PANIO Enterprise Product User Manual

HW5900_B

Panel Window Processor 5 Inputs 9 Outputs

User Manual | Version: V1.0

5-input / 9-output 4K video wall processor for splicing walls in conference rooms, command centres, retail venues, and monitoring rooms.

Model Number	HW5900_B
Product Positioning	5 HDMI Inputs / 9 HDMI Outputs Video Wall Processor
Key Features	4K 60Hz & 1080P 60Hz inputs, 9×1080P 60Hz outputs, 9 windows per screen, PIP, background image, scrolling text, Web GUI, HTTP & Serial central control

Table of Contents

1. Safety Reminders

2. Product Introduction

3. Key Features

4. Technical Specifications

5. Package Contents

6. Panel Layout & Port Description

7. Installation & Operation

8. Advanced Control & API Commands

9. Troubleshooting & Notes

10. Warranty Service

1. Safety Reminders

Thank you for choosing the PANIO HW5900_B Panel Window Processor 5 Inputs 9 Outputs. To ensure stable performance and operational safety throughout installation, daily operation, and long-term deployment, please read this section carefully before using the unit, and retain this manual for future reference.

Safety Instructions

- Before powering on the equipment, ensure that the chassis and the entire system are properly grounded, so as to prevent static discharge that could endanger the equipment and personal safety and to achieve good shielding effects.
- Use a single-phase three-wire AC 110V–240V power supply with protective grounding, and ensure that the whole system shares the same protective ground. Do not use an ungrounded power supply, and do not damage the grounding pin of the power cord.
- When moving the equipment or carrying out work that requires the power to be disconnected, switch off all power sources, including the power switch, and unplug the power cord.
- Do not place objects on power lines, signal lines or communication lines, and avoid stepping on or compressing the cables, so as to prevent electric leakage or short circuits.
- Power off the device before plugging or unplugging any signal cable. Damage caused by hot plugging is not covered by the warranty.
- Place the device in a reasonable position and ensure good ventilation, because the power supply generates heat during operation. Install it in a standard rack, enclosure or cabinet, or on a stable platform, to prevent it from falling.
- Keep the working environment free from dust and moisture, and avoid placing the system in excessively cold or hot locations.
- Avoid liquid soaking into or splashing onto the interior of the equipment, and keep chemicals and liquids away from the device.
- All repair work must be carried out by qualified maintenance personnel. Do not attempt to repair the equipment yourself without proper training, so as to avoid electric shock hazards and further equipment damage.

2. Product Introduction

This video wall processor supports 5 HDMI input ports (1 × 4K60Hz and 4 × 1080P60Hz) and 9 HDMI output ports at 1080p. Working together with the PC control software, it provides users with perfectly customised ultra-high-resolution display effects, achieving resolutions up to N×M (N = 1920 × m, number of columns; M = 1080 × m, number of rows) and presenting detailed, clear images.

The controller also supports PIP (Picture-in-Picture) with up to 9 windows per screen, cross-screen display, background images and scrolling text, all of which can be managed uniformly through the PC software. The software additionally supports video wall content playback preview, file renaming and audio control.

This product is ideal for shopping malls, commercial venues, conference rooms and monitoring centres.

3. Key Features

- Supports 5 HDMI input interfaces (4 × 1080P and 1 × 4K60).
- Supports up to 9 HDMI output ports, with a maximum resolution of 1080P60.
- Supports opening 9 windows per screen, with a maximum total of 81 windows.
- Supports video content playback preview.
- Supports Web GUI control for scene saving and calling.
- Supports audio passthrough and a 3.5 mm audio output interface.
- Supports background image and scrolling text functions.
- Supports customisable LED screen output resolution and synchronisation technology.

4. Technical Specifications

4.1 Video & Audio Specifications

Item	Specification
Agreement Support	HDMI 1.4; HDCP 1.4
HDMI Pixel Bandwidth	340 MHz, fully digital
HDMI Interface Bandwidth	Total bandwidth 10.2 Gbps
Maximum Input Resolution	3840×2160@60Hz; backward compatible
Maximum Output Resolution	1920×1080@60Hz
Video Interface	HDMI-A
HDMI Interface Impedance	100Ω
Recommended HDMI Cable Length	Resolution below 5 million pixels, frame rate 1920×1080@60Hz
Audio Interface	3.5 mm stereo audio
Audio Format	44.1K, 48K, 96K, 176K, 192K
Audio Signal Type	Analogue

Note: Specification values are measured under standard test conditions and are subject to change without prior notice.

4.2 General Specifications

Item	Specification
Power	AC 110–240V
Maximum Power Consumption	25W
Operating Temperature	0℃ – 50℃
Operating Humidity	5% – 90%

Item	Specification
Weight	Net weight: 2.64 kg; Gross weight: 3.68 kg
Product Dimensions	Without hanging ears: 440×225×44 mm; With hanging ears: 482×225×59 mm
Packaging Dimensions	558 × 275 × 90 mm
Power Supply	Replaceable-head power adapter, AC 220–240V 50/60Hz, DC 12V/3A

5. Package Contents

5.1 Standard Packing List

Item	Qty.	Unit
Panel Window Processor 5 Inputs 9 Outputs	1	Piece
Ground wire	1	Root
12V/3A power adapter	1	Piece
Power adapter	1	Piece
Hanging ear (for the 5-in / 9-out window processor)	1	Pair
Manual	1	Part

Note: Please verify the items above upon unpacking. If anything is missing or appears damaged, contact your authorised PANIO sales or service representative immediately.

6. Panel Layout & Port Description

6.1 Front Panel

Serial Number	Name	Description
A	POWER	Power indicator light

6.2 Rear Panel

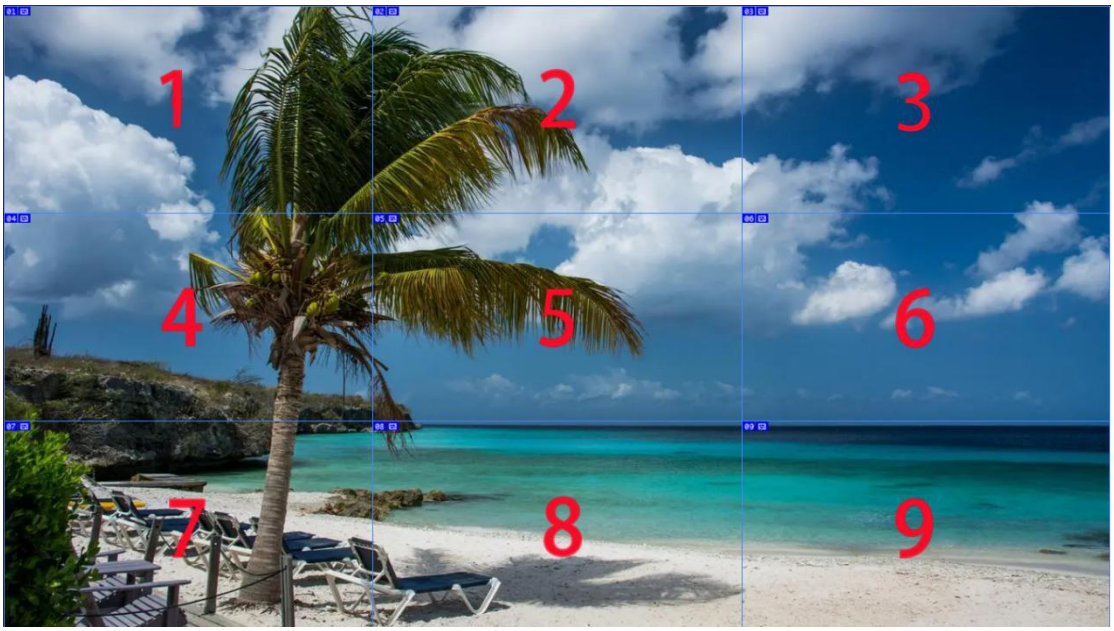
Serial Number	Name	Description
B	Screw	Grounding screw
C	ON-OFF	Power switch
D	DC 12V	12V/3A power interface
E	OUTPUT	2K output interface
F	INPUT	2K input interface
G	UHD	4K input interface
H	USB	USB 2.0 upgrade port
I	RS232	Serial control port
J	LAN	Network control port

7. Installation & Operation

7.1 Product Connection

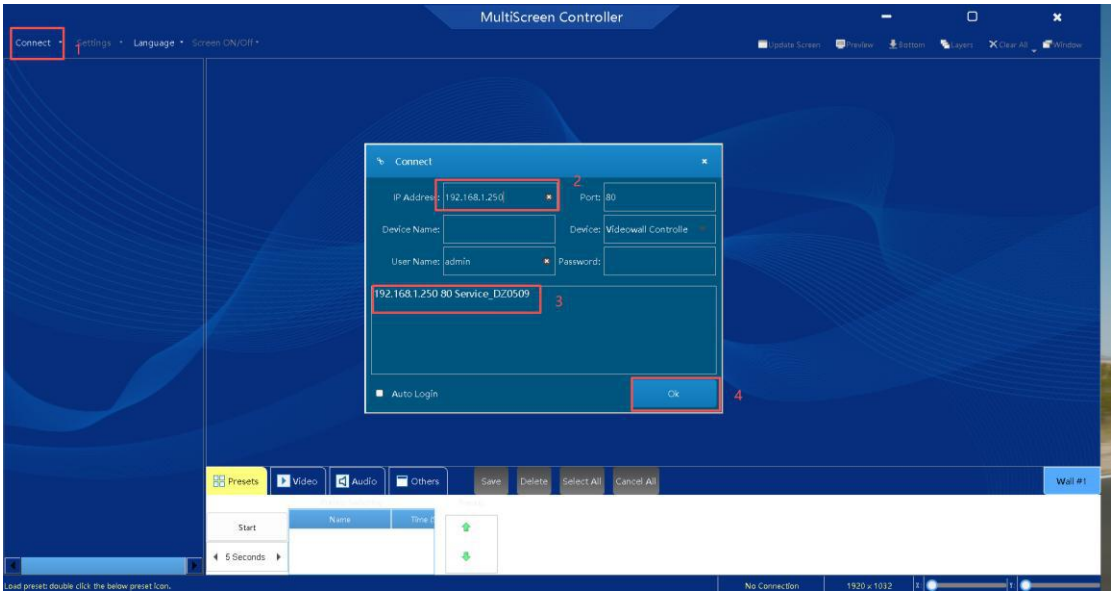
3×3 output wiring diagram. After connecting the software and setting the screen output, the software virtual screen will display the wiring order of the output ports; connect the large-screen output cables to the corresponding output ports on the processor according to the wiring order shown in the software.

Note: The large-screen output cables must correspond one-to-one with the output port order of the processor.



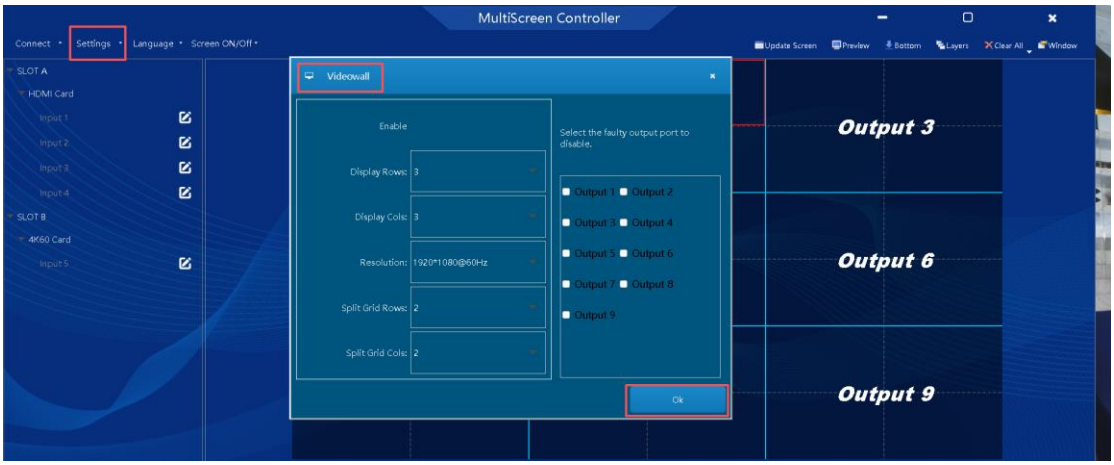
7.2 Software Connection

- Copy the client installation package to any drive on the computer.
- Double-click the client installation package to install the software.
- Connect the computer directly to the RJ45 port of the processor with a network cable, or connect both to the same switch or router.
- The factory IP address of the processor is 192.168.1.250. Set the IP address of the computer to 192.168.1.100 so that the computer and the processor are on the same subnet.
- Open the software, click Connect → Connect to New Host, and a login dialog will pop up. Enter the IP address of the processor and the user name (admin), and leave the password blank.

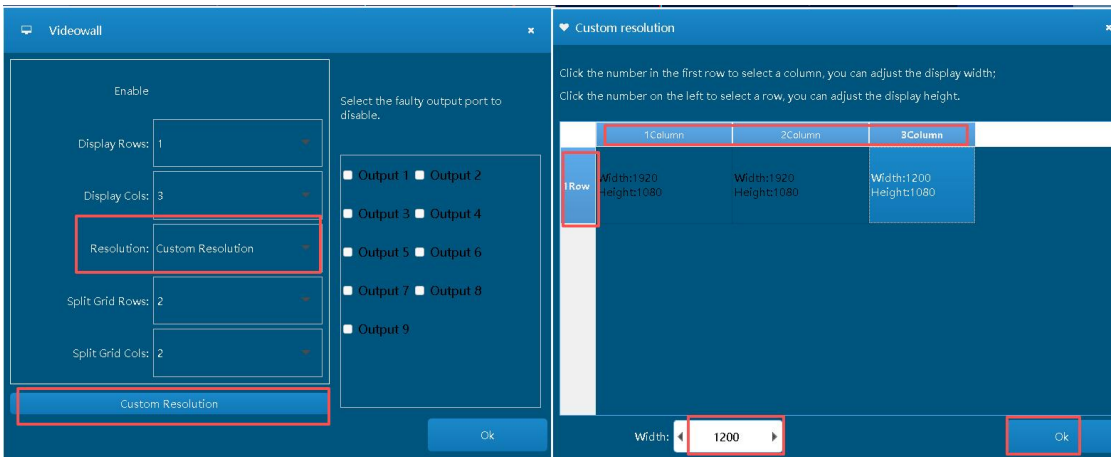


7.3 Splicing Wall Settings

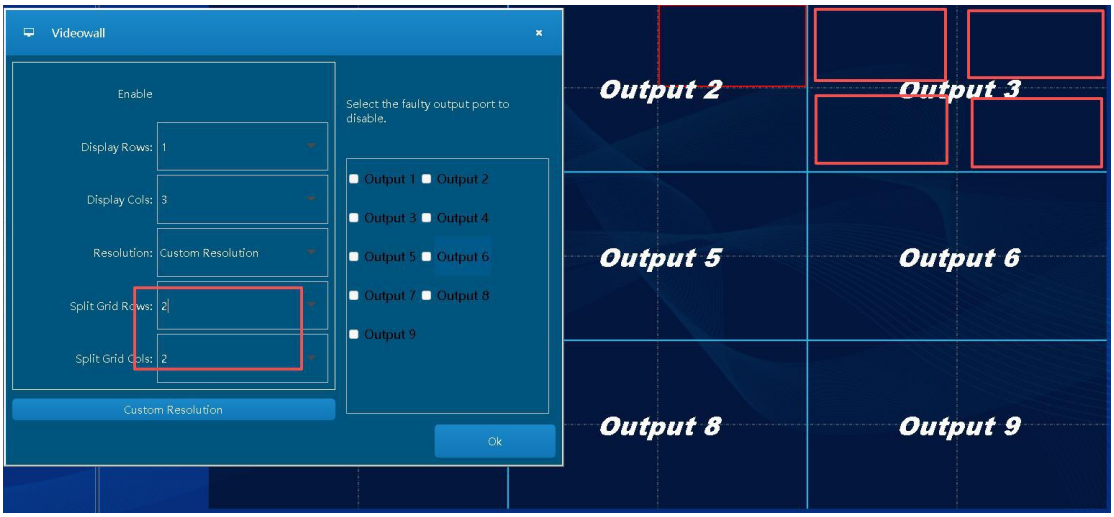
- Click System → Screen Settings. If the rear display is an LCD screen with a standard resolution, set the output resolution of the device according to the resolution of the screen.



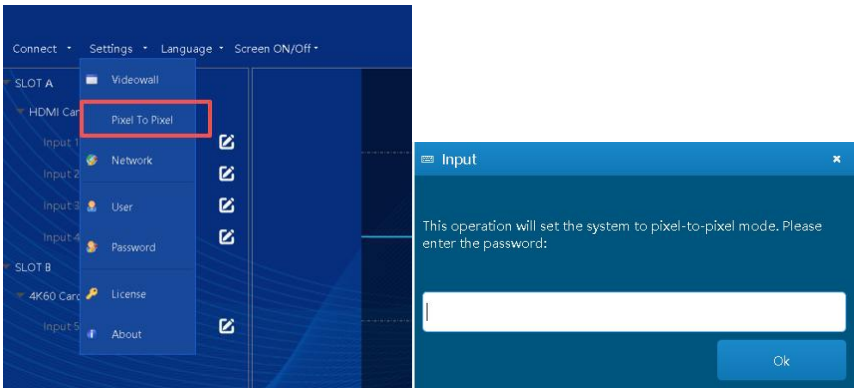
- If the rear display is a non-standard-resolution LED screen, select “Custom Resolution” in the screen resolution section, and then enter the output resolution width and height (in pixels) for each LED sending card in the dialogue box.



- Setting the logical screen involves splitting a single screen; the default is 1 row and 1 column, and it can also be set to multiple rows and columns.



- Point-to-point settings: this function is for specified models. Click System at the top-left corner, select point-to-point mode in the pop-up dialogue and use the password “admin”; after clicking OK, cut off the power and restart the processor. Point-to-point mode requires a dedicated graphics card to match the corresponding resolution directly.

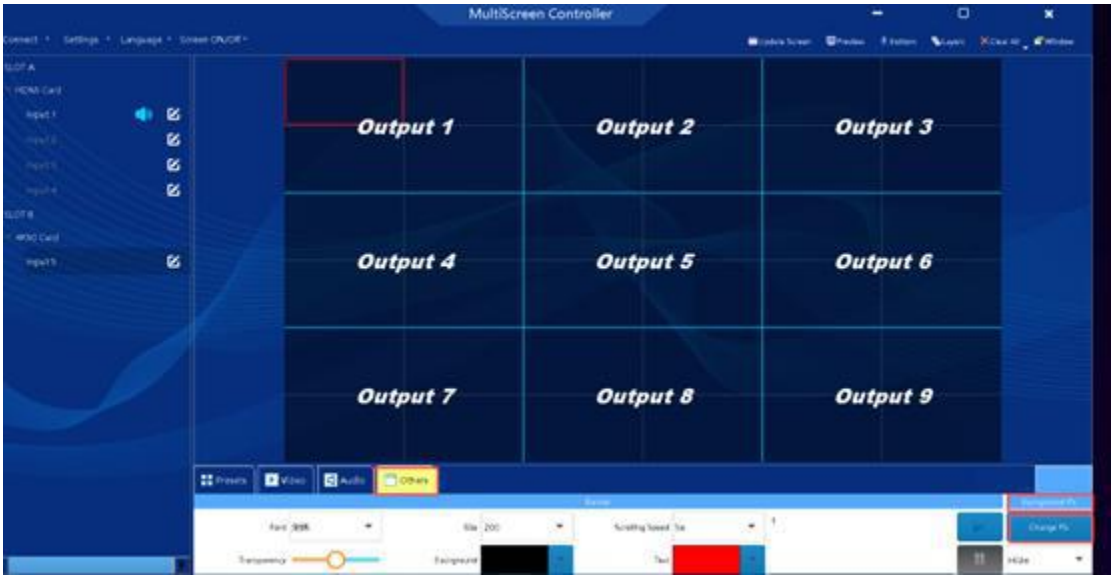


Modes and supported resolutions: 1×4 vertical screen (4320×1920@30Hz); 1×5 vertical screen (5400×1920@30Hz); 1×6 portrait (6480×1920@30Hz); 1×7 portrait (7560×1920@30Hz); 1×4 landscape (7680×1080@30Hz); 2×2 horizontal screen (3840×2160@60Hz); 2×3 landscape (3840×3240@30Hz); 2×4 landscape (3840×4320@30Hz); 3×3 landscape (5760×3240@30Hz).

7.4 Set Background Image

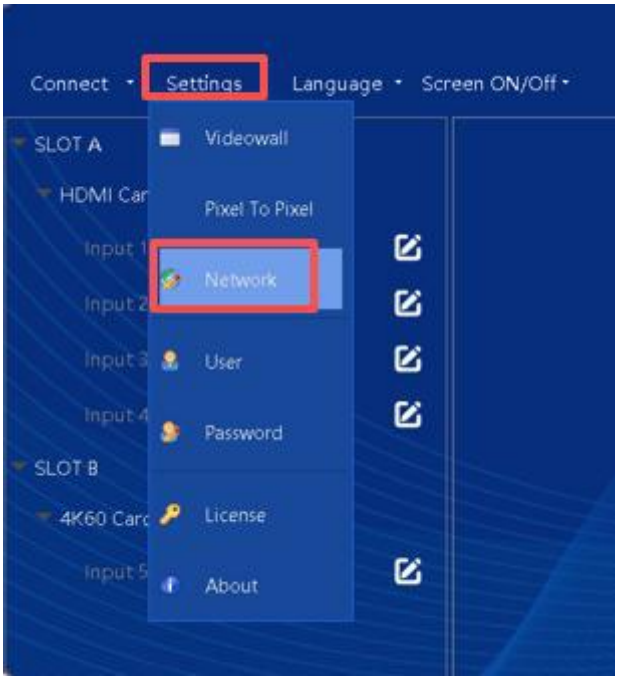
Click the “Others” menu below, then select the Background menu, which can enable the background image → Change Pic (highlighted indicates the enabled state).

*Note: The background image size cannot exceed 3840×2160, and the image format supports *.jpg / *.jpeg.*



7.5 Modify Processor IP

Click Settings at the top-left corner, then Network Settings, to set the IP address of the processor.



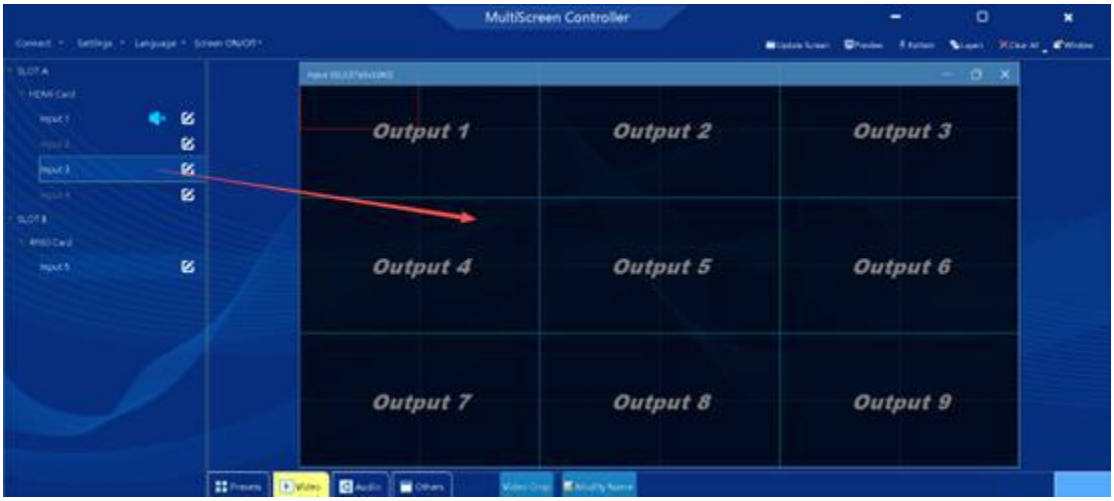


7.6 Signal Source Windowing

- Double-click a signal source with the mouse, or drag the signal source to the designated window position.



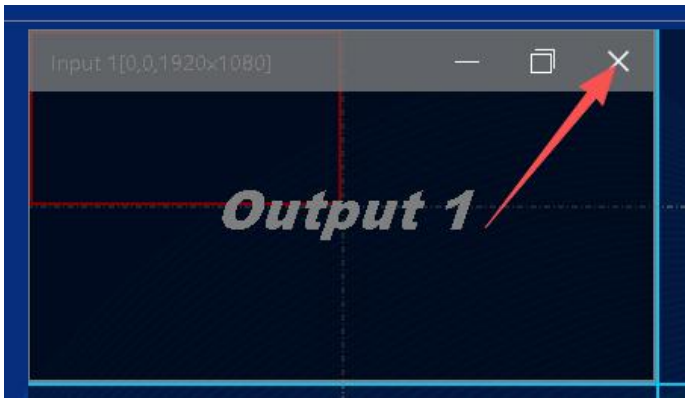
- Select the signal source, hold down the left mouse button on the software virtual screen, slide the mouse to any area on the virtual screen, and release the mouse; the signal source will fill the selected window area.



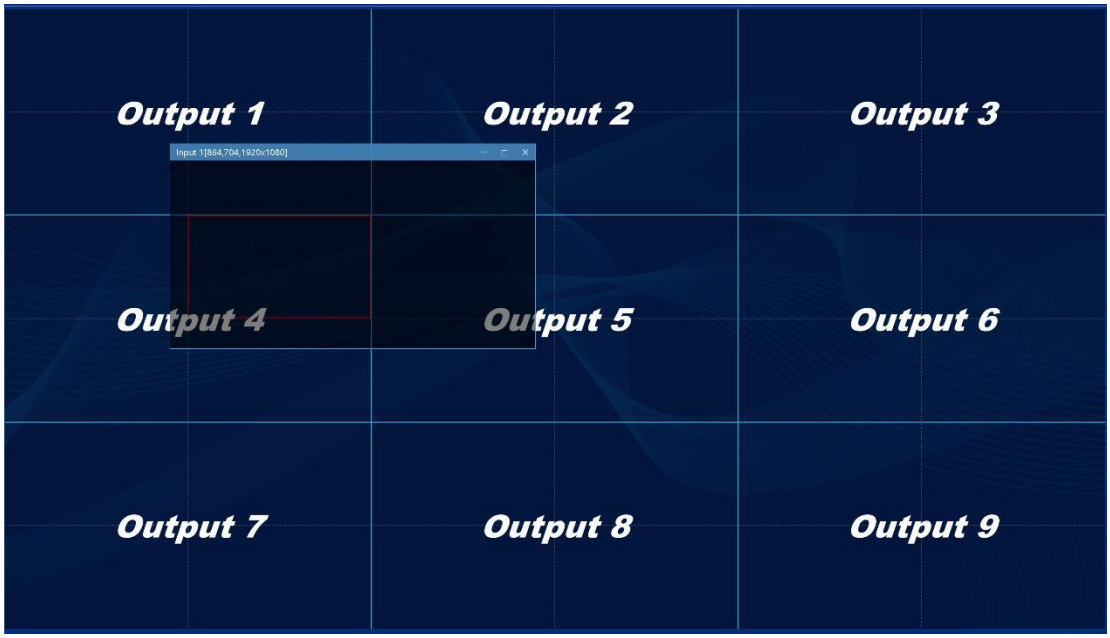
- Click Layers and select to open a single screen or the entire screen to complete quick windowing.



- Close Window: click “All” in the upper-right corner of the window to close the current window; click Clear Screen in the top-right corner of the client to quickly clear all images on the large screen.

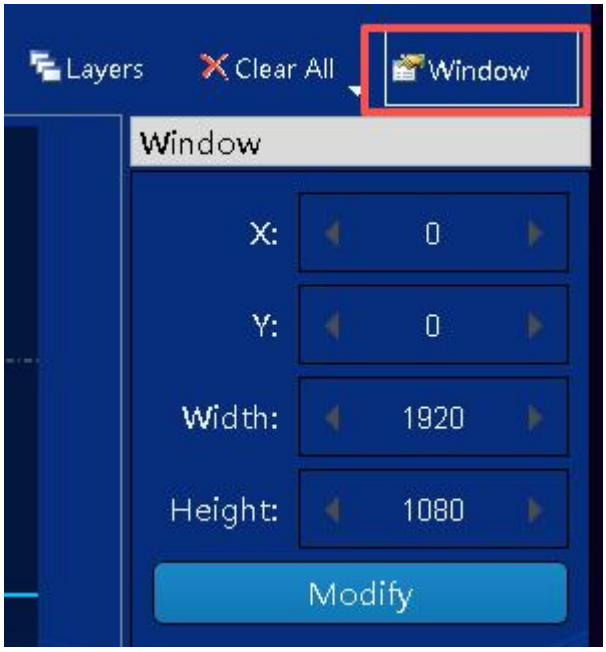


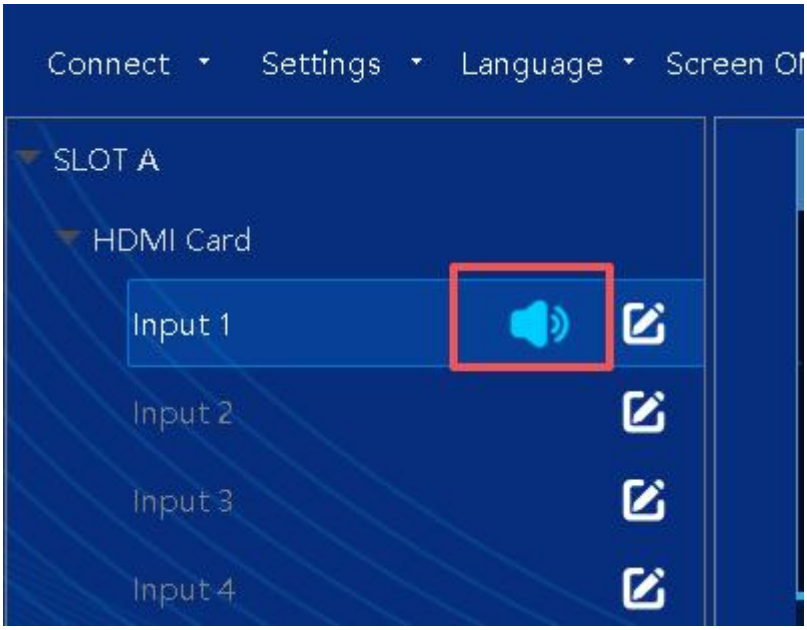
- Adjust Window Position and Size: drag the window position and resize the window with the mouse, or modify it through the window properties in the top-right corner of the client.



7.7 Audio On/Off

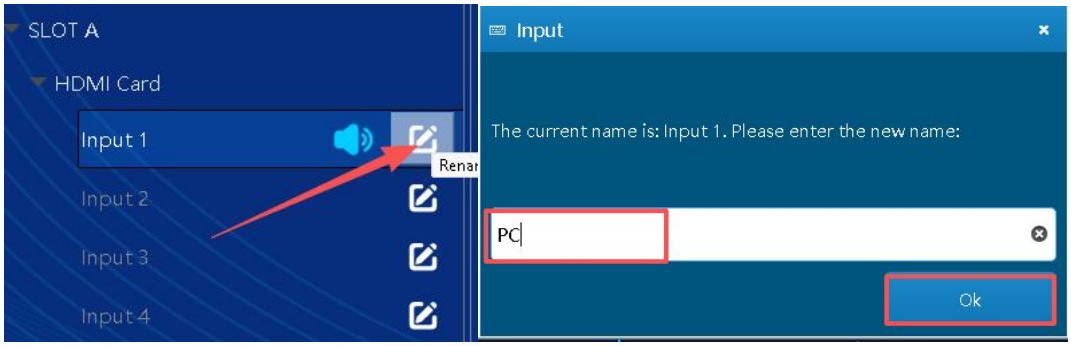
Click the small blue speaker on the right side of the signal source to toggle the audio output of the corresponding signal source.



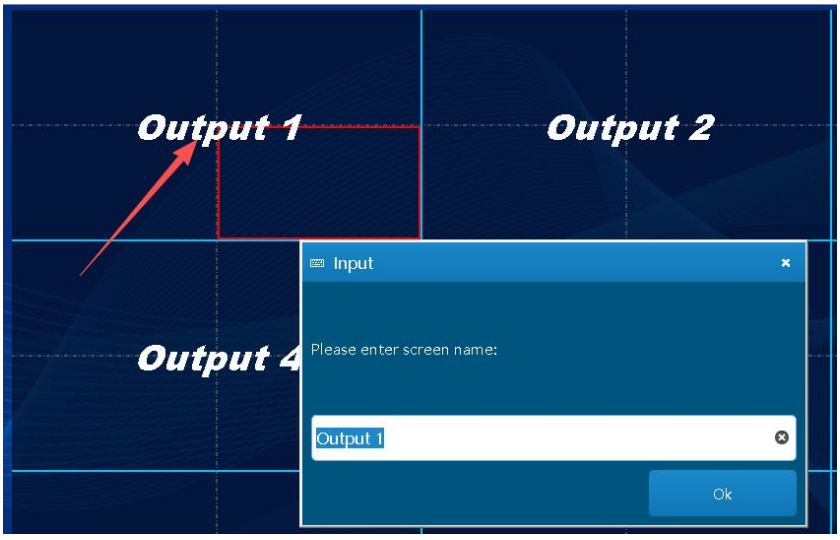


7.8 Renaming Signal Source and Output Port

- Click the edit button next to the signal source name you want to modify, and enter the new name to complete the modification.

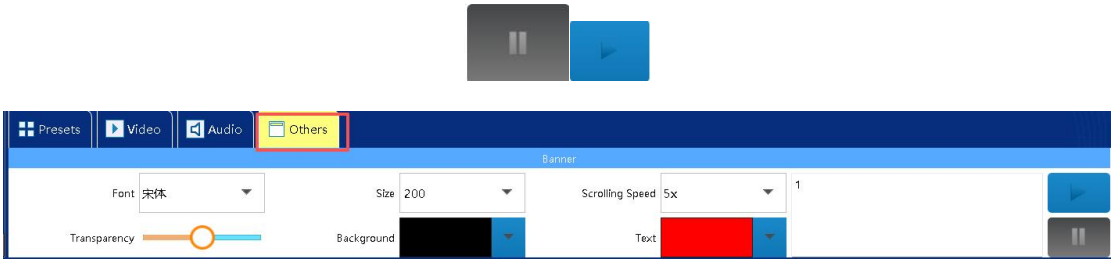


- Double-click the name of the output channel you want to modify, enter the new name, and click OK to complete the modification.



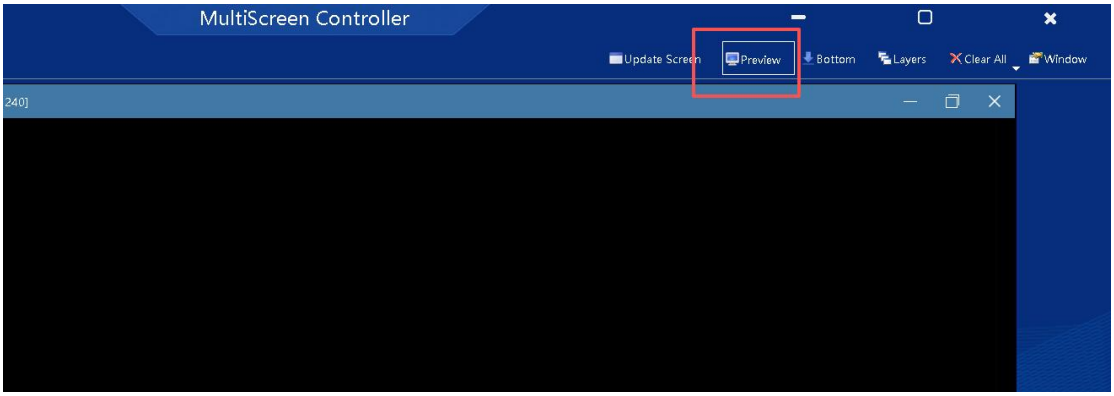
7.9 Subtitle On/Off

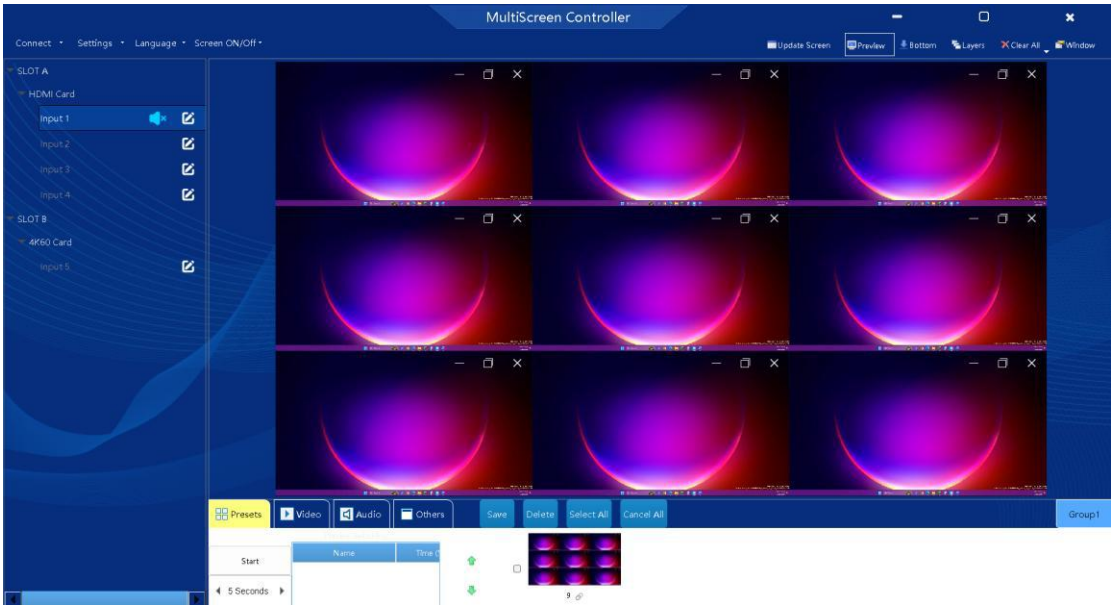
Click “Others” at the bottom of the software, then enter the subtitle content you want to display in the input box. After configuring the subtitles (font / font size / scrolling speed / text colour / background colour / background transparency), click the play button to display the subtitles and the pause button to hide them.



7.10 Echo On/Off

Click the top-right corner of the client to enable echo.

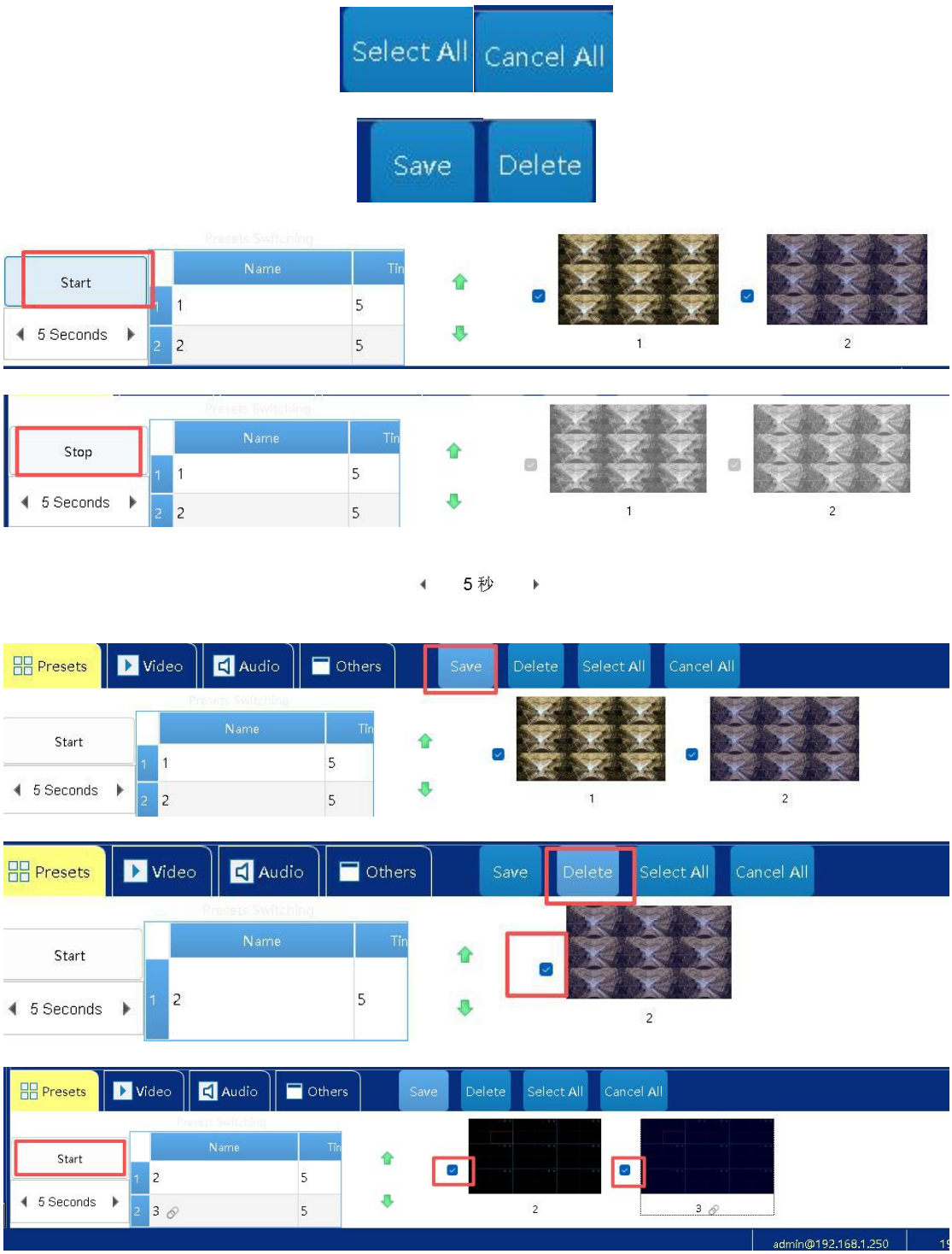




7.11 Scene/Plan Save and Call

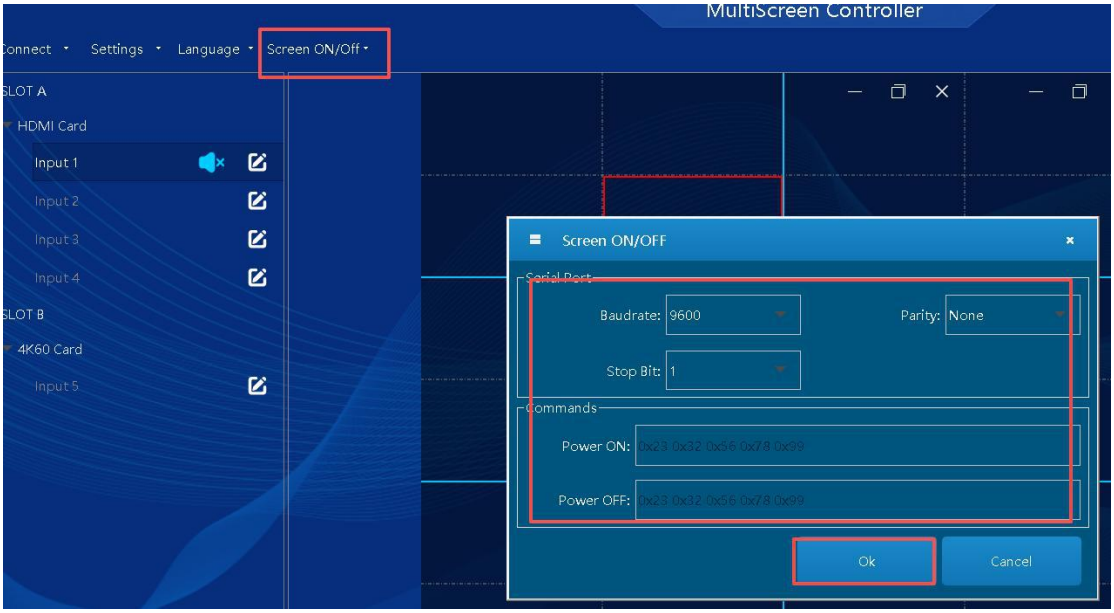
Arrange the scene layout, click Presets at the bottom of the client, and click the Save button to store the scene. Double-click the name of the plan you want to switch to, or check the plans you want to delete

and click the delete button. To rotate scenes, check two or more scenes, enter the interval time in the time interval field, and click to start rotation.



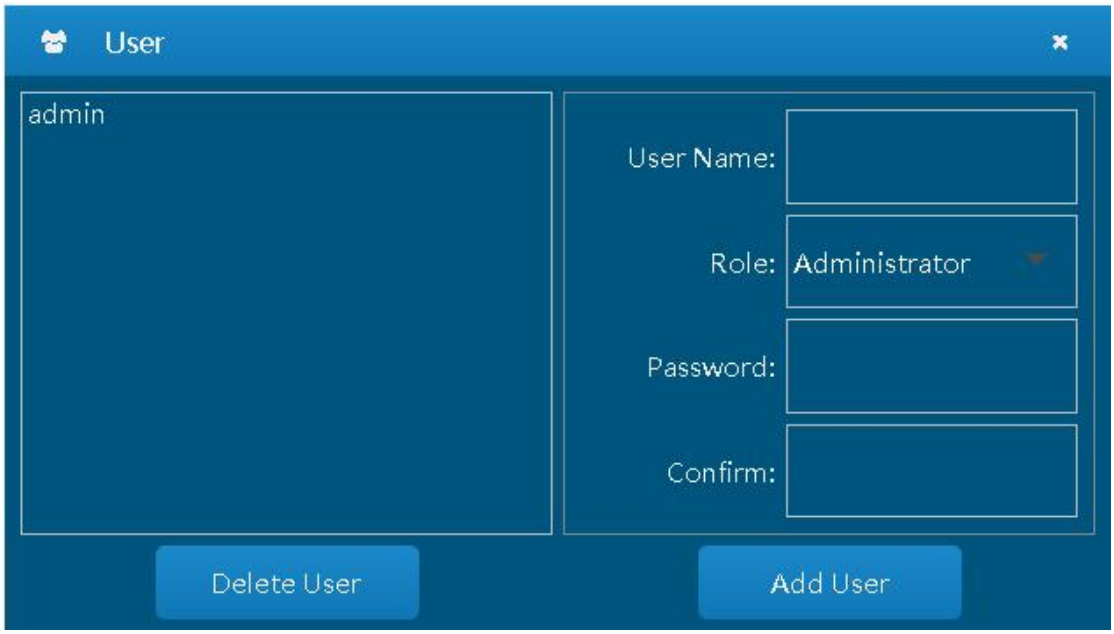
7.12 Switch Screen

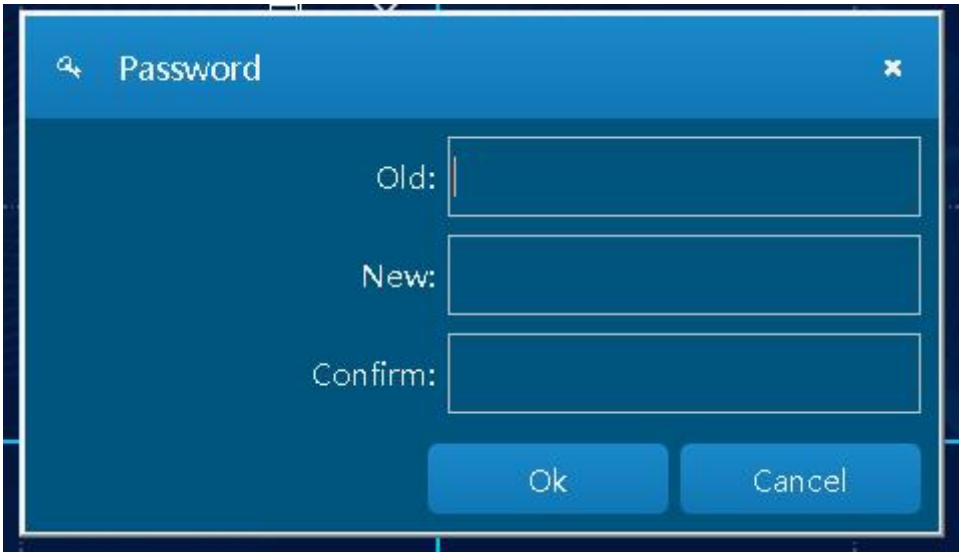
Connect the serial cable from the large screen to the processor correctly, then click Screen Switch and fill in the corresponding large-screen switch code according to the example format to control the large screen on and off.



7.13 User Management and Change Password

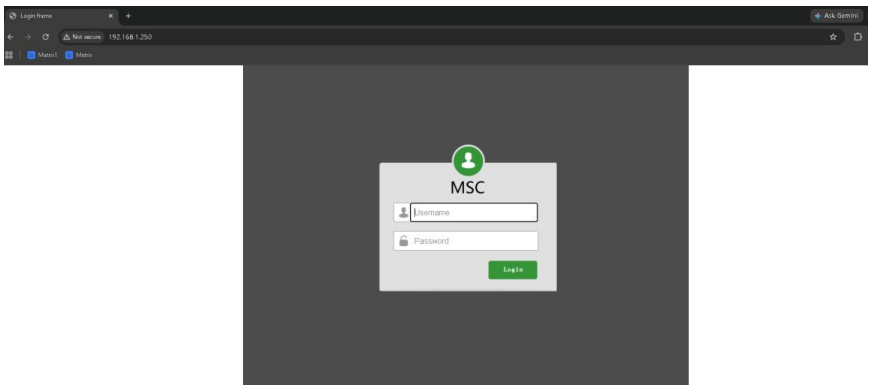
Click Settings → User Management, enter the user name and password, and click Add New User; select the user you want to delete and click Delete User. Click Settings → Password Management to modify the current account password.

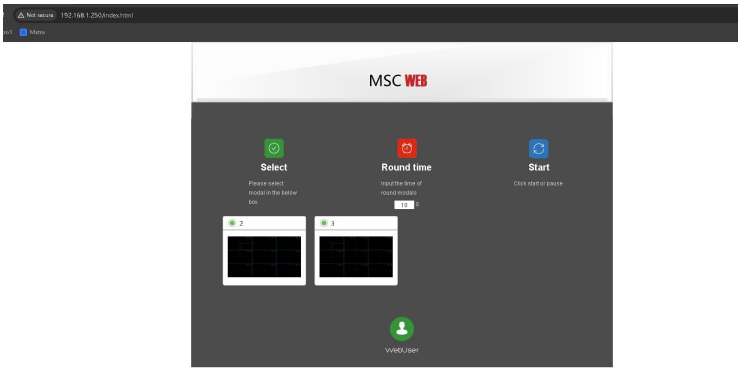




7.14 Web Control

Open the browser on a mobile terminal within the local area network, enter the IP address of the processor in the address bar, and the Web login page will pop up. Enter the account and password to log in (the initial account is “admin” and the password is empty). After a successful login, click the desired scene to retrieve it, and you can also set the scene for automatic rotation.

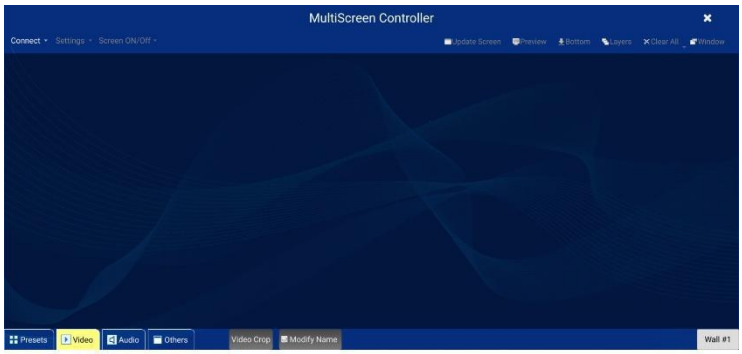




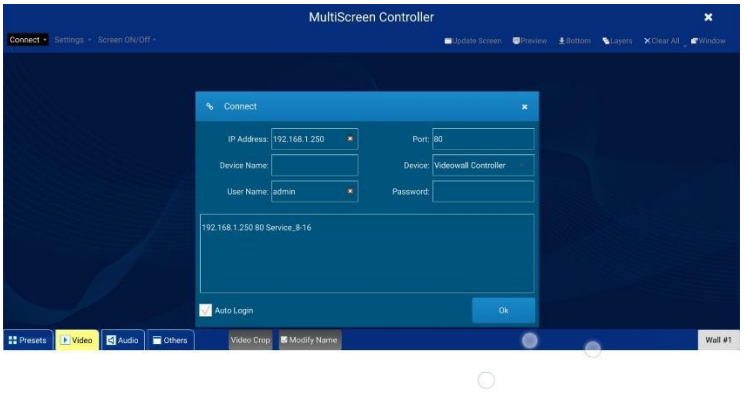
7.15 Android Operation Instructions

Install the app software on a tablet or phone, and make sure the Wi-Fi connection is on the same subnet as the processor; open the software and enter the IP address of the processor and the user name (admin), leaving the password empty, to log in. The Android interface operates in the same way as the computer interface. On the left is the signal source list: drag a signal source to the virtual screen

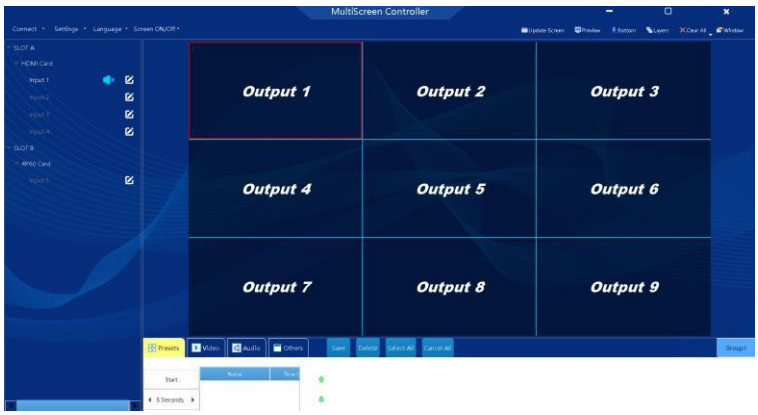
to display it, or click the audio switch in the upper-right corner of the signal source to turn the sound on or off. In the middle is the virtual screen, where you can zoom in and out, overlay and roam. On the right is the scene list: double-click to call a scene.











8. Advanced Control & API Commands

The HW5900_B supports centralised control over HTTP and serial port, and can be integrated with third-party control platforms. This chapter describes the HTTP interface and the serial-port command set.

8.1 Connection Method

This system supports switching scenes via HTTP and serial port.

8.2 HTTP Interface

Port: 80. Keep-alive mode is not supported. Unless otherwise specified, the POST or GET URLs in the interfaces below are: http://<host IP address>/index2.html

Interface	Request / Response
Login	POST. Content (JSON): {"Command":"Login","UserName":"Username","Password":"MD5 string of the password"}. Response (JSON): {"Status":"Ok"/"Error","SessionId":"...","ScreenGroup":[...],"Message":"..."} . The session ID must be saved for use in later requests.
Get Host Contingency Plan List	GET. Header includes session_id. Content: Command=GetAllModal&ScreenGroup=screen group number (1~4). Response (JSON): {"Status":"Ok"/"Error","ModalList":["Plan Name","Plan Name",...]}.
Get Host Plan Thumbnail	GET. URL: http://xxx.xxx.xxx.xxxx/. Header includes session_id. Response: image data.
Switch Plan	POST. Header includes session_id. Content (JSON): {"Command":"LoadModal","ScreenGroup":screen group number(1~4),"ModalName":"Plan Name"}. Response (JSON): {"Status":"Ok"/"Error","Message":"..."}.

8.3 Serial Port Interface

- Port and baud rate: set in communication settings, default 9600.
- Parity: None. Flow control: None. Data bits: 8. Stop bits: 1.

Packet format: the commands sent from the central control to the devices, as well as the responses sent from the devices back to the central control, are encapsulated into data packets. Each packet starts with the “$” character and ends with the “^” character. Op represents the operation command (a single character); Scr represents the screen group number to be operated on (a single character).

Op	Scr	Function / DATA
1	1–4	Retrieve the host plan list. Returns multiple plan names separated by spaces (UTF8). Example: $11^
2	1–4	Get the current window list. Returns window information in the format [Window ID, top-left X, top-left Y, bottom-right X, bottom-right Y]. Example: $21^
3	1–4	Switch plan. DATA is the plan name (UTF8). Example: switch screen group one to Plan Five: $31Plan Five^
4	1–4	Window signal source opening. DATA: [Window ID][Input Port Number 1-8][Top-left X, top-left Y, bottom-right X, bottom-right Y]. Example: $41[2][2][1920,1080,3840,2160]^
5	1–4	Switch window signal source. DATA: [Window ID][Input Port Number 1-8]. Example: $51[21326][3]^
6	None	Retrieve processor IP. Example: $6^. Response: IP:[192.168.1.250]
7	None	Set the processor IP address. DATA: IP address. Example: $7192.168.1.200^
8	None	Reset the processor. Example: $8^ (takes effect after restarting the processor).
9	None	Switch audio channel. DATA: [Input port number 1-8]; set to 0 to close the audio input. Example: $9[3]^

Op	Scr	Function / DATA
0	1–4	Close window. DATA: [Window ID]; set to 0 to close all windows in the current group. Example: $01[1]^
a	1–4	Move window. DATA: [Window ID][Top-left X, top-left Y, bottom-right X, bottom-right Y]. Example: $a1[1][1920,1080,3840,2160]^

Note: Write commands return a device response of Ok or Error.

9. Troubleshooting & Notes

9.1 Troubleshooting

Symptom	Possible Cause & Suggested Action
Cannot connect to the processor	Confirm that the PC and the processor are on the same subnet. The factory IP address is 192.168.1.250 and the PC is normally set to 192.168.1.100.
The software cannot find the host	Check the network cable and the RJ45 connection, and make sure the Connect to New Host dialogue uses the correct IP address and the user name admin.
No image on the virtual screen	Verify that the input sources are powered and connected, that the screen output has been configured, and that the output cables match the wiring order shown in the software.
A window cannot be opened or moved	Confirm that the window ID is unique and greater than or equal to 1. Point-to-point mode of the HW5900_B model does not support window operations.
Incorrect LED screen resolution	Select Custom Resolution and enter the correct output resolution width and height for each LED sending card.
Web or App login fails	Confirm that the mobile terminal is on the same subnet as the processor, and use the account admin with an empty password on first use.
No audio output	Click the speaker icon on the right side of the signal source to enable audio, or use the command $9[3]^ to switch the audio channel.

9.2 Notes

- Provide stable power and an appropriate installation environment according to the equipment specification. Avoid high temperature, high humidity, dusty conditions and strong electromagnetic interference.
- HDMI signals are sensitive to cable quality. Use certified HDMI cables and keep the cable length within the recommended range for the selected resolution.
- Before updating the firmware or the PC software, back up your scenes and network settings, and do not interrupt the power or disconnect the network cable during the update.
- For long-term reliable operation, periodically check connector tightness, cable condition and equipment ventilation. If the equipment becomes unusually hot or emits unusual sounds or odours, power it off immediately and contact service.

- When integrating the processor into a central control system, validate each command with the software or a serial terminal first, then incorporate the validated commands into your macros or scenes.

10. Warranty Service

PANIO International Co., Ltd. provides a one-year limited warranty from the date of purchase from PANIO or an authorised distributor. Within this period, provided that the product is used normally and in accordance with the official service support requirements, the unit will be repaired, replaced, or otherwise serviced under the warranty terms when a non-induced fault occurs in the course of normal operation.

If the product experiences a failure that does not meet the above guarantee scope within the guarantee period, PANIO will choose one of the following methods to address the issue, with all related costs borne by the company: repair the defective product or its components; replace it with a product or component that is functionally equivalent to the original; or refund the full price paid for the defective product. All replaced products become the property of PANIO, and replacement products or components may be new or professionally refurbished to meet quality standards. For products or components that are replaced or repaired, an additional 90-day guarantee period applies; where the remaining time of the original guarantee period exceeds 90 days, the longer of the two periods applies.

The warranty does not cover damage caused by misuse, abnormal voltage, lightning strikes, accidental impact, unauthorised disassembly or modification, custom firmware modification, or the use of non-original power adapters or cables. Regardless of whether the product is within the guarantee period, PANIO assumes no responsibility for any software, firmware, information or stored data included in, stored on, or integrated with the products sent back for repair; it is the responsibility of the user to back up such data.

To request after-sales service, please contact PANIO International Co., Ltd. or your authorised service representative with the following information so that your request can be handled promptly: model number (HW5900_B), product serial number, date and channel of purchase, a clear description of the fault, and a brief diagram of the on-site connection topology.