



INSTRUCTIONS

Z8

USER MANUAL

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1. Safety Precautions

To prevent personal injury and to protect the device from damage, read and follow these safety precautions.

1.1 Do not remove the cover

To avoid personal injury, do not remove the top cover.

1.2 Only use the power supply and accessories specified by the manufacturer

The operating voltage of this product is 100V-240V AC. Only use the power cord provided with the product or the power cord that meets the appropriate local rating standards.

1.3 Prevent function interfaces from contact with charged objects

This is an electric product. The circuit elements may be damaged if the function interfaces contact charged objects.

1.4 Grounding

To avoid electrical shock, ensure that the product is grounded.

1.5 Electromagnetic Interference

This is a class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

1.6 Environmental Condition

Use only at altitudes not more than 5000m above sea level.

1.7 Avoid Moisture

This product is not waterproof, so avoid contact with liquid or operating the product in a humid environment.

1.8 Keep the product away from flammable and explosive hazardous substances

1.9 Unpacking and Inspection

After unpacking, checking the items according to the packing list in the box. Please contact the salesman in time if you find the accessories are incomplete.

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.

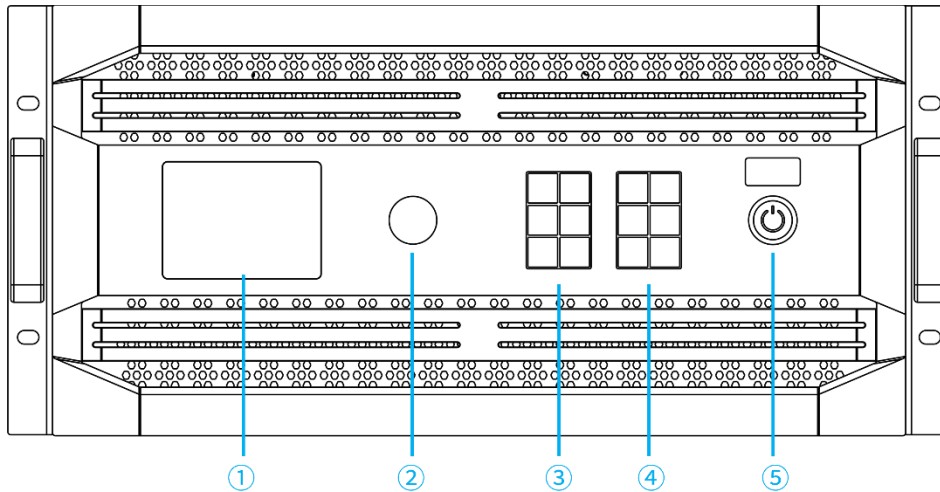
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CLASS 1 LASER PRODUCT

This unit complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed.3., as described in Laser Notice No.56, dated May 8,2019.

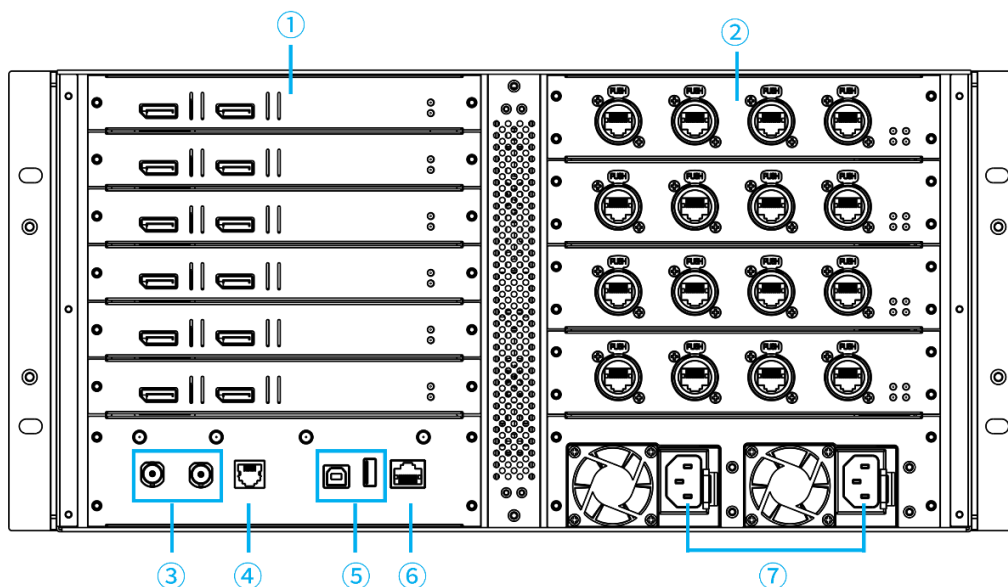
2. Hardware

2.1 Front Panel



No.	Item	Function
①	3.5-inch LCD	Displays the operation menu and system information
②	Knob	Turn the knob to select an item or adjust the parameter, press the knob to confirm your selection or adjustment
③	Function keys	OK: Enter key ESC: Escape current operation or selection Lock: Lock keys Bright: Adjust brightness Black: Blackout Freeze: Freeze screen image
④	Mode keys	Home: Switch to the initial interface Menu: Main menu Input: Switch to the setting menu of input images Output: Switch to the setting menu of output images Signal: Switch to the signal source information interface Mode: Switch to the preset mode selection interface
⑤	Button	Power button

2.2 Rear Panel

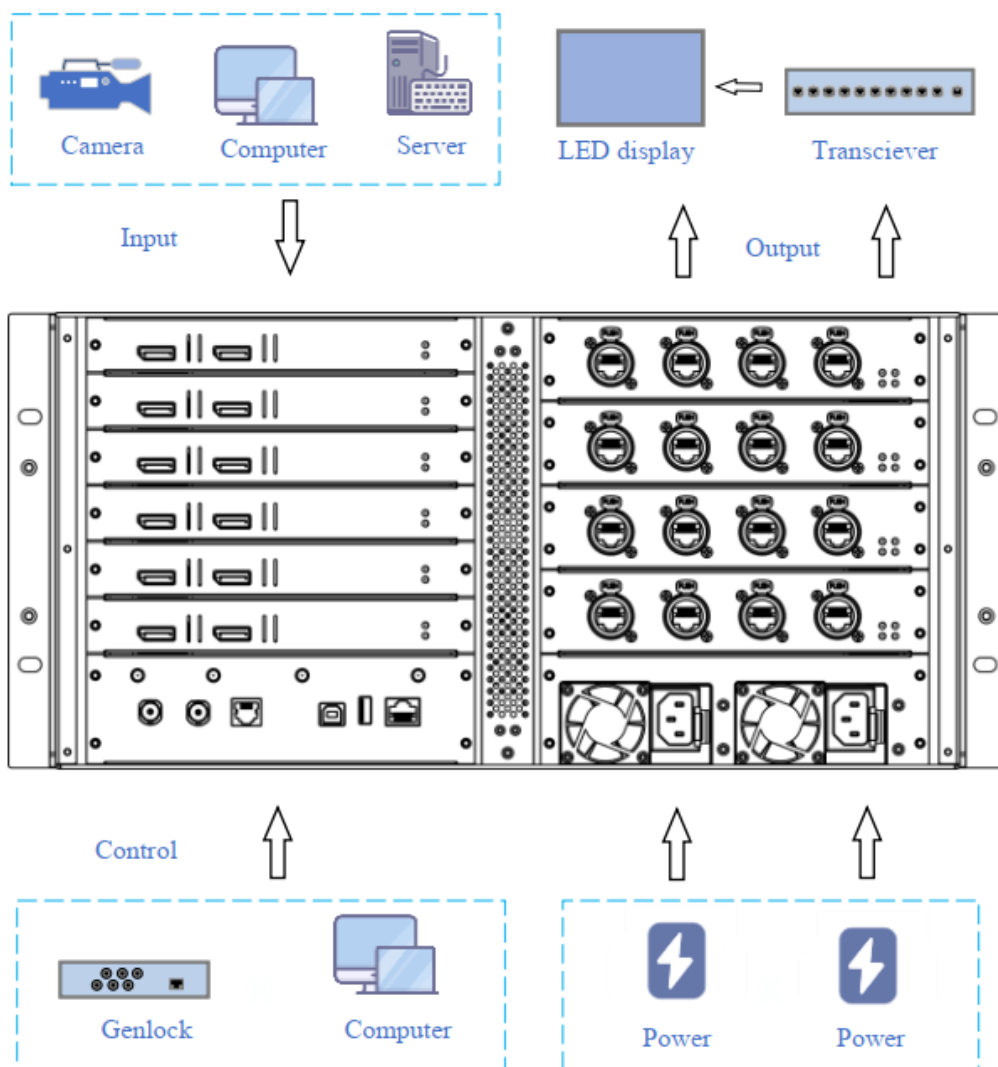


Input		
①	Input card	Up to 6 input cards can be installed, up to two 4K (4096×2160@60Hz resolution) signal inputs per card
Output		
②	Output card	Up to 4 output cards can be installed, only the same type card can be installed, outputting up to 13.1 million pixels per card at 60Hz, 8bit
Control		
③	GENLOCK	Input synchronized signal
	GENLOCK LOOP	Output synchronized signal
④	RS232	RJ11 port, connect to the third-party device
⑤	USB IN	USB2.0 Type B, connect to the computer for debugging, or as cascading input
	USB OUT	USB2.0 Type A, connect to the next device as a cascade interface
⑥	LAN	Connect to the computer, or connect to the router for access to the local area network
Power		
⑦	POWER A, B	AC100-240V, 50/60Hz, ships with dual-redundant

*Note: The equipment shown in the picture is for reference only. Due to the difference of boards assembled by the equipment, the appearance of the equipment may be different from the picture. Please refer to the actual product.

3.Connections

Before using the equipment, please connect the input, output and control interfaces according to the hardware interface, and finally connect the power supply.



*Note: When the hardware is different, there will be the following usage differences.

Network port output: when installing the network port output board, the network port is directly connected to the LED display screen through the network cable.

Optical port output: when installing the optical port output board , the optical port is first connected to the optical fiber transceiver, and then connected to the LED display screen through the network cable.

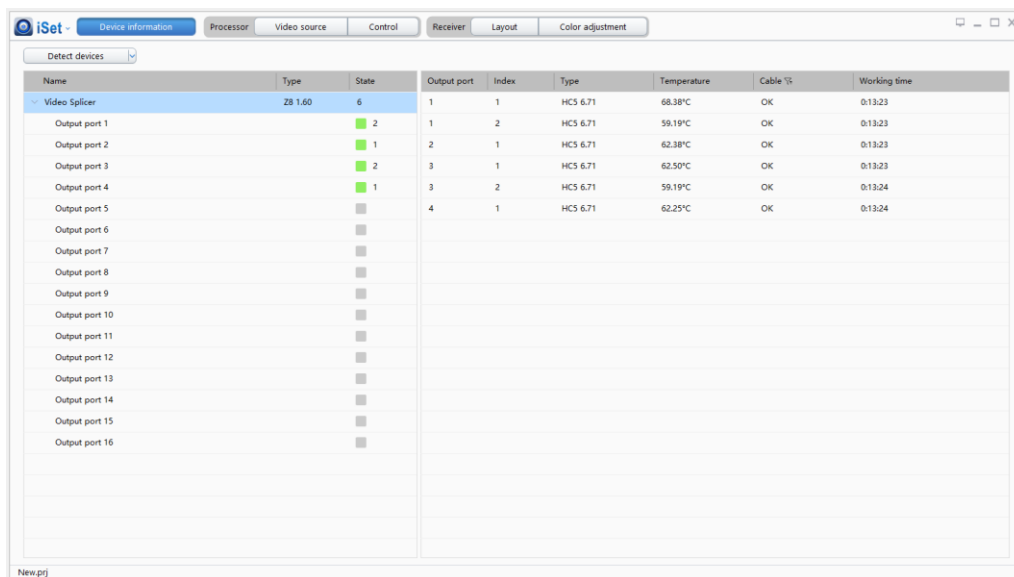
Caution: Disconnect all power sources before moving the device.

4. Operating Software

Please make sure the correctness of the hardware connection before setting, then use iSet to detect senders and all receiver cards. (Download url: www.colorlightinside.com, Click **Products > Software > iSet** to download and install)

4.1 Device Information

Click [**Device Information**] to enter the interface, then click [**Detect devices**], the software will automatically acquire all devices and related information, including processor type, quantity, working status, and type of receiving cards, quantity, temperature, etc. Please check the hardware connection or the installation of the relevant driver if cannot detect device.



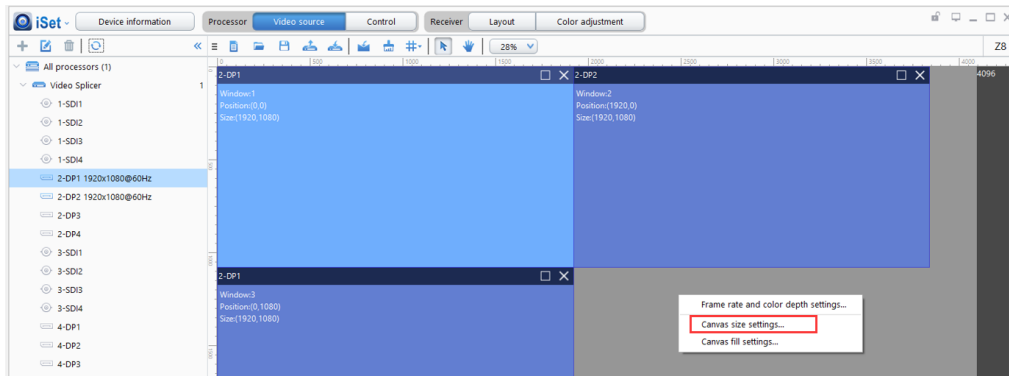
4.2 Video Source

Click the [**Video Source**] and enter the video source setting page, it includes settings such as canvas, PIP, scaling, cropping, EDID, etc., which can adjust the display range of the image output by the device. Once the input sources working, the software will automatically acquire the signal information and display on the bottom right corner.

4.2.1 Canvas

The canvas is used to limit the display resolution of the device as a whole, its maximum width is 16384 pixels. You need to set the canvas size according to your LED screen, all

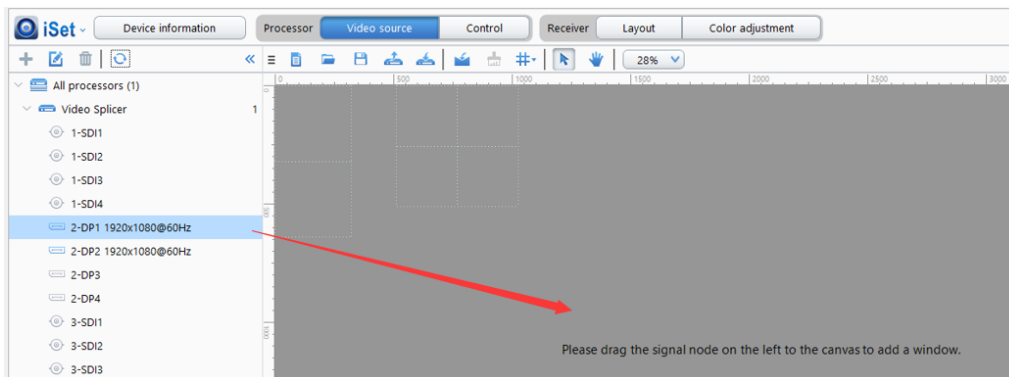
windows are confined to the canvas. You can right-click the grey canvas area, and select canvas size settings to change it.



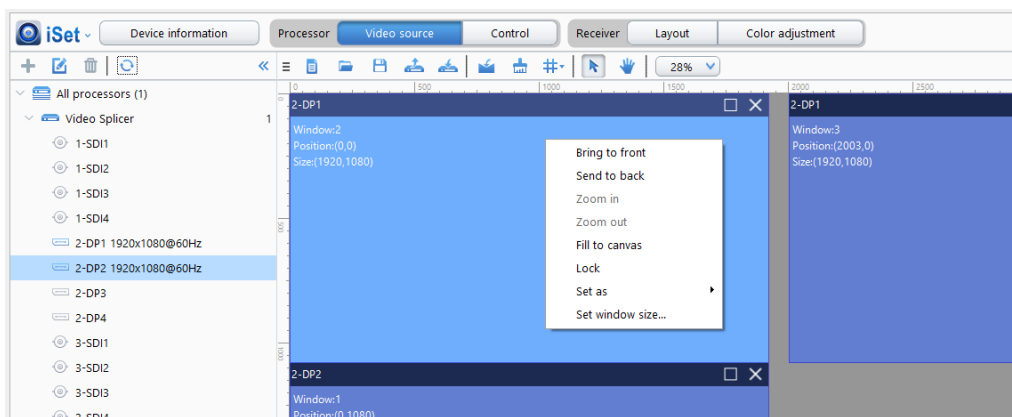
4.2.2 PIP

The Z8 supports multi- window display, each PIP window can be set individually.

① You can add a new window with drag the input icon to **CanvasArea**.

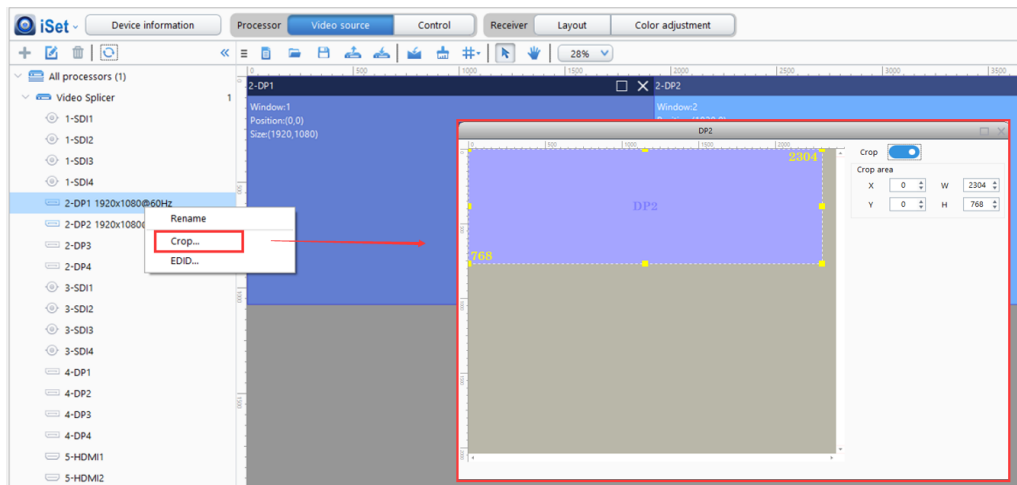


② You can right-click the window to change the layer, size, and input signal. And you can click the border of window, and drag it to resize.



4.2.3 Cropping

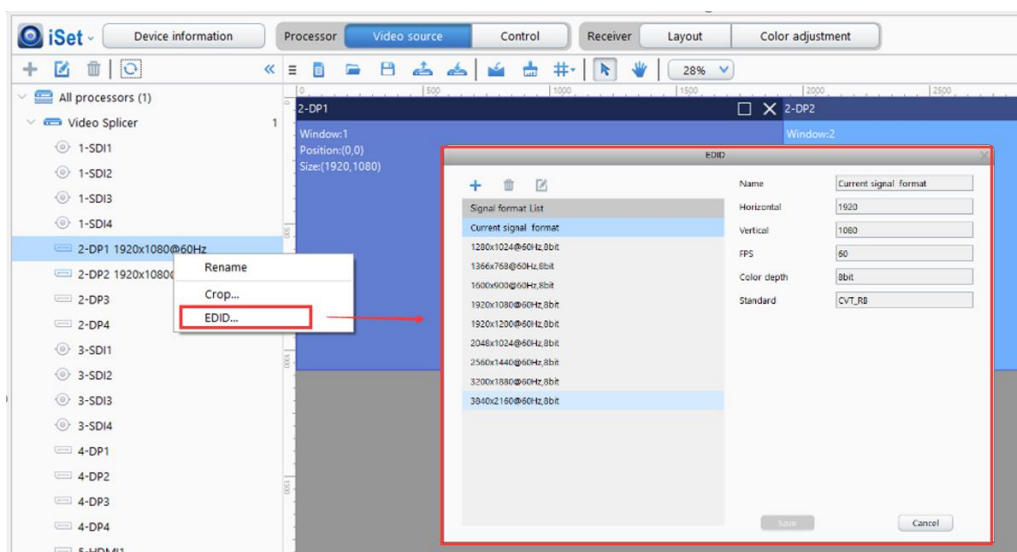
- ① Right click the signal that you want to crop, then select [crop] to set.
- ② In the cropping interface, click "" to enable this feature , then set X (Horizontal), Y (Vertical), W(Width) and H(Height).



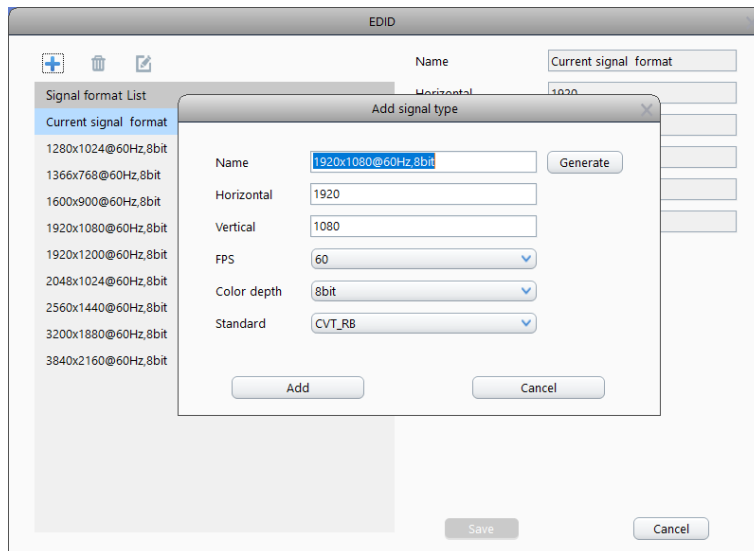
4.2.4 EDID

EDID is Extended Display Identification Data, which can be used to set the resolution information of this device.

- ① In the left input signal area, right-click the signal source and select EDID to enter the setting interface. You can directly select the preset EDID.



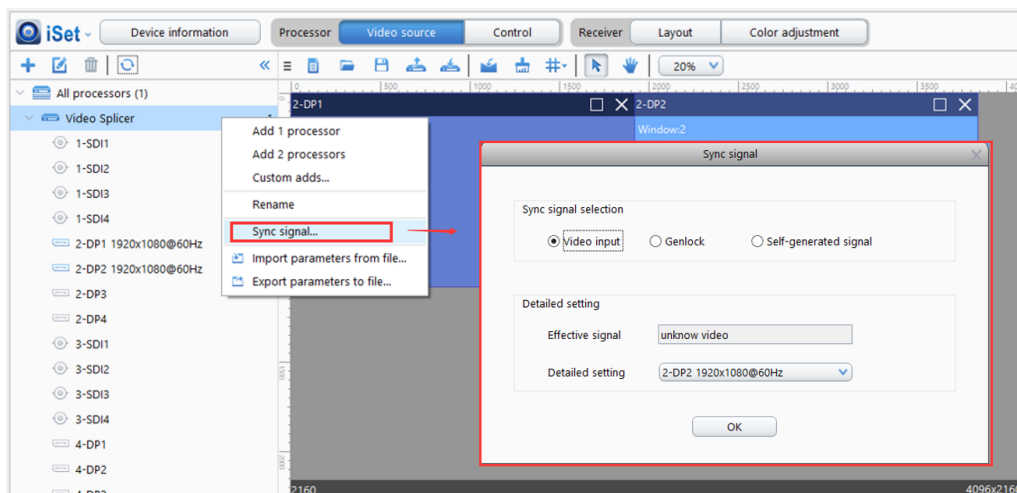
- ② In the EDID interface, you can click "+" to add a special signal format. You can set inputting width, height, frame rate, color depth and standard, then click generate the custom resolution and add to it the list.



4.2.5 Sync Signal

The Z8 supports lock sync to video source, genlock and self-generated signal. And self-generated signal is not synchronized between multiple devices.

- ① Right-click the device, select Sync signal, and enter the setting interface, you can select Video input, Genlock and Self-generated signal.
- ② When selecting self-generated signal, you can select different frame rate as you need.



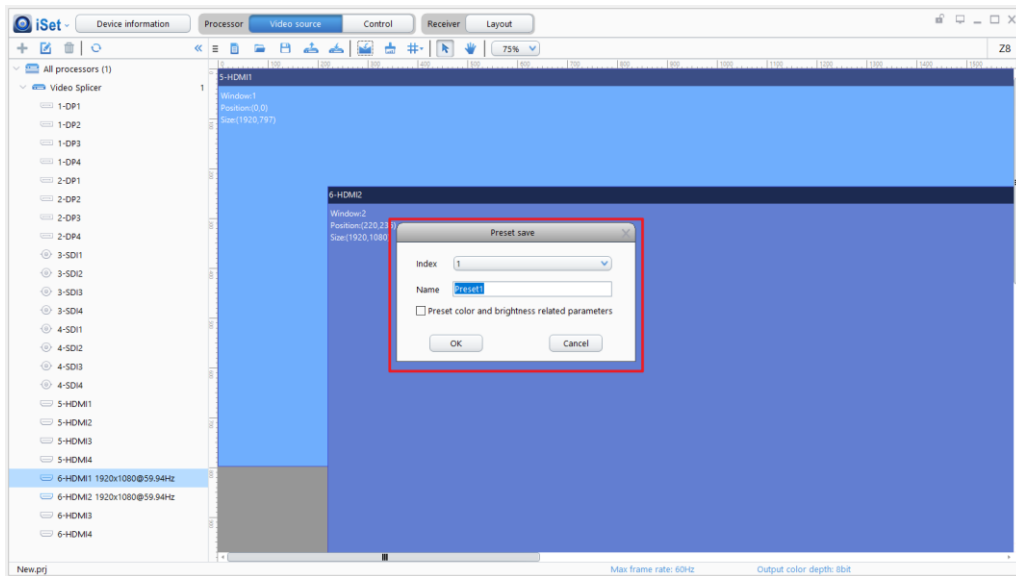
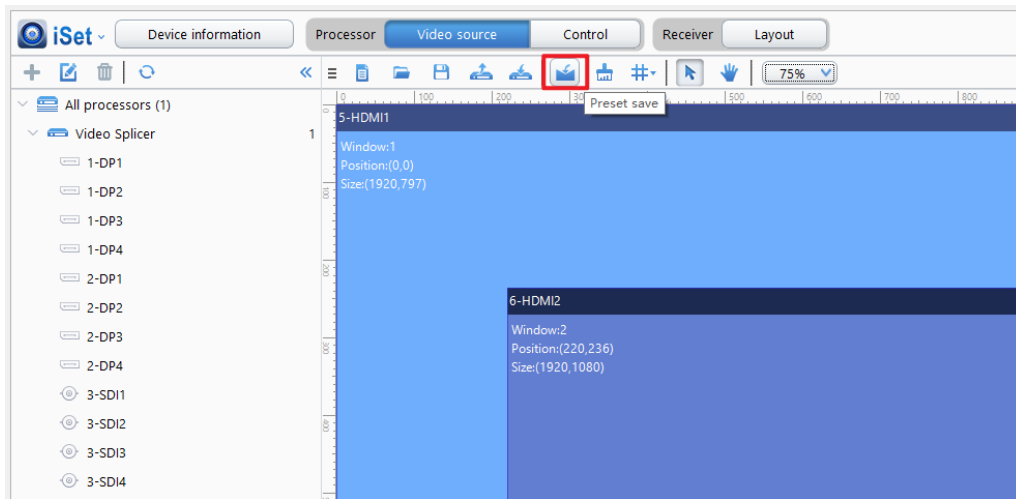
4.2.6 Preset Scene

Preset scenes involve the saving, loading and management. Up to 16 scenes can be preset, and scenes can be switched freely through the front panel.

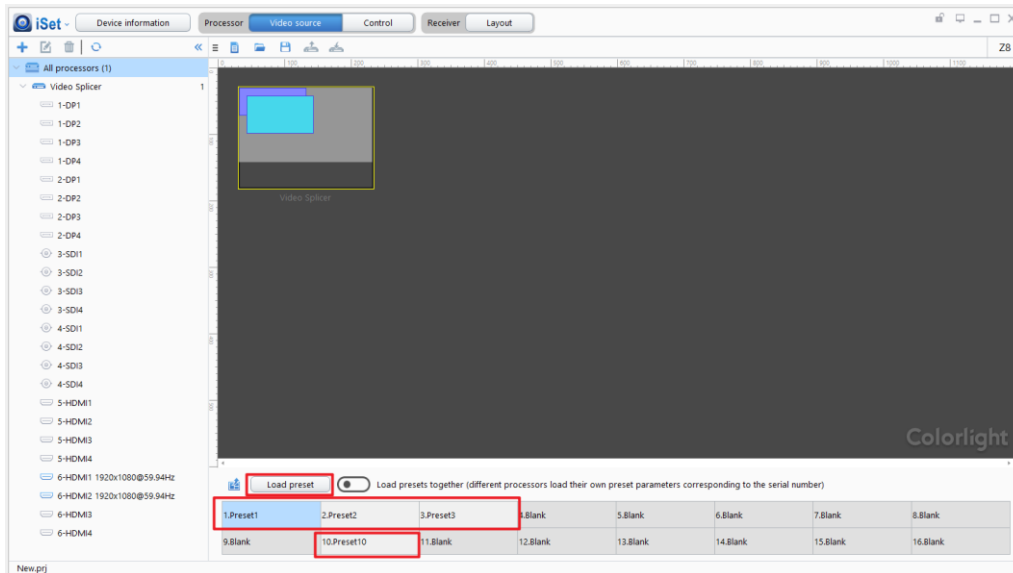
Preset Save

- ① Click the [Video Source] and enter the video source setting page, you can add a or more new windows with drag the input icon to canvas area. click "[Add icon]" to set index and


scene name, then save as preset. If you want to save multiple preset scenes, please repeat the above steps.

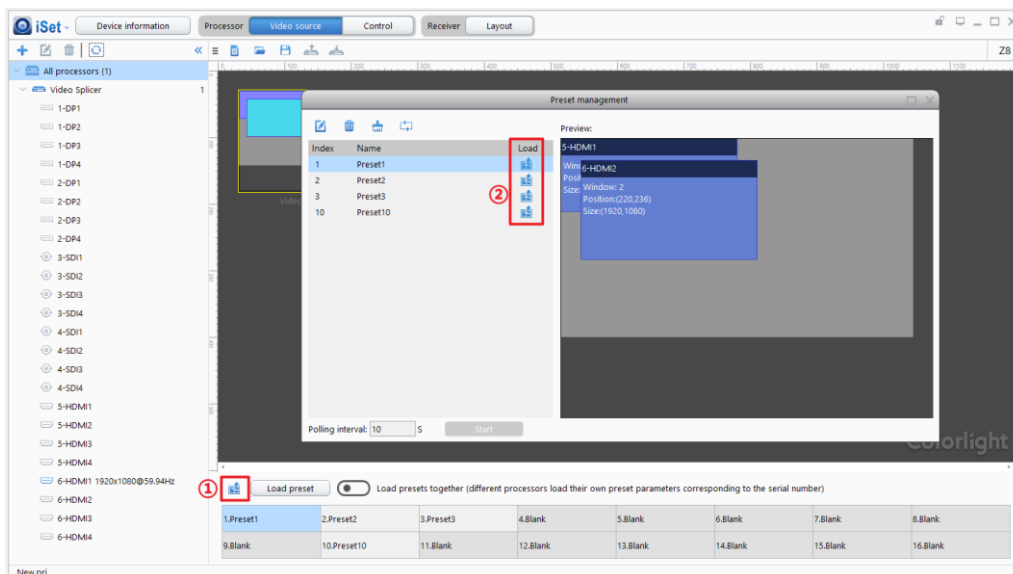



- ② Click " **All processors** " to view the saved preset scene of the corresponding serial number in the left input signal areas.

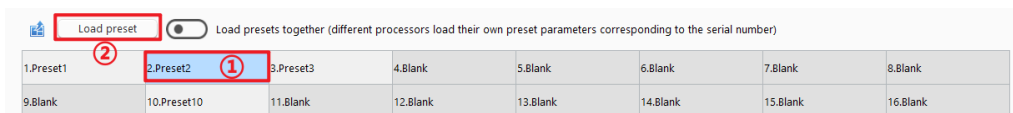







Preset Management

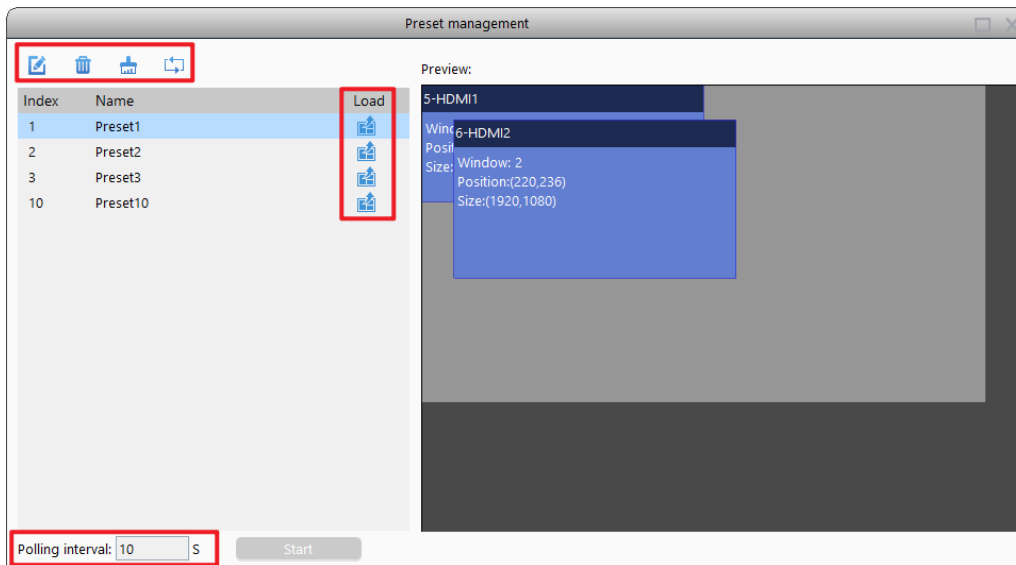
- Click "  " to enter the preset management interface, you can select the preset scene to load.



- Or directly select a preset in the preset list and click "  " to load the preset for display.



- You can rename "  ", delete "  ", clear all "  ", load "  ", and preset polling "  " the saved scenes through preset management, and you can set the polling interval of preset polling by yourself.

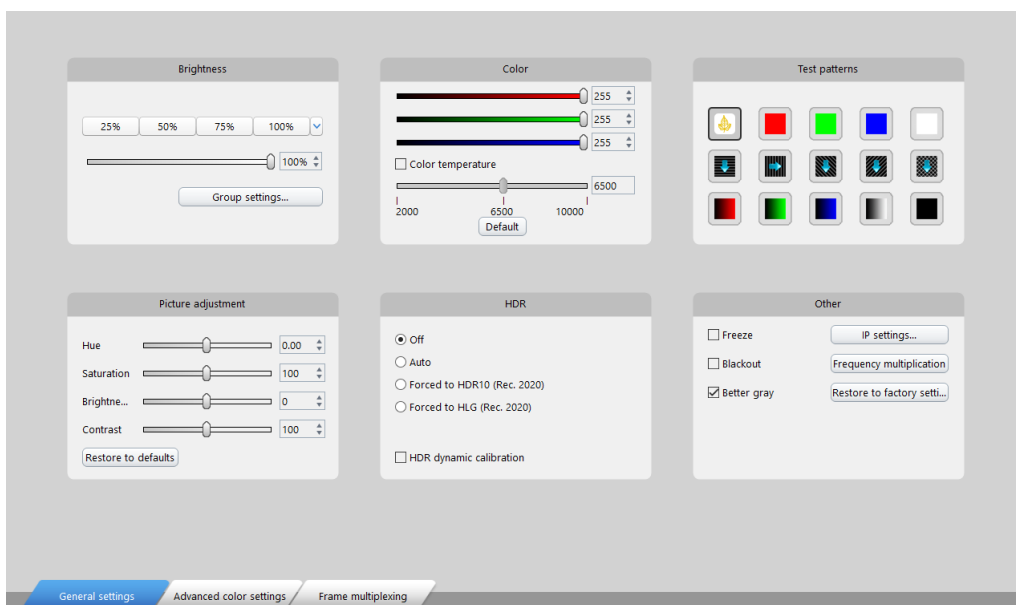


4.3 Control

In the [Control] interface, there are general settings, advanced color settings and frame multiplexing. Selecting the processor to set the brightness, color, test patterns, picture adjustment, HDR and other.

4.3.1 General settings

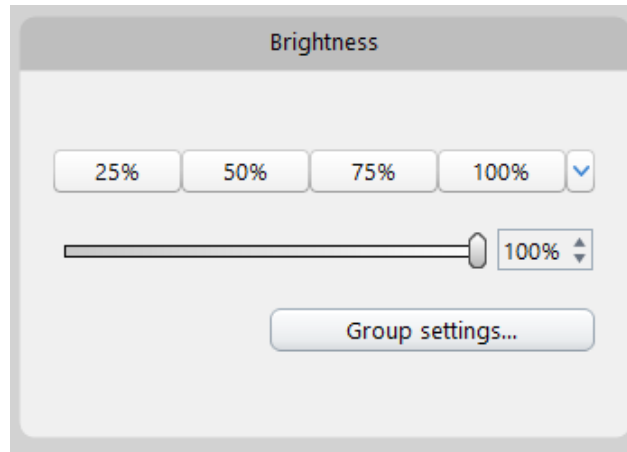
The General settings interface including brightness, color, test mode, picture adjustment, HDR, IP setting, etc.



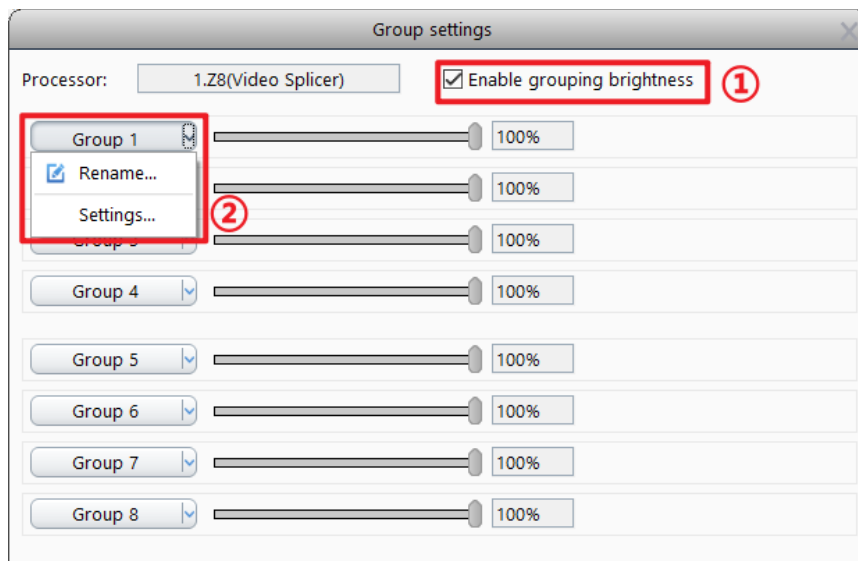
Brightness

- ① Preset four ways to quickly adjust the brightness of the processor: 25%, 50%, 75%, and 100%. If you need to adjust other brightness levels, you can adjust it by dragging

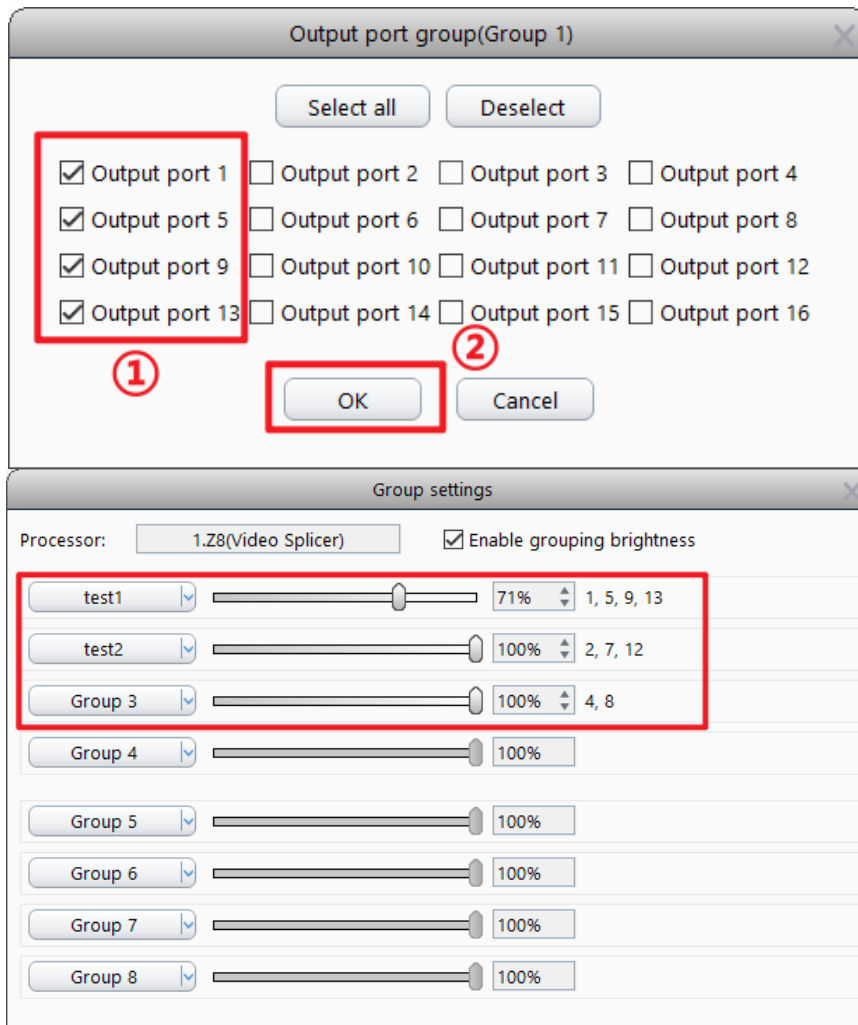
the slider with the mouse. 0% is a black screen, and 100% is the maximum brightness.



- ② When multiple network ports are connected, click "Group settings" to enter the following interface. After checking "Enable grouping brightness" to rename and set output port group.

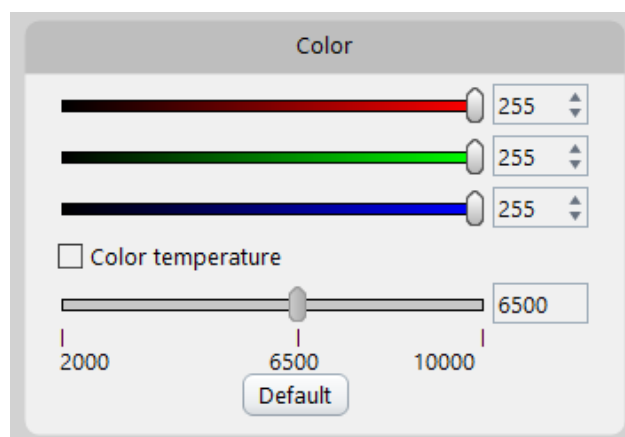


- ③ You can click the "Settings" to choose the output port that you need to be controlled for each group, but a output port can only be assigned to one group. After setting, you can adjust brightness of the group by the slider or the fine-tuning button of the value box, then you can rename the group as needed.



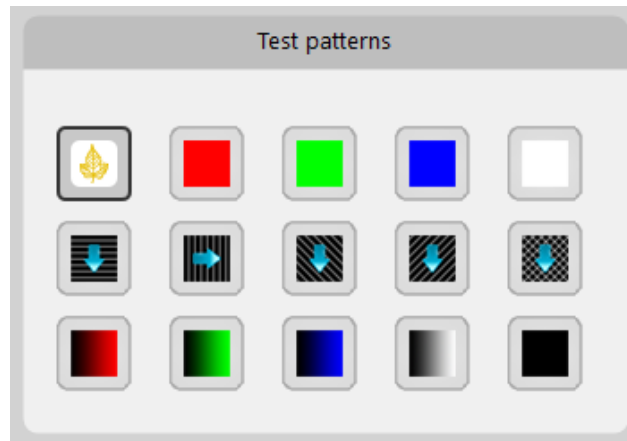
Color

- ① You can change the LED display effect by modifying the brightness of red, green and blue.
- ② You can also change the color temperature by moving the slider, so as to change the LED display effect. Click the "Default" to quickly reset the color temperature to 6500K, the color temperature range that can be set is 2000K-10000K.



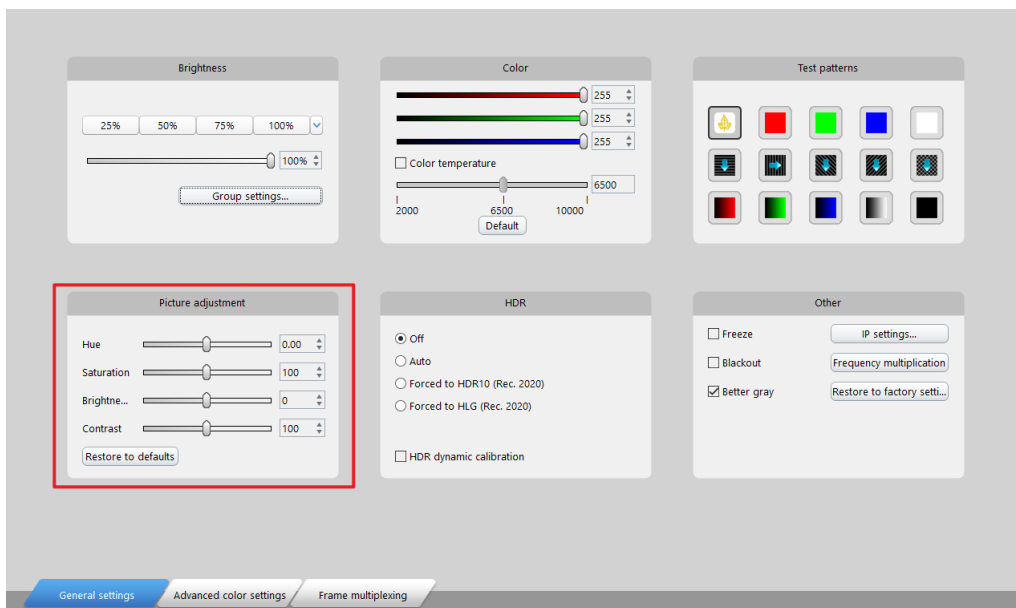
Test patterns

- ① There are 15 test patterns, including normal, red, green, blue, white, vertical moving line, horizontal moving line, right slash move down, left slash move down, grid move down, gradient red, gradient green, gradient blue, gradient white and black display.
- ② You can set different test patterns according to your needs. Click any pattern, and the processor will output the corresponding display effect. You can detect and diagnose the LED through the test patterns.



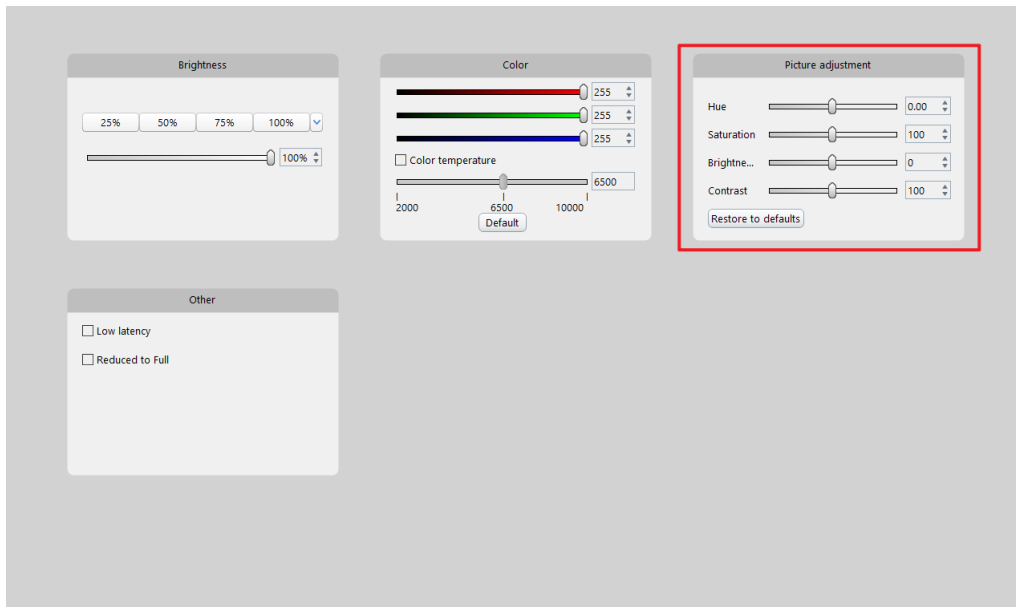
Picture adjustment

- ① Adjustment of the output picture of the processor, you can click “All processors” in the left input signal area to adjust the hue, saturation, contrast and brightness compensation of the output picture of the processor.



- ② Picture adjustment of the input signal source, left-click to select the left signal source,

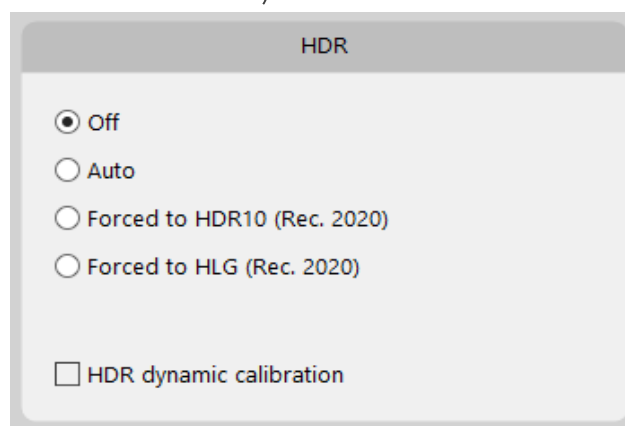
and then adjust the hue, saturation, contrast and brightness compensation of the input signal picture.



HDR

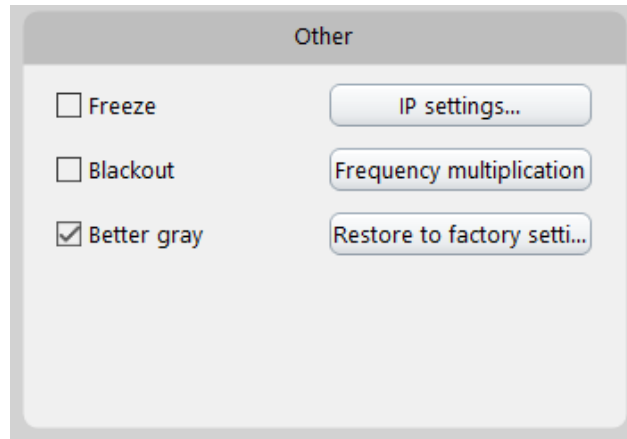
HDR (high dynamic range images) can provide more dynamic range and image detail than ordinary images. Both HDMI and DP of this device support HDR, including HDR10 and HLG.

- ① Prerequisites: You need to set the Z8's output color depth to 10bit/12bit and enable "Precise color management"; The receiving card firmware should support HDR, set the input bit depth of receiver parameters as 10bit / 12bit, and then click other parameters > HDR related Settings > check " ST2084 Electro-Optical Transfer Table " and " Hybrid Log-Gamma Table " and save to receivers.
- ② Enable HDR, which can be set to "Auto" or "Forced to HDR10 (Rec.2020)" or "Forced to HLG (Rec.2020)" to output HDR10 or HLG picture effects. (Notes: Need to cooperate with i9 or above receivers to achieve)

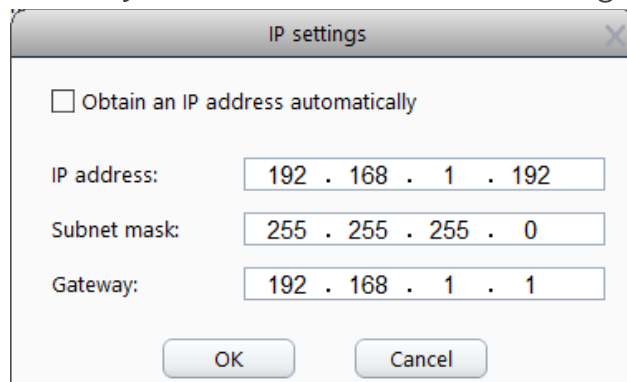


Other

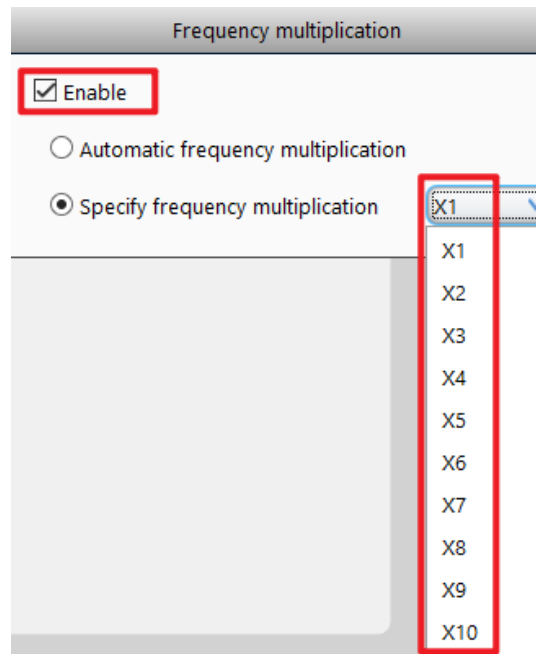
Other settings include " Freeze ", " Blackout ", " Better gary ", " IP settings ", " Frequency multiplication " and " Restore to factory settings " .



- ① Freeze: Check "Freeze", the output images will freeze that you can see a red "Freeze" appears at the bottom right of the software interface.
- ② Black screen: Check "Blackout", and output images is black. There will be a red "Blackout" at the bottom right of the software interface. If you check "Freeze" and "Blackout" at the same time, only the red "Blackout" is displayed at the bottom right of the software interface.
- ③ Better gray: After checking "Better gray", the display effect of the LED under low brightness can be optimized.
- ④ IP settings: You can set the IP address of the device independently, or check "Obtain an IP address automatically" to obtain the IP address through the router.



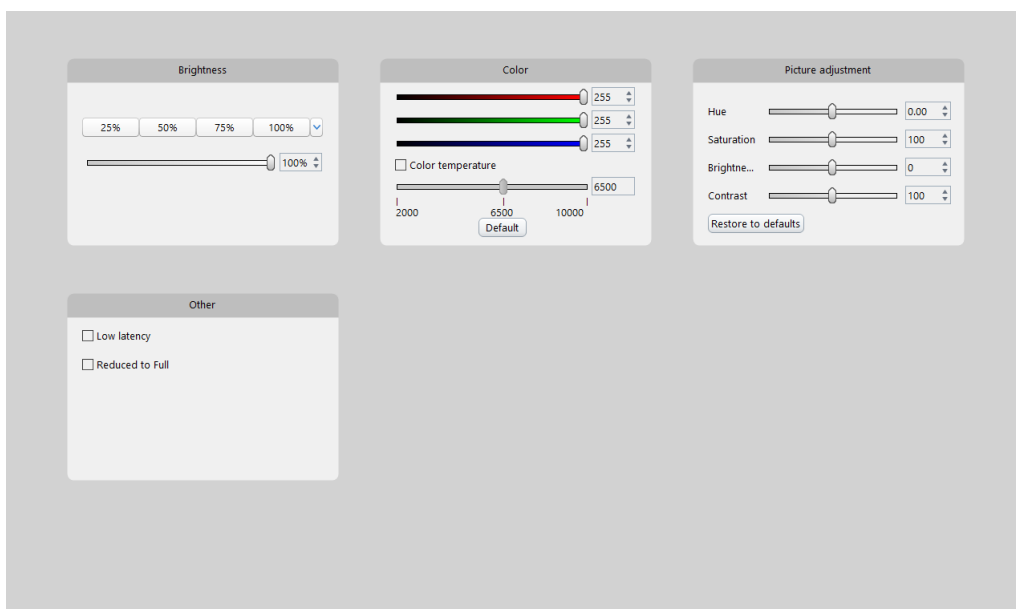
- ⑤ Frequency multiplication: Check "Enable" to select automatic frequency multiplication or specify frequency multiplication. The device supports a maximum of 240Hz.



⑥ Restore to factory settings: The device parameters are restored to the factory state.

4.3.2 Video source picture setting

Click a signal source on the left of the control interface to set the brightness, color, picture adjustment and others individually.



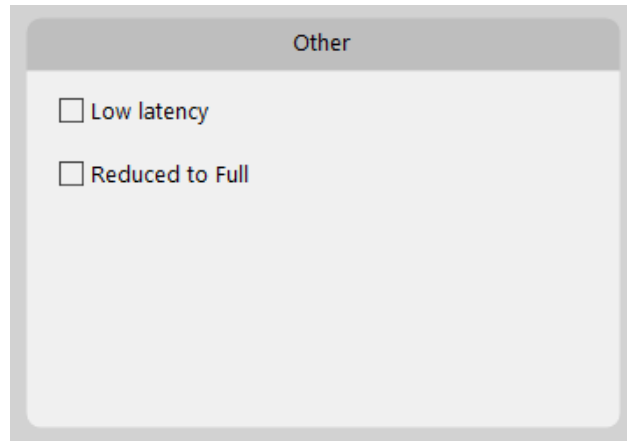
Low latency

Check "Low latency" to reduce the signal processing time of the device.

Reduced to Full

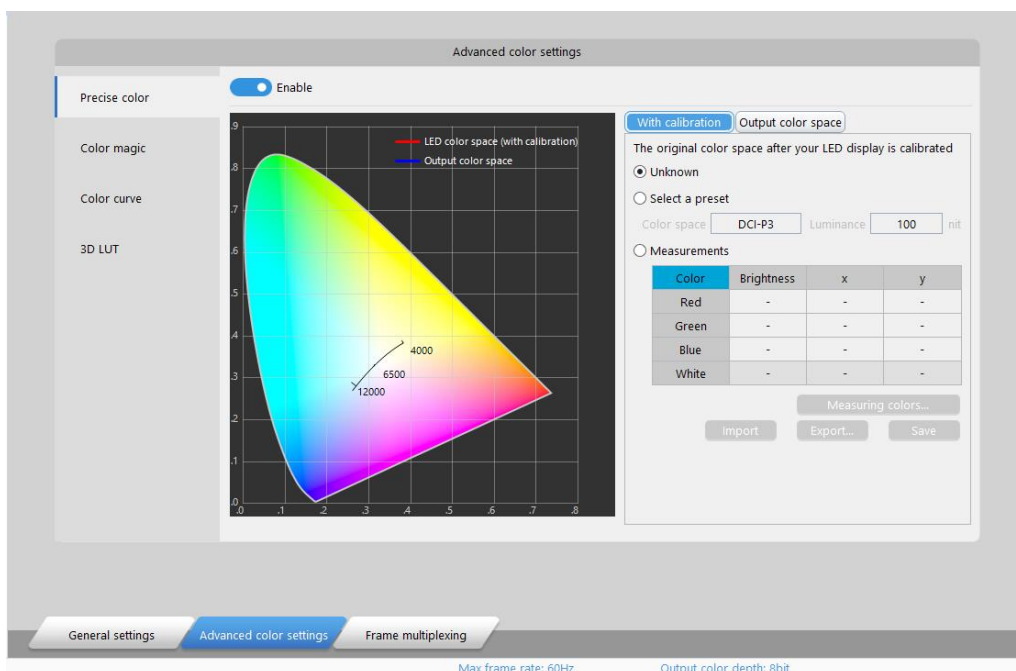
After checking "Reduced to Full", the gray level changes from 16-235 to 0-255, and the

color format is converted from limited to full, which mainly solves the problem that the 0 gray scale of LED is not black.



4.3.3 Advanced color settings

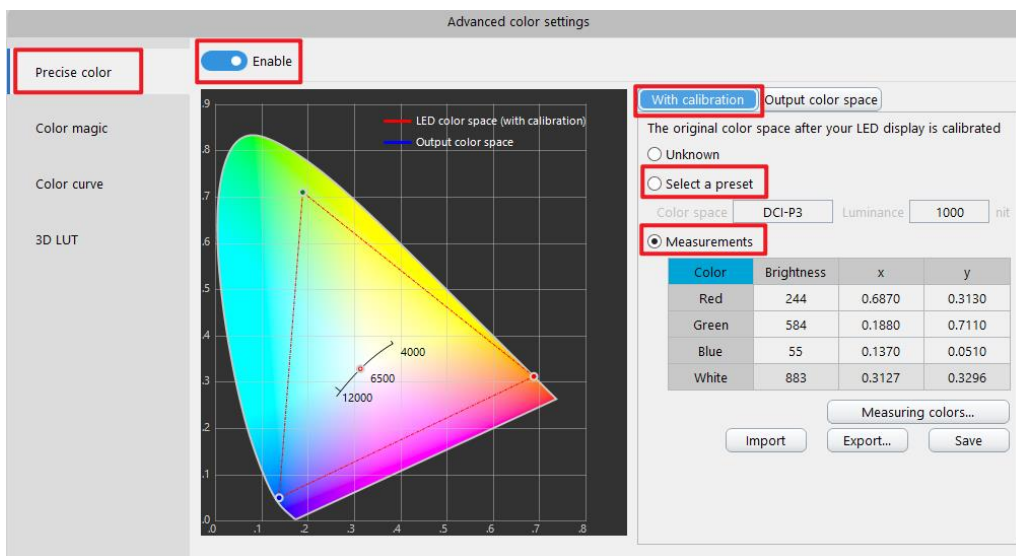
The advanced color setting interface allows more professional color adjustment, it includes precise color, color magic, color curve, 3D-LUT. The serial processing mode is adopted when using this part of functions, and the processing sequence is **picture adjustment > color magic > color curve > 3D LUT > brightness adjustment**. When the related functions are turned on, the picture adjustment takes effect first and the brightness adjustment takes effect finally, and then overlying other functions in turn to adjust the effect.



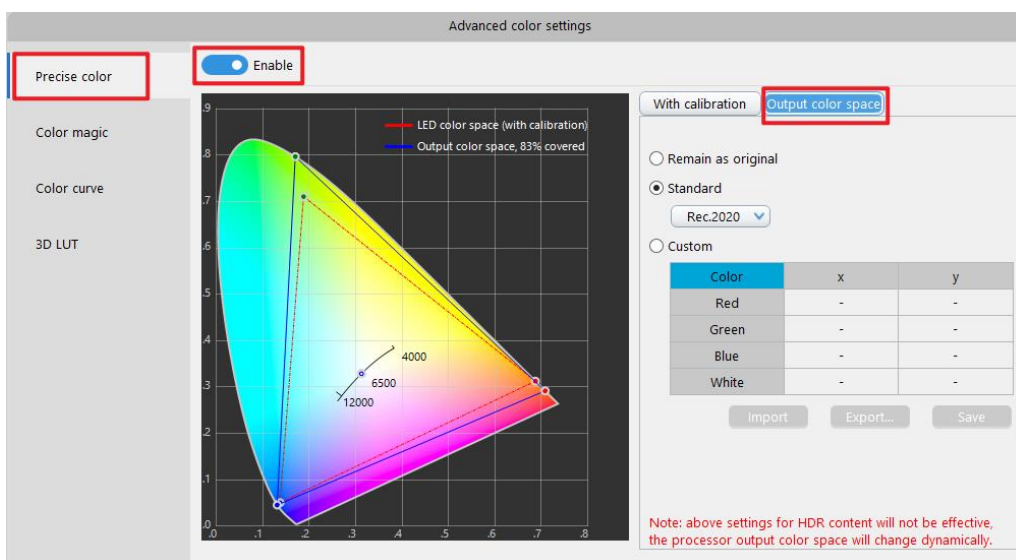
Precise color

Enable this function to accurately adjust the color gamut of the LED, which is used to display a picture more suitable for the color gamut of the video source. It needs to be used with i9 and above receivers.

- ① Enable "Precise color" and select "With calibration" interface, you can select the [Measurements] option and fill in the data of the screen color measured by the colorimeter, or quickly select a preset color space.



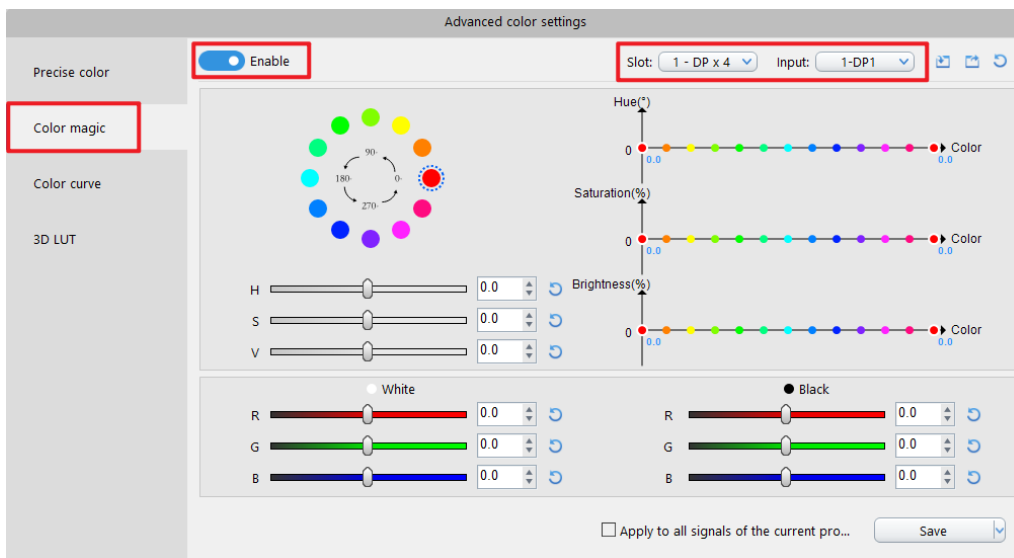
- ② Click the "Output color space" to select or customize the output color space. When the output color space range is larger than the LED's original color space range, the approximate value will be selected within the LED's original range.



Color magic

This function what adjusts hue (H) , saturation (S) and value (V) under HSV color model. When the hue, saturation or value of a color is adjusted separately, the effect of other colors will not be changed, so as to realize local color adjustment.

12 colors that can be adjusted include red, orange, yellow, lime, green, turquoise, cyan, cobalt, blue, violet, magenta and crimson. These colors are evenly distributed on the circumference of the HSV color space, and you can adjust the "H", "S" and "V" of each color. In addition, white and black are used to adjust the brightness of the overall display screen.



- ① Enter the color magic interface, click "enable" and select the slot and input signal source to enable the color magic of the input source.
- ② Select the color to be adjusted according to your needs, you can left-click drag the slider to adjust the values of H, S and V.
- ③ If you need to adjust the bright and dark parts of overall output screen, you can adjust white or black, and then click save.

Color curve

Adjust the YRGB curves to change the color effect of the picture. Y is the overall brightness, R is red components, G is green components, B is blue components, and the abscissa represents 0~255/0~1023 grayscale. Adjust the Y-curve to change the overall brightness, but it does not affect the hue. Adjust the R, G, B curves to change the saturation of red, green and blue, pull up the curve to increase the saturation, and pull down the curve to decrease the saturation.

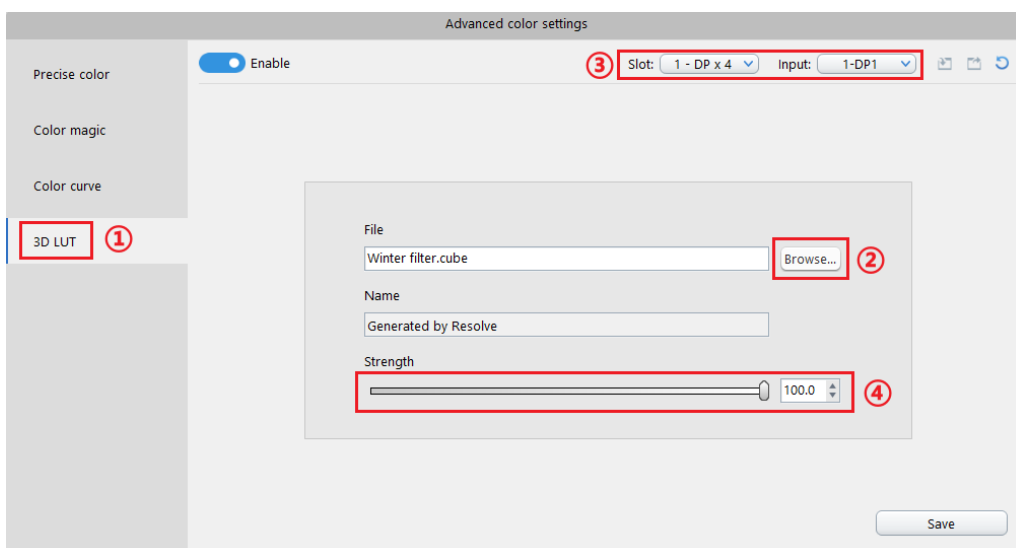


- ① Enter the color curve interface, click "enable" and select the slot and input signal source to enable the color curve of the input source.
- ② Select any point on the curve according to your needs, you can left-click drag the curve to adjust the Y, R, G and B. (Note: each curve has 22 adjustable nodes in total)

3D LUT

3D LUT can calibrate the display color of the LED, and unify the color style of video images in different color spaces.

- ① After clicking "Browse" and loading the ".cube" file in the computer, the 3D LUT will be automatically enabled. You can select the slot and input signal source and adjust the strength as your needs. If the strength is 0, it is no effect.

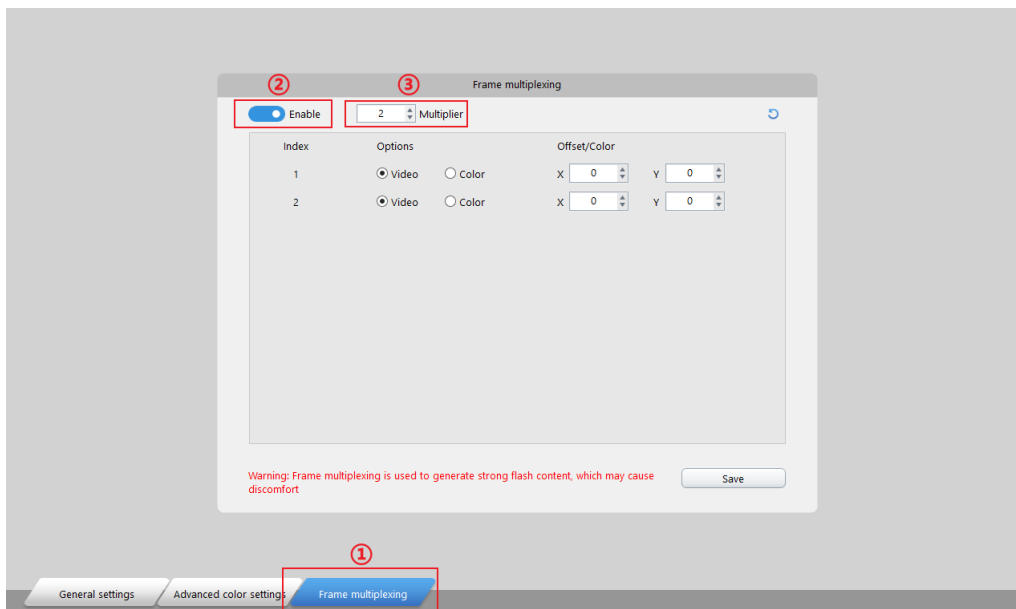


Note: 3D LUT must be enabled under the video source with full RGB output to ensure the

effect of 3D LUT. If you load the 3D LUT file under video sources with limited range output, the expected effect cannot be achieved. 3D-LUT files can be produced by professional video processing software " 3D LUT Creator ", " Adobe Photoshop "etc.

4.3.4 Frame multiplexing

Frame multiplexing for multi-camera shooting of virtual background, support fusion output of multiple video signals.



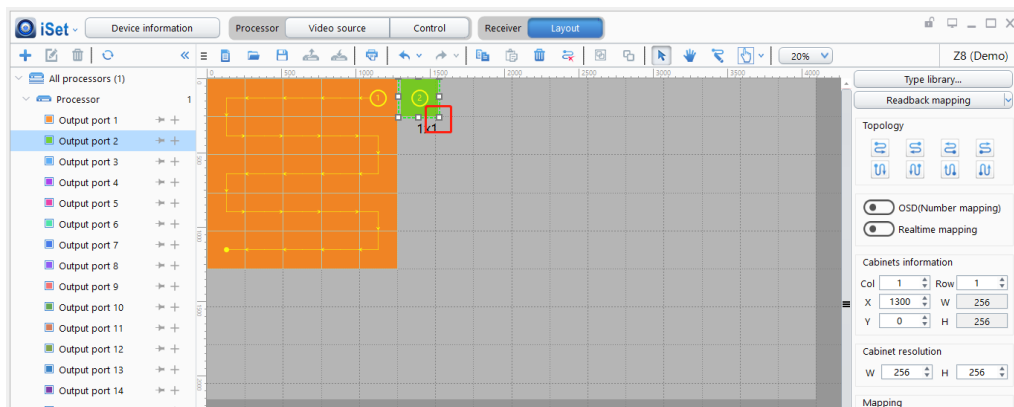
- ① Click the "Enable" in the frame multiplexing interface to enable this function. Select the multiplier according to the required number of images overlays. For example, if there are three different backgrounds, you need set the multiplier to three. Output frame rate = phase-locked frame rate × multiplier.
- ② Select video or solid color according to the displayed images. When selecting the video, you need to set the offset (X and Y) of the display screen. The display range will be automatically calculated according to the output network port control area. When selecting solid color, you can specify the color.

4.4 Layout

Click [**Layout**] to enter setting of receiving cards. You need to set the layout according to the actual LED panel placement and network cable connection mode.

① Add Cabinets

Select the output port, click "+" and select imported cabinets model or cutstom to add a cabinet, then you can drag the corner of the cabinet to increase or decrease the number of cabinets.



② Setting Mapping

Added Cabinets will set default connection mapping, it may not correct. You can click "🔄" to clean the mapping. Click "🔍" at the top symbol line, then click the cabinets one by one from the start to the end. Or you can select all cabinets and choose the existing topology to set mapping.



③ Save Mapping

Once the cabinets connection mapping is finished, click [**Save mapping**], the cabinets connection mapping will be sent to sender and saved. Then, the screen will display correctly.

5. LCD Operate Instruction

5.1 Operational Instruction

Knob/OK:

- Rotate the knob to select the menu or press the knob/OK under the operation interface of the menu to select current menu or enter submenu.
- Rotate the knob to adjust parameters after selecting the menu with parameter; press the knob/OK again for confirmation after adjustment.

ESC: Return key, exit current menu or operation.

Lock: Lock all front keys, and repress and following the directions to press "OK" to quit.

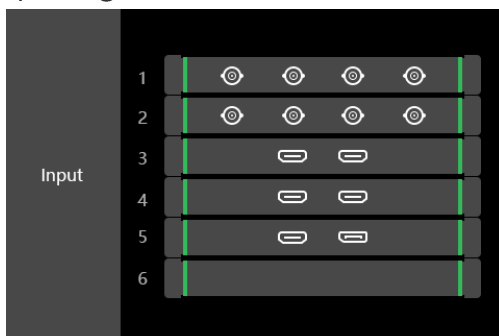
Brightness: Enter the adjustment interface of "Brightness", press the knob/OK to rotate the knob to change the percentage of brightness in the option of "Brightness" .

Black: Press the knob/OK to switch on/off LED screen.

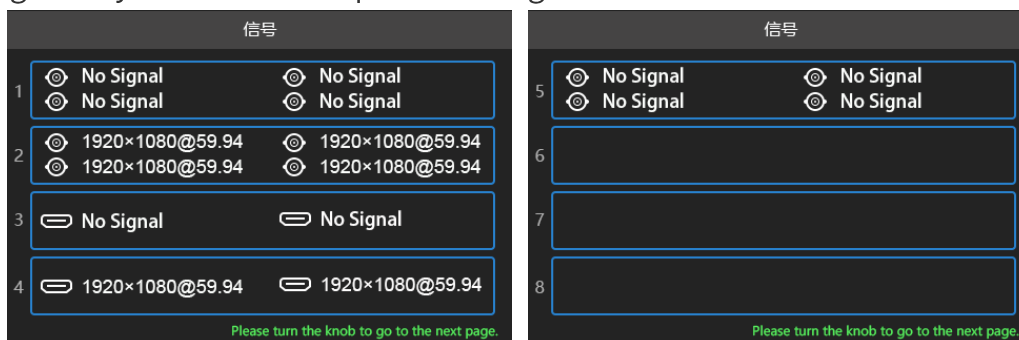
Freeze: Press the "Freeze" to switch on/off LED screen freeze.

Home: Press the "Home" to quickly return to the home page.

Input: Input key, view the input signal information of the board.

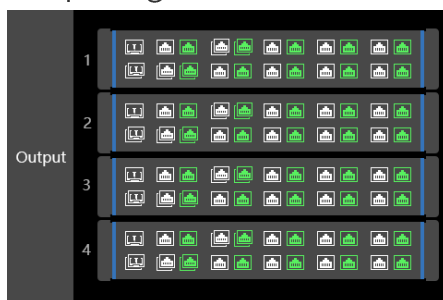


Signal: Signal key to check the input of the signal source.

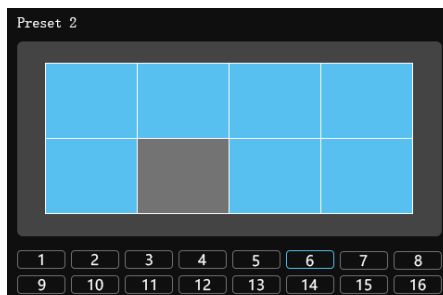


Menu: Press the "Menu" to enter the menu interface and set the function of the menu page.

Output: Output key, view the output signal information of the board.



Mode: Once press "Model", the screen will load the preset setting.



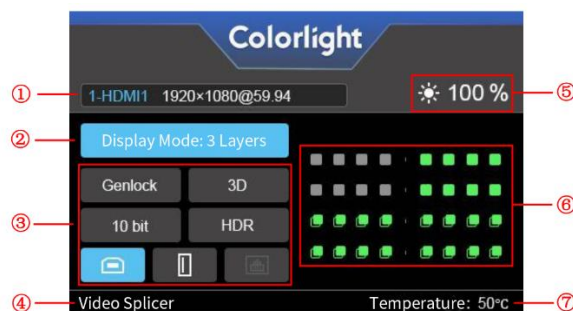
5.2 Starter

When powering on the Z8, it will show the picture until Z8 ready.



5.3 Main Interface

After starting the controller, the main interface of the LCD display is as follows:



- ① Display the input port and the resolution and frame rate of the corresponding signal
- ② Display mode
- ③ Genlock, 3D, 10bit, HDR, USB IN, USB OUT, LAN

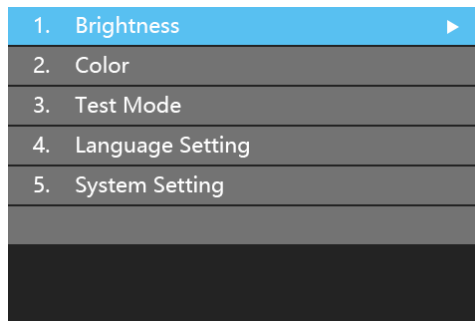
- Blue background: The function or port is being used.
- White icon & gray background: The function or port is not used.
- Gray icon: The function or port is not supported

- ④ Device name (can be modified in software)
- ⑤ Output brightness
- ⑥ Connection status of output ports (Gray: unconnected, Green: connected, Overlay: redundant)
- ⑦ Device temperature

*Note: When the hardware is different, the interface will be slightly different.

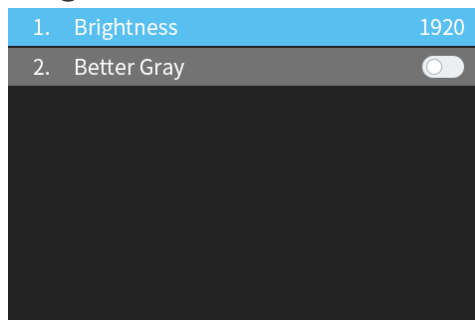
5.4 Operation Instruction

Press the knob/OK to enter the operation interface of the menu, and it includes 5 operation instructions: Brightness Setting, Color Setting, Test Mode, Language Setting, System Setting.



5.4.1 Brightness Setting

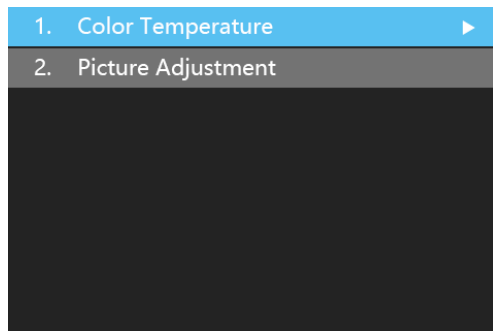
Rotate the knob to select the brightness setting, and press the knob/OK key to enter the submenu of "Brightness Setting".



- ① In the option of "Brightness", rotate the knob to change the brightness, and it will be auto-saved if there is no following operation.
- ② In "Better Gray", press the knob / OK key to turn on or off the function.

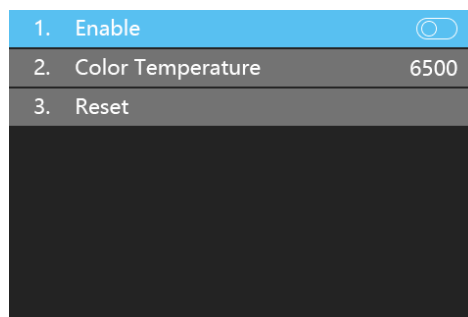
5.4.2 Color Setting

Rotate the knob to select the color setting, and press the knob/OK key to enter the submenu of "Color Setting"



Color temperature

Rotate the knob to enable the function, and then change the value of color temperature in the option of "Color Temperature", and it will be auto-saved within 10 seconds if there is no continuing operation; otherwise, you can press the knob/OK to reset the value of color temperature as 6500 in the option of "Reset".



Picture Adjustment

Enter the setting interface of "Picture Adjustment", and users can set hue, saturation, brightness compensation, and contrast of the image by knob. Users can also reset all parameters to default values, hue and brightness compensation default to 0, saturation and contrast default to 100.



5.4.3 Test Mode

Enter the interface of "Test Mode", rotate the knob to select test mode, press ESC back to normal mode.

1. Normal ✓	9. Right Slash Move Down ✓
2. Red	10. Grid Move Down
3. Green	11. Gradient Red
4. Blue	12. Gradient Green
5. White	13. Gradient Blue
6. Horizontal Moving Line	14. Gradient White
7. Vertical Moving Line	15. Black
8. Left Slash Move Down	

5.4.4 Language Setting

Enter the setting interface of "Language", press the knob/OK to switch the language.

1. English ✓
2. Chinese

5.4.5 System Setting

Enter the setting interface of "System Setting", you can restore factory settings and check current firmware information and upgrade the device.

1. Factory Reset ▶	Are you sure to do factory reset?
2. Version V1.0	1. No
3. Version Details	2. Yes
4. Upgrade	

Board Type	FPGA1	FPGA2	MCU
Rear Board	1.00	-	-
In SDI×4	0.25	-	-
In SDI×4	0.26	-	-
In HDMI×2	0.60	-	-
In HDMI×2	0.60	-	-
In DP×2	3.67	-	-
Out 10G-Fiber	0.91	-	-

Front Board	-	-	1.80
Main Board	-	-	2.20



Visual Future

Colorlight Cloud Tech Ltd
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