



DC220/230

Multifunctional HD Video Decoder

# USER MANUAL

Changsha KILOVIEW Electronics CO.,LTD.

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## 1 Product introduction

DC220/230 is a professional hardware decoding device, which can independently decode IP video streams in various formats (from ip-camera stream, RTSP/RTMP/SRT unicast or multicast media streams, etc.), and output with SDI signals, DVI-I signal (compatible with HDMI/VGA signals). And it supports multiple video to decode and output simultaneously.

### 1.1 Advantages

#### **Strong decoding ability, strong error-resistance, low latency.**

- With Kiloview unique image enhancement and fault-tolerant technology, it has powerful error resistance for video encoded at low bitrate with up to 10% packet loss, excellent image output can be obtained.
- Decoding latency can be less than 200 ms under a typical network environment with Kiloview intelligent latency control technology.
- Decoding Output of H.264 Coded Video and AAC-LC/G.711 Coded Audio Supporting Bit Rate up to 40Mbps.

#### **High compatibility, SDI + DVI dual output, wide application.**

- It supports RTMP/HLS/TS over UDP/RTSP/SRT protocols as well as SIP, it can also be connected with different kinds of encoding device, streaming media servers and IP cameras.
- With dual output SDI & DVI ( HDMI/ VGA compatible ), and the resolution can be self-defined.
- Outputs of SDI/ HDMI can be up to 1080p60, and VGA up to UXGA solution;
- Analog audio and embedded SDI/ HDMI audio can be output simultaneously.
- Audio mixing, tally and column loudspeaker indicating design supported

#### **Portable size, low power consumption, multifunctional, 24h continuous operation available.**

- Compact and power consumption is 5w, makes 24h continuous operation available.
- With image scaling function, the output video can be scaled as well as frame rate conversion, in order to adapt different output video formats.

## 1.2 Parameters

Model	DC220
Input	1*RJ-45,100/1000Mbps
USB port	1*USB 2.0 Type-A
Video output	1*SDI, SD-SDI (270M),HD-SDI (1.485G),3G-SDI(2.97G); 1*DVI-I, HDMI1.4 /DVI 1.0/VGA
Output formats	SDI/HDMI: Up to1080P60Hz;VGA:Up to UXGA SDI: 1080P60/50,1080P30/25/24,1080I60/50,720P60/50,576I50,480I60; HDMI/DVI : 1080p60/50,1080p24/25/30,1080i60/50,720p60/50VESA standard formats; VGA: 1080p,720p,UXGA(1600x1200),SXGA(1280x1024),XGA(1024x768),SVGA(800 x600),VGA(640x480) and other VESA formats. Note:1080p59.95/i59.94 is not supported
Audio output	Analog line-out; SDI/HDMI embedded
Media protocols	RTMP/HLS/TS over UDP/RTSP/SRT
SDI transmitting distance	Belden 1694A cable standard: SD SDI $\geq$ 350m; HD SDI $\geq$ 180m; 3D SDI $\geq$ 100m
Video decoding	H.264
Audio decoding	AAC/ G.711
Decoding delay	$\leq$ 200ms (adjustable)
Decoding ability	Single channel video decoding
Management	Web operation
Power supply /Consumption	DC 12V, 1A/ 5W
Size/ Weight	140*105*28mm/380g
Operation temperature	-20°C~60°C

Model	DC230
Input	1*RJ-45,100/1000Mbps
USB port	1*USB 2.0 Type-A
Video output	1*SDI, SD-SDI(270M),HD-SDI(1.485G),3G-SDI(2.97G); 1*DVI-I, HDMI1.4 /DVI 1.0/VGA
Output formats	SDI/HDMI: Up to 1080P60Hz,VGA: Up to UXGA. SDI:1080P60/59.94/50,1080P30/29.97/25/24/23.98,1080I60/59.94/50, 720P60/59.94/50, 576I50,480I60; HDMI/DVI:1080p60/50,1080p24/25/30,1080i60/50,720p60/50, VESA standard formats; VGA:1080p,720p,UXGA(1600x1200),SXGA(1280x1024),XGA(1024x768),SVG A(800x600),VGA(640x480) and other VESA formats.
Audio output	Analog line-out; SDI/HDMI embedded
Media protocols	RTMP/HLS/TS over UDP/RTSP/SRT
SDI transmitting distance	Belden 1694A cable standard: SD SDI $\geq$ 350m; HD SDI $\geq$ 180m; 3D SDI $\geq$ 100m
Video decoding	H.264
Audio decoding	AAC/ G.711
Decoding delay	$\leq$ 200ms (Adjustable)
Decoding ability	Up to 4 channels 1080p30/ 2 channels 1080p60
Management	Web operation
Power supply /Consumption	DC 12V, 1A/5W
Size/Weight	140*105*27mm/380g
Operation temperature	-20°C~60°C

## 2 Operation guidance

- Installation and Connection of Device

Connect the power supply and start the device. Connect the decoder SDI/DVI interface (DVI compatible with HDMI and VGA, need adaptor) to the display.

- Network Connection and Configuration

First, connect the decoder's Ethernet port to the switch or PC by using the network cable. Then, set up your PC's IP address in the subnet of 192.168.1.0/24, and login the web page through <http://192.168.1.168> (the default IP address of the Ethernet port is 192.168.1.168), and the default login user name/password is admin/admin. After login, set parameters such as IP/DNS of the Ethernet port in the "Network" menu.

- Adding Video Sources

Login the web page, click 'Add' on the "Media" tab, fill in the corresponding parameters (RTSP/RTMP/HLS and other video sources) according to the video source information, and then confirm, you can add a video source.

- Decoding output

The decoder has two output windows, select any output window and click the HDMI/SDI/VGA option to be green, which means that the window screen is output to the corresponding HDMI/SDI/VGA interface. Then drag the added video source to the output window and the decoder will start decoding it. If the decoding is normal, the video will be output.

### 3 Packing list and interface description

#### 3.1 Packing list

Please check the parts and accessories you received are exactly

Name	Unit	Quantity	Note
DC220/DC230 Decoder	SET	1	
DC12V/1A power adaptor	PCS	1	
DVI to HDMI adaptor/ DVI to VGA adaptor	PCS	1	Optional Parts
Quick start guide	PCS	1	
Certificate/Warranty card	PCS	1	

#### 3.2 Interface description



1. USB interface    2. SDI output    3. Reset  
 4. Audio output    5. Audio input    6. LED Status    7. Power input



8. 100/1000M Ethernet port    9. DVI/HDMI/VGA output

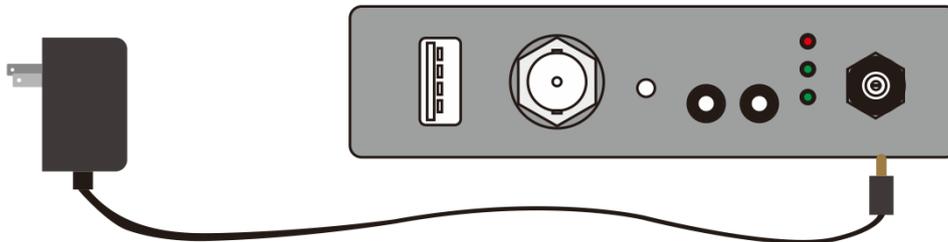
### 3.3 Led indicators

Name	COLOR	STATUS	DESCRIPTION
POWER	RED	ON	Powered up
		OFF	No power supplied
RUN	GREEN	ON	Device is working
		OFF	Device is starting up
LINK	GREEN	ON	Network connected
		OFF	Device disconnected or starting up

## 4 Installation and connection

### 4.1 Connect power

Using the power adaptor (DC12V/1A) connected to the device, after the power is turned on, the device starts working.



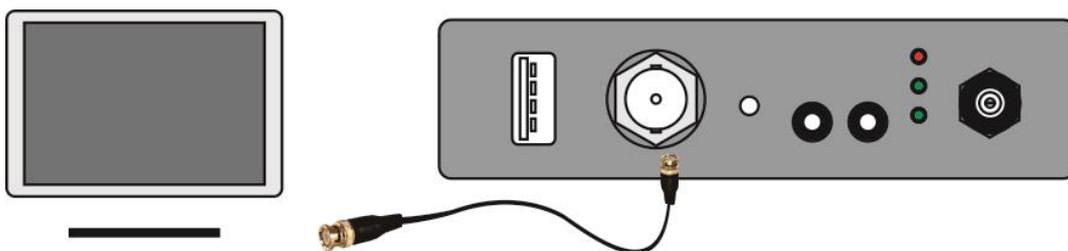
**⚠ Note:** Please use the standard power adaptor provided. Using other unqualified power supplies may damage the device.

### 4.2 Connect display device

Connect SDI or DVI/HDMI/VGA wires to the corresponding interface of the device (If necessary, you can connect two output ports, the decoder supports simultaneous output of two signals), and the other end connect to the display device such as display, electronic screen, etc.

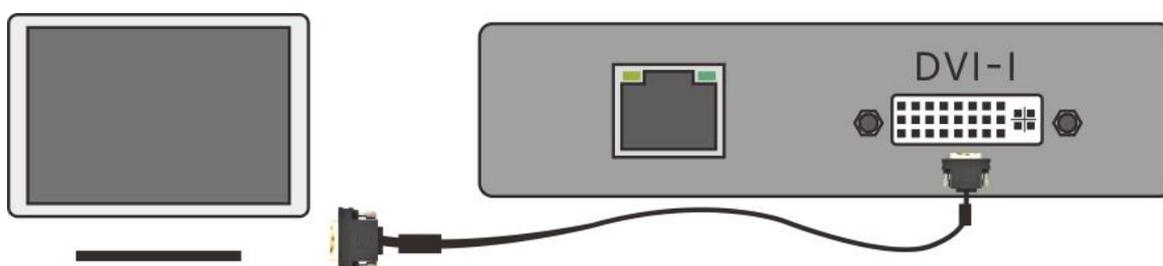
#### 4.2.1 Connect SDI monitor

Using SDI cable to connect SDI output interface with SDI monitor



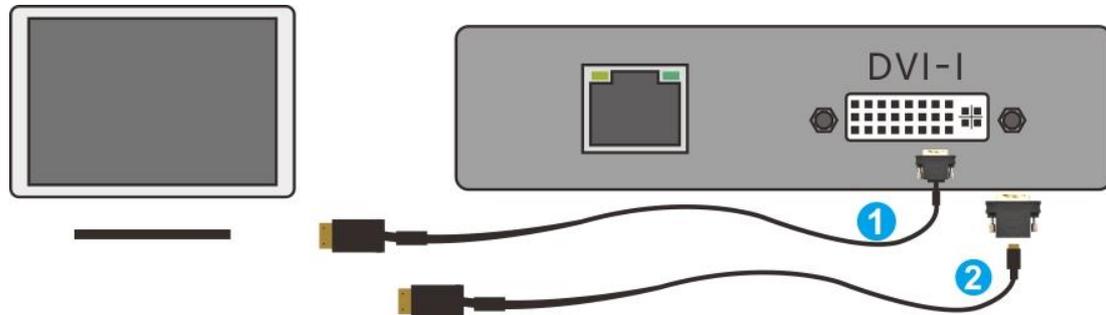
#### 4.2.2 Connect DVI monitor

Connecting DVI video output interface with DVI monitor via DVI cable.



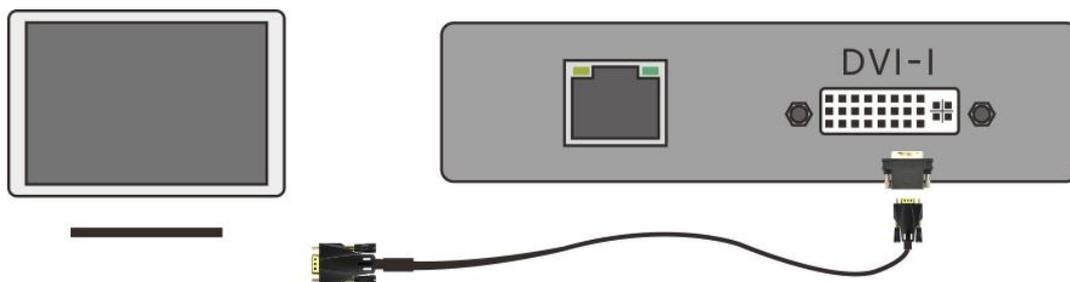
### 4.2.3 Connect HDMI monitor

- Using DVI to HDMI cable to connect DVI video output interface with HDMI monitor (recommended);
- Or by DVI to HDMI adaptor with HDMI cable.



### 4.2.4 Connect VGA display device

Using DVI to VGA adaptor connected to DVI interface, then with VGA cable to monitor.

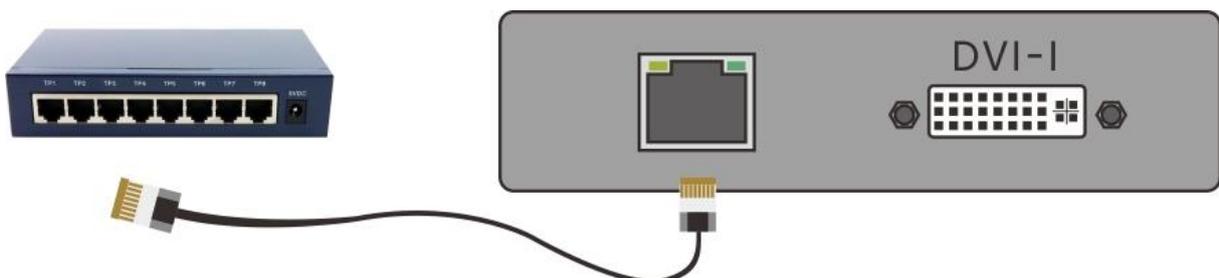


### 4.3 Connect analog audio signals

If analog audio input and output are required, the analog audio interface needs to be connected; if not, no connection is required.

### 4.4 Connect network

Connect one end of the network cable to the decoder 100/1000M Ethernet port, the other end is connected to the network switch or the computer's Ethernet port.



## 5 Login and network configuration

### 5.1 Login to the web page

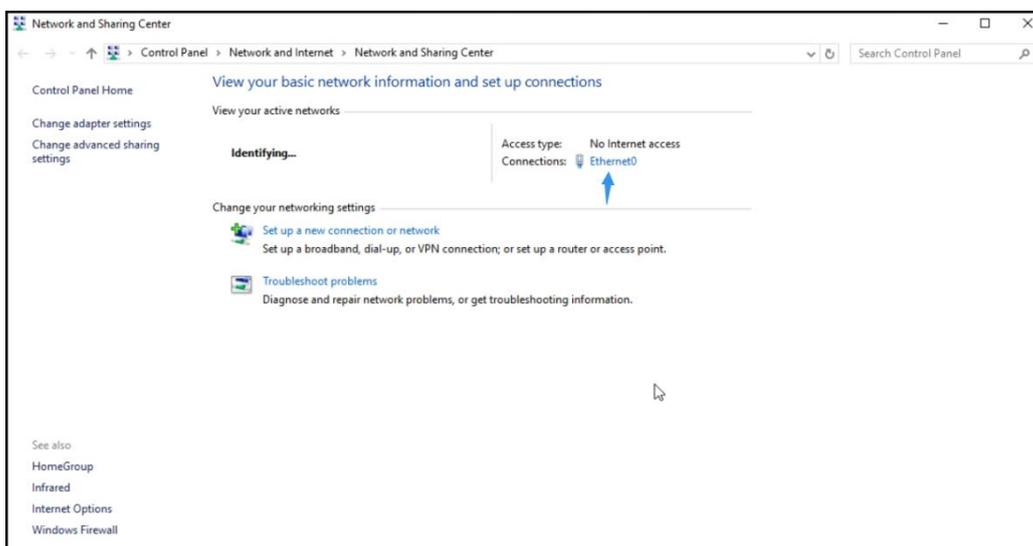
First, the decoder and the computer are connected to the same switch, or the decoder is directly connected to the computer network port. Then the decoder and the computer are configured in the same network segment so that the computer can access the WEB page of the decoder.

The default management IP of the decoder's network port is 192.168.1.168. If the computer's IP is not 192.168.1. \* subnet, it is necessary to set the computer's network port IP to 192.168.1. \* subnet. Here are the steps (Take Win10 as an example, other versions of Windows are similar):

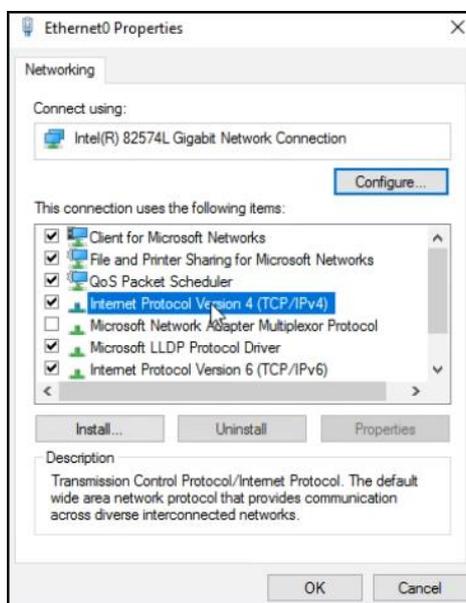
1) Roll your mouse and click the network icon in the lower right corner, click on "Network and Internet Settings" and then click on "Network and Sharing Center";



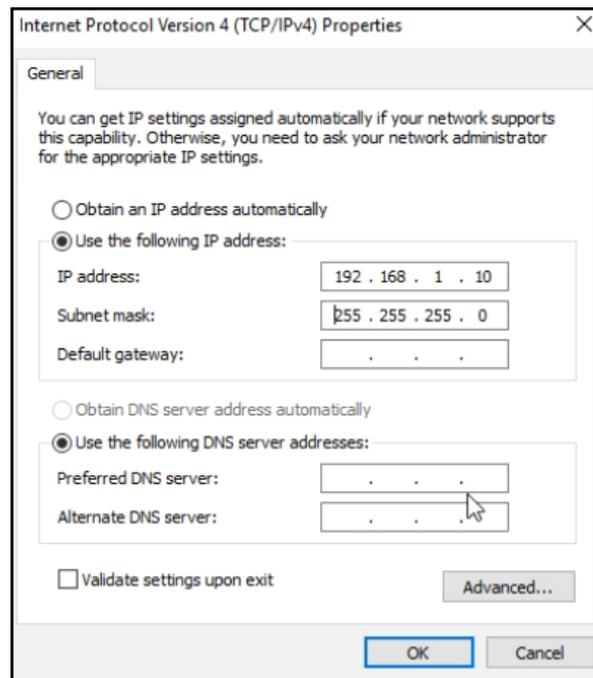
2) A network connection panel will pop up and the left mouse button will click "Ethernet";



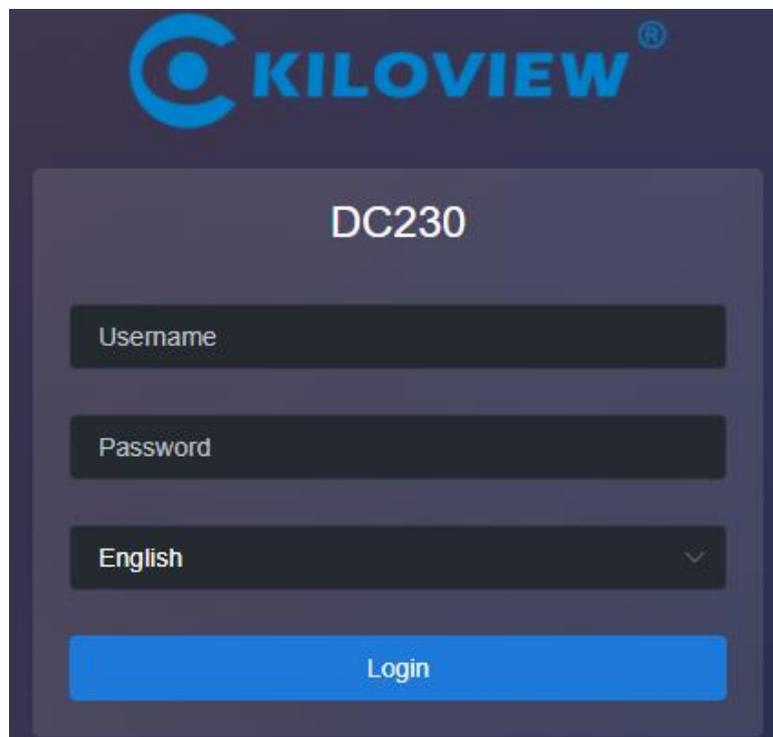
3) In the pop-up Ethernet status bar, click the "Property" button and left-click the "Internet Protocol Version 4" option;



4) The computer defaults to "auto-get IP address", at which point you need to select "Use the IP address below" and manually enter 192.168.1.10, the IP address and subnet mask, click OK.



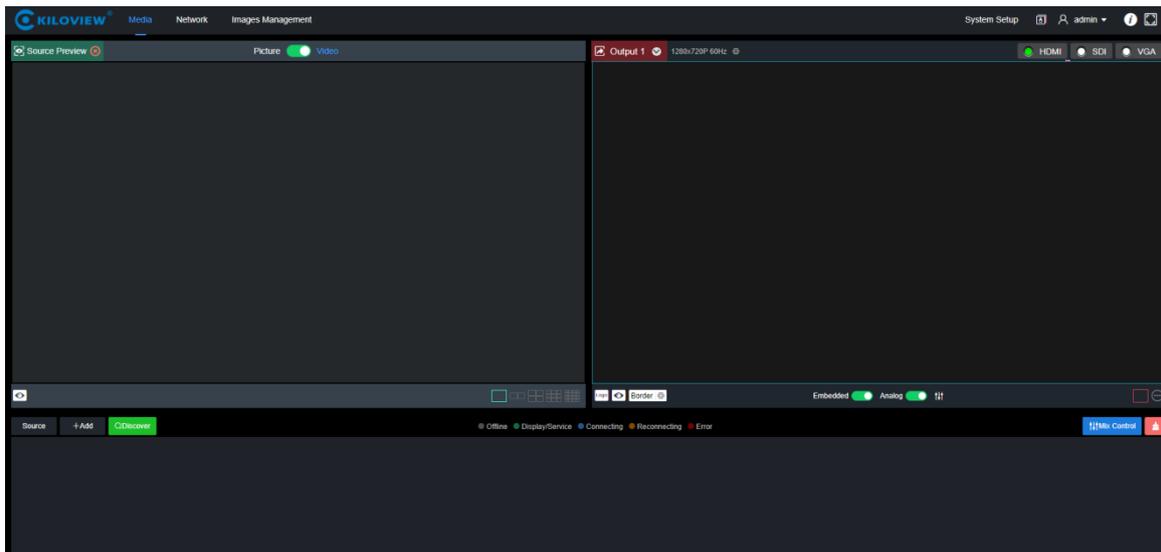
5) Open the WEB browser, enter the IP address of the decoder directly (default is 192.168.1.168) or the address <http://192.168.1.168>, click Enter to open the login interface of the decoder. When you open the page, an authentication dialog box pops up. You need to fill in the username and password. The default username and password of the decoder is admin/admin, and then click "Login".



**Note:** Due to the browser compatibility issues, it may cause the web page display abnormal, it is recommended to use Chrome and Firefox.

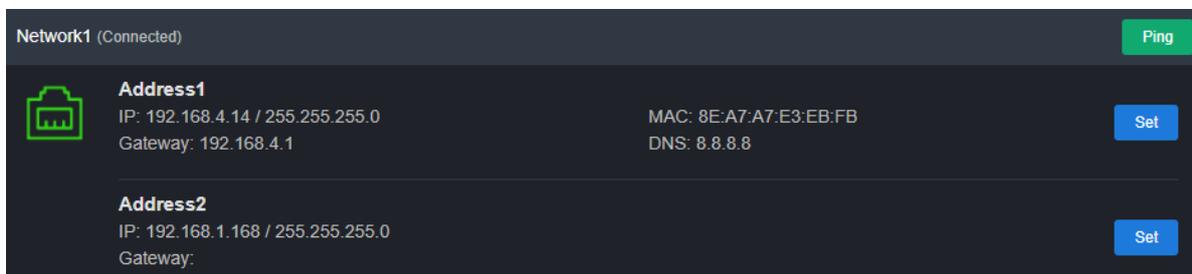


6) After login, you can set decoding parameters and functional parameters on the Web page. The left window is for preview by default, the right one is the output 1/2 for decoding. Users can choose to close the preview window. The decoder page looks like this:

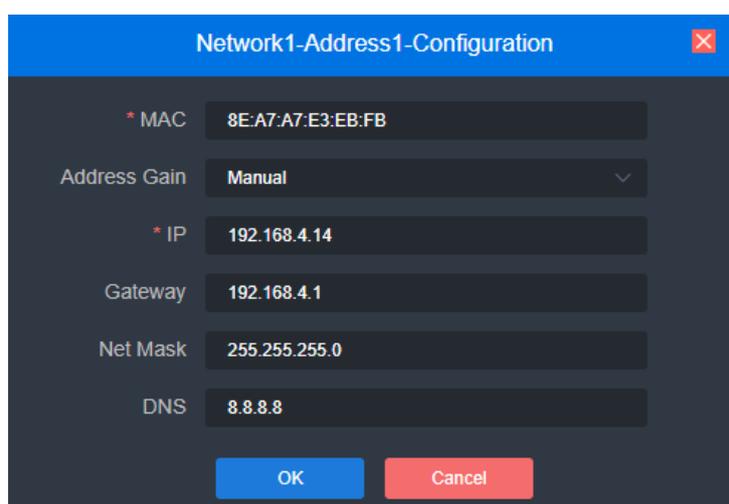


## 5.2 Network configuration

Click on the "Network" menu of the decoder web page to enter the configuration page. Decoder ports can be configured with three IP addresses: general "Address 1" configuration for device work IP (this IP can be used for both network streaming and device management); "Address 2" as the default management address (generally do not modify).



Click on the "Settings" button of Network 1 Address 1 to configure the IP address of the interface. The way to get the address can be selected as "DHCP Dynamic" and "Manual Set". The IP addresses acquired by DHCP may change. The manually specified IP addresses can be fixed to facilitate device management. The configuration of IP address should be based on the actual situation of local network.



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To choose a manual configuration, you need to set the IP, gateway, net mask, DNS parameters in turn. If the local network is in 192.168.4. \*/24 subnet, you can configure Address 1 to 192.168.4.14, 255.255.255.0, 192.168.3.1, and 8.8.8.8.(Make sure that the IP address is not occupied)

After the IP address is configured, you can test whether the IP address can ping through other computers in the local network, or access the web page of the device through <http://192.168.3.14>.

Only when the IP address configuration is correct, the device can work properly.



***NOTE: Because the device writes the configuration file to the system regularly for saving, the device can not power off immediately after the IP address is manually configured or modified, otherwise the IP address may be lost. If you want to save the configuration immediately, you can restart the device once on the WEB page.***

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## 6 Function Configuration

### Media (Pull stream and Decode)

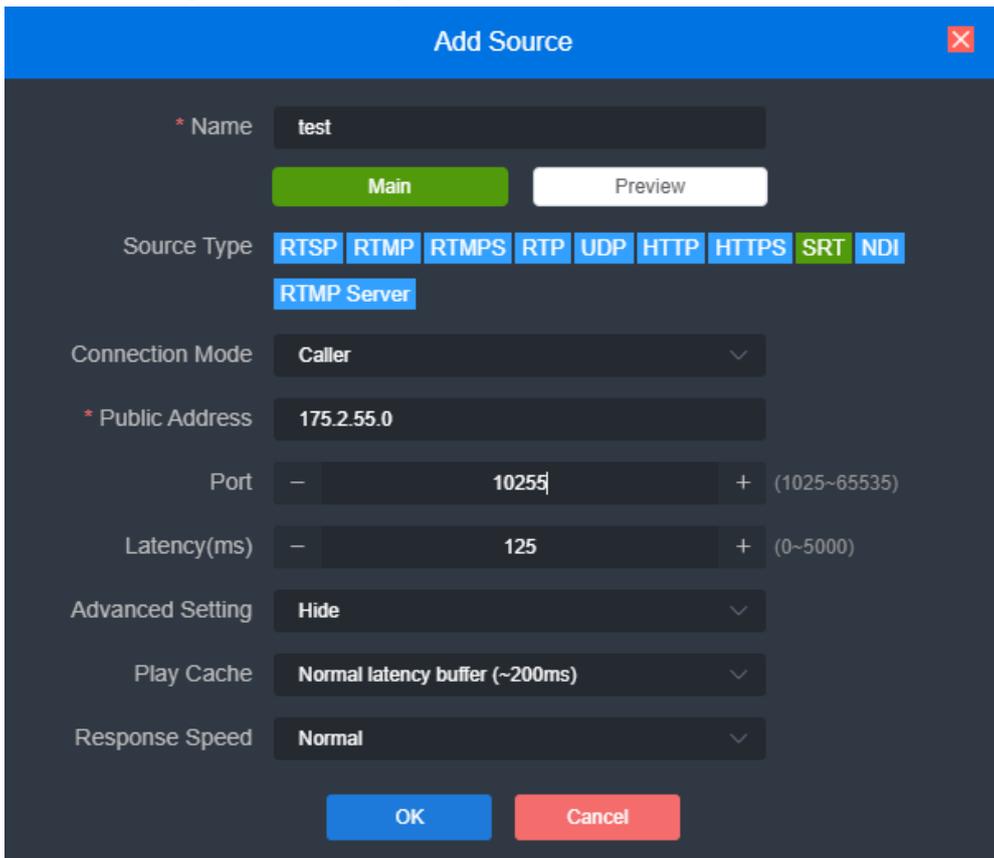
Click on the "Media" menu to set up the pull stream and decode. There are three functions: one is to add a video sources and the video sources list; the second one is for preview; the third one is to set two output parameters of decoder, such as streaming, split-screen and so on.

#### 6.1 Video source

##### 6.1.1 Add RTSP source

Click "Add" to configure the relevant parameters in the pop-up dialog box, and click "OK" to add a video source.

Under the same name, you can add two URL addresses, one main stream and one sub-stream. The main stream is used to decode the output, and the sub-stream is used for previews. If only one main stream address is filled in, both the preview and output will use the main stream.



 **NOTE:** First of all, we need to get the correct video source URL address from other platforms. The abnormal video source address will cause the device to not work properly. (Video source can be tested by VLC player.)

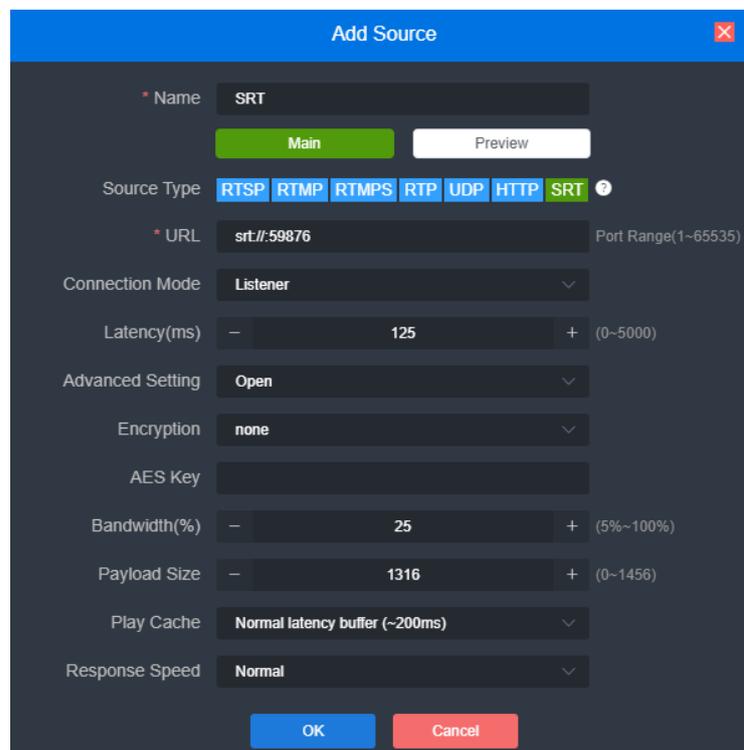
The above picture shows how to add an RTSP source as an example, other types of video sources operations are the same, the relevant parameters please refer to the below table.

The parameters of the video source are defined as follows:

Name	Video source name, can be set arbitrarily, support mixed Chinese and English
URL Address	Support RTSP, RTMP, RTMPS, UDP, HTTP and other protocols, decoder can automatically identify the URL address. After entering the URL address, if some advanced parameters are configured, the dialog box will automatically pop up to configure the corresponding parameters. You can also click on the protocol options on the page to set the parameters directly.
Transmission Mode	Choose TCP or UDP TCP is a reliable transport protocol and UDP is an unreliable transport protocol
User/Password	Configuration is based on whether or not the video source is authenticated by the user. Normally, no configuration is required.
Decoding buffer and delay	For a variety of different application scenarios and networks, to balance of delay and fluency of the decoding, the device provides a variety of buffering strategies for users to choose. Zero buffer, 50ms, 120ms, 200ms, 500ms, 1s are optional. Users can choose on actual network conditions, good network with lower latency, and poor network with higher latency.

## 6.1.2 Add SRT source

1) Add a SRT source in the page of video decoder by "Media" - "Add Source" - "SRT".



The screenshot shows the 'Add Source' dialog box with the following configuration:

- Name:** SRT
- Source Type:** SRT (selected from RTSP, RTMP, RTMPS, RTP, UDP, HTTP, SRT)
- URL:** srt://59876 (Port Range: 1~65535)
- Connection Mode:** Listener
- Latency (ms):** 125 (Range: 0~5000)
- Advanced Setting:** Open
- Encryption:** none
- AES Key:** (empty)
- Bandwidth (%):** 25 (Range: 5%~100%)
- Payload Size:** 1316 (Range: 0~1456)
- Play Cache:** Normal latency buffer (~200ms)
- Response Speed:** Normal

SRT Setting parameters means the following:

Name: You can name it freely, supporting letters and numbers combination;

Connection Mode: Caller、Listener、Rendezvous;

URL: When using CALLER mode, the URL address format is: srt://the-other-end public IP address: port, and when using Listener mode, the URL address is: srt://port

Address: Set IP address of the receiving port;

Port: Configure a listening port which should be consistent with the sending port;

Latency: please set it according to the configuration of the video encode and the final delay will be the larger one between encoder and decoder. Default is 125ms;

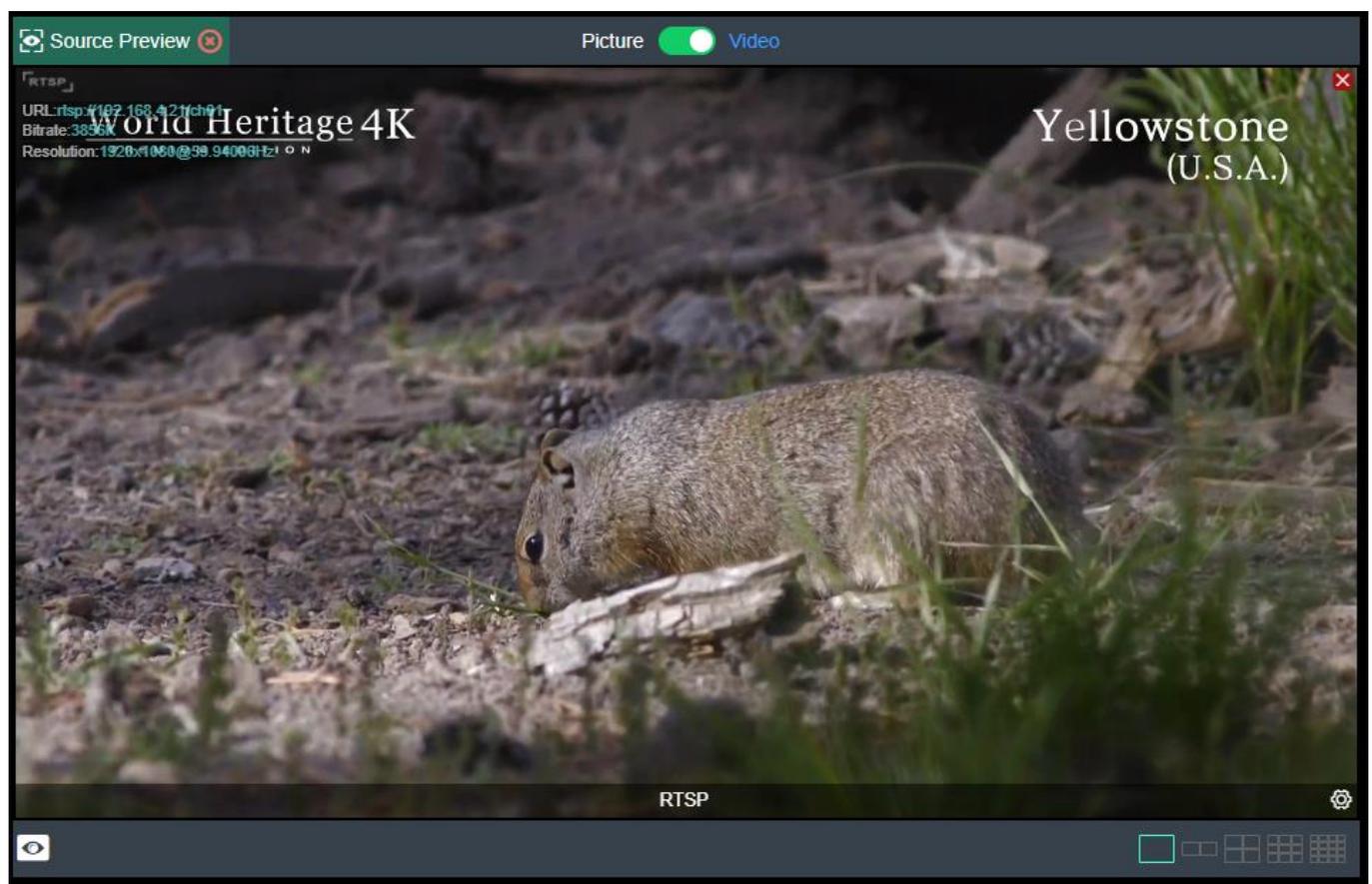
Encryption Mode/AES KEY : AES-128, AES-192 and AES-256, it should be the same as the sender;

Key: encryption key, according to the encryption method to fill in 10-32 letters or number combinations;

Bandwidth Overhead: The percentage value set based on network link quality. Multiply this percentage value by the total AVIS code rate encoded by the encoder to obtain the maximum bandwidth footprint allowed by Bandwidth Overhead, which is the threshold for the current SRT transmission bandwidth and the maximum bandwidth that the SRT stream can use. As understood from the "overhead" point of view, it is the media content required for transmission (which can be understood as the payload of the load), the additional "invalid" bandwidth to occupy, but it is different from our common protocol overhead, TCP first overhead, UDP first overhead, where the bandwidth overhead is not a fixed 20 to 60 bytes TCP first overhead or 8 bytes UDP first overhead, but according to network conditions change in real time, the network link conditions are worse, the more normal transmission. The setting range is 5% to 100%, and the default size is 25%.

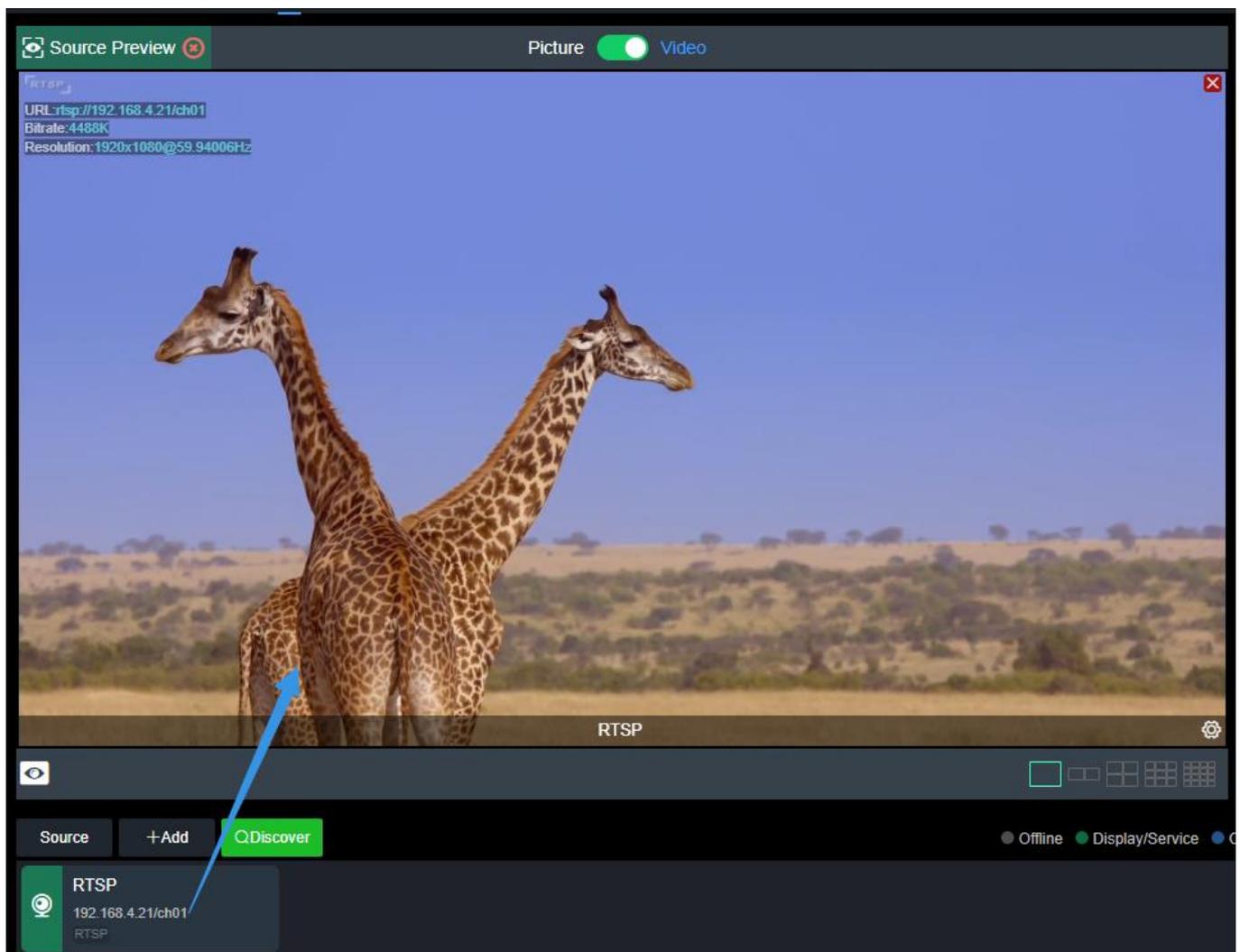
Payload size: Please keep the same settings as the sender, the default one is 1316.

2) Please add the SRT source to the output window, and the decoder starts to listen for SRT requests, it will establish the SRT connection while receiving the right SRT "Call", and decode then output video.



### 6.1.3 Video sources list

This list shows all the video sources and source parameter information you added, not all of them are decoded. To decode the output, you need to manually drag it to the upper output area to decode. When the video source is shown as green "View/Pull", the video source is decoded or pushed; the representative displayed as gray "Off" is not used as decoding source; Shown as blue "Connecting" indicates that the source is establishing a connection ready for decoding and the Yellow "Connecting/Reconnecting" indicates that the source is decoding abnormally in the decoder and tries to connect and decode. Shown as a red "take stream" indicates that the source may be wrong and does not support decoding.

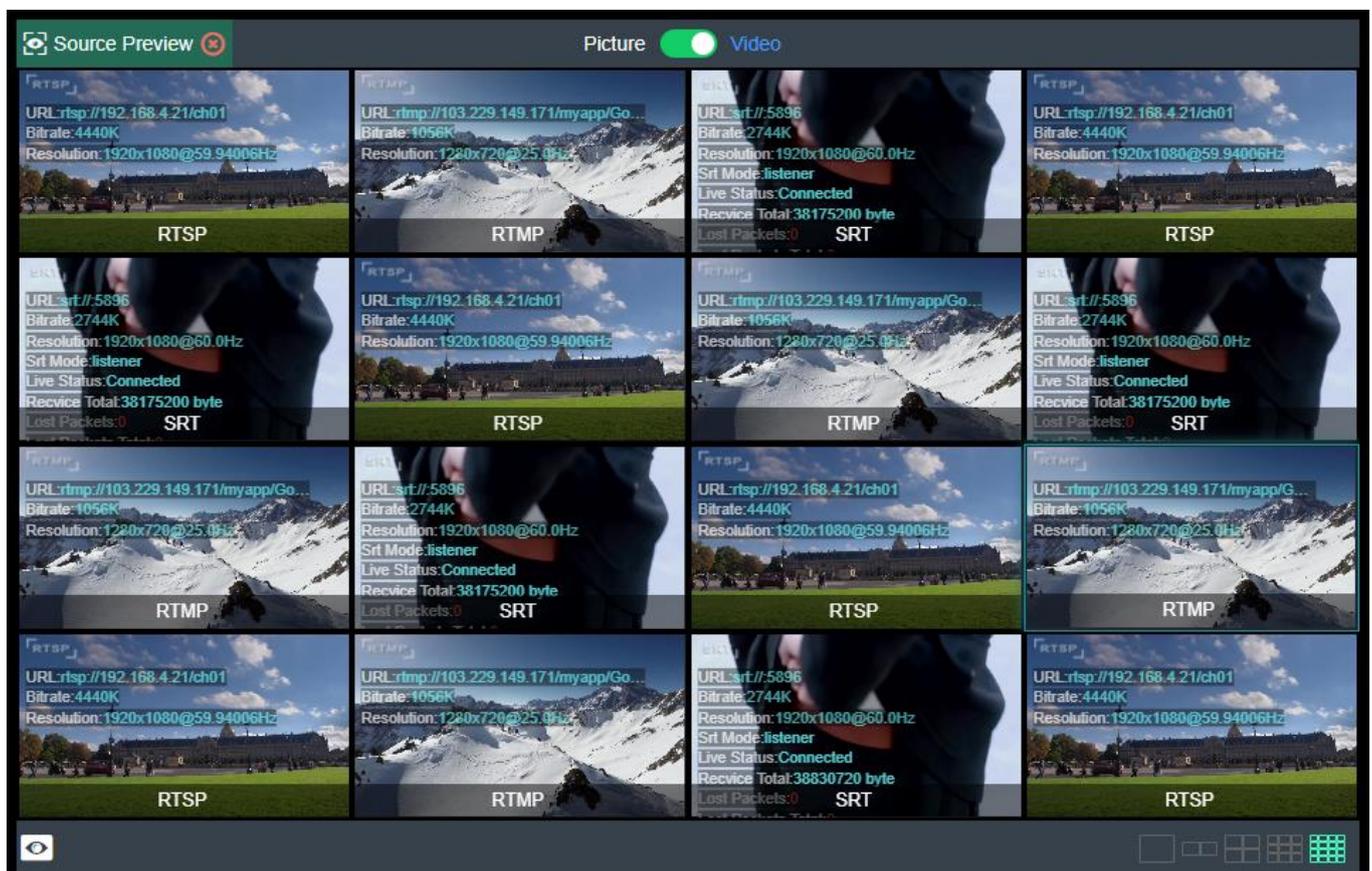


**⚠️ NOTE:** It is non-decoding status, after video sources being added. You need to drag it into the above output window, then the device starts to connect to the source and decode it.

## 6.1.4 The source preview

Supports local preview of video sources through web pages, with a click in the upper left corner to turn off the preview function. Through Picture/video switch button, you can switch picture or video preview mode.

- Support picture/video preview. If you use pictures in the preview, you will see the picture stream, which is expressed as a picture change in about three seconds; when you use the video preview, it is a smooth video;
- The preview function mainly consumes the computer's CPU/GPU performance. If the multi-screen preview is freezing, it may be related to your computer performance;
- Preview supports 1/2/4/9/16 split screen, up to 16 split screen previews;
- Required browser: the latest version of Google and Edge;
- Only support for local preview in the same LAN for the computer and device, and cannot preview across WAN;
- Display of decoding status and source parameter information.

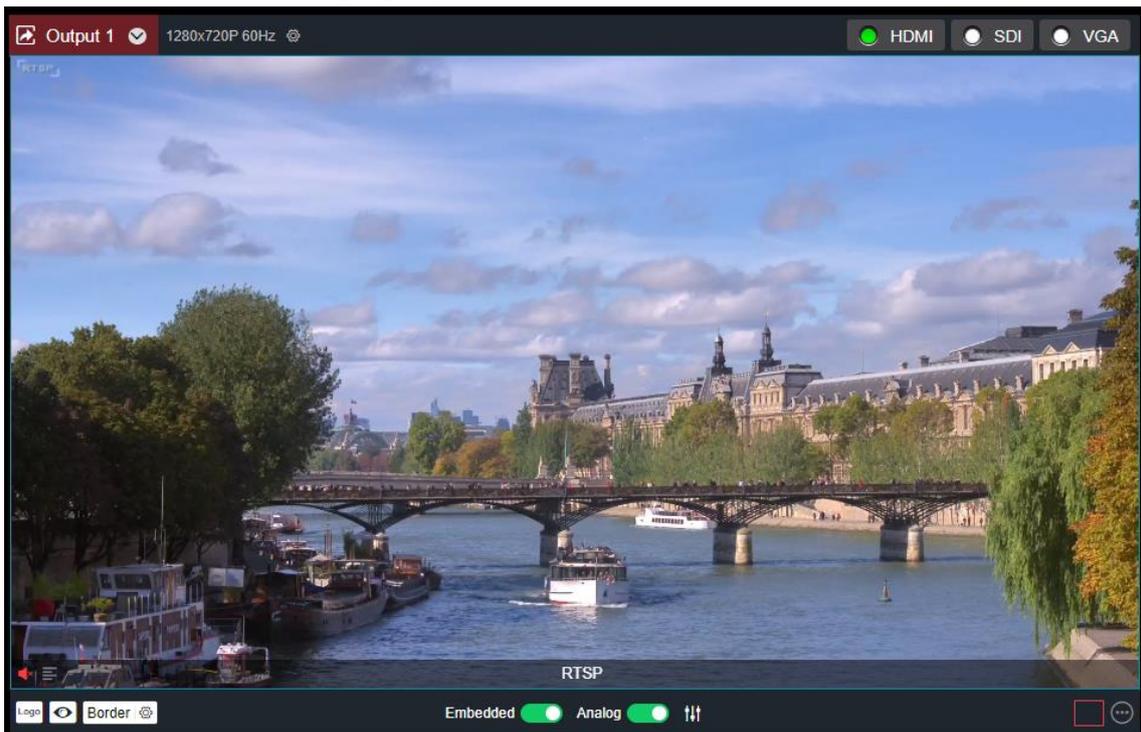


**NOTE:** Browser preview does not support video sources with B-frame encoding.

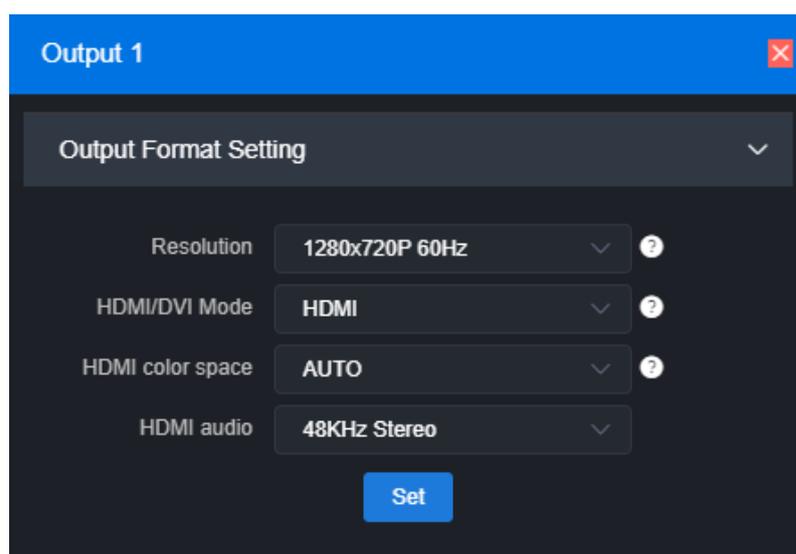
### 6.1.5 Video output setting

The decoder supports H.264 decoding and can support dual interfaces of SDI and DVI (compatible with HDMI and VGA) to simultaneously output the same and different signal sources or split screen pictures.

The decoder WEB page has three output window, corresponding to the two hardware interfaces of SDI/DVI. You only need to drag the added video source to the corresponding output window, and the decoder will start decoding. Take "Output 1" as an example to illustrate the control of the output window in detail (as shown in the following figure):



Click the settings button to set the video output parameters



**⚠ NOTE:** This window is only an operation window, which can not preview the decoded video output. If you want to watch the decoded output video, you need to connect DVI / HDMI / VGA or SDI display for viewing.



## ① Setting Video Output Parameters

### Resolution:

Support SDI&DVI/HDMI/VGA (up to 1920x1080P60Hz) multi-resolution configuration. All the resolutions labeled SDI only are valid on the SDI output interface. On the HDMI interface, the output is the resolution closest to this resolution.

### HDMI/DVI Mode:

Three modes can be selected: automatic mode, HDMI mode and DVI mode. If "Automation" is selected, the HDMI/DVI mode will be automatically selected according to the EDID description of the HDMI device connected. In DVI mode, the color space and audio parameters will not be set.

### HDMI color space:

Optional "automatic", "RGB444", "YCBCR444", "YCBCR422", "YCBCR420". If "Automation" is selected, an appropriate color space will be automatically selected according to the EDID description of the HDMI device connected. If the output is not normal in this case, please choose the right HDMI color space by yourself.

### HDMI audio:

32K/44.1K/48KHz dual channel is optional. Please choose according to actual needs, default 48KHz.

## ② Display current video source information

It can display the current output of the video source name, current bit rate and other parameters.

## ③ Setting up the way of video output

Three output modes, HDMI (compatible with DVI) / SDI / VGA, can be selected. Click to select the output mode to become green, that is to say, it is selected. Select HDMI to represent the current signal source will be output to the HDMI interface; select SDI to represent the current signal source will be output to the SDI interface; select VGA to represent the current signal source will be output to the VGA interface.

Two output windows can choose the same signal source and screen splitting, or can be set to different signal sources and screen splitting.

## ④ Audio switch

Click  It can be set to turn on and off audio output

## ⑤ Icon switch

Click  It can set On/Off Overlay LOGO Display, Click  It can set background overlays on and

off, Click  It can set turn source status and information display on and off, Click  It can set border overlays on and off.

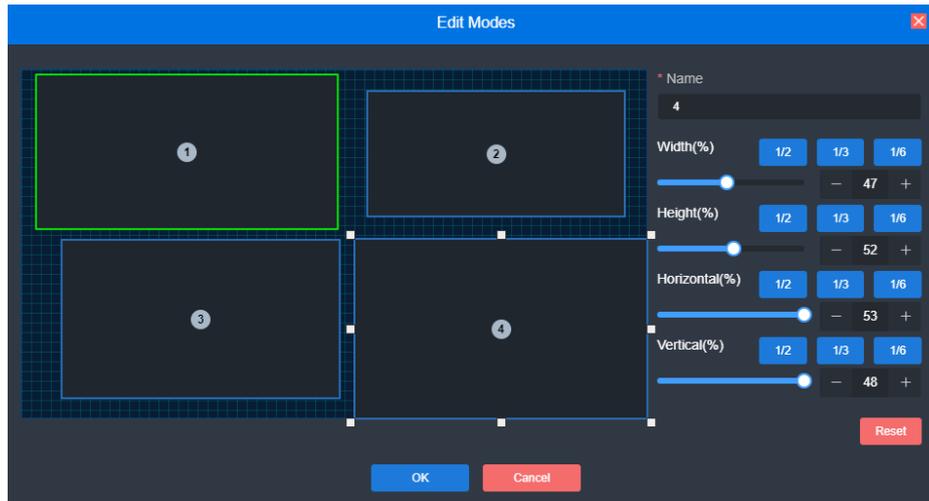
## ⑥ Audio gain setting

It can set the "Digital" and "analog" audio gain, or turn off analog audio output.

⑦ Screen splitting settings (only supported by DC230)

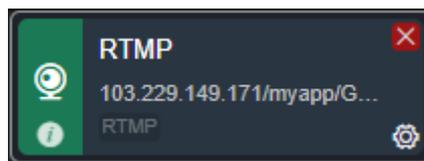
DC230 decoder can display four split-screen modes, with 1/2/3/4 split-screen, supporting up to 4 channels 1080P30 or 2 channels 1080P60 or less. By clicking on the right-hand expansion button, you can set the split-screen mode you want to display, available in 1-4 options. Within the expansion button, the selected split-screen mode is bright and the unselected split-screen mode is gray.

Click “Add Layout” to go to the layout editing page. Select a split-screen layout, you can drag the size and overlay the picture-in-picture at will for multiple screens in the layout, and you can modify the layout in real time when the layout is in use.



⑧ Video Source Settings

Click the settings button to modify the parameters of the video source; Click “✕” button to delete the modified video source; Click “i” , then pop up video source parameters and decode status information.

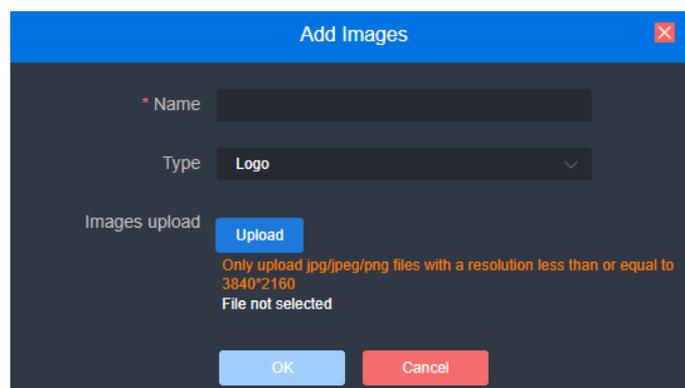


6.1.6 Pictures and OSD overlays

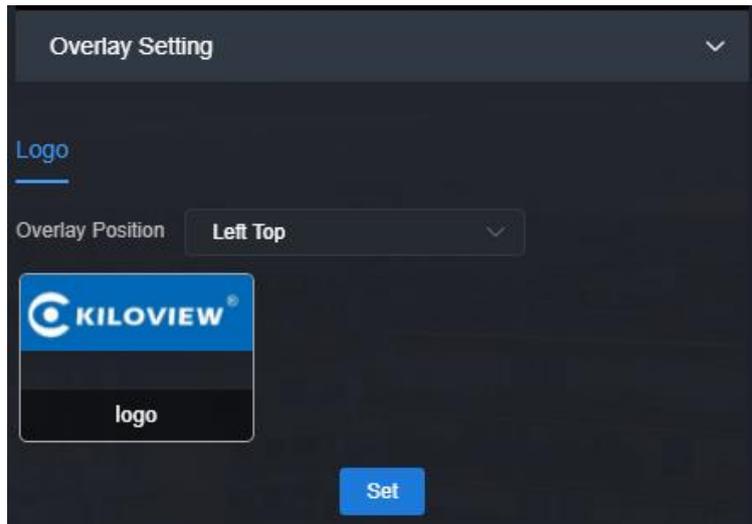
Image overlays are divided into logos and background overlays, starting with uploading images that need to be superimposed in image management and then overlaying them in overlay settings.

1) Picture management

On the page "Picture Management" - "Add Pictures", in the pop-up add box, fill in the name, Logo/background, choose to upload a picture, and then click “Save”.



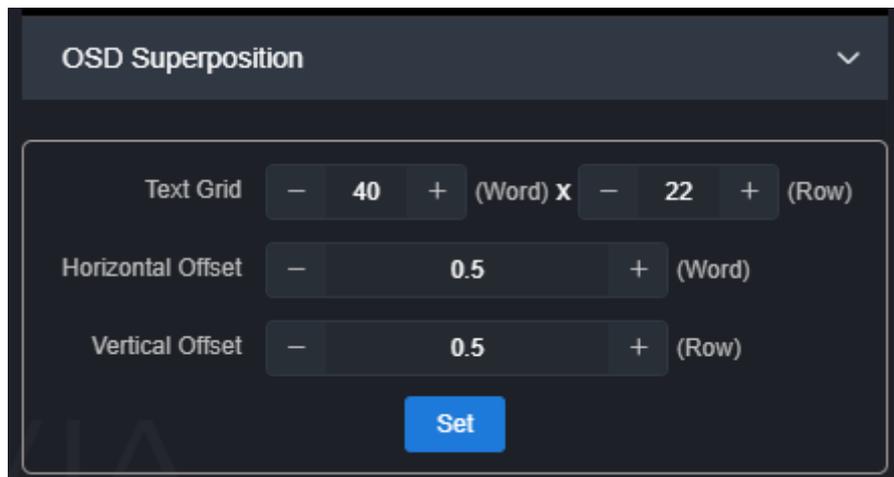
Click the output (1/2) box setting and select your picture or logo. You can overlay your Logo either place on the Window. After clicking "Set" to save, you can see the overlaid effect on the output screen.



**⚠ NOTE :** *Overlay Logo image pixels should not be too large, otherwise too much video will be overwritten. The picture format only supports JPEG and PNG..*

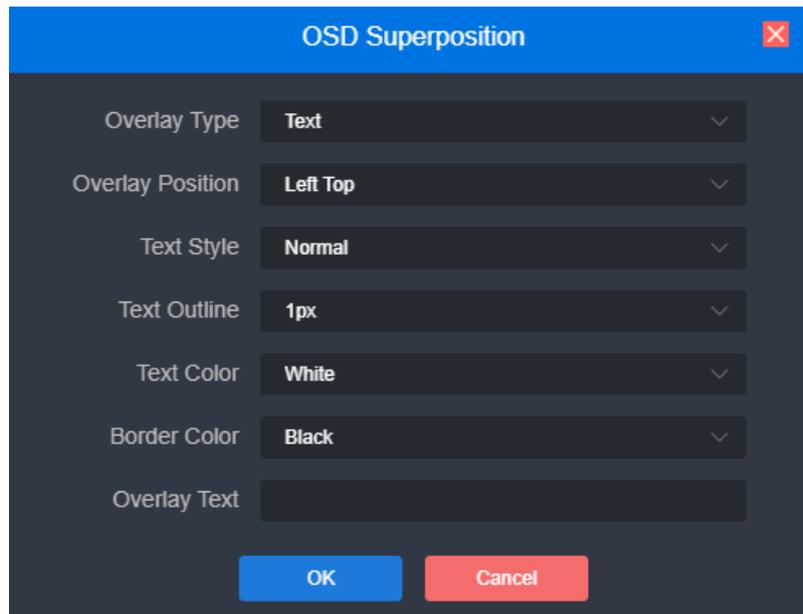
## 2) OSD overlay

First, you can have an overall configuration for the overlay and adjust the overlay position. It allows you to adjust the character's position in the display according to the actual situation.



- Screen grid: Divide the screen into horizontal M grids and vertical N lines, each character occupies one grid;
- Horizontal shift: Adjust character position in the horizontal direction of the screen. The unit is character.
- Vertical shift: Adjust character position in the vertical direction of the screen. The unit is character.

Then set the overlay parameters, select "Overlay Type", and configure the overlay function separately for the "Text" and "System Time" and "the overlay items".

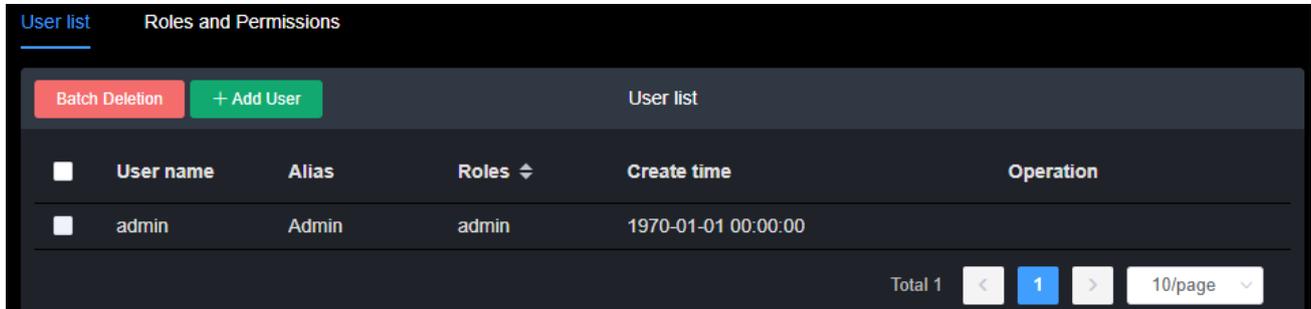


- Overlay type: "No superimposition, text, date, time and date/time" can be selected;
- Overlay position: 7 preset display positions and custom positions can be selected, and the display position of characters after overlay can be selected according to actual needs;
- Horizontal position: when the overlay position is customized, adjust the character shift based on the global horizontal shift setting;
- Vertical position: When the overlay position is customized, adjust the character shift based on the global vertical shift setting;
- Text style: normal and bold;
- Text outline: 0-10px;
- Text color: optional;
- Border color: optional

## 7 System setup

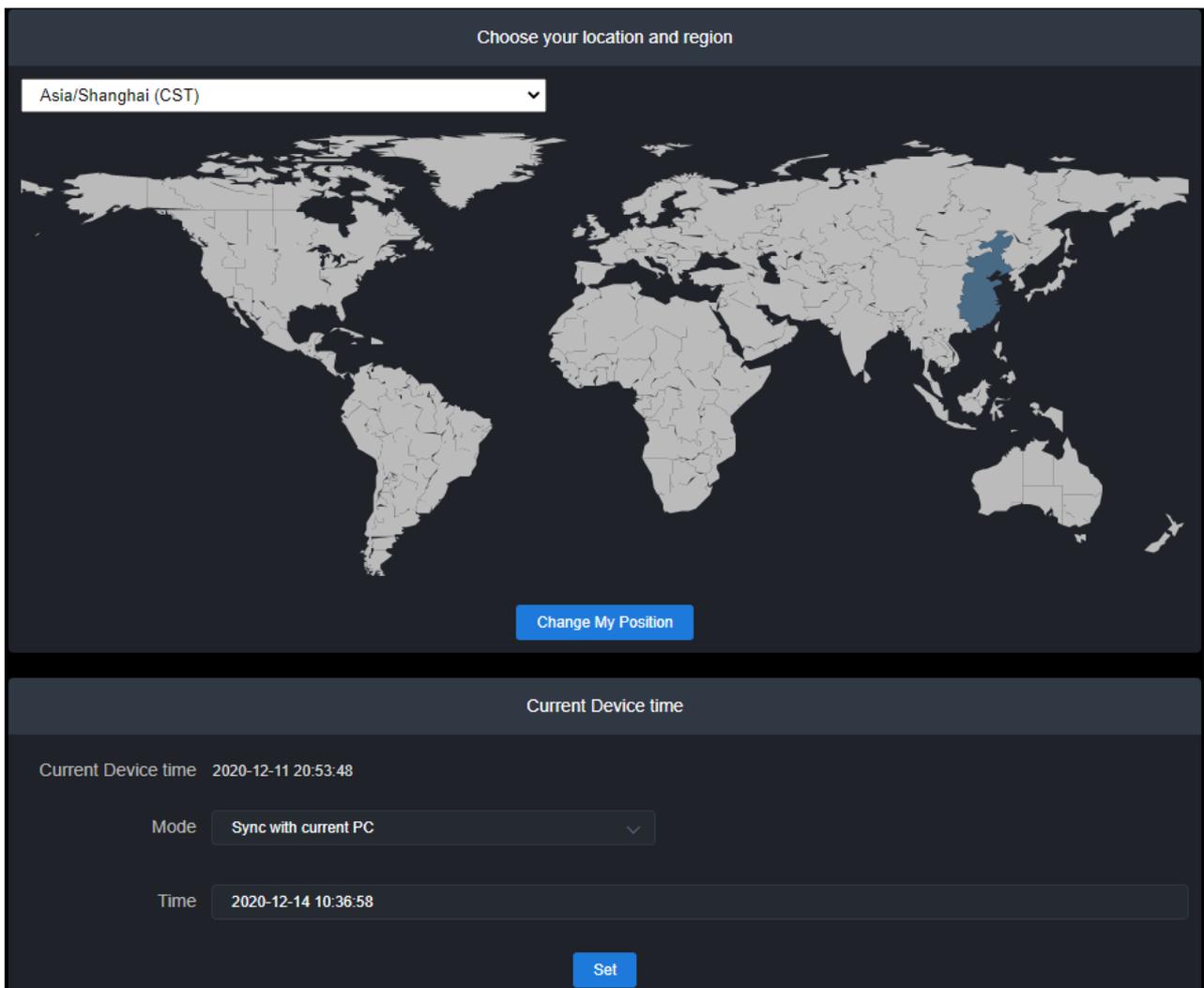
### 7.1 User Management

Viewing User Lists, Adding and Deleting Users



### 7.2 System Time

Timing mode can be set: synchronization with current PC, manual timing and slave NTP server. Choose the right time zone to ensure the correct time from the NTP server.



### 7.3 Reset

Used to reset decoding services, usually used to make the modified parameters take effect immediately or

decode abnormal situations. The current decoding services will be temporarily interrupted, requiring about 3S.

## 7.4 Reboot

Device software restart, it lasts about 3 minutes.

## 7.5 Restore

If users change parameters that lead decoder can't work (The typical situation is changed network address, so it can't login decoder), users could restore factory setting to default value.

There are two ways to restore the factory settings. Restoring the factory settings will lead to a hard restart of the device. The restart process will take about 3 minutes.

- 1) WEB page "Restore", click to take effect
- 2) RESET button of device panel. At the RESET button position of the device, hold down the reset key and maintain for more than 5 seconds. The device will be restored to the factory settings.

Below parameters will be restored after restoring factory setting:

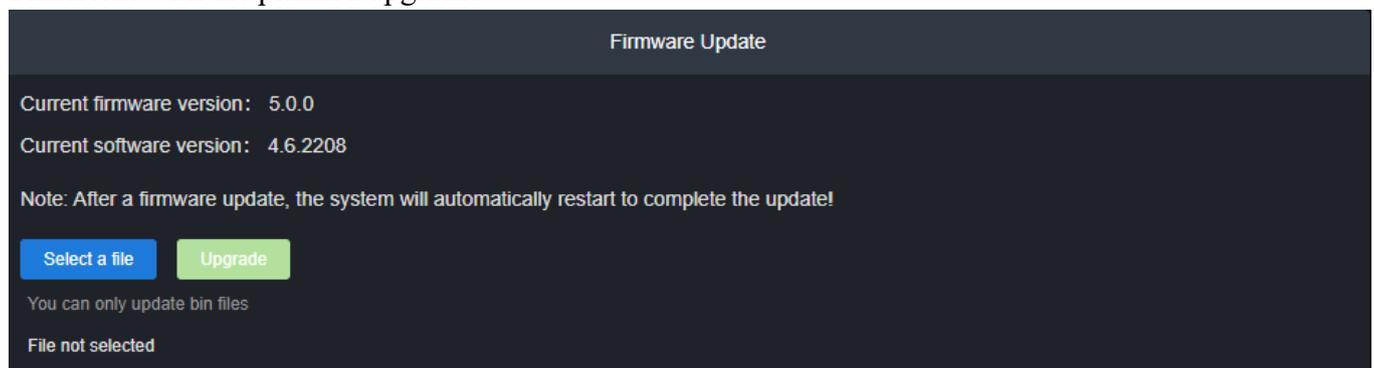
- Login username and password will be turned to admin;
- The IP address will be restored to 192.168.1.168 and mask is 255.255.255.0;
- All the video/audio decoding settings will be restored;
- Streaming settings will be restored.

## 7.6 Firmware

Please check the device information and firmware before upgrading, download the firmware to the local computer in advance.

After the firmware is uploaded successfully, the power can not be cut off during the upgrade process. After the upgrade, the device will restart. The whole upgrade process will last about 3-5 minutes (depending on the size of firmware and network environment).

After the device is restarted, you can click on the upper right button to see if the software version is consistent with the planned upgrade.



**Thank you for reading.**

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