SMC Series Ultra HD Hybrid Matrix
Operation manual

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Safety Reminder

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To protect the device and operating personnel from electrostatic discharge, you need to check and ensure that the device is grounding good before the device is powered on. Please observe the following when you install, use, maintain this equipment.

Make sure the device ground connection.

➢ Please use single-phase three wire system AC 220V power supply, and ensure all transmission system is grounding good.

➢ To protect operating personnel and the device ,please turn off all power supplies and pull the plug before moving the device or doing some specific works witch need to be done when the electricity is turned off . Please turn off   the main power switch on rainy days or when not in use for a long time.

➢ Please do not put anything upon the cables, or tread the cables .

➢ To avoid damaging the device , please turn off power supply before plugging cable into the device or pulling cable from device. The damage caused by plugging/ pulling cables without turning off power supply is outside the scope of the warranty.

➢ The power of the device gives out heat when it works, so it's necessary to keep the work environment ventilated to protect the device from the damage caused by overtemperature.

➢ Do not place the device in very cold or very hot places. Do not sprinkle any corrosive chemicals or liquid on or around the device.

➢ To avoid accident or any further damage ,non-professionals please do not dismantle or maintain the device without permission.

➢ Do not sprinkle any corrosive chemicals or liquid on or around the device.

1. Introduction

SMC series is a kind of professional enhanced HD modular matrix. The plug-in design can realize the flexible configuration of various signal. Supports common video signal input, such as Fiber HDMI, DVI, VGA, YPBPR, DP, CVBS, 3G/HD/SD-SDI, IP streaming media, etc., supports powerful audio embedding and de-embedding function. This series matrix integrated control signal (RS232/IP) transmission and control functions, support system state input/output signal intelligent monitoring, intelligent signal automatic backup, dual control backup, dual power backup.

2. Product Features

- Modular structure design--single and dual card design is flexible for configuration of signal type for input and output channels
- Support CVBS, YPbPr,VGA , HDMI,DVI, AUDIO,3GSDI,HDBaseT,fiber signal and H.323,SIP transfer protocol,Seamless docking distributed IP monitoring system; video conference system and recording and broadcasting system;
- Each card support Bi-directional RS-232 transmit, which can realize the centralized control of the peripheral equipment;
- Support fast seamless switching technology ;
- Support intelligent EDID switching technology and HDCP management ;
- Every channel support color, brightness, resolution, scaling and other image adjustment
- Support resolution up to 4K@60HZ;
- Support HDMl2.0,DPl.1,HDCP2.2;
- Support Deep color 48/36/30/24-bit, VUV4:2:2/4:4:4;
- Each output channel can   fix   output by 16 kinds of common resolutions;
- Support TCP,UDP,IP,HTTP,NTP,RTP,IGMP,RTSP,RTCP network protocol;
- Support H.264 Baseline, Main High , support Profile encoding, advanced video preprocessing algorithm MBAFF;
- Supports fiber transmission technology, the maximum transmission distance is 80 kilometers;
- Support video port intelligent backup;
- Support POC power supply （ HDBaseT) ;
- Support equipment temperature monitoring, video port state monitoring;
- Support software testing and adjusting function of input / output port ;
- Support touch screen control and double RS-232, double TCP/IP control;
- The front panel 7 inch high-definition color touch screen can show real-time state feedback;
- Adopt the design of double power supply, support 7*24 hours of uninterrupted operation;

3. Connection and Operation

1. Connect signal source such as blu-ray player,game controller,A/V receiver,cables,satellite receiver etc. to the HDMI input port of the matrix.

2.Connect the output port of the matrix to HD display or HD projector with HDMI input port.Notice:It's better to use High-Speed HDMI Cable when the transmission distance is too long.

3.Firstly power on the signal source， then the matrix(with power supply)， finally devices connected to the output port .

4.Plug in power to each device in the same order .

5.If all devices are connected properly,every display device should display the specified signal to make sure the devices are normal.If one of the displays failed to receive signal correctly,enter the menu of display,adjust the resolution from MIN to MAX until the signal is displayed normally.A 24 Hz vertical refresh rate may work better than 60 Hz or higher.

The following diagram is S-Mix-Pro matrix switching system application:
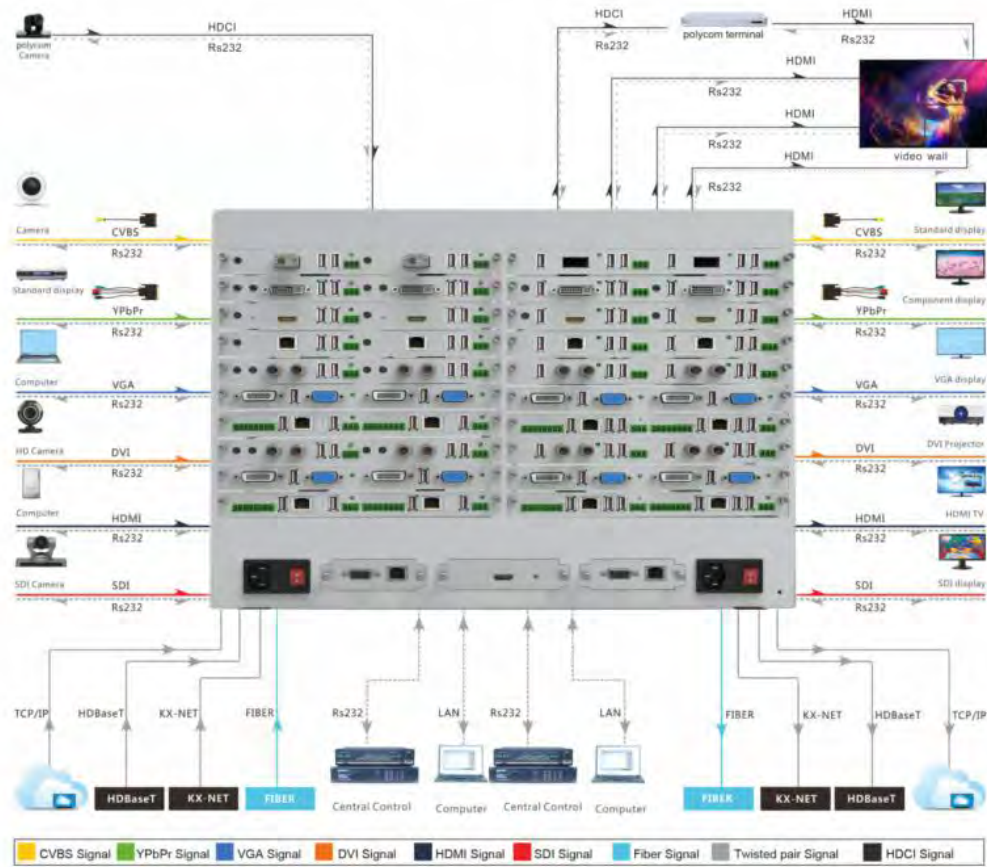
4. Standard Packing list

Please check the outer package before using this product. Please contact us if the product is faulted or not intact. We will sincerely serve you according to relevant provisions.

NO.	Name	Quantity	Unit
1	Matrix enclosure	1	pcs
2	AC power adapter	2	pcs
3	Certification	1	pcs
4	Warranty Card	1	pcs
5	User manual	1	pcs

5. Specification

Model	SMC100	SMC200	SMC400	SMC800
Name	10 ways enhanced modular matrix	20 ways enhanced modular matrix	40 ways enhanced modular matrix	80 ways enhanced modular matrix
input/slot	10/5	20/10	40/20	80/40
Output/slot	10/5	20/10	40/20	80/40
Input/output module	Support HDCI,CVBS,YPbPr,VGA,HDMI,DVI,3GSDI,AUDIO,HDBseT,FIBER,IP streaming			
Static protection	Human body discharge mode: ± 8kV (air gap discharge) ± 4kV (contact discharge)			
Input voltage	Power supply 100VAC~260VAC, 50/60 Hz, international adaptive power supply			
Control	Serial port, network port, touch screen and other control methods			
Bandwidth	18GBPS			
Serial port control	Control protocol	RS-232 (Baud rate:115200 data bit:8bit stop bit:1 No parity bit)		
	Connector	9 pin D-sub(DE9F) Socket 2=TX, 3=RX 5=GND		
Network IP	Control Protocol	TCP/IP		
	connector	RJ45 Connector 10/100Base-T Ethernet		
Color space	Support RGB444, YUV444, YUV422 color space, support x.v.Color extended color gamut			
Transmission distance	HDBaseT technology transmits 70M (Cat 6 cable), H264 technology transmits more than 200 meters (Cat 6 cable), 2-80 Km (single-core single-mode fiber); 30 meters (digital cable)			
Dimension w/h/d	440x221x374(5U)	440x355x374(8U)	440x620x374(14U)	440x1100x374(25U)
Work temperature	-10℃---50℃			
Storage temperature	-25℃---55℃			

6. Equipment operation and function description

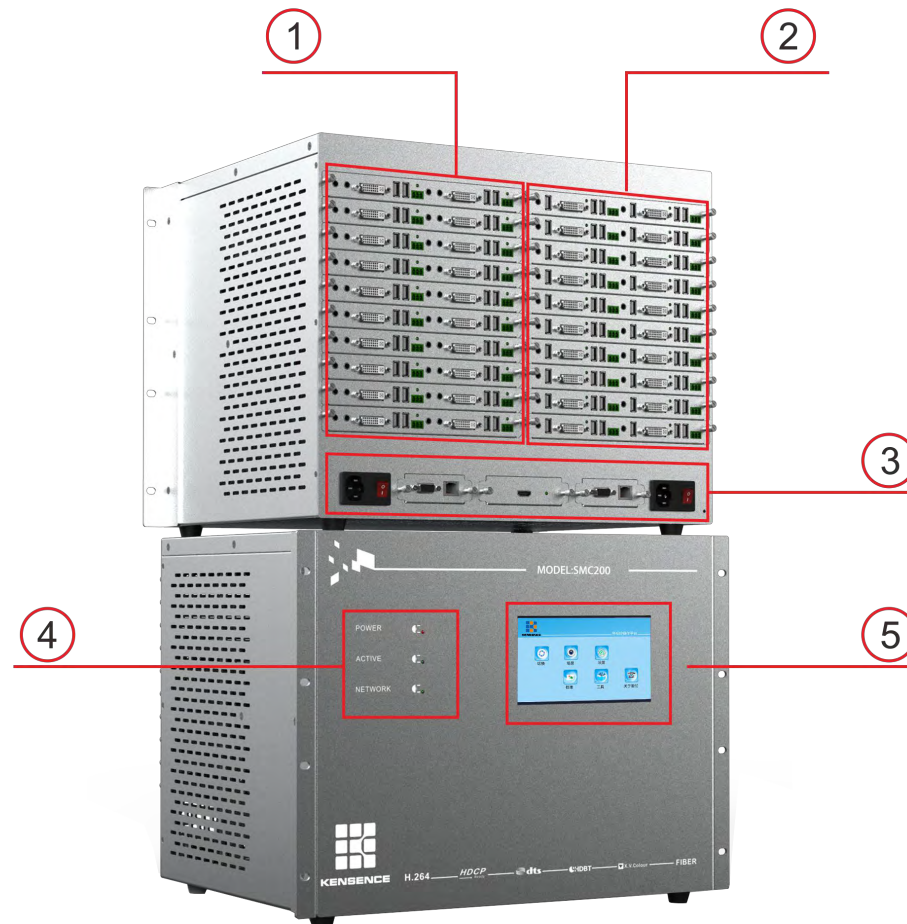## 6.1Panel introduction (SMC200 as an example)

Figure 6.1.3 SCM200 product picture

Explanation:

1. Signal input card area

2. Signal output card area;

3. In order of power supply 1, control interface 1 (network port and serial port), screen preview

card, control interface 2, power supply 2;

4.POWER: power indicator, power on;

   ACTIVE: data transmission indicator;

Network: network connection status indicator;

5.7-inch touch screen, through the screen control matrix;

6.2 Touch screen control instructions

The matrix can be controlled by the front panel high-definition touch screen. The touch interface contains six operating options: "Display, Switch, Scene, Settings, Tools, About Us". As shown in Figure 6.2.1, click any option to enter The operation interface of this option, after entering the operation interface, click the button icon of this option again to return to the main interface.

Figure 6.2.1 matrix touch screen operation main interface

1.Matrix switching operation: In the main interface, click the "Switch" option to enter the input signal selection interface, as shown in Figure 6.2.2, select the input signal port "15", then the output port selection interface will pop up, select the output port, Then click "Execute" to switch successfully, as shown in Figure 6.2.3. (You can select more than one output port at a time. Clicking the "All" button in the interface will automatically select all the output ports. The selected port number will be highlighted in red. The output port shown in Figure 6.2.3 is "25, 27,28,29,30").
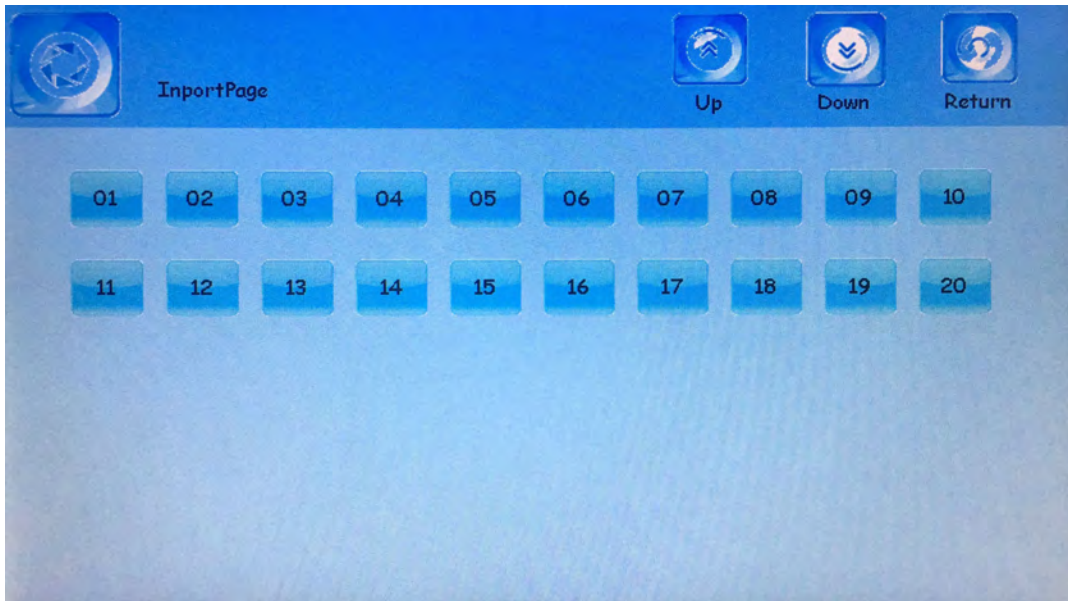
Figure 6.2.2 Signal input output port selection interface

In the input port selection interface, click "previous page" "next page" to page, select the input signal, click "preview" to preview the screen of the currently selected signal, double-click the screen to exit the preview, click "return" to return The previous interface
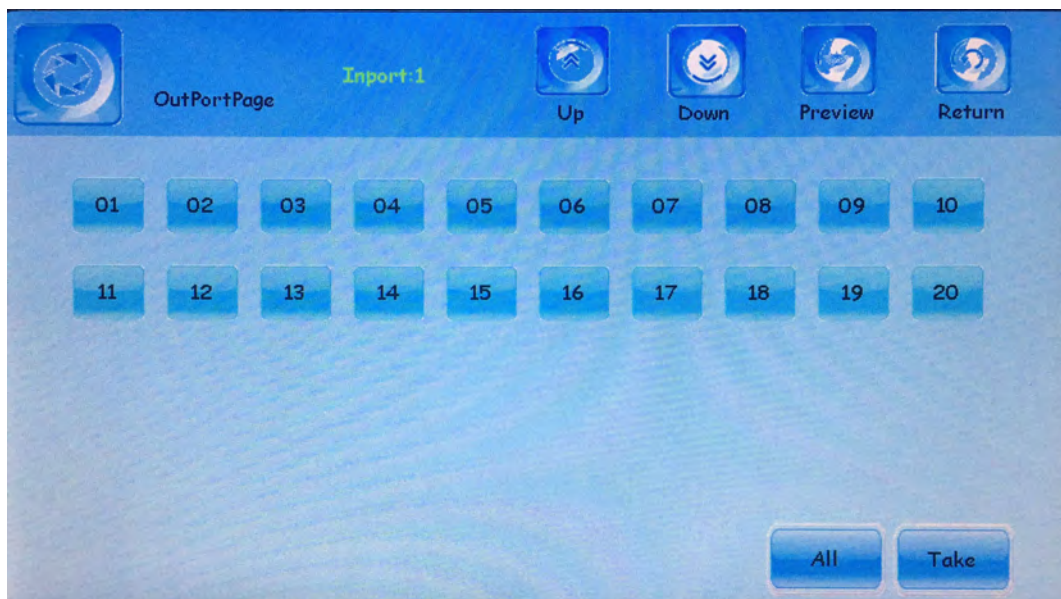

Figure 6.2.3 output port selection interface

In the output port selection interface, click "previous page" and "next page" to page up and down, click "return" to return to the previous interface.

Scene save and recall: Click the "Scene" button in the main interface to enter the scene save and recall interface. As shown in Figure 6.2.4, there are 12 scene options "0~11". Save or recall

the scene first. Select the scene number, and then click "save" or "call" button to complete the operation, such as save "scene 8" please select the scene number, and then click "save" button can be, such as calling "scene 11" please select The scene number, and then click the "call" button.

After selecting the scene number, click the "View" button to view the input and output status of the scene, as shown in Figure 6.2.5, where scene "0" is the current real-time scene of the matrix, select the scene "0" and click the "View" button to display the current matrix Input and output status, select the scene number and click the "Clear" button to clear the scene.
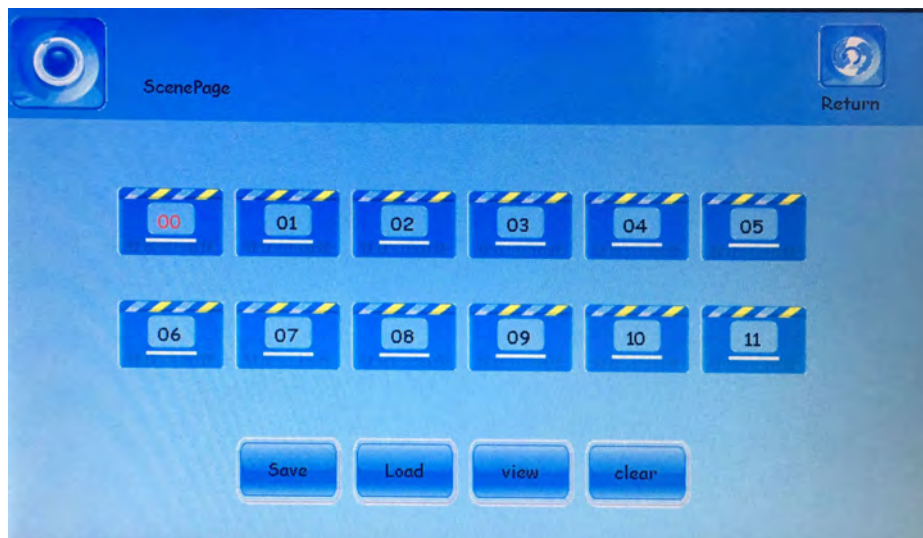

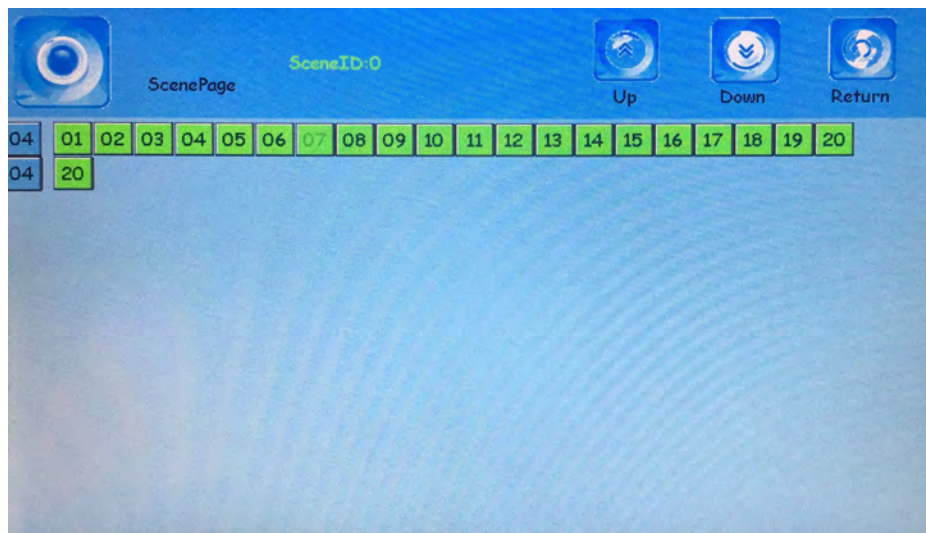Figure 6.2.4 scene save and recall interface

Figure 6.2.5scene input output state interface

2.Matrix setting：Matrix setting: Click "Settings" option in the main interface to pop up the matrix setting interface, as shown in Figure 6.2.6. This interface shows the matrix configuration information, such as input and output port number, serial number, version number, etc. The
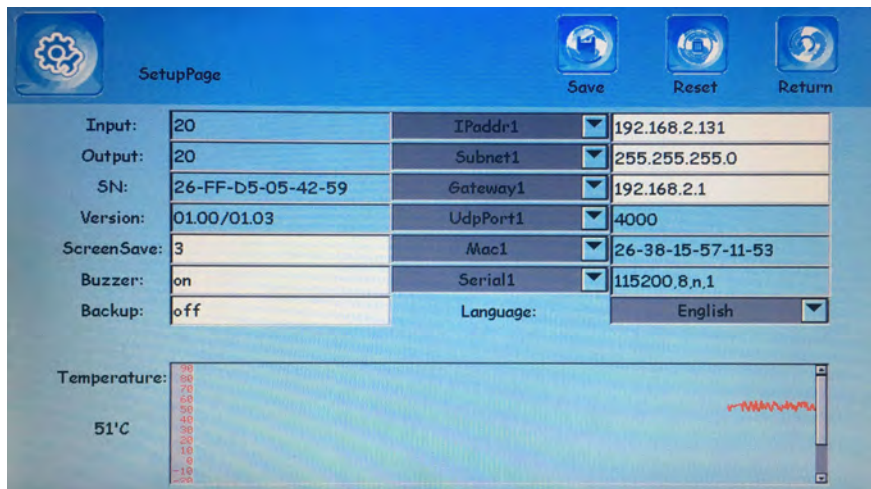
8

following options can be set:

Figure 6.2.6 Matrix setting interface

✧ **Screen saver time:** Click this option to pop up the numeric keypad and customize the screen saver time. The matrix default screen saver time is 3 minutes.

✧ **Buzzer switch:** Click this option and enter ON or OFF to turn the buzzer off or on.

✧ **Backup switch:** Click this option and input ON or OFF to turn off or turn on the backup function. The backup function exists between input signals 1 and 2, 3 and 4, and input signals 2 and 4 are backup signals.

✧ **Network control port selection:** Click the triangle drop-down arrow of "IPaddr1" and select "IPaddr1" or "IPaddr2" to control the matrix.

✧ **IP address change**: Click on the IP address, the number keypad pops up, and the IP number to be changed.

✧ **Serial Control Port Selection:** Click the triangle drop-down arrow of "Serial" option to change the serial port control port.

✧ **Chinese and English interface switching:** Click "Language" option and select "Chinese" or "English" interface.

The setting interface will take effect immediately after the "Chinese and English interface switching" selection, other settings need to be clicked after the "Save" button is available.

4,The use of shortcut tools: In the main interface, select "Tools" option, the pop-up tool interface, as shown in Figure 6.2.7:

Figure 6.2.7 shortcut tools operation interface

Shortcut method of operation instructions:

1 switch to more ,switch one of the input signals to the output of multiple outputs:
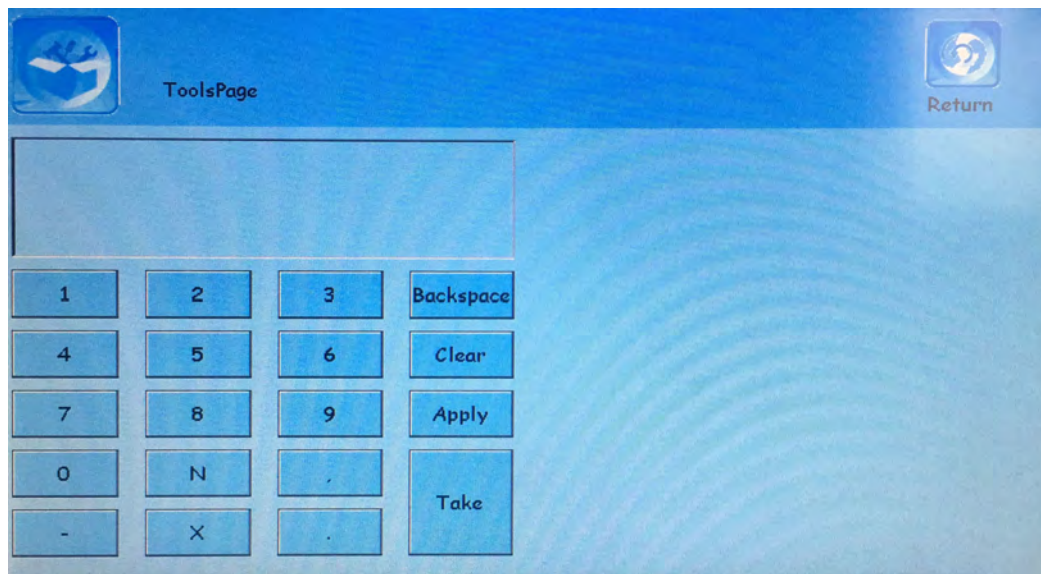
 Command: 1X1,2,3,4. (Input 1 output 1,2,3,4)
 Command: 1X1-4. (Input 1 output 1,2,3,4)
 Command: 1X1-4,6,9,10,11. (Input 1 output 1,2,3,4,6,9,10,11)
 Command: 1X1-4,6,9-11.(Input 1 output 1,2,3,4,6,9,10,11)

Multi-channel switch to multiplex, switch multiple input signals to   multiple outputs:

Commands: 1X1, 2.2X3-5, 7, 9.4X10-12, 14, 16-18. (Input 1 output 1,2
                            Input 2 cut output 3,4,5,7,9
                            Input 4 cut output 10,11,12,14,16,17,18)
Special switch, switch all input and output signals one by one:
Command: NXN. (1 cut 1, 2 cut 2, 3 cut 3 and so on to 40 cut 40)

Remarks: All switching commands must end with the symbol ".", after the command is entered, click the "Apply" button, and then click the "Execute" button to execute. If there are multiple signals connected in the command, the symbol "-" can be used, for example, 2X6-10. (input 2 cut output 6, 7, 8, 9, 10), the symbol can be used when there are multiple unconnected signals in the command " ,"If 3X11,19,25. (input 3 cut output 11, 19, 25), multiple groups of commands are separated by the symbol ".", such as 1X1, 2.2X3-5, 7, 9.4X10-12, 14,16-18.(Input 1 output 1,2, input 2 output 3,4,5,7,9, input 4 output 10,11,12,14,16,17,18) .

5,Touch screen calibration: Select "Calibrate" option in the main interface, pop-up touch screen calibration interface, as shown in Figure 6.2.8, click the screen to complete the calibration settings.
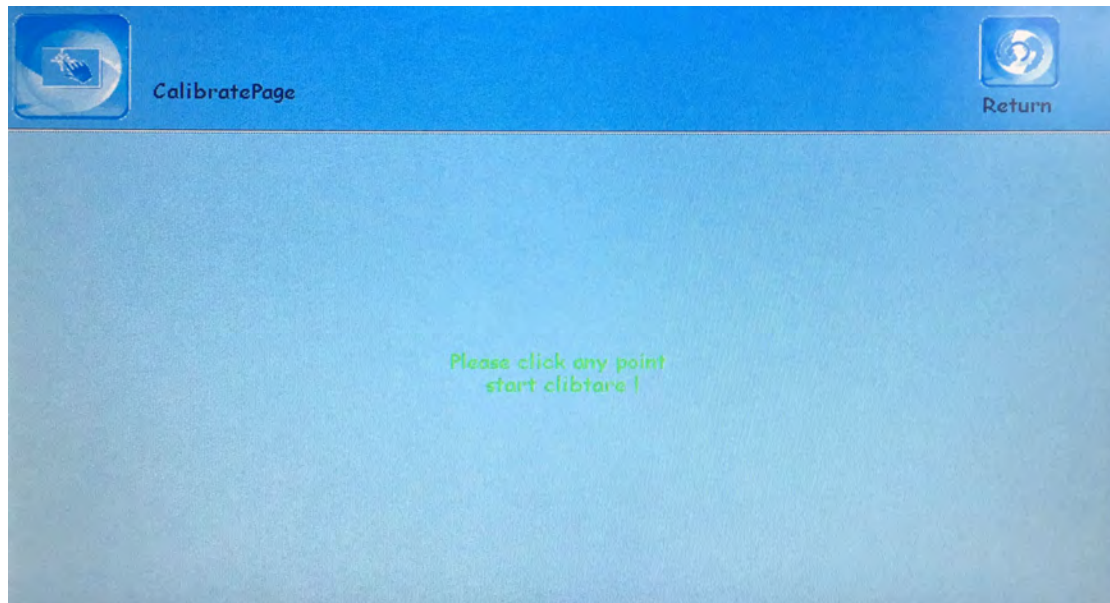
Figure 6.2.8 Calibration interface

6.3 PC Control Software Operation Instructions

The SMC Cloud Media Signal Management Platform is a green software that can be used by double-clicking on the main program to connect the matrix and computer via RS232 serial cable or network cable, and control the matrix through the SMC control software.

Note: When using a network connection, please set the IP ofS the computer to be in the same network segment as the matrix IP, as shown below:
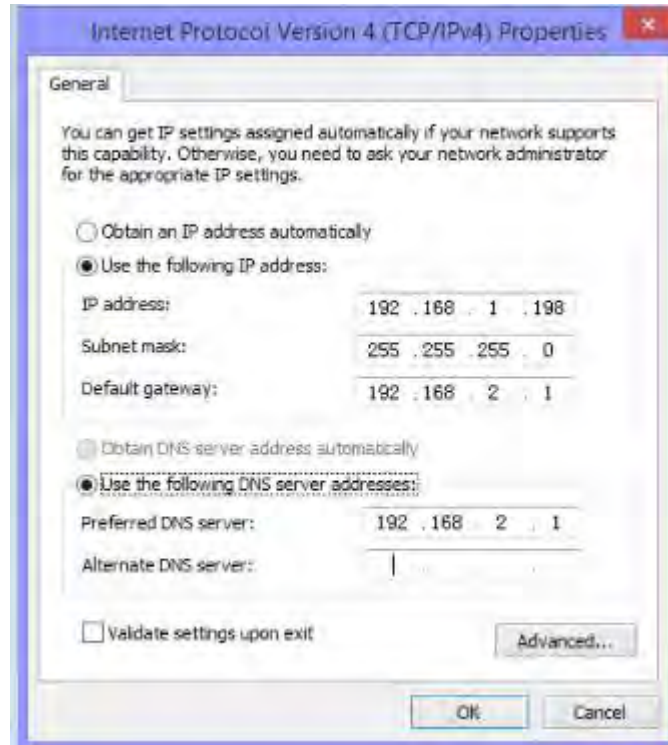
Figure 6.3.0 Computer IP change

1) **Network connection:**Network connection: Use a network cable to connect the computer and matrix, double-click to open the control software, click the "SETUP" button, if you control the matrix through the network port, you must set the computer IP and matrix IP in the same network segment, in the network port online Select the computer's IP address in the column (click the "SETUP" button on the matrix touch screen to view the matrix network address), and then click the "net port connection" button to connect. When all the buttons in the lower right corner of the interface are displayed in green, the connection is successful. . At this point, click on the "Load" button on the interface to display the matrix configuration, as shown in Figure 6.3.1.

Figure 6.3.1 Network Connection

2) **Serial connection:**Use a straight serial cable to connect the computer and matrix,

double-click to open the control software, click the "SETUP" button, select the serial port

connected to the matrix, for example, "COM2", then select the serial device "COM2", click

"serial connection", when all the buttons in the lower right corner show green, the connection

is successful. Click "Load" at this time to display some configuration of the matrix, as shown

in Figure 6.3.2

Figure 6.3.2 Serial Port Connection

3) **Change the matrix IP:** Make sure the matrix is connected to the computer. Enter the IP to be

changed in the network address in the configuration bar. Click Save to change the IP

4) **Turn on/off the buzzer:** Make sure the matrix is connected to the computer. Click the "ON"

button next to the buzzer to turn off or on the buzzer.

5) **Turn on/off video backup:** Make sure the matrix is connected to the computer. Click the

"Open" button next to the video backup to close or open the video backup.

6.3-1 Switch operation

Click the switch button to switch between video, USB, and audio (for example, switch video, click input port 2 on the video interface, and then click Select All, then click Apply, and finally click Execute); if you want to switch USB, then in the function button zone switches to the USB option, video, USB, audio, and the three states can be switched back and forth.
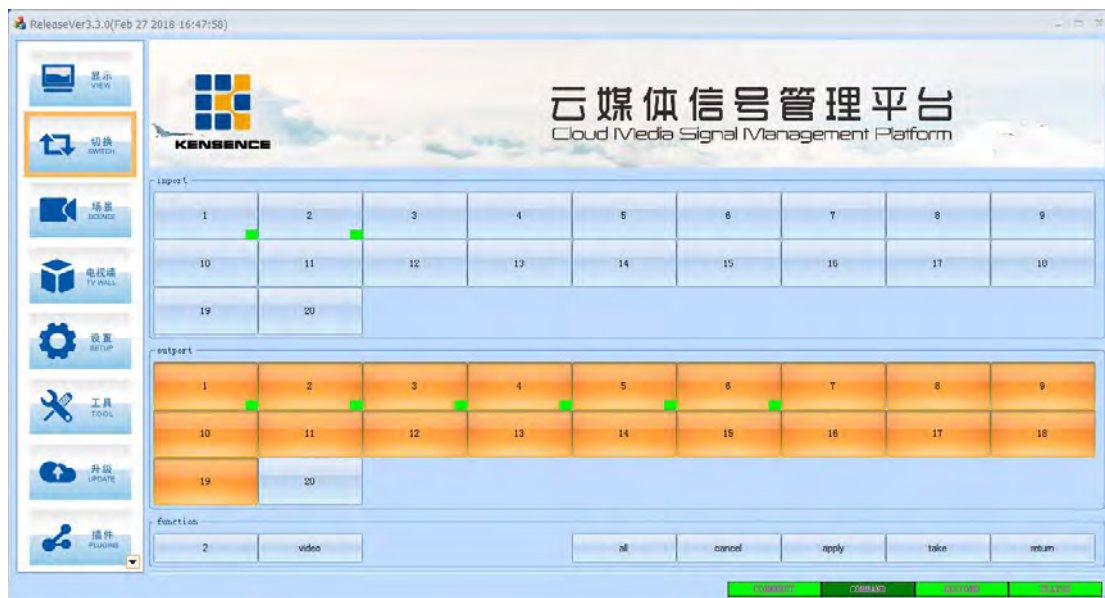

Figure 6.3.3 Switch interface

6.3-2 Input and output card central control, resolution, name change and other operations

1）**Input card :**After double-clicking any input signal on the "SWITCH" interface and popping up the interface as shown in Figure 6.3.4, you can set this input signal . In the "control" column, we can control the equipment such as the camera which connected to the card (**this function needs to ask the equipment supplier for relevant information. The command sending format is shown in Table 1**). In the "Video Control" column, you can adjust the brightness ,contrast, and reset the card of the input card, . In the "Name" column, you can rename the name of the signal.

Figure 6.3.4 **Input central control, resolution, name change and other operations**

2）Output card: After you double-click any output signal on the "SWITCH" interface and pop up the interface as shown in Figure 6.3.5, you can set this output signal of the channel. In the "control" column, we can control the devices ,such as the camera which the card is connected to (**this function requires the supplier of the equipment to request relevant information. The format of the command transmission is shown in Table 1)**. In the "Video Control" column, we can choose the output resolution supported by the card and adjust the brightness, contrast, saturation, etc. settings of the signal screen. You can rename the name of the signal in the "Name" column. .

Figure 6.3.5 **output card central control, resolution, name change and**

6.3-3 Scene save operation

Click the "VIEW" button to pop up the interface as shown in Figure 6.3.6. On the right side of the interface, click on the scenes you want to save in numbers 1 to 12. Press the "SAVE" button to move the current matrix. The switching status is saved as a scene, and the three status scenes of video, USB and audio can be switched back and forth.
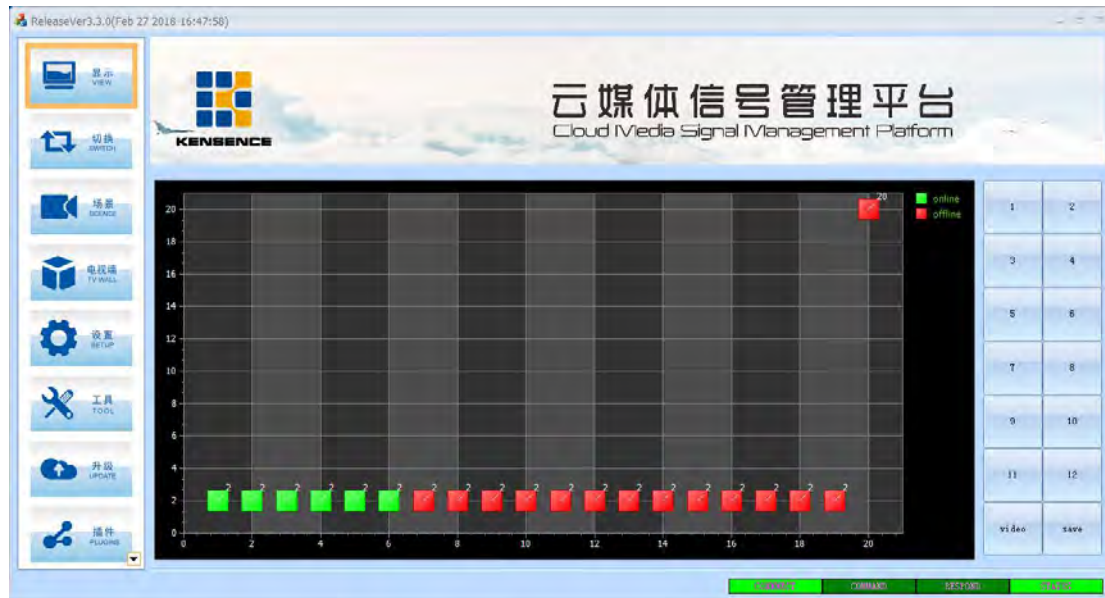

Figure 6.3.6 scene save

6.3-4 Scene recall

Click the "SCENE" button to pop up the interface as shown in Figure 6.3.7. Select the scene to be recalled on the right side of the interface. After selecting, you can view the input and output conditions of the selected scene in the interface. Finally, click "(recall)" button to call the selected scene, click video, USB, audio three state scenes can switch back and forth.
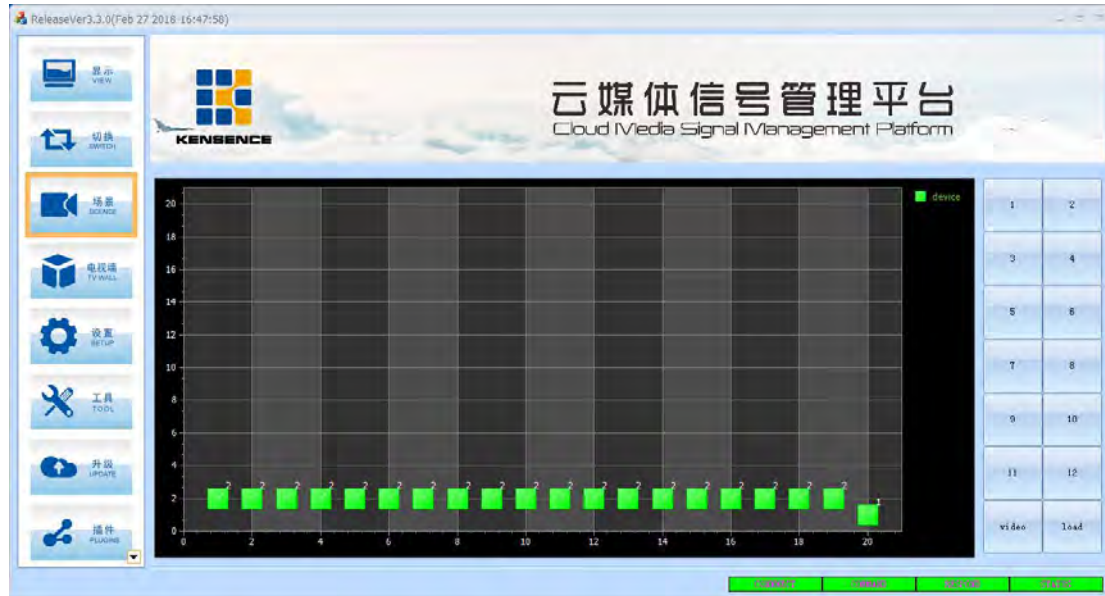
Figure 6.3.7 scene recall

6.3-5 External serial port commands

The external serial port command is sent in the following format (black characters are fixed, "parameter" in the red character indicates the string command to be sent, "param length" indicates the length of the string command, and "packet length" is equal to "param length" plus 12 Convert to hex)

Synchronization Head（2BYTE）	Packet Length（2BYTE）	Packet Count（2BYTE）	Method（1BYTE）	Command（2BYTE）	Parameter Length（2BYTE）	Parameters（n BYTE）	CRC（1BYTE）
0x55 0x55	n+12	0x00 0x00	0x02	0x07 0x01	n	String Command to be sent	0x00

The command uses hexadecimal calculations: For example, if you want to send the string command "abcd123", send it as follows:

Synchronization Head（2BYTE）	Packet Length（2BYTE）	Packet Count（2BYTE）	Method（1BYTE）	Command（2BYTE）	Parameter Length（2BYTE）	Parameters（n BYTE）	CRC（1BYTE）
55 55	00 13	00 00	02	07 01	00 07	61 62 63 64 32 33 34	00

Tip: The SMC cloud media management platform can intelligently detect the card. There is a small green box mark in the interface, indicating that the corresponding input and output signals have card connections.

Figure 6.3.8 intelligent detect

6.3-6 TV Wall Splicing

The video wall currently supports up to 16 ways splicing. We use 4   splicing as an example to set the video wall .Select Video wall button.Click Load   to set the row and column and valid window (line: 2, column: 2 valid window: 4)   save, and the screen shown in Figure 6.3.9 will appear .

Figure 6.3.9 TV wall configuration

As shown in the above figure, the 4 areas represent 4 display screens. Double-click each area to set in sequence. If we select "1" for the input signal, double-click the first area and enter "1" in the input box. Also enter "1", in the output box , double-click on the second block, enter "1" in the input box, enter "2" in the output box, double-click on the third block, enter "1" in the input box, and type in the output box "3", double-click the 4th block area, enter "1" in the input box, and enter "4" in the output box. After the setting is completed, each block has a different color display, as shown in Figure
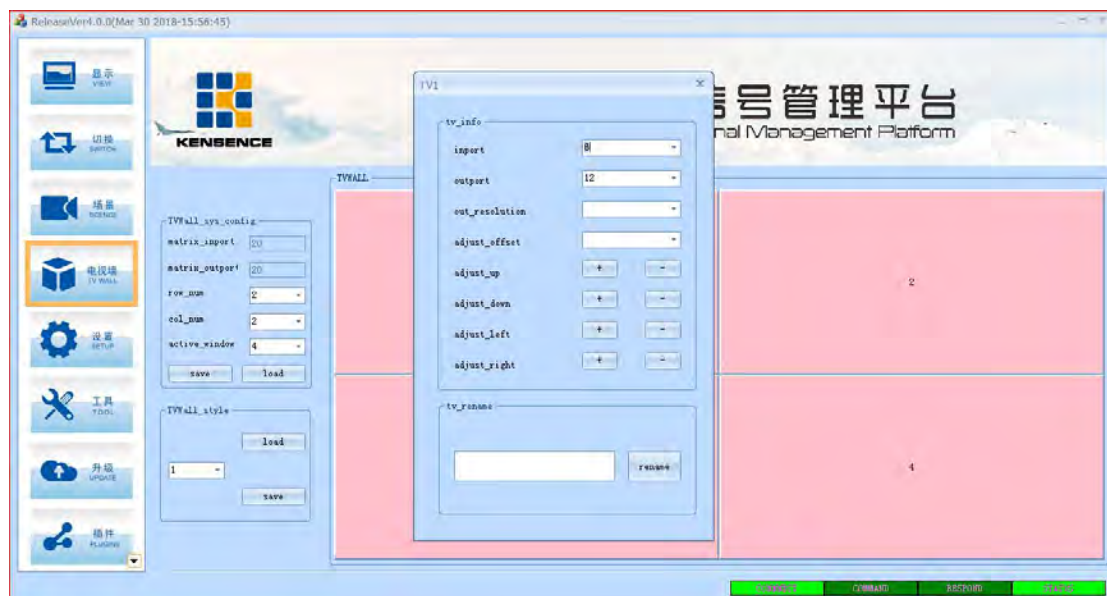
6.3.10.

Figure 6.3.10 Set the input and output relations of each area

Figure 6.3.11 Use mouse drag to splice
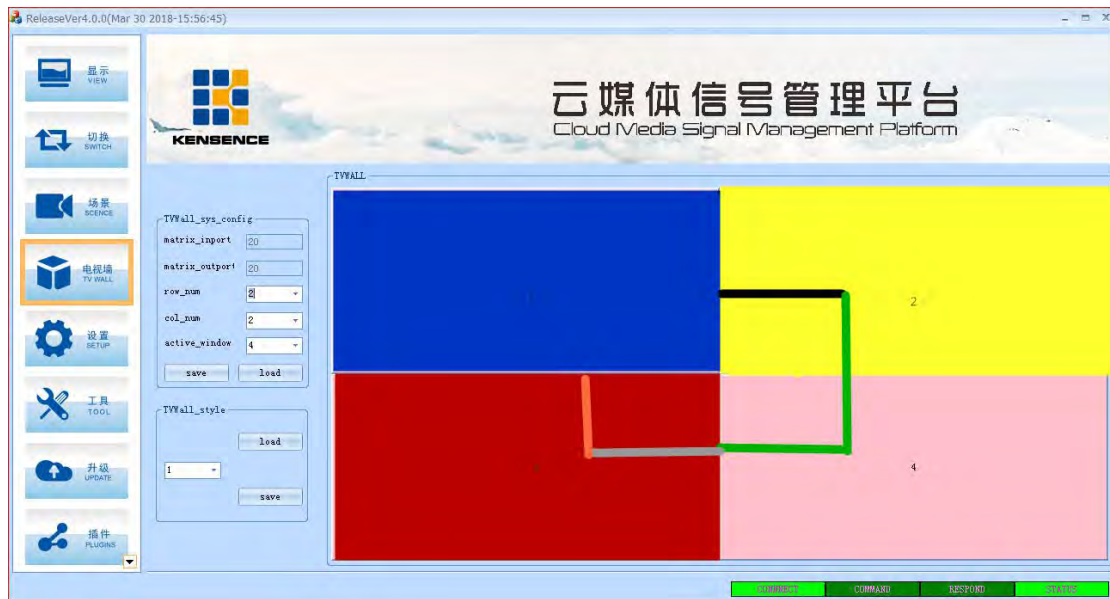

Figure 6.3.12 Successful splicing

6.3-7 Upgrade equipment

Select the upgrade button, click the drop-down button to select the serial port which connected to the matrix and the device to be upgraded, then double-click the upgrade file to select the software to be upgraded, and then click to start the upgrade. After the upgrade is complete，confirm and restart the device．

Figure 6.3.13 Select serial port, upgrade device, upgrade file

Figure 6.3.14 Successful upgrade

6.3-8 Add a plugin

Users can add some common tools by themselves; first, the user needs to put the tools they want to add in the root folder of the Plugins folder, and then open the sys_config.ini file and add the path after PLUGINS_LIST=. Example PLUGINS_LIST=\\Plugins\\SplicerControl\\Splicer.exe+\\Plugins\\stc-isp-15xx-v6.75.exe, save and open the software as shown in Figure 2, 2 plug-ins have been added.

Figure 6.3.15 Plug-in was added successfully

6.3-9 Distributed Matrix Function

Connect this unit with the encoder and decoder to the network switch. Refresh the list to see the IP of the encoder and decoder. To switch, just select the encoder and decoder IP and click to switch. As shown in Figure 6.3.16

Figure 6.3.16 Codec switching

To achieve the preview function must be RTSP stream encoder, as shown in Figure 6.3.17, click the encoder and gateway encoder IP, then click to switch, then click preview.

Figure 6.3.17 Screen preview

Note: In the SMC cloud media signal management platform software, the "Tools", "Audio Processor", and "Large Panel Splice" functions are valid for specific models, and are not described here.

7. Communication protocol and control instruction code

Communication protocol: (baud rate 115200, data bit 8, stop bit 1, parity bit)

Type	Control Command	Function Description
operation instruction	aXb.take.	switch the input of a way to the output of b way
	aX1-b.take.	Switch the input of a wayto the output of 1-b way
	aXb1,b2,b3.take.	Switch the input of a way to the output of b1, b2, b3.
	a1Xb1.a2Xb2.a3Xb3.take.	Switch the input a1, a2, a3 to the corresponding b1, b2, b3
	NXN.Take.	Special switch (switch all input and output one by one)
	Save[Y].	Saves the current status to the [Y] memory location. [Y] is a 1-12 number key
	Recall[Y].	Recall the input/output switching status of the [Y] memory location. [Y] is 1-12.
	Buzzer on.	Turn on the buzzer
	Buzzer off.	Turn off the buzzer
	Backup On.	Turn on video backup
	Backup off.	Turn off video backup
	Reset.	Restore factory settings
	Get table.	Get switch state table
	1U1.TAKE.	USB switching
	savep[Y].	Splicing save command
	recallp[Y].	Splicing recall command

Remarks:

1, In the above table, a represents input and b represents output. The subscripts "1", "2", and "3" in the instruction are not sending characters. The numerical ranges of a and b are determined according to the controlled matrix, such as out of range. , as the command input error handling;

2,Punctuation marks are all punctuation marks in the English input method;

3,all commands end with ".", the first letter of the word can be capitalized.

Some instruction code examples

1)The first input signal is switched to the second port output, send the command: 1X2.take.

2)The first input signal is switched to 1-5 port output, send the command: 1X1-5.take.

3)The first input signal is switched to the third, 8th, 15th port output, send the command:

1X3,8,15.take.

4) Switch the 4th, 5th, and 6th input signals to the 21st, 25th, and 33rd port outputs and send the

command: 4X21.5X25.6X33.take.

5)Switch all inputs and outputs in one-to-one correspondence (1 to 1, 2 to 2, 3 to 3 and so on to 40

to 40) Send the command: NXN.Take.

6)Save the current status command: save [Y].

Example: To save the current status to the seventh storage unit, enter "save7."

7)Recall the stored unit instruction: recall [Y].

Example: To recall the status of the 7th storage unit and configure the input/output status, enter

"recall7."

8)Turn on and off the buzzer:

Example: Buzzer on. Turn on the buzzer and hear the beep sound when switching

Buzzer off. Turn off the buzzer and you won't hear a beep when switching

8. Version and production information

Release Notes(Document Number:)		
Date	Version Number	Description
March 2018	V1.01.01	First version