

SCIENCE IMAGE[®]

Make better



USER MANUAL

NDI STUDIO 4K SH / S / H

SCIENCE IMAGE[®]

READING BEFORE USE

If you find that some functions are unavailable in future use, you need to check the following to find out whether it is caused by improper operation or settings:

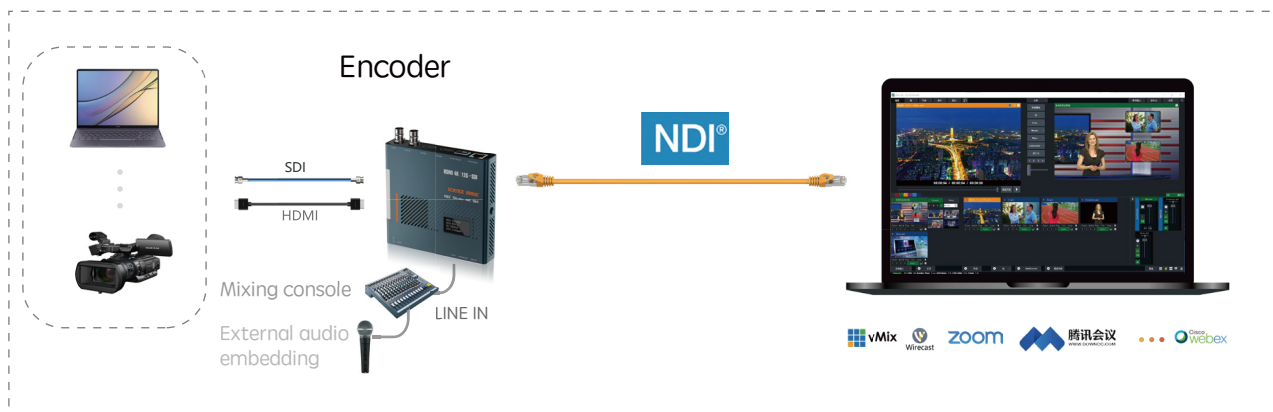
- 1 Please use the officially designated adapter.
- 2 If you cannot log in to the WebUI, please check whether the device's IP is in the same network segment as the computer's IP address, and whether the device's IP address conflicts with the IP addresses of other devices in the network segment.
- 3 If the IP address of the device is found to be "192.168.8.8", please log in to the WebUI to set the IP address mode in the I network settings to manual and fill in the IP address, subnet mask and gateway you need.
- 4 If a blank screen appears in the decoding, please check the decoding settings in the WebUI, and whether the NDI source is selected, please try to click Refresh the list and select again.
- 5 If the login fails due to the upgrade, please clear the browser cache and refresh the page and log in again.
- 6 If the video freezes during use, please check whether the CPU temperature of the device is too high, generally should not exceed 70°C; check whether the device is connected to a Gigabit Ethernet port; or try to close the multicast mode in the WebUI.
- 7 If the video output from the device to the display device has abnormal colors, sounds, or images, please try to restart the device in the Web UI system
- 8 If you find that the video stream is not detected in NDI Studio Monitor, please check whether the encoder stream name conflicts within the network segment, whether the NDI group or discovery server settings have been set to the NDI Access Manager on the device or PC, and try to change the settings back. , Close
- 9 NDI Studio Monitor and reopen the search.

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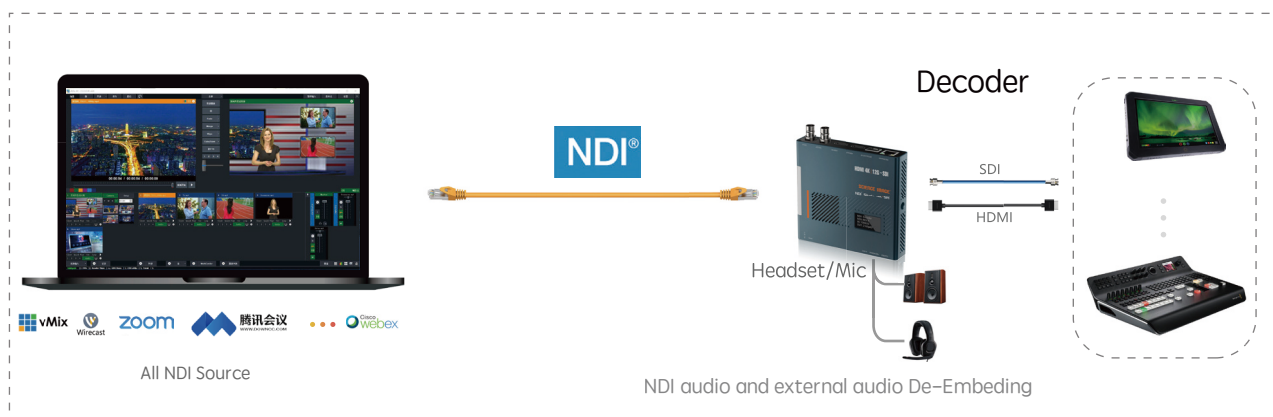
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1. NDI Studio 4K Application Topology

NDI Encoder Application Topology

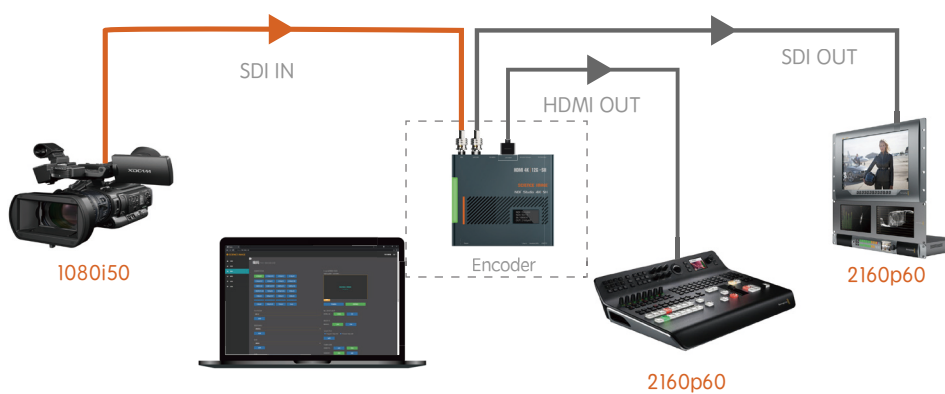


NDI Decoder Application Topology

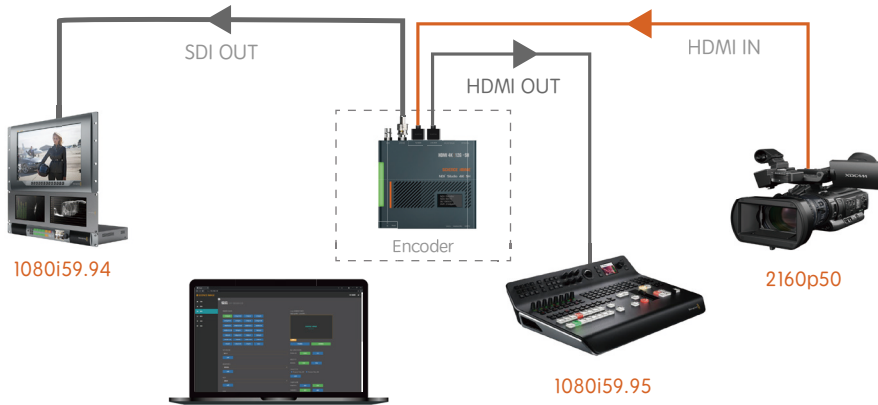


UpDown conversion Application Topology

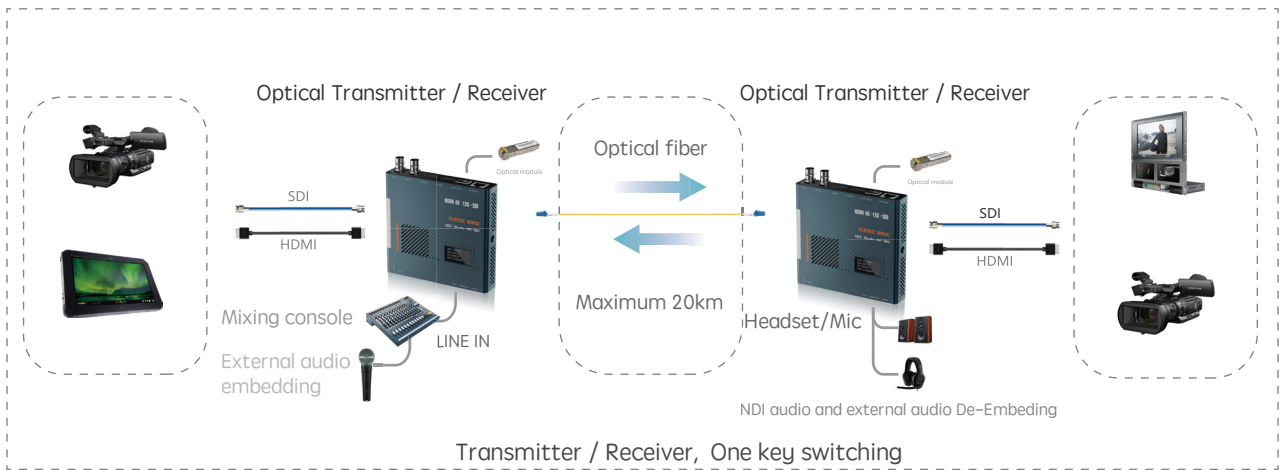
SDI to HDMI Up conversion



HDMI to SDI Down conversion



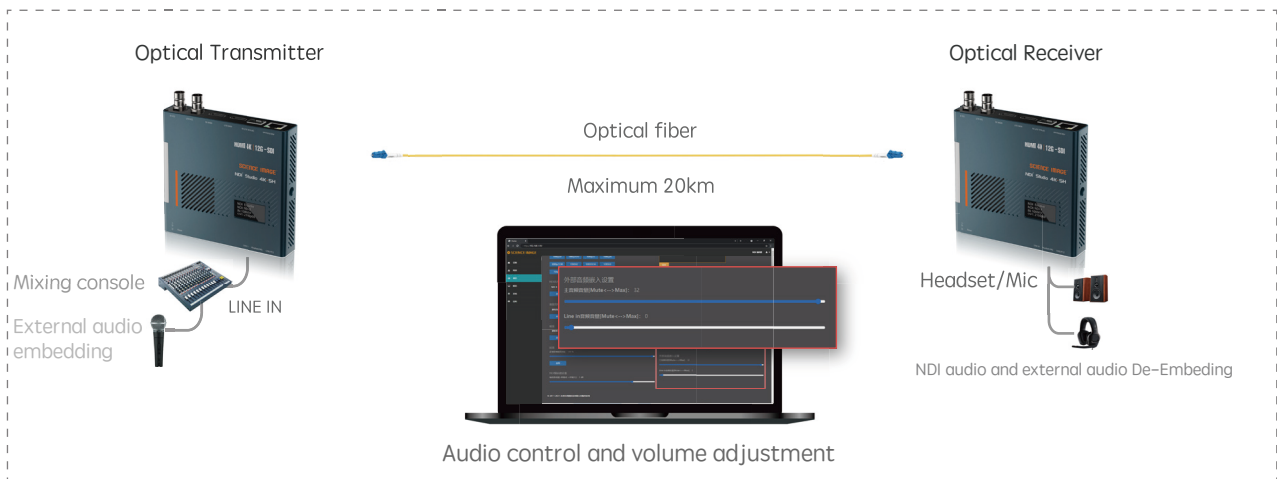
Optical Transceiver Application Topology



NDI Encoding / Decoding + UpDown conversion Application Topology



Audio Embedding/De-Embedding Application Topology



2. NDI Studio 4K interface and indicator introduction



- 1 SDI input:SDI signal input interface (Studio 4K-H does not have this interface)
- 2 SDI output:Encoder is looped out picture, decoder is decoded output picture (Studio 4K-H does not have this interface)
- 3 HDMI input:HDMI input signal (Studio 4K-S does not have this interface)
- 4 HDMI output:The picture is looped out in the encoding state,and the output picture is decoded in the decoding state(Studio 4K-S does not have this interface)
- 5 Optical input/output:SMPTE optical fiber SFP socket, used to connect different types of Gigabit/10 Gigabit/12G-SDI optical fiber modules
- 6 Network port/POE:Network connection / PoE (Power Over Ethernet) switch can be connected to the LAN and powered on at the same time
- 7 Tally indicator:Real-time display of the two states of the current broadcast video: green/pre-monitor, red/program
- 8 12V DC-IN:12V DC power input
- 9 Reset:Long press for 5 seconds to restore factory settings
- 10 LINE IN:3.5mm audio input port for external analog audio embedding
- 11 Headset or Mic:Headphone jack, adopts American standard; at the same time can be used as Mic
- 12 USB/PTZ:support all-round (up and down, left and right) movement of the pan/tilt, zoom lens, zoom control camera connection
- 13 1 / 4 inch screw hole:Fixed connection hole with imaging equipment
- 14 Power LED

3. Three ways to power on and connect to LAN

For NDI Studio 4K series, you can choose two power supply modes: DC input and POE

1. DC-12V Input

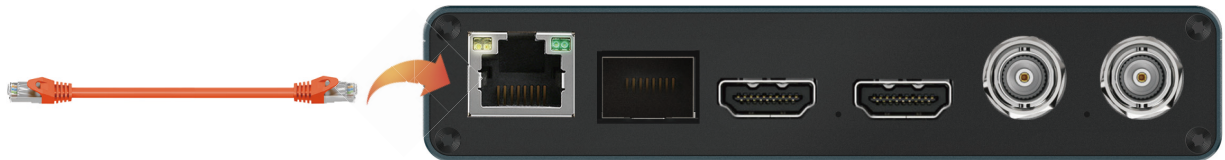
Power on with the SCIENCE IMAGE original standard 12V power supply



Always use genuine SCIENCE IMAGE power adapters, 3rd party products perhaps can cause permanent damage.

2. POE Power supplier

Power up through the network cable connecting the POE (power over Ethernet) with Gigabit network switch

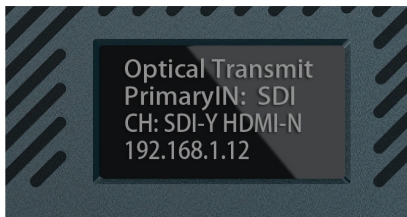


PoE Power over Ethernet(802.11af/at) support

Always use a certified 802.11 af/at with minimum 10W port power capacity and it's a gigabit network switch.

After startup, you will find that the character SCIENCE IMAGE Tech begins to appear on the OLED screen, and the power light on the right starts to light up.

At this time, the device is powered up successfully.

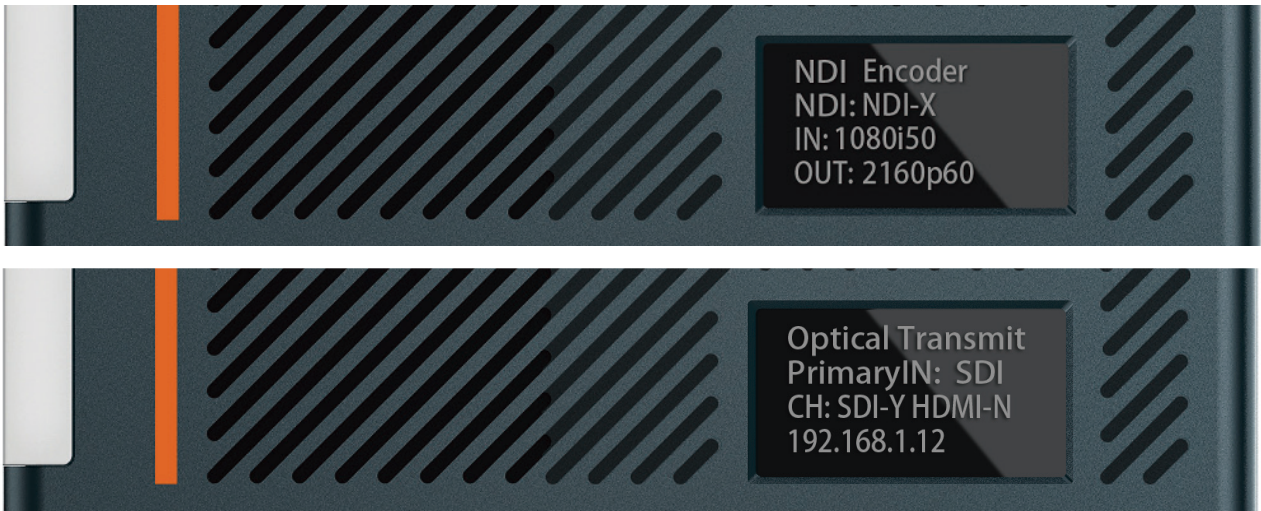


4. OLED screen display instructions

In the coding status, the current status and parameters will be displayed alternately on lines 2, 3 and 4 of the screen



It takes about 30 seconds from power on to NDI working normally. It takes time for linux system to start and please wait patiently.



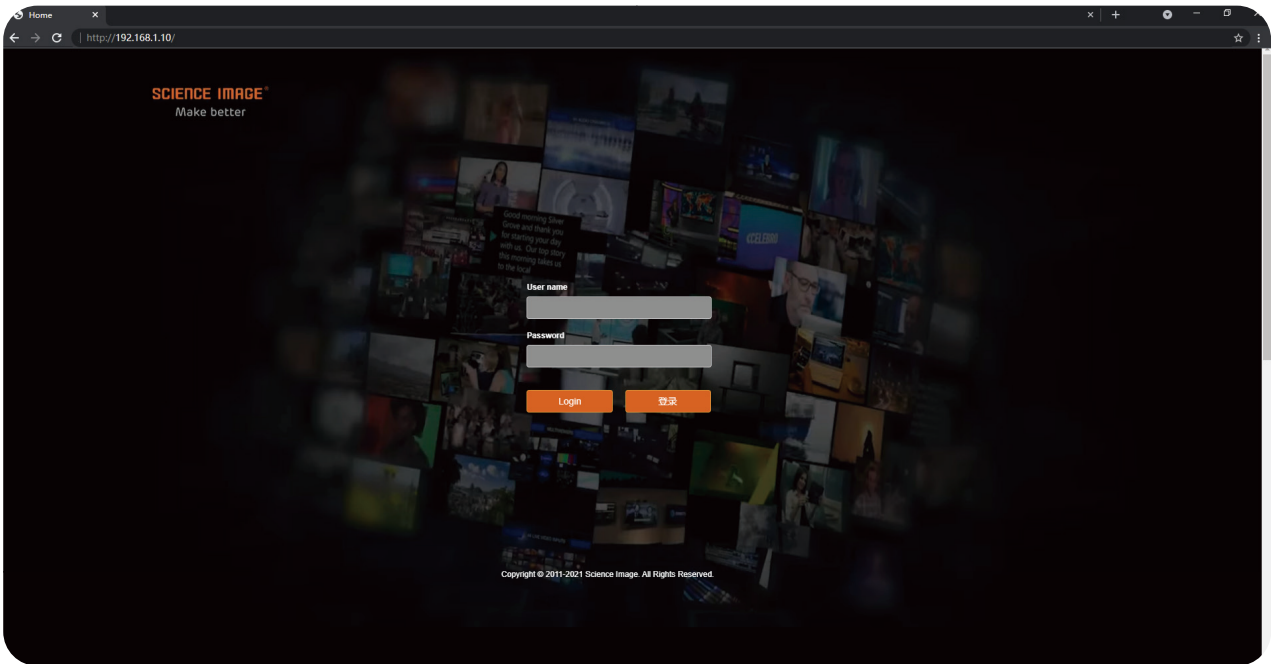
- First Line---NDI Encoder / NDI Decoder/Optical Transmit
Displays the current NDI ® Studio 4K working modes: Encoding or Decoding.
The receiver or sender of the optical transceiver can only be used in coded mode.
- Second Line---NDI Source Name / Primary HDMI/SDI Selection
In encoding mode, will displayed NDI stream name such as "NDI-X" that user could define this stream name on Web UI
Displays the interface selected by the user's primary input, such as SDI or HDMI
In decoding mode, will display NDI source which was decoding on line, alternatively display ***** if there is no NDI source was selected.
- Third Line--- IN: 1080I50 / CH: SDI-Y HDMI-N
Displays the video format of the current input source of the device (when the device serves as an optical receiver, the video format of the optical input is displayed) and whether the SDI and HDMI inputs are detected (Y indicates that there is an input and N indicates that there is no input).
- Fourth Line---OUT: 2160p60 / 192.168.3.166
Display the output format after Up/Down conversion selected by the user
Displays the current IP address of the device

! If the NDI® Studio 4K has been set to the decoding mode, the screen will first display the default initialization encoding state each time it is first powered on, and it will resume displaying the currently set decoding state after waiting for about 10 seconds.

5. Login Web UI

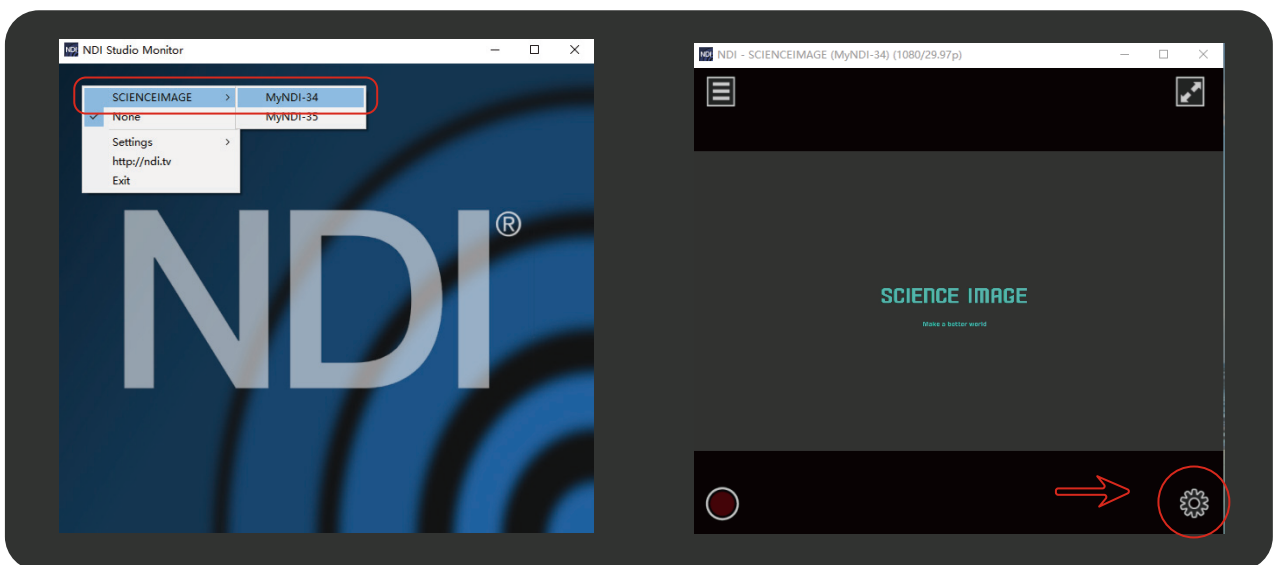
Method 1:Open the computer or mobile browser, enter the IP address displayed on the fourth line of the OLED screen of the device in the address bar, and press Enter to enter the login page, as shown below:

! The PC or mobile phone must be in the same routing network as the NDI® Studio 4K device.



Open the IE browser, enter the IP address on the OLED screen and enter the Web UI home page Default user name: **admin** Password: **admin**

Method 2: Open the login page through NDI Studio Monitor



The first step: Download and install the free NDI® tool–NDI Studio Monitor on NewTek's official website. Download link: "<https://ndi.tv/tools>"

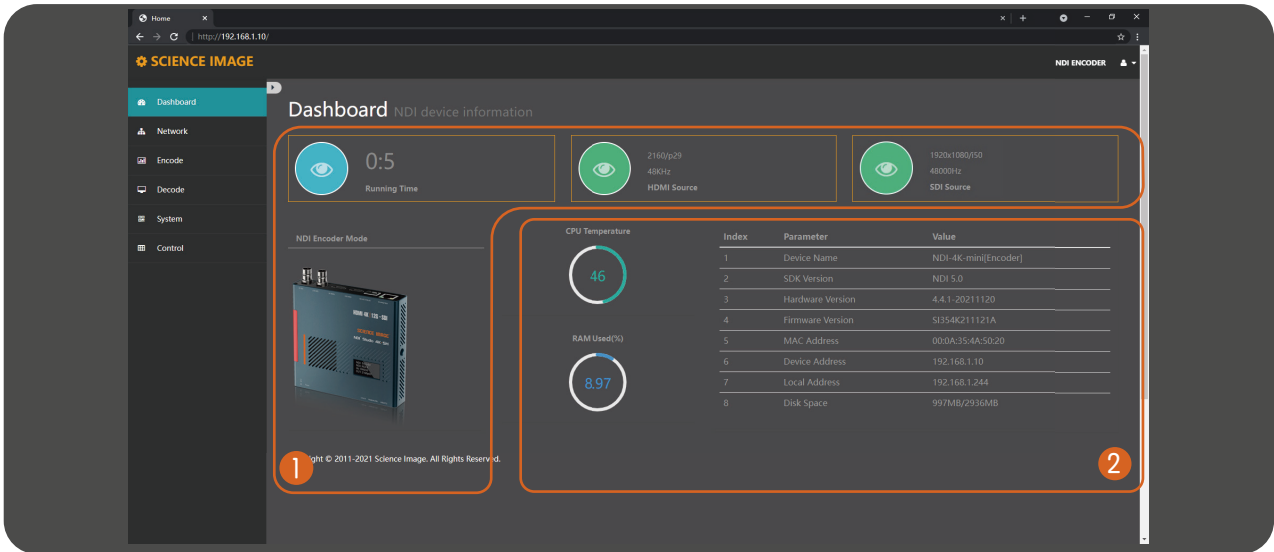
The second step: After the installation is complete, open the "NDI Studio Monitor" program.

The third step: Click the menu icon in the upper left corner or right-click anywhere, select "SCIENCEIMAGE"–click to find an item consistent with the NDI stream name of the device. As shown in the left picture above.

The fourth step: On the opened Studio Monitor page, click the gear icon in the lower right corner. As shown in the above right picture.

6. Device Information

This page is the NDI® Studio 4K device information page, which contains the following information:

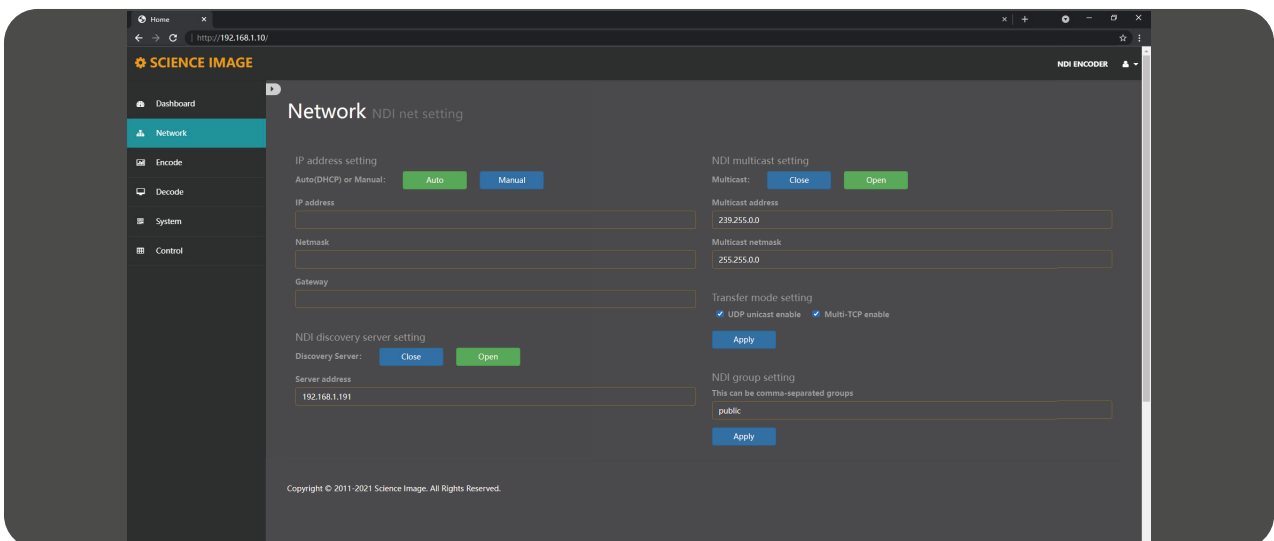


- 1 Device running time (since power-on), the video resolution and audio frequency of the HDMI source or SDI source of the current encoding input (or the format of the decoded NDI video stream Information).
- 2 The device information includes:
Device name (can display the current codec mode of the device), device serial number, hardware version, firmware version (can be upgraded on the system page with the version update), MAC address (unique and unmodifiable), device IP address (can be Modify at any time on the web page), local IP address (the IP address of the local PC or mobile phone), and disk space (usage of hardware flash disk space), Real-time temperature of the main chip .

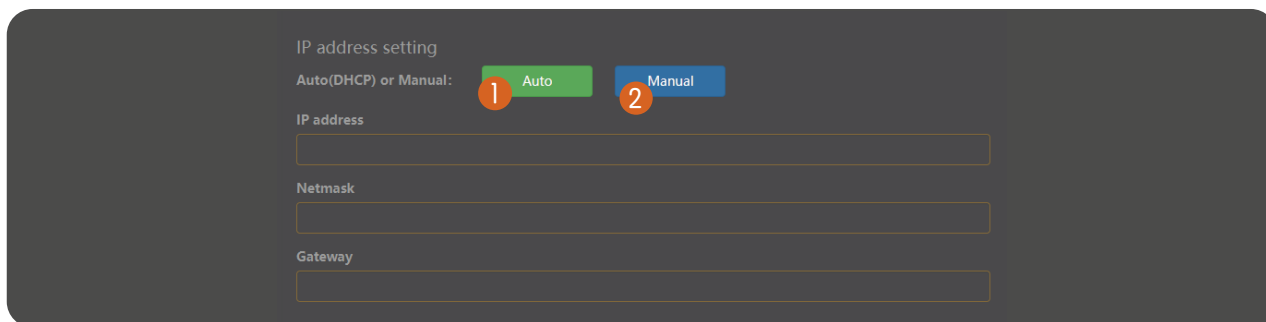
7. Network settings

7.1 Modify IP

Click [Network] to enter the network setting page



There are two modes for device IP address setting: DHCP and manual.

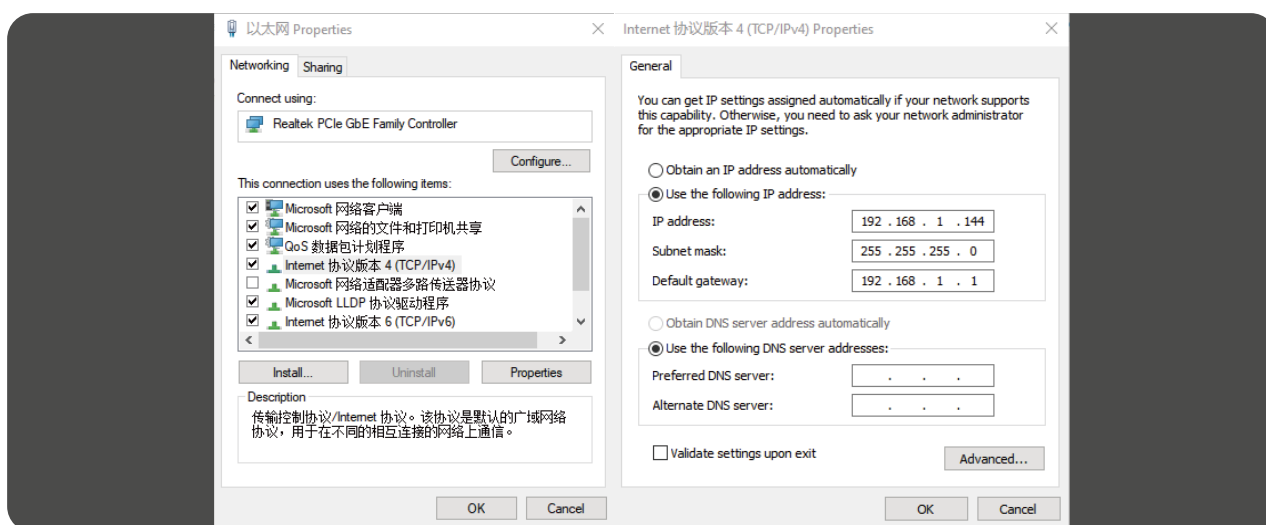


7.1.1 DHCP mode

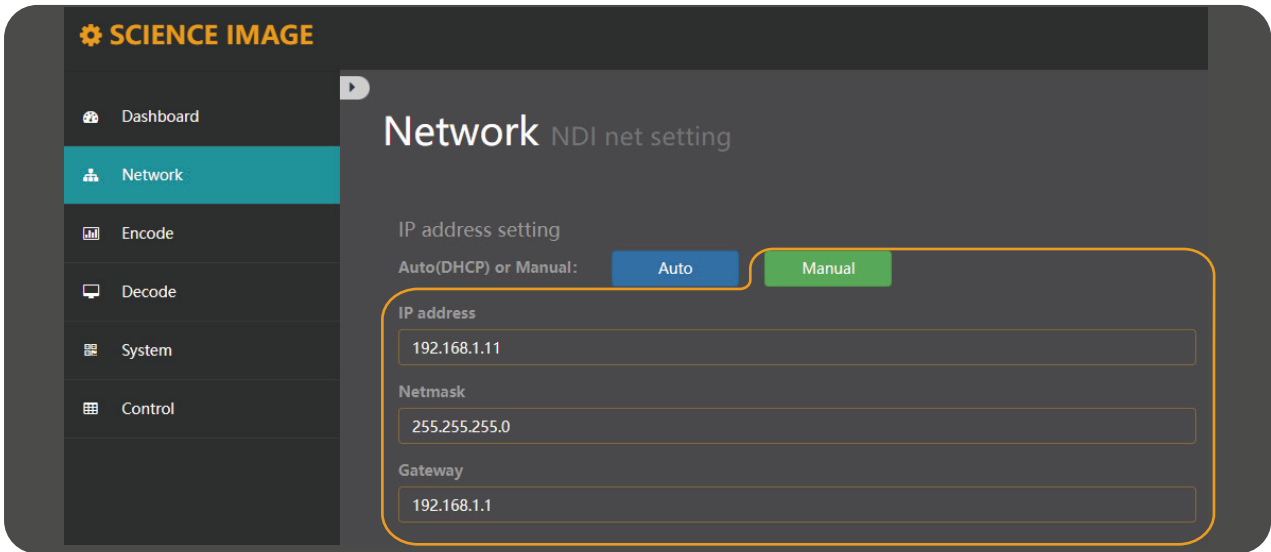
- 1 The router dynamically assigns an IP address to the device in real time. Each time the device is powered on, the ROUTER randomly assigns an IP address to the device. You can log in to the web page and modify the IP address based on the IP address assigned by the router. The default device IP address is 192.168.8.8. Click the auto button to switch to this mode. Then the device automatically restarts and obtains the IP address assigned by the router on the link (this process takes about 30 seconds). After the new IP address is displayed on the screen of the device, enter the IP address in the browser to log in.

7.1.2 Manual mode

- 2 In manual mode, enter the IP address, subnet mask, and gateway, and click the Manual button to switch to manual mode. Ensure that the IP address of the device is in the same network segment as that of the LOCAL PC or mobile phone. For example, if the Ethernet IPv4 information of the local PC is IP address: 192.168.1.140 Subnet mask: 255.255.255.0 Default gateway: 192.168.1.1, set the IP address of the local PC to IP address: 192.168.1.142; Gateway: 192.168.1.1; Subnet mask: 255.255.255.0 The gateway and subnet mask are the same as those of the local PC or mobile phone.



After filling in the IP address, click the [apply] button below, and then the system will complete the modification of the IP address and automatically restart the equipment. The network page will also automatically enter the modified IP address page (there is no need to enter the new IP again). This process takes about 30s.



7.2 NDI discovery server settings

NDI discovery server can transfer video stream across network segments. To use this function, you need to use the official website of newtek (<https://www.ndi.tv/sdk/> Download and install NDI SDK and NDI tools.)

Step 1: open NDI discovery service and record the IPv4 address of this computer (for example: 192.168.1.106).

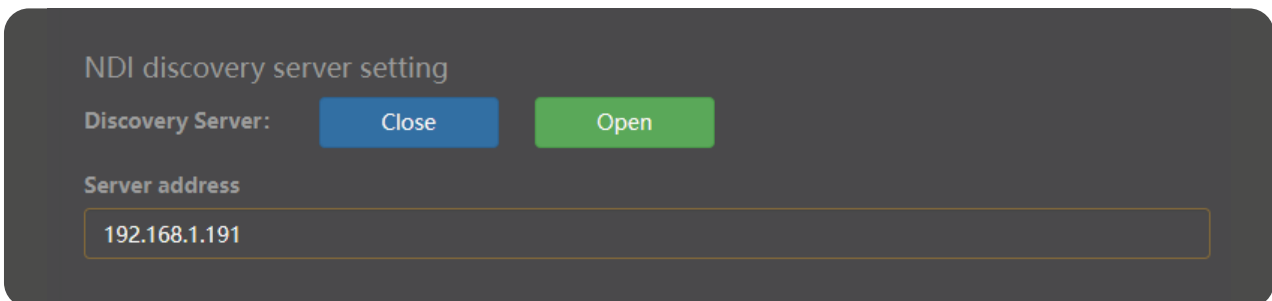
NDI NewTek NDI Discovery Service - 快捷方式

```
NDI Discovery Service v4.5.3.0
Copyright (C)2014-2020, NewTek, inc.
```

```
0:00:01 [-----|-----] 0 Sources, 0 Listeners. _
```

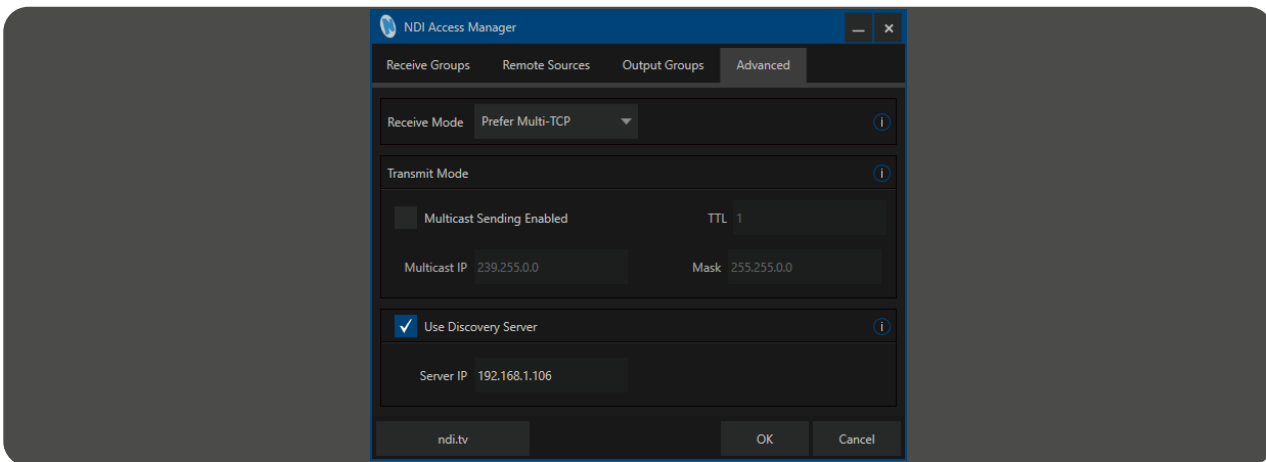
Sources represents the number of encoders connected to the server, and listeners represents the number of decoders connected to the server.

Step 2: log in to the Web UI and find the NDI discovery server settings under the network, click open, fill in the IPv4 address (192.168.1.106) recorded in the first step for the server address, and click apply.



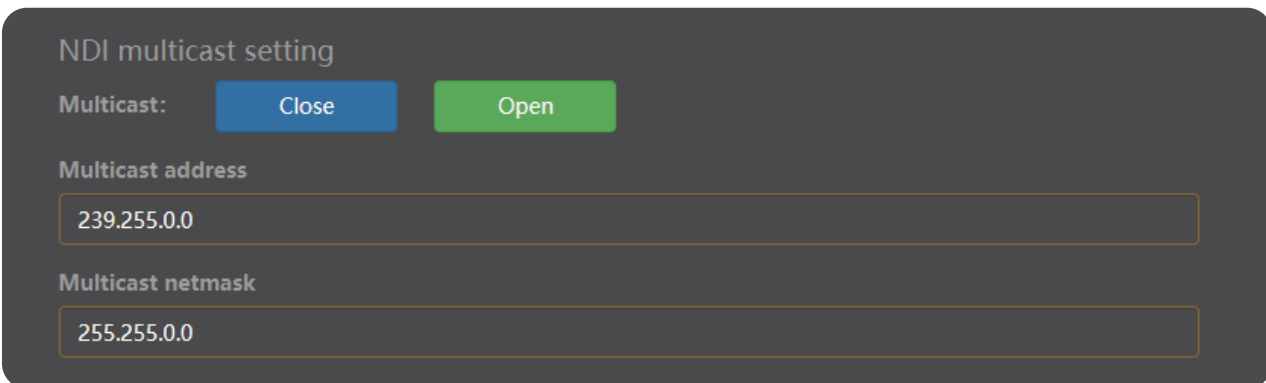
Step 3: NDI® Studio 4K decoding mode also needs to open NDI discovery server settings and fill in the same server address in order to find the signal source of NDI® Studio 4K in cross segment coding mode (for example: 192.168.1.191) click apply.

Step 4: To discover the source of NDI® Studio 4K in cross-segment coding mode, download and install the NDI Tools and turn on the NDI For Access Manager, type ✓ in front of Use Discovery Server under Advanced, and enter the IP of Server into the IPv4 address recorded in the first step (192.168.1.106), then click OK.



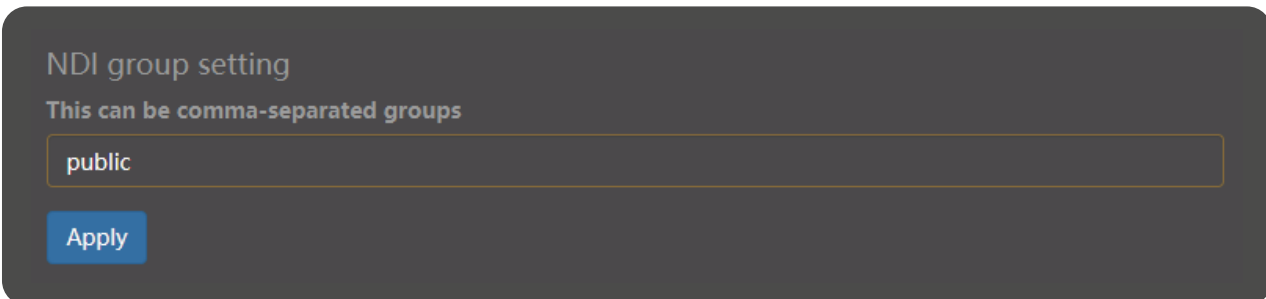
7.3 NDI multicast settings

When Multicast mode is turned on, which is the UDP (Multicast) delivery mode, it has a default Multicast address and a subnet mask. You can configure the address manually, and clicking Apply takes effect. Close the multicast. The transmission mode of TCP (Multi-Connection) is adopted. The default is to turn Open multicast mode.



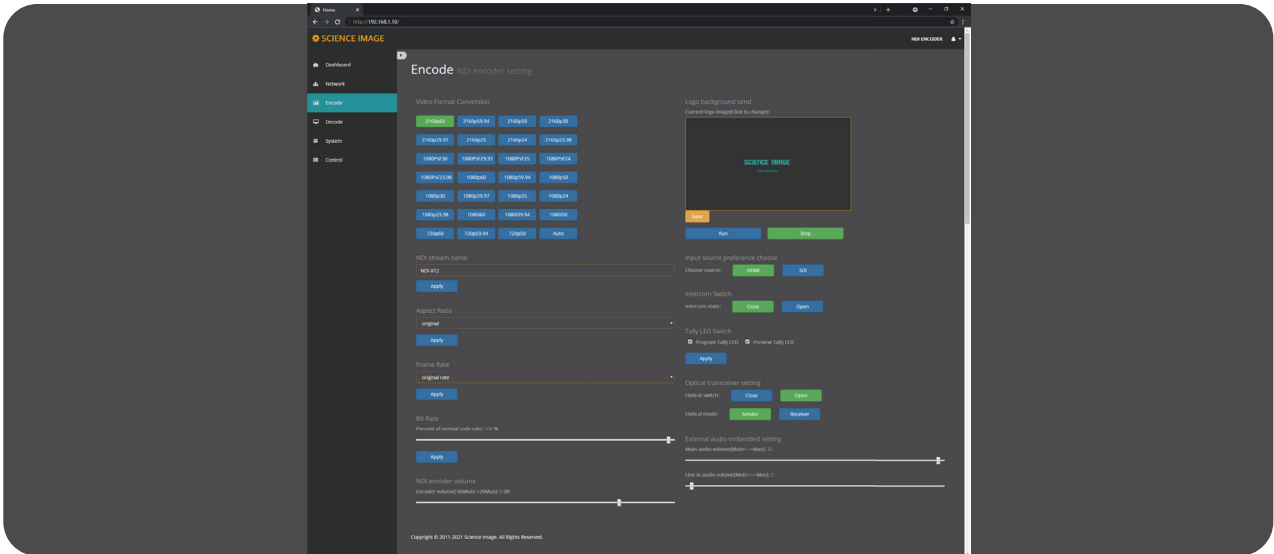
7.4 NDI group settings

NDI defaults to public group. If you want to add a new group, separate it with comma ",". You can also create a separate privacy group, such as science image, so that only the device that also fills in the science image can obtain the video information.



8. Encoding settings

Encoder setting page can set the output format of video, stream name of video source, aspect ratio of picture, frame rate, code rate, tally light switch, NDI encoder volume and optical transceiver.



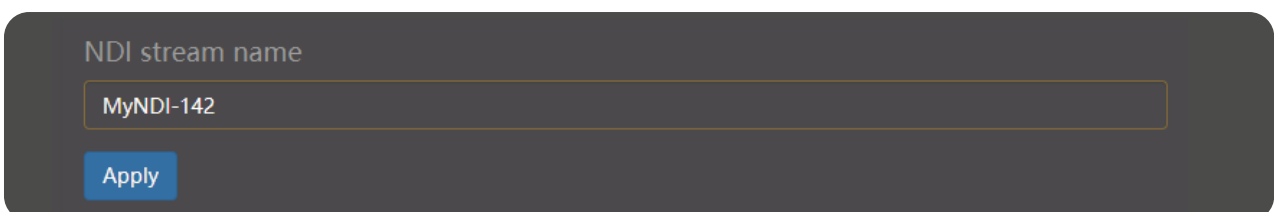
8.1 Video format conversion

No matter what the input format is, you can convert the output to the corresponding format by clicking the following format. Such conversion will not change the image quality. After selecting the format, it will be green. If no transformation is required, select auto, which is the same as the input source format.



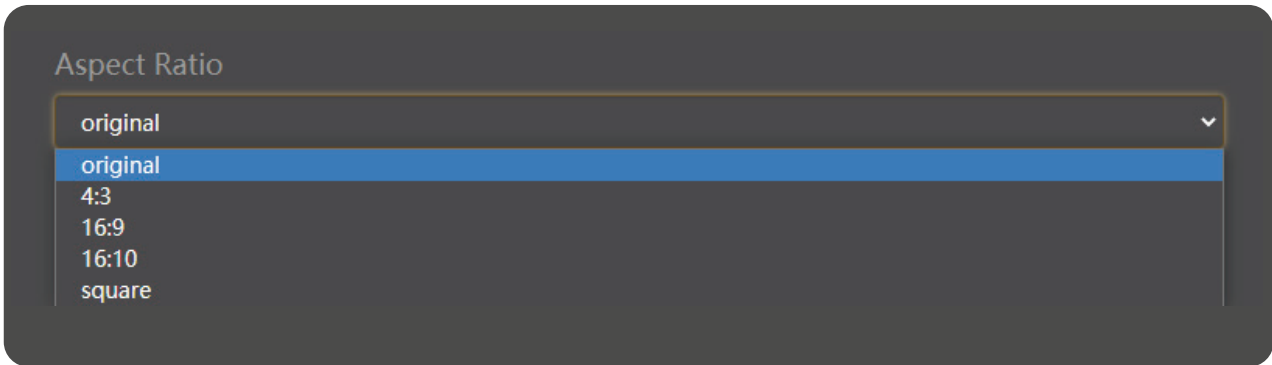
8.2 Modify the NDI stream name in the encoding state

If the device is used as an encoder, you need to modify the NDI stream name. The NDI stream name must be unique locally, otherwise software such as NDI Studio Monitor may not be recognized. After the modification, click the [Apply] button below to take effect in real time. You can see the modification result on the second line of the OLED screen of the device. The default is NDI-X, and the firmware upgrade will restore the default.



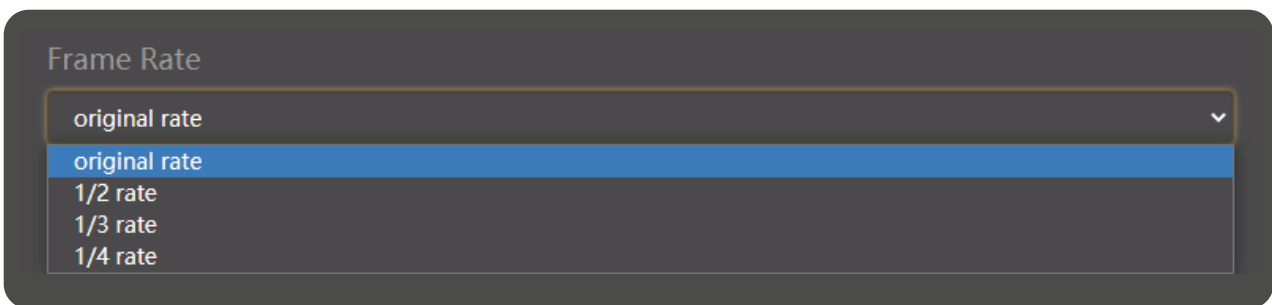
8.3 Set screen aspect ratio

Supports five screen aspect ratio settings: source aspect ratio, 4:3, 16:9, 16:10, square.



8.4 Set frame rate

Support 4 kinds of frame rate settings: source frame rate, 1/2 frame rate, 1/3 frame rate, 1/4 frame rate.



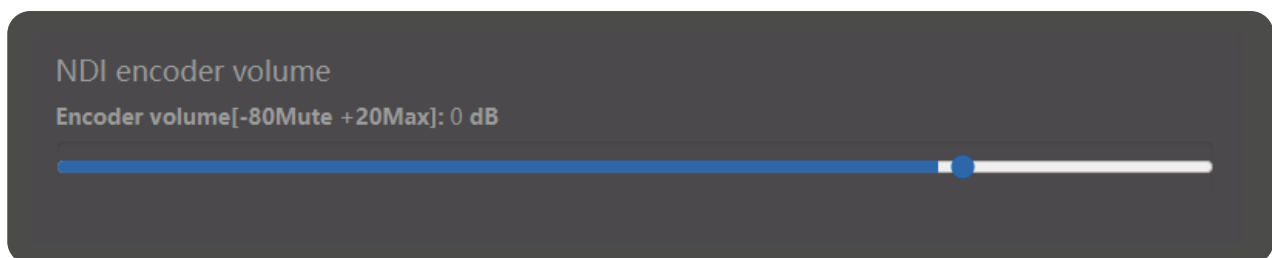
8.5 Set bitrate (Bandwidth)

The adjustment of bit rate can be reduced to save network bandwidth when the requirement of image quality is not very high



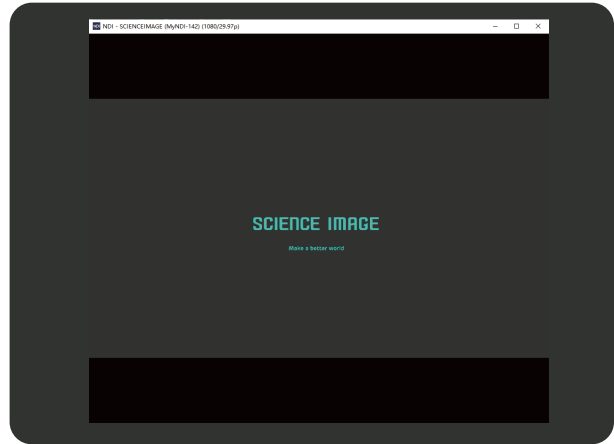
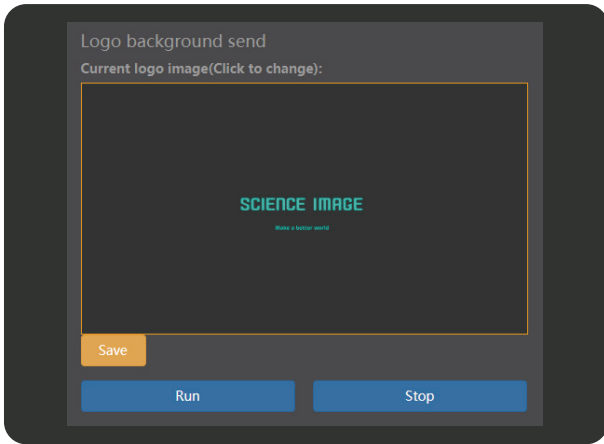
8.6 Set NDI encoder volume

"Encoder volume" regulates the volume of the video source encoded by the encoder, such as the volume of the screen in NDI Studio monitor.



8.7 Logo background image upload streaming

If it is in the encoding state, users can choose to set the logo background image as the image stream according to the actual needs. Click the image to add a local file, and then click Save to start the stream pushing. If not, click end stream pushing.



Push stream background image displayed in NDI Studio monitor

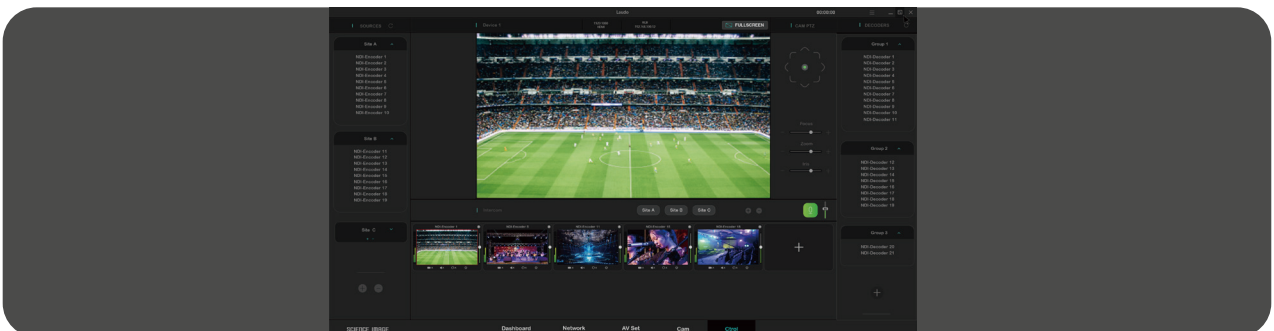
8.8 Set up Tally lights

Program and preview are both started, and software with tally (such as vmix) is used to decode the signal source and broadcast the program. Tally lights up the red light, while pre monitoring lights up the green light. If the green light is on when pre monitoring is not needed, close preview and click apply; If you don't need tally function, you can turn it all off (note that if you turn off program, the green light will not be on when the pre monitor is turned on). The tally function is turned on by default.



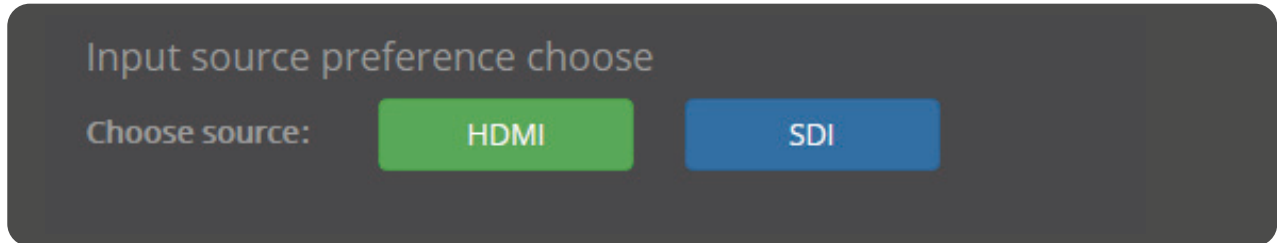
8.9 Intercom switch

Call switch: Click "Open" to call the supporting broadcast guide software Laudo. Click "Close" to Close the call function.



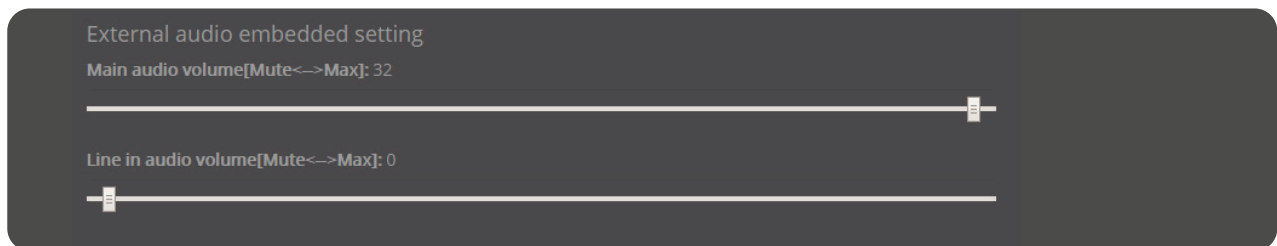
8.10 Input source priority selection

When both SDI and HDMI sources are input at the same time, the HDMI source is preferred by default. If you want to select the preferred SDI source, click SDI application. When there is only one source, it will be automatically recognized and will not be affected by this setting.



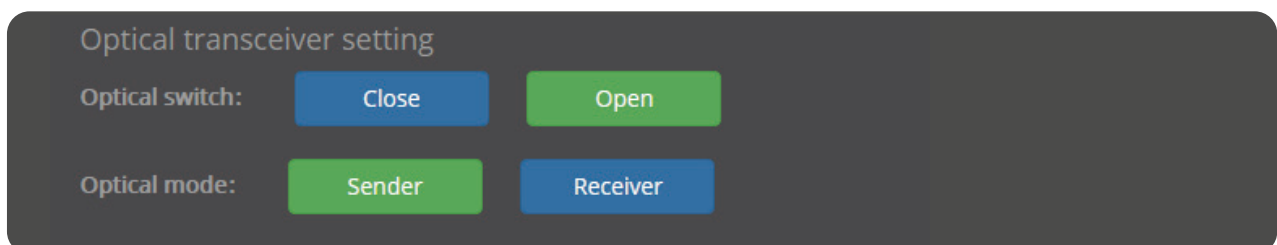
8.11 External audio embedding settings

The main audio volume is the volume of the video source, and the Line IN audio volume is the volume of the audio embed. When embedding external audio through Line IN, you only need to turn on the volume and mute it by default. Two channels of audio volume can be adjusted freely according to demand.

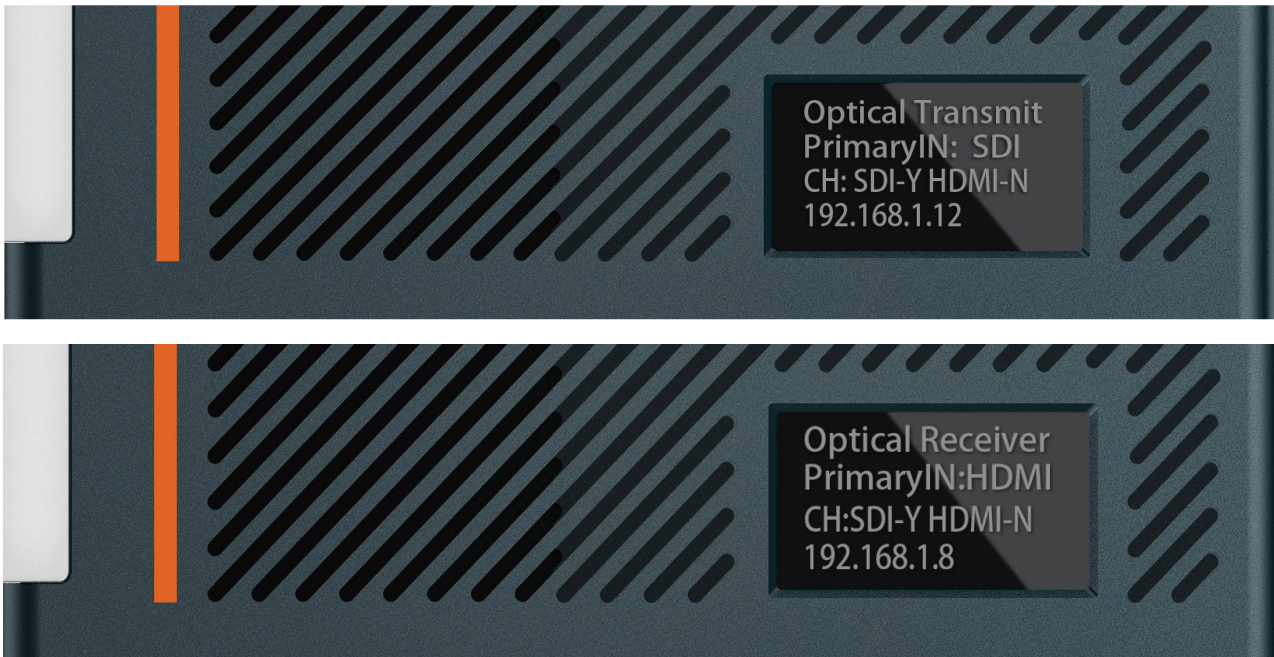


8.12 Optical transceiver settings

Optical transceiver setting is to regard the device as an optical transceiver and use optical fibers for data transmission. It is necessary to send one transmission and receive one transmission to two devices, and both devices are in coding mode. First, select a device as the sender, log in to the web user interface (WebUI), locate the optical device on the coding page, and enable the select sending mode. Video format conversion and input source preference You can select frequency conversion and signal source for optical signal transmission. Then, select another device as the receiver, log in to the WebUI of the receiver, enable the Settings of the optical device, and select the receiving mode. SDI OUT and HDMI OUT output optical signals. The same light output can also be converted to video format, but selecting AUTO will fix the output to 1080p60.



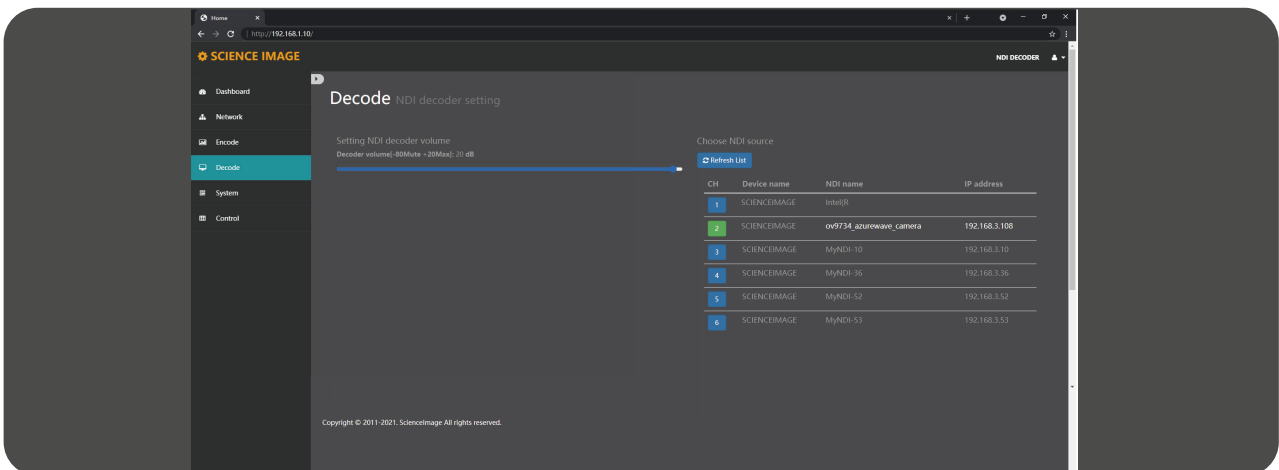
The Sender and Receiver of the Optical end machine can also be seen in the first line of the OLED. The Trans- mit is shown as an Optical Transmit and the Receiver as an Optical Receiver. When the optical terminal is turned on, IN, the third line of the OLED at the optical receiver, displays the format of the optical input.



The frame rate of the video format conversion of both sender and receiver should be integer or decimal! Otherwise, the transmission fails. For example, if the transmitting end converts 2160p60, the receiving end must select 2160p50, 1080p50, and 1080p23.98. Similarly, if the sending end is a decimal, the receiving end must also be in decimal format.

9. Decoder settings

The decoder settings need to be changed in decoding mode. Please refer to page 12 for switching mode.



9.1 Set NDI decoder volume

In decoding state, this page displays "set NDI decoder volume", and "decoder volume" adjusts the volume of decoding output to display device, such as output to TV, etc.

Setting NDI decoder volume

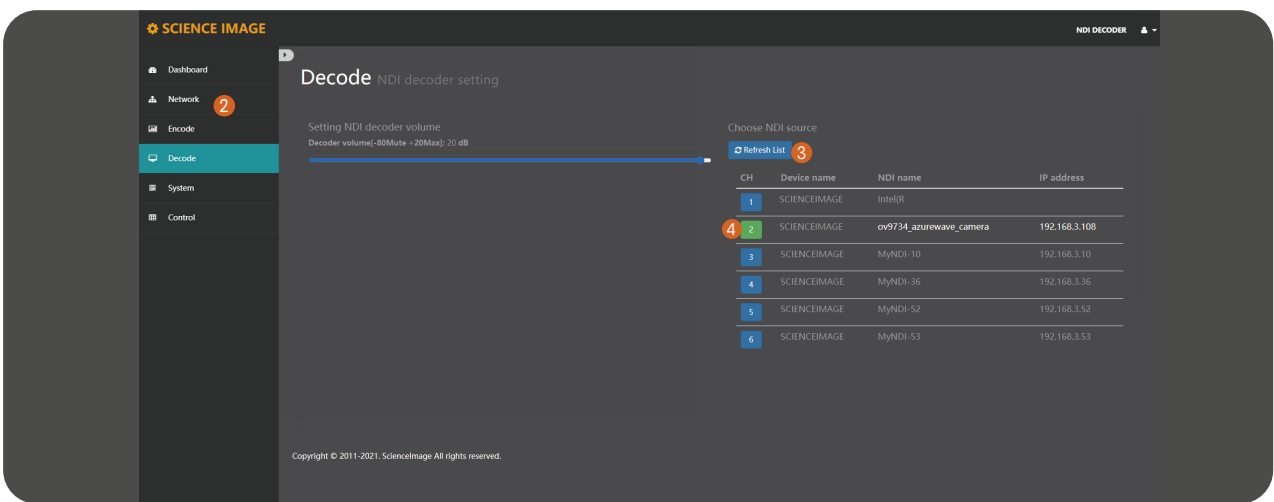
Decoder volume[-80Mute +20Max]: 0 dB



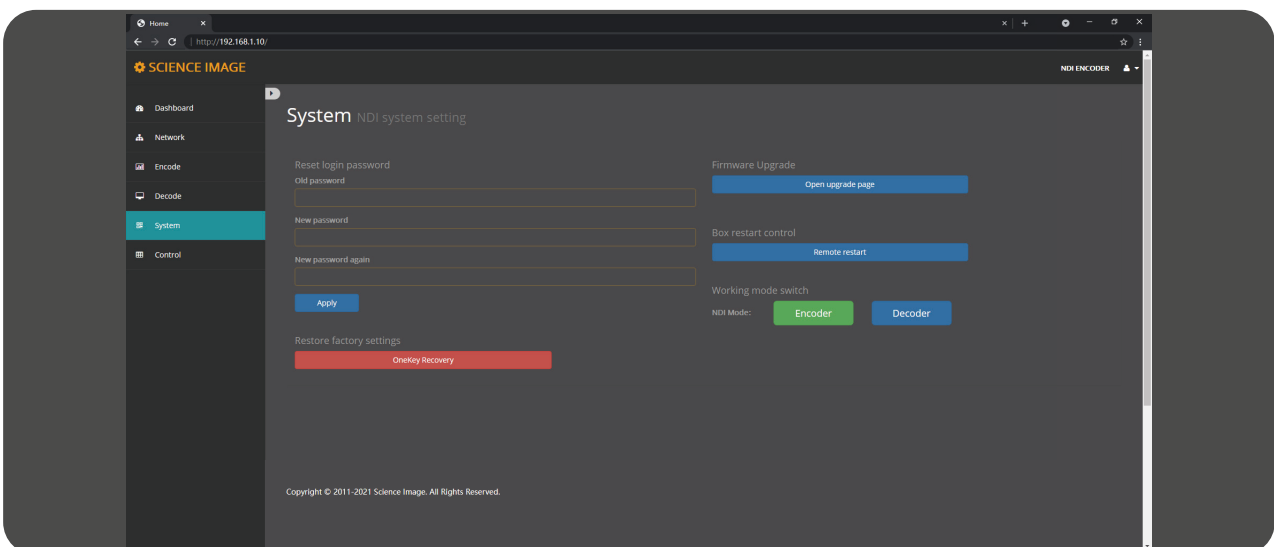
9.2 Select NDI source to decode in decoding state

If this device is used as a decoder, you need to select an NDI source to decode and output. Setting steps:

- ① Log in to the WebUI of the decoder
- ② Click [Network]
- ③ Click [Refresh List]
- ④ Click the number in front of the NDI source to be decoded (2 is the NDI source currently being decoded)

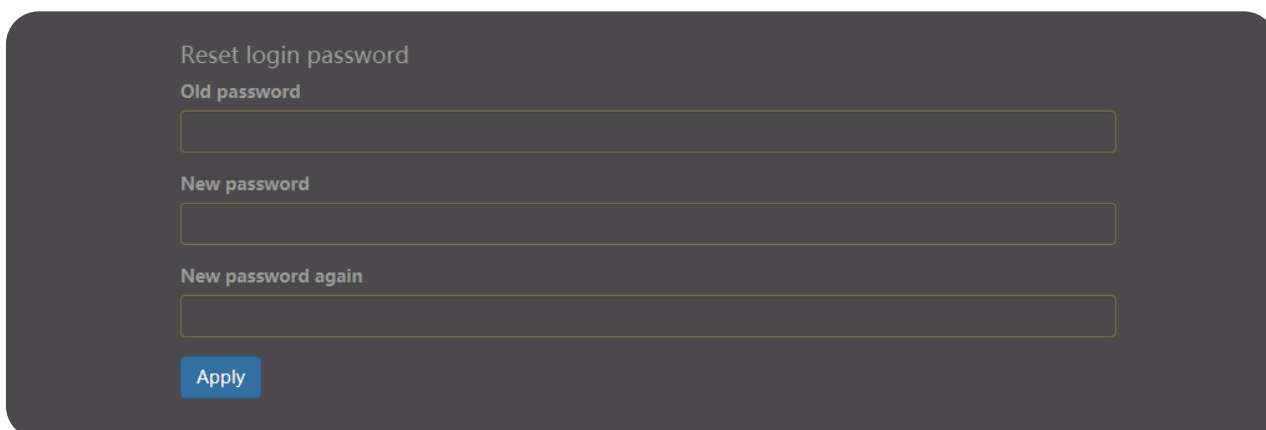


10. System settings



10.1 Reset login password

Modify the login password and click apply. After the password is modified, it will take effect at the next login.



Reset login password

Old password

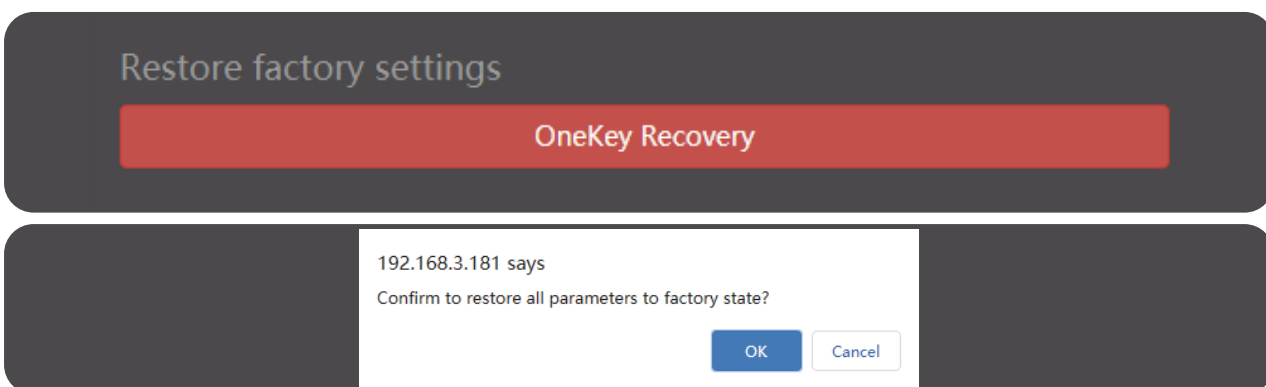
New password

New password again

Apply

10.2 Restore factory settings

Restoring factory settings can restore the device to its initial state, but the firmware version will not be restored (the factory default IP address of the device is DHCP manual mode. If there is no router that automatically assigns IP addresses in the LAN, the device IP will change to 192.168.8.8).



Restore factory settings

OneKey Recovery

192.168.3.181 says

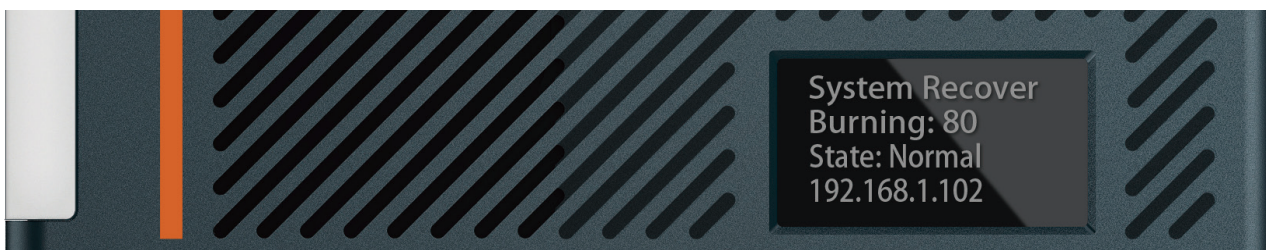
Confirm to restore all parameters to factory state?

OK Cancel

The second is to restore all the settings on the firmware version and WebUI to the factory. To restore the factory settings, you need to power off the device, press and hold the reset key on the device from the small hole, and power on the device at the same time. When you see system recover on the first line of the device screen, you can release the reset key. During the process of restoring the factory settings, the light turns red and starts flashing. When "burning: 100" is displayed on the second line of the screen, the light always turns green, and the whole process takes about 20 minutes to complete. At this time, power on the equipment again.

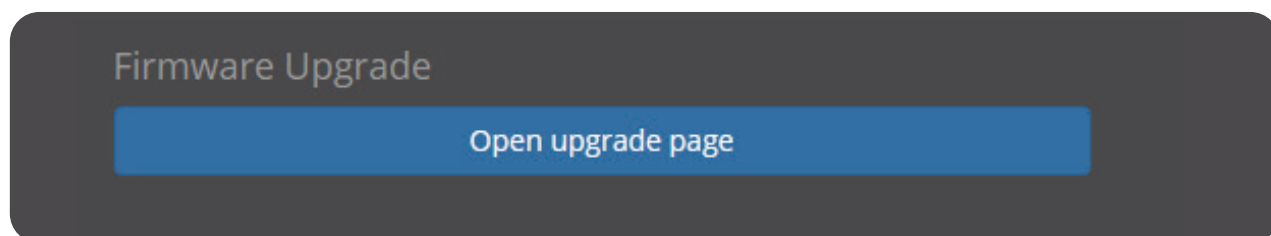


The second way is to restore the factory settings. Once it starts, the original system will not start. Please use this function carefully.



10.3 Firmware upgrade

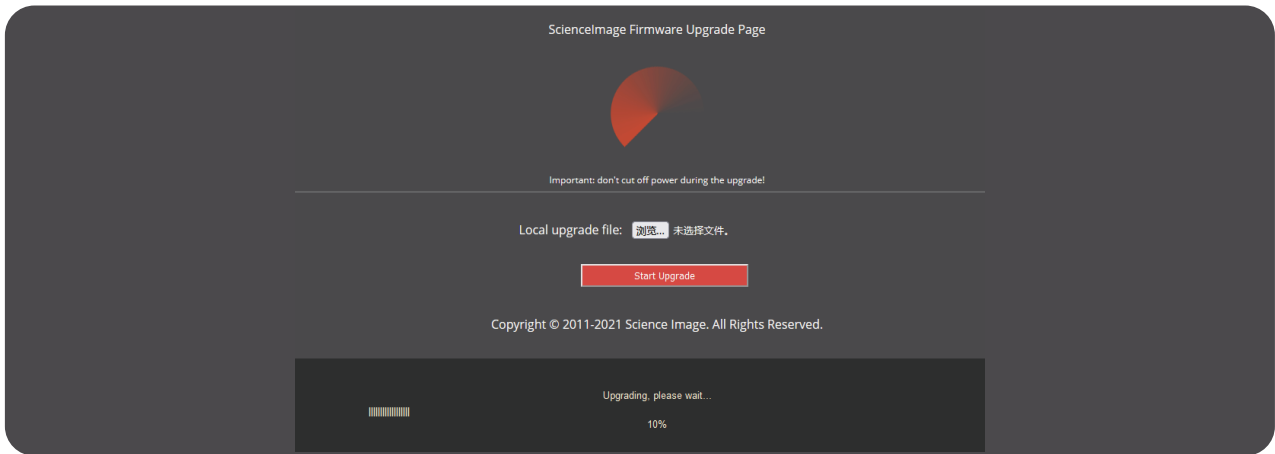
New firmware upgrades will be released regularly on the company's official website. Users can download the latest firmware to upgrade as needed. Download address: "http://www.science-image.com/cn/-file-123084-92200.html" After downloading, you can click the [open upgrade page] button on the [system] page to enter the upgrade page, or click the figure icon in the upper right corner, and then click the [firmware upgrade] button. Just push the button.



After entering the page, click the [select file] button at ①, select the firmware to be upgraded, such as siup-ndi-20201220b.si, and open it. At this time, there will be a progress prompt in the lower left corner of the browser. When the progress is completed, the uploaded file information will be displayed. The button at ② will also change from red to green, and then click to start upgrading. As shown in the figure below:



Don't be surprised when the progress bar reaches 10% and there is a long pause, just wait patiently



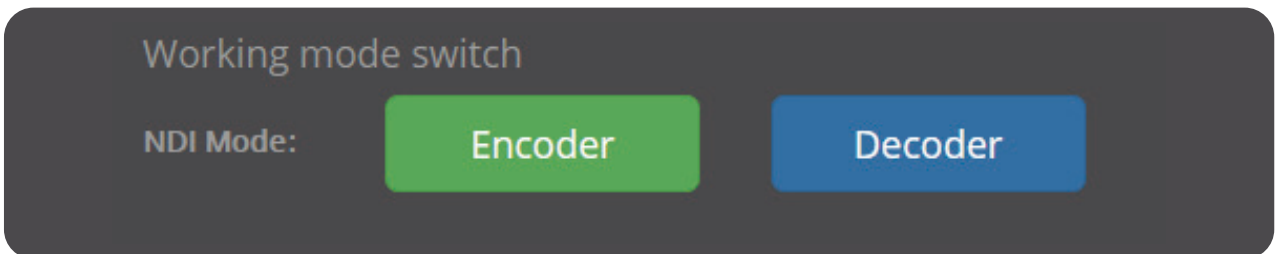
After the progress bar reaches 100%, the upgrade page is closed and the device restarts. Then, log in to the WebUI again and check the firmware version to check whether the upgrade is successful.



During the upgrade, do not switch off the power supply or close the upgrade page. Otherwise, system files may be damaged and the system may fail to start.

10.4 Working mode switch

Click "encoder" or "decoder" button to switch to the corresponding mode, the default encoder mode.

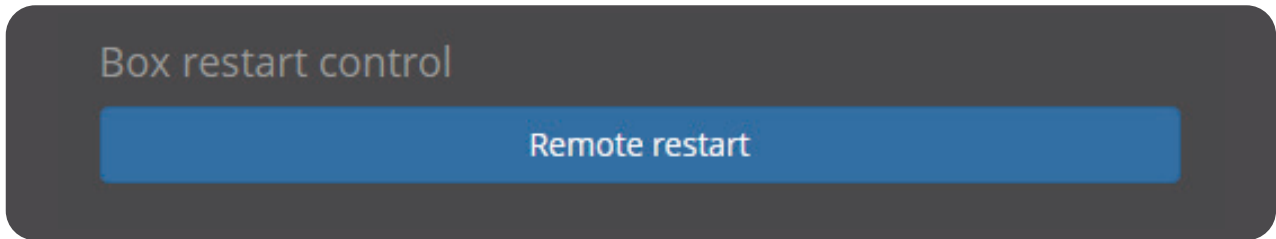


The first line of the OLED screen of the product will display the working mode, "NDI encoder" is the encoder, and "NDI decoder" is the decoder, as shown in the figure below.

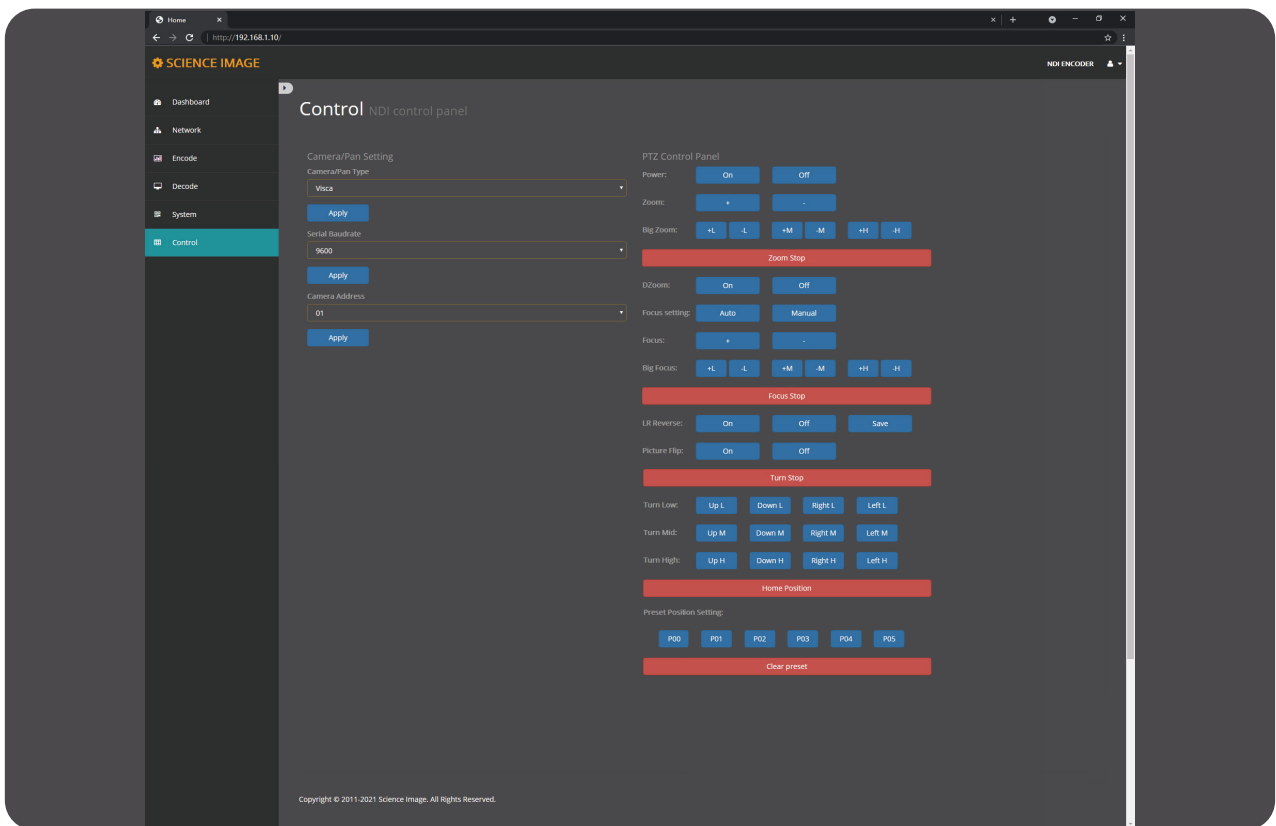


10.5 Device restart

Click the restart device button under the box restart control to restart the controlled device.

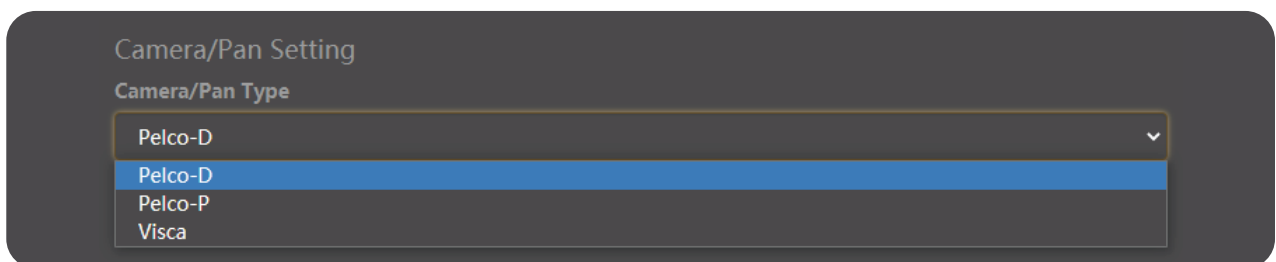


11. Control

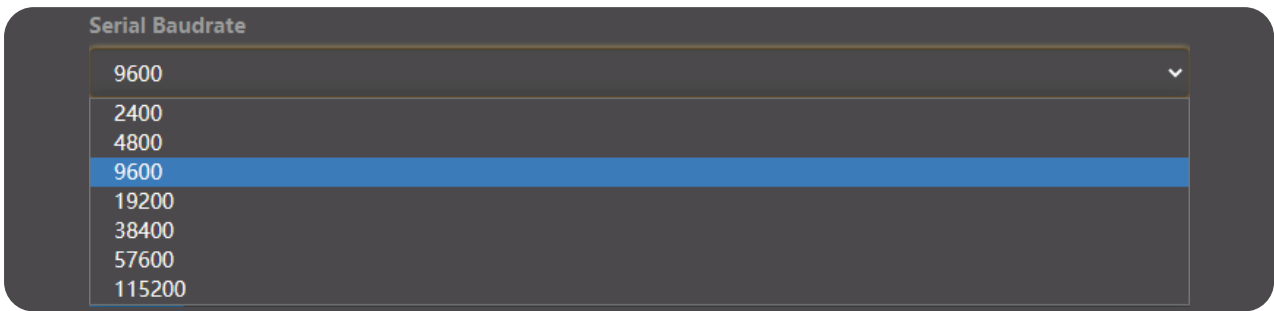


11.1 Camera settings

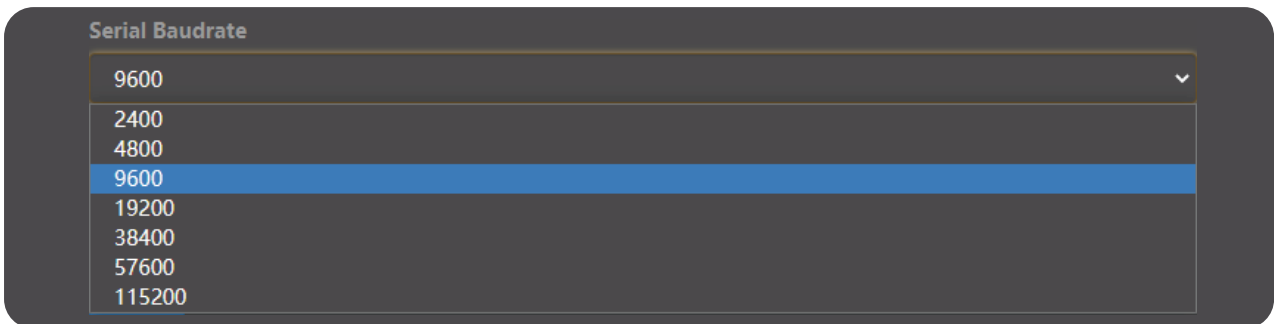
Camera type: Select the type of camera and click Connect.



Serial port baud rate: Select the baud rate of the serial port and click Apply.

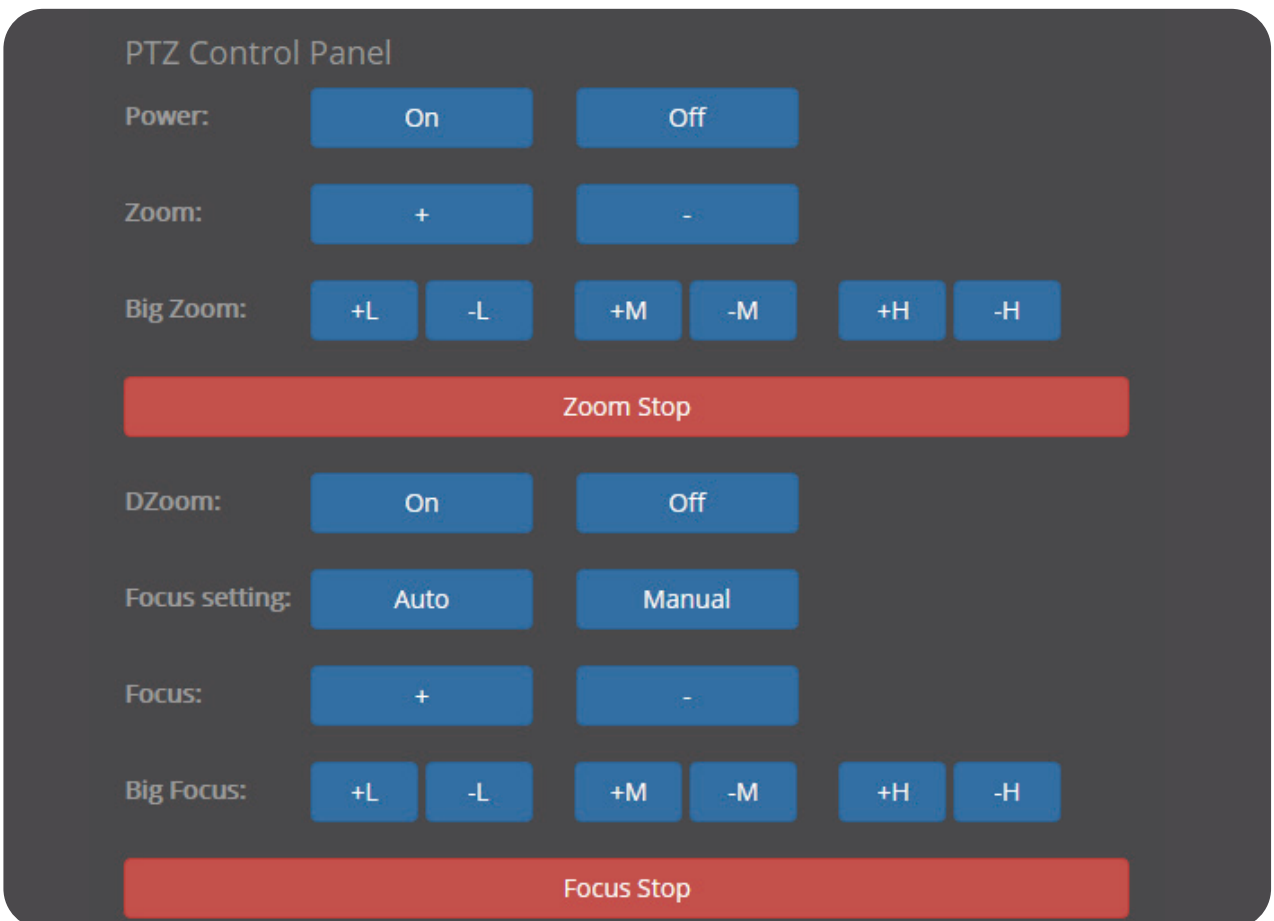


Camera address : Select the camera address and click Apply.



11.2 PTZ Control Panel

The control panels for PELco-D and PELco-P are shown below:

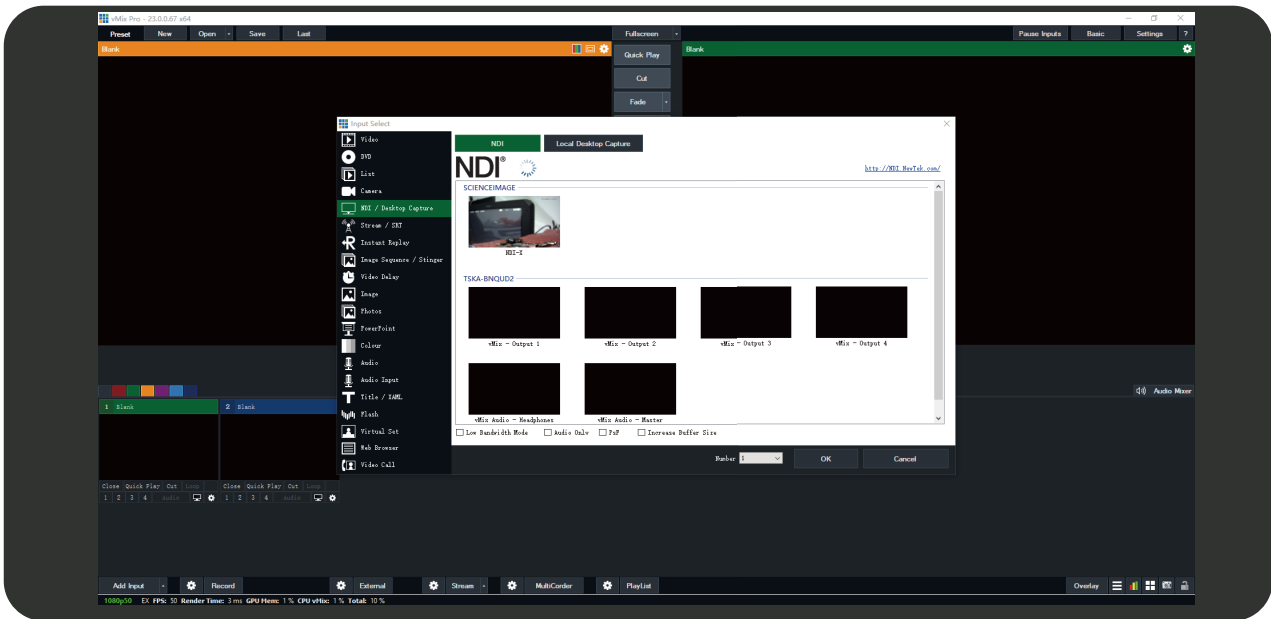




12. Briefly introduce how to use vMix and Studio Monitor software to view NDI video stream

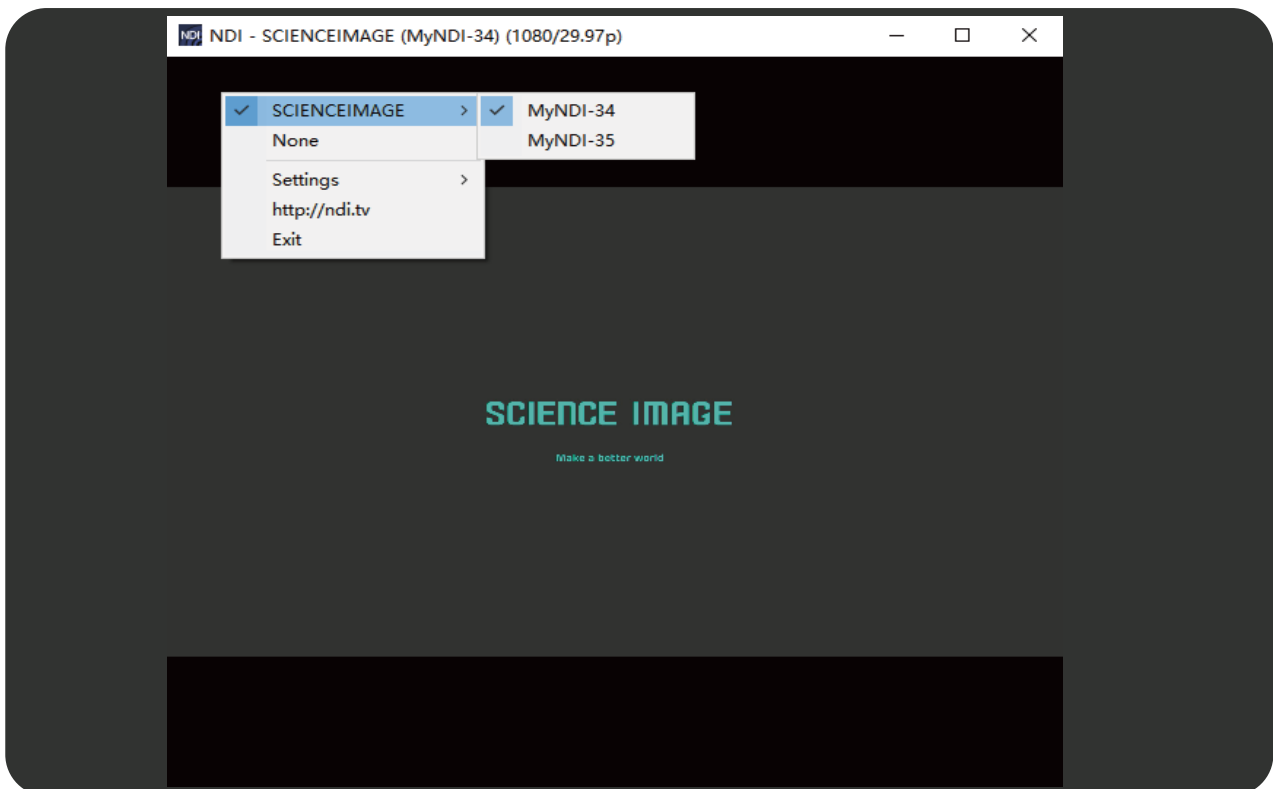
12.1 How to use vMix to add NDI video stream and view

vMix official download address: "<https://www.vmix.com/software/download.aspx>" Open the vMix software, click [Add Input] in the lower left corner in turn--->[NDI/Desktop Capture]---> double-click the video source you want to view



12.2 How to use Studio Monitor to view NDI video stream

Open the Studio Monitor software, click in the upper left corner or right-click anywhere----> **【SCIENCEIMAGE】** ----> click the name of the NDI stream you want to view



FAQ

Q. Why can't the device start?

A. Check whether the device power indicator (located on the right side of the chassis) and OLED screen are on, and restart again with the official power adapter;

Do not turn off the upgrade page and power during device upgrade!!

Q. Why not log in to the Web UI?

A. Check whether the IP address of the device and the IP address of the computer are in the same network segment, and whether the IP address of the device conflicts with the IP address of other devices in the network segment; Check whether the network environment is good; Attempt to power down and restart the device.

Q. Why does the device IP address display 192.168.8.8?

A. This is because the device is in the automatic IP acquisition mode in the network settings of the webui, but there is no router in the LAN connected to the device to assign an IP address to the device. At this time, change the computer IP to 192.168.8. **, then log in to the Web UI, change the device to manually obtain the IP, fill in the address, subnet mask and gateway, and click [apply].

Q. Why is the image output from the device to the display device abnormal in color, sound or picture?

A. Try to restart the device in the Web UI system, or manually power off and restart.

Q. Why is the device output to the white screen of the display device in decoding mode?

A. This is because the decoding device does not select which NDI source to solve. Try to log in to the Web UI, check whether the correct coding source is selected under the decoding column, click refresh list and select again.

Q. NDI decoding is stuck and not smooth

If the NDI decoding picture is not smooth and jammed, please turn multicast on or off to test the fluency of NDI under the condition of ensuring a good network environment.

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