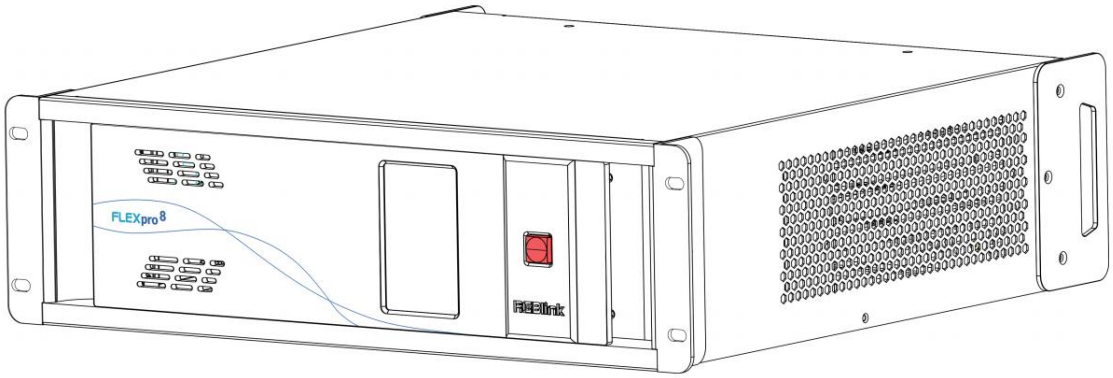
FLEXpro 8



USER MANUAL

RGBlink®

Article No: RGB-RD-UM- FLEXpro 8 E004
Revision No: V1.4

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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 explosive atmosphere.

Installation Safety Summary

Safety Precautions

For all FLEXpro 8 processor 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 FLEXpro 8 processor 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 FLEXpro 8 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



DVI Cable



SDI Cable



RJ11 to DB9 Serial Cable



Antistatic Bag

Note:

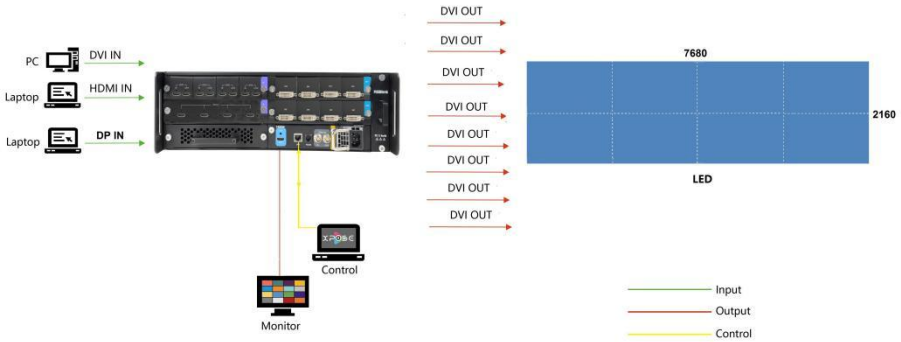
AC Power Cable supplied as standard according to destination market.

Upgrade tool package and user manual are stored in the USB disk, please keep it.

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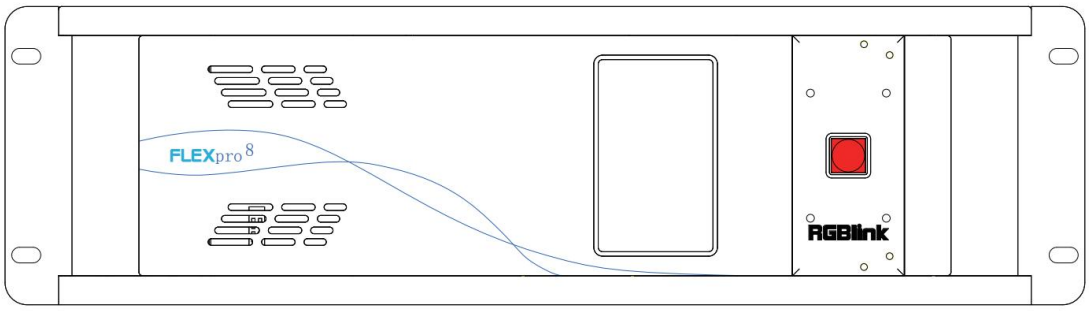
1.2 Product Overview

FLEXpro 8 is an all new video processing solution for modern large scale display applications. With support for over 18 mega pixels across eight outputs, FLEXpro 8 is designed for professional applications. Fit up to 16 independent inputs integrating a range of video sources and signals utilized in commercial display systems. The innovative RGBlink modular signal system provides native on support for HDBaseT, Fiber and LED Control signals as well as conventional signals, embracing flexibility while being an efficient self-contained system. Whether for integration or proAV FLEXpro 8 has the multi-signal, multi-layer technology for virtually any display application.



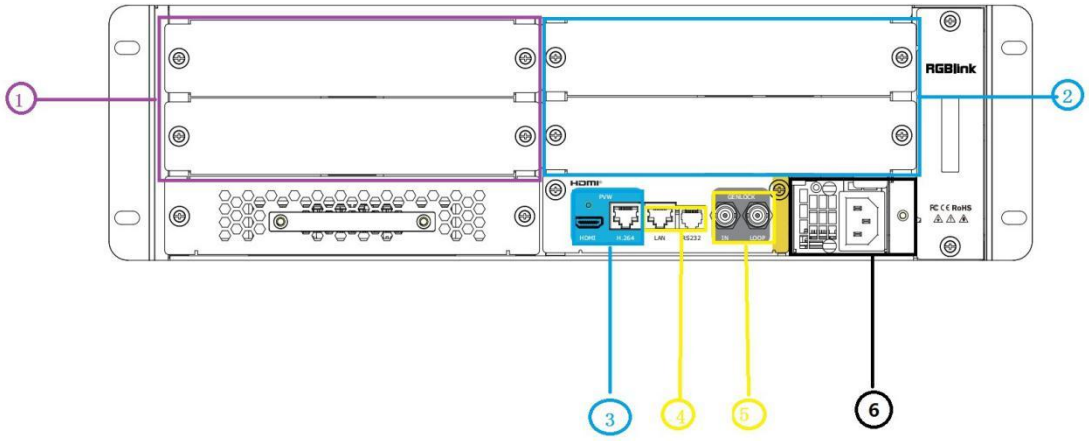
FLEXpro 8 Application Diagram

1.2.1 Front Panel



1	**OLED Panel** Show the input shot and output slot information, device status, COM. Version, IP address and serial address.
2	**POWER** Power button, long push the button, the device can be boot up. Under normal running state, push the button once, the info shown on OLED can be refreshed once ; long push the button, the OLED will pop up a confirm box, release the power button, push the power again before the confirm box disappears, and the power can be turned off.

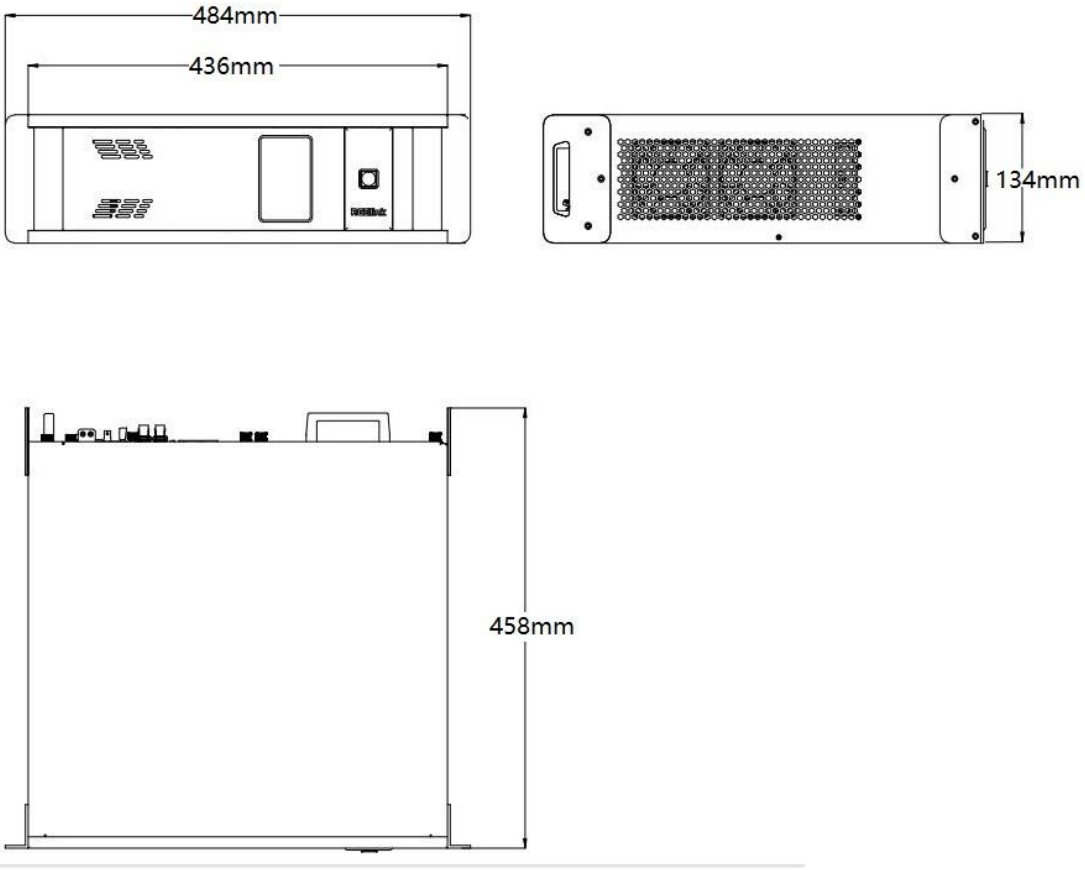
1.2.2 Rear Panel



Chassis Module Structure			
1	2 slots for input modules, support DVI, HDMI and SDI optional module	4	Communication
2	2 slots for output modules, support DVI, HDMI, SDI, HDBaseT and Subito Sender optional modules	5	Genlock
3	Independent PVW output ports	6	PSU Module

1.2.3 Dimension

Following is the dimension of Felxpro 8 for your reference:



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Chapter 2 Install Your Product

2.1 Plug in Signals

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

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

Turn on the power switch on the real panel.

OLED display will show as below,completing initialization before loading the latest settings and input/output configuration.

The system begins to work,and the OLED module shows the input slot and output slot information, device status, COM. Versions. IP address and serial number.

2.4 Connect FLEXpro 8 and Computer

Use network cable to connect the FLEXpro 8 and computer with USB A-B cable from In the Box.

Set the IP address of the computer and make sure the computer and the device are in same network range. IP address of the device is available on the OLED screen after it is powered on. For example if the IP of the device is 192.168.110.1, just make sure the IP of the computer is in 192.168.xxx.x, but not exact the same as the device

Chapter 3 Use Your Product

3.1 Install XPOSE 2.0

Environment Requirements:

Window

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

Memory: 4 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 1920x1080 pixel or above (it can not display normally if the resolution is lower than 1920x1080)

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

CPU:i5 and above

Mac

Monitor: Resolution must be 1680x1050 pixel or above (it can not display normally if the resolution is lower than 1680x1050)

CPU:i5 and above



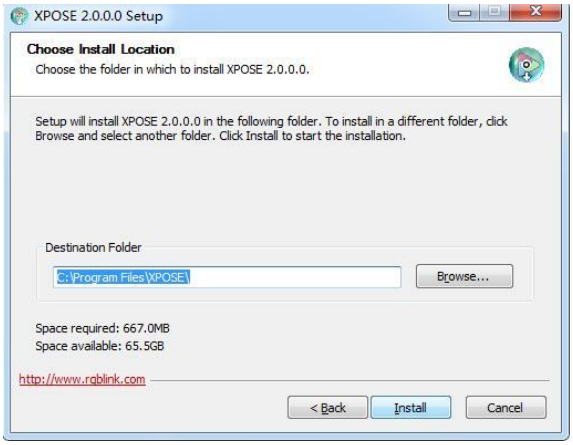
Double click ,it will pop-up the installer language box, select the language, for example, select “English”, and click “OK” to confirm.



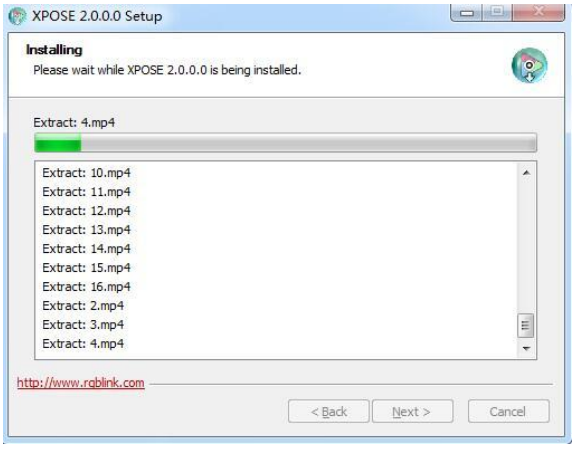
Click “Next” to install:



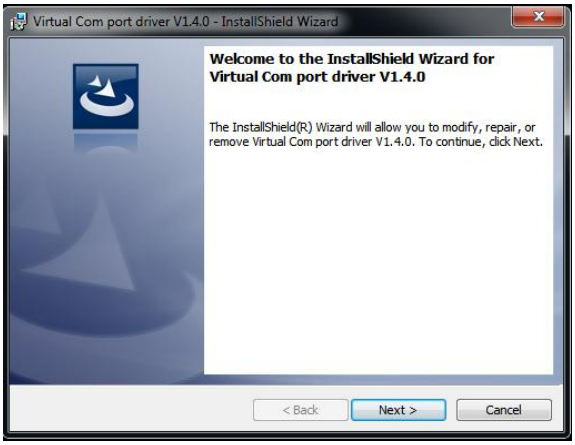
Click “Browse...” to select the XPOSE software install location:



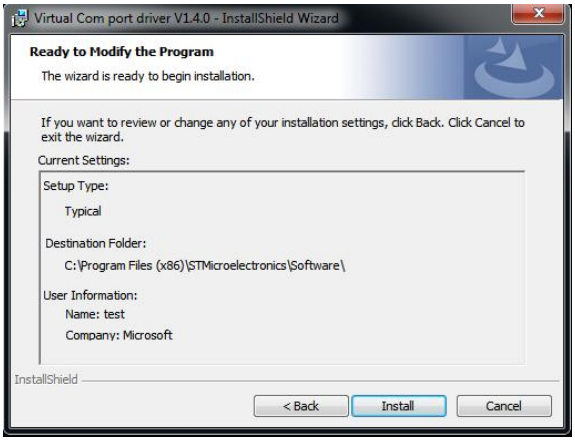
Click “Install”:



During installation, it will pop up the window of Install Shield Wizard for Virtual Com port:



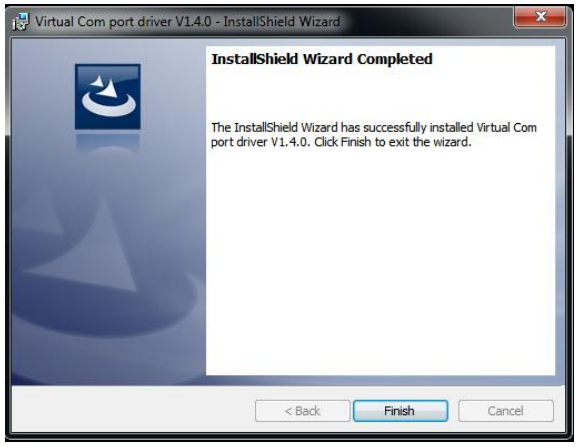
If user install the XPOSE software for the first time, click “Next



Then click “Install", as shown in the figure below:



Click “Finish” and complete the installation, as shown in the figure below:



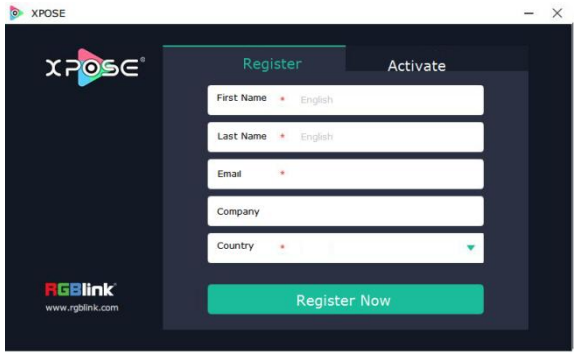
Click “Finish” and is ready to run the XPOSE :

3.2 XPOSE Controls FLEXpro 8

3.2.1 Login in XPOSE

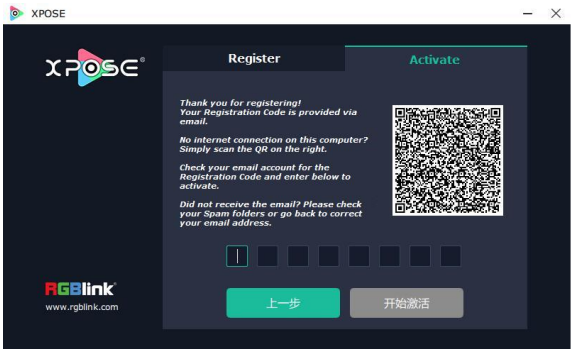
Double click this icon 

,and enter the log on interface as follow

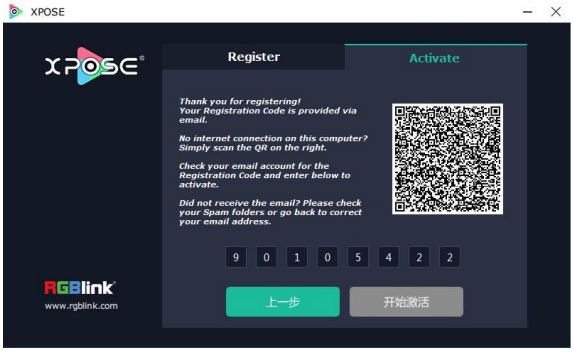


The initial language of XPOSE 2.0 is self adjusted based on the operation system language of the computer. **Click Register** and fill in the blank with first name, last name, email, company and country and then click **Register Now.** Please note that the email shall be invalid and complete otherwise Registration&Activation code cannot be received.

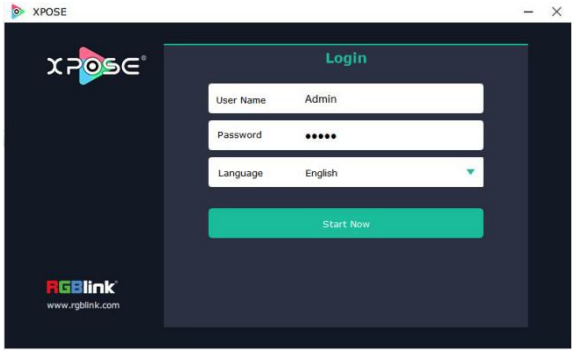
Click **Activate** and scan the QR code



an email from **RGBlink Registrations** will be sent to the **Register** email address.
Type in the activate code and confirm

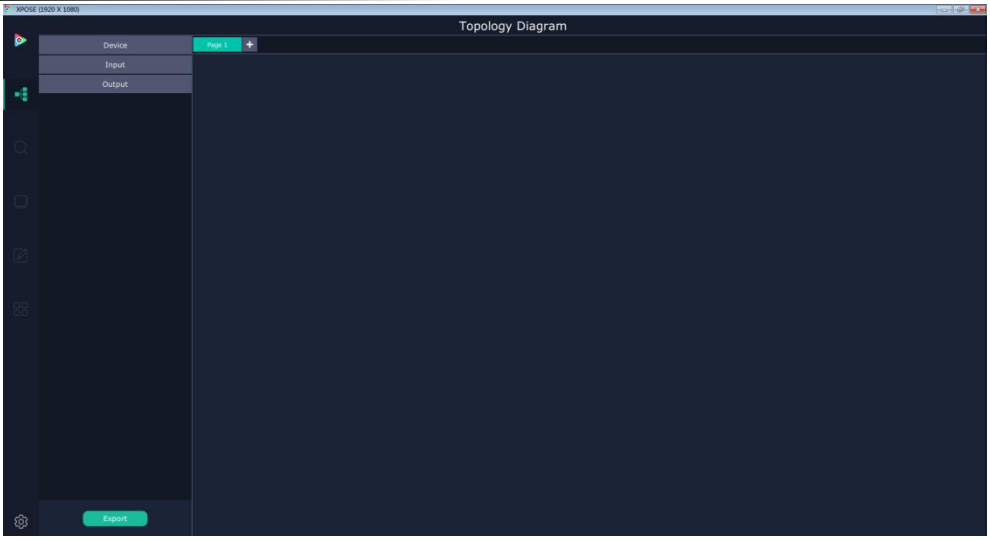


then enter the login interface.



Keep the user name as “Admin” and password blank and then click **Start Now.**
Note: If exact Name and Password are needed, users can set up them in Authorization Setting under System Setting.

After login, users can find the management including:Topology Diagram,Search,Display System, Layer Management, Preset Management, Keyboard Settings. The details of each hierarchy will be described hereafter.



In the following text, we are going to show how to use XPOSE 2.0 to control FLEXpro 8.

3.2.2 Topology Diagram

XPOSE 2.0 offers the feature of making topology diagram which can assist users to import the actual input and output connection into XPOSE control.

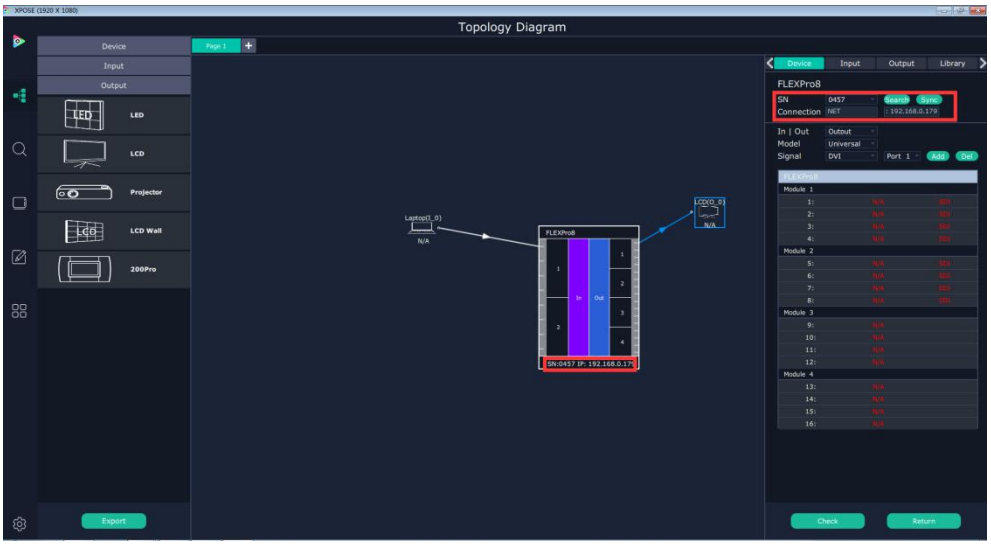
1. Drag device, input source device and output device from the list on the left based on the field application. For example, drag FLEXpro 8 from Device, Laptop from Input and LDC from Output list as follows:



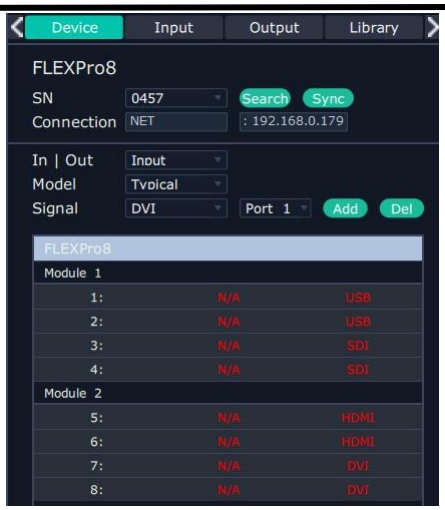
2. Click the icon  at the right bottom corner and open the setting interface as following:

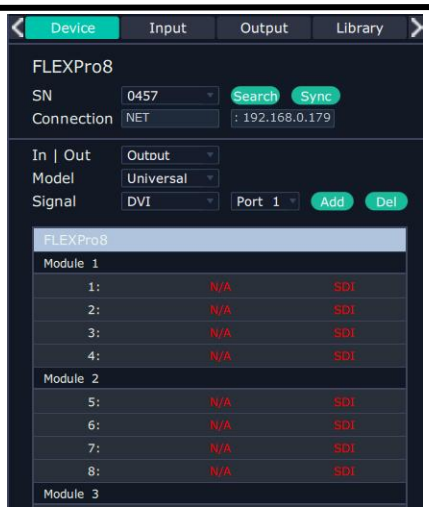


3. After FLEXpro 8 is dragged into the topology diagram interface, users can find how many FLEXpro 8 devices currently linked in the same network from the drop-down arrow after SN.



After one of the device is chosen, the device on the topology diagram shows the SN and IP address of the chosen one.



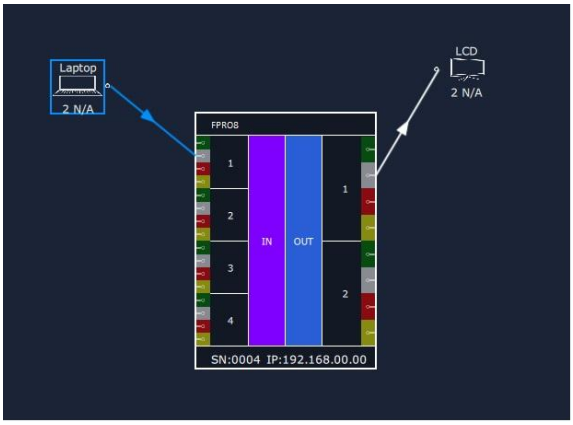


4. Choose board type of In and Out according to the actual input and output modules configuration user want. For example, set the first input board as DVI module as the following

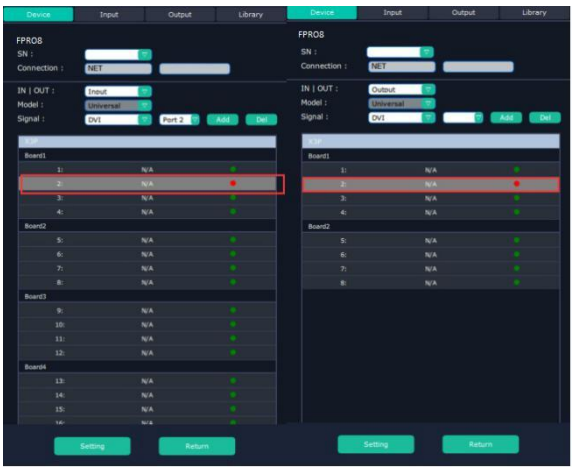
Select IN|OUT: In, Model:Universal, Signal:DVI, Port:any figure from 1 to 4, click ADD 

to finish

If the input module is formed by different signal input ports, choose the Model as Typical, it will allow users to set port type one by one.

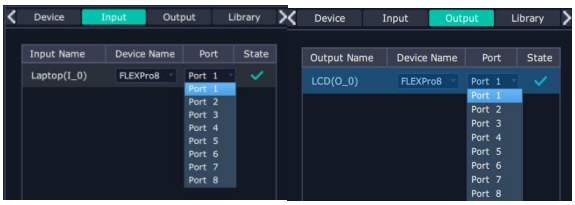


The chosen port of board of In and Out indicated by red dot as below:

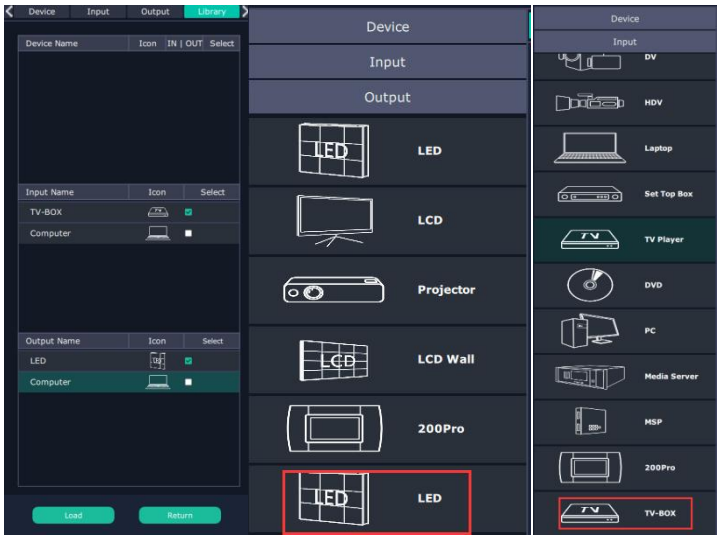


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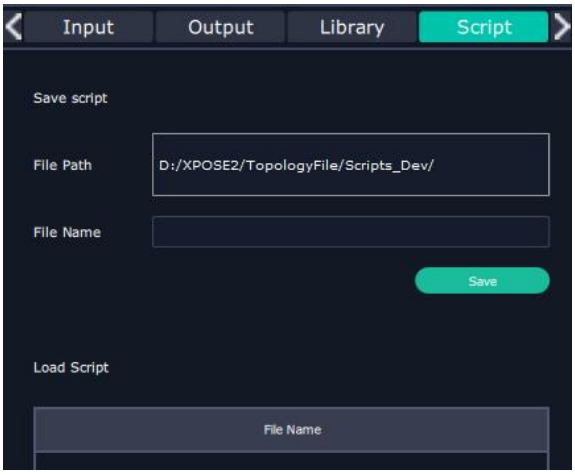
5. After choosing board type, users can check the state in **Input** and **Output** and change the connection port if needed.



6. If there are not enough devices in the device list on the left column, users can select and load more devices to the list from the **Library**.



7. After topology diagram is finished, users can store the script to local hard drive so that there is no need to do topology diagram next time again. Users can upload the previously stored script if the input and output deployment is the same.



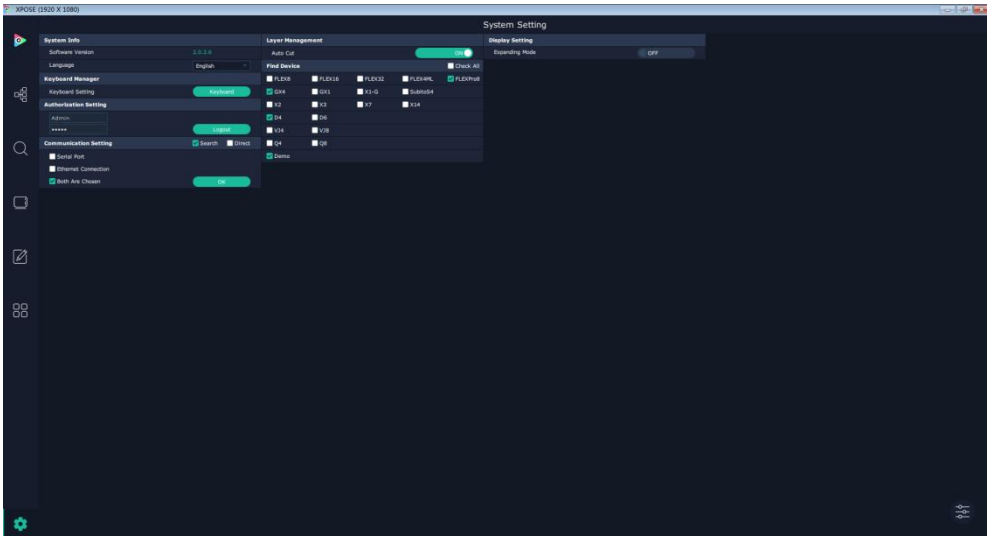
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3.2.3 System Settings

Find Device

New version of XPOSE 2.0 is blank default in Find Device. Users are supposed to choose the device needed in System Setting.

Then click icon  Click this icon and enter the interface, choose the device X14.



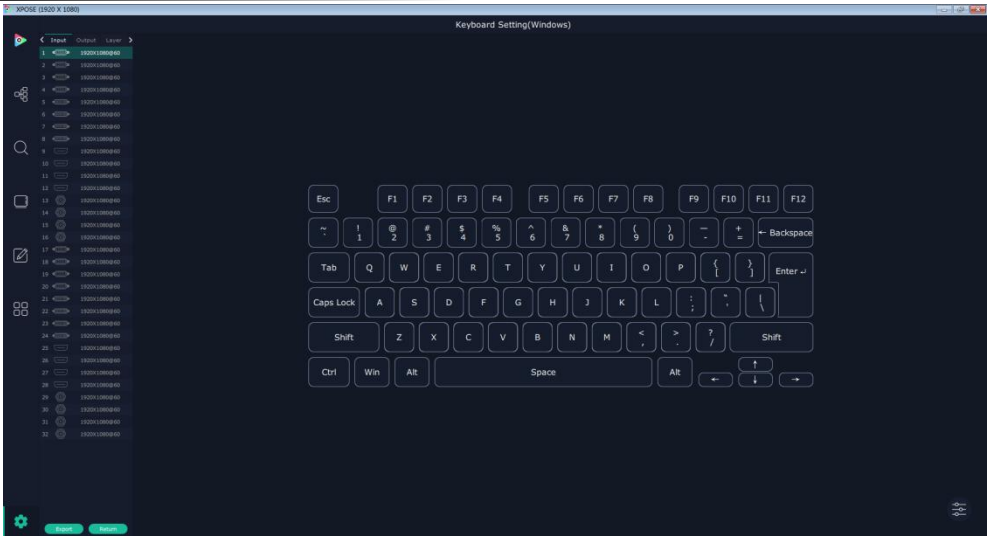
System Info: show the current software version
Language:Chinese, English and Russian
Communication Setting: Search or Direct, Search default.
Serial port, Ethernet Communication, Both are Choose. Both are Chosen default.
Layer Management:Auto Cut On or Off

Keyboard Manager

click keyboard 

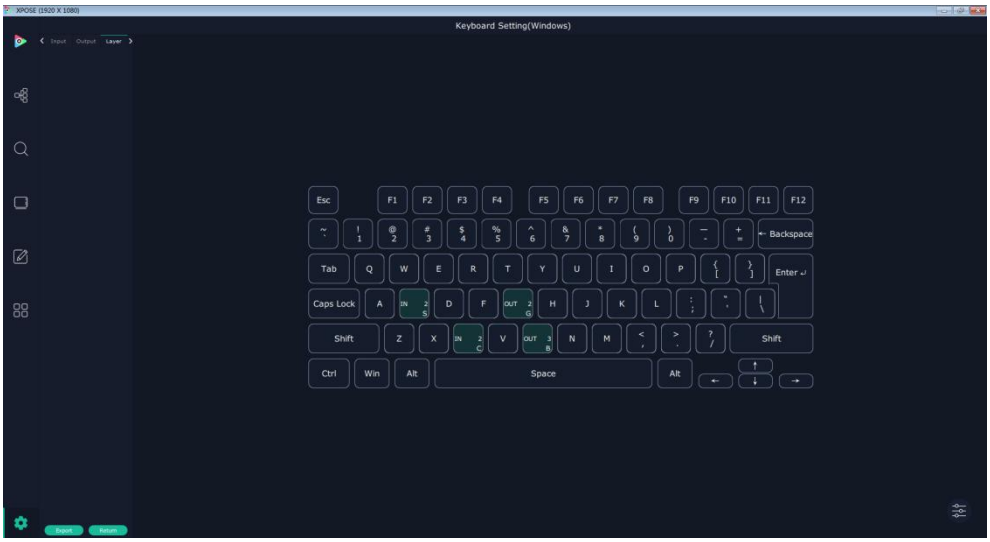
it will redirected to keyboard setting window.

Keyboard setting is designed to fit for different operation systems such as Windows and Mac. Users can set short cut keys for Input, Output, Layer and Preset.



Drag Input, Output, Layer and Preset from the list to the keys you desired as follow:

Input, Output, Layer.



Please note the keyboard area where allows to set short cut keys as follow:

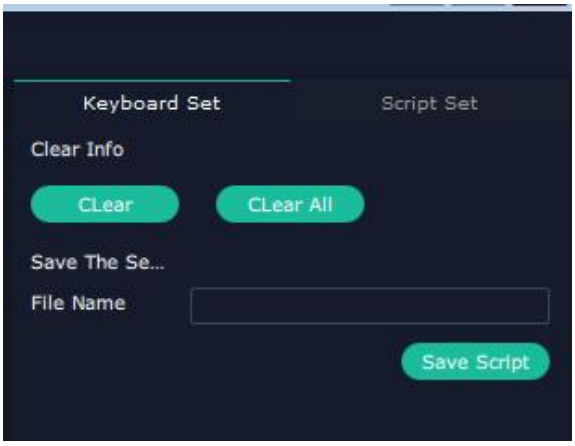


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If the setting goes wrong or no need for short cut keys any more, click  to clear some keys or clear all.

Clear: is to clear some keys, the keys need to selected before hand.

Clear all: is to remove all already set short cut keys.

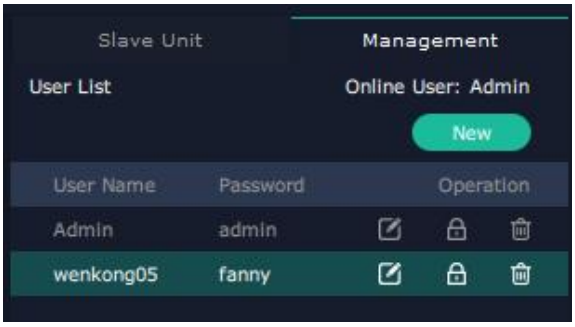


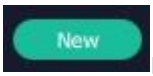
Authorization Setting

Click  to open up the authorization entry.



Click **Management**



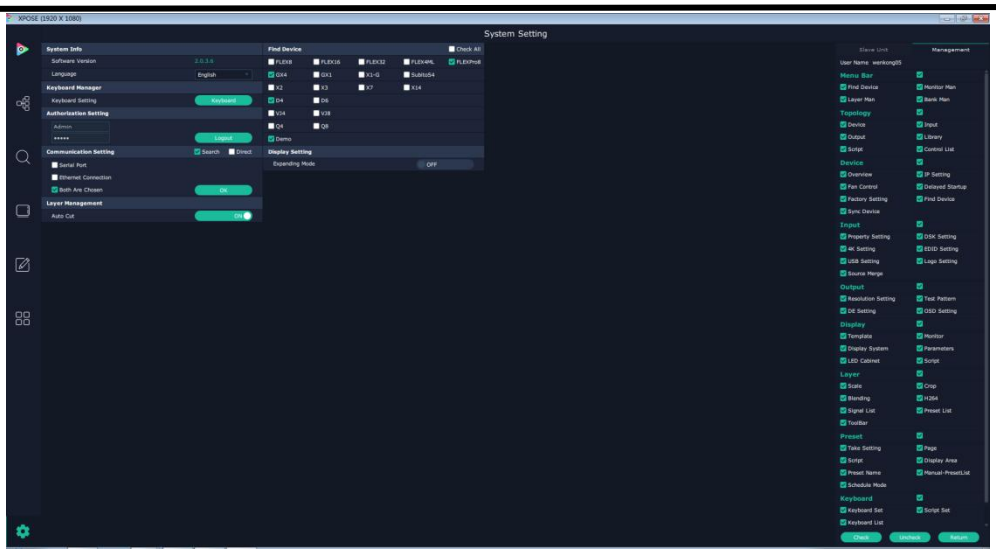


New:Add new USER NAME and PASSWORD


Edit: Edit user name and password already built.


Delete:Delete user name and password already built.


Permission: functions on this XPOSE 2.0 on this computer that the users are allowed to operate.

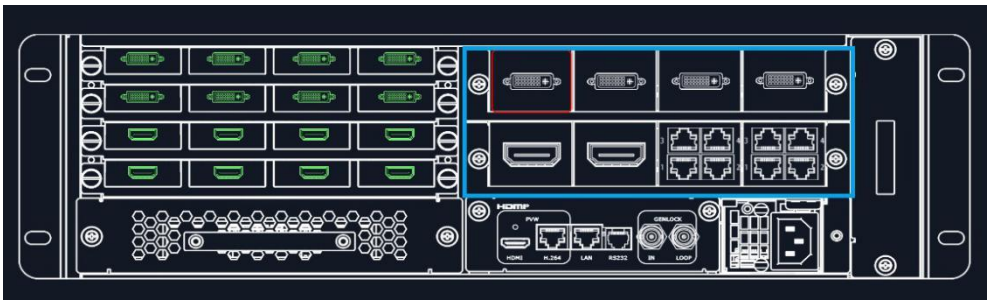


Click the green block to remove the function not to be permitted.

3.2.4 Output | Input | Overview

Output Setting

1. Click any output port, the board where the port locates is selected. Users can do settings to the port now.



A red rectangle flashes around the chosen port when it is clicked.

After DVI port is selected, users can do the following settings in the edit section after clicking icon , Resolution setting, Test Pattern, DE Setting, Property Setting.





After DP, HDMI or SDI is selected, resolution setting and DE setting can be done.



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After HDBaseT is selected, resolution setting, Test pattern and OSD setting can be done.



2.1.1 **Resolution Setting**

Output Switch: Slide On or OFF

Format Rage: Slide to select ALL or Module. (For output modules on Flexpro, there is no difference between selecting All or Module as there is only one port on each each module)

Format Type:Standard or Customize.

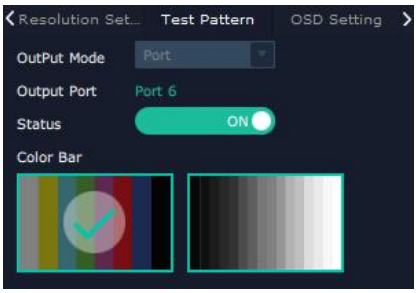
There are 32 standard (normal) resolution types available, the highest is 2560x816@60.

If Customize is chosen, users can put in desired resolution (Width, Height, Refresh Rate) based on field application.



2.1.2 **Test Pattern**

slide ON/OFF the Status. After slide ON the test pattern.



2.1.3 **DE Setting**

Output Port: choose current port

HDMI Output Type: DVI or HDMI

Color Range: Image or Video

Bits: 8 bits for DV, 8bits/10bits/12bits for HDMI

Brightness: 0-128



2.1.4 **OSD Setting:**

Output port: the current port

Status: ON or OFF

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X/Y:the starting horizontal and vertical position

Width/Height:the horizontal and vertical size of the text

Font: font of the text,all fonts installed in the computer is available

Font Type: Normal,Italic,Bold,Bold Italic

Font size: 0-300 pixels

Pixel alignment: Left, Right, Center to Horizontal,Vertical Center Right, Align Bottom Right, Align left bottom, Vertical center left, Vertical center, Horizontal center bottom

Font Transparent,

Background Transparent

Scroll Speed: 0-16

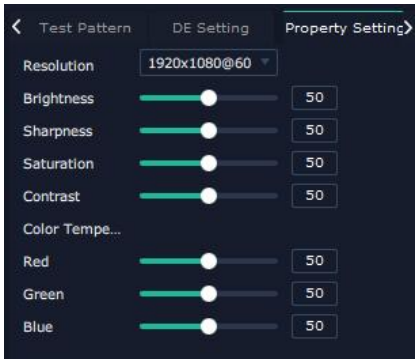
Scroll Direction: Scroll Off, Scroll Left, Scroll Right

Input Text:The exact content of the text.

After setting, users choose Save OSD,Clear OSD(if the setting is not desired) or Close All OSD.



Property Setting of DVI output module

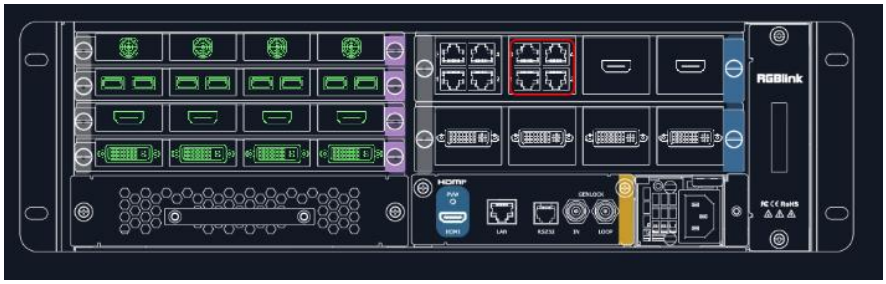


Output setting Checklist

	DVI	HDMI 1.3	HDBaseT	SDI
Resolution Setting	√	√	√	√
Test Pattern	√	√	√	√
DE Setting	√	√		
OSD			√	
Property	√			

2.2 **Sending/receiving card settings**

Click LAN port to adjust sending/receiving card parameters



Out Bright 0~255

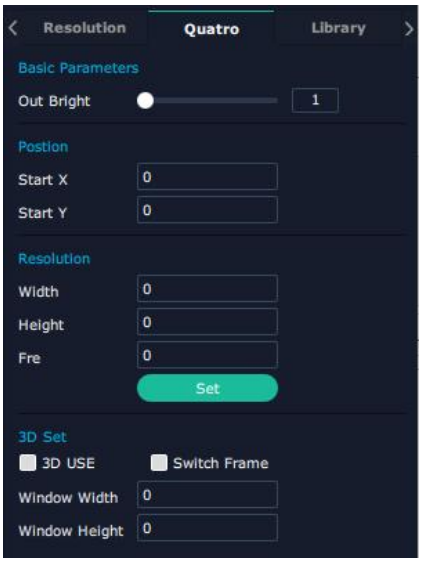
Set position,resolution and 3D

Resolutions:

Select standard resolution or customize



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Library:There are 3 kinds of method to adjust the screen parameters

Method 1: Select the saved files In XPOSE.

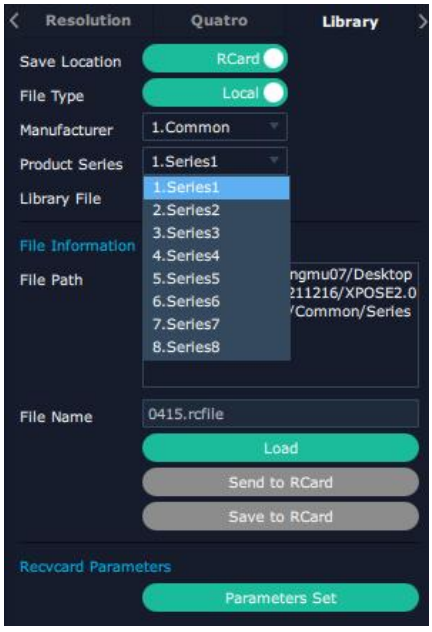
Save Location:select Device or RCard

File Type:select Local;

Product Series/Library File:select according to your needs

Click “Load”,and the file will be imported into the software.

Click “Send to RCard” to view the real-time change in LED screen;click “Save to RCard”to ensure the data without loss.

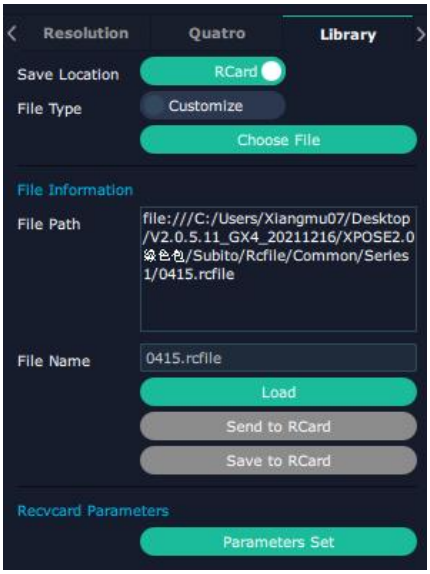


Method 2: Import the file from manufacture to XPOSE.

Save Location:select RCard

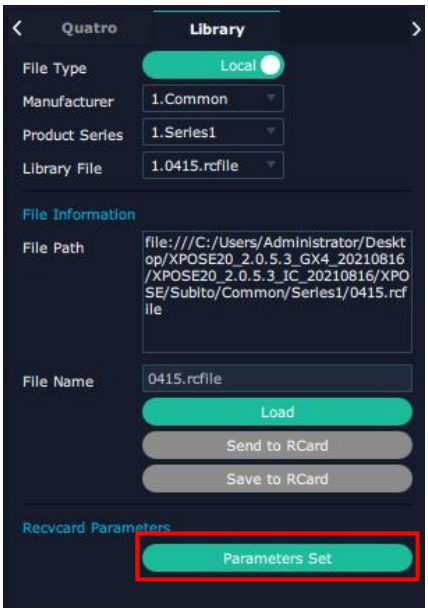
File Type:select Customize

Click “Choose File” ,select the file from your computer and then click“Load” to import.

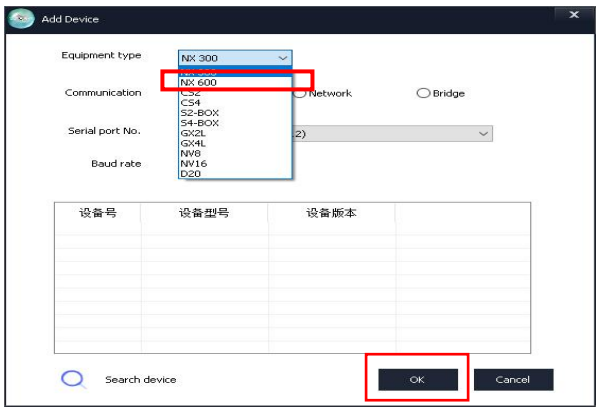


Method 3 : If the saved files could not meed your needs,you can click“Parameter Set”to adjust the parameters.

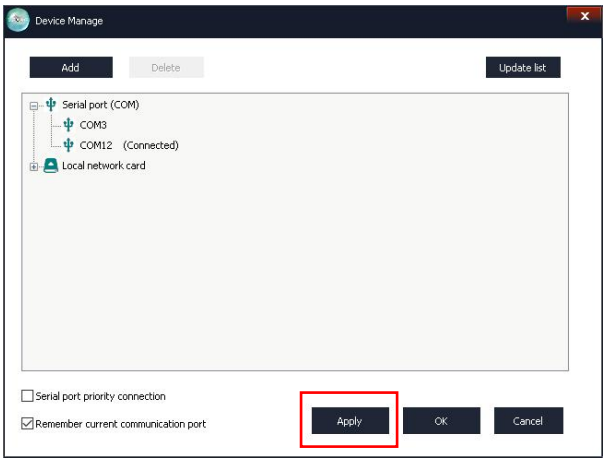
Click<**Parameters Set**>to open adjustment page



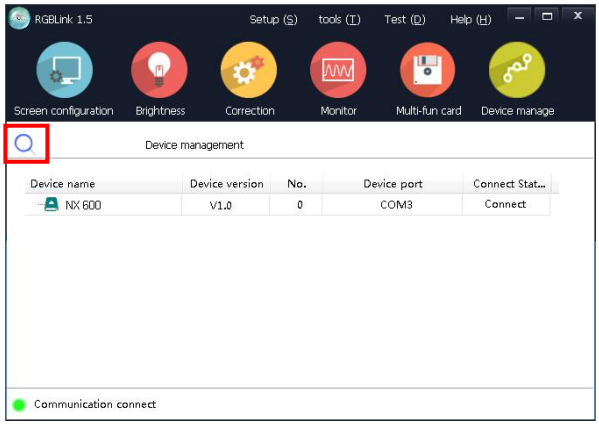
1. Click “Device manage”-- “Add device”,select NX 600,and click“OK”.



Select the Serial Port to connect,and click“Apply”.

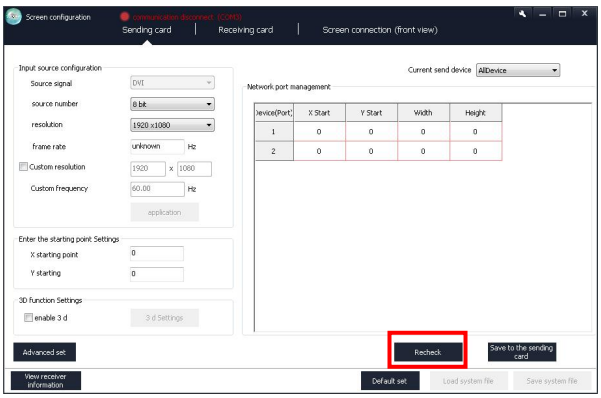


please click to connect the device .



2. Click “Screen Configuration” to enter Sending Card interface.

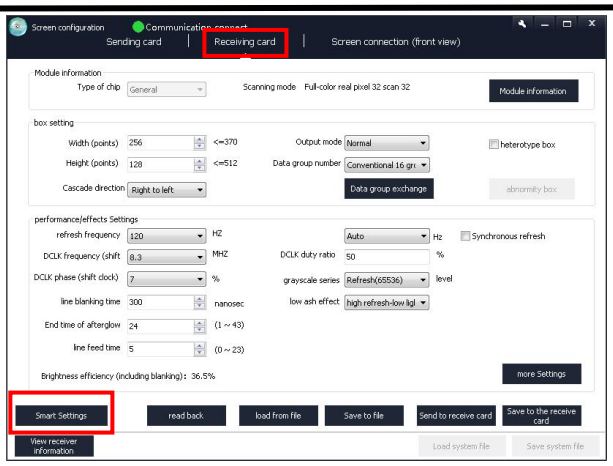
Please ensure that the **resolution** of sending card should be the consistent with that of your computer.After setting the sending card, it is necessary to click "Save to the sending card", otherwise the previous setting will be lost after power off and restarting.



3. Click “Receiving Card” to enter the interface as shown in the left figure.

4. Click “Smart Settings” to set receiving card.

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5. **Chip selection:**select the chip for the corresponding module.

Data Type: It is generally to choose parallel driver for common modules by default (If you would like to customize some modules needed to select serial data, please contact with our company.

Module Type: If width of single module is 16,then choose "Regular light board".If not,then choose"Profiled lamp board(with taps)".

the actual number of:the width of single module

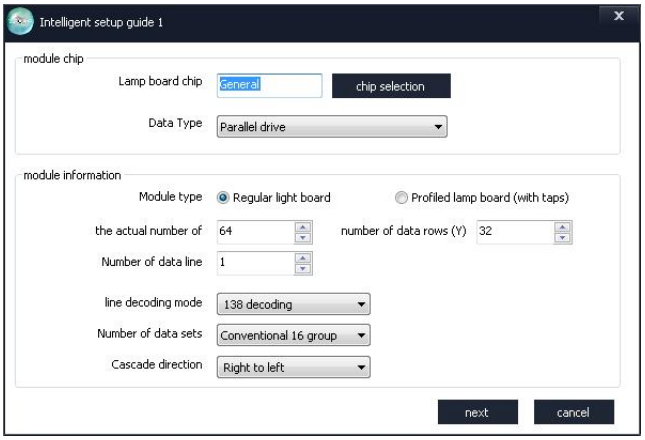
Number of data rows:the height of single module

Number of data line: It can be viewed according to the number of RBG groups defined by the module interface.

Line decoding mode:138 decoding,etc

Number of data sets: Conventional and Serial can be selected.

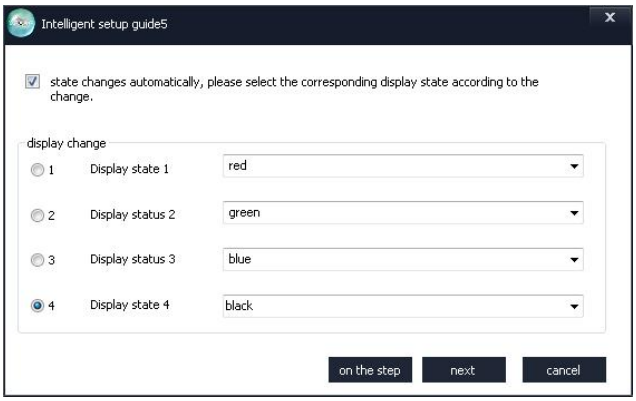
Cascade direction: Left to right/Right to left/Top to bottom/Bottom to top



6. Users can remove the √ of "state changes automatically", and click 1/2/3/4 to change the display state according to the observation of the LED screen.

For example,click "1" and observe the color of LED screen,and select "red" if the LED screen shows red.

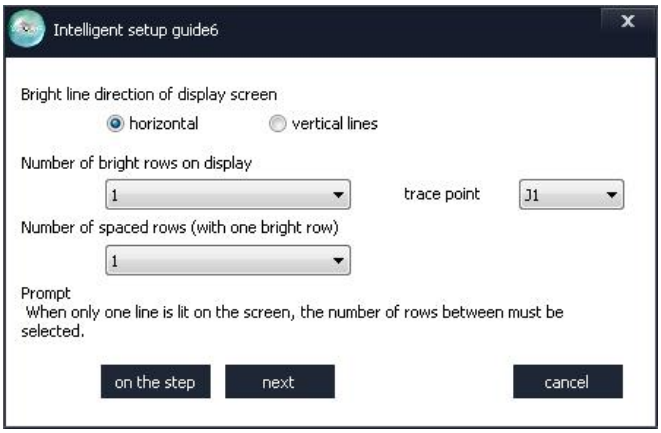
After all 4 states being done,click "next"



7. Select “horizontal or vertical lines” according to the actual bright line direction of display screen.

Number of bright rows on display:according to the LED screen

Number of spaced rows: When only one line is lit on the screen,the number of rows between must be selected.

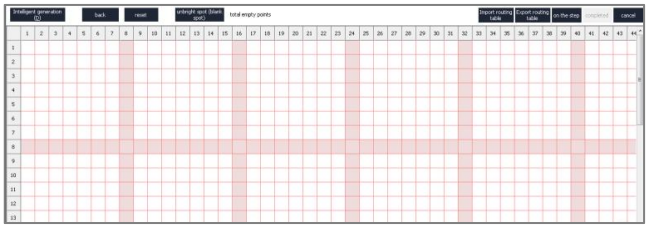


8. Observe the position of the bright spot on the first module of the LED screen, and click the corresponding grid.

If you make a mistake,click “back” to the last step or “reset” to restart.

If you select “Profiled lamp board(with taps)” in 5th step,you need to click blank spots.Observe the first module,and click “unbright spot(blank spot)” if no flash spot appears.

After the settings, a prompt will pop up. Click "OK" and then click "Finish" to confirm.



9. After <Smart Settings>,it will return to <Receiving card>interface and set a new parameters for receiving cards.

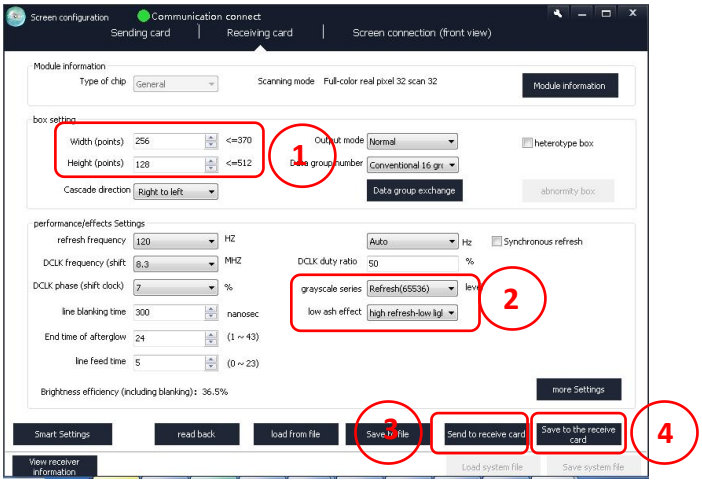
①Fill in the total Width/Height of box.

There is no need to adjust other parameters if the image of the single receiving card is normal.

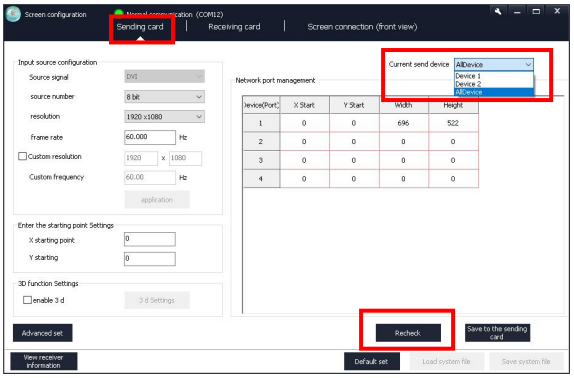
②It is recommended to change “grayscale series” and “low ash effect” to change the refresh rate.

③**Send to receive card:**Each time you change the parameters, you can click “Send to receive card” and observe the change of the screen.

④**Save to the receive card:**After debugging,click “Save to the receiving card” and the data will not be lost after power off and restart.

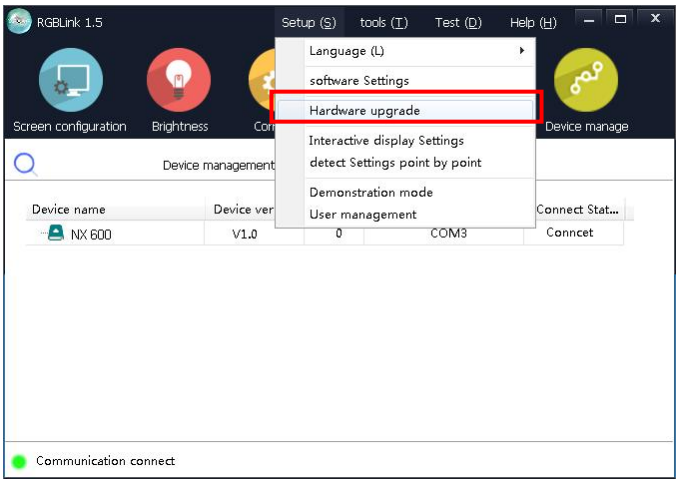


Note: If you want adjust the second sending card after setting the first one,select “Device 2”in the Current send device firstly,and click“recheck”to refresh.After that,repeat the adjustment steps as the first sending card,.



Upgrade

1. Click “Setup” -- “Hardware upgrade”.



2. Type in password “admin” or 168.



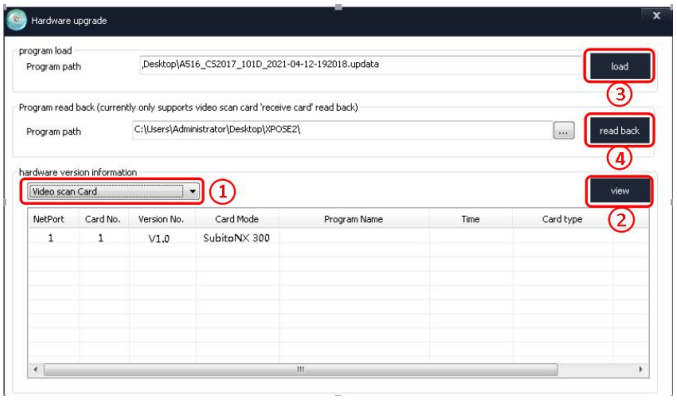
Send Card Upgrade:

① Select “Send Card”

② View the version

③ Load corresponding send card

④ Click “upgrade”



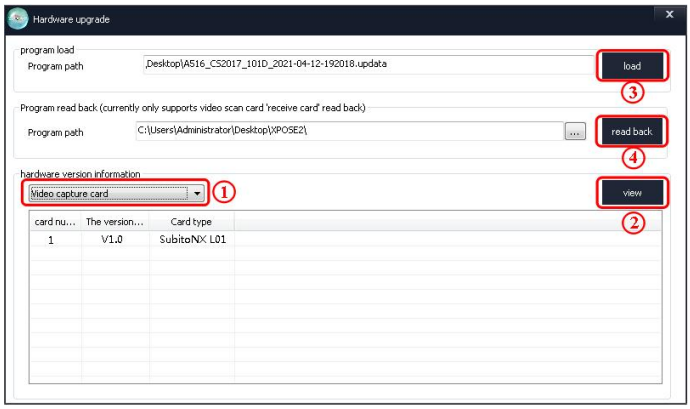
Receive Card Upgrade:

① Select “Receive Card”

② View the version

③ Load corresponding send card

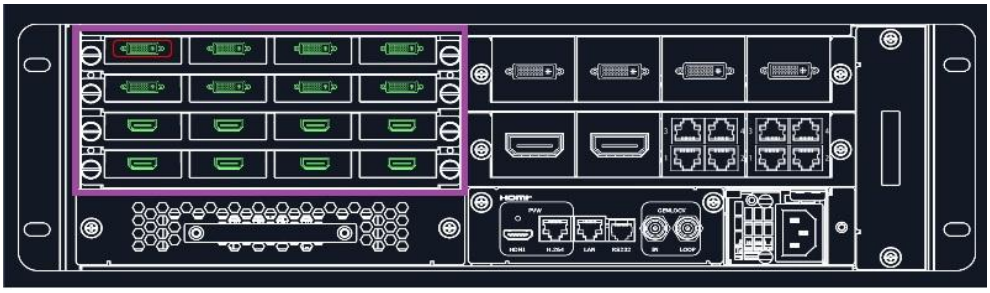
④ Click “upgrade”,do not unplug the serial port to prevent communication disconnection



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Input Setting

Click any input port in purple area, the board where the port locates is selected. Users can do settings to the board now. A red rectangle flashes around the chosen port when it is clicked.



When DVI or HDMI is chosen, Property, EDID and Test Pattern could be done.

Property

DVI port Property setting

Input Port: Current port

Source:CVBS,YPbPr, VGA, DVI (DVI module for FLEXpro 8support for CVBS,YPbPr, VGA signal via adapter)

Scale

X/Y: Vertical and horizontal position

Width/Height: Vertical and horizontal size

Crop:

Left:crop left

Top:crop top

Width:horizontal size after crop

Height:vertical size after crop

Display mode： Live or Freeze

Picture Adjustment

Mirror: ON or OFF

Alpha: transparency adjustment, range from 0~128.

Mini Delay mode:On or Off. Select this mode on the output and input is simultaneously, without refresh rate delay. Under this mode, the image is under the best state.

Saturation: slide to adjust

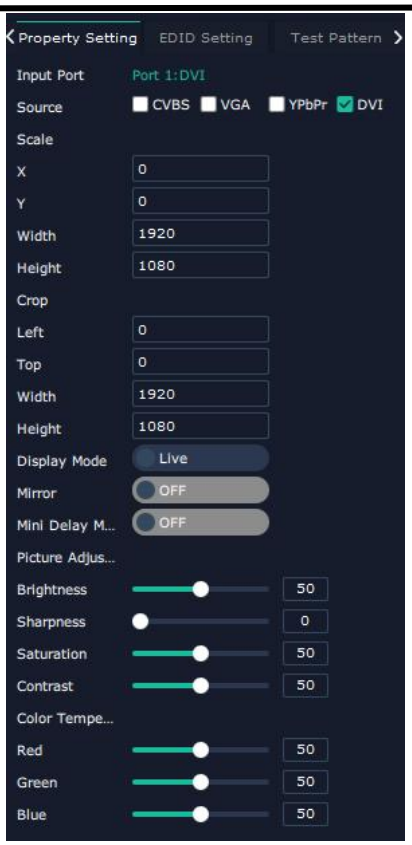
Hue: slide to adjust

Color Temperature

Red: Slide to adjust

Green: Slide to adjust

Blue: Slide to adjust



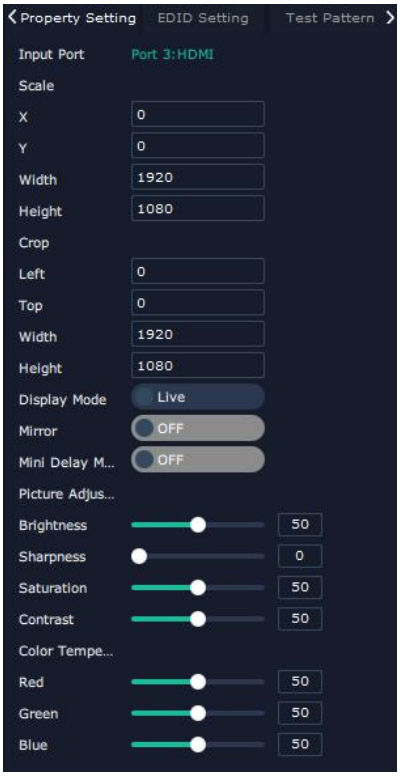
Contrast

Red:Slide to adjust

Green: Slide to adjust

Blue: Slide to adjust

HDMI Port Property Setting



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EDID Setting

Input Port: Current Port and type

Customized EDID

EDID Template : RGB-DVI and RGB-HDMI to choose

White Height Frequency: automatically show current port.

DVI Port EDID setting



HDMI Port EDID Setting



Test Pattern：

Input Port:Current Port

Preset： Customize,White on Black 1,White on Black 2,Black on White 1,Black on White 2,Green on Black 1,Green on Black 2,Green on White 1,Green on White 2,Red on Black 1,Red on Black 2,Red on White 1,Red on White 2

DSK Setting switch： On or Off

Operation Mode： 0 or 1,automatically show according to user's Preset choice

Transparent： 0-255,automatically show according to user's Preset choice

Red,Green,Blue Max： 0-255,automatically show according to user's Preset choice

Red, Green Min： 0-255,automatically show according to user's Preset choice

DVI Port Test Pattern



HDMI Port Test Pattern



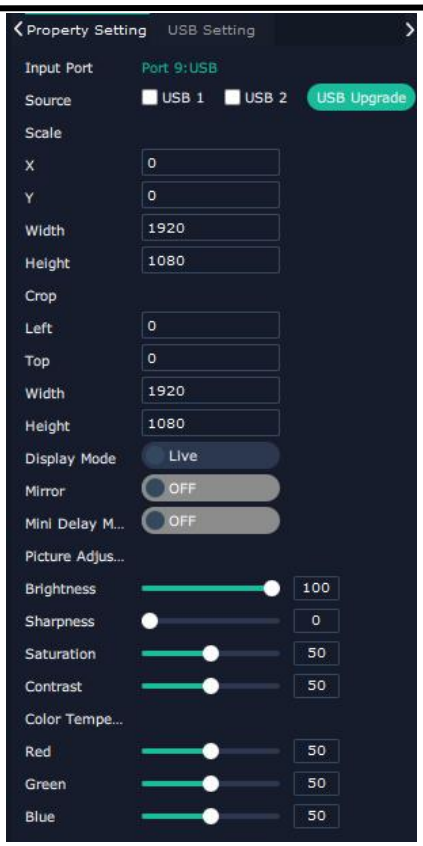
SDI Port Test Pattern



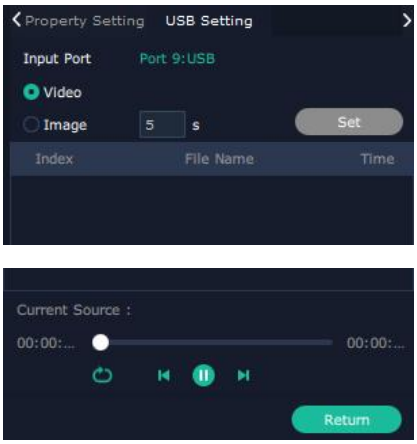
When USB port is selected, Property setting could be done.

USB Property

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USB Setting



Input Port Current USB port

Select **Video** or **Image**

Choose Video, will list down the media files in video format by index.

Set play loop by ,switch to previous , next and stop playing

Choose Image, will list down the media files in graphic format by index.

Set playing time from 0 to 255S.

Note: the time setting is only enable when User select Image

Checklist of input setting

	DVI	HDMI	3G SDI	USB	HDBaseT
Property	√	√	√	√	√
Test Pattern	√	√	√		
EDID	√	√			
USB Setting	√			√	

Device Overview

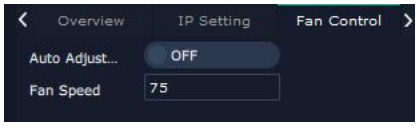
Click Return Return, there are overview, IP setting,Factory Setting,Power ON,Fan Control Overview show Device Info, board info in each slot.



IP: select Auto IP address or manually type in the IP address, MASK and Gateway

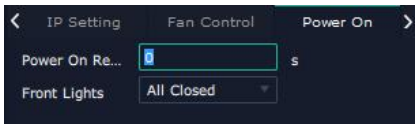


Fan Control: Auto adjustment,Fan speed 0-99

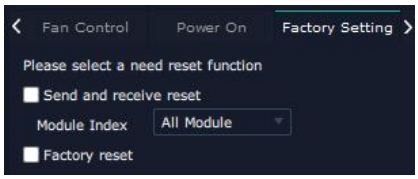


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Power on: 0-255S



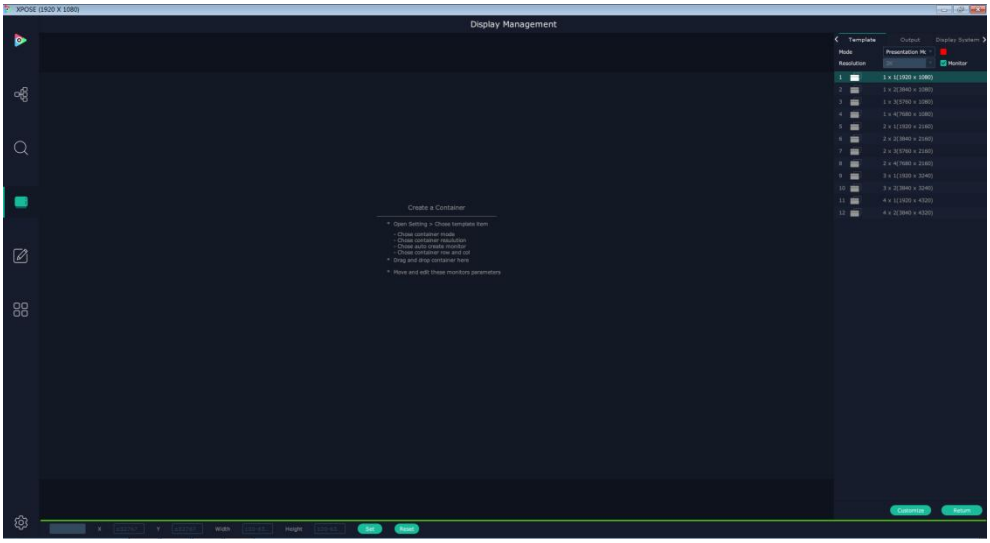
Factory setting: Remove Logo and/or Remove EDID



3.2.5 Display System

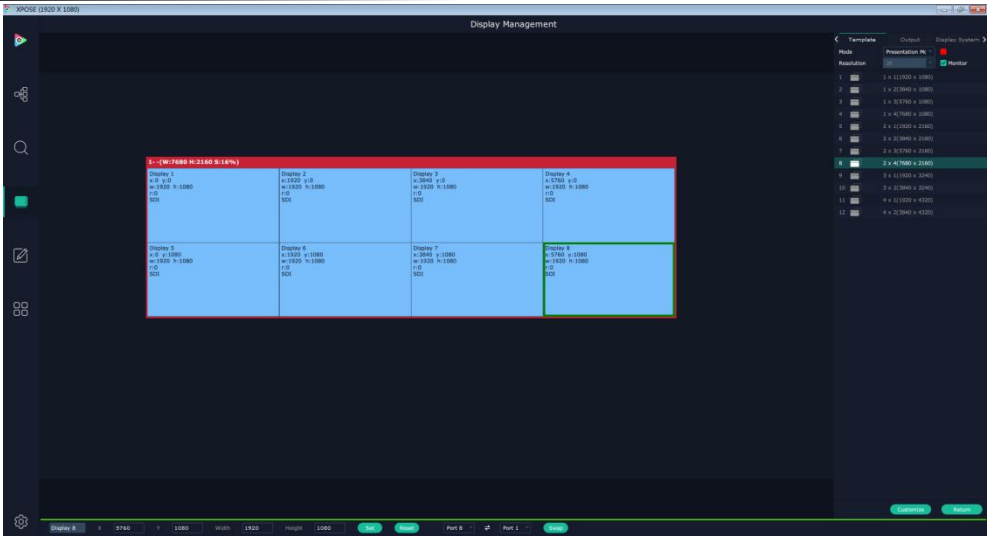
Display System is for users to set layout of outputs.

Click this icon first and then click enter the interface as follow:



Template：

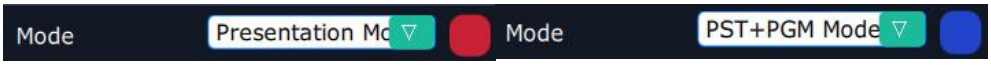
There are 16 types of basic “Display Area” which is used to contain output interface,and could be regarded as layout of output. Drag a layout for example 2x4 (7680x2160) from the template list to the middle interface.



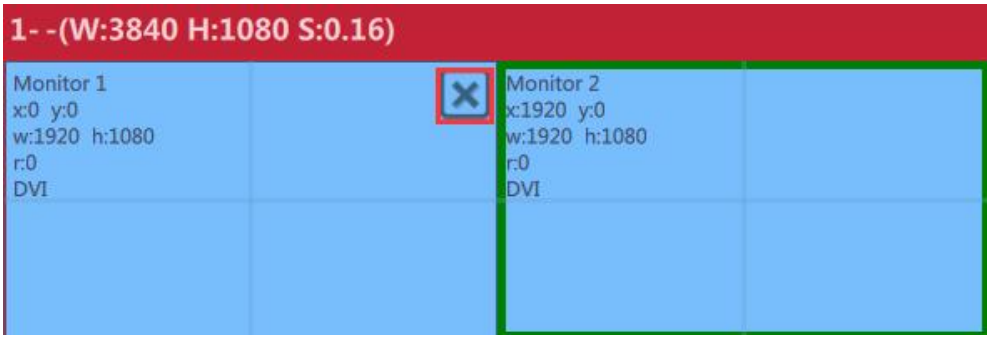
Mode：

At present, there are Presentation Mode, PST+PGM Mode,Matrix|Aux.

XPOSE 2.0 allows multiple modes running on one same interface, to differentiate each mode, different color is given to each mode.



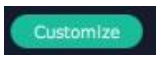
Click this icon  to cancel the monitor in Display Area



Long pressing this icon  to cancel the Display Area



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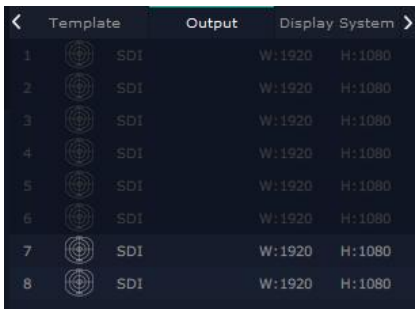
Created: Click Customize 

below template, user can type in the total width and height , row and column , according to actual display in field, it will automatically calculate the height and wdth of each monitor based on the parameter above, as the following example, creat a 5400x1080 display area. To save this display area, just click 



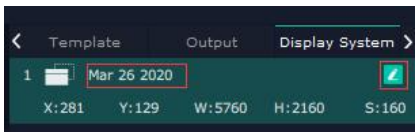
Output

Show all the output ports (monitors) of this device. If the monitor is in dark (black), it indicates that this output is used, otherwise it is in grey.



Display System

Display System allows users to edit the name of the display area that has been created just click the .

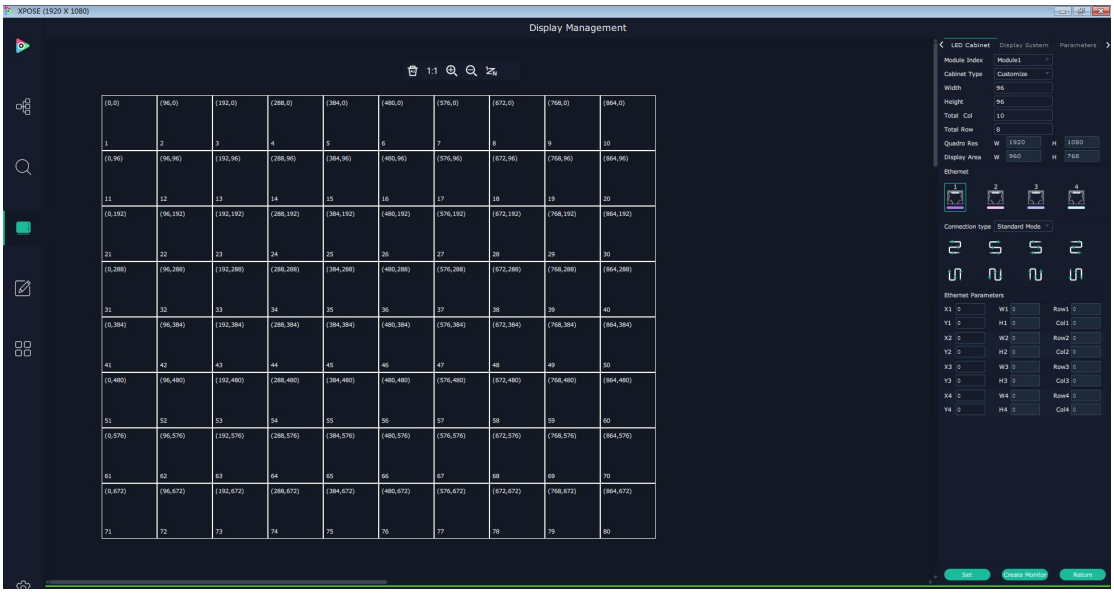


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LED cabinet

FLEXpro 8 support to install RGBLink Subito Quatro sender designed to take direct control LED display.
Led cabinet is offered to do cabinet settings.



Module Index: choose the number of the Quatro modules.
Cabinet Type: Customize or Manufacture
Cabinet Type: Manufacturer or Customize
Width, Height: manually filled in if choose cabinet type as Customize
Total Col, Total Row: set numbers of total column and numbers of total row according to Quadro Res (maximum capacity of a Subito Quadro Sender card) 1920x1080 and Display Area shows the total width × total height. The number cannot show if Display Area exceed the restriction.
Tools:



Delete all, 1:1, Zoom in, Zoom Out, Sort Change

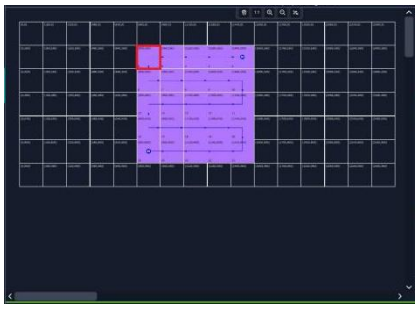
Set each Display Area of each ethernet port
Cabinet Rang: Ethernet
Ethernet:choose port 1 (or, 2,3,4)
Connection type:Standard or customize, choose Standard here
Choose customize if the standard connection cannot apply to field application.
Fill in total row and total column number according to the restriction of single RJ45 Port 655360 pixels.
For example Port 1 control 800x800 on the LED screen as follows:
Go back to cabinet type as Module, the display area just set will show



Use ethernet parameters to adjust position of control area.

Click Ethernet then click Module to refresh

Fill in the X number and Y number and set.

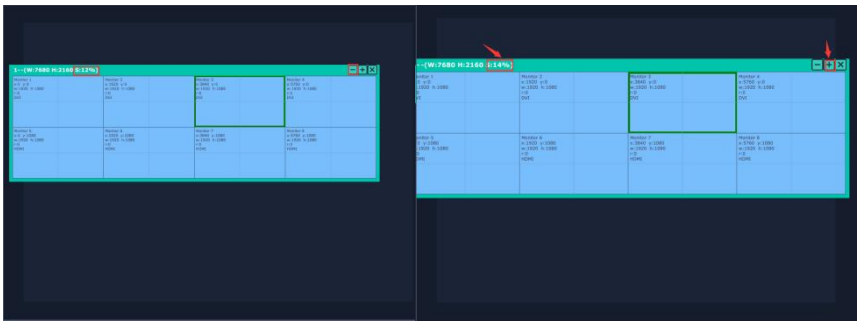


Customize connection :Ctrl+Left Mouse

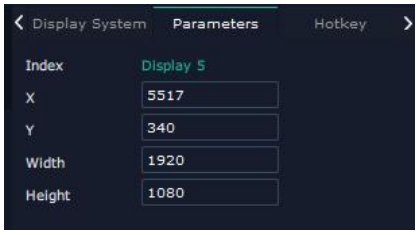
Adjust Display Area

Drag the boarder of the display area to move its place in the interface.

Click icon  to shrink,Click  to enlarge the proportion of display area on interface.

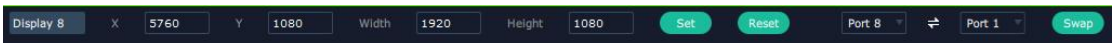


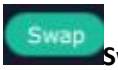
Parameters



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Set the position and size of each output display in Parameters or use the bar under the interface and type in the parameter to set resolution and position of monitor



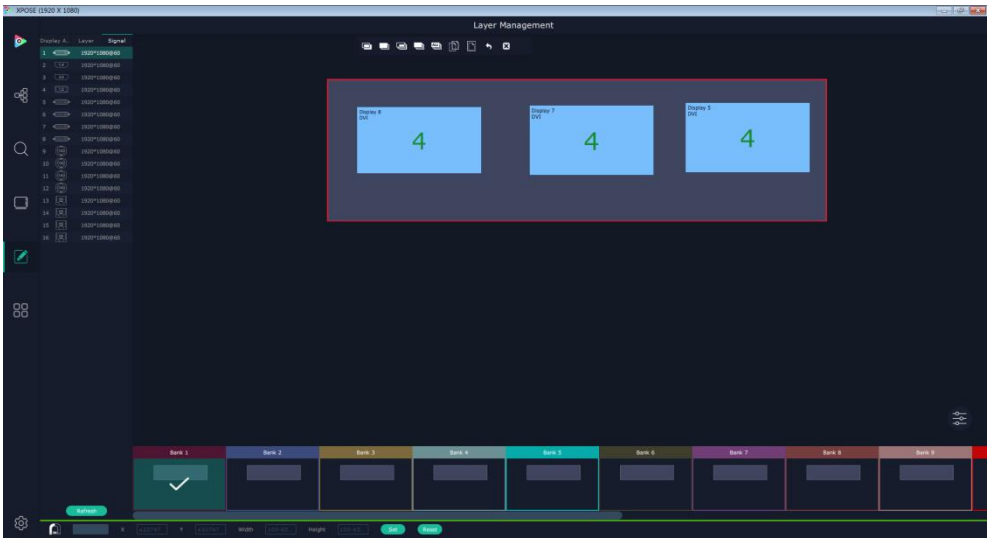


Swap Port: users can swap two monitors display

Choose port from the drop down arrow list.

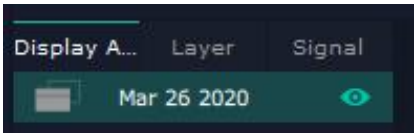
3.2.6 Layer Management

Layer Management is designed to manage the layer of each monitor.  Click this icon to enter the interface:



Display Area

Here is to show all the Display Area set in previous step System Management. Click  to cancel or use the corresponding Display Area.



Signal 

To show the signal list of 16 inputs. Drag source from signal list to monitor.

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Numbers on Monitor

Numbers on monitor is to show how many layers at present allowed to put in the monitor .

Each monitor (output port) can contain layers no more than 4. Any 1 input signal cross 1 border of a monitor is regarded as 2 layers.



Layer Adjustment

There are two ways to adjust layer.

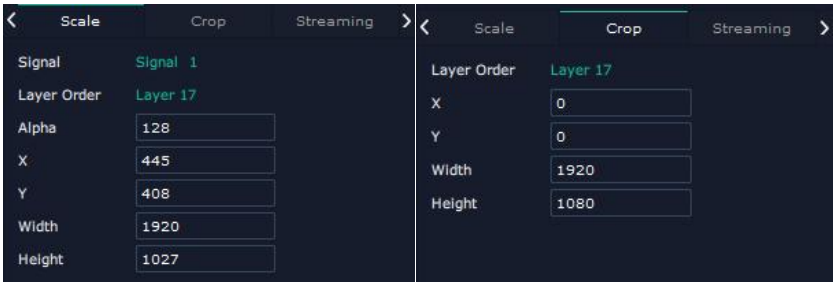
1. Use the bar under the interface

Choose one layer and the bar shows its signal source, type in position and size.



2. Layer Scale or Crop

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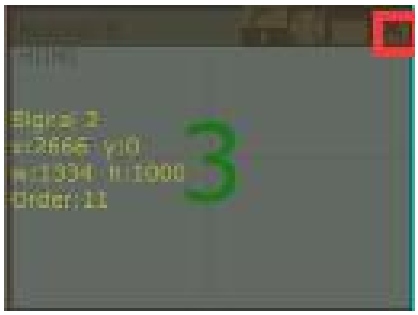


Layer Movement

Place the cursor on the layer, it turns to a palm icon , press the left of mouse, the icon turns to a fist , moving the mouse can drag the layer.

Layer Remove

Click the cross on the top right of the layer to remove the layer if needed.



Layer Max

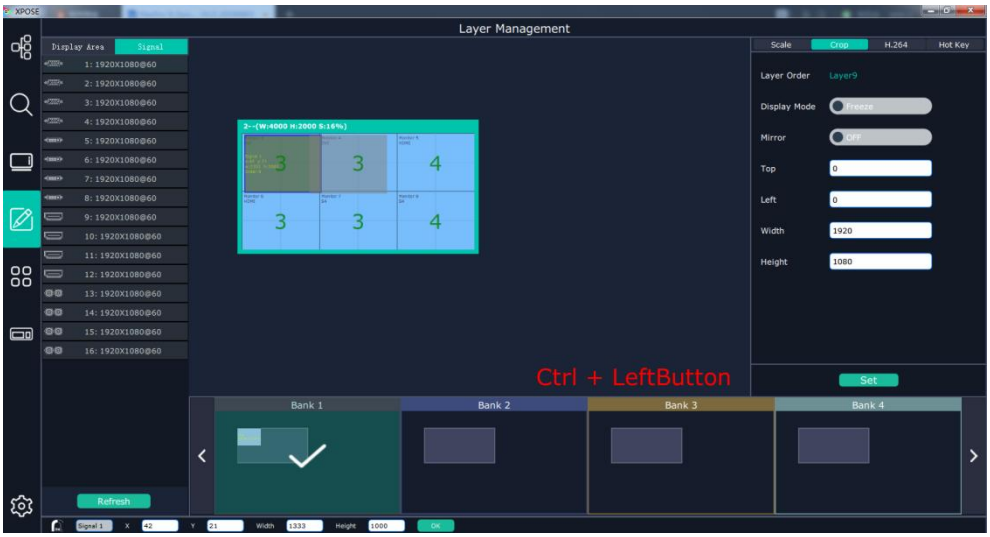
Click this icon , to cover up all monitors in the same Display Area with the one signal, as the following:



Layer Copy

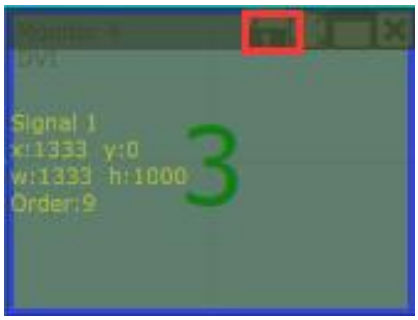
Press Ctrl and mouse left at the same time, move the mouse the layer selected can be copied and place in any monitor in the same Display Area but it doesn't work when cross over display area.

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Layer Lock

Click the lock icon on the right middle of the later boarder.



When the layer is locked, any movement or removal to the layer is invalid

Streaming



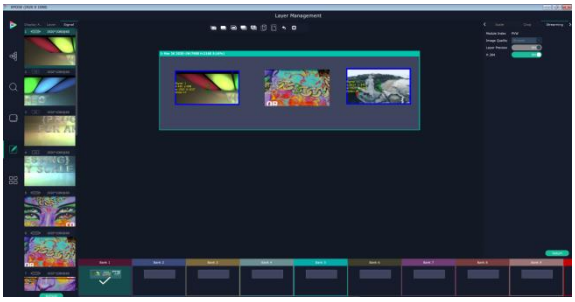
Module Index:PVW, PVW port is fixed on the communication module with a dedicated HDMI port.

Image Quality: to choose from Hi-Q, Normal, Smooth

the better the preview input image but if band width of network is not good enough, high ratio image quality may cause problem. We usually suggest user to choose smooth.

Layer Preview and H.264. Turn on Layer Preview first and then turn on H.264, all input source and layers in the display areas can be previewed as follow pictures.

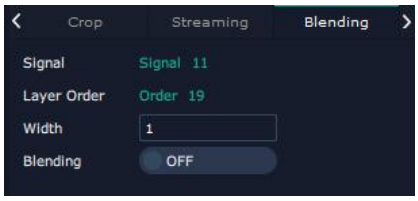
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If turn on H.264 only, only input signal can be previewed.

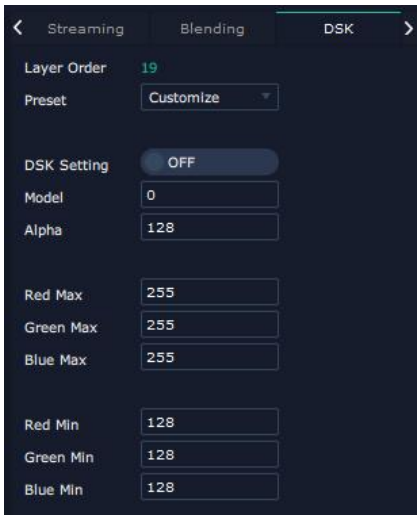


Blending



Signal: current chosen signal
Layer Order:Current chosen layer
Width: set blending width here
Blending: turn ON and OFF Blending feature.

DSK



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Input Port:Current Port

Preset: Customize,White on Black 1,White on Black 2,Black on White 1,Black on White 2,Green on Black 1,Green on Black 2,Green on White 1,Green on White 2,Red on Black 1,Red on Black 2,Red on White 1,Red on White 2

DSK Setting switch： On or Off

Operation Mode： 0 or 1,automatically show according to user's Preset choice

Transparent： 0-255,automatically show according to user's Preset choice

Red,Green,Blue Max： 0-255,automatically show according to user's Preset choice

Red, Green， Blue Min： 0-255,automatically show according to user's Preset choice

Hot Keys

Hot keys, provided to do quick layer setting such as Copy Layer, Layer move

Description	Windows	Mac OS
Copy Layer	Ctrl + Mouse drag	Cmd + Mouse drag
Layer Group	Ctrl + G	Cmd + G
Ungroup	Ctrl + Shift + G	Cmd + Shift + G
Layer Backward	Ctrl + [	Cmd + [
Layer Forward	Ctrl +]	Cmd +]
Layer to Bottom	Ctrl + Shift + [	Cmd + Shift + [
Layer to Front	Ctrl + Shift +]	Cmd + Shift +]
Select All	Ctrl + A	Cmd + A
Select Layer	Ctrl + Mouse click	Cmd + Mouse click
Delete Layer	Delete	Delete
Copy Select	Ctrl + C	Cmd + C
Paste Select	Ctrl + V	Cmd + V
Cancel Select	Ctrl + D	Cmd + D
Snap to Grid	Ctrl + T	Cmd + T
Move Layer	Direction	Direction
Change Source	Double Click Signal	Double Click Signal

Save to Bank Automatically

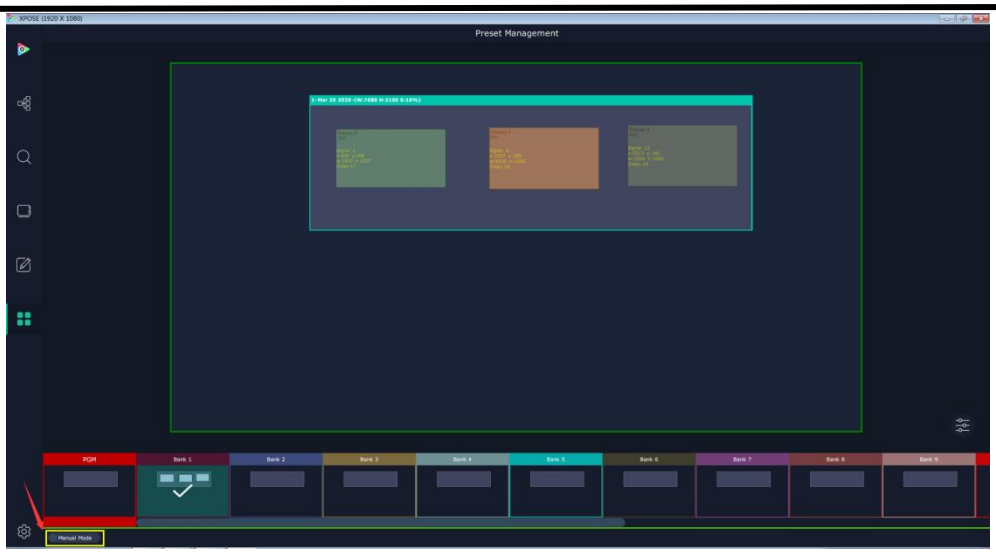
When one Bank (where the set is contained) is finished, click next Bank, previous set is saved to bank.



3.2.7 Preset Management

Preset Management is designed to switch bank (scene setting done in last step).

Preset Management Mode: 1 Manual Mode, 2 Schedule Mode



Manual Mode

Switch Manual Mode or Schedule Module by the bar in the left bottom corner of the window.

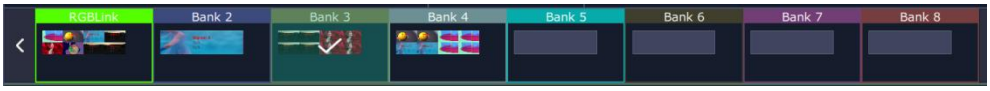


Take Setting

Fade Time 0.0-10.0S

Black out, slide to ON or OFF

The tick on the bank indicates that the bank is selected.



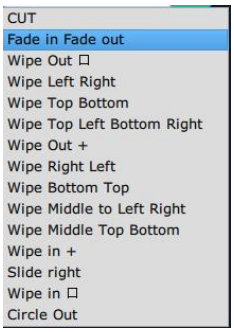
Cut|Take

Cut, switch from PST to PGM without any effect.

Take, switch from PST to PGM with chosen effect in set Fade Time.

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Transition Effect

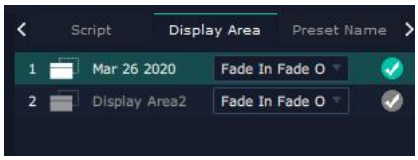


Display

separate display area switching

Slide Display to ON 

, click  to see more settings and select the Display Area



when users need to switch scene from eg. Bank 1 to Bank 4 but want to keep Display Area 2 the same as Bank 1.

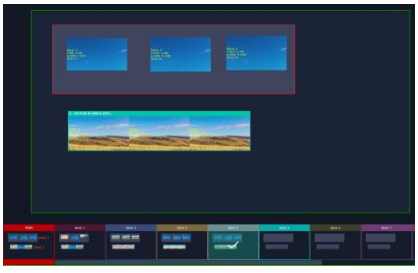
Follow the steps below to do the setting.

Step1: click Bank 2 and open Display Area

Step 2: click the  icon behind to cancel the display area of 2 and click 

to confirm,

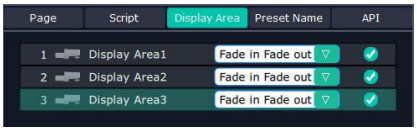
Step 3:TAKE or Cut



Display Are 1 of Bank 4 is switched to PGM but Display Area 2 keep the same as Bank 1.

Display Area

is to let users to choose which display areas to display on the PGM and allow users to set transition effect for each display area so that they can switch from PST to PGM in desired effect.



Keep|Swap

Only when separate **Display** switching is OFF can **Keep|Swap** work.

Under the **Keep** status, users need to select a bank and use Cut or Take to switch image from PST to PGM.

Under **Swap** status, users select a bank, then use Take or Cut to swap this bank and the bank before this one.

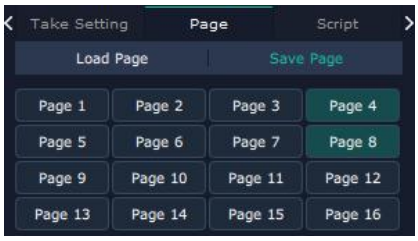
Bank Save and Load

Save Bank to Page

Select a bank,click Page,select Page X,the bank is saved in the page.
The page turns green then become grey, indicating the bank is saved in the page.

Load bank from Page

Click Load Page, pages with bank saved are green, select one from them and the selected one becomes red. The bank is loaded from page to PST.

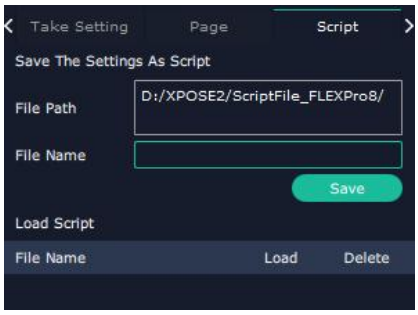


Script Save and Load

Save Script

Click 

,fill in the blank with the name of setting and Save



Load and Delete Script

After the script is saved, the bank name will appear in the load list.

Select the file and click Load

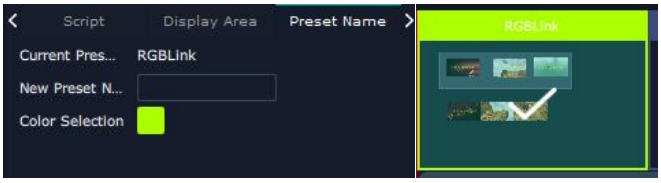
Select the file and click Delete, the chose file can be deleted from list.

Preset Name

Select a bank and click Preset Name , fill in the blank after New Preset Name to rename a Preset (Bank)
Click the color block after Color Selection and choose a new color for the boarder of chosen bank.

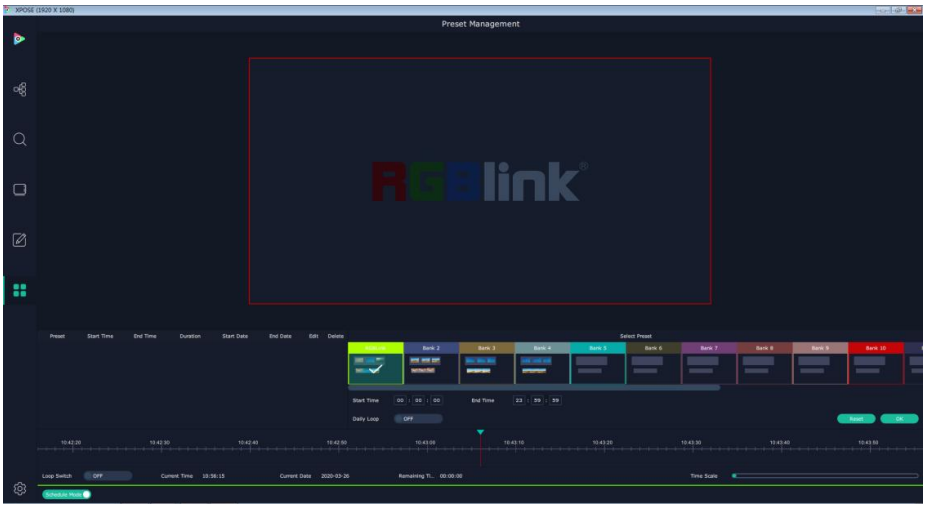


For example change Bank1to RBGLINK, with pointed boarder



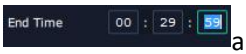
Schedule Mode

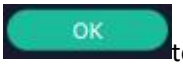
This mode is designed to set auto bank (scene/preset) switch.



Select the bank that need to be looped.

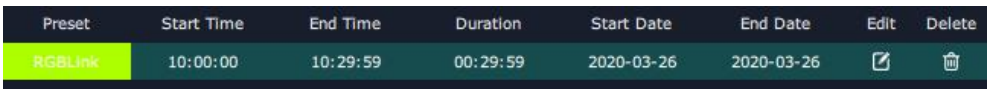
Set **Start Time** 

and **End Time** 

and press **OK** 

to confirm.

The Preset can be added into the loop list after confirm.




click this icon to edit Start Time and End Time if needed.


Click this icon to delete this preset if it is not needed.

Turn on Daily Loop and Loop Switch.



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Chapter 4 Order Codes

4.1 Product

710-1008-02-0	FLEXpro 8

4.2 Options

4.2.1 Input Options

190-1001-09-0	Single HDBaseT Input Module-Dual Bracket
190-0001-10-2	Single USB Input and Backup Module
190-0001-07-2	Single 3G-SDI Input/ Loop Module
190-0001-13-2	Single HDMI Input Module
190-0001-04-2	Single DVI Input Module

4.2.2 Output Options

790-0001-22-0	Single HDMI Output Module
790-0004-21-0	Single S-DVI (Sync) Output Module
790-0001-24-0	3G SDI Output Module
790-0001-27-0	Single DP Output Module
790-1001-28-0	Subito Quatro Sender Module
190-1001-29-0	Single HDBaseT Output Module

4.2.3 Other

980-0008-01-0	Input EXT Interface-Single Height
980-0009-01-0	Input EXT Interface-Double Height

Chapter 5 Support

5.1 Contact Us



RGBlink Headquarters
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Beijing Region Office
Beijing, China

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+010- 8577 7286

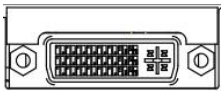
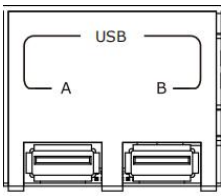
Europe Regional Sales & Support
Eindhoven, Holland

Flight Forum Eindhoven 5657 DW

+31 (040) 202 71 83

Chapter 6 Appendix

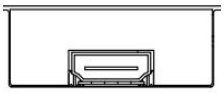
6.1 Specification

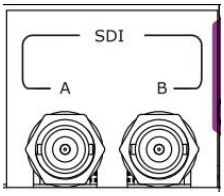
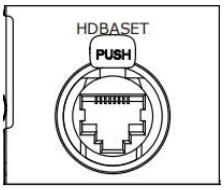
Single DVI Input Module					
Interface Appearance					
Board Size	40x20mm				
Number of Connectors	1				
Connector	DVI-I (Compatible with DVI,CVBS,YPbPr, VGA)				
Supported Standards	Single Link DVI				
Supported Resolution	SMPTE	480i | 576i | 720p@50/59.94/60 | 1080i@50/59.94/60 | 1080p@50/59.94/60			
	VESA	800×600@60 |1024×768@60 |1280×768@60 I 1280×1024@60 | 1600×1200@60 | 1920×1080@60 | 1920×1200@60 | 2048×1152@60			
Single USB Input/Backup Module					
Interface Appearance					
Board Size	40×38mm				
Number of Connectors	2 (1 In/1 Backup)				
Connector	USB-A				
Supported Standard	USB 2.0				
Midia Types	Video Formats	MPEG1| MPEG2 | MPEG4 | H264 | RM | RMVB| MOV | MJPEG | VC1 | DIVX | FLV			
	Image Formats	JPEG | BMP | PNG			
	Audio Formats	WMA | MP3 |M4A|AAC			
Video Formats	File Type	File Extension	Encoding	Max Resolution	Max Bitrate
	MPEG1	.DAT | .MPG | .MPEG		1920x1080 @30	20Mbps
	MPEG2	.MPG		1920x1080 @30	20Mbps
	MPEG4	.AVI | .MP4 | .3GP	DVIX | XVID	1920×1080 @30	20Mbps

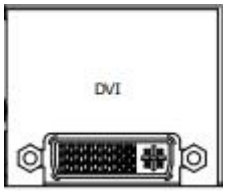
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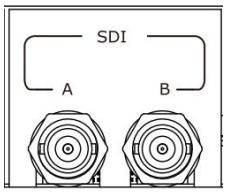
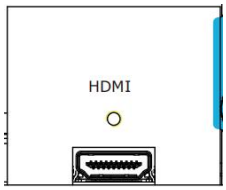
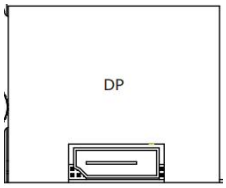
		| .ASF			
	RM | RMVB	.RM | .RMVB	RV8 | RV9 | RV10	1280×720@30	10Mbps
	H264	.MKV | .MOV	H.264	1920×1080@30	20Mbps
	MJPEG	.AVI		640×480@30	10Mbps
	DivX	.DIVX | .AVI	MPEG | DVIX | H264	1920×1080@30	20Mbps
	VC1	.WMV | .ASF	VC1	1920×1080@30	20Mbps
	FLV	.FLV	H264	1920×1080@30	20Mbps

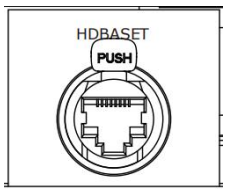
Picture Formats	File Type	Max Resolution	Compression	Supported Resolution
	JPEG	15360×8640	Progressive JPEG	Support 1024×768 only
			Baseline （“Standard”）	Full Range
			Baseline Optimized	Full Range
	BMP	9600×6400	Monochrome	Full Range
			16-color	Full Range
			256-color	Full Range
			16 bit	Full Range
			24 bit	Full Range
			32 bit	Full Range
	PNG	9600×6400	Non-interlaced	Full Range

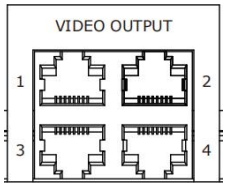
Single 2K HDMI Input Module	
Interface Appearance	
Board Size	40x20mm
Number of Connectors	1
Connector	HDMI-A
Supported Resolution	SMPTE 480i | 576i | 720p@50/59.94/60 | 1080i@50/59.94/60 | 1080p@50/59.94/60 VESA 800×600@60 | 1024×768@60 | 1280×720@50/59.94/60 | 1280×800@60 | 1280×960@60 | 1280×1024@60 | 1400×1050@60 | 1600×1200@60 | 1920×1080@23.98/24/25/29.97/30/50/59.94/60
Supported Standard	HDMI 1.3
3G-SDI Input /Loop Module	

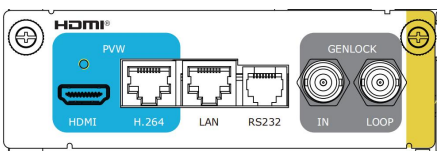
Interface Appearance		
Board Size	40(L)×38(W)（mm）	
Number of Connectors	2 (1 Input, 1 Loop)	
Connector	BNC	
Supported Resolution	SMPTE	480i | 576i | 720p@50/60 | 1080i@59.94/60 | 1080p@23.98/24/25/29.97/30/59/59.94/60 | 1080psf@23.98/24/25/29.97/30
Supported Standard	SMPTE 425M (Level A & B) | SMPTE 424M | SMPTE 292M | SMPTE 259M-C | DVB-ASI	
HDBaseT Input Module		
Interface Appearance		
Board Size	40(L)×38(W)（mm）	
Number of Connectors	1	
Connector	RJ45	
Supported Resolution	SMPTE	720p@50/59.94/60 | 1080p@23.98/24/25/29.97/30/50/59.94/60
	VESA	800×600@60/75/85 | 1024×768@60/75/85 | 1280×768@60 | 1280×800@60 |1280×1024@60/75/85 | 1360×768@60 | 1366×768@60 |1400×900@60 | 1600×1050@60 | 1600×1200@60 |1680×1050@60 | 1920×1080@60 | 1920×1200@60 | 2048×1152@60 | 2560×812@60 | 2560×816@60
Standard	HDBaseT 1.0	

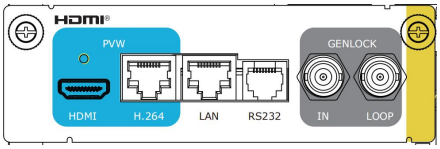
DVI Output Module		
Interface Appearance		
Board Size	40(L)×38(W)（mm）	
Number of Connectors	1	
Connector	Standard DVI-I Socket	
Supported Resolution	SMPTE	720p@50/59.94/60| 1080p@50/59.94/60
	VESA	800x600@60 |1024x768@60/75/85 |1280x720@50/59.94/60 |1280x800@60 |1280x960@60 | 1280x1024@60/75/85 |

	1400x1050@60 |1600x1200@60 |1920x1080@23.98/24/25/29.97/30/50/59.94/60 |2048x1152@60
3G SDI Output Module	
Interface Appearance	
Board Size	40(L)×38(W)（mm）
Number of Connectors	2 (Single Chanel dual port)
Connector	BNC interface
Supported Standard	SMPTE 425M (Level A & B) | SMPTE 424M | SMPTE 292M | SMPTE 259M-C | DVB-ASI
Supported Resolution	SMPTE 720p/50/59.94/60 | 1080i/50/59.94/60 |1080p/50/59.94/60
2K HDMI Output Module	
Interface Appearance	
Board Size	40(L)×38(W)（mm）
Number of Connectors	1
Connector	HDMI-A
Supported Resolution	SMPTE 720p50/59.94/60 | 1080i50/59.94/60 | 1080P50/59.94/60 VESA 800×600@60 | 1024×768@60 | 1280×768@60 | 1280×1024@60 | 1600×1200@60 | 1920×1080@50/60
Format Standard	HDMI 1.3
DP 1.1 Output Module	
Interface Apperance	
Board Size	40(L)×38(W)（mm）
Number of Connectors	1
Connector	DisplayPort
Supported Resolution	SMPTE 720p50/59.94/60 | 1080i50/59.94/60 | 1080P50/59.94/60 VESA 800×600@60 | 1024×768@60 | 1280×768@60 | 1280×1024@60 | 1600×1200@60 | 1920×1080@50/60
Format Standard	DP 1.1
HDBaseT Output Module	

Interface Appearance	
Number of Connectors	1
Connector	RJ45
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 VESA 800×600@60/75/85 | 1024×768@60/75/85 | 1280x768@60 | 1280×800@60 |1280×1024@60/75/85 | 1360×768@60 | 1366×768@60 |1400×900@60 | 1600×1050@60 | 1600×1200@60 |1680×1050@60 | 1920×1080@60 | 1920×1200@60 | 2048×1152@60 | 2560×812@60 | 2560×816@60
Supported Standards	HDBaseT 1.0

Subito Quatro Sender	
Interface Appearance	
Number of Connectors	4×RJ45
Supported Resolution	VESA 1024×768@60 | 1280×1024@60 | 1440×900@60 | 1600×900@60 | 1600×1050@60 | 1920×1080@60 | 1920×1200@60 | 2048×1152@60 | 2560×1440@60
Capacity	655,360 pixels (each port)
Horizontal Range	3840 pixels(each port)
Vertical Range	2048 pixels(each port)

Communication	
Interface Appearance	
Genlock	
Number of Connectors	2
Connector	BNC (1 In | 1 Loop)
Control	
Number of Connectors	2
Connector	1×RJ11 |1× RJ45

PVW	
Interface Appearance	
Number of Connectors	2 (1 HDMI | 1 H.264)
Connector	1×HDMI-A |1× RJ45
Extras	
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 Terms & Definitions

●**RCA**：Connector used primarily in consumer AV equipment for both audio and video. The RCA connector was developed by the Radio Corporation of America.

●**BNC:** Stands for Bayonet Neill-Concelman. A cable connector used extensively in television (named for its inventors). A cylindrical bayonet connector that operates with a twist-locking motion .

●**CVBS**： CVBS or Composite video, is an analog video signal without audio. Most commonly CVBS is used for transmission of standard definition signals. In consumer applications the connector is typically RCA type, while in professional applications the connector is BNC type.

●**YPbPr:** Used to describe the colour space for progressive-scan. Otherwise known as component video.

●**VGA**：Video Graphics Array. VGA is an analog signal typically used on earlier computers. The signal is non-interlaced in modes 1, 2, and 3 and interlaced when using in mode

●**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.

●**SDI**：Serial Digital Interface. Standard definition video is carried on this 270 Mbps data transfer rate. Video pixels are characterized with a 10-bit depth and 4:2:2 color quantization. Ancillary data is included on this interface and typically includes audio or other metadata. Up to sixteen audio channels can be transmitted. Audio is organised into blocks of 4 stereo pairs. Connector is BNC.

●**HD-SDI:** high-definition serial digital interface (HD-SDI), is standardized in SMPTE 292M this provides a nominal data rate of 1.485 Gbit/s.

● **3G-SDI**: standardized in SMPTE 424M, consists of a single 2.970 Gbit/s serial link that allows replacing dual link HD-SDI.

●**6G-SDI:** standardized in SMPTE ST-2081 released in 2015, 6Gbit/s bitrate and able to support 2160p@30.

●**12G-SDI**:standardized in SMPTE ST-2082 released in 2015, 12Gbit/s bitrate and able to support 2160p@60.

●**U-SDI**:Technology for transmitting large-volume 8K signals over a single cable. a signal interface called the ultra high definition signal/data interface (U-SDI) for transmitting 4K and 8K signals using a single optical cable. The interface was standardized as the SMPTE ST 2036-4.

●**HDMI**： High Definition Multimedia Interface: An interface used for the transmission of uncompressed high definition video, up to 8 channels of audio, and control signals, over a single cable.
●**HDMI 1.3:** released on June 22 2006, and increased the maximum TMDS clock to 340 MHz (10.2 Gbit/s). Support resolution 1920 × 1080 at 120 Hz or 2560 × 1440 at 60 Hz). It added support for 10 bpc, 12 bpc, and 16 bpc color depth (30, 36, and 48 bit/px), called deep color.

● **HDMI 1.4 :** released on June 5, 2009, added support for 4096 × 2160 at 24 Hz, 3840 × 2160 at 24, 25, and 30 Hz, and 1920 × 1080 at 120 Hz. Compared to HDMI 1.3, 3 more features added which are HDMI Ethernet Channel (HEC) , audio return channel (ARC),3D Over HDMI, a new Micro HDMI Connector, an expanded set of color spaces.

● **HDMI 2.0**, released on September 4, 2013 increases the maximum bandwidth to 18.0 Gbit/s. Other features of HDMI 2.0 include up to 32 audio channels, up to 1536 kHz audio sample frequency, the HE-AAC and DRA audio standards, improved 3D capability, and additional CEC functions.

● **HDMI 2.0a:** was released on April 8, 2015, and added support for High Dynamic Range (HDR) video with static metadata.

● **HDMI 2.0b:** was released March, 2016, support for HDR Video transport and extends the static metadata signaling to include Hybrid Log-Gamma (HLG).

● **HDMI 2.1** : released on November 28, 2017. It adds support for higher resolutions and higher refresh rates, Dynamic HDR including 4K 120 Hz and 8K 120 Hz.

● **DisplayPort:** A VESA standard interface primarily for video, but also for audio, USB and other data. DisplayPort (orDP) is backwards compatible with HDMI, DVI and VGA.

● **DP 1.1:** was ratified on 2 April 2007, and version 1.1a was ratified on 11 January 2008. DisplayPort 1.1 allow a maximum bandwidth of 10.8 Gbit/s (8.64 Gbit/s data rate) over a standard 4-lane main link, enough to support 1920x1080@60Hz

● **DP 1.2:** introduced on 7 January 2010, effective bandwidth to 17.28 Gbit/s support increased resolutions, higher refresh rates, and greater color depth, maximum resolution 3840 × 2160@60Hz

● **DP 1.4:** publish on 1 Mar, 2016.overall transmission bandwidth 32.4 Gbit/s ,DisplayPort 1.4 adds support for Display Stream Compression 1.2 (DSC), DSC is a "visually lossless" encoding technique with up to a 3:1 compression ratio. Using

DSC with HBR3 transmission rates, DisplayPort 1.4 can support 8K UHD (7680 × 4320) at 60 Hz or 4K UHD (3840 × 2160) at 120 Hz with 30 bit/px RGB color and HDR. 4K at 60 Hz 30 bit/px RGB/HDR can be achieved without the need for DSC.

●**Multi-mode Fiber:** Fibers that support many propagation paths or transverse modes are called multi-mode fibers, generally have a wider core diameter and are used for short-distance communication links and for applications where high power must be transmitted.

●**Single-mode Fiber:** Fiber that support a single mode are called single-mode fibers. Single-mode fibers are used for most communication links longer than 1,000 meters (3,300 ft).

●**SFP** ： small form-factor pluggable , is a compact, hot-pluggable network interface module used for both telecommunication and data communications applications.

●**optical fiber connector:** terminates the end of an optical fiber, and enables quicker connection and disconnection than splicing. The connectors mechanically couple and align the cores of fibers so light can pass. 4 most common types of optical fiber connectors are SC, FC, LC,ST.

●**SC:**(Subscriber Connector), also known as the square connector was also created by the Japanese company – Nippon Telegraph and Telephone. SC is a push-pull coupling type of connector and has a 2.5mm diameter. Nowadays, it is used mostly in single mode fiber optic patch cords, analog, GBIC, and CATV. SC is one of the most popular options, as its simplicity in design comes along with great durability and affordable prices.

● **LC**： (Lucent Connector) is a small factor connector (uses only a 1.25mm ferrule diameter) that has a snap coupling mechanism. Because of its small dimensions, it is the perfect fit for high-density connections, XFP, SFP, and SFP+ transceivers.

● **FC** :(Ferrule Connector) is a screw type connector with a 2.5mm ferrule. FC is a round shaped threaded fiber optic connector,mostly used on Datacom, telecom, measurement equipment, single-mode laser.

● **ST:** (Straight Tip) was invented by AT&T and uses a bayonet mount along with a long spring-loaded ferrule to support the fiber.

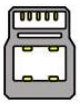
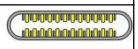
● **USB:** Universal Serial Bus is a standard that was developed in the mid-1990s that defines cables, connectors and communication protocols. This technology is designed to allow a connection, communication and power supply for peripheral devices and computers.

● **USB 1.1**: Full–Bandwidth USB, specification was the first release to be widely adopted by the consumer market. This specification allowed for a maximum bandwidth of 12Mbps.

●**USB 2.0**:or Hi–Speed USB, specification made many improvements over USB 1.1. The main improvement was an increase in bandwidth to a maximum of 480Mbps.

● **USB 3.2:** Super Speed USB with 3 varieties of 3.2 Gen 1(original name USB 3.0), 3.2Gen 2(original name USB 3.1), 3.2 Gen 2x2 (original name USB 3.2) with speed up to 5Gbps,10Gbps,20Gbps respectively.

USB version and connectors figure:

	Type A	Type B	Mini A	Mini B	Micro-A	Micro -B	Type C
USB 2.0							
USB 3.0							
USB 3.1&3.2							

●**NTSC :** The colour video standard used in North America and some other parts of the world created by the National Television Standards Committee in the 1950s. NTSC utilizes an interlaced video signals.

●**PAL:** Phase Alternate Line. A television standard in which the phase of the colour carrier is alternated from line to line. It takes four full images (8 fields) for the colour-to-horizontalimages (8 fields) for the colour-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, is widely used in needed on a PAL TV set. PAL, is widely used in Western Europe, Australia, Africa, the Middle East, and Micronesia. PAL uses 625-line, 50-field (25 fps) composite colour transmission system.

● **SMPTE**：Society of Motion image 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.

●**VESA:** Video Electronics Standards Association. An organization facilitating computer graphics through standards.

●**HDCP:** High-bandwidth Digital Content Protection (HDCP) was developed by Intel Corporation an is in wide use for protection of video during transmission between devices.

●**HDBaseT:** A video standard for the transmission of uncompressed video (HDMI signals) and related features using Cat 5e/Cat6 cabling infrastructure.

●**ST2110:** A SMPTE developed standard, ST2110 describes how to send digital video over and IP networks. Video is transmitted uncompressed with audio and other data in a separate streams.
SMPTE2110 is intended principally for broadcast production and distribution facilities where quality and flexibility are more important.

●**SDVoE: S**oftware Defined Video over Ethernet (SDVoE) is a method for transmission, distribution and management AV signals using a TCP/IP Ethernet infrastructure for transport with low latency. SDVoE is commonly used in integration applications.

●**Dante AV:** The Dante protocol was developed for and widely adopted in audio systems for the transmission of uncompressed digital audio on IP based networks. The more recent Dante AV specification includes support for digital video.

●**NDI:** Network Device interface (NDI) is a software standard developed by NewTek to enable video-compatible products to communicate, deliver, and receive broadcast quality video in a high quality, low latency manner that is frame-accurate and suitable for switching in a live production environment over TCP (UDP) Ethernet based networks. NDI is commonly found in broadcast applications.

●**RTMP:** Real-Time Messaging Protocol (RTMP) was initially a proprietary protocol developed by Macromedia (now Adobe) for streaming audio, video and data over the Internet, between a Flash player and a server.

●**RTSP :** The Real Time Streaming Protocol (RTSP) is a network control protocol designed for use in entertainment and communications systems to control streaming media servers. The protocol is used for establishing and controlling media sessions between end points.

●**MPEG:** Moving Picture Experts Group is a working group formed from ISO and IEC developing standards that allow audio/video digital compression and Transmission.

●**H.264:** Also known as AVC (Advanced Video Coding) or MPEG-4i is a common video compression standard. H.264 was standardized by the ITU-T Video Coding Experts Group (VCEG) together with the ISO/IEC JTC1 Moving Picture Experts Group (MPEG).

●**H.265:** Also known as **HEVC** (High Efficiency Video Coding)H.265 is the successor to the widely used H.264/AVC digital video coding standard. Developed under the auspices of ITU, resolutions up to 8192x4320 may be compressed.

●**API:** An Application Programming Interface (API) provides a predefined function which allows access capabilities and features or routines via a software or hardware, without accessing source code or understanding the details of inner working mechanism. An API call may execute a function and/or provide data feedback/report.

●**DMX512:** The communication standard developed by USITT for entertainment and digital lighting systems.The wide adoption of the Digital Multiplex (DMX) protocol has seen the protocol used for a wide range of other devices including video controllers. DMX512 is delivered over cable of 2 twisted pairs with 5pin XLR cables for connection.

●**ArtNet:** An ethernet protocol based on TCP/IP protocol stack, mainly used in entertainment/events applications. Built on the DMX512 data format, ArtNet enables multiple “universes” of DMX512 to be transmitted using ethernet networks for transport.

●**MIDI:** MIDI is the abbreviation of Musical Instrument Digital Interface. As the name indicates the protocol was developed for communication between electronical musical instruments and latterly computers. MIDI instructions are triggers or commands sent over twisted pair cables, typically using 5pin DIN connectors.

●**OSC:** The principle of Open Sound Control (OSC) protocol is for networking sound synthesizers, computers, and multimedia devices for musical performance or show control. As with XML and JSON, the OSC protocol allows sharing data. OSC is transported via UDP packets between devices connected on an Ethernet.

●**Brightness：** Usually refers to the amount or intensity of video light produced on a screen without regard to colour. Sometimes called black level.

●**Contrast Ratio：** The ratio of the high light output level divided by the low light output level. In theory, the contrast ratio of the television system should be at least 100:1, if not 300:1. In reality, there are several limitations. Well-controlled viewing conditions should yield a practical contrast ratio of 30:1 to 50:1.

●**Colour Temperature:** The colour quality, expressed in degrees Kelvin (K), of a light source. The higher the colour temperature, the bluer the light. The lower the temperature, the redder the light. Benchmark colour temperature for the A/V industry include 5000°K, 6500°K, and 9000°K.

●**Saturation:** Chroma, Chroma gain. The intensity of the colour, or the extent to which a given colour in any image is free from white. The less white in a colour, the truer the colour or the greater its saturation. Saturation is the amount of pigment in a colour, and not the intensity.

●**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.

●**Frame:** In interlaced video, a frame is one complete image.A video frame is made up of two fields, or two sets of interlaced lines. In a film, a frame is one still image of a series that makes up a motion image.

●**Genlock:** Allows synchronisation of otherwise video devices. A signal generator provides a signal pulses which connected devices can reference. Also see Black Burst and Color Burst.

●**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.

●**Colour Burst:** In colour TV systems, a burst of subcarrier frequency located on the back part of the composite video signal. This serves as a colour synchronizing signal to establish a frequency and phase reference for the Chroma signal. Colour burst is 3.58 MHz for NTSC and 4.43 MHz for PAL.

●**Colour Bars：** A standard test pattern of several basic colours (white, yellow, cyan, green, magenta, red, blue, and black) as a reference for system alignment and testing. In NTSC video, the most commonly used colour bars are the SMPTE standard colour bars. In PAL video, the most commonly used colour bars are eight full field bars. On computer monitors the most commonly used colour bars are two rows of reversed colour bars

●**Seamless Switching:** A feature found on many video switchers. This feature causes the switcher to wait until the vertical interval to switch. This avoids a glitch (temporary scrambling) which often is seen when switching between sources.

●**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.

●**PIP:** Picture-In-Picture. A small image within a larger image created by scaling down one of image to make it smaller. 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 .

●**HDR:** is a high dynamic range (HDR) technique used in imaging and photography to reproduce a greater dynamic range of luminosity than what is possible with standard digital imaging or photographic techniques. The aim is to present a similar range of luminance to that experienced through the human visual system.

●**UHD:** Standing for Ultra High Definition and comprising 4K and 8K television standards with a 16:9 ratio, UHD follows the 2K HDTV standard. A UHD 4K display has a physical resolution of 3840x2160 which is four times the area and twice both the width and height of a HDTV/FullHD (1920x1080) video signal.

●**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 provided EDID data, ensuring proper video image quality.

6.3 Revision History

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

Format	Time	ECO#	Description	Principal
V1.0	2019-09-01	0000#	Release	Fanny
V1.1	2020-3-26	0001#	Revise XPOSE operation	Fanny
V1.2	2020-5-15	0002#	Revise order codes	Fanny
V1.3	2021-08-17	0003#	Add adjustment of sending/receiving card	Sylvia
V1.4	2021-12-23	0004#	Revise XPOSE menu of sending card adjustment	Sylvia
V1.5	2025-09-10	0005#	Update the included accessories	Alyssa

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