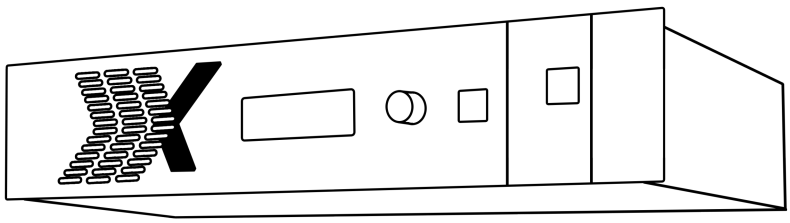
X2



USER MANUAL

RGBlink

Article No: RGB-RD-UM-X2 E009
Revision No: V1.9

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Thank you for choosing our product!

This User Manual is designed to show you how to use this video processor quickly and make use of all the features. Please read all directions and instructions carefully before using this product.

Declarations

FCC/Warranty

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the user will be responsible for correcting any interference.

Guarantee and Compensation

RGBlink provides a guarantee relating to perfect manufacturing as part of the legally stipulated terms of guarantee. On receipt, the purchaser must immediately inspect all delivered goods for damage incurred during transport, as well as for material and manufacturing faults. RGBlink must be informed immediately in writing of any complains.

The period of guarantee begins on the date of transfer of risks, in the case of special systems and software on the date of commissioning, at latest 30 days after the transfer of risks. In the event of justified notice of compliant, RGBlink can repair the fault or provide a replacement at its own discretion within an appropriate period. If this measure proves to be impossible or unsuccessful, the purchaser can demand a reduction in the purchase price or cancellation of the contract. All other claims, in particular those relating to compensation for direct or indirect damage, and also damage attributed to the operation of software as well as to other service provided by RGBlink, being a component of the system or independent service, will be deemed invalid provided the damage is not proven to be attributed to the absence of properties guaranteed in writing or due to the intent or gross negligence or part of RGBlink.

If the purchaser or a third party carries out modifications or repairs on goods delivered by RGBlink, or if the goods are handled incorrectly, in particular if the systems are commissioned operated incorrectly or if, after the transfer of risks, the goods are subject to influences not agreed upon in the contract, all guarantee claims of the purchaser will be rendered invalid. Not included in the guarantee coverage are system failures which are attributed to programs or special electronic circuitry provided by the purchaser, e.g. interfaces. Normal wear as well as normal maintenance are not subject to the guarantee provided by RGBlink either.

The environmental conditions as well as the servicing and maintenance regulations specified in this

manual must be complied with by the customer.

Operators Safety Summary

The general safety information in this summary is for operating personnel.

Do Not Remove Covers or Panels

There are no user-serviceable parts within the unit. Removal of the top cover will eXPOSE dangerous voltages. To avoid personal injury, do not remove the top cover. Do not operate the unit without the cover installed.

Power Source

This product is intended to operate from a power source that will not apply more than 230 volts rms between the supply conductors or between both supply conductor and ground. A protective ground connection by way of grounding conductor in the power cord is essential for safe operation.

Grounding the Product

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective-ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Use the Proper Power Cord

Use only the power cord and connector specified for your product. Use only a power cord that is in good condition. Refer cord and connector changes to qualified service personnel.

Use the Proper Fuse

To avoid fire hazard, use only the fuse having identical type, voltage rating, and current rating characteristics. Refer fuse replacement to qualified service personnel.

Do Not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an e×plosive atmosphere.

Installation Safety Summary

Safety Precautions

For all X2processor installation procedures, please observe the following important safety and handling rules to avoid damage to yourself and the equipment.
To protect users from electric shock, ensure that the chassis connects to earth via the ground wire provided in the AC power Cord.
The AC Socket-outlet should be installed near the equipment and be easily accessible.

Unpacking and Inspection

Before opening X2processor shipping box, inspect it for damage. If you find any damage, notify the shipping carrier immediately for all claims adjustments. As you open the box, compare its contents against the packing slip. If you find any shortages, contact your sales representative.
Once you have removed all the components from their packaging and checked that all the listed components are present, visually inspect the system to ensure there was no damage during shipping. If there is damage, notify the shipping carrier immediately for all claims adjustments.

Site Preparation

The environment in which you install your X2 should be clean, properly lit, free from static, and have adequate power, ventilation, and space for all components.

Chapter 1 Your Product

1.1 In the Box

AC Power Cord



Network Cable



HDMI to DVI Cable



Serial DB9 to 3.5mm Jack



USB Cable



Antistatic Bag

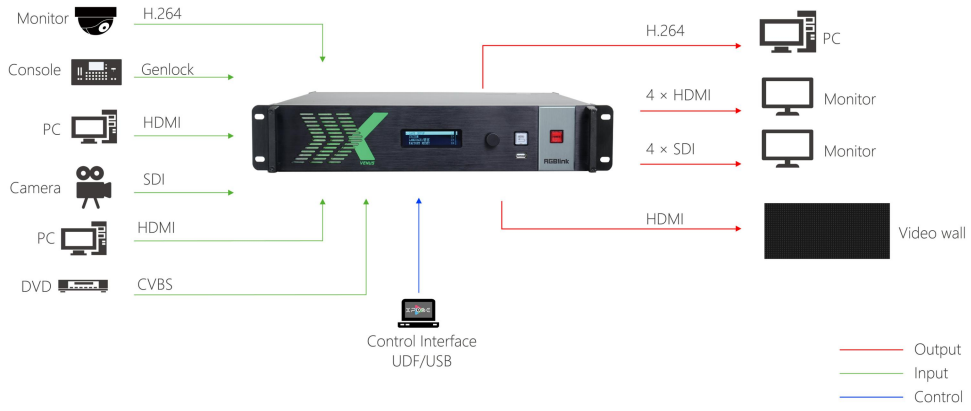
Note:

AC Power Cable supplied as standard according to destination market.

Upgrading tool package and user manual are stored in the U disk, please keep it.

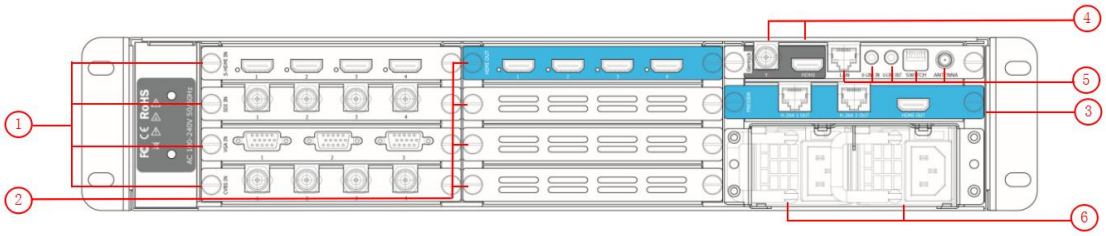
1.2 Product Overview

X2 is a multiple outputs video processor, it offers nine card cages that accepts a wide variety of video signals, including VGA, CVBS, SDI, HDMI, H.264, 4K and USB (for media files play). X2combines truly seamless, fade in fade out, glitch-free switching with advanced scaling technologies to meet the requirements of high quality, high resolution video presentations. X2supports EDID editing for VGA, HDMI input ports and read EDID for output ports, the EDID can be modified by windows control program, users can edit the EDID of input port according to the resolution of outputs to achieve the optimal input resolution.
X2also supports resolution real-time total adaptation, color uniformity compensation technology and 90°, 180°and 270°rotate. In addition, it supports local front panel operation, remote widows based software control by Ethernet, and WIFI control. In addition, X2is based on replaceable input optional modules structure, with different modules, you can reach more possibility and application range.



X2 System Connection Diagram

1.2.1 Back Panel



Input Option Slots

1	X2provides 4 input option slots, range of inputs are available for user fitting, including S-HDMI, SDI, VGA, CVBS, USB, HDMI, H.264 and 4K. **S-HDMI** Each HDMI module supports 4 HDMI-A inputs. Standard signal from computer can input. **3G-SDI** Each SDI module supports 4 SDI inputs. Standard 3G-SDI signals can input. **VGA** Each VGA module supports 3 DB15 inputs. Standard VGA signals can input. **CVBS** Each CVBS module supports 4 BNC inputs. Standard video signal from players, cameras can input. **USB** Each USB module supports 4 USB-A inputs. Access the USB device or mobile hard disk with USB storage function. Support general image and video formats. **H.264** Each H.264 module supports 4 RJ15 inputs. Standard signal from cameras and router can input. **4K** Each 4K module supports 1 HDMI input and 1 DP input, each with loop. The HDMI input can input the image signal from computer. The HDMI Loop can connect to the HDMI input of the ne×t X2or the device with HDMI input. Standard DisplayPort signals can be input for DP input. The DP Loop can connect to the DP input of the ne×t X2or the device with DP input.

Program Output Option Slots

2	X2provides 4 output option slots, range of inputs are available for user fitting, including HDMI and SDI. **HDMI** Connect to the display device, video processor or matri× with HDMI input. **3G-SDI**

	Connect to the ne×t device with SDI input.

Preview Output Option Slots

3	The preview module supports 2 H.264 output and 1 HDMI output. **H.264** Connect to the ne×t device with RJ45 input. **HDMI** Connect to the display device, video processor or matri× with HDMI input.

Genlock Connectors

4	It includes 1 BNC connector and 1 HDMI-A connector BNC connector receive sync signal from the controller or signal generator HDMI-A receive sync signal from computer.

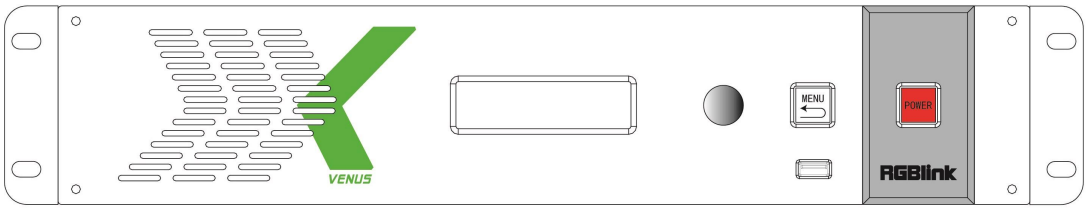
Control Connectors

5	It includes 1 LAN port, 1 U-LINK IN, 1 U-LINK OUT, 1 DIP switch and 1 antenna port. **Ethernet** Connect to TCP/IP network for remote control by windows software. **U-LINK IN** Connect to the U-LINK output of the ne×t X2, adopt 3.5mm jack audio interface, for multiple cascade. **U-LINK OUT** Connect to the U-LINK input of the ne×t X2, adopt 3.5mm jack audio interface, for multiple cascade. **DIP Switch** To set the device address, identifying the processor when multiple devices are linked **Antenna** SMA F for standard antenas (Wifi module sold seperately)

Power Connection

6	**Power Input** Main power input AC 100-240V MAX 205W.

1.2.2 Front Panel



Display

	**OLED Display** Displays current status of the product, and for feature selections provides interactive choices in conjunction with buttons on the front panel.

Multi-Function Buttons

	**Rotary Button** This button used for menu selections and confirmation. The button is both rotary (turn to left and right), and push-button (confirm selection)

Illuminated Buttons

	**MENU Button** This button used for menu selections – refer to Understanding the MENU Structure. Push the button again will return to the last level menu or e×it the menu.
	**POWER Button** Power button, push the button, the touch screen will pop up the confirm box, select “OK”, and turn the device off.

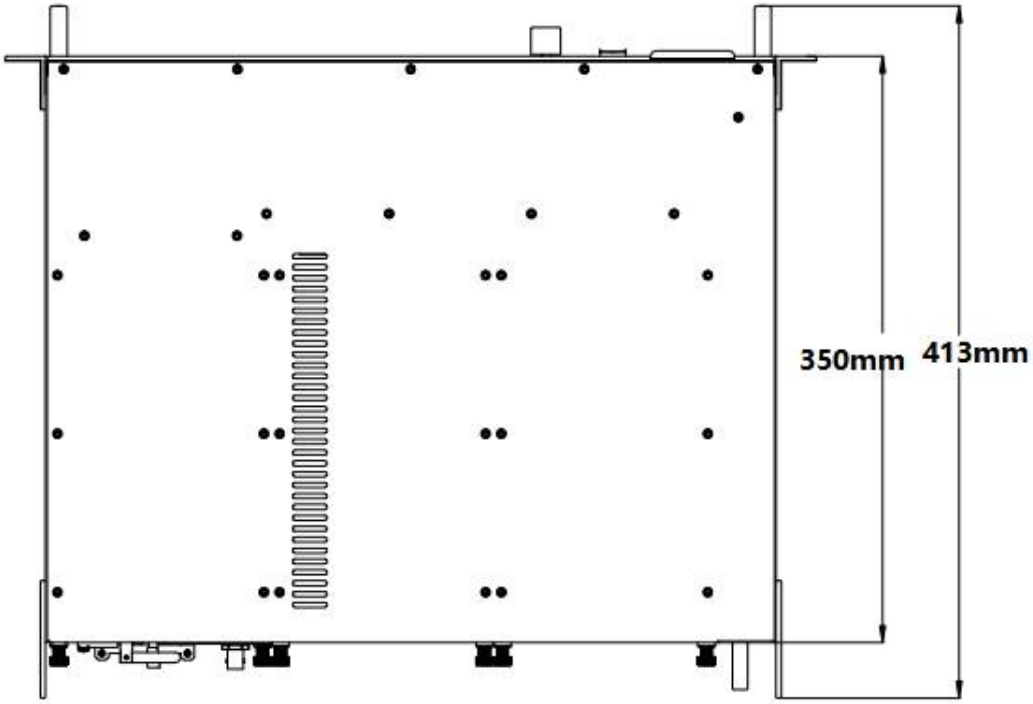
Control Interface

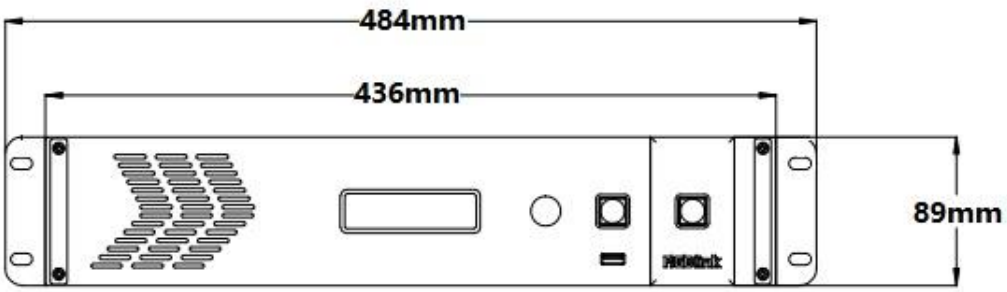
	**USB Interface** Use for device upgrade.

1.2.3 Dimension

Following is the dimension of X2for your reference:







Chapter 2 Install Your Product

2.1 Plug in Signals

Connect signals to the product (ensure all devices are powered off first). Tighten connector screws/locks where provided.



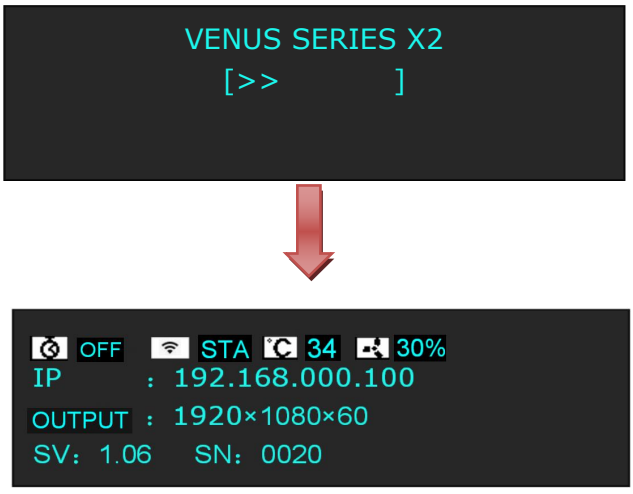
For connector protection and for additional cable support this product is fitted with protection frames on either side of the device. For cable support use cable ties to attached to the protection frames to avoid stress on signal connectors.

2.2 Plug in Main Power

Connect IEC cable to device and plug into wall socket. Turn on power at wall socket.

2.3 Turn on Your Product

The device will enter to the boot interface, and OLED display will show as below, completing initialization before loading last settings and input/output configuration.
On delivery, the output format is defaulted to 1920×1080×6



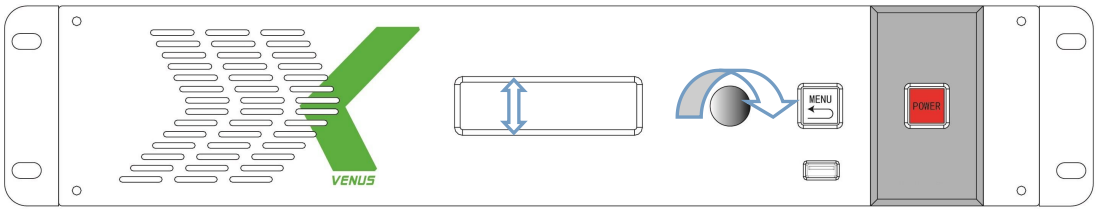
Chapter 3 Use Your Product

3.1 Use the MENU Button

Push the [MENU] button to enter the menu display.

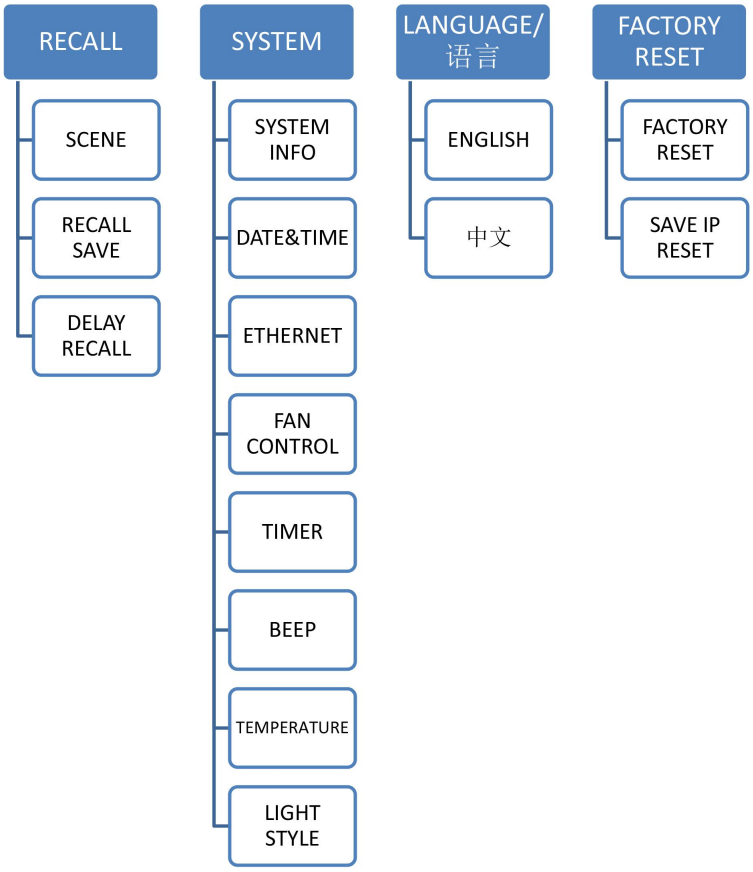
Turn the rotary knob to navigate to the menu item required. The → symbol shows the current item. Push the knob to select and enter into the menu item.

As shown in the figure below:



3.2 MENU Structure

The MENU structure is shown in the figure below:

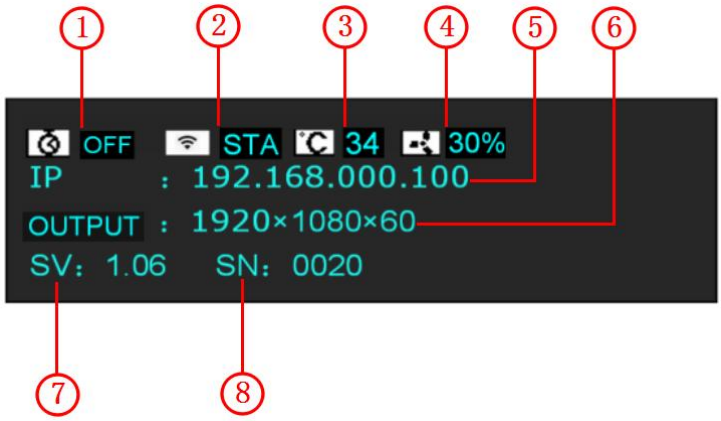


3.3 Use the Menu

Use the menu system for convenient and intuitive operation. X2OLED display shows the menu items. The OLED display will show the default state when the menu is not in use, or the operation has timed out. Using the MENU button and rotary knob in the front panel, the OLED display will show the corresponding menus according to user selections.

3.3.1 OLED

Turn the power switch to the ON position, the OLED display will show the start-up interface and show the default menu after completing initialization as below:



Introduce for the above information:

1	**Timer** Shows the timer state of the product. When not displayed here, the timer can be set via the SYSTEM menu.
2	**Ethernet** Displays whether Ethernet connection is active or inactive. Ethernet settings are available in the SYSTEM menu.
3	**Temperature** Shows the temperature of the product. When not displayed here, the temperature can be found via the SYSTEM menu.
4	**Fan Control** Shows the current speed of the product. When not displayed here, the speed can be set via the SYSTEM menu.
5	**IP Address** Shows the IP address of the product. When not displayed here, the IP address can be set via the SYSTEM menu.
6	**Output Resolution** Show the current output resolution. A wide range of resolutions are supported – refer to Specification.
7	**Software version**

	Shows the software version of the product. When not displayed here, the serial number can be found via the SYSTEM menu.
8	**Serial Number** Shows the serial of the product. When not displayed here, the serial number can be found via the SYSTEM menu.

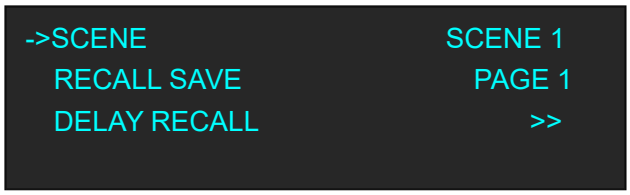
3.3.2 Main Menu

Push the MENU button in the default state and turn the rotary knob, the OLED display will show the main menus as below:



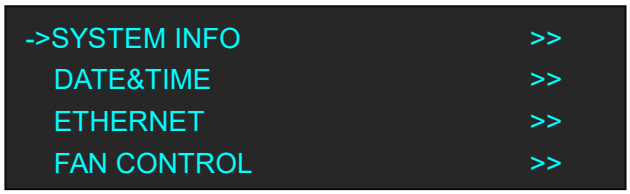
There are 4 menu items in the main menu, and display in 1 page. Turn the rotary knob, and select any menu above, push the rotary knob to confirm, the OLED display will show the submenu. If push the MENU button, the OLED display will return to the last level menu.

3.3.3 Recall



SCENE	Save all current settings with the X2to 1 of the 16 available slots.
RECALL SAVE	Restores/Loads all current settings with the X2from 1 of the 16 available slots.
DELAY RECALL	**SCENE** Select the scene that will delay call.
	SAVE PAGE Select the save page that will delay call.
	DELAY TIME Delay output time setting.

3.3.4 System



SYSTEM INFO	**SN** Display the serial number of the device.
	DEVICE INFO Display the version of input card, output card, COM. CARD and KEYPAD.
	TECH SUPPORT Display the factory sales, customer service, email and other contact information, etc.
DATE&TIME	User can view and change the date, time and week, view the current time, total time and boot times.
ETHERNET	DHCP, IP, mask, gateway, MAC and WIFI setting. User can enable or disable the DHCP function. Default IP address is 192.168.000.100, mask is 255.255.255.000, gateway is 192.168.000.001. Enable or disable the WIFI function. When select “ON”, STA or AP mode can be selected.
FAN CONTROL	**AUTO SPEED** Enable or disable the auto speed function
	CURRENT SPEED Set the current speed.
TIMER	User can set the timer power on and timer power off from Sunday to Saturday. When set timer as “ON”, the timer tasks will take effect.
BEEF	Enable or disable the beep function.
TEMPERATURE	**ALARM** Set the alarm temperature. The device will alarm when reach the alarm temperature.
	UNIT

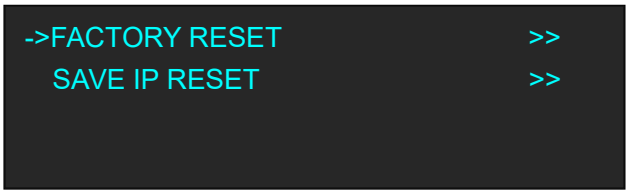
	Select the unit as ℃ or ℉.
LIGHT STYLE	X2provides 8 kinds of light style, user can select any mode from mode 0 to mode 7 according to actual need.

3.3.5 Language



Language	Select Chinese or English.

3.3.6 Factory Reset



FACTORY RESET	Select “YES” or “NO”. Select “YES” to restore default settings.
SAVE IP RESET	Select “YES” or “NO”. Select “YES” to restore default settings, but keep the IP.

Chapter 4 Control by XPOSE

4.1 Software Installation

Environment Requirements:

Processor: 1 GHz or above 32 bit or 64 bit processor

Memory: 2 GB or more

Graphics: Support DirectX 9 128M or above (open AERO effect)

Hard disk space: Above 16G (primary partitions, NTFS format)

Monitor: Resolution must be 1280×720 pixel or above (it can not display normally if the resolution is lower than 1280×720)

Operating system: Windows 7 or above (full version, not Ghost version or compact version)



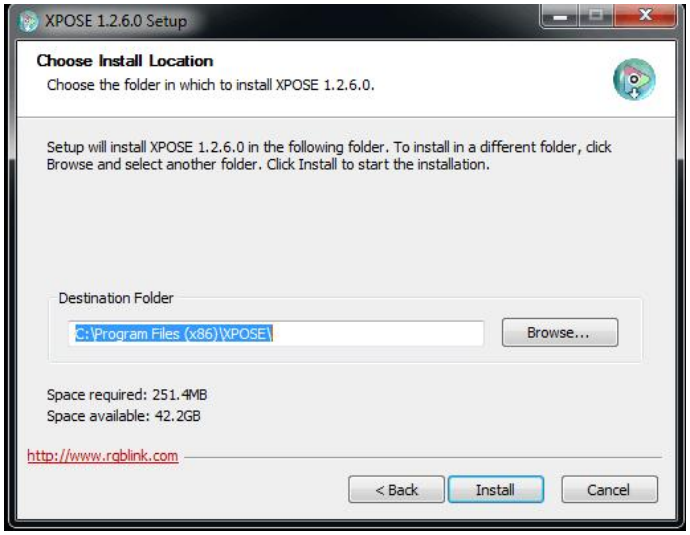
Double click icon, it will pop-up the installer language box, select the language, for example, select “English”, and click “OK” to confirm.



Click “Next” to install:



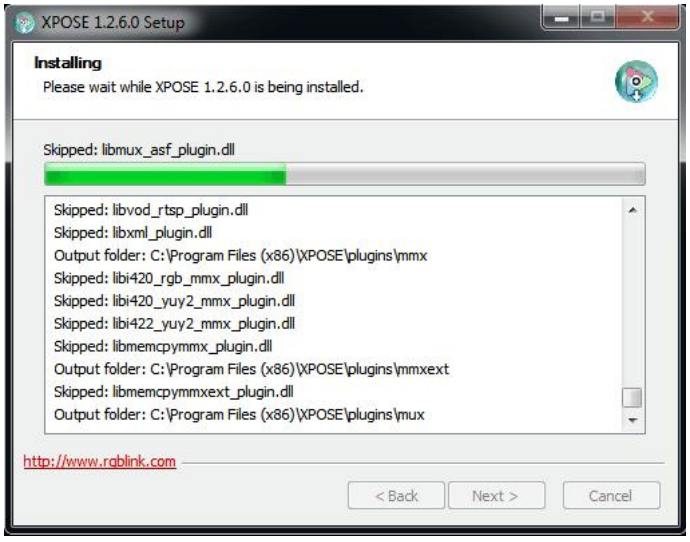
Select “Browse...” to select the XPOSE software install location:



Note

User should get the rights in “Roles Management” when install the software to disk C if the system is Windows 7 or above.

Click “Install”:



Click “Finish” and is ready to run the XPOSE management software:

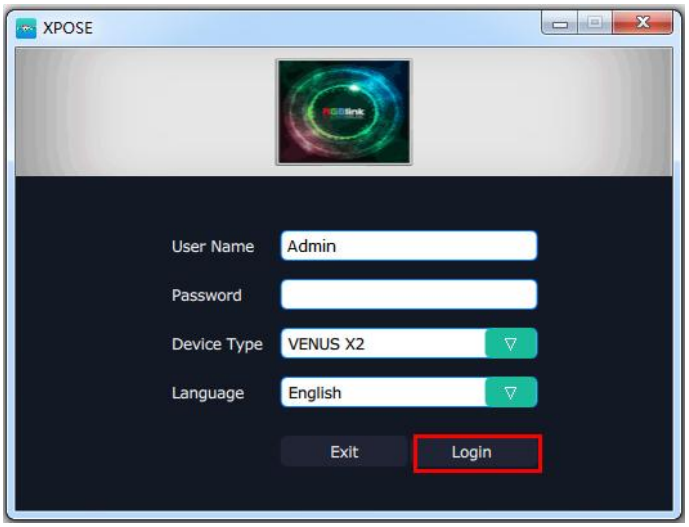


4.2 Software Operation

4.2.1 Login to the Software

Double click the icon 

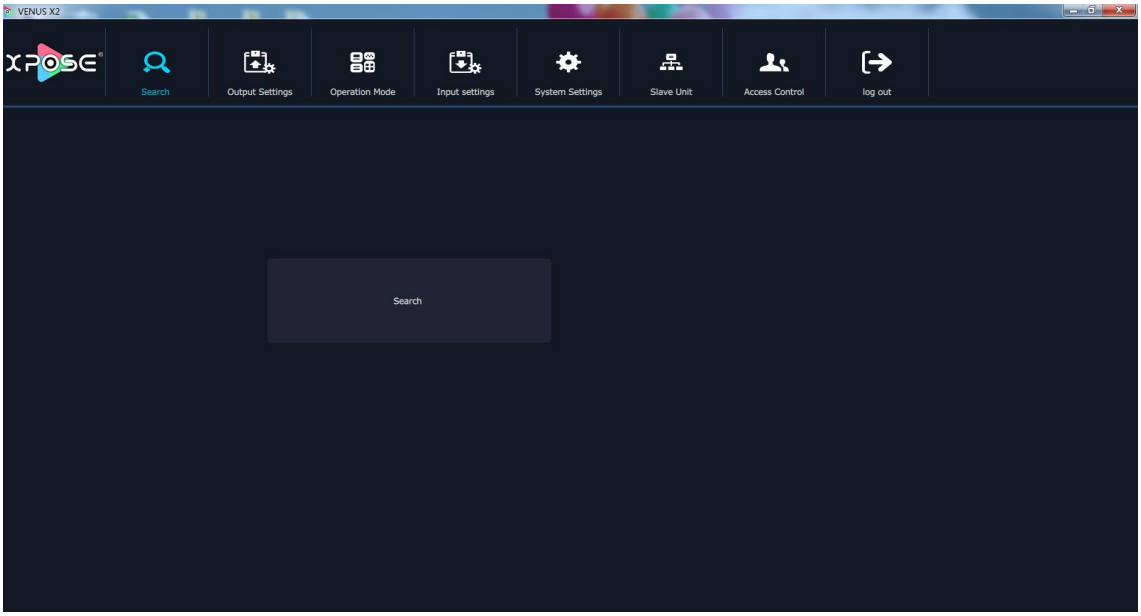
on the desktop. Log in interface will be enter after opening, the user name is Admin, and there is no password, select “X2”, and enter into the software by clicking “Login”.



If user want to change the language to Chinese, click the drop down arrow after “Language” and select “Chinese”, as shown in the figure below, then click “Login” to enter into the software.



XPOSE management software interface is shown as follows.

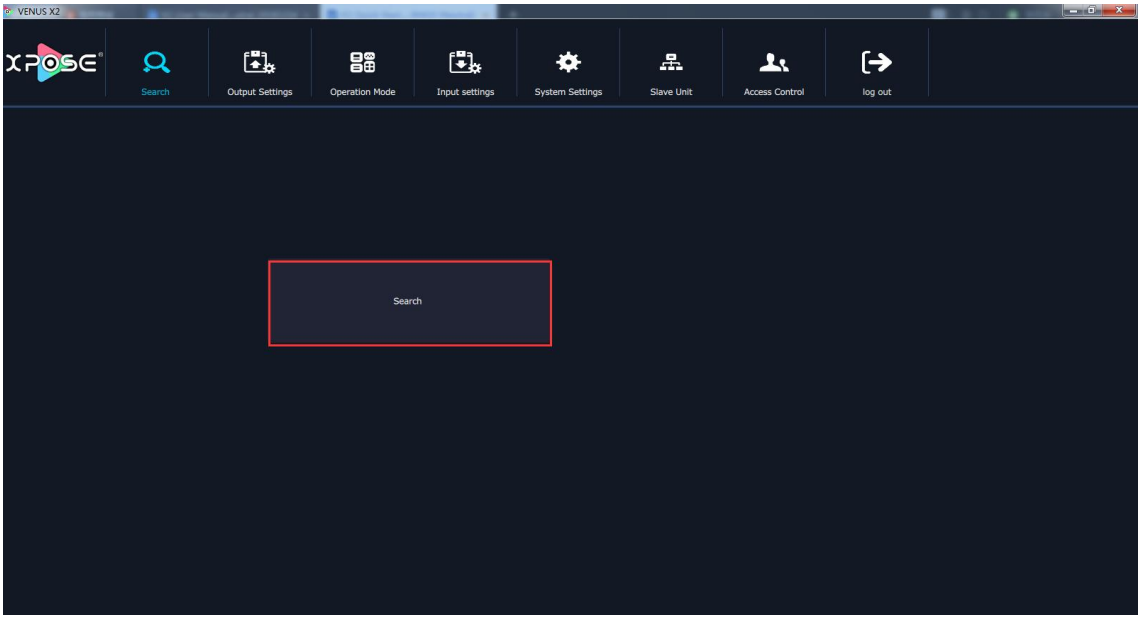


XPOSE management software contains the functions including: web links, search, output settings, operation mode, input settings, slave unit, access control and system settings. In the following parts, we will introduce these in detail.

4.2.2 Connect the Device

First, set up the device IP, and ensure the IP of the computer and device is on the same network segment. Connect the XPOSE management software to the computer with the network cable and power up the device. Users can find the IP address of the device on its LCD screen after initializing.

Then, click the shortcut “Search” on the operation interface.

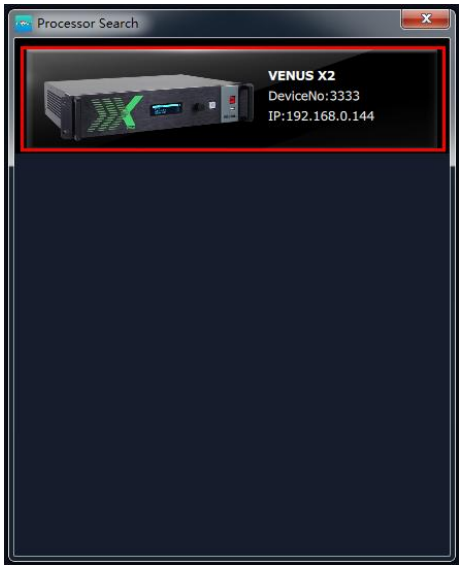


Then it will search the device, and show the device name, device number and IP after search, as shown in the figure below:

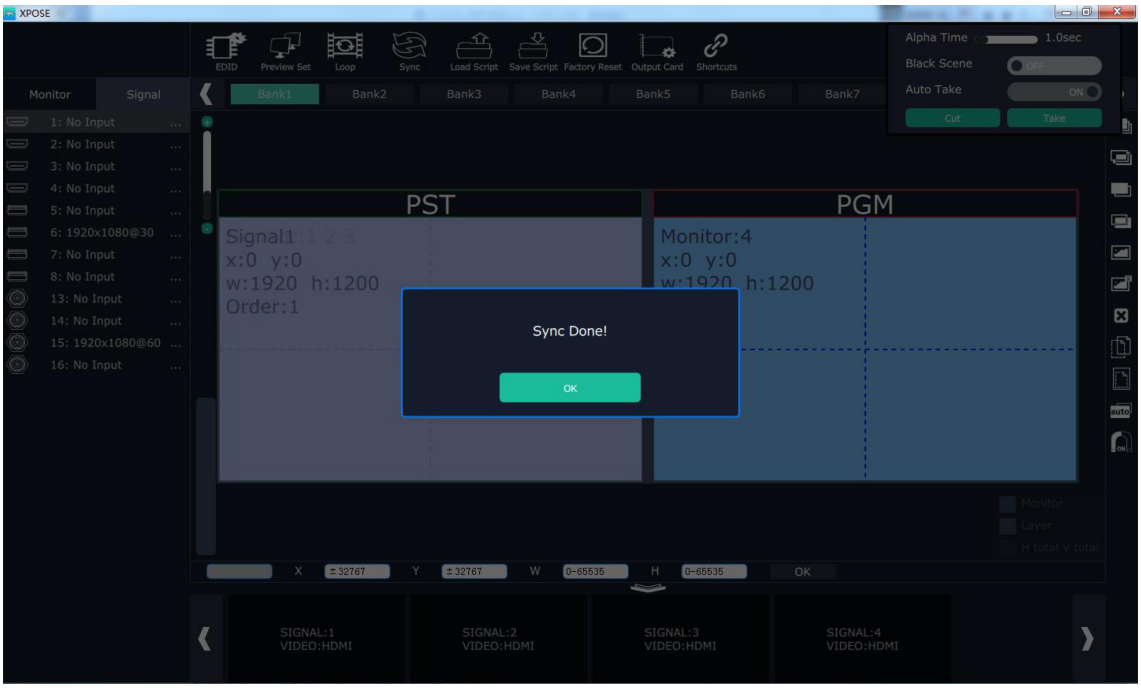


Finally, click the device to connect, as shown in the figure below:

3

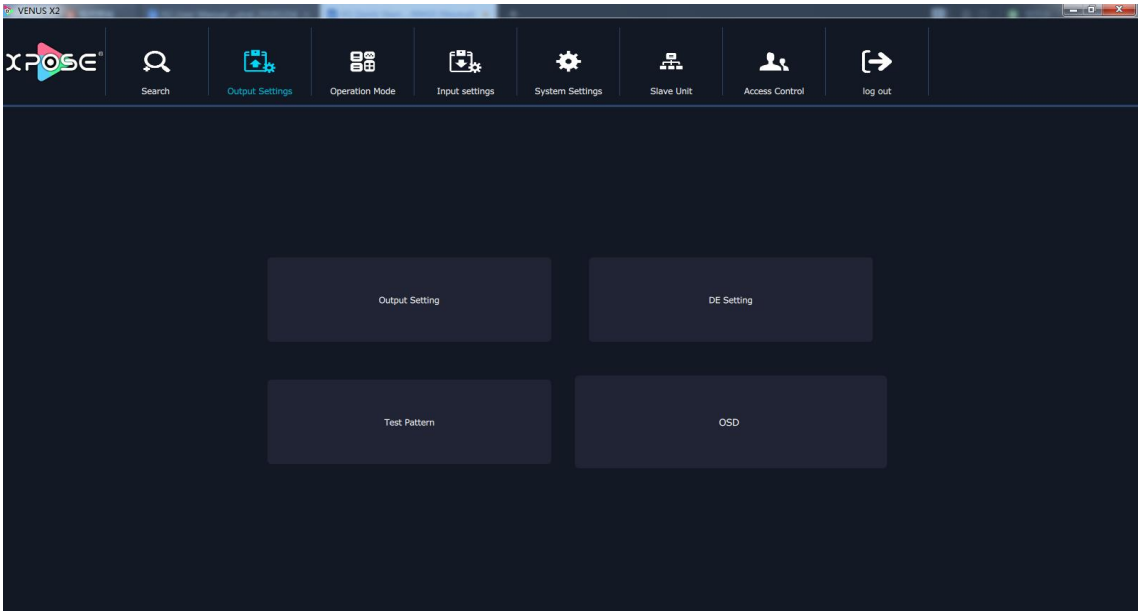


The software will automatically synchronize after connection, as shown in the figure below:



4.2.3 Output Settings

Click the “Output Settings”, and enter to the interface as follows:



Output Setting, DE Setting, Test pattern and OSD are included in output settings, specific as follows:

Output Setting

Click the “Output Setting”, and pop-up window as follows:



Output: Click the drop down arrow after the format, and select the output resolution in the pull-down menus according to actual need.

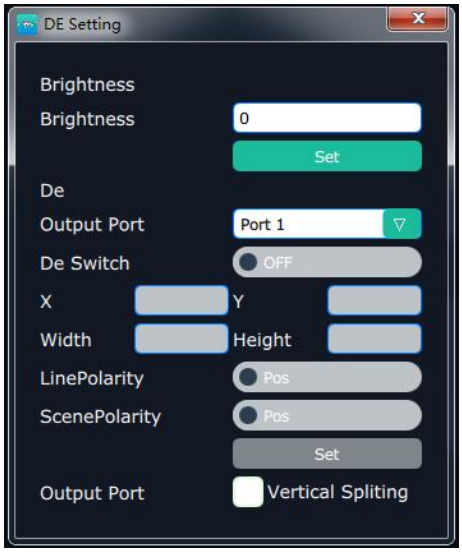
Format: The width, height and frequency can be set if select “**Custom**” in “Format”. Click “**Setting**” to confirm.

Genlock: Enable or disable the Genlock function by sliding the Genlock switch. If select “ON”, the output resolution will be same with the resolution that selected. HDMI or BNC can be selected in

"Input Source" by sliding the switch.

DE Setting

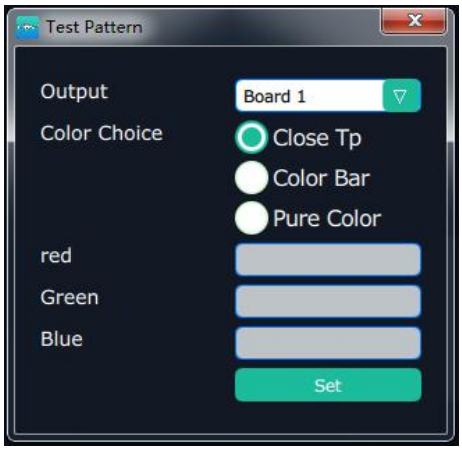
Click the "DE Setting", and pop-up window as follows:



Brightness: The brightness adjustment range is between 0~128. Click "**Set**" to confirm.
De: User can select one port or all ports, and enable the De function by sliding the De Switch. The settings for De include X, Y, width, height, line polarity and scene polarity. Vertical spliting can be selected in "Output Port".

Test Pattern

Click the "Test Pattern", and pop-up window as follows:



Output: User can select any board among the four boards.
Color Choice: TP, colour bar and pure colour can be selected.
Red, Green, Blue: If select "Pure Colour", red, green and blue can be adjusted, the adjustment range is between 0~255.
Click "**Set**" to confirm.

OSD

Click the "OSD", and pop-up window as follows:



Output Mode: One output mode or more output mode can be selected. In one output mode, user need to enable the OSD function and select the output first. The operations are as follows:

Size and Position Adjustment: The size and position can be adjusted by setting ×, Y, W and H.

Font Setting: The font, font size, font type and font color can be set. Use can also select font alpha.

BG Alpha: Can set the background color or background alpha.

Input Information: Input the information that will display in the box.

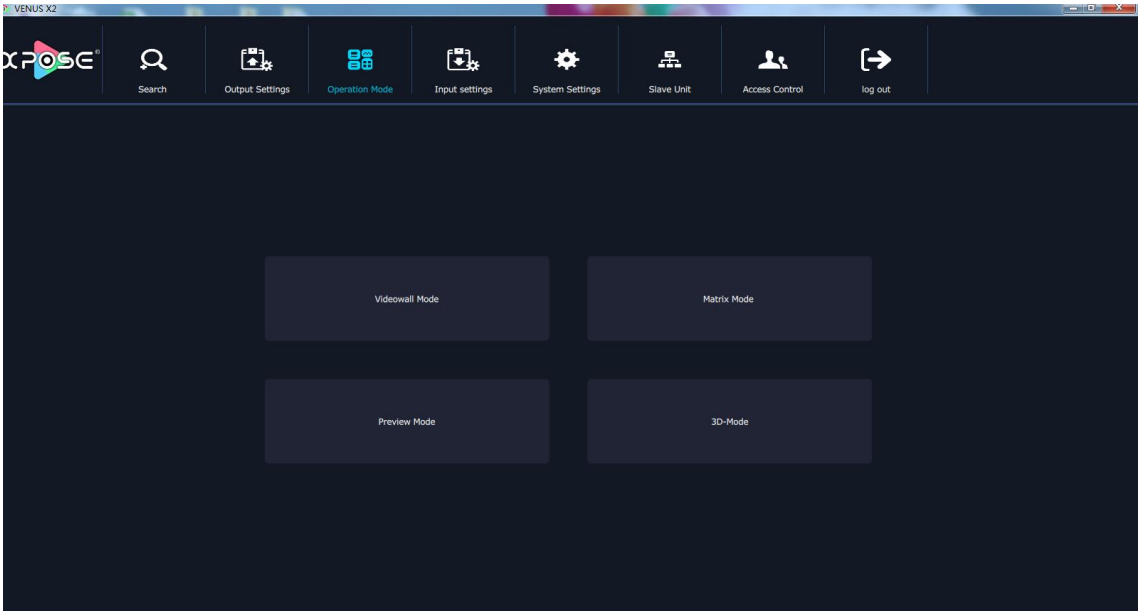
Scrolling Speed: The scrolling speed can be set, and the adjustment range is between 1~16.

OSD Scroll: Can select no scroll, left scroll and right scroll.

Click "**Save**" and "**Apply**" after setting.

4.2.4 Operation Mode

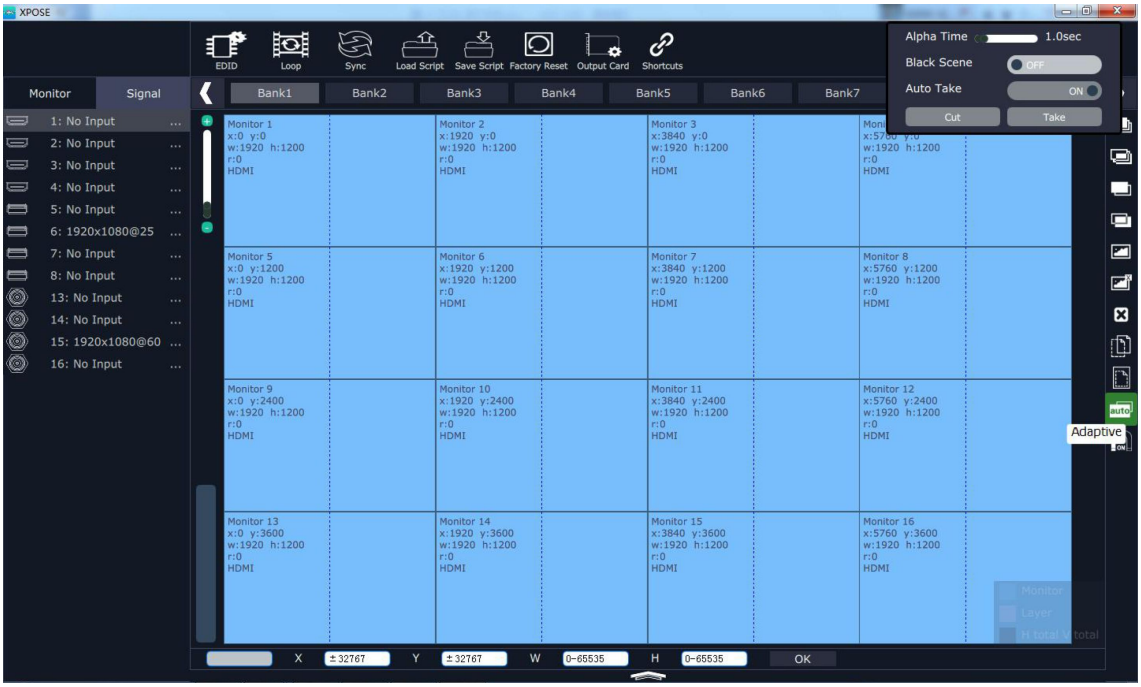
Click the “Operation Mode”, and enter to the interface as follows:



Videowall Mode, Matrix Mode, Preview Mode and 3D-Mode are included in operation mode, specific as follows:

Videowall Mode

Click the “Videowall Mode”, and enter to the interface as follows:



Signal List

The signal list is shown as follows:



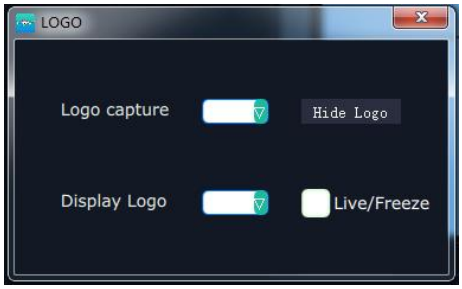
It displays the input module type, the quantity of inputs and input format. Right click the input for the following settings:

Change Name: Select “New Name”, and input the new name, click “OK” after setting.



Refresh Signals: Right click the input and select “Refresh Signals”. If there is signal, it will show the input format, or it will show “No Input”.

LOGO: Right click HDMI/DVI input, and select “LOGO”, it will enter to the LOGO menu items.



LOGO capture: Select the LOGO, there are 10 groups of LOGO. The image is frozen when capture LOGO.

Hide LOGO: Select “Hide LOGO”, the LOGO will be hidden.

Display LOGO: Select the number of “Display LOGO”.

Live/Freeze: Select “Live/Freeze”, the image is frozen. Cancel it, the image is live.

USB Player: Right click the USB input, and select “USB Player”, it will enter to the USB Player interface, including movie and picture, default play the USB movie.



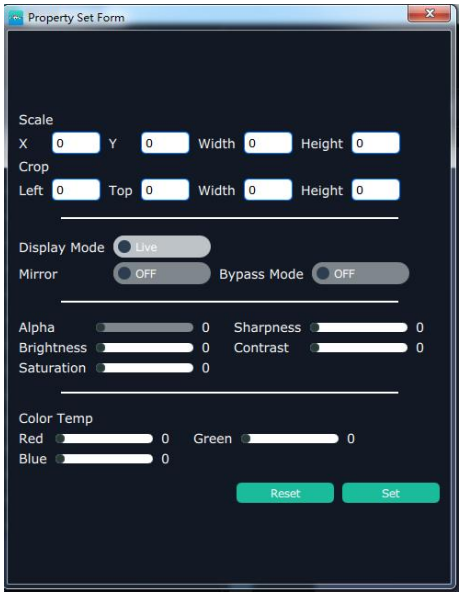
USB movie player setting: Can select play in order, random, single cycle and all cycle, switch to pre or next, pause or play, and read the movie name, progress bar and time.

USB picture play time: Click the picture, it will display the setting interface, default the time is 0s. Set the switch time, and click “Set”.

USB picture player setting: Can select play in order, random, single cycle and all cycle, and switch to pre or next, pause or play.

USB Upgrade: Put the file in the form of MERGE.bin to the USB disk root directory, and connect to the USB input. Right click the USB input, and select “USB Upgrade” to begin to upgrade USB. (Note: upgrade is only for the USB port that connected, user need to upgrade the four USB ports respectively.

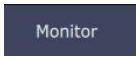
Set Input Property: Right click the input and select “Set Input Property”, it will enter to the interface as follows:



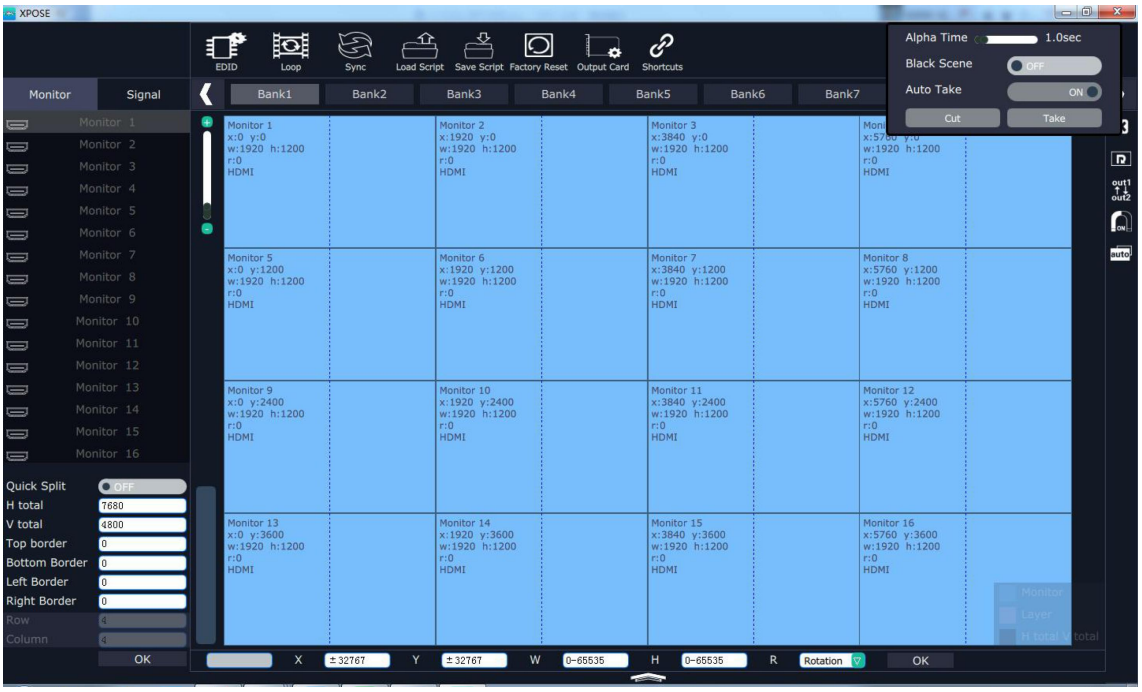
Scale: Set the X, Y, width and height.

Crop: Crop the left, top, width and height.
Display Mode: Select “Live” or “Freeze”.
Mirror: Enable or disable the mirror function, default “OFF”.
Bypass Mode: Enable or disable the bypass mode. When select “ON”, the output format will be the same with the input format.
Alpha: Set the alpha, the adjustment range is 0~128.
Sharpness: Set the sharpness, the adjustment range is 0~100.
Brightness: Set the brightness, the adjustment range is 0~100.
Contrast: Set the contrast, the adjustment range is 0~100.
Saturation: Set the saturation, the adjustment range is 0~100.
Color Term: Set the color temp (red, green and blue), the adjustment range is 0~100.
Reset: Select “Reset”, the input property will be recover to factory setting.

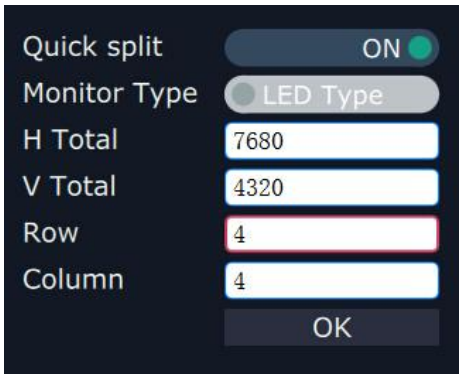
Output Setting

Click “Monitor” shortcut 

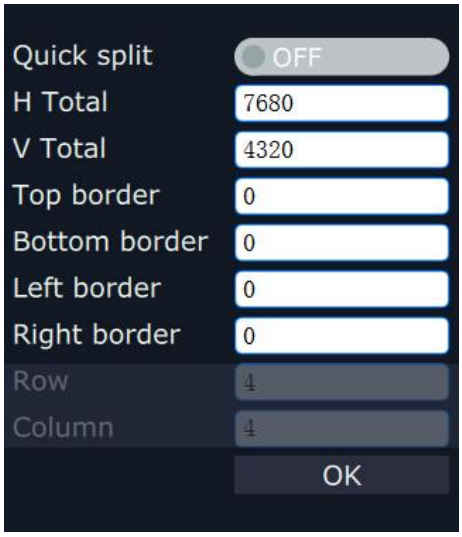
, it will enter the interface as follows:



Split Mode: Default quick split “OFF”. User can enable the quick split function by sliding the switch to “ON”. LED type and LCD type can also be selected by sliding the monitor type switch, specific as follows:
LED Type: Default LED type. In LED type, user can custom the H total, V total, row and column, as shown in the figure below:



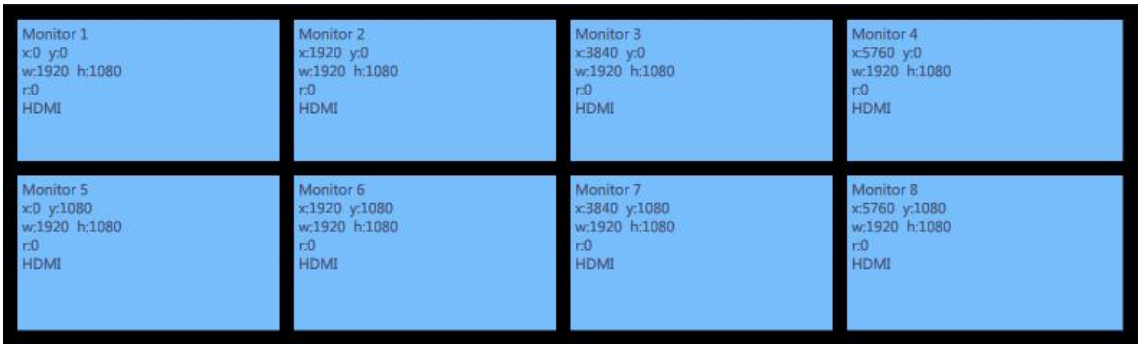
LCD Type: Slide the monitor type switch, and select “LCD Type”. Besides H total, V total, row and column, user can custom the top border, bottom border, left border and right border in LCD type, as shown in the figure below:



Note

Top border and bottom border, left border and right border are changed equivalently. For example, if set top border as 100, bottom border will be changed to 100 automatically, and if set left border as 200, right border will be changed to 200 automatically.

For example, set the top border, bottom border, left border and right border as 100, as shown in the figure below:



Close monitor: Click the icon  on the top right corner of the monitor to close one monitor, or click the shortcut  on the right side of the interface to close all monitors.

Reset monitor: User can reset the monitor by clicking the shortcut  on the right side of the interface.

Swap monitor: User can swap the monitor by clicking the shortcut  on the right side of the interface, as shown in the figure below.

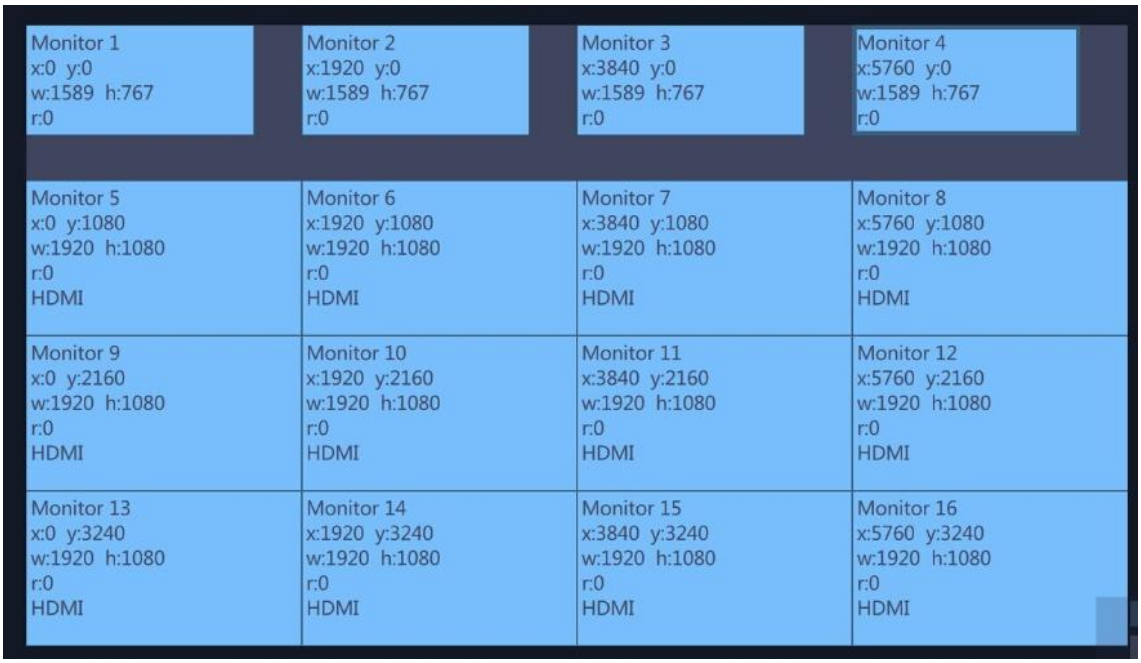


Auto tile: User can enable or disable the auto tile function by clicking the auto tile shortcut  on the right side of the interface. If select auto tile “ON’, the layer will automatically snap to the output grid when move the layer to the position within the threshold value.

Monitor Size and Position Setting: Move the mouse to the lower right brink of the monitor, and press the left key of the mouse. Move the mouse to the suitable position and release the mouse. But this method can only adjust the size and location roughly, if an accurate adjustment is needed, select the monitor, and set the X, Y, width and height in the bottom of the interface.



Monitor Size changed equivalently: Select any monitor, for example, select monitor 1, and adjust the size. Click this monitor, then press button C and don’t let go, select the monitor that will set, the size of the selected monitor will be changed to the same size of monitor 1, as shown in the figure below:



Rotation: Select the monitor, and set the rotation as 0°, 90°, 180° and 270° in the bottom of the interface. Click "**OK**" to confirm. As shown in the figure below:

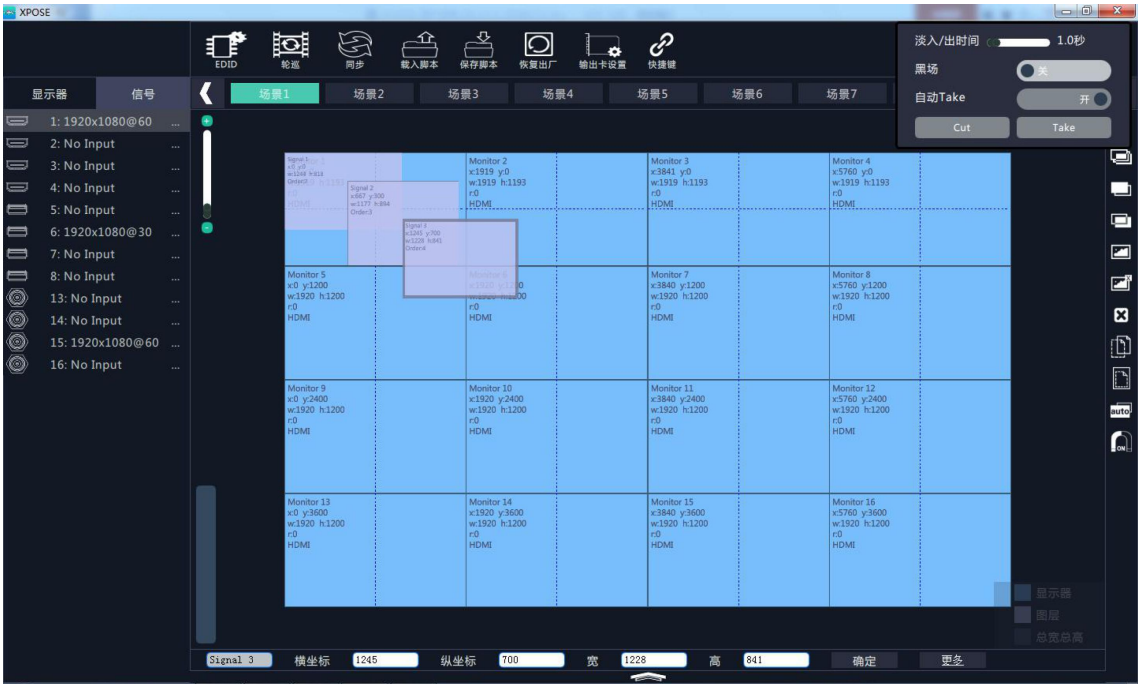


Right click the monitor can also rotate the monitor.

Output Area Size Setting: Move the mouse to the output area and slide the mouse wheel, the output area size can be zoom in and out.

Layer Setting

New Layer: In output screen zone of controlling software, press the left mouse key and drag on the intended output screen to cover the whole current screen. And the below interface will be displayed. A layer can also be opened by double clicking the left signal source to be shown on the window.



Adjust Layer: Two ways can change the size and location of the opened layer:

a. Drag the opened layer by mouse. The details are: move the mouse to the brink of the opened layer, when the mouse shows"<—>", press the left key of the mouse and drag the window to a suitable size and then release the mouse. Or move the mouse to the lower right of the opened layer, press the left key of the mouse and drag the window to a suitable size and then release the mouse. Move the mouse to the opened layer and press the left key of the mouse and move the mouse, then the layer will be moved, release the mouse when moved to the suitable location. But this method can only adjust the size and location roughly, if an accurate adjustment is needed, the second method can be used.

b. Select the layer to be adjusted, and set the X, Y, width and height in the bottom of the interface.



Hierarchical relations between layers: After creating the layers, the hierarchical relations can be changed by the following: click the shortcut key bring layer to top "", bring layer to bottom "", layer forward "" or layer backward "". The layer can be set as background by click "" and click "" to remove the layer background.

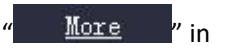
Close one layer or all layers: Click the icon  on the top right corner of the layer to close one layer, or click the shortcut key "" to close all layers.

Lock the layer: Click the icon  on the top right corner of the layer to lock the layer, the layer can't be moved or adjusted if be locked.

Full the layer: Click the icon  on the top right corner of the layer to full cell, and click the icon  to full screen.

Copy and paste bank: Select the bank that to copy, and click the copy bank shortcut "" on the right side of the interface, then select the bank that to paste, and click the paste bank shortcut "". The selected layer will pasted to the bank.

Adaptive: If scale the output area to a large area, click the adaptive shortcut "" on the right side of the interface, the output area will be return to the best position.

Layer Property Setting: Select the layer to be adjusted, click the More shortcut "" in the bottom of the interface, and enter the interface as follows:



Scale: Set the X, Y, width and height.

Crop: Crop the left, top, width and height.

Display Mode: Select “Live” or “Freeze”.

Mirror: Enable or disable the mirror function, default “OFF”.

Bypass Mode: Enable or disable the bypass mode. When select “ON”, the output format will be the same with the input format.

Alpha: Set the alpha, the adjustment range is 0~128.

Sharpness: Set the sharpness, the adjustment range is 0~100.

Brightness: Set the brightness, the adjustment range is 0~100.

Contrast: Set the contrast, the adjustment range is 0~100.

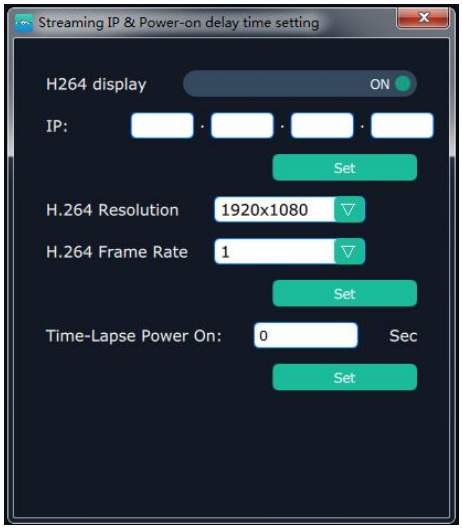
Saturation: Set the saturation, the adjustment range is 0~100.

Color Term: Set the color temp (red, green and blue), the adjustment range is 0~100.

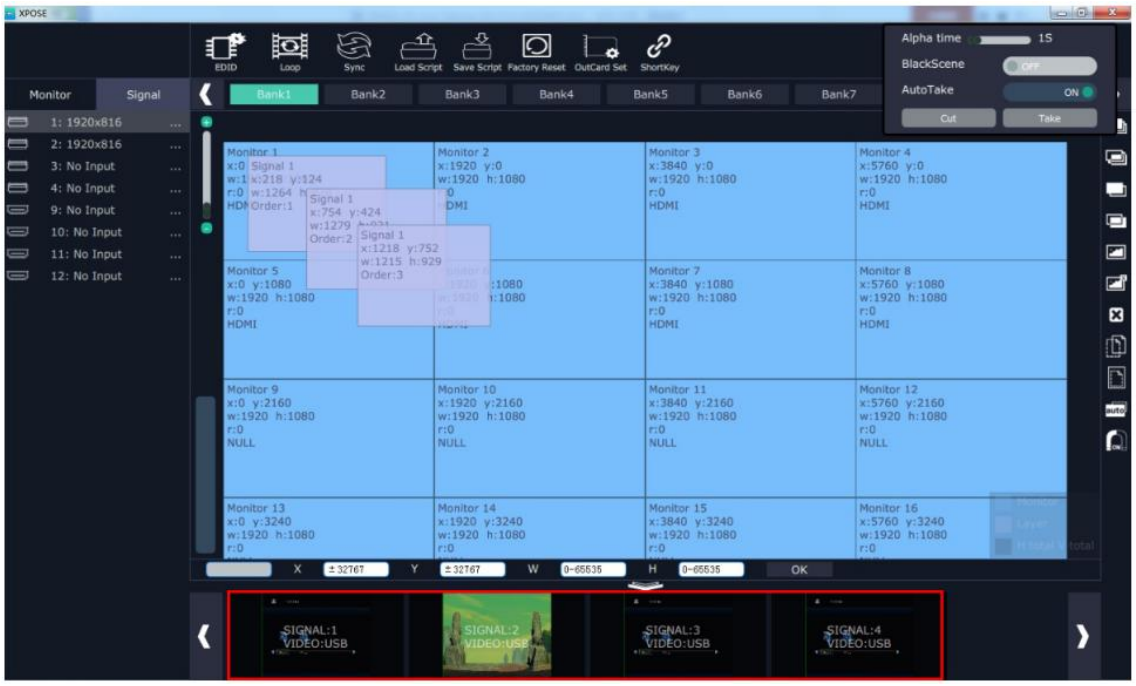
Reset: Select “Reset”, the input property will be recover to factory setting.

H264 Video Preview

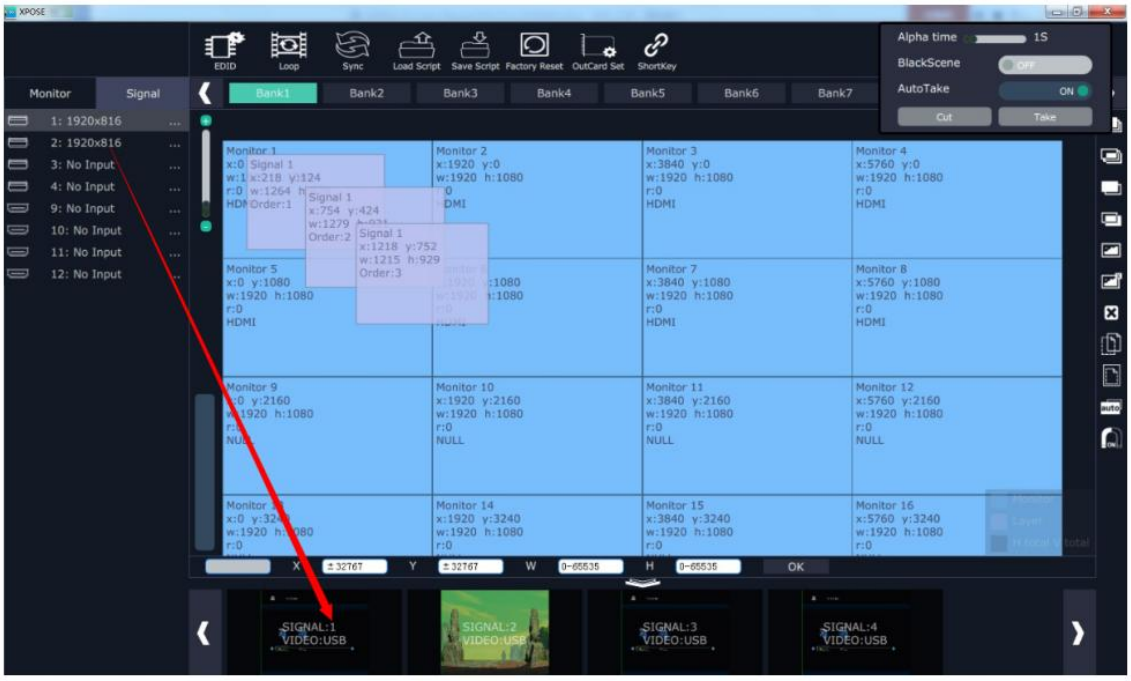
Select “System Settings” and click “Streaming IP & Power On Setting”, Set “ON” for “H264 Display”, as shown in the figure below:



Then enter to the videowall mode, the bottom of the interface will display the H264 video, as shown in the figure below, which is for preview.



Drag the signal to the H264 video area, the preview signal will be switched, as shown in the figure below:



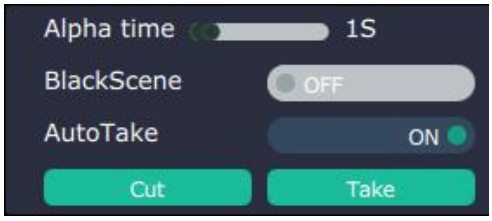
Click the arrow on both sides of the H264 video, the groups of the preview signals will be switched, as shown in the figure below:



Take

The take interface is shown as the figure below:

6



Set the alpha time, and the adjustment range is 0~10S.

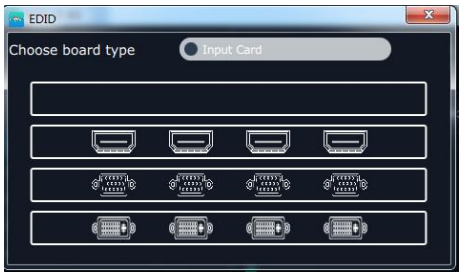
Slide the black scene switch to enable or disable the black function. Auto take on is the default state. If select black scene and auto take on, the preview image will black or seamless switch to LED display instantaneously.

Click “Cut” or “Take”, the preview will be cut or seamless switch to LED display.

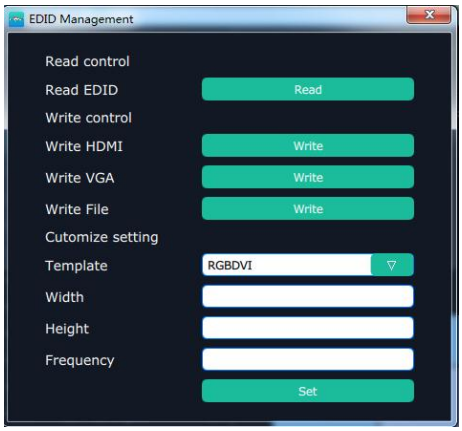
EDID

Click the EDID shortcut “

”, and pop-up window as follows:



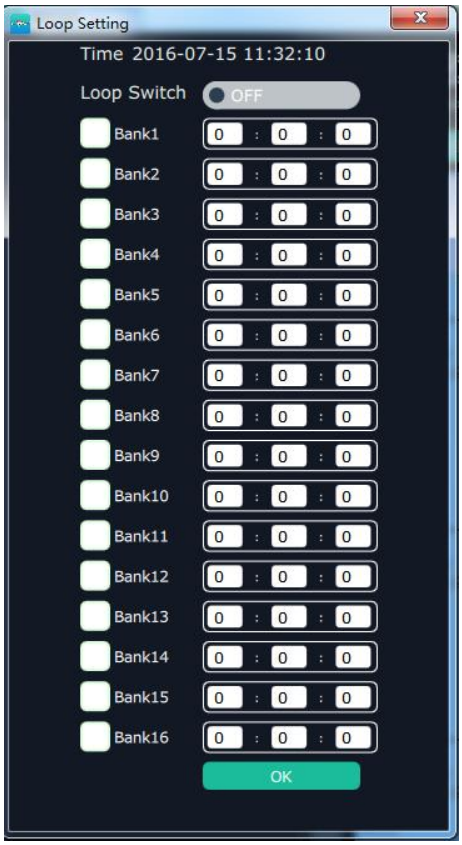
The special display project or LED display application would like to require special resolution settings to meet the requirement. Select the input or output board to read and write the EDID. As shown in the figure below:



Loop

Click the loop shortcut “

”, and pop-up window as follows:



Slide the loop switch to enable or disable the loop function for the bank. If select “ON”, the bank play time can be set.

Sync

Click the sync shortcut “

” to synchronize the current data.

Load Script

Click the load script shortcut “

”, user can load the data from the computer.

Save Script

Click the save script shortcut “

”, user can save the data to the computer.

Factory Reset

Click the factory reset shortcut “

” to reset to factory settings.

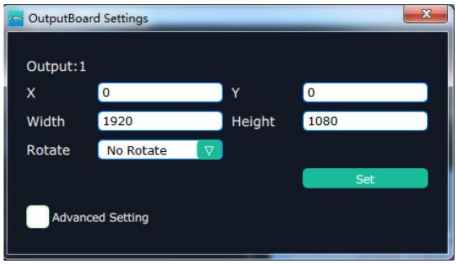
Out Card Set

Click the out card set shortcut “

”, and pop-up window as follows:

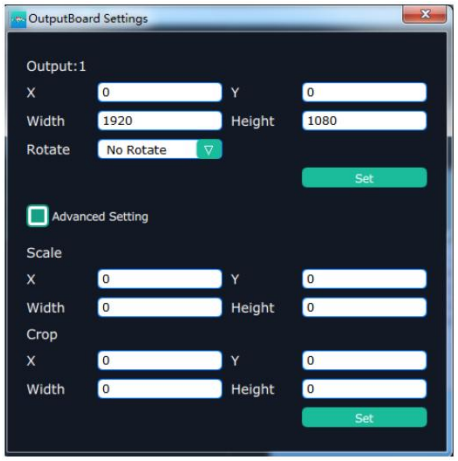


Click any output, and pop-up window as follows:



X, Y, width, height, rotate can be set.

If click “Advanced Setting”, pop-up window as follow:

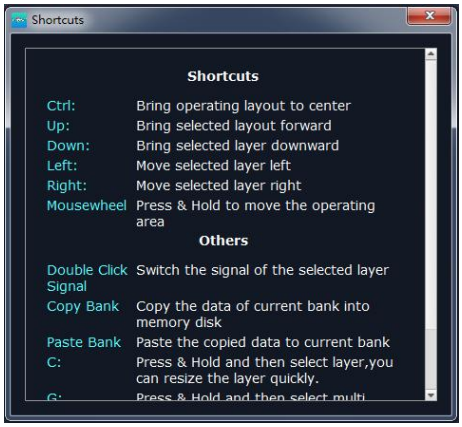


In advanced setting, scale and crop can be set. **Not recommended to use “Advanced Setting”.**

Short Key

Click the shortcut “

”, and pop-up window as follows:



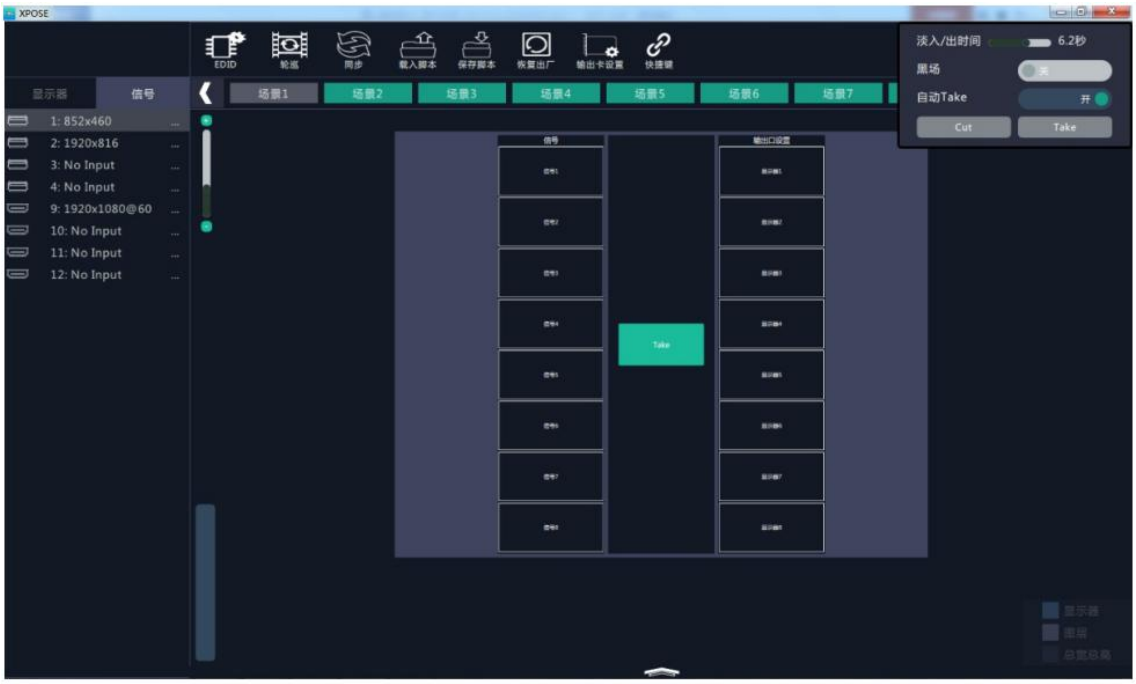
Use shortcut key to operate fast and easily.

Matrix Mode

Click the “Matrix Mode”, and pop-up window as follows:

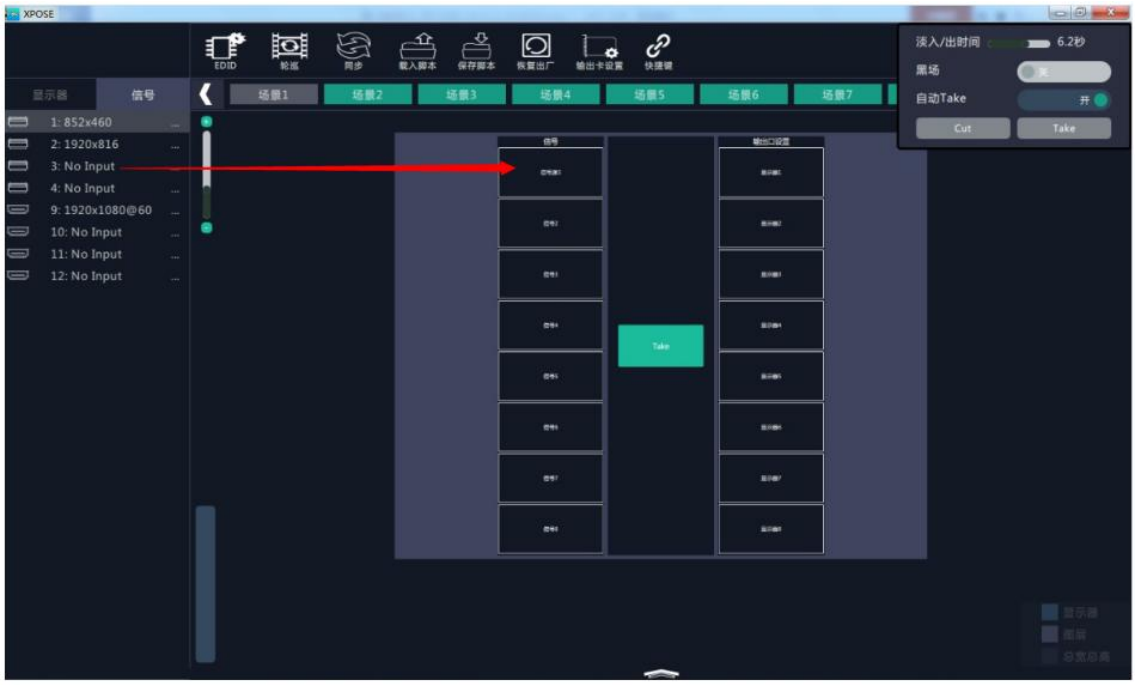


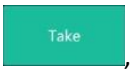
Click “OK”, and the system will synchronize the data, about 5 seconds later, it will enter the interface as follows:



In matrix mode, any operations are unavailable except signal selection, bank selection, alpha time and black scene setting.

Default source 1 to monitor 1, source 2 to monitor 2, and so on. Select the signal, and drag it to the source that will set. For example, set signal 3 for source 1, as shown in the figure below:

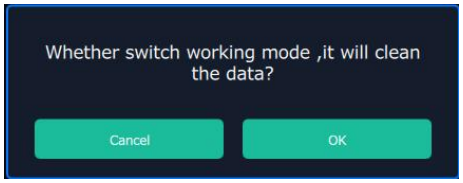


Source 1 will be switched to signal 3, click source 1, then click “TAKE” icon 

, the signal will be switched to the corresponding monitor. Connect the signal to the corresponding output after setting.

Preview Mode

Click the “Preview Mode”, and pop-up window as follows:

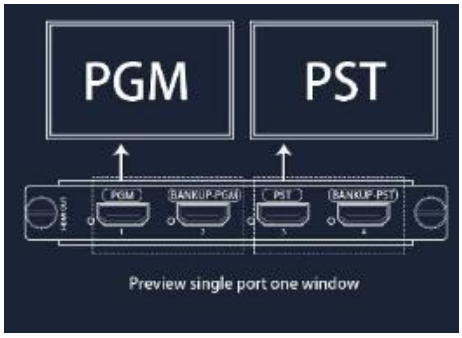


Click “OK”, the system will synchronize the data, and it will finish about 5 seconds later, click “OK”, it will enter the interface as follows:

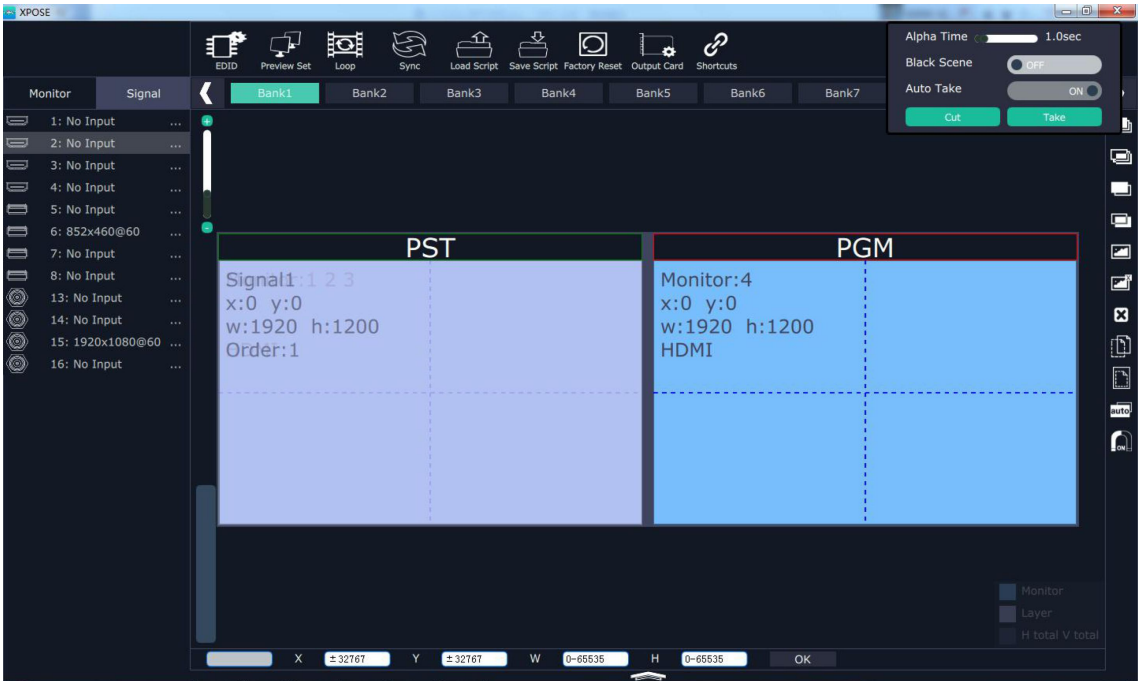


Select the preview mode, and select multiview or splice multiview, then select the preview image according to actual need. User can select max three outputs in one output card.

The connection diagram area will show the corresponding splice guidance figure, as shown in the figure below:



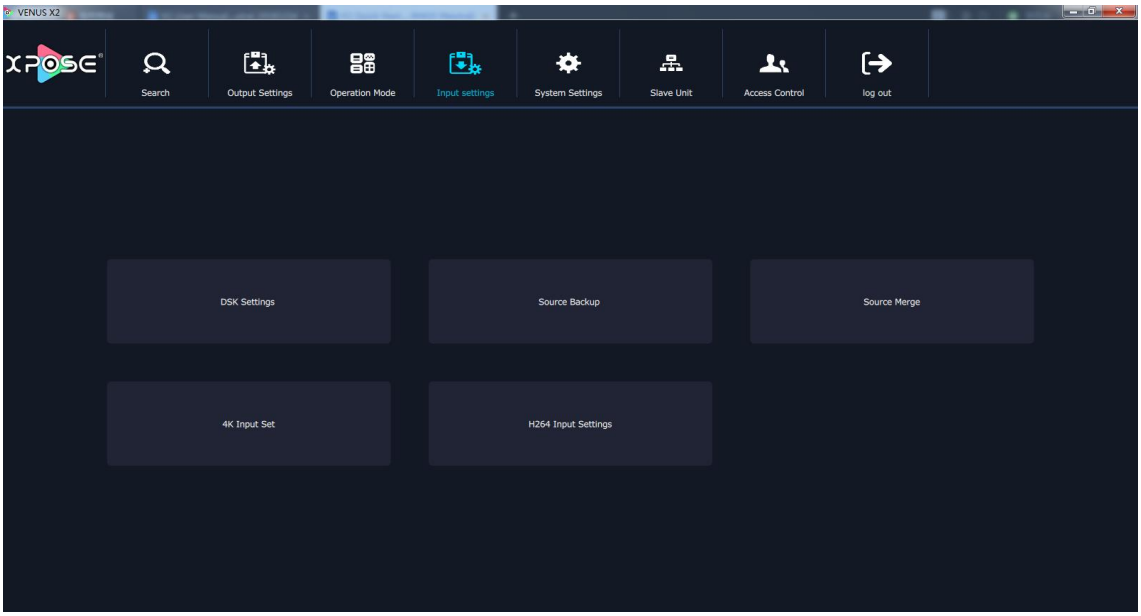
Click “Ok”, the settings will be displayed in the monitor, as shown in the figure below. Click “Take” or “Cut” in “Take” box to seamless switch or cut the preview signal to the LED display.



Note: The adjustment for monitor is available when there is no any layer in PST or PGM window.

4.2.5 Input Settings

Click the “Input Settings”, and enter the interface as follows:



DSK settings, source backup, source merge and H264 input settings are included in input settings, specific as follows:

DSK Settings

Click the “DSK Settings”, and pop-up window as follows:

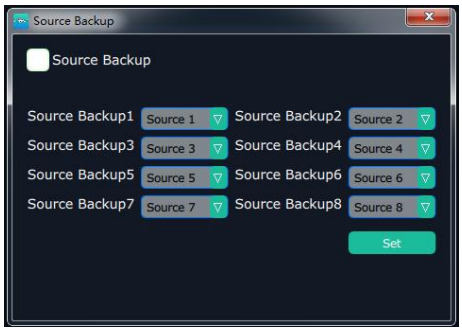


Select DSK ON, as shown in figure 

, then set the input ports, including preset selection, custom mode, alpha and color setting. Click “**Set**” to confirm.

Source Backup

Click the “Source Backup”, and pop-up window as follows:



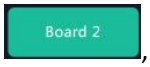
Enable the hot backup function, as shown in figure 

, and set the backup signal for Hot Backup 1 to Hot Backup 8. It will switch to the backup signal if the signal is interrupted.

Source Merge

Click the “Source Merge”, and pop-up window as follows:



The S-HDMI input optional module support signal merger. Click any valid input board, for example, select 

, then select the merger mode, for example, select 
, as shown in the figure below:



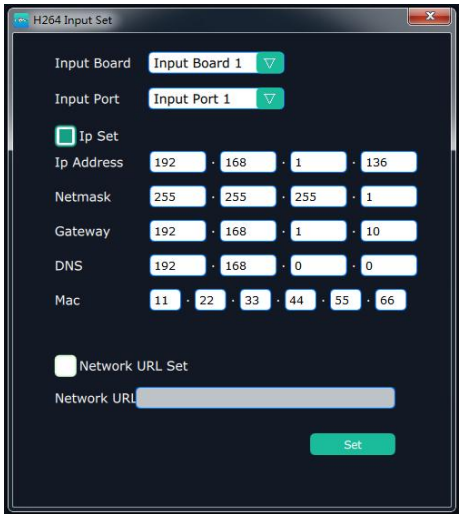
Click any layer, then click any source, and the layer source can be switched, as shown in the figure below:



User can also scale or crop the layer.

H264 Input Settings

Click the “H264 Input Settings”, and pop-up window as follows:



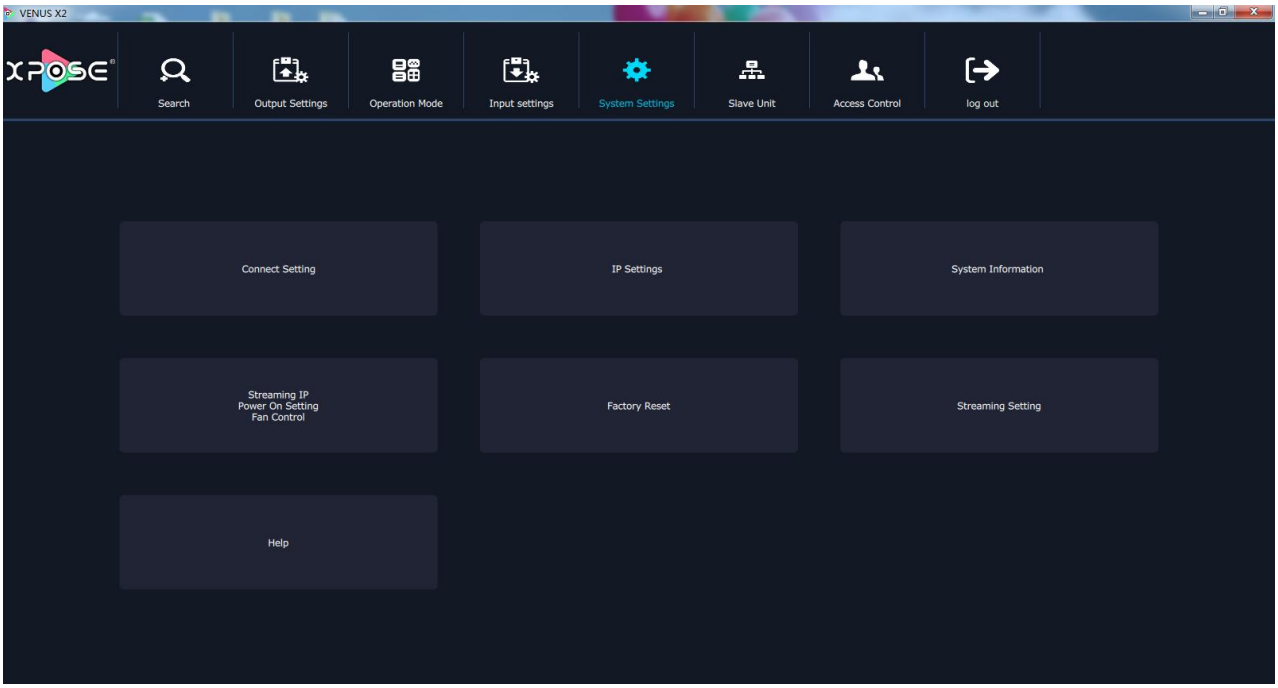
Select the input board and input port.

IP Set: Select “Ip Set”, and Ip Address, Netmask, Gateway, DNS and Mac can be edited.

Network URL Set: Select “Network URL Set”, it will read the URL address automatically, user can also input the network URL.

4.2.6 System Settings

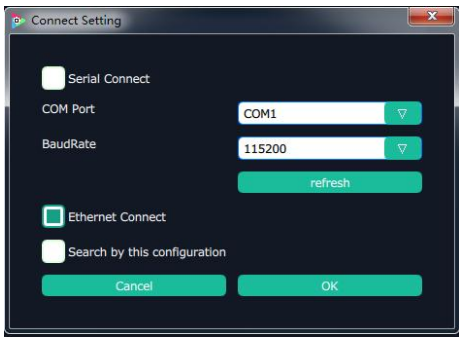
Click the “System Settings”, and enter the interface as follows:



Connect Setting, IP settings, System information,Streaming IP Power on Setting Fan Control, Factory Reset and Streaming Setting are included in system settings, specific as follows:

Connect Setting

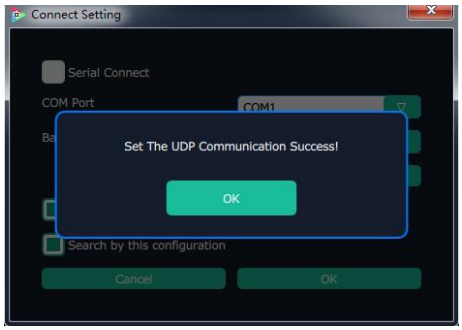
Click the “Connect Setting”, and pop-up window as follows:



Select the serial connect and Ethernet connect, the software will search all the devices if not select “Search by this configuration”.

If select “Serial Connect” and “Search by this configuration”, the software will search all the devices with corresponding serial port.

If select “Ethernet Connect” and “Search by this configuration”, the software will search all the devices with corresponding IP.



System Information

Click the “System Information”, and pop-up window as follows:



Display the device version information. Including device model, serial number, IP address, firmware version, etc.

IP Settings

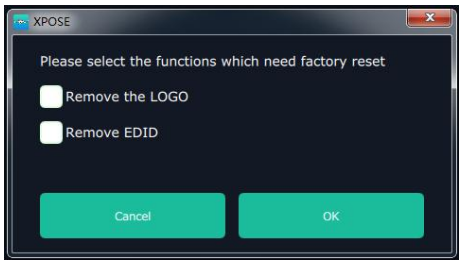
Click the “IP Settings”, and pop-up window as follows:



Default “Auto get ip address”. Users can also set IP address, mask and gateway manually. This is usually used if one computer control some devices or remote control. It takes effect after reboot the software if change IP through network.

Factory Reset

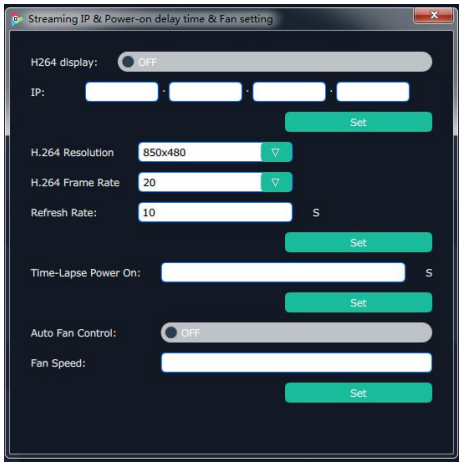
Click the “Factory Reset”, and pop-up window as follows:



Select “Remove the LOGO”, and click “**OK**”, the LOGO will be removed.
Select “Remove EDID”, and click “**OK**”, the EDID will be removed.

Streaming IP & Power On Setting & Fan Setting

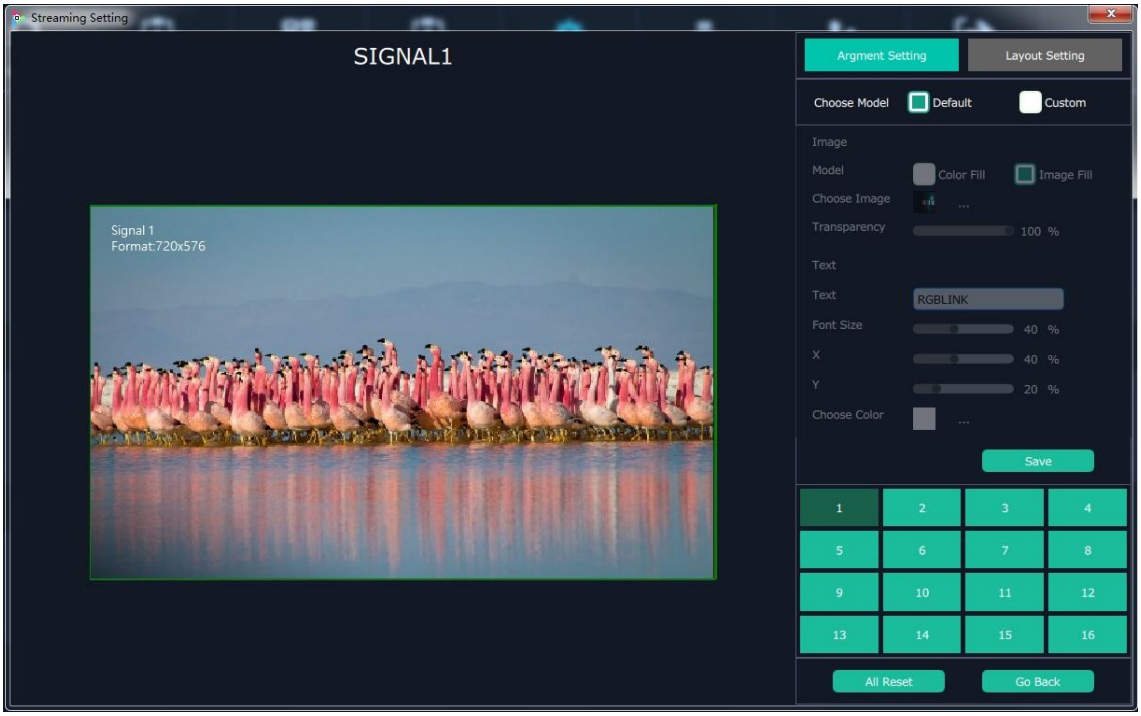
Click the “Streaming IP Power On Setting Fan Control”, and pop-up window as follows:



H264 Display: Enable or disable the H264 display function. If select “ON”, the interface will display the H.264 video when enter to the operation mode, which is for preview.
IP: Set the IP address of H264 video, click “**Set**” after setting.
H.264 Resolution: Set the resolution of H.264.
H.264 Frame Rate: Set the frame rate of H.264.
Time-Lapse Power On: The adjustment range is 0~255, click “**Set**” after setting.
Auto Fan Control/Fan Speed: OFF/ON to enable or disable auto fan control. If disable it, **Fan Speed** can be adjusted manually. The rang of Fan Speed is 0-100.

Streaming Setting

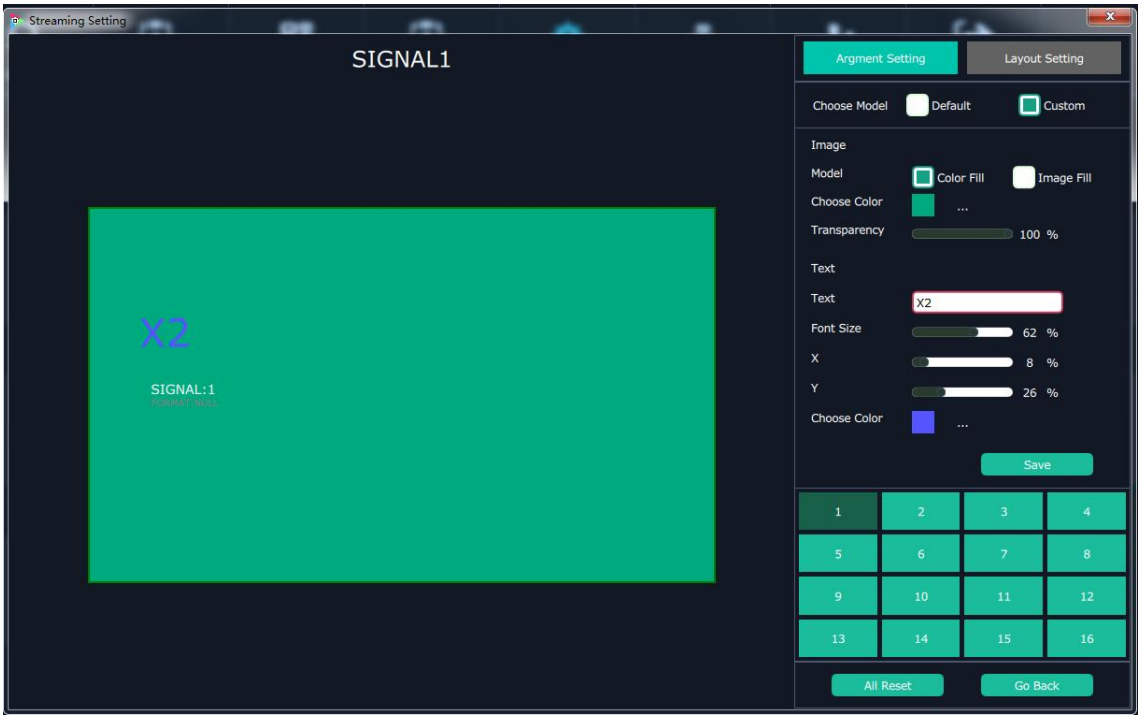
Click the “Streaming Setting ”, and enter the default mode of Streaming Setting and pop-up window as follows:



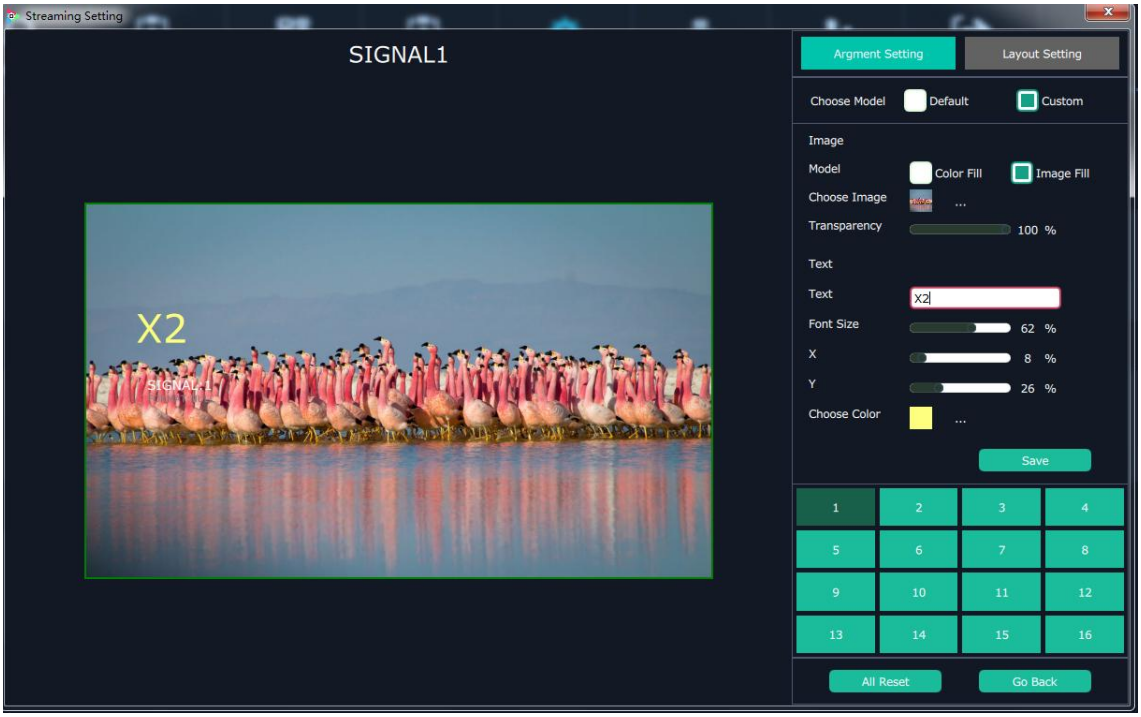
Users can choose any one from the 16 signal source from right bottom section.

Users can custom the streaming display by selecting Custom and choose Color Fill or Image Fill.

Choose Color Fill as following example:



Choose Image Fill, users can load image from computer, see below:



Transparency: range from 0-100 which can adjust the transparency of the the filled image or color on the streaming display

text

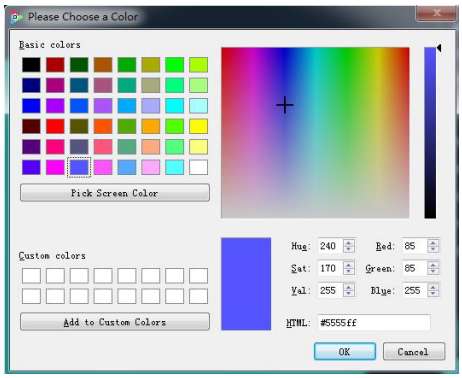
text: Users can type in the text to show on the streaming display.

Font Size: Adjust the font size of the text, range from 0-100

X: Adjust the text horizontal position

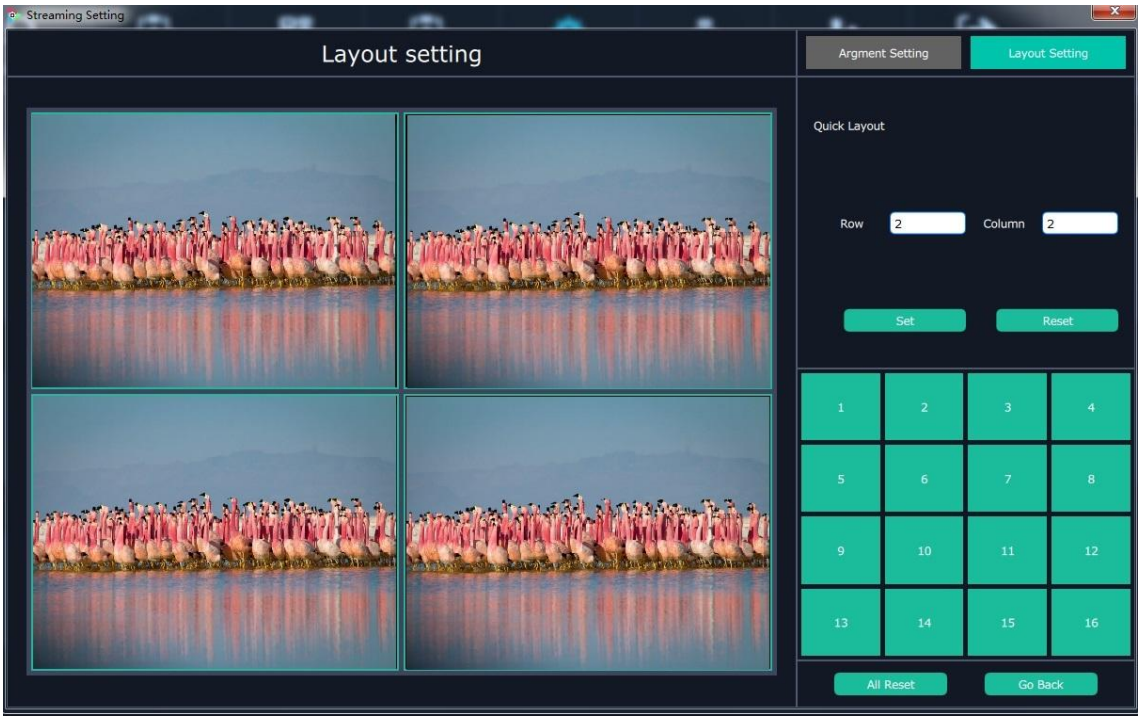
Y:Adjust the text vertical position

Choose Color: Choose color for the text.



Choose **Layout Setting**

Users can set layout of the streaming display of the 16 inputs. Quick Layout is offered, for example 2 Row 2 Column, as picture below:



Total number of Row can not exceed 4, neither does the Column.

4.2.7 Slave Unit

Click the “Slave Unit”, pop-up window as follows:

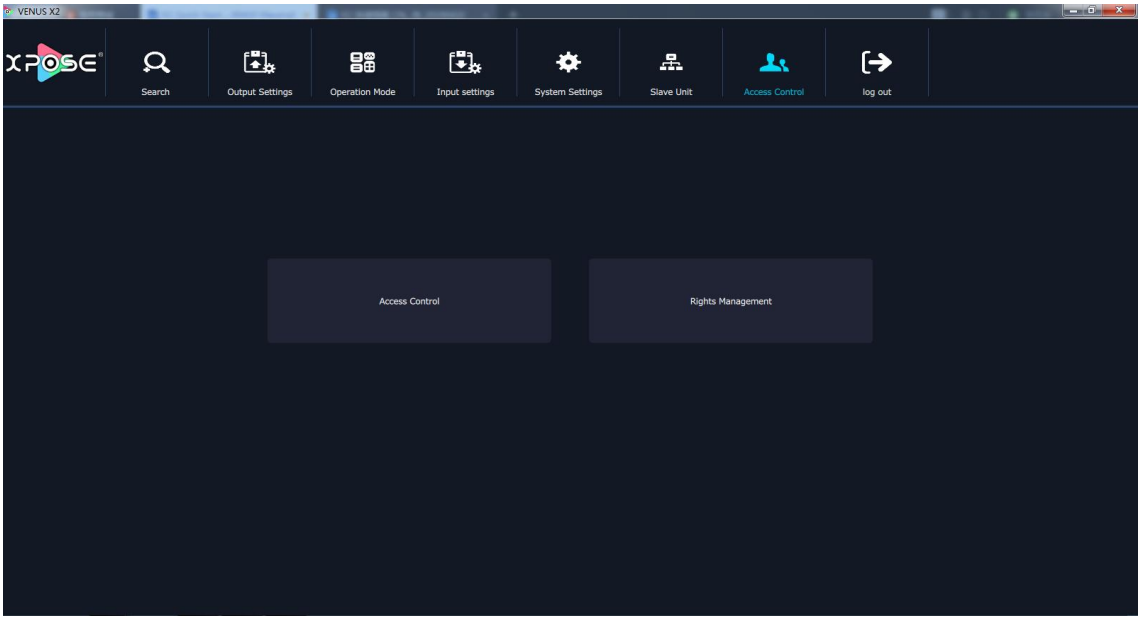


If X2need to cascade with other devices, type in the number of devices and **Set Numbers**.
IP of other devices will be shown. Users can close/open one by one or all.

When any connecting port is open the dot behind Index number will turn green, otherwise it keeps red.

4.2.8 Access Control

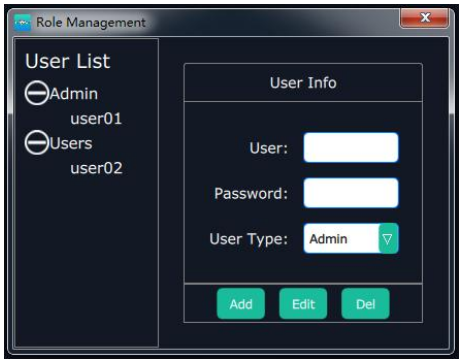
Click the “Access Control”, and enter the interface as follows:



Role management and rights management are included in access control, specific as follows:

Role Management

Click the “Role Management”, and pop-up window as follows:



Add: Input the user name and password, and select the user type as “Admin’ or “Users”, click “**Add**” after setting.

Edit: Select the admin or users in user’s list, then edit the password or user type, click “**Edit**” after setting.

Del: Select the admin or users in user’s list, then click “**Del**”, the selected user will be deleted.

Rights Management

Click the “Rights Management”, and pop-up window as follows:



Select the admin or users in user's list, then click the rights in "Managements Detail". Click "**OK**" after setting. User can operate the rights that selected.

User Info: Display all the Admin or Users list, double click it will unfold or fold the list.

Management Details:

The admin can manage all the admin users and users user.

Admin users can manage all the users user, except the admin users.

Users can not mange all the users, including admin user and users user.

Chapter 5 Order Codes

5.1 Product

310-0002-01-0	X2

5.2 Options

5.2.1 Input Options

190-0002-02-1	Quad HDMI Input Module
190-0002-03-0	Triple VGA Input Module
190-0002-04-1	Quad SDI Input Module
190-0002-05-1	Quad CVBS Input Module
190-0002-09-1	Quad H.264 IP Streaming Input Module
190-0002-10-1	Quad USB Input Module
190-0002-11-0	4K@30 Digital Input Module
190-0002-06-0	Quad HDBaseT Input Module

5.2.2 Output Options

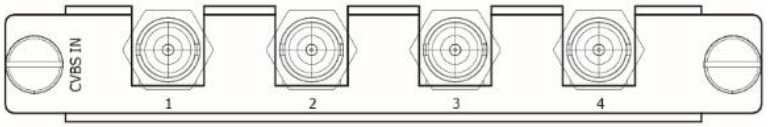
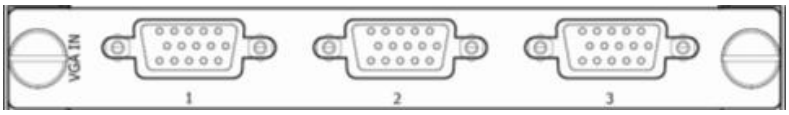
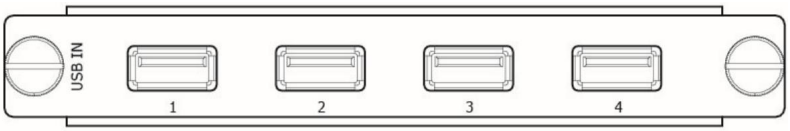
190-0002-22-1	Quad 2K HDMI Output Module
190-0002-24-0	Quad 3G SDI Output Module
190-0002-28-0	H.264 Output Module
190-0002-25-0	Quad HDBaseT Output Module

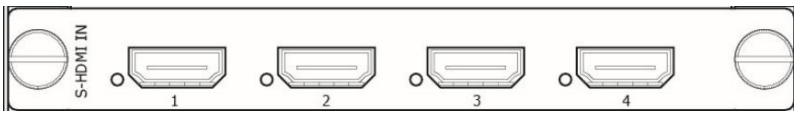
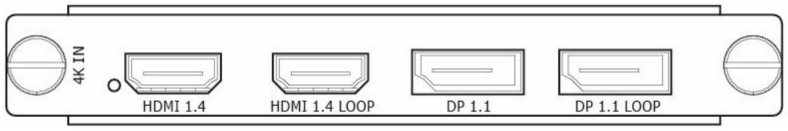
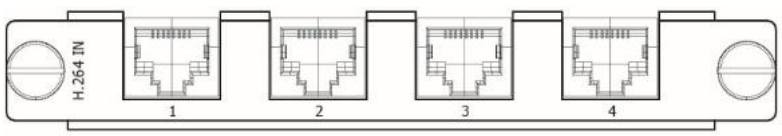
5.2.3 Other

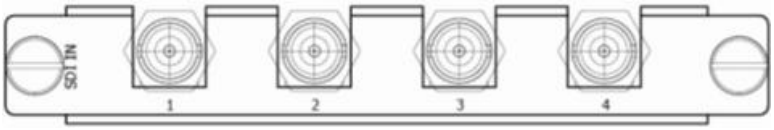
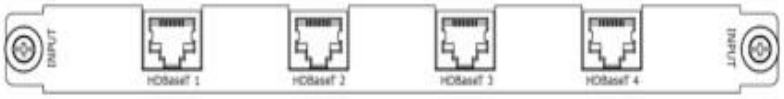
950-0001-00-0	Hot Swap PSU 200W
190-0002-50-1	Preview (PVW) Module H.264/HDMI

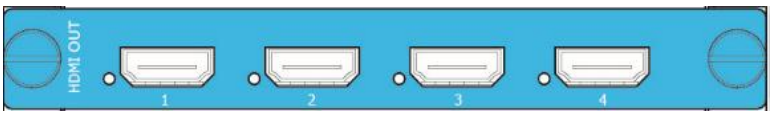
Chapter 6 Appendix

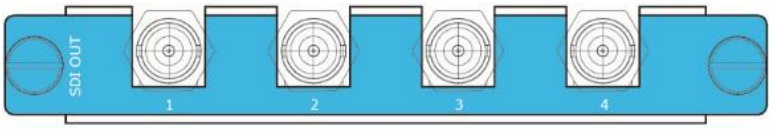
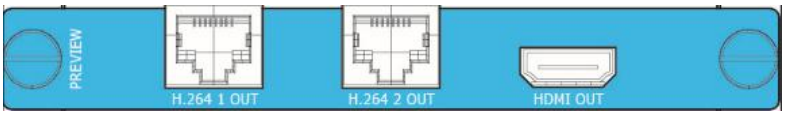
6.1 Specification

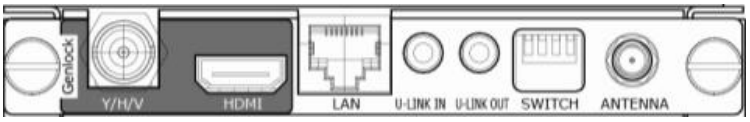
CVBS Input Module	
Interface Appearance	
Board Size	131.6(L)×20(W)（mm）
Number of Inputs	4
Connector	BNC
Supported Standards	PAL/NTSC/SECAM
Signal Level	1Vpp±3db (0.7V Video+0.3v Sync) 75 ohm
Multiple×	480i | 576i
VGA Input Module	
Interface Appearance	
Board Size	131.6(L)×20(W)（mm）
Number of Inputs	3
Connector	DB15
Supported Standards	VGA-UXGA
Signal Level	R, G, B, Hsync, Vsync:0 to1Vpp±3dB (0.7V Video+0.3v Sync) 75 ohm black level: 300mV Sync-tip: 0V
Supported Resolution	VESA 800×600@60 | 1024×768@60 | 1280×1024@60 | 1440×900@60 | 1600×1200@60 | 1920×1080@60
Supported Standard	VGA-UXGA
USB Input Module	
Interface Appearance	
Board Size	131.6(L)×20(W)（mm）
Number of Inputs	4
Connector	USB-A
max Supported Resolution	1920×1080@60
Supported Standard	Support general Image and video formats

S-HDMI Input Module	
Interface Appearance	
Board Size	131.6(L)×20(W)（mm）
Number of Inputs	4
Connector	HDMI-A
Supported Resolution	SMPTE 625/25/50 PAL, 525/29.97/59.94 NTSC, 720p@50/60 |1080i@50/59.94/60 | 1080p@50/59.94/60 VESA 800×600@60 | 1024×768@60 | 1280×768@60 | 1280×1024@60 | 1600×1200@60 | 1920×1080@60
Embedded Audio Channels	Select one from two inputs
Format Standard	HDMI 1.3
4K Input Module	
Interface Appearance	
Board Size	131.6(L)×20(W)（mm）
HDMI Input	
Number of Inputs	2 (1 HDMI In, 1 Loop | 1 DP In, 1 Loop)
Connectors	2×HDMI-A| 2×DisplayPort
Supported Resolution	SMPTE 480i | 576i | 720p@50/59.94/60 | 1080i@50/59.94/60 | 1080p@50/59.94/60 | 2160p@23.98/24/25/29.97/30 VESA 800×600@60 | 1024×768@60 | 1280×1024@60 | 1366×768@60 | 1440×900@60 | 1600×1200@60 | 1920×1080@60 |3840X2160@24 | 3840X2160@25 | 3840×2160@30
Supported Standards	HDMI 1.4 DP 1.1a
H.264 Input Module	
Interface Appearance	
Board Size	131.6(L)×20(W)（mm）
Number of Inputs	4
Connector	RJ45
Supported Resolution	176×144 | 240×180 | 320×180 | 320×240 | 320×256 | 352×228 | 352×480 | 400×224 | 400×320 | 480×270 | 480×272 | 480×320 | 480×360 | 480×384 | 480×480 | 544×480 | 608×448 | 640×360 |

	640×480 | 704×576 | 720×404 | 720×480 | 720×540 | 720×576 | 850×480 | 1024×576 | 1280×720 | 1680×1056 | 1920×1080
Refresh Rates	25~60Hz
Supported Standards	H.264/MPEG-4 AVC
Decoding Protocols	H.264 baseline/main/high profile L5.0 MPEG4 SP L0–3/ASP L0–5 MJPEG/JPEG baseline
3G-SDI Input Module	
Interface Appearance	
Board Size	131.6(L)×20(W)（mm）
Number of Inputs	4
Connector	BNC
Data Rate	2.97Gb/s, 2.97/1.001Gb/s, 1.485Gb/s, 1.485/1.001Gb/s and 270Mb/s
Supported Standards	SMPTE 425M (Level A & B) | SMPTE 424M | SMPTE 292M | SMPTE 259M-C | DVB-ASI
Supported Resolution	480i | 576i | 720p@50/60 | 1080i@59.94/60| 1080p@23.98/24/25/29.97/30/50/59.94/60 | 1080psf@23.98/24/25/29.97/30 /50/59.94/60
HDBaseT Input Module	
Interface Appearance	
Number of Inputs	4
Connector	RJ45
Supported Standard	HDBaseT 1.0
Supported Resolution	SMPTE 480i | 576i | 720p@50/59.94/60 | 1080i@50/59.94/60 | 1080p@50/59.94/60 VESA 800×600@60 |1024×768@60 |1280×768@60 | 1280×1024@60 | 1600×1200@60 | 1920×1080@60 | 1920× 1200@60 | 2048×1152@60 | 2560×816@60

HDMI Output Module	
Interface Appearance	
Board Size	131.6(L)X20(W)（mm）
Number of Outputs	4
Connector	HDMI-A
Supported Resolution	SMPTE 625/25 PAL, 525/29.97 NTSC, 625/50p PAL, 525/59.94p NTSC,

	VESA 720p50/60 |1080i50/59.94/60 | 1080P50/59.94/60 800×600@60 |1024×768@60 | 1280×768@60 | 1280×1024@60 | 1600×1200@60 1920×1080@50 |1920×1080@60 |
Supported Standards	HDMI 1.3
SDI Output Module	
Interface Appearance	
Board Size	131.6(L)×20(W)（mm）
Number of Outputs	4
Connector	BNC
Supported Standards	SMPTE 425M (Level A) | SMPTE 424M | SMPTE 292M | SMPTE 259M-C | DVB-ASI
Supported Resolution	SMPTE 720p@50/59.94/60 |1080i@50/59.94/60 | 1080p@23.98/24/25/29.97/30/50/59.94/60
Supported Bandwidth	Max Data Rate up to 2.97Gbps
H.264 Preview Output Module	
Interface Appearance	
Board Size	131.6(L)×20(W)（mm）
H.264 Output	
Number of Outputs	3
Connector	2×RJ45|1×HDMI-A
Supported Resolution	H.264 176×144 | 240×180 | 320×180 | 320×240 | 320×256 | 352×228 | 352×480 | 400×224 | 400×320 | 480×270 | 480×272 | 480×320 | 480X360 | 480X384 | 480×480 | 544×480 | 608×448 | 640×360 | 640×480 | 704×576 | 720×404 | 720×480 | 720×540 | 720×576 | 850×480 | 1024×576 | 1280×720 | 1680×1056 | 1920×1080
	HDMI SMPTE 480i | 576i | 720p@50/59.94/60 | 1080i@50/59.94/60 | 1080p@25/29.97/30/50/59.94/60 VESA 1024×768@60/75/85 | 1280×800@60 | 1280×1024@60/75/85 | 1360×768@60 | 1366×768@60 | 1400×1050@60 | 1440×900@60 | 1600×1200@60 | 1680×1050@60 | 1920×1080@60
Supported Standards	H.264 MJPEG/JPEG baseline HDMI 1.3
HDBaseT Output Module	

Interface Apperance	
Number of Inputs	4
Connector	RJ45
Supported Standard	HDBaseT 1.0
Supported Resolution	SMPTE 720p@50/59.94/60 | 1080p@50/59.94/60 VESA 800×600@60 |1024×768@60/75/85 |1280×720@50/59.94/60 |1280×800@60 |1280×960@60 | 1280×1024@60/75/85 | 1400×1050@60 |1600×1200@60 |1920×1080@23.98/24/25/29.97/30/50/59.94/60 | 2048×1152@60
Communication Interface	
Interface Appearance	
Board Size	131.6(L)X20(W)（mm）
Genlock Input	
Number of Inputs	2
Connector	1×BNC| 1× HDMI-A
Signal Level	Genlok (Y/H/V) NTSC/PAL, TRI SYNC/Blackmagic signal HDMI HDMI to TTL timing signal
Supported Resolution	Genlok (Y/H/V) 480i | 576i | 720p@50/60 | 1080i@50/59.94/60 | 1080p@50/59.94/60 HDMI 1920×1080@60
Control Port	
LAN	RJ45
ULink	ULink In | ULink Out
Function	
Switch	Support any two inputs fade in fade out
E×tras	
Power Supply	100-240V IEC-3
Working Environment	0°C~45°C
Stored Environment	10% to 90%
Product Warranty	3 years parts and labor warranty

6.2 Software Upgrade

Upgrade the software by the USB interface in the front panel of X2, the upgrade steps are as follows:

1. Copy the “*.pkg” file to the USB disk, and modify the file name to “_update.pkg”.
2. Plug into the power cord and make sure the X2is in normal operation.
3. Plug the USB disk into the USB interface in the front panel of X2, the device will upgrade automatically. The buzzer sounds beeps during upgrade, the beeps will stop and the USB disk will delete the upgrade file automatically after complete upgrade.

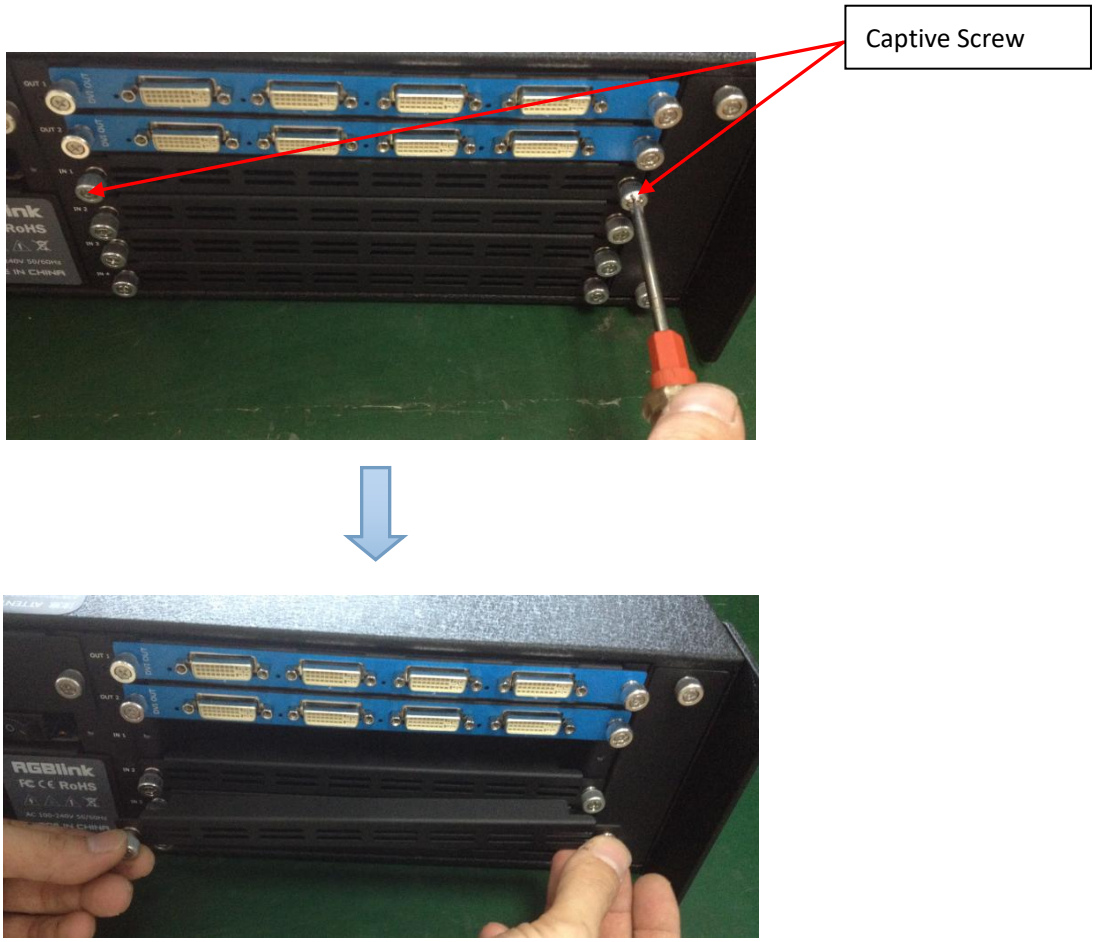
6.3 Install Options

6.3.1 Install Input Module

X2 and VENUS X3 support replaceable input and output optional modules, user can install or replace the optional module according to actual need. The installation steps of X2and VENUS X3 are the same. Here we take VENUS X3 for example, specific steps are as follows:

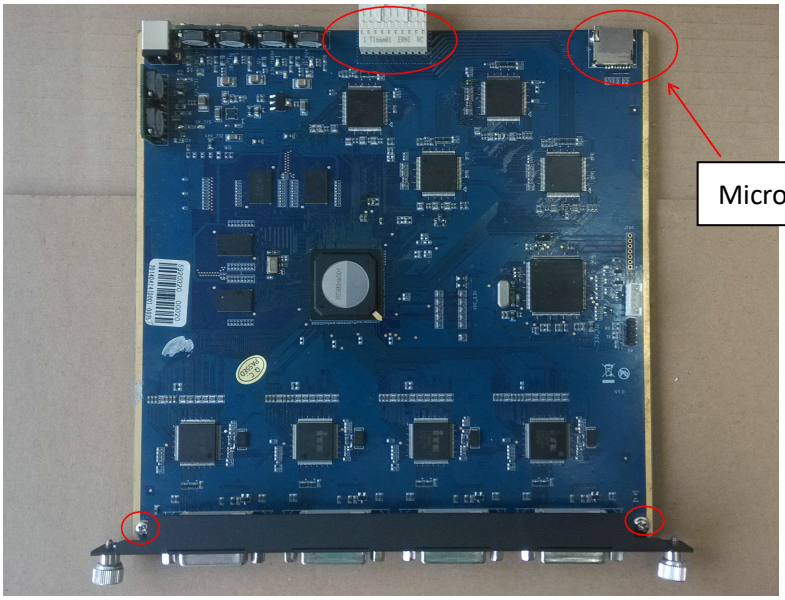
Install the Optional Module

1. Unscrew the 2 captive screws in input modules block, and pull out the input module block, as shown in figure:

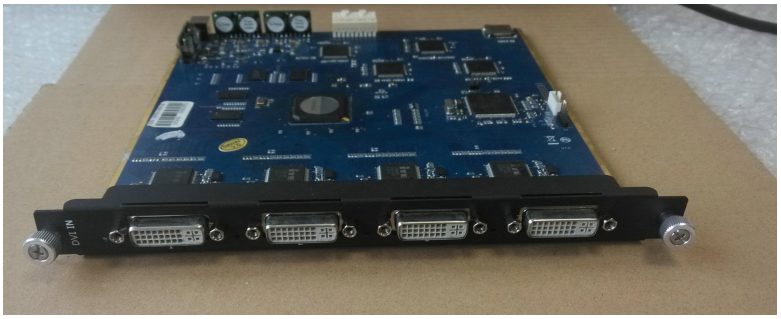


2. Install the input module:

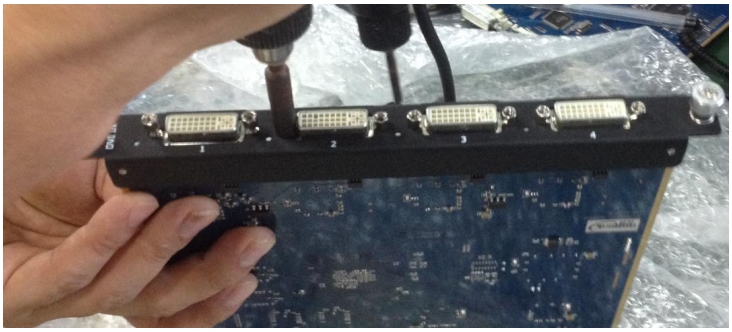
   For the whole PCB input module with DVI or HDMI interface, fix the input module on the plate with 2 M3*4 flat screws, also need to install the 2G Micro SD card.



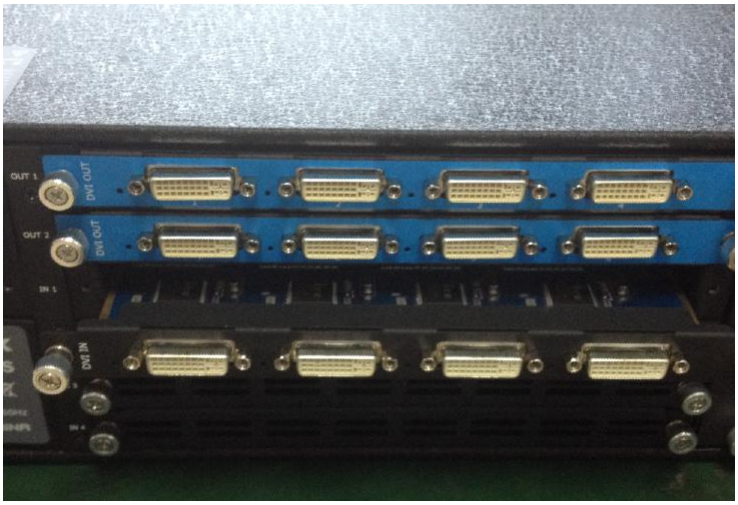
DVI input module:



3. fix the input module block with fixed screws, as shown in figure:



4. Push the input modules into the device along the slide rail, and screw the captive screws, as shown in figure:





Note: The install steps of output module installation and input/output module replacement are the same as above.

6.3.2 Install Power Module

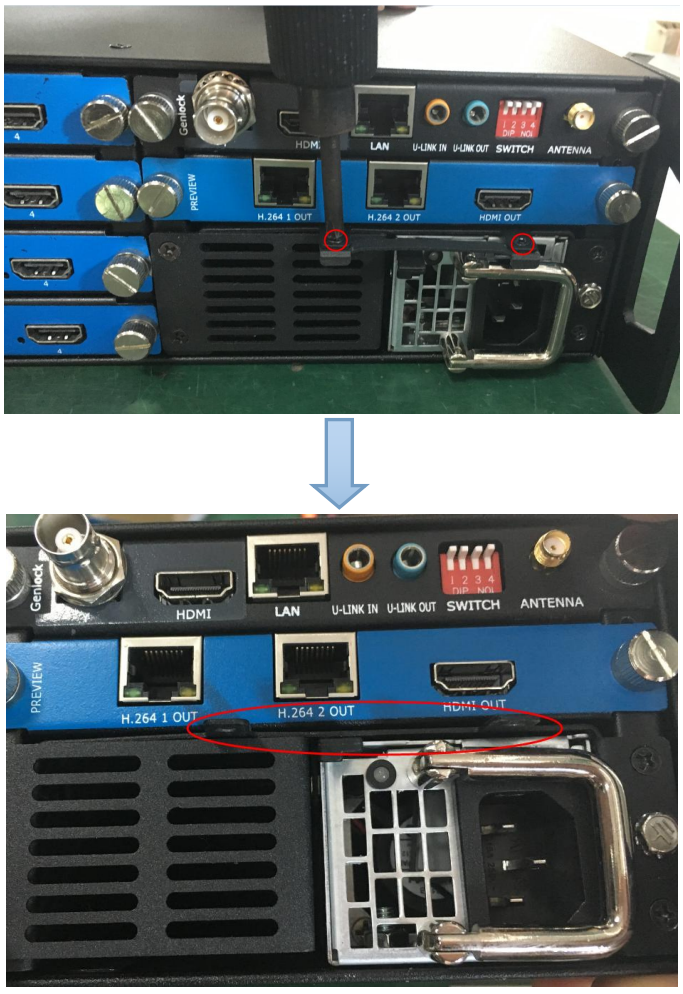
One power module as standard for X2, as shown in figure 1:



(Figure 1)

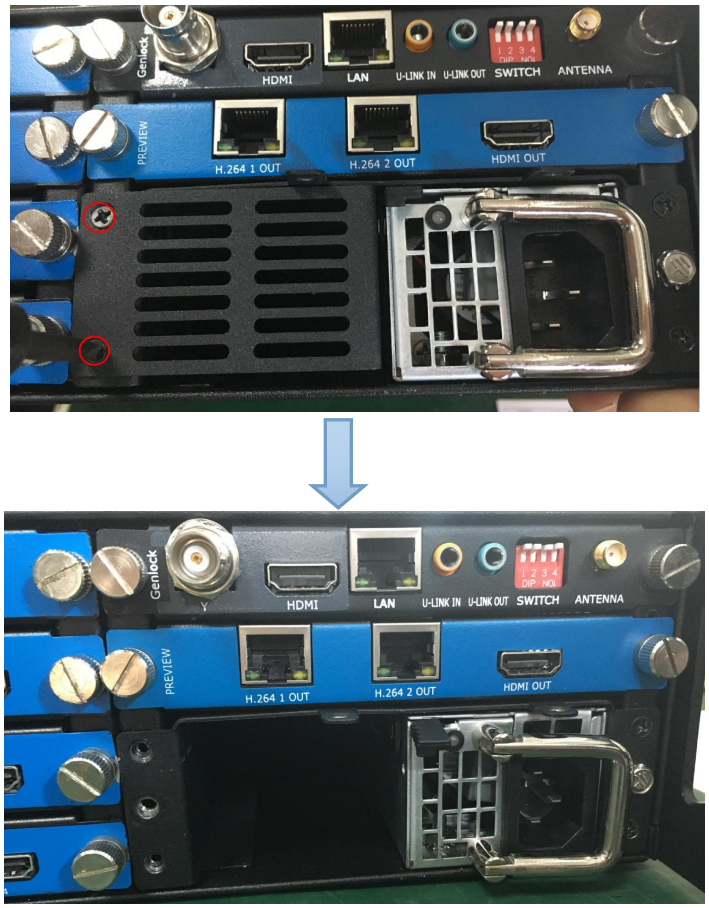
If necessary, two power modules can be installed, the specific steps are as follows:

1. Unscrew the two M4 ground screws between the power module and power box with a screwdriver, and take out the power module fixed holder, as shown in figure 2:



(Figure 2)

2. Unscrew the two M3*8 flat head screws on the left side of the power module holder with a screwdriver, and take out the power module holder, as shown in figure 3:



(Figure 3)

3. Push the power module into the slot, as shown in figure 4:



(Figure 4)

4. fix the two power modules with two M4 ground screws and a power module fixed holder, as shown in figure 5:



(Figure 5)

5. fix the power box with two M3*8 flat head screws, and the installation is finished, as shown in figure 6:



(Figure 6)

6.4 Care and Preventive Maintenance

6.4.1 Clean Cooling Fan

The fan is designed to keep the device cool and within temperature range during normal operation. Ensuring that the fan module is clean, dust free is important to maintain product warranty, correct working order and for safety.
Clean fan assembly at least every six months, or more regularly depending on the installed environment.

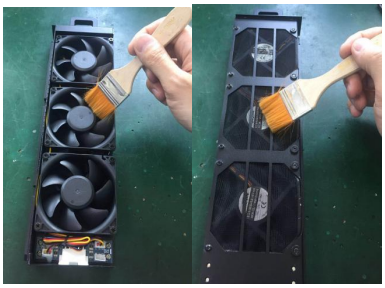
Step 1: Loosen the screw and pull out the fan module



Step 3: Loosen the locking screw to separate the dust screen and fan. Clean the screen and fan by brush.



Step: Clean dust on the front and back of the fan module by brush.



Step 4: Reverse steps above.

Put the dust screen back to the fan and tighten the screw.

Push the fan module back to the device and tighten the screw.

6.5 Terms & Definitions

The following terms and definitions are used throughout this guide.

- **“ASCII”:** American Standard for Information Interchange. The standard code consisting of 7-bit coded characters (8 bits including parity check) used to e×change information between data processing systems, data communication systems, and associated equipment. The ASCII set contains control characters and graphic characters.
- **“Aspect ratio”:** The relationship of the horizontal dimension to the vertical dimension of an image. In viewing screens, standard TV is 4:3, or 1.33:1; HDTV is 16:9, or 1.78:1. Sometimes the “:1” is implicit, making TV = 1.33 and HDTV = 1.78.
- **“AV”:** Audio visual, or audio video.
- A **“Background”** is an unscaled source, typically originating from a computer. A background source appears at the system’s lowest priority — visually in back of all other sources.
- **“Baudrate”:** Named of J.M.E. Baudot, the inventor of the Baudot telegraph code. The number of the electrical oscillations per second, called baud rate. Related to, but not the same as, transfer rate in bits per second (bps).
- **“Blackburst”:** The video waveform without the video elements. It includes the vertical sync, horizontal sync, and the chroma burst information. Blackburst is used to synchronize video equipment to align the video output. One signal is normally used to set up an entire video system or facility. Sometimes it is called House sync.
- **“BNC”:** Bayonet Neill-Concelman. A cable connector used e×tensively in television and named for its inventors. A cylindrical bayonet connector that operates with a twist-locking motion. To make the connection, align the two curved grooves in the collar of the male connector with the two projections on the outside of the female collar, push, and twist. This allows the connector to lock into place without tools.
- **“Brightness”:** Usually refers to the amount or intensity of video light produced on a screen without regard to color. Sometimes called “black level.
- “**CAT 5**”**:** Category 5. Describes the network cabling standard that consists of four unshielded twisted pairs of copper wire terminated by RJ-45 connectors. CAT 5 cabling supports data rates up to 100 Mbps. CAT 5 is based on the EIA/TIA 568 Commercial Building Telecommunications Wiring Standard.
- **“Color bars”:** A standard test pattern of several basic colors (white, yellow, cyan, green, magenta, red, blue, and black) as a reference for system alignment and testing. In NTSC video, the most commonly used color bars are the SMPTE standard color bars. In PAL video, the most commonly used color bars are eight full field bars. In the computer, the most commonly used color bars are two rows of reversed color bars.
- **“Color burst”:** In color TV systems, a burst of subcarrier frequency located on the back porch of the composite video signal. This serves as a color synchronizing signal to establish a frequency and phase reference for the chroma signal. Color burst is 3.58 MHz for NTSC and 4.43 MHz for PAL.
- **“Color temperature”:** The color quality, expressed in degrees Kelvin(K), of a light source. The higher the color temperature, the bluer the light. The lower the temperature, the

redder the light. Benchmark color temperature for the A/V industry include 5000°K, 6500°K, and 9000°K.

- **"Contrast ratio":** The radio of the high light output level divided by the low light output level. In theory, the contrast radio of the television system should be at least 100:1, if not 300:1. In reality, there are several limitations. In the CRT, light from adjacent elements contaminate the area of each element. Room ambient light will contaminate the light emitted from the CRT. Well-controlled viewing conditions should yield a practical contrast ratio of 30:1 to 50:1.
- **"DVI":** Digital Visual Interface. The digital video connectivity standard that was developed by DDWG (Digital Display Work Group). This connection standard offers two different connectors: one with 24 pins that handles digital video signals only, and one with 29 pins that handles both digital and analog video.
- **"EDID":** Extended Display Identification Data – EDID is a data structure used to communicate video display information, including native resolution and vertical interval refresh rate requirements, to a source device. The source device will then output the optimal video format for the display based on the provided EDID data, ensuring proper video image quality. This communication takes place over the DDC – Display Data Channel.
- **"Ethernet":** A Local Area Network (LAN) standard officially known as IEEE 802.3. Ethernet and other LAN technologies are used for interconnecting computers, printers, workstations, terminals, servers, etc. within the same building or campus. Ethernet operates over twisted pair and over coaxial cable at speeds starting at 10Mbps. For LAN inter-connectivity, Ethernet is physical link and data link protocol reflecting the two lowest layers of the OSI Reference Model.
- **"Frame":** In interlaced video, a frame is one complete picture. A video frame is made up of two fields, or two sets of interlaced lines. In a film, a frame is one still picture of a series that makes up a motion picture.
- **"Gamma":** The light output of a CRT is not linear with respect to the voltage input. The difference between what you should have and what is actually output is known as gamma.
- **"HDMI" - High – Definition Multimedia Interface:** An interface used primarily in consumer electronics for the transmission of uncompressed high definition video, up to 8 channels of audio, and control signals, over a single cable. HDMI is the default standard for HDTV displays, Blu-ray Disc players, and other HDTV electronics. Introduced in 2003, the HDMI specification has gone through several revisions.
- **"HDSDI":** The high-definition version of SDI specified in SMPTE-292M. This signal standard transmits audio and video with 10 bit depth and 4:2:2 color quantization over a single coaxial cable with a data rate of 1.485 Gb/s. Multiple video resolutions exists including progressive 1280×720 and interlaced 1920×1080 resolution. Up to 32 audio signals are carried in the ancillary data.
- **"JPEG" (Joint photographic Expects Group):** Commonly used method of lossy compression for photographic images using a discreet cosine transfer function. The degree of compression can be adjusted, allowing a selectable tradeoff between storage size and image quality. JPEG typically achieves 10:1 compression with little perceptible loss in image quality. Produces blocking artifacts.

- **“MPEG”:** Motion Picture Expect Group. A standard committee under the auspices of the International Standards Organization working on algorithm standards that allow digital compression, storage and transmission of moving image information such as motion video, CD-quality audio, and control data at CD-ROM bandwidth. The MPEG algorithm provides inter-frame compression of video images and can have an effective compression rate of 100:1 to 200:1.
- **“NTSC”:** The color video standard used in North America and some other parts of the world created by the National Television Standards Committee in the 1950s. A color signal must be compatible with black-and-white TV sets. NTSC utilizes an interlaced video signals, 525 lines of resolution with a refresh rate of 60 fields per second (60 Hz). Each frame is comprised of two fields of 262.5 lines each, running at an effective rate of 30 frames per second.
- **“Operator”:** Refers to the person who uses the system.
- **“PAL”:** Phase Alternate Line. A television standard in which the phase of the color carrier is alternated from line to line. It takes four full pictures (8 fields) for the color-to-horizontal phase relationship to return to the reference point. This alternation helps cancel out phase errors. For this reason, the hue control is not needed on a PAL TV set. PAL, in many transmission forms, is widely used in Western Europe, Australia, Africa, the Middle East, and Micronesia. PAL uses 625-line, 50-filed (25 fps) composite color transmission system.
- **“PIP”:** Picture-in-Picture. A small picture within a larger picture created by scaling down one of the images to make it smaller. Each picture requires a separate video source such as a camera, VCR, or computer. Other forms of PIP displays include Picture-by-Picture (PBP) and Picture-with-Picture (PWP), which are commonly used with 16:9 aspect display devices. PBP and PWP image formats require a separate scaler for each video window.
- **“Polarity”:** The positive and negative orientation of a signal. Polarity usually refers to the direction or a level with respect to a reference (e.g. positive sync polarity means that sync occurs when the signal is going in the positive direction).
- **“RJ-45”:** Registered Jack-45. A connector similar to a telephone connector that holds up to eight wires, used for connecting Ethernet devices.
- “**RS-232”:** An Electronic Industries Association (EIA) serial digital interface standard specifying the characteristics of the communication path between two devices using either DB-9 or DB-25 connectors. This standard is used for relatively short-range communication and does not specify balanced control lines. RS-232 is a serial control standard with a set number of conductors, data rate, word length, and type of connector to be used. The standard specifies component connection standards with regard to the computer interface. It is also called RS-232-C, which is the third version of the RS-232 standard, and is functionally identical to the CCITT V.24 standard.
- **“Saturation”:** Chroma, chroma gain. The intensity of the color, or the e×tent to which a given color in any image is free from white. The less white in a color, the truer the color or the greater its saturation. On a display device, the color control adjusts the saturation. Not to be confused with the brightness, saturation is the amount of pigment in a color, and not the intensity. Low saturation is like adding white to the color. For example, a low-saturated red looks pink.

- **“Scaling”:** A conversion of a video or computer graphic signal from a starting resolution to a new resolution. Scaling from one resolution to another is typically done to optimize the signal for input to an image processor, transmission path or to improve its quality when presented on a particular display.
- **“SDI”:** Serial Digital Interface. The standard based on a 270 Mbps transfer rate. This is a 10-bit, scrambled, polarity independent interface with common scrambling for both component ITU-R 601 and composite digital video and four channels of (embedded) digital audio.
- **“Seamless Switching”:** A feature found on many video switchers. This feature causes the switcher to wait until the vertical interval to switch. This avoid a glitch (temporary scrambling) which normally is seen when switching between sources.
- **“SMPTE”:** Society of Motion Picture and Television Engineers. A global organization, based in the United States, that sets standards for baseband visual communications. This includes film as well as video and television standards.
- **“S-Video”:** A composite video signal separated into the luma (“Y” is for luma, or black and white information; brightness) and the chroma (“C” is an abbreviation for chroma, or color information).
- **“Sync”:** Synchronization. In video, sync is a means of controlling the timing of an event with respect to other events. This is accomplished with timing pulses to insure that each step in a process occurs at the correct time. For example, horizontal sync determines e×actly when to begin each horizontal scan line. Vertical sync determines when the image is to be refreshed to start a new field or frame. There are many other types of sync in video system.(Also known as “sync signal” or “sync pulse.”)
- **“TCP/IP”:** Transmission Control Protocol/Internet Protocol. The communication protocol of the Internet. Computers and devices with direct access to the Internet are provided with a copy of the TCP/IP program to allow them to send and receive information in an understandable form.
- **“USB”:** Universal Serial Bus. USB was developed by seven PC and telecom industry leaders (Compaq, DEC, IBM, Intel, Microsoft, NEC, and Northern Telecom). The goal was easy plug-and-play expansion outside the box, requiring no additional circuit cards. Up to 127 external computer devices may be added through a USB hub, which may be conveniently located in a keyboard or monitor. USB devices can be attached or detached without removing computer power. The number of devices being designed for USB continues to grow, from keyboards, mice, and printers to scanners, digital cameras, and ZIP drives.
- **“VESA”:** Video Electronics Standards Association. A nonprofit number organization dedicated to facilitating and promoting personal computer graphics through improved standards for the benefit of the end-user. www.vesa.org
- **“VGA”:** Video Graphics Array. Introduced by IBM in 1987, VGA is an analog signal with TTL level separate horizontal and vertical sync. The video outputs to a 15-pin HD connector and has a horizontal scan frequency of 31.5 kHz and vertical frequency of 70 Hz (Mode 1, 2) and 60 Hz (Mode 3). The signal is non-interlaced in modes 1, 2, and 3 and interlaced when using the 8514/A card (35.5 kHz, 86 Hz) in mode 4. It has a pi×el by line resolution of 640×480 with a color palette of 16 bits and 256,000 colors.

- **“YCrCb”:** Used to describe the color space for interlaced component video.
- **“YPbPr”:** Used to describe the color space for progressive-scan (non-interlaced) component video.

6.6 Revision History

The table below lists the changes to the Video Processor User Manual.

Format	Time	ECO#	Description	Principal
V1.0	2015-06-11	0000#	Release	Vira
V1.1	2015-07-16	0001#	Add “Optional Module Installation and Replacement Instruction”	Vira
V1.2	2015-11-12	0002#	1. Update the product picture. 2. Update the back panel. 3. Update the dimensions drawing. 4. Update the menu tree. 5. Update the windows control program.	Vira
V1.3	2016-03-07	0003#	1. Update the back panel. 2. Update the logo. 3. Update the fa× number.	Vira
V1.4	2016-05-05	0004#	1. Update the windows control program.	Vira
V1.5	2016-07-20	0005#	1. Update the style and structure of the user manual. 2. Update the back panel. 3. Add “Ordering Codes”. 4. Add 4K, H.264 and WIFI specification, etc. 5. Add “Installing WIFI Module”. 6. Add “Installing Power Module”.	Vira
V1.6	2018-12-11	0006#	1. Update SDI output module 2. Update “In the box”	Fanny
V1.7	2019-04-10	0007#	1. Add Control by XPOSE 2. Add HDBaseT Input and Output to Specification	Fanny
V 1.8	2019-06-20	0008	1. Revise 4K@30 input	Fanny
V1.9	2019-08-09	0009#	1. Add “Clean Cooling Fan”	Fanny
V2.0	2025-09-09	0010#	1. Update the included accessories (delete the screw driver and the U disk).	Alyssa