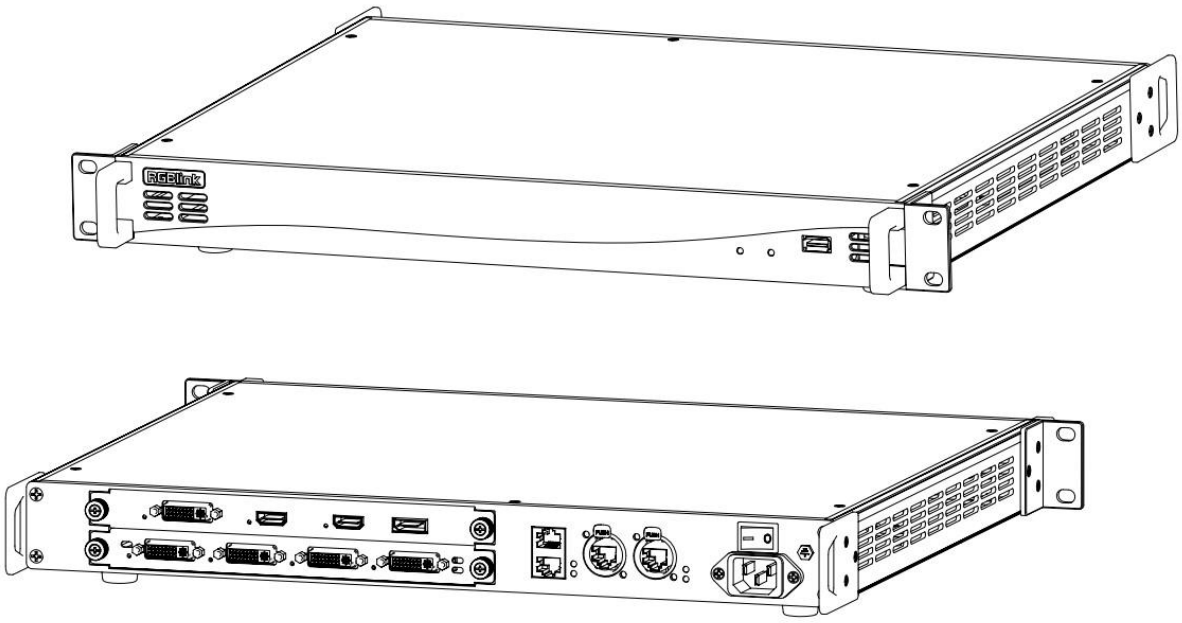
FLEX RS1



User Manual

RGBlink®

Article No: RGB-RD-UM-FLEX RS1 E001
Revision No: V1.1

CONTENTS

Declarations 2
FCC/Warranty 2
Operators Safety Summary 3
Installation Safety Summary 3
Chapter 1 Your Product 5
1.1 In the Box 5
1.2 Product Overview 6
1.2.1 Front Panel 7
1.2.2 Back Panel 8
1.2.3 Dimension 9
Chapter 2 Installing Your Product 10
2.1 Plugging in Signals 10
2.2 Plugging in Main Power 10
Chapter 3 Using Your Product 11
3.1 XPOSE Operation 11
3.1.1 XPOSE Installation 11
3.2 XPOSE Controls FLEX RS1 16
3.2.1 Login in XPOSE 16
3.2.2 Web Links 18
3.2.3 Connect Device 18
3.2.4 System Setting 19
3.2.4.1 Connect Setting 19
3.2.4.2 IP Setting 20
3.2.4.3 System Information 21
3.2.4.4 Factory Reset 21
3.2.4.5 Fan Control 22
3.2.5 Output Settings 23
3.2.5.1 Test Pattern 23
3.2.5.1 DE Setting 25
3.2.6 Input Setting 26
3.2.7 Operation Mode 28
3.2.7.1 Independent Mode 29
3.2.7.2 Rotation Mode 33
3.2.7.3 Projection Mode 37
Chapter 4 Ordering Codes 39
4.1 Product 39
Chapter 5 Support 40
5.1 Contact Us 40
Chapter 6 Appendix 41
6.1 Specification 41
6.2 FLEX RS1Upgrade 43
6.3 Terms & Definitions 44
6.4 Revision History 49

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 FLEX RS1 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 FLEX RS1 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 FLEX RS1should 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



HDMI Cable



HDMI to DVI Cable



DVI Cable



RS232 to RJ45 Cable



USB Cable



Antistatic Bag

Note:

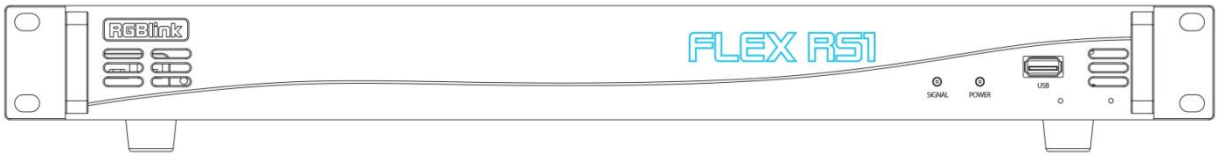
AC Power Cable supplied as standard according to destination market.

USB is contained on the Warranty/Registration Card. Please keep.

1.2 Product Overview

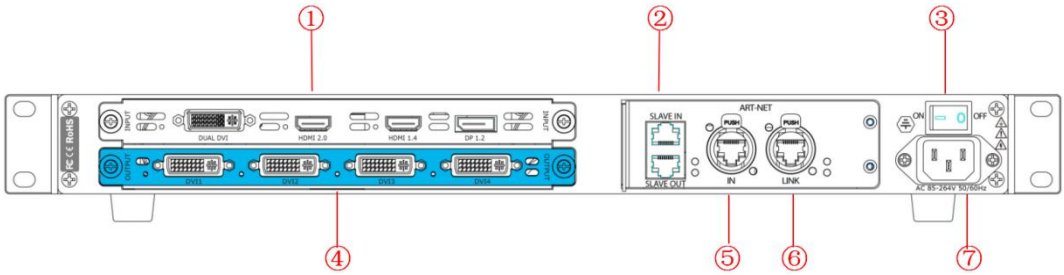
FLEX RS1 enables creative video split including any degree rotation, edge blending for the projector and video wall hard splicing. FLEX RS1 supports up to 4K2K, the UHD input resolution. It supports two HDMI inputs, a dual-link DVI input, a Display Port input and four DVI outputs. Different resolutions can be set in each output.
FLEX RS1 features in multiple cascade, and simple managed by XPOSE software.

1.2.1 Front Panel



Panel Instruction			
SIGNAL	Signal indicator lights when device has connected with input signal.	USB Interface	To upgrade the device
POWER	Power indicator lights when device has power supply.		

1.2.2 Back Panel



Input Interface

1	Slot for Input Module Supporting for 4K@60Hz signals. Connectors includes dual-link DVI, HDMI1.4, HDMI2.0, DP1.2. Each HDMI module supports 1 HDMI-A input.

Output Interface

4	4 DVI outputs

Control Interface

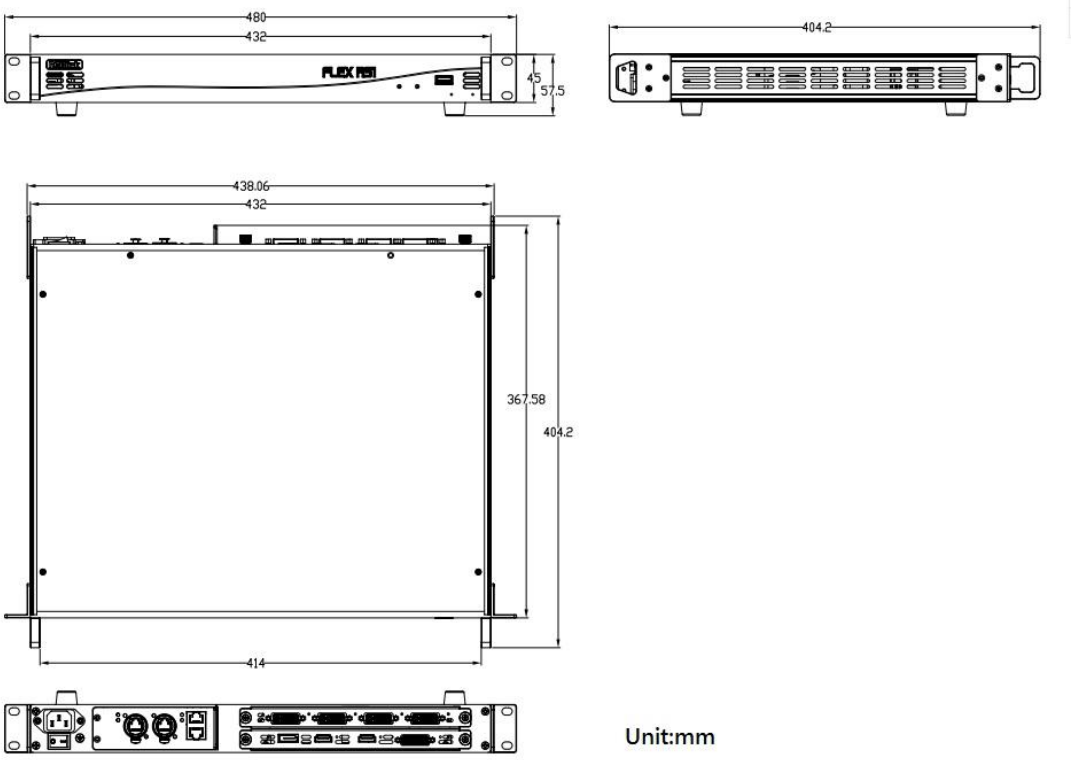
2	SLAVE IN and OUT SLAVE IN Connect to XPOSE software by RGBlink supports a USB to RS 232 converter and the RS 232 to RJ11 cable for this connection, as standard accessories.
5	ART-NET IN Connect to ARTNET(DMX) controller.
6	ART-NET LINK Connect to another equipment to make multiple cascade.

Power Connection

3	Power Switch
7	AC 85-264V 50/60HZ

1.2.3 Dimension

Following is the dimension of FLEX RS1for your reference:



Unit:mm

Chapter 2 Installing Your Product

2.1 Plugging in Signals

Connect signals to the product (ensure all devices are powered off first). Tighten connector screws/locks where provided.Connect to XPOSE software by DB9 to RJ45cable. RGBlink provides a DB9 to RJ45 cable for this connection, as a standard accessories. Please check in the package for this cable..



2.2 Plugging in Main Power

Connect IEC cable to device and plug into wall socket. Turn on power at wall socket. The power indicator on front panel lights.

Chapter 3 Using Your Product

3.1 XPOSE Operation

3.1.1 XPOSE Installation

Environment Requirements:

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

Memory: 2 GB or more

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

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

Monitor: Resolution must be 1280 x720 pixel or above (it can not display normally if the resolution is lower than 1280 x720)

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



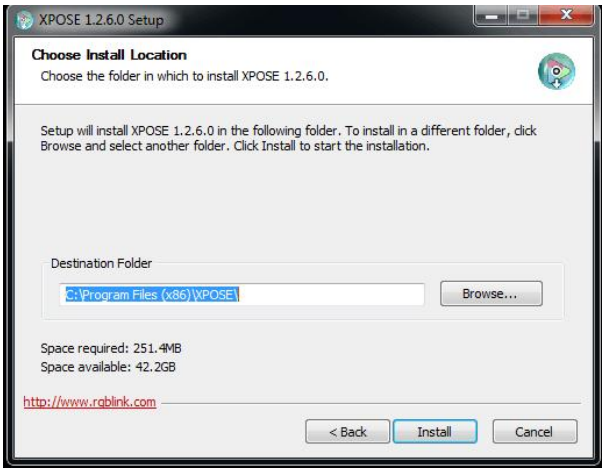
Double click icon, it will pop-up the installer language box, select the language, for example, select “English”, and click “OK” to confirm.



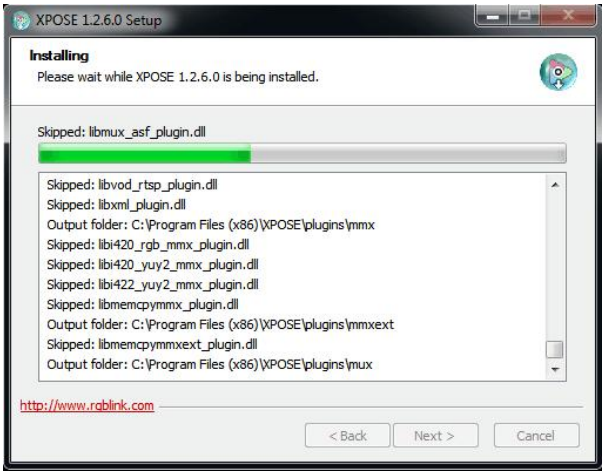
Click “Next” to install:



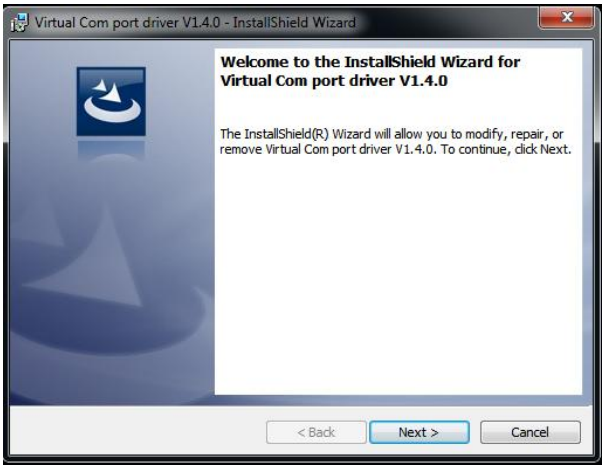
Select “Browse...” to select the XPOSE software install location:



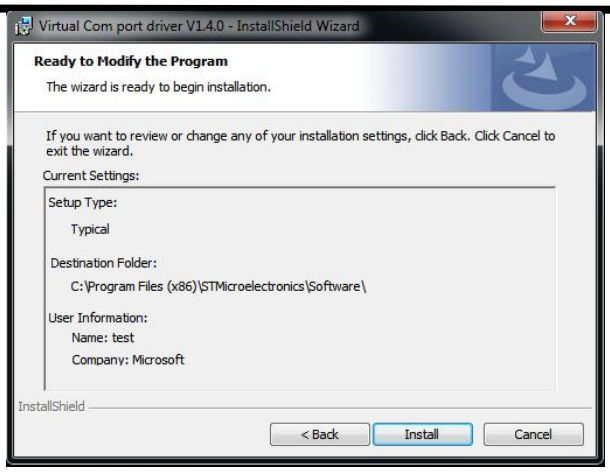
Click “Install”:



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



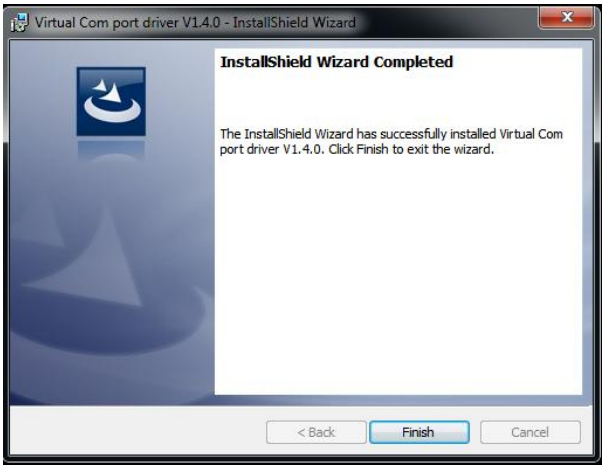
If user install the XPOSE software for the first time, click “Next”



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



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



Select”Finish”and the device driver is completed installed，：



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

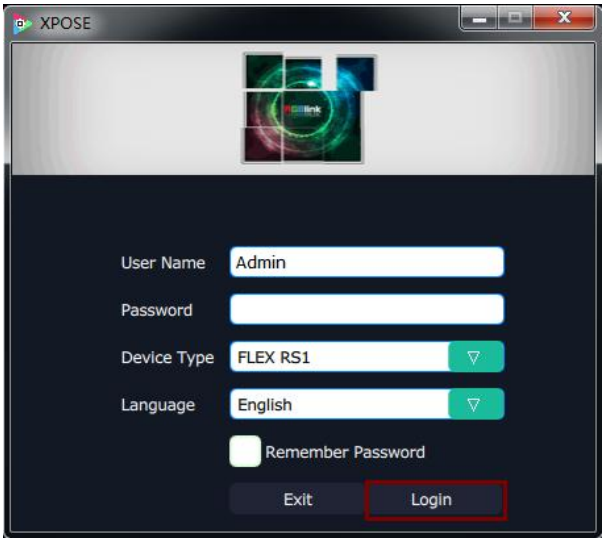


3.2 XPOSE Controls FLEX RS1

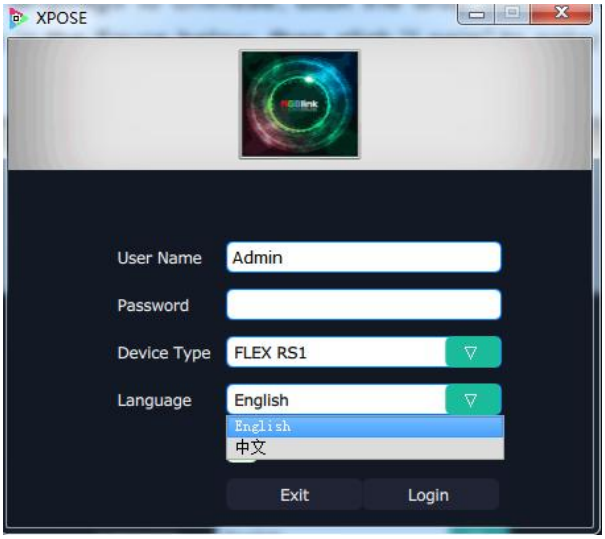
3.2.1 Login in XPOSE

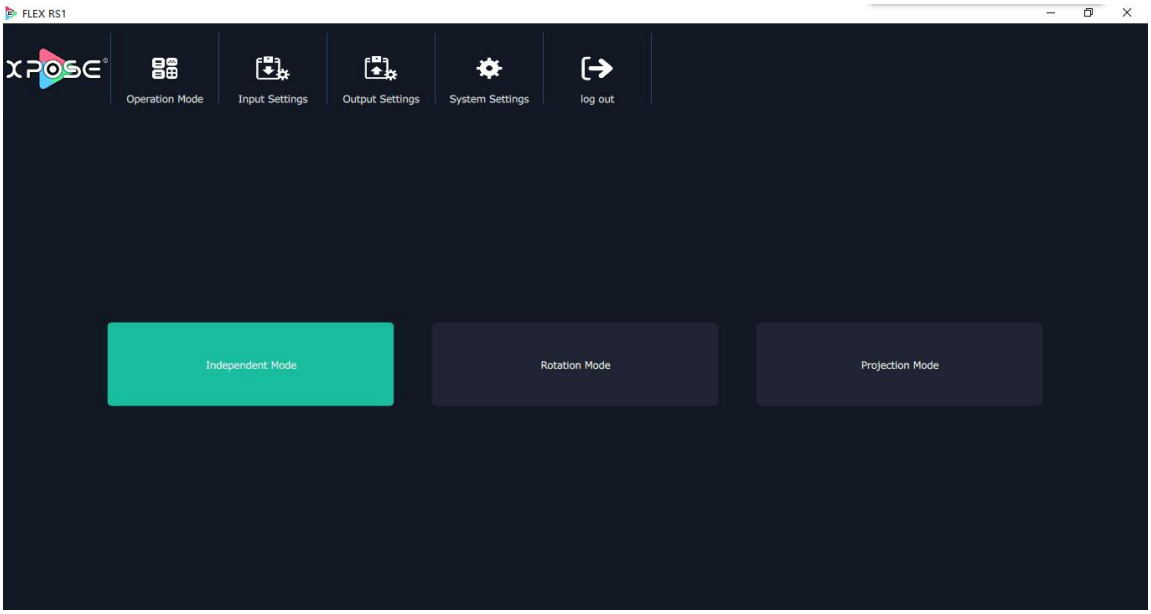
Double click the icon 

on the desktop. Login interface will pop up, the user name is Admin, and there is no password, select “FLEX RS1”, and enter the XPOSE by clicking “Login”.



If user want to change the language, click the drop down arrow after “Language” and there are “English” and “中文” for option, as shown in the figure below, then click “Login” to enter into the XPOSE.





XPOSE management software interface is shown as follows:

XPOSE management software contains the functions including: Operation Mode, Input Settings, Output Settings, System Settings and Log out. In the following parts come with the detail.

3.2.2 Web Links

XPOSE management software sets up the web links. Click the web links icon on the top left corner, and enter the RGBlink's website, as shown in the picture below:



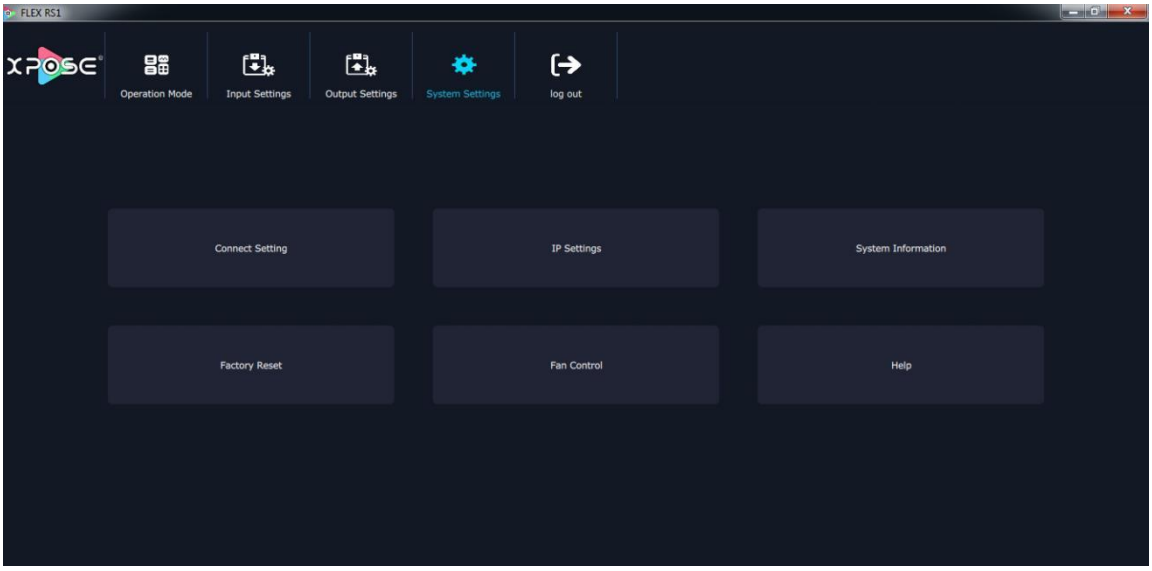
Search the device "FLEX RS1" on RGBLink's website,
Users will find related document and upgrade firmware and tool in "Download"
Click Search on the right top of the page, key in the product name in search bar and click search. Users can find the product and enter the page of the product, scroll down to the end, "Download" will be found.

3.2.3 Connect Device

The remote controller PC which runs XPOSE connects with Flex RS1 by the USB to the RS 232 converter and the RS 232 to RJ45 cable (with the standard accessories).

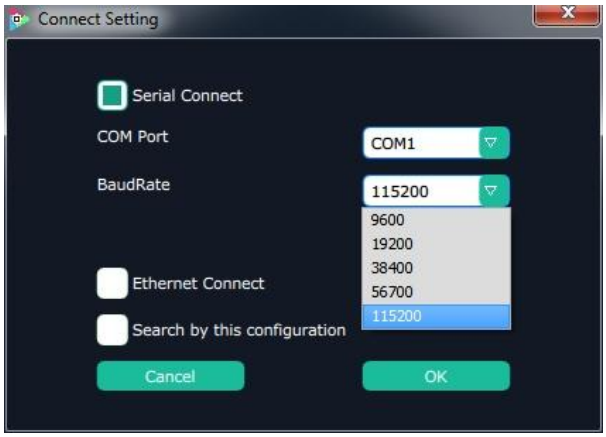
3.2.4 System Setting

Click “System Setting” in the main interface:

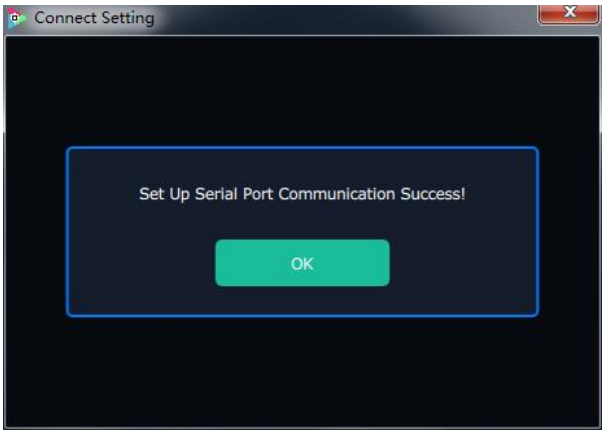


3.2.4.1 Connect Setting

Click “Connect Setting”: Select ”COM Port” and “Baud Rate”, click the drop down arrow after them, and click “OK”.

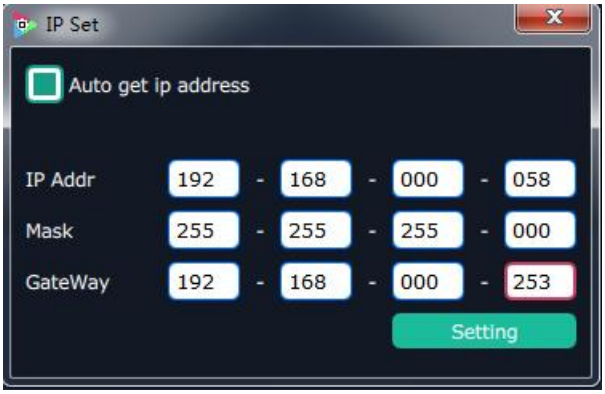


Setting the device connecting ways: Serial Connect, Ethernet Connect and Search by this configuration.
After setting ”COM Port” and “Baud Rate”, pop-up window as follows:



3.2.4.2 IP Setting

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



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

3.2.4.3 System Information

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



Display the device version information. Including Model Number, Serial Number, IP Address, firmware version, etc.

3.2.4.4 Factory Reset

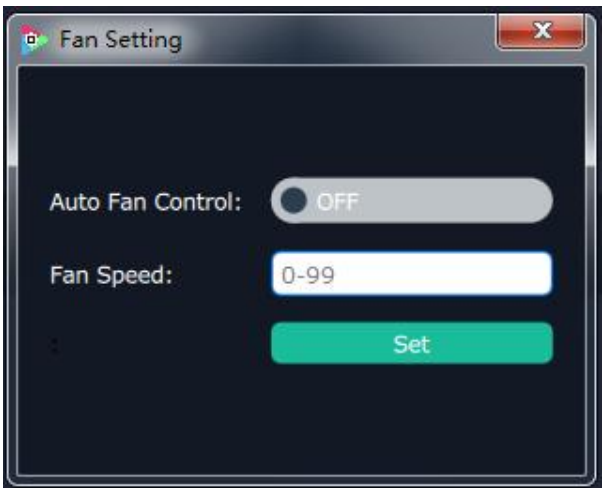
Click “Factory Reset”, and pop-up window as follows:



Click “OK” or “Cancel” to confirm or cancel the IP reset.

3.2.4.5 Fan Control

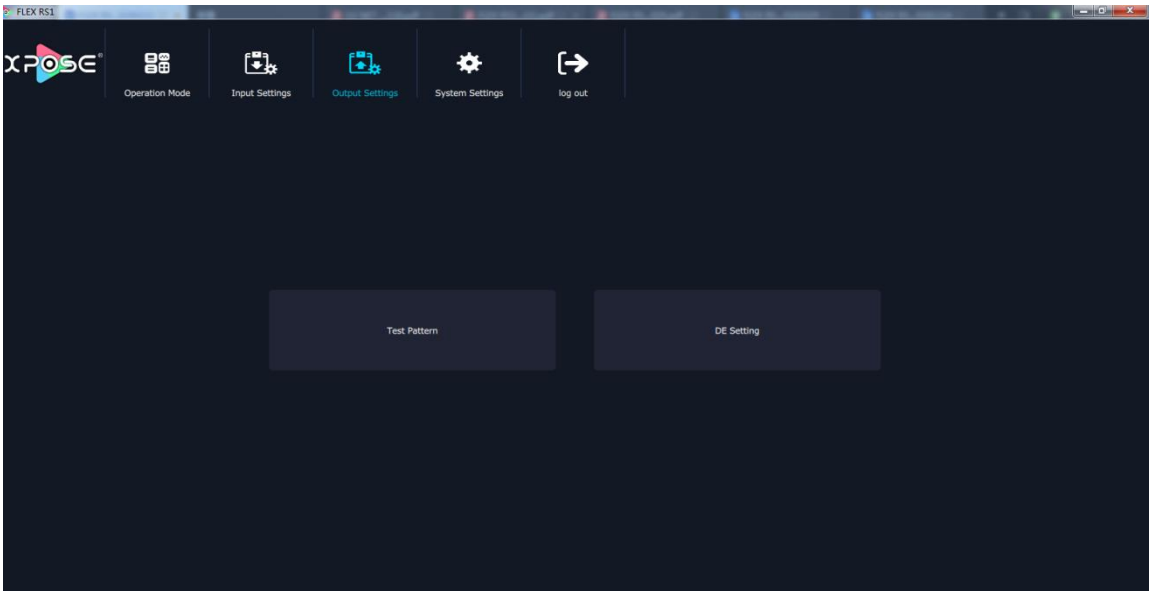
Click “Fan Control”, and pop-up window as follows:



Enable or disable the Auto Fan Control, set Fan Speed and click ”Set”, that will load.

3.2.5 Output Settings

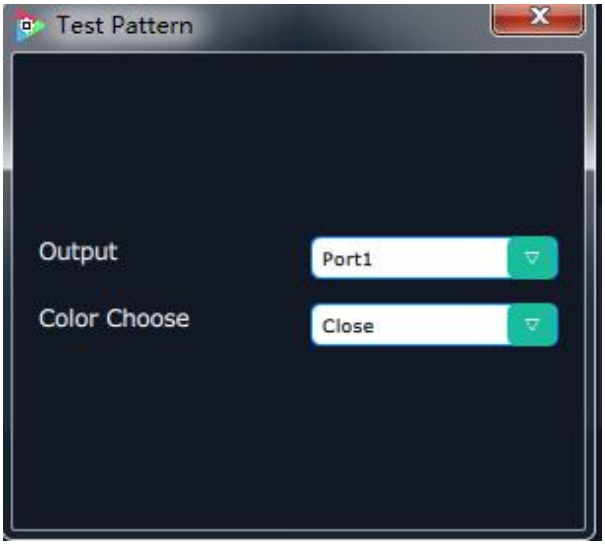
Click the “Output Settings”, and enter the interface as follows:



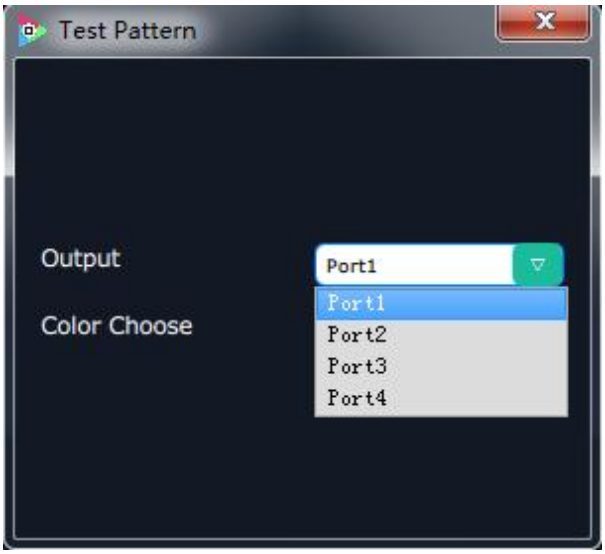
Test Pattern and DE Setting are included in output settings, specific as follows:

3.2.5.1 Test Pattern

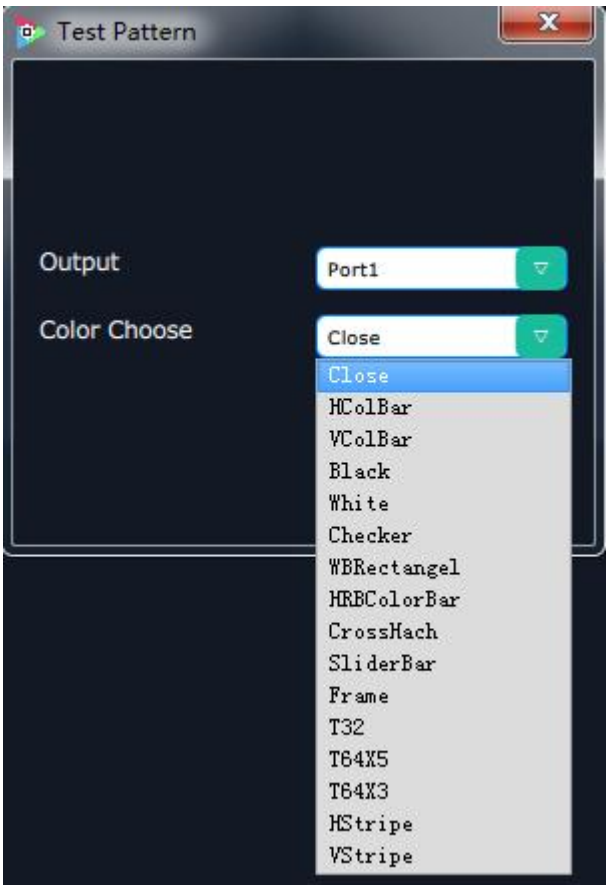
Click the “Test Pattern”, and pop-up window as follows:



Click the drop down arrow of “Output”and select any Ports among the four boards.

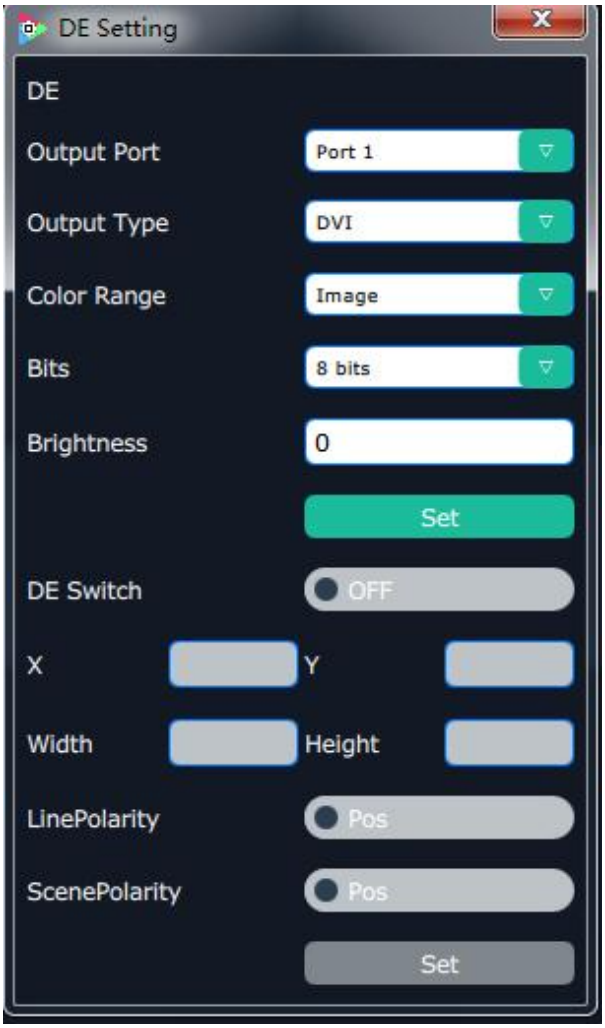


Click the drop down arrow of “Color Choose”and select any Ports among the sixteen boards.



3.2.5.1 DE Setting

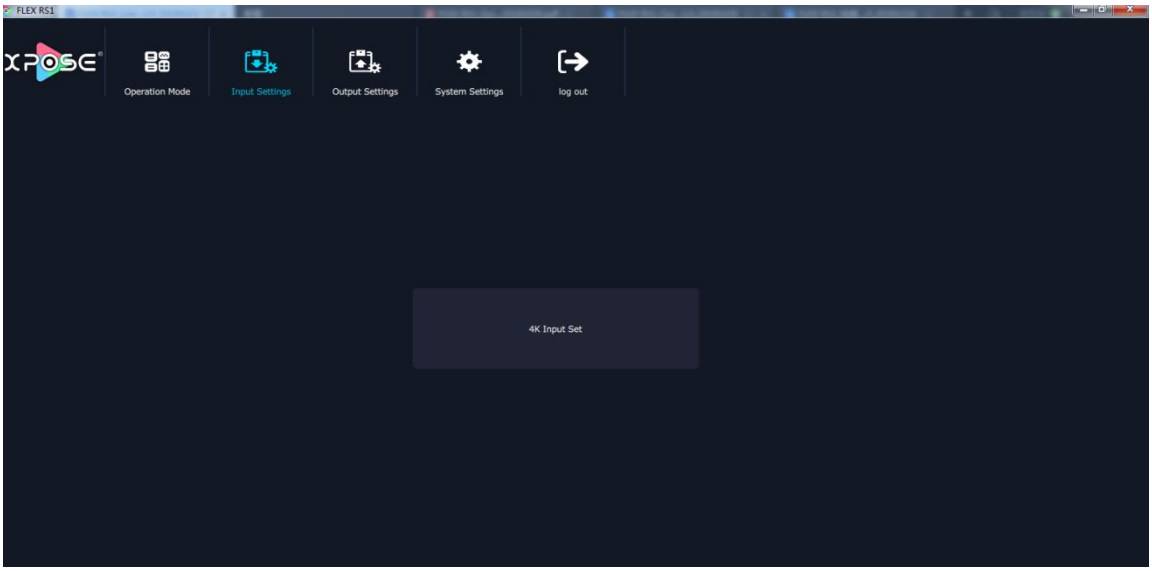
Click the “DE Setting”, and pop-up window as follows:



(1) Output Port: Select the out put port as requirement.
(2) Output Type: Select HDMI or DVI as needed.
(3) Color Range: Select Image or Video.
(4) Bits: 8 Bites as requirement.
(5) Brightness: The brightness adjustment range is between 0~128. Click “**Set**” to confirm.
(6) De Swith: Select on or off.
(7) X, Y, Width, Height: Select the as requirement.
(8) LinePolarity: Select the Pos or Neg as requirement.
(9) ScenePolarity: Select the Pos or Neg as requirement and click ”Set” to confirm.

3.2.6 Input Setting

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



Click the “4K Input Set” and pop-up window as follow:



Work Mode: Click the drop down arrow, select the input source among “4K x 2K” ,“4K x 1K” “2K x 1K”

Input type: Dual DVI, HDMI 1.4, HDMI2.0, DP1.2

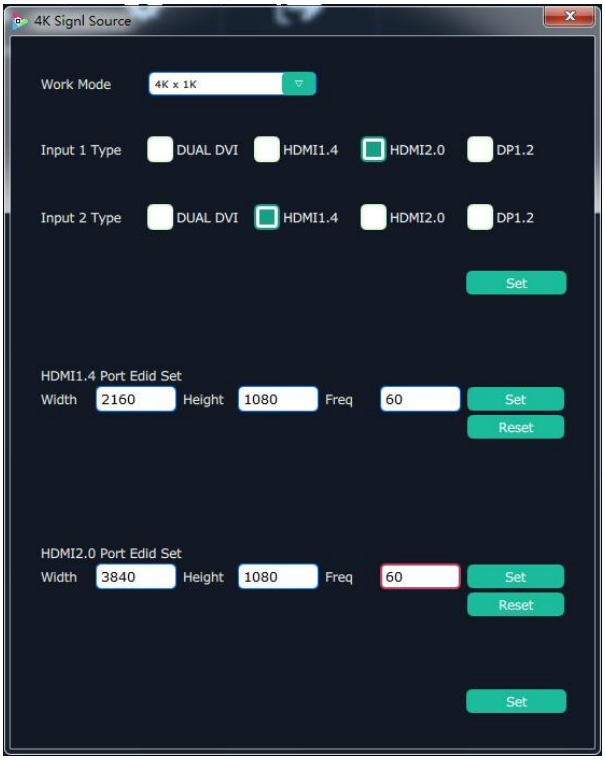
Under the ‘**Work Mode”** of 4K x 2K, users can only choose one input.

Under the “**Work Mode”** of 4K x 1K or 2K x 1K,Users can choose two same input or two different input. See the example below when users select 4K x 1K **“Work Mode”**.



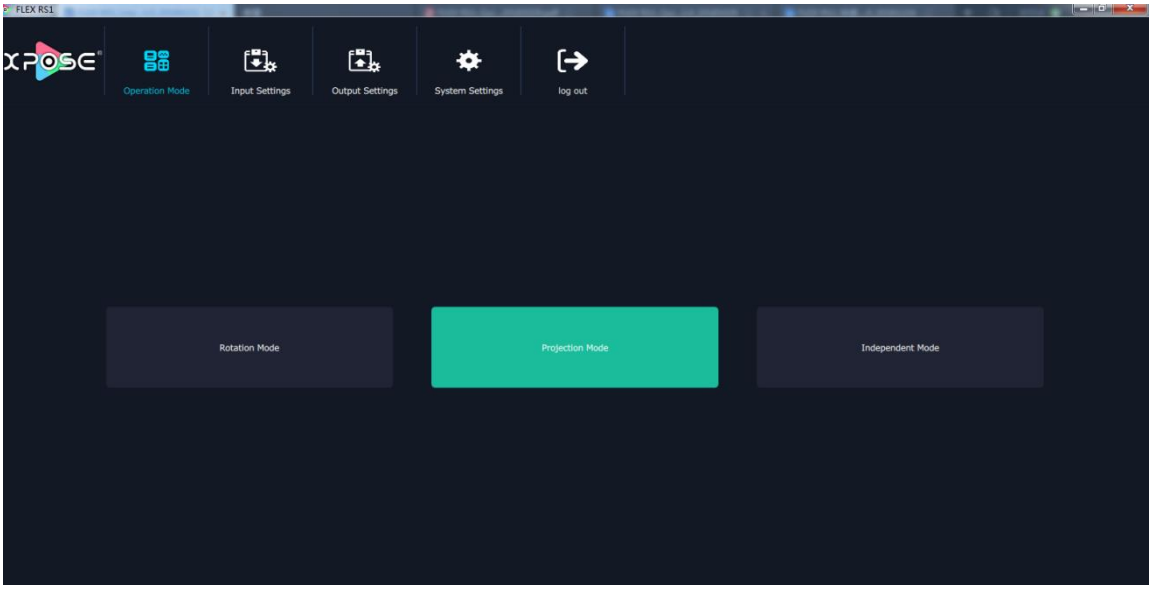
Dual DVI/HDMI1.4/HDMI2.0/DP1.2 Port EDID Set.

After choosing Input type, users can do corresponding port EDID set of Width, Height and Frequency.



3.2.7 Operation Mode

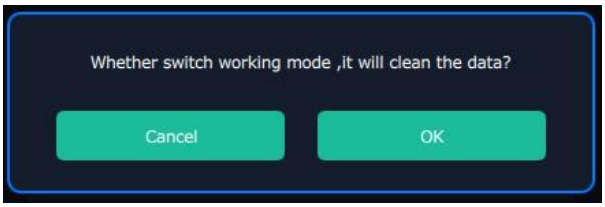
Click the “Operation Mode”, and enter the interface as follows:



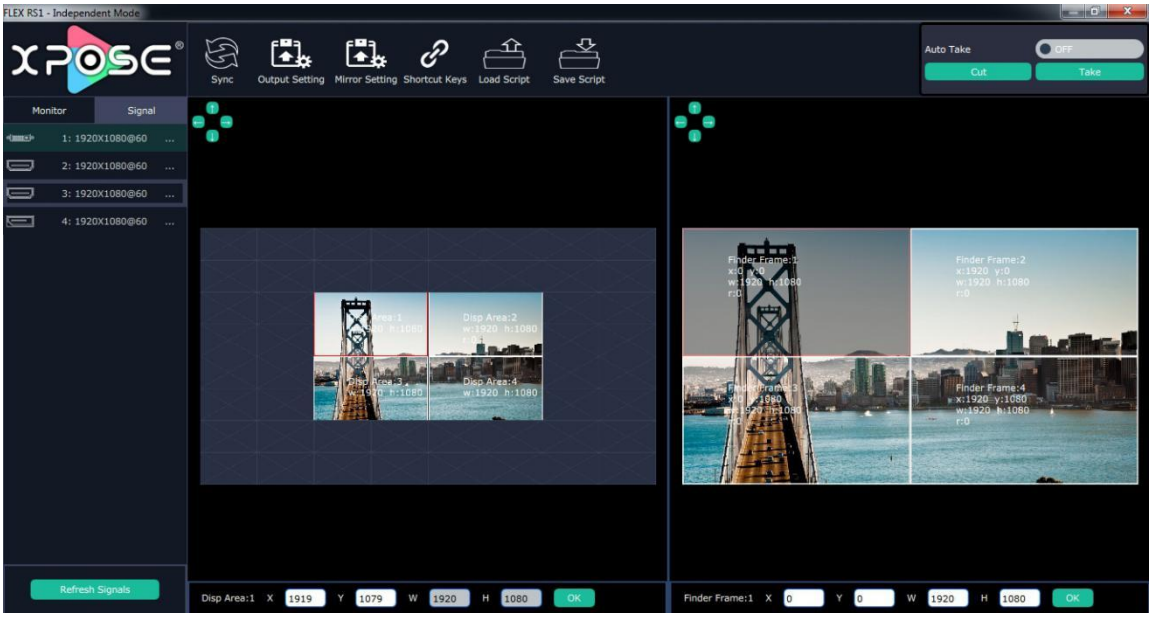
There are 3 working modes, including the **Rotation Mode, Projection Mode, Independent mode.**

3.2.7.1 Independent Mode

There is a warning window as below pop-up every time when users switch operation mode.



Click ok and enter Independent Mode interface.

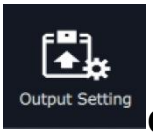


Disp Area 1~4: X, Y for position, W, H is display size.

There are two ways can change the size and location of the display:

A.Drag the layer by mouse: click the right window, select any layer, press the rim of the layer with mouse to drag the size, release the mouse, click the layer again, and press the mouse to drag the layer to suitable position.

B. Choose number directly: click the left or right window, select any layer and choose any number as X, Y, W, H to ensure accurate position and size.



1. Output Setting

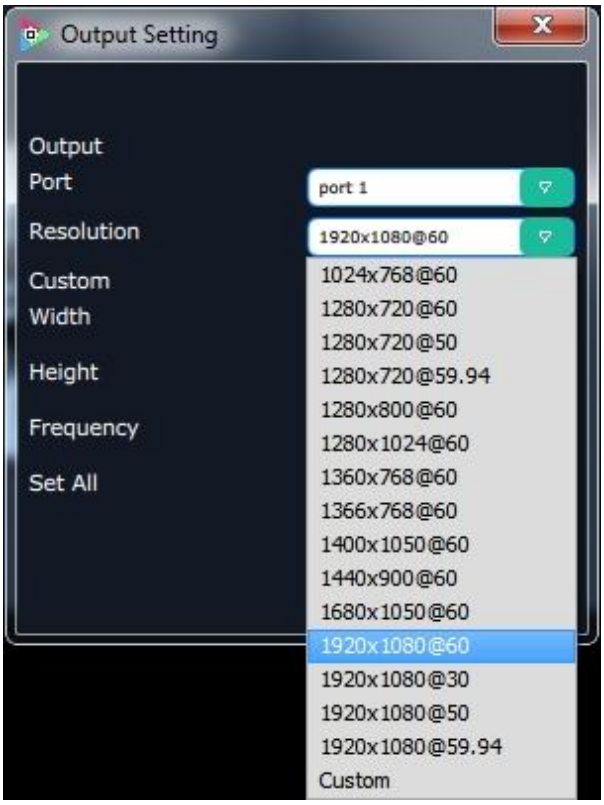
Click the Output Settings shortcut and pop-up window as follows:



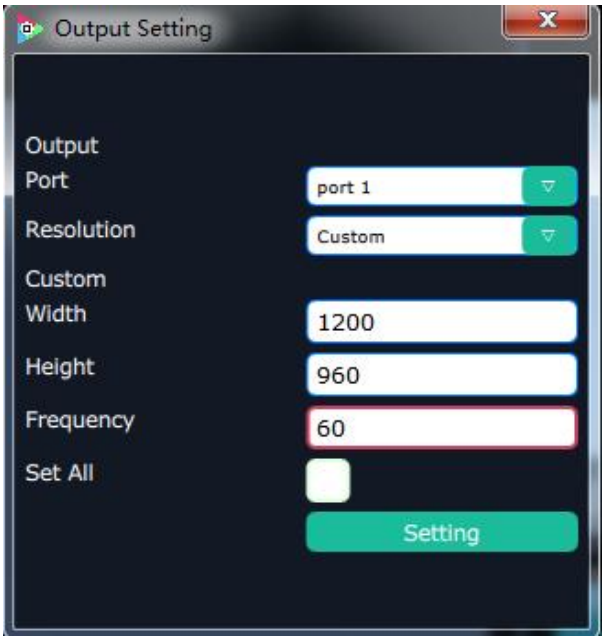
Click drop down arrow of Port and select any port among the four boards. This mode allow set each port resolution independently.



Click drop down arrow of “resolution” and select any resolution among the 15 boards.



Users can choose Custom when the non standard resolution is proper.
Width, Height and Frequency can be filled after users choose Custom.



Select “Set All” if users want all the four outputs at same resolution.



2. Mirror Setting

Click the Mirror Setting shortcut and pop-up window as follows:

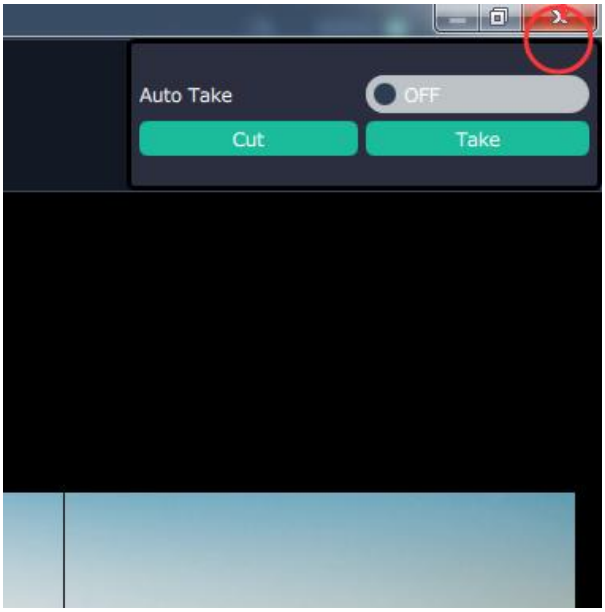


Click “Mirror Port” drop down arrow and select any port. Enable or disable the horizontal or vertical mirroring effect by sliding the switch.

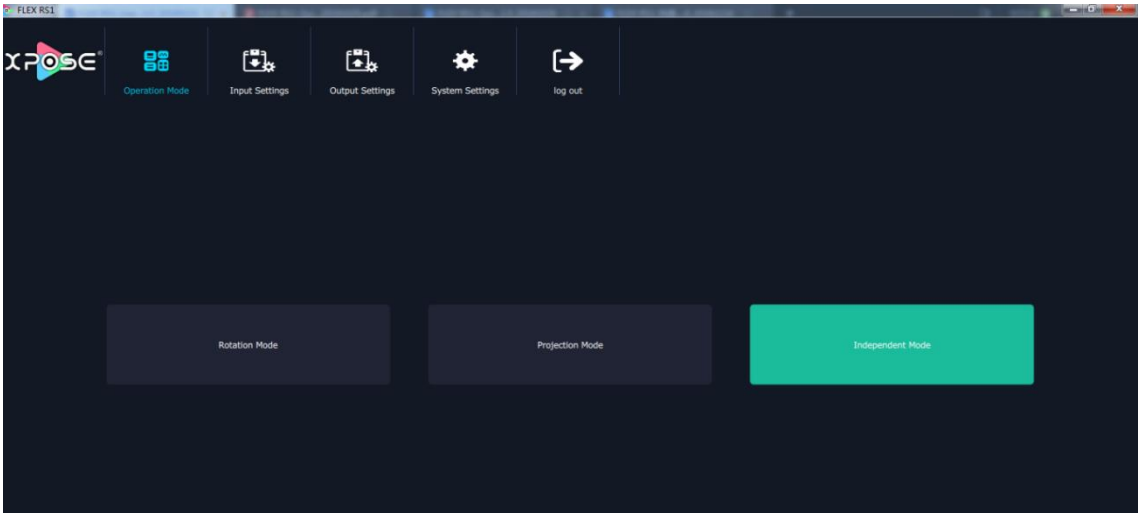
Independent mode is applied when each display independently show same or different content at same or different resolution. Each output is allowed to show mirror image under this mode.

3.2.7.2 Rotation Mode

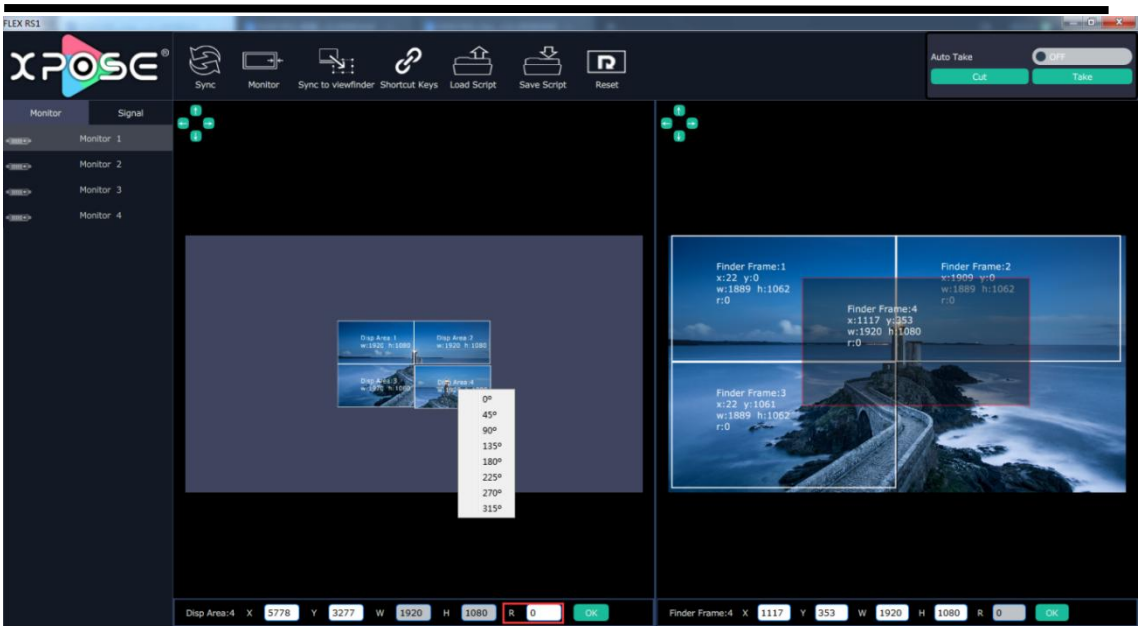
To exit current interface, just click the red cross on the right top.



And go back to the Operation Mode interface.

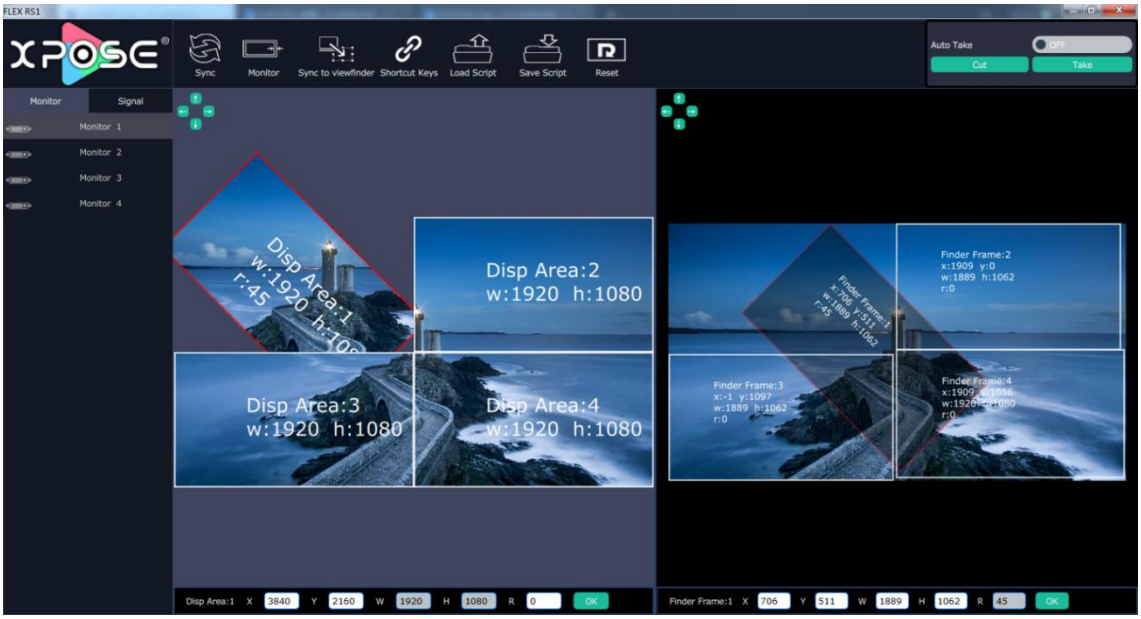


Click the “Rotation Mode”, and enter the following interface.



1.Disp Area: Display area, where users can select the display layer, set the position in blank bar after X and Y, rotate the display at 45 °, 90 °,135 °,180 °,225 °,270 °,315 ° by right clicking the mouse or fill in the exact degree in the blank bar after R. FELX RS1 support any rotation at 1 ° increment.

2.Finder Frame:where users can choose the display content here. When one display area is selected, its corresponding finder frame is selected as well. For example, when Disp Area 1 is selected and rotate it at 45 °, its finder frame is selected with 45 ° rotation. Users can select the display content for Disp Area by dragging the finder frame.



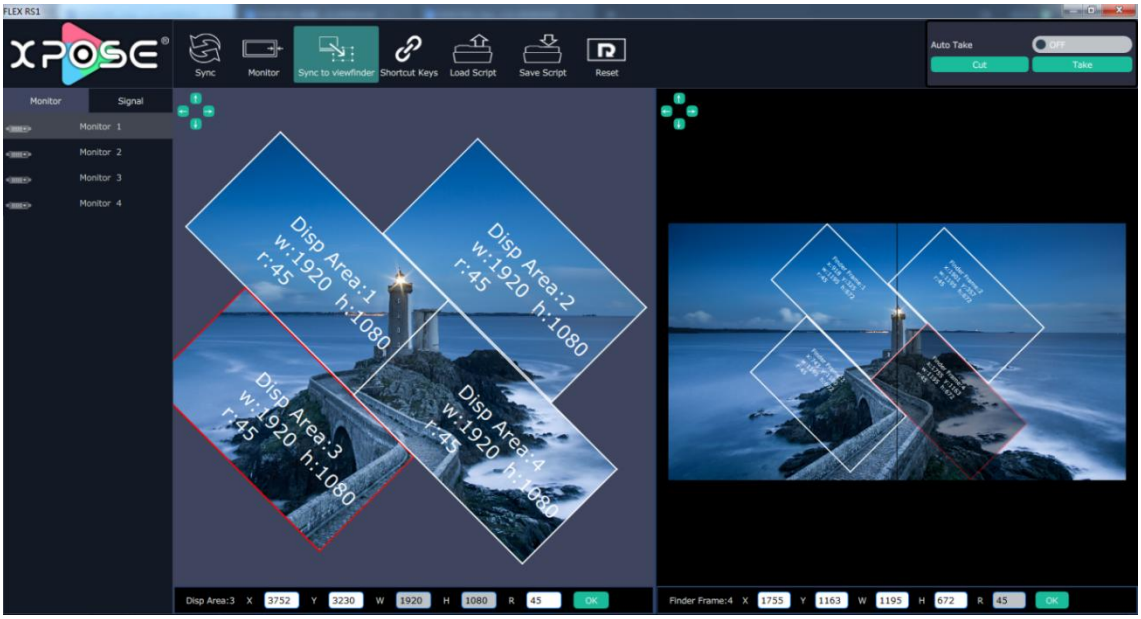


3. Monitor, set monitor size and border size here.



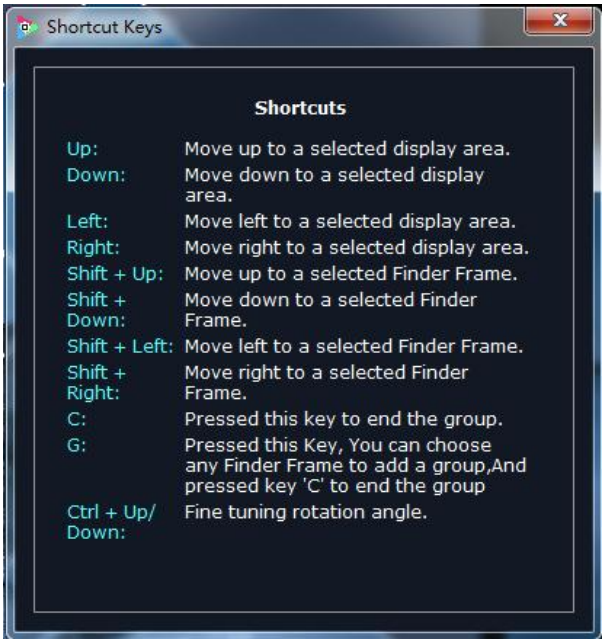


4. Sync to View Finder. Synchronize display area and finder frame.



5. 

Shortcut Keys

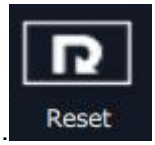


6. 

Save Script, Users can save the setting to computer or USB drive by clicking it.

7. 

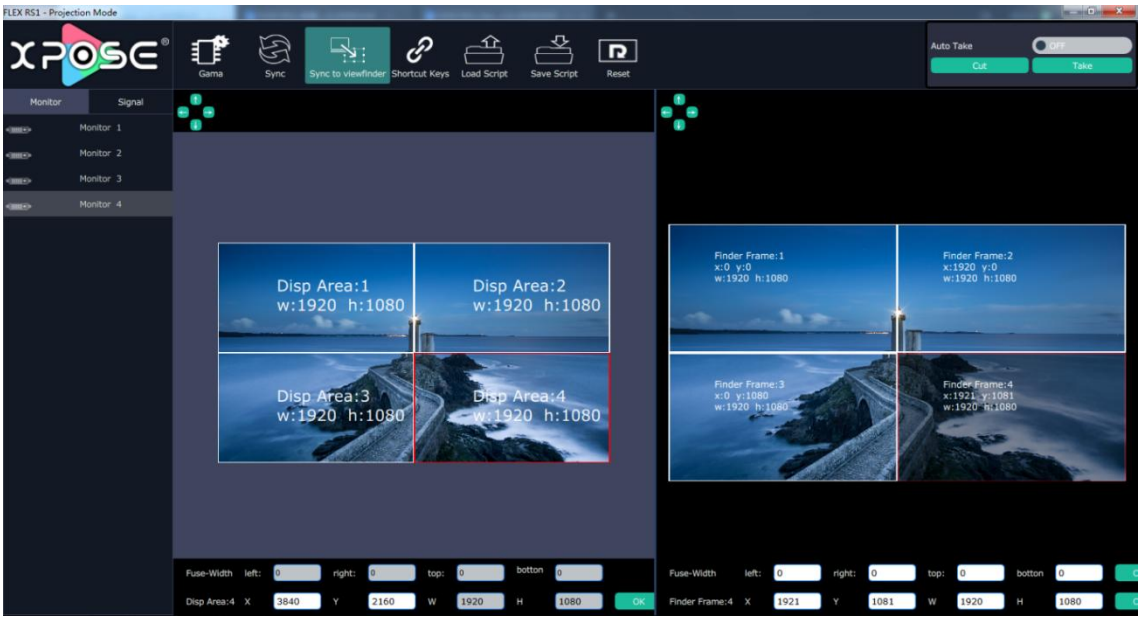
Load Script, users can load previously saved setting from computer or USB drive by clicking it.

8. 

Reset, if the operation is not proper, reset to clear former setting.

3.2.7.3 Projection Mode

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



1.Disp Area: Display area, where users can select the display layer, set the position in blank bar after X and Y.

2.Finder Frame:where users can choose the display content here. When one display area is selected, its corresponding finder frame is selected as well. Users set finder frame position in the blank bar after X and Y, set size after W and H.

3.Fuse Width above Finder Frame: To adjust border blending of each projection display by dragging the corresponding finder frame. The Fuse Width can show the exact parameter automatically. Users can also put in the exact pixels in the blank bar after Left, Right, Top, Bottom.

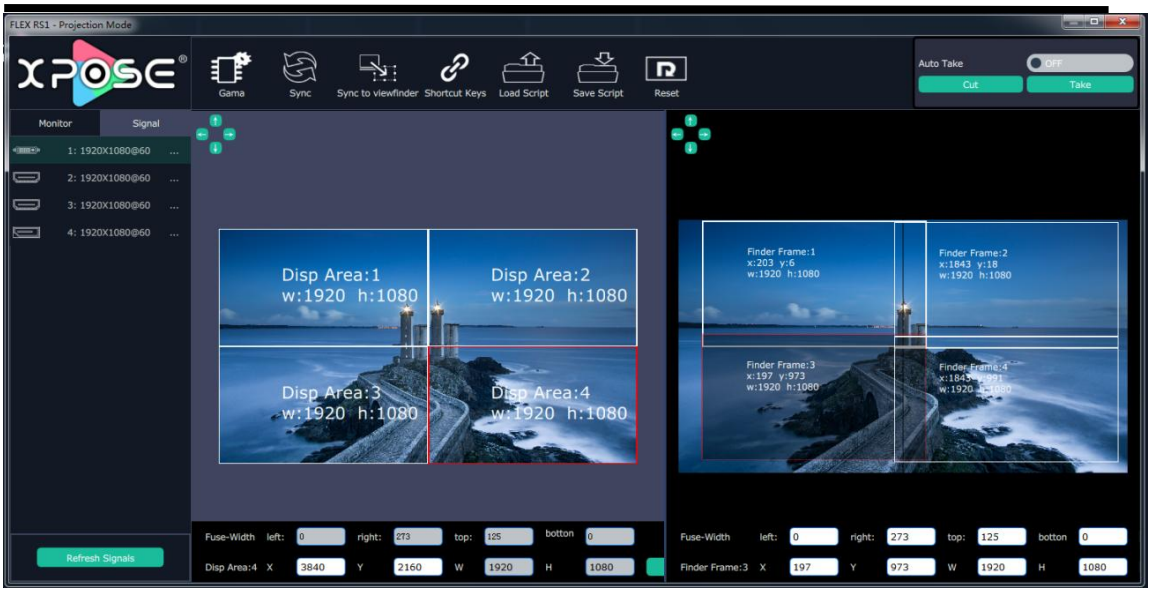
Note:Finder Frame 1 allow users to key in exact pixels of right and bottom

Finder Frame 2 allow users to key in exact pixels of left and bottom

Finder Frame 3 allow users to key in exact pixels of right and top

Finder Frame 4 allow users to key in exact pixels of left and top

Projection mode is applied to adjust the border blending of each projection output display to make perfect splicing .




Gamma

Users can set R,G,B value for each output.

Value range from 0~255





Sync

Reconnect XPOSE to device and synchronize data from device to XPOSE.

Chapter 4 Ordering Codes

4.1 Product

700-0001-01-0	FLEX RS1

Chapter 5 Support

5.1 Contact Us

www.rgblink.com



Inquiries

+86-592-577-1197
info@rgblink.com
rgblink.com/contact-us

Global Support

support@rgblink.com
rgblink.com/support-me

@RGBLINK /rgblink +rgblink /rgblink rgblink rgblink

RGBlink Headquarters
Xiamen, China

Room 601A, No. 37-3 Banshang community, Building 3, Xinke Plaza, Torch Hi-Tech Industrial Development Zone, Xiamen, China

+86-592-577-1197

China Regional Sales & Support
Shenzhen, China

11th Floor Baiwang Building 5318 Shahe West Road Baimang, Nanshan

+86-755 2153 5149

Beijing Region Office
Beijing, China

Building 8, 25 Qixiao Road Shahe Town Changping

+010- 8577 7286

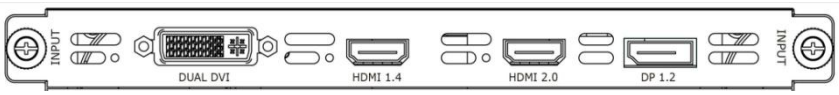
Europe Regional Sales & Support
Eindhoven, Holland

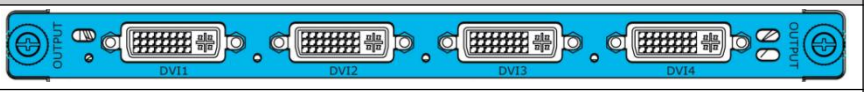
Flight Forum Eindhoven 5657 DW

+31 (040) 202 71 83

Chapter 6 Appendix

6.1 Specification

4K@60Hz Input		
Interface Appearance		
Number of Inputs	4	
Connector	1x DVI-I| 2x HDMI-A| 1 x DisplayPort	
Supported Standards	DVI	
	HDMI	2.0 | 1.4
	DisplayPort	1.2
Input Resolutions	SMPTE	525/29.97/59.94 NTSC | 625/25/50 PAL | 720p50/59.94/60 | 1080i50/59.94/60 |1080P23.94/24/25/30/50/59.94/60 |2160P23.94/24/25/30/50/59.94/60
	VESA	3840x2160@24 | 3840x2160@25 | 3840x2160@30 | 3840x2160@50 | 3840x2160@60

Quad DVI Output		
Interface Appearance		
Number of Inputs	4	
Connector	DVI-I	
Supported Standards	DVI	Single
Output Resolutions	SMPTE	720p@50/60 |1080p@/50/60
	VESA	800x600@50/60 | 1024x768@60 | 1280x720@50/50.9460 | 1280x800@60 | 1280x1024@60 | 1360x768@60 | 1366x768@60 1400x1050@ | 1440x900@60 | 1680x1050@60 | 1920x1080@30/50/59.94/60

Extras		
Communication	RS485	Salve In|Out 2×RJ45
	Artnet	In| Link 2×RJ45 （Ethercon）
Power Supply	AC: 110~240V , 50/60HZ	
Max Power	65W	
Working Environment	0°C -40°C	
Relativity Humidity	10% –85 % RH	
Weight	2.5kg	
Dimensions	483mm x 303mm x 45mm	
Product Warranty	3 years parts and labor warranty	

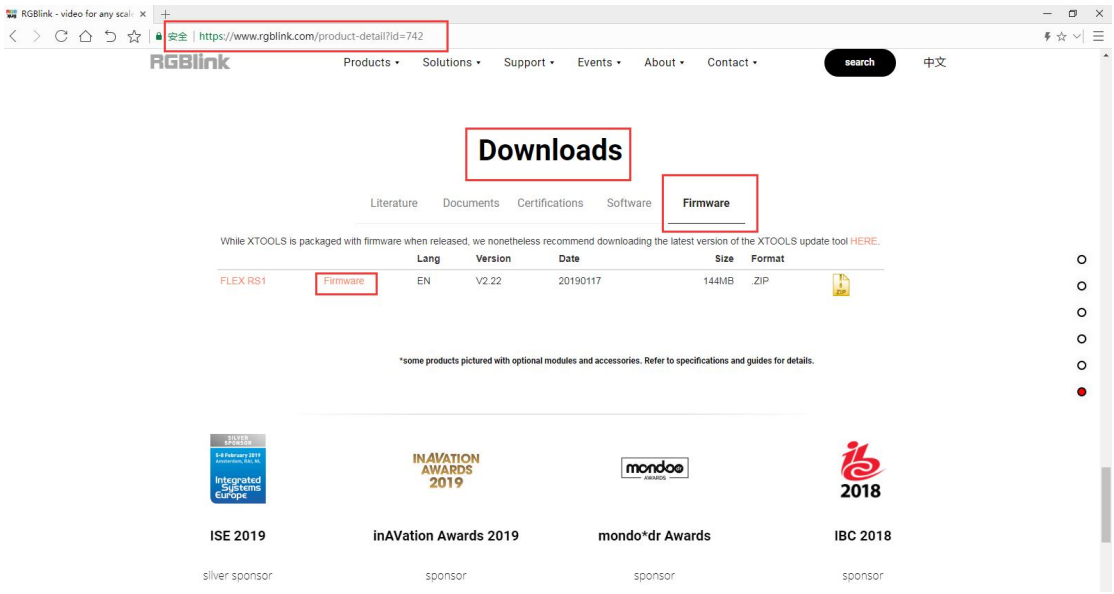
6.2 FLEX RS1 Upgrade

We offer upgrade software pack and tool on our website.

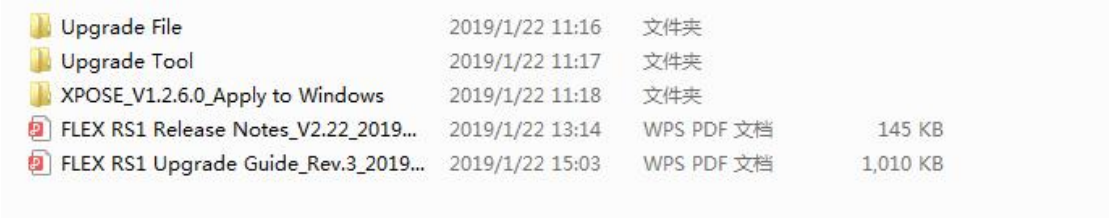
1. Download firmware and upgrade tool package

https://www.rgblink.com/product-detail?id=742

Use above directly link to the product page on our website, scroll down to the end, **Downloads** will be seen. Click **Firmware**，the latest upgrade package will be found. Download the package (the ZIP file).



2. Unzip the package.



3. Read FLEX RS1 Upgrade Guide and follow the guide to install upgrade tool , the XTOOl.
4. Connect FLEX RS1 with USB cable **In The Box** to Computer and follow the Upgrade Guide to upgrade the device.

6.3 Terms & Definitions

The following terms and definitions are used throughout this guide.

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

- **“Color temperature”:** The color quality, expressed in degrees Kelvin(K), of a light source. The higher the color temperature, the bluer the light. The lower the temperature, the redder the light. Benchmark color temperature for the A/V industry include 5000°K, 6500°K, and 9000°K.
- **“Contrast ratio”:** The radio of the high light output level divided by the low light output level. In theory, the contrast radio of the television system should be at least 100:1, if not 300:1. In reality, there are several limitations. In the CRT, light from adjacent elements contaminate the area of each element. Room ambient light will contaminate the light emitted from the CRT. Well-controlled viewing conditions should yield a practical contrast ratio of 30:1 to 50:1.
- **“DVI”:** Digital Visual Interface. The digital video connectivity standard that was developed by DDWG (Digital Display Work Group). This connection standard offers two different connectors: one with 24 pins that handles digital video signals only, and one with 29 pins that handles both digital and analog video.
- **“EDID”:** Extended Display Identification Data – EDID is a data structure used to communicate video display information, including native resolution and vertical interval refresh rate requirements, to a source device. The source device will then output the optimal video format for the display based on the provided EDID data, ensuring proper video image quality. This communication takes place over the DDC – Display Data Channel.
- **“Ethernet”:** A Local Area Network (LAN) standard officially known as IEEE 802.3. Ethernet and other LAN technologies are used for interconnecting computers, printers, workstations, terminals, servers, etc. within the same building or campus. Ethernet operates over twisted pair and over coaxial cable at speeds starting at 10Mbps. For LAN interconnectivity, Ethernet is physical link and data link protocol reflecting the two lowest layers of the OSI Reference Model.
- **“Frame”:** In interlaced video, a frame is one complete picture. A video frame is made up of two fields, or two sets of interlaced lines. In a film, a frame is one still picture of a series that makes up a motion picture.
- **“Gamma”:** The light output of a CRT is not linear with respect to the voltage input. The difference between what you should have and what is actually output is known as gamma.
- **“HDMI” - High – Definition Multimedia Interface:** An interface used primarily in consumer electronics for the transmission of uncompressed high definition video, up to 8 channels of audio, and control signals, over a single cable. HDMI is the de facto standard for HDTV displays, Blu-ray Disc players, and other HDTV electronics. Introduced in 2003, the HDMI specification has gone through several revisions.
- **“HDSDI”:** The high-definition version of SDI specified in SMPTE-292M. This signal standard transmits audio and video with 10 bit depth and 4:2:2 color quantization over a single coaxial cable with a data rate of 1.485 Gbit/second. Multiple video resolutions exists including progressive 1280x720 and interlaced 1920x1080 resolution. Up to 32 audio signals are carried in the ancillary data.
- **“JPEG” (Joint photographic Expects Group):** Commonly used method of lossy compression for photographic images using a discreet cosine transfer function. The

degree of compression can be adjusted, allowing a selectable tradeoff between storage size and image quality. JPEG typically achieves 10:1 compression with little perceptible loss in image quality. Produces blocking artifacts.

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

a given color in any image is free from white. The less white in a color, the truer the color or the greater its saturation. On a display device, the color control adjusts the saturation. Not to be confused with the brightness, saturation is the amount of pigment in a color, and not the intensity. Low saturation is like adding white to the color. For example, a low-saturated red looks pink.

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

- **“VGA”:** Video Graphics Array. Introduced by IBM in 1987, VGA is an analog signal with TTL level separate horizontal and vertical sync. The video outputs to a 15-pin HD connector and has a horizontal scan frequency of 31.5 kHz and vertical frequency of 70 Hz (Mode 1, 2) and 60 Hz (Mode 3). The signal is non-interlaced in modes 1, 2, and 3 and interlaced when using the 8514/A card (35.5 kHz, 86 Hz) in mode 4. It has a pixel by line resolution of 640×480 with a color palette of 16 bits and 256,000 colors.
- **“YCrCb”:** Used to describe the color space for interlaced component video.
- **“YPbPr”:** Used to describe the color space for progressive-scan (non-interlaced) component video.

6.4 Revision History

The table below lists the changes to the User Manual of FLEX RS1.

Format	Time	ECO#	Description	Personnel
V1.0	2019-02-27	0000#	Release	Fanny
V1.1	2022-11-07	0001#	Revise connector information	Aster
V1.2	2025-09-12	0002#	Update the included accessories	Alyssa