™ Audio Formats	LPCM 2.0CH, 16bit, 48k
Analog Audio Formats	Left and right stereo analog audio
ESD Protection	IEC 61000-4-2: ± 15kV (Air-gap discharge) & ± 8kV (Contact discharge)
Connection	
Input	1x HDMI™ IN [Type A, 19-pin female] 2x AUDIO IN [3-pin phoenix connector, stereo balanced linear interface]
Output	1x HDMI™ OUT [Type A,19-pin female] 2x AUDIO OUT [3-pin phoenix connector, stereo balanced linear interface]
Control	1x LAN (PoE) [RJ45, supporting PoE] 1x RS-232 [3-pin phoenix connector] 1x USB HOST [Type B, 4-pin female] 2x USB DEVICE [Type A, 4-pin female] 1x SFP [Fiber slot]
Mechanical	
Housing	Metal Enclosure
Color	Black
Dimensions	204mm [W] × 132mm [D] × 30mm [H]
Weight	760g
Power Supply	Input: AC 100 - 240V 50/60Hz Output: DC 12V/2.5A (US/EU standards, CE/FCC/UL certified)
Power Consumption	Encoder: 12W; Decoder: 8.5W
Operating Temperature	0°C ~ 40°C / 32°F ~ 104°F
Storage Temperature	-20°C ~ 60°C / -4°F ~ 140°F
Operating Humidity	20%~80% (relative humidity, non-condensing)
Storage Humidity	10%~90% (relative humidity, non-condensing)

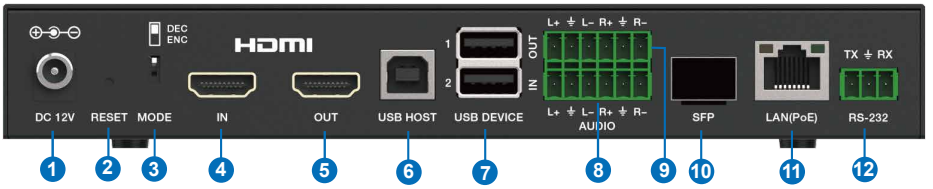
5. Operation Controls and Functions

5.1 Front Panel



No.	Name	Function Description
1	OLED display screen	The name and IP address of the device will be displayed after the device is turned on. The screen will go off after 90 seconds.
2	ENC LED	When the device is in Encoder mode, the green ENC LED is on.
3	DEC LED	When the device is in Decoder mode, the green DEC LED is on.
4	LINK LED	When the network is connected normally, the green LINK LED flashes.
5	100M(Y)/ 1000M(G) LED	Network connection rate indicator: ▪ When the device is connected to a 100M network, the yellow indicator is on. ▪ When the device is connected to a 1000M network, the green indicator is on.
6	READY LED	▪ When the system is running normally and no fault occurs , the green LED is on. ▪ When the device is in standby mode, the green LED is on. ▪ When a fault occurs while the system is running, the green LED flashes at a frequency of 1Hz.
7	POWER LED	▪ When the device is working normally, the green POWER LED is on. ▪ When the device is in standby mode or powered off, the green POWER LED is off.
8	Power button	The power button supports power-off memory function. ① When the device is working normally, power off and power on the device again, it will enter the system directly and work normally. ② When the device is in standby mode, power off and power on the device again, it will enter the standby mode automatically. Then short press the power button to turn on the device. ③ When the device is working normally, short press the power button to view the current encoder/decoder mode and IP address on the OLED display screen; press and hold the power button for more than 2 seconds to turn off the device.

5.2 Rear Panel

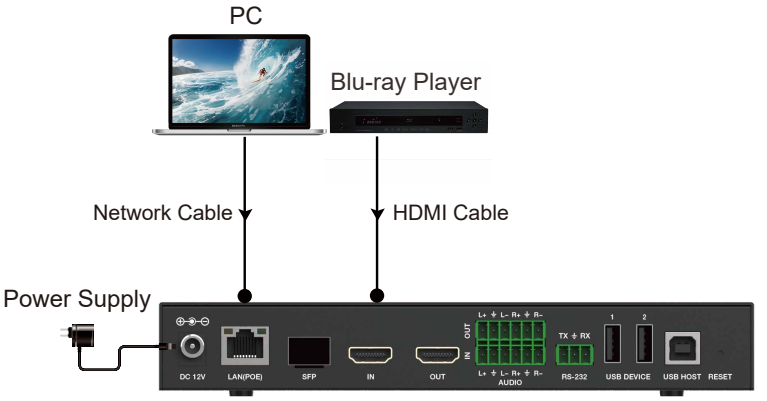


No.	Name	Function Description
1	DC 12V	DC 12V/2.5A power input port. **Note:** The device can be powered via two methods: ① Local DC 12V power supply ② PoE from Network Switch. Device acts as PD mode. When the two power supply modes are used at the same time, the local DC 12V power supply is preferred.
2	RESET button	System reset button. ▪ Long press this button for 5 seconds and reboot the device manually, the system will be restored to the factory default setting. ▪ Long press this button for 15 seconds, the software will be restored to the factory default version.
3	MODE switch	ENC/DEC mode switch, turn up to DEC mode and down to ENC mode. After switching, the device needs to be restarted for it to take effect.
4	IN port	HDMI signal input port, connected to HDMI signal source device such as PC or PS4 with HDMI cable.
5	OUT port	HDMI signal output port, connected to HDMI display device such as TV or monitor with HDMI cable.
6	USB HOST	USB Host port, connected to computer in ENC mode.
7	USB DEVICE	USB 1.1 device ports, connected to keyboard and mouse in DEC mode.
8	AUDIO IN port	Stereo balanced line input port, connected to audio source device through 6pin-3.81mm phoenix connector.
9	AUDIO OUT port	Stereo balanced line output port, connected to audio playback device through 6pin-3.81mm phoenix connector.
10	SFP port	1G fiber port, connected to Switch for audio/video transmission.
11	LAN (PoE) port	1G network port, connected to Switch for audio/video transmission. This port supports PoE power supply.
12	RS-232 port	RS-232 serial port, relay RS-232 command transmission from the Control Server.

6. VLC Pull Streaming Operation Guide

This transceiver supports playing MainStream/Substream on computer through the software such as VLC media player, the operation steps are as following.

Step 1: Connect the transceiver (in encoder mode) with a PC, HDMI source device and power supply. The connection diagram is shown as below.

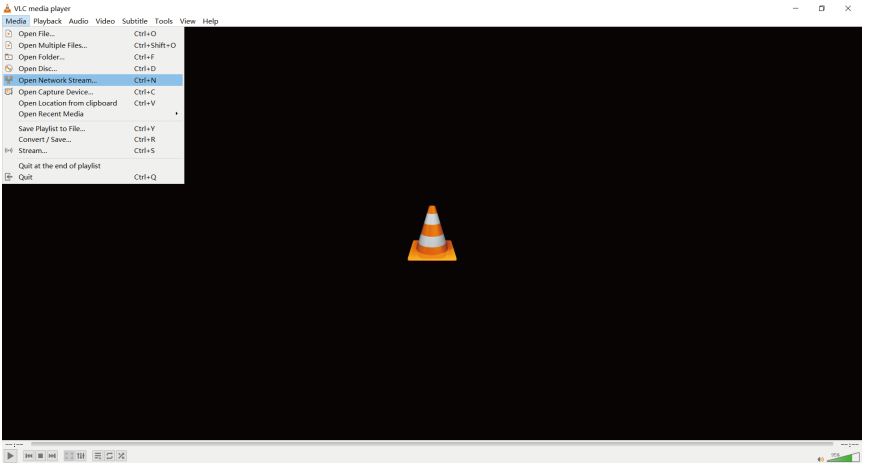


Step 2: View the IP address of the transceiver (in encoder mode) on the OLED screen on the front panel.

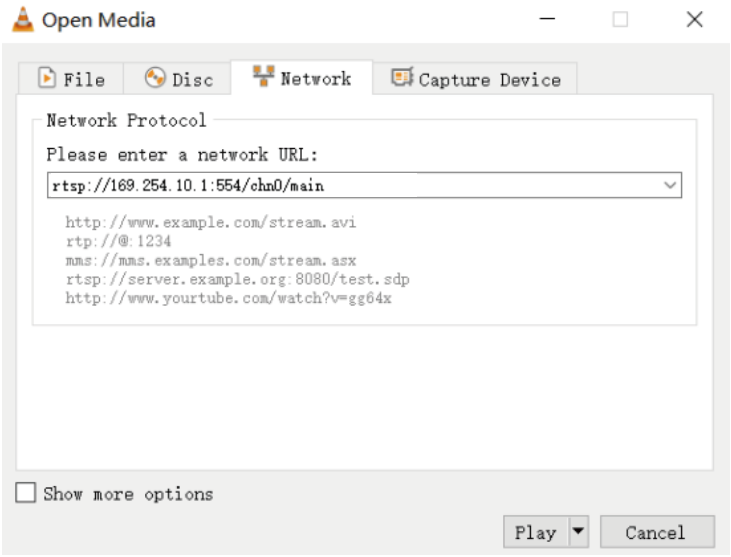
Step 3: Set the PC's IP address to be in the same network segment as the IP address of the transceiver (in Encoder mode).

Step 4: Open the VLC media player on PC. Please see the following icon.

Step 5: Click "Media > Open Network Stream"



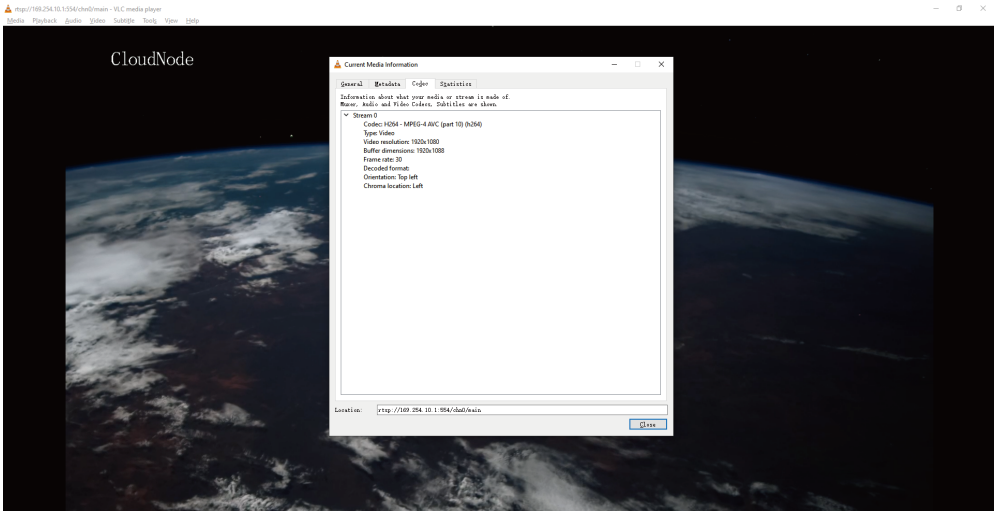
After clicking the “Open Network Stream” option, the following window will appear.



Step 6: Enter a MainStream or SubStream network URL, then click “Play” button.

Video Stream	Network URL	Resolution
MainStream	rtsp://169.254.10.1:554/chn0/main	1080P30
SubStream	rtsp://169.254.10.1:554/chn0/sub	720P30

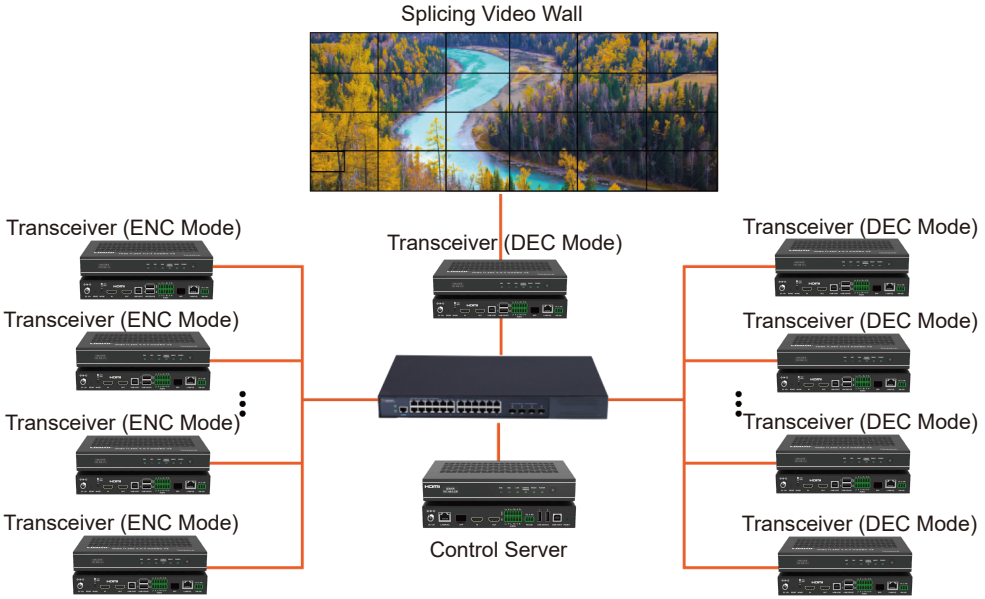
On the VLC media player, you can check the settings of Secondary Main Stream or Sub Stream. Select “Tools>Codec information”, or tap the shortcut key “Ctrl+J”, to view the Stream information (such as the current codec and resolution), as shown in the figure below.



7. Main Functions and Characteristics

7.1 More Stable Architecture for AV over IP

- H.264/265 codec
  Standard H.264/H.265 video encoding and processing technology, with high image quality, small bandwidth and low latency.
- Signal distribution, switching, extension and matrix mode
  Equipped with Gigabit Switch, unlimited device quantity.
  Arbitrary switching, extension, audio independent switching, audio and video asynchronous switching, etc.
- Seamless integration of H.264/265 encoding and decoding for security camera



7.2 High Quality Image

- 4Kx2K@60 4:4:4 image
  True 4K ultra-high image resolution, 4:4:4 encoding and decoding for true color restoration, supporting ultra high resolution point-to-point display.
- HDMI™ 2.0b
  Comply with the HDMI™ 2.0b standard, enjoy the high-definition visual feast of a large screen cinema.
- Adapt to all types of screens
  Synchronization within 100μ s., supporting all types of display terminals, including LCD screen splicing, small pitch LED, etc. Output resolution can be customized. Support output grouping management and input signal source sharing.

7.3 Seamless Switching

- Instant switching

  The image switches seamlessly and instantaneously without black screen, flash screen, jitter or tearing. The visual experience is smooth.

Traditional switching with black screen

Seamless switching

Instant switching with
smooth visual experience

7.4 Integrated Design, Excellent Performance

- Integrated design of encoder and decoder

  The integrated design of encoder and decoder, convenient for stock management, install and maintain.

- Good compatibility

  Support IPC access. Directly connect and decode all kinds of IPC such as Hikvision, Dahua and Yushi in the network to display on the wall.

  Support the PTZ control of the camera.

  It is suitable for multi-platform docking in large system, realizing unified management and scheduling of multi-system.

7.5 Video Wall

- Video wall function

  High-performance splicing processing capability, perfect splicing in both horizontal and vertical directions.

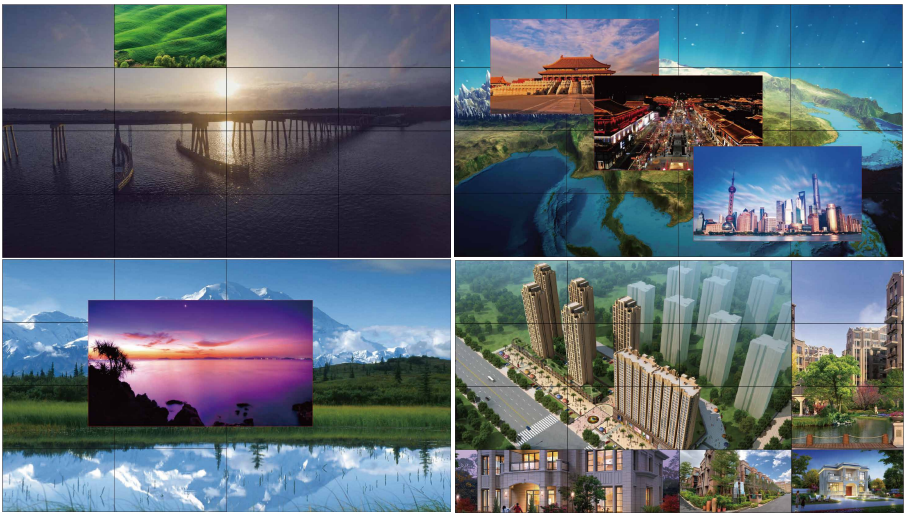
- Video signal processing

  Adopt top-notch image processing chips for acquisition, encoding, transmission, decoding and frame synchronization. Ensure that each video signal has no frame loss or lag, and can withstand the test of fast moving video.

  Support high definition background image.

7.6 Free Window Display Output

- Free output display
  A single screen can process up to 36 signals, enabling arbitrary windowing, roaming, overlaying and splicing.

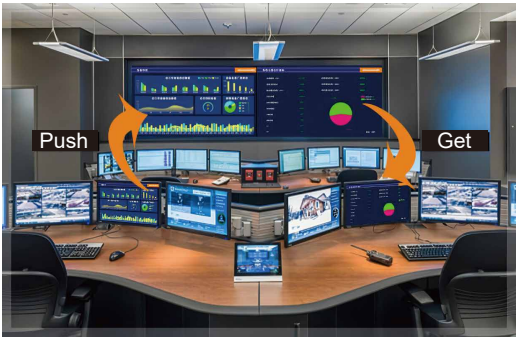


7.7 Subtitle/Banner/Logo Display Output

- Supports scrolling subtitles, input/output character overlay, LED bar screen, and scrolling subtitle display.
  You can freely define the font, color, size and position of overlay characters.

7.8 KVM Collaborative Management

- Signal push management
  KVM collaborative management can push the current signal to other personnel and large screens for quick collaborative scheduling.
- Visual takeover
  The system supports shortcut keys and OSD menu, which can quickly realize the functions of signal switching, push, control, etc., so as to achieve centralized control.
- Seat roaming
  A single display can achieve 1/4/9/16 split screen display.
- One person with multiple machines, one machine with multiple screens
  The seat operator can control multiple PCs through a set of mouse and keyboard, and a single PC can be spliced and displayed on multiple displays.
- Man-machine separation
  All PCs are centrally managed in the computer room, achieving real-time operation and remote control.

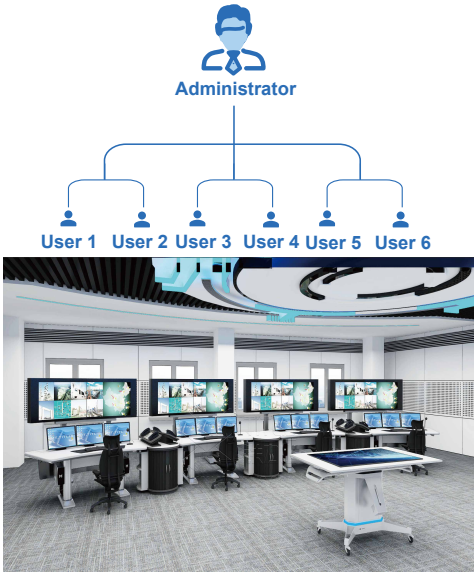


7.9 Additional Practical Functions

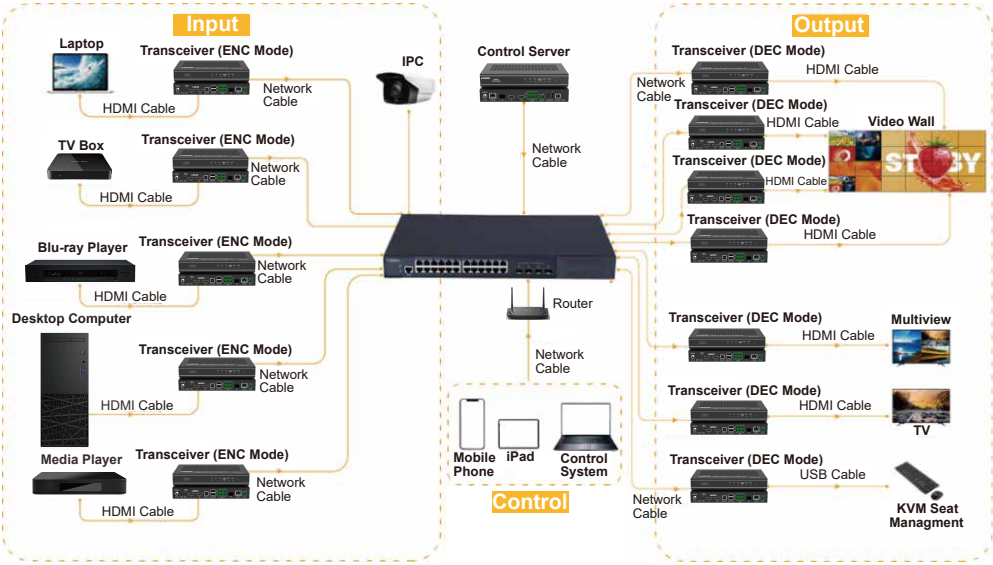
- RS-232 relay command
  Connected to PC or control system for RS-232 relay control command.
- HDMI™ loop out
  Convenient for signal cascading or connecting to local signal monitoring equipment.
- PoE power supply
  Reduce construction wiring and reduce costs.
- Audio embedding and de-embedding
  With audio embedding and de-embedding function, it is convenient for users to use audio signal processing for various purposes.

7.10 Multi-level User Rights Management

- Supports hierarchical management of user rights and simultaneous online management of multiple users
  Fully meets customers' multi-level management needs for rights and match the business management process. Through the IP distribution, systematic, scientific and rigorous right management mechanism, the hierarchical and grouped rights are defined and allocated to form a detailed right list, so that the rights and responsibilities are clearly defined.
  The account follows the person and can move according to the user's login position, ensuring that responsibility is assigned to the person.



8. Application Example



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