

KLS24

24 lan ports two-in-one video controller

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Manual



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Professional Ultra HD Video Display
Control system integrated solution and service provider

Version record

Version	Change details	release time
V1.0	first release	2021.10.25
V1.1	Correct size data	2021.11.18

Security Considerations



Critical Insurance

- The equipment has high voltage, not professional maintenance personnel should not open the back cover, in order to avoid danger.



Notice

- This equipment is not waterproof equipment, in humid environment, please do water treatment;
- This device is prohibited from approaching an ignition or high temperature environment;
- If the device emits a strange noise, smoke or smell, should immediately unplug the power Plug and contact the Distributor;
- **prohibit live unplug VGA,DVI signal cable.**



Note

- 1、 Please read this manual carefully before use, and save it for later use;
- 2、 In the case of lightning or long-term use, unplug the power plug;
- 3、 this equipment is not suitable for non-professional operation debugging, please use under the guidance of professionals;
- 4、 DO not plug any object from the vent hole of this device to prevent damage or accident;
- 5、 It is not advisable to place this equipment in near water or other humid places;
- 6、 It is not advisable to place this equipment in the heat sink or other high-temperature places;
- 7、 please properly arrange and put the power cord to prevent breakage;
- 8、 unplug the device and entrust maintenance if the following conditions are present:
 - when a liquid is spilled into this device
 - When this device falls or the chassis is damaged
 - When this device appears to have a significant functional anomaly or a significant performance difference

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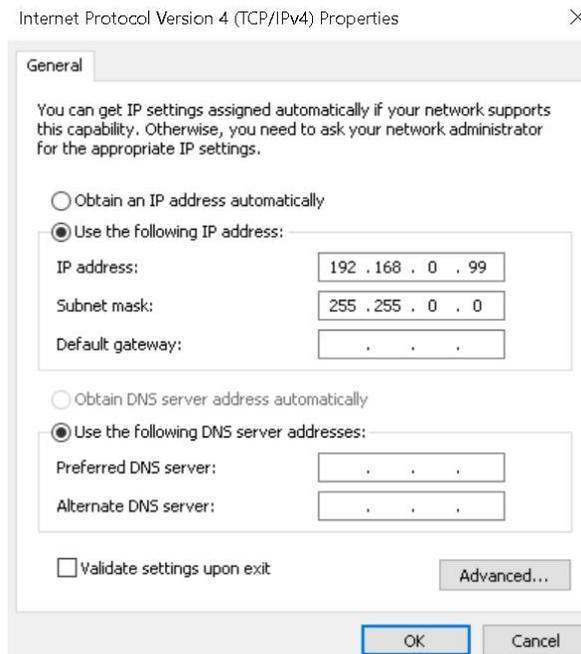
Preface: Equipment Debugging Process

Open “kystar” video processor software→screen configuration→open window→select signal source→save mode →open “kystar control system” software→expert debug→Receiving card debugging→screen connection→total save parameter.

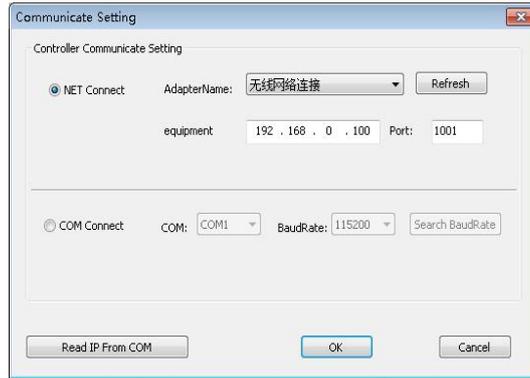
1、 video processor setting

1、 IP address: change PC IP and KSV24 on the same network segment。

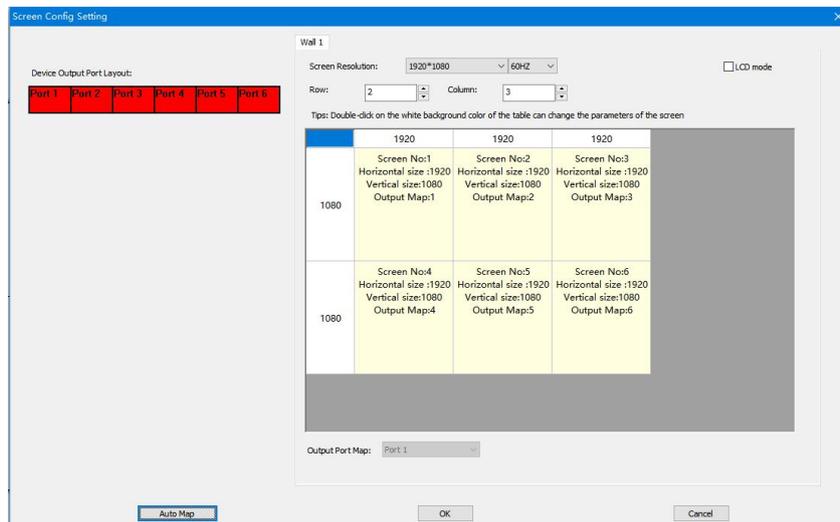
KLS24 default IP address: 192.168.0.100。



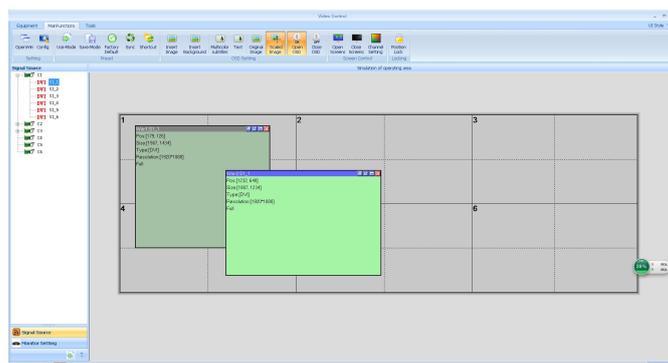
2、 software connect: open PC software to debug (kystar software) , connect device, select Ethernet to connect.



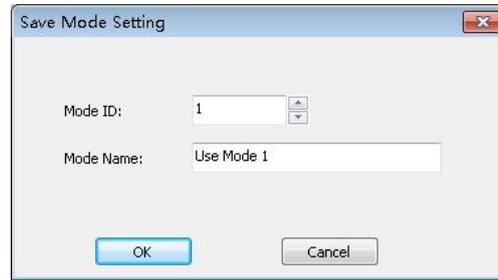
3、screen configuration setting: click“setting”“screen configuration, Change the loading of each output port and the arrangement of the output ports according to the actual output.



4、open window: Click on the upper left corner to open a new screen or hold down the left mouse button and drag in the operation area. When a rectangle is drawn, release the left button and a window will be created. Double-click the signal source on the left to switch the signal.

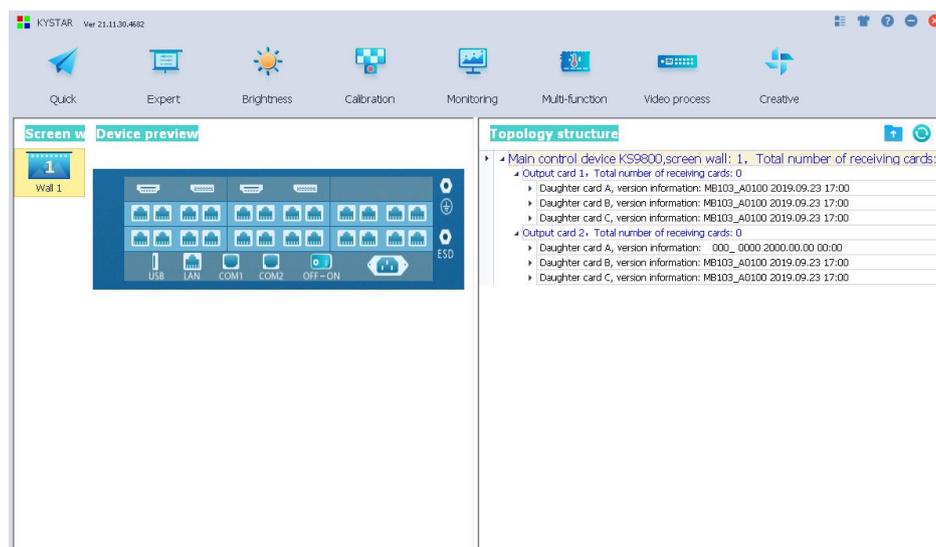
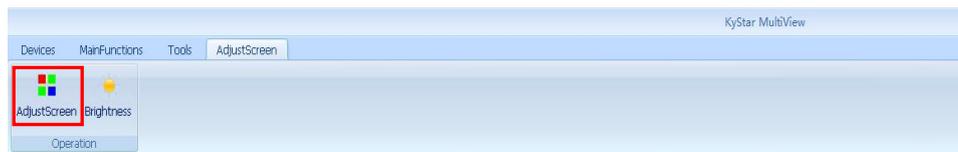


5、save mode: Click Save mode in the “setting”, select mode ID, and enter a mode name.



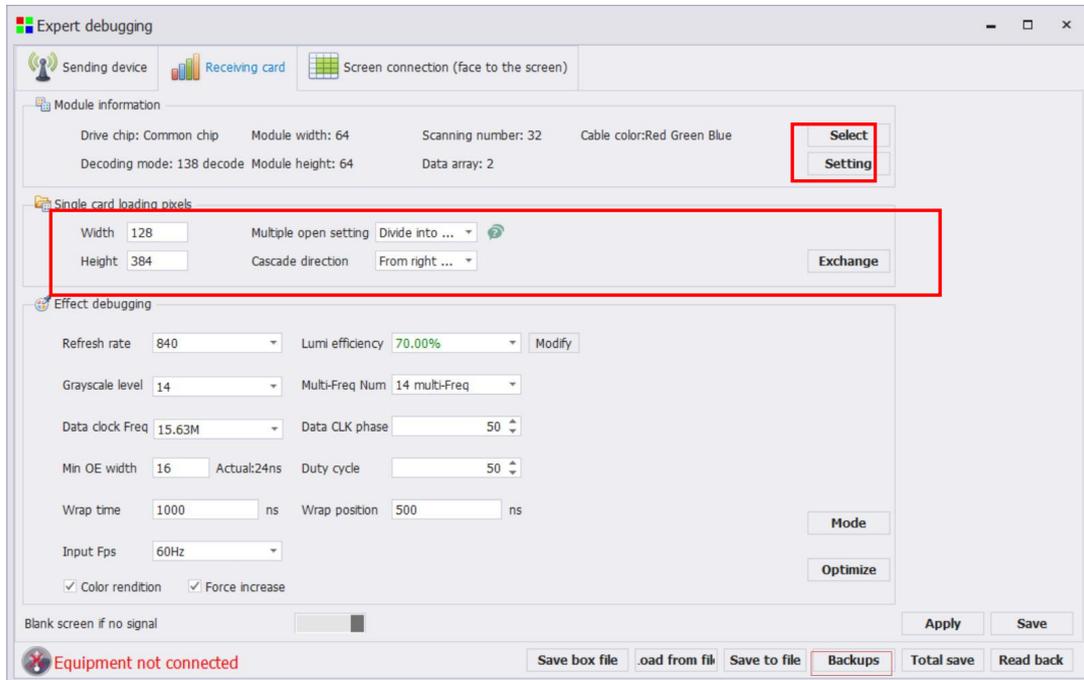
2、 control system setting

1、 open kystar control system of “kystar” software, click “kystar control system software” enter control card debug interface, first time debug KLS24, click “666888” in keyboard after open software, select network cable direct connection mode, select “directly connected to sending device” .

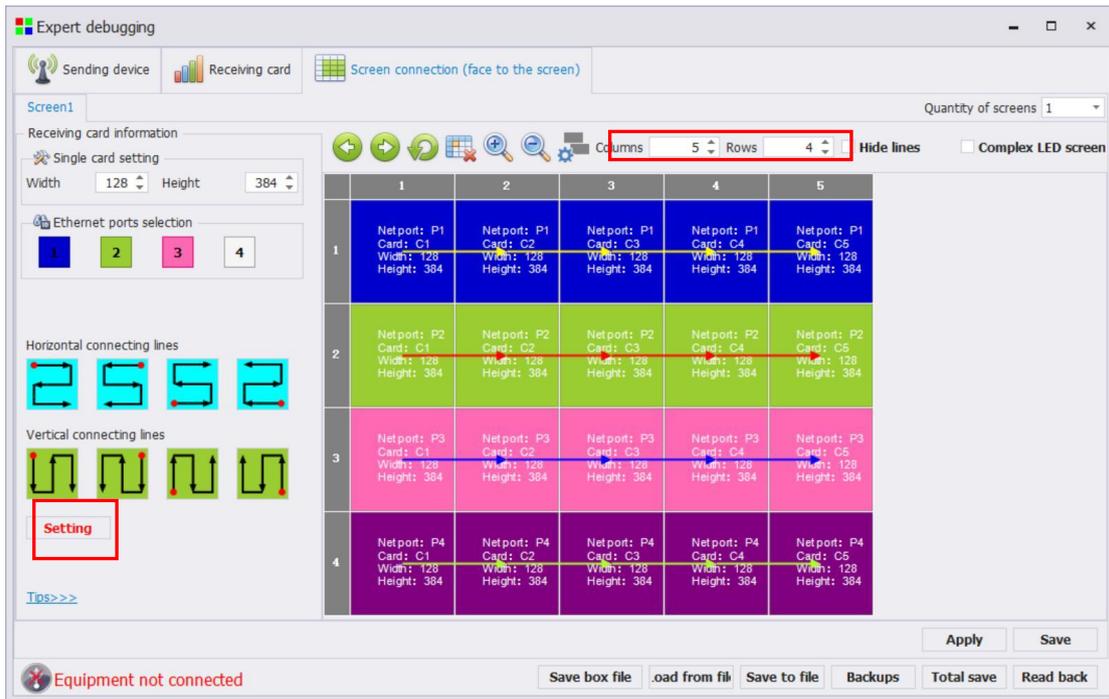


2、 On the receiving card interface, add module configuration information through

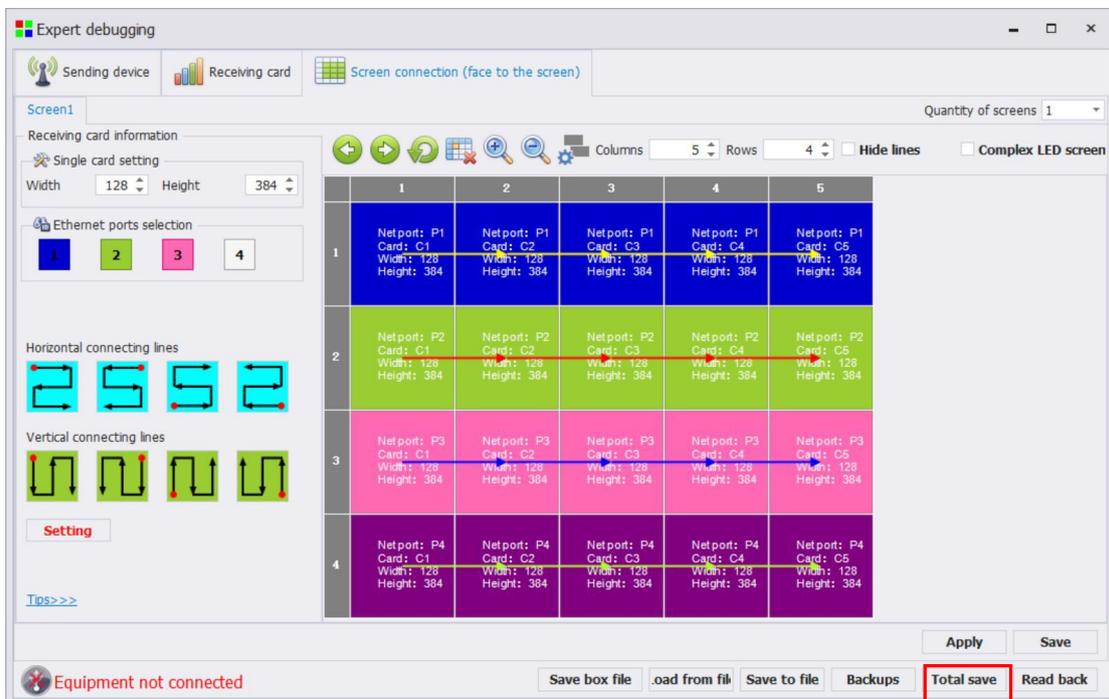
"module selection" or "settings", and then fill in the content of the single-card loading area according to the receiving card loading situation. If there is a previously saved configuration file, it can also be loaded on this interface and sent to the receiving card parameters.



3、 On screen connection interface, set the number of card columns and card rows according to the positions of all receiving cards, click the “ setting ” connection, complete the connection according to the prompts and modify the load size of each receiving card.



4、 Finally, after confirming that the screen is displayed normally, click "Solid All" to complete all debugging operations of KLS24.



1、 Product discussion

With the rapid development of the LED display industry and the continuous expansion of application requirements, various control requirements for large-screen control systems have emerged. However, due to the limitations of the large-screen control system in image processing, picture control and signal format conversion, the LED large-screen control system has some weak links and cannot meet the needs of users. The main problems are as follows:

1.The signal source access format of the LED large screen control system is limited. Currently, only digital DVI signals are generally used. Many signal sources (such as VGA, etc.) cannot be displayed on the LED large screen directly through the control system;

2.The traditional signal acquisition card has poor image processing effect, which causes great loss to the clarity of the picture when the signal format is converted;

3.The LED large screen control system can only capture the image corresponding to the number of points on the LED large screen for display, and in some customer sites, it is necessary to display the screen of any size or complete computer desktop at will;

4.With the continuous reduction of the distance between the LED screens and the continuous increase of the number of screen points, the era of single-card loading and single-screen display of a single screen will soon cease to exist, and more application requirements and display requirements will be highlighted. LED large screen control system It needs better cooperation with other peripheral equipment to fulfill the needs of customers.

In response to the above problems, our company has independently developed a variety of video processing products. The product adopts advanced control and image processing technology, which can not only realize fast and stable switching between signals, but also perform multi-level processing on the screen.

KLS24 is a control processor designed for live performance LED large screen. Adopt the industry's top design technology, in line with international and industry standards. Pure hardware FPGA design architecture, all boards of the product adopt modular design, and input boards can be freely selected. It is a 3U device that supports 4K@60Hz input in the industry.

The whole machine has 13.8 million pixels of custom loading, which can meet the needs of most of the scene.

2、Features

- ◇ Pure hardware FPGA architecture: no CPU, no core, no poisoning and crash risk, and the system runs stably. Mean time to failure MTBF>30,000 hours, support 365 × 24 hours of continuous operation.
- ◇ A single network port can carry 650,000 pixels, and the whole machine can carry a maximum of 13.8 million pixels. The width can reach up to 24,000 points, and the height can reach up to 24,000 points. The single machine has 24 network port outputs.
- ◇ Multi-picture display, the whole machine can display up to 16 windows at the same time, and the single-layer output board can display up to 8 windows at the same time.
- ◇ Equipped with 4K@60Hz module, supports DP1.2, HDMI2.0 input, the maximum resolution supports 4096×2160@60Hz or 7680×1080@60Hz.
- ◇ Software control, the user can directly connect to the host computer software or control the local area network, and supports B/S architecture, users can use the browser to access the device through the local area network or the Internet for management.
- ◇ Group screen management, the device supports two groups of screen management, and the corresponding output port resolution of each group of screens can be set separately to meet the mixed control of various display terminals in special-shaped screens and complex scenes.
- ◇ Super Resolution zoom technology, video compensation processing algorithm, no size limit when the screen is reduced, and retains image details, reducing the out-of-focus phenomenon after the screen is enlarged multiple times.
- ◇ CrossInt splicing processing technology effectively eliminates splicing dislocation and asynchrony.
- ◇ Mode call function, users can preset multiple display layout plans, which can be called with one key when using, and supports up to 200 modes.
- ◇ The mobile terminal management function can be used for parameter setting and signal management of the device through the mobile terminal device APP software, supporting Android and IOS.
- ◇ Seamless switching function, no black screen, no flickering, no jamming in the whole process when switching the signal of the screen or calling the mode.
- ◇ EDID management function, by changing the EDID information of the device, the user can set the input resolution of the device by himself.

3、 Technical parameter

The video processor adopts the latest patented video processing technology, and has the video conversion capability of any format input and corresponding format output. Video signals including DVI, HDMI, DP, etc. can be processed and enhanced to meet customer application requirements. The detailed specifications are as follows:

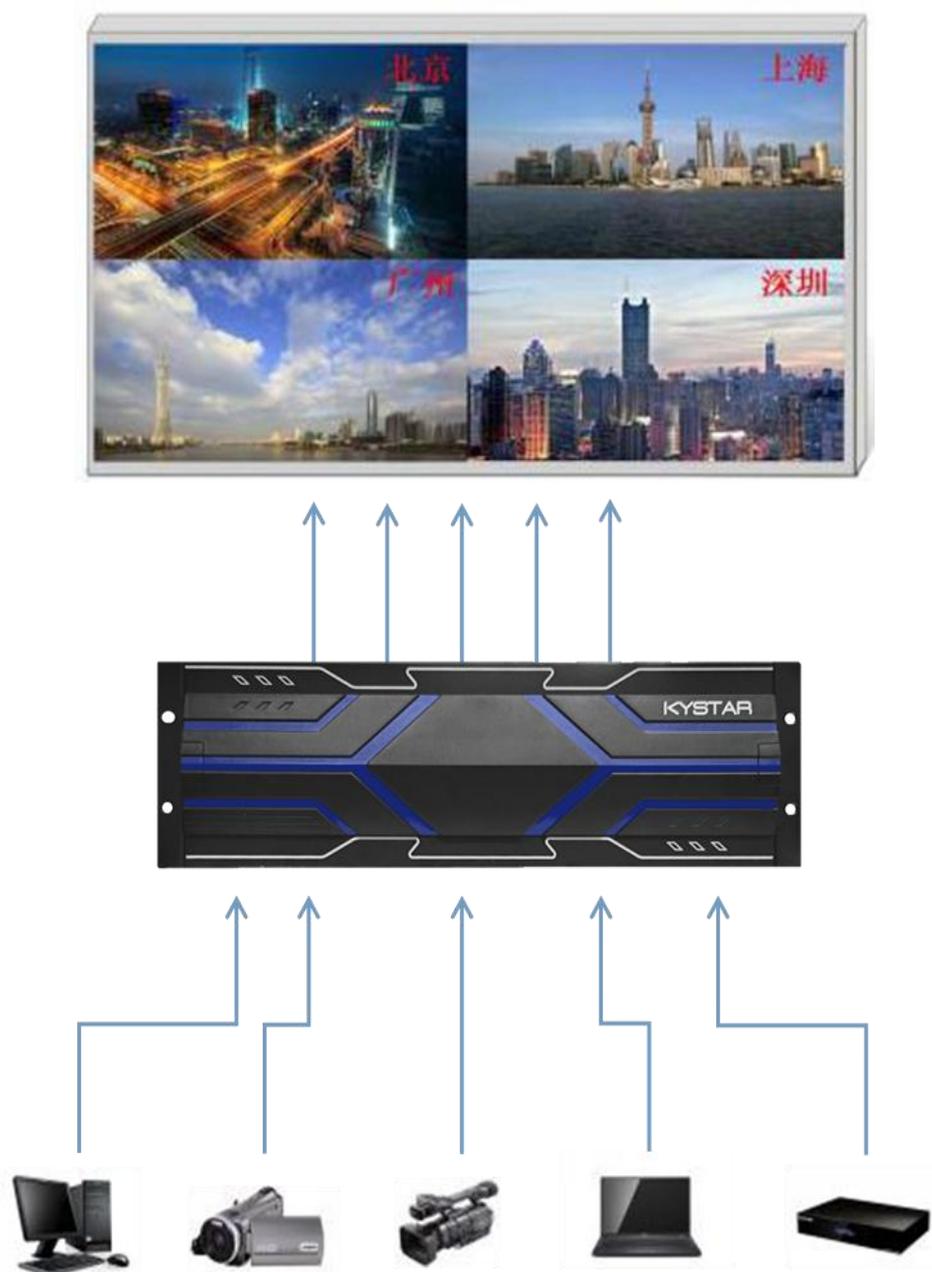
Input port		
Type	quantity	Specification
DVI-D (24+1)	2	·The maximum supported resolution is 2048×1152@60Hz, and support custom resolution ·Compatible with HDMI1.3 and below
HDMI 1.3	2	·The maximum supported resolution is 2048×1152@60Hz, and support custom resolution ·Compatible with HDMI1.3 and below
HDMI2.0	1	·The maximum supported resolution is 4096×2160@60Hz or 7680×1080@60Hz, supports custom resolution, the horizontal width is up to 8000 pixels, and the height is up to 4000 pixels
DP1.2	1	·The maximum supported resolution is 4096×2160@60Hz or 7680×1080@60Hz, supports custom resolution, the horizontal width is up to 8000 pixels, and the height is up to 4000 pixels

Output port		
Type	quantity	Specification
LAN	24	·LAN port, used to transmit data to the receiving card ·A single network port can load up to 650,000 pixels, with a maximum width of 4000 and a maximum of 4000 ·The maximum load of the whole machine is 13.8 million pixels, the maximum width is 24000, and the maximum is 24000

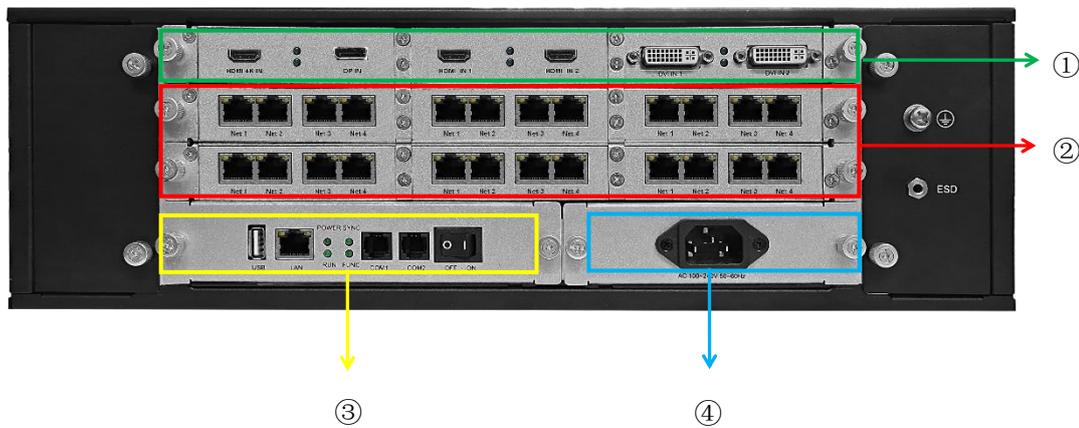
Control port		
Type	quantity	Specification
RJ11 (RS-232)	1	Data transfer rate is 4800, 9600, 19200, 38400, 57600, 115200 (BT)
RJ-45	1	100M

Machine specification	
input power	100-240V AC~50/60Hz 6.6A
Operating temperature	0-45°C
Dimensions	482.6×315.7×138.4mm (L×W×H)
Net weight	10KG
Power	80W

4、 Working diagram



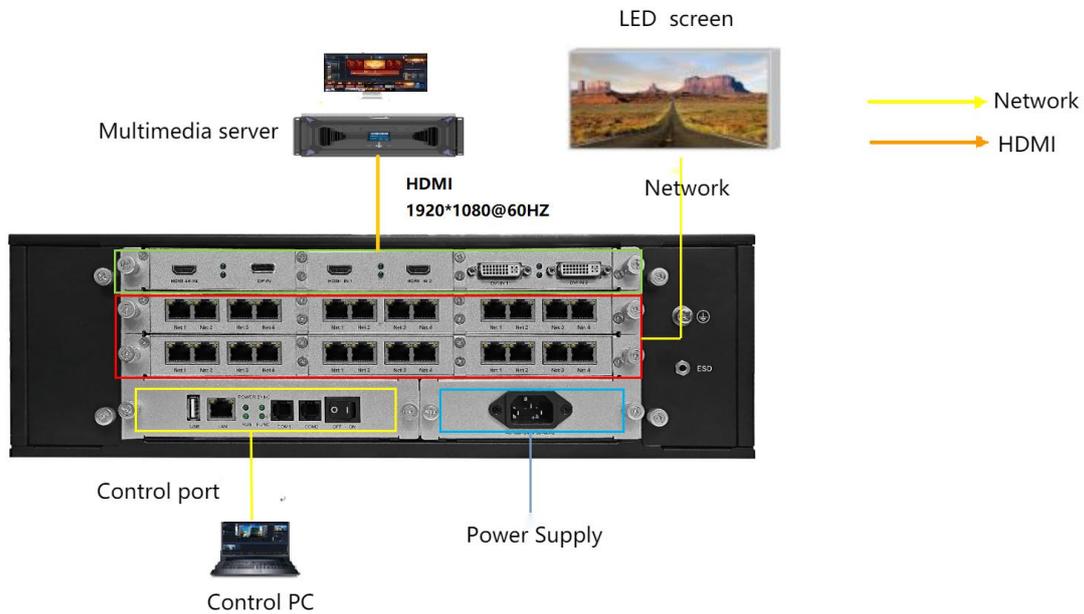
5、 panel structure



1. Input board card: 4K@60Hz module, support DP1.2, HDMI2.0 input, max support resolution 4096×2160@60Hz or 7680×1080@60Hz.
2. Output board card : 24 pcs lan cable out.
3. Control board: including power switch, COM port, network port, USB.
4. Power supply: 100-240V AC~50/60Hz 6.6A,not support backup power supply.

6、 cable connection and Installation

Cable connection diagram



Installation steps

- 1、 Wiring as shown in the figure, connect the output port of the server graphics card to the input port of the KLS24 controller;
- 2、 Then connect cable as shown in the figure, connect the control computer to the LAN control port of the device through the network cable, and connect the output network port of the KLS24 controller to the receiving card;
- 3、 Make sure that the wiring is correct and then power on and open the gold card debugging software. The software can correctly identify the model of the sending card and the number of receiving cards, and the debugging can be done normally.

7、 video processor software debugging instructions

7.1 open software

Double-click the software shortcut on the desktop, open the software, and go to the software start-up page.

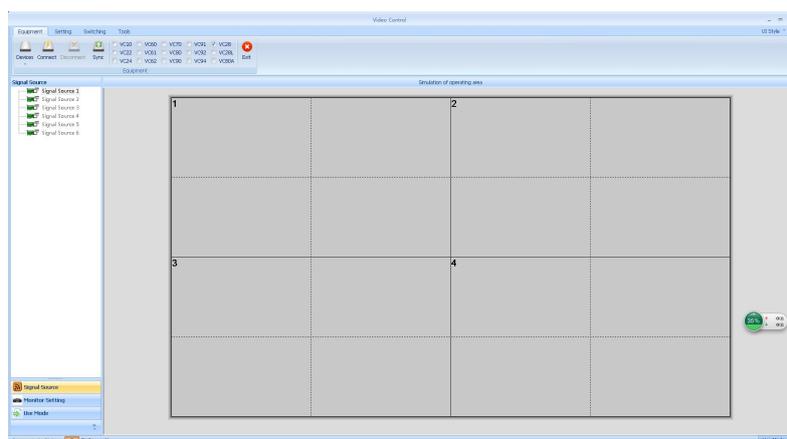
As shown in the following illustration:



The first use of no password direct click to determine, if you set the user password requires the correct password to enter the software control / settings.

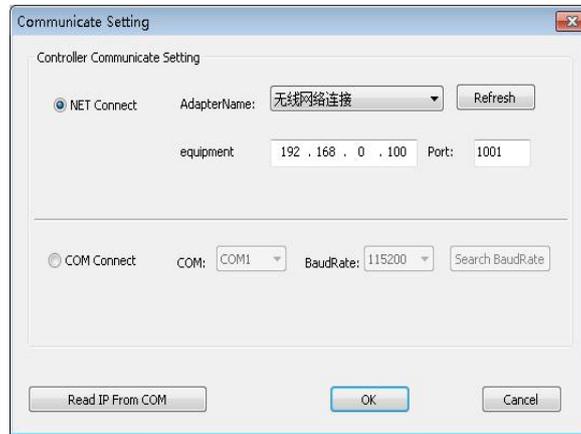
Click OK to enter the software main interface.

As shown in the following illustration:



7.2 Software connection

, Click Device Selection, select Video wall , and then click Connecting Devices , Pop-up Communication Settings window, as shown in the following illustration:



The software can choose NET or COM two ways to connect, choose a different connection way to prepare for different.

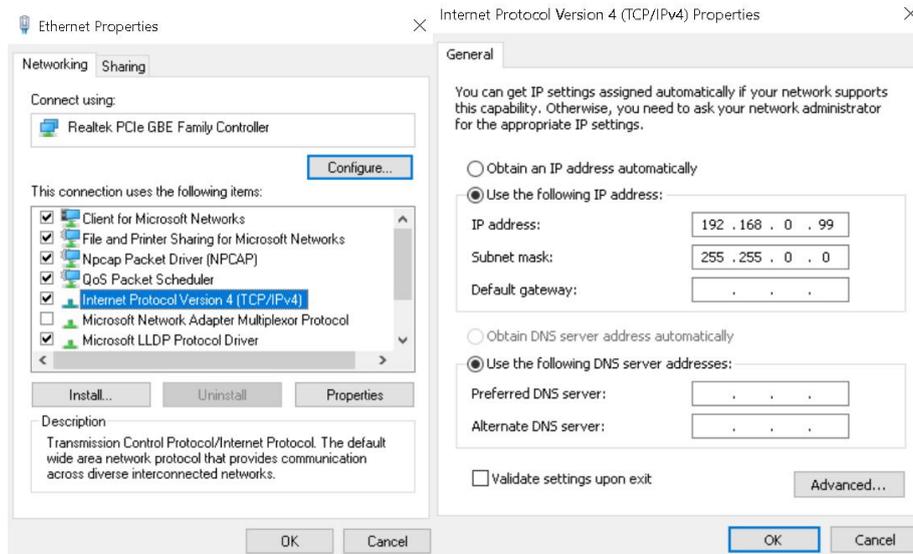
7.2.1 select NET connect

(1) Wiring

Use CAT5 network cable, one end connected to the processor LAN Port, one end is connected to PC the network port of the, which can also be connected through a switch.

(2) Modify Local Area Connection IP

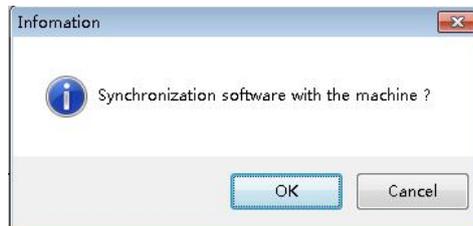
In Windows system, go to Start → Control Panel → View Network Tasks → Change Adapter Settings, you can find Local Area Connection, right-click Local Area Connection and select Properties, the following dialog box will pop up, double-click Internet Protocol Version 4 (TCP/IPv4), and set the The data modification and other IP addresses in the same network segment of the splicer, for example, the default IP address of the splicer is 192.168.0.100, at this time, the IP address of the computer can be modified to 192.168.0.123, and the subnet mask is 255.255.255.0. As shown below.



Note: Device IP address defaults to 0 network segment, other device's IP the guarantees that the same field and different numbers are available for normal communication. To change The network segment of IP, you need to change the software settings now.

(3) Establish communication

in software communication, Select NET Connect , and click directly OK , if the connection succeeds, a prompt box will pop up, as shown in the following figure, and click OK .



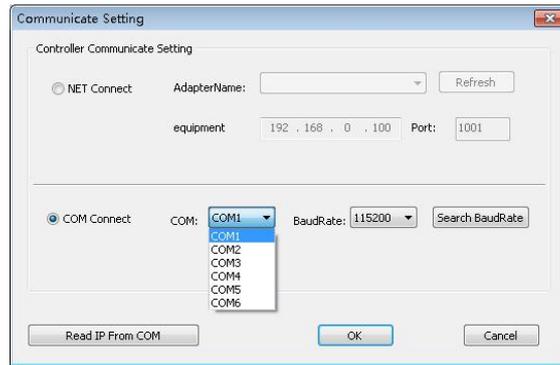
7.2.2 Select COM Connect

(1) Wiring

Use random distribution RS230--RJ11 connector, one end attached to the processor's COM1 Port, one end is connected to PC Serial Port (if no nine-pin serial port to use serial port to turn USB Convert header to USB up PC 's USB port).

(2) Modify COM Port

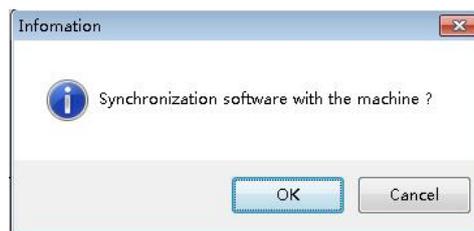
When software communicates, Select COM Connect :



In General, the software automatically recognizes COM port, users do not need to set, click to confirm. However, in some cases the PC machine may have more than one com port at work, causing software recognition errors, at this point you need to select com Port (Please try it in turn).

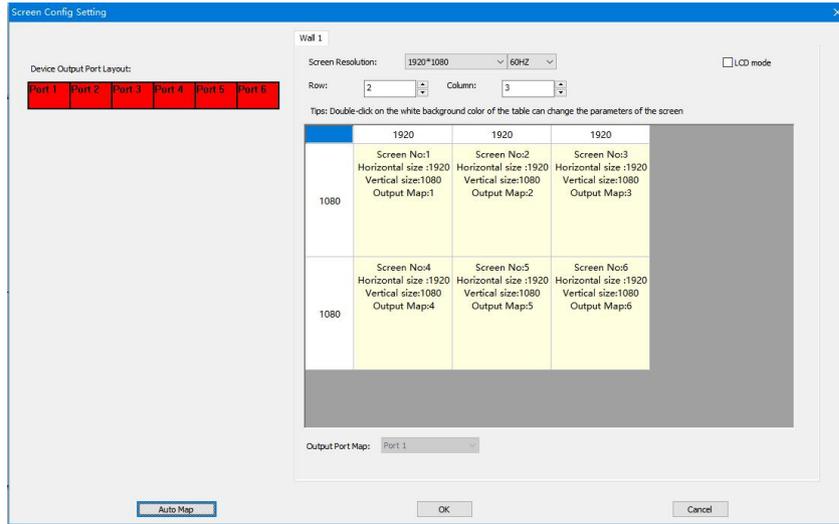
(3) Establish communication

When software communicates, Select NET Connect , and click directly OK , if the connection succeeds, a prompt box will pop up, as shown in the following figure, and click OK .



7.3 Out port settings

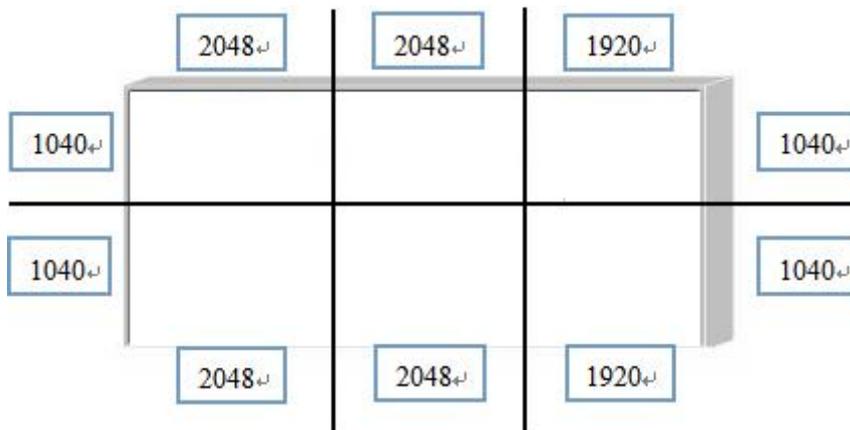
Click after device connection succeeds Primary Ribbon under Screen Configuration , pop-up screen parameter setting interface , the six dotted field word box in the operation area corresponds to the device output port (see left to right) one by one, the load on each outlet and the outlet arrangement are set in the interface. As shown in the following illustration:



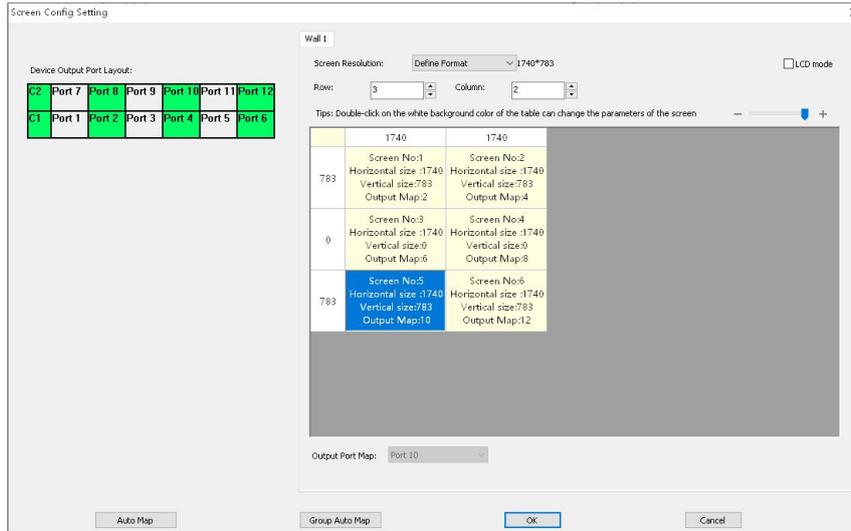
Screen Resolution The maximum resolution that the can output for each outlet, typically greater than the resolution of each card or display.

Row and Columns set on your own, above the layout diagram 1920 and the on the left 1080 the can be modified according to the actual number of load points, double-click the value to modify.

For example: Screen size is 6016*2080 , with six send cards, with load size and arranged as shown in the following figure:



Then, the screen parameter settings interface requires the following settings:

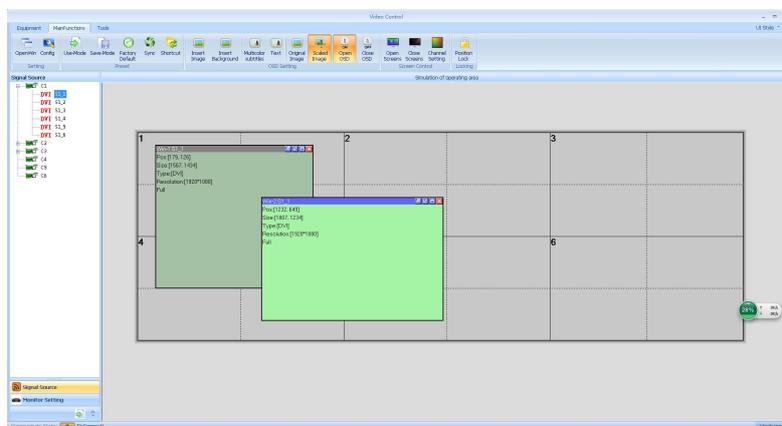


P: Sync all screen brightness The check mark indicates that the color value of the modified rear is for all outlets, and removing the checkmark can be used to adjust the color for a single outlet.

Set up a good outlet layout and load points after the click to determine, return to the operating area.

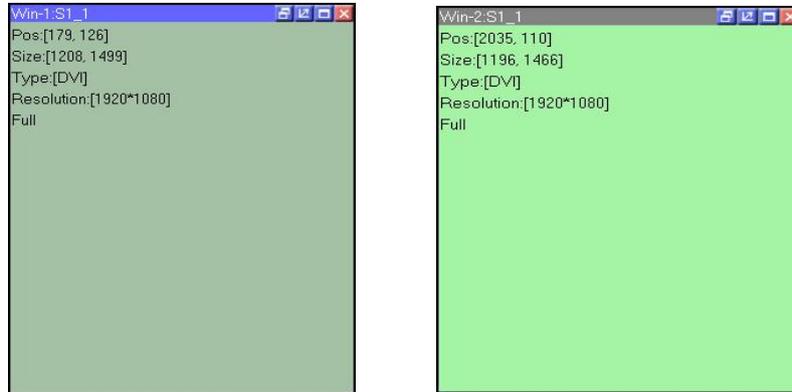
7.4 Open window

Through the above settings, has been the whole large screen stitching up, gray area to represent the entire large screen, the big screen how to display, need to create a picture, here to 2 Row 3 The column shows an example of how to create a picture.



Hold down the left mouse button and drag in the operation area, and when you draw a rectangle, release it, and a window is created (or click New Open Window).

The top bar of the window has both gray and blue display, when the window is blue to indicate that the window is selected, you can do a direct operation, when the window is gray to indicate that the window is unchecked, if you want to operate the window, you need to left-click the top bar of the window, the top bar becomes blue to set the window. The selected and unchecked states are shown in the following illustration:

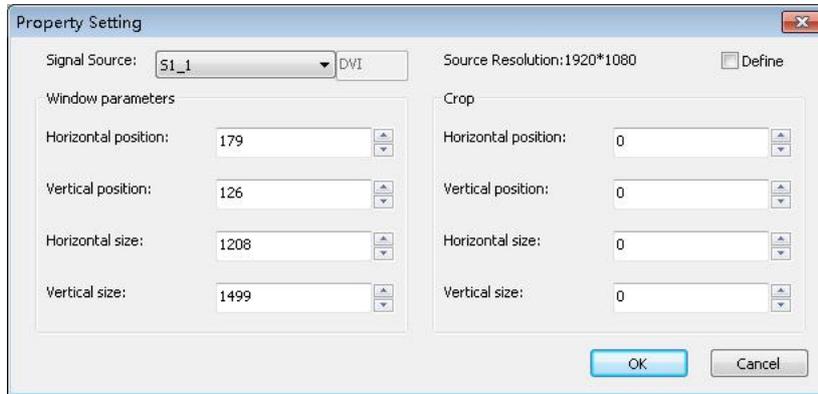


Right-click the window in the selected state to see a list of menu features for this window:

Among them, click "Properties" to see:

Name	Function description
Save setting	Archive the currently set parameters, a total of 12 gears
Top	Place the current window at the top level
Bottom	Place the current window at the bottom
Property	Set the properties of the current window
Full-screen	Toggle between panorama and local mode: panorama is the input signal of the whole picture, local is the input signal local image (by changing the window properties of the input zoom to select the size and location of the local screen; if not set, and the window size is less than the resolution of the input signal, the default local screen size is the same as the window size, Start with 0,0)
Full-screen	The current window is paved with the entire screen
Maximize the Unit	The analog operation area is divided into areas by dotted lines and solid lines, and the current window may span multiple areas but not fully fill them, allowing the current window to be filled with spanned areas
Restore	Restores window size to adjustment (after full screen or cell maximization)
Shut down	Close (delete) the current window
Close all	关 Close all windows in the simulation operation area

Click Properties Visible:

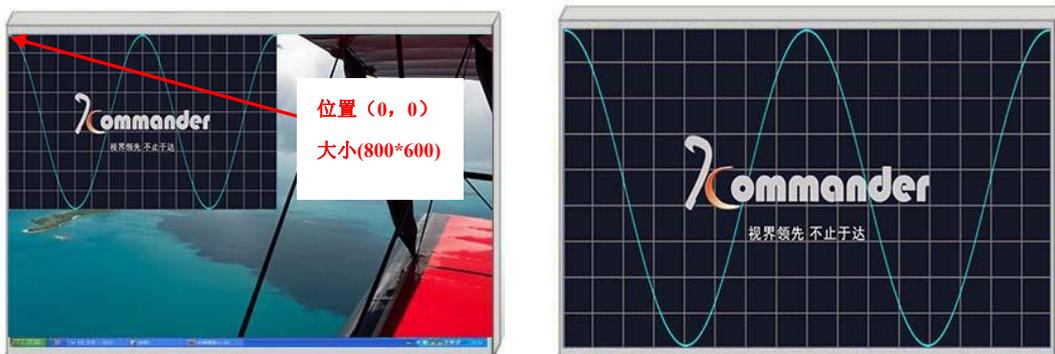


Property settings mainly include the following three items: Signal source Selection, screen parameters, local display.

Signal source selection is for the current window to select the desired signal source, you can also directly click on the left of the signal source bar signal Source to switch.

Screen parameters are set the current window size, if you need the entire screen to play a screen, the size of the window set to screen pixel size can be, if you need to show the effect of multiple screens, according to the actual situation to make adjustments.

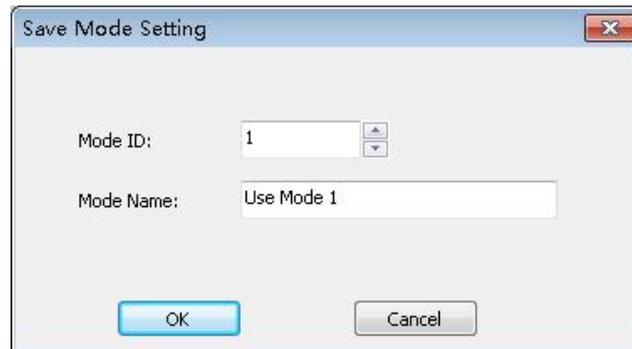
When need to intercept the blue print area to play out in a window, you need to set the horizontal, vertical position of the window input zoom to 0 , the horizontal size is set to To 800 , set vertical size to 600 , if the window is full screen size, the effect on the screen is:



7.mode save and call

7.5.1 Mode save

Click Save Mode in the main ribbon to eject the Save Mode Settings window, as shown in the following image:



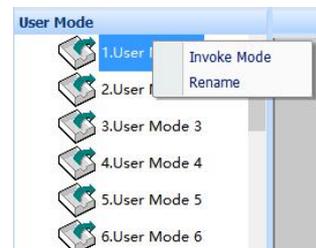
You can change the pattern as needed ID , that is, to save to the first few modes, you can also change the schema name as needed. (excluding the pre-monitoring and hot-backup settings).

P: The device defaults to boot mode one data, so it is recommended to save the most commonly used display mode data in the pattern 1 .

7.5.2 mode call

Click Left User Mode , click on the corresponding mode to invoke the display, in addition, if you right-click user mode to change the mode name, make the pattern easier to remember and use.

As shown in the following illustration:

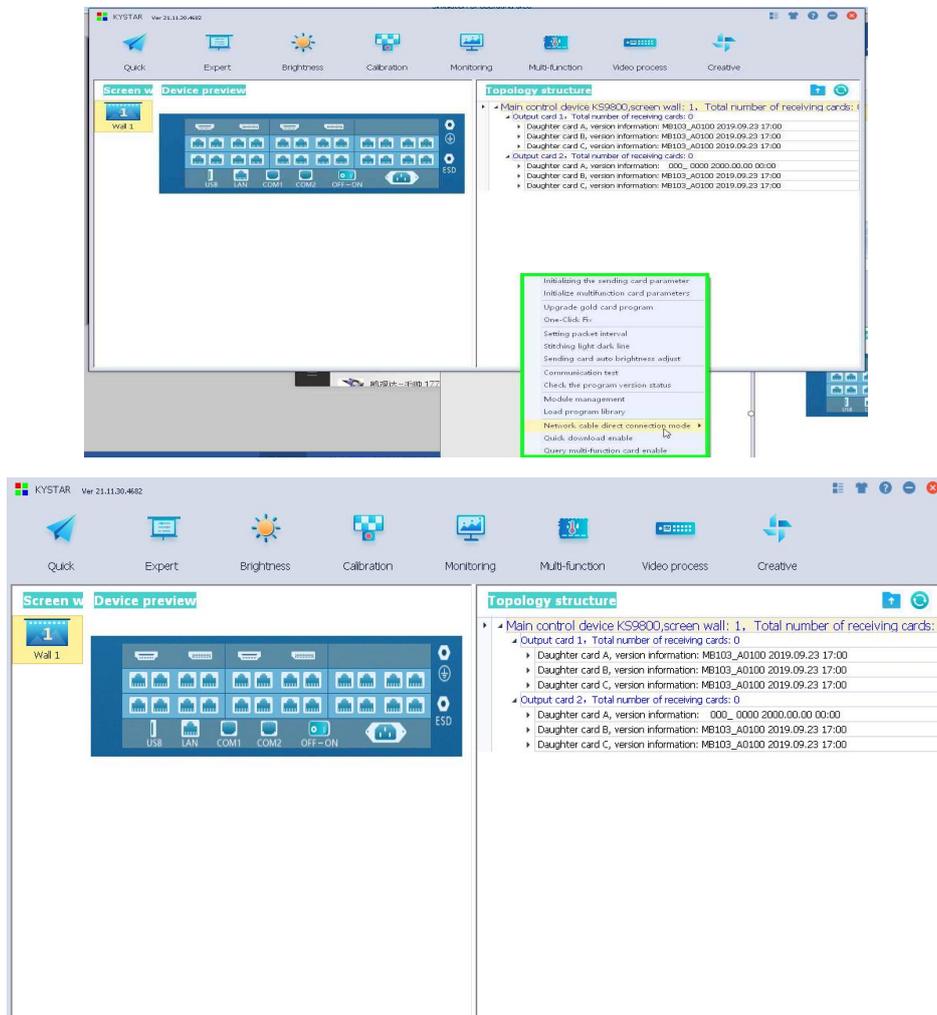


8、 Control card software debugging instructions

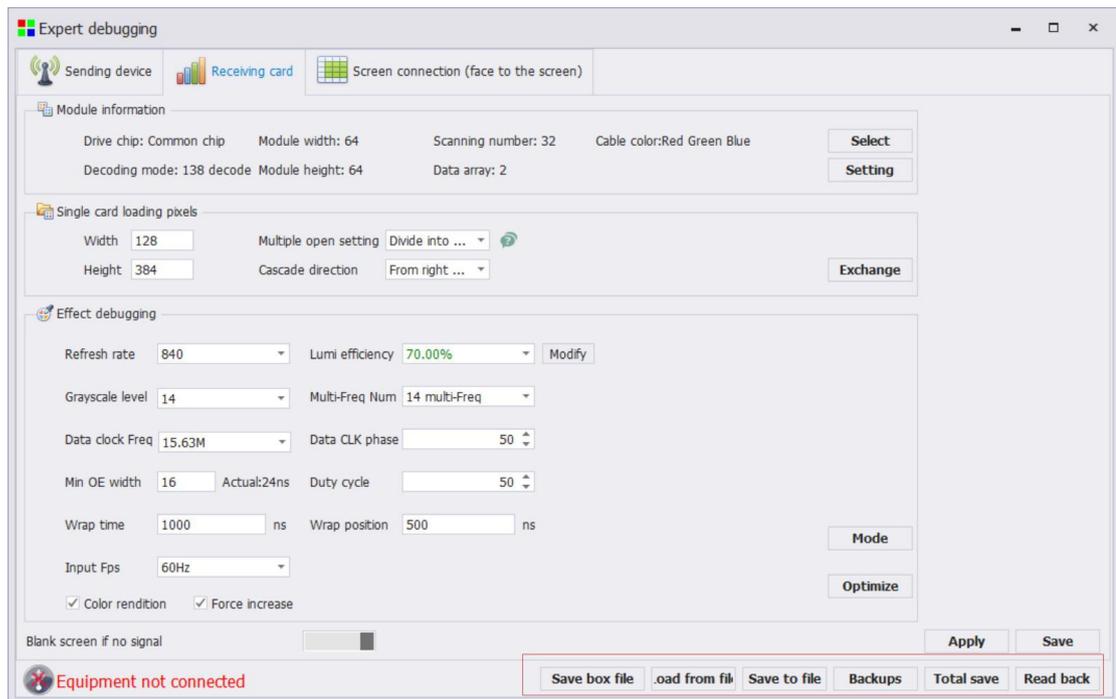
Open the software to enter the expert debugging interface, set the parameters of the sending card, the receiving card parameters, and the screen connection.

1、 software connection

Use the network cable to connect, when debugging KLS24 for the first time, after opening the software, type "666888" on the keyboard, select the network cable direct connection mode, check the "direct connection sending device", and detect that the number of receiving cards is the actual number of on-site loads to debug.



2、 Receiving card parameter settings



The common IC and dual-latch IC mainly adjusts the test data clock frequency and multiplier to refresh and debug to 1920, and the PWM chip mainly adjusts the gray-scale clock frequency and refreshes and debugs to 3840.

Module select: Select the corresponding module manufacturer; check the module specifications, driver chips and decoding chips.

Setting: According to the width and height of the module, the driver chip and the decoding chip, the unit board loading file is made.

data line color: The arrangement of red, green and blue can be directly exchanged without resetting intelligently.

Draw settings: The lamp panel is drawn and applied to small spacing and unconventional lamp panels.

Set up single card loading: Receives the width and height of the cartridge load.

Multi-opening Setup and Cascade Direction: Set the multi-opening method and rotation angle.

data set exchange: Exchange data sets and smart lookups.

Keep last frame after signal loss: Set the screen to be black or keep the last frame

when the receiving card has no signal.

effect debugging: Debug data clock frequency and multiplier, and refresh to 1920 (PWM chip debug gray clock frequency, refresh to 3840).

Effective means to improve the display effect:

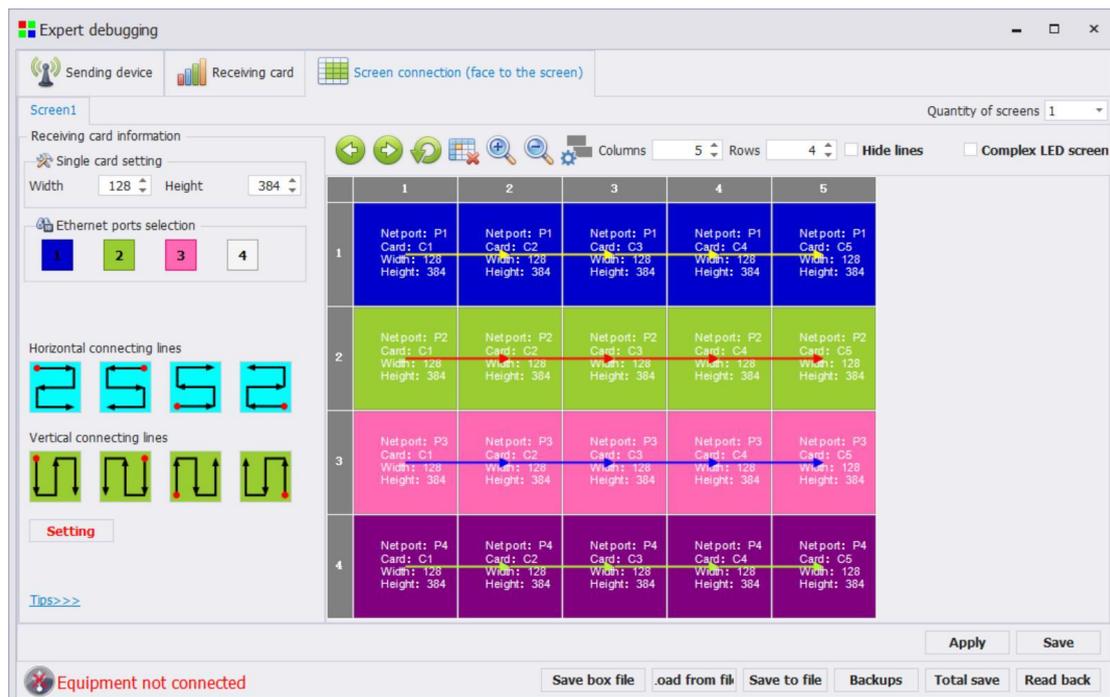
1、 **Raise the data clock:** The frequency is not affected by other parameters, which is the first condition; if there is a blurry screen, reduce it one by one; try to adjust the clock phase if it is slightly tricky; the 32-scan module is generally adjusted to 20.83; too high has a great impact on the module itself and is troublesome to maintain .

2、 **Reduce OE width:** The default is 32ns, in units of 8, and it is reduced one by one; note that too low will affect the low gray effect.

3、 **Adjust the output gray level:**Conventional modules are generally adjusted to 12-14; 12 represents 2 to the 12th power, that is, 4096.

4、 Appropriately reduce the parameter value, and then solidify: After the display effect is normal, reduce the above data appropriately without affecting the refresh rate and brightness efficiency. At present, it is to reduce power consumption and increase the life of the screen.

3、 screen connection



Single card setup: Set the receiving card load size.

Network port selection: Select the peer network port settings.

Connection method (horizontal/vertical): The serial connection method between the receiving card and the receiving card.

Setting: According to the flickering of the large screen, click the corresponding area to intelligently identify the serial connection method of the network port and network cable.

Complex Display Connections: Used to individually adjust the load and location information for each receiving card. For alien items.

Save to file: Save the display connection kcfg file separately.

Hub port offset: Set the offset of the HUB port (select the receiving card and click the port offset to set).

Debugging Tips: Select the network port to directly change the width and height of all cards in the network port.

Click the number before each row or column to change the size of a row or column.

4、 save parameter

After the parameter setting is completed, the large-screen display is normal, and you can click all to cure. For detailed software parameter settings, please refer to the "Kstar Control System User Manual".

9、FAQ

Q1: DVI, HDMI port definition.

A:

DVI: Digital (HD) video signal is an interface standard introduced by DDWG (Digital Display Working Group) in 1999 by Silicon Image, Intel and other companies. It has been well optimized in speed, clarity and HDCP protocol. Signal sources are typically desktop computers, notebooks, etc.

HDMI : High Definition Multimedia Interface (HDMI) is a digital video/audio interface technology. It is a special digital interface suitable for image transmission. It can transmit audio and video signals at the same time. The maximum data transmission speed is 5 Gbps. Signal sources are usually cameras, notebooks, information dissemination systems, etc.

Q2: Briefly describes the connection mode of video card, video processor, receiving card and large LED screen.

A: The DVI (VGA) output port of the graphics card is connected to the DVI-IN (VGA-IN) input of the video processor - the network port output of the video processor is connected to the terminal receiving card behind the screen through a network cable - the receiving card connection control The respective part of the screen body is connected to the entire large screen by cascading.

Q3: How to set the keyboard lock of the video processor? How to unlock?

A: A: Menu - Advanced Menu - Expert Settings - Keyboard Lock. Keyboard can be locked after opening. Keyboard can be unlocked even by pressing MENU key 10 times.

Q4: What are the possible reasons why the upper computer can't detect the equipment?

A: Use a computer to control the video processor, serial line.

The connection failure may be caused by the following conditions.

- ① The device is not powered on;

- ② The USB cable driver is not installed on the computer or the USB driver is damaged;
- ③ The serial port cable is not well connected or the cable is damaged;

Q5: The large screen of the video card directly connected with the sending card is displayed normally, and the screen will appear black screen when it is connected to the video processor.

A: Observe whether the sending card indicates that the green light flashes normally. If the signal is given by the processor's output port, the possible reasons are as follows:

① The problem of signal source. When connecting the computer graphics card, the copy mode of the graphics card should be set. If not, the DVI port of the graphics card has no data output. Setup steps: Turn off the power supply of video processor - reinsert the line from video card to video processor - ATI graphics card reads and replicates automatically. NVIDIA graphics card needs to enter the graphics card control center and set up multiple display + double screen replicate mode.

② Connection problems. When the signal line interface contacts badly or there is a problem inside the wire, the large screen will appear abnormal phenomena such as color stripes, flower screens and so on. Check carefully whether the pin in the signal line is broken or inclined and change the signal line.

If the above suggestions do not solve your problem, please contact our customer service staff in time. We will help you solve the problems in the first time.