X3

User Manual

RGBlink®

CONTENTS

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 product 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 product 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 product 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

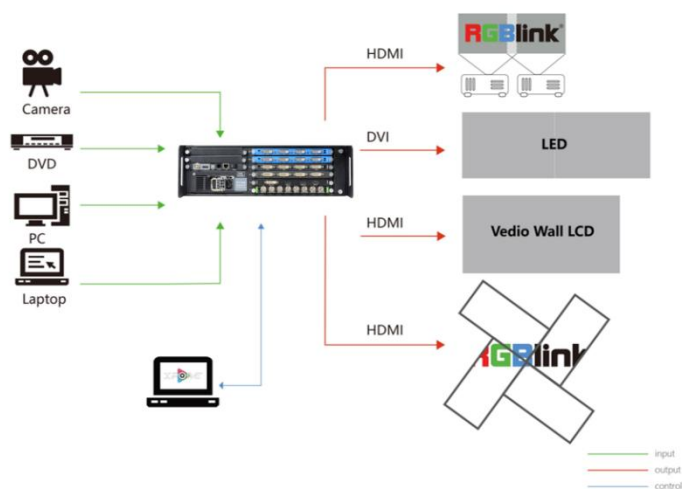|		
1 x AC Power Cord	1 x USB Cable	1 x Network Cable
1 x DVI Cable	1 x SDI Cable	1 x DB9 to RJ11 Cable
1 x Anti-static Bag		

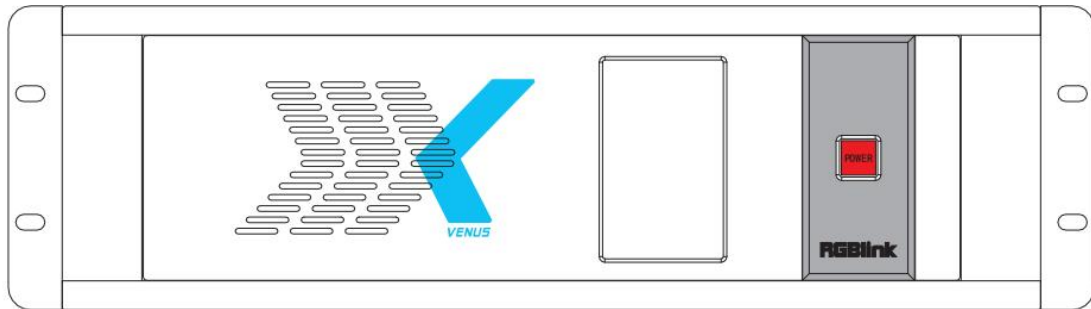**Note:** AC Power Cable supplied as standard according to destination market.

1.2 Product Overview

X3 is an HDCP-compliant, scalable, expandable videowall processor configurable to support a variety of input, output and windowing capabilities. It features high performance video scaling capable of producing very high quality images.

X3 offers six card cages that support various combinations of input and output cards for DVI, VGA, HDMI, CVBS, SDI and USB (for media files play) or video sources. Hundreds of additional video or graphic sources can be input to the X3 using the RGBlink AVDXP Matrix and Router. Multiple X3 can be cascaded to create very large display arrays. A dedicated, high-speed video/graphic bus maintains real-time performance even under heavy loading of inputs.

Compared with other videowall processors, X3 extends two main important performance for presentation application. One is seamless switching between the inputs, the other comes with local control panel option. These advantages make the X3 ideal for all types for all types of surveillance, presentation, and visualization applications, whether traffic, security, military, or process control.

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
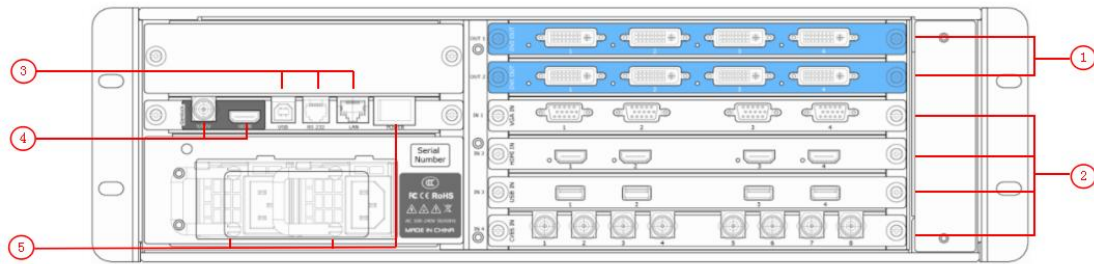
Chassis Module Structure			
1	2 output module slots	4	Genlock interface
2	4 input module slots	5	Power Switch and Power Module
3	Communication ports		

Input Interface	
1	4 input slots, supports input modules including DVI, VGA, HDMI, USB, CVBS, 4K@60HZ module and 12G-SDI. For details, please refer to Specification at the end of this document.

Output Interface	
2	2 output module shots, support DVI,SDI and HDMI 2.0 signals. For details, please refer to Specification at the end of this document.

Control Interface		
3	USB	Connect the window control program or device upgrade.
	RS232	Connect the window control program or device upgrade.

	LAN	Connect the network cable.

Genlock Interface	
4	Includes 1 Genlock input and 1 HDMI output. Genlock Input Input signal from the controller or signal generator and other device. HDMI Input Connect to the display device, video processor or matrix.

Power Connection		
5	Power Switch	Connect the windows control program and device upgrade.
	Power Interface	AC:100-240V Power: Max 65W Power Supply Interface: IEC-3.

1.2.3 Dimension

Following is the dimension of X3 for your reference:
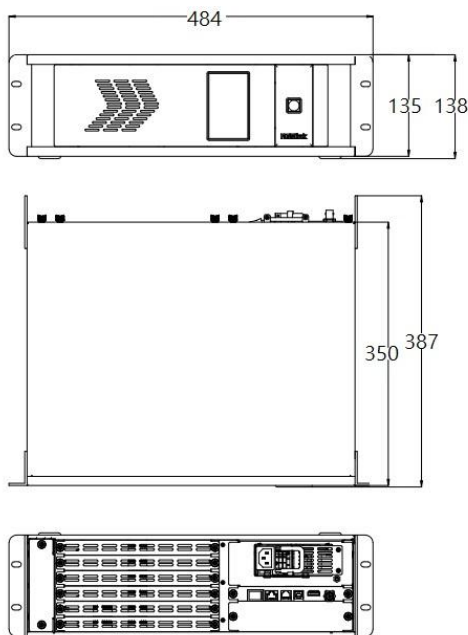
Chapter 2 Installing Your Product

2.1 Plugging in Signals

Connect signals to the product (ensure all the device are all power off first).Tighten connector

screws/locks where provided.

2.2 Plugging in Main Power

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

2.3 Turning 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.

```
INPUT SLOT
    1: DVI      V2.16
    2: USB      V1.09
    3: 4k60     V1.12
    4: EMPTY
OUTPUT SLOT
    1: DVI      V1.49
    2: DVI      V1.49
DEVICE STATUS OK
    COM. VER: 2.08
    IP: 192.168.0.100
    SN: 0335
```
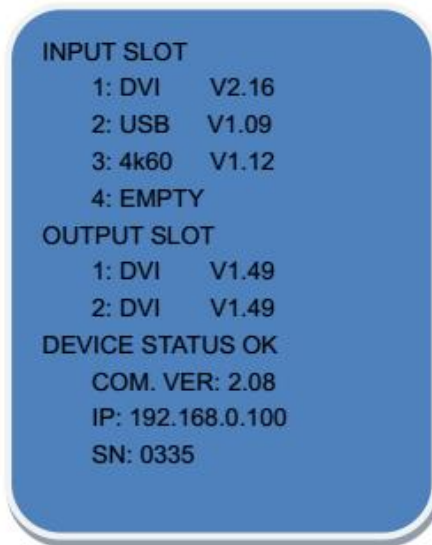
The system begins to work,and the OLED module shows the input slot and output slot

information, device status, COM. Versions. IP address and serial number.

2.4 Connect X3 and Computer

Use network cable to connect the X3 and computer as the following picture show:

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 Using Your Product

3.1 XPOSE 2.0 Installation

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

1. Double click ,it will pop-up the installer language box, select the language, for example, select "English", and click "OK" to confirm.
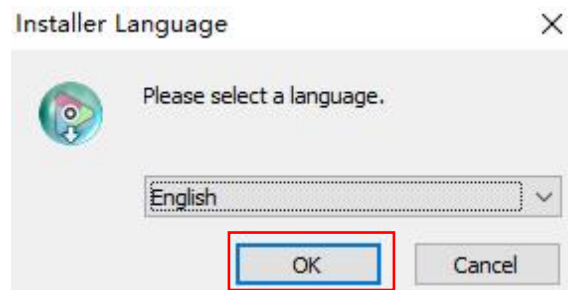
2. Click "Next" to install.
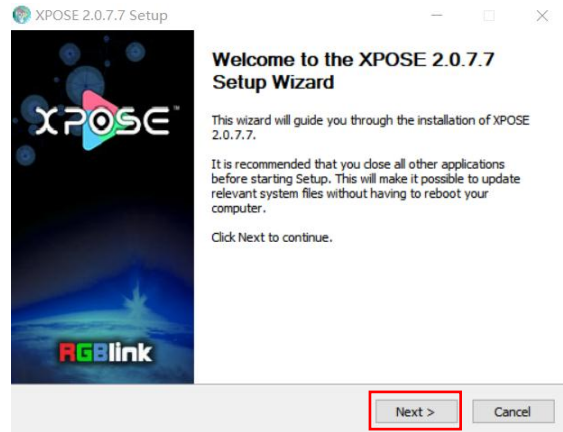
3. Click "Browse..." to select the XPOSE software install location.

Click "Install".
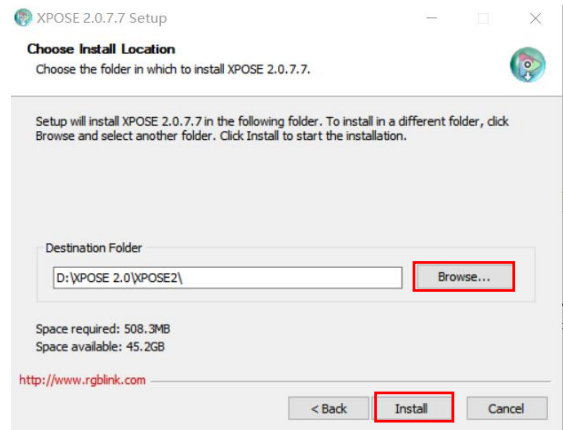
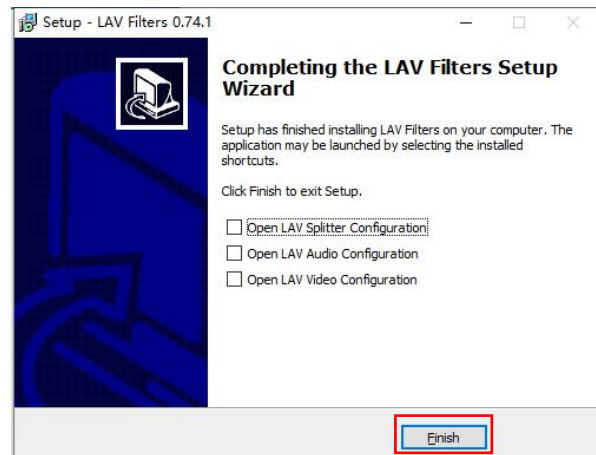4. During installation, it will pop up the window of Install Shield Wizard for Virtual Com port.
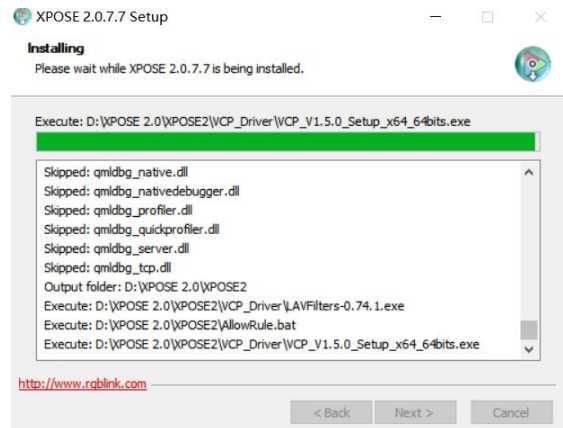
5. Click "Next".
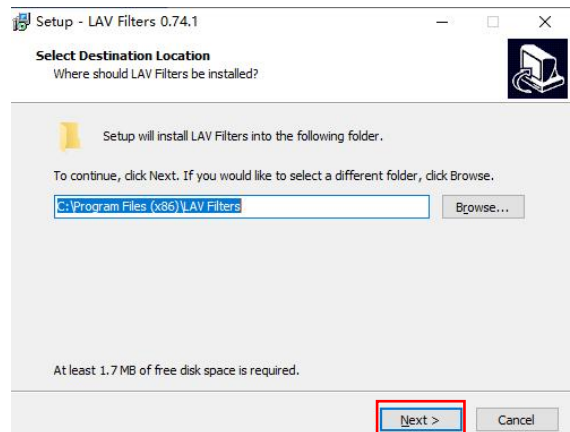
6. Then click "Install", as shown in the figure.
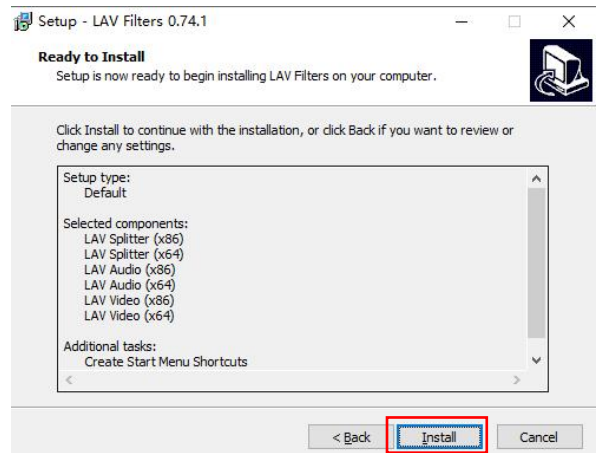
8. Click "Finish" and complete the installation, as shown in the figure below.

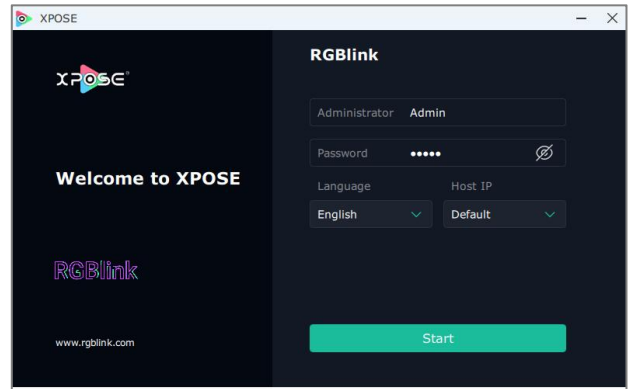7. Click "Finish" and is ready to run the XPOSE software.
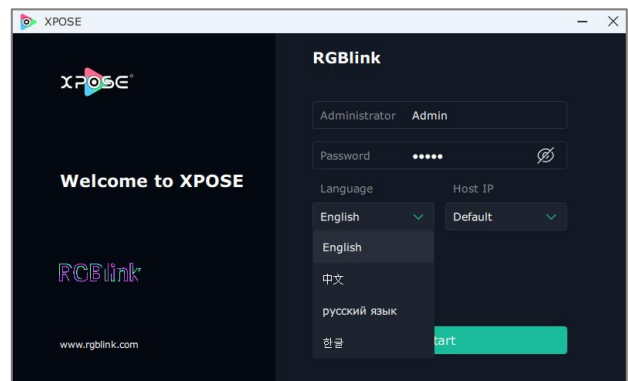
3.2 XPOSE 2.0 Operation

3.2.1 Login in XPOSE

Double click this icon ,and enter the log on interface shown in the right:

The initial language of XPOSE 2.0 is self adjusted based on the operation system language of the computer.
If you want to change language, just click **Language** and choose one you need.

Keep the user name as "Admin" and password blank and then click **Start**.

After login,the interface is shown in the right.

Users can find 5 major parts : **System Setting, Connect Setting, Display Management, Layer Management, Scenes Management.**

3.2.2 System Setting

Click ![gear icon] to enter **<System Setting>**interface.

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


System Info: Check current software version and

choose system language you need.

Keyboard Management: Click <**Keyboard**> to enter the interface shown in the right.

Keyboard Setting is designed to fit for different

operation system such as Windows and Mac.

Users can **set short cut keys**.

Drag Input, Output, Layer and Preset from the list

to the keys you desired as shown in the figure:
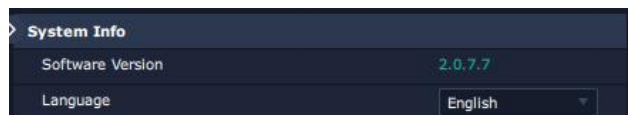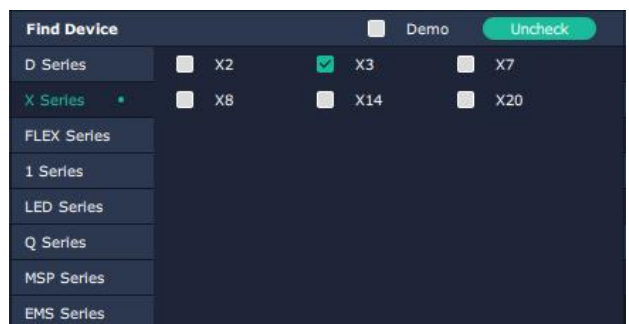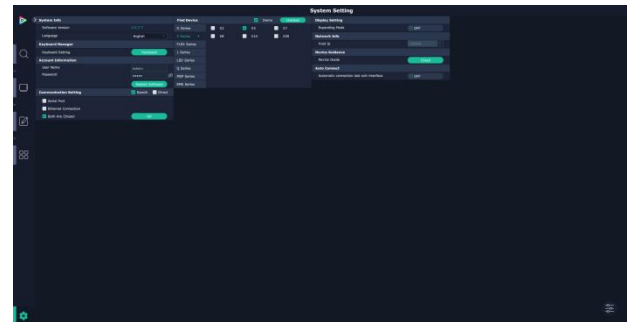
Please note the keyboard area where allows to set short cut keys.

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

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

Clear all: To remove all already set short cut keys.

Users can also **Save The Keyboard Setting As Script.**

Scrip Set

File Path: Save the current Keyboard Settings in the script to the local path
File Name: Script file name
Load Script: Load/Delete
Click **Return** to back to <System Setting>

Communication Setting：The default is **<search>**, if it is **<direct>**, users need to type the corresponding IP address.
**Serial Port**：Search only those connect via serial port.
Ethernet Connection：Search only those connect via Ethernet.
Both Are Chosen: Click both, both connections change synchronously.

Display Setting: Turn on **Expanding Mode** if there is an extension screen.

Novice Guide: Check novice guide for quicker operation of XPOSE 2.0 software.

Auto Connect: Turn on auto connection switch and the interface will pop up a prompt to remind the user whether to restore the previous interface.
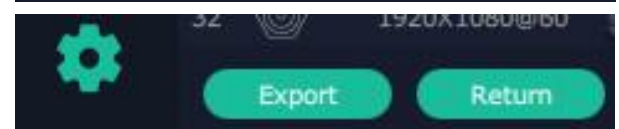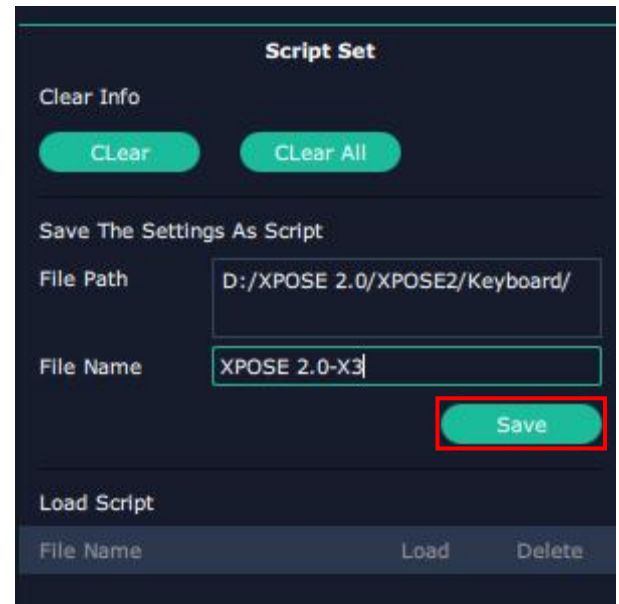
Authorization Setting

Click ![icon] to open up the authorization entry.

Authorization Setting is used to add and edit the user name and password for authorized users, as well as the permissions that users can operate.

Authorization Status **defaults to OFF**, please **Turn On Status** for operation.

For operating device for the first time, or device upgrade, or factory reset, XPOSE defaults to log in as Administrator with **name defaults to Admin, and PWD defaults to admin**. ![icon] is displayed in Chosen Devices.

If users have logged in XPOSE before, ![icon] is displayed in Chosen Devices. Enter Name and PWD, then click Login. ![icon] icon indicates successful operation.

Click **New** in Authorization interface to add new USER NAME and set PWD.
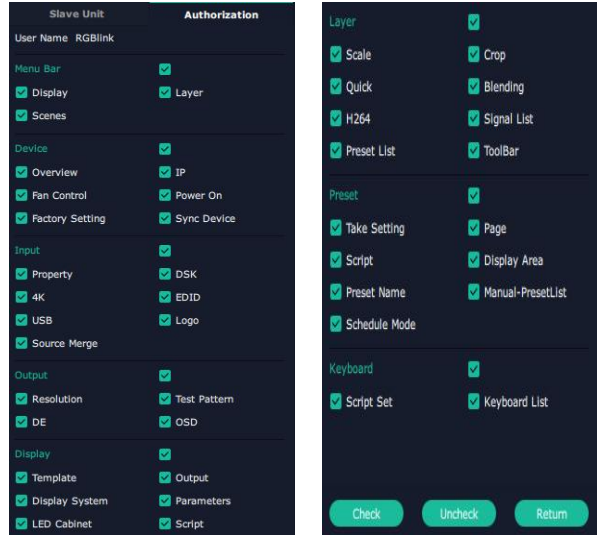
Then click **Save** to confirm.
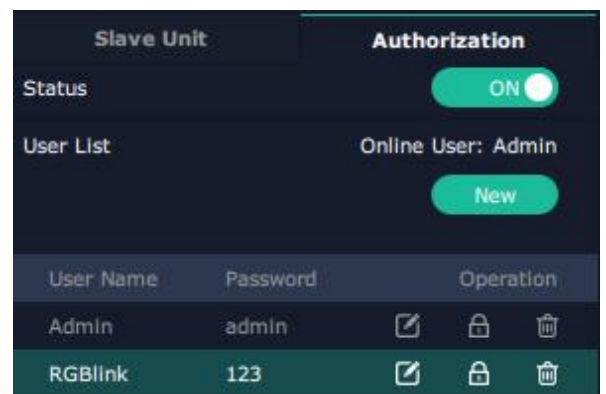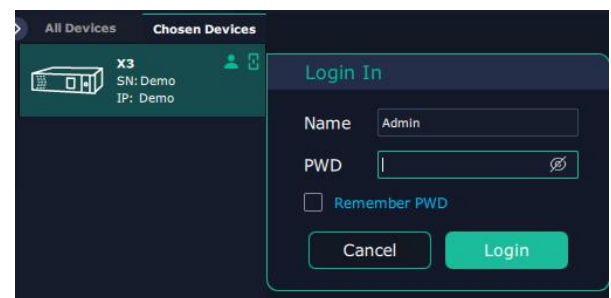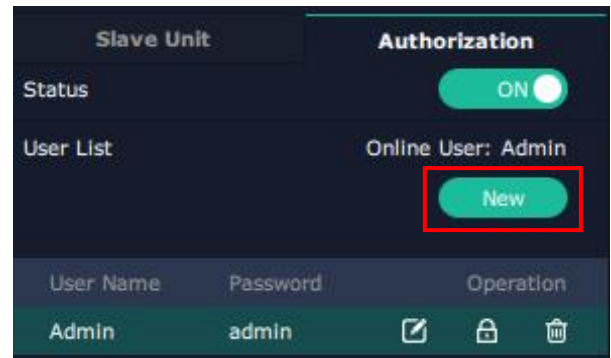
Edit: Edit user name and password already built.

Delete: Delete user name and password already built.

Authorization Set: Functions on 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.

Slave Unit

Slave Unit is to control multiple devices **simultaneously**, which are connected to same network. (**"In the same network"** means that the the third section in the IP address digits are the same)

XPOSE do operation on one device, same operation synchronized to other devices. For example, there is another devices linked to the same network, one with IP: 192.168.0.112, SN:0027; the other with IP: 192.168.0.129, SN: 3344.

If you want the same operation on 3344 to be backed up to 0027, you can do as follows.

1. Set device numbers；
2. Select the IP of the device in the drop-down menu for Device IP；
3. Click **ON,** the tow device are connected when the red pot turns to be green one ;
4. Click **OFF to disconnect,** it could not control two device at the same time.
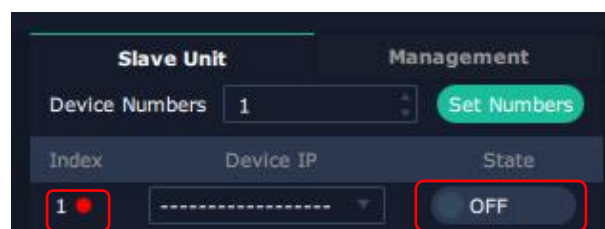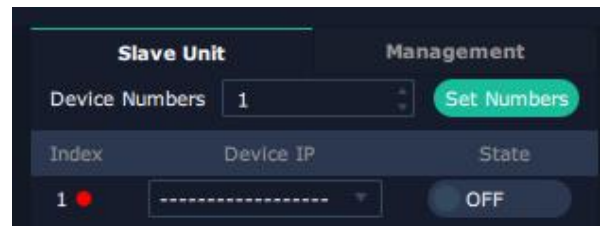
3.2.3 Output | Input | Overview

Click 🔍 to check rear panel interface as shown in the right figure.

> **Note:**
>
> 1. ⊕ purple tip indicates input, ⊕ blue tip indicates output, ⊕ yellow tip indicates communication.
>
> 2. Interface Color Description: 1) Green: normal signal; 2) Yellow: abnormal signal; 3) White: no signal.
> (Due to hardware limitation, **interface of SDI output module** always displays white whether there is or isn't a signal.)

Device Connection

1. Click the device needed in the <All Devices> list.

2. Click device name in the <Chosen Devices>. 🔗 icon indicates successful connection.
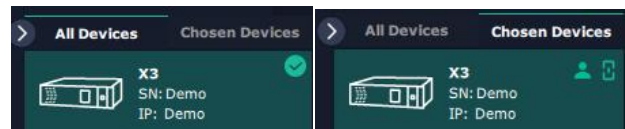
Output Setting

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 chosen.
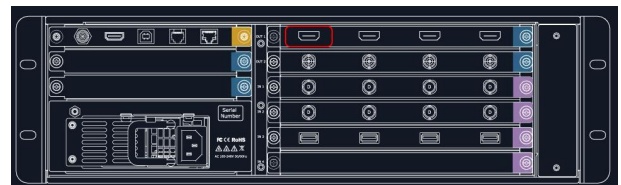
Resolution

X3 supports resolution settings of output modules.

Switch Mode: Manual/Auto
Output Switch: ON/OFF
Format Range: ALL/Board
All Format Range: To set output resolution of all output modules to be the same. Resolutions can be chosen as shown in the right figure.
Board Format Range: To set the resolution of all output ports of the selected module to be the same. The resolution of other modules can be set to different resolutions.
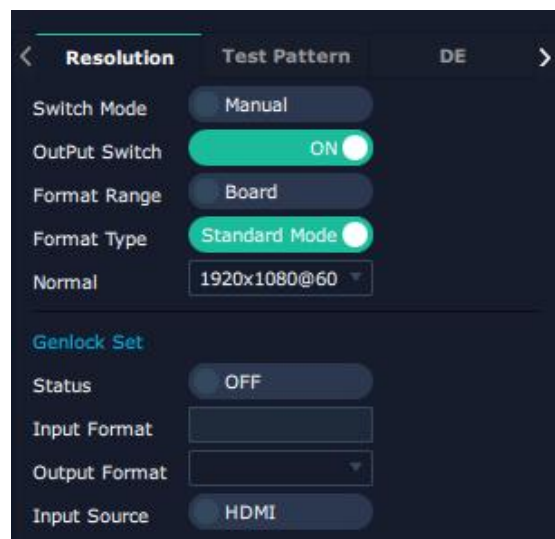
Format Type: Standard Type/Customize

Standard Resolutions: Can be chosen from the list as shown in the right figure.

Customize: Customize output resolution. Click output port and type in Width, Height and Refresh Rate.
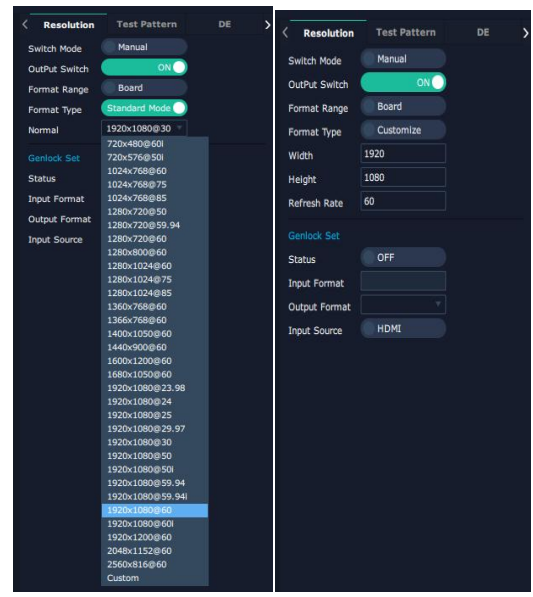
Standard   **Customize**

Genlock Set

Status: 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.

Input Source: HDMI or BNC can be selected in "Input Source" by sliding the switch.
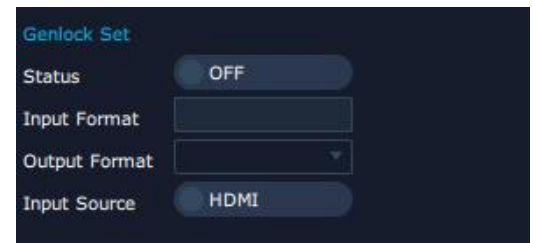
Test Pattern

Output Port: Output port to be tested.

Status: ON/OFF. Enable to select color bar or pure color and preview the corresponding RGB values and the color.
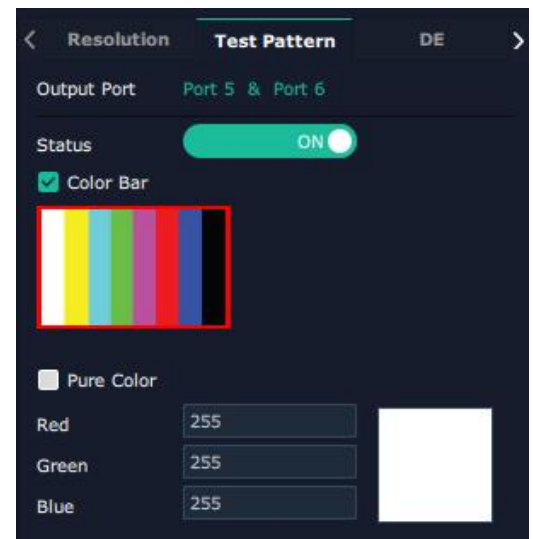
DE

Port: Current Port/All Port

Basic Parameters

Type: DVI/HDMI

Color Range: Image/Video

Bits: 8 bits can be selected if the output type is DVI. 8 bits, 10 bits and 12 bits can be selected if the output type is HDMI.

Brightness: 0~128

Position

DE Switch: : Enable or disable the DE function by sliding the DE Switch and do settings with X, Y, width, height, line polarity and scene polarity.
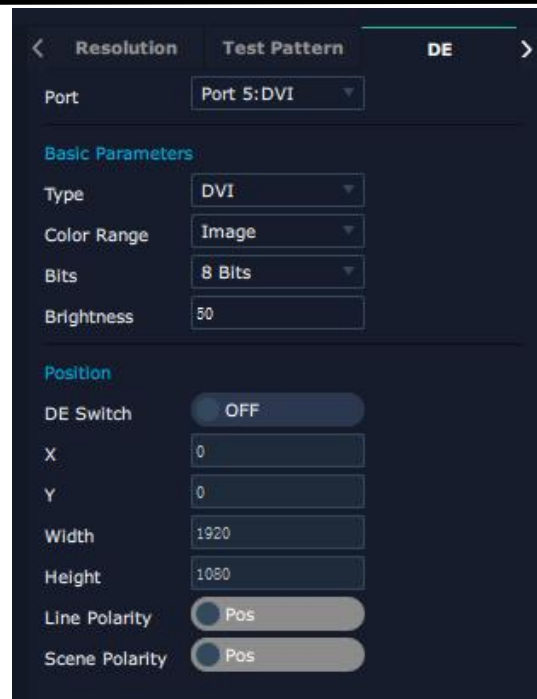
OSD

X3 output modules support OSD settings, **please Turn ON Status first.**

Operation Mode: Single Output/Multiple Outputs

Output Port: Current output port

Status: ON/OFF OSD

Position

X/Y: The starting horizontal and vertical position

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

Font Style

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

Type: Normal, Italic, Bold, Bold Italic

Size: 0-300 pixels

Alignment: set alignment type

Background: Choose transparent or set background color

Scrolling

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**.

After all settings done, click **<Set>** and the OSD will be displayed on the screen.
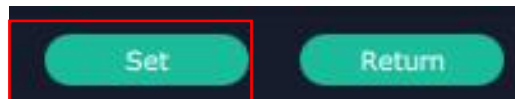
Input Setting

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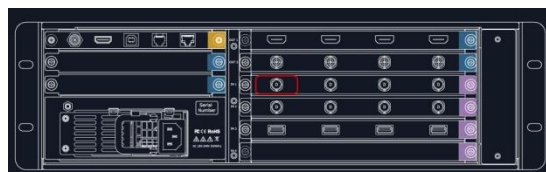
A red rectangle flashes around the chosen port when it is clicked.

Property Setting

Input Port: Chosen port

Scale

X/Y: The starting horizontal and vertical position

Width/Height : the horizontal and vertical size of scale

Crop

Support cropping for position, height and width

Picture Operation

Display Mode: Select "Live" or "Freeze" .

Mirror: Enable or disable the mirror function, default "OFF"

Picture Adjustment

Brightness: Set the brightness, the adjustment range is 0~128

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

Hue: Set the hue, the adjustment range is 0~100

Color Temperature

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

Contrast

Set the contrast value (red, green and blue), the adjustment range is 0~100
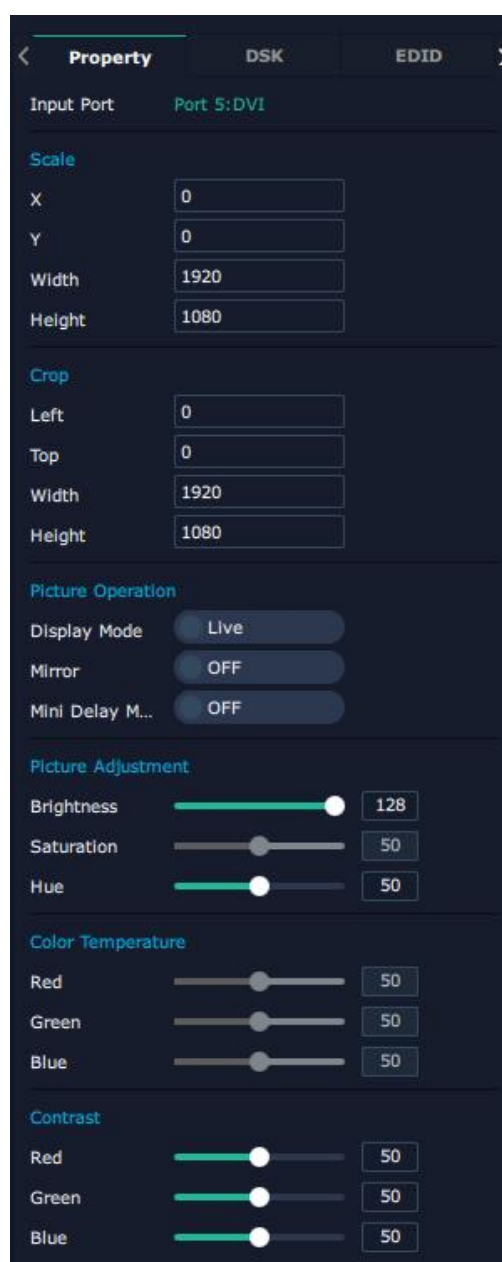
DSK (Chroma Key)

Users can perform chroma key on image video for the selected input port. Please **turn on** DSK switch and then do settings on transparency and RGB values.

Input Port: Chosen port
Preset: Select preset
Basic Parameters
DSK Setting: ON/OFF
Operation Mode: Customize mode
Transparent: Customize transparency
Max/Min: Set maximum and minimum RGB values

EDID

Input Port: Chosen port
Basic Parameters
EDID Template: RGB-DVI or RGB-HDMI
Monitor Name: Type the monitor name
Width/Height/Frequency: Type in custom parameters to meet your needs
Read Control
Export File: Export EDID file
Write Control
Write HDMI or DVI
Other
Follow EDID: Choose output port to follow EDID

LOGO

Users need to pre-store the Logo on the SD card for Logo capture.

Output Port: Current port
Logo Operation
Logo Capture: Select the LOGO, there are 10 groups of LOGO. The image is frozen when capture LOGO
Delete Logo: Clear logo set already
Set Logo
Status: Hide/Show Logo
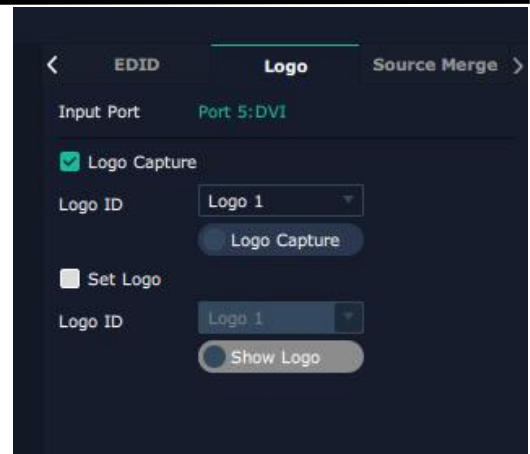
Source Merge

For DVI and HDMI input module, X3 support s to customize layout to do signal merger.

Channels： Select channel
Layers： Select layer
Merger Mode： 10 types optional
Source: Select signal source
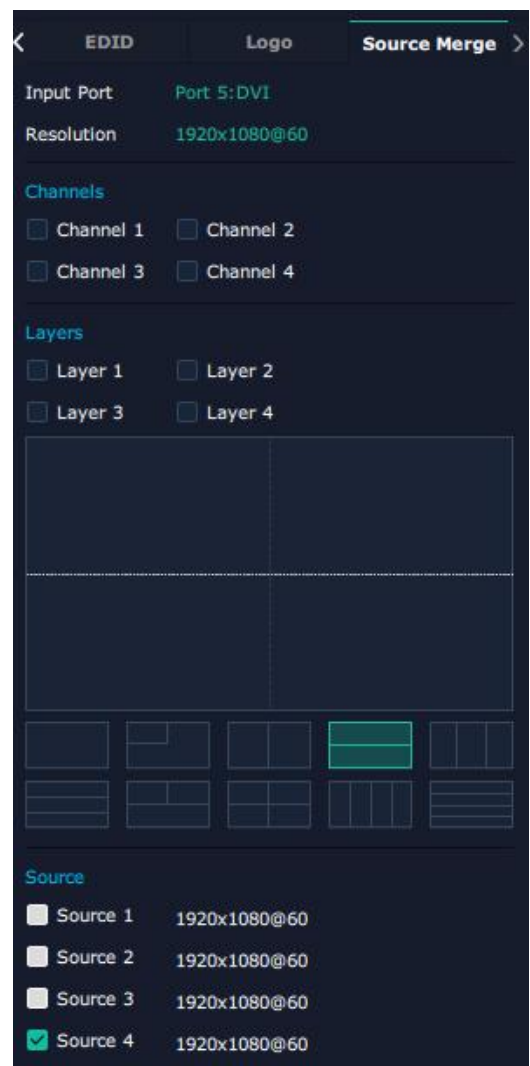
Scale

X/Y： The starting horizontal and vertical position
Width/Height : The horizontal and vertical size of scale.

Crop

Support cropping for position, height and width.

Select **USB input port** and the interface is shown in the right.
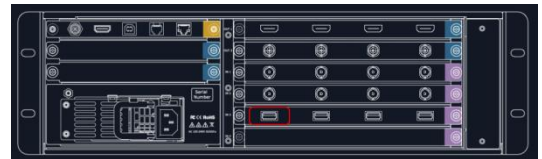
Property Setting

Input Port： Chosen port

Scale

X/Y： The starting horizontal and vertical position
Width/Height : The horizontal and vertical size of scale

Crop

Support cropping for position, height and width

Picture Operation

Display Mode: Select "Live" or "Freeze".

Mirror: Enable or disable the mirror function, default "OFF"

Picture Adjustment

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

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

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

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

Color Temperature

Set the color temp (red, green and blue), the adjustment range is 0~100
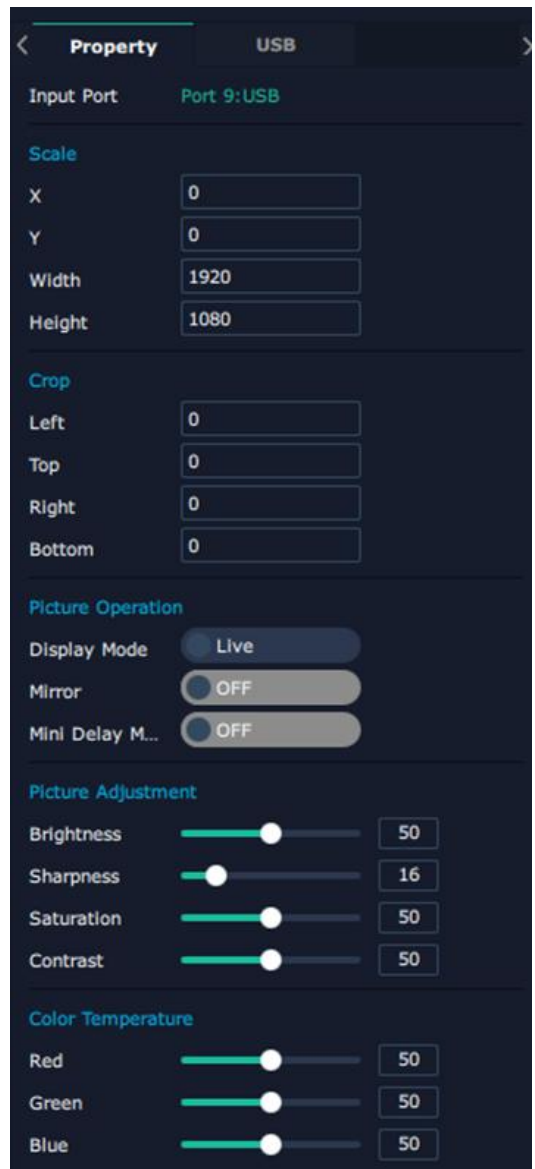
USB

Input Port： Chosen USB port

USB Video Player Setting: Can select play in order, random, single cycle and all cycle, switch to pre or next, pause or play, and read the video progress bar and time.

USB Image Play Time: Click the image, it will display the setting interface, default time is 0s. Set the switch time, and click "Set"

Play Image Player Setting: Can select play in order, random, single cycle and all cycle, and switch to pre or next, pause or play

Overview

Click **Return** Return , there are Overview, IP, Fan Control, Factory Setting.

Device Info: users can check communication module version, current device temperature and MAC information.
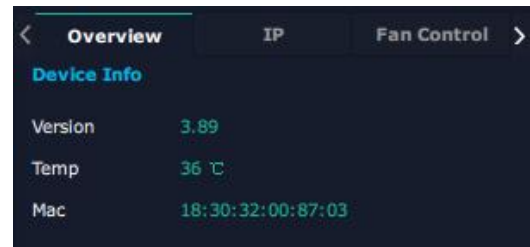
Input Module Info: Users can check current input module name and MCU version.

"...." indicates that there are no input modules, as shown in the right figure.

Output Module Info: Users can check current output module name and MCU version.

"...." indicates that there are no output modules, as shown in the right figure.

IP

Support auto/manual setting. Show IP Address, Netmask, Gateway
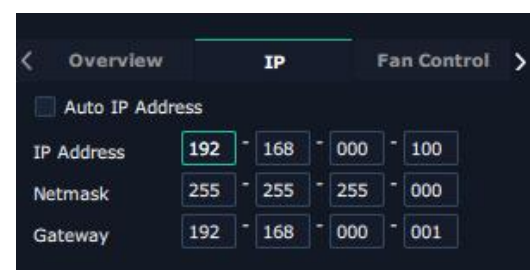
Fan Control

X3 supports auto/manual setting for fan speed.
Fan Speed: 0-100 adjustable

Notice: To avoid insufficient heat dissipation, the recommended manual fan speed is not less than 30%.

Backup

Backup: Select ON or OFF to enable or disable backup
Backup Mode: Set backup mode to Input Backup or Preset Backup. Click "Add" below to add backup source.

Power On

Power On Restart: Range from 0~255s
Front Lights: Select front lights effect
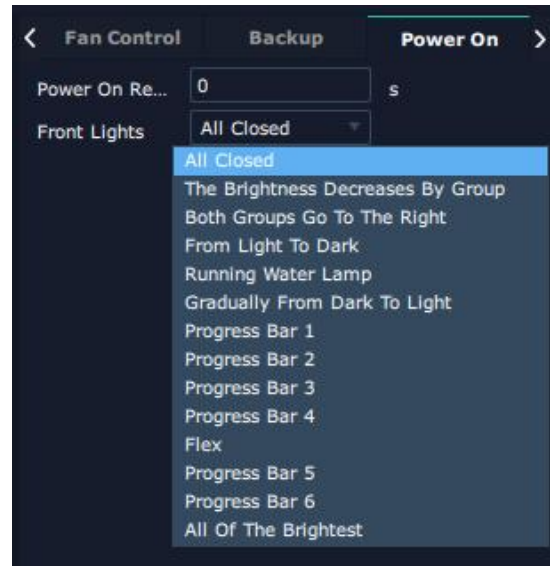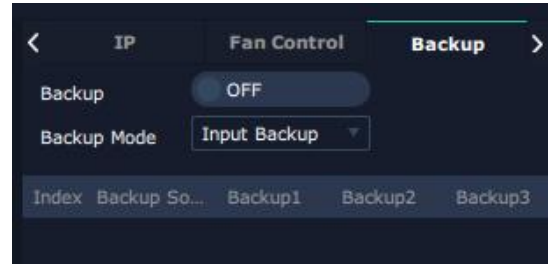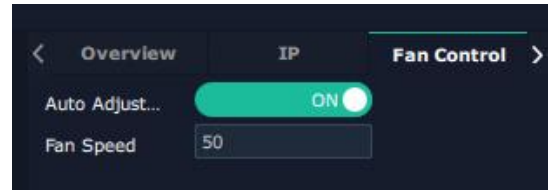
Factory Setting

Remove Logo: Clear the previous Logo
Remove EDID: Clear the previous EDID parameter
Save IP: No change of IP after reset

3.2.4 Display Management

Display System is for users to set layout of outputs.

Click [icon] first and then click [icon] to enter the interface.
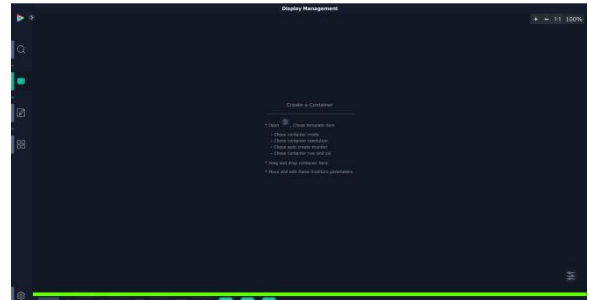
Container

Container here means the Display Area, for example it could be a formed LED screen or an array of LCDs.
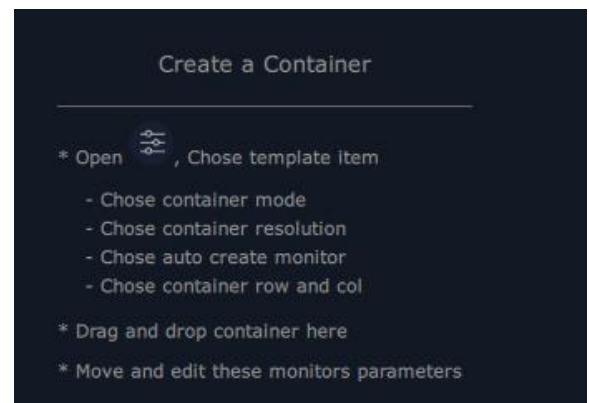
Template

There are **12** types of basic "Display Area" which is used to contain output interface, and could be regarded as layout of output.
Drag a template to create a container in other word a display area.

Resolution

Users can choose output resolution as shown in the figure.
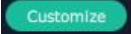
Mode

Each mode is marked in different color and provided with fitted templates. Users can do operations like splice under different modes.

X3：Presentation Mode (by default) , PST+PGM Mode, Rotation Mode and Edge Blending Mode optional.

Customize Container

Click [Customize] at the bottom of template list.

Monitor Layout: Auto or Manual

Steps of create container are as follows:

1. Fill in H Total/V Total and Row/Column,it will calculate H item and V item automatically.
For example, if you would like to create a container with 2 rows and 2 columns and each display has a width of 1920 and a height of 540, the total width will be 3840 and the total height will be 1080.

2. Click <**Create**>, the container will display in the interface, and shows the width and height of each Display.

3. Click<**Save**> to save the container.
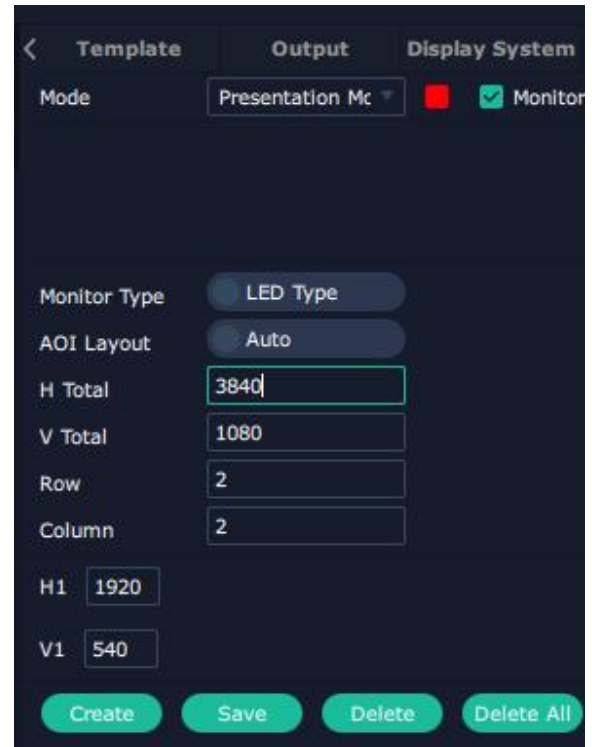
Container Adjustment

1. **Move:** Drag the boarder of the display area to move its place in the interface.

2. **Scale:** Click icon [−] to shrink, click [+] to enlarge the proportion of display area on interface.

3. **Cancel:** Press and hold [×] to cancel the screen group.
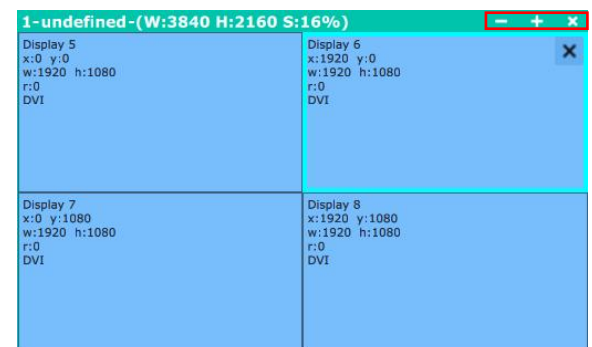
Display

Output List:
White one: available
Gray one: unavailable
Operation Steps:
Left-mouse click the output and drag it to the display of the set container.
Replacement:
Drag and drop the output into the corresponding display. The output being replaced will turn from gray to white in the list.

Display System

X3 allows users to edit the name of the

Display Area that has been created just click .
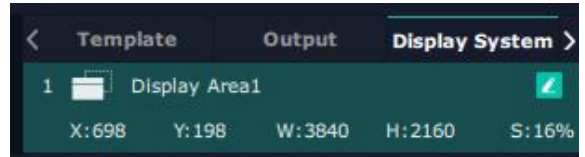
3.2.5 Layer Management

Layer Management is designed to manage the layer

of each monitor. Click to enter the interface:
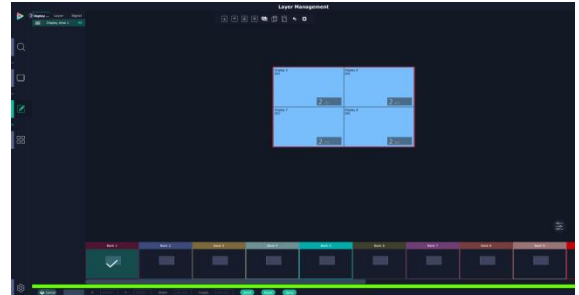
Display Area

When enter Layer Management interface, the window is blank. The screen group created in Display System shall be dragged from the **Display Area.**

Signal

Signal list, showing all input signals and resolutions currently. Drag the signal to the display.

Click, users can rename the input signal and then

click to confirm.
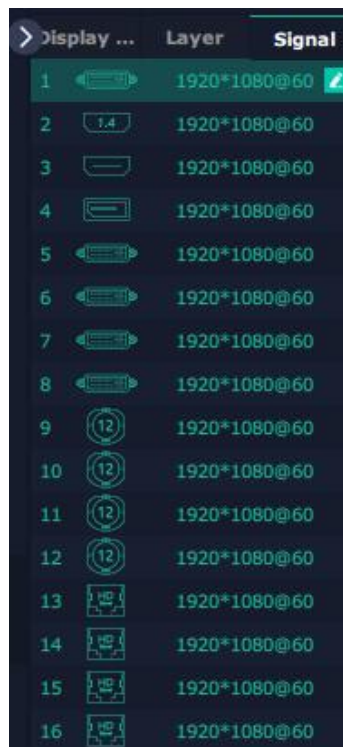
Layer

Layer number： Numbers in the corner is to show how many layers at present allowed to put in the output.

The number in the red rectangle on the right figure represents the number of layers that can be placed at the output.
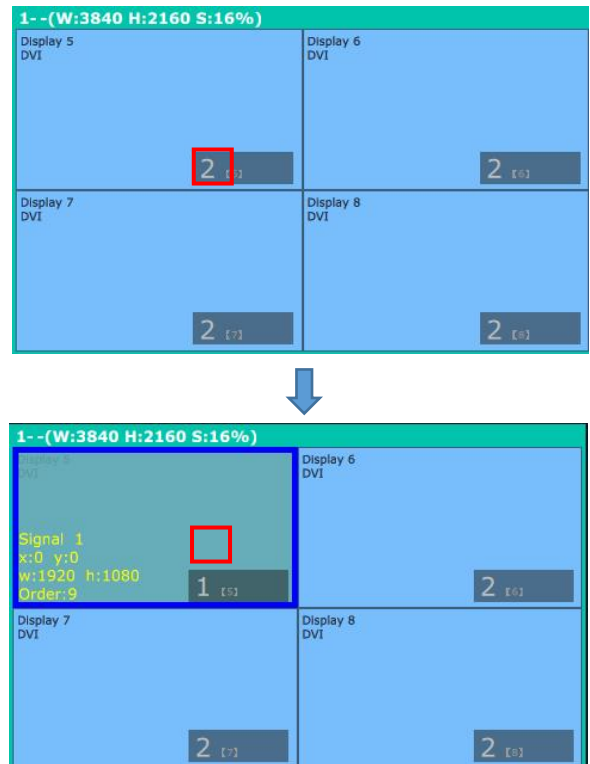
> **Note:** One signal occupies one layer (4K signal occupies four layers), signal can be dragged into the container repeatedly.

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. Click **Set** to confirm.
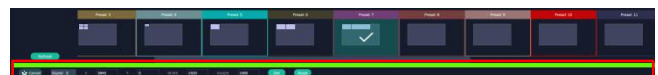
2. Layer Scale and Crop

Choose one layer needed to be adjusted.

 this icon means data related, when width is changed, height will be changed as same proportion.

 this icon means data not related, width and height need to be filled respectively.
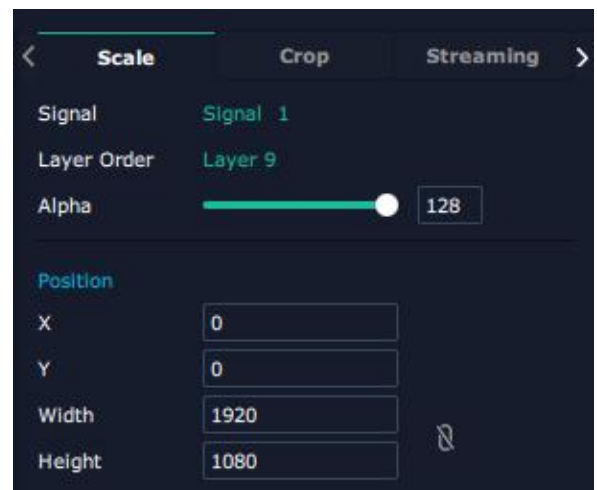
Scale

Alpha: Set the alpha, the adjustment range is 0~128
Position: Type in X/Y/Width/Height

Crop

Display Mode：Select Active or Freeze
Mirror：Enable or disable the mirror function, default to OFF
Position: Type in X/Y/Width/Height
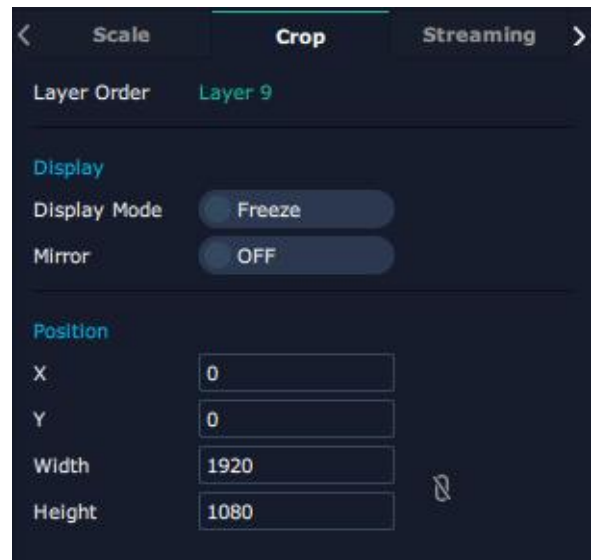
Layer Movement

Moving the mouse to drag the layer.

Layer Remove

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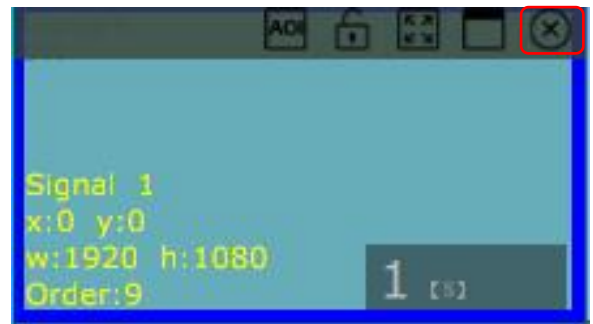
Layer Set

AOI : to crop the layer

🔒 : lock the layer to prevent wrong operations

⤢ : max to cover up the monitor.

▢ : cover up all monitors in the same screen group with the one signal.
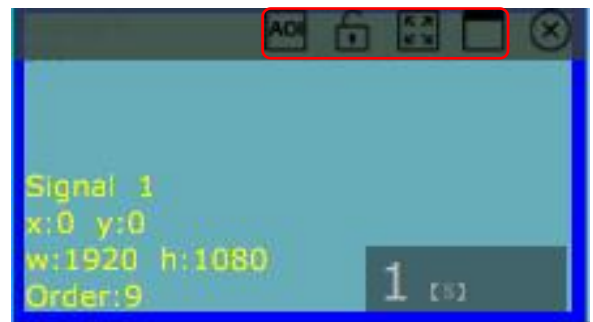
Layer Copy

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.

Other Operation on Layer

Use the tools bar on top of window to do such operations.

	Layer Backward		Layer to Top		Paste Selected
	Layer Forward		Select All		Cancel Selected
	Layer to Bottom		Copy Selected		Delete Selected

Note: One signal occupies one layer (4K signal occupies four layers), signal can be dragged into the container repeatedly.

Streaming

PVW Module supports to preview image.

Users can do refer to steps below:

1. Turn on Layer Preview, Input Preview, Scene Preview or Expand Preview according to the actual need.

2. Turn on H.264 and users can preview the image. As shown in the right figure, the interface shows that Layer Preview, Input Preview, Scene Preview switch have been turned on.
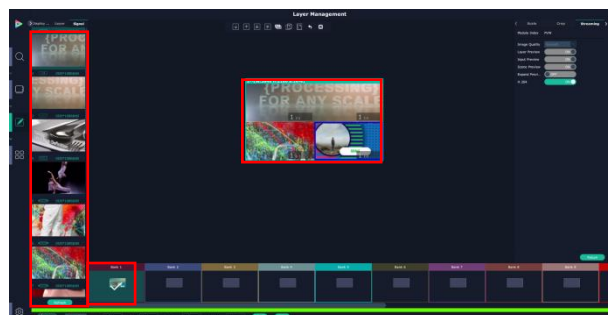
Note: H.264 is the master switch. If the user turns on H.264 first, it cannot be set successfully.

3.2.6 Preset Management

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

Preset Management Mode:

1. Manual Mode   2. Schedule Mode
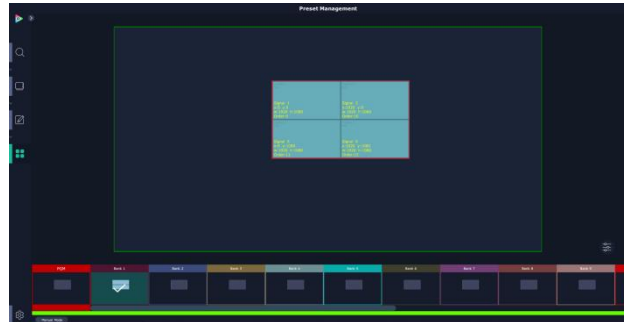
1. Manual Mode

The chosen scene will be displayed in the main interface, and the PGM screen is in the first in the Bank Column.

Take Setting

Fade Time: The adjustment range is 0~10S

Display: ON/OFF

Black Out: ON/OFF

Keep | Swap: Select Keep or Swap

Preset Scene: ON/OFF
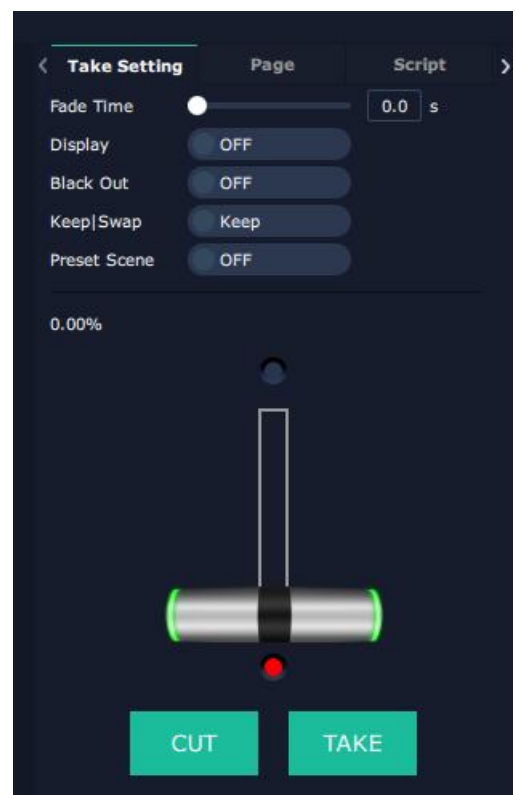
Page

Save Page

Select a Preset, click Save Page, then choose Page X, and the Preset will be saved in this page. Page with saved preset displays in green.
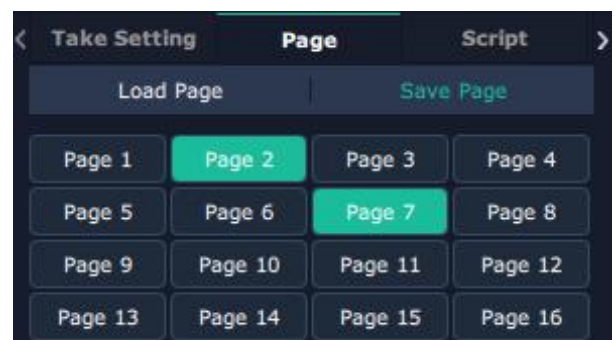
Load Page

Click Load Page, page with saved preset displays in green. Select one preset and then load this preset, the page turns in red.
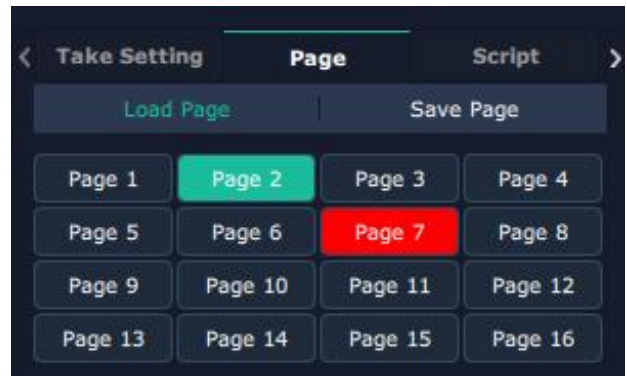
Script

Click<**Script**>, fill in the file name and click **"Save"** ,the file can be seen in the <**Load Script**>

Click **"Load"** [icon] to load the file into XPOSE.

Click **"Delete"** [icon] to delete saved script.
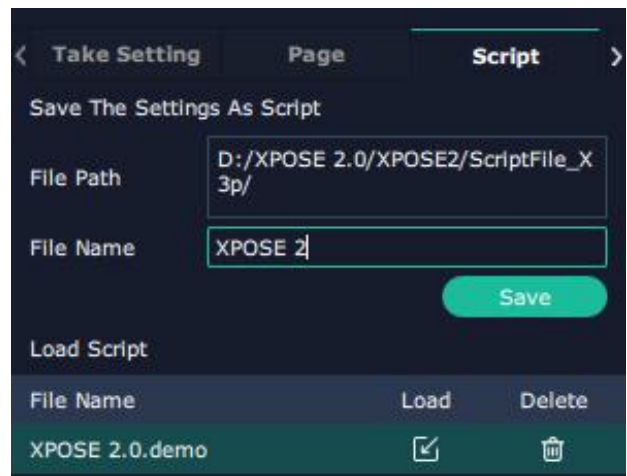
Preset Name

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.
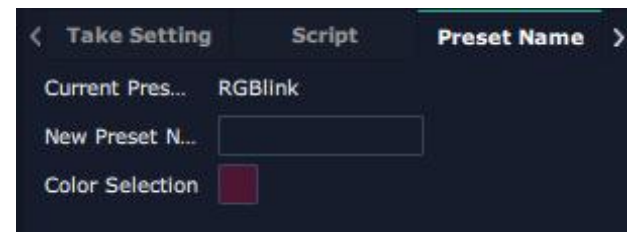
Hotkey

Use hotkey to let the operation in Preset Management more convenient.
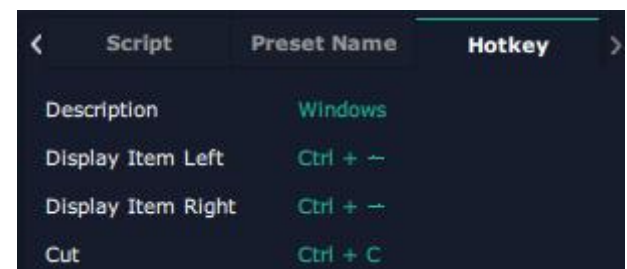
2. Schedule Mode

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

Steps are as follows：

1. Turn on **"Schedule Mode"**

2. Choose **"Times Loop"** in Loop Mode

3. Choose the BANK

4. Fill in the **"Duration"**

5. Click "**OK"**

Users can click ![edit icon] to edit and ![delete icon] to delete. After

settings done, turn on **"Loop Switch"** .
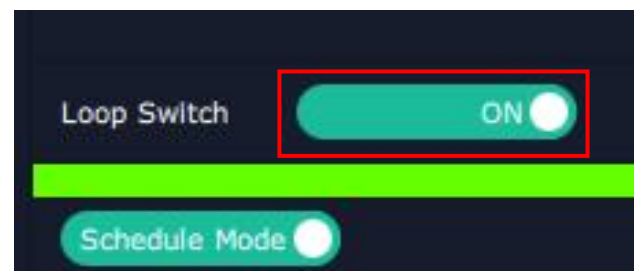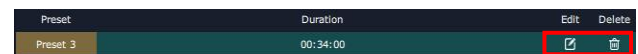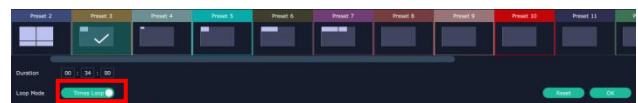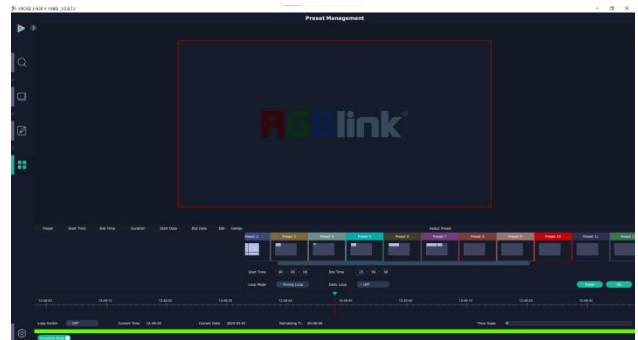
Chapter 4 Ordering Codes

4.1 Product Code

310-1003-11-0   X3p

310-0003-16-0   X3e

310-0003-01-0   X3 Touch

310-0003-15-0   X3

4.2 Module Code

4.2.1 Input Modules

190-0003-01-0   Quad DVI Input Module

190-0003-05-0   Quad 2K@60 HDMI Input Module

190-0003-06-0   Quad CVBS (Backup) Input Module

190-0003-11-0   4K@30 Input Module (Choose one of three signals)

190-0003-14-0   Quad 3G SDI Input/Loop Module

190-0003-15-0   4K@60 Input Module (Choose one of four signals)

190-0003-17-0   12G SDI Input Module (single 12G-SDI, dual 6G-SDI, quad 3G-SDI)

190-0003-18-0   Quad HDBaseT Input Module

190-0003-19-0   4K HDR Input Module

190-0003-35-0   Quad 2K@60 HDMI Input Module   (De-interlace)

4.2.2 Output Modules

190-0003-21-0   Quad DVI Output Module

190-0003-22-0   Quad 2K HDMI Output Module

190-0003-24-0   Quad 3G-SDI Output Module

190-0003-27-0   Quad H.264 (RJ45) Streaming Output Module

190-0003-28-0   ARO Rotation Module (independent and arbitrary rotation for DVI)

190-0003-38-0   Dual 4K HDMI 2.0 Output Module

190-0007-01-0   PVW Module

190-0007-21-0   Dual 4K HDMI 2.0 Output Module (Multi-Layer)

4.2.3 Others

950-0005-00-0   Power Supply 400W

Chapter 5 Support

5.1 Contact Us

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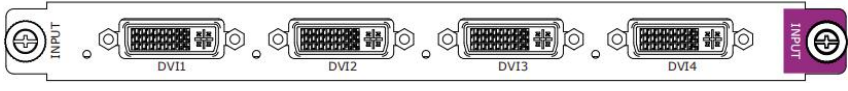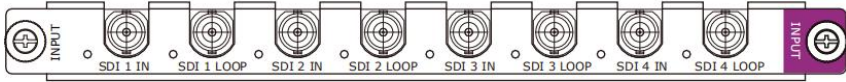
Flight Forum Eindhoven
5657 DW
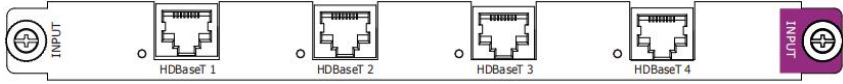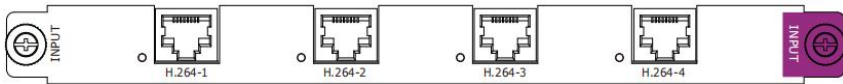
📞 +31 (040) 202 71 83
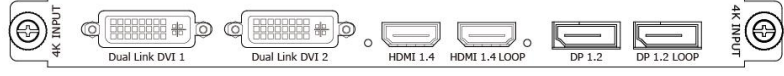
Chapter 6 Appendix

6.1 Specification

DVI Input Module		
Interface Appearance		
Dimension	216*200*20(mm)	
Number of Connectors	4	
Connector	DVI-I	
Input 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
Format Standard	Single Link DVI	
Color Space	8bit RGB	
Indicator Light	White Light:normal signal connection;Unlit:no signal connection	
HDMI Input Module （**De-interlace and Sync**）		
Interface Appearance		
Dimension	216*200*20(mm)	
Number of Connectors	4	
Connector	HDMI- A	
Input 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
Format Standard	HDMI 1.3	
Color Space	8 bit RGB/YUV 4:2:2/YUV 4:4:4	
Indicator Light	White Light:normal signal connection;Unlit:no signal connection	
HDMI 2.0 HDR Input Module		
Interface Appearance		
Dimension	216*212*20(mm)	
Number of	8（4 In | 4 Loop）	
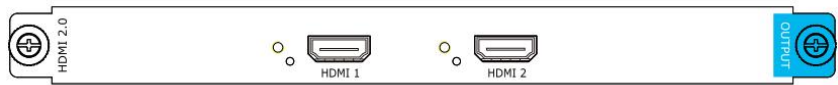
Connectors	
Connector	HDMI-A
Input Resolution	SMPTE 720P@60 | 1080P@60 |2160@60
	VESA 800×600@60 | 1024×768@60 | 1280×720@60 | 1280×800@60 | 1366×768@60 | 1400×1050@60 | 1600×1200@60 | 1920×1080@60 | 2048×1152@60 | 2560×812@60 | 2560×816@60 | 2560×1600@60 | 3840×1080@60|3840×2160@23.98/24/25/29.97/30/50/60 | 4096×2160@60 | 7680×1080@60
Format Standard	HDMI 2.0
Color Space	8 bit RGB/YUV 4:2:0/YUV 4:2:2/YUV 4:4:4 10 bit RGB/YUV 4:2:0/YUV 4:2:2/YUV 4:4:4 12 bit RGB/YUV 4:2:0/YUV 4:2:2/YUV 4:4:4
Indicator Light	White Light:normal signal connection;Unlit:no signal connection
3G-SDI Input /Loop Module	
Interface Appearance	
Dimension	216*220*20(mm)
Number of Connectors	8 (4 Input, 4 Loop)
Connector	BNC
Input 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 274M SMPTE 296M | SMPTE 272M | SMPTE 299M | SMPTE 259M-C | DVB-ASI
Color Space	10 bit YUV4:2:2
Indicator Light	White Light:normal signal connection;Unlit:no signal connection
12G-SDI Input Module	
Interface Appearance	
Dimension	216*220*20(mm)
Number of Connectors	4 （3G SDI×4 or 12G SDI×1）
Connector	BNC
Input Resolution	SMPTE 480i | 576i | 720p@25/30/50/60Hz | 1080i@50/50.94/60 | 1080p@23.98/24/25/29.97/30/50/59.94/60Hz| 2160p@30/50/60
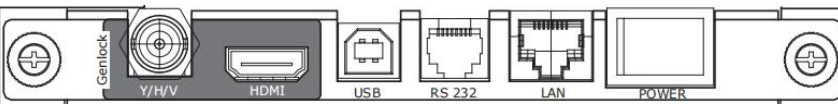
Supported Standard	SMPTE ST 2082-1, SMPTE ST 2081-1, SMPTE ST 424, SMPTE ST 292-1, SMPTE 274M SMPTE 296M | SMPTE 272M | SMPTE 299M | SMPTE ST 259, DVB-ASI,MADI
Color Space	10bit YUV 4:2:2
Indicator Light	White Light:normal signal connection;Unlit:no signal connection

HDBaseT Input Module

Interface Appearance	
Dimension	216*220*20(mm)
Number of Connectors	4
Connector	RJ45
Input 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
Color Space	8 bit RGB/YUV 4:2:2/YUV 4:4:4 10 bit RGB/YUV 4:2:2/YUV 4:4:4 12 bit RGB/YUV 4:4:4
Indicator Light	White Light:normal signal connection;Unlit:no signal connection

H.264 Input Module

Interface Appearance	
Dimension	216*220*20(mm)
Number of Connectors	4
Connector	RJ45
Input Resolution	176×144@60 | 240×180@60 | 320×180@60 | 320×240@60 | 320×256@60 | 352×228@60 | 352×480@60 | 400×224@60 | 400×720@60 | 480×270@60 | 480×272@60 | 480×720@60 | 480×760@60 | 480×784@60 | 480×480@60 | 544×480@60 | 608×448@60 | 640×760@60 | 640×480@60 | 704×576@60 | 720×404@60 | 720×480@60 | 720×540@60 | 720×576@60 | 850×480@60 |1024×576@60 | 1280×720@60 | 1680×1056@60 | 1920×1080@60
Standard	H.264/MPEG-4 AVC

Indicator Light	White Light:normal signal connection;Unlit:no signal connection		
4K@30 Input Module			
Interface Appearance			
Dimension	216*212*20（mm）		
Number of Connectors	6		
Connector	DVI-I | HDMI-A | DisplayPort		
Input Resolution	SMPTE	480i | 576i | 720p@50/59.94/60 | 1080i@50/50.94/60 | 1080p@ 23.94/24/25/30/50/59.94/60 | 2160p@23.94/24/25/30	
	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 | 2560×1440@60 | 2560×1600@60 | 3840×2160@24/24/25/30	
Standard	DVI	DUAL	
	HDMI	1.4	
	DisplayPort	1.1	
Color Space	8 bit RGB/YUV 4:2:2/YUV 4:4:4		
Indicator Light	White Light:normal signal connection;Unlit:no signal connection		
4K@60 Input Module			
Interface Appearance			
Dimension	216*212*20(mm)		
Number of Connectors	4		
Connector	DVI-I | HDMI-A |DisplayPort		
Input Resolution	SMPTE	720p@60 | 1080p@60 |2160p@24/25/30/50/60	
	VESA	800×600@60 | 1024×768@60 | 1280×768@60 | 1280×800@60 |1280×1024@60 | 1360×768@60 | 1366×768@60 |1400×900@60 | 1600×1050@60 | 1600×1200@60 |1680×1050@60 | 1920×1080@23.98/24/25/29.97/30/50/59.94/60 | 1920×1200@60 |2048×1152@60 | 2560×812@60 | 2560×816@60 | 2560×1600@60 | 3840×1080@60| 3840×2160@23.98/24/25/29.97/30/50/60 | 4096×2160@60	
Support Standards	DVI	DUAL	
	HDMI	2.0 | 1.4	
	DisplayPort	1.2	
Color Space	8 bit RGB/YUV 4:2:0/YUV 4:2:2/YUV 4:4:4		

	10 bit RGB/YUV 4:2:0/YUV 4:2:2/YUV 4:4:4
	12 bit RGB/YUV 4:2:0/YUV 4:2:2/YUV 4:4:4
Indicator Light	White Light:normal signal connection;Unlit:no signal connection

DVI Output Module	
Interface Appearance	
Dimension	216*200*20(mm)
Number of Connectors	4
Connector	DVI-I
Signal Level	TMDS pw, 165MHz bandwidth
Output 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
Color Space	8 bit RGB
Indicator Light	White Light:normal signal connection;Unlit:no signal connection
SDI Output Module	
Interface Appearance	
Dimension	216*220*20(mm)
Number of Connectors	4
Connector	BNC
Signal level	800mV±10%
Supported Standard	SMPTE 425M (Level A and Level B), SMPTE 424M, SMPTE 292, SMPTE 259M-C and DVB-ASI
Output Resolution	SMPTE 480i	576i	720p/50/59.94/60	1080i/50/59.94/60 |1080p/50/59.94/60
Equalization	Belden 1694A 100m HD 1.485G, 300m SD 270Mbps
Color Space	10 bit YUV 4:2:2
Indicator Light	White Light:normal signal connection;Unlit:no signal connection
2K HDMI Output Module	
Interface Appearance	
Dimension	216*220*20(mm)

Number of Connectors	4	
Connector	HDMI-A	
Output Resolution	SMPTE	480i | 576i | 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	
Color Space	8 bit RGB 10 bit RGB 12 bit RGB	
Indicator Light	White Light:normal signal connection;Unlit:no signal connection	

HDMI 2.0 Output Module

Interface Appearance		
Dimension	216*212*20(mm)	
Number of Connectors	2	
Connector	HDMI-A	
Output Resolution	SMPTE	720p@60 | 1080p@60 | 2160p@60
	VESA	1280×720@60 | 1360×768@60 | 1366×768@60 | 1600×900@60 |1920×1080@60|2540×1440@60| 3480×2048@60 | 3840×2160@60 | 4096×2160@60
Color Space	8 bit RGB 10 bit RGB 12 bit RGB	
Indicator Light	White Light:normal signal connection;Unlit:no signal connection	

Communication	
Interface Appearance	
Board Size	165(L)×19(W)（mm）
Genlock	
Number of Connectors	2
Connector	BNC (Genlock Y/H/V)| HDMI (Genlock Loop)
Control	
Number of Connectors	3

Connector	USB-B	RJ11	RJ45
Function	
Switch	Support any two inputs fade in fade out
Extras	
Power Supply	100-240V IEC-3
Working Temperature	0°C~45°C
Stored Humidity	10%~90%
Product Warranty	3 years parts and labor warranty

6.2 Installing Options

X3 supports replaceable input and output optional modules, user can install or replace the optional module according to actual need. Take X3 for example, the specific installation 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:

Captive Screw
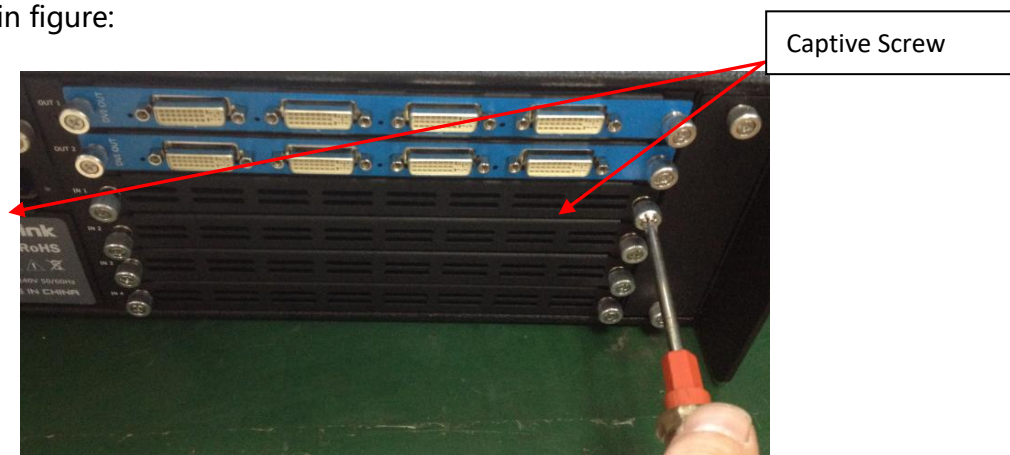
2. Install the input module:

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.

Micro SD card
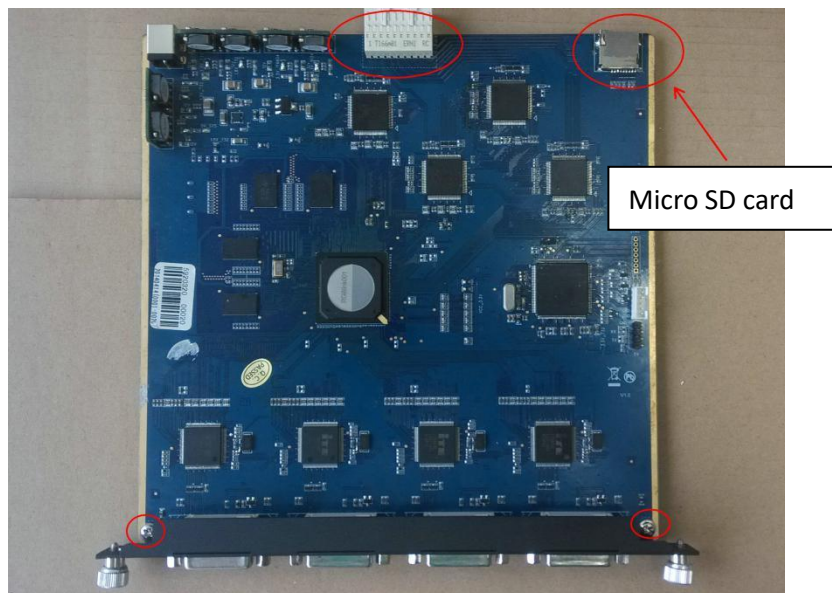
DVI input module:

① For the joined PCB input module with CVBS, HDMI, VGA, USB or SDI interface, fix the input

module on the plate with 2 M3*4 flat screws and 2 M3*4 round head screws.

HDMI input module:

VGA input module:

CVBS input module:

USB input module:

3. Fix the input module block with fixed screws, as shown in figure:
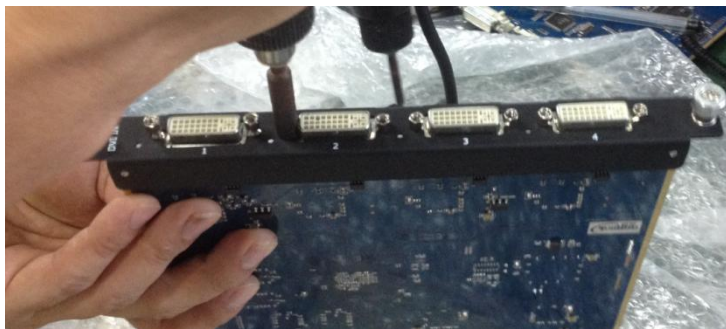
4. Push the input modules into the device along the slide rail, and screw the captive

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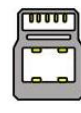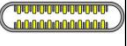
●**USB:** Universal Serial Bus is a standard that was developed in the mid-1990s that defines cables, connectors and communication protocols. This technology is designed to allow a connection, communication and power supply for peripheral devices and computers.

●**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:** Software 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.

6.4 Revision History

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

Format	Time	ECO#	Description	Principal
V1.0	2015-01-06	0000#	Release.	Vira
V1.1	2015-05-07	0001#	1. Add the optional module. 2. Update the menu tree. 3. Update the windows control program.	Vira
V1.2	2015-07-17	0002#	1. Add the menu operation instruction. 2. Add "Optional Module Installation and Replacement Instruction".	Vira
V1.3	2015-07-29	0003#	1. Update the windows control program. 2. Update the common Questions and solutions. 3. Update the specification.	Vira
V1.4	2015-12-02	0004#	1. Update the back panel. 2. Update the windows control program. 3. Update the software upgrade. 4. Update the specification.	Vira
V1.5	2018-06-15	0005#	1. Update XPOSE control 2. Update Specification	Fanny
V1.6	2021-07-08	0006#	Update Appendix	Sylvia
V1.7	2023-10-26	0007#	Update XPOSE 2.0 operation	Aster
V1.8	2023-12-01	0008#	Update order codes	Aster

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