Embedded Multi-Screen Controller

User's Manual

V1.0.0

Foreword

General

This user's manual introduces the functions and operations of embedded multi-screen controller (hereinafter referred to as "the Controller").

Safety Instructions

The following signal words might appear in the manual.

Logo	Description
DANGER	Indicates a high potential hazard which, if not avoided, will result in death or serious injury.
WARNING	Indicates a medium or low potential hazard which, if not avoided, could result in slight or moderate injury.
CAUTION	Indicates a potential risk which, if not avoided, could result in property damage, data loss, reductions in performance, or unpredictable results.
TIPS	Provides methods to help you solve a problem or save time.
NOTE	Provides additional information as a supplement to the text.

Revision History

Version	Revision Content	Release Time
V1.0.0	First release.	September 2024

Important Safeguards and Warnings

This section introduces content covering the proper handling of the device, hazard prevention, and prevention of property damage. Read carefully before using the device, and comply with the guidelines when using it.

Transportation Requirements

Transport the device under allowed humidity and temperature conditions.

Storage Requirements

Store the device under allowed humidity and temperature conditions.

Installation Requirements

 DANGER

-  Electrical Hazard
  Preventive measures: Make sure the power is off when you put your hand into the device.
- Stability Hazard
  Possible result: The rack might fall down and cause serious personal injury.
  Preventive measures (including but not limited to):
  - Before extending the rack to the installation position, read the installation instructions.
  - When the Device is installed on the slide rail, do not place any load on it.
  - Do not retract the slide rail while the Device is installed on it.

 WARNING

-  Rotating Fan Blades Hazard
  Avoid touching the fan blades, especially when they are moving.
-  Before installation, disconnect all the power cords.
- Do not connect the power adapter to the device while the adapter is powered on.
- Strictly comply with the local electric safety code and standards. Make sure the ambient voltage is stable and meets the power supply requirements of the device.
- Do not connect the device to two or more kinds of power supplies, to avoid damage to the device.
- Replace unwanted batteries with new batteries of the same type and model. Replace unwanted batteries with new batteries of the same type and model to avoid the risk of fire and explosion. Dispose of the old batteries as instructed.
- Do not expose the battery to extremely hot environments, such as direct sunlight and fire, to avoid the risk of fire and explosion.

- The device must be installed in a location that only professionals can access. Non-professionals are not allowed to enter the installation area.

- Personnel working at heights must take all necessary measures to ensure personal safety including wearing a helmet and safety belts.
- Do not place the device in a place exposed to sunlight or near heat sources.
- Keep the device away from dampness, dust, and soot.
- To ensure heat dissipation, the gap between the device and the surrounding area should not be less than 10 cm on the sides and 5 cm on top of the device.
- Install the device on a stable surface to prevent it from falling.
- Use an adapter or cabinet power supply provided by the manufacturer.
- Please follow the electrical requirements to power the device.
  - Following are the requirements for selecting a power adapter.
    - The power supply must conform to the requirements of IEC 60950-1 and IEC 62368-1 standards.
    - The voltage must meet the SELV (Safety Extra Low Voltage) requirements and not exceed ES-1 standards.
    - When the power of the device does not exceed 100 W, the power supply must meet LPS requirements and be no higher than PS2.
  - We recommend using the power adapter provided with the device.
  - When selecting the power adapter, the power supply requirements (such as rated voltage) are subject to the device label.
- The device is a class I electrical appliance. Make sure that the power supply of the device is connected to a power socket with protective earthing.
- Use the power cords that are recommended for the region and conform to the rated power specifications.
- When installing the device, make sure that the power plug and appliance coupler can be easily reached to cut off power.
- The appliance coupler is a disconnection device. Keep it at a convenient angle when using it.
- A safety circuit breaker is designed on the device panel to cut the power of the device. Make sure the breaker can be easily operated during installation.

Operation Requirements

-  The Device or remote control contains button batteries. Do not swallow the batteries due to the risk of chemical burns.
  Possible result: The swallowed button battery can cause serious internal burns and death within 2 hours.
  Preventive measures (including but not limited to):
  - Keep new and used batteries out of reach of children.
  - If the battery compartment is not securely closed, stop using the product immediately and keep out of reach of children.
  - Seek immediate medical attention if a battery is believed to be swallowed or inserted inside any part of the body.
- Battery Pack Precautions
  Preventive measures (including but not limited to):
  - Do not transport, store or use the batteries in high altitudes with low pressure and environments with extremely high and low temperatures.

- Do not dispose the batteries in fire or a hot oven, or mechanically crush or cut the batteries to avoid an explosion.
- Do not leave the batteries in environments with extremely high temperatures to avoid explosions and leakage of flammable liquid or gas.
- Do not subject the batteries to extremely low air pressure to avoid explosions and the leakage of flammable liquid or gas.

WARNING

- Operating the device in a domestic environment may cause radio interference.
- Place the device in a location that children cannot easily access.
- High Current
  Preventative measure: Ground the screw of the device to protective ground before you power it on.
- Do not use multiple devices together to avoid generating high current.
  Preventative measure: Ground the device to protective ground before you power it on.

- Check whether the power supply is correct before use.
- Do not unplug the power cord on the side of the device while the adapter is powered on.
- Operate the device within the rated range of power input and output.
- Use the device under allowed humidity and temperature conditions.
- Do not drop or splash liquid onto the device, and make sure that there is no object filled with liquid on the device to prevent liquid from flowing into it.
- Do not place an open flame on the device, such as a lit candle.
- Do not disassemble the device without professional instruction.

Maintenance Requirements

DANGER

Replacing unwanted batteries with the wrong type of new batteries might result in explosion.
Preventive measures (including but not limited to):

- Replace unwanted batteries with new batteries of the same type and model to avoid the risk of fire and explosion.
- Dispose of the old batteries as instructed.

- It is prohibited for non-professionals and unauthorized personnel to open the device casing.
- The appliance coupler is a disconnection device. Keep it at a convenient angle when using it. Before repairing or performing maintenance on the device, first disconnect the appliance coupler.

Table of Contents

1 Product Overview

1.1 Product Introduction

The embedded multi-screen controller DSCON2100 supports 4-way input and a maximum of 16-way output. It features a front panel with multimedia display and button design, enabling fast content switching. The controller also supports EDID customization, with support for up to 4K at 60Hz resolution. Additionally, it allows for a maximum of 16-way signal copy to the wall, as well as image stitching and roaming functions. This versatile device is suitable for a variety of scenarios, including lecture halls, exhibition halls, medium and large conference rooms, supermarkets, monitoring centers, and small to medium-sized command centers.

1.2 Main Features

Multimedia Shortcut Operation

- LCD Rotary Knob: Supports quick modification of IP, quick restore of default configuration, and quick switching of on-wall mode.
- Function area: Supports scheme switching, scheme patrol, large screen switch, and mute button.
- Quick input and output area: Video wall full screen content switching, signal access and signal output status real-time display.

4K Acquisition

The 4-channel HDMI input supports up to 4K@60Hz and three mode switching modes: 1-channel 4K@60 Hz, 2-channel 4K@30 Hz, and 4-channel 1080P@60 Hz.

Ultra Low Latency

The delay from acquisition to output is less than 50 ms, and the fused screen is less than 72 ms.

High Definition Image Quality

Supports RGB888 acquisition and RGB888 output.

Multi-channel Duplicates

The whole machine can copy up to 16 channels of 1080P signals or 4 channels of 4K signals.

2 Device Appearance

2.1 Unpacking inspection

When you receive the Controller, check whether there is any visible damage or not. The protective material of the device package can resist most accidental collisions during transportation.
The label at the bottom of the box contains device serial number and other information. Keep the label well and show it to the after-sales service personnel when you need after-sales assistance.

2.2 Device Introduction

2.2.1 Front Panel Introduction

Figure 2-1 Front panel

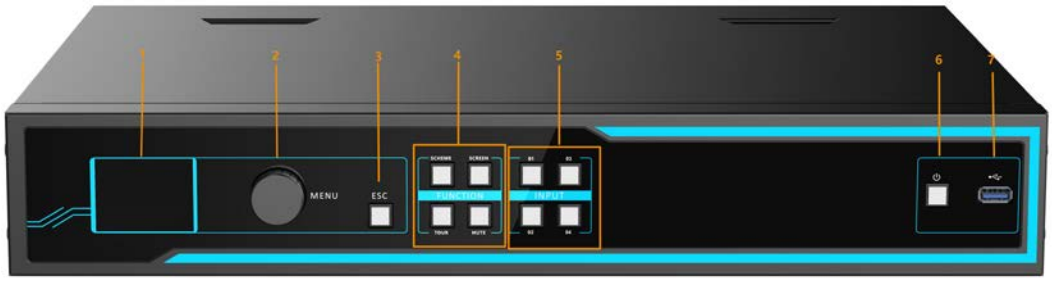


Table 2-1 Front panel description

No.	Description
1	LCD Display. Displays IP address, device model, version number, and more.
2	Rotary knob. Adjust the volume and configure the device network. When adjusting the volume in the display screen main page, rotate clockwise to increase the volume, and rotate counterclockwise to decrease the volume.
3	Exit. Return to the previous step. Press and hold the Exit key for 5 to 10 seconds, and then release it to perform a factory settings.

No.	Description
4	Function keys. Clockwise from left to right: Scheme switching, large screen control, mute button, scheme tour. ● Scheme switching: Press the button to switch the scheme. ● Large screen control: Press the button to control the screen on or off. You need to configure the screen control and serial port parameters in Webpage first. ● Mute button: When the mute button light is off, there is a "beep" sound when the front panel button is pressed; when the mute button light is solid on, the front panel button is mute. ● Scheme tour: Press the button to start or end scheme tour. You need to configure the schemes and scheme tour on the webpage first.
5	Press the Enter key, and then the signal collection will be displayed on the wall. ● Solid blue: Signal source is connected and signal on the wall. ● Blue light flashing: Signal source is connected but not on the wall. ● Light off: Signal source is not connected.
6	Power button. Press the power button, the indicator lights on and the device turns on. Press and hold the power button for more than 5 seconds to shut down the device.
7	USB 1.0 port.

2.2.2 Rear Panel Introduction

Figure 2-2 DSCON2100-0410H

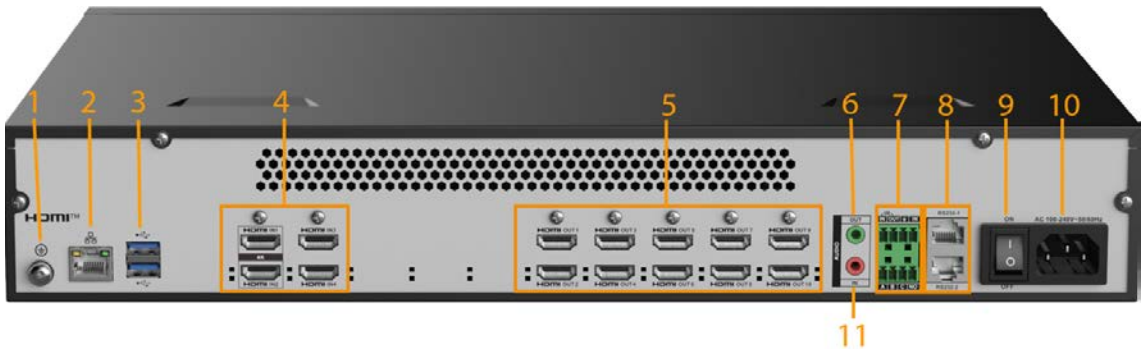


Table 2-2 Rear panel description

No.	Description
1	Ground.
2	10/100/1000 Mbps Ethernet port.
3	2 USB 3.0 ports.
4	4 HDMI input port, of which HDMI1 is a 2.0 port, and HDMI2, HDMI3, and HDMI4 are HDMI1.4 ports.
5	10 HDMI1.4 output port.

No.	Description
6	3.5mm audio output port.
7	Alarm line in/out port and RS-485port.
8	2 RS-232 port.
9	Power button.
10	Power port. Supports 100 VAC-240 VAC, 50/60 Hz power supply.
11	3.5 mm port (function reserved).

Figure 2-3 DSCON2100-0412H

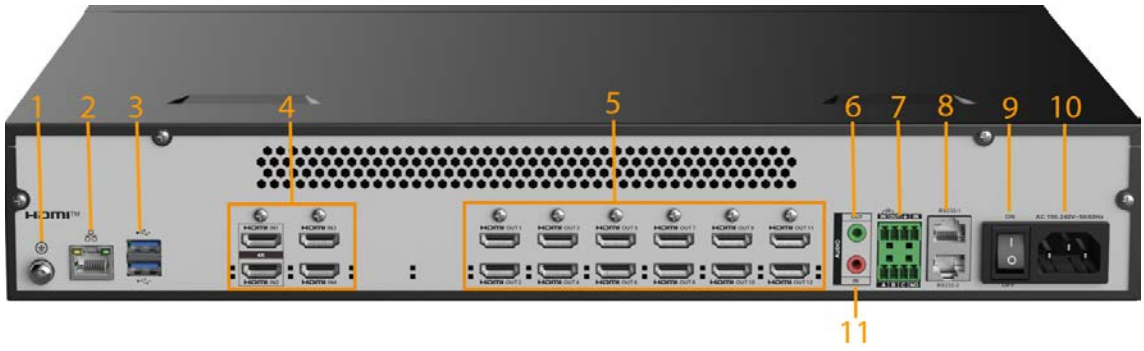


Table 2-3 Rear panel description

No.	Description
1	Ground.
2	10/100/1000 Mbps Ethernet port.
3	2 USB 3.0 ports.
4	4 HDMI input port, of which HDMI1 is a 2.0 port, and HDMI2, HDMI3, and HDMI4 are HDMI1.4 input port.
5	12 HDMI1.4 output port.
6	3.5 mm audio output port.
7	Alarm Line In/Out port and RS-485 port.
8	2 RS-232 ports.
9	Power button.
10	Power Port, supports 100 VAC-240 VAC, 50/60 Hz power supply.
11	3.5 mm port (function reserved).

Figure 2-4 DSCON2100-0416H

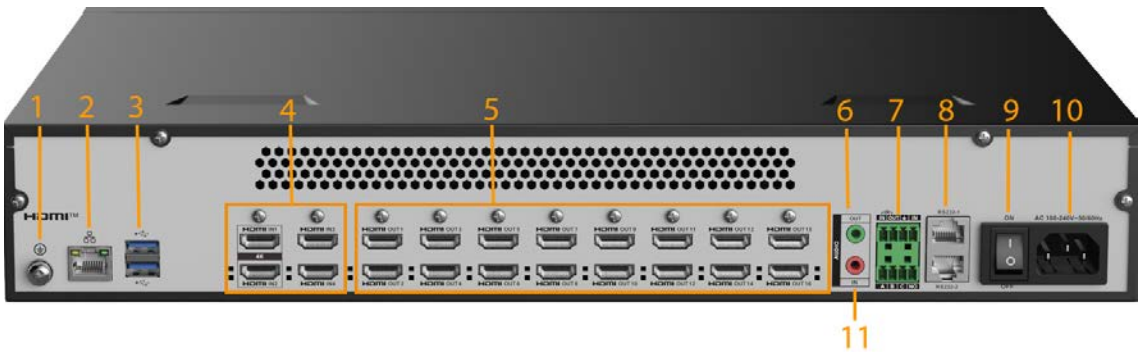


Table 2-4 Rear Panel Description

No.	Description
1	Ground.
2	10/100/1000 Mbps Ethernet port.
3	2 USB 3.0 ports.
4	4 HDMI input port, of which HDMI1 is a 2.0 port, and HDMI2, HDMI3, and HDMI4 are HDMI1.4 ports.
5	16 HDMI1.4 output ports.
6	3.5 mm audio output port.
7	Alarm Line In/Out port and RS-485port.
8	2 RS-232 port.
9	Power button.
10	Power port. Supports 100 VAC – 240 VAC, 50/60 Hz power supply.
11	3.5 mm port(function reserved).

3 LCD Screen Function

3.1 Information Display

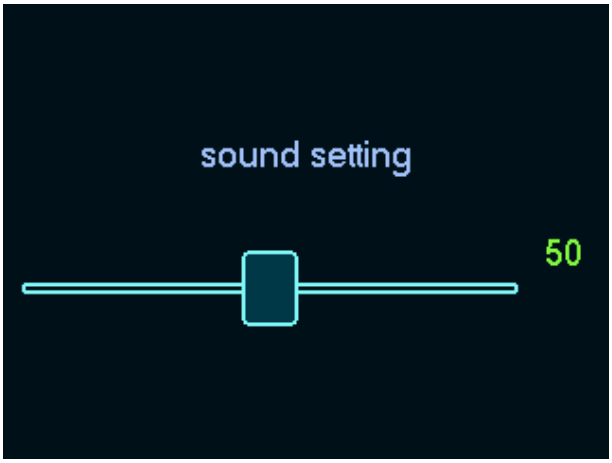
After the device is turned on, it enters the LCD display screen main page. The device IP address, device model and version are displayed. On the main page, press the Rotary Knob to enter the main operation page.

Figure 3-1 Information display

3.2 Volume Adjustment

When the LCD display screen is in the Status Indication Interface, turning the Rotary Knob left or right can adjust the volume of the audio output port on the rear panel.

Figure 3-2 Volume Adjustment



- Volume adjustment range: 0 to 100.
- Volume adjustment page recovery displays the status information after 3 seconds of no operation.

3.3 Network Settings

Supports switching DHCP mode, IP address, mask and gateway.

Steps

Step 1 On the main page, press the Rotary Knob and select **Network Settings**.

Step 2 Turn the Rotary Knob left and select the edit box.

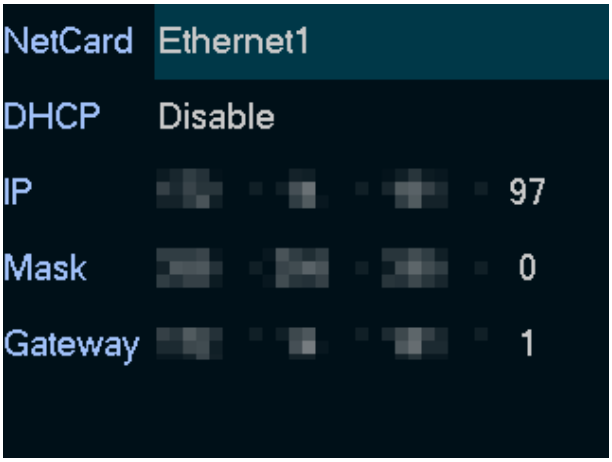
Turning the Rotary Knob left or right will toggle the selected edit box.

Step 3 Press the Rotary Knob to confirm editing the parameter.

Press Exit on the front panel to exit editing.

Step 4: When editing, turn the Rotary Knob left or right to change the Parameter value.

Figure 3-3 Edit parameter



Step 5 Press the Rotary Knob to save the configuration.

After successful saving, it will automatically return to the main operation page.

3.4 System Settings

System settings support deleting user and recovery to default settings.

In the main Operation page, rotate the Rotary Knob and select **Settings**.

- Turn the Rotary Knob to select **Delete User**, press the Rotary Knob and select **OK** in the pop-up dialog box.

  This action will cause the user settings to set a factory reset and the Device will reboot.

- Turn the Rotary Knob to select “Recovery Default”, press the Rotary Knob and select “OK” in the pop-up dialog box.

  This operation will cause all configurations except network settings to be restored to default and the device will restart.

3.5 Video Wall Quick Operation Mode

Prerequisites

Video wall has been configured on the client. For details, see“4.5.5.1 Configure Video Wall.”

Steps

Step 1 On the main operation page, rotate the Rotary Knob, select **Quick Control**, and press the Rotary Knob to enter the quick control options.

Step 2 Rotate the Rotary Knob, select **Video Wall** under **Video Wall Quick Operation Mode**, and press the Rotary Knob to enter the video wall quick operation mode.

Step 3 Press any output key on the front panel, and then press Enter to upload the signal to the video wall where the output port is located.

4 Webpage Operations

4.1 Network Connection

If you have configured IP via the LCD screen, you can skip this section.

Procedure

Step 1 Connect the network port of the Controller to the network port of your computer with the network cable.

Step 2 Set the computer and the Controller to the same IP segment.

The default IP address of the Controller is 192.168.1.108.

Step 3 Ping ***.***.***.***(IP address of the Controller) on your computer to check whether connection is working normally. Usually the returned TTL value should be less than or equal to 64.

Step 4 Open the browser, enter the IP address of the Controller in the address bar, and then press Enter.

Webpage controls can be recognized and downloaded automatically. The system can download the latest Webpage controls and remove the old one.

Step 5 After you log in to the webpage, change the IP address of the Controller according to the actual situation.

Step 6 Connect the Controller to the network.

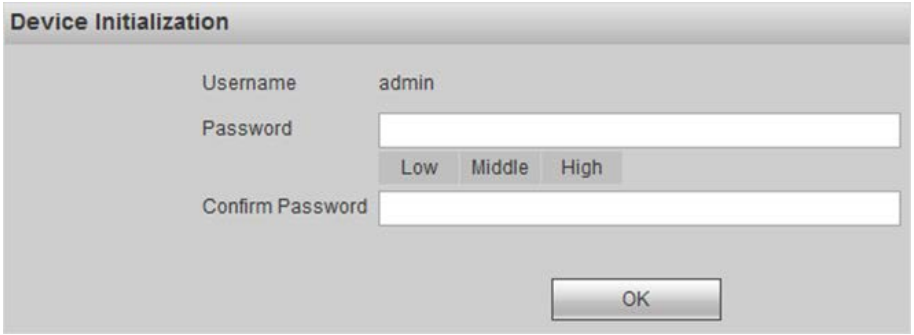
4.2 Initialization

Procedure

Step 1 Enter the IP address of the Controller in the browser address bar.

Step 2 Set the password for the admin user.

Figure 4-1 Initialization



- The password must consist of 8–32 non-blank characters and contain at least two types of the following characters: Uppercase and lowercase letters, numbers, and special characters (excluding ' " ; : &).
- Set a high security password according to the password strength prompt.

Step 3 Click **OK**.

Step 4 Enter the username and the password, and then click **Login**.

Related operations

Click "**Exit**" in the upper-right corner to exit the system.

4.3 Video Wall

For the first-time login, click  to add video wall.

Figure 4-2 Video Wall

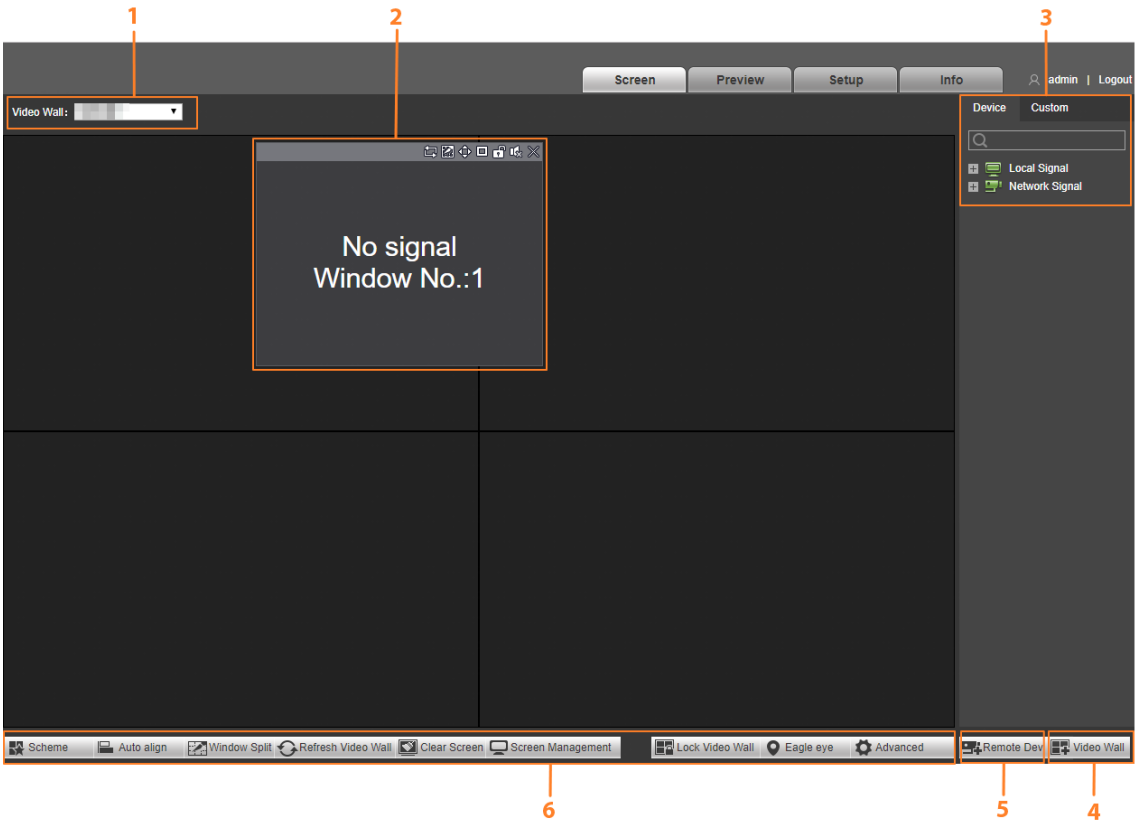


Table 4-1 Video Wall function introduction

No.	Name	Description
1	Video wall selection area	After you add a video wall, you can select the video wall from the drop-down list of **Video Wall**.
2	Window configuration	You can turn off signals and add, adjust and put windows down at the bottom.

No.	Name	Description
3	Signal management	Select different tabs to operate. ● Click the **Device** tab. You can view local signals, channel information and preview and display the signals on the video wall. ● Click the **Custom** tab. You can view information on signal groups and configure signal tour on the video wall.
4	Video wall	Click **Video Wall** to go to the **Video Wall Setup** page where you can add, modify, and delete video walls.
5	Remote device	Click **Remote Dev** to go to the **Network Signal** page where you can add, modify, and delete devices.
6	Video wall management	You can perform management and auto-align, split windows, refresh the video wall, clear the screen, access screen management, and lock and unlock the video wall.

4.3.1 Window Configuration

4.3.1.1 Adjust Window

Click the adjustment icon in the upper right corner of the window to adjust the window.

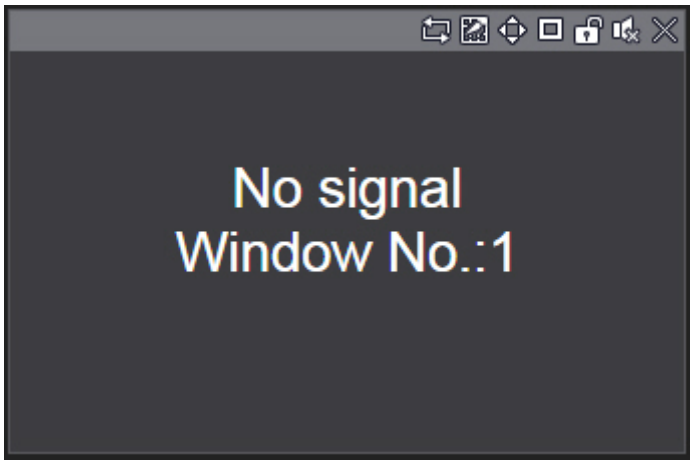
Table 4-2 Window adjustment icon description

Icon	Name	Description
	Start/stop signal tour	Click it to start signal tour, and the icon becomes  . Click to stop signal tour.
	Split	You can split the window across 2 windows (horizontal/vertical), and also across 4, 9, 16, 25, and 36 windows.  When the window is maximized or pasted to the screen, the icon becomes  . Click the icon to drag the window anywhere.
	Paste screen	Click it to paste the window to the screen. For this, the dimensions of the window cannot be adjusted.
	Paste window	Click it, and then the window will be maximized without covering other windows.
	Lock	Click it to lock the window, and then the position and size of the window cannot be adjusted.  Click  to unlock the window.
	Audio	Turn on or off audio. This function is reserved.
	Close	Close the window.

4.3.1.2 Adding a Window

Click the video wall display area and move the pointer to add a window.

Figure 4-3 Add window



- Select a window, press and move the left mouse button. The selected window will be moved to the required position.
- Select a window, drag the control point in any direction to change the dimensions of the selected window.
- Select a window, right-click and select **Bottom**. The selected window will appear the bottom of other windows.
- Select a window that is displaying a signal, right-click and then select **Signal Off**. The signal will turn off.

4.3.1.3 Configuration Window Information

Set the coordinate and size of the window as needed.

Prerequisites

Manual setting window wide and height has been enabled.

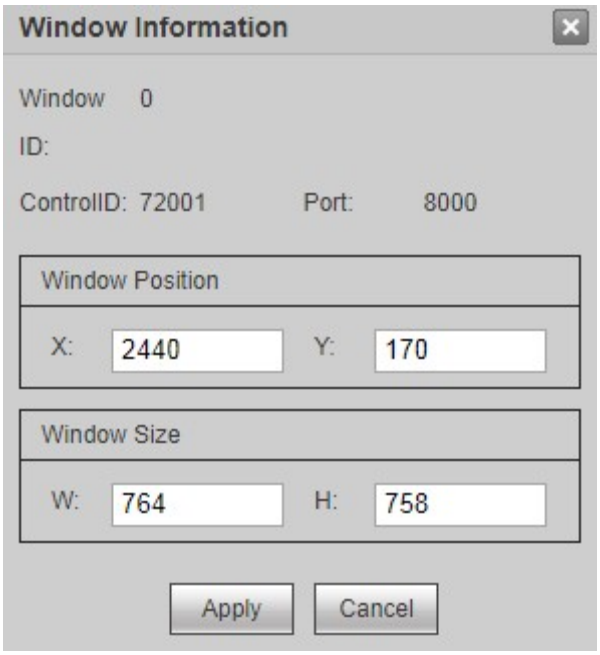
Procedure

Step 1 Log in to the webpage, and then click the **Screen** tab.

Step 2 Double-click the window.

Step 3 Configure window position and window size.

Figure 4-4 Window information



4.3.2 Signal Configuration

Select signals, or enter the name of the signal in the search box to search for signals.

4.3.2.1 Device Tree

The Device Tree displays all On-Premises signals and Added network signals.

- **On-Premises Signal**: Displays the On-Premises signal source.
- **Network Signal**: Displays the sources of signals that were added.

4.3.2.2 Signal Grouping

The "Signal Grouping" tab shows the signal source in the added group. Drag the signal to the window in the Video Wall to achieve Ring Play of each signal in the group. For detailed operations, see“4.5.4.3 Signal Grouping.”

4.3.2.3 Signal on Wall

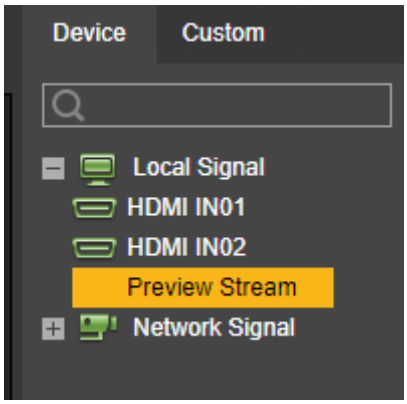
After you output a signal to a window on the video wall, you can view videos related to the signal on the video wall.

Step 1 Log in to Webpage and select the **Video Wall** tab.

Step 2 Select a window on the Video Wall, or press and hold the Left Mouse Button to create a new window on the Video Wall.

Step 3 In the **Device Tree** or **Signal Group** on the right side of page, select **Signal Source**. Here we take **Device Tree** as an example.

Figure 4-5 Select signal source



Step 4 The signal is displayed on the wall.

- The On-Premises signal of the Device Tree will only display the Enter channels available in the current mode according to different Enter modes.
- Press and hold the Left Mouse Button and drag the signal to the specified window to output the signal to the window.
- Select the window and double-click the preview or main/sub stream of the channel to output the signal to the window.
- Enter mode 1 supports up to16On-Premises signal copy to the wall; Enter mode 2 supports up to8On-Premises signal copy to the wall; Enter mode 3 supports up to4Copy the On-Premises signal to the wall. Enter mode settings, for detailed operations, see “4.5.4.2.1 Enter Mode Settings"。

4.3.2.4 Window Signal Tour

Drag the configured signal group to the corresponding window, and you can play the signals in the signal group in this window in a loop. You can set the dwell time and stream type as needed.

Favorites Configure Signal Tour

Signal group has been configured under **Favorites**. For details, see“4.5.4.3 Signal Grouping.”

1. Log in to Webpage and select **Video Wall**.
2. Select the window that needs signal tour.
3. Select a signal group under **Signal Group** > **Favorites**, hold down the left button, and drag the Signal Group to the specified window. The window will automatically start signal tour.
4. Click . The system displays all channel lists in this window.

Figure 4-6 Channel List

5. Set the tour dwell time for each signal, the default is 10 seconds, and select the stream type as needed.

- After clicking a signal, The signal will not appear in the tour queue, but the signal group still exists.
- Click or to adjust the signal patrol order.
- This setting takes effect in real time.
- Click in the upper right corner of the window to stop signal tour.

Global Configuration Signal Tour

In the global configuration, **Window Signal Tour** has been enabled. For details, see"4.5.5.3.2 Global Settings."

1. Log in to webpage, and then select **Video Wall**.
2. Select the window that needs signal tour.
3. Drag different signals to the window, click and start signal tour.

4.3.3 Managing Video Wall

Manage video wall, including scheme management, automatic window alignment, window splitting, video wall refresh, screen clearing, screen management, video wall lockout, eagle eye map, and advanced function settings.

4.3.3.1 Scheme Management

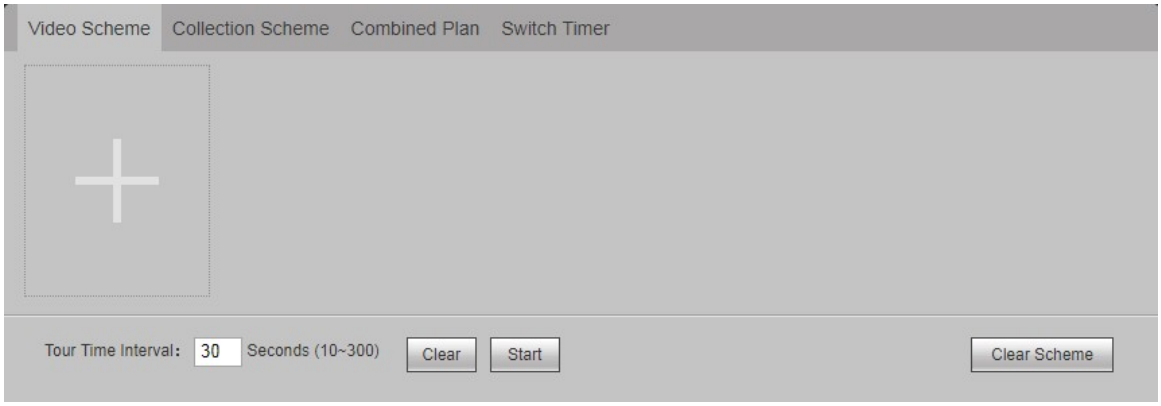
Manage video scheme, collection scheme and combined scheme, and set switch timer.

4.3.3.1.1 Video Scheme

Save the video wall video layout as a video plan, and configure multiple video scheme to be played in turn on the big screen to manage the video schemes.

Step 1 Log in to webpage, and then select the **Video Wall**.
Step 2 Click **Scheme Management**.
Step 3 Click to add scheme.

Figure 4-7 Video scheme



Step 4: Reconfigure the current layout and repeat
You can add multiple schemes.

Click **Clear Scheme** to clear all schemes.

4.3.3.1.2 Collection Scheme

Save the virtual LED and background configuration to a collection scheme. Multiple collection schemes can be played in turn on the screen through configuration to achieve the management of Additional Scheme. For detailed introduction, please refer to " 4.3.3.1.1 Video Scheme.

4.3.3.1.3 Combined Scheme

Combine Video Scheme and collection scheme into a combined scheme. Configure multiple combined schemes to play in turn on the screen to manage combined schemes. For details, see"4.3.3.1.1 Video Scheme."

4.3.3.1.4 Scheme Tour

Prerequisites

The scheme has been configured.

Steps

Step 1 Log in to the Webpage, and then select the **Video Wall**.

Step 2 Click **Scheme Management**.

Step 3 Set the **Tour Time Interval**.

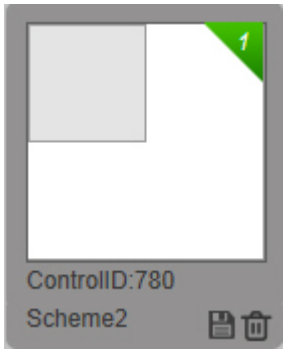
Figure 4-8 Setting the tour time interval

Step 4 Click in the upper right corner of each Scheme to add the scheme to the tour queue.

changes to a number, indicating the order of the Scheme in the tour queue.

Double-click **ControlID** and scheme name to modify the controlID and scheme name. The control number is used to distinguish different schemes when using the central control device to send command.

Figure 4-9 Setting the tour order



Step 5 Click **Start**.

The system starts scheme tour, and the tour information is displayed in the lower right corner of the page.

- Click **Stop** to stop scheme tour.
- The screen page cannot be operated during scheme tour.
- Click **Clear** to clear the entire scheme tour plan.

4.3.3.1.5 Scheduled Switch

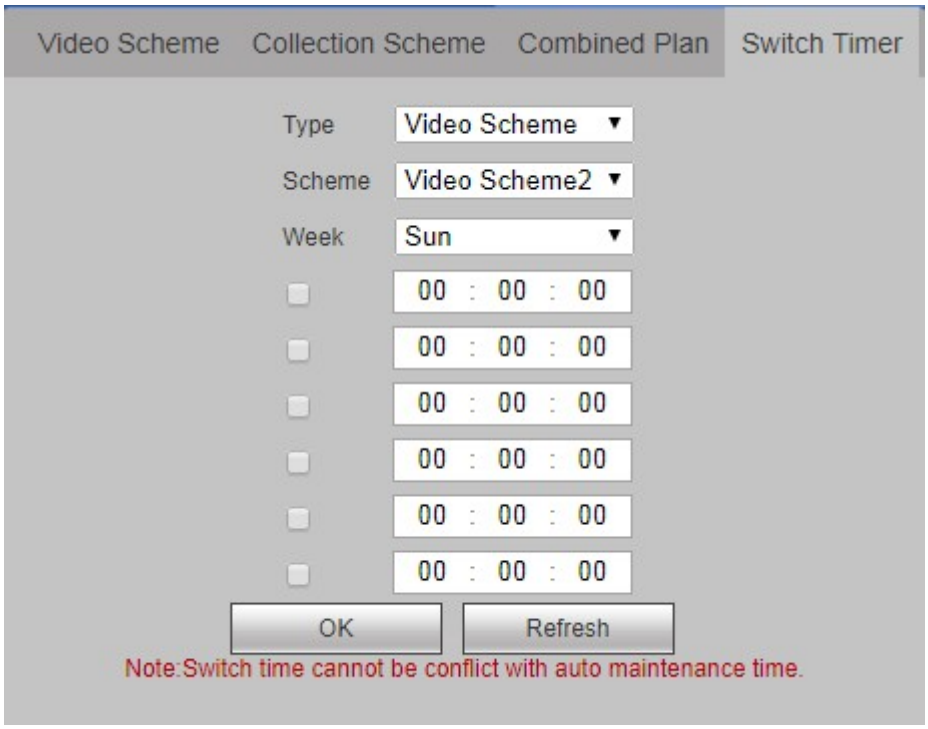
After setting the switch time for a certain scheme, the system automatically switches to the Scheme when the switch time arrives.

Step 1 Log in to webpage and select **Video Wall.**

Step 2 Select **Scheme Management** > **Scheduled Switch**.

Step 3 Select type, scheme, week, and set the time for scheduled switching.

Figure 4-10 Scheduled switch



- Select check box, and then the time interval will take effect.
- Two scheme times cannot be set the same.

Step 4 Click **OK**.

4.3.3.2 Automatic Align

Click **Auto Align** and all windows will automatically align in the following way.

- Based on the premise of padding the entire video wall, divide the size of each window equally.
- The windows are arranged horizontally from top to bottom.

4.3.3.3 Window Segmentation

Select the block or window as needed and perform the split operation according to the split scheme provided by the system or manually enter the split number.

The total number of current video wall windows cannot exceed 9×current video wall number of channels, and the number of a single channel window cannot exceed 9.

4.3.3.3.1 Splitting Blocks

When splitting a block, the system will clear the split window of the original block, and then re-split the window according to the selected number of splits. After the block is split, the original window will be shut down, and the original signal will not be reserved.

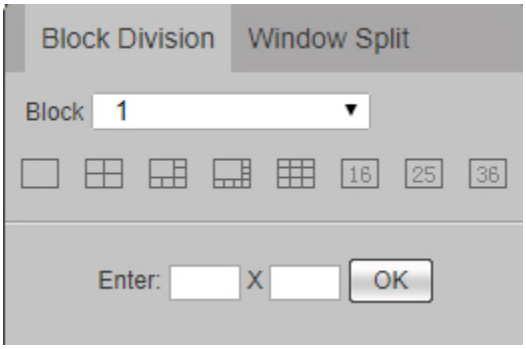
Step 1 Log in to webpage and select **Video Wall**.

Step 2 Select **Window Split** > **Block Division**.

Step 3 Select the block to be split.

Step 4 Select a fixed split , or manually enter the number of splits (for example, 3×3 means 9 splits).

Figure 4-11 Block division



Step 5 Click **OK**.

Step 6 In the confirmation dialog box that pops up, click **OK**.

After the blocks are divided, the window defaults to the Lockout state. If you need to adjust the window position and size, you need to click to unlock.

4.3.3.3.2 Split window

Supports free splitting of the selected window, and the original signal is reserved in the first window after splitting.

Step 1 Log in to Webpage and select “Video Wall”.

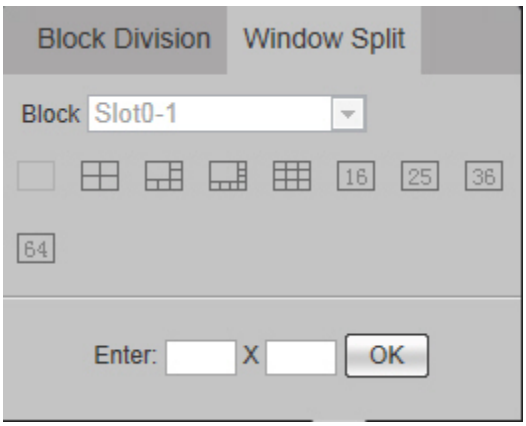
Step 2 Select the signal window that needs to be split.

It is recommended not to select patrol window for window splitting.

Step 3 Select Window Split > Window Split.

Step 4 Select a fixed split , or manually enter the number of splits (for example, 3×3 means 9 splits).

Figure 4-12 Window Split



Step 5 Click **OK**.

After the windows are split, the original signal is displayed in the first window, and other windows display "no signal".

4.3.3.4 Refresh Video Wall

Click **Refresh Video Wall** to refresh the channel preview and layout information of the current video wall.

4.3.3.5 Clear Screen

Click **Clear Screen** to clear the screen.

4.3.3.6 Screen Management

Correctly connect the device to the screen's serial port wire as required to control the screen's on and off.

Steps

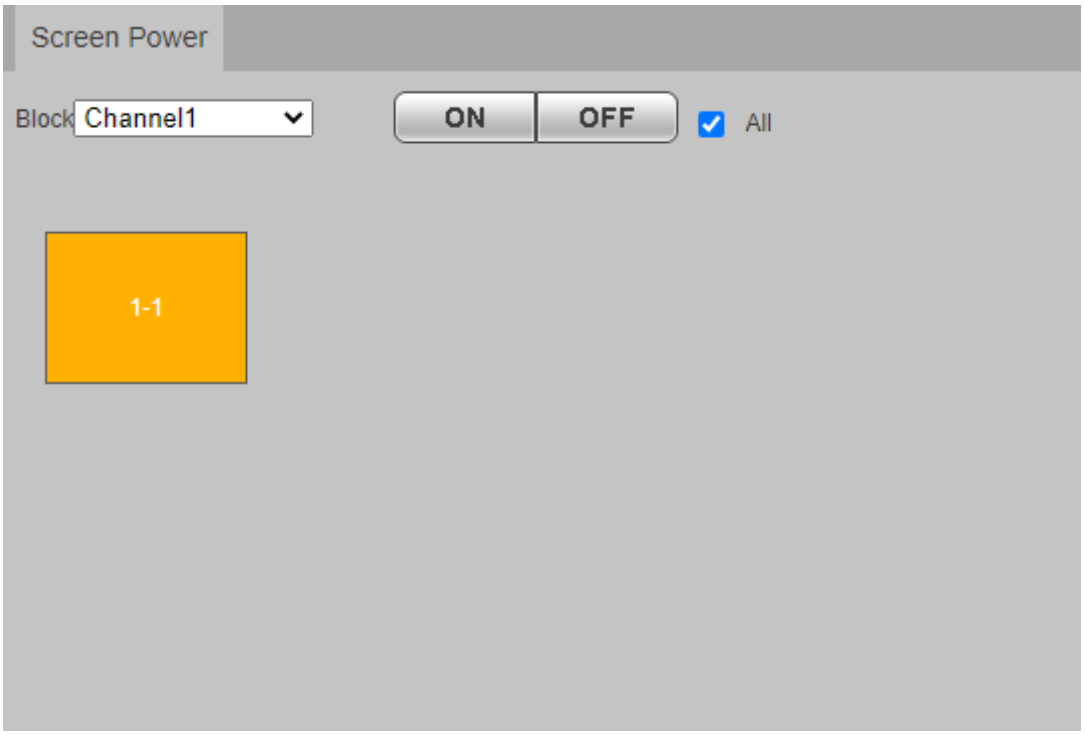
Step 1 Log in to webpage, and then select **Video Wall**.

Step 2 Select **Screen Management** > **Screen Switch**.

Step 3 Select a screen area.

- Select a screen area, then select the screen to turn on or shut down the selected screen.
- Select **All Blocks**, then select a screen block to turn on or shut down the screen of the selected block.

Figure 4-13 Screen blocks



Step 4 Click **ON** or **OFF** to control the screen on/off.

4.3.3.7 Locking Video Wall

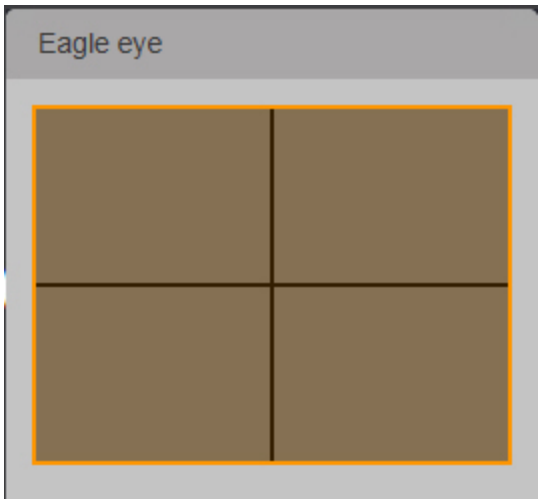
Click Lock **Video Wall**, the video wall will be locked and the user cannot adjust the relative position of the window. Click again to unlock the video wall.

4.3.3.8 Eagle Eye Map

Eagle eye map, also known as thumbnail, is used to adjust the display size and display area of the webpage screen main window.

Click **Eagle Eye Map**, drag the black dot to adjust the size of the area box in eagle eye map or use mouse wheel scale to change the size of the corresponding main window display area; drag the position of the area box in eagle eye map to change the corresponding main window display area.

Figure 4-14 Eagle eye map



4.3.3.9 Advanced Functions

Set up advanced functions, including controlling PTZ, configuring virtual LED, configuring background, configuring decoding strategy and display screen number.

4.3.3.9.1 PTZ Control

Select the window where the signal is located, click **PTZ Control**, and perform operations such as rotation of the PTZ device (including up, down, left, right, top left, bottom left, top right and bottom right), focus, zoom, aperture, and more.

To use On-Premises serial port PTZ control, you need to configure the PTZ parameters and ensure that the connection is correct.

Figure 4-15 PTZ Control

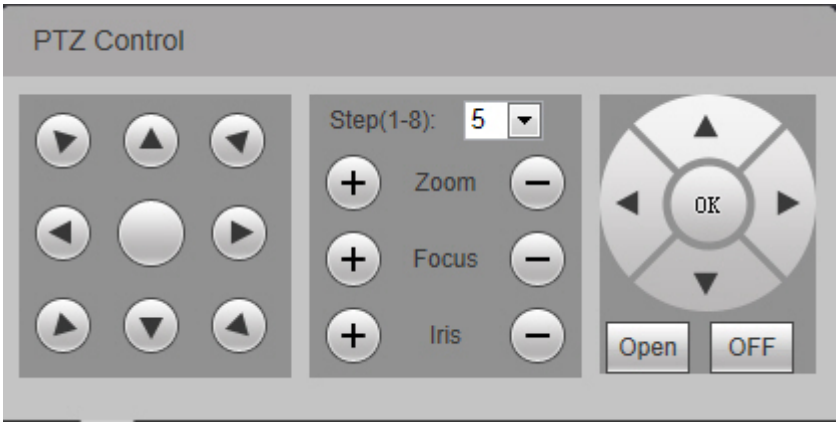


Table 4-3 PTZ Control parameter description

Parameter	Description
Direction control	By setting the PTZ rotation direction, you can control the Device to rotate in eight directions, namely up, down, left, right, upper left, upper right, lower left, and lower right.
Speed	Control the PTZ rotation speed, you can set 1 to 8 different rotation speeds.

Parameter	Description
Zoom	Click ⊕ or ⊖ to adjust zoom.
Focus	Click ⊕ or ⊖ to adjust the definition.
Aperture	Click ⊕ or ⊖ to adjust the Brightness.
PTZ Menu	• Click **Open** to open the PTZ menu of the device preview page. After opening the PTZ menu of the device preview page, you can use the arrow keys to select different functions to operate the PTZ. • Click **OFF** to preview the PTZ menu of device page.

4.3.3.9.2 Virtual LED

Customize an Area on the Video Wall and enter characters of any Format to finally achieve the LED subtitle effect on the screen.

Step 1 Log in to webpage and select **Video Wal**l.

Step 2 Select **Advanced Functions** > **Virtual LED**.

Step 3 Click  to add virtual LED and configure related parameters.

- A single video wall can only be configured with 1 virtual LED at most.
- If an output port is set to ultra-high or ultra-wide resolution, a single device can only be configured with one virtual LED.

Figure 4-16 Virtual LED

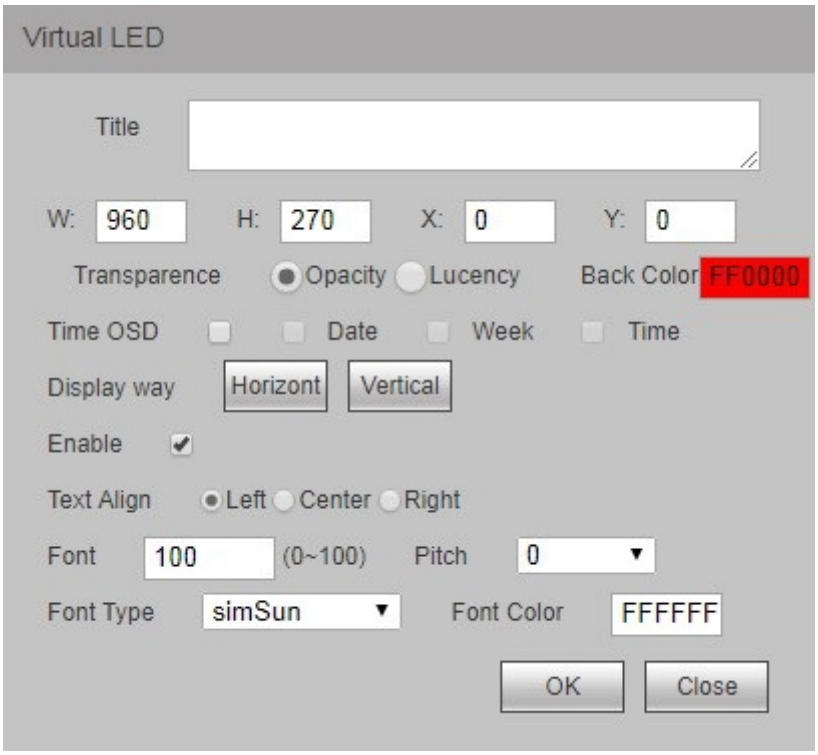


Table 4-4 Virtual LED parameter description

Parameter	Description
Title	Enter the title of the virtual LED, which is the title displayed on the video wall.

Parameter	Description
W/H	Enter the width and height of the virtual LED background.
X/Y	Enter the coordinate of the virtual LED.
Transparency	Set the Transparency of the virtual LED, which can be set to **Opaque** or **Transparent**.
Background color	To set the virtual LED background color, you can manually enter a 6-bit RGB value, or click the color area to select.
Arrangement	Set the arrangement of the virtual LED title, which can be set to **Horizontal** or **Vertical**.
Display Enable	Select whether to display the title of the virtual LED on the video wall. ● Select check box and click **OK** to save, then the virtual LED title will be displayed on the video wall. ● Cancel select check box, after clicking **OK** to save, the window on the webpage will display the virtual LED title, but it will not be displayed on the video wall.
Align method	Set the alignment of the virtual LED title in the background, which can be set to **Left**, **Center** or **Right**.
Scroll mode	Set the scrolling method of the virtual LED title on the screen, Optional: Select **From left to right** or **From right to left**.
Scroll speed	Set the scrolling speed of the virtual LED title, which can be set to 0~5.  Speed 0 is static Text.
Font scale	Set the font ratio of the virtual LED title, which can be set from 0 to 100.
Letter Spacing	Set the distance between virtual LED title characters, which can be set to 0 to 5.
Font type	Set the Font of the virtual LED title. It can be set to "**SimSun**" or "**simHei**". You can also select the font uploaded by the User.
Font color	To set the color of the virtual LED title, you can manually enter a 6-bit RGB value, or click the color area to select it.

Step 4 Click OK.

The title content will be displayed on the virtual LED.

- Move the mouse to the virtual LED, press and hold the left mouse button and move it to move the virtual LED to another location.
- Click the virtual LED and drag the control point in any direction to change the size of the virtual LED.

Figure 4-17 Effect diagram

4.3.3.9.3 Background

Configure the Image uploaded to the system as the screen background image, and the Image will be displayed on the screen as the background.

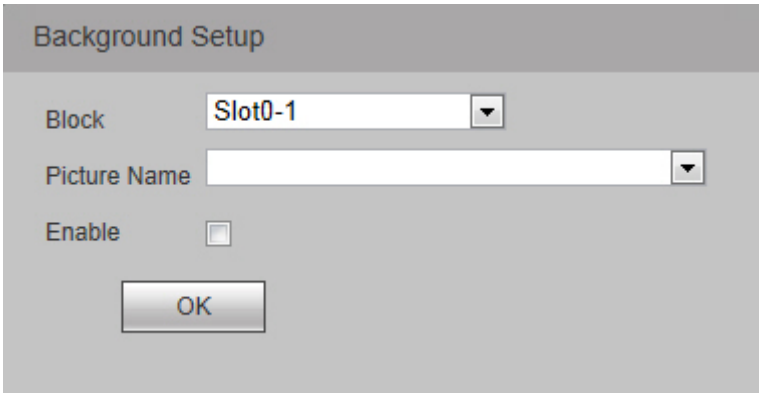
Background can only select the Image that has been uploaded to the system.

Step 1 Log in to webpage and select the **Video Wall**.

Step 2 Select **Advanced** > **Background**.

Step 3 Select **Block** and **Picture Name**, and select **Enable**.

Figure 4-18 Add background



Step 4 Click **OK**.

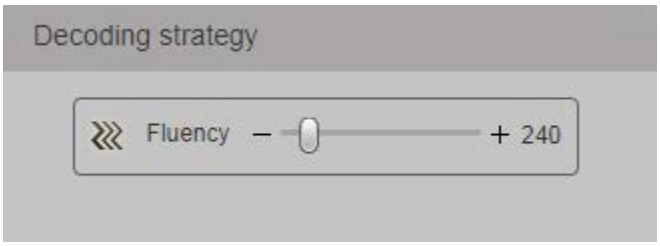
4.3.3.9.4 Decoding strategy

Drag the slider to adjust window fluency, and thus balance real-time decoding and fluency (only network signal supports this function).

Step 1 Log in to webpage, and then select the **Video Wall**.

Step 2 Select a network signal window, click Advanced, and then click Decoding strategy.

Figure 4-19 Decoding strategy



Step 4 Drag the slider to adjust the smoothness of the window image.

The larger the smoothness value is, the higher the screen latency is. Please set it according to the actual situation.

4.3.3.9.5 Display Screen number

Click "Display Screen Number" to display the Screen number on the big screen. Click again to hide the Screen number.

The Display Screen number and virtual LED functions cannot be turned on at the same time.

4.4 Preview

Select the **Preview**, and then the system displays the preview page.

Figure 4-20 Preview

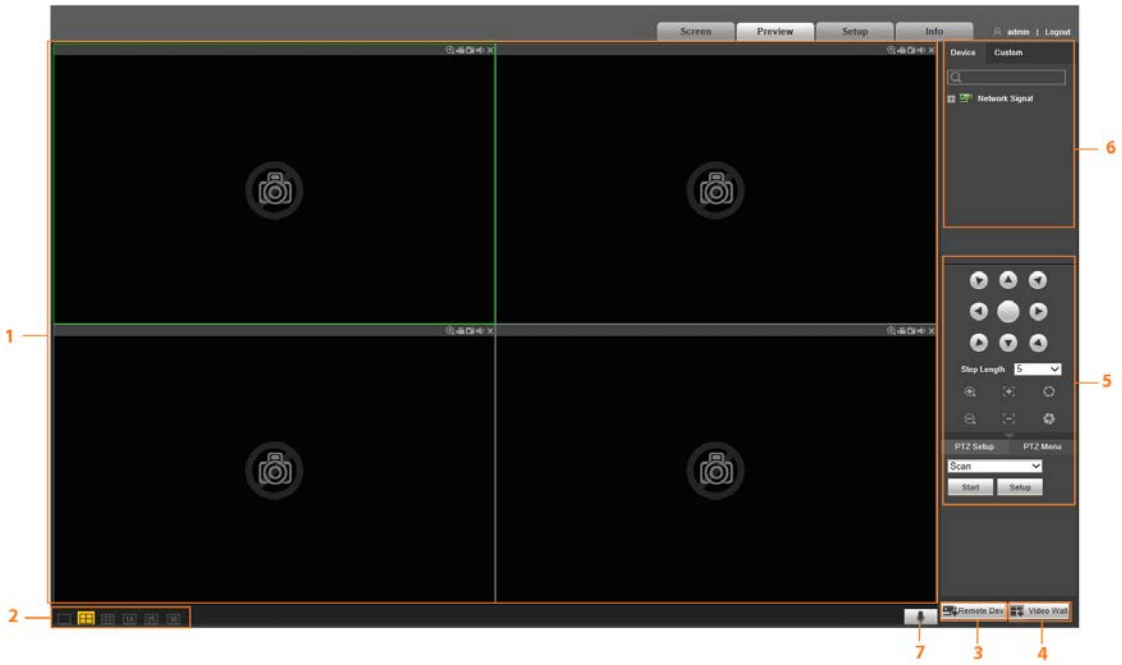


Table 4-5 Preview Interface Function Description

No	Name	Description
1	Window	Video can be previewed in the window.
2	Window Splitting	The window can be split into single, 4, 9, 16, 25 and 36 splits.
3	Remote Device	Click **Remote Device,** and then enter the **Network Signal** page to add a device. For details, see "4.5.4 Signal Management."
4	Video Wall	Click **Video Wall**, enter the Video Wall Configuration interface, you can Add, Modify and delete Video Wall. For details, see "4.5.5.1 Configure Video Wall."
5	PTZ Control Area	It can perform simple PTZ operations on cameras with PTZ function. For details, see "4.3.3.9.1 PTZ Control."
6	Signal Configuration Area	Configurable signals, for details see "4.4.2 Signal Configuration."

4.4.1 Window Functions

Click the icon in the upper right corner of the window to adjust the window.

Figure 4-21 Window functions

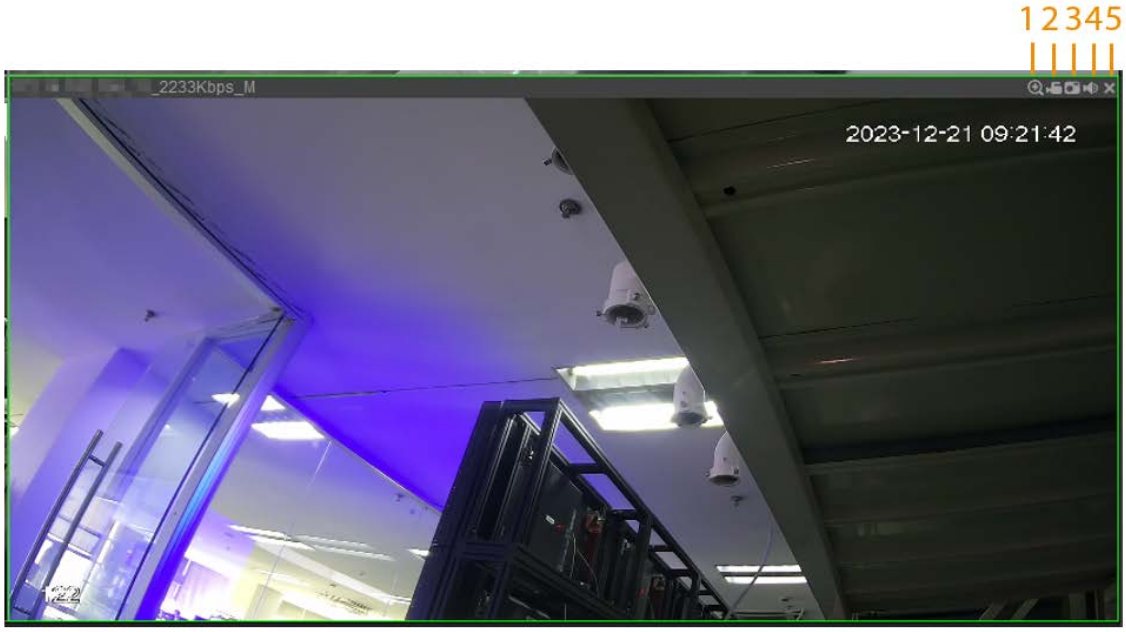


Table 4-6 Functional description

No.	Name	Description
1	Zoom in	• When the video is in the original status, click the icon, press and hold the left mouse button to select any area. The selected area will be zoomed in. When the video is zoomed in, press and hold the left mouse button to drag the video image. Right-click to restore original status. • Click it to zoom in and zoom out the video image with the wheel button.
2	Local Record	Record video file storage to the configured record video path.
3	Snapshot	Take a snapshot of the Video. The snapshot file storage is to the configured snapshot path.
4	Turn on Sound	Turn on the video sound.
5	Close Video	Close the window.

4.4.2 Signal Configuration

After adding a signal, you can view the signal information or the added signal group information and configure the signal preview.

4.4.2.1 Device Tree

The device Tree displays all On-Premises signals and added network signals.

- On-Premises Signal: Displays the On-premises signal source. For details, see “4.5.4.2 On-Premises Signal.”
- Network signal: Displays the signal source of the device added in **Remote Device**. For a details, see4.5.4.1 Network signal.”

4.4.2.2 Signal Grouping

You can customize signal group. The added group and the signal source in the group are displayed. The signal group can realize the signal wall and the loop play between the signals in the group. For details, see "4.5.4.3 Signal Grouping."

4.4.2.3 Image Preview

Select a window, select signal source in **Device Tree** or **Signal Group**, click the signal source, and preview the Image in the corresponding window.

4.4.3 PTZ Control

PTZ control refers to the rotation direction of the PTZ Device (including up, down, left, right, upper left, lower left, upper right and lower right), line scan, Preset, Point Tour, Pattern and other settings.

To use On-Premises serial port PTZ control, you need to make relevant settings in the parameter settings and ensure that the connection is correct.

Figure 4-22 PTZ Control

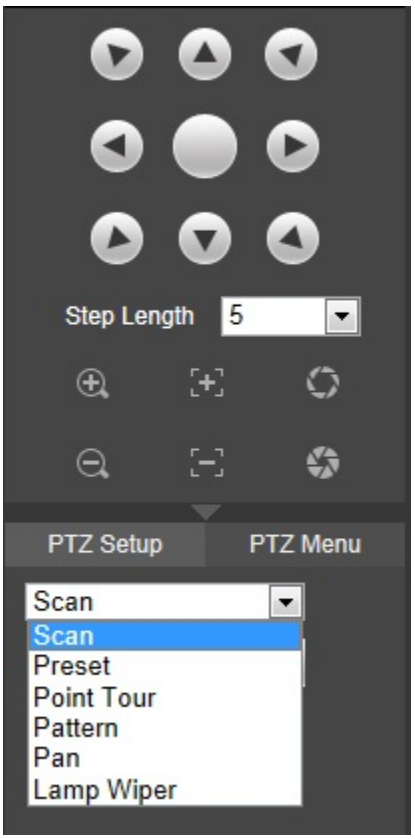


Table 4-7 PTZ Setting parameter description

Parameter	Description
Scan	● Click **Setup**, use the arrow keys to rotate the camera, and click Set Left Boundary and Set Right Boundary to set the left and right boundaries of the PTZ Scan. ● Click **Start** to start PTZ line scanning; click **Stop** to stop Line scanning.
Preset	● Determine a point, and then click **Add** to add a preset point. ● In the input box, enter the preset value, and then click **View**; the camera moves to the location of preset point.
Point Tour	● Enter preset point number, and then click **Add** to add this preset point after the last preset point of this tour path. ● In the input box, enter tour path, and click **Start** to start tour. Click **Stop** to stop tour.
Pattern	● Click **Add**, and you can configure a new pattern path with **Start Record** and **Stop Record**. ● Enter the pattern value, and then click **Start** to start pattern. Click **Stop** to stop the pattern.
Pan	Click **Start**, and PTZ starts to pan. Click **Stop**, and PTZ stops panning.
Lamp Wiper	Click **Enable** to enable the lamp and wiper, and click **Disable** to disable the lamp and wiper.  Only some PTZ devices support this function.

4.5 Setup

4.5.1 System Settings

On this page, you can complete general setting, user management, configuration backup, automatic maintenance, system upgrade, picture management, fan control, common setup, safe management, and storage path.

4.5.1.1 General

You can configure basic information of the device, such as device information and system date.

4.5.1.1.1 Configuring the General Information

Configure the device name, number, and more.

Procedure

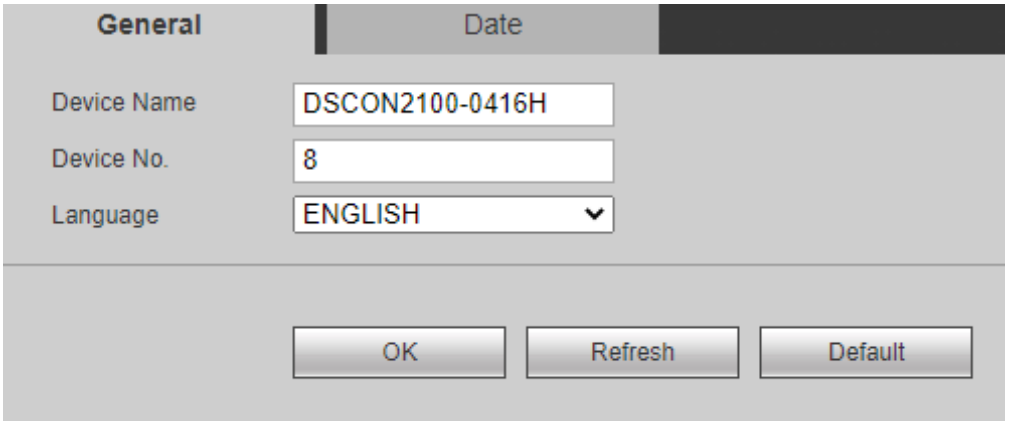
Step 1 Log in to webpage.

Step 2 Select **Setup** > **System Settings** > **General** > **General**.

Step 3 Configure the parameter.

- Device Name: Device name is different depending on device model.
- Device No.: Configure the device control number that is for device control.
- Language: The system language is determined by the language of the program package.

Figure 4-23 General settings



Step 4 Click **OK**.

4.5.1.1.2 Configuration Date

Configure the system date of the Controller, and you can also choose whether to enable the NTP (Network Time Protocol (NTP)) function as needed. After enabling NTP, the Controller Device can automatically synchronize time with the NTP server.

Step 1 Log in to webpage.

Step 2 Select **Setup**> **System Settings** > **General** > **Date**.

Step 3 Configure the parameters.

Figure 4-24 Date settings

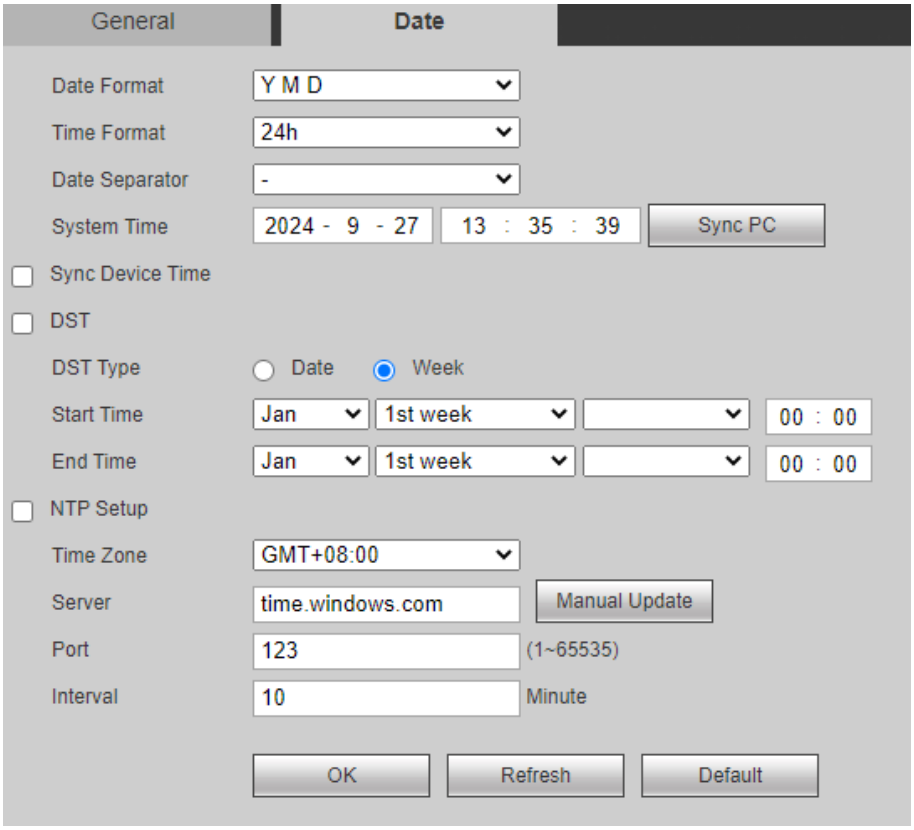


Table 4-8 Date parameter description

Parameter	Description
Date Format	Select the date display format, including "**Y-M-D**", "**M-D-Y**" and "**D-M-Y**".
Time Format	Select the corresponding time Format to be displayed, including 24-hour and 12-hour formats.
Date Separator	Select the corresponding date separator to be displayed, including ".", " - " and "/".
System Time	Set the device system time and click "**Sync PC**" to make it consistent with the current PC time.
Sync Device Time	Select the check box to enable automatic correction of remote device time.
DST	Select the check box to enable **Daylight Saving Time** (DST).
DST Type	Select DST type by "**Date**" or "**Week**".
Start Time/End Time	• When you select **Date** for DST type, enter the year, month, day, start time, and end time. • When you select **Week** for DST type, select the month, week, day of the week, start time and end time in the drop-down box.
NTP Setup	Select the Check Box to enable the NTP synchronization function.
Time Zone	Select a time zone.
Server	Enter the server address or domain name.
Port	Enter NTP server port number.

Parameter	Description
Update Cycle	Set the update cycle, that is, how often to synchronize with the NTP server.

Step 4 Click **OK**.

4.5.1.2 User Management

User management adopts two-level management mode: user and user group. You can manage their basic information (only those with user management permission can operate user management).

- User name and group name support maximum 6 characters and can only consist of letter, number, and underline (_).
- The password can be set from 8 through 32 non-empty characters and contains at least two types from capital letters, lower-case letters, numbers, and special characters (excluding "'", """, ";", ":" and "&"). The user with permission can change their own password, but also change the password of other users.
- The system supports a maximum of 64 users and 20 user groups by default.
- There are two-level management modes: user and user group. Group name and user name shall be unique. One user can only belong to one group.
- Current user cannot modify their own permission.
- During initialization, there is 1 default user "admin". Admin is defined as high-permission user by default.

4.5.1.2.1 Adding New Groups

In the entire network, the permissions of users accessing the descrambler may be different. Users with the same permissions are grouped together to facilitate the maintenance and management of user information.

Step 1 Log in to webpage.

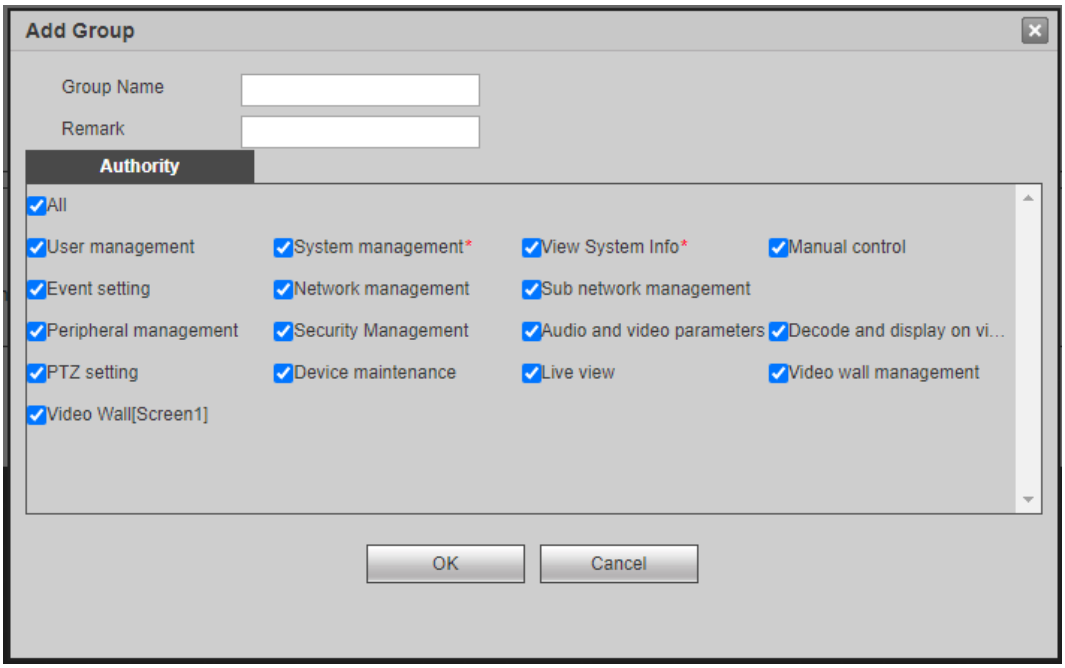
Step 2 Select **Setup** > **System Setup** > **User Management** > **User Management** > **Group**, and click **Add Group**.

Step 3 Enter **Group Name** and **Remarks**.

Step 4 Select the operation system authority in the permission list.

- Select check box to enable the function permission.
- Select **All** to select authority permission.

Figure 4-25 Add group



Step 5 Click **OK**.

4.5.1.2.2 Adding Users

Add user to the group and set user's authority control. The system default highest permission user admin cannot be deleted.

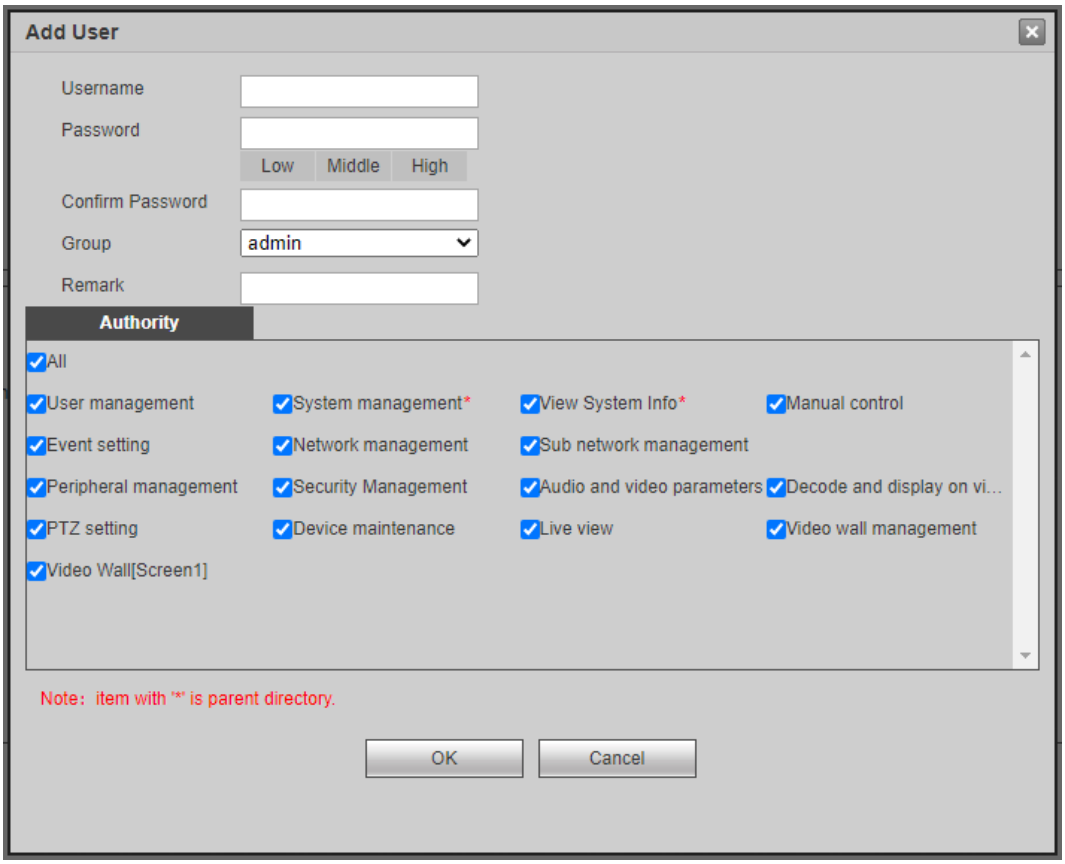
Step 1 Log in to webpage.

Step 2 Select "**Setup** > **System Setup** > **User Management** > **User Management** > **User** and click **Add User**.

Step 3 Enter the username and password, and then confirm the password. Select the group, and enter the remarks.

- Once a group is selected, the user's permissions can only be a subset of the group and cannot exceed the group's permission attributes.
- To facilitate user management, it is recommended that the permissions of ordinary users be defined to be lower than those of advanced users.

Figure 4-26 Add user



Step 4 Select the user's operation system permission in the authority list.

- Select check box to enable the function permission.
- Select **All** to select authority limit.

Step 5 Click **OK**.

4.5.1.3 Configuring Backup

Select "**Setup** > **System Setup** > **Backup** to export the profile of the Controller to the backup in the On-Premises computer. When the Controller device exception occurs, you can quickly recover the configuration by importing the profile.

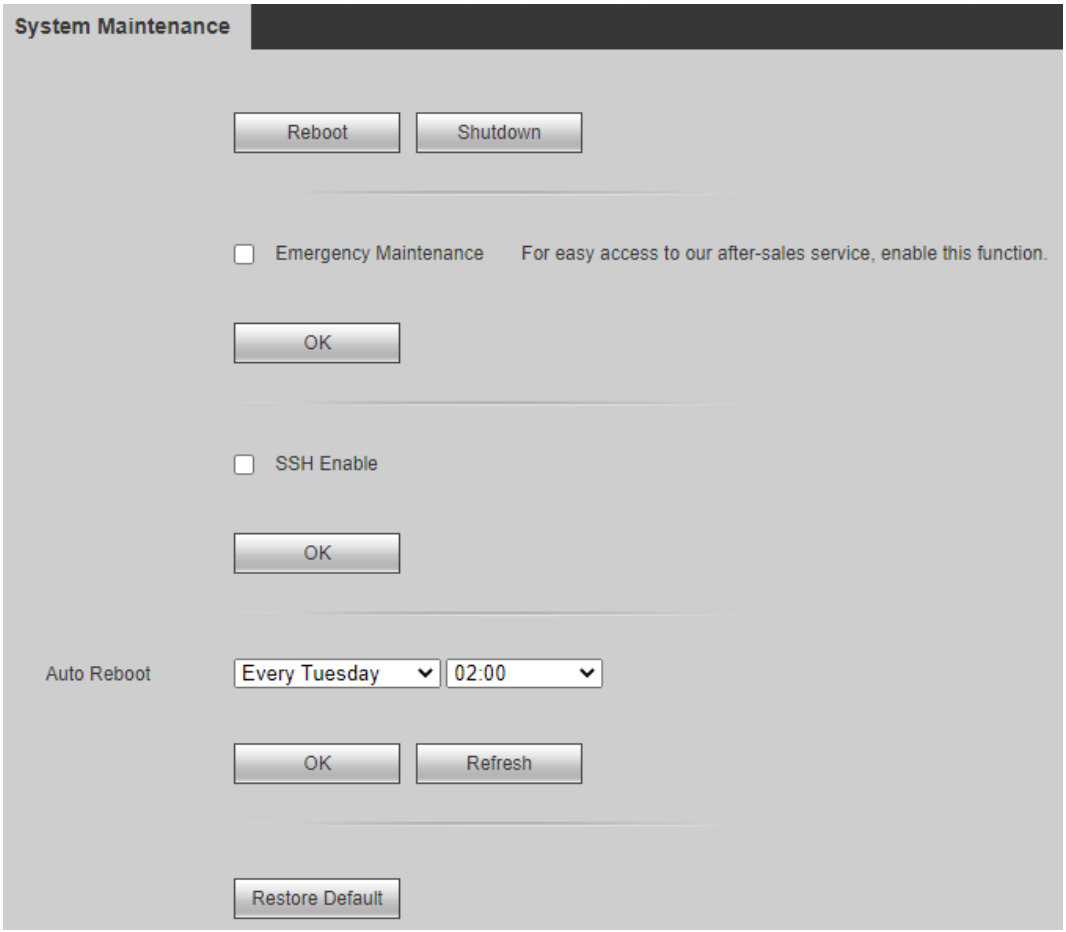
- Click **Import Config**, and then select configuration file (.backup) to import the configuration file.
- Click **Export Config**, and then select storage path to export configuration file for backup.

4.5.1.4 System Maintenance

Select **Setup** > **System Setup** > **System Maintenance** to perform maintenance operations on the system, including restart, shutdown, SSH enable, set automatic restart, and restore

default.

Figure 4-27 System maintenance



- To manually reboot the system, click **Reboot**, and the system will reboot at once. Click **Shutdown**, and the system will be shut down at once.
- Select **Emergency Maintenance** and click **OK** to use it in conjunction with the Device Error diagnostic tool.
- SSH is used to open background debugging port for technicians. Select **SSH Enable**, and click **OK** to enable remote debugging function.
- When selecting automatic restart, first set the day of the week and time for automatic restart, and then click **OK**.

⚠

Click **Restore Default** and the system will recover to the default settings. Please operate with caution.

4.5.1.5 System Upgrade

Upgrade the device system version by importing the upgrade file.

Prerequisites

The upgrade file has been placed in the computer associated with the Controller.

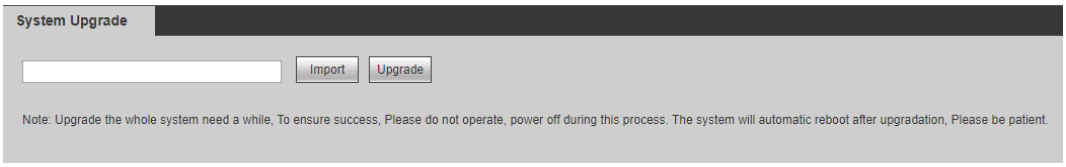
Steps

Step 1 Log in to webpage.

Step 2 Select **Setup** > **System Setup** > **System Upgrade**.

Step 3 Click **Import** and select the upgrade file.

Figure 4-28 Upgrade system



Step 4 Click **Upgrade** to perform the upgrade. A progress bar will be displayed during the upgrade process.

According to the system prompt, after uploading the upgrade file successfully, the Controller will restart the system automatically. Please keep the power on and wait patiently until the system automatically restarts.

4.5.1.6 Picture Management

You can upload a picture to the system, and set the uploaded picture to be screen background.

Procedure

Step 1 Log in to webpage.

Step 2 Select **Setup** > **System Setup** > **Picture Management**.

Step 3 Click **Browse** and select an image.

Step 4 Click **Upload** to upload the image.

- Select an image and click **Delete** to delete the Image.
- After uploading the background image successfully, you need to select the corresponding image in the video wall configuration.

4.5.1.7 Font Template

Upload the Font to the system. The uploaded font can be configured as the font of the virtual LED.

Procedure

Step 1 Log in to webpage.

Step 2 Select **Setup** > **System Setup** > **Font Template**.

Step 3 Click **Browse,** and then select the font.

Step 4 Click **Upload** to upload the font.

4.5.1.8 Fan Control

You can configure fan temperature control and buzzer alarm.

4.5.1.8.1 Fan Temperature

Set different temperature ranges for fan speed, and the system will trigger different fan speed levels according to different temperature ranges.

Fan speed is divided into three levels: low speed, medium speed and high speed. Different

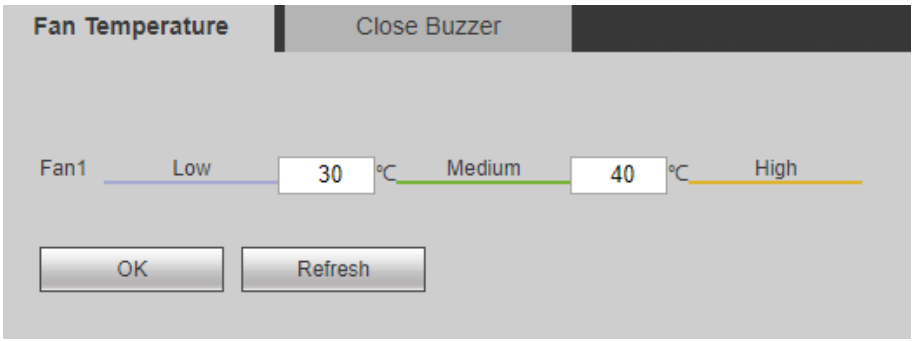
temperature ranges trigger different speed levels.

Step 1 Log in to webpage.

Step 2 Select "**Setup** > **System Setup** > **Fan Control** > **Fan Temperature**".

Step 3 Set the temperature for each fan to trigger different speed levels.

Figure 4-29 Fan temperature control



Step 4 Click **OK**.

Click **Refresh** to recover the default settings.

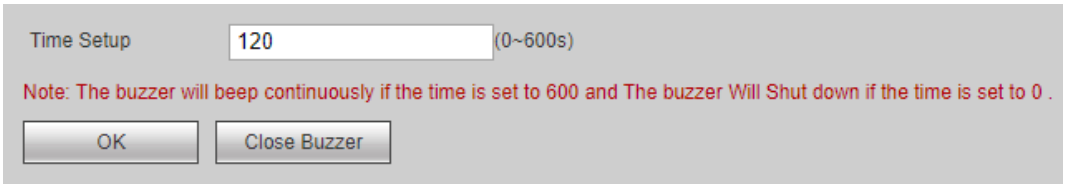
4.5.1.8.2 Close Buzzer

Set the time for the buzzer alarm. When an alarm occurs, the system will continue to emit buzzer sounds according to the set time to prompt the alarm.

Step 1 Log in to webpage.

Step 2 Select **Setup** > **System Setup** > **Fan Control** > **Close Buzzer**.

Figure 4-30 Close buzzer



Step 3 Set the time for the buzzer alarm.

Step 4 Click **OK** to complete the settings.

Click **Close Buzzer** to shut down the current beep.

4.5.1.9 Comm Setup

After comm parameters are set, the network video decoder can connect other devices through comm ports, for the purpose of debugging and operation.

Step 1 Log in to webpage.

Step 2 Select **Setup** > **System Config** > **Comm Setup**.

Step 3 Configure the parameters.

Figure 4-31 Serial Port Settings

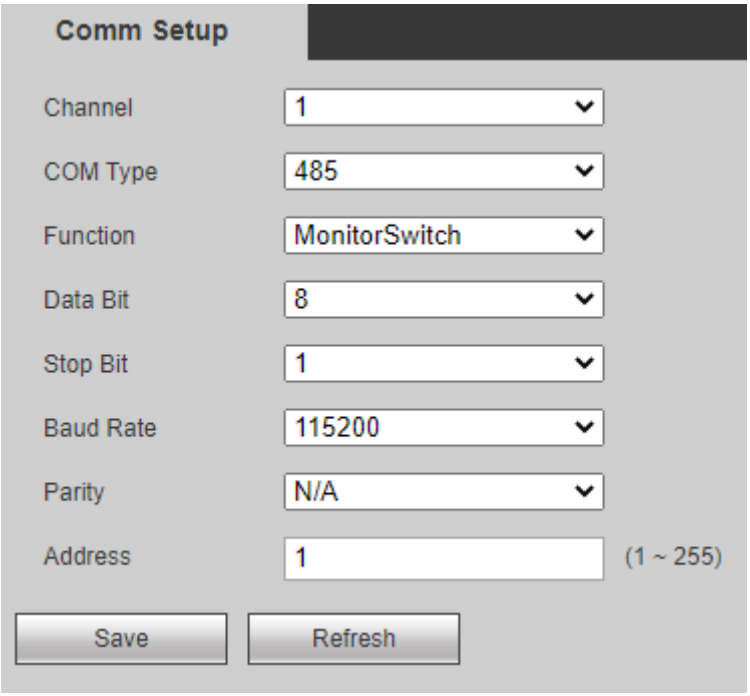


Table 4-9 Serial Port Parameter Description

Parameter	Description
Channel	Select the Channel that needs to be configured.
COM Type	Default is RS-485.
Function	Set the function of Serial Port.
Data Bit	Set the Data Bit of Serial Port, including 5, 6, 7, and 8.
Stop Bit	Set the Stop Bit of Serial Port, including Stop Bit 1 and Stop Bit 2.
Baud Rate	Configure Baud rate of comm. It shall be consistent with the device that will be connected.
Parity	Select a parity mode from N/A, Odd, Even, Flag Parity and Empty Parity.
Address	Set the address of Serial Port, ranging from 0 to 255.

Step 4 Click **Save**.

4.5.1.10 Security Management

Configure system service, enable or disable HTTPS function according to your need, to strengthen system security management.

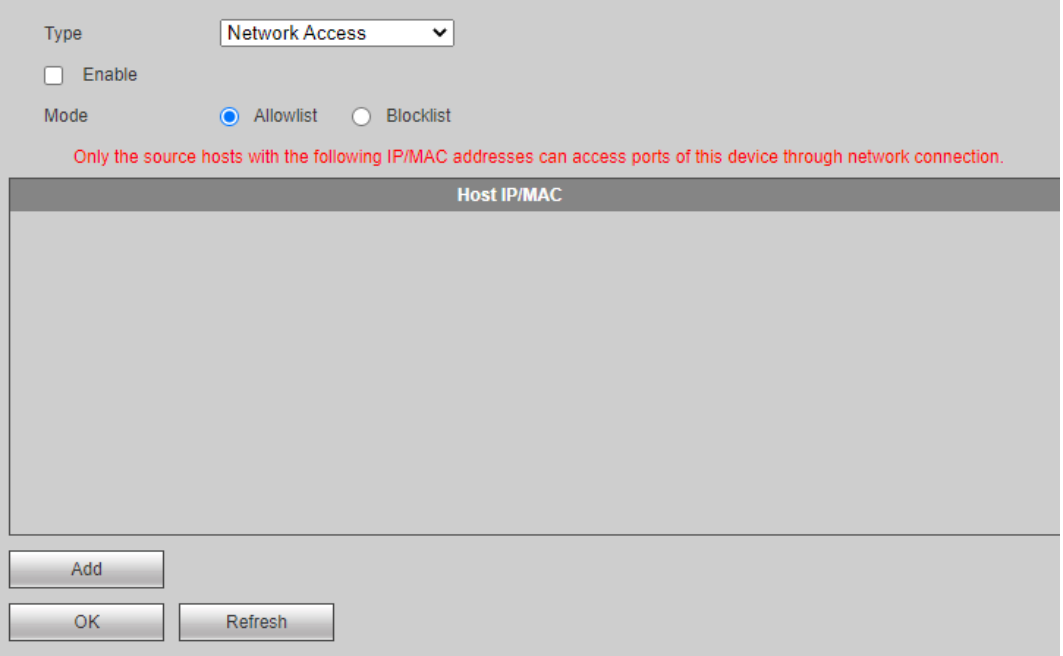
4.5.1.10.1 Firewall

Select the firewall that you want to enable.

Step 1 Log in to webpage.

Step 2 Select **Setup** > **System Config** > **Security Management** > **Firewall**.

Figure 4-32 Firewall



Step 3 Select Type. Currently, three types are supported: Network Access, Ping Prohibition and Half-open Connection Prevention.

- Network access, configure the firewall through the Add Blocklist & allowlist mode.
- Disable Ping. Once enabled, all network access will be prohibited.
- Anti-Half-open Connection, when enabled, it can block SYN Half-open Connection attacks and prevent attackers from maliciously consuming Device resources and causing Denial of Service.

Step 4 Select **Enable**.

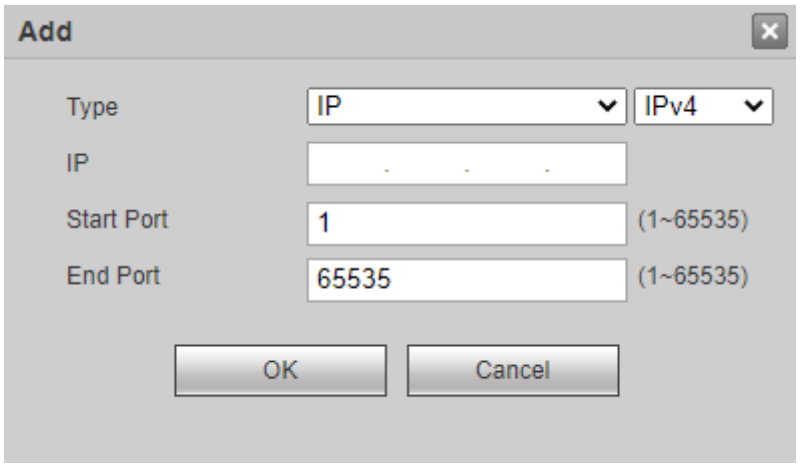
Step 5 (Optional) Select the mode. Configure the allowlist & bocklist.

- Allowlist, only allows the source Main Server corresponding to the configured IP/MAC to access the corresponding port number of this Device through the network connection.
- Blocklist, prohibit the source Main Server corresponding to the configured IP/MAC from accessing the corresponding port number of this Device through the network connection.

- Only the **Network Access** type supports Blocklist/Allowlist configuration.
- The settings of Blocklist and Allowlist are the same. Here we take the configuration of Allowlist as an example.

1. Select the mode as "Allowlist".
2. Click **Add**.
3. Select “Type” and configure “IP address”, “starting port”, “ending port”, etc. Supports three types: "IP Address", "IP Network Segment" and "Media Access Control Address (MAC Address)". Different types require different parameters to be configured. Please configure according to the actual situation.

Figure 4-33 Add



4. Click **OK**.

Step 6 Click **OK**.

Click Refresh to clear unsaved device data.

4.5.1.10.2 System Services

Select the system services you want to enable based on your needs.

Step 1 Log in to the webpage.

Step 2 Select Select **Setup** > **System Config** > **Security Management** > **System Service**.

Step 3 Select the system services to enable based on actual needs.

Figure 4-34 System Services

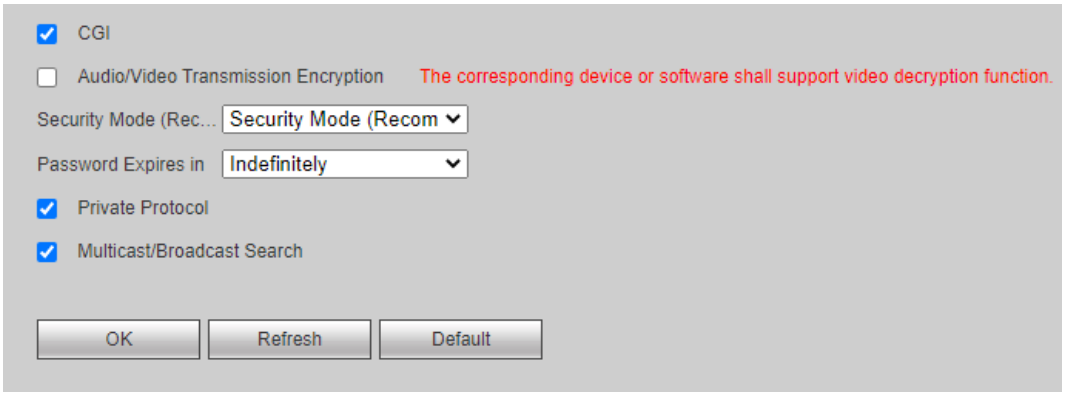


Table 4-10 System service parameter description

Parameter	Description
CGI	Common Gateway page (CGI) is an interface between external application programs and web server.
Audio/Video Transmission Encryption	Encrypt the video during transmission. Audio encryption is not currently supported.
RTSP TLS Service	Encrypt before requesting video service from video server.
Security Mode	We recommend you select **Security Mode**. **Compatible Mode** has potential security risks.
Password Expires in	Set the interval to update the password.

Step 4 Click **OK** to complete the settings.

Related operations

- Click **Refresh** to clear unsaved data.
- Click **Default** to restore to the system default settings.

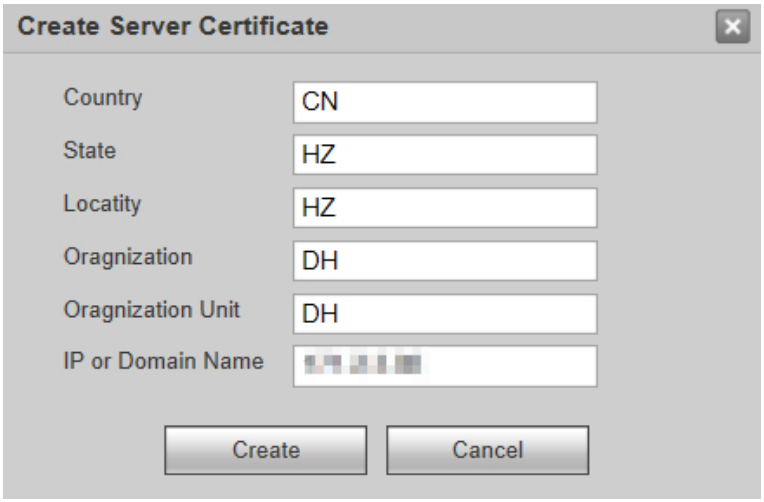
4.5.1.10.3 HTTPS

In the HTTPS setup page, users can create a server certificate or download a root certificate to enable the PC to log in normally through HTTPS, ensuring the security of communication data and providing protection for user information and device security with reliable and stable technical means.

Background Information

- If you use this function for the first time or change the device IP, you need to click Create Server Certificate to create a server certificate.

Figure 4-35 Create server certificate



- If you use HTTPS for the first time after changing the computer, you need to click **Download Root Certificate** and re-execute the root certificate.
- If a **Signing Certificate** already exists on-premises, click Install Signing Certificate and choose to install the certificate.
- The HTTPS Enable status requires a reboot to take effect.

Steps

Step 1 Log in to webpage.

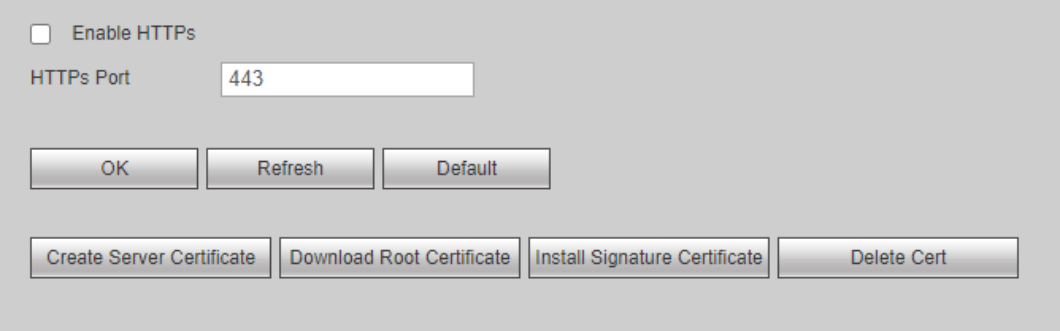
Step 2 Select Settings > System Settings > Security Management > HTTPS.

Step 3 Select “Enable HTTPs”.

Step 4 Configure the HTTPs port.

Step 5 Click **OK**.

Figure 4-36 HTTPS



When the HTTPS function is enabled, you can no longer use HTTP to access the Device. If you use HTTP to access the Device, the system will jump from Mandatory to HTTPS.

After deleting a created and installed certificate, it cannot be recovered, so please operate with caution.

4.5.1.10.4 Security Exception Linkage

Set the alarm mode of exception event. When exception event occurs during the operation of the Controller, the system executes alarm linkage action.

Step 1 Log in to webpage.

Step 2 Select **Setup** > **System Config** > **Security Exception Linkage**.

Step 3 Select **Security exception alarm linkage** and enable it.

Step 4 Select the alarm linkage mode, including **Buzzer** and **Log**.

Two alarm linkage modes can be selected at the same time.

Step 5 Click **OK**.

4.5.1.10.5 Static ARP binding

The Address Resolution Protocol (ARP) binding function allows certain devices on a LAN to be bound to fixed IP addresses. In this way, other devices cannot use the IP addresses, which allow you to manage devices on the network with ease.

Step 1 Log in to webpage.

Step 2 Select **Setup** > **System Config** > **Security Management** > **Static ARP Bind.**

Step 3 Set **IP** and **MAC Address**

Step 4 Click **OK**.

4.5.2 Network

4.5.2.1 TCP/IP

According to Network Planning, set the IP address, DNS server and other information of the

descrambler Device.

Prerequisites

Before setting the network parameters, please make sure that the Device has been correctly connected to the network.

- If there is no routing device in the network, please Allocate the IP address of the same Network Segment.
- If there is a routing device in the network, you need to set the corresponding gateway and Subnet Mask.

Steps

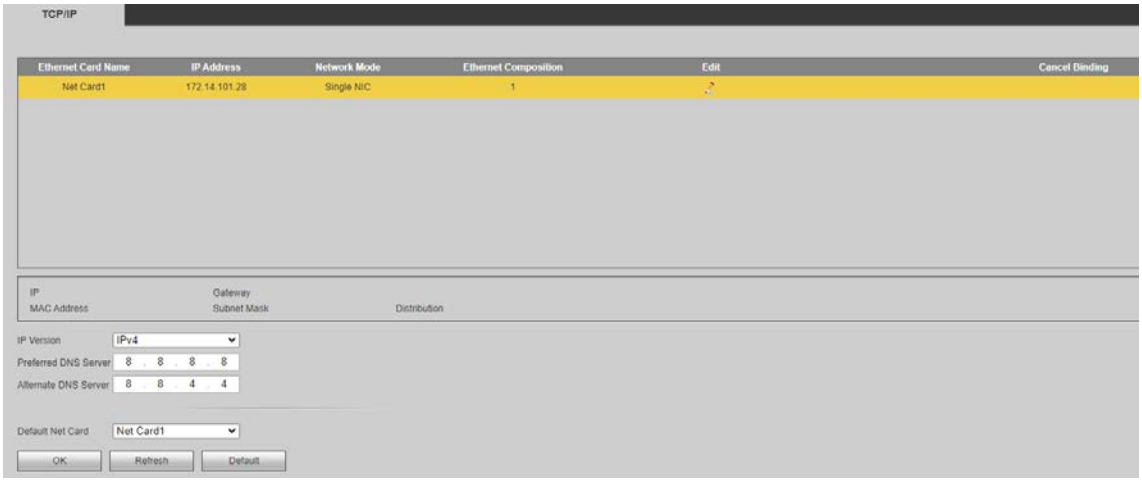
Step 1 Log in to Webpage.

Step 2 Select "Settings > Network Settings > TCP/IP".

Step 3 Configure TCP/IP parameter.

- IP version: Select the IP version, the Default is Internet Protocol Version 4 (IPv4).
- Default Network Adapter: Select the Default Network Adapter in the Network Adapter List.

Figure 4-37 TCP/IP



Step 4 Click, Modify Network Adapter information.

Figure 4-38 Modify Network Adapter

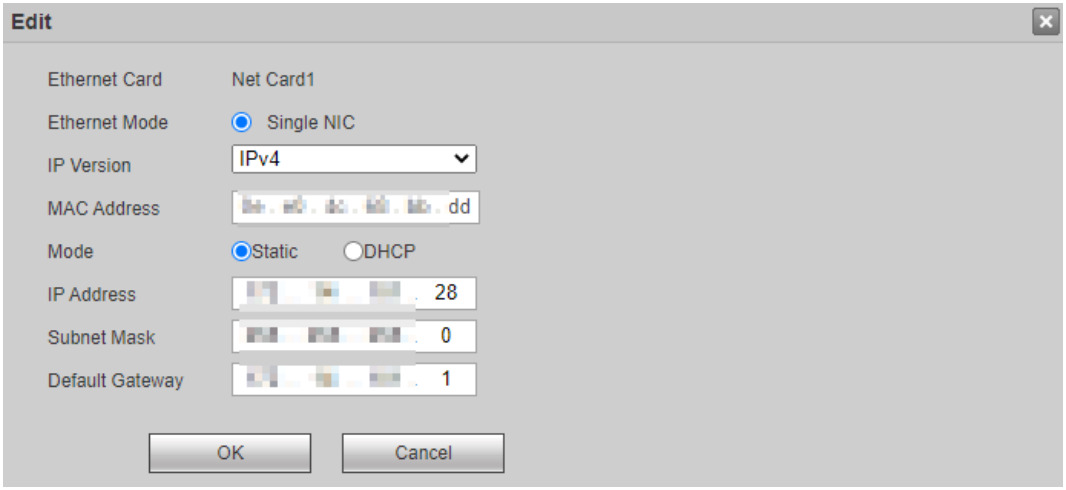


Table 4-11 Network Adapter Parameter Description

Parameter	Description
Network Adapter Mode	Single Network Adapter: Multiple Network Adapters are used independently, and HTTP, RTSP and other services provided by the Device can be requested through a certain Network Adapter. The user needs to set a Default Network Adapter (Default is Network Adapter 1) to request DHCP, Email, FTP and other network services actively initiated by the Device. During the network status detection, as long as one Network Adapter is disconnected, the network is considered disconnected.
IP version	Default is Internet Protocol Version 4 (IPv4).
Media Access Control Address (MAC Address)	Displays Device Media Access Control Address (MAC Address).
Mode	● Static: Manually set IP address, Subnet Mask, and gateway. ● DHCP: Automatically obtain IP function. When DHCP is enabled, “IP address”, “Subnet Mask” and “Default Gateway” cannot be set. ◇ If DHCP is effective, the obtained information will be displayed in the **IP Address** box, **Subnet Mask** box and **Default Gateway** box. If DHCP is not effective, they all display 0. ◇ To view manually set IP when DHCP is not effective, you shall disable DHCP first, and then the device will display IP info that is not obtained through DHCP. If DHCP is effective, if DHCP is not enabled, static IP information will restore default settings. You need to configure IP again.
IP address Subnet Mask Default Gateway	Enter the number to change the IP address, and then set the corresponding "Subnet Mask" and "Default Gateway" of the IP address.  The IP address and Default Gateway must be in the same Network Segment.

Step 5 Click "OK" to complete the Modify of Network Adapter information.

Step 6 Click "OK" to complete the settings.

4.5.2.2 Ports

Set max connection and port number to visit network video decoder through client (including web client and PC client).

Step 1 Log in to webpage.

Step 2 Select **Setup** > **Network** > **Port** > **Connection Setup.**

Step 3 Configure the Max. Number of Connections and each port value of the Device.

Figure 4-39 Connection setup

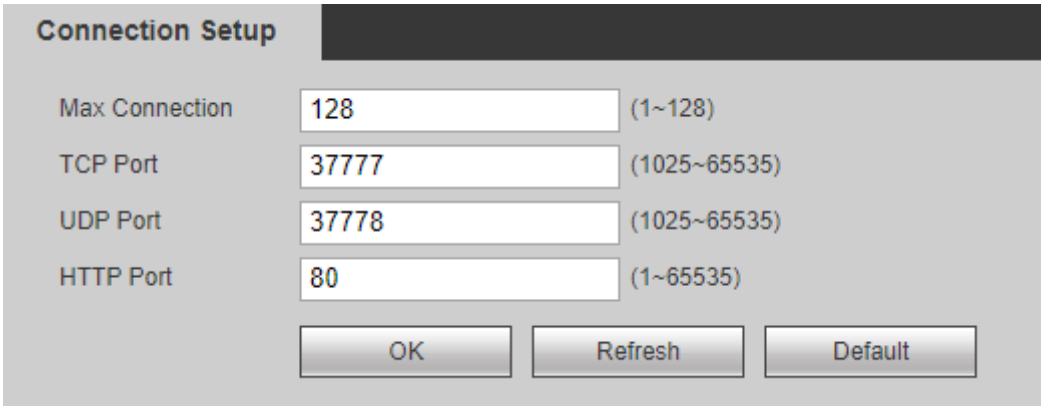


Table 4-12 Port parameter description

Parameter	Description
Max Connection	The allowable maximum number of clients accessing the Decoder at the same time, such as web, platform, and mobile phone. The default value is 128.
TCP Port	TCP service port. The default setting is 37777. You can configure this parameter.
UDP Port	User Datagram Protocol port. The default value setting is 37778. You can enter the value.
HTTP Port	Hyper Text Transfer Protocol port. The default setting is 80. You can enter the value, and in this case, please add the modified port number after the address when logging the Device on the browser.

Step 4 Click **OK**.

Except **Max Connection**, modifications of other parameters will take effect after reboot.

4.5.3 Event Management

Manage Exception Event, and the system executes Alarm Linkage action according to the settings.

4.5.3.1 Alarm Setup

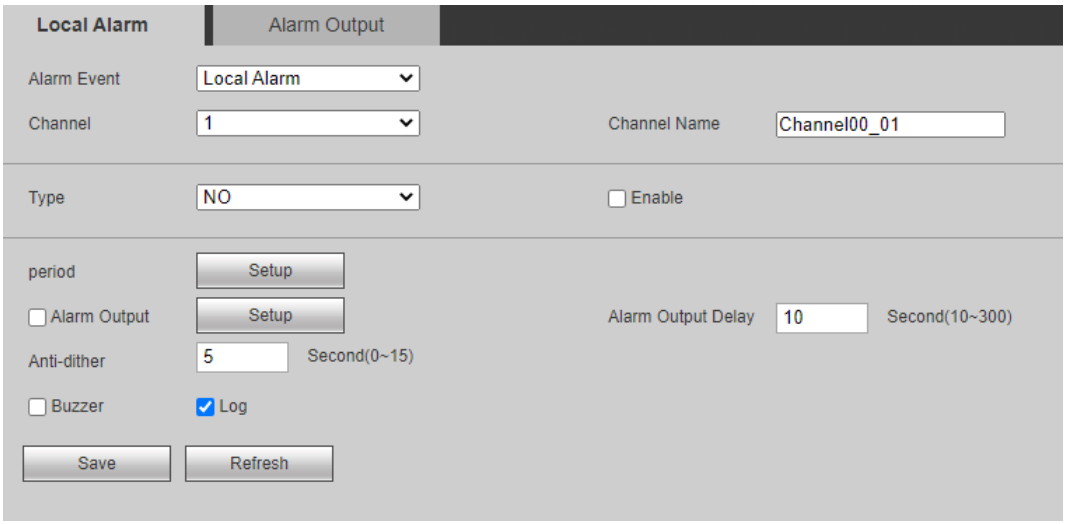
You can configure local alarm and alarm output.

4.5.3.1.1 Local Alarm

Configure local alarm. When an abnormal event occurs, the system executes alarm linkage actions.

Step 1 Select **Setup** > **Event Management** > **Alarm Setup** > **Local Alarm**.

Figure 4-40 Local alarm



Step 2 Configure the parameters.

Table 4-13 Alarm setup parameter description

Parameter	Description
Alarm Event	Select alarm event. It is **Local Alarm** by default.
Slot	Select the slot of local alarm.
Channel	Select the alarm channel.
Channel Name	Enter the alarm channel name.
Type	Select external alarm device type. Both NO and NC are supported. Select the check box to enable the function.
Period	Configure alarm period. Alarm is produced only within the configured period. Click **Setup** to configure alarm period in the following steps: 1. Select week. 2. Configure the time period. A total of 6 periods can be configured. • Click **Default Time**, and all periods will be default period, 00:00:00–23:59:59. • Click **Current Time**, and the period will be the last saved time. 3. Select the day(s) in **Apply to** zone, so the configured periods will be applied to the day(s). 4. Click **OK**.
Alarm Output	Connect alarm output port with alarm devices (such as light and siren etc.). In case of alarm, the system will send alarm information to alarm devices. Click **Setup** to select slot.
Alarm Output Delay	After the alarm is stopped, the alarm output is delayed for some time, ranging from 10 seconds through 300 seconds.
Anti-dither	The system records only one alarm input event during the configured period.
Buzzer	The system activates a buzzer alarm when an alarm event occurs.
Log	The log records alarm information when an alarm event occurs.

Step 3 Click Save.

4.5.3.1.2 Alarm Output

When an abnormal event occurs, alarm output channel produces alarm signal. Alarm device connected with alarm output port will execute alarm linkage actions.

Step 1 Select **Setup** > **Event Management** > **Alarm Setup** > **Alarm Output**.

Step 2 Configure the name of the alarm channel.

Step 3 Click **Save.**

4.5.3.2 Abnormal

Set alarm linkage actions when an abnormal event occurs. The system executes alarm linkage actions.

Step 1 Log in to webpage.

Step 2 Select **Setup** > **Event Management** > **Abnormal**.

Step 3 Select the exception type as needed, including **Network Offline**, **IP Address Conflict** and **MAC Conflict**.

Step 4 Select **Enable** and configure related parameters.

The parameters that need to be configured for the three types of Exception Events are consistent.

Figure 4-41 Exception handling

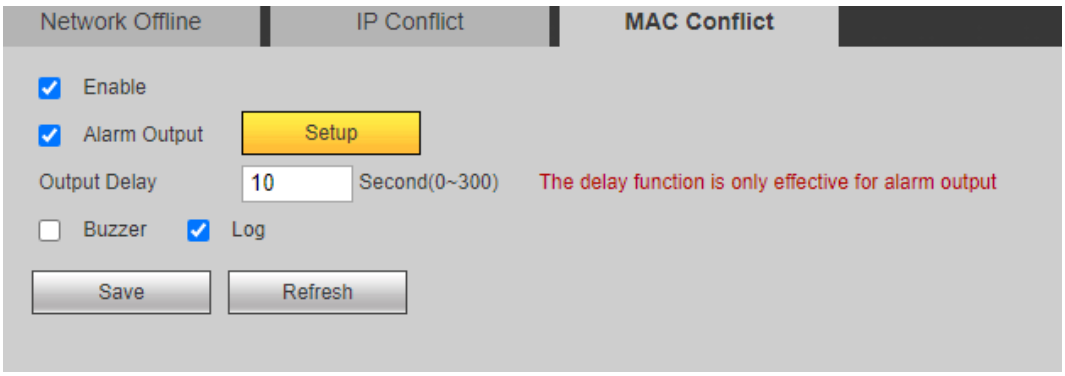


Table 4-14 Exception processing parameter description

Parameter	Description
Alarm Output	Connect alarm output port with alarm devices (such as light and siren etc.). In case of alarm, the system will send alarm information to alarm devices. Click **Setup** to select slot.
Output Delay	After the alarm is stopped, the alarm output is delayed for some time, ranging from 0 seconds through 300 seconds.
Buzzer	The system activates a buzzer alarm when an alarm event occurs.
Log	The log records alarm information when an alarm event occurs.

Step 5 Click **Save**.

4.5.4 Signal Management

You can manage network signal, local signal and signal group.

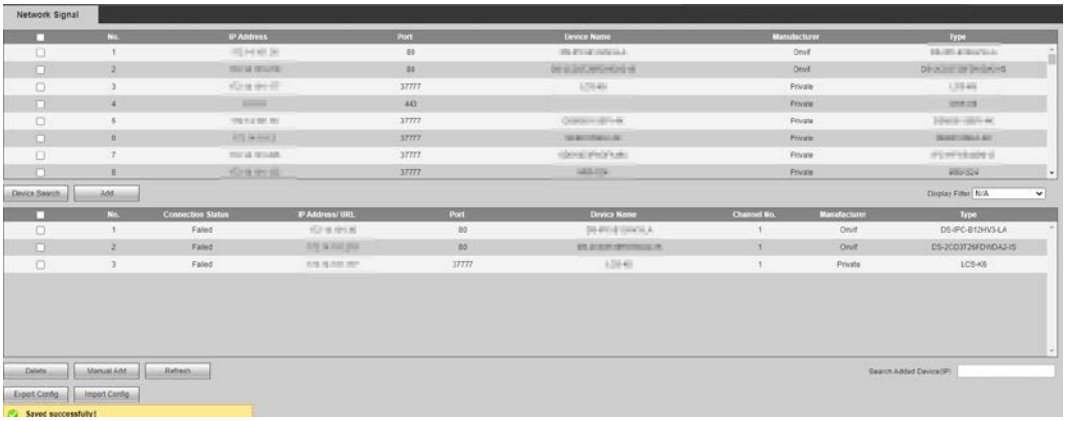
4.5.4.1 Network Signal

You can add devices in the network, preview and display network signal on the video wall, and also control the remote device.

The device shall have a decoding card, so network signal can be decoded and displayed on the video wall.

Select **Setup** > **Signal Management** > **Network Signal**.

Figure 4-42 Network signal



4.5.4.1.1 Searching and Adding

Steps

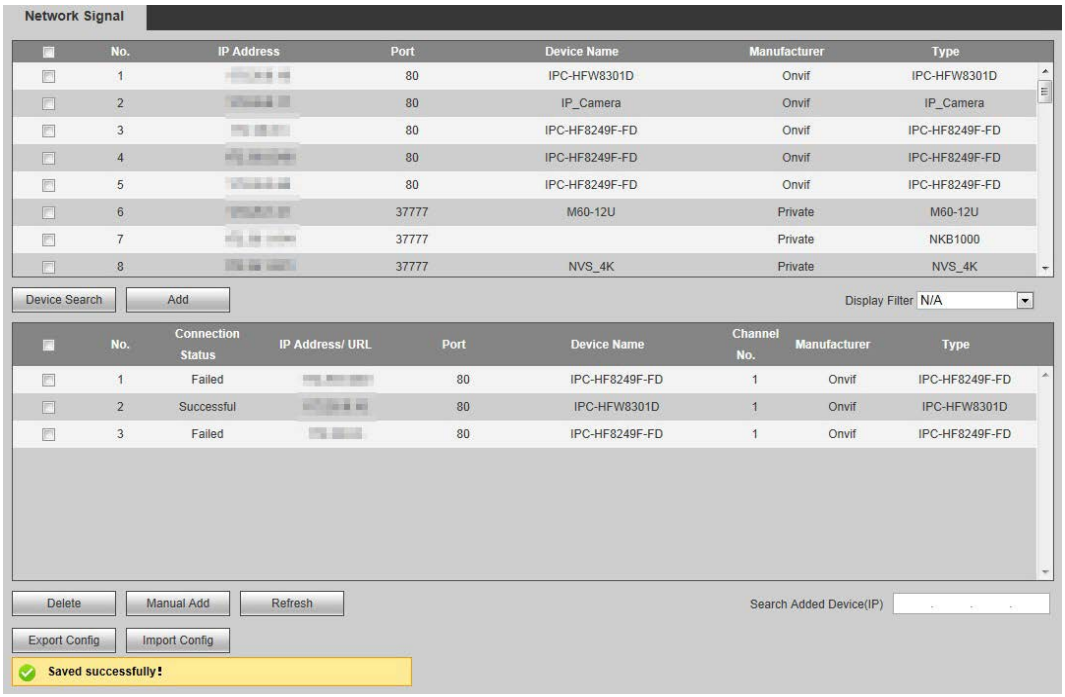
Step 1 Log in to Webpage.

Step 2 Select **Setup**> **Signal Management** > **Network Signal,** and then click **Device Search**.

Step 3 Select the network signal that needs to be added and click "Add".

- If the device is under normal use, **Connection Status** will change from **Failed** to **Successful** after several seconds. The system will display **Saved successfully** again.
- If **Connection Status** remains **Failed**, the device might not be started, or a blocklist has been configured, or it is not included in an allowlist.

Figure 4-43 Add signal



Related operations

- Search Device

◇ In "Display Filter", you can filter the Device type. If you select "IPC", only all IPCDevice will be displayed here.

◇ Enter the IP address in the "Find Added Device (IP)" search box, and the Device information will be marked in yellow in the List.

- Delete Device

  Select the device to be deleted in the Added Device List and click Delete.

- Sorting

Click each attribute field, and will appear on the right of the field, meaning the network signal is arranged in descending order. Click it again, and the icon turns into , meaning the network signal is arranged in ascending order.

4.5.4.1.2 Manual Add

Step 1 Log in to webpage.

Step 2 Select **Setup** > **Signal Management** > **Network Signal** and click **Manual Add**.

Step 3 Configure the parameters.

Different protocols require different parameter information, please refer to the actual one. This section takes the private protocol as an example.

Figure 4-44 Device Parameter (Private Protocol)

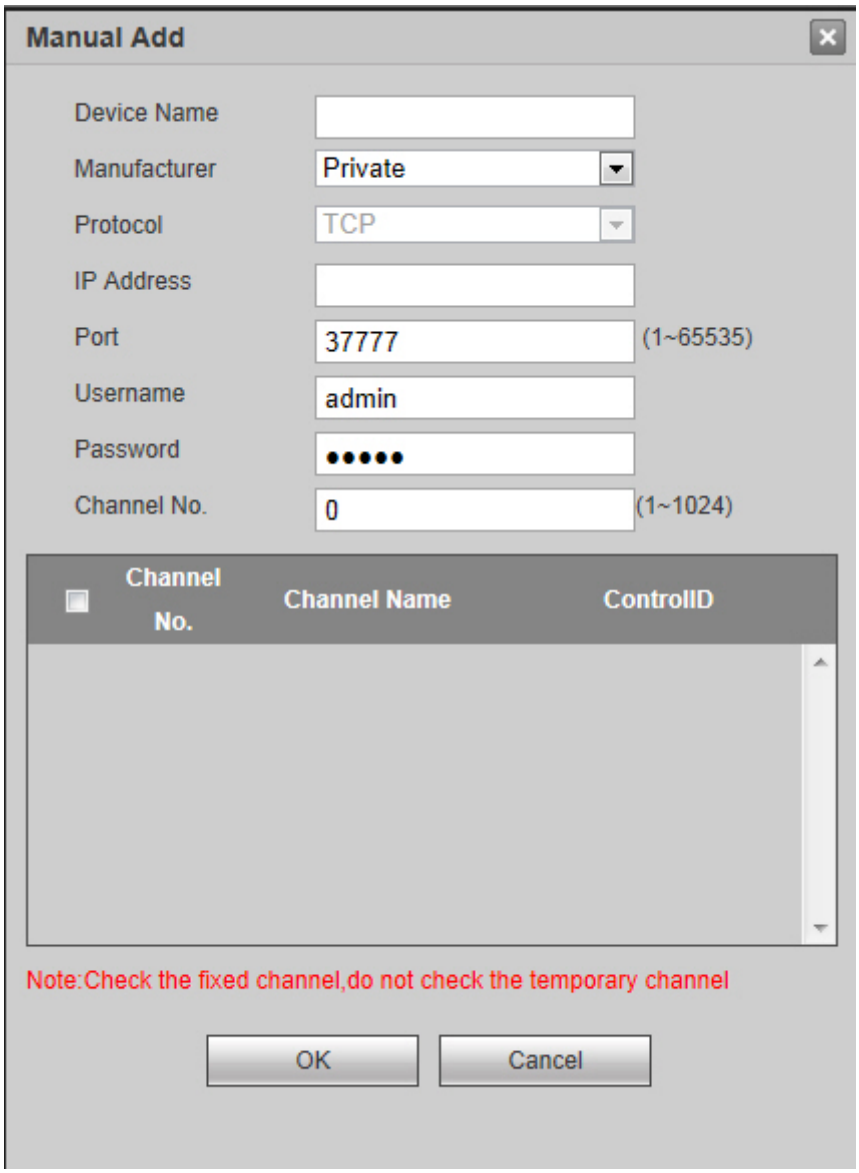


Table 4-15 Manual Add Parameter Description

Parameter	Description
Device Name	Customize the Input Device name to distinguish it from other devices.
Manufacturer	Select the "Private" Protocol.
Protocol	Default is Transmission Control Protocol (TCP, Transmission Control Protocol), which cannot be changed.
IP address	The IP address of the Device to be Added.
Port	The port that provides services for TCP protocol communication can be set according to the actual needs of the user. The default is 37777.
Username	Log in with the Username and password for the Device to be Added.
Password	

Parameter	Description
Number of Channels	The total number of channels to be added to the device.
On-Premises Channel Name	After selecting, you can get the name and quantity of the Add front-end Device.

Step 4 (Optional) Set Channel Remarks, control number and Channel type.

- The control number can correspond to the binding source (such as Keyboard) to realize the binding source Acquire Stream on the wall.
- Channel type Default select Remote Channel.

Step 5 Click **OK**.

4.5.4.1.3 Import and Export Configuration

Import and export configurations to add network signals in batches.

Enable HTTPS before using **Import Config** and **Export Config** functions.

Step 1 Import or export configurations.

- Click **Import Config** to import the preset devices information into the system.
- Click **Export Config** to export configuration file and save it in local device for backup.

Step 2 Click **Import Config** or **Export Config** in HTTP environment.

Step 3 Click **OK**. The system jumps to HTTPS environment.

You need to log in again, and then click **Import Config** or **Export Config.**

4.5.4.2 On-Premises Signal

Set On-Premises signal, including Enter mode setting, EDID customization, Image Crop and Enter name.

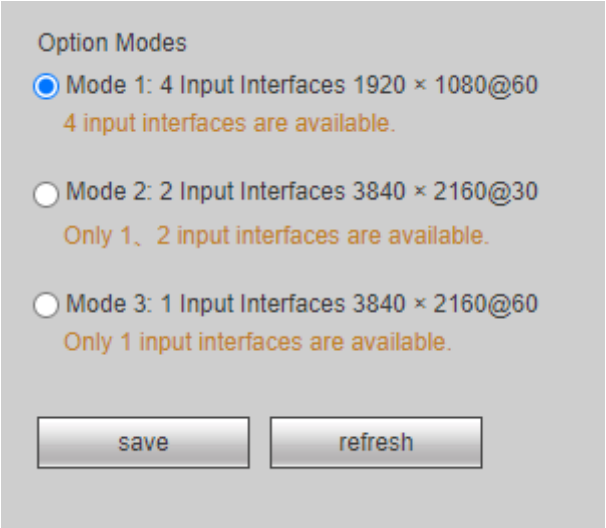
4.5.4.2.1 Enter mode setting

Steps

Step 1 Select Settings > Signal Management > On-Premises Signal > Enter Mode Settings.

Step 2 Select the Enter mode that is actually required.

Figure 4-45 Enter mode



- Mode 1: The 4 input ports all support 1080P@60fps.
- Mode 2: Only the first 2 input ports support signal acquisition and support 4K@30 fps.
- Mode 3: Only the first port supports signal acquisition and support 4K@60fps.

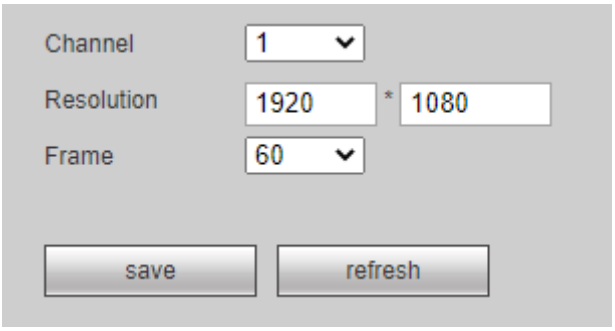
Step 3 Click **Save**.

4.5.4.2.2 EDID Custom

After you customize the Extended Display Identification Data (EDID) Settings, the computer outputs the EDID at the set resolution.

Select **Setup** > **Signal Management** > **Local Signal** > **EDID Custom**.

Figure 4-46 EDID customization



Select channel, resolution and frame, and then click **Save**.

- The default resolution width and height are multiples of 4.
- Mode 1: Default resolution 4 channels 1920×1080@60 Hz, wide range 600～2560, high range 400～2560 and the product of width × height × Frame Rate cannot exceed 124416000.
- Mode 2: Default resolution 2-channel 3840×2160@60 Hz, wide range 600～4092, high range 400～4092 and the product of width × height × Frame Rate cannot exceed 265420800.
- Mode three: Default resolution 1 channel 3840×2160@60 Hz, wide range 600～4092, high range 400～4092 and the product of width × height × Frame Rate cannot exceed 5308416000.

4.5.4.2.3 Setting Image Crop

Crop the collected Image according to the set size, and display it on the Output screen according to the set Coordinate.

4.5.4.2.4 Enter name

Set the Enter name, Enter name and control number of each Channel of Compression Card. The set control number can correspond to the binding source to realize Acquire Stream of the binding source on the wall.

Step 1 Select **Setup** > **Signal Management** > **Local Signal** > **Input Title**.

Figure 4-47 Enter name

Step 2 Configure the channel name and control number of each channel.

- After entering “Start Control Number” and clicking “Set”, the control numbers of each channel will be numbered sequentially starting from the start control number.
- According to different Enter modes, only the Enter names of the available channels in the current mode are displayed.
- After entering “Start Control Number” and clicking “Set”, the control numbers of each channel will be numbered sequentially starting from the start control number.

Step 3 Click **OK**.

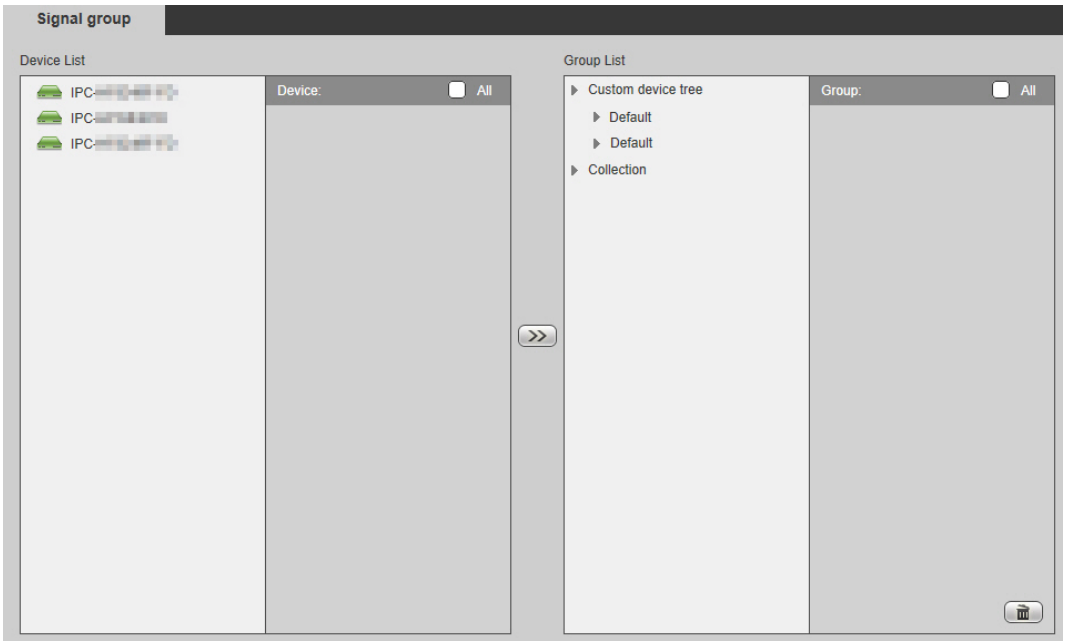
4.5.4.3 Signal Group

You can customize signal group. The **Signal Group** tab displays added group and signal source. You can drag signal group to the window for loop play of signals in the group.

Step 1 Log in to webpage.

Step 2 Select **Setup** > **Signal Management** > **Signal Group**.

Figure 4-48 Signal grouping



Step 3 Create a new group.

1) Move your mouse pointer to **Custom device tree** or **Collection** in **Group list**, and then click +.
2) Enter group name, and then click **OK**.
   A group has been created.
   Move your mouse pointer to group name. Editing icons are displayed.
   - Click + to create a sub-group under this group.

     Sub-group cannot be created under **Collection** group.
   - Click ✎ to rename this group.
   - Click ✕ to delete this group.

Step 4 Select a signal.

1) Select a device from **Device List**.
   Device name list displays all signals under this device.
2) Select one signal or multiple signals.

Select **All** to select all the signals.

Step 4 Select a group.

Step 5 Click >>.

Signals have been divided into groups.

- Select a signal from a group, and click 🗑 to delete the signal.

- Select **All** to select all the signals.

4.5.5 Display Management

You can configure video wall, manage screen, configure output display and output name.

4.5.5.1 Video Wall

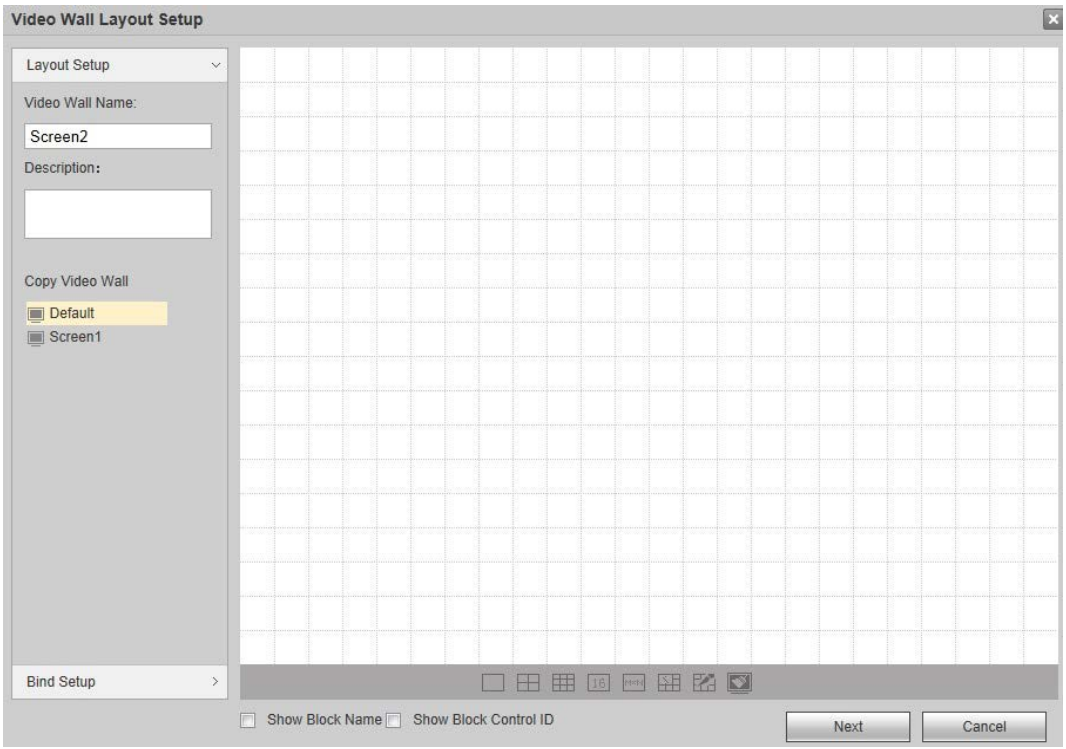
You can configure video walls according to actual quantity and splitting of screens, so signals can be displayed on video walls.

Step 1 Log in to webpage.

Step 2 Select **Setup** > **Display Management** > **Video Wall Setup**.

Step 3 Configure the video wall layout.

Figure 4-49 Video wall layout configuration



1. Customize the **Video Wall Name** and **Description**.
2. Click the icon at the bottom of Interface to quickly add single screen and splicing screen.

Press and hold the Left Mouse Button to drag the screen to any position.

Table 4-16 Screen operation Parameter Description

Icon	Name	Description
	Single Screen and Splicing Screen	Click the icon to add a single screen, a 4-split Splicing Screen, a 9-split Splicing Screen, a 16-split Splicing Screen or a custom-split Splicing Screen.

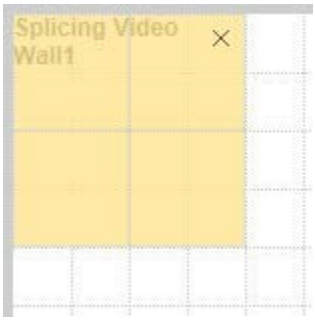
Icon	Name	Description
	Splicing	Select the single screen that needs to be spliced and click the icon to splice multiple screens together. ● The selected screen cannot contain Splicing Screen. ● Single screens must be connected horizontally or vertically.
	Unsplicing	Select the Splicing Screen that needs to be un-spliced and click the icon to un-splice the Splicing Screen.
	Clear Screen	Clear all screens on the Video Wall.

3. (Optional) You can select existing video wall from **Copy Video Wall** zone on the left of the interface, and then layout of video wall is displayed on the right of the page. You can modify the layout directly.

Step 4 (Optional) Select **Show Block Name**. Every splicing screen will show a block name, such as Splicing Video Wall 1.

- For single screen, it still shows Screen 1, Screen 2 and more.
- Double-click to modify block name.

Figure 4-50 Display block name Interface



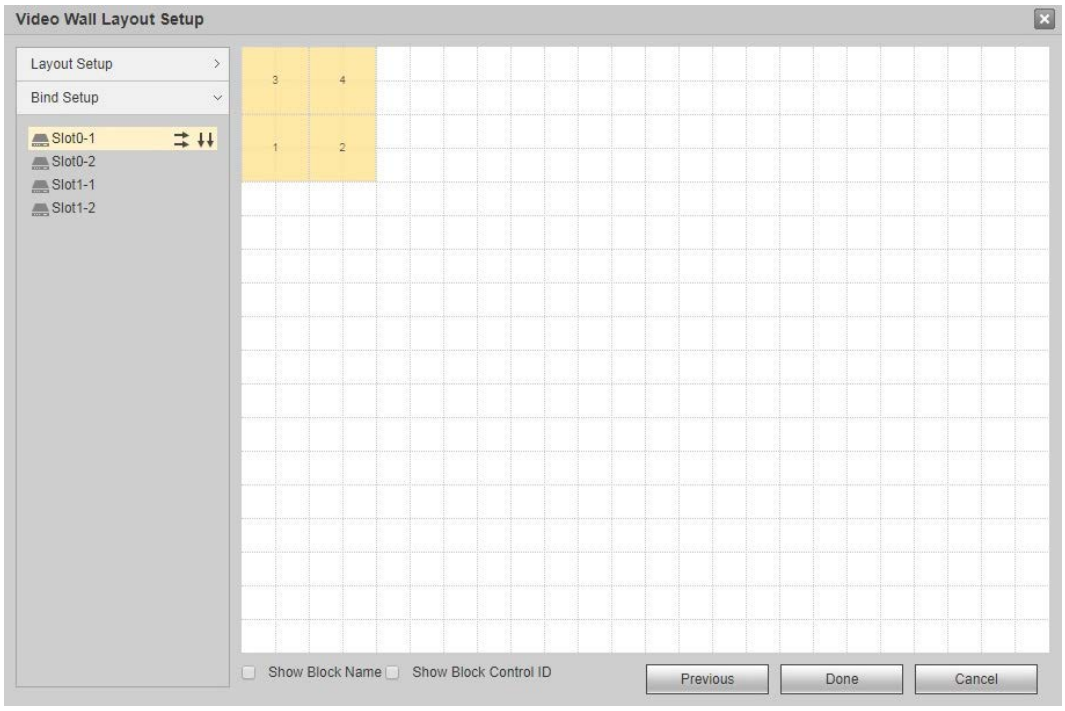
Step 5 Click the **Bind Setup** tab or **Next**.

The slot information is displayed.

Step 6 Select one slot, press and hold on left mouse button to drag the slot onto the screen, and bind the slot channel with screen.

- All screens on the video wall shall be bound with slot channel; otherwise, when you click **Done**, the system will prompt you that "**There is sub screen without bound decoding channel in screen!**"
- Slot cannot be bound repeatedly. In case of error, drag a correct slot channel onto the screen, to cover it directly.
- Click to automatically bind slot with single screen horizontally.
- Click to automatically bind slot with single screen vertically.

Figure 4-51 Channel binding



Step 7 Double-click the newly created Video Wall block and configure the block Parameters.

Figure 4-52 Block settings

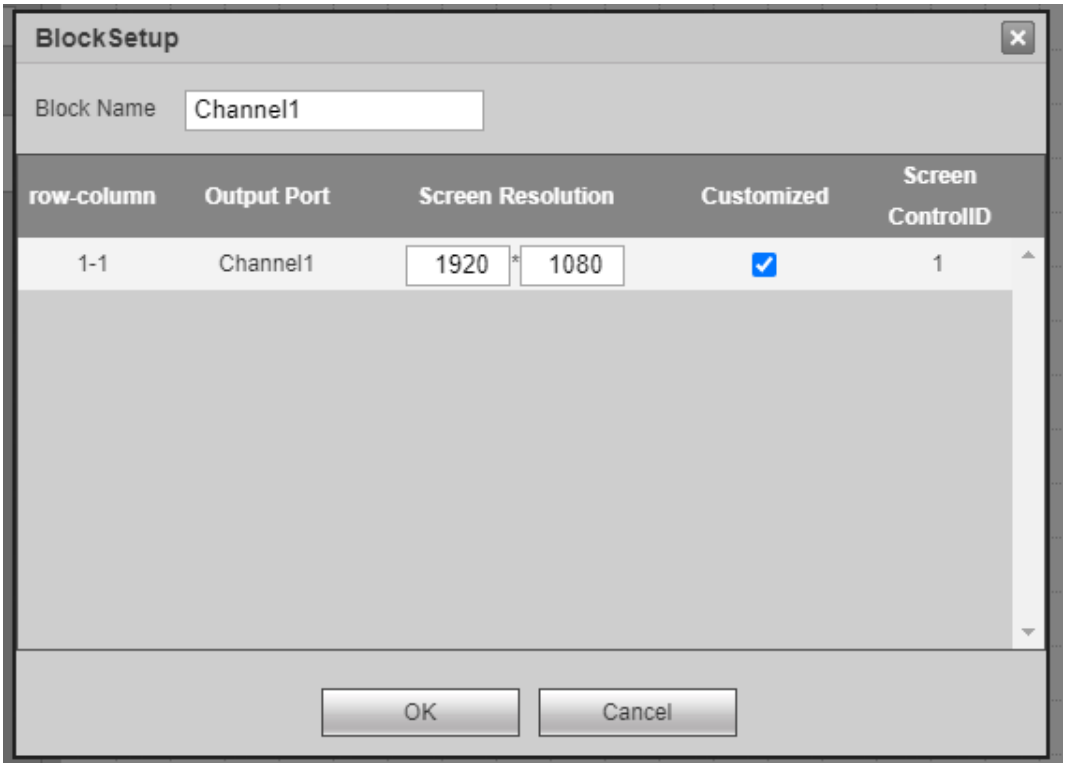


Table 4-17 Block Setting Parameter Description

Parameter	Description
Block name	Set the block name.
Resolution	The Default is 1920×1080. Select **Customized** to set the resolution of the Output screen corresponding to each channel.

Parameter	Description
Screen Control Number	Double-click the number in the screen control number column to modify the control number on the Output screen.

Step 8 Click **OK**.

Step 9 Click **Done**.

The system exits **Video Wall Layout Setup** page. The new video wall is displayed in video wall list.

Figure 4-53 Add completed

The default status of the newly created Video Wall is ON. Click ON to Shut Down the Video Wall.

4.5.5.2 Screen Management

You can configure screen parameters, to turn on and turn off the screen.

4.5.5.2.1 Screen Setup

Configure manufacturer, serial port and com address of every output screen, to realize communications between screen and device. Com address shall be the same with DIP address of video wall.

Step 1 Log in to webpage.

Step 2 Select **Setup** > **Display Management** > **Screen Management** > **Screen Setup**.

Figure 4-54 Screen setup

Step 3 Click drop-down list or text box to configure manufacturer, serial port and com address.

- They shall be the same with actual manufacturer, serial port and com address (DIP address) of video wall.
- Click the drop-down list at the top to configure manufacturer and serial port together.

Step 4 Click **Save**.

4.5.5.2.2 Screen ON/OFF

According to preset interval and time, the device sends ON/OFF commands to all screens continuously, and ensures that each screen receives commands and turns ON/OFF.

Step 1 Log in to webpage

Step 2 Select **Setup** > **Display Management** > **Screen Management** > **Screen ON/OFF**.

Step 3 Select the **Regional Switch Enable** check box to enable the function, and then configure the parameters.

- Switch Times: The times of sending ON/OFF command.
- Switch Interval: Interval of sending ON/OFF command.
- Screen interval: The interval for every screen to receive ON/OFF command.

Step 4 Click **OK**.

4.5.5.2.3 Screen Timer

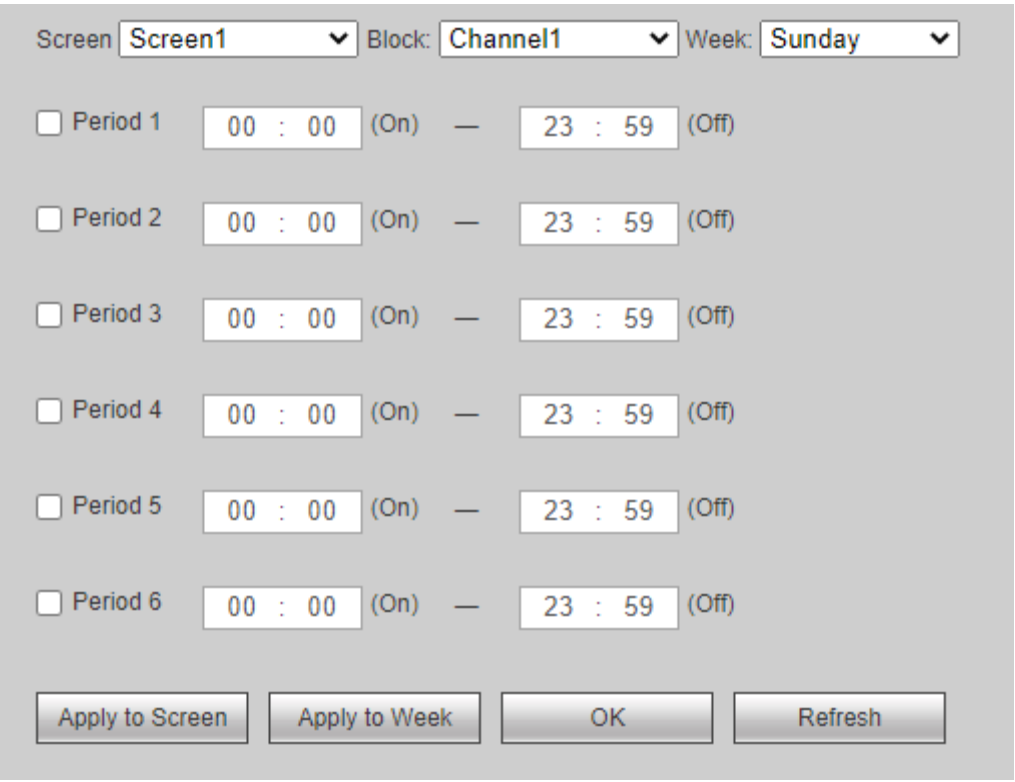
The interval for every screen to receive ON/OFF command.

Steps

Step 1 Log in to Webpage.

Step 2 Select **Setup** > **Display Management** > **Screen Management** > **Screen Timer**.

Figure 4-55 Screen timer switch



Step 3 Select **Screen**, **Block** and **Week**.

Step 4 Select period and configure ON/OFF time.

Step 5 Click **OK**.

After periods of one week have been configured.

- Click **Apply to Screen**, and select another slot in the pop-up page to apply this configuration to the slot.
- Click **Apply to Week**, and select another week in the pop-up page to apply this configuration to the week.

4.5.5.2.4 Screen Custom Control

Customize screen on and off commands.

Step 1 Log in to Webpage.

Step 2 Select **Setup** > **Display Management** > **Screen Management Screen Custom Control**.

Step 3 Enter the **Customized Manufacturer Name**.

Step 4 Configure Screen on command and Screen off command.

Configure a hexadecimal number.

Step 5 Click **Save**.

4.5.5.3 Display Setup

4.5.5.3.1 Configure Display

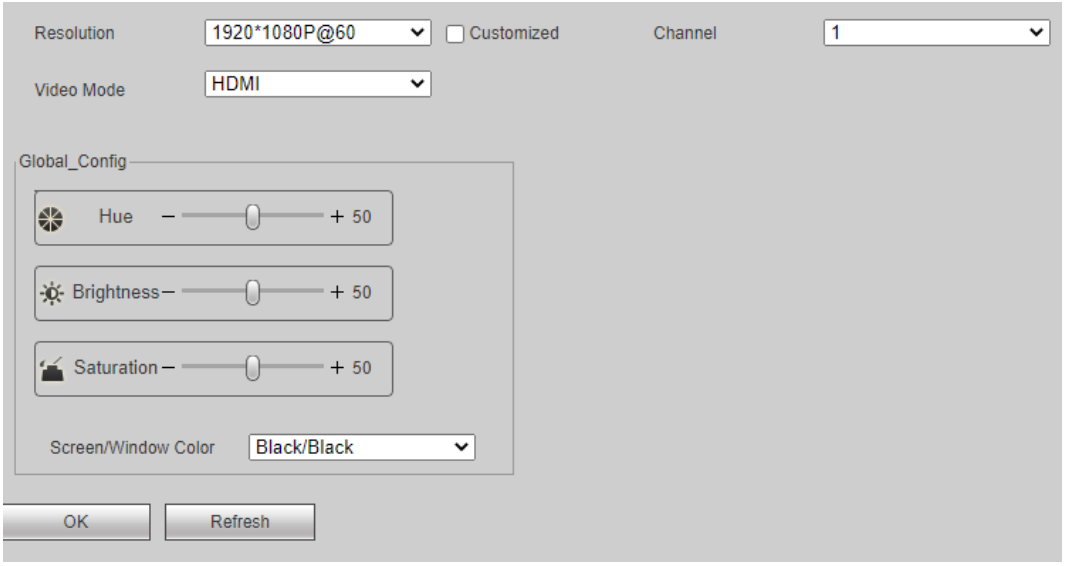
You can configure the resolution, video mode, hue, brightness and other parameters of the display, and adjust screen display.

Step 1 Log in to webpage.

Step 2 Select **Setup** > **Display Management** > **Display Setup** > **Display Setup**.

Step 3 Configure the parameters.

Figure 4-56 Display setup



When setting a custom resolution, the resolution width and height must be 2Aligned.

Table 4-18 Parameter description

Parameter	Description
Resolution	Set the resolution of the Output screen or select "Custom" to customize the resolution. Custom resolution setting range: width 128-3840, height 128-3840. For example: maximum ultra-wide resolution: 3840×524, maximum ultra-high resolution: 522×3840.
Channel	Select Channel on the Output screen.
Video Output Mode	Set Video Output mode, Optional DVI and HDMI.
Chromaticity	Adjust the Hue and Saturation of the Image.
Brightness	Adjust the overall brightness of the image through Linear Adjustment Mode. The larger the value, the brighter the image, and vice versa. When the value is set to a larger value, the image tends to appear blurry.
Saturation	Adjust the color depth. The larger the value, the darker the color will be, and vice versa. This value will not affect the overall brightness of the image.
Screen color/window color	Set the screen color and window color of the Output screen, Optional black/black, blue/green.

The Hue, Brightness and Saturation settings will take effect on the entire Device.

Step 4 Click OK.

4.5.5.3.2 Global Setup

You can configure to enable main/sub stream auto switch, window prompt information and "do not decode when being covered".

Step 1 Log in to the webpage.

Step 2 Select **Setup** > **Display Management** > **Display Setup** > **Global Setup**.

Step 3 Select the check boxes.

Figure 4-57 Global setup

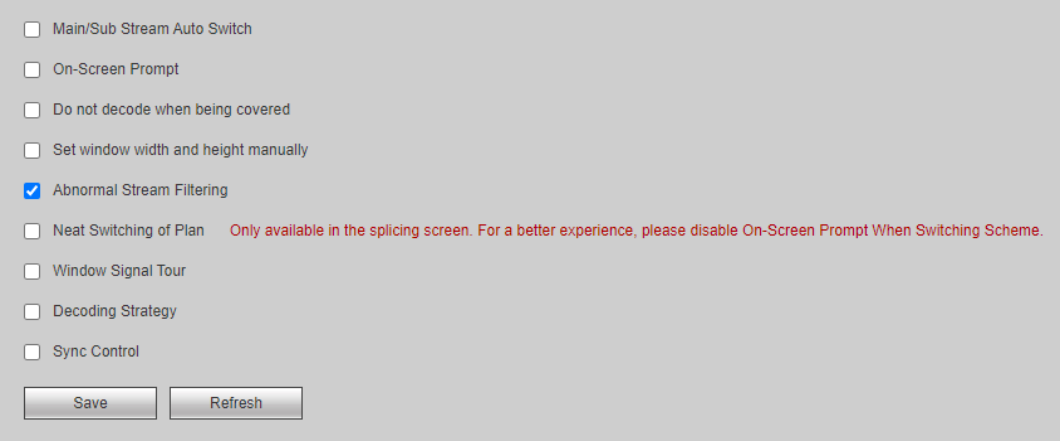


Table 4-19 Global Setting Parameter Description

Parameter	Description
Main Sub Stream automatic switching	If the upper wall stream in the window is Main Stream, if you zoom the window out to below D1 resolution, the Main Stream will automatically switch to Sub Stream.
Window prompt information	A prompt message is displayed on the window.
Overwrite without Decoding	Windows that are completely covered by other windows suspend decoding.
Manually set window width and height	Double-click the Video Wall Interface window to adjust the window's Coordinate and size.
Exception Stream Filtering	The system will check the Exception Stream and filter the Exception Stream to prevent a green screen from appearing.
Scheme neat switch	Scheme Stream switches synchronously and neatly to enhance visual effects.
Window signal patrol	After being enabled, manual configuration of window signal patrol is supported.
Decoding strategy	After turning it on, the Interface displays the Fluency Adjustment Area. The user can use the Drag Slider to adjust the window screen fluency according to the actual situation and make a trade-off between decoding real-time and screen fluency. Only network signals support Throttle smoothness adjustment.

Step 4 Click Save.

4.5.5.4 Output Name

You can configure output name and control ID of each channel on the board card. Control ID can correspond to the binding source (such as keyboard), so the binding source can be displayed on the video wall.

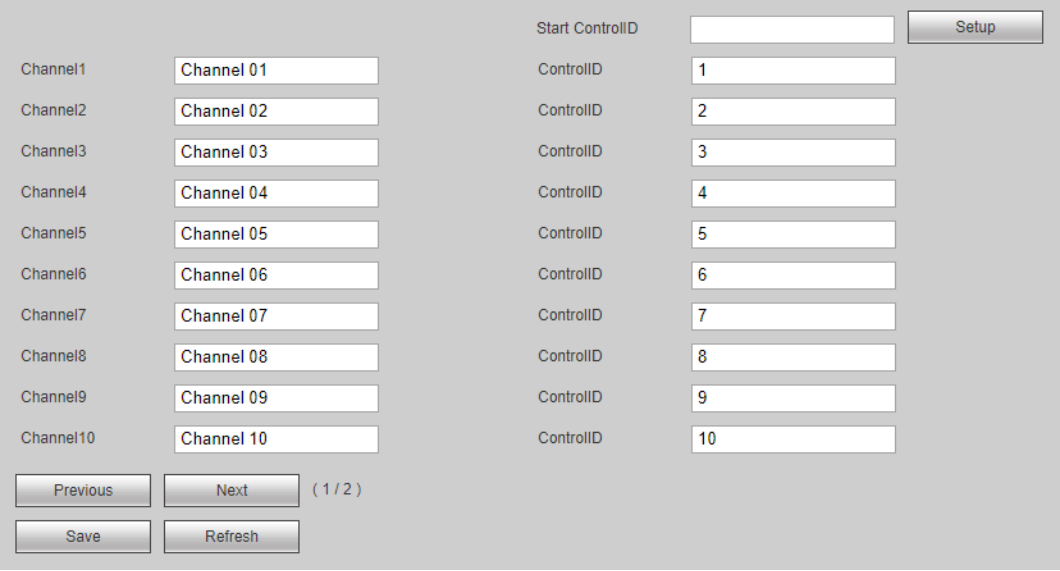
- Output name is only used to distinguish channels.
- Select output screens through control ID, and you can configure video wall display of keyboard or other devices.

Step 1 Log in to webpage.

Step 2 Select **Setup** > **Display Management** > **Output Name**.

Step 3 Configure output name and control ID for each channel.

Figure 4-58 Output name



Step 4 Click **Save.**

4.6 Information

View Device information, including Compression Card information, Decoding information, system status, System Log, online User and local information.

4.6.1 Card Information

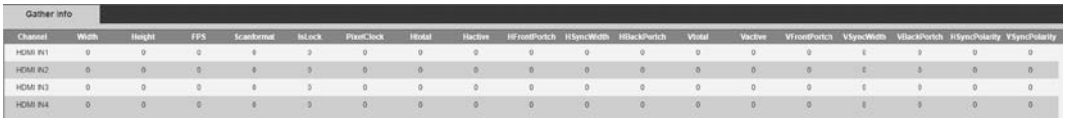
Log in to the Webpage, select "Information > Device Information > Card Info" to view the Compression Card information of the descrambler Device, including the Compression Card status, Compression Card type, Port Type, temperature status, etc.

Figure 4-60 Compression Card Information

4.6.2 Collection Information

Log in to Webpage, select "Information > Device Information > Collection Information" to check the information that the computer Graphics Card Output gives to the Encoder to determine whether the Video Signal Collection Parameter is correct.

Figure 4-61 Collection Information



According to different Enter modes, only the Collection information of the Enter channels available in the current mode is displayed.

4.6.3 Decoding information

Log in to the Webpage, select "Information > Device Information > Decoding Information" to view the relevant information of the Decoding Channel, including Decoding status, resolution, Frame Rate, Data Flow, Decoding traffic and other information.

Figure 4-62 Decoding information

You can set the "Record Video Time Interval" in the upper right corner of the Interface. Click it and the system will record the video for the Channel according to the set duration.

4.6.4 Device information

4.6.4.1 Get Device Information

Get the Device's Information File and logs.

Step 1 Log in to Webpage.

Step 2 Select "Information > Device Information > Device Information > Device Information".

Figure 4-63 Device Information

Step 3 Click Get to obtain the Device information.

4.6.4.2 Network Packet Capture

Network Packet Capture refers to the interception, retransmission, editing, and transfer of Data Packets sent and received by Network Transmission, which is used to check Cyber Security. When a network Exception occurs in the Controller Device, the Packet Capture operation is performed on the Interface, the Packet Capture file is downloaded to On-Premises, and provided to technical support for analyzing network conditions.

Step 1 Log in to Webpage.

Step 2 Select "Information > Device Information > Device Information > Network Packet Capture".

Step 3 Configure Parameter.

Figure 4-64 Network Packet Capture

Table 4-21 Network Packet Capture Parameter Description

Parameter	Description
Ethernet	Select the bound Network Adapter.
IP address	Set the network IP address.
Protocol	Select Network Protocol, including "All", "TCP" and "UDP".
Port	Set the network ports.

Step 4 Click Start Packet Capture.

Step 5 After a Segment period of time, click “Stop Packet Capture”.

4.6.4.3 Packet Internet Groper (PING)

Use the Packet Internet Groper (PING) Command to check whether the front-end device or network device is connected properly.

Step 1 Log in to Webpage.

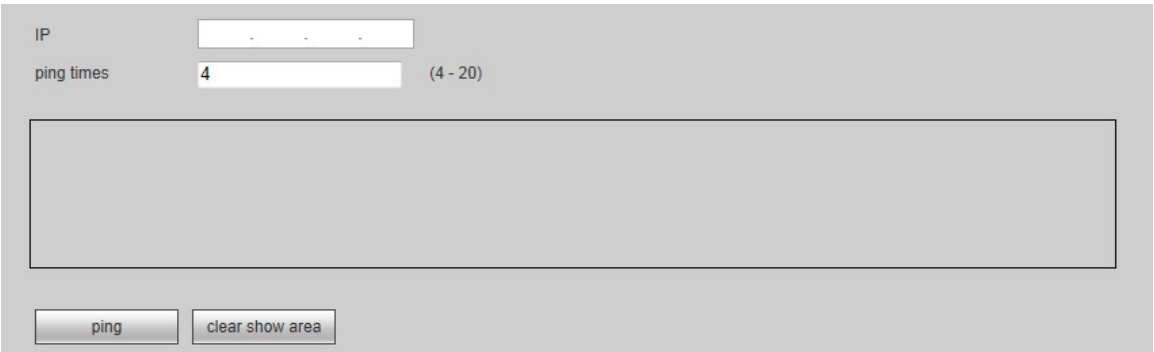
Step 2 Select "Information > Device Information > Device Information > Packet Internet Groper (PING)".

Step 3 Enter the IP address that needs to be PINGed by Packet Internet Groper (PING) and the number of times Packet Internet Groper (PING) is to be PINGed, and click “Packet Internet Groper (PING)”.

After a few seconds, Packet Internet Groper (PING) information is displayed on the Interface.

When the Packet Internet Groper (PING) function is enabled, only one webpage Customer terminal can be opened, otherwise the Packet Internet Groper (PING) information may not be fully displayed.

Figure 4-65 Packet Internet Groper (PING)



4.6.4.4 Log Level

Set the background printing commissioning log level.

Step 1 Log in to Webpage.

Step 2 Select "Information > Device Information > Device Information > Log Level".

Step 3 Set the Log Level as needed.

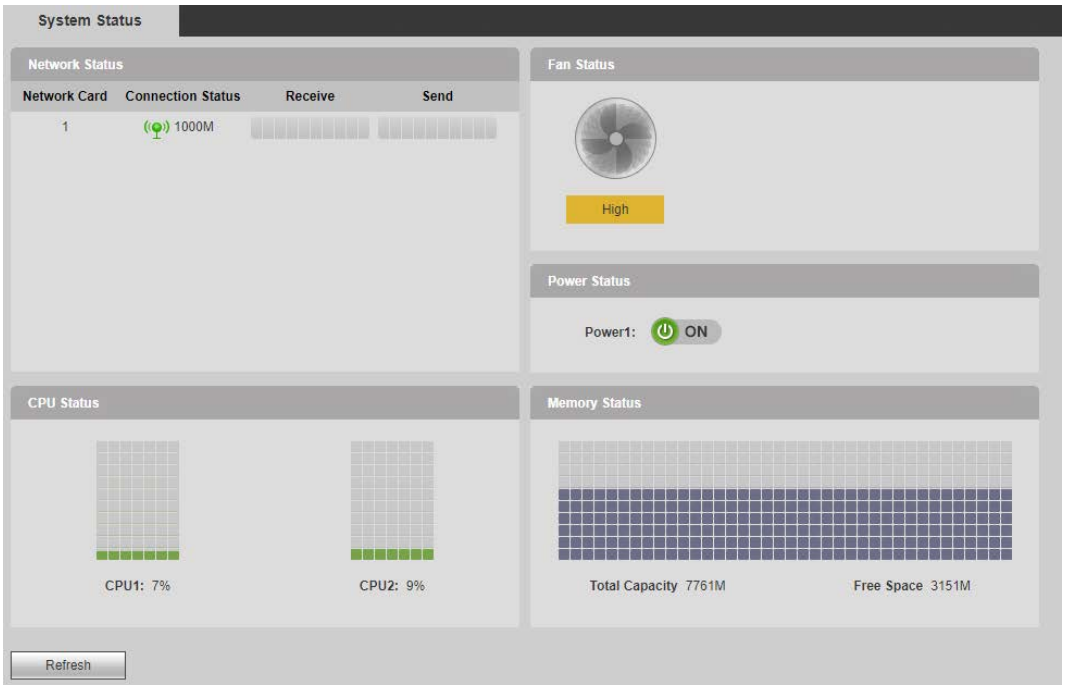
Step 4 Click OK.

4.6.5 System status

Log in to the Webpage, select "Information > Device Information > System Status" to view the Device's network status, Fan Rotational Speed, power status, CPU usage, Memory usage and other information.

- Network Status: Displays the connection status of the Network Adapter, and the status of data receiving and sending.
- CPU Status: Displays the CPU status of all inserted Compression Cards.
- Fan status: Displays the running status of Fan.
- Power status: Displays the on/off status of the two power supplies.
- Memory status: Displays memory usage.

Figure 4-66 System Status



4.6.6 System Log

Search and view the System Log information of the Controller device according to time and log type, and back up the log to the On-Premises PC.

Step 1 Log in to Webpage.

Step 2 Select "Information > Device Information > System Log".

Step 3 Set the “Start Time”, “End Time”, and “Type”, and click “Search”.

The system displays the logs that meet the requirements.

Figure 4-67 System Log

- Click a log record to display detailed information about the log.
- Click Clear to clear all log information on the Device.
- Click “Backup” to back up the searched System Log information to the PC currently used by the User.

4.6.7 Online User

Log in to Webpage, select "Information > Device Information > Online User" to view the online User's basic information such as Username, User group, IP address, User login time, etc.

4.6.8 About this machine

Log in to the Webpage, and in "Information > Device Information > About This Device", check the version information of this Device, including serial number, Device type, Microcontroller Unit (MCU) version, Output Firmware version, WEBPAGEPAGE version, system version, Collection Firmware version, Security Baseline version, and Onvif version.

4.6.9 Legal Information

Log in to Webpage, and check the Open-source Software Declaration in "Information > Device Information > Legal Information".

Appendix 1 Cybersecurity Recommendations

Mandatory actions to be taken for basic device network security:

1. **Use Strong Passwords**

   Please refer to the following suggestions to set passwords:

   - The length should not be less than 8 characters.
   - Include at least two types of characters; character types include upper and lower case letters, numbers and symbols.
   - Do not contain the account name or the account name in reverse order.
   - Do not use continuous characters, such as 123, abc, etc.
   - Do not use overlapped characters, such as 111, aaa, etc.

2. **Update Firmware and Client Software in Time**

   - According to the standard procedure in Tech-industry, we recommend to keep your device (such as NVR, DVR, IP camera, etc.) firmware up-to-date to ensure the system is equipped with the latest security patches and fixes. When the device is connected to the public network, it is recommended to enable the “auto-check for updates” function to obtain timely information of firmware updates released by the manufacturer.
   - We suggest that you download and use the latest version of client software.

"Nice to have" recommendations to improve your device network security:

1. **Physical Protection**

   We suggest that you perform physical protection to device, especially storage devices. For example, place the device in a special computer room and cabinet, and implement well-done access control permission and key management to prevent unauthorized personnel from carrying out physical contacts such as damaging hardware, unauthorized connection of removable device (such as USB flash disk, serial port), etc.

2. **Change Passwords Regularly**

   We suggest that you change passwords regularly to reduce the risk of being guessed or cracked.

3. **Set and Update Passwords Reset Information Timely**

   The device supports password reset function. Please set up related information for password reset in time, including the end user’s mailbox and password protection questions. If the information changes, please modify it in time. When setting password protection questions, it is suggested not to use those that can be easily guessed.

4. **Enable Account Lock**

   The account lock feature is enabled by default, and we recommend you to keep it on to guarantee the account security. If an attacker attempts to log in with the wrong password several times, the corresponding account and the source IP address will be locked.

5. **Change Default HTTP and Other Service Ports**

   We suggest you to change default HTTP and other service ports into any set of numbers between 1024–65535, reducing the risk of outsiders being able to guess which ports you are using.

6. **Enable HTTPS**

   We suggest you to enable HTTPS, so that you visit Webpagepage service through a secure communication channel.

7. **MAC Address Binding**

We recommend you to bind the IP and MAC address of the gateway to the device, thus reducing the risk of ARP spoofing.

8. **Assign Accounts and Privileges Reasonably**
   According to business and management requirements, reasonably add users and assign a minimum set of permissions to them.
9. **Disable Unnecessary Services and Choose Secure Modes**
   If not needed, it is recommended to turn off some services such as SNMP, SMTP, UPnP, etc., to reduce risks.
   If necessary, it is highly recommended that you use safe modes, including but not limited to the following services:
   - SNMP: Choose SNMP v3, and set up strong encryption passwords and authentication passwords.
   - SMTP: Choose TLS to access mailbox server.
   - FTP: Choose SFTP, and set up strong passwords.
   - AP hotspot: Choose WPA2-PSK encryption mode, and set up strong passwords.
10. **Audio and Video Encrypted Transmission**
    If your audio and video data contents are very important or sensitive, we recommend that you use encrypted transmission function, to reduce the risk of audio and video data being stolen during transmission.
    Reminder: encrypted transmission will cause some loss in transmission efficiency.
11. **Secure Auditing**
    - Check online users: we suggest that you check online users regularly to see if the device is logged in without authorization.
    - Check device log: By viewing the logs, you can know the IP addresses that were used to log in to your devices and their key operations.
12. **Network Log**
    Due to the limited storage capacity of the device, the stored log is limited. If you need to save the log for a long time, it is recommended that you enable the network log function to ensure that the critical logs are synchronized to the network log server for tracing.
13. **Construct a Safe Network Environment**
    In order to better ensure the safety of device and reduce potential cyber risks, we recommend:
    - Disable the port mapping function of the router to avoid direct access to the intranet devices from external network.
    - The network should be partitioned and isolated according to the actual network needs. If there are no communication requirements between two sub networks, it is suggested to use VLAN, network GAP and other technologies to partition the network, so as to achieve the network isolation effect.
    - Establish the 802.1x access authentication system to reduce the risk of unauthorized access to private networks.
    - Enable IP/MAC address filtering function to limit the range of hosts allowed to access the device.