



# S-MIX-PRO1600 Customized Input Output Hybrid Matrix Switch

## Operation Manual



**Version: V1.01.01**

**2018-3**

**Kensence (shenzhen) Technology Development CO.,LTD**

# Contents

Operation Manual.....	1
1. Brief Introduction.....	1
2. Product Features.....	1
3. Connection and operation .....	1
4. Standard Packing list.....	2
5. Specification .....	3
6. Equipment operation and function.....	4
6.1 Panel introduction .....	4
6.2 Touch screen control instructions .....	5
6.3 PC control software operation instructions.....	9
6.3-1 Switching Operation .....	12
6.3-2 Input, Output, Board Control, Resolution, Name Change, etc.....	12
6.3-3 Scene save operation .....	14
6.3-4 Scene recall.....	14
6.3-5 External serial port commands .....	15
6.3-6 TV Wall Splicing .....	16
6.3-7 Device update .....	18
6.3-8 Add plugin .....	19
6.3-9 Distributed matrix function .....	20
7. Communication protocol and control instruction code.....	21
8. Version and production information .....	22

## Safety Reminder



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 over temperature.
- 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. Brief Introduction

The S-MIX-PRO1600 is a new, single-card, single signal port, high-definition seamless hybrid matrix that supports a total of 16 high-definition video. Among them, 16 channels can be customized as input/output mode, which can automatically detect the card type and support the asymmetrical configuration of input/output channels. The system supports HDMI, DVI, VGA, SDI, YPBPR, CVBS, HDBaseT, H.264, HDCI, Fiber and other signals, and can customize the output resolution, up to 3840\*2160@30Hz. At the same time, the system uses a seamless switching technology, there is no black screen, blue screen, tearing, jitter and other phenomena in the switching process. At the same time also supports 15 wall display. Can be widely used in government, justice, military, education, medical, corporate and other occasions.

## 2. Product Features

- > Support 16-channel multi-type video interface, any configuration for input or output, 16-way arbitrary combination;
- > Single-card single signal port design, configuration and maintenance more flexible;
- > Built-in board intelligent identification technology, automatic detection of card type, plug and play;
- > Support input signals: HDMI, DVI, SD/HD/3G-SDI (Adaptive), VGA, YPBPR, CVBS, HDBaseT, H.264, Fiber, HDCI (Poly com video conferencing terminal dedicated interface)
- > Support output signal: HDMI, DVI, VGA, Fiber YPbPr, CVBS, HDBaseT, H.264, HDCI (Poly com video conferencing terminal dedicated interface)
- > Support output resolution custom adjustment, up to 3840\*2160@30Hz;
- > Using seamless switching technology, there are no black screens, blue screens, tearing, jitter, etc. during the switching process;
- > Support EDID management, compatible with HDCP protocol
- > Support subtitles logo function

## 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.

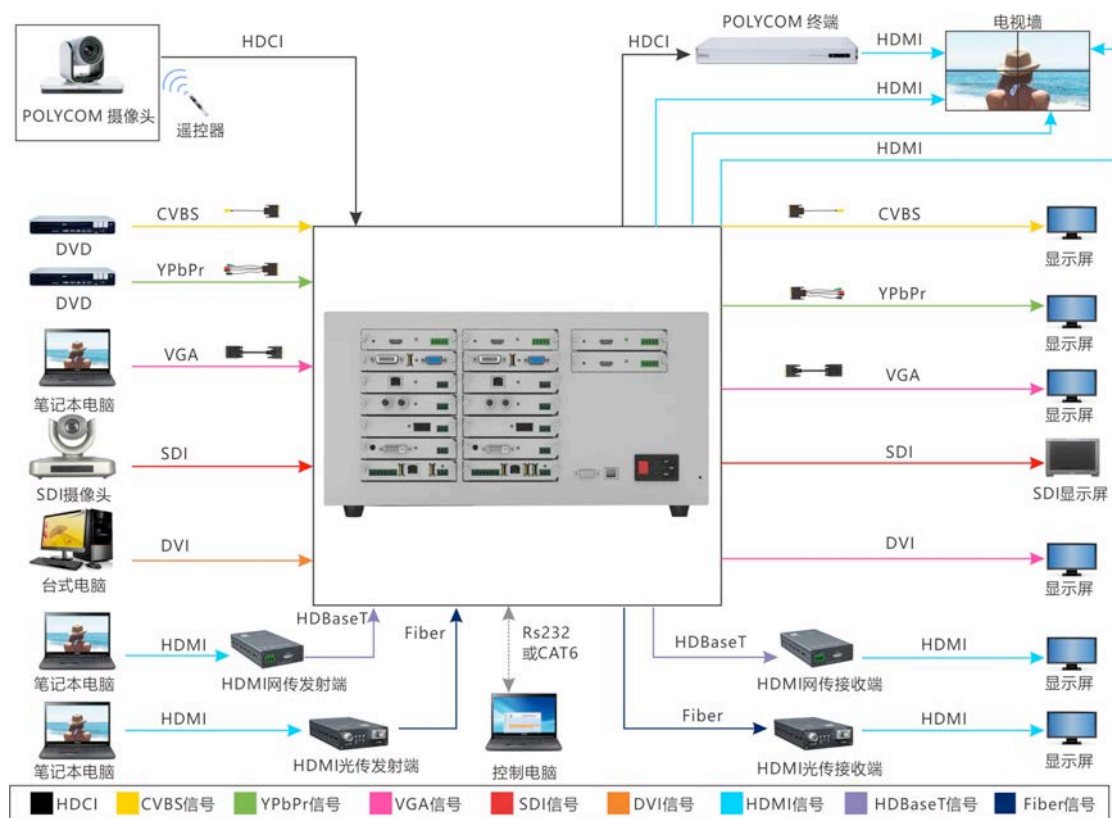
2.Connect the output port of the matrix to HD display or HD projector with HDMI input port. Notice: It's better to use High-Speed HDMI Cable when the transmission distance is too long.

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-Pro1600 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 cable	1	PCs
3	Certification	1	PCs
4	Warranty Card	1	PCs
5	User manual	1	pcs

## 5.Specification

Model	S-MIX-PRO1600
Name	S-Mix-Pro1600 HD seamless switch hybrid matrix
Slot	16 way, customized input and output
Input/output module	Support CVBS、YPbPr、VGA、HDMI、DVI、AUDIO、3GSDI、HDBaseT、H.264、 Fiber、IP streaming
Static protection	Human body discharge mode: $\pm 8kV$ (air gap discharge) $\pm 4kV$ (contact discharge)
Input voltage	Power supply 100VAC~260VAC,50/60 Hz,Internationale adaptive power supply23W(max)/0.5w(standby status)
Control	Serial port ,network port and touch screen ,PC client etc
Bandwidth	10.2GBPS

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 EthernetEthernet
Color space	Support RGB444, YUV444, YUV422 color space, support x.v.Color extended color	
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)	
Work temperature	-10°C--50°C	
Storage temperature	-25°C--55°C	

## 6. Equipment operation and function

### 6.1 Panel introduction



Figure6.1.3 Product picture

Explanation:

1. POWER: power indicator , Constant light when power is on;  
ACTIVE: data transmission indicator;  
Network: network connection status indicator;
2. 7-inch touch screen, matrix can be controlled through the touch screen;
3. RS232 port and LAN port used to control the matrix;
4. Power interface ;
- 5



## 6.2 Touch screen control instructions

The matrix can be controlled by the front panel high-definition touch screen. The touch interface includes four operating options: display, switching, scene, and setting. As shown in Figure 6.2.1, the display interface, real-time display matrix switching status, horizontal The value indicates the output port and the vertical indicates the input port. At the same time, the current input and output relations can be saved on the right side of the interface. There are 13 scenes from 01 to 13 on the right side of the interface for users to use. Select any number from 01 to 13 and click "SAVE" to save the scene. (00 is the current real-time status of the matrix, not optional).



Figure6.2.1 Matrix touch screen operation main interface

**1.Matrix switching operation:** In the main interface, click the "Switch" option, enter the signal area on the left to select the input port, select the output port in the right output signal area, then click the "Apply" button, and finally click the "Execute" button. The switch was successful. As shown in Figure 6.2.2, the input signal "08" is switched to the "06", "07", and "12" output ports.

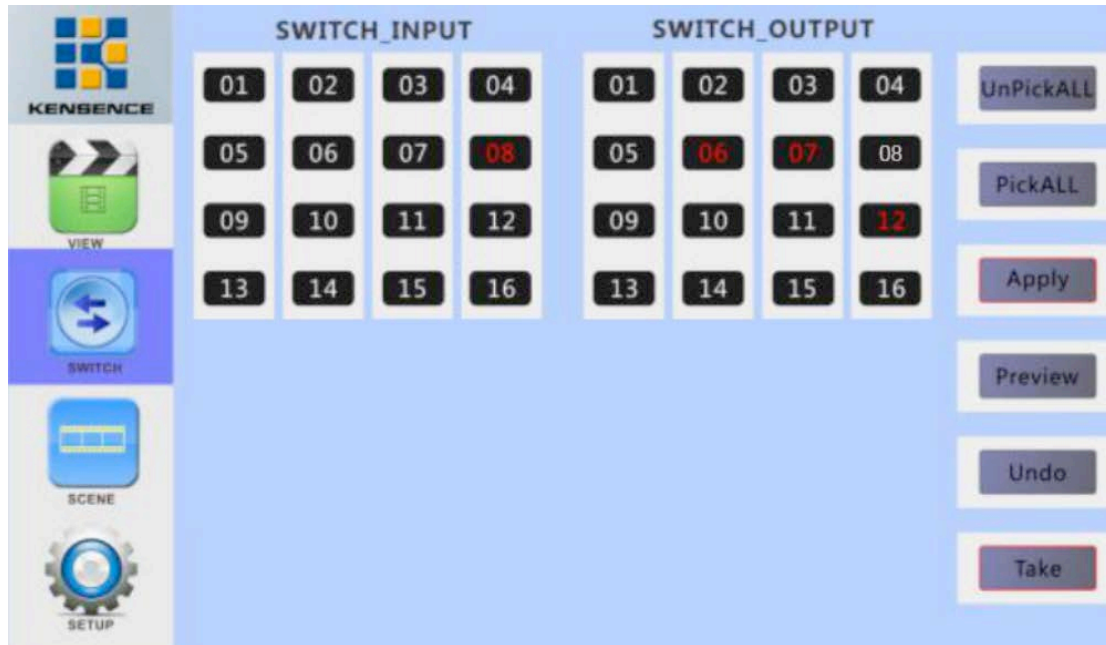


Figure6.2.2 Switch interface

**2.Scene save and recall:** As shown in Figure 6.2.3, the interface can easily recall the saved scene. Select the scene to be called in 01~13. After the selection, the configuration of the current scene will be displayed. Click “Load”. Call the selected scene (**00 is the matrix’s current input/output status, do not select**). Select “Scene 8” as shown in the figure below, and click “Load” to invoke.



**3.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 following options can be set

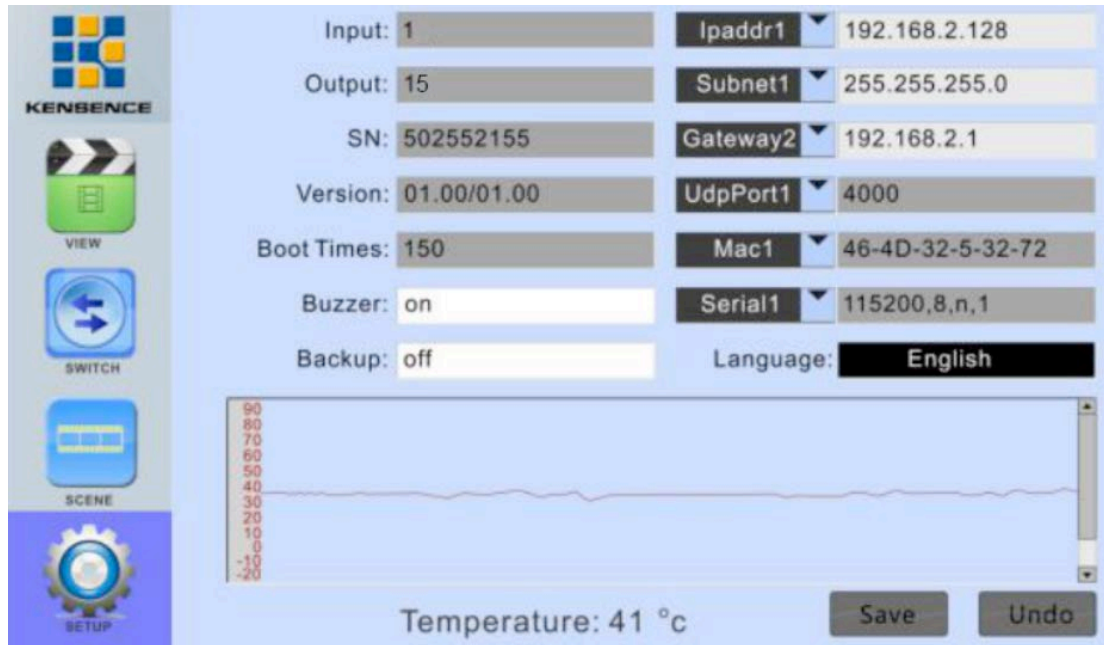
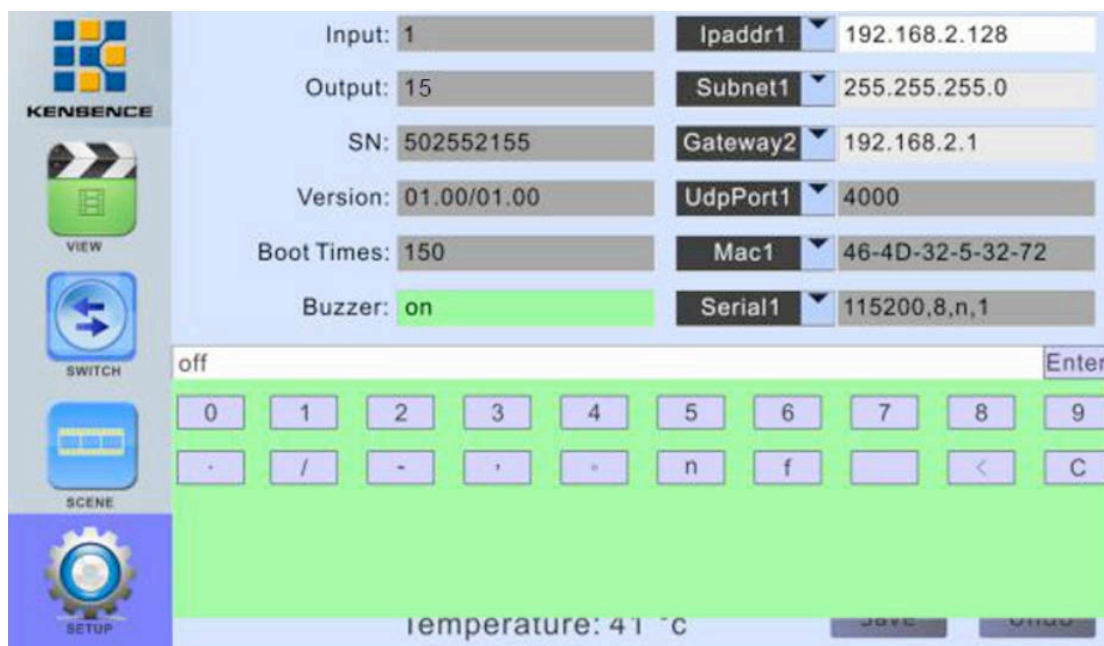


Figure6.2.6 Matrix setting interface

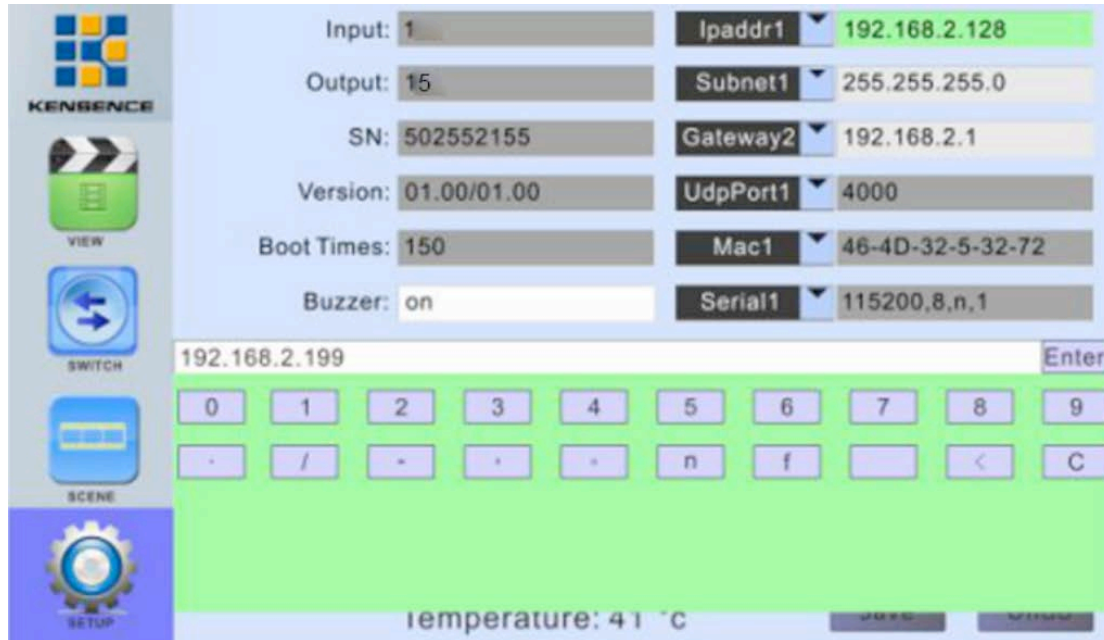
**Buzzer switch:** Click the white bar next to “Buzzer” to pop up the numeric keypad, enter on/off, click “ENTER” and then click “Save” to close or open the buzzer, as shown in the following figure:



**Video backup switch:** The operation is similar to that of the buzzer. Click the white bar next to “Backup” to pop up the numeric keypad, enter on/off, click “ENTER” and then click “Save” to save.

**Backup description:** When using the backup function, please connect two identical input signals to the “1” and “2” ports of the machine. When one of the two signals fails, the device will automatically switch to the other signal.

**IP address change:** Click the white bar on the right side of “IPaddr1” to pop up the numeric keypad, enter the new IP address, click “ENTER”, and then click “Save” to save it, as shown in the following figure:



## 6.3 PC control software operation instructions

The cloud media signal management platform is a green software. Double-click the main program to open and use it, and control it through RS232 serial port cable or network cable connection matrix and computer.

**Note:** When using a network connection, please set the IP of the computer to be in the same network segment as the matrix IP, as shown below:

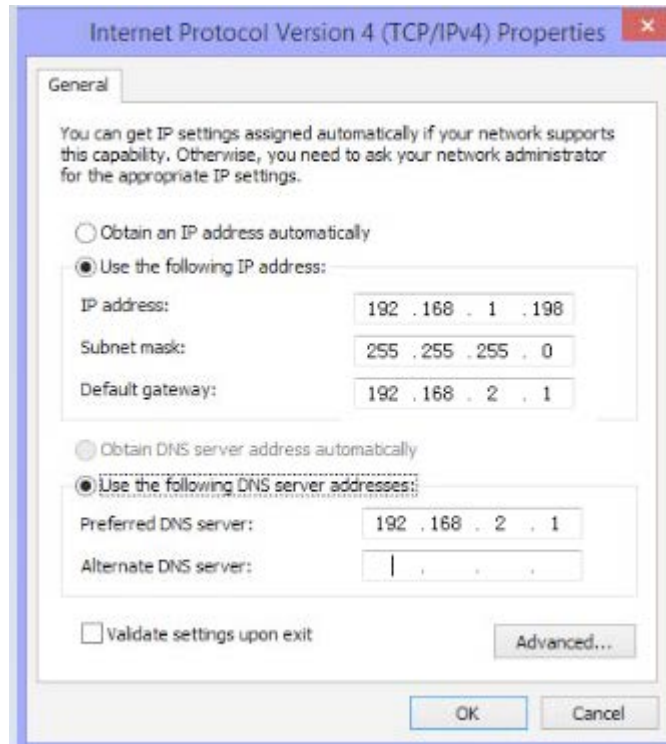


Figure6.3.0 Computer IP change

- 1) **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 need to set the IP of the computer and the IP of the matrix in the same network segment, in the online port of the network port Select the computer's IP address (click the "SETUP" button on the matrix touch screen to view the matrix network address), and then click the "network 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.





Figure6.3.1 Network connection

- 2) **Serial connection** : Use a direct 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 at 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

Figure6.3.2



Figure6.3.2 Serial port connection

- 3) **Change Matrix IP** :After ensuring that the matrix is connected to the computer normally,

enter the IP to be changed at the network address in the configuration bar, and click Save to change the IP.

- 4) **Turn on/off the buzzer** : After ensuring that the matrix is connected to the computer, click on the “On” button next to the buzzer.
- 5) **Turn on/off video backup** : After ensuring that the matrix is connected to the computer ,click the “Open”button next to the video backup.

## 6.3-1 Switching Operation

Click the switch button and select the video option at the function button of the software interface (please ignore the USB/Audio option).

As shown in the figure below, there is a green rectangle indicating that there is a board online. When you switch, select “input port” and then select “output port” then click “apply” and finally click “execute”.



Figure6.3.3 Switch interface

## 6.3-2 Input, Output, Board Control, Resolution, Name Change, etc.

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 the input signal of the circuit. In the “control” column, we can The equipment such as the camera connected to the circuit board is controlled (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 and contrast of the input board, reset the board, etc. In the "Name" column, you can rename the name of the signal.



Figure6.3.4 Input board central control, video control, naming operation interface

**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 the output signal of this circuit. In the "control" column, we can The camera and other devices connected to the circuit board card are controlled (this function needs to obtain relevant information from the equipment supplier, and the command transmission format is shown in Table 1). In the "Video Control" column, we can select the various resolutions supported by the output board, adjust the brightness, contrast, saturation and other settings of the signal screen. In the "Name" column, you can rename the name of the signal.



Figure6.3.5 output board control, video control, naming operation interface



### 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" key to move the current matrix. The switching status is saved as a scene

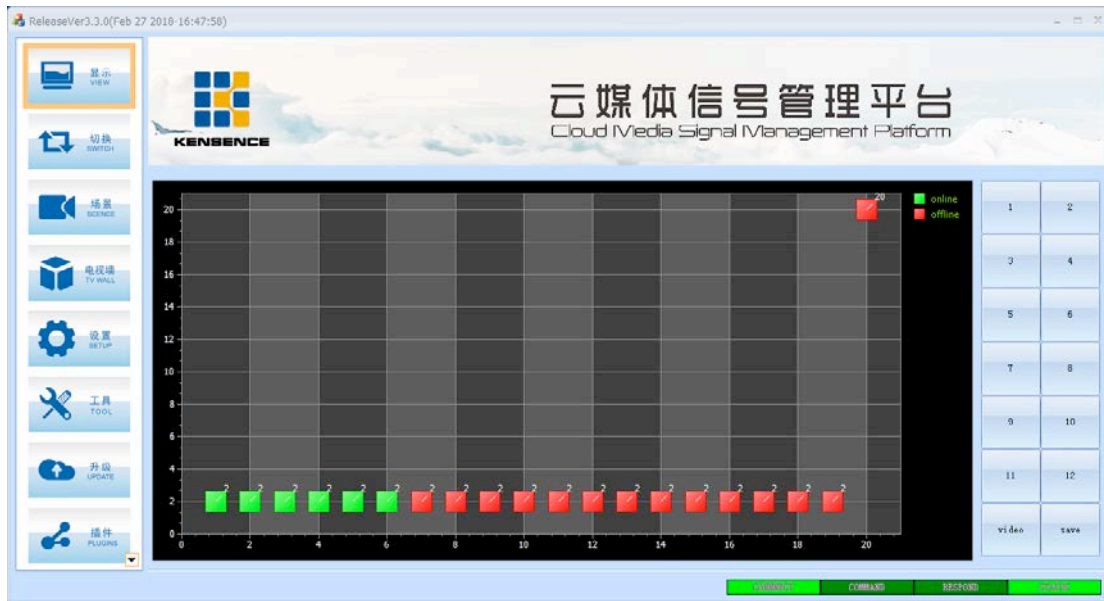


Figure6.3.6 scene save

### 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 invoked 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 "(Invoke The ")" button invokes the selected scene.

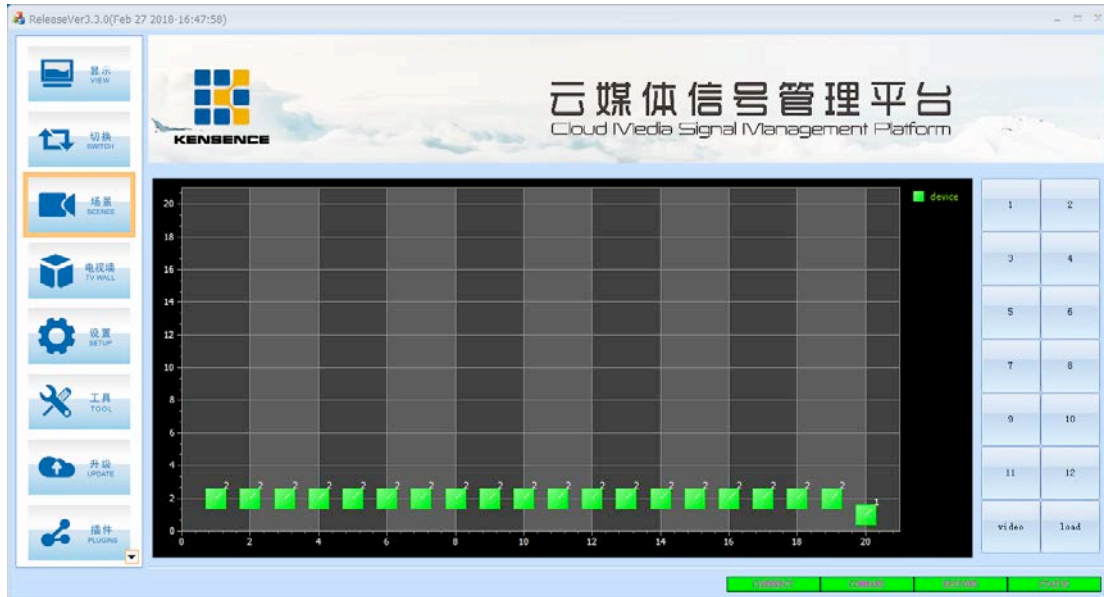


Figure6.3.7 scene recall

### 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" equals "param length" plus 12 Convert to hex)

Synchronization Header (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 send	0x00

**The command uses hexadecimal calculations.** If you want to send the string command "abcd123", send it as follows:

Synchronization Header	Packet Length	Packet Count	Method	Command	Parameter Length	Parameters	CRC
(2BYTE)	(2BYTE)	(2BYTE)	(1BYTE)	(2BYTE)	(2BYTE)	(n BYTE)	(1BYTE)

(2BYTE)	)			)	)		
55 55	00 13	00 00	02	07 01	00 07	61 62 63 64 32 33 34	00

### 6.3-6 TV Wall Splicing

The TV wall currently supports up to 15 channels of splicing. Let's set up the 4 splicing as an example. First select the "TV Wall Button", Then Click "Load" to set the row and column and the valid window (line: 2, column: 2 valid window: 4) to save, and then the screen shown in Figure 6.3.8 appears.



Figure6.3.8 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", double-click the second block, enter "1" in the input box, enter "2" in the output box, double-click the third block, enter "1" in the input box, and enter "3" in the output box. , Double-click on the 4th block area, enter "1" in the input box, and enter "4" in the output box. After the setting is complete, each block has a different color display, as shown in Figure 6.3.10.

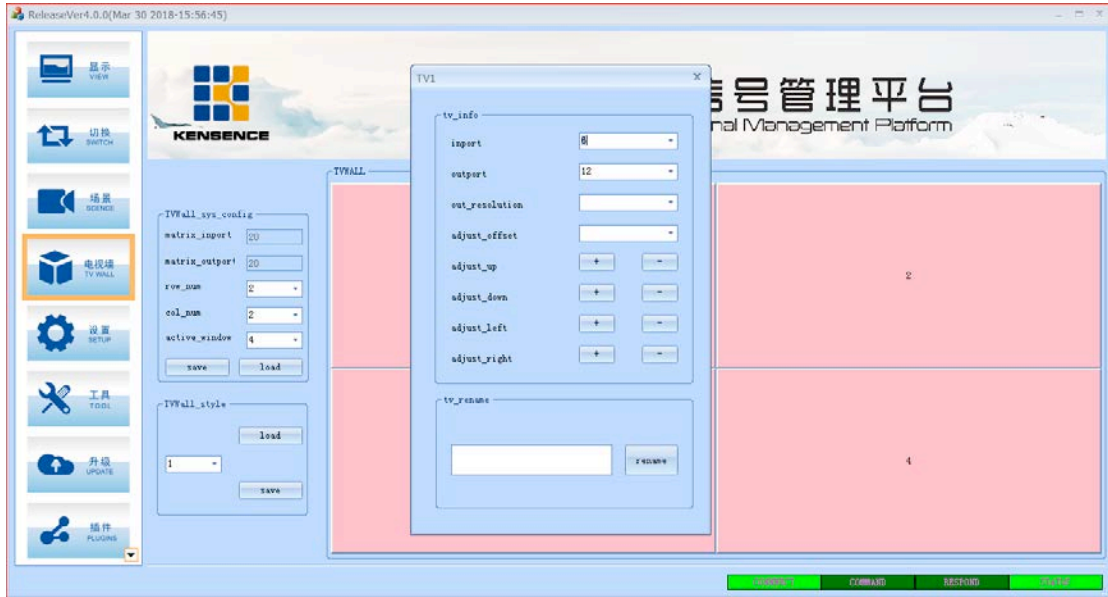


Figure6.3.9 Set the input and output relations of each area

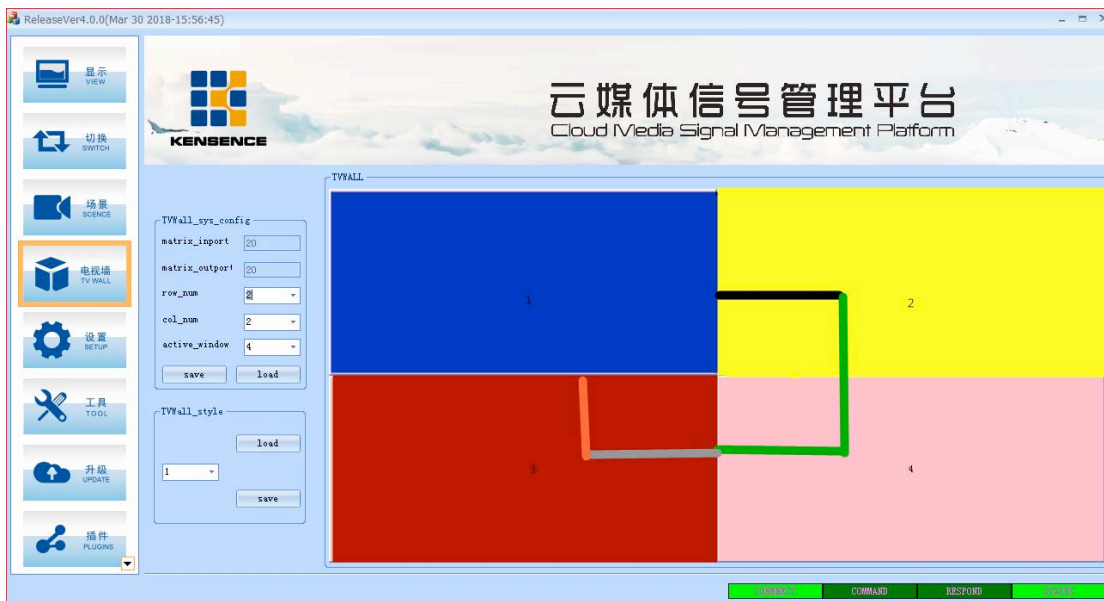


Figure6.3.10 Use mouse drag to splicing

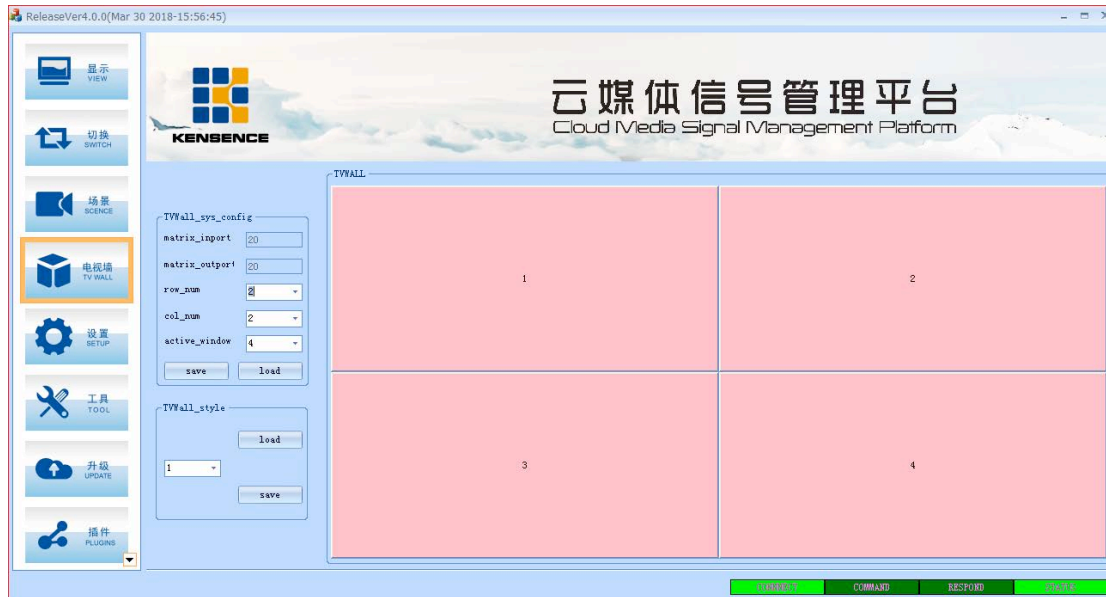


Figure6.3.12 Successful splicing

## 6.3-7 Device update

Select the upgrade button, click the drop-down button to select the serial port of the connection 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.



Figure6.3.13 Select serial port, upgrade device, upgrade file



Figure6.3.14 update succeeded

### 6.3-8 Add plugin

Users can add common tools by themselves; first, the user needs to put the tools you want to add into the root directory of the Plugins folder, then open the sys\_config.ini file and add the path after PLUGINS\_LIST=, for example PLUGINS\_LIST=\\Plugins\\SplicerControl\\Splicer.exe+\\Plugins\\stc-isp-15xx-v6.75.exe, save the software and then open the software as shown in Figure 2, 2 plugins have been added.



Figure6.3.15 Plug-in added successfully

### 6.3-9 Distributed matrix function

Connect the unit to the encoder and decoder to the switch. Refresh the list to view the IP of the encoder and decoder. To switch, select the encoder and decoder IP and click “Switch”. Figure 6.3.16



Figure6.3.16 encoder decoder switching

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



Figure6.3.17 Preview screen

Remarks: In the cloud media signal management platform software, the functions of “tool”, “audio processor” and “ splicing” are effective for some special customized models, and will not be introduced here.



# 7. Communication protocol and control instruction code

Communication protocol: (baud rate 115200, data bit 8, stop bit 1, check digit none)

Type	Control command	Function description
Operation commands	aXb.take.	Switch the input of a road to the output of b road
	aX1-b.take.	Switch the input of a road to the output of 1-b road
	aXb1,b2,b3.take.	Switch the input of a way to the output of b1, b2, b3
	a1Xb1.a2Xb2.a3Xb3.take.	Switch the a1, a2, and a3 inputs to the corresponding b1, b2,
	NXN.Take.	Special switch (one-to-one switching of all input and output))
	Save[Y].	Save the current status to the [Y] memory location, [Y] is the 1-12 number key
	Recall[Y].	Invokes the input/output switching status of the [Y] memory location. [Y] is a 1-12 number key
	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.	reset
	Get table.	Get switching status table
	1U1.TAKE.	USB switch
	savep[Y].	Splicing save command
recallp[Y].	Splicing recall command	

Remark:

1. In the above table, a represents input and b represents output. The subscripts "1", "2", and "3" in the instruction are not transmitted characters. The range of values of a and b depends on the controlled matrix. As a 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. Switch the 1st input signal to the 2nd port output and send the command: 1X2.take.



2. Switch the first input signal to the 1-5 port output and send the command: 1X1-5.take.
3. Switch the first input signal to the 3rd, 8th, and 15th port output, and 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 the inputs and outputs one by one (1 cut 1, 2 cut 2, 3 cut 3 and so on to 40 cut 40) Send command: NXN.Take.
- 6, save the current state command: save[Y].

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

7. Call the stored unit instruction: recall [Y].

Example: To call the status of the 7th memory location and set the input/output status, enter "recall7."

- 8, buzzer opening and closing:

Example: Buzzer on. Turning the buzzer on, you can hear beeps 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
2018-3	V1.01.01	First version