

INSTRUCTIONS



X20

USER MANUAL

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1.Safety Information

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

- **Do not remove the cover**

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

- **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.

- **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.

- **Grounding**

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

- **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

- **Environmental Condition**

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

- **Avoid Moisture**

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

- **Keep the product away from flammable and explosive hazardous substances**

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.

2 Overview

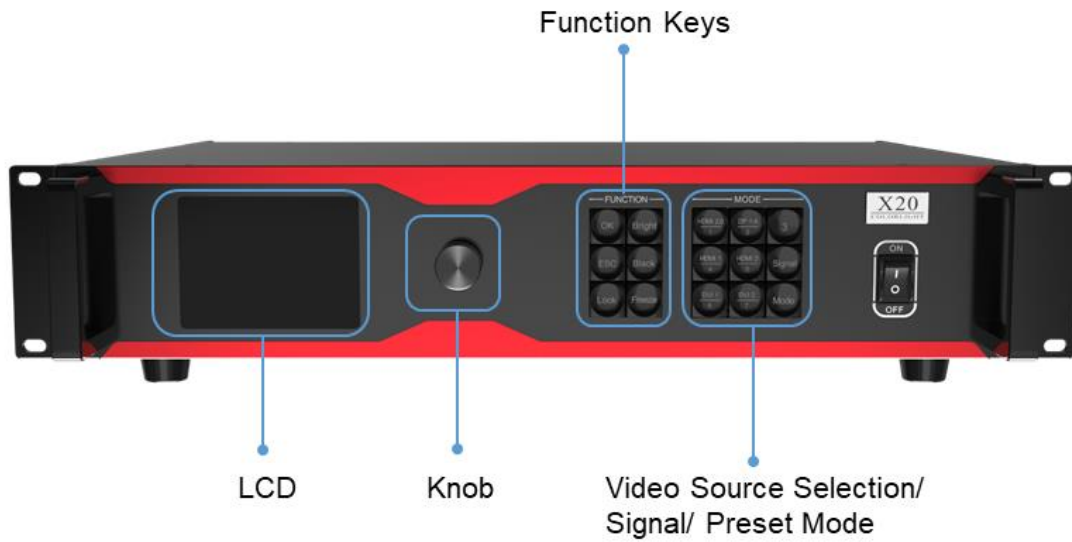
X20 is a controller possessing powerful video signal input and processing capacity. It supports 4K inputs with DP1.4 and HDMI2.0 connectors, and 2K inputs with HDMI1.4 and DVI connectors, and the multiple signals can be seamlessly switched. A single unit features a loading capacity of 16384 pixels in maximum width or 8192 pixels in maximum height. Equipped with 20 Gigabit Ethernet ports and 2 10G optical fiber ports, X20 is able to meet the need of different clients. Additionally, X20 boasts abundant practical functions that enable flexible screen control and high-quality image display.

Features

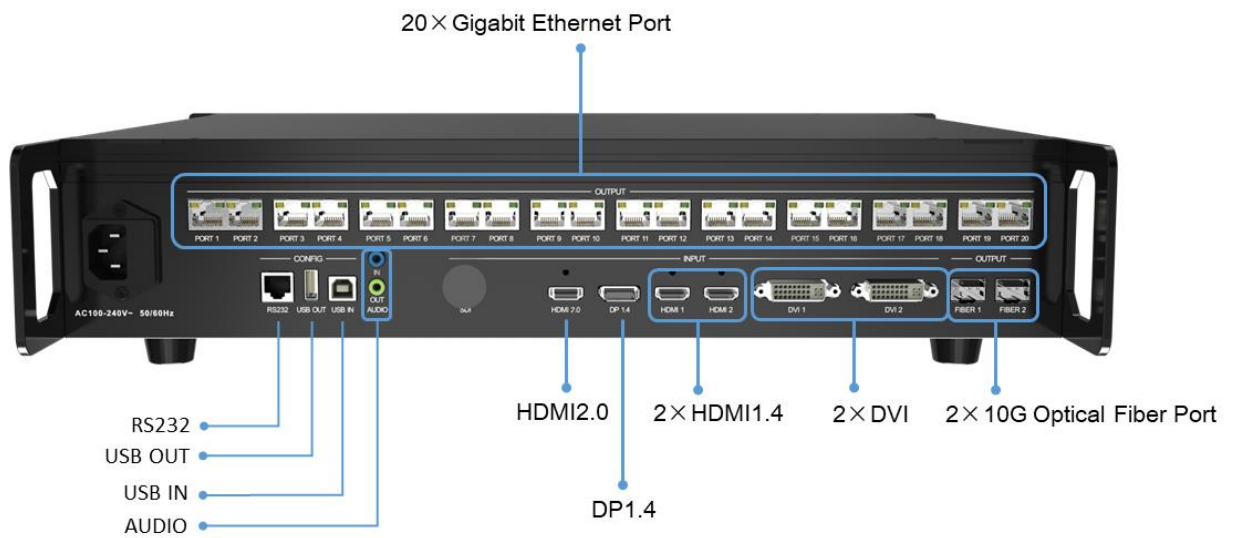
- Input connectors: 1×DP 1.4, 1×HDMI 2.0, 2×HDMI 1.4, 2×DVI
- Input resolution: up to 4096×2160@60Hz, supporting customized setting
- Output connectors: 20×Gigabit Ethernet port, 2×10G optical fiber port
- Supports video source switching, cropping, splicing and scaling
- Supports up to 6 windows, of which the location and size can be freely adjusted
- Supports precise color management and display gamut adjustment
- Supports video sync
- Separate audio input and output
- Support RS232 protocol control
- Support HDCP
- Brightness and color temperature adjustment
- Better gray at low brightness

3 Appearance

Front Panel

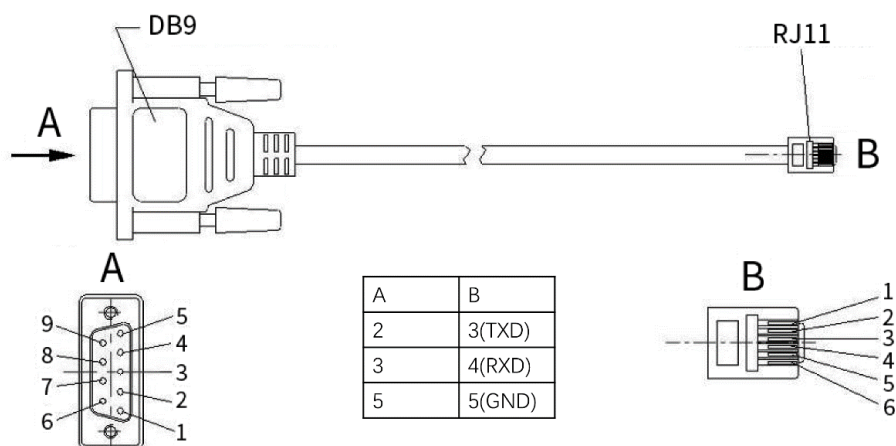


Back Panel



Input		
1	HDMI 2.0	1×HDMI 2.0
2	DP 1.4	1×DP 1.4
3	HDMI1, HDMI2	2×HDMI 1.4
4	DVI1, DVI2	2×DVI
Output		
1	Port 1-20	RJ45, 20×Gigabit Ethernet port
2	Fiber1 Fiber2	Dual LC, 2×10G optical fiber port
Control		
1	RS232	RJ11(6P6C)*, used to communicate via 3 rd party interfaces
2	USB OUT	USB output, for cascading with the X20 controller
3	USB IN	USB input, connecting to PC for debugging
Audio		
1	AUDIO IN	Audio input, for inputting audio signals from the computer or other devices
2	AUDIO OUT	Audio output, for outputting audio signals to the speaker (Support outputting the audio signals of HDMI and DP)
Power supply		
1	AC 100~240V	AC power connector, containing a built-in fuse

*DB9 female to RJ11(6P6C) cable:

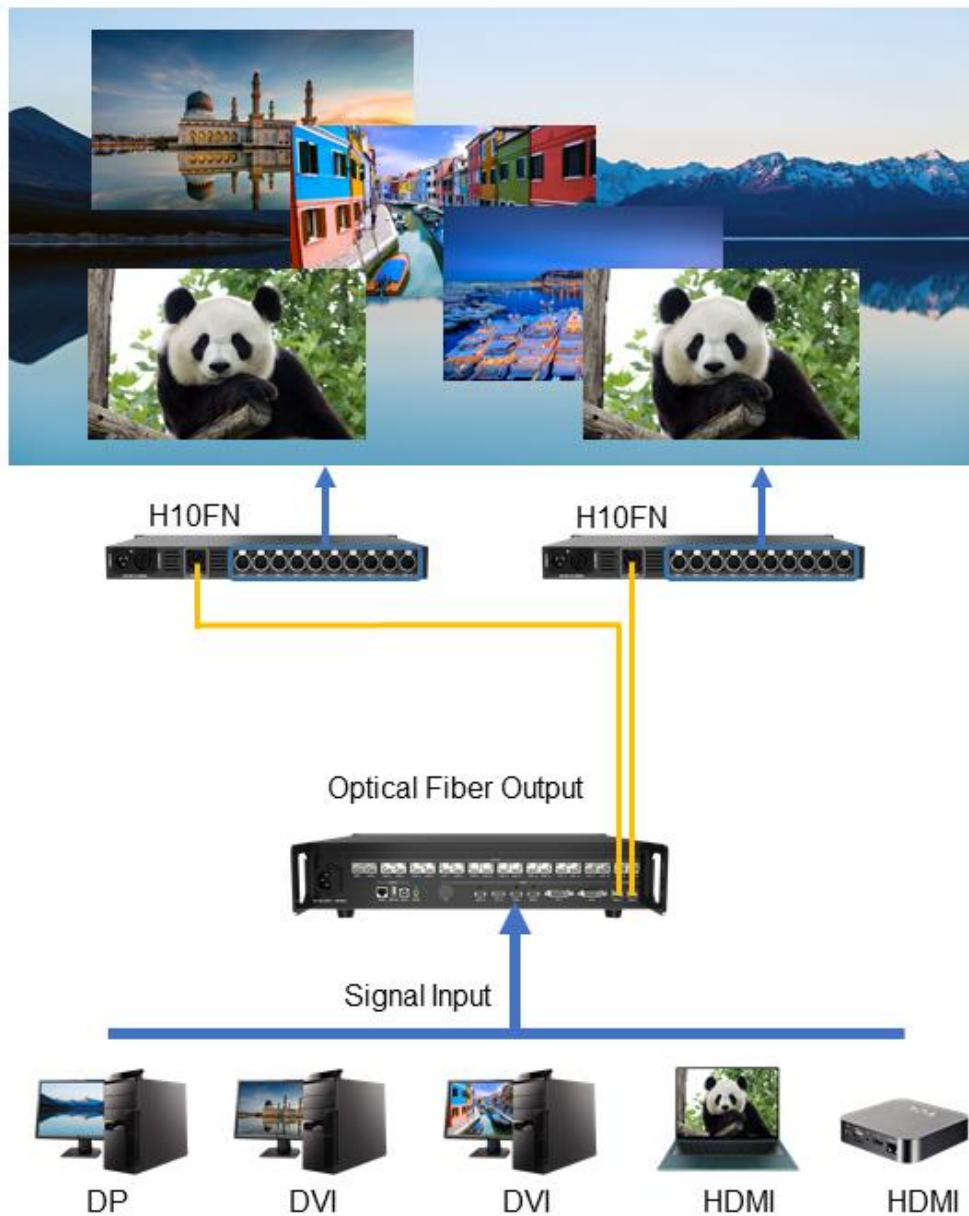


4 Application Scenarios

4.1 Ethernet Output



4.2 Optical Fiber Output



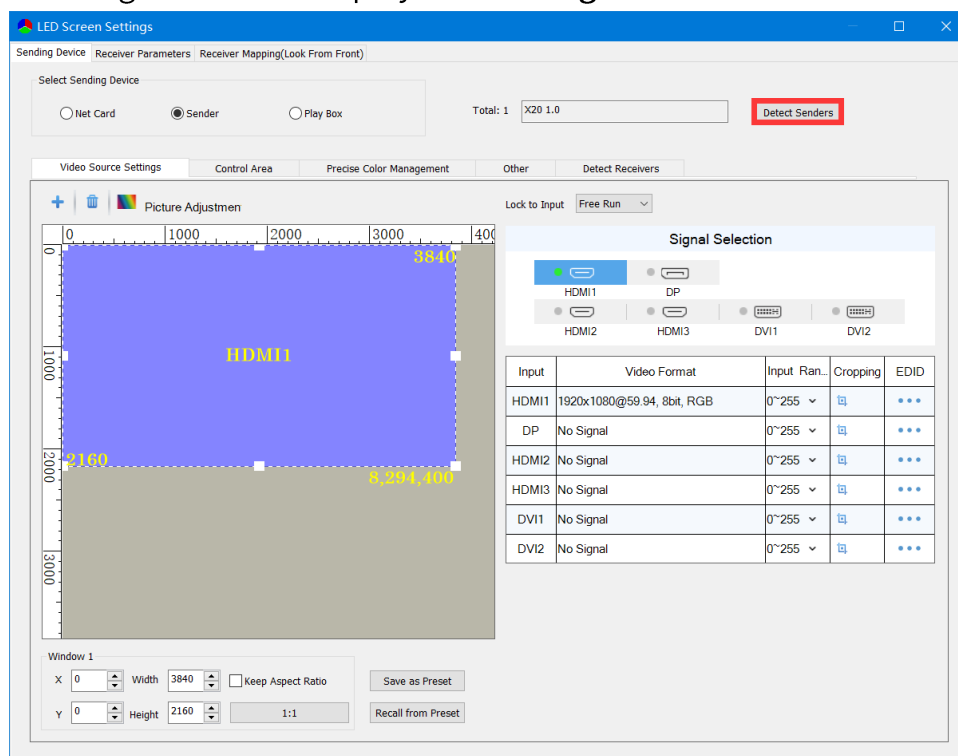
5 Software Operation Instruction

Please make sure the hardware is properly connected before setting parameters, and that all senders and receiver cards can be detected by the software. You can visit www.colorlightinside.com to download LEDVISION installer.

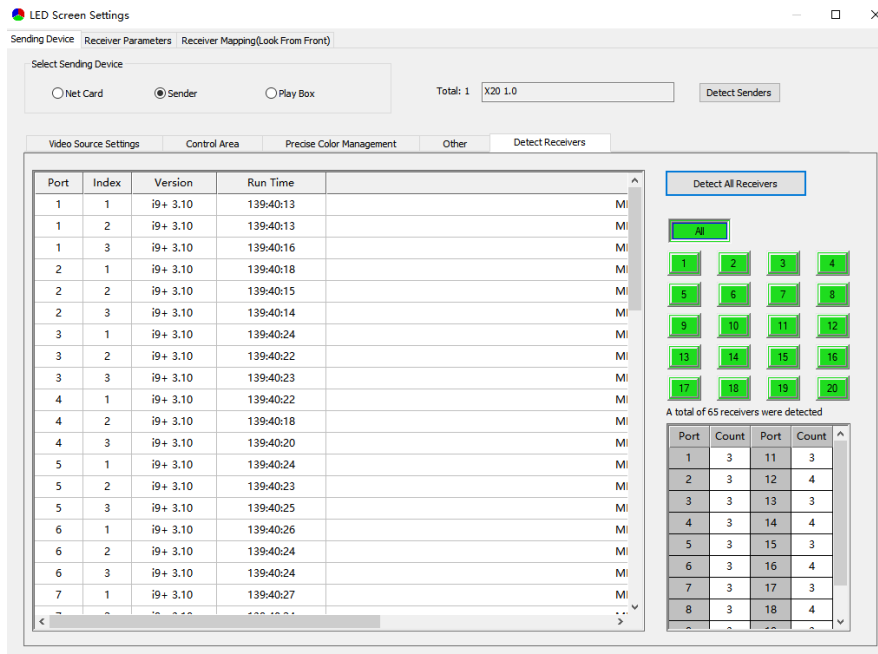
5.1 Detect the Sender and Receiver Card

Open LEDVISION, click **Control**, select **LED Screen Settings** from the drop-down list, and enter the password “168” .

In the pop-up **LED Screen Settings** window, click **Detect Senders** in the upper-right corner of the window, and the number, model and version of the sender are displayed in the field next to **Detect Senders**. When the input of signals is normal, the current status of signals can be displayed in the **Signal Selection** area.

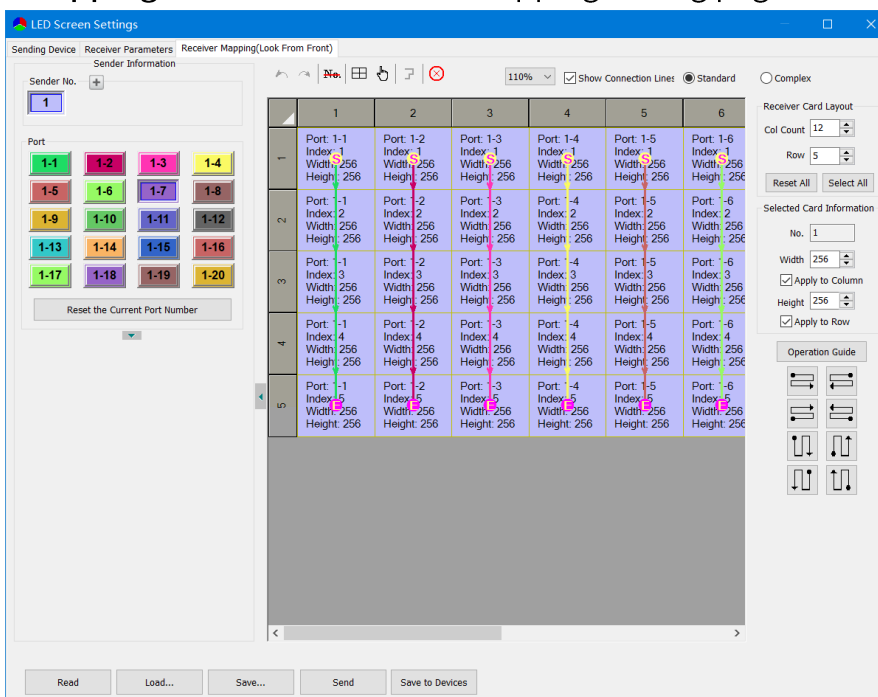


Click **Detect Receivers**. On the **Detect Receivers** subpage, click **Detect All Receivers**, and the software will automatically acquire information such as the port, index, version, running time, and supported chips of the receiver card. Please check the corresponding cable if the number of receiver cards are inconsistent with actual status.



5.2 Receiver Mapping Settings

Click **Receiver Mapping** to enter the receiver mapping setting page.

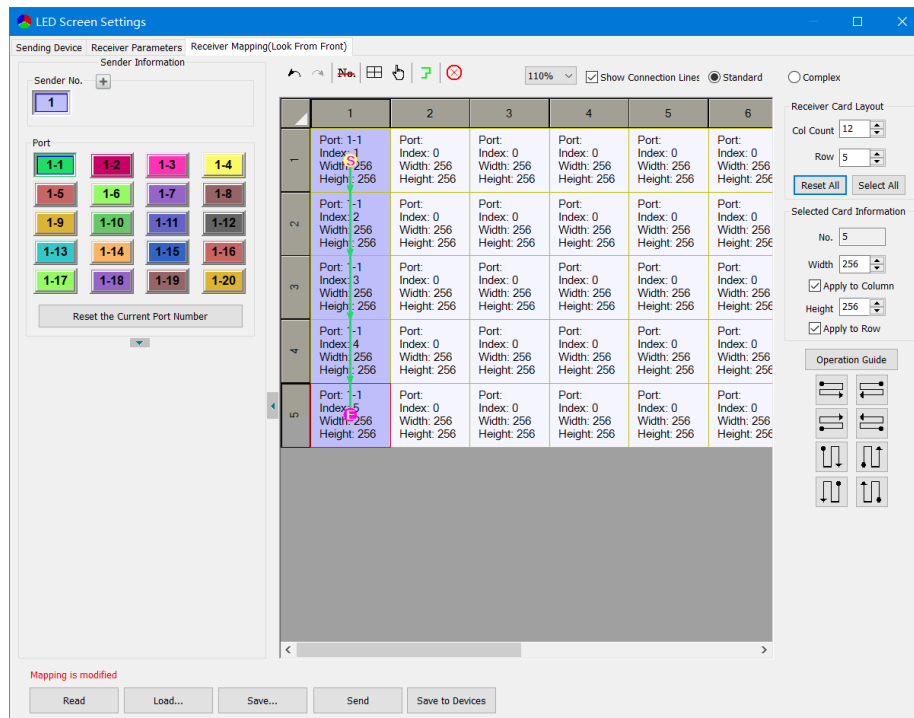


Detailed setting steps are as follows:

5.2.1 Mapping Settings

Select the target Ethernet port on the left side, and then select the corresponding cabinets within the actual control area of the port and set the connection lines in the simulated cabinet area.

In the simulated cabinet area, select the corresponding cabinet of the first receiver card based on the actual connection of the Ethernet port (view from the front), and left-click the cabinet one by one according to actual connecting line, until the last one this Ethernet port controls.



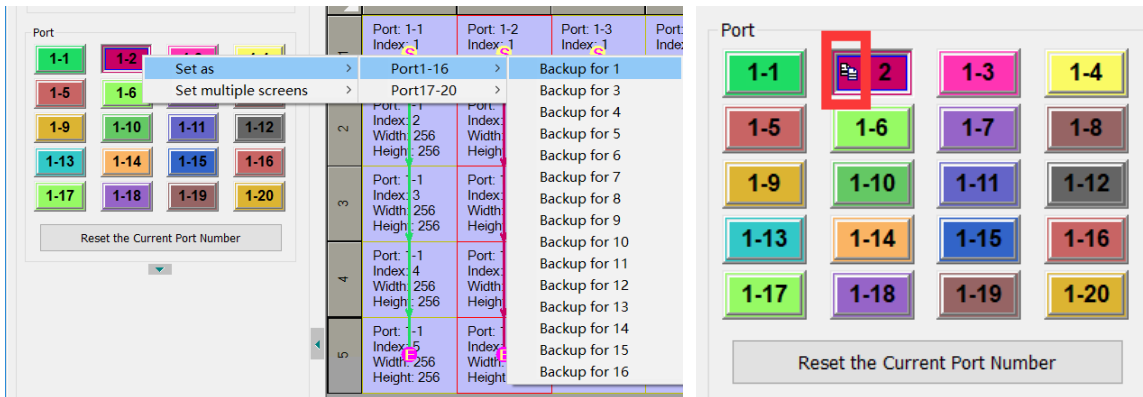
For the cabinets with different specifications (different in dimensions), you can select them and adjust the mapping separately after setting.

5.2.2 Saving Mapping

After successively setting the cabinets each port controls and their mapping, click **Send** and **Save to Devices** at the bottom of the window to send and save the mapping to the current sender and receiver cards.

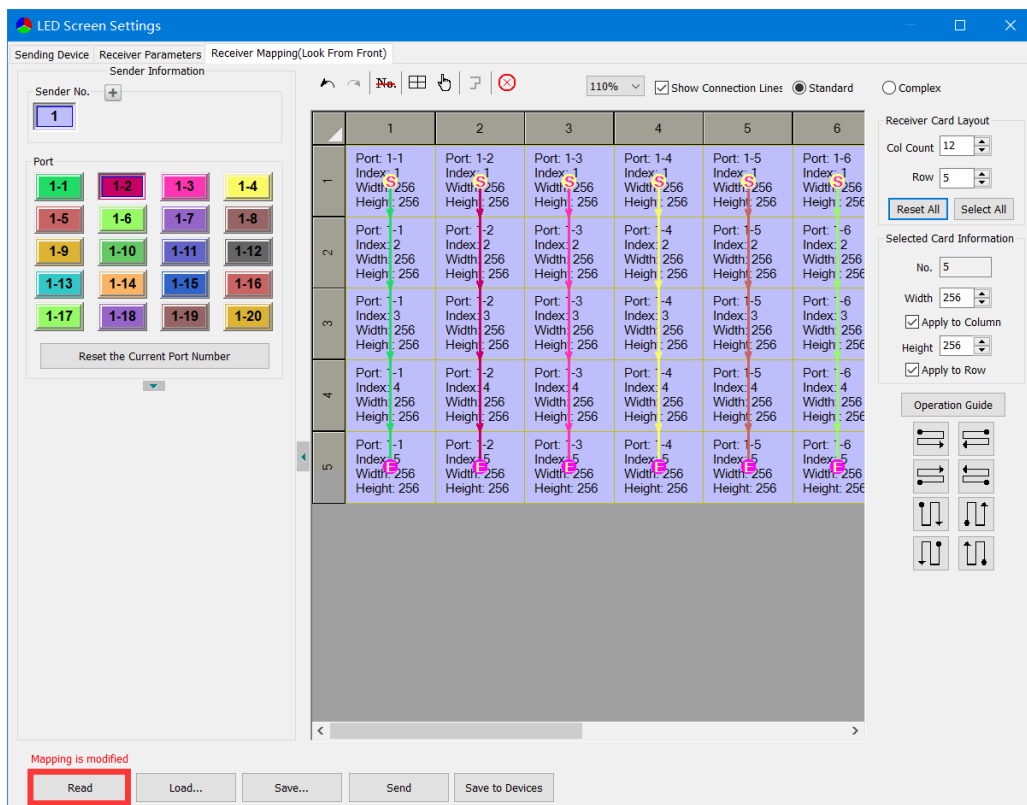
5.2.3 Backup Port Settings

Right-click the sequence number of the backup port, and select the target port that needs a backup. After setting, a backup sign will be displayed besides the sequence number of the backup port.





5.2.4 Reading Mapping

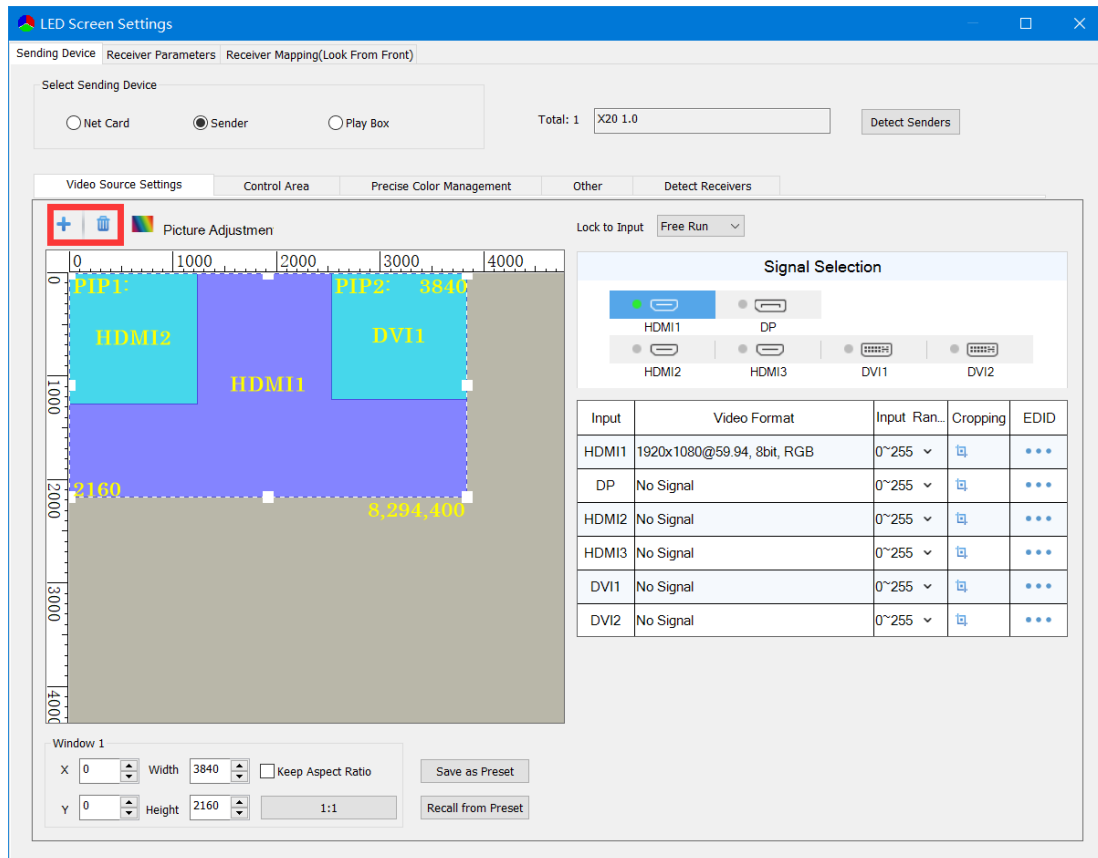
Click Read in the lower-left corner of the page, and the mapping parameters of cabinets saved in the receiver cards can be read back.



5.3 Video Source Settings

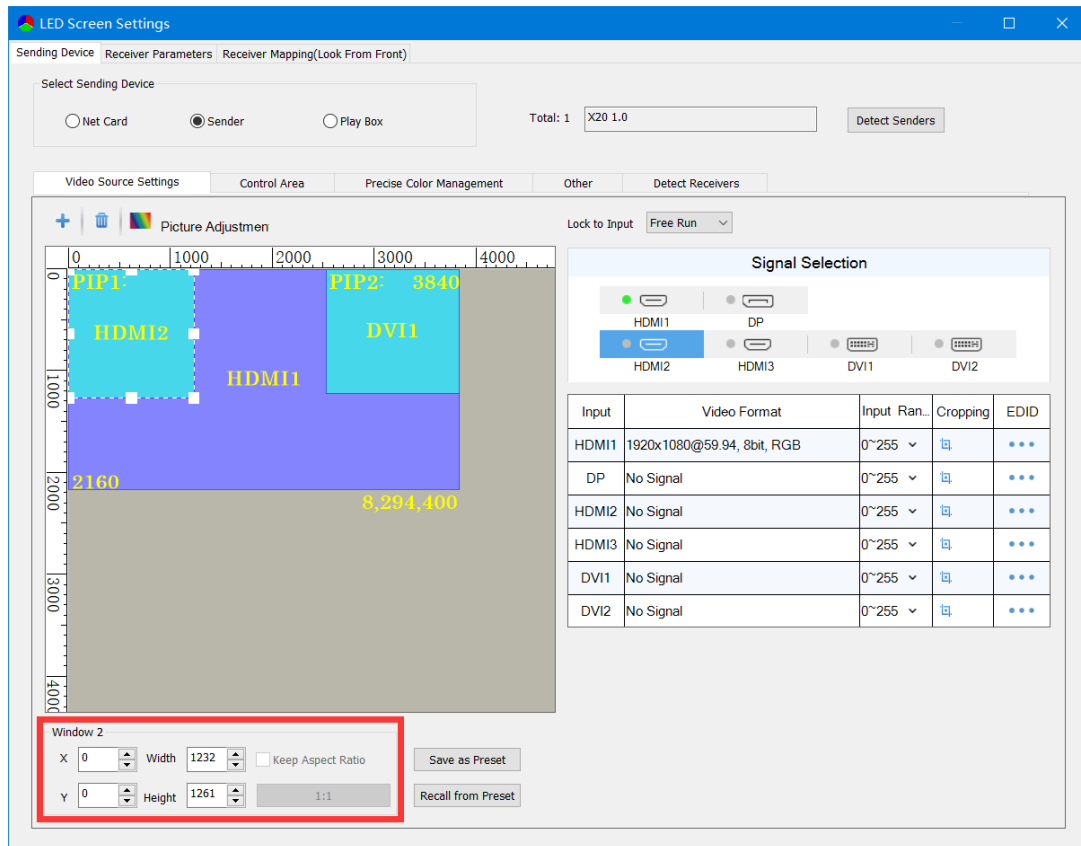
5.3.1 Multi-window Display

The device supports up to 6-window display. You can click  to add a window, and then select the added window and switch signals in the **Signal Selection** area; or click  to delete the selected window.




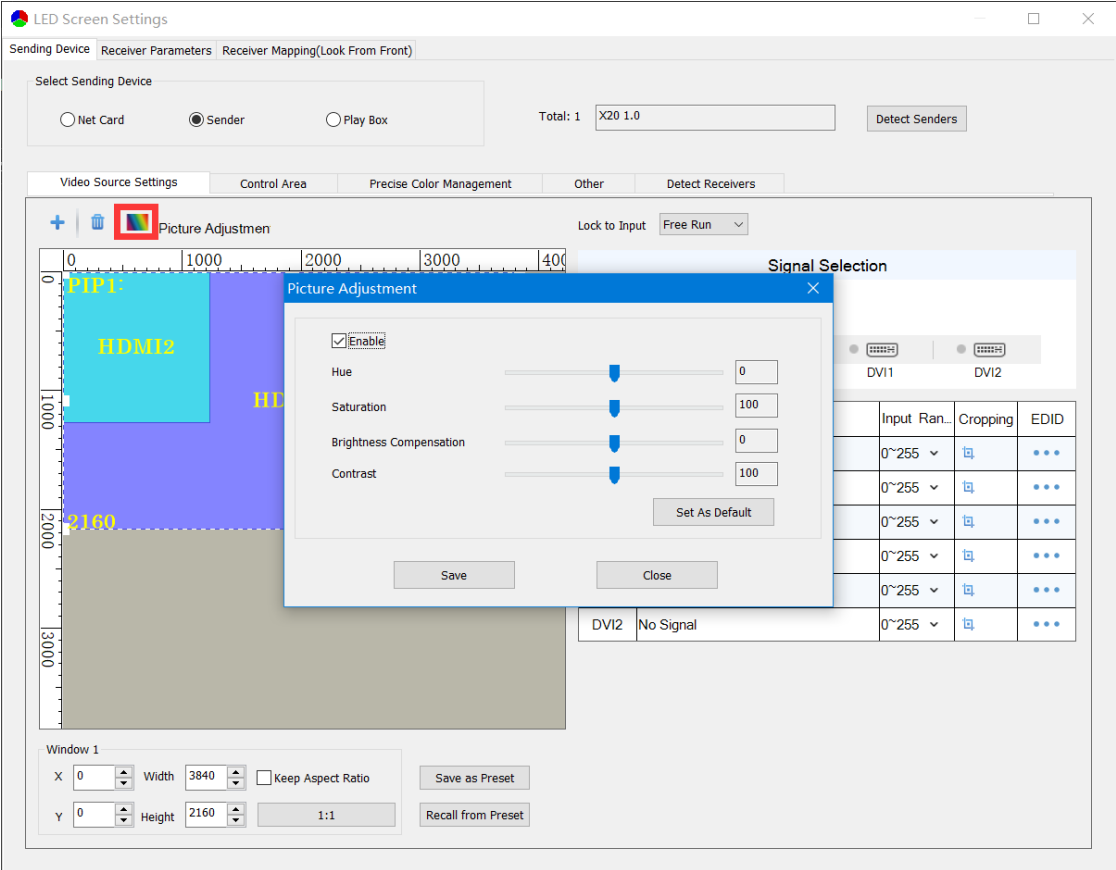
5.3.2 Window Settings

In the lower-left corner of the **Video Source Settings** subpage, you can set the position and size of the selected window. You can also scale up or scale down the window by dragging the frame of the selected window.



5.3.3 Picture Adjustment

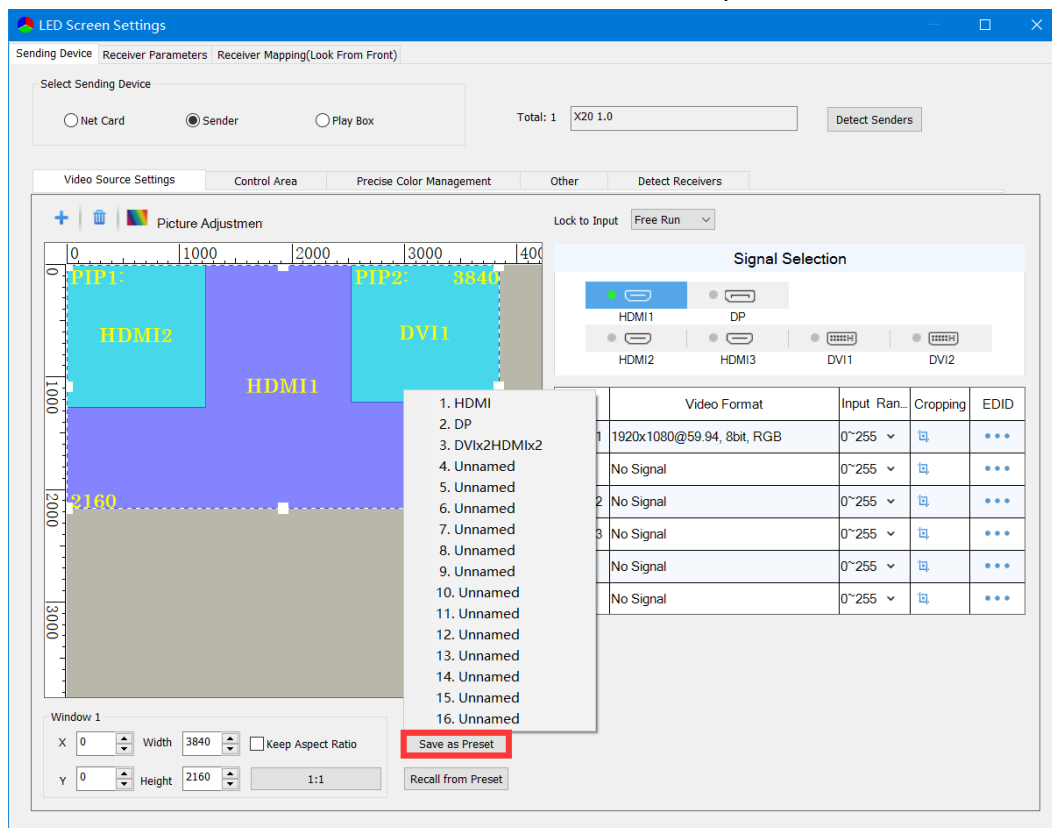
Click , and select the **Enable** check box, and then you can adjust the hue, saturation, brightness compensation and contrast values of the image.



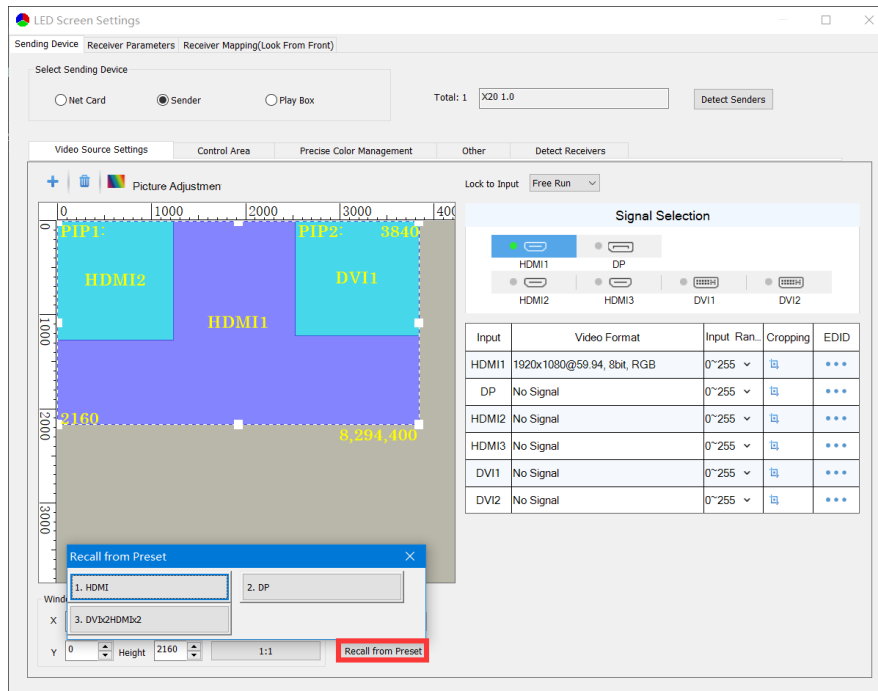
5.3.4 Preset

You can save 16 preset modes, and every preset mode includes the following parameter information of the video source setting: scaling, cropping, multi-window display, picture adjustment, color space, brightness and color temperature. You can also directly load the saved preset mode to display the image according to your need without needing to set up all the parameters again.

After setting the video source parameters, click **Save as Preset**, select an unnamed preset item and rename it, and then click **OK** to save the preset to the sender.

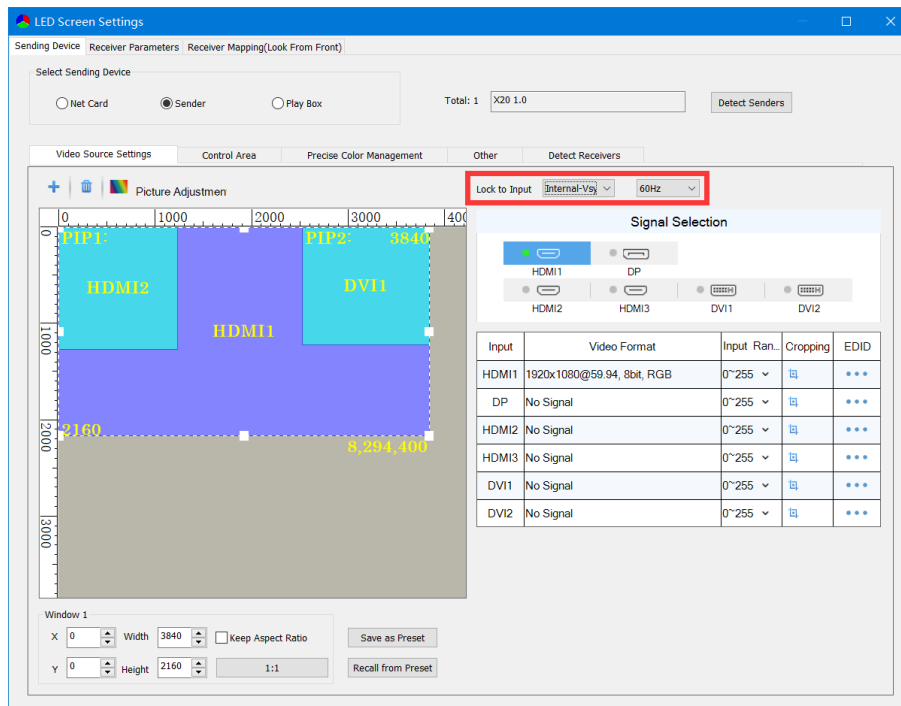


Click **Recall from Preset**, select a preset item, and the screen will display image on the basis of the preset parameter.




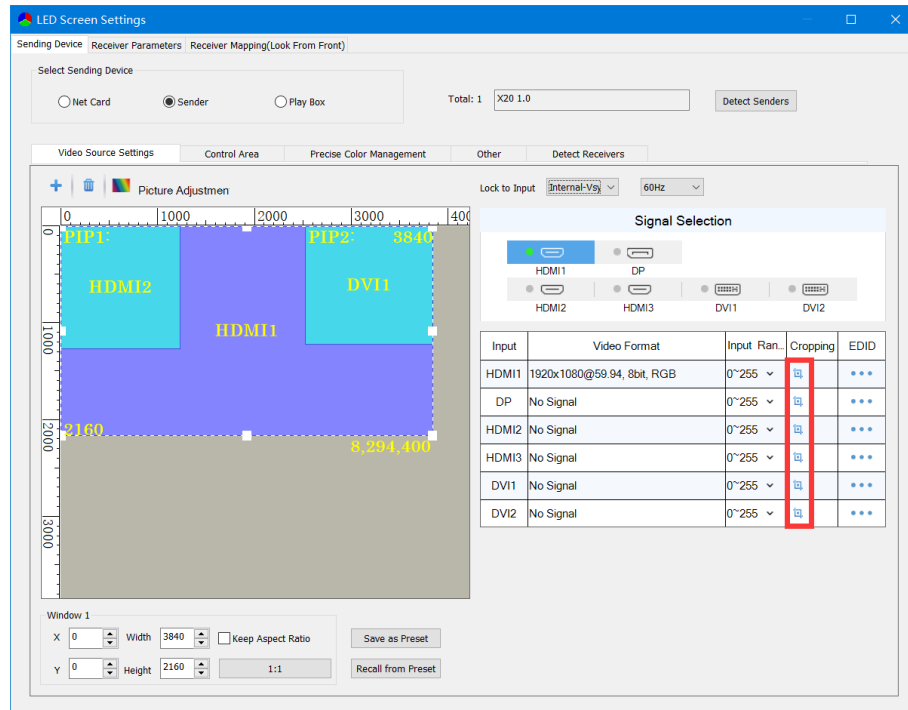
5.3.5 Genlock

The synchronous signal source can be any channel of input signals or **Internal-Vsync**. If the specified synchronous signal source has no signal, the main image will serve as the source.

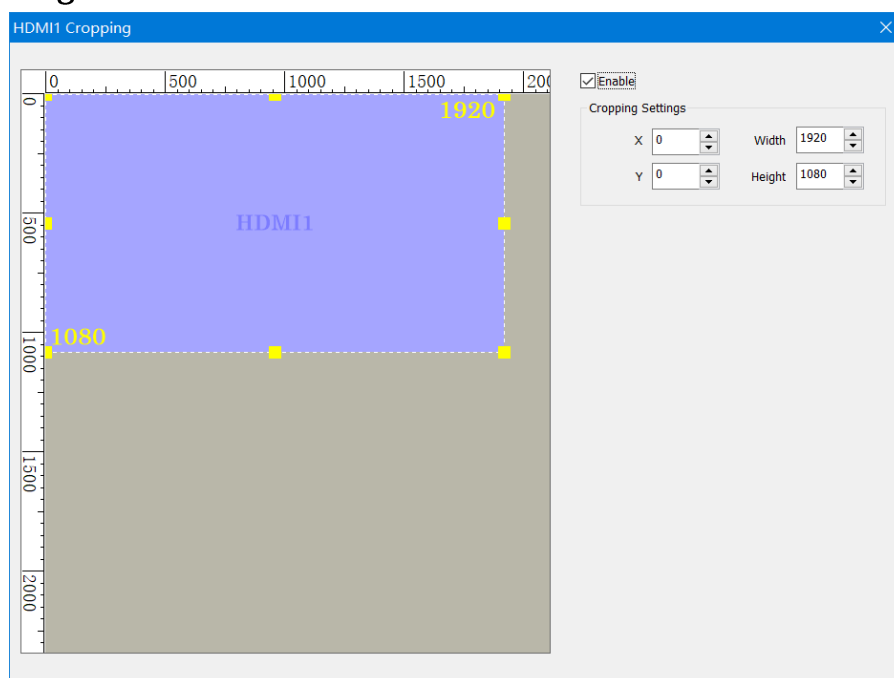


5.3.6 Cropping

At the right side of the **Video Source Settings** subpage, click  to enter the cropping setting window.

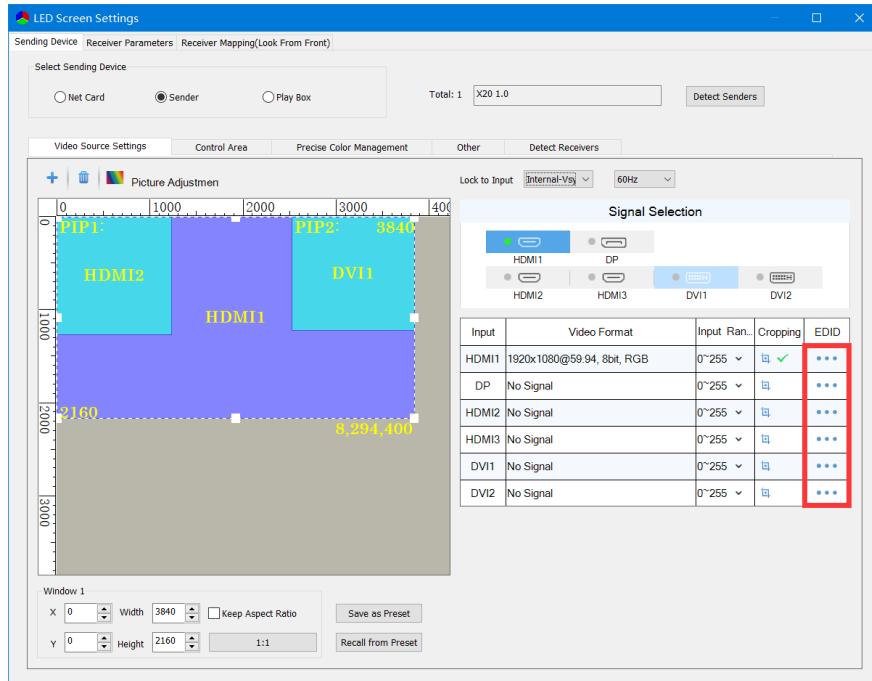


In the cropping setting window, select the **Enable** check box, and set the row starting point (X), the column starting point (Y), and the width and height in the **Cropping Settings** area.

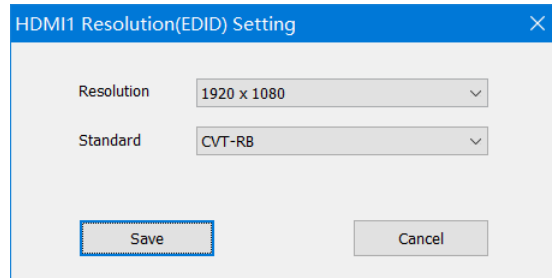


5.3.7 EDID (Resolution)

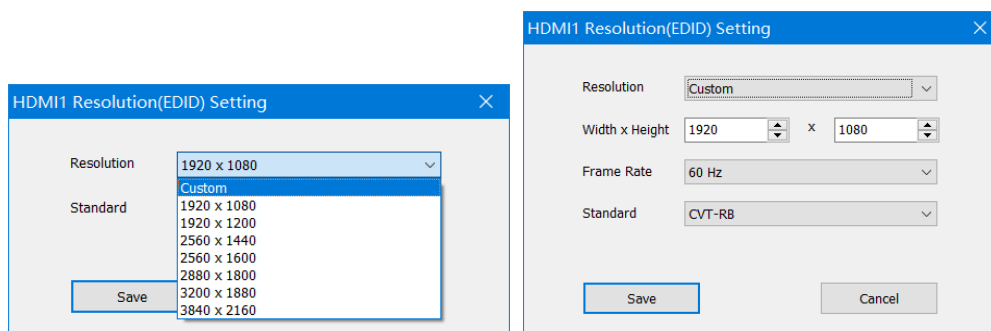
In the lower-right corner of the **Video Source Settings** subpage, click .



In the **Resolution (EDID) Setting** dialog box, the resolution of the current sender is displayed by default.



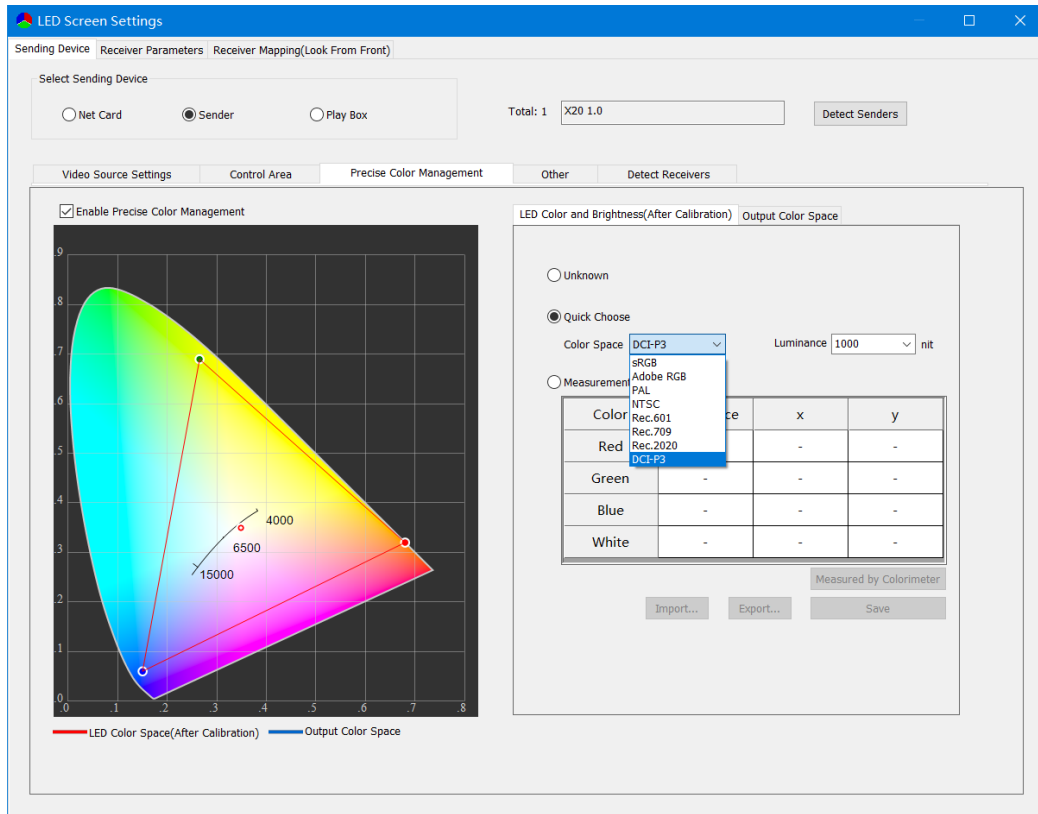
Click the dropdown button. From the resolution list, you can select a conventional resolution, or select **Custom** and set the width, height, frame rate and standard of the customized resolution.



After setting, click **Save**.

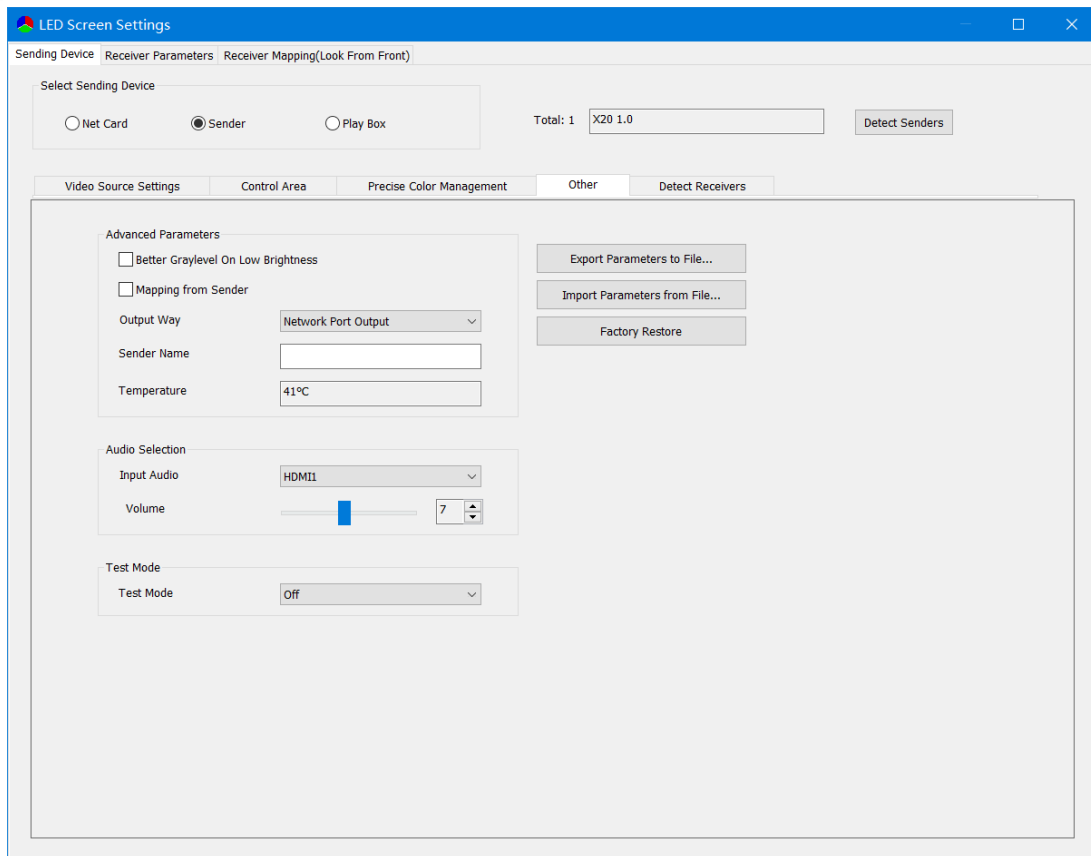
5.4 Precise Color Management

Select the **Enable Precise Color Management** check box in the upper-left corner of the **Precise Color Management** subpage, and you can modify the parameters of LED color and brightness, and color space.



5.5 Other

On the Other subpage, you can set **Better Gray On Low Brightness**, **Mapping from Sender**, **Output Way** (Ethernet port/ optical port) and **Input Audio**, adjust volume, modify the sender name, and select a test mode.



6 LCD Operation Instruction



6.1 Operation Instruction

Knob/OK:

- In the main interface, press the knob/OK to enter the operation menu.
- On the operation menu, rotate the knob to scroll to a menu item, press the knob/OK to select the current item or enter the submenu.
- Rotate the knob to adjust parameters after selecting the menu item with the parameter and press the knob/OK to save the parameter.

Bright: Press the key and rotate the knob to adjust screen brightness, and then press the knob/OK to confirm the current brightness.

ESC: Exit the current menu or operation.

Black: Blackout. Press the key, and the display will go dark. You can press it again to make the screen go back to normal.

Lock: Lock all the keys of the front panel. You can press it again and follow the directions to press OK to exit the Lock mode.

Freeze: Freeze the image of the LED display.

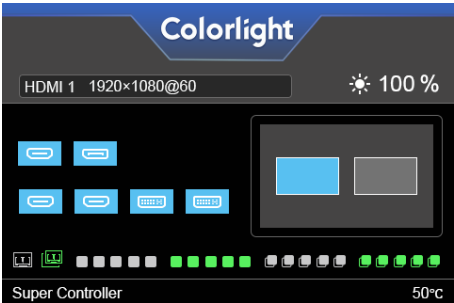
Signal: View signal status.

Mode: Mode selection keys. Press the key and then press the number selection keys to switch modes.

HDMI2.0, DP1.4, 3, HDMI1, HDMI2, DVI1, DVI2: Video source selection keys, which function as number selection keys in mode selection.

6.2 Main Interface

After starting up the X20 controller, the main interface of the LCD display is as follows:



First row: Company logo

Second row: Signal sources, Brightness

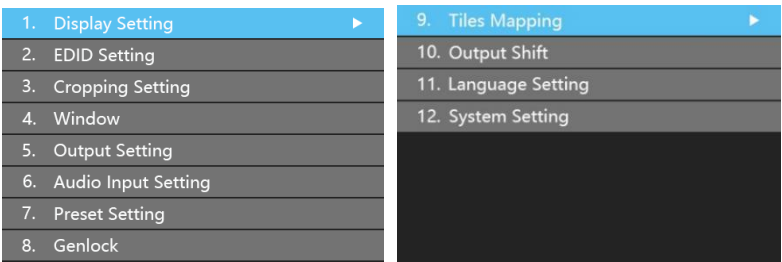
Third and fourth row: Connection status of signal sources, Window layout

Fifth row: Connection status of optical ports and Ethernet ports

Sixth row: Sender name, Temperature

6.3 Menu Operation

Press the knob/OK to enter the operation menu, which includes the following operation items: Display Setting, EDID Setting, Cropping Setting, Window, Output Setting, Audio Input Setting, Preset Setting, Genlock, Tiles Mapping, Output Shift, Language Setting and System Setting.



6.3.1 Display Setting

Select Display Setting to enter the Display Setting submenu.



Broadcast

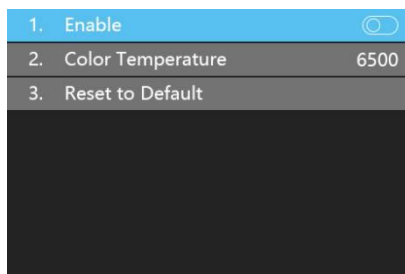
Press the knob/OK to turn on or off the **Broadcast** function. If the broadcast function is turned on, the setting of the menu items in this submenu (**Brightness**, **Color Temperature**, **Better Gray**, **Picture Adjustment**, **Test Mode** and **Precise Color Management**) will be synchronously sent to the devices cascaded with this controller.

Brightness

Select **Brightness**, rotate the knob to change the brightness, and then press the knob/OK again to save the brightness.

Color Temperature

In the **Color Temperature** menu, press the knob/OK to turn on or off **Enable**. If **Enable** is turned on, you can rotate the knob to change the value of color temperature (range: 2000-10000) , or select **Reset to Default** to reset the value of color temperature as 6500.



Better Gray

Press the knob/OK to turn on or off the **Better Gray** function.

Picture Adjustment

In the **Picture Adjustment** submenu, press the knob/OK to turn on or off **Enable**. If **Enable** is turned on, you can select **Hue**, **Saturation**, **Brightness Compensation** or **Contrast** and rotate the knob to modify their values, or select **Reset** to reset the hue value as 0, saturation value as 100, brightness value as 0, and contrast value as 100. Finally select **Save** to save all these parameters.

1. Enable	<input type="checkbox"/>
2. Hue	0
3. Saturation	100
4. Brightness Compensation	0
5. Contrast	100
6. Reset	
7. Save	

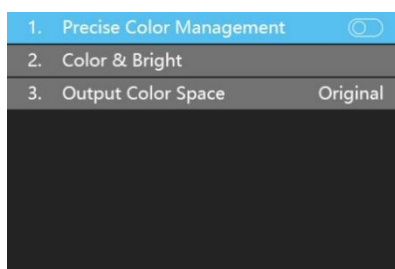
Test Mode

In the **Test Mode** menu, you can select a test mode.

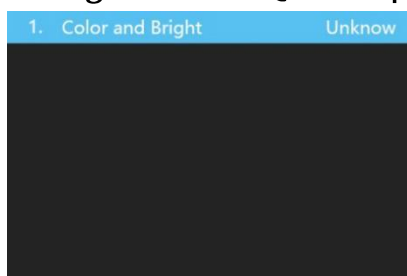
1. Display Test ▶	1. Normal ✓
2. Frame Rate	2. Red
	3. Green
	4. Blue
	5. White
	6. Horizontal Moving Line
	7. Vertical Moving Line
	8. Left Slash Move Down
9. Right Slash Move Down ✓	1. 50Hz ✓
10. Grid Move Down	2. 60Hz
11. Gradient Red	
12. Gradient Green	
13. Gradient Blue	
14. Gradient White	
15. Black	

Precise Color Management

In the **Precise Color Management** menu, you can press the knob/OK to turn on or off **Precise Color Management**.



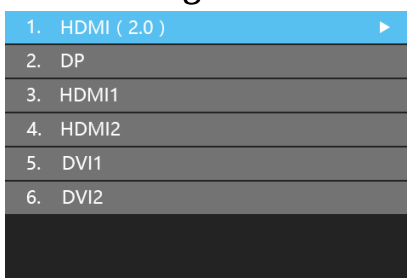
If **Precise Color Management** is turned on, you can select **Color & Bright**, and set **Color and Bright** as **Unknow**, **Measured Value** or **Quick Input** (you can set color space and luminance when **Color and Bright** is set as **Quick Input**).



If **Color and Bright** is known (**Measured Value** or **Quick Input**), you can select **Output Color Space** and set **Color Space** as **Original**, **sRGB**, **Adobe RGB**, **PAL**, **NTSC**, **Rec.601**, **Rec.709**, **Rec.2020**, **DCI-P3** or **Custom**.

6.3.2 EDID Setting

Rotate the knob and select **EDID Setting** to enter the **EDID Setting** submenu.



In the EDID setting submenu of signals (take **HDMI (2.0)** as an example), you can rotate the knob and select a conventional resolution to save the selected resolution to the sender, or select **Custom** and rotate the knob to adjust the width, height and frame rate of resolution, and then select **Save** to save the setting in the sender.

1. 3840×2160	✓	1. Width	1920
2. 3200×1880		2. Height	1080
3. 2880×1800		3. Frame Rate	60
4. 2560×1600		4. Save	
5. 2560×1440			
6. 1920×1200			
7. 1920×1080			
8. Custom			

6.3.3 Cropping Setting

Rotate the knob and select **Cropping Setting** to enter the **Cropping Setting**

1. HDMI (2.0)	▶
2. DP	
3. HDMI1	
4. HDMI2	
5. DVI1	
6. DVI2	

submenu.

In the cropping setting submenu of signals, press the knob/**OK** to turn the cropping function on or off. If **Enable** has been turned on, you can rotate the knob to set the row starting point (**X**), the column starting point (**Y**), and the width and height of the signal image, and then select **Save**.

1. Enalbe	
2. X	0
3. Y	0
4. Width	1920
5. Height	1080
6. Save	

6.3.4 Window

Rotate the knob and select **Window** to enter the **Window** submenu, in which you can set the canvas size, window number and the signal, row starting point, column starting point, width and height of the window.

1. Canvas Size ▶	1. Width 3840	1. Signal HDMI
2. Number Of Windows 1	2. Height 2160	2. X 0
3. Main	3. Save	3. Y 0
		4. Width 3840
		5. Height 2160
		6. Save

6.3.5 Output Setting

Rotate the knob and select **Output Setting** to enter the **Output Setting** submenu, in which you can choose an output way (By Network, By Fiber).

1. By Network ✓
2. By Fiber

6.3.6 Audio Input Setting

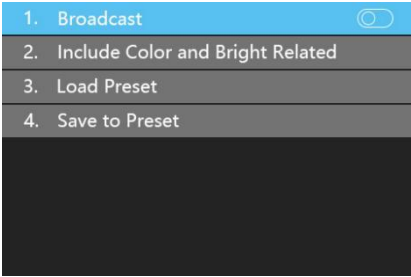
Rotate the knob and select **Audio Input Setting** to enter the **Audio Input Setting** submenu.

In the submenu, select **Audio Selection** to enter its submenu, in which you can select an audio source. You can also select **Volume** and rotate the knob to adjust the volume of the audio signal.

1. Audio Selection ▶	1. Auto ✓
2. Volume 15	2. HDMI (2.0)
	3. DP
	4. HDMI1
	5. HDMI2
	6. Audio Input

6.3.7 Preset Setting

Rotate the knob and select **Preset Setting** to enter the **Preset Setting** submenu.



In the submenu, you can press the knob/OK to turn on or off the broadcast function. If **Include Color and Bright Related** is checked, and you select **Save to Preset**, then you can save the parameters of the current image that include color and brightness information. You can also select **Load Preset** and choose an item to load preset parameters.

1. HDMI	9. Blank
2. DP	10. Blank
3. DVI×2 HDMI×2	11. Blank
4. Blank	12. Blank
5. Blank	13. Blank
6. Blank	14. Blank
7. Blank	15. Blank
8. Blank	16. Blank

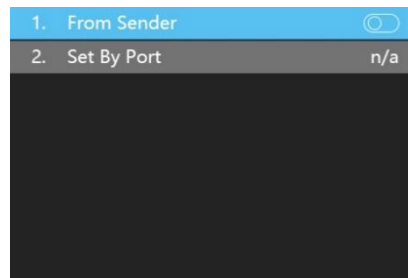
6.3.8 Genlock

When several controllers are cascaded with each other, **Genlock** is necessary to ensure the synchronization of the video displays. Rotate the knob and select **Genlock** to enter the submenu, in which you can set **Genlock Mode** as **Free Run**, **Internal** or **Lock to Input**.

1. Genlock Mode Free Run	1. Genlock Mode Internal 2. Internal Frequency 60	1. Genlock Mode Lock to Input 2. Input Selection HDMI(2.0)
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6.3.9 Tiles Mapping

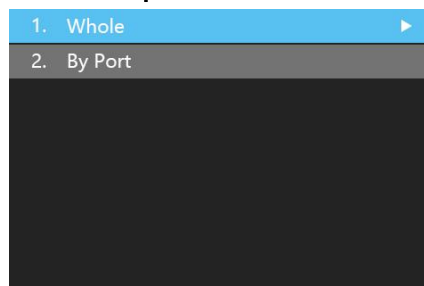
Select **Tiles Mapping** to enter the **Tiles Mapping** submenu.



In the submenu, press the knob/OK to turn on or off **From Sender**. If **From Sender** is turned on, the sender is set as the connection source. Then select **Set by Port** to enter the submenu, in which you can choose the Ethernet port from 1 to 20 that needs setting mapping, and set the row offset value(X) and column offset value(Y) of the port, and the width, height, row number, column number and link type of the corresponding cabinets. Finally select **Save** to save the mapping.

6.3.10 Output Shift

Select **Output Shift** to enter the **Output Shift** submenu.



Output shift includes two selections: **Whole** and **By Port**. On the submenu of **Whole**, you can rotate the knob to set the row starting point (X) and column starting point (Y) of the whole image and save the setting; on the submenu of **By Port**, you can respectively set the row starting point (X) and column starting point (Y) of the image of the 20 Ethernet ports and save the setting.

1. X	0	1. Port 1 X	0
2. Y	0	2. Port 1 Y	0
3. Save		3. Port 2 X	960
		4. Port 2 Y	0
		5. Port 3 X	1920
		6. Port 3 Y	0
		7. Port 4 X	2880
		8. Port 4 Y	0

6.3.11 Language Setting

In the Language Setting menu, you can switch languages.

1. English	✓
2. Chinese	

6.3.12 System Setting

In the **System Setting** menu, you can restore factory settings, and view the current version and its details.

1. Restore Factory Setting ▶	Are you sure to do factory reset?	Type	FPGA1	FPGA2	MCU
2. Version V1.00	1. No	Main Board	V1.00	V1.00	V1.00
3. Version Details	2. Yes	Front Board	-	-	V1.00
		Output	V1.00	V1.00	-

