IC4

AV over IP Encoder & KVW/Scaling Decoder





User Manual

RGBlink®

Article NO: RGB-RD-UM-IC4 E000

Version NO: V1.0

Before using this product, please read this manual carefully and keep it for reference. Read the safety operation guide carefully. Pay attention to reminder symbol: ⚠ dangerous and ⚠Attention.

This manual is only for user operation instructions, not for maintenance services. The expiration date of the function is April 1, 2023. If the function or related parameters after this date are changed, supplementary explanations will be provided without prior notice. For details, please contact each distributor.

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The product picture in this manual is for reference only, please refer to the actual product.

Safety Operation Guide

To ensure reliable use of the equipment and personnel safety, observe the following precautions when installing, using, and maintaining the equipment:

⚠ Danger
● There are live parts in the equipment, non-professionals without permission, please do not disassemble the equipment, so as to avoid the risk of electric shock. ● Please do not disassemble the equipment when the power is on or running to avoid the risk of electric shock. ● Do not operate with wet hands in case of electric shock. ● It is strictly forbidden to place the product in the environment of inflammable substance, containing explosive gas or heat source.
⚠ Attention
● Do Not sprinkle any corrosive chemicals or liquids on or near the equipment. ● Do Not Plug the hole, and keep the working environment of good ventilation, facilitate the equipment in the work of the heat released in a timely manner, so as not to damage the equipment temperature is too high ● In order to avoid the damage caused by strong vibration during transportation, it is recommended to use proper packing or original packing during transportation. ● Do not use heavy objects to squeeze power cord and equipment ● The equipment must be supplied with a grounded power supply. ● Please do not repair the equipment without permission, so as not to aggravate the damage. ● When handling equipment, guard against equipment drop, avoid causing injuries or equipment damage. ● The wet environment or long time do not use, should turn off the general power supply equipment. ● The equipment should be stored for a long time before use. It must be checked and tested before use. ● Before cleaning the equipment, the equipment must be power cut, and please use a dry cloth to clean the equipment. ● Please dispose of the equipment as industrial waste and do not burn it.

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Chapter 1 The Introduction

1.1 Introduction

This is a device that makes full use of advanced technologies such as video compression processing, network technology, visualization technology, and centralized control. It integrates multiple functions, including video stitching and processing, KVM cooperative management, audio processing, centralized control, and photoelectric mutual backup, and integrates codec with IP network. It has the characteristics of distributed, network, visualization and decentralized server. The product fully takes into account the key performance of video processing, such as synchronization, real-time, compatibility, respiration effect and color restoration. It can reach 4K@60Hz input and 4K@60Hz output, support LCD, LED and DLP split-screen, support I/O, IR, RS232, Relay and RS485 external control, and provide cost reduction, easy wiring, visual control, decentralized operation and central control integrated solutions for various HD or 4K video application scenarios.

It can be widely used in conference center, exhibition center, command center, traffic center and so on.

1.2 Functional Features

- Integrated encoder and decoder, dip switch mode;
- Supports H.264 and H.265 codec protocols.
- True distributed, no server, no need for other auxiliary equipment, completely decentralized;
- Good real-time performance and good experience. The average time between KVM video output and host local is 60ms.
- Operation visualization, KVM and client visualization;
- Input and output up to 4K@60Hz;
- Better synchronization performance, supporting LCD, LED, DLP splicing screen; Support multi-channel decoding, single screen 16 screen, roaming, overlay;
- Support common custom window layout presets; Support pre-layout and release; Support subtitle, scene, scene polling;
- Supports user interface customization.
- Support instant pre-layout release;
- The front panel supports IP display.
- Optional OPto-electronic mutual backup is supported.

1.3 Components of Packaging

The Host x 1	Machine Foot x 4
The User Manual x 1	Certificate of Quality & Warranty Card x 1
Phoenix seat x 6	

🕮 **Note:** The machine is strictly packed before leaving the factory. Please confirm whether the ordered products and accessories are damaged, deformed or missing before using the product. If there is any damage, discrepancy or missing, please contact the product supplier.

Chapter 2 Product Appearance

2.1 Front Panel



Figure 2-1 Front panel

No.	Name	Description
1	OLED screen	0.91 inch OLED screen, supporting IP address, CPU usage, temperature, startup time, network display, etc.

2.2 Rear Panel

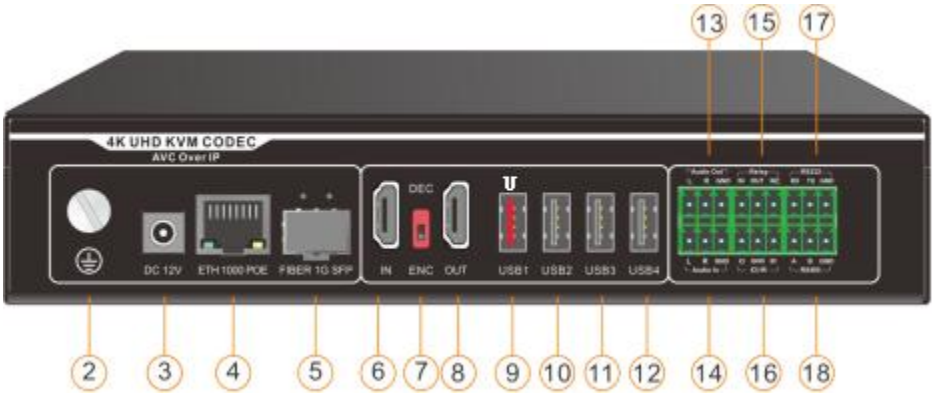


Figure 2-2 Rear Panel

No.	Name	Description
2	Grounding screw	• For ground wire.
3	DC 12V power port	• 12V2A female connector of the DC power supply connects to the male connector of the 5.5 x 2.1 DC power supply and interconnects with the network POE power supply.

No.	Name	Description
4	ETH 1000 POE	● Gigabit network ports that support POE power supply, connect to gigabit switches, and interwork with network POE power supply. The default IP address is 192.168.*.*
5	FIBER 1G SFP	● LC interface, Wavelength: 1310nm, 1550nm, single mode and two fiber, Package format:SFP、SFP+（1310nm,10km,LC）（1310nm,40km,LC）（1550nm,80km,LC）
6	HDMI IN Video input interface	● When used as an input node, it is used for HDMI video input.
7	Dial the code switch	● Used for encoding input and decoding output mode switching. ● Dial ENC code, as the input node, connect to the signal source. ● The upper dial is decoded by DEC as the output node, KVM host node and IPC forwarding node.
8	HDMI OUT	● As an input node, it is used for input signal loop out ● As an output node, it is used to connect the HDMI output terminal
9	USB1	● When entering (ENC) mode, this interface PC accepts the USB interface of the host that controls the signal source. Used to transfer mouse and keyboard signals. ● When output (DEC) KVM mode, this interface can be connected to the mouse or keyboard, ordinary output node, the interface does not work.
10	USB2	● This interface is invalid when entering the (ENC) mode. ● When output (DEC) KVM mode, this interface can be connected to the mouse or keyboard, normal output node, the interface does not work.
11	USB3	● This interface is invalid when entering the (ENC) mode. ● When output (DEC) KVM mode, this interface can be connected to the mouse or keyboard, normal output node, the interface does not work.
12	USB4	● This interface is invalid when entering the (ENC) mode. ● When output (DEC) KVM mode, this interface can be connected to the mouse, keyboard or U disk, normal output node, the interface does not work.

No.	Name	Description
13	Audio Out	● 3.5mm 3 Pin interface, used for analog audio output interface. L is the left channel,R is the right channel, and GND is the ground
14	Audio In	● 3.5mm 3 Pin analog audio input port. L is the left channel,R is the right channel, and GND is ground
15	RS232	● RS232 serial port 3 Pin port, two-way function and network side direct transparent transmission, TX for sending, RX for receiving, GND for ground.
16	Relay	● Relay interface, 12V Max. IN indicates a 12V input port, and OUT indicates a 12V output port. IN and OUT Default ports.
17	IR/IO	● IR/IO multiplexing 3pin interface, IR and IO function of two options. The IR can only receive or send. IO Supports receiving or sending. There are two ways of IO.
18	RS485	● RS485 serial port 3 Pin port for bidirectional and transparent transmission on the network side. The 3 Pin port A is for sending, B is for receiving, and GND is for ground.

instructions:

- The IR operation consumes a lot of resources during the reception, which is only used for learning infrared. The IR reception is not performed in the daily operation of nodes.
- The product picture is for reference only.

Chapter 3 System Connection

3.1 Matters Needing Attention

1. The system installation and use environment should be kept clean, with proper temperature and humidity, and good ventilation;
2. All power switches, plugs, sockets, and power cables in the system must be insulated safely.
3. Connect peripheral devices and power on the system.

3.2 Connection Diagram

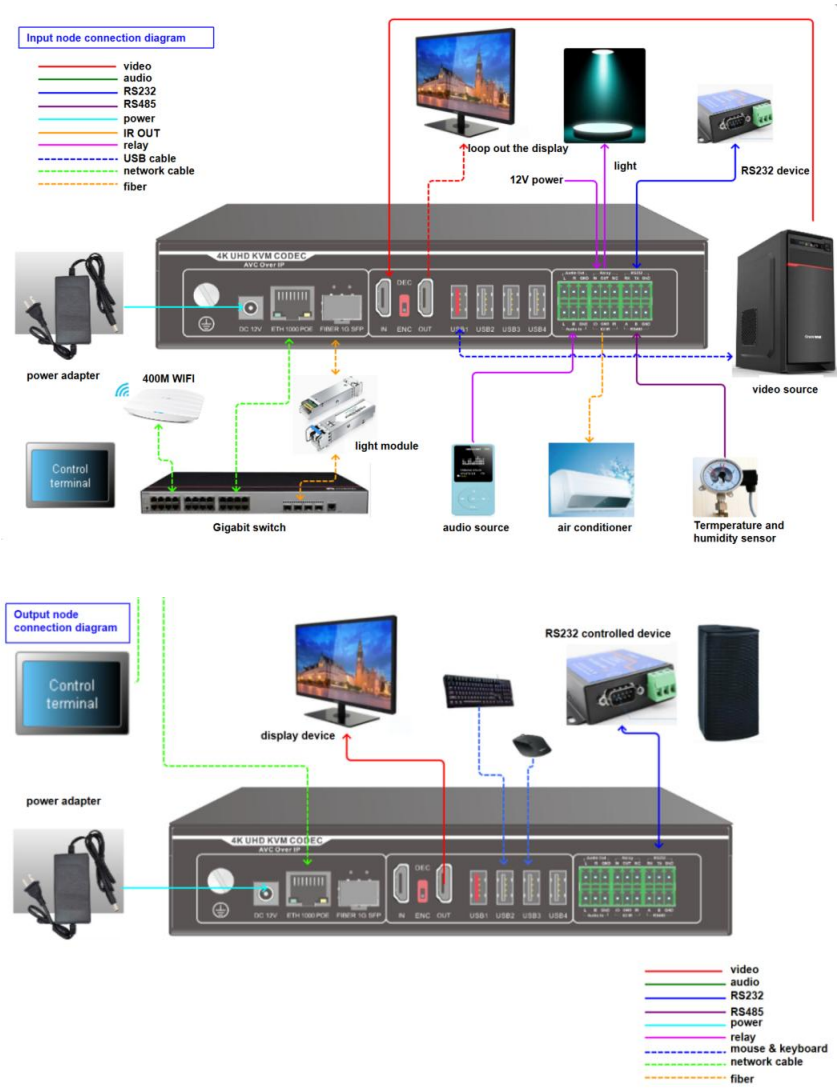


Figure 3-1 Connection configuration diagram

Chapter 4 System Settings

The node has network ports. The default IP address of the node is 192.168.*.*, mask 255.255.0.0, and gateway 192.168.*.1 (The IP address and gateway can be changed)

Nodes and control computers are connected to the LAN.

Three major pieces of software are required for onsite distributed commissioning, as shown below.

① Node parameter setting software: UMPlatform, green version.

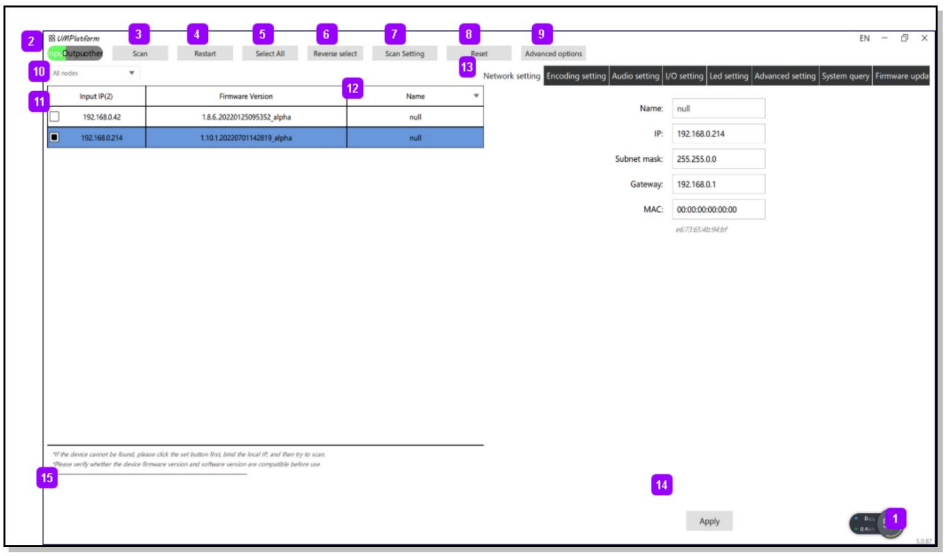
② System design and configuration software: Designer, green version.

③ Client: WinClient, IOS distributed system control platform, Windows version is the green version.

Note: Need to put on the firewall, set reference.

4.1 Parameter Settings

4.1.1 UMPlatform Interface is Introduced



(1) Current UMPlatform software version

(2) Node type options: The software distinguishes input, output and parameter modification of other nodes

(3) Scan: Click and broadcast to query data. Nodes that receive broadcast information will return node information.

(4) Restart: Restart the selected device. You need to restart the system after some parameters are modified or upgraded.

(5) Select All: Select all input nodes or output nodes.

(6) Reverse select: The selected node is unselected.

(7) Scan Setting: Select the local network IP address and set the scanning mode. Parameters can be modified on the same network segment. The purpose of scanning across network segments is to discover devices. After the destination IP address is detected, set the local network IP address to be on the same network segment as the destination IP address so that parameters can be modified.

(8) Reset: Restore some node parameters, except network Settings, LCD Settings and other parameters.

(9) Advanced options: Mainly set some very useful and advanced parameters, password = (current year + month + day) X current time, such as 15:31 on March 1, 2022. Password = (2022+3+1) x15=30375

(10) Node handsome selection function: This function is used to select nodes of different device models for upgrade.

(11) Node list: Click and enter the IP address to sort the IP address. You can view the current version number.

(12) Click to view the name, external device, master/slave, product name (model), and access resolution information.

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(13) Node setting options: including network parameters, codec Settings, audio Settings, LCD Settings, advanced Settings, etc.

(14) Settings: After modifying the parameters, click Settings and determine whether to restart the system based on the information displayed in 15.

(15) Prompt area: A prompt is displayed when you modify parameters.

4.1.2 Set the Node Name and IP Address

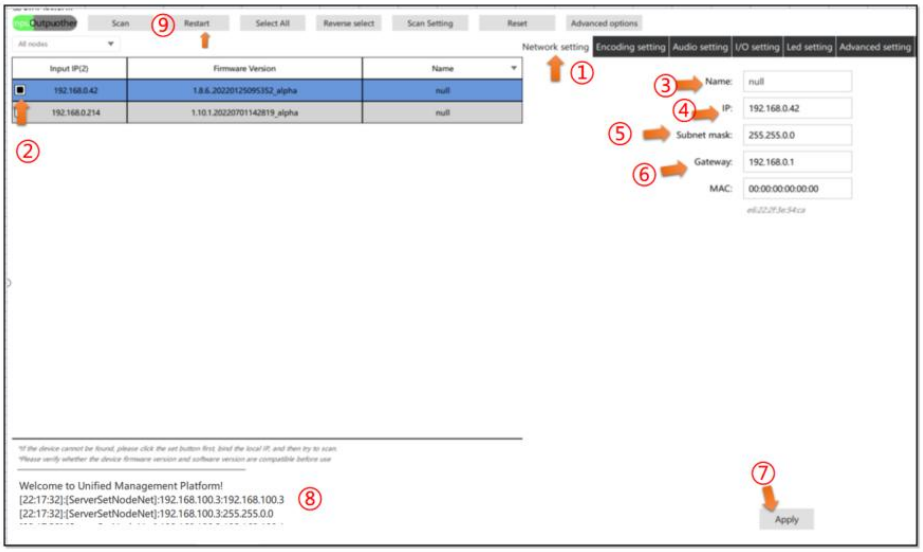
Step 1: Connect devices based on the networking diagram.

Set the computer IP address to 192.168.0.x, mask to 255.255.0.0, and gateway to 192.168.0.1, as shown in the following figure.

Step 2: Use the UMP software to perform the following steps to scan for the input and output IP addresses of the current connection.



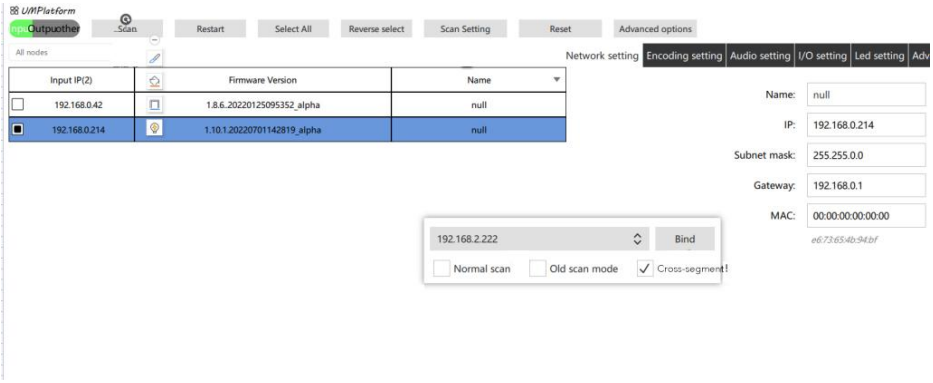
Step 3: Change the node name and IP address as planned.



Step 4: If some nodes are not detected, perform the following steps to scan across network segments.

Step 5: According to the scanned network segment, set the IP of the computer again to the same network segment as the node, that is, repeat step 1 to Step 4, until the IP of all nodes is modified correctly.

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Step 6: Do the same for the output node.

Step 7: Some parameters are advanced parameters. You need to enter a password to set them.

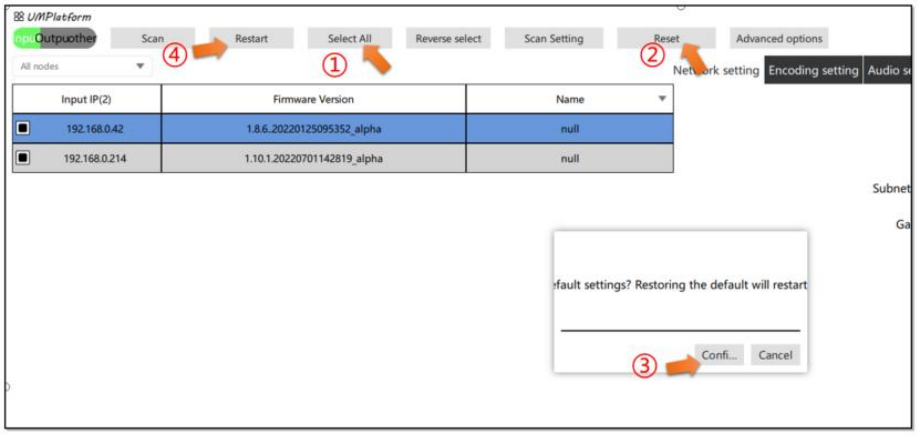
As shown in the figure below. Enter password = sum of current year, month and day X current time, such as 9 o 'clock on March 5, 2022, then calculate (2022+3+5) X 9=18270, enter password 18270, you can enter the parameter setting of advanced options.



4.1.3 Set General Node Parameters

➢ This step is based on 4.1.2.

Step 1: If the node is newly added, restore the default value.



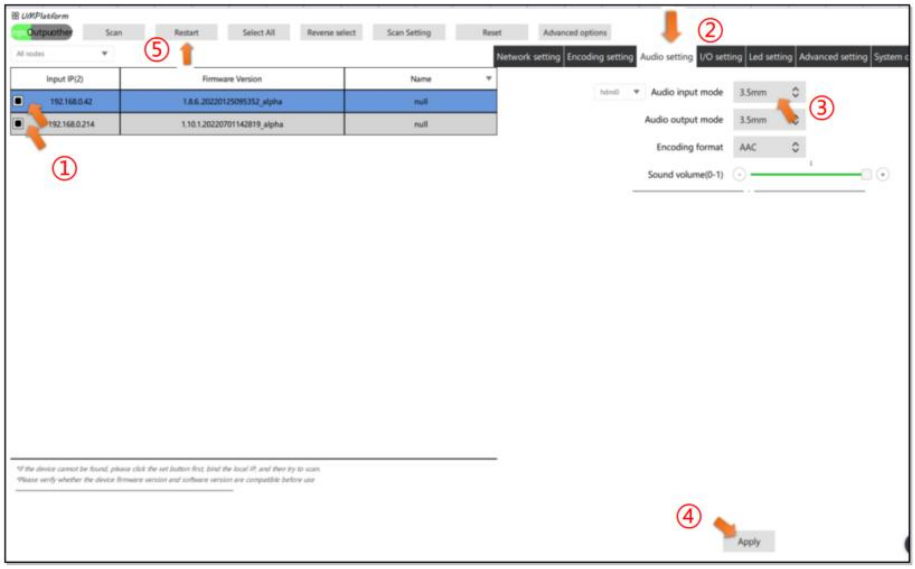
Step 2: Set the audio input mode

Check node parameters and audio input mode. Set the HDMI input or 3.5mm (3pin Phoenix terminal) input according to the actual situation. Other parameters do not need to be modified.

HDMI input Settings are shown in the following figure. Do not modify other parameters.



3.5mm (3pin phoenix terminal) input Settings are shown in the following figure. Do not modify other parameters.



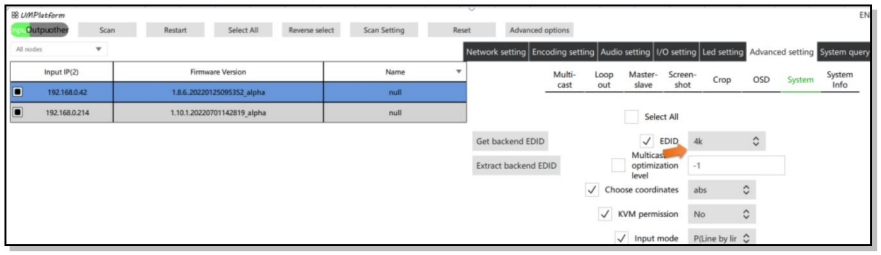
Step 3: Set the encoding type in Substream to H.264.

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4.1.4 Input Node 4K Input Parameter Settings

➢ Input node 4K Input parameter Settings

Enter node-Advanced Settings -System-EDID-4K (or 4K60). The setting takes effect after a restart.



Input node-code setting to view the resolution of the current HDMI interface input status, as shown in the following figure.

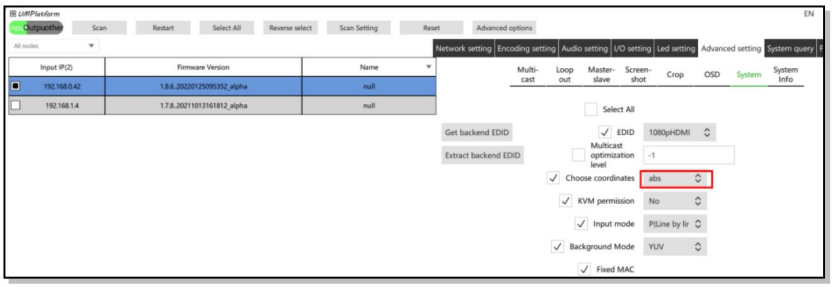
4.1.5 KVM Input Node Settings

➢ This step is based on 4.1.2.

(1) Set KVM access parameters in WINDOWS.

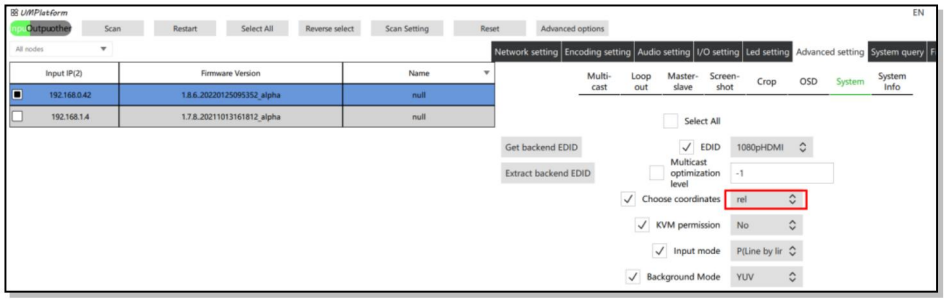
Enter node - Advanced Settings - System - Coordinate selection - ABS, the effect will take effect after restart. This parameter is ABS by factory default.

(REL-relative mode, ABS -absolute mode)



(2) Set access parameters for the extended screen and KVM of a non-Windows operating system.

Enter node - Advanced Settings - System - Coordinate selection -rel and restart. (REL-relative mode, ABS -absolute mode)



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4.1.6 Master Node (Synchronization Node) Settings

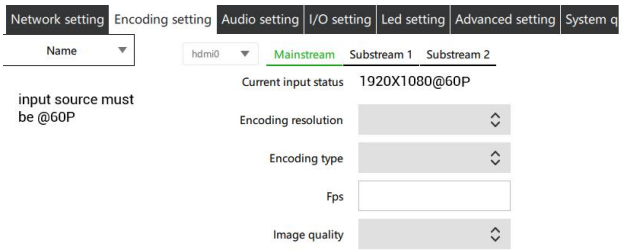
The entire system requires a single master node for clock synchronization. If more than two nodes are set as masters, the election function needs to be enabled. The parameter settings are as follows. If the following requirements are not met, the default settings apply, i.e., the nodes act as slave nodes and the election function is not enabled.

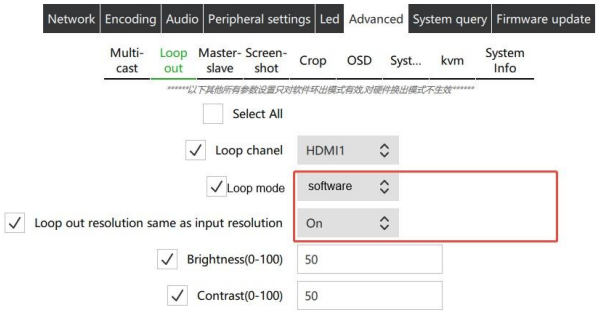
In the current network, it is sufficient to set two nodes as master nodes; no more are needed. Input nodes are preferred. It is not limited to input or output nodes; as long as there are available nodes. Note: KVM nodes are not allowed to be set as master nodes, and they do not require synchronization.

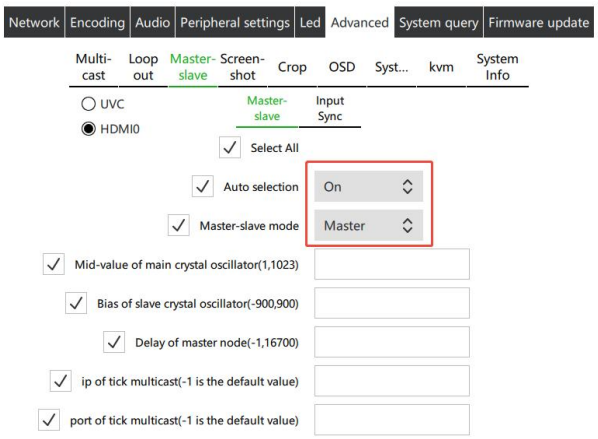
1. Input nodes

The HDMI input should be at 60 frames per second or have no input source connected. The parameter settings and requirements for HDMI signal connection are as follows.

The input node serves as the master node.





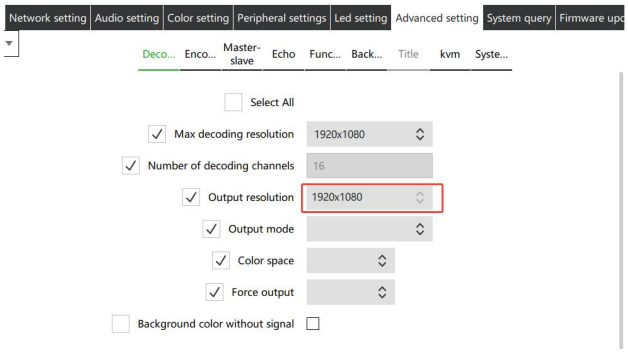


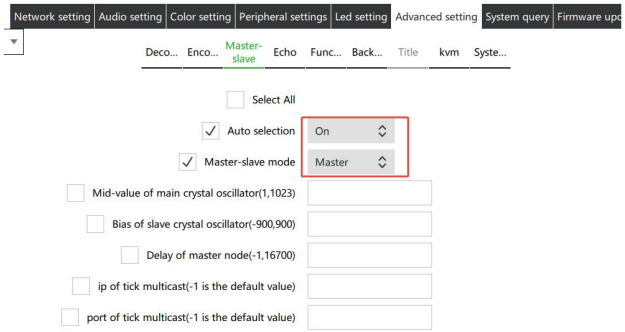
2. Output Node

Requirements:

a. Output resolution should be set as 1920*1080@60 or 3840*2160@60

b. Enable “Auto selection” and “Master-slave mode”





3. The settings should be as follows:

Input IP(2)	Firmware Version	Name
192.168.0.46	1.6.4.20230513103732_alpha	slave(sync)
192.168.0.110	1.7.1.20230703175719_alpha	master(sync)

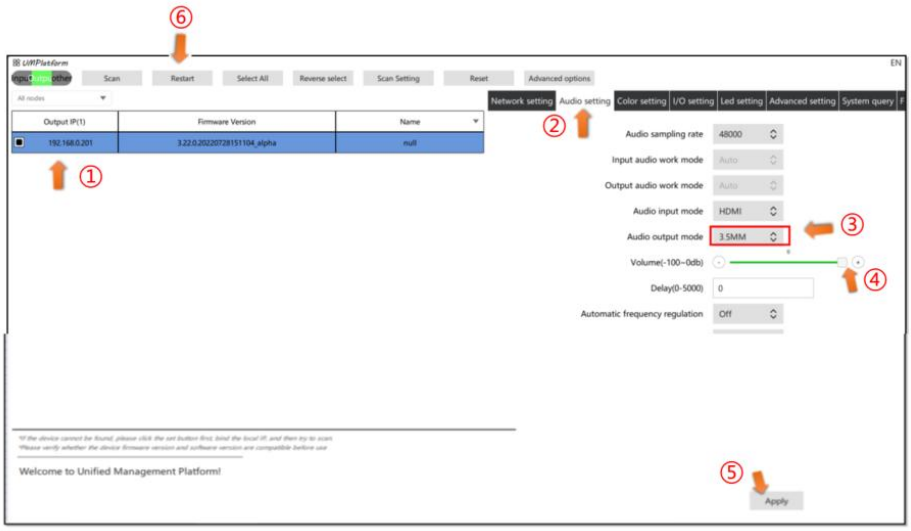
4.1.7 General Parameter Settings for the Output Node

- This step is performed on the basis of 4.1.2.
- Audio output Settings
- Output resolution setting
- Other parameters generally need not be modified

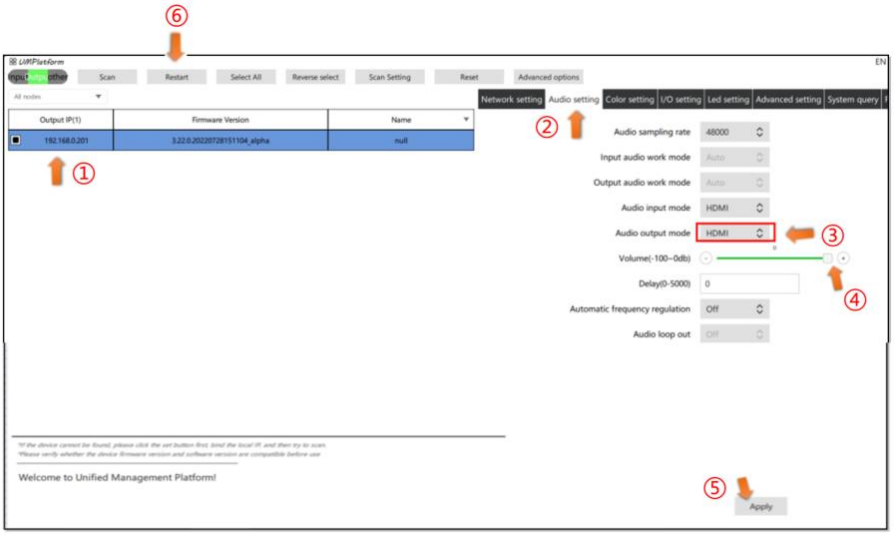
Step 1: Audio setup

Choose HDMI output or 3.5mm (3pin Phoenix terminal) output according to the audio output mode in the field.

3.5mm 3PIN Phoenix block, output Settings as shown below, adjust the volume to the maximum (0). You do not need to modify other parameters.



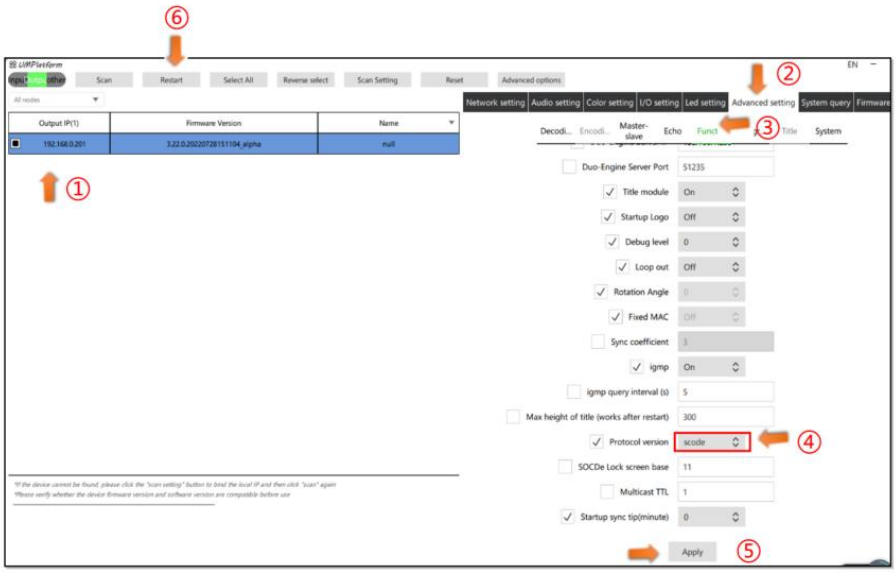
The HDMI output Settings are shown below, and the volume is adjusted to the maximum (0). You do not need to modify other parameters.



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Step 2: Set the protocol version

Check and set Advanced Settings - Functionality (protocol version) for SCODE.



4.1.8 Set Parameters of the Output Node of the Splice Wall

- On the basis of 4.1.4.
- You can set the output resolution based on the display. The default output resolution is 1080P@60Hz.
- Support 3840x2160@60, 3840x2160@30, 1080P@60, 1080P@30, 720P@6 and custom.
- Other parameters do not need to be modified

Step 1: Enter the advanced option mode, as shown in Step 7 of 4.1.2.

The output resolution is within the range of advanced options. You need to enter a dynamic password to set the output resolution.

Step 2: Setting generally has the following four situations.

(1) Network 2K decoding, HDMI 2K output. For parameter Settings, see the following figure (default Settings). See Chapter 5 for the video wall binding node.

(2) Network 2K decoding, HDMI 4K output. For parameter Settings, see the following

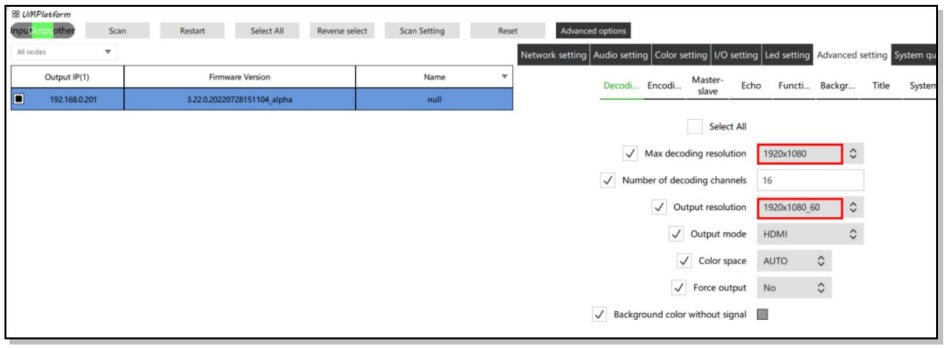
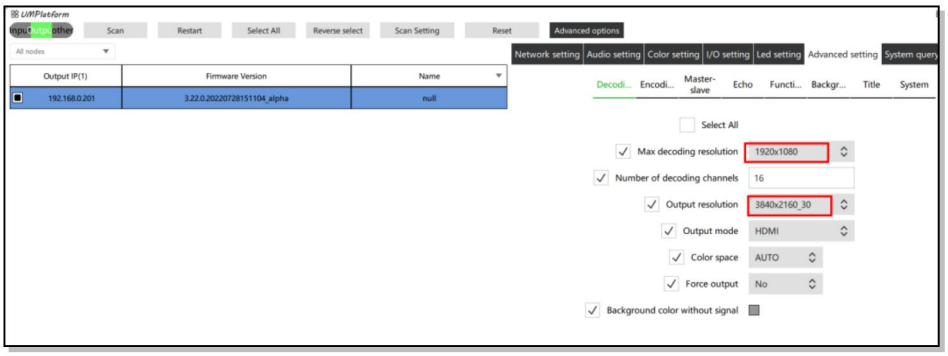
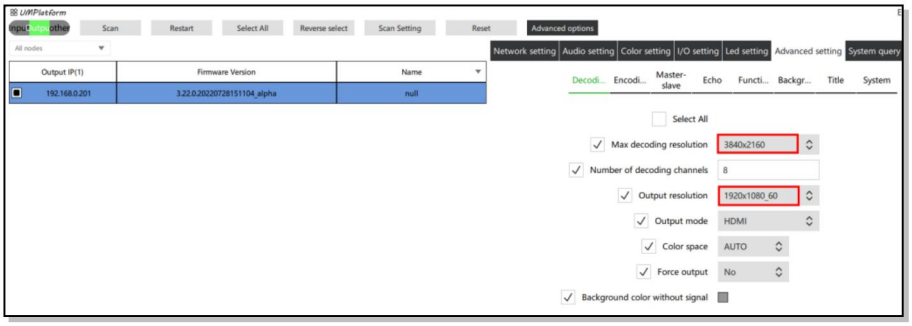


figure (default Settings). See Chapter 5 for the video wall binding node.

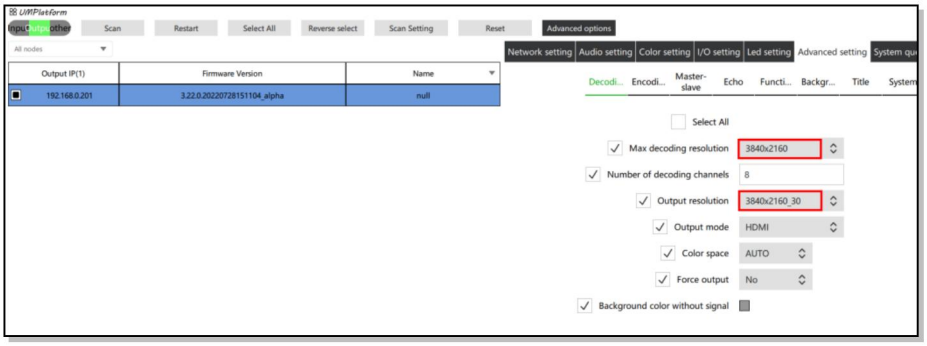
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(3) Network 4K decoding, HDMI 2K output. For parameter Settings, see the following figure (default Settings). See Chapter 5 for the video wall binding node.



(4) Network 4K decoding, HDMI 4K output. For parameter Settings, see the following figure (default Settings). See Chapter 5 for the video wall binding node.

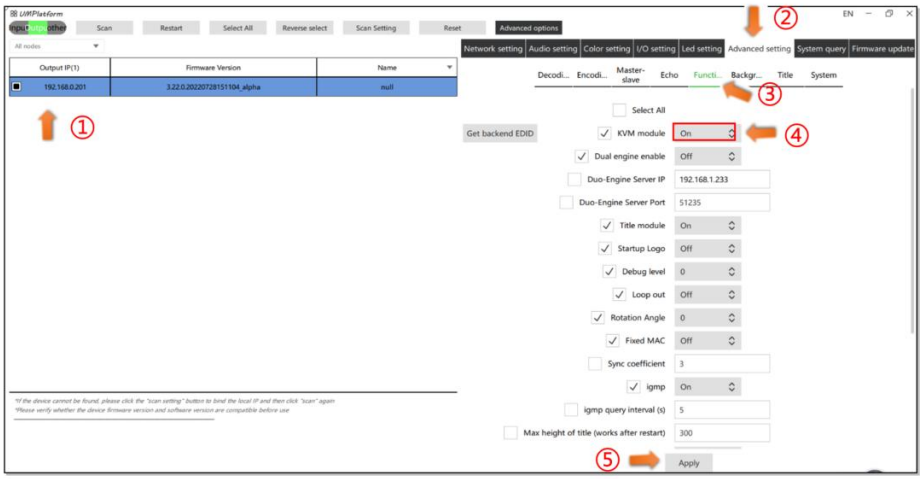


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4.1.9 Configure the KVM Output Node

- Proceed on the basis of 4.1.4
- Enable the KVM function. See Chapter 5 for more details on the seat binding node.

Step 1: Advanced Settings - Functions - Enable Settings for the KVM module.



Step 2: After opening, it needs to completely power off and restart, that is, all the wiring of this node is unplugged and then connected back one by one.

Step 3: Please refer to the previous chapter for settings of Max decoding resolution and Output resolution .

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4.1.10 Forwarding node settings

- Function: It enables the RTSP stream to be previewed by clients and generates multicast streams to all output nodes in the system.
- Proceed based on 4.1.4.
- There is no need to connect input or output to the HDMI interface.
- Refer to the Designer's instruction manual.
- Once a node is set as a forwarding node, it cannot be used as a splicing output node.

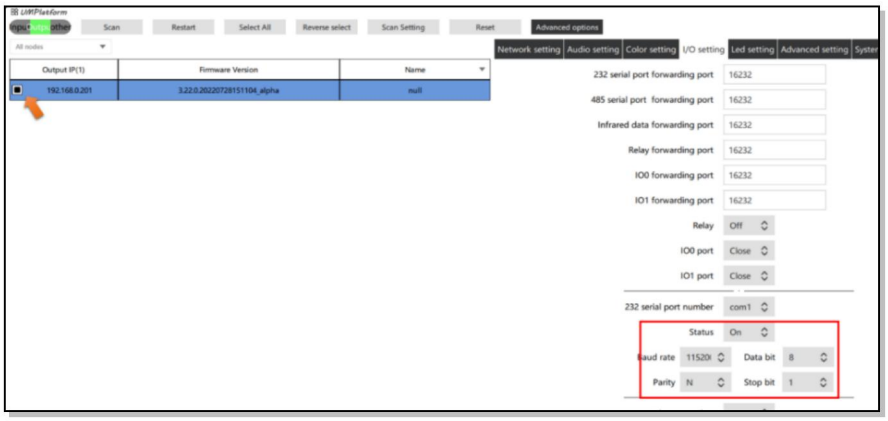
4.1.11 RS232 Configure Transparent Serial Port Transmission

- Function: Connects to a third-party device through an RS232 interface.
- Regardless of audio and video, specify the device IP address and port and network transparent transmission command.
- The RS232 serial port supports baud rates of 4800, 9600, 15200, 38400 and 115200.
- Transparent transmission between the port and the network port. The port supports UDP and communication port 16232. The node receives the 16232 port instruction data and sends it directly to the RS232 serial port.
- Configure the interconnection with third-party devices based on site requirements.

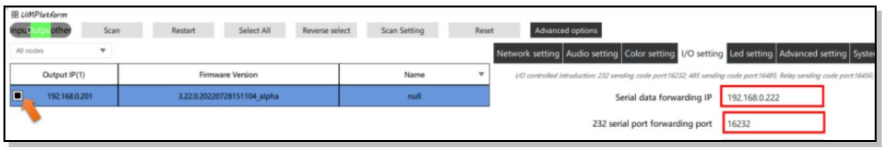
Step 1: Enter advanced options. See 4.1.2 for the entry method.

Step 2: Determine the network and serial port interface parameters.

Step 3: Receive instructions through the network port Send instructions to the RS232 device through the serial port. The parameters are set as follows.



Step 4: The RS232 device sends the serial port instruction, and the node receives the serial port instruction and forwards it to the network device through the network. The parameter Settings are as follows. For example, IP address and port number of the network device 192.168.0.222:16232。



4.1.12 RS485 Configure Transparent Serial Port Transmission

- Function: Interconnects with a third-party device.
- Regardless of audio and video, specify the device IP address and port and network transparent transmission command.
- The RS485 serial port supports the baud rate of 9600, 19200, 38400, and 115200.
- Transparent transmission with the network port, supporting UDP, and communication port 16485. The node receives the command data for port 16485 and directly sends it to the RS485 serial port.
- Configure the interconnection with third-party devices based on site requirements.

Step 1: Enter advanced options. See 4.1.2 for the entry method.

Step 2: Determine the network and serial port interface parameters.

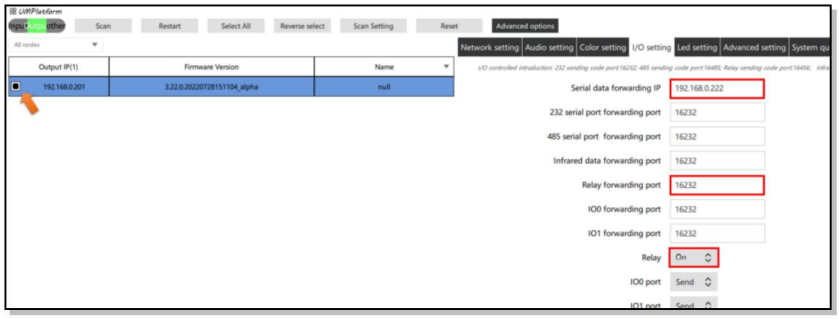
Step 3: Receive commands over the network port Send commands to the RS485 device through the serial port. Set parameters as follows:



Step 4: The network sends instructions to the RS485 device through the node. After receiving the serial port instructions, the node sends them to the RS485 device through the serial port.

4.1.13 Relay Configuration

- Function: 12V circuit switch.
- Regardless of audio and video, the relay switch IN the network transmission control device is closed and disconnected until the IN and OUT ports are closed and disconnected by default.
- It supports UDP protocol and communicates with the network port 16456. The node receives the 16456 port instructions ON and OFF. For the closed port and port respectively, GET obtains the current interface status.
- Parameter Settings are as follows.



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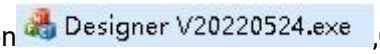
Chapter 5 System Design and Configuration

5.1 Overview

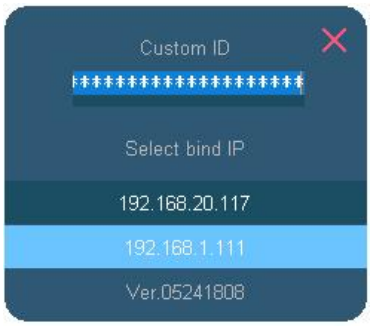
The designer software is applied to node input configuration, output splicing wall configuration, seat configuration and user authorization configuration.

Before using the UMPlatform, configure the node network and output resolution based on the network plan. After the configuration, ensure that each node has been bound.

5.2 Log in to Software

Double-click on the following icon 

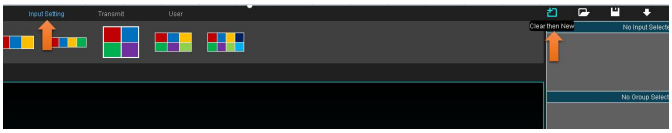
,Click the IP address on the same network segment as the distributed node.



5.3 Signal Source Configuration

5.3.1 Clear the Configuration of the Current Signal Source

Input-seting，clear then New.

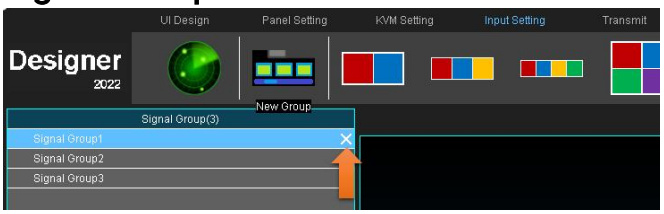


5.3.2 Add Signal Group



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5.3.3 Del Signal Group



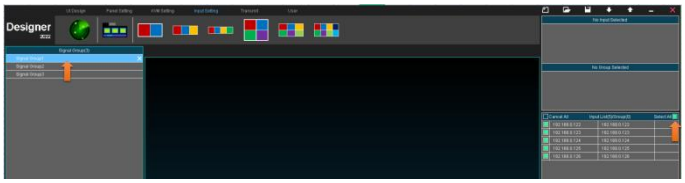
5.3.4 Renames Signal Group

Double-click the name to enter the modify mode.



5.3.5 The Group Binds the Input Node

Bind all input sources.



Bindable partial input source.



5.3.6 Associative Setting of Interface Signals and Input Groups

UI design-PageList-Panel1; Choose Signal module; Click Link to select the established signal group. Multiple selection is supported.

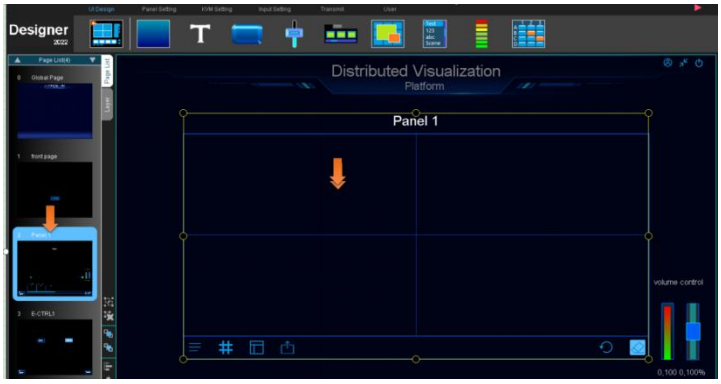


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5.4 Video Wall Configuration

5.4.1 Set the Panel Scale

Double click video wall



Enter the Panel Setting: Rows<=12,Colums<=20



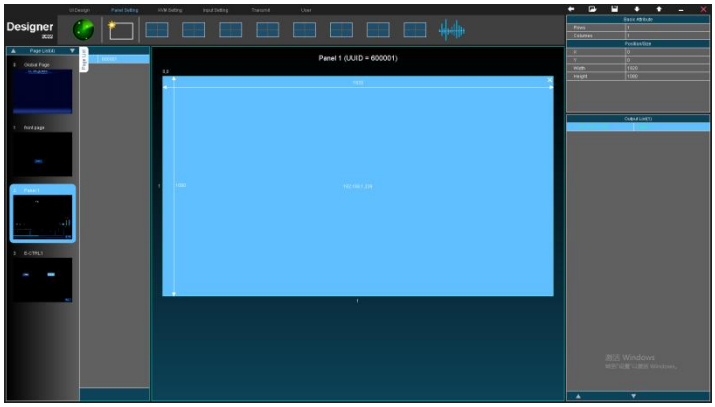
In this example, it is set to 1,1.



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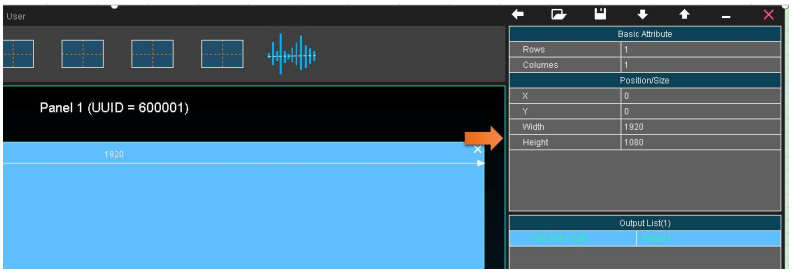
5.4.2 Bind Output Nodes

Select a node in the output list and click on the middle Panel square area. Realize the binding of the output node and the video wall position.



5.4.3 Set the Wall Resolution for Each Node

The pixels in each row and column are the same, which is consistent with the actual node resolution.



5.4.4 The Wall Audio Output Node Setting

The audio follow settings page is displayed.

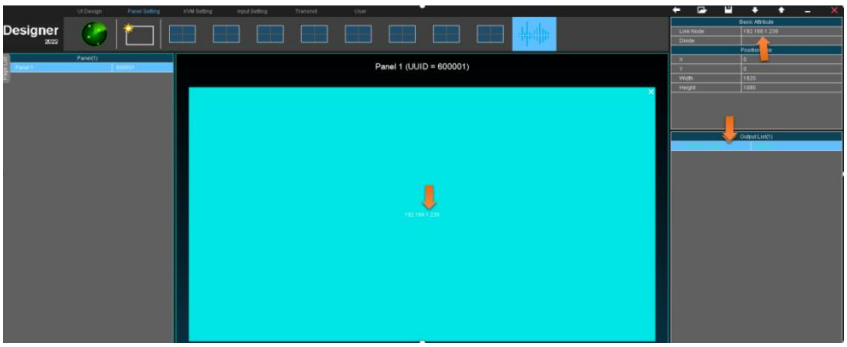


Set the audio output area. You can configure the nXm by region. In this example, it is set to 1X1.



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Bind the audio output node. Select the middle area (bright blue) and double-click the output node in the output list to bind the IP address of the corresponding output node in the associated node.

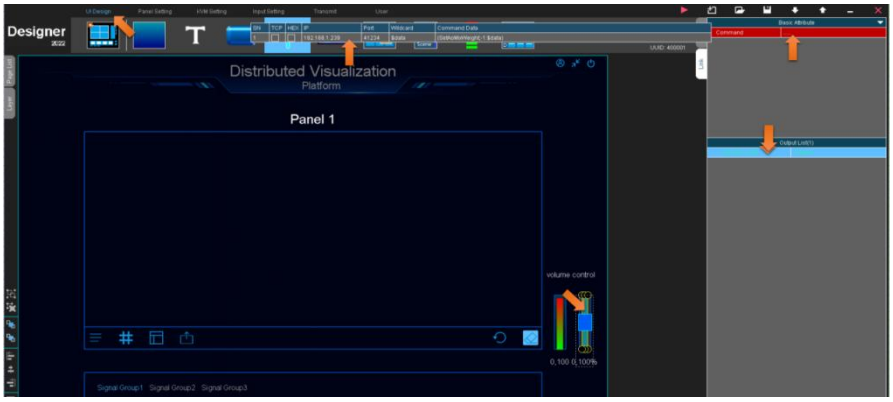


When the video window overlaps with this area, the corresponding audio of the signal source is output.

5.4.5 Configure Audio Control and Read Back

5.4.6 Volume Slider Binding

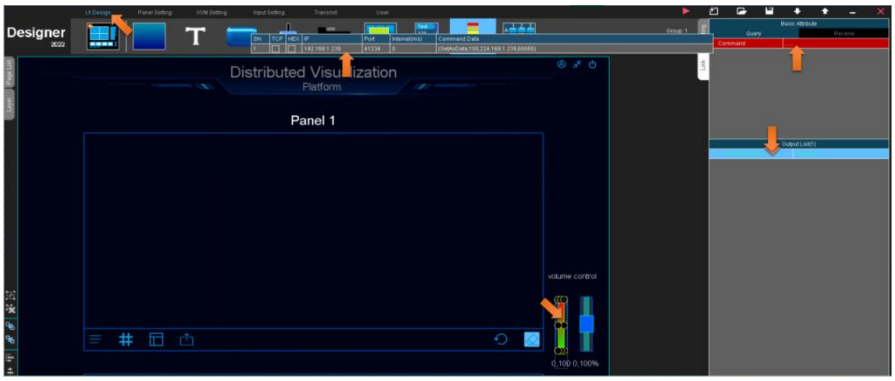
UI design-PageList-Panel 1. Select the bar chart in the middle of the slider module.Link- Double-click the output list input source, click on the right side of the command... To view the bound IP address.



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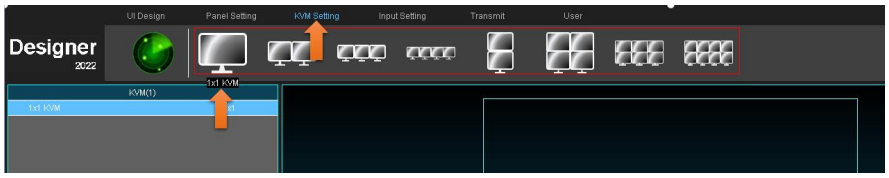
5.4.7 Volume Read Back Binding

UI design-PageList-Panel1.Select the middle bar chart of the get back module. Link- Double-click the output list input source, click on the right side of the command... To view the bound IP address.

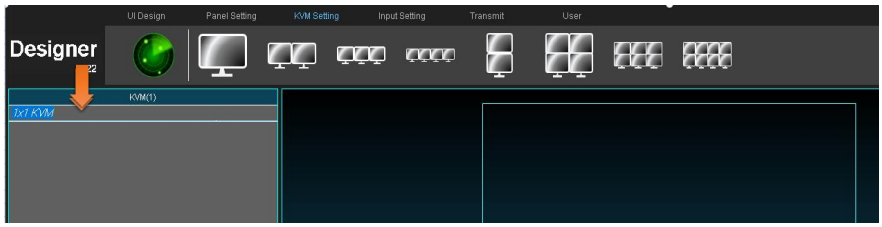


5.5 KVM Seting

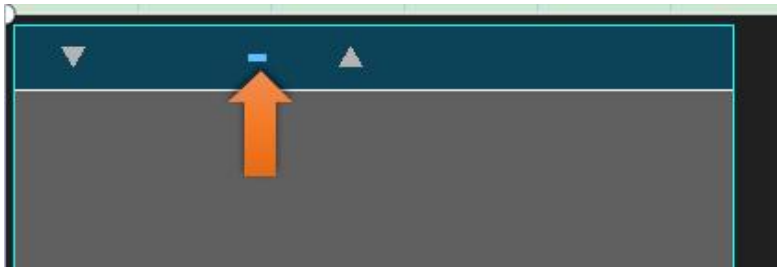
Refer to the following figure to select different display sizes for seats. A single seat can support a maximum of 2X4 splice screen size.



Double-click to change the seat name.



Click - Delete the selected seat.



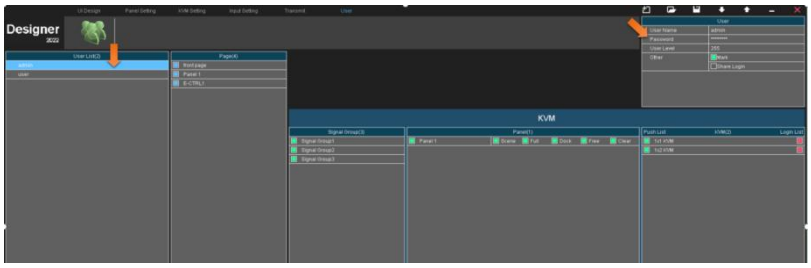
Select a seat, and then select an unallocated output node in the output list, and then click one of the boxes above the middle area of the software to realize the binding between the output node and the seat node.



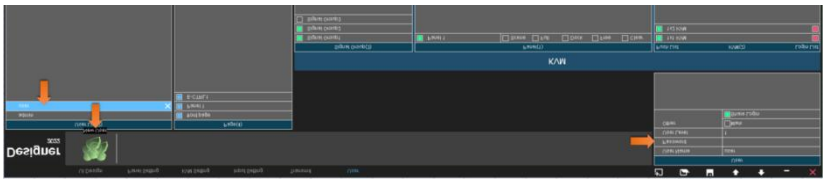
5.6 Authorization

The default user name is admin and the password is Admin123. The account cannot be changed, and the password can be changed. A strong 8-digit password containing upper and lower case digits is mandatory. Must not contain special symbols.

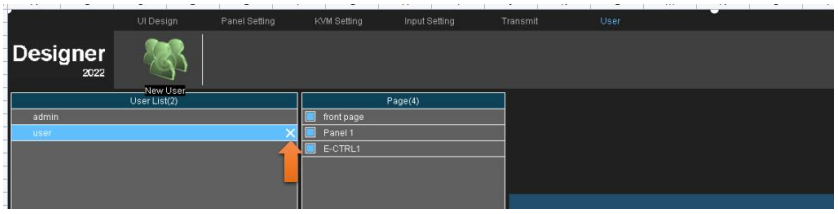
The default account has all permissions and cannot be changed.



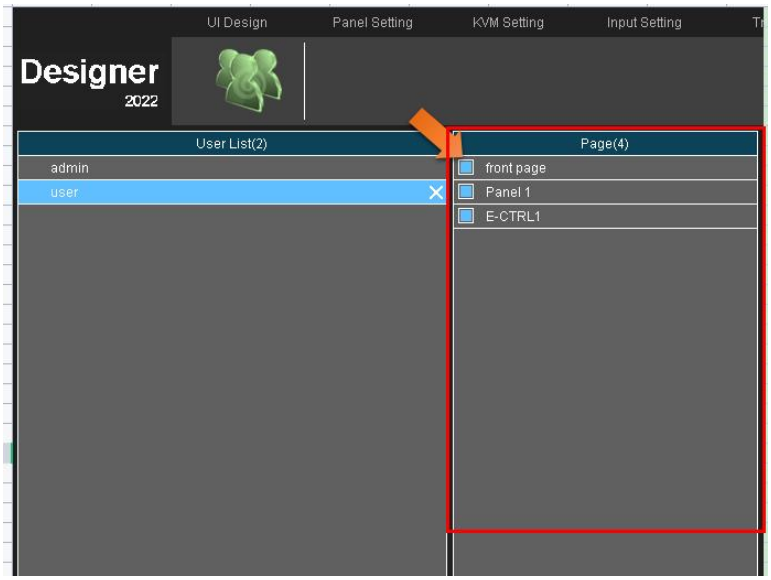
When an account is added, the password is changed in the upper right corner.



To delete the account, click x.

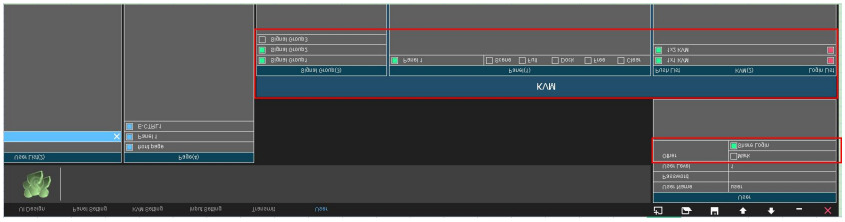


The user is authorized by the client. If this item is selected, the user has the operation rights on the page.



User KVM agent authorization includes agent login, agent push, signal source grouping, video wall, standard functions, and account sharing login multiple agent functions.

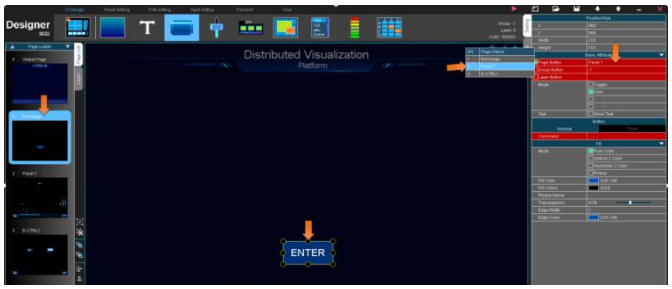
If you select this option, you have this permission.



5.7 UI design-Button Configuration

5.7.1 Page Adjustment Button Settings

Click the button and select the corresponding page on the right of the page button in Configuration - Basic Properties.



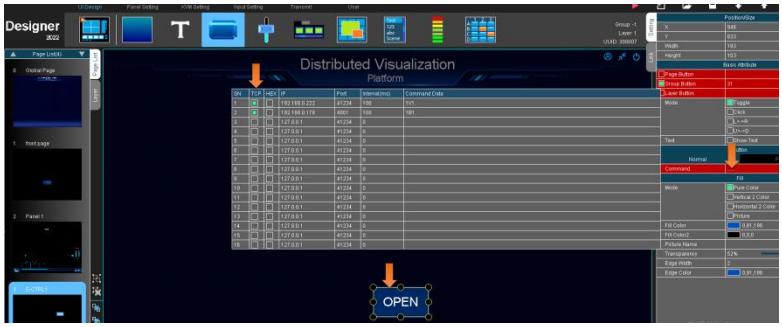
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5.7.2 Button to Send UDP Command Settings

To select the page where you can add or modify commands based on existing buttons, click on the right side of Configuration-Command... . Popover dialog box to modify. If TCP is not selected, the client sends commands using UDP. If HEX is not selected, the command is the ACSII code. You need to set the destination IP address and port number. The button supports 16 commands, and the interval for each command must be longer than 50ms.Command area Enter a command that contains a maximum of 128 characters.

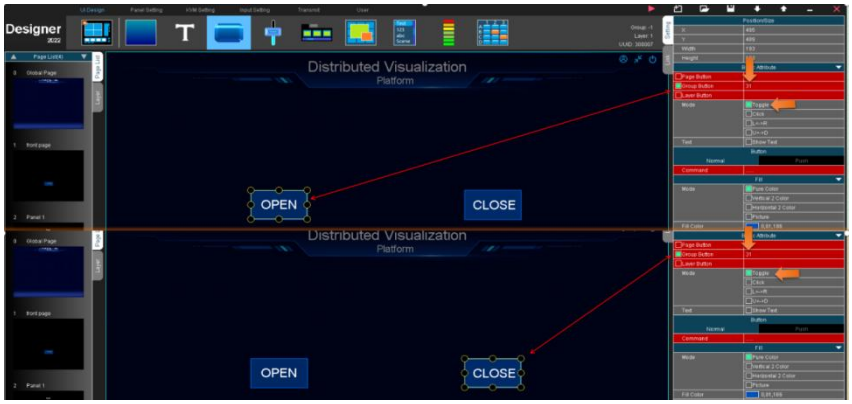


5.7.3 Button to Send TCP Command Settings



5.7.4 Mutually Exclusive Button Settings

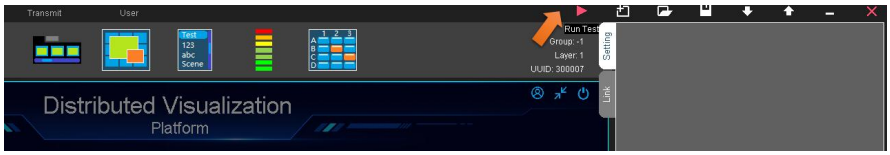
If multiple buttons are mutually exclusive, select the group button and set the same group number. The two buttons in the picture below.The group ID cannot exceed 99. Button mode selection toggle.



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5.8 Practice Test

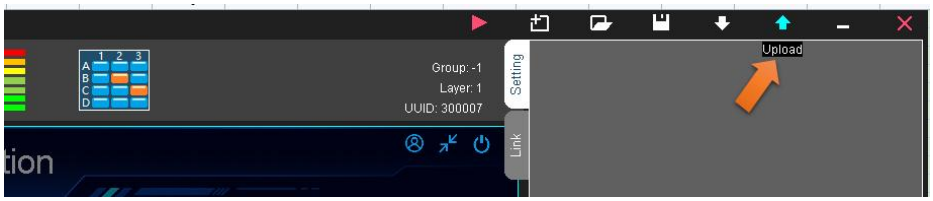
Click the button below to perform the simulation test.



5.9 Configure Upload and Download

5.9.1 Configure Upload

After the configuration is complete, you need to upload it to each node for the configuration to take effect.



If the output node is configured in KVM mode for the first time, you need to completely power off. That is, you need to remove one port for all power supplies, including 12V power supply, POE power supply, and HDMI cables, and then reinsert them one by one.

If the file fails to be uploaded, upload it again.

If the upload fails for several times, a network exception may occur, such as an offline node or a large picture. The image size should not exceed 500K.

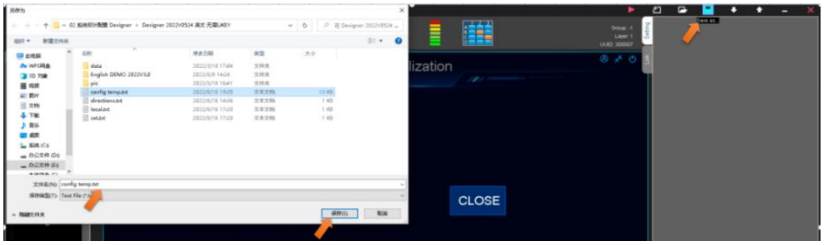
5.9.2 Download Configuration

Click Download to overwrite the current configuration. Therefore, you need to save the current configuration before downloading.



5.10 Configuration Saving, Backing up and Importing

5.10.1 Save the Configuration



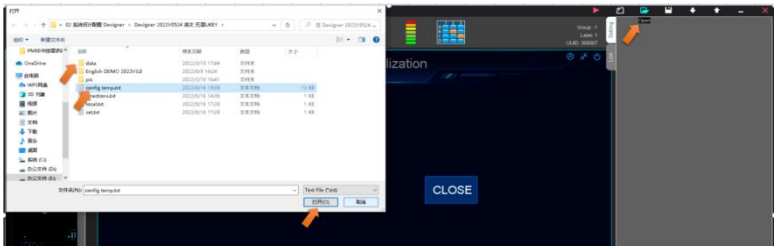
5.10.2 Configure Backup

Contains the current configuration and data file saved.



5.10.3 Import the Configuration

To import the configuration, you need to save the data file in the original backup file to the designer directory. Then open the TXT document through the designer.The configuration is overwritten after the import. Exercise caution when performing this operation.

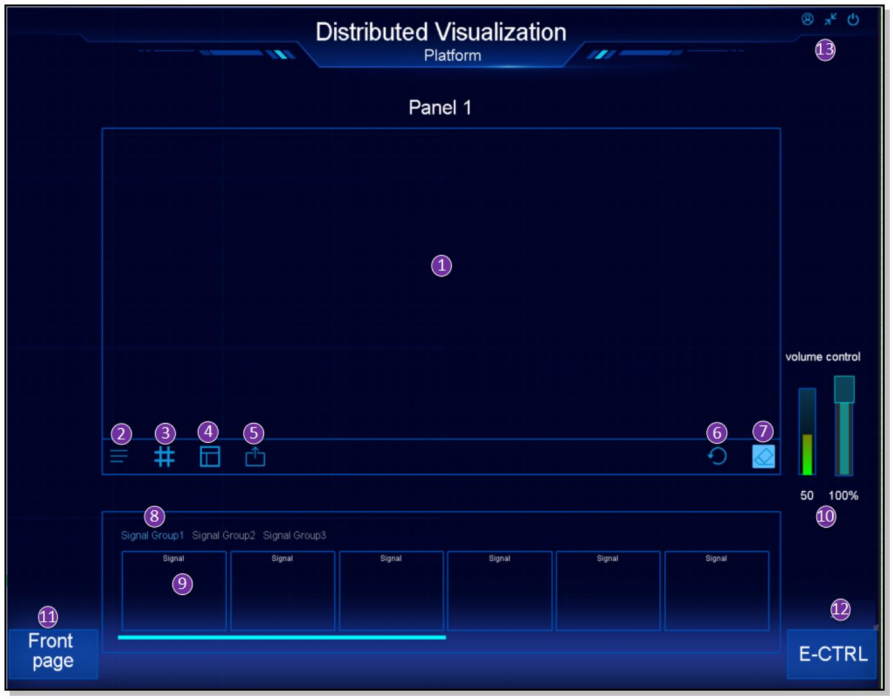


Chapter 6 Perform Operations on the Client

Running the Client. Enter the local network IP address.

The default password is admin or Admin123.

After login, you can pull the signal to the wall, click the button to realize the page jump, etc. As shown in the figure below.



If no preview is found, you can disable other networks, including wireless networks, only the network connected to the distributed network, and then open the client to achieve preview.

No.	Name	Description
1	Video wall	● Drag a signal to this window, switching between videos ● Display the window layout synchronously with the actual wall
2	scenario	● Do scene saving, calling, polling
3	layout	● Full screen, self - use, custom docking layout selection. Realize adsorption fenestration

No.	Name	Description
4	The default configuration	● Click Take Effect to make the preset arrangement window of the client, and the real-time window opening of other clients of the current video wall will not be updated at this time. The operation on the local client is temporarily performed on the client. Click on the pre-arranged release will proceed to the wall operation.
5	Pre-scheduled release	● After clicking, the window opening condition of the preset arrangement of the current client's video wall will be published to the actual video wall.
6	refresh	● Refresh the current video wall window opening information to the local client.
7	Clear the screen	● After clicking, the window of the current video wall will be opened to clear.
8	Signal grouping	● Displays the signal group name to which this signal component is bound
9	Signal source preview window	● previews the signals of all input nodes ● previews a signal that passes the IPC forwarding node ● No preview signal, show no blueprint.
10	Audio switching wall	● Pull the signal to this window for independent audio switching
11	Return home button	● Click to return to the home page, and then jump to other areas or screen operation pages from the home page.
12	Environmental control	● Click to enter the customized environment operation interface, including power timing device, camera, large-screen switch, light, air conditioner, etc.
13	Function buttons	● log out, minimize, and close

Chapter 7 KVM operation

K for keyboard, V for display wall, M for mouse. In the seat area, KVM is used to remotely control the host.

Through the distributed node, the mouse and keyboard signals are encoded into IP packets, which are transmitted by the switch to the input node, and then unscrambled into USB signals. The computer receives and executes the restored mouse and keyboard actions. A video of the operation is then passed from the input source to the seat monitor. So as to achieve remote control.

1) **In normal use mode:**
   - Press CTRL three times within 500ms to enter the OSD agent signal switching mode.
   - Press Alt three times within 500ms to enter the OSD video wall mode.
   - Press Shift three times within 500ms to enter the OSD between sitting-push mode.

2) **In lock screen mode:**
   - Press ENTER to log in
   - Press TAB: Switch the input box (user name/password)

3) **In OSD mode:**

   Main Functions:
   - 1) Drag or double-click the mouse to switch the signal source.
   - 2) Drag and drop the mouse to push signal sources to the wall or other seats.
   - 3) Press ESC to exit the OSD mode and enter the normal remote mode.
   - 4) Press the HOME button to lock the screen.
   - 5)To expand screen and non-WINDOs systems, set parameters in the next chapter.

Chapter 8 Upgrade the firmware

8.1 Matters Needing Attention

Before the upgrade, check the mainboard information of the device before uploading the upgrade file. Do not change the name of the upgrade file. If not, contact support engineers for confirmation.

8.2 Check and Upgrade the Mainboard

Step 1: Open

Step 2: Check the motherboard information

Input - Advanced Settings - System Info (Motherboard)

Output - Advanced Settings - System (Motherboard)

Step 3: Select multiple nodes that have been checked on the mainboard

Step 4: Firmware Upgrade - Select files

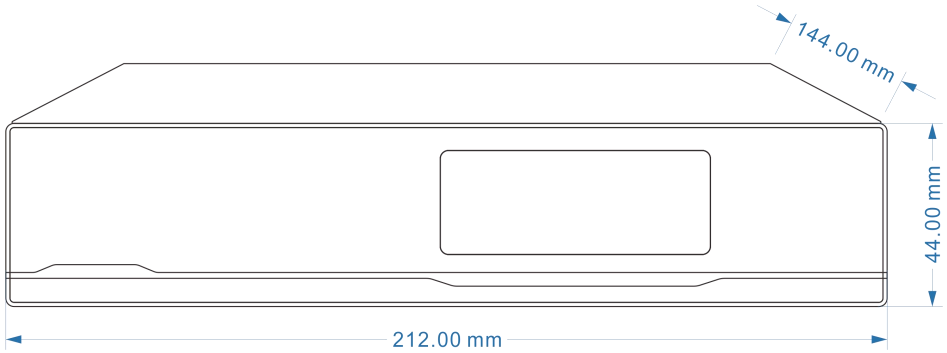
Upgrade sequence: public-> Output ->input

Step 5: Click Upload.

Do not lose power during the upload process.

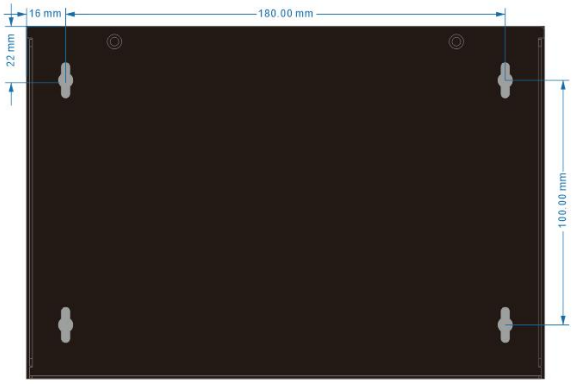
Step 6: Restart the node

Chapter 9 Size



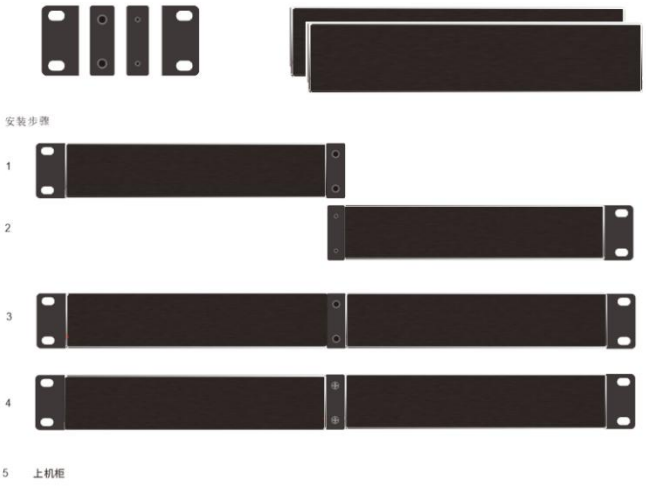
Chapter 10 Installation

10.1 Hanging Installation



10.2 Rack Installation

Optional 1U hanging ears, 1U height, standard 19-inch rack mount, as shown below.



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Chapter 11 After Sales Service

1. If you use this product, in the warranty period, the normal use of the product, due to its own quality problems caused by the failure, the company will be responsible for free repair.

2. The company provides two-year warranty service for this product, the warranty period start date:

- ✓ Date of manufacture;
- ✓ The above date can not be obtained, to the company's SN code product production date shall prevail.

3. Under any of the following circumstances, no warranty service, reasonable charge for maintenance of spare parts:

- ✓ Damage caused by improper use, storage and maintenance by consumers;
- ✓ Man-made damage to appearance and components;
- ✓ Damage caused by changing the configuration or modifying the product without the authorization of the company;
- ✓ Damage caused by force majeure.

4. Under any of the following circumstances, the company reserves the right to refuse to provide maintenance services or to provide maintenance services at a fee:

- ✓ No warranty certificate and valid invoice, no sn code;
- ✓ The fragile label of the machine body is damaged (except authorized by our company) , the content of the product label is altered or blurred and can not be recognized;
- ✓ Damage caused by installation, disassembly and repair not authorized by the company;
- ✓ No sales certificate or sales certificate is not in accordance with the maintenance product model;
- ✓ Production and sales of non-company products.

5. You may contact our after-sales service department by letter or by telephone. Please let us know the following:

- ✓ The type and name of the product you are using;
- ✓ Failure Phenomena (as detailed as possible);

Before and after the occurrence of a fault.

Chapter 12 Ordering Codes

12.1 Product Code

660-0004-02-0 IC4

Chapter 13 Appendix

13.1 Terms & Definitions

●**RCA:** Connector used primarily in consumer AV equipment for both audio and video. The RCA connector was developed by the Radio Corporation of America.

●**BNC:** Stands for Bayonet Neill-Concelman. A cable connector used extensively in television (named for its inventors). A cylindrical bayonet connector that operates with a twist-locking motion .

●**CVBS:** CVBS or Composite video, is an analog video signal without audio. Most commonly CVBS is used for transmission of standard definition signals. In consumer applications the connector is typically RCA type, while in professional applications the connector is BNC type.

●**YPbPr:** Used to describe the colour space for progressive-scan. Otherwise known as component video.

●**VGA:** Video Graphics Array. VGA is an analog signal typically used on earlier computers. The signal is non-interlaced in modes 1, 2, and 3 and interlaced when using in mode.

●**DVI:** Digital Visual Interface. The digital video connectivity standard that was developed by DDWG (Digital Display Work Group). This connection standard offers two different connectors: one with 24 pins that handles digital video signals only, and one with 29 pins that handles both digital and analog video.

●**SDI:** Serial Digital Interface. Standard definition video is carried on this 270 Mbps data transfer rate. Video pixels are characterized with a 10-bit depth and 4:2:2 color quantization. Ancillary data is included on this interface and typically includes audio or other metadata. Up to sixteen audio channels can be transmitted. Audio is organised into blocks of 4 stereo pairs. Connector is BNC.

●**HD-SDI:** High-definition serial digital interface (HD-SDI), is standardized in SMPTE 292M this provides a nominal data rate of 1.485 Gbit/s.

●**3G-SDI:** Standardized in SMPTE 424M, consists of a single 2.970 Gbit/s serial link that allows replacing dual link HD-SDI.

●**6G-SDI:** Standardized in SMPTE ST-2081 released in 2015, 6Gbit/s bitrate and able to support 2160p@30.

●**12G-SDI:** Standardized in SMPTE ST-2082 released in 2015, 12Gbit/s bitrate and able to support 2160p@60.

●**U-SDI:** Technology for transmitting large-volume 8K signals over a single cable. a signal interface called the ultra high definition signal/data interface (U-SDI) for transmitting 4K and 8K signals using a single optical cable. The interface was standardized as the SMPTE ST 2036-4.

●**HDMI:** High Definition Multimedia Interface: An interface used for the transmission of uncompressed high definition video, up to 8 channels of audio, and control signals, over a single cable.

●**HDMI 1.3:** Released on June 22 2006, and increased the maximum TMDS clock to 340 MHz (10.2 Gbit/s). Support resolution 1920 × 1080 at 120 Hz or 2560 × 1440 at 60 Hz). It added support for 10 bpc, 12 bpc, and 16 bpc color depth (30, 36, and 48 bit/px), called deep color.

●**HDMI 1.4:** Released on June 5, 2009, added support for 4096 × 2160 at 24 Hz, 3840 × 2160 at 24, 25, and 30 Hz, and 1920 × 1080 at 120 Hz. Compared to HDMI 1.3, 3 more features added which are HDMI Ethernet Channel (HEC) , audio return channel (ARC),3D Over HDMI, a new Micro HDMI Connector, an expanded set of color spaces.

●**HDMI 2.0:** Released on September 4, 2013 increases the maximum bandwidth to 18.0 Gbit/s. Other features of HDMI 2.0 include up to 32 audio channels, up to 1536 kHz audio sample frequency, the HE-AAC and DRA audio standards, improved 3D capability, and additional CEC functions.

●**HDMI 2.0a:** Was released on April 8, 2015, and added support for High Dynamic Range (HDR) video with static metadata.

●**HDMI 2.0b:** Was released March, 2016, support for HDR Video transport and extends the static metadata signaling to include Hybrid Log-Gamma (HLG).

●**HDMI 2.1:** Released on November 28, 2017. It adds support for higher resolutions and higher refresh rates,

Dynamic HDR including 4K 120 Hz and 8K 120 Hz.

●**DisplayPort:** A VESA standard interface primarily for video, but also for audio, USB and other data. DisplayPort (orDP) is backwards compatible with HDMI, DVI and VGA.

●**DP 1.1:** Was ratified on 2 April 2007, and version 1.1a was ratified on 11 January 2008. DisplayPort 1.1 allow a maximum bandwidth of 10.8 Gbit/s (8.64 Gbit/s data rate) over a standard 4-lane main link, enough to support 1920x1080@60Hz

●**DP 1.2:** Introduced on 7 January 2010, effective bandwidth to 17.28 Gbit/s support increased resolutions, higher refresh rates, and greater color depth, maximum resolution 3840 × 2160@60Hz

●**DP 1.4:** Publish on 1 Mar, 2016.overall transmission bandwidth 32.4 Gbit/s ,DisplayPort 1.4 adds support for Display Stream Compression 1.2 (DSC), DSC is a "visually lossless" encoding technique with up to a 3:1 compression ratio. Using DSC with HBR3 transmission rates, DisplayPort 1.4 can support 8K UHD (7680 × 4320) at 60 Hz or 4K UHD (3840 × 2160) at 120 Hz with 30 bit/px RGB color and HDR. 4K at 60 Hz 30 bit/px RGB/HDR can be achieved without the need for DSC.

●**Multi-mode Fiber:** Fibers that support many propagation paths or transverse modes are called multi-mode fibers, generally have a wider core diameter and are used for short-distance communication links and for applications where high power must be transmitted.

●**Single-mode Fiber:** Fiber that support a single mode are called single-mode fibers. Single-mode fibers are used for most communication links longer than 1,000 meters (3,300 ft).

●**SFP:** Small form-factor pluggable , is a compact, hot-pluggable network interface module used for both telecommunication and data communications applications.

●**Optical Fiber Connector:** Terminates the end of an optical fiber, and enables quicker connection and disconnection than splicing. The connectors mechanically couple and align the cores of fibers so light can pass. 4 most common types of optical fiber connectors are SC, FC, LC,ST.

●**SC:** (Subscriber Connector), also known as the square connector was also created by the Japanese company – Nippon Telegraph and Telephone. SC is a push-pull coupling type of connector and has a 2.5mm diameter. Nowadays, it is used mostly in single mode fiber optic patch cords, analog, GBIC, and CATV. SC is one of the most popular options, as its simplicity in design comes along with great durability and affordable prices.

●**LC：** (Lucent Connector) is a small factor connector (uses only a 1.25mm ferrule diameter) that has a snap coupling mechanism. Because of its small dimensions, it is the perfect fit for high-density connections, XFP, SFP, and SFP+ transceivers.

●**FC:** (Ferrule Connector) is a screw type connector with a 2.5mm ferrule. FC is a round shaped threaded fiber optic connector,mostly used on Datacom, telecom, measurement equipment, single-mode laser.

●**ST:** (Straight Tip) was invented by AT&T and uses a bayonet mount along with a long spring-loaded ferrule to support the fiber.

●**USB:** Universal Serial Bus is a standard that was developed in the mid-1990s that defines cables, connectors and communication protocols. This technology is designed to allow a connection, communication and power supply for peripheral devices and computers.

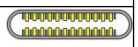
●**USB 1.1:** Full–Bandwidth USB, specification was the first release to be widely adopted by the consumer market. This specification allowed for a maximum bandwidth of 12Mbps.

●**USB 2.0:** or Hi–Speed USB, specification made many improvements over USB 1.1. The main improvement was an increase in bandwidth to a maximum of 480Mbps.

● **USB 3.2:** Super Speed USB with 3 varieties of 3.2 Gen 1(original name USB 3.0), 3.2Gen 2(original name USB 3.1), 3.2 Gen 2x2 (original name USB 3.2) with speed up to 5Gbps,10Gbps,20Gbps respectively.

USB version and connectors figure:

	Type A	Type B	Mini A	Mini B	Micro-A	Micro -B	Type C
USB 2.0							

USB 3.0							
USB 3.1&3.2							

●**NTSC:** The colour video standard used in North America and some other parts of the world created by the National Television Standards Committee in the 1950s. NTSC utilizes an interlaced video signals.

●**PAL:** Phase Alternate Line. A television standard in which the phase of the colour carrier is alternated from line to line. It takes four full images (8 fields) for the colour-to-horizontalimages (8 fields) for the colour-to-horizontal phase relationship to return to the reference point. This alternation helps cancel out phase errors. For this reason, the hue control is not needed on a PAL TV set. PAL, is widely used in needed on a PAL TV set. PAL, is widely used in Western Europe, Australia, Africa, the Middle East, and Micronesia. PAL uses 625-line, 50-field (25 fps) composite colour transmission system.

●**SMPTE:** Society of Motion image and Television Engineers. A global organization, based in the United States, that sets standards for baseband visual communications. This includes film as well as video and television standards.

●**VESA:** Video Electronics Standards Association. An organization facilitating computer graphics through standards.

●**HDCP:** High-bandwidth Digital Content Protection (HDCP) was developed by Intel Corporation an is in wide use for protection of video during transmission between devices.

●**HDBaseT:** A video standard for the transmission of uncompressed video (HDMI signals) and related features using Cat 5e/Cat6 cabling infrastructure.

●**ST2110:** A SMPTE developed standard, ST2110 describes how to send digital video over and IP networks. Video is transmitted uncompressed with audio and other data in a separate streams.

SMPTE2110 is intended principally for broadcast production and distribution facilities where quality and flexibility are more important.

●**SDVoE:** Software Defined Video over Ethernet (SDVoE) is a method for transmission, distribution and management AV signals using a TCP/IP Ethernet infrastructure for transport with low latency. SDVoE is commonly used in integration applications.

●**Dante AV:** The Dante protocol was developed for and widely adopted in audio systems for the transmission of uncompressed digital audio on IP based networks. The more recent Dante AV specification includes support for digital video.

●**NDI:** Network Device interface (NDI) is a software standard developed by NewTek to enable video-compatible products to communicate, deliver, and receive broadcast quality video in a high quality, low latency manner that is frame-accurate and suitable for switching in a live production environment over TCP (UDP) Ethernet based networks. NDI is commonly found in broadcast applications.

●**RTMP:** Real-Time Messaging Protocol (RTMP) was initially a proprietary protocol developed by Macromedia (now Adobe) for streaming audio, video and data over the Internet, between a Flash player and a server.

●**RTSP:** The Real Time Streaming Protocol (RTSP) is a network control protocol designed for use in entertainment and communications systems to control streaming media servers. The protocol is used for establishing and controlling media sessions between end points.

●**MPEG:** Moving Picture Experts Group is a working group formed from ISO and IEC developing standards that allow audio/video digital compression and Transmission.

●**H.264:** Also known as AVC (Advanced Video Coding) or MPEG-4i is a common video compression standard. H.264 was standardized by the ITU-T Video Coding Experts Group (VCEG) together with the ISO/IEC JTC1

Moving Picture Experts Group (MPEG).

●**H.265:** Also known as **HEVC** (High Efficiency Video Coding)H.265 is the successor to the widely used H.264/AVC digital video coding standard. Developed under the auspices of ITU, resolutions up to 8192x4320 may be compressed.

●**API:** An Application Programming Interface (API) provides a predefined function which allows access capabilities and features or routines via a software or hardware, without accessing source code or understanding the details of inner working mechanism. An API call may execute a function and/or provide data feedback/report.

●**DMX512:** The communication standard developed by USITT for entertainment and digital lighting systems. The wide adoption of the Digital Multiplex (DMX) protocol has seen the protocol used for a wide range of other devices including video controllers. DMX512 is delivered over cable of 2 twisted pairs with 5pin XLR cables for connection.

●**ArtNet:** An ethernet protocol based on TCP/IP protocol stack, mainly used in entertainment/events applications. Built on the DMX512 data format, ArtNet enables multiple "universes" of DMX512 to be transmitted using ethernet networks for transport.

●**MIDI:** MIDI is the abbreviation of Musical Instrument Digital Interface. As the name indicates the protocol was developed for communication between electronical musical instruments and latterly computers. MIDI instructions are triggers or commands sent over twisted pair cables, typically using 5pin DIN connectors.

●**OSC:** The principle of Open Sound Control (OSC) protocol is for networking sound synthesizers, computers, and multimedia devices for musical performance or show control. As with XML and JSON, the OSC protocol allows sharing data. OSC is transported via UDP packets between devices connected on an Ethernet.

●**Brightness:** Usually refers to the amount or intensity of video light produced on a screen without regard to colour. Sometimes called black level

●**Contrast Ratio:** The ratio of the high light output level divided by the low light output level. In theory, the contrast ratio of the television system should be at least 100:1, if not 300:1. In reality, there are several limitations. Well-controlled viewing conditions should yield a practical contrast ratio of 30:1 to 50:1.

●**Colour Temperature:** The colour quality, expressed in degrees Kelvin (K), of a light source. The higher the colour temperature, the bluer the light. The lower the temperature, the redder the light. Benchmark colour temperature for the A/V industry include 5000°K, 6500°K, and 9000°K.

●**Saturation:** Chroma, Chroma gain. The intensity of the colour, or the extent to which a given colour in any image is free from white. The less white in a colour, the truer the colour or the greater its saturation. Saturation is the amount of pigment in a colour, and not the intensity.

●**Gamma:** The light output of a CRT is not linear with respect to the voltage input. The difference between what you should have and what is actually output is known as gamma.

●**Frame:** In interlaced video, a frame is one complete image.A video frame is made up of two fields, or two sets of interlaced lines. In a film, a frame is one still image of a series that makes up a motion image.

●**Genlock:** Allows synchronisation of otherwise video devices. A signal generator provides a signal pulses which connected devices can reference. Also see Black Burst and Color Burst.

●**Blackburst:** The video waveform without the video elements.It includes the vertical sync, horizontal sync, and the Chroma burst information. Blackburst is used to synchronize video equipment to align the video output.

●**Colour Burst:** In colour TV systems, a burst of subcarrier frequency located on the back part of the composite video signal. This serves as a colour synchronizing signal to establish a frequency and phase reference for the Chroma signal. Colour burst is 3.58 MHz for NTSC and 4.43 MHz for PAL.

●**Colour Bars:** A standard test pattern of several basic colours (white, yellow, cyan, green, magenta, red, blue, and black) as a reference for system alignment and testing. In NTSC video, the most commonly used colour bars are the SMPTE standard colour bars. In PAL video, the most commonly used colour bars are eight full field bars. On computer monitors the most commonly used colour bars are two rows of reversed colour bars

●**Seamless Switching:** A feature found on many video switchers. This feature causes the switcher to wait until the vertical interval to switch. This avoids a glitch (temporary scrambling) which often is seen when switching between sources.

●**Scaling:** A conversion of a video or computer graphic signal from a starting resolution to a new resolution. Scaling from one resolution to another is typically done to optimize the signal for input to an image processor, transmission path or to improve its quality when presented on a particular display.

●**PIP:** Picture-In-Picture. A small image within a larger image created by scaling down one of image to make it smaller. Other forms of PIP displays include Picture-By-Picture (PBP) and Picture- With-Picture (PWP), which are commonly used with 16:9 aspect display devices. PBP and PWP image formats require a separate scaler for each video window.

●**HDR:** is a high dynamic range (HDR) technique used in imaging and photography to reproduce a greater dynamic range of luminosity than what is possible with standard digital imaging or photographic techniques. The aim is to present a similar range of luminance to that experienced through the human visual system.

●**UHD:** Standing for Ultra High Definition and comprising 4K and 8K television standards with a 16:9 ratio, UHD follows the 2K HDTV standard. A UHD 4K display has a physical resolution of 3840x2160 which is four times the area and twice both the width and height of a HDTV/FullHD (1920 x1080) video signal.

●**EDID:** Extended Display Identification Data. EDID is a data structure used to communicate video display information, including native resolution and vertical interval refresh rate requirements, to a source device. The source device will then output the provided EDID data, ensuring proper video image quality.

13.2 Revision History

The table below lists the changes to the User Manual.

Format	Time	ECO#	Description	Principal
V1.0	2024-02-22	0000#	Release	Aster

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+86-592-577-1197
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RGBlink Headquarters
Xiamen · China

Room 601A, No. 37-3 Banshang community. Building 3, Xinke Plaza, Torch Hi-Tech industrialDevelopment Zone, Xiamen,China

+86 0592 577 1197

China Regional **Sale & Support**
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705, 7th Floor, South District, Building 2B, Skyworth Innovation Valley, No. 1 Tangtou Road, Shiyan Street, Baoan District, Shenzhen City, Guangdong Province

+86 0755 2153 5149

Beijing Region Office
Beijing · China

Room 33, 2nd Floor, Building 1, National Defense Science and Technology Park, Zhongguancun Campus, Beijing institute of Technology, Haidian

+010 8577 7286

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