KILOVIEW®

DC220/230

Multifunctional HD Video Decoder

USER MANUAL

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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/RTP/SRT unicast or multicast media streams, etc.), and output with SDI signals, DVI-I signal (compatible with HDMI/VGA signals).

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; 1080p/1080i 59.94 is also compatible.
- 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.

- Size is 138mm*105mm*27mm only; 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(800x600),VGA(640x480) and other VESA formats.
Audio output	Analog line-out; SDI/HDMI embedded
Media protocols	RTMP/HLS/TS over UDP/RTP/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
Decoding ability	Single channel video decoding
Management	Web operation
Power supply /Consumption	DC 12V, 1A/ 5W
Size/ Weight	138*105*27mm/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/RTP/RTSP/SRT
SDI transmitting distance	Belden 1694A cable standard: SD SDI ≥ 350m; HD SDI ≥ 180m; 3D SDI ≥ 100m
Video decoding	H.264
Audio decoding	AAC/ G.711
Decoding delay	≤200ms
Decoding ability	Up to 4 channels 1080p30/ 2 channels 1080p60
Management	Web operation
Power supply /Consumption	DC 12V, 1A/ 5W
Size/ Weight	138*105*27mm/380g
Operation temperature	-20°C~60°C

2 Operation guidance

● Installation and Connection of Device

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

● 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' menu, 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

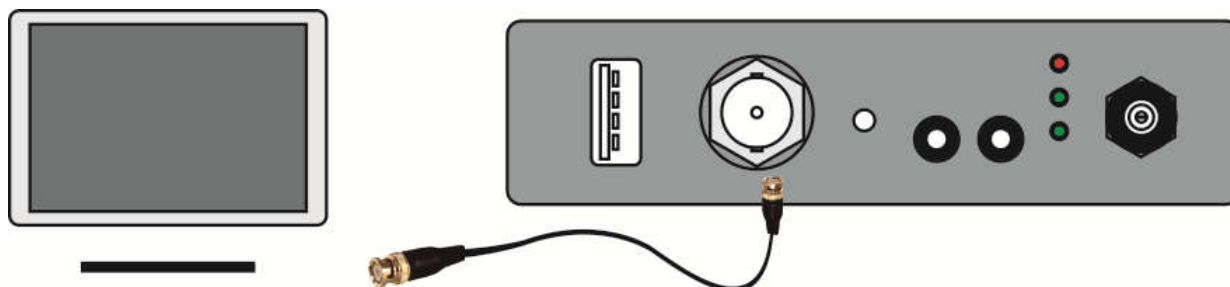Using the power adaptor (DC12V/1A) connected to the device, after the power is turned on, the device starts working.

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

4.2　Connect displayer

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 displayer

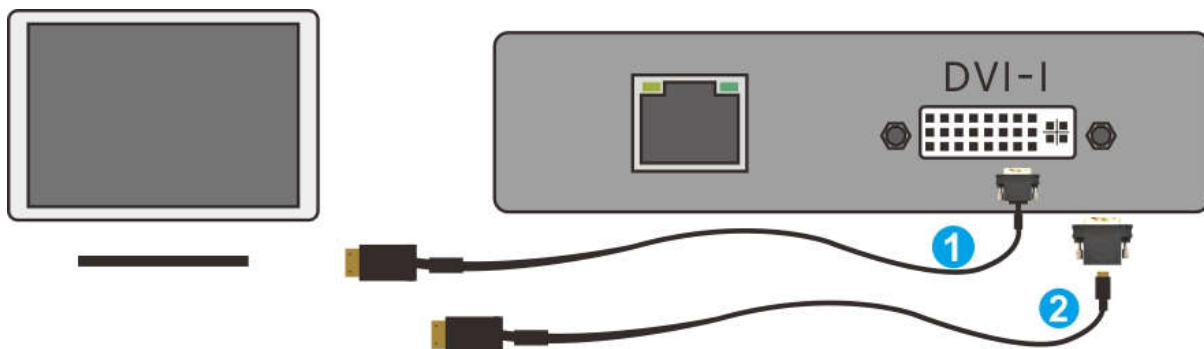Using SDI cable to connect SDI output interface with SDI displayer

4.2.2   Connect DVI displayer

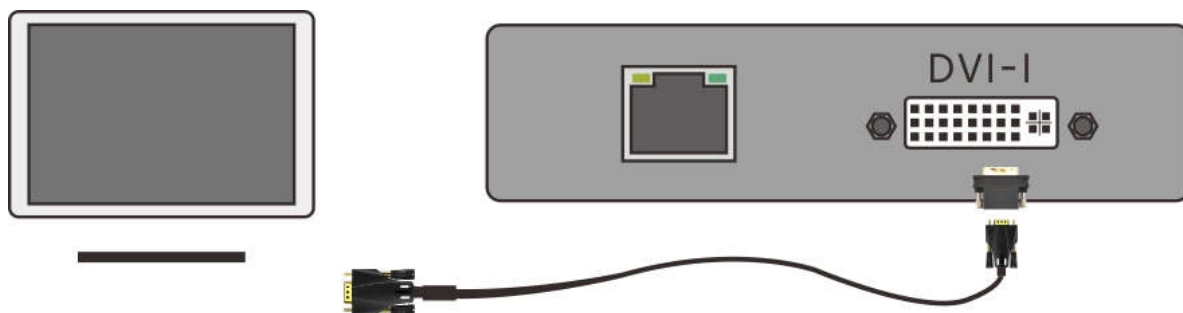Connecting DVI video output interface with DVI displayer via DVI cable.

4.2.3   Connect HDMI displayer

● Using DVI to HDMI cable to connect DVI video output interface with HDMI displayer (recommended);
● By DVI to HDMI adaptor with HDMI cable to connect.

4.2.4   Connect VGA displayer

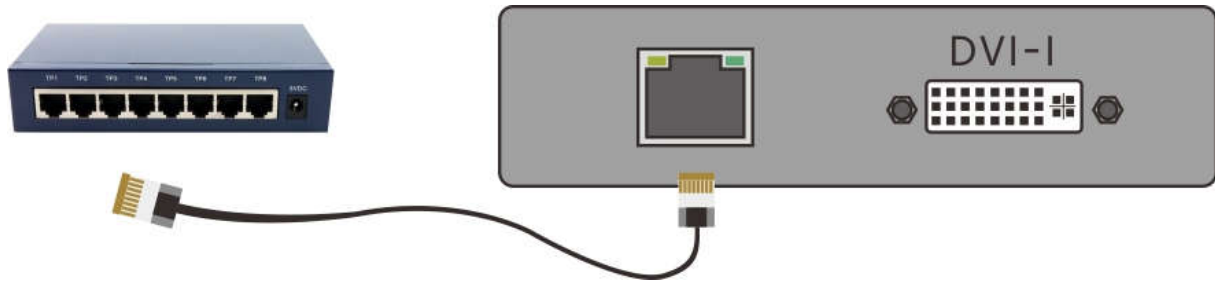Using DVI to VGA adaptor connected to DVI interface, then with VGA cable to displayer.

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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 Ethernet port, the other end is connected to the network switch or the computer's Ethernet port.
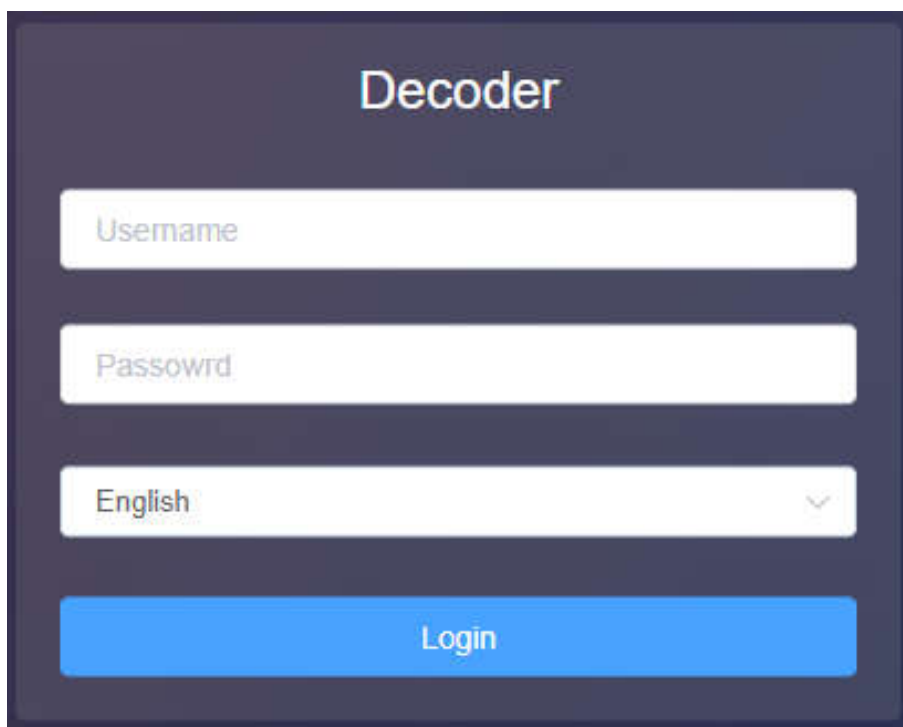
5 Login and network configuration

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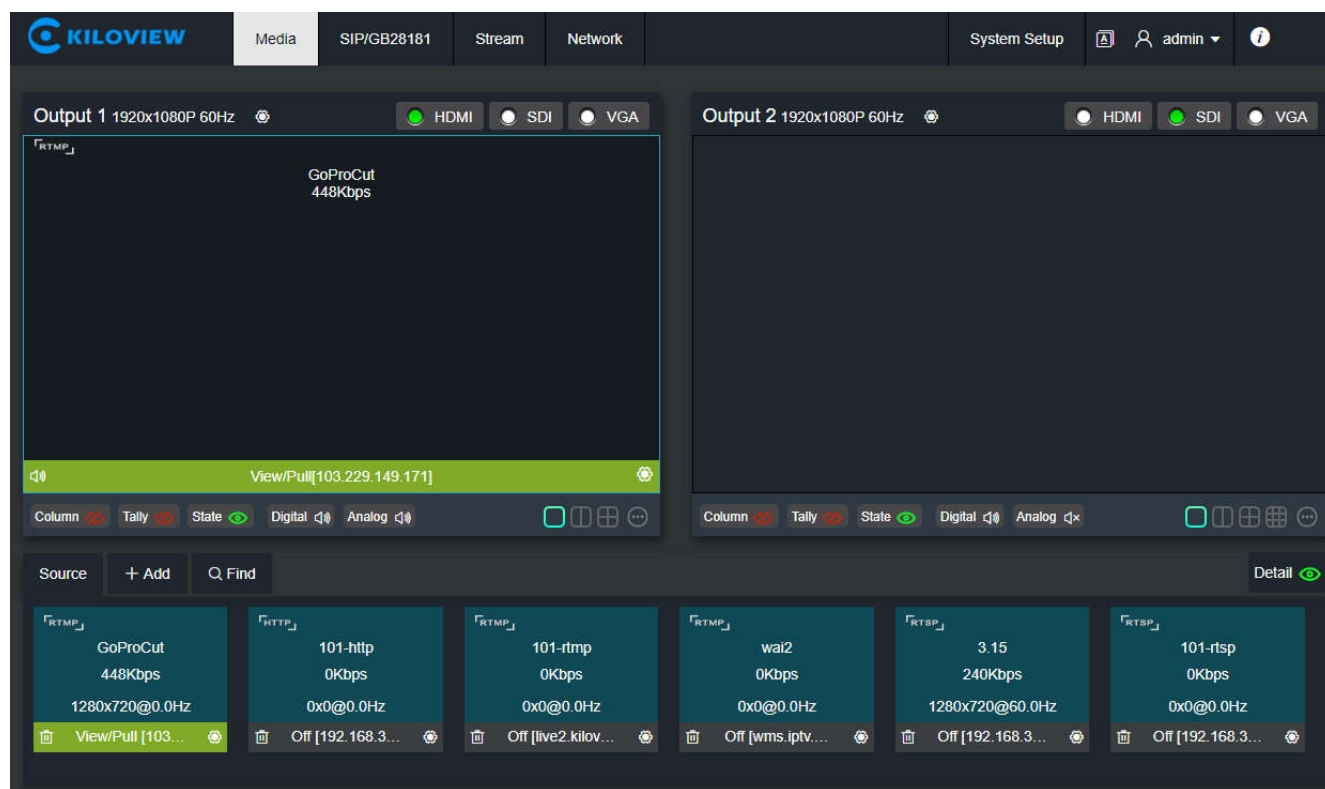
Open the WEB browser, enter the IP address of the decoder directly (default is 192.168.1.168) or the address http://192.168.1.168, click Enter to open the login interface of the decoder. When you open the page, an authentication dialog box pops up. You need to fill in the username and password. The default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

After normal login, decoding parameters and functional parameters can be set on the web page of decoder. The decoder page is shown in the following figure:
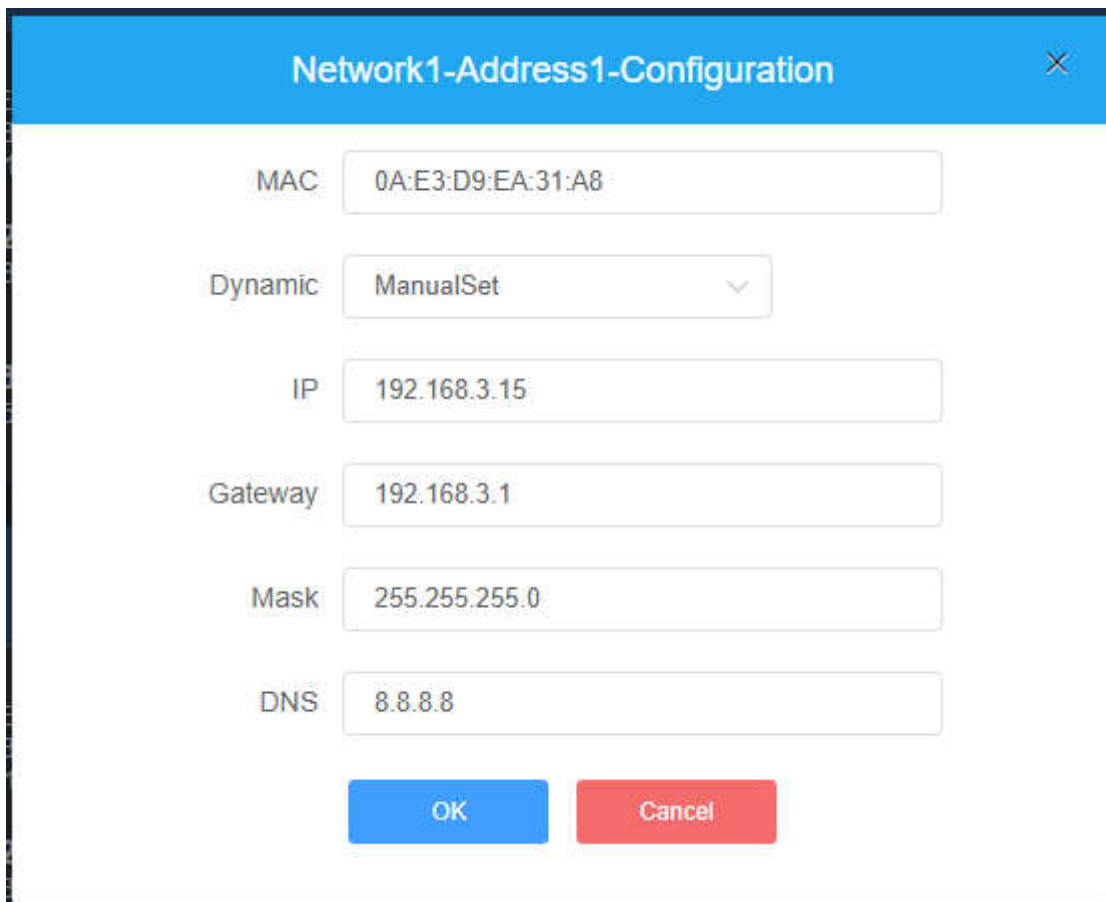
5.2 Network configuration

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); "Address 3" can be used for other purposes. "IP1" and "IP3" can also be used as device management after proper configuration.

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.

To choose a manual configuration, you need to set the IP, gateway, mask, DNS parameters in turn. If the local network is in 192.168.3. */24 subnet, you can configure Address 1 to 192.168.3.15, 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://192.168.3.15.

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.*

6　Function Configuration

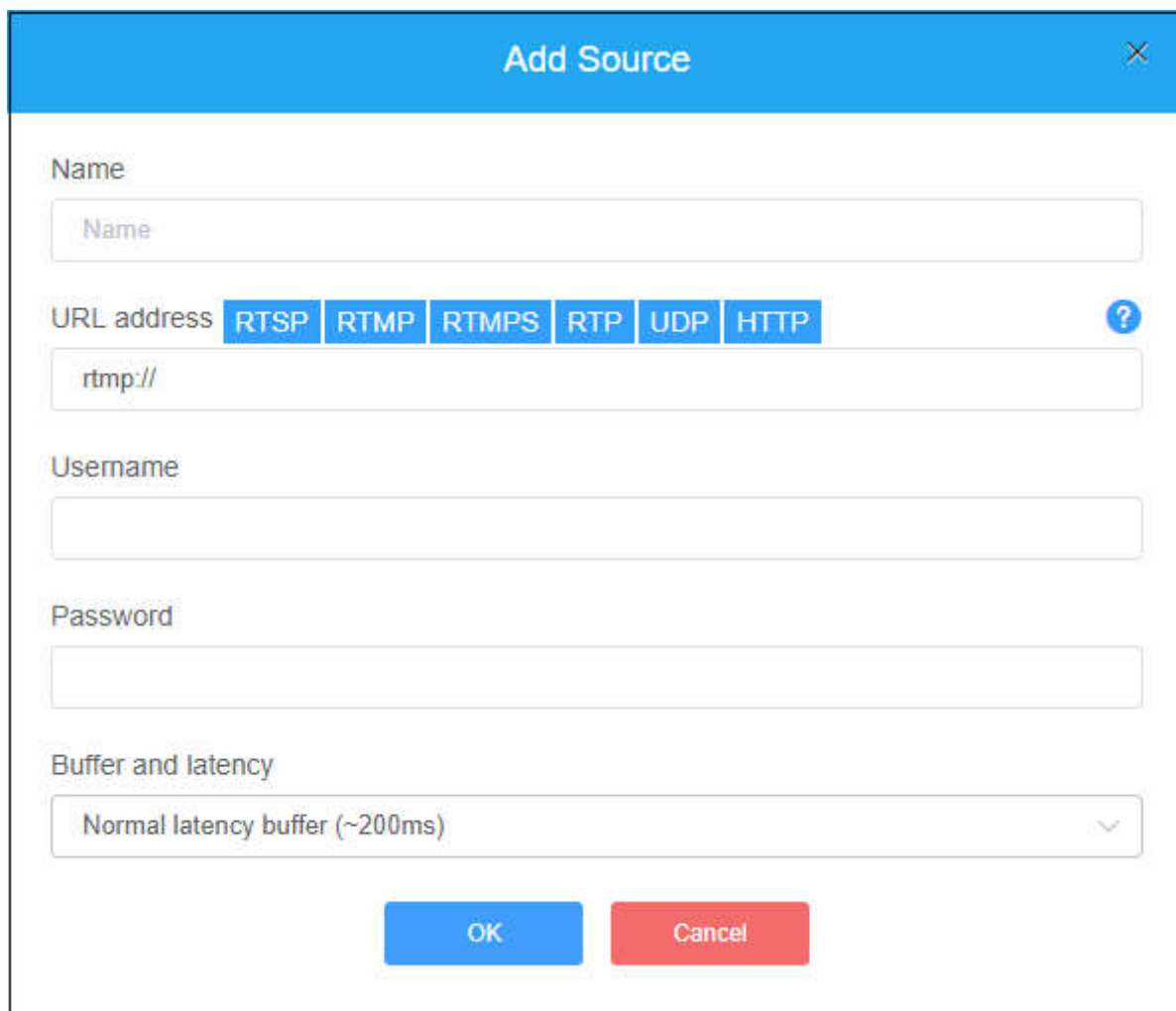## 6.1　Media（Pull stream and Decode）

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

6.1.1　Video source

6.1.1.1　Add RTMP source

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

⚠　*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 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, RTP, 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
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 bad network with higher latency.
Video Receiving Port	RTP protocol usage,Range 1-65535
Audio Receiving Port	RTP protocol usage,Range 1-65535
Binding Network	RTP protocol usage,Default auto
Video Coder	RTP protocol usage,[PT,]CODER[/Timestamp-unit],i.e.96,H264/90000
Audio Coder	RTP protocol usage, [PT,]CODER[/Timestamp-unit/channels],i.e.96,MPEG4-GENERIC/48000/2

6.1.1.2 Add SRT source

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

Setting parameters means the following:

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

Connection Mode: Listener;

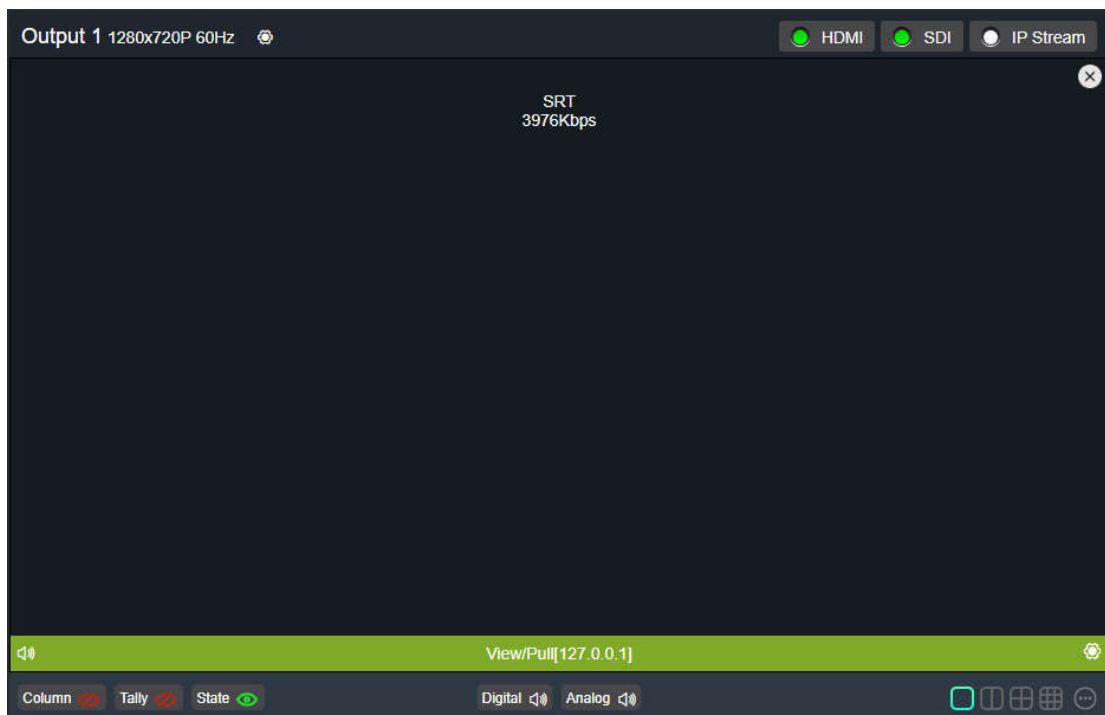Port: Configure a listening port which should be consistent with the sending port;

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;

Bandwidth Overhead:It is set as the percentage value based on network link quality, the default is 25%;
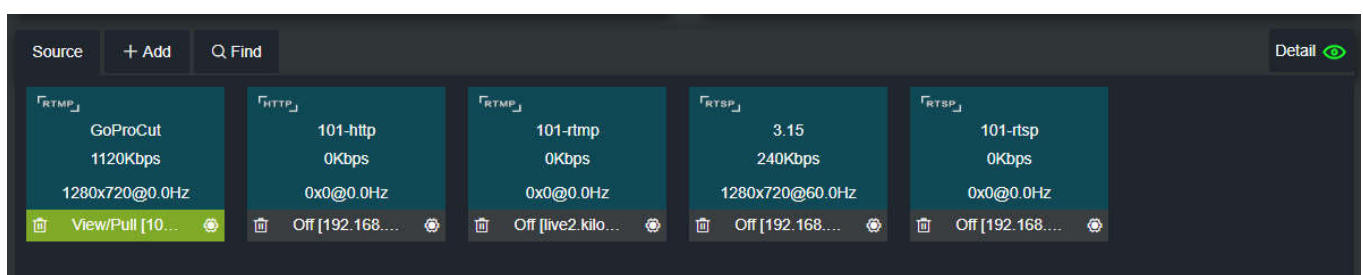
Payload size: Please keep the same settings as the sender, the default one is 1316.

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.
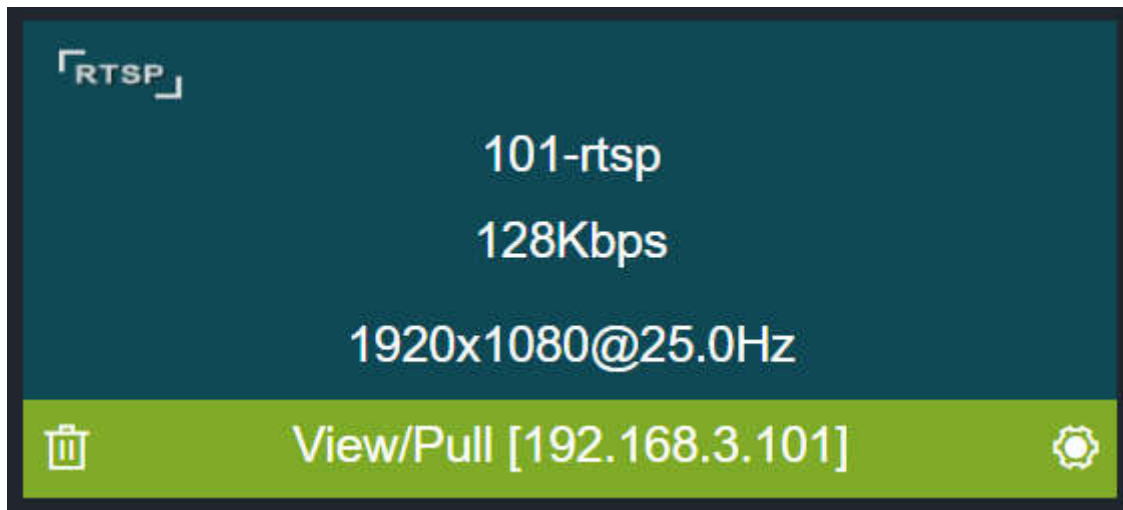

6.1.1.3 Video sources list

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; and the Yellow "Connecting/Reconnecting" indicates that the source is decoding abnormally in the decoder and tries to connect and decode. Click on the "Detail" button in the upper right corner to set the bit rate and resolution of each video source to be displayed or not to be displayed.

View the video sources in the list, which shows the protocol type, name, bit rate, resolution,stream status and IP address of the video sources.The button in the lower left corner is the "Delete" video source button, and the button in the lower right corner is the "Setup" button. The Settings button can be modified for the parameters of the video source.
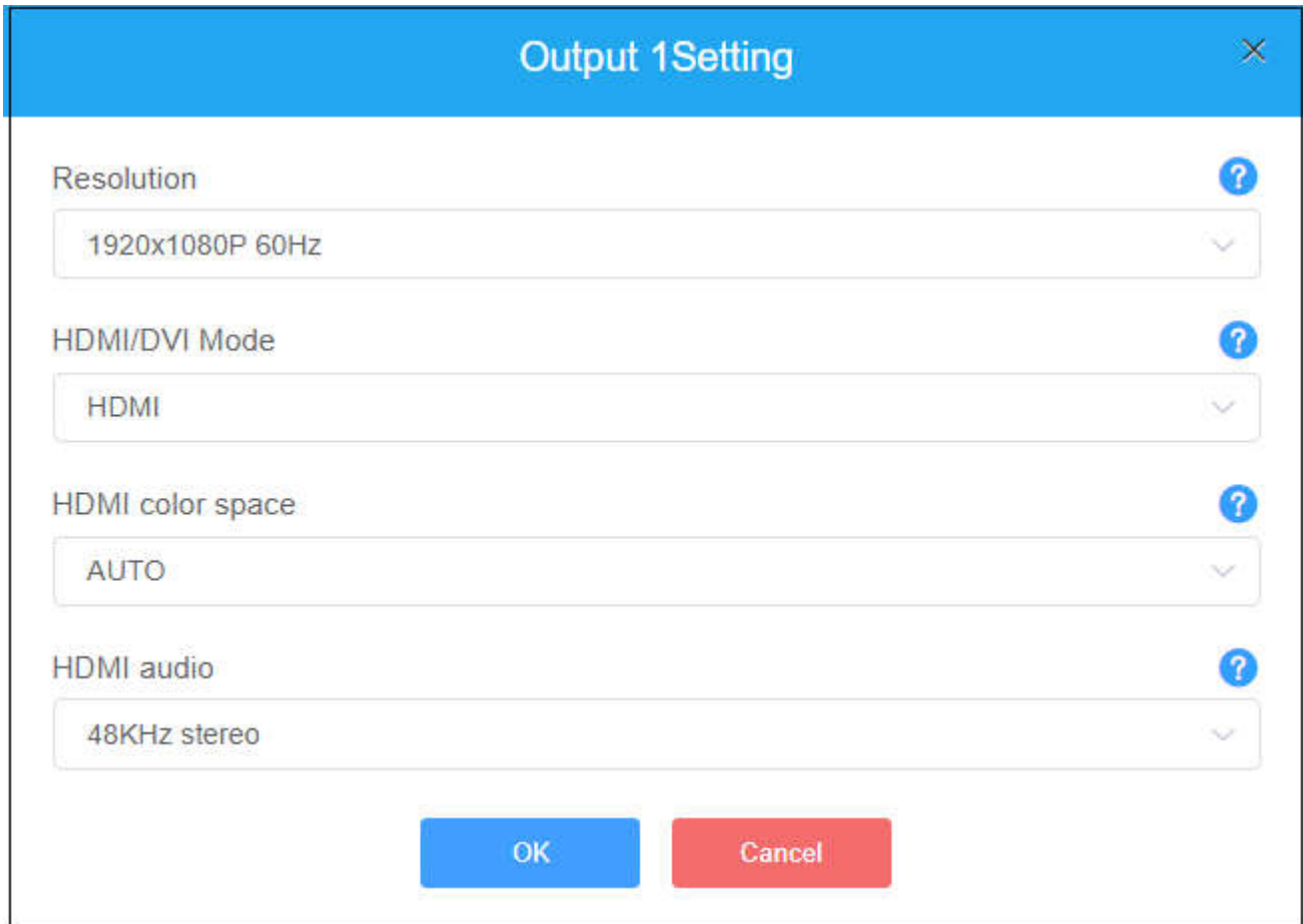
6.1.2   Video output setting

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 two output windows, 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 ❶----❽ of the output window in detail (as shown in the following figure):

⚠   *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.

⚠️   *NOTE：HDMI/SDI/VGA can only be selected by one signal output window at the same time. If output 1 was originally selected as HDMI, and then click output 2 to select HDMI, HDMI selection box of output 1 will become grey and signal output will be closed. When a signal output window selects both HDMI and SDI, it represents that the current screen will be output to both HDMI and SDI interfaces.*

④   Audio switch
It can be set to turn on and off audio output

⑤   Status
Display or hide video source rate, source address and other parameters.

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.

⑧   Video Source Settings
Click to modify the parameters of the video source directly, which is consistent with the parameters configuration of the video source added earlier.

⚠️   *NOTE：For multi-screen pictures, a video source can only be selected to output to a small sub-screen; if multiple sub-screens choose the same video source, the selected area later will be displayed as a black screen, that is, the video output can not be displayed normally. If multiple splitting screens need to decode and output the same video content (that is, the same URL video source), you just need to create a new video source name, using the same URL, when setting the splitting screen, different splitting areas can choose different names of the video source.*

6.2 System setup

6.2.1 User Management

Viewing User Lists, Adding and Deleting Users

6.2.2 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.

6.2.3 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.

6.2.4 Reboot

Device software restart,it lasts about 3 minutes.

6.2.5 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.

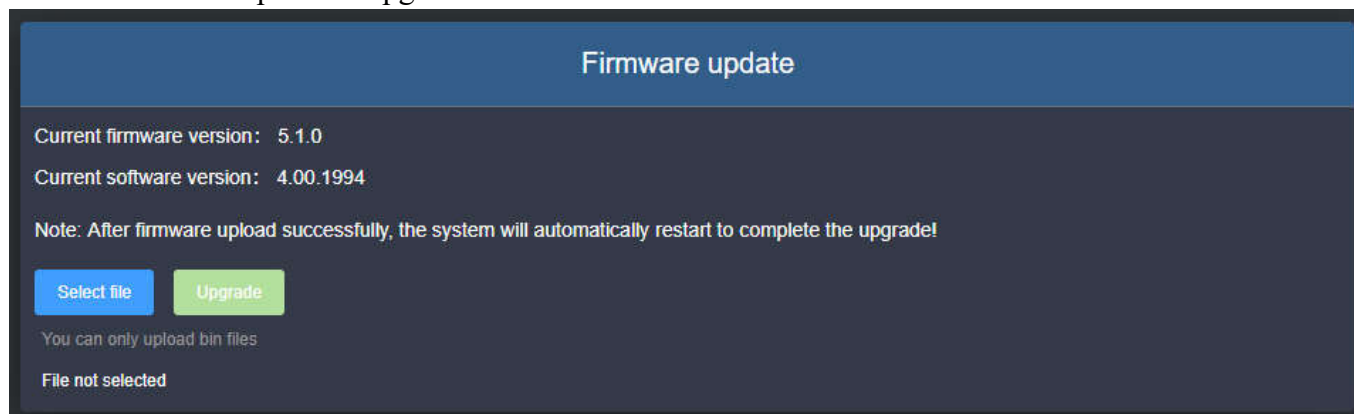Below parameters will be restored after restoring factory setting:
● Login username and password will be turned to admin;
● The IP address will be restored to 192.168.1.168 and mask is 255.255.255.0;
● All the video/audio decoding settings will be restored;
● Streaming settings will be restored.

6.2.6 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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