D4

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 D4 processor installation procedures, please observe the following important safety and handling rules to avoid damage to yourself and the equipment.
To protect users from electric shock, ensure that the chassis connects to earth via the ground wire provided in the AC power Cord.
The AC Socket-outlet should be installed near the equipment and be easily accessible.

Unpacking and Inspection

Before opening D4 processor shipping box, inspect it for damage. If you find any damage, notify the shipping carrier immediately for all claims adjustments. As you open the box, compare its contents against the packing slip. If you find any shortages, contact your sales representative.

Once you have removed all the components from their packaging and checked that all the listed components are present, visually inspect the system to ensure there was no damage during shipping. If there is damage, notify the shipping carrier immediately for all claims adjustments.

Site Preparation

The environment in which you install your D4 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×AC Power Cord	**2×HDMI Cable**	**1×USB Cable**

1×Antistatic Bag

Note:

AC Power Cable supplied as standard according to destination market.

1.2 Product Overview

With standard any in and any out, D4 is so much more than 4K scale.

With multiple output modes, D4 is a very flexible solution across a range of applications whether for scaling, presentation switching, 4K distribution or broadcast.

Truly an All-In-One solution, D4 accept a wide range of input signals in a huge array of formats. Inputs can be converted, scaled, transcoded to standard HDMI 2.0 outputs or output to optional ports including DP1.2,12G SDI and DVI.

With a built-in dual channel 4k scaler, D4 provides 12bit interface connection, with EDID management,HDCP2.X compliant and YUV4:4:4 10 bit color reproduce.

Based on the flexible modular structure, D4 can be expanded to more connection or any connection in need, but not features only as a standard unit, besides its embedded and de-embeded audio processing capacity.
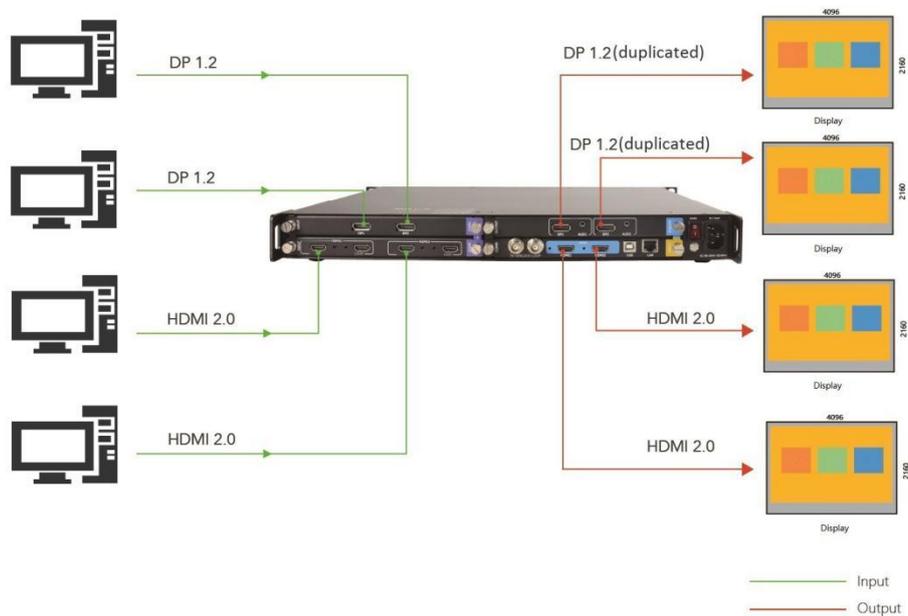
D4 System Connection Diagram

1.2.1 Front Panel
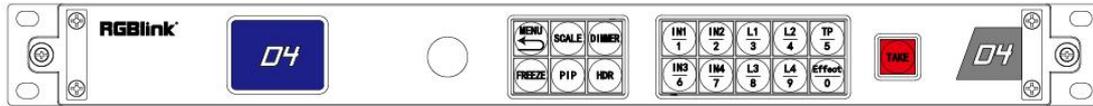
Button Instruction			
	Number button 0~9, use for scale, crop, zoom and custom setting		Input signal source button
	Show operation menu items		Test pattern button
	Layer selection button		Short cut button to open Effect menu
	Confirm and adjust OLED menu		Scale button
	Menu and back button		Dimmer button
	Picture in Picture Button		Freeze Current Image
	High Dynamic Rang Image button		Switch from preset to program with transition effect

UI Instruction			
	Black and White		D4
	DSK		Dual Mode
	Fan 1		Fan 2

	Fan 3		Fan 4
	Genlock		Lock
	MENU		Mini Delay Mode
	Mirror Flip		Not Remote
	PIP		Presentation
	PST		Remote
	Rotate		Spit
	Standard		Temperature
	Unlock		

1.2.2 Back Panel
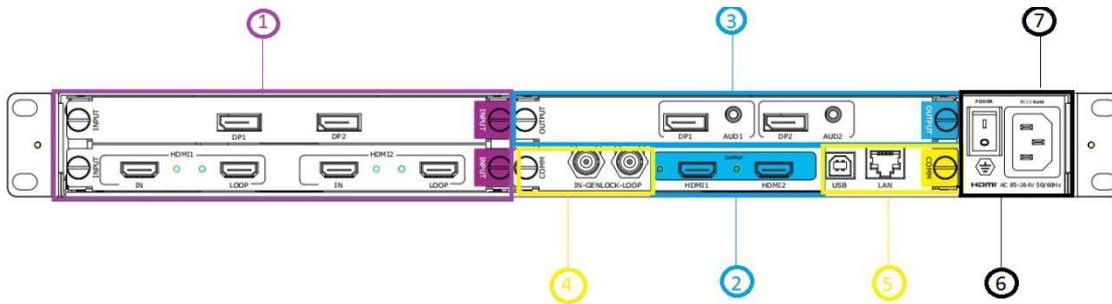
Chassis Module Structure				
1	2 input module slots, support DP1.2, 12G SDI, HDMI 2.0 and 3G SDI output input modules (The bottom slot support HDR)	5	Communication connectors including 1 LAN port and 1 USB-B port	
2	2 standard HDMI outputs (HDR supported)	6	Power switch	
3	1 output module slot, support DP1.2, 12G SDI, DVI optional output modules	7	Power socket	
4	Genlock In/Loop			

1.2.3 Dimension

Following is the dimension of D4 for your reference:
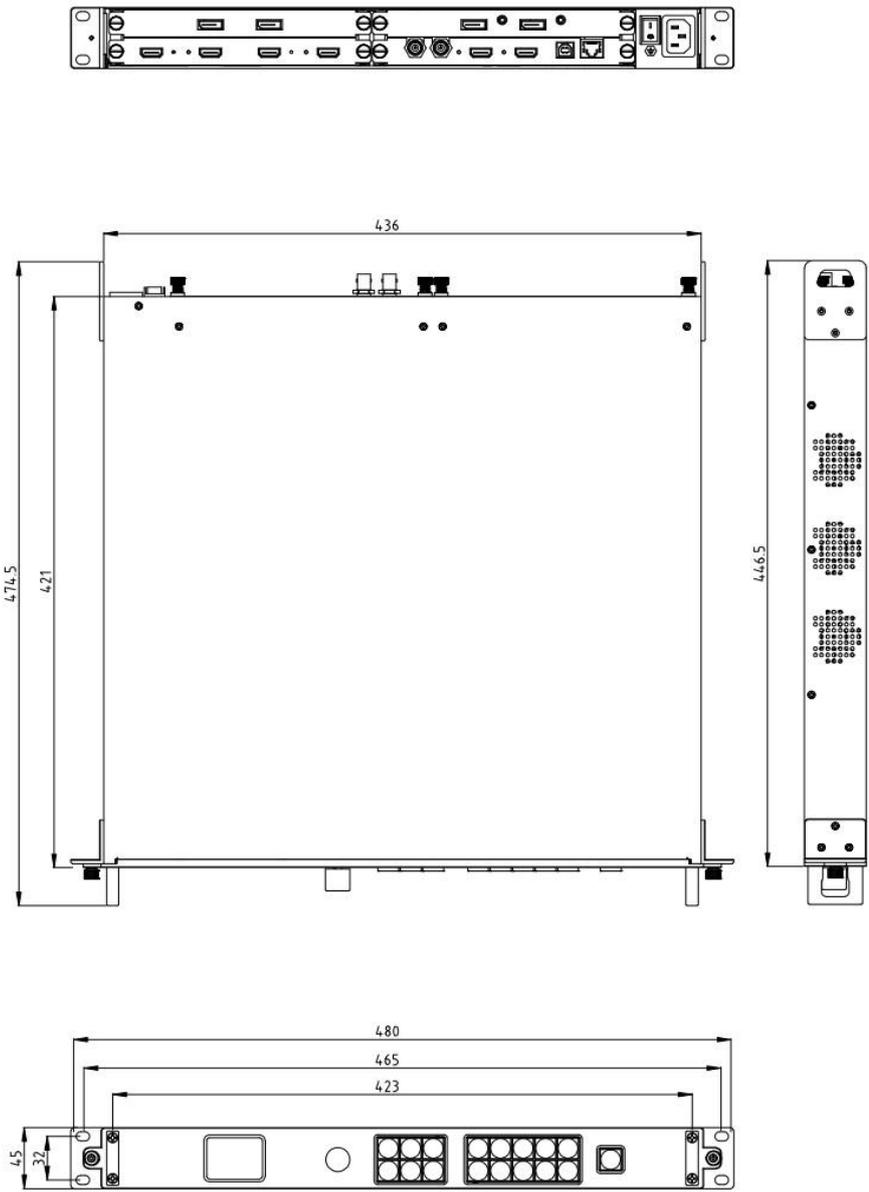
Chapter 2 Install Your Product

2.1 Plug in Signals

Connect input signals and output display to the product before all devices are powered on. Tighten connector screws/locks where provided.

Note: Please use cable that can support HDMI 2.0 or DP 1.2 to ensure 4K@60Hz input and output.

2.2 Plug in Main Power

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

2.3 Turn on Your D4

The device will enter to the boot interface, and OLED display will show as below, completing initialization before loading last settings and input/output configuration.
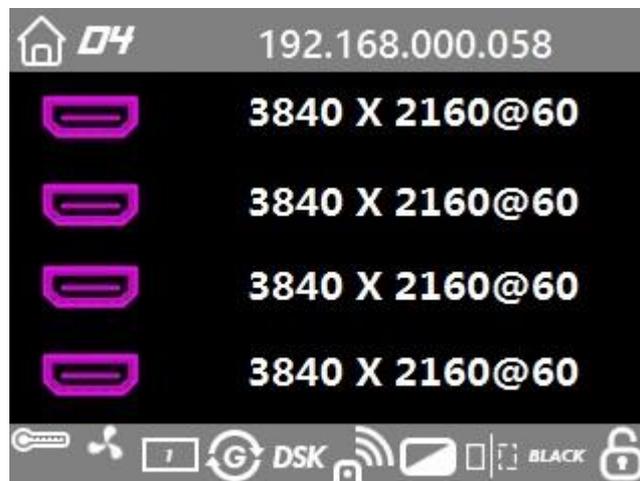
Chapter 3 Use Your Product

3.1 Use the MENU Button

Push【MENU】button to enter main menu.

Turn the knob to select corresponding menu item.

The symbol > indicate that the item is selected.

Push the knob or【OK】button to confirm the operation.

The symbol ＊ means the selected item is under editing state, ready to be set or checked

The operation diagram is as follows：
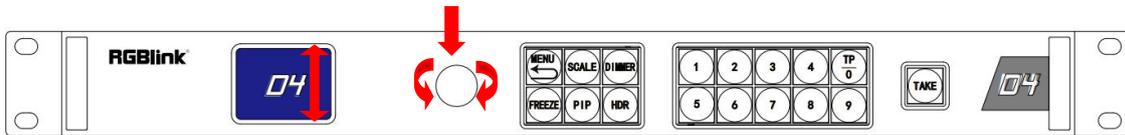
3.2 MENU Structure

The MENU structure is shown below in the figure:

Input	Output	Customize Format	System Mode	Preset	System	Tech Support	Factory Reset
Input Info	Output Info	Customize Format	System Mode	Save To	System Info		Factory Reset
Sizing Adjust	Output Format			Load From	Language		
EDID Management	Genlock				DSK		
	Test Pattern				Transition		
	Split				Ethernet		
	Effects				Lock Front Panel		
	Output Adjust				Button Color		
	DVI Output Operation Guide				Fan Speed		
	Audio						

3.3 Menu Operation

Use the menu system for convenient and intuitive operation. D4 TST display shows the menu items. The TST display will show the default state when the menu is not in use, or the operation has timed out. Use the 【MENU】button and rotary knob in the front panel, the TST display will show the corresponding menus according to selections.

3.3.1 Input Setting

Press MENU button and enter the the menu item. Rotate the knob and select **Input**.

```
> Input              >>
Output               >>
Customize Format     >>
System Mode          >>
Preset               >>
```

In Input sub-menu, there are items as follows:

```
Input Info           >>
Sizing Adjust        >>
EDID Management      >>
```

1. Input Info: Show the input info of each input port, such as input resolution, Color Space(RGB/YUV) and HDR.

```
>Input 1:        HDMI 2.0
No Input
No HDR
RGB
```

2. Sizing Adjust:

1) Adjust input size and position.

```
H Size               3840
V Size               2160
H Pos                   0
V Pos                   0
Reset Size            OFF
```

Note: H Size+H Pos≦ H size of Input source ; V Size+ V Pos≦ V size of Input source.

2) Crop input source.

```
MASK TOP             >>
MASK BOTTOM          >>
MASK LEFT            >>
MASK RIGHT           >>
RESET MASK
```

3. EDID Management: Select EDID destination port and source. Custom EDID is available.

```
Destination       Port 1
>Source:       RGBHDR4K
Color Space
>RGB444&YUV422 444
```

Destination Port: select from 1 to 4

Source: RGB4K,FOLLOW,CUSTOM,RESET

Color Space: RGB444&YUV444, RGB444&YUV444 422, RGB444&YUV444, RGB444@422

Choose CUSTOM to Customize Format for input.

```
Customize Format:
*3840x2160@60
Width＜4096
```
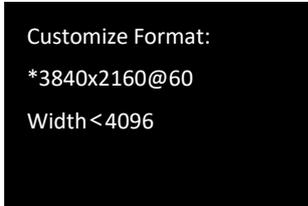
3.3.2 Output Setting

Press MENU button [MENU] and enter the the menu item. Rotate the knob and select **Output**.

```
Input              >>
>Output            >>
Customize Format   >>
System Mode        >>
Preset             >>
```

In Output sub-menu, there are items as follows:

```
Output Info    >>        Effects          >>
Output Format  >>        Output Adjust    >>
Genlock        >>        Audio            >>
Test Pattern   >>
Split          >>
```
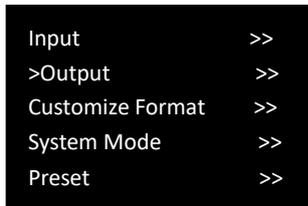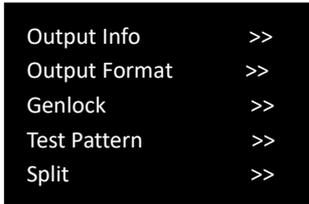
1. Output Info: Include output resolution,signal type, greyscale, color space, etc.

```
Output 1:      HDMI 2.0         No HDR Support
3840x2160@50                    _____
HDMI Mode        HDMI           Output 2:      HDMI2.0
Bits           8Bits>>          3840x2160@50
Color Space        YUV          HDMI Mode        HDMI
```

```
Bits           8Bits>>          3840x2160@50         I
Color Space        YUV          Bits           8Bits>>
No HDR                          Color Space        YUV
_____
Output 3:        DP 1.2
```
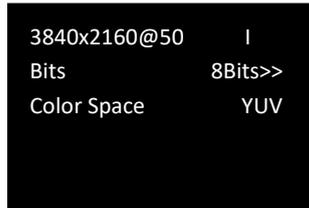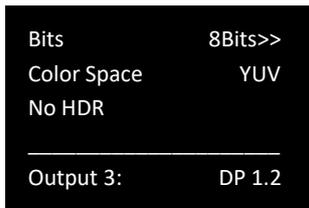
2. Output Format: Users can rotate the knob to choose desired output resolution from 60 types of normal resolutions up to 4096x2160@60.

```
Output Format
      3840x2160@50
```
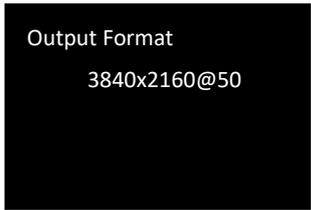
3. Custom Format

In the first page of MENU items, there is **Customize Format** available.

```
Input               >>
Output              >>
>Customize Format   >>
System Mode         >>
Preset              >>
```
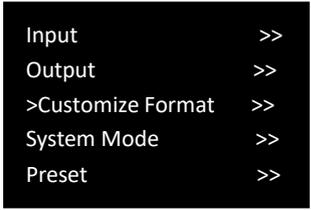
Users can custom output resolution by input numbers on the front panel.

```
Customize Format:

>3840x2160@24
```

HDCP 2.X, UHD, 4K, HDR10, HLG, HDMI 2.0, DP 1.2, HDMI 2.1, DP 1.4, 6G SDI, 12G SDI, H.264, H.265
Turn the knob to resolution line and press the knob, ">" (arrow) changes to "*" (star), type the number for width, then press the knob to confirm.

Type the number for height and frame rate in the same way. For example setting resolution 2560x1152@60, here are the steps:

```
Customize Format:          Customize Format:

*3840x2160@24              *2560x0000@00
```

```
Customize Format:          Customize Format:

*2560x1152@00             *2560x1152@60
```
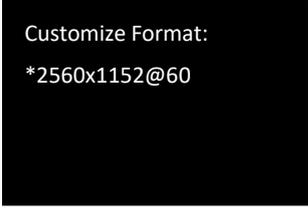
The number buttons turning green indicate that users can use button to key in numbers.

Note: Maximum resolution is 4096*2160*60, if customized resolution exceed it, the device will show up

warning as "Beyond Range".

4. Genlock: Users can turn on or off Genlock and set Genlock Format.

```
>Genlock           OFF
Genlock Format
     3840x2160@50
```

Users can turn the knob to choose Genlock Y or Frame lock.

5. Test Pattern

```
*Type          Color Bar
Red                  255
Green                255
Blue                 255
```

Type: Users can choose OFF to disable test Pattern, or choose any one from the following test patterns:Pure Color, Color Bar, V Color Bar, Ramp,Red/Blue,Checker,Window,Crosshatch,Slide Bar, Frame, T 32 Dots, T 64 Dots 5, T64 Dots 3, H Stripe, V Stripe

When pure color is chosen, value of Red, Green, Blue shall be set: RGB value for test pattern, each one ranges from 0 to 255.

TP button ⎡TP 5⎤ on the front panel is the short cut button to open Test Pattern menu.

6. Split: It is provided for users to do splitting on One Machine or Multiple Machines.

```
One or Multi
*          One Machine
```

```
One or Multi
*          Multi Machine
```
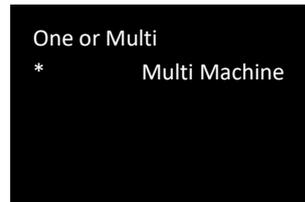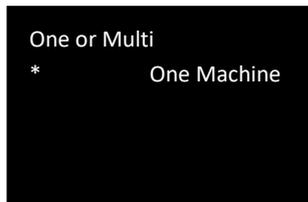
Use knob to choose <One Machine> or <Multi Machine>.
Enter enter choose splitting template H One-to-Two or V One-To-Two

One Machine:
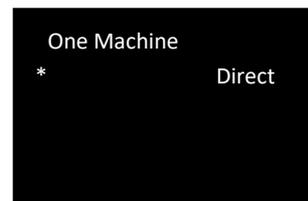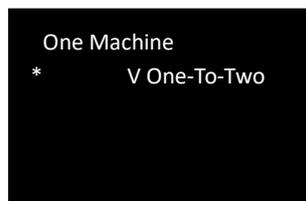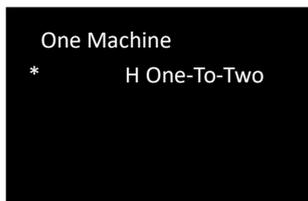
```
One Machine
*       H One-To-Two
```

```
One Machine
*       V One-To-Two
```

```
One Machine
*              Direct
```

Multi Machine:

```
Multi Machine
*       H One-To-Two
```

```
Multi Machine
*       V One-To-Two
```

```
Multi Machine
*              Direct
```
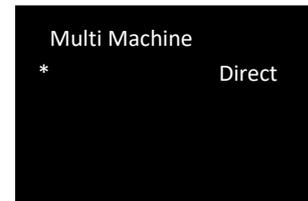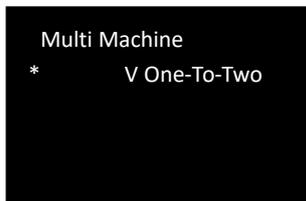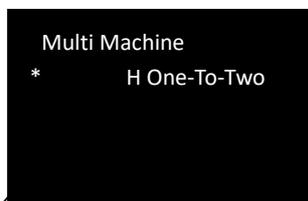
7. Effects: Users can set output image effects here. To open up Effect menu, just press Effect button on the front panel.

Layer	1
Brightness	>>
Contrast	>>
Chroma	>>
Black&White	OFF

Layer: Layer 1 or 2.

Brightness: Range from -1024 to 1024, users can not only adjust the overall brightness, but also the brightness of R,G,B, each ranging from -1024 to 1024.

>Brightness	1024
Brightness R	1024
Brightness G	1024
Brightness B	1024

Contrast: range from 0 to 399
Chroma: range from 0 to 399
Black&White: On/Off

Hue	180
Color Temp	6500K
Gamma	Gamma 1.0
H Sharpness	0
V Sharpness	0

Hue: range from -180 to 180
Color Temp: range from 6500K to 9300K
Gamma: select from Gama 1.0, Gamma 1.8, Gamma 2.2, Gamma 2.6
H Sharpness: adjust horizontal sharpness, range from -10 to 10
V Sharpness: adjust vertical sharpness, range from -10 to 10

Noise Reduction

```
Noise Reduction      >>
Flip V               OFF
Flip H               OFF
Reset                OFF
```

6 noise reduction modes available. Each rangs from 0 to 3.

```
Horizontal NR        0          Combining NR         0
Vertical NR          0
TemporalNR           0
Block NR             0
Mosquito NR          0
```

Flip V: vertical mirror, On or Off

Flip H: horizontal mirror, On or Off

Reset: On or Off, select on to reset all above parameter

```
Flip V               On
Flip V               Off
Reset                Off
```

8. Output Adjust:

Users can turn on HDR adjust here.

```
Output 1:
HDMI Mode            HDMI
Bits                 8Bits
Color Splace         YUV
Output HDR           ON
```

```
Output 2:
HDMI Mode            HDMI
Bits                 8Bits
Color Splace         YUV
Output HDR           ON
```

Note: HDR requires input source device and processing device and display device, all need to support HDR, otherwise the HDR adjust can't work.

Here is contrast example of before and after HDR adjust:

**Before HDR On**   **After HDR On**

9. DVI Output Operation Guide

1) HDMI 2.0 Enter EDID to customize 3584*2048@60.

Destination IN4	Customize Format	DP：NO INPUT
>Source CUSTOM	>3584×2048×60	DP：NO INPUT
ColorSpace ALL	Enter Number Keys	HDMI:3840×2160@60
	Width < 4096	HDMI:3584×2048@60
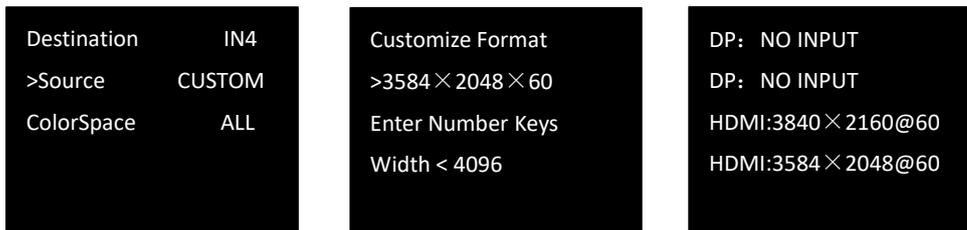
2) HDMI 2.0 output resolution is defined by 3584*2048@60, and DVI output is defined by 1792*1024@60. If standard resolution is used for output, "Output > Output format" to set HDMI 2.0 output and DVI output resolutions.

Input >>	UHD	2K
Output >>	>3584×2048×60.0	>1792×1024×60.0
Customize Format >>	Enter Number Keys	Enter Number Keys
AOI >>	13.5M<=freq<=600M	13.5M<=freq<=165M
Preset >>		
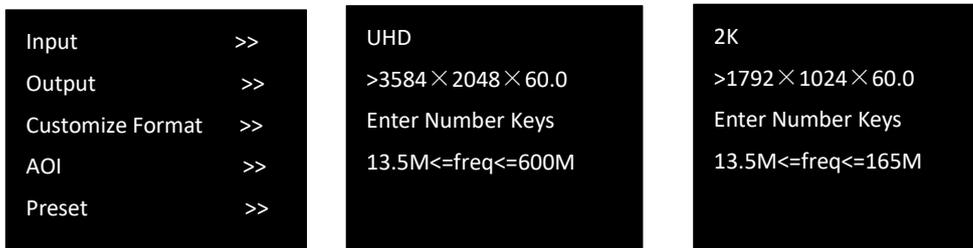
3) DVI Parameter setting and confirmation : "output >> split >>DVI splicing". Select the corresponding output outlet to set the clipping value. The clipping value (position + size) should not exceed the total output width and height of HDMI 2.0 and the clipping value of single port ≤1/2HDMI2.0 output resolution width and height.

Output Info >>	Split >>
Output Format >>	DVI Splicing >>
Genlock >>	
Split >>	
Effects >>	

● By setting the clipping value, Tian-zi Mosaic , Horizontal one-quarter Mosaic, Vertical

one-quarter Mosaic, and Horizontal one-quarter Mosaic can be displayed.

● Splicing and AOI for HDMI output screen can be achieved through cropping.

>Output	DVI 1	>Scale width	1792
Crop X	0	Scale height	1024
Crop Y	0		
Width	1792		
Height	1024		

● SCALE adjustment does not support position adjustment, and size only supports for enlarging but not shrinking.

10. Audio: Select the output port for audio, users can choose Auto or output from Port 1 to Port 4.

```
*Audio            Port 2
```
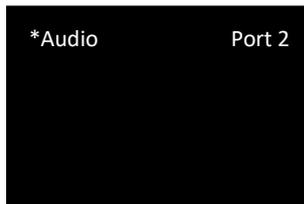
3.3.3 System Mode

Press MENU button and enter the the menu item. Rotate the knob and select **System Mode**.

```
Input             >>
Output            >>
Customize Format  >>
> System Mode     >>
Preset            >>
```
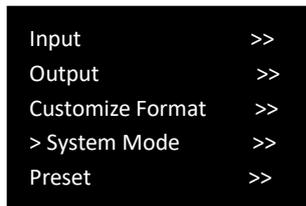
The sub-menu of System Mode is as follows:

```
System Mode       >>
>Standard
```
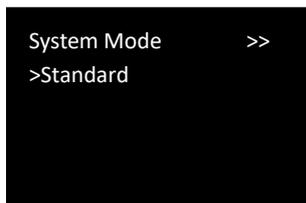
System Mode can be set to **Standard, Switch, Presentation, Dual, Split or Mini Delay**.

1) Standard Mode

Both output channels are duplicated offering the same output as program and monitor. PIP's are available in this mode with PiP/layer count dependent on output resolution and layer arrangement.
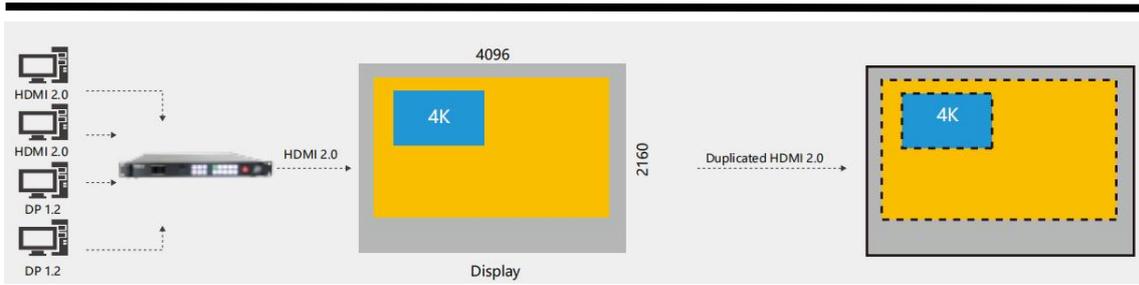
Example: 4K input scaled across a 4K output with 4K PIP source overlaid.

2) Switch (Preview) Mode

Both outputs are set to the same resolution, whether 2K or 4K, with one channel serving as program (PGM), and the other channel as preset preview (PST) for full seamless alpha switching between preset and programme. All adjustment made on PST prior to switching to live PGM display output.

3) Presentation Mode

Up to three 4K inputs maybe used as PIPs over a 4K background video source.
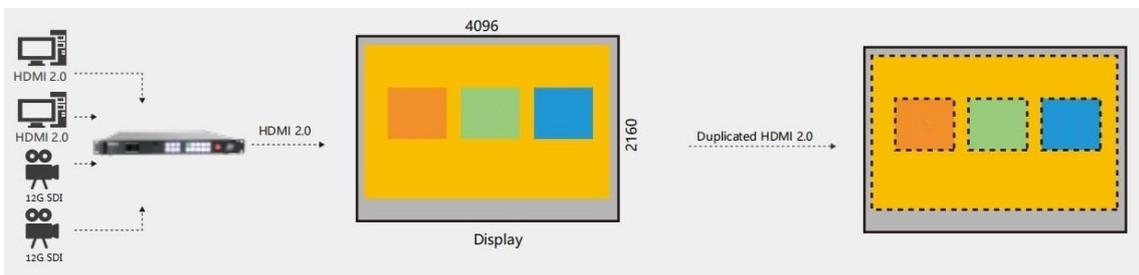
Example: three 4K sources with a 4K background video.

4) Independent (Dual 4K) Mode

Each of output channels separately configured for image, resolution, scale and other attributes.
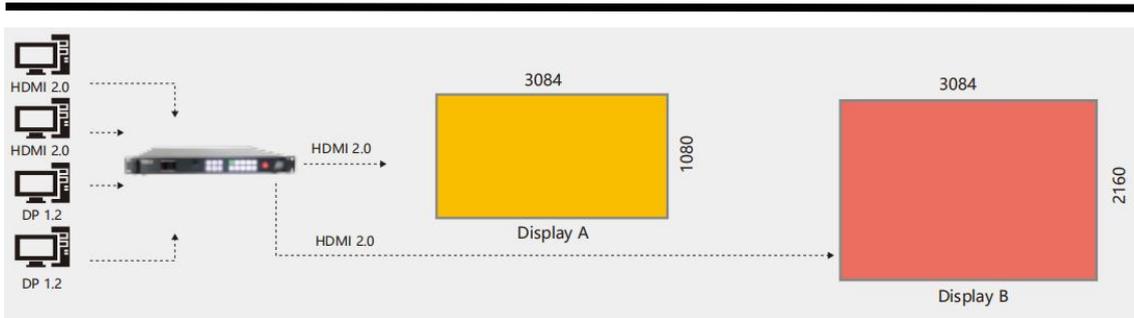
Example: Two separate inputs to two separate outputs, each at different resolution.

5) Split Mode

Output channels are utilised to split or splice input source(s) to create large seamless and fully synchronized video wall.
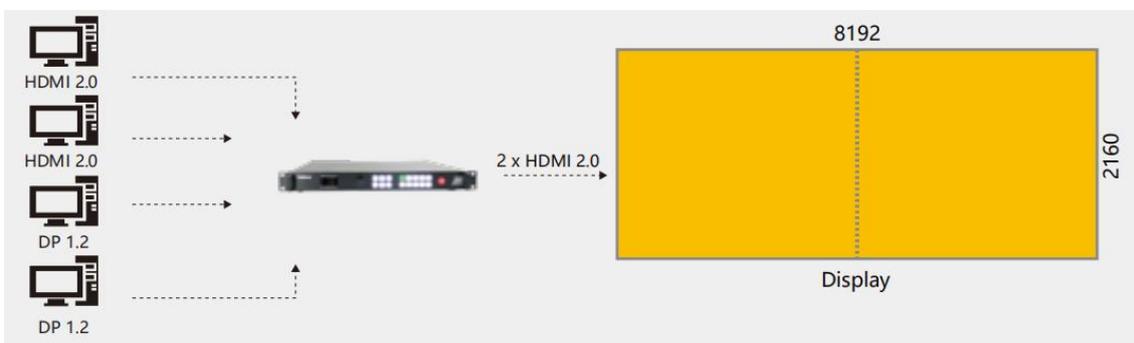
Example 1: 4K input scaled across 8K x 2K display area using two outputs, forming panoramic or wide screen display.
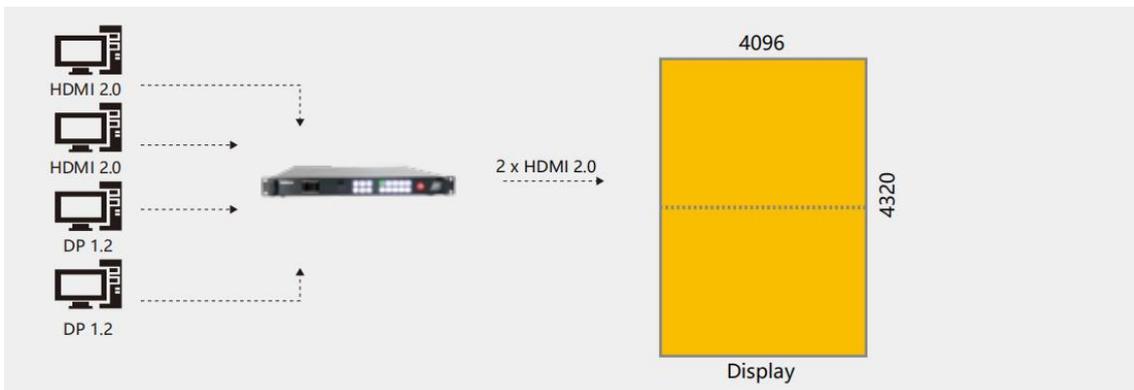
Example 2: 4K input scaled across 4K x 4K display area using two outputs, forming a seamless portrait display of high screen display.

3.3.4 Save & Load Preset

Press MENU button ![MENU] and enter the the menu item. Rotate the knob and select **Preset**.

```
Input              >>
Output             >>
Customize Format   >>
System Mode        >>
> Preset           >>
```
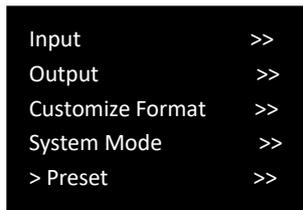
The sub-menu of Preset is as follows:

```
Save To            >>
Load From          >>
```
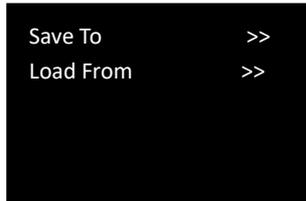
1) Save To: Save settings made above to Save_1,2,3...16, use knob to choose SAVE 1,2,3...16.

```
Save To
>              Save_1
```
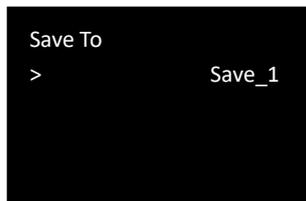
2) Load From: Load saved settings from Save_1,2,3...16,use knob to choose SAVE 1,2,3...16

```
Load From
>              Save_1
```

3.3.5 System

Press MENU button [MENU] and enter the the menu item. Rotate the knob and select **System**.

```
>System            >>
Tech Support       >>
Factory Reset      >>
```
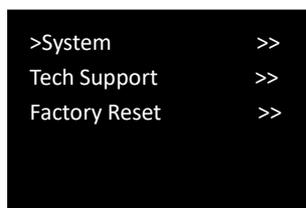
The sub-menu of System is as follows:

```
System Info        >>        Lock Front Panel   >>
Language 语言      ENG       Button Color       >>
DSK                >>        Fan Speed          >>
Transition         >>
Ethernet           >>
```

1) System Info: Show MCU version, Serial Number, and IP address of the device.

```
MCU Version          1.8
SN                   0504
192.168.000.058
```

2) Langauge 语言: to switch language to English or Chinese. User can also press MENU+ SCALE [MENU] [SCALE] for 3S to switch language.

3) DSK: Rotate knob to move the cursor to DSK, press knob to enter the following interface.

```
>Preset          User
Alpha            0
Red Min          0
Red Max          0
Green Min        0
```

```
Green Max        0
Blue Min         0
Blue Max         0
DSK              ON
```

You can follow steps below to operate DSK function:

1. Upgrade D4 to version 4.48 or above；

2. Enter System Mode interface and select **Presentation**；

```
System Mode          >>
>Presentation
```
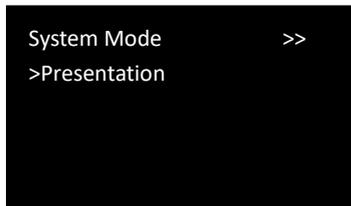
3. Place signal sources that require DSK in Layer Four；

4. Turn on DSK switch;

```
Green Max        0
Blue Min         0
Blue Max         0
DSK              ON
```
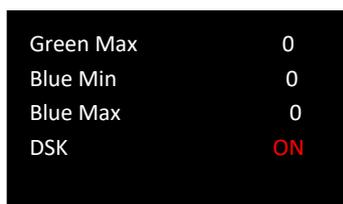
5. Users can adjust RGB values according to background of the DSK material. DSK allows users to

set values for red, green, and blue to determine which parts will be overlaid and which parts will be transparent so as to achievesuperposition effect.

The greater the gap between the minimum value and the maximum value, the more content will be saved.

For example, if the minimum value of the three colors is set to 0 and the maximum value set to 255, all the content will be saved.

>Preset	User
Alpha	0
Red Min	0
Red Max	255
Green Min	0

Green Max	255
Blue Min	0
Blue Max	255
DSK	ON

By narrowing the value gap, some color will be erased.

>Preset	User
Alpha	0
Red Min	16
Red Max	255
Green Min	16

Green Max	255
Blue Min	16
Blue Max	255
DSK	ON

DSK funtion is shown as below：
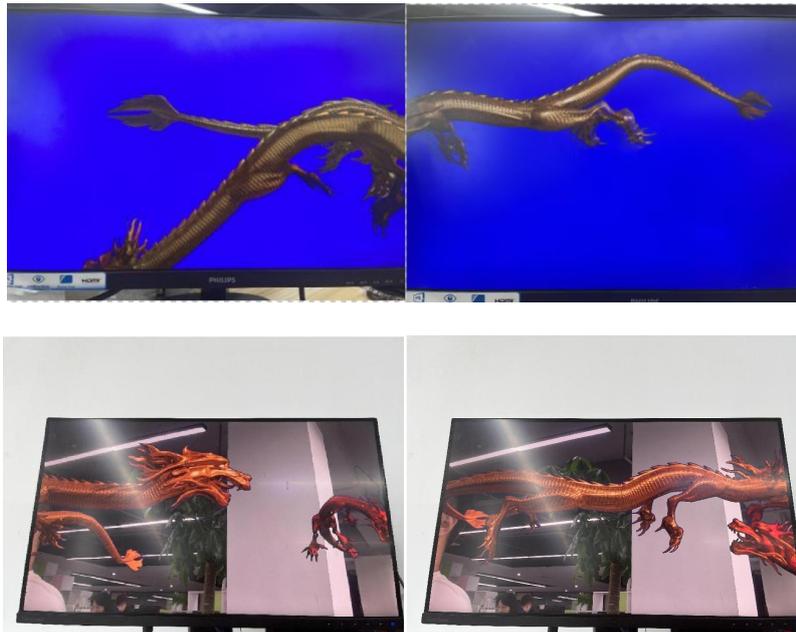
4) Transition: to set transition mode and duration.

>Mode	Fade
Duration	0.5s

Mode: to select the transition mode for switching. Cut or Fade available.

Duration: the duration time of transition. If under Fade Mode, duration time range from 0.0 to 2.0s.

5) Ethernet: Users can manually set IP address, Subnet mask, Gateway by rotating the knob if needed.

```
IP Address          >>
Subnet Mask         >>
Gateway             >>
```

6) Lock Front Panel: Users can lock the panel to prevent accidental touch.

```
Lock Front Panel
Yes <OK>, No <Menu>
```

After front panel is locked, the OLED display will show:
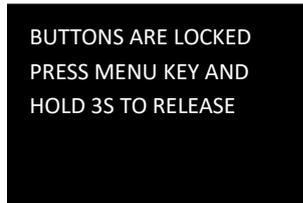
```
BUTTONS ARE LOCKED
PRESS MENU KEY AND
HOLD 3S TO RELEASE
```

7) Button Color: Set button color and brightness
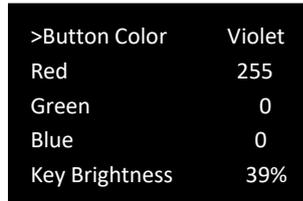
```
>Button Color       Violet
Red                 255
Green               0
Blue                0
Key Brightness      39%
```

Users can adjust values of Red, Green, Blue so as to custom color or set button color to White, Red, Orange, Yellow, Green, Cyan, Blue or Violet.
Adjust the button light brightness as needed by rotating the knob.

8) Fan Speed

```
Fan Speed           70%
```

Adjust fan speed from 1% to 99% by rotating the knob.

3.3.6 Tech Support

Show the contact info of RGBlink.

```
Sales Hotline:
    4008-592-114
After-Sale Service:
    4008-592-315
sales@rgblink.com
```

3.3.7 Factory Reset

```
Factory Reset
YES<OK>,NO<MENU>
```

All parameters will be restored to default parameters, which include but not limited to device IP, EDID, etc.

3.4 Shortcut Button Operation

3.4.1 Scale Button

Press Scale Button [SCALE] on the front panel to enter scale setting menu under different system mode as follows:

Under Standard/Switch mode:

H Size	960		Reset	OFF
V Size	540			
H/V Size	960			
H POS	0			
V Pos	0			

Under Presentation mode:

Layer	Layer A		V Size	2160
Alpha	128		H/V Size	3840
Layer On/Off	ON		H POS	0
Template	BG+3		V Pos	0
H Size	3840		Reset	OFF

Under Split Mode

Layer	Layer A	H POS	0
Alpha	128	V Pos	0
H Size	960	Reset	OFF
V Size	540		
H/V Size	960		

Limitation: No Split Mode option on XPOSE software, please use the front panel for Split Mode selection.

Under Dual:

Channel	CH 1	V Pos	0
H Size	1920	Reset	OFF
V Size	1080		
H/V Size	1920		
H POS	0		

Note: Under MinDelay, Scale is disabled.

Presentation Layer: Choose from layer A /B/ C/ D

Template: BG+3 1,BG+3 2, Square

Channel: Choose from CH.1, CH.2

H SIZE: Set the horizontal pixels of output image

V SIZE: Set the vertical pixels of output image

H/V Size: Set the scale ratio by putting in the horizontal width, the vertical height will be auto adjusted according to the ratio of new width/old width.e.g. Set ratio as 1920 and the first width is 3840, the height will be automatically adjusted to 1080.

**H POS:** Set the horizontal position of image

V POS: Set the vertical position of image

RESET: If operation is improper, turn knob to <RESET> and start over.

3.4.2 PIP Button

Press PIP Button [PIP] on the front panel under Standard system mode to open up PIP feature (picture in picture) as follows:

>PIP	ON
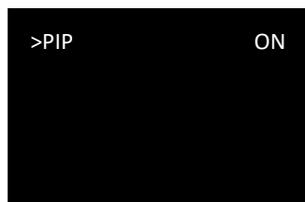
Note: Under Switch, Split, Dual,Presentation, MinDelay, PIP is not supported.

3.4.3 DIMMER Button

Press Dimmer Button [DIMMER] on the front panel to set Dimmer value or long pressing Dimmer button the value can immediately skip from 0 to 128.

```
>Dimmer          128
```

Dimmer range: 0~128

3.4.4 HDR Button

Press HDR button [HDR] on the front panel to activate HDR feature:

```
>Input Port       Port3
In HDR Support    ON
Output Port       CH1
Out HDR Support   ON
```
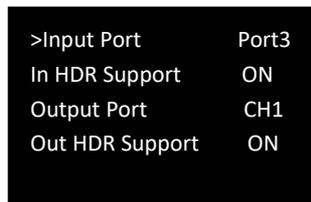
Input Port: Select from Port1, Port 2, Port 3 or Port 4
In (input) HDR: On or Off
Output Port: Select from CH1 or CH2
Out(output) HDR: On or Off

Chapter 4 Ordering Codes

4.1 Product

120-0004-01-0   D4

4.2 Options

4.2.1 Input Options

191-0004-01-0   Dual DP 1.2 Input Module
191-0004-02-0   Dual HDMI 2.0 Input Module
191-0004-03-0   Dual 3G SDI Input Module
191-0004-04-0   Dual 12G SDI Input Module

4.2.2 Output Options

191-0004-21-0   Dual DP 1.2 Output Module
191-0004-22-0   Dual 12G SDI Output Module
191-0004-23-0   Quad DVI Output Module

Chapter 5 Support

5.1 Contact Us

www.rgblink.com

Inquiries

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✉ info@rgblink.com
🖥 rgblink.com/contact-us

Global Support

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

@RGBLINK   /rgblink   +rgblink   /rgblink   rgblink   rgblink

RGBlink Headquarters	**China Regional Sales & Support**	**Beijing Region Office**	**Europe Regional Sales & Support**
Xiamen, China	Shenzhen, China	Beijing, China	Eindhoven, Holland
Room 601A, No. 37-3 Banshang community, Building 3, Xinke Plaza, Torch Hi-Tech Industrial Development Zone, Xiamen, China	705, 7th Floor, South District, Building 2B, Skyworth Innovation Valley, No. 1 Tangtou Road, Shiyan Street, Baoan District, Shenzhen City, Guangdong Province	Building 8, 25 Qixiao Road Shahe Town Changping	Flight Forum Eindhoven 5657 DW
📞+86-592-577-1197	📞 +86-755 2153 5149	📞 +010- 8577 7286	📞+31 (040) 202 71 83

Chapter 6 Appendix

6.1 Specification

DP1.2 Input Module(optional)	
Connector Appearance	
Numbers of Input	2
Connector Type	DisplayPort
Supported Standard	2.0
Input Resolutions	**VESA** 720p@25/30/50/60 | 1080i@50/59.94/60 | 1080p@23.98/24/25/29.97/30/50/59.94/60 | 2160p@30/50/60 **SMPTE** 1920×1200@60 | 2560×1600@60 | 3840×2160@23.98/24/25/29.97/30/50/60 | 4096×2160@50/60

HDMI 2.0 Input Module(optional)	
Connector Appearance	
Numbers of Input	2(2 Input,2Loop）
Connector Type	HDMI-A
Supported Standard	2.0
Input resolutions	**SMPTE** 720p@25/30/50/60 | 1080p@23.98/24/25/29.97/30/50/59.94/60 | 2160p@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@50/60 | 7680×1080@60
	7680×1080@60 supported only when HDMI 2.0 input module is installed in lower slot where IN 3 and IN4 locate.

3G SDI Input Module(optional)	
Connector Appearance	
Numbers of Input	2 (2 Input, 2Loop）
Connector Type	BNC
Supported Standard	SMPTE 425M (Level A) | SMPTE 424M | SMPTE 292M | SMPTE 259M-C | DVB-ASI
Support Resolution	SMPTE　720P@50/59.94/60 | 1080i@59.94/60 | 1080P@23.98/24/25/29.97/30/50/60 | 1080psf@23.98/24/25/29.97/30
	3G SDI In supports Level A only (does not support Level B)
12G SDI Input Module(optional)	
Connector Appearance	
Numbers of Input	2 (2 Input, 2Loop）
Connector Type	BNC
Supported Standard	SMPTE ST 2082-1, SMPTE ST 2081-1, SMPTE ST 424, SMPTE ST 292-1, SMPTE ST 259, DVB-ASI,MADI
Support Resolution	SMPTE　720P@50/59.94/60 |1080i@23.98/24/25/29.97/30/50/60 | 1080P@23.98/24/25/29.97/30/50/60 | 2160p@30/60

DP1.2 Output Module(optional)	
Connector Appearance	
Numbers of Output	4
Connector Type	2xDisplayPort | 2x3.5mm Jack
Supported Standard	DisplayPort 1.2
Output Resolutions	SMPTE　720p@25/30/50/60 | 1080p@23.98/24/25/29.97/30/50/59.94/60 | 2160p@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@50/60

HDMI 2.0 Output (Standard)		
Connector Appearance		
Numbers of Output	2	
Connector Type	HDMI-A	
Supported Standard	HDMI 2.0	
Supported Resolution	SMPTE	720p@25/30/50/60 | 1080p@23.98/24/25/29.97/30/50/59.94/60 | 1080i@50/59.94/60 | 2160p@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@50/60 | 7680×1080@60

DVI Output Module(Optional)		
Connector Appearance		
Numbers of Output	4	
Connector Type	DVI-I	
Supported Resolution	SMPTE	720p@25/29.97/30/50/59.94/60 1080p@23.98/24/25/29.97/30/50/59.94/60
	VESA	1024×768@60 | 1280×720@@50/59.94/60 | 1280×768@60 | 1280×960@60 | 1280×1024@60 | 1280×1280@60 | 1360×768@60 | 1366×768@60 | 1400×1050@60 | 1400×900@60 | 1680×1050@60 | 1920×1080@50/59.94/60

12G SDI Output Module(optional)	
Connector Appearance	
Numbers of Input	2
Connector	BNC

Type	
Supported Standard	SMPTE ST 2082-1, SMPTE ST 2081-1, SMPTE ST 424, SMPTE ST 292-1, SMPTE ST 259,MADI
Support Resolution	SMPTE 1080i@50/59.94/60 | 1080p@59.94/60 | 2160p@25/29.97/30/50/59.94/60

Extras		
Communication	LAN	RJ45
	USB	USB Type B
	Genlock Y In/Loop	2xBNC
Power Supply	AC: 85~264V , 50/60HZ	
Max Power	100W	
Working Environment	0°C -45°C	
Relativity Humidity	10% –85 % RH	
Weight	7.2kg	
Dimensions	480mmx474mmx45mm	
Product Warranty	3 years parts and labor warranty	

6.2 Terms & Definitions

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

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

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

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

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

●**DVI**：Digital Visual Interface. The digital video connectivity standard that was developed by DDWG (Digital Display Work Group). This connection standard offers two different connectors: one with 24 pins that handles digital video signals only, and one with 29 pins that handles both digital and analog video.

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

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

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

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

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

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

●**HDMI:** High Definition Multimedia Interface: An interface used for the transmission of uncompressed high definition video, up to 8 channels of audio, and control signals, over a single cable.

●**HDMI 1.3:** released on June 22 2006, and increased the maximum TMDS clock to 340 MHz (10.2 Gbit/s). Support resolution 1920 × 1080 at 120 Hz or 2560 × 1440 at 60 Hz). It added support for 10 bpc, 12 bpc, and 16 bpc color depth (30, 36, and 48 bit/px), called deep color.

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

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

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

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

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

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

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

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

● **DP 1.4:** publish on 1 Mar, 2016.overall transmission bandwidth 32.4 Gbit/s ,DisplayPort 1.4 adds support for Display Stream Compression 1.2 (DSC), DSC is a "visually lossless" encoding technique with up to a 3:1 compression ratio. Using DSC with HBR3 transmission rates, DisplayPort 1.4 can support 8K UHD (7680 × 4320) at 60 Hz or 4K UHD (3840 × 2160) at 120 Hz with 30 bit/px RGB color and HDR. 4K at 60 Hz 30 bit/px RGB/HDR can be achieved without the need for DSC.

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

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

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

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

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

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

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

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

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

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

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

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

USB version and connectors figure:

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

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

●**PAL:** Phase Alternate Line. A television standard in which the phase of the colour carrier is alternated from line to line. It takes four full images (8 fields) for the colour-to-horizontalimages (8 fields) for the colour-to-horizontal phase relationship to return to the reference point. This alternation helps cancel out phase errors. For this reason, the hue control   is not needed on a PAL TV set. PAL, is widely used in needed on a PAL TV set. PAL, is widely used in Western Europe, Australia, Africa,   the   Middle East, and Micronesia. PAL uses 625-line, 50-field (25 fps) composite colour transmission system.

● **SMPTE：** Society of Motion image and Television Engineers. A global organization, based in the United States, that sets standards for baseband visual communications. This includes film as well as video and television standards.

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

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

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

●**ST2110:** A SMPTE developed standard, ST2110 describes how to send digital video over and IP networks. Video is transmitted uncompressed with audio and other data in a separate streams.

SMPTE2110 is intended principally for broadcast production and distribution facilities where quality and flexibility are more important.

●**SDVoE:** 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.

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

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

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

●**Scaling:** A conversion of a video or computer graphic signal from a starting resolution to a new resolution. Scaling from one resolution to another is typically done to optimize the signal for input to an image processor, transmission path or to improve its quality when presented on a particular display.

●**PIP:** Picture-In-Picture. A small image within a larger image created by scaling down one of image to make it smaller. Other forms of PIP displays include Picture-By-Picture (PBP) and Picture- With-Picture (PWP), which are commonly used with 16:9 aspect display devices. PBP and PWP image formats require a separate scaler for each video window.

●**HDR:** is a high dynamic range (HDR) technique used in imaging and photography to reproduce a greater dynamic range of luminosity than what is possible with standard digital imaging or photographic

techniques. The aim is to present a similar range of luminance to that experienced through the human visual system.

●**UHD:** Standing for Ultra High Definition and comprising 4K and 8K television standards with a 16:9 ratio, UHD follows the 2K HDTV standard. A UHD 4K display has a physical resolution of 3840x2160 which is four times the area and twice both the width and height of a HDTV/FullHD (1920x1080) video signal.
●**EDID:** Extended Display Identification Data. EDID is a data structure used to communicate video display information, including native resolution and vertical interval refresh rate requirements, to a source device. The source device will then output the provided EDID data, ensuring proper video image quality.

6.3 Revision History

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

Format	Time	ECO#	Description	Principal
V1.0	2019-05-13	0000#	Release	Fanny
V1.1	2019-06-06	0001#	Revise	Fanny
V1.2	2020-03-20	0002#	● Add System mode,UI , button color 2. ● Revise menu of Scale and PIP under different system mode ● Revise Term and Definition ● Add 8K1K in specification	Fanny
V1.3	2020-11-16	0003#	● Add Quad DVI Output Module ● Add DVI Output Operation Module	Sylvia
V1.4	2021-04-16	0004#	Add 12G SDI Output Operation Module	Sylvia
V1.5	2023-05-17	0005#	Add limitation description of split mode	Aster
V1.6	2025-05-09	0006#	Add DSK function	Aster

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