NEXIS

HE100PT & HE100PR

# 1080P over IP 100M/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

The AV over IP product distributes multiple HD contents to multiple HD display devices over a 100M/1G Network Switch. It offers configurable high quality, low-bandwidth H.265/H.264 configurable compression video and supports resolution up to 1920x1200@60Hz 4:4:4. Signal transmission distance can be extended up to 328ft / 100m via CAT5E/6/6A/7 cable. The product supports analog audio embedding and extracting. It also supports RS-232 control (pass-through & Guest mode) and single-machine control (without a Controller Box, matrix switching can be realized with panel buttons or RS-232 control).

# 2. Features

- ☆ HDMI™ 1.3 and HDCP 1.4 compliant
- ☆ Video resolution up to 1920x1200@60Hz 4:4:4
- ☆ Support 4.95Gbps video bandwidth
- ☆ Signal transmission distance can be extended up to 328ft / 100m via CAT5E/6/6A/7 cable
- ☆ Support point-to-point signal extension
- ☆ Support signal distribution, multicast mode, distributed matrix and video wall (up to 9 x 9) functions over a 1G Network Switch
- ☆ Intelligent video wall management makes it achievable of novel layout of wall configurations
- ☆ Support LPCM 2.0CH (32/44.1/48KHz) audio format
- ☆ Support audio embedding and extracting
- ☆ Support RS-232 control (pass-through & Guest mode)
- ☆ Support main stream and sub stream encoding modes
- ☆ Stream parameters can be configured via Web GUI or Controller Box
- ☆ Controlled via panel buttons, RS-232, TCP/IP, Web GUI and Controller Box
- ☆ Support POE function (802.3af Class 3, PD mode)
- ☆ Smart networking design for easy and flexible installation

# 3. Package Contents

| Qty | Item |
|---|---|
| 1 | 1080P over IP 100M/1GbE Encoder |
| 2 | 3-pin Phoenix Connector (3.81mm, male) |
| 4 | Machine Screw (KM3, 4mm) |
| 2 | Mounting Ear |
| 1 | 12V/1A Locking Power Adapter |
| 1 | User Manual |

or

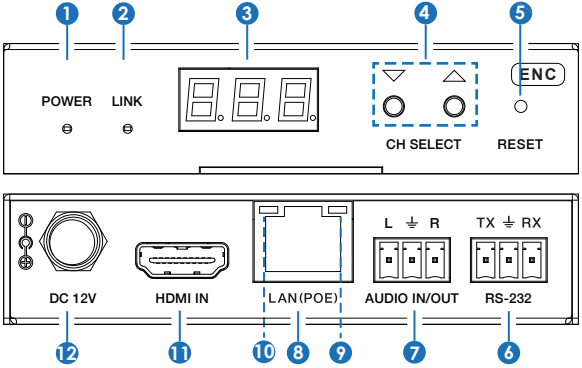
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| 2 | Mounting Ear |
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| 1 | User Manual |

# 4. Specifications

| Technical | |
|---|---|
| HDMI™ Compliance | HDMI™ 1.3 |
| HDCP Compliance | HDCP 1.4 |
| Video Bandwidth | 4.95Gbps |
| Video Compression Standard | H.265/H.264 |
| Transmission Distance | 100m (CAT5E/6/6A/7) |
| Video Resolution | Up to 1920x1200@60Hz 4:4:4 |
| Color Space | RGB 4:4:4, YCbCr 4:4:4, YCbCr 4:2:2 |
| Color Depth | Input: 8-bit, 10-bit, 12-bit (1080p@60Hz)<br>Output: 8-bit |
| Audio Formats | LPCM 2.0CH (32/44.1/48KHz) |
| **Connection** | |
| Encoder | 1x HDMI™ IN [Type A, 19-pin female]<br>1x LAN [RJ45 connector, POE]<br>1x AUDIO IN/OUT [3-pin phoenix connector]<br>1x RS-232 [3-pin phoenix connector] |
| Decoder | 1x HDMI™ OUT [Type A, 19-pin female]<br>1x LAN [RJ45 connector, POE]<br>1x AUDIO OUT [3-pin phoenix connector]<br>1x RS-232 [3-pin phoenix connector] |
| **Mechanical** | |
| Housing | Metal enclosure |
| Color | Black |
| Dimensions | Encoder / Decoder:<br>120mm [W] x 95mm [D] x 21.5mm [H] |
| Weight | Encoder: 295g, Decoder: 295g |
| Power Supply | Input: AC100 - 240V 50/60Hz,<br>Output: DC 12V/1A |
| Power Consumption | Encoder: 2.88W, Decoder: 2.88W |
| 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) |

# 5. Operation Controls and Functions

## 5.1 Encoder Panel




| No. | Name | Function Description |
|---|---|---|
| 1 | POWER LED (Red) | The LED flashes at 1Hz during the system startup, and the LED is always on after the startup is complete. |
| 2 | LINK LED (Green) | Network connection status LED.<br>▪ Light on: Network is connected well, and there is compatible signal (the resolution is less than 1920*1200, and the frame rate is less than or equal to 60) access.<br>▪ Light flashes at 1Hz: Network is connected well, but there is not video input.<br>▪ Light flashes at 10Hz: Network is connected well, but the accessed signal is incompatible (resolution is greater than 1920*1200, or the frame rate is greater than 60).<br>▪ Light off: Network is not connected. |
| 3 | LED screen | Displays IP address, ID etc information.<br>*Note: When clicking the SHOW ME option of the corresponding machine on the Controller, the LED screen of the corresponding machine will flash "SHO", so that you can find the corresponding machine in the system.* |

| | | |
|---|---|---|
| 4 | CH SELECT | Used to set Encoder ID and other settings. |
| 5 | RESET | System reset button. Press and hold this button for 5 seconds, the system will restart and restore factory Settings. |
| 6 | RS-232 | RS-232 serial port, supporting signal pass-through and local serial port control. |
| 7 | AUDIO IN/OUT | AUDIO IN: Analog stereo audio input port. Connect to an audio input source device. |
| | | AUDIO OUT: Analog stereo audio output port. Connect to an audio output device. |
| 8 | LAN (POE) | 100M/1G Network port. Connect to a Switch/Router/Hub for data transmission or POE function. |
| 9 | Link Signal Indicator lamp (Green) | ▪ Illuminating: The network cable is connected normally.<br>▪ Dark: The network cable is not connected well. |
| 10 | Data Signal Indicator lamp (Yellow) | ▪ Flashing: There is data transmission.<br>▪ Dark: There is no data transmission. |
| 11 | HDMI IN | HDMI input port, connect to an HDMI signal source device such as DVD or Set-top box with an HDMI cable. |
| 12 | DC 12V | The device can be powered via two methods:<br>▪ Local DC 12V/1A power supply;<br>▪ POE from Network Switch. Device acts as PD mode.<br>When the Switch supports POE function, DC power supply is not needed. |

*Note:*
*Encoder can choose HDMI audio input or external audio embedding. It can be set through the CH SELECT buttons on the front panel of the Encoder. (The default setting is HDMI audio input.)*
*If it is set to HDMI audio input, the L/R OUT output of Encoder is HDMI audio loop out.*
*If it is set to external audio embedding, the L/R IN input of Encoder is the input of external audio embedding, and the L/R OUT output is the external audio embedding loop out.*

**Description of the LED screen and CH SELECT buttons (For the Encoder).**

1, After the system is powered on, the Encoder's LED screen will show the ENC ID (000 by default if not set).
2, Press and hold the UP button for 5 seconds, the Encoder's LED screen will show in sequence "IP:", "xxx", "xxx", "xxx", "xxx", which is the IP address of the Encoder.
3, Press and hold UP + DOWN buttons at the same time for 5 seconds, then release to enter the "Configuration" mode with "CFN" displaying on the LED screen.

4, For Channel ID settings, press the UP or DOWN button to display the current ID number (e.g. 001) on the LED screen. Press and hold UP + DOWN buttons for 5 seconds, then release to enter the “ID Settings” mode. The ID number (e.g. 001) on the LED screen will flash at 1Hz, then press the UP or DOWN button to select the Channel ID you desired, then press and hold UP + DOWN buttons for 5 seconds to confirm the setting and stop flashing.

5, For EDID ID settings, press the UP or DOWN button until the LED screen shows “E00” (in which “E” refers to EDID, “00” to EDID ID). Press and hold UP + DOWN buttons for 5 seconds, then release to enter the “EDID Settings” mode. The EDID ID number (e.g. E01) on the LED screen will flash at 1Hz, then press the UP or DOWN button to select the EDID ID you desired, then press and hold UP + DOWN buttons for 5 seconds to confirm the setting and stop flashing.

The corresponding EDID ID is as follows:

| EDID ID | EDID Description |
|---|---|
| 00 | H1080P60_2CH |
| 01 | H720P60_2CH |
| 02 | D1024P60 |
| 03 | D1080P60 |
| 04 | D1200P60 |
| 05 | H1200P60_2CH |
| 06 | COPY |
| 07 | USER1 |
| 08 | USER2 |

*Notes:*

*(1) H refers to HDMI; D refers to DVI. (The default EDID of 1080p60 will be used if you have not previously copied the EDID to ID 06 or downloaded EDID to ID 07/08 on the controller box web page.)*

*(2) EDID ID 06/07/08 is not available without Controller Box.*

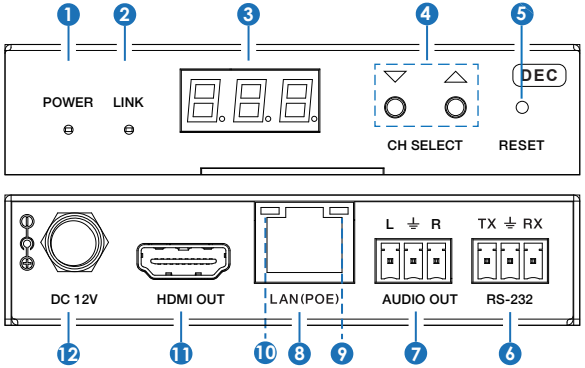
6, For audio options settings, press the UP or DOWN button until the LED screen shows “AHE” (in which “A” refers to Audio and “HE” to HDMI EMB). Press and hold UP + DOWN buttons for 5 seconds, then release to enter the “AUDIO Settings” mode. The audio option (AHE or AEI) on the LED screen will flash at 1Hz, then press the UP or DOWN button to select the AUDIO option, then press and hold UP + DOWN buttons for 5 seconds to confirm the setting and stop flashing.

The corresponding audio options are as follows:

AHE: Use HDMI Audio

AEI: Use external Audio In

## 5.2 Decoder Panel




| No. | Name | Function Description |
|---|---|---|
| 1 | POWER LED (Red) | The LED flashes at 1Hz during the system startup, and the LED is always on after the startup is complete. |
| 2 | LINK LED (Green) | Network connection status LED.<br>▪ Light on: Network is connected well, and there is video data.<br>▪ Light flashes: Network is connected well, but there is no video data.<br>▪ Light off: Network is not connected. |
| 3 | LED screen | Displays IP address, ID etc information.<br>*Note: When clicking the SHOW ME option of the corresponding machine on the Controller, the LED screen of the corresponding machine will flash "SHO", so that you can find the corresponding machine in the system.* |
| 4 | CH SELECT | Used to set Decoder ID and other settings. |
| 5 | RESET | System seset button. Press and hold this button for 5 seconds, the system will restart and restore factory Settings. |
| 6 | RS-232 | RS-232 serial port, supporting signal pass-through and local serial port control. |
| 7 | AUDIO OUT | Analog stereo audio output port. Connect to an amplifier or loudspeaker through a 3-pin phoenix connector. It follows the audio output of the Encoder. |

| | | |
|---|---|---|
| 8 | LAN (POE) | 100M/1G Network port. Connect to a Switch/Router/Hub for data transmission or POE function. |
| 9 | Link Signal Indicator lamp (Green) | ▪ Illuminating: The network cable is connected normally.<br>▪ Dark: The network cable is not connected well. |
| 10 | Data Signal Indicator lamp (Yellow) | ▪ Flashing: There is data transmission.<br>▪ Dark: There is no data transmission. |
| 11 | HDMI OUT | HDMI output port, connect to an HDMI display device such as TV or monitor. |
| 12 | DC 12V | The device can be powered via two methods:<br>▪ Local DC 12V/1A power supply;<br>▪ POE from Network Switch. Device acts as PD mode. When the Switch supports POE function, DC power supply is not needed. |

**Description of the LED screen and CH SELECT buttons (For the Decoder).**

1, After the system is powered on, the Decoder's LED screen will show the ID of the connected Encoder (000 by default if not set).

2, Press and hold the UP button for 5 seconds, the Decoder's LED screen will show in sequence "IP:", "xxx", "xxx", "xxx", "xxx", which is the IP address of the Decoder.

3, Press and hold UP + DOWN buttons at the same time for 5 seconds, then release to enter the "Configuration" mode with "CFN" displaying on the LED screen.

4, For Channel ID settings, press the UP or DOWN button to display the current ID number (e.g. 001) on the LED screen. Press and hold UP + DOWN buttons for 5 seconds, then release to enter the "ID Settings" mode. The ID number (e.g. 001) on the LED screen will flash at 1Hz, then press the UP or DOWN button to select the Channel ID you desired, then press and hold UP + DOWN buttons for 5 seconds to confirm the setting and stop flashing.

5, For output resolution settings, press the UP or DOWN button until the LED screen shows "S00" (in which "S" refers to Scaler and "00" to resolution ID), then press and hold UP + DOWN buttons for 5 seconds, then release to enter the "Output Resolution Settings" mode. The Resolution ID number (e.g. S01) on the LED screen will flash at 1Hz, then press the UP or DOWN button to select the Resolution ID you desired, then press and hold UP + DOWN buttons for 5 seconds to confirm the setting and stop flashing.

The corresponding output resolution ID is as follows:

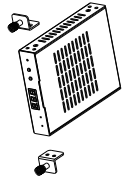
| Resolution ID | Resolution Description |
|---|---|
| 00 | Pass Through (default) |
| 01 | 1080P60 |
| 02 | 1080P50 |
| 03 | 1080P30 |
| 04 | 1080P25 |
| 05 | 1080P24 |
| 06 | 720P60 |
| 07 | 720P50 |
| 08 | 576P50 |
| 09 | 480P60 |
| 10 | 640X480P60 |
| 11 | 800X600P60 |
| 12 | 1024X768P60 |
| 13 | 1280X800P60 |
| 14 | 1280X1024P60 |
| 15 | 1366X768P60 |
| 16 | 1440X900P60 |
| 17 | 1600X1200P60 |
| 18 | 1680X1050P60 |
| 19 | 1920X1200P60 |

# 6. Rack Mounting Instruction

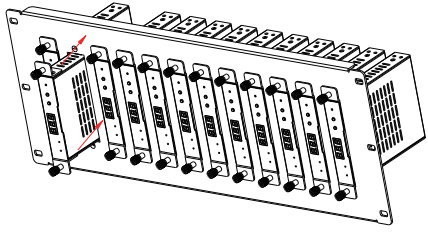
## 6.1 4U Rack Mounting

This product can be mounted in a standard 4U rack (Please contact your supplier for 4U rack sale). The mounting steps are as follows:

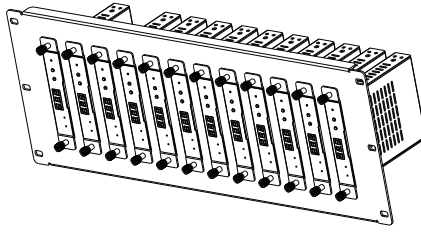
**Step 1:** Use included screws to fix two mounting ears on the product, as shown in the figure below:



**Step 2:** Insert the product with mounting ears into a 4U rack (up to 12 units can be installed vertically), as shown in the figure below:



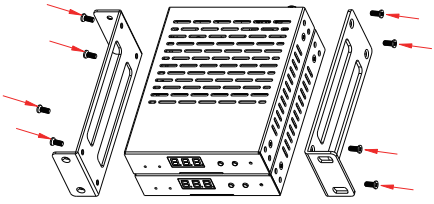
**Step 3:** Use screws to fix mounting ears on the rack to complete the mounting, as shown in the figure below:



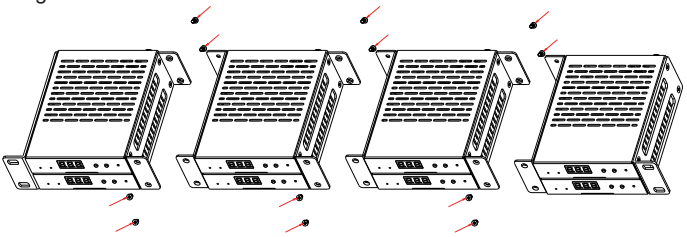
### 6.2 1U Rack Mounting

This product also can be mounted in a standard 1U rack (up to 8 units can be installed horizontally). The mounting steps are as follows:

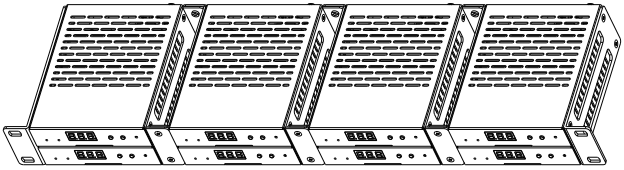
**Step 1:** Stack two products on top of each other, then use included screws to fix two 1U rack panels on the products, as shown in the figure below:



**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 eight products are mounted in a 1U rack, as shown in the figure below:

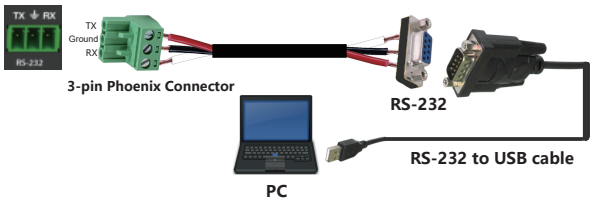


# 7. Encoder and Decoder Matching Settings

When multiple Encoders and Decoders are in the system without a Controller Box, it is necessary to match them well firstly. You can match all Encoders and Decoders in following two methods.

**Method 1:** Use the CH SELECT buttons on the front panel of the Encoder/Decoder.
According to the methods mentioned in Chapter 5, set the ID of Encoder, then set the ID of Decoder, finally set the Encoder ID from which to subscribe the stream. Match all Encoders and Decoders in the same way.

**Method 2:** Use the RS-232 serial port command control.
Connect the RS-232 port of Encoder/Decoder to a PC or control system, as shown in the figure below. Then use a Serial Command tool on PC to send the RS-232 command code: “!OUT xxx FR yyy\r\n”. The function of this command is to connect the Decoder (ID:xxx) to the Encoder (ID:yyy). Match all Encoders and Decoders in the same way.

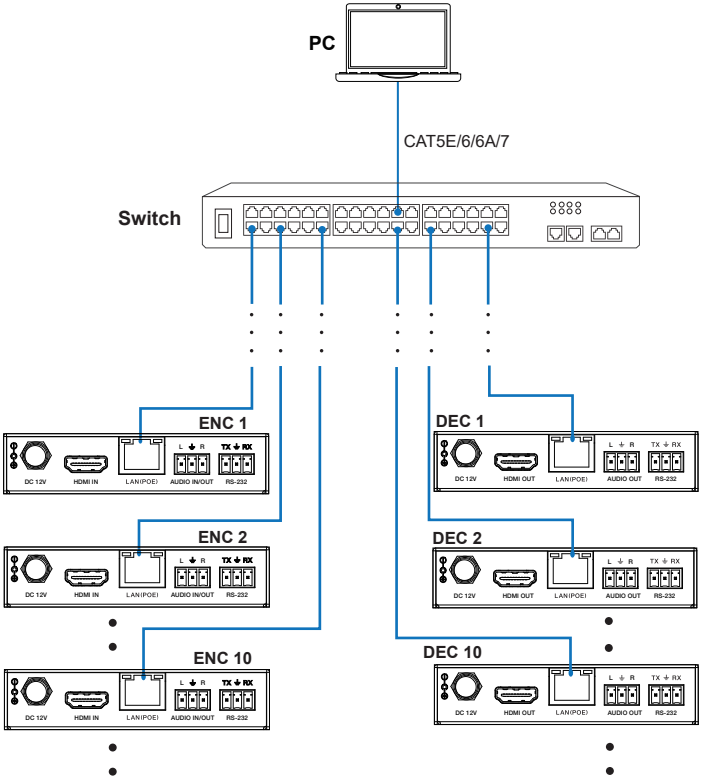


# 8. Web GUI Operation Guide

You can use the built-in Web GUI to configure all products through a Switch. The operation method is shown as below.

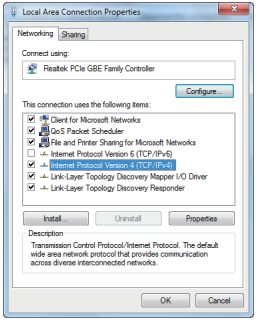
**Step 1:** Match all Encoders and Decoders as described in Chapter 7.

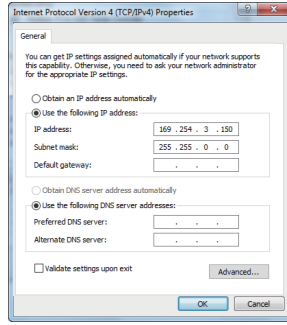
**Step 2:** Connect the PC and IP products you need to configure to a Switch. The connection diagram is shown as below.



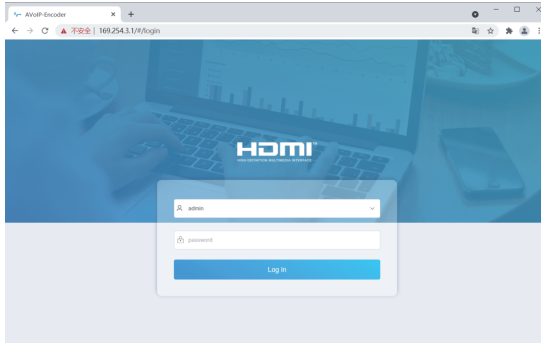
**Step 3:** Press and hold the (CH SELECT) UP button on the front panel of the Encoder/Decoder for 5 seconds to check the IP address. (Please refer to Chapter 5 for details.)

**Step 4:** Set the PC's IP address to be in the same network segment with the Encoder/Decoder, for instance, set the IP address to be 169.254.3.150 and Subnet mask to be 255.255.0.0.




**Step 5:** Input the IP address of the Encoder/Decoder into the browser on PC to enter the Web GUI login interface.

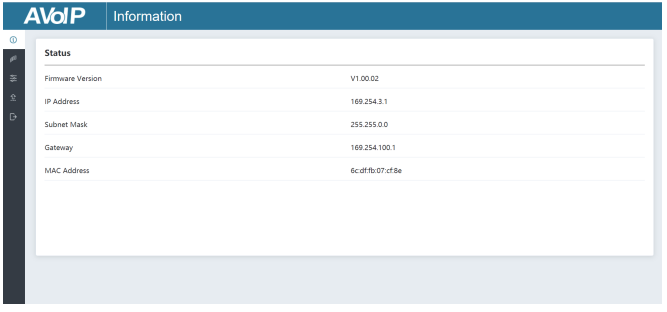



**Step 6:** Input the default User "admin" and the default Password "admin", and then click "Log In" to enter the Web GUI interface.

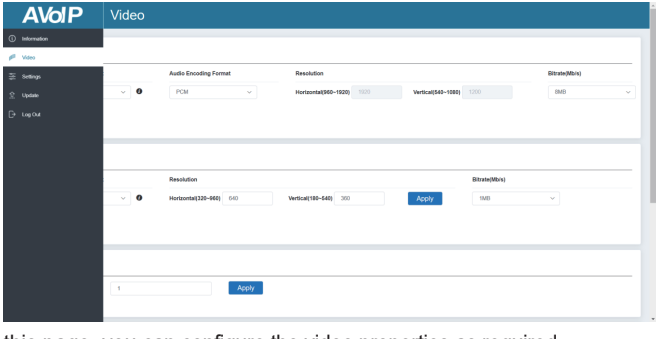
The Web GUI function pages are shown as below:

## ■ Device Information Page

The Status page provides basic information about the Encoder/Decoder, such as Firmware Version, IP Address, Subnet Mask, Gateway and MAC Address.



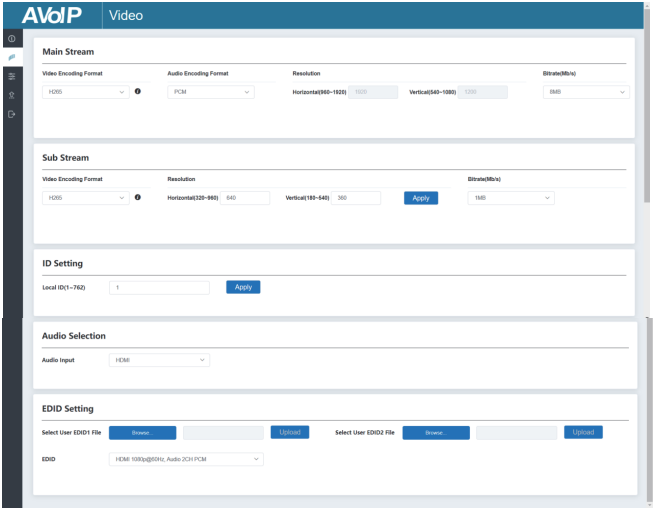

## ■ Video Configuration Page




On this page, you can configure the video properties as required.

**Encoder Video Configuration**

Encoder video configuration page includes Main Stream, Sub Stream, ID Setting, Audio Selection and EDID Setting.



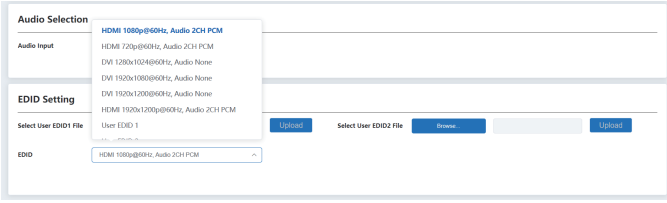

**Main Stream:** You can configure Video Encoding Format, Audio Encoding Format and Bitrate. Video Encoding Format supports H.264 and H.265 (H.265 by default). Audio Encoding Format supports PCM and AAC (PCM by default). Encoding Resolution cannot be set, it follows the input resolution. The default Bitrate is 8Mb/s.

**Sub Stream:** You can configure Video Encoding Format, Resolution and Bitrate. Video Encoding Format supports H.264 and H.265 (H.265 by default). The default Encoding Resolution is 640*360. The default Bitrate is 1Mb/s.

**ID Setting:** You can configure the ID of the Encoder. (After setting the ID, the IP will change. You need to press and hold the (CH SELECT) UP button on the front panel of the Encoder for 5 seconds to check the IP address, and then re-enter the new IP address on the web page to continue setting).

**Audio Selection:** You can configure the Audio Input (HDMI/Anologue).

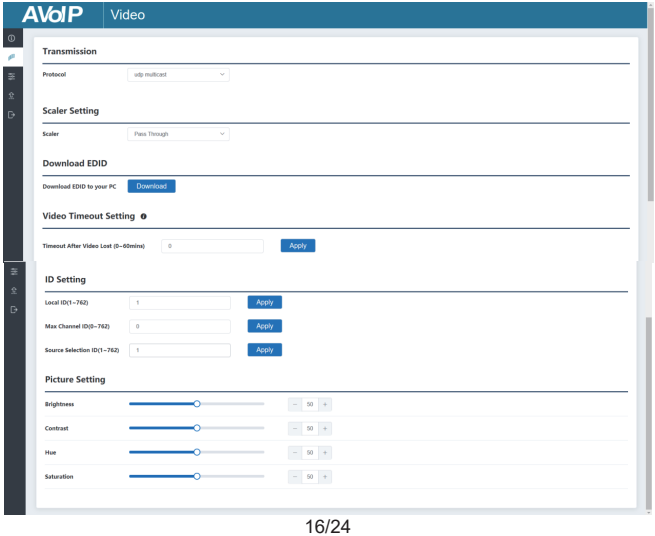
**EDID Setting:** You can choose an EDID option from the drop-down list as shown in the below figure.




User EDID 1 and User EDID 2 can be uploaded in Select User EDID1 File and Select User EDID2 File, and the content of the uploaded binary file is EDID. (This file can be downloaded from the Download EDID of the Decoder Video page.)

**Decoder Video Configuration**

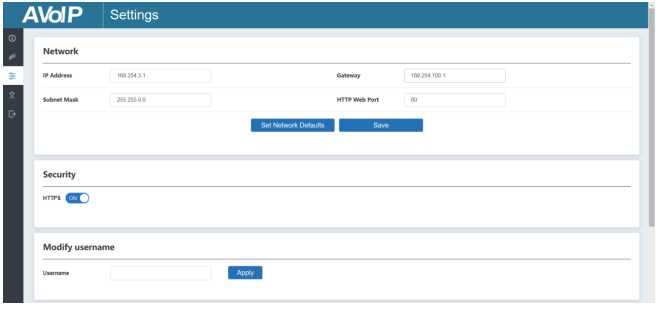
Decoder video configuration page includes Trasmission Protocol, Scale Setting, Download EDID, Video Timeout Setting, ID Setting and Picture Setting.

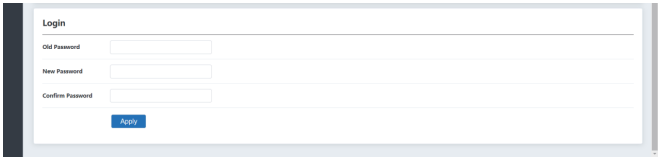


**Transmission Protocol:** You can select “udp unicast” or “udp multicast” (udp multicast by default).
**Scaler Setting:** You can set the output resolution (Pass Through by default).
**Download EDID:** You can download the EDID binary file of the display device connected to the Decoder. The EDID file can be used as the User EDID file to be uploaded to the Encoder.
**Video Timeout Setting:** You can set the timeout to turn off the video output when no input video signal is detected. 0 means never close.
**ID Setting:**
**Local ID:** You can set the ID of the Decoder. (After setting the ID, the IP will change. You need to press and hold the (CH SELECT) UP button on the front panel of the Decoder for 5 seconds to check the IP address, and then re-enter the new IP address on the web page to continue setting).
**Max Channel ID:** You can set the maximum range of Source Selection ID that can be set. When it is set to 0, there is no limit to the setting range of Source Selection ID.
**Source Selection ID:** You can select the ID of the Encoder to be the input source.
**Picture Setting:** You can configure the picture parameters (Brightness, Contrast, Hue and Saturation).

### ■ Settings Page

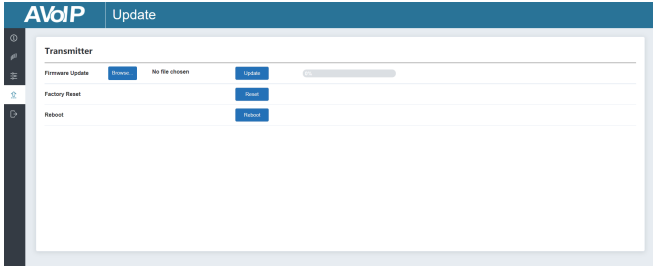
On this page, you can set Network settings, configure Security Module, modify username and Login Password as required.





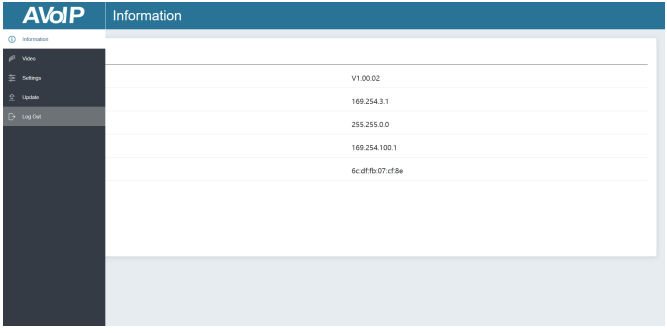

*Notes:*
*(1) The Network Settings can be set only when the Mode button is set to Static.*
*(2) All changes will take effect by clicking "Save" below.*
*(3) After any changes to the Network Settings, username or Login Password, it will redirect to the Web browser home page or the Web GUI login interface. You need to log in the Web GUI again with the new settings.*

## ■ Update Page




Click "Browse.." to import the upgrade file and click "Update" to start upgrade. There will be a progress bar prompt during the upgrade process. When the progress bar reaches 100%, it indicates the upgrade is successful, and the device will be restarted automatically.
Clicking "Reset" can reset the device to factory default settings.
Clicking "Reboot" can reboot the device.

■ **Log Out Page**

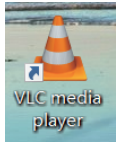



Click “Log Out” on the left, the Web GUI will exit and skip to the login interface automatically.

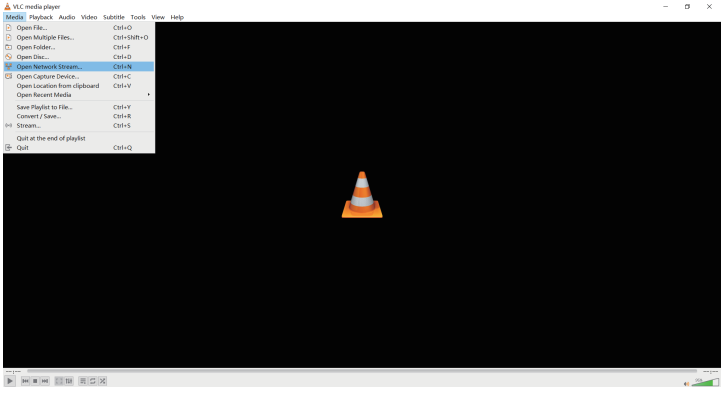
## 9. VLC Pull Streaming Operation Guide

This product supports playing MainStream/Substream on computer through the corresponding software such as VLC media player, simultaneously you can access the build-in Web GUI to configure the MainStream/Substream. After successfully logging into the Web GUI following the instructions in the previous chapter, proceed with the VLC pull streaming operation by following the steps below.

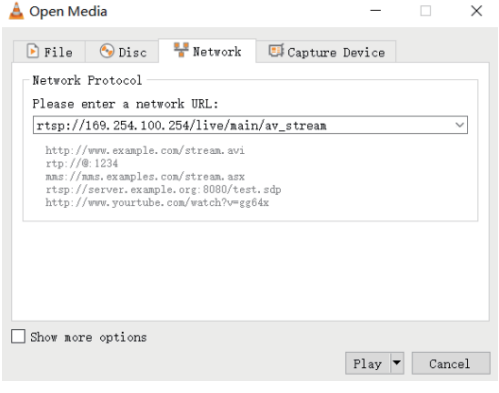
**Step 1:** Open the VLC media player on PC. Please see the following icon.



**Step 2:** Click “Media > Open Network Stream”




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

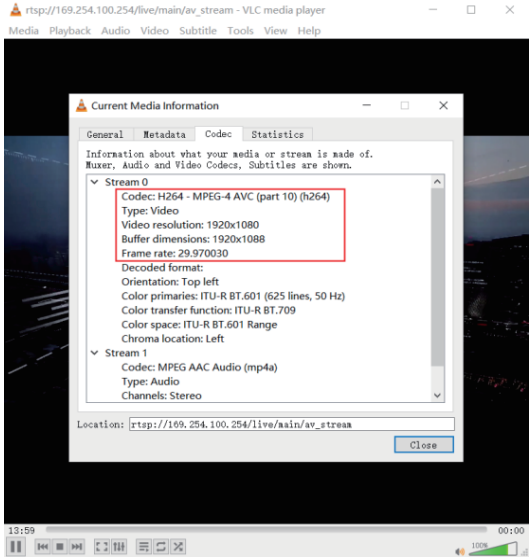



**Step 3:** Enter a MainStream or SubStream network URL, then click “**Play**” button.

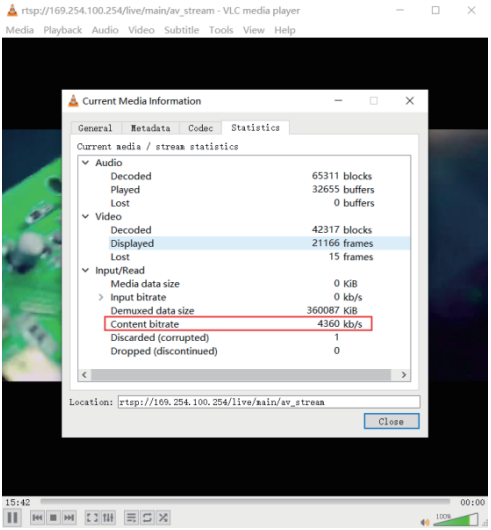
| Video Stream | Network URL |
|---|---|
| **MainStream** | rtsp://169.254.100.254/live/main/av_stream |
| **SubStream** | rtsp://169.254.100.254/live/sub/av_stream. |

*Note: The default IP address of device is 169.254.100.254. If there is a router in the system, you can use the front panel buttons and LED screen to check the current IP address of the device, and use the current IP address as the network URL.*

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 “8. Web GUI Operation Guide” 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 the current Bitrate, as shown in the figure below.




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

## 10. 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. Support multicast, and need to enable the multicast function.
4. Support IGMP snooping, and need to enable the IGMP snooping function.
5. Support filter/drop unregistered Multicast traffic, and need to enable the function.

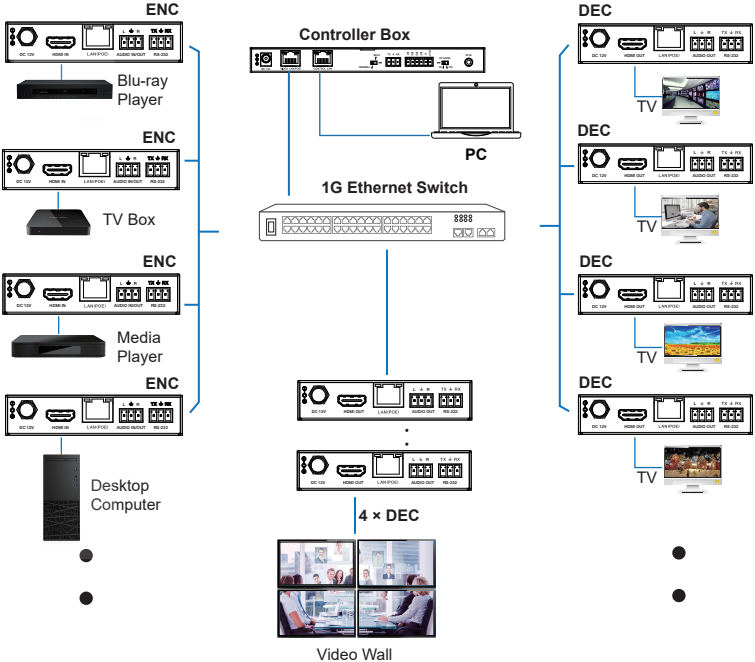
The following Switch models are highly recommended.

| Manufacturer | Model Number |
|---|---|
| HUAWEI | S5720S-28X-PWR-LI-AC |
| NETGEAR | S3300 |

## 11. 1080P over IP System Control

This product also can be controlled by Controller Box or third-party controller. For details of 1080P over IP system control, please refer to 1080P over IP Controller Box user manual.

## 12. Application Example



*Notes:*

*(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.*

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