Colorlight

LEDSetting

User Manual V1.6

Revision History

No.	Version	Date	Author	Description
1	1.0	2023.03.30	Chen Rui, Jiang Min	Initial release
2	1.2	2023.08.29	Jiang Min	Revisions & Updates
3	1.6	2024.04.29	Jiang Min	Revisions & Updates

Contents

1. Overview

LEDSetting is developed for the screen adjustment with full range of devices from Colorlight, which also support various screen driver IC, screen types, and screen testing. It allows for manual calibration of large LED screens and is compatible with correction data collected by other professional calibration devices.

1.1 Runtime Environment

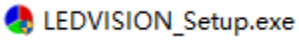
Table 1-1 Runtime Environment

Environment		Configuration
System Supported		Windows
System Version		Windows11, Windows10, Windows7, Windows Server
Recommended Configuration	Processor	Intel Core i5, AMD FX-6350 or later
	Running Memory	4GB RAM or more
	Graphics Card	NVIDIA GeForce GT 730, ATI Radeon HD 7730 or later
	Network Card	Gigabit network card, up to 1Gbps

1.2 Software Installation

Software Installation

Step 1: To download the software LEDVISION from the official website of Colorlight, go to https://www.lednets.com/product/download/381

Step 2: Double-click 

to begin setup wizard.

Step 3: Follow the setup wizard and select the **I accept: Software agreements** checkbox. Then choose **Quick Installation** or **Customize.**

- Quick Installation

Click the **Quick Installation** button and the software will be installed to the path by default: C:\Program Files (x86)\ColorLight, as shown in Figure 1.2.1.

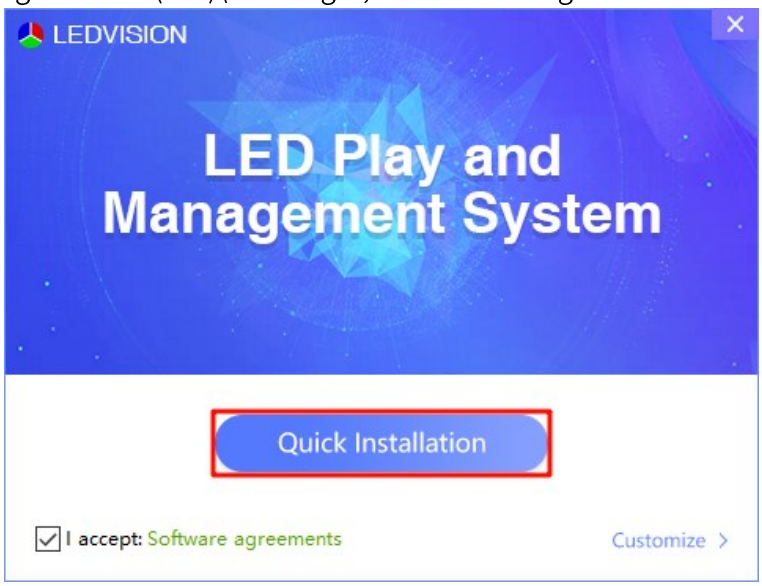


Fig 1.2.1 Quick installation

- Custom Installation

Step 1: In the installation interface, click **Customize** and choose a path you desired for installation. Then click **Install** to continue, as shown in Figure 1.2.2.

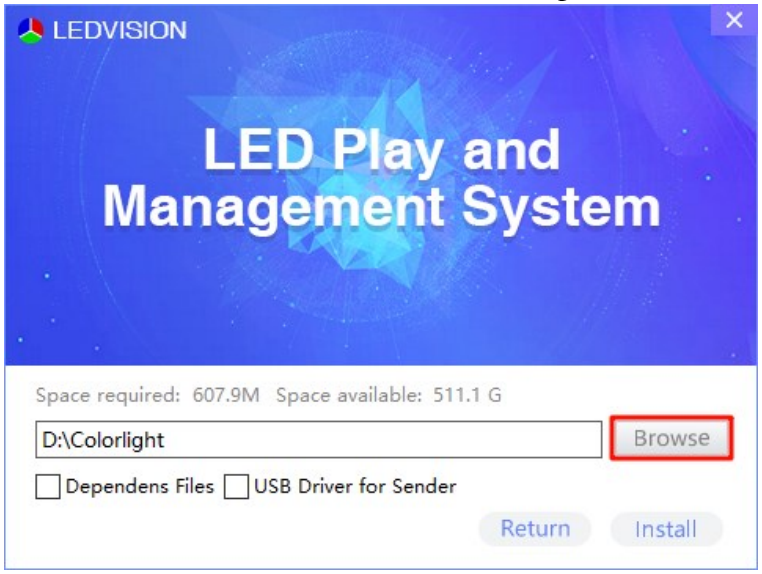


Fig 1.2.2 Custom installation

Step 2: Installation is completed as shown in Figure 1.2.3. After a successful installation, LEDVISION and LEDSetting shortcuts are created on the desktop. LEDVISION is the playback software and LEDSetting is the control software.

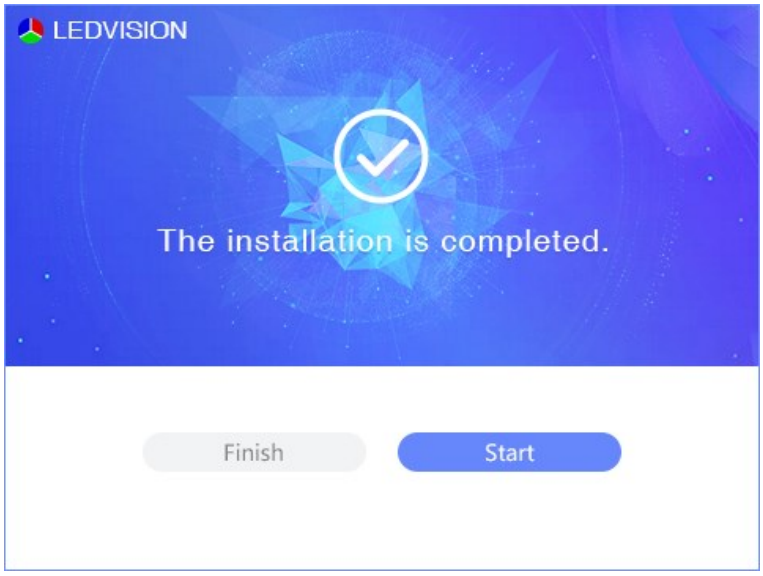


Fig 1.2.3 Installation completion

Software Uninstall

Right-click the LEDSetting shortcut, then select **Open File Location** to open the installation path and double-click uninst.exe to uninstall the LEDSetting software.

2. Quick Start

2.1 Device Detection

Step 1: Cabinets should be connected to the optical fiber transceiver via an Ethernet cable. The optical fiber transceiver and sender are connected with a fiber optic cable. Then connect the transmitter to the computer through a USB cable, as shown in Figure 2.1.1.

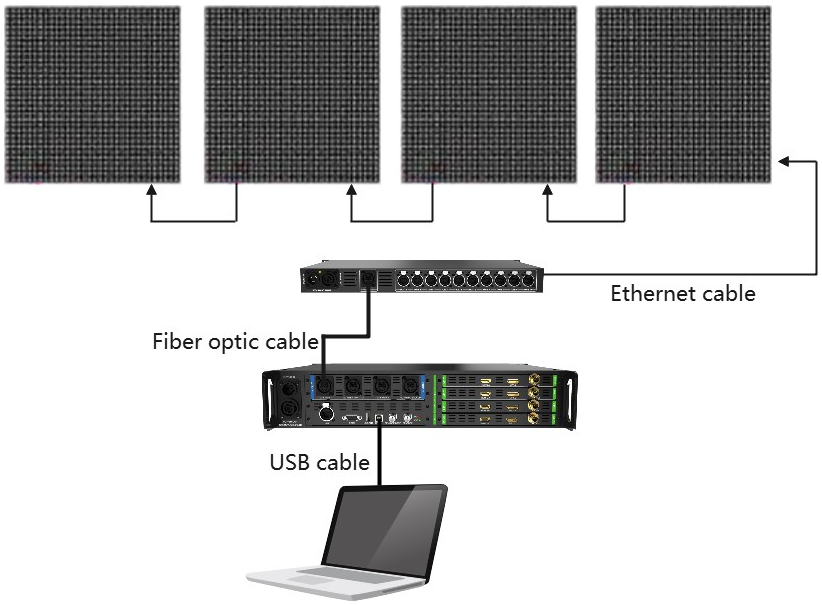


Fig 2.1.1 Device connection topology

Step 2: Open LEDSetting and double-click **Screen Configuration**, then enter the authorized password to access **Screen Configuration** > **Device Information**.

Step 3: Click the **Detect Device** button for device information.

2.2 Configure Sender

Step 1: Click the **Sender Settings** button to switch to the **Sender Settings** tab.

Step 2: Modify the canvas size to keep consistent with the resolution of the input signal.

Step 3: Select the signal source to be displayed, then drag it to the canvas to make it display normally, as shown in Figure 2.2.1.

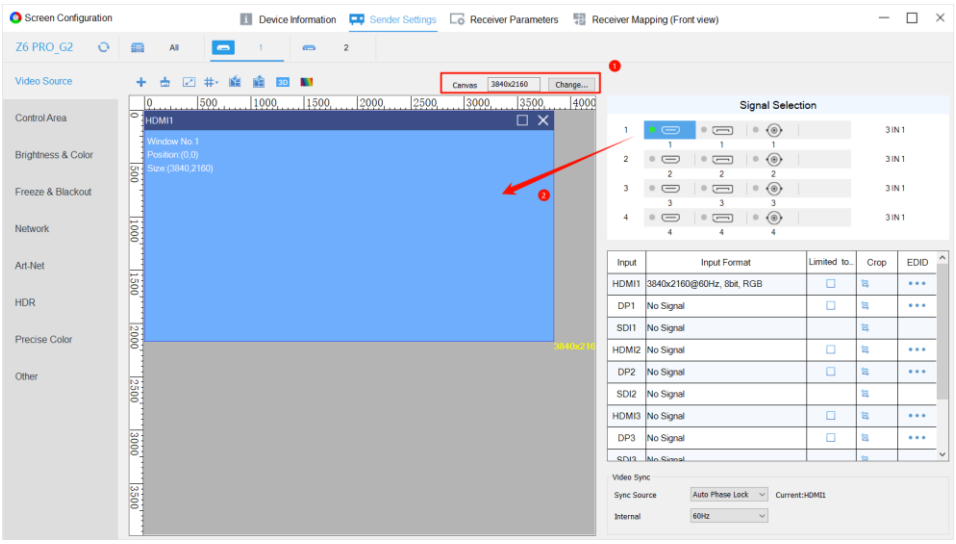


Fig 2.2.1 Video source

2.3 Configure Receiver Parameters

Step 1: Click the **Receiver Parameters** button to switch to the **Receiver Parameters** tab.

Step 2: Configure the correct parameters of the receiver card through **Load…** or **Intelligent Settings**.

Step 3: After the parameters are configured, click the **Save to Receiver** button to save the parameters to the receiver cards, as shown in Figure 2.3.1.

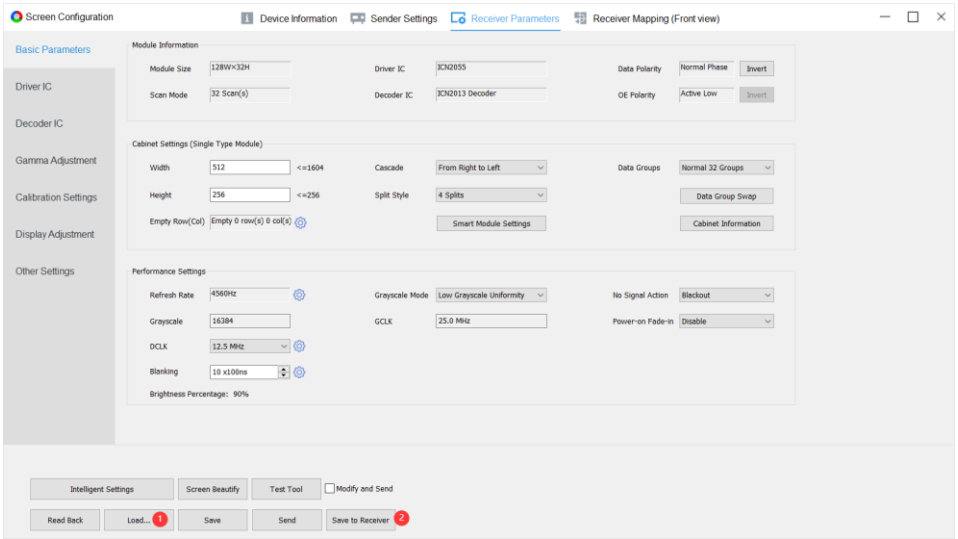


Fig 2.3.1 Save receiver parameters

2.4 Configure Receiver Mapping

Step 1: Click the **Receiver Mapping** button to access the **Receiver Mapping** tab.

Step 2: Configure **Receiver Count** and **Selected Receiver Info** according to the number and size of the cabinets.

Step 3: Select the corresponding Ethernet port and set the cabinet mapping according to the number of cabinets and the physical connections under each Ethernet port, as shown in Figure 2.4.1.

Step 4: Save the current mapping to the receiver card and light up the LED screen.

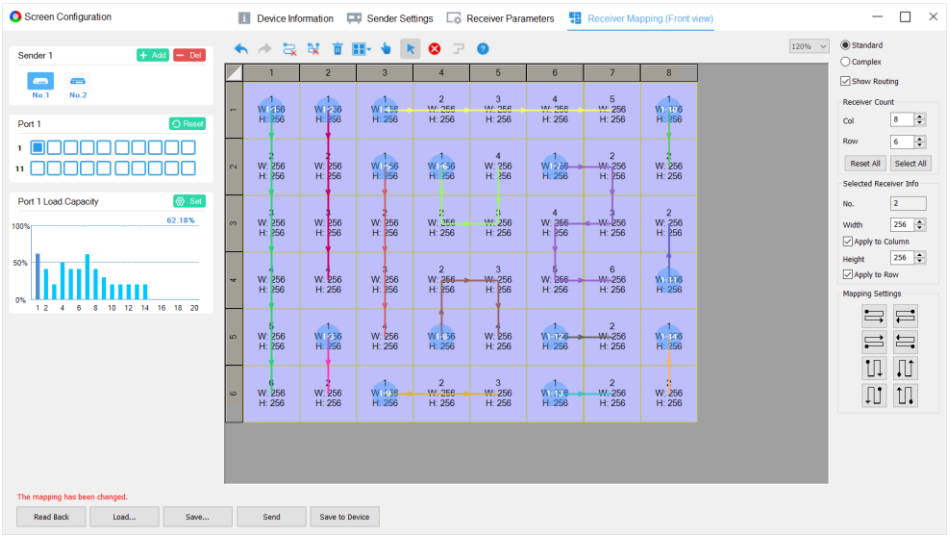


Fig 2.4.1 Cabinet mapping settings

3. Main Interface

The main interface consists of 3 parts: title bar, device bar and function entrance.

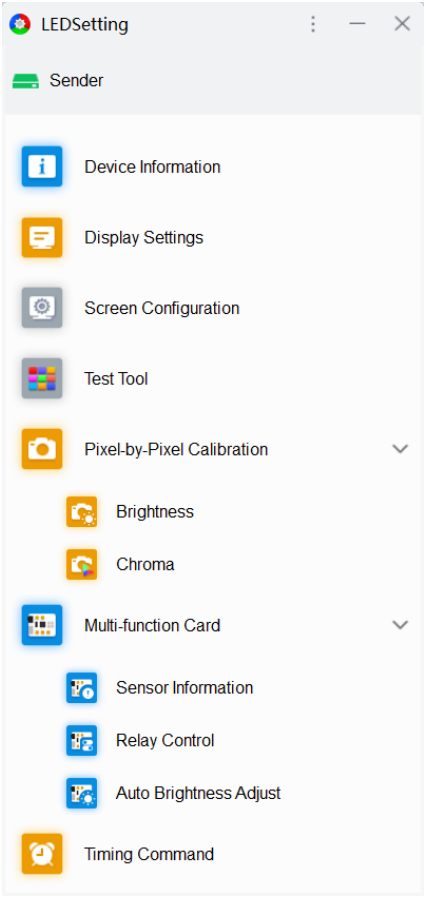


Fig 3.1 Main interface

Title Bar

The title bar includes software logo, software name, bubble tips, settings menu (**Language**, **Software Settings**, **Software Section**, **User Manual**, **About**), minimize button, and close button.

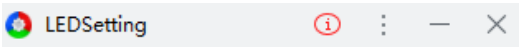


Fig 3.2 Title bar

- Bubble tips: A bubble will pop up when an error occurs with the sender. Hover the mouse over the bubble to view the tips.

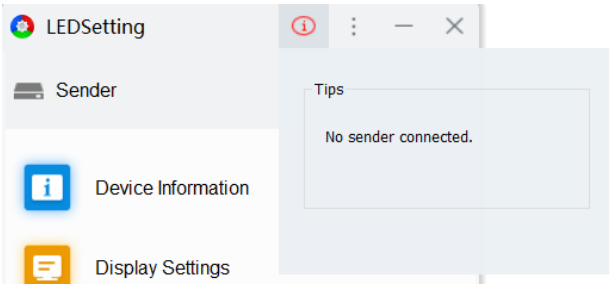


Fig 3.3 Bubble tips

Bubble tips for sender abnormality are shown in Table 3-1.

Table 3-1 Bubble tips summary

Abnormalities	Tips
Sender is offline.	No sender connected.
Sender brightness is 0.	The current brightness value of the sender is 0.
Sender enabled the screen blackout.	The LED screen is currently in **Blackout** mode.
Sender enabled the freeze mode.	The LED screen is currently in **Freeze** mode.
Sender enabled the blackout test pattern.	The sender is currently in blackout test pattern.

- **Software Settings**: You can modify the software theme and general settings of the software.
- **Software Theme**: Modify the theme color of the main interface. Support **Light**, **Warm** and **Dark**.

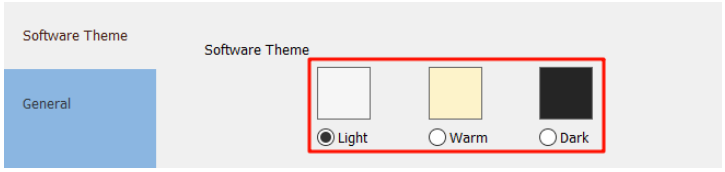


Fig 3.4 Software theme

- **General**: Set the temperature display format and common password memory time.

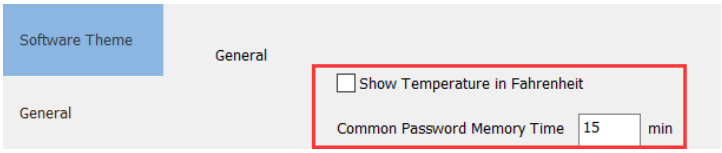


Fig 3.5 General settings

- **Show Temperature in Fahrenheit**: Select to display the temperature in Fahrenheit (°F). Otherwise, the temperature is displayed in Celsius (°C).
- **Common Password Memory Time**: After entering the password, you don't need to input the authorized password again to operate the software within the memory time.
- **Software Section**: Configure the status and order of the module entries in the main interface.

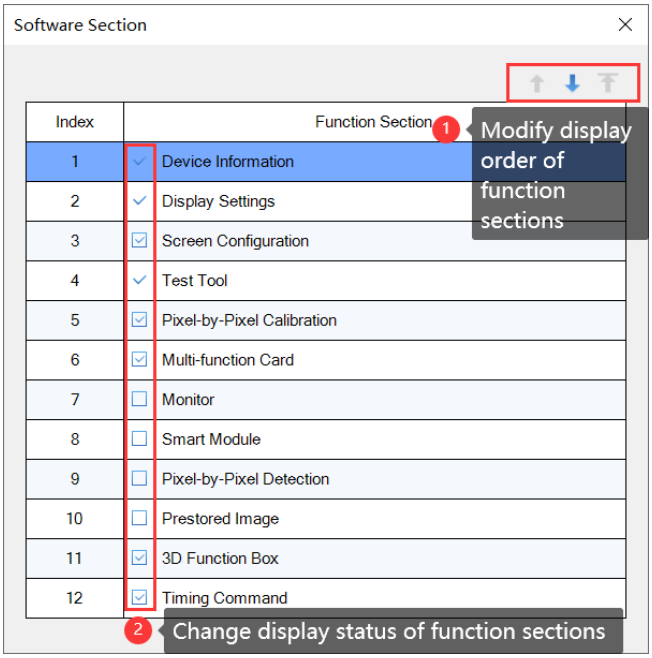


Fig 3.6 Software section settings

- Module order adjustment: Select a module and click to move up the display order of modules. Click to move down the display order of modules. Click to top the display order of the modules.
- Default modules: 7 modules are selected by default, including Device Information, Display Settings, Screen Configuration, Test Tool, Pixel-by-pixel Calibration, Multi-function Card and Timing Command.
- Module display status modification: Select the checkbox of a module to display the module in the main interface and deselect to hide it.

Device Bar

- Mode: Display the current sending mode of the software. The **Sender** icon indicates sender mode, and the **Player** icon indicates player mode.
- Device status
- Online status: The current device is in normal connection, and the sender/player icon is green.

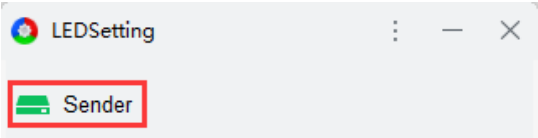


Fig 3.7 Online status

- Offline status: The current device is in an abnormal connection, and the sender/player icon is gray.

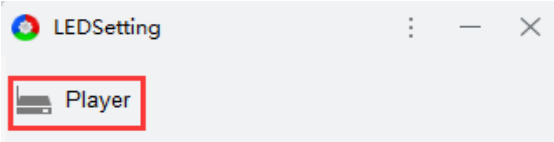


Fig 3.8 Offline status

Module Entries

- 7 common modules are displayed by default, and the display status of other module entries needs to be configured in **Software Module**.
- Click a module to open its secondary module or select it.
- Double-click a module to enter its corresponding function interface.
- If you switch the sending mode, the function entries will be changed accordingly.

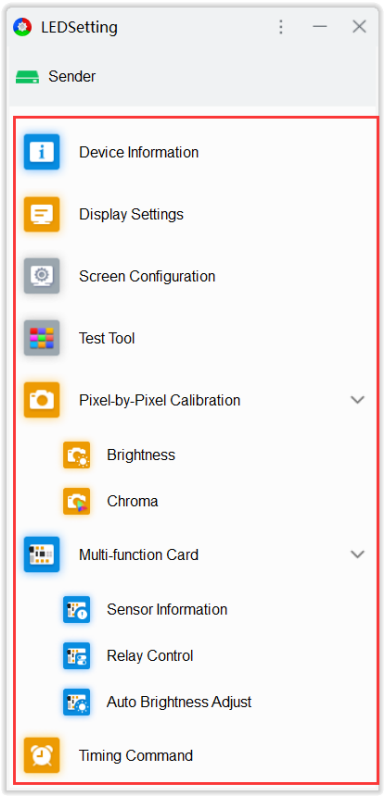


Fig 3.9 Function entries

4. Device Information

This feature is mainly used to detect sender and receiver card information, which are displayed on the left and right side of the panel respectively.

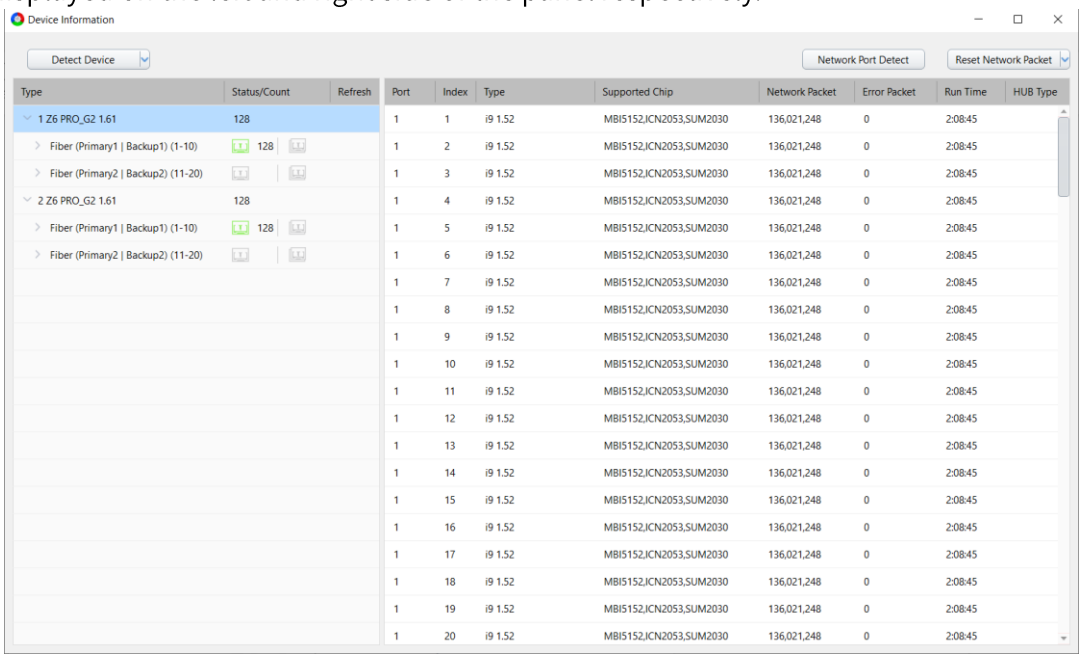


Fig 4.1 Device information interface

- **Detect Device**: Click **Detect Device** to detect all senders and receiver card information of selected senders.
- Device cascading: When you want to cascade multiple senders, right-click the **Detect Device** button to show the **All Devices** and **Sender Only** options. Select **Sender Only** to display only sender information in the list.

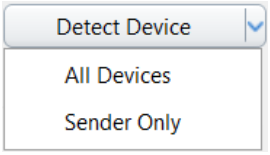


Fig 4.2 Detect senders

- **Reset Network Packet**: Click the **Reset Network Packet** button to reset the network packets and error packets of the receiver card. Right-click **Reset Network Packet** to show the reset network packet extension.

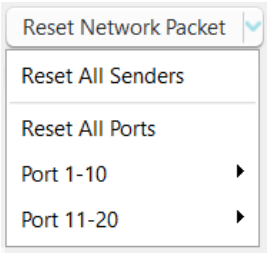


Fig 4.3 Reset network packets extension

- **Reset All Senders**: Reset the Network Packets and Error Packet for all receiver cards.
- **Reset All Ports**: Reset the **Network Packets** and **Error Packet** of all receiver cards under the selected Senders.
- **Port**: Select a network port and reset the **Network Packets** and **Error Packet** of all receiver cards under this port.

Sender List

The Sender information bar displays the buttons of **Type**, **Status/Count**, and **Refresh**.

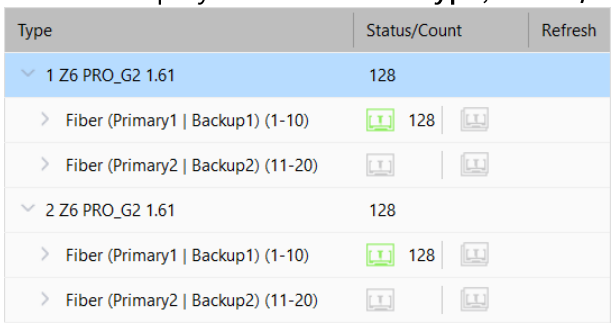


Fig 4.4 Sender list

- **Type**: It displays the index, type, and version of the sender.
- Click the Sender type button to display the network ports under the sender.
- Version Detail: Hover the mouse over the sender type to display ⓘ, and click the button to open the **Version Detail** dialog box for the program version information.
- **Status/Count**: It shows the number of all receiver cards under the device. Network port icon and optical fiber transceiver icon show the connection status. Icons in green indicate normal connection and in gray indicate disconnection.
- **Refresh**: Hover the mouse over the sender, optical fiber transceiver, and network port, then button will be displayed in the **Refresh** column.
- **Sender**: Click to re-detect all receiver cards under this sender.

- **Optical Fiber Transceiver**: Click to re-detect the receiver cards under the current optical optic transceiver.
- **Network Port**: Click to re-detect the receiver cards under the current network port.

Receiver Card List

The receiver card information column displays Port, Index, Type, Supported Chip, Network Packets, Error Packets, Run Time, and HUB Type.

Port	Index	Type	Supported Chip	Network Packet	Error Packet	Run Time	HUB Type
1	1	i9 1.52	MBI5152,ICN2053,SUM2030	0	0	2:10:48	
1	2	i9 1.52	MBI5152,ICN2053,SUM2030	0	0	2:10:48	
1	3	i9 1.52	MBI5152,ICN2053,SUM2030	0	0	2:10:48	
1	4	i9 1.52	MBI5152,ICN2053,SUM2030	0	0	2:10:48	
1	5	i9 1.52	MBI5152,ICN2053,SUM2030	0	0	2:10:48	
1	6	i9 1.52	MBI5152,ICN2053,SUM2030	0	0	2:10:48	
1	7	i9 1.52	MBI5152,ICN2053,SUM2030	0	0	2:10:48	
1	8	i9 1.52	MBI5152,ICN2053,SUM2030	0	0	2:10:48	
1	9	i9 1.52	MBI5152,ICN2053,SUM2030	0	0	2:10:48	
1	10	i9 1.52	MBI5152,ICN2053,SUM2030	0	0	2:10:48	
1	11	i9 1.52	MBI5152,ICN2053,SUM2030	0	0	2:10:48	
1	12	i9 1.52	MBI5152,ICN2053,SUM2030	0	0	2:10:48	

Fig 4.5 Receiver card list

A list of receiver card information is shown in Table 4-1.

Table 4-1 Receiver card list information

Feature	Description
Port	Display the index of the network ports where the receiver cards are connected.
Index	Display the physical connection number of the receiver cards.
Type	Display the receiver card type and FPGA program version.
Supported Chip	Display the type of driver chip supported by the receiver card program.
Network Packets	Display the number of network packets generated by the communication of receiver cards.
Error Packets	Display the number of error packets generated by the communication of receiver cards.
Run Time	Display the time the receiver card has been running continuously.
HUB Type	Display the HUB type of the receiver cards.

5. Display Settings

Configure the sender parameters to adjust the LED screen display.

Brightness & Color

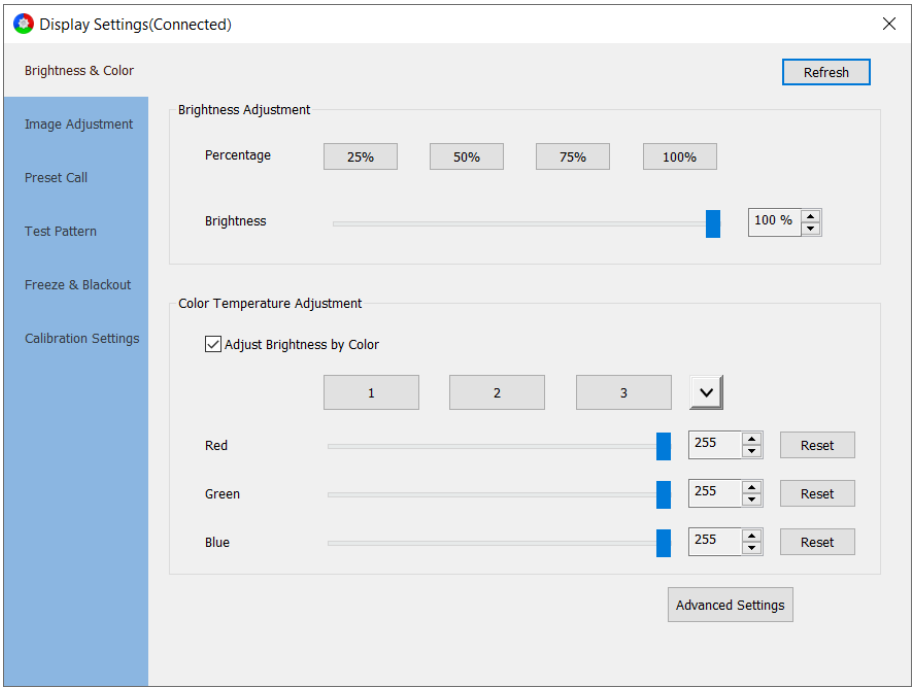


Fig 5.1 Brightness & Color

- **Brightness Adjustment**: Configure the brightness parameters to adjust the LED screen brightness.
  - **Percentage**: Quickly adjust the screen to the specified brightness.
  - **Brightness**: Adjust the screen brightness by dragging the slider or clicking the spin button with your mouse.
- **Color Temperature Adjustment**: Configure color temperature parameters to adjust the color temperature of LED screen.
  - **Adjust Brightness by Color**: Check to adjust the color temperature by red, green, and blue respectively.
  - **Color Temperature**: Check to adjust the color temperature of the screen by dragging the slider or clicking the spin button with your mouse.
- **Advanced Settings**: Click to open the Advanced Settings dialog box.
  - Adjust the brightness and color temperature for single or multiple devices.
  - Click **Adjustment Brightness by Port** to adjust the brightness of each output port under the sender independently.

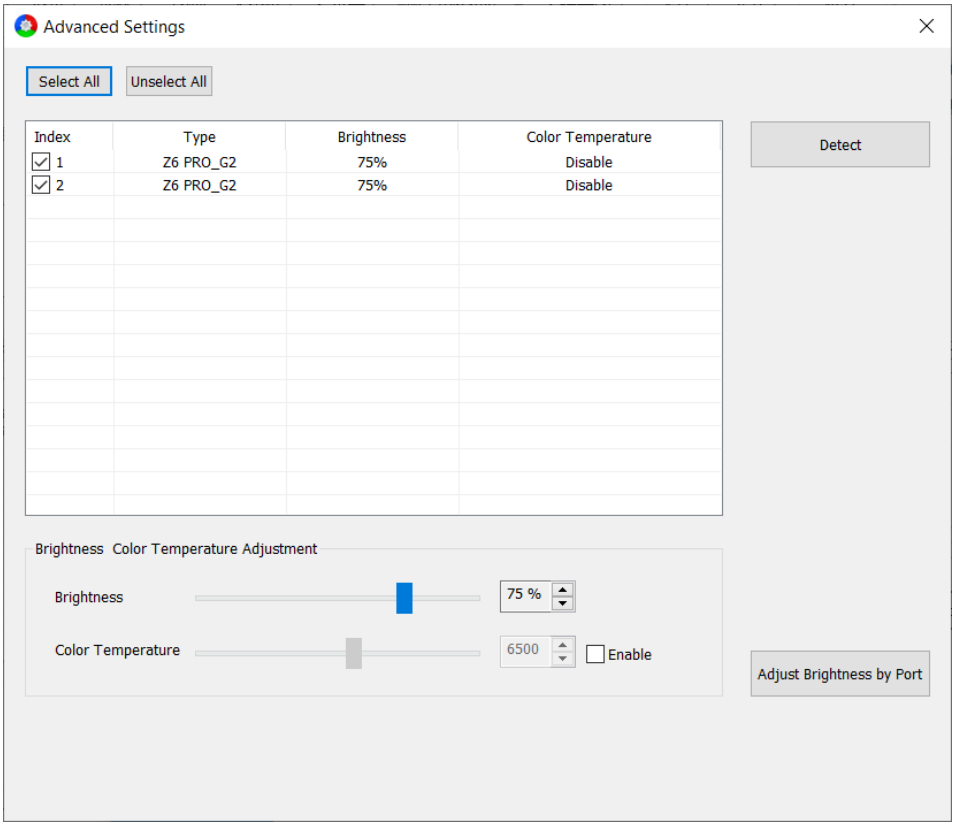


Fig 5.2 Advanced settings

- **Select All**: All devices in the list will be selected.
- **Unselect All**: No devices in the list will be selected.

The list items of the **Advanced Settings** interface are described in Table 5-1 below.

Table 5-1 List items information

Item	Description
Index	The physical connection order of the senders.
Type	Display the sender type and version.
Brightness	Display the brightness value of the sender.
Color Temperature	Before **Color Temperature** is enabled, **Disable** is displayed; after it is enabled, the color temperature value of the sender is displayed.

- **Detect**: Detect all senders.
- **Brightness & Color Temperature Adjustment**: Adjust the brightness value and color temperature value of the selected sender.
- **Adjust Brightness by Port**: After grouping the ports, adjust the brightness of the groups independently.

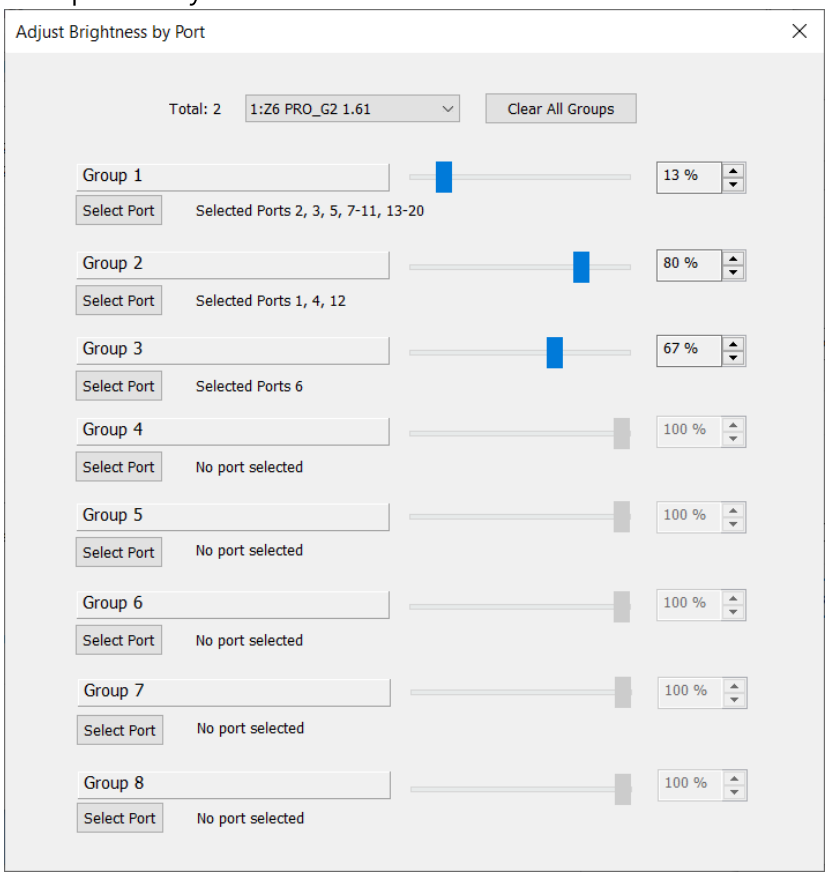


Fig 5.3 Adjust brightness by port

Image Adjustment

Select to adjust the **Hue**, **Saturation**, **Brightness Compensation**, and **Contrast** parameters by dragging the slider with the mouse, clicking the spin button , or modifying the values in the fields.

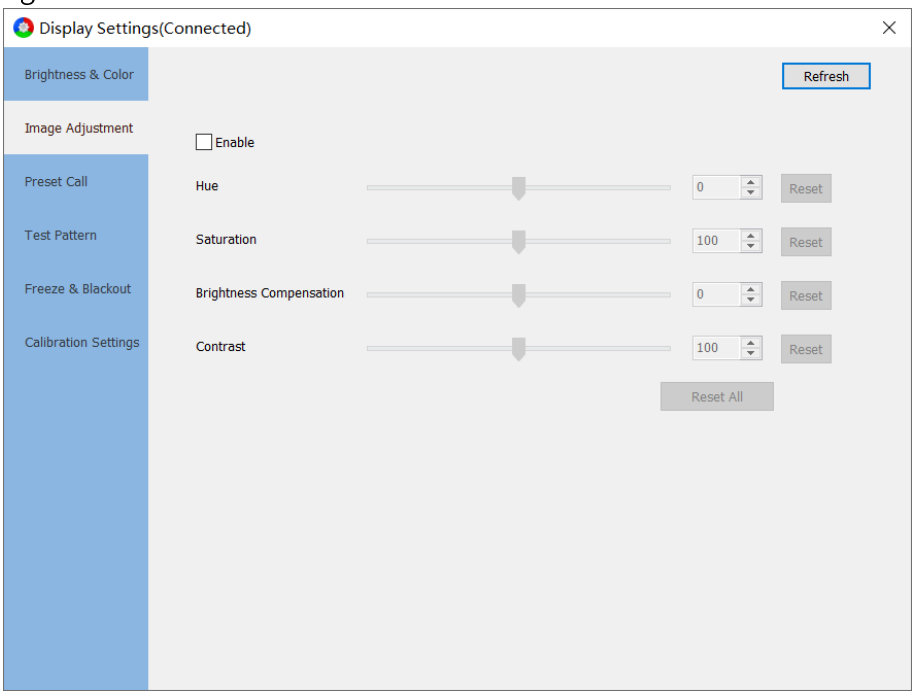


Fig 5.4 Image adjustment

- **Reset**: Reset the corresponding parameters to defaults.
- **Reset All**: Reset all parameters to defaults.

Preset Call

Click to call the presets of the sender.

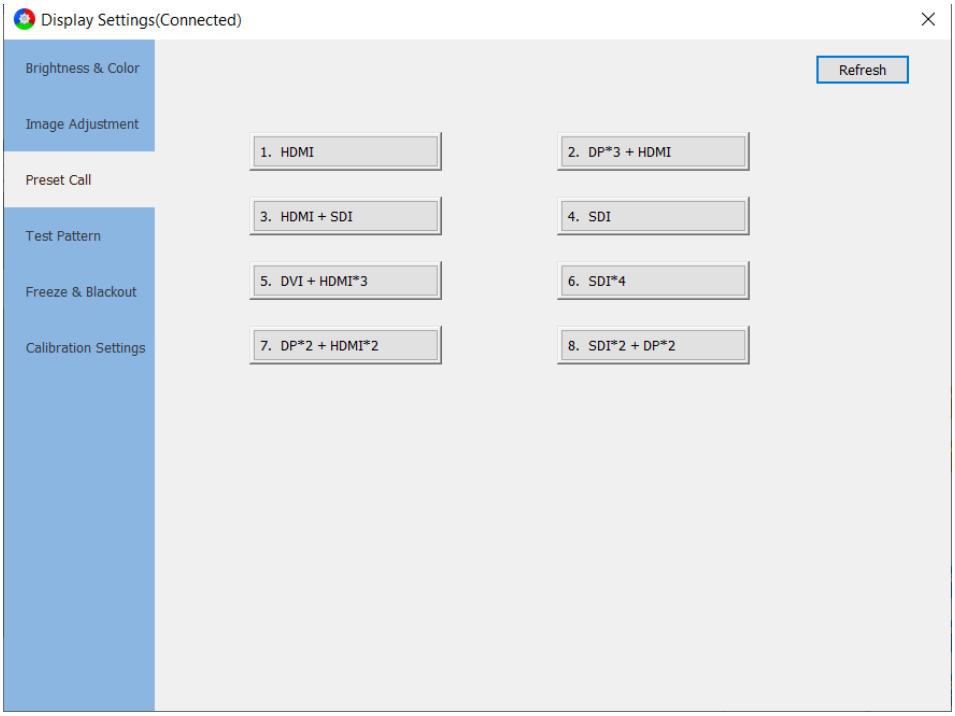


Fig 5.5 Preset call

Test Pattern

You can set different test modes according to your needs. View the display effects of LED screen with **Test Pattern** to test and diagnose the screen.

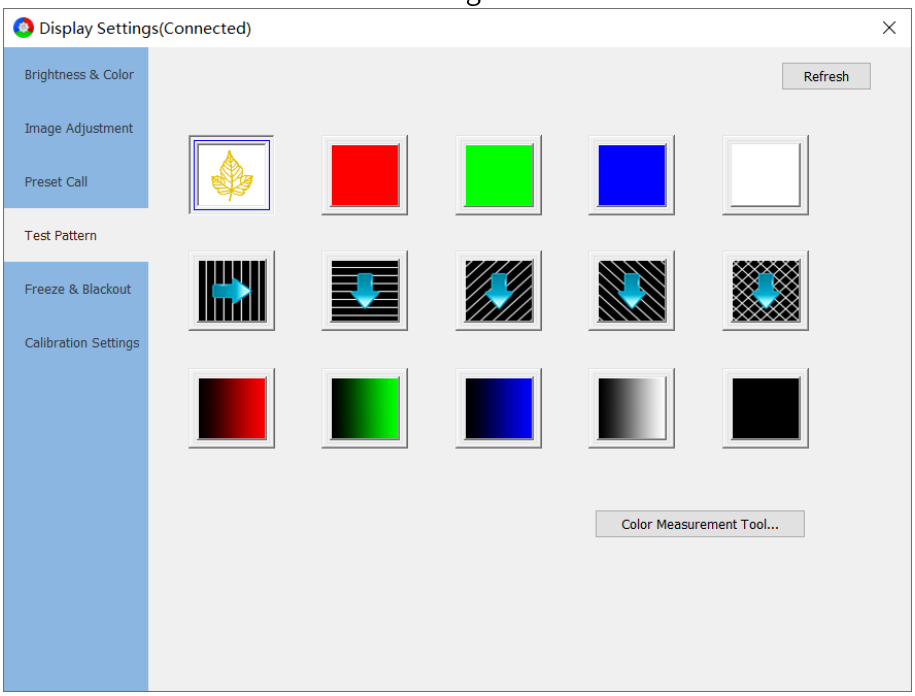


Fig 5.6 Test pattern

Freeze & Blackout

Freeze or black out the senders output screen.

- **Freeze**: Click **Freeze** to display the last frame.
- **Blackout**: Click **Blackout** to black out the LED screen.

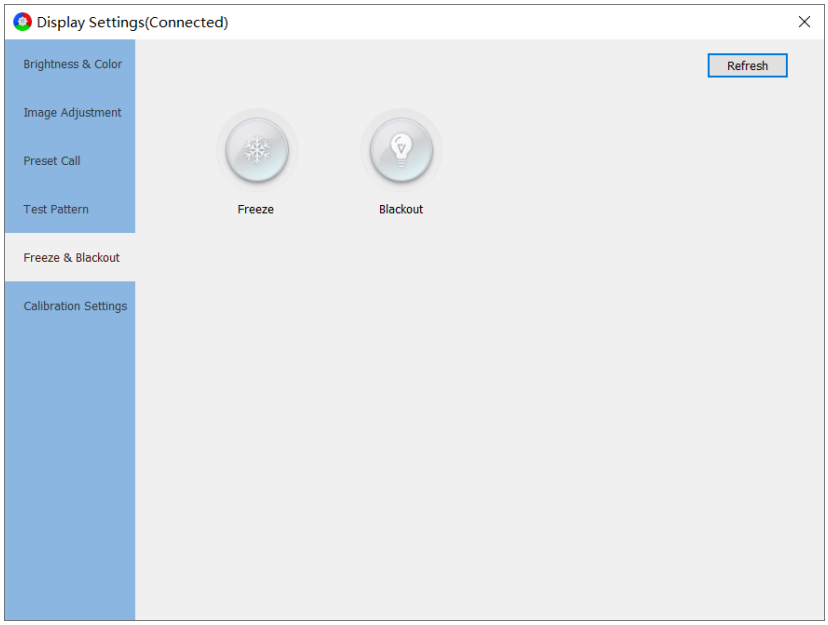


Fig 5.7 Freeze & Blackout

Calibration settings

Set **Calibration Mode** (**Disable**, **Brightness**, **Chroma**) and **Calibration Source** (**Receiver**, **Module**).

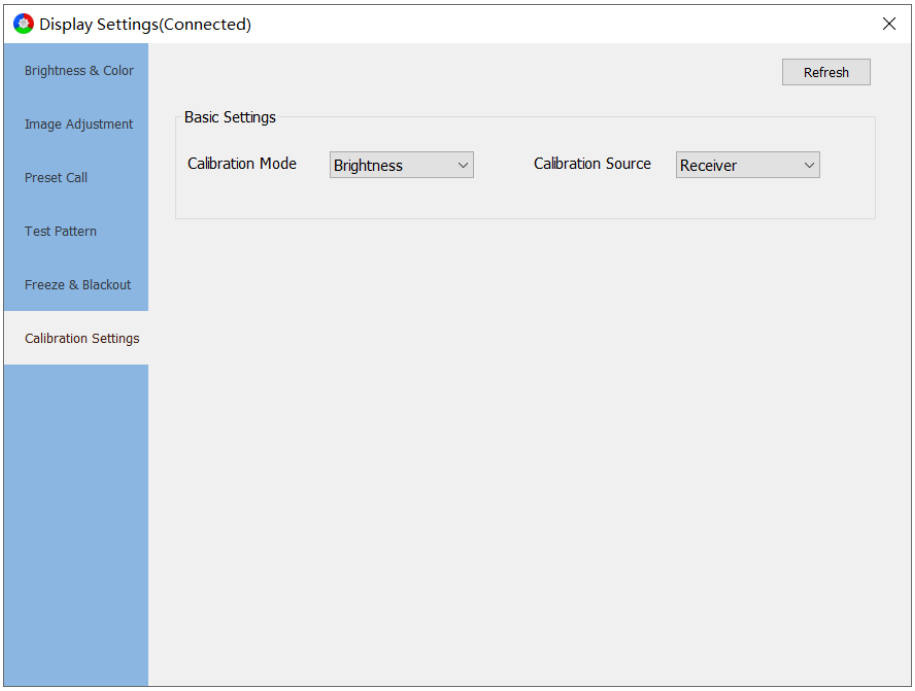


Fig 5.8 Calibration settings

6. Screen Configuration

The Screen Configuration interface includes 4 tabs: Device Information, Sender Settings, Receiver Parameters, and Receiver Mapping.

6.1 Device Information

Display information of all devices connected.

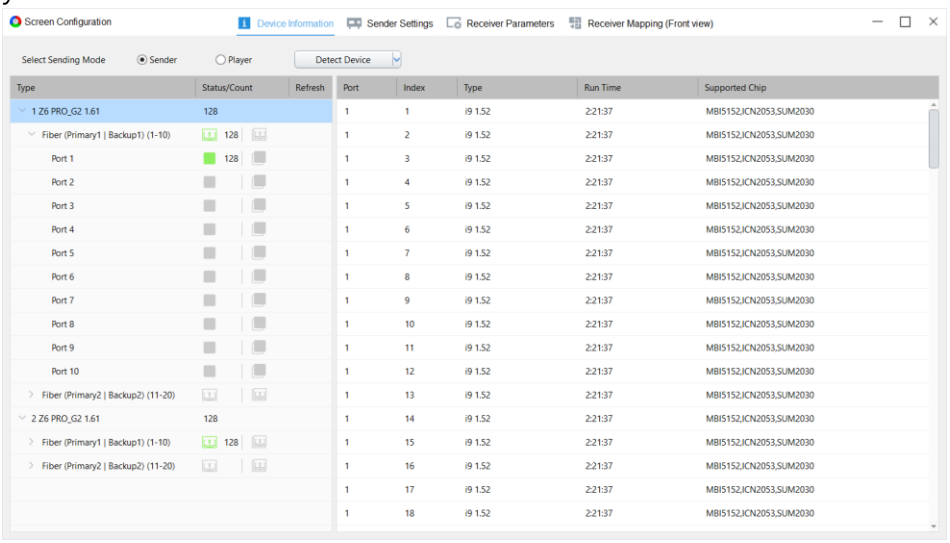


Fig 6.1.1 Device information

- **Sender**: Detect and control the sender.
- **Player**: Detect and control the player.
- **Detect Device**: Click the **Detect Device** button to show the connected device information in the list.
- List: The left panel shows the sender/player information, and the right panel shows the receiver card information. For more details, please refer to section 4.2 of the manual.

6.2 Sender Settings

Set up the connected sender. When it is not connected, you can simulate the device and view the simulation interface of the device.

The sender settings interface is divided into two parts: **Device bar** and **Function menu**.

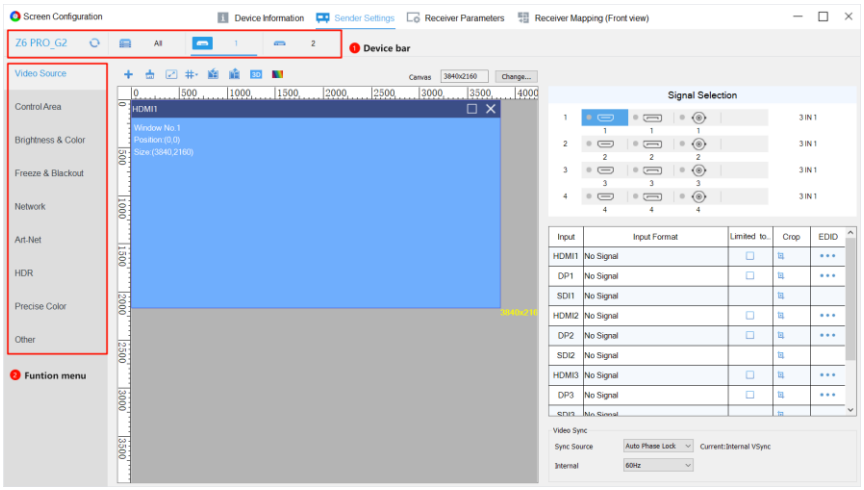


Fig 6.2.1 Sender settings

- Device bar: It displays the device type and index. Switch between indexes to configure different devices individually. When cascading multiple devices, switch to the **All** tab to configure all devices simultaneously.
- **All**: It includes 4 function menus, including **Video Source**, **Brightness & Color**, **Freeze & Blackout**, and **Other**. The actual menus available may vary depending on the device.
- **Video Source**: The left panel shows the signal window of the device, while the right panel shows the device’ s preset list.
- **Brightness & Color**, **Freeze & Blackout**, and **Other**: These 3 items display information of the first device correspondingly. Any configuration will apply to all cascaded devices in real time.
- : Click to re-detect senders and refresh the **Sender Settings** interface.
- Function menu: It displays the functions supported by the connected devices. Take Z6PRO_G2 as an example.

6.2.1 Video Source

The video source setup interface includes toolbar, canvas area, and right panel.

Toolbar

The toolbar contains Add Window, Delete All Window(s), Resize, Guide Line, Save as Presets, Preset Management, 3D Settings, Image Adjustment, and Change (Canvas Size).

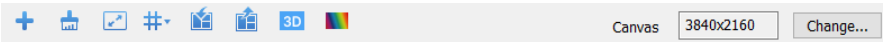


Fig 6.2.1.1 Toolbar

- **Add Window**: Click the + button to add a signal window to the canvas area.

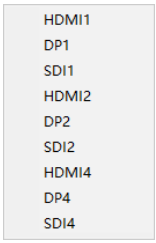


Fig 6.2.1.2 Add signal window

- **Delete All Window(s)**: Click the button to clear all signal windows in the canvas area.
- **Set Window Size**: Click the button to pop up the **Resize** window to set the starting position (**X** & **Y** coordinates), **Width**, and **Height** for the selected signal window.

Fig 6.2.1.3 Set window size

- **Guide Line**: It is used to guide the layout of signal windows. Click to show the drop-down menu, then add, modify, or delete the guide lines.

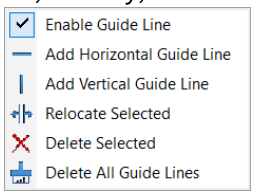


Fig 6.2.1.4 Set guide line

The guide line functions are described in detail in Table 6.2.1-1.

Table 6.2.1-1 Guide line functions

Feature	Description
Enable Guide Line(s)	When selected, the guide lines are shown; when unselected, the guide lines are hidden.
Add Horizontal Guide Line	When selected, you can add horizontal guide lines to the canvas.
Add Vertical Guide Line	When selected, you can add vertical guide lines to the canvas.
Set Position of Guide Line Selected	Modify the position of the selected guide line.
Delete Guide Line Selected	Delete the selected guide lines.
Delete All Guide Line(s)	Delete all guide lines in the canvas.

- **Save as Presets**: Click  to open the drop-down menu and save the preset scene to the sender.

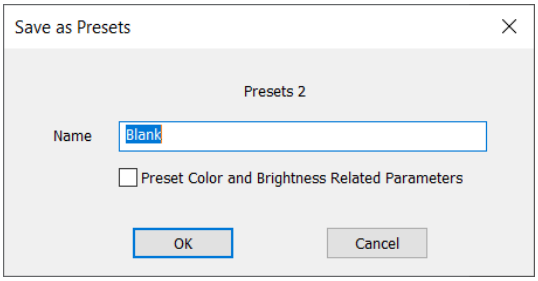


Fig 6.2.1.5 Save as presets

- **Preset Management**: Click  to open the **Preset Management** window, then click  to load preset parameters.

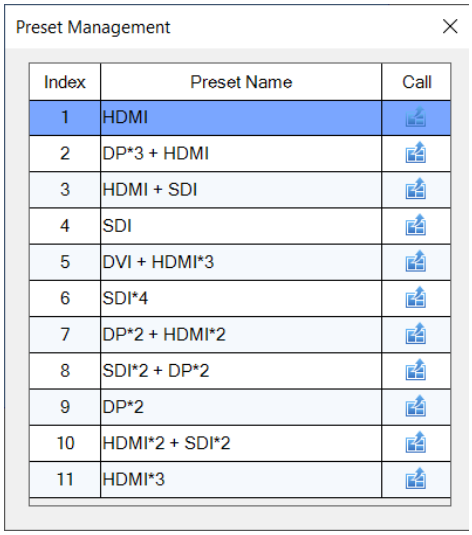


Fig 6.2.1.6 Preset management

- **3D Settings**: Click the 3D button to enter the **3D settings** interface. After selecting **Enable 3D**, the output image will be more three-dimensional and real. However, the total output capacity will reduce by half.

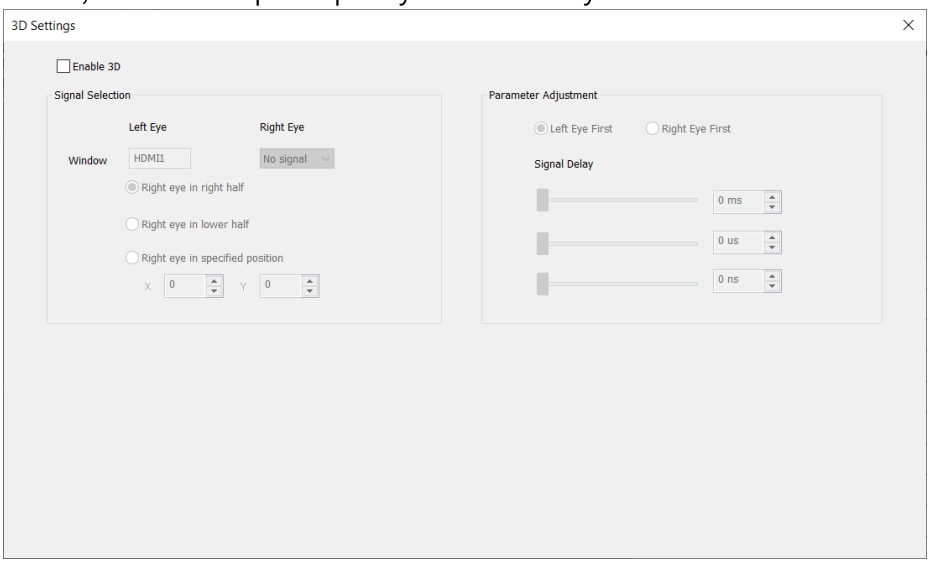


Fig 6.2.1.7 3D settings

- **Image Adjustment**: Click to open the **Image Adjustment** dialog box, then you can adjust the screen display effects by adjusting the parameters.

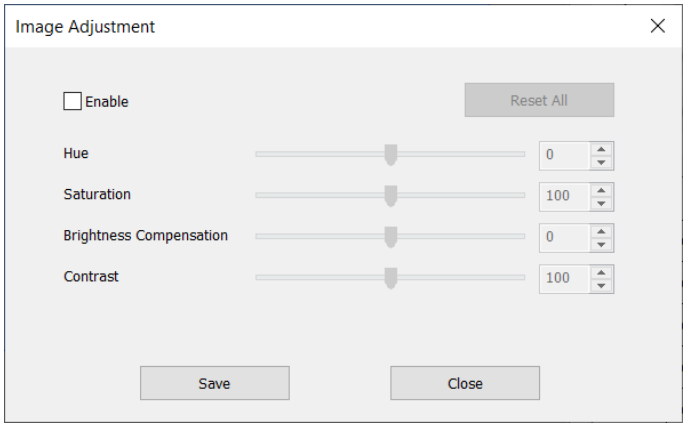


Fig 6.2.1.8 Image adjustment

- **Change Canvas Size**: The field shows the current size of the canvas. Click the **OK** button to change the canvas size.

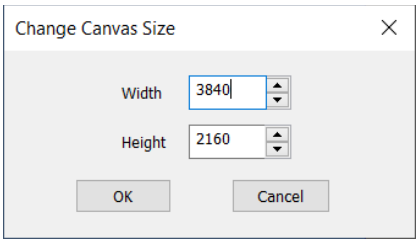


Fig 6.2.1.9 Change canvas size

Right Panel

The right panel is divided into 3 sections: **Signal Selection**, Signal list, and **Video Sync.**

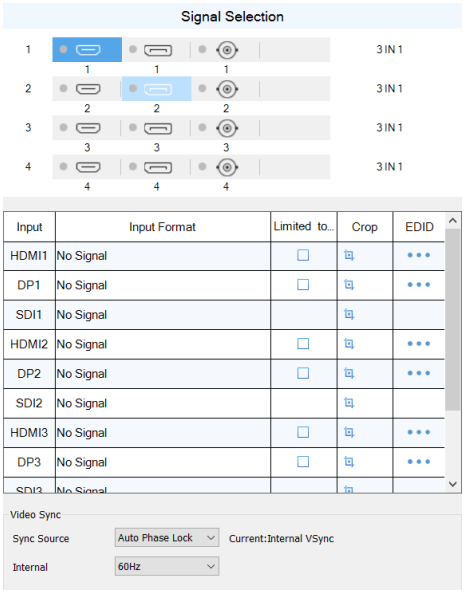


Fig 6.2.1.10 Right panel

Signal Selection

It is used for adding and switching the signal windows. It displays the sub board index, interface type, and sub board type in sequence.

- Sub board index: Display the physical location index of the sub board.
- Interface type: Display all interfaces of the sub board.
- Interface status: When the indicator is green or gray, it means the signal is connected or unconnected respectively.
- Sub board type: Display the sub board type. It shows **Unconnected** when no sub board is inserted.

Fig 6.2.1.11 Sub board type and connection status

- Add signal window: Drag the sub board interface into the canvas area to add a signal window.

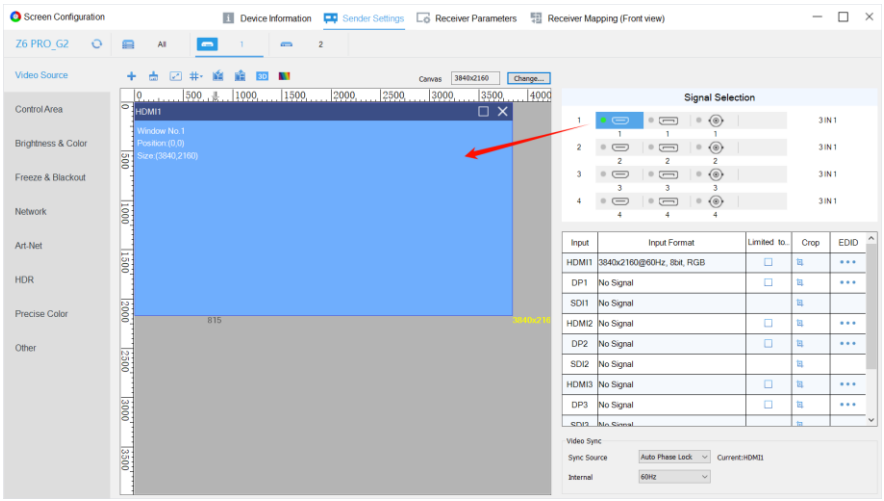


Fig 6.2.1.12 Add and switch between signal windows

Signal List

It represents device interface information, including **Input**, **Video Format**, **Limit to Full**, **Crop**, and **EDID**.

- **Input**: Show the signal interface type.
- **Input Format**: Contain resolution @ frame rate, color depth, and color model.
- **Limit to Full**: When enabled, you can change the color depth of the input signal.

- **Crop**: Click to open the **Crop** dialog box. Once enabled, you can set the size and position of the cropping area by dragging the dashed box with the mouse or changing the crop settings.

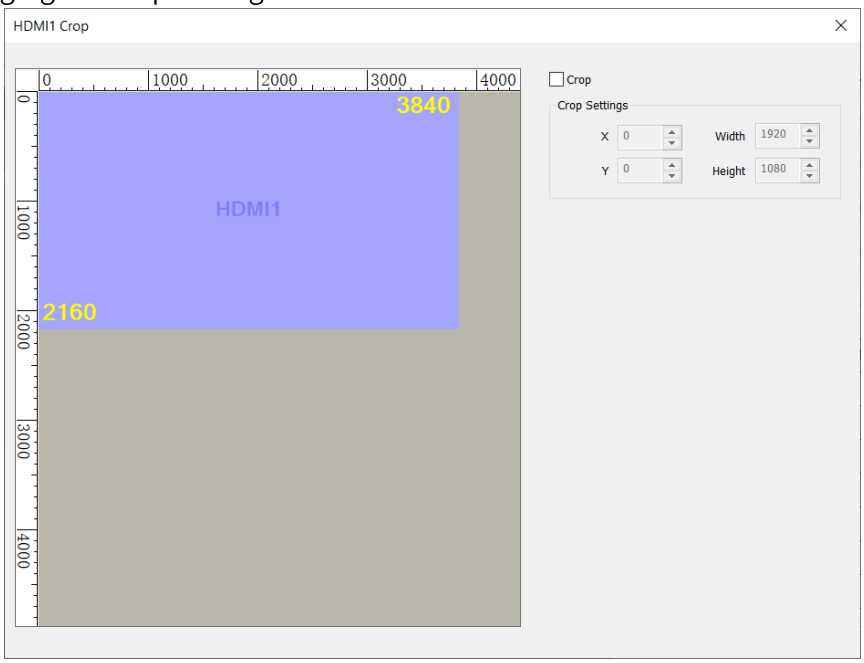


Fig 6.2.1.13 Signal cropping

- **EDID**: Click to open the **EDID Settings** dialog box for preset selection or custom resolution.

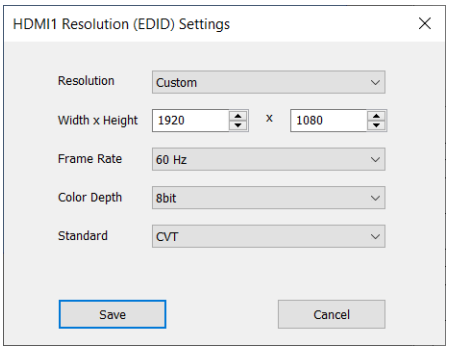


Fig 6.2.1.14 EDID settings

Video Sync

Synchronize the frame rate of the input signals. The frame rate of the LED display will be shown according to **Current Phase Lock**.

- **Sync source**: Select the **Sync Source** signal to synchronize the frame rate of the input signals with the frame rate of the **Current** signal.
- **Internal**: Modify the frame rate of **Internal** signal.

Canvas Area

Canvas area displays input signal layout and signal size. It also supports dragging the signal window by mouse to change the position and size of the window.

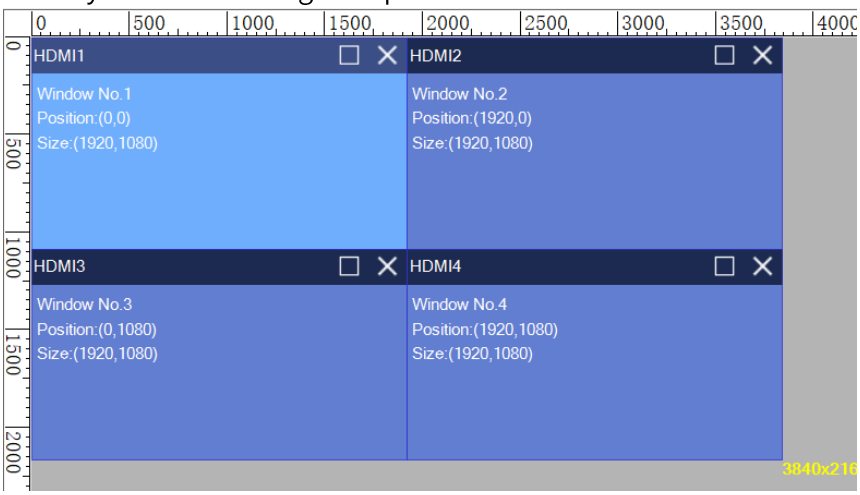


Fig 6.2.1.15 Canvas area

Right-click on the signal window to show the context menu.

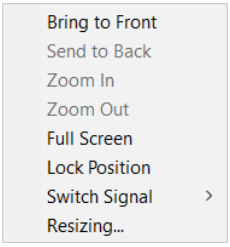


Fig 6.2.1.16 Context menu

The detailed function description of the context menu is shown in Table 6.2.1-2.

Table 6.2.1-2 Context menu function

Feature	Description
Bring to Front	The selected window layer will be brought to front.
Send to Back	The selected window layer will be sent to back.
Zoom in/out	Zoom in the window to spread it over the guide line area. Zoom out the window to restore the window size.
Full Screen	Spread the window over the canvas area.
Lock Position	Onced locked, the window size and position cannot be modified.
Switch Signal	Replace the selected window signal.
Resize	Modify the window size and position.

6.2.2 Control Area

This feature is applied to modify the network port control area, which includes view area and list area.

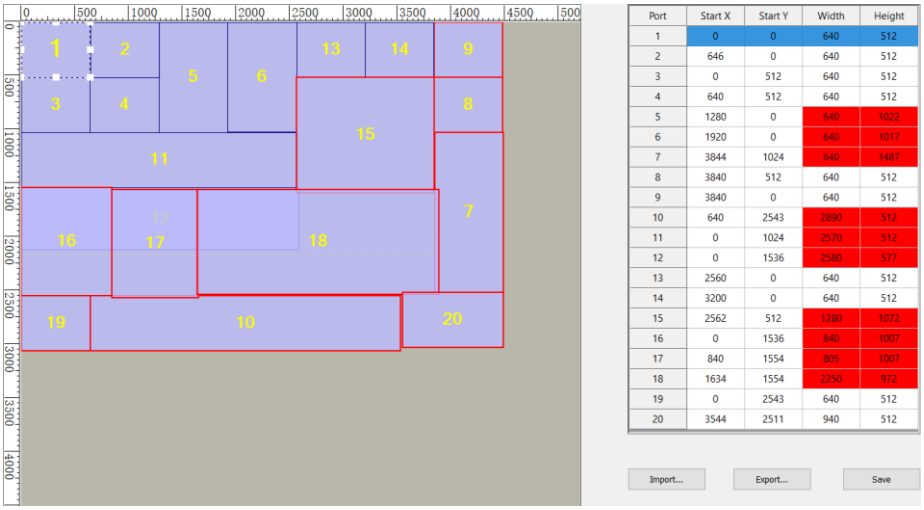


Fig 6.2.2.1 Control area

- View area: It graphically displays the port control area. You can change the position and size of the control area by drag-and-drop operation.
- List area: It shows the position and size of the port control area. You can modify

the position and size of the control area by modifying the parameter in the field.

- **Import**: Import the local parameter file.
- **Export**: Export the parameters of port control area as a local file.
- **Save**: Save the parameters of port control area to the sender.

6.2.3 Brightness & Color

Change the brightness and color temperature of the sender to adjust the LED display effects.

- **Brightness**: Adjust the brightness of LED display.
  - Abnormal tips: When the brightness is 0, a pop-up tip will be displayed at the menu bar.

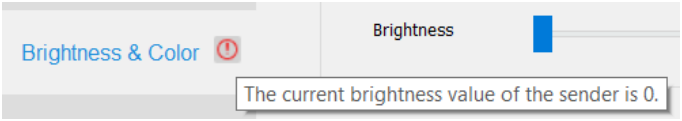


Fig 6.2.3.1 Abnormal tips

- **Color temperature**: Adjust the color temperature of LED display.

6.2.4 Freeze & Blackout

The sender displays a freeze or blackout screen.

- **Freeze**: Enable **Freeze** to display the LED screen at the last frame. A tip will pop up at the menu bar.
- **Blackout**: Enable **Blackout** to black out the LED screen. A tip will pop up at the menu bar.

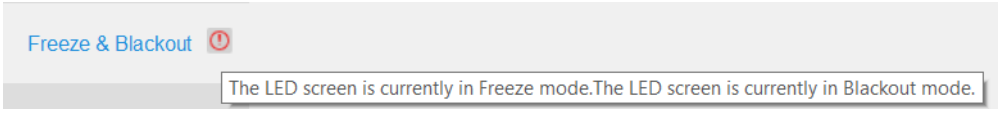


Fig 6.2.4.1 Freeze & Blackout tips

6.2.5 Network

Set the IP address of the sender.

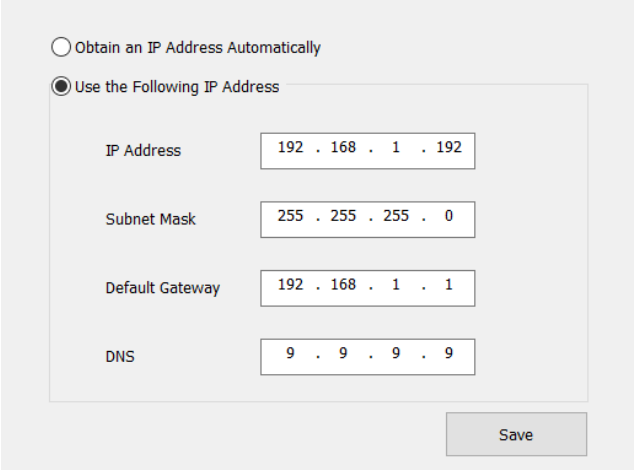


Fig 6.2.5.1 Network settings

- **Obtain an IP address automatically**: Use the IP address assigned by the DHCP server.
- Use the following IP address: **Set the IP Address**, **Subnet Mask**, and **Default Gateway** of the sender.
- **DNS**: Require sender programs for DNS settings. After configuring settings, you can access other hosts using the domain name.

6.2.6 Art-Net

The Art-Net feature works with a console.

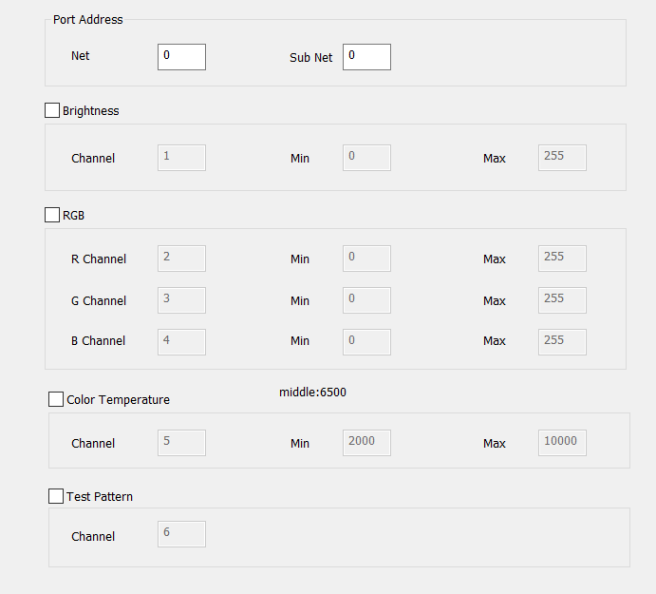


Fig 6.2.6.1 Art-Net settings

6.2.7 HDR

HDR (High Dynamic Range) image provides a higher dynamic range and more image details.

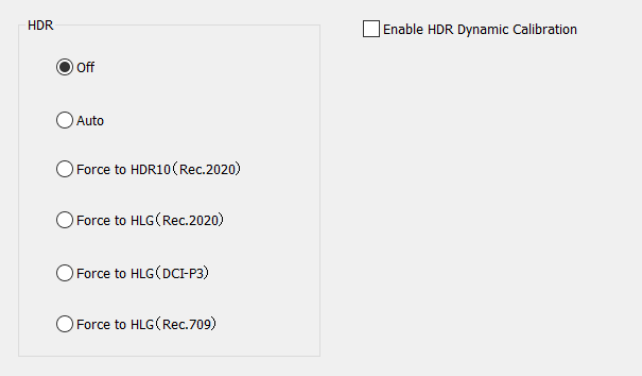


Fig 6.2.7.1 HDR

6.2.8 Precise Color Management

You can modify the color and brightness information, as well as color space according to needs. When **HDR Dynamic Calibration** is enabled, there will be a **Before Calibration** tab.

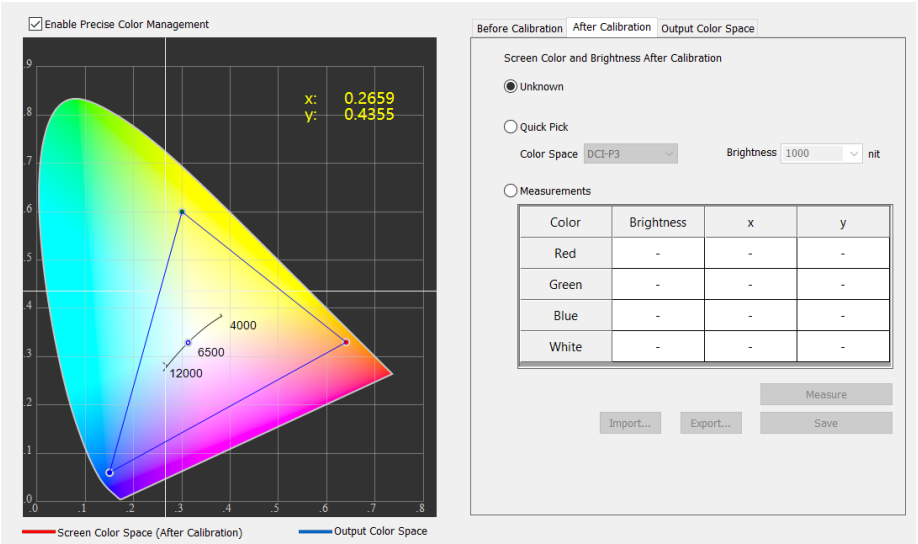


Fig 6.2.8.1 Precise color management

6.2.9 Other

Configure Advanced Parameters, Advanced Functions, and Test Pattern for the sender.

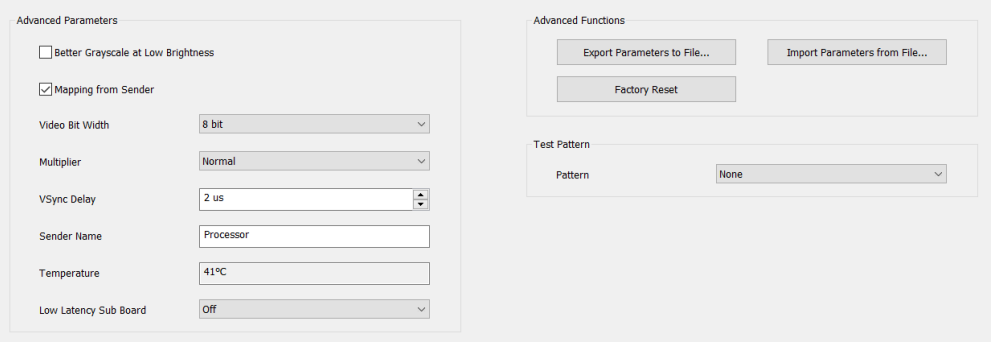


Fig 6.2.9.1 Other settings

Advanced Parameters

- **Better Grayscale at Low Brightness**: When selected, optimize the screen display effects at low brightness.
- **Mapping from Sender**: When selected, the mapping from the sender will be applied.
- **Video Bit Width**: Adjust the color depth from the sender.
- **Multiplier**: Multiply the frame rate of the input signal.
- **VSync Delay**: Adjust the delay time of the VSync signal.
- **Sender Name**: Modify the name displayed on the front panel of the sender.
- **Temperature**: Display the sender temperature.
- **Low Latency Sub Board**: Reduce the delay time of video signal from the sub board.

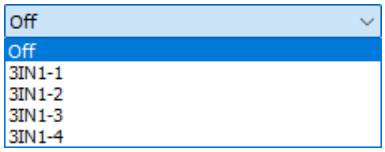


Fig 6.2.9.2 Low latency sub board

Advanced Functions

- **Export Parameters to File**: Export the sender parameters as a local file.
- **Import Parameters from File**: Import a local parameter file from the sender.
- **Factory Reset**: Reset the sender parameters.

Test Pattern

You can set different test patterns according to your needs and view the display effects

of LED screen with test patterns to test and diagnose the screen.

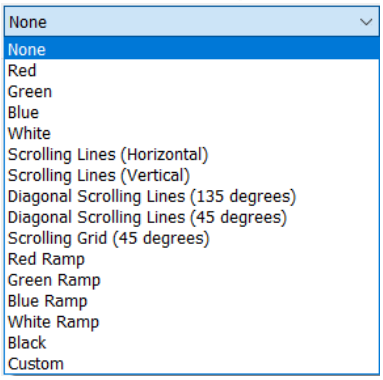


Fig 6.2.9.3 Test pattern

- Abnormal tips: Select the blackout test pattern. A tip will pop up at the menu bar.

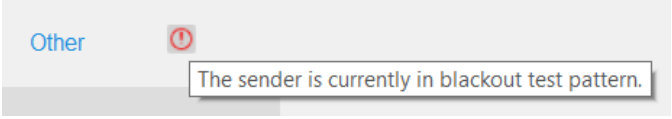


Fig 6.2.9.4 Test modes tips

6.3 Receiver Parameters

Select the Receiver Parameters tab in the Screen Configuration interface to set LED display parameters, including Basic Parameters, Driver IC, Decoder IC, Gamma Adjustment, Calibration Settings, Display Adjustment, and Other Settings.

6.3.1 Basic Parameters

The basic parameters of the receiver card can be configured, including **Module Information**, **Cabinet Settings**, and **Performance Setting**.

Depending on the cabinet construction, the basic parameters of **Module Information** and **Cabinet Settings** can be different. Take the chip set ICN2055 + ICN2013 as an example.

Module Information (Single Type Module)

The module information section displays the basic information of the module.

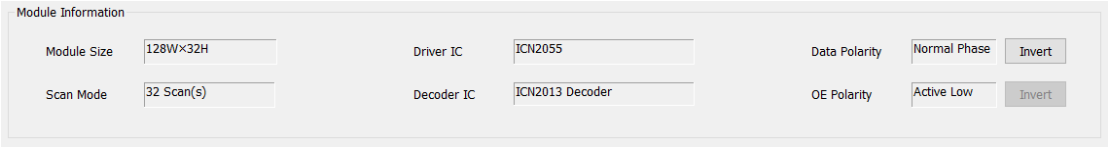


Fig 6.3.1.1 Module information (single type module)

Function description of module information is shown in Table 6.3.1-1.

Table 6.3.1-1 Functional description of module information

Parameters	Description
Module Size	Show the width and height of the module.
Scan Mode	Show the scans of the module.
Driver IC	Show the driver IC of the module.
Decoder IC	Show the decoder IC of the module.
Data Polarity	Set the data polarity of the module.
OE Polarity	Set the OE polarity of the module.

Cabinet Settings (Single Type Module)

In this section, the basic parameters of the cabinets can be configured.

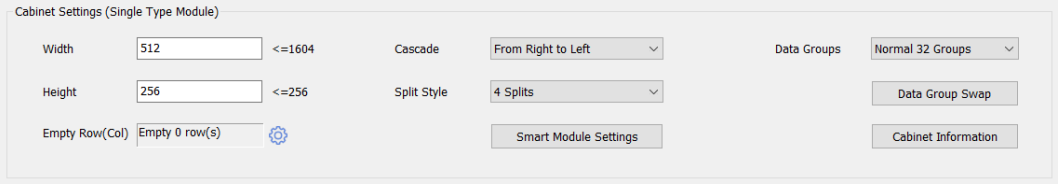


Fig 6.3.1.2 Cabinet settings (single type module)

- **Width & Height**: Set the width and height of the cabinets.
- **Cascade**: Modify the image of cascade direction displayed on the LED screen.

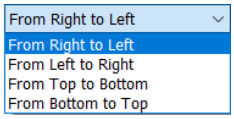


Fig 6.3.1.3 Cascade

- **Split Style**: Increase the bandwidth by reducing the load height of the receiver card.

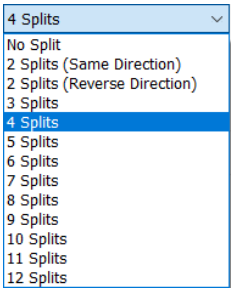


Fig 6.3.1.4 Split style

- **Data Groups**: Modify the number of data groups from the receiver card.

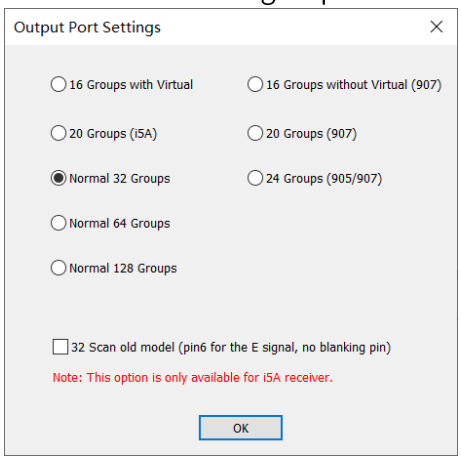
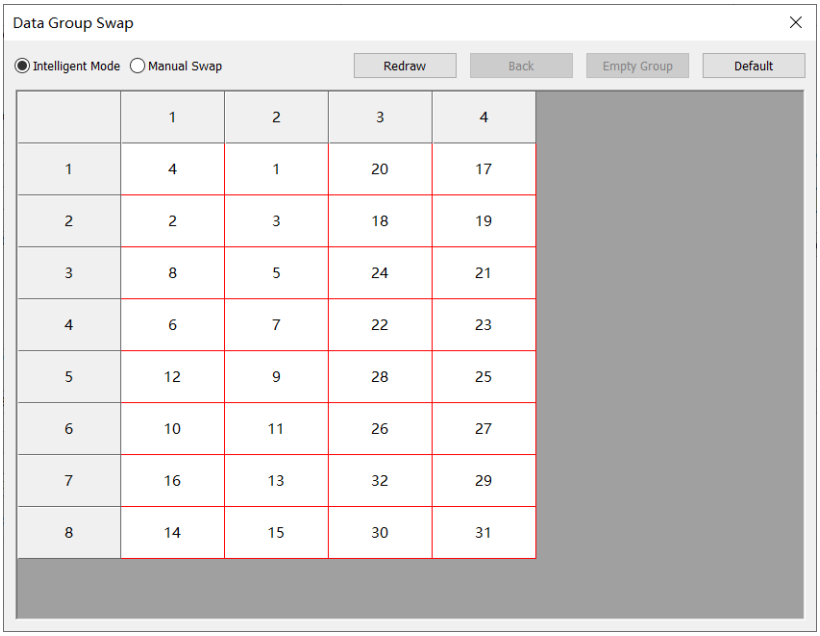


Fig 6.3.1.5 Data groups

- **Data Group Swap**: Click the **Data Group Swap** button to open the **Data Group Swap** dialog box, which supports two modes: **Intelligent Mode** and **Manual Swap**.



	1	2	3	4
1	4	1	20	17
2	2	3	18	19
3	8	5	24	21
4	6	7	22	23
5	12	9	28	25
6	10	11	26	27
7	16	13	32	29
8	14	15	30	31

Fig 6.3.1.6 Data group swap

- **Smart Group Drawing**: Configure the data group location to make the cabinet display normally according to the on-screen instructions.

The description of smart group drawing is shown in Table 6.3.1-2.

Table 6.3.1-2 Smart group drawing

Feature	Description
Drawing Area	Configure the data group index.
Redraw	Clear the current data group index and redraw the group.
Back	Click the button to return to the previous step.
Empty Group	Click the button to skip the current data group index.
Restore Defaults	Reset the data group index.

- **Manual Swap**: Manually swap the data group index to achieve the normal display of the cabinets.

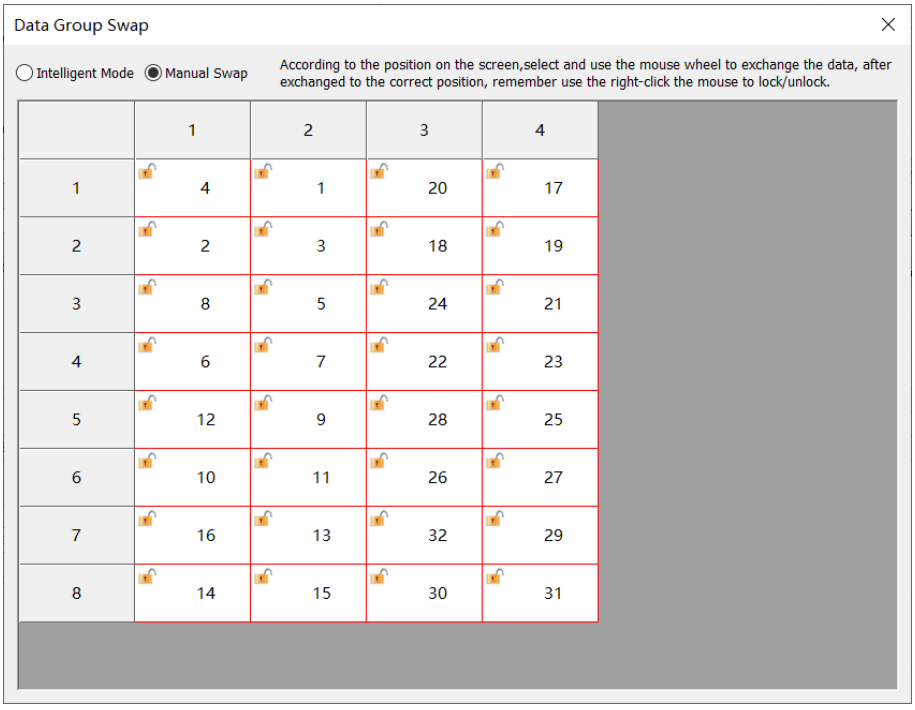


Fig 6.3.1.7 Manual swap settings

The manual swap actions are shown in Table 6.3.1-3.

Table 6.3.1-3 Actions of manual swap

Action	Description
Right-click	Lock or unlock the data group index.
Click	Select the data group index.
Mouse Wheel	Change the index of the selected data group, and the index of the locked data group is automatically skipped.

- **Empty Row/Col**: Display the number of empty rows and columns. Click to open the **Empty Row/Col Settings** dialog box, which supports two modes: **Normal Empty Row** and **Custom Empty Row/Col**.
- **General empty row**: Only the empty row is supported.
  - **Start Row**: Set the start for empty rows.
  - **Empty Row Count**: Empty regular rows according to the number of rows you set.
- **Custom Empty Row/Col**: Support customizing empty rows and columns.

Quick Start

Step 1: Click the + button to open the **Add** dialog box and set the empty rows and columns according to the actual empty rows and columns position of the cabinets.

Step 2: Modify the width and height of the cabinets, as shown in Figure 6.3.1.8.

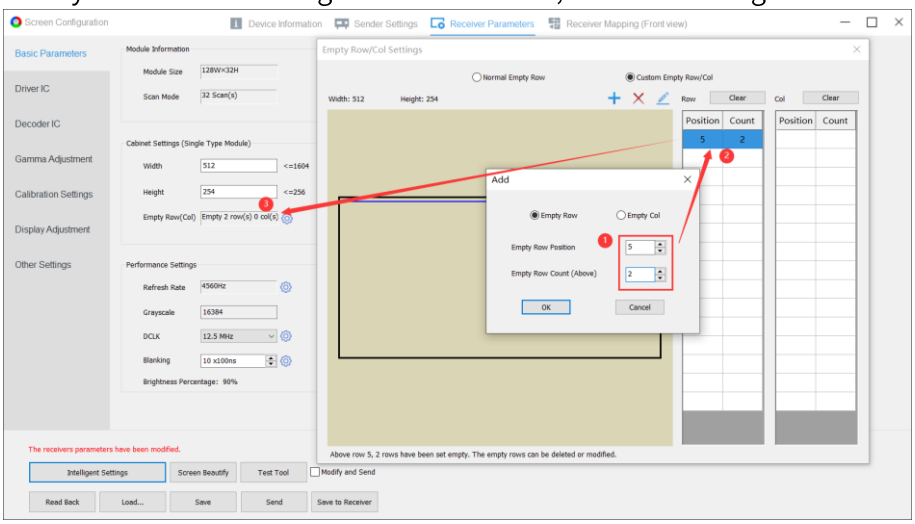


Fig 6.3.1.8 Empty row/col settings

The features of custom empty row/col are shown in Table 6.3.1-4.

Table 6.3.1-4 Custom empty row/col

Feature	Description
List	The list displays the empty rows and columns you set.
View Area	Graphically display the empty rows and columns you set.
+	Click to add empty rows and columns.
×	Click to delete the selected empty rows and columns.
✎	Click to modify the position and number of the selected empty rows and columns.
Row Clear	Clear the empty rows you set.
Col Clear	Clear the empty columns you set.

- Smart Module Settings: Click the Smart Module Settings button to open the Smart Module Setting dialog box, which supports two modes: Default Location and Customize Position.

■ **Default Location**: Set module position according to the actual module size.

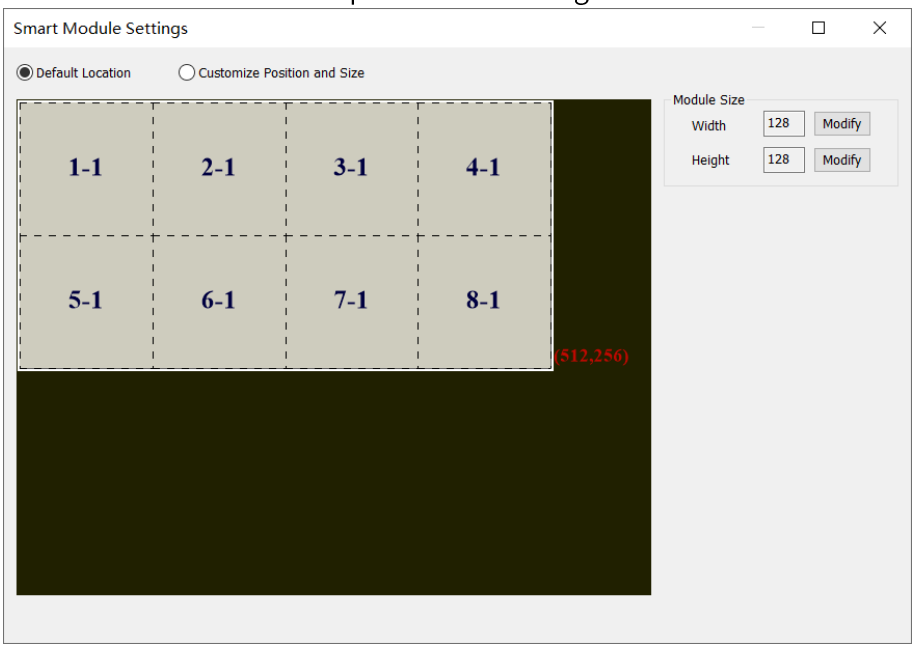


Fig 6.3.1.9 Default location

- **Width**: Click **Modify** to select the width of the module.
- **Height**: Click **Modify** to select the height of the module.
- **Customize Position and Size**: Set the position, size, and number of the smart module manually.

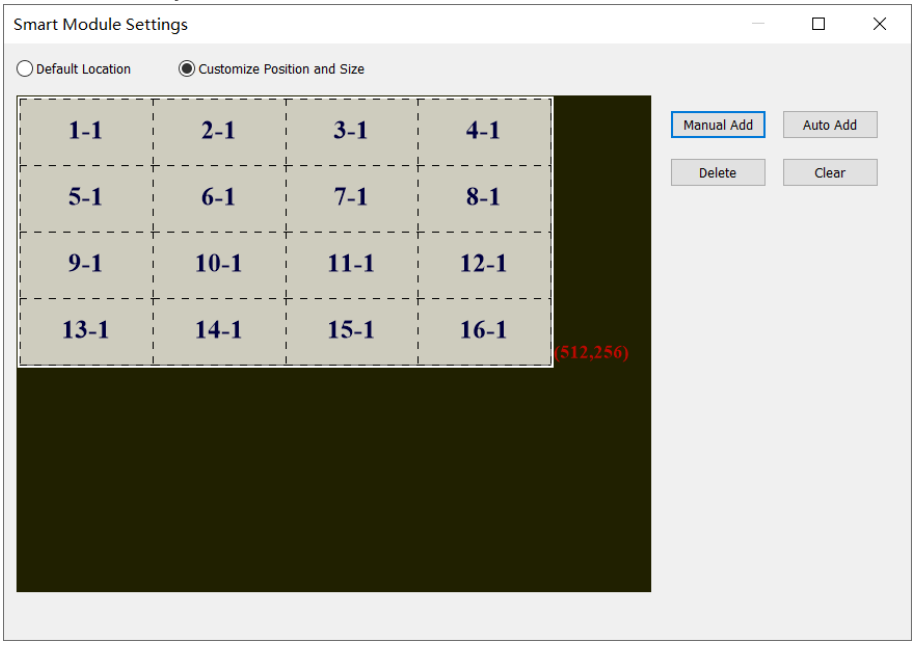


Fig 6.3.1.10 Customize position

- **Manual Add**: Click Add to open the Add Mod Info dialog box. Then, set the Pin Number, Cascade Location, Module Position, and Module Size for modules.

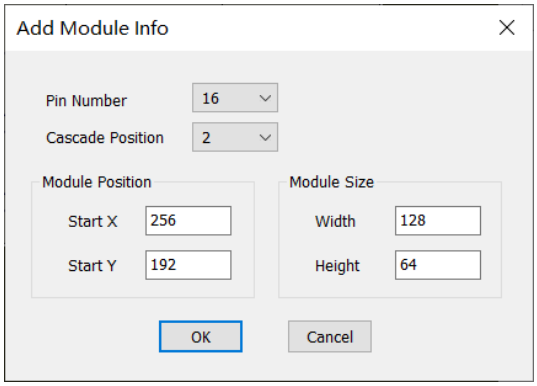


Fig 6.3.1.11 Add module information

- **Auto Add**: Copy the module settings from **Default Location**.
- **Delete**: Click to delete the selected smart module.
- **Clear**: Click to clear all smart modules.
- **Modify**: Select a smart module and modify its **Pin Number**, **Cascade Location**, **Module Position** and **Module Size** on the right side.

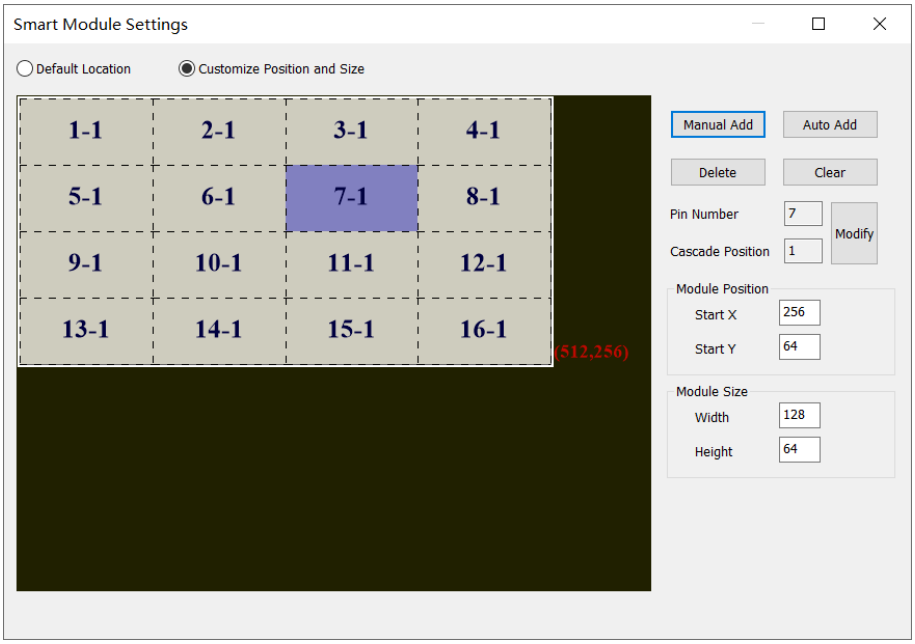


Fig 6.3.1.12 Modify

- View area: Display all the smart modules.
- **Cabinet Information**: Click to open the corresponding dialog box to set the cabinet information and save it to receiver card.

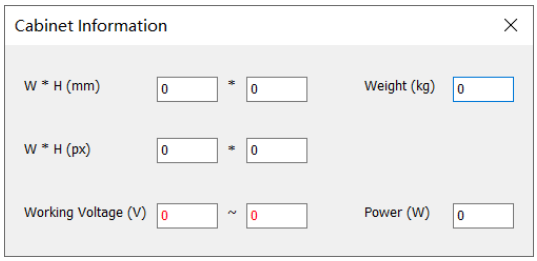


Fig 6.3.1.13 Cabinet information

Module Information (Multi-Type Module)

Switch module types on the right to check module information.

Fig 6.3.1.14 Module Information (Multi-Type Module)

Cabinet Settings (Multi-Type Module)

Configure basic parameters of cabinets.

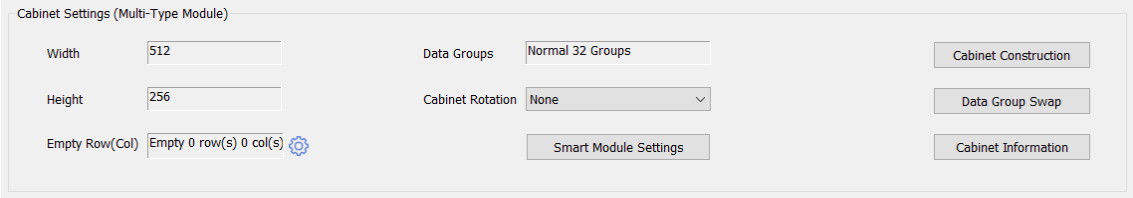


Fig 6.3.1.15 Cabinet Settings (Multi-Type Module)

Cabinet settings features are illustrated in Table 6.3.1-5.

Table 6.3.1-5 Cabinet settings

Feature	Description
Width	Show cabinet width.
Height	Show cabinet height.
Data Groups	Show cabinet data groups.
Cabinet Rotation	Display the image after rotating cabinet.
Cabinet Construction	Click to open the **Cabinet Construction** dialog box.
Data Group Swap	Click to open the **Data Group Swap** dialog box.
Empty Row/Col	Only **Custom Empty Row/Col** mode is supported.
Smart Module Settings	Only Customize Position and Size mode is supported.
Cabinet Information	Set cabinet information and save it to receiver card.

- **Cabinet Construction**: Add modules and set the layout and data group index for the added modules to construct a complete cabinet.
- Quick Start

Step 1: Click the + button and select the module type to add modules and construct the cabinet, as shown in Figure 6.3.1.16.

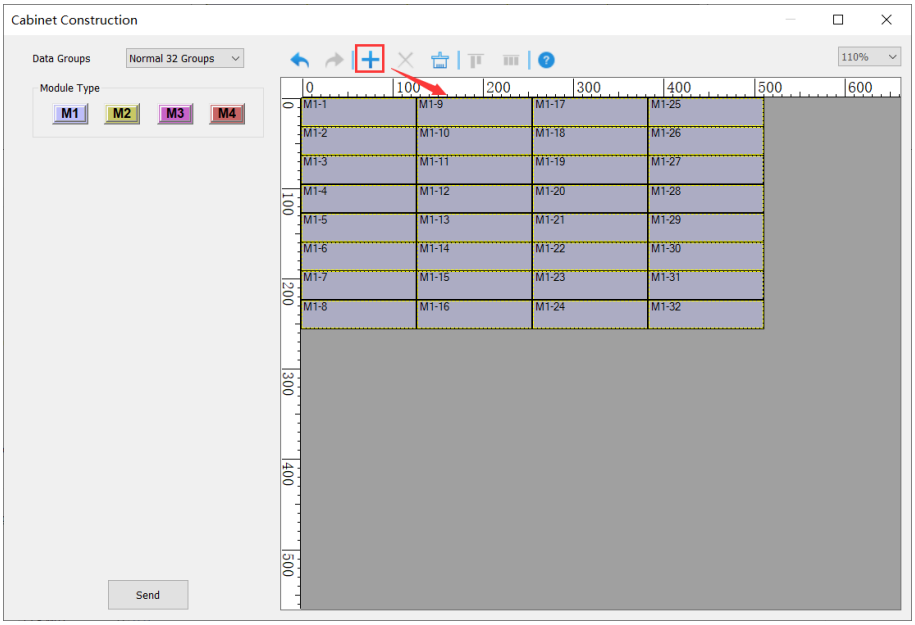


Fig 6.3.1.16 Cabinet Construction

Step 2: Select the modules one by one to number the modules. When finished, click **Send** to complete the cabinet construction, as shown in Figure 6.3.1.17.

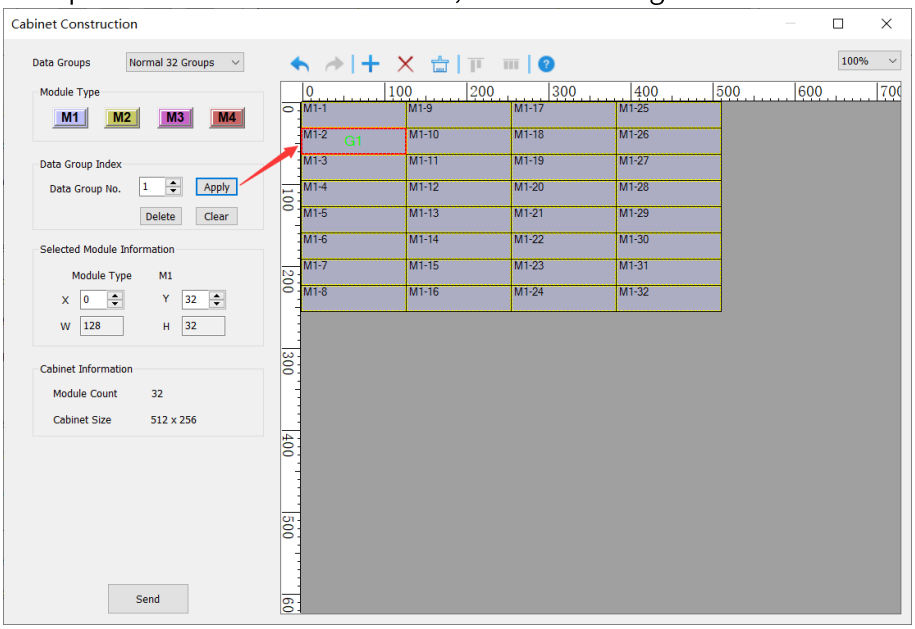


Fig 6.3.1.17 Data group numbering

- Left panel: Support configuring module types, data group numbering, modifying position and size, and viewing cabinet information.

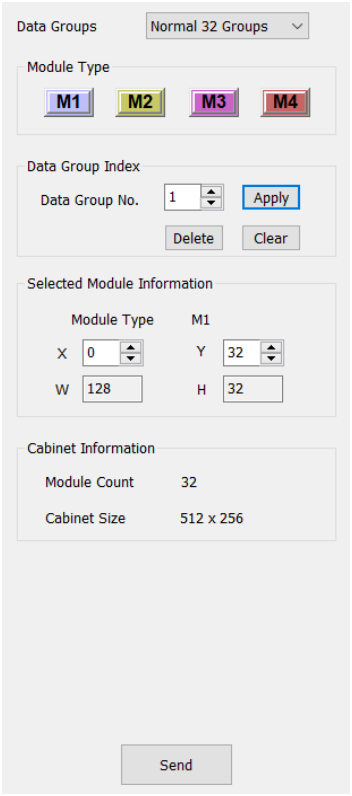


Fig 6.3.1.18 Left panel

- **Data Groups**: Modify the number of data groups from receiver card.
- **Module Type**: Support adding, deleting, viewing, and editing.

The module type functions are described in Table 6.3.1-6.

Table 6.3.1-6 Module type function

Feature		Description
Right-click module type	Remark	Rename the remark for the **Module Type**.
	Import	Import a locally saved module type parameter file.
	Export	Export the module type parameter as a local file.
	View Information	View the selected module type information.
	Delete	Delete the selected module type.
Add	Generate	Configure the module type information, enter Wizard 8, and generate a new module type after the drawing is

		finished.
	Import from File	Import a locally saved module type parameter file to generate a new module type.
Double-Click Module Type		Enter Wizard 8 drawing interface.

- **Data Group Index**: Number the data groups of the selected modules.

The data group index functions are described in Table 6.3.1-7.

Table 6.3.1-7 Data group numbering

Feature	Description
Data Group No.	Set the data group index.
Apply	Apply the **Data Group No.** to the data groups of the selected modules.
Clear	Clear the data group indexes of all modules.
Delete	Delete the data group index of the selected modules.

- **Selected Module Information**: You can view module type, width and height, and position. Change the position of modules by modifying X and Y.
- **Cabinet Information**: Display the number of modules in the drawing area and cabinet size.
- **Send**: Send the cabinet information to the receiver card.
- Toolbar: Add, delete, and sort modules in the drawing area.

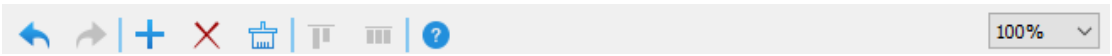


Fig 6.3.1.19 Cabinet construction toolbar

Toolbar function descriptions are shown in Table 6.3.1-8.

Table 6.3.1-8 Toolbar functions

Feature	Description
	Click to return to the previous step.
	Click undo the action in the previous step.
	Add a module to the drawing area.
	Delete the modules selected in the drawing area.
	Empty all modules in the drawing area.
	Select multiple modules to align the layout of modules.
	Select multiple modules to sort the layout of the modules.
	Open the **Cabinet Construction** help document.
Zoom	Zoom in/out by switching the drop-down box options or Ctrl + mouse wheel.

- Data Group Swap: Click the Data Group Swap button to open the Data Group Swap dialog box. Two modes are supported: Smart Group Drawing and Manual Swap.
- Toolbar
  - **Smart Group Drawing**: Data group numbering based on cabinet display, where you can undo, restore, reset, and empty groups.
  - **Manual Swap**: Exchange the indexes of two data groups individually, which supports locking and unlocking functions.

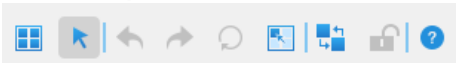


Fig 6.3.1.20 Data group swap toolbar

The description of the data group swap toolbar functions is shown in Table 6.3.1-9.

Table 6.3.1-9 Toolbar

Feature		Description
		Turning on the **Screen Test** mode and the receiver card control area shows white.
	Switch Modes	
	Select Data Groups	In drawing area, click to select the data group.
		
		Click to undo the previous step.
		Reset all data group numbers.
	Void Group	Skip the current data group number.
	Data Group No.	In drawing area, click to number data groups.
		
	Lock or Unlock	In drawing area, right click to lock or unlock data groups.
	Swap Data Groups	In drawing area, swap the number of the selected data groups with mouse wheel.
Help		Open the help file.
Zoom		Zoom in/out by switching the drop-down box options or Ctrl + mouse wheel.

Module Information (Irregular Module)

Display basic information about the module, please refer to Single Type Module for more information.

Cabinet Settings (Irregular Module)

Configure the basic parameters of the cabinets, refer to Cabinet Settings (Multi-Type Module) for details.

Performance Settings

The display effect of the cabinets can be adjusted, which supports the configuration of **Refresh Rate**, **Grayscale Mode**, **No Signal Action**, **Grayscale**, **GCLK**, **Power-on Fade-in**, **DCLK**, **Blanking Parameters**, as well as view the **Brightness Percentage**.

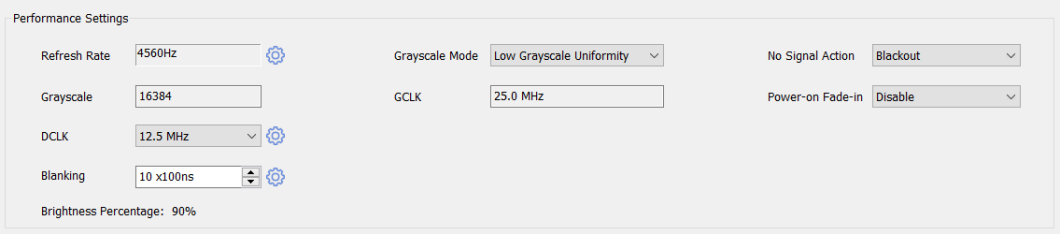


Fig 6.3.1.21 Performance settings

- **Refresh Rate**: Display refresh rate, which is the number of times per second that the LED screen is able to draw a new image. The higher the refresh rate, the more stable the image.
- **Grayscale Mode**: Select different modes to change the Gamma value of the low-grayscale part in the gamma table, making the transition of the low-grayscale part more even.
- **No Signal Action**: Set the content displayed when the signal of receiver card is invalid.
- Grayscale: The higher the grayscale level, the richer the color.
- **GCLK**: Display clock. The larger GCLK is, the higher the refresh rate, the grayscale, and the brightness percentage.
- **Power-on Fade-in**: When enabled, the screen becomes brighter gradually when the LED display is powered on to protect the LED beads.
- **DCLK**: Pixel clock. The higher the pixel clock, the higher the horizontal load capacity of the receiver card. Click ⚙ to adjust DCLK duty ratio.

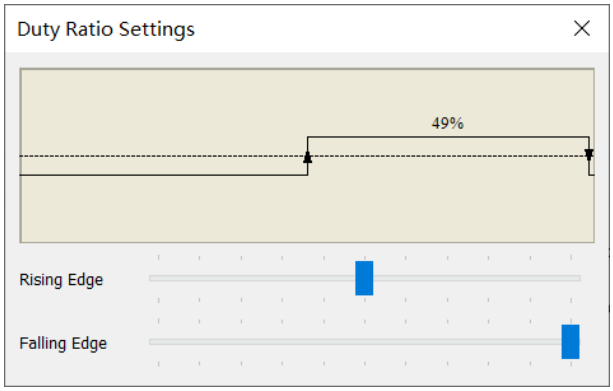


Fig 6.3.1.22 Duty ratio settings

- **Blanking**: Solve the problem of dark LED beads and improve the display effect. Click to adjust 4051 parameters for further optimization of the display effects.

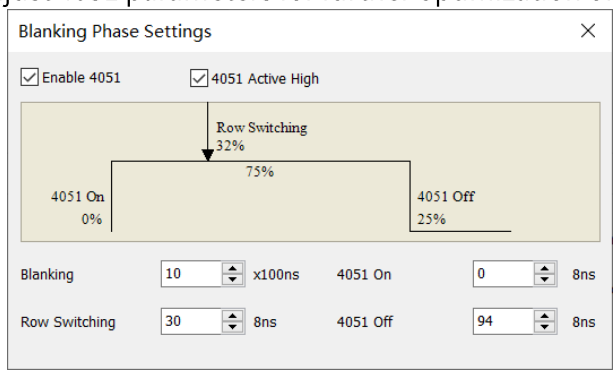


Fig 6.3.1.23 Blanking phase setting

- **Brightness Percentage**: The smaller blanking, lower refresh rate, and the higher gray level leads to the higher brightness percentage.

6.3.2 Driver & Decoder IC

Driver IC

The chip parameters can be adjusted to optimize the display effect of the LED cabinet, including **Chip Parameter Settings**, **Extended Settings**, and **Advanced Settings**.

- **Chip Parameter Settings**: Adjust the current gains of red, green, and blue by dragging the slider.

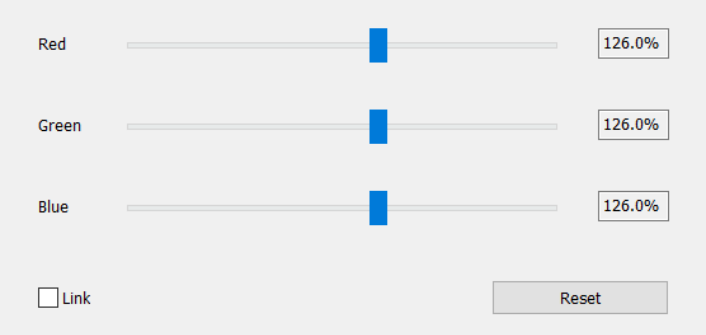


Fig 6.3.2.1 Current gains

The current gain function is described as shown in Table 6.3.2-1.

Table 6.3.2-1 Current gain

Feature	Description
Current Adjustment	The higher the red, green, and blue current, the brighter the brightness.
Link	After ticking this checkbox, the red, green, and blue currents are synchronized for adjustment.
Reset	The red, green, and blue currents are reset to the default value.

- **Extended Settings**: It can be used to adjust the advanced parameters of the driver IC to solve the problems of low grayscale color blocks, color cast, color spots, darkening of the first row, high-contrast coupling, and cross-board color difference, optimizing the display effect.
- **Advanced Settings**: Register level parameters can be configured to optimize the display effect.

Decoder IC

Blanking can be adjusted to eliminate the upper ghost of the display and improve the caterpillar failure caused by the short circuit of the beads.

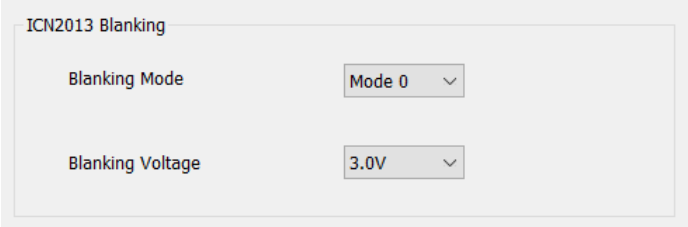


Fig 6.3.2.2 Decoder IC

6.3.3 Gamma Adjustment

The gamma values can be configured corresponding to different grayscales in the gamma table, making the image display more delicate.

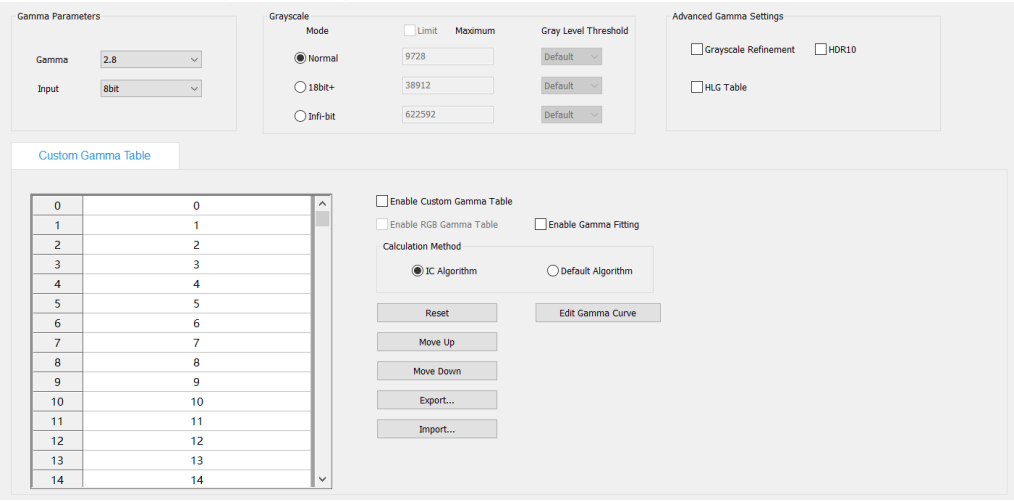


Fig 6.3.3.1 Gamma adjustment

Gamma Parameters

- **Gamma**: Select the gamma coefficient to adjust the values in the gamma table.
- **Input**: Adjust the color depth of the receiver card.

Grayscale

The grayscale supports three modes: **General**, **18bit+**, and **Infi-bit**. Switching modes will affect the custom Gamma table, HDR10, HLG table values.

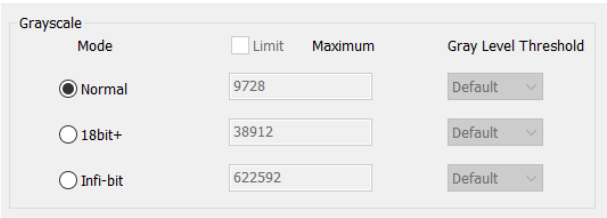


Fig 6.3.3.2 Grayscale

Grayscale features are described in Table 6.3.3-1.

Table 6.3.3-1 Grayscale

Feature	Description
Mode	Expand the gamma values in the gamma table. The general value is 16bit, and 18bit + and Infi-bit expand 2bit and 6bit respectively based on the general value.
Limit	Show the maximum gamma value for different modes.
Maximum	Tick to limit the maximum gamma value of the general mode.
Gray Level Threshold	The gamma value is multiplied and only the Infi-bit mode is supported.

Advanced Gamma Settings

This feature consists of 3 settings: **Grayscale Refinement**, **HDR10**, and **HLG Gamma Table**. Select the checkbox for **Grayscale Refinement** to enable the function.

Custom Gamma Table

Custom Gamma table supports setting gamma values for all grayscales and adjusts the display of cabinets at different grayscales.

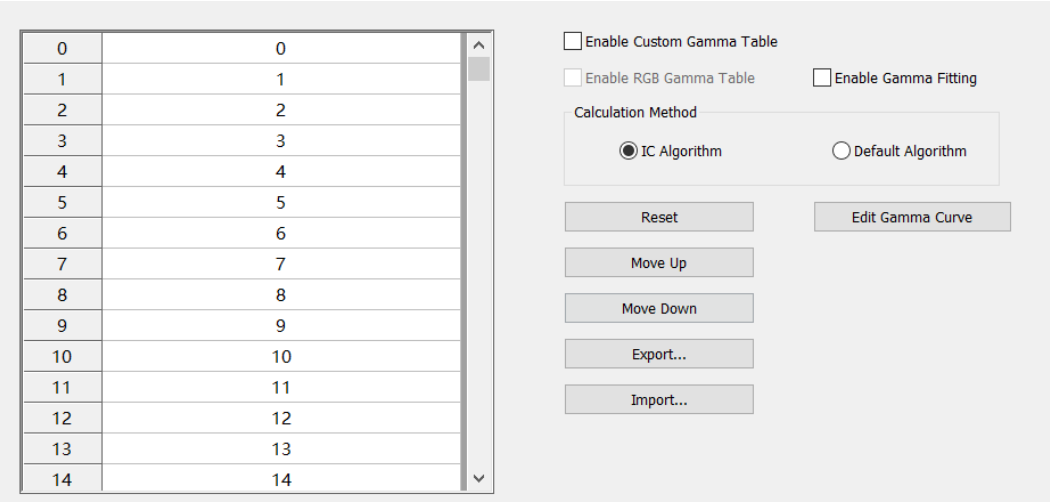


Fig 6.3.3.3 Custom Gamma table

Custom Gamma table features are shown in Table 6.3.3-2.

Table 6.3.3-2 Custom gamma table function

Feature	Description
Enable Custom Gamma Table	Enable custom gamma tables to display corresponding grayscale with gamma values.
Enable RGB Independent Gamma Table	The gamma value of red, green, and blue vector can be modified.
Calculation Method	Support **IC Algorithm** and **Default Algorithm**. **IC Algorithm** is related to the driver IC and the **Default Algorithm** is based on the built-in gamma table.
Reset	Reset the custom Gamma table.
Move Up	Select a Gamma value to move up one cell.
Move Down	Select a gamma value to move down one cell.
Export	Export the custom gamma table parameters to a local file.
Import	Import a local parameter file to the custom gamma table.
Gamma Curve Edit	Edit the gamma table by adjusting the gamma curve.

- **Gamma Curve Edit**: After **Gamma Curve Edit** is completed, custom gamma table will be changed synchronously by clicking **Apply**.

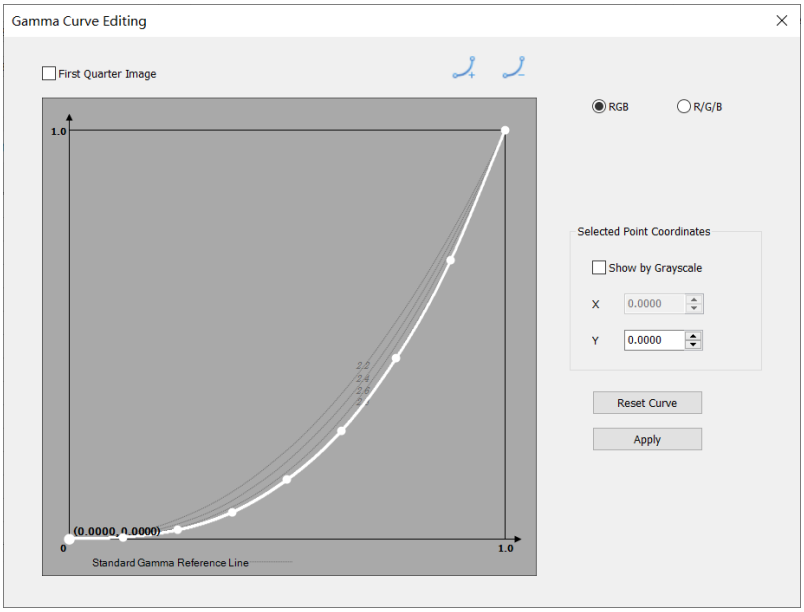


Fig 6.3.3.4 Gamma curve edit

The gamma curve edit function is described in Table 6.3.3-3.

Table 6.3.3-3 Gamma curve editing function

Feature	Description
First Quarter Image	The first quarter part of gamma curve is displayed in drawing area.
	Add route pixels on the gamma curve of the drawing area.
	Delete the route pixels on the gamma curve of the drawing area.
RGB	Modify the white gamma curve.
R/G/B	Modify red, green, and blue gamma curves.
Show by Grayscale	Tick to convert the coordinate in the gamma curve to show by grayscale.
Reset Curve	Reset to the gamma curve that specifies the gamma coefficient.
Apply	Click the button to apply the gamma curve to a custom gamma table.
Drawing Area	Show the gamma curve, which can be adjusted by modifying the points.

Grayscale Refinement

Grayscale refinement mainly solves the problem of brighter low grayscale or darker high grayscale which are resulted from the circuit design, chip performance and other factors. Grayscale refinement is divided into **White (Normal Grayscale Refinement)** and **RGBW (Infi-bit Grayscale Refinement)**.

- Quick Operations

Step 1: Set up the measurement environment to set the grayscale mode of the gamma table and enter the **Grayscale Refinement** tab.

Step 2: Click the **Measure** button to open the **Grayscale Refinement Measurement** window.

Step 3: Set the grayscale refinement measurement mode to match the grayscale mode of the gamma table. After configuring **Advanced Settings**, click the **Measure** button, then the color meter begins to measure the data, as shown in Figure 6.3.3.5.

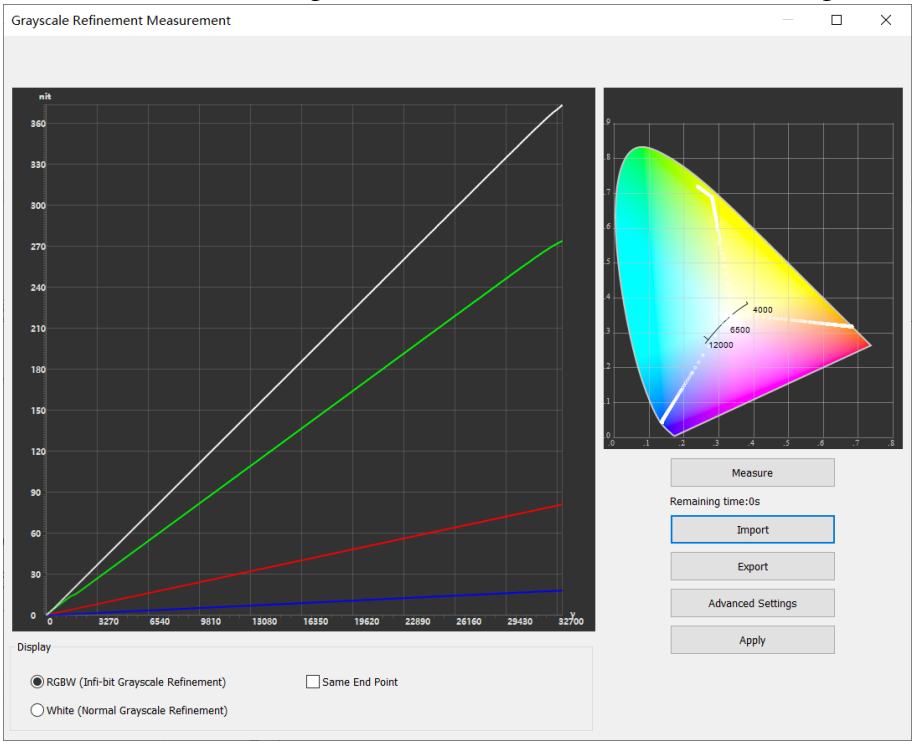


Fig 6.3.3.5 Grayscale refinement measurement

Step 4: When the measurement is completed, click the **Apply** button to update the grayscale color cast table and refinement table according to the measurement data.

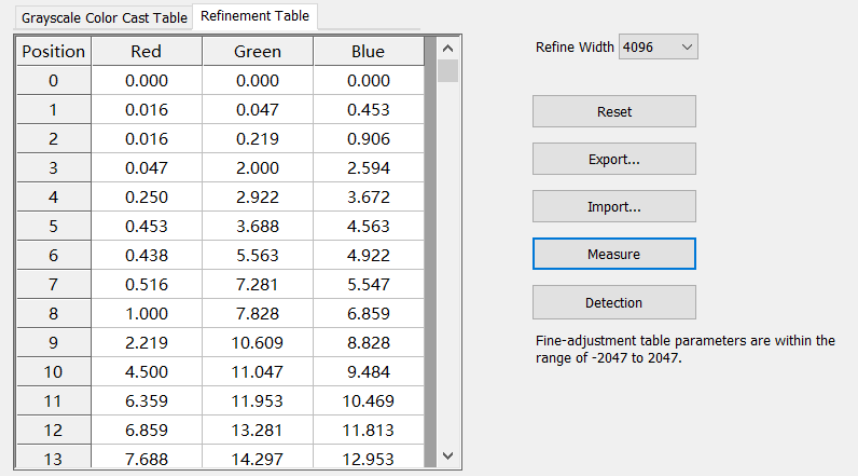


Fig 6.3.3.6 Interface after application

The functions of **Grayscale Refinement** are described in Table 6.3.3-4.

Table 6.3.3-4 Description of grayscale refinement

Feature	Description
Refinement Width	Support **Grayscale Refinement Extension**, with available refinement widths of 4096, 7168, and 13312.
Grayscale Color Cast Table	View and modify grayscale color cast table information.
Export Grayscale Color Cast Table	Export the parameters of the grayscale color cast table to a local file.
Import Grayscale Color Cast Table	Import the local parameter file to the grayscale color cast table.
Refinement Table	View and modify refinement table information.
Export Refinement Table	Export the refinement table parameters to a local file.
Import Refinement Table	Import a local parameter file to the refinement table.
Reset	Reset the grayscale color cast table or refinement table information.

Measure	Click the **Measure** button to open the window of **Grayscale Refinement Measurement**.
Detection	Click the **Detection** button to detect the receiver cards.

- **Grayscale Refinement Measurement**: The brightness and color coordinates at each grayscale of the red-green-blue-and-white display is measured by a color meter to generate calibrated data according to the **Refinement Mode**. After application of the algorithm, you will get a new grayscale color cast table and refinement data table, LED display effects are optimized.

The descriptions of **Grayscale Refinement Measurement** are shown in Table 6.3.3-5.

Table 6.3.3-5 Grayscale refinement measurement

Feature	Description
RGBW (Infi-bit Gray Refinement)	The gray mode for gamma table is **Infi-bit**.
White (Normal Gray Refinement)	The gray mode for gamma table is **General** or **18bit +**.
Same End Point	When checked, all curve ends in the view area are at the same endpoint.
Measure	Click the **Measure** button to measure the curve in the current grayscale mode.
Import	Import a local parameter file into the view area.
Export	Export the view area measurement parameters to a local file.
Advanced Settings	Click to open the **Advanced Settings** dialog box. 1. Switch between Refinement Mode (Eye/Professional). 2. Select White Priority or Monochrome Priority as required.

	3. Set **Gray Level Threshold** for measurement. 4. Set Refinement Width for Grayscale Refinement Extension. 5. Enable **Correction Mode** and set **Correction Times**. Click **OK** to save the settings.
Application	When applied, the gray table and refine table will be updated.
View Area	Display the measurement curve.

HDR10

You can adjust HDR10 Gamma table information to optimize the HDR video display.

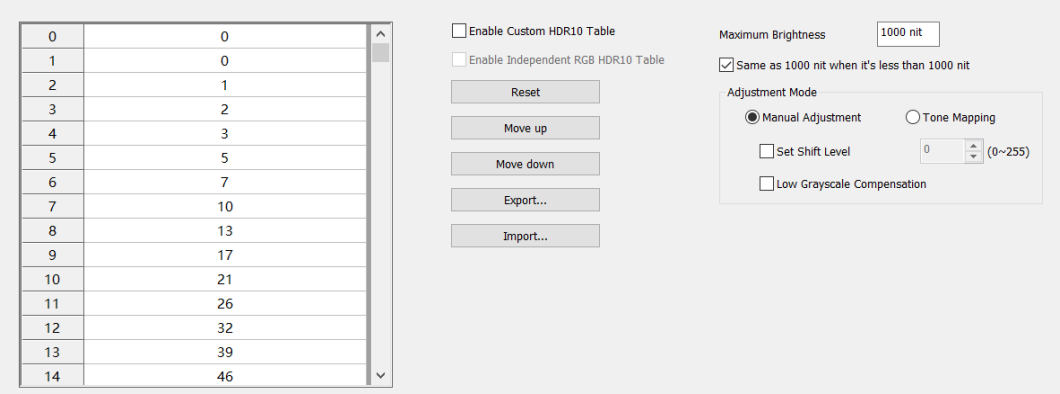


Fig 6.3.3.7 HDR10

The descriptions of **HDR10** are shown in table 6.3.3-6.

Table 6.3.3-6 HDR10 function

Feature	Description
Enable Custom HDR10 Table	Select **Enable Custom HDR10 Table** checkbox to display the corresponding grayscale with Gamma values.
Enable Independent RGB HDR10 Table	The Gamma value of red, green, and blue vectors can be modified.

Reset	Reset the HDR10 Gamma table.
Move up	Select a Gamma value to move up one cell.
Move down	Select a Gamma value to move down one cell.
Export...	Export the HDR10 Gamma table parameter as a local file.
Import...	Import the local parameter file to the HDR10 Gamma table.
Maximum Brightness	Adjust the maximum brightness of the LED screen.
Adjustment mode	Adjust the values in the Gamma table to support both manual adjustment and tone mapping modes.

HLG Gamma Table

You can adjust HLG Gamma table information to optimize HLG video display.

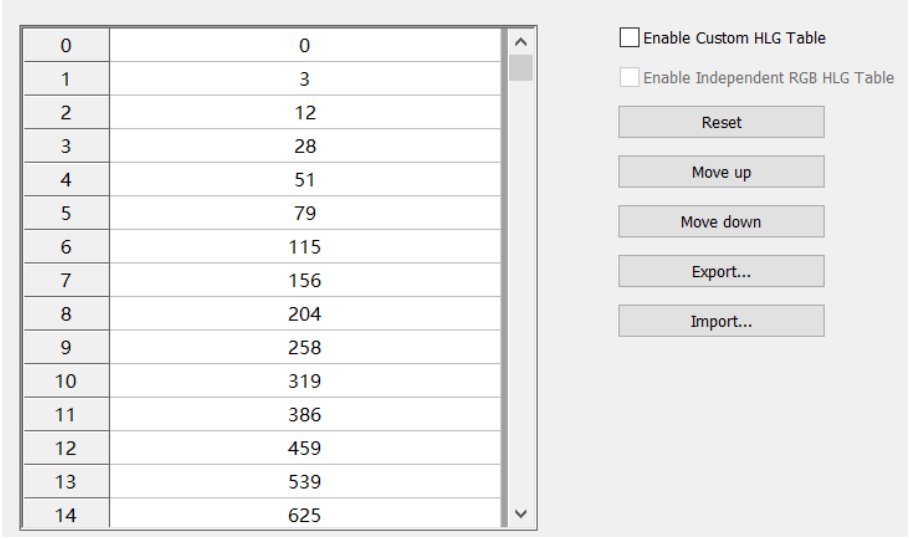


Fig 6.3.3.8 HLG Gamma table

HLG gamma table features are described in Table 6.3.3-7.

Table 6.3.3-7 HLG Gamma table

Feature	Description
Enable Custom HLG Table	Enable the custom HLG table to display the corresponding grayscale at gamma values.
Enable Independent RGB HLG Table	The gamma value of red, green, and blue vectors can be modified.
Reset	Reset the HLG gamma table.
Move up	Select a gamma value to move up one cell.
Move down	Select a gamma value to move down one cell.
Export...	Export the HLG gamma table parameters to a local file.
Import...	Import the local parameter file to the HLG gamma table.

6.3.4 Calibration

Calibration Mode

Switch the calibration status of the cabinets.

Calibration Coefficient Source

Select the source of the cabinet calibration coefficient.

Advanced Deseam

Turn on or turn off **Advanced Deseam**.

Double Layer Calibration

Set the grayscale interval where the double layer calibration (**Low Layer Grayscale** and **High Layer Grayscale**) coefficients take effect.

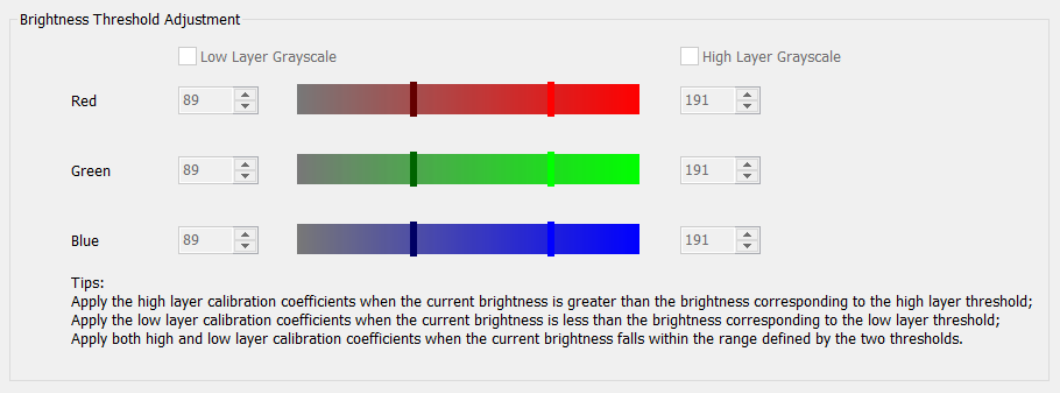


Fig 6.3.4.1 Double layer calibration

- **Low Layer Grayscale**: Select the checkbox to enable or disable calibrating low layer grayscale.
- **High Layer Grayscale**: Select the checkbox to enable or disable calibrating high layer grayscale.
- **Brightness Threshold Adjustment**: Adjust the low layer grayscale and high layer grayscale thresholds by sliders or input boxes.

Low Grayscale Calibration

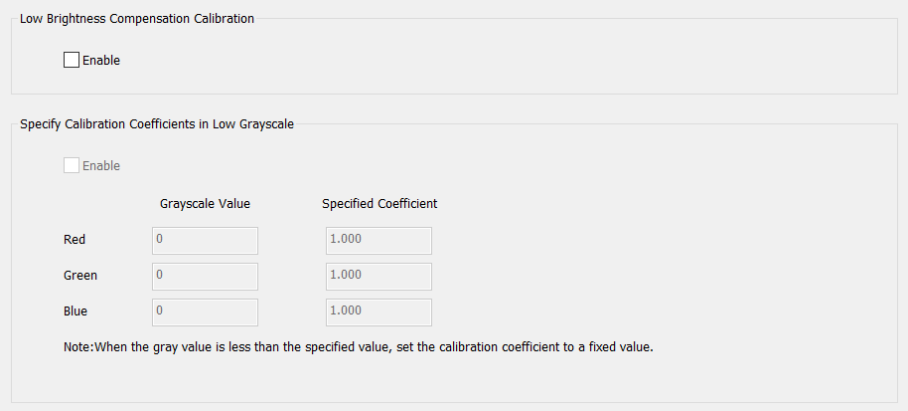


Fig 6.3.4.2 Low grayscale calibration

- **Low Brightness Compensation Calibration**: Enable or disable the **Low Brightness Compensation Calibration** function of the receiver cards. For the coefficient sending, please refer to Section 8.4.2.
- **Specify Calibration Coefficients in Low Grayscale**: When the screen shows a grayscale value less than the grayscale value you set, please use the given correction coefficient.

- **Enable**: Select this checkbox to enable or disable **Low Brightness Compensation Calibration**.
- **Grayscale Value**: Set the interval where the specified coefficients for calibration in low grayscale of red, green, and blue take effect.
- **Specified Coefficient**: Specify the coefficient for calibration in low grayscale.

Thermal Dynamic Calibration

This feature addresses the problem of reduced screen calibration effect resulting from changes in screen temperature.

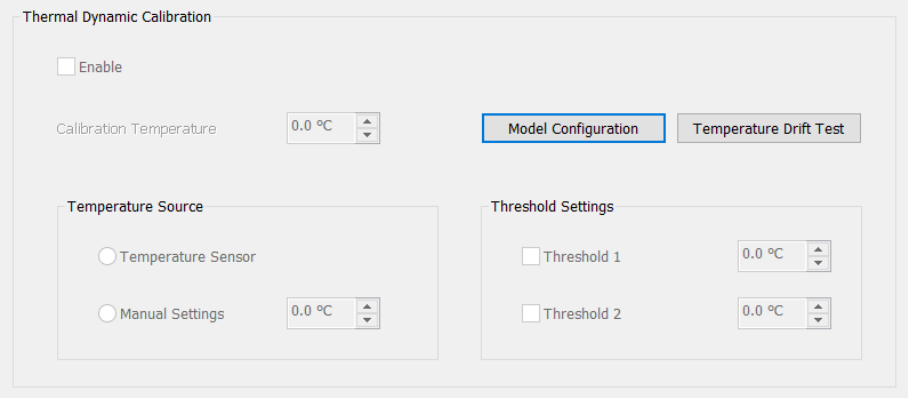


Fig 6.3.4.3 Thermal dynamic calibration

- **Enable**: Enable or disable the **Thermal Dynamic Calibration** function.
- **Calibration Temperature**: Set the temperature for screen calibration.
- **Temperature Source**: Get screen temperature. You can apply different models based on detected temperature changes to adjust the calibration effect.
- **Temperature Sensor**: Get data from an external temperature sensor connected to the cabinet.
- **Manual Settings**: Enter the screen temperature value manually.
- **Threshold Settings**: Set the temperature range for model 1 and model 2 to take effect.

📖 Notes:
0°C ~ calibration temperature: No calibration model should be applied.
Calibration temperature ~ threshold 1: Model 1 should be applied.
Threshold 1 ~ threshold 2: Both model 1 and model 2 should be applied.
Threshold 2 ~ 100°C: Model 2 should be applied.

- **Model Configuration**: Click to open the **Model Configuration** window, as shown in the figure below.

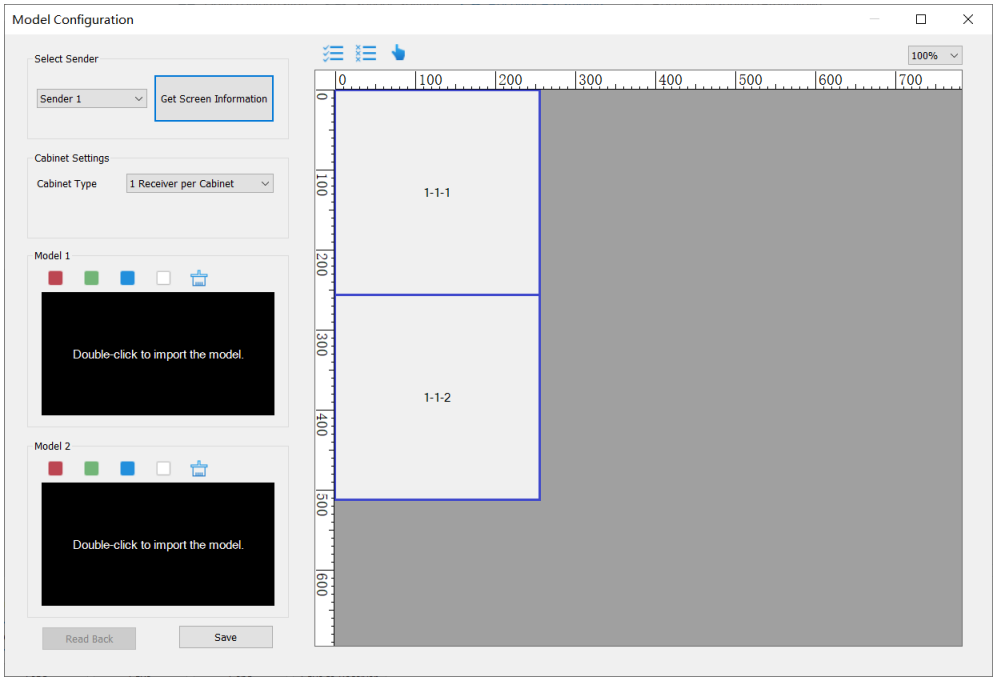


Fig 6.3.4.4 Model configuration

- **Select Sender**: Select a sender from the drop-down options under **Select Sender**. Click **Get Screen Information** to obtain a real-time mapping diagram of the receiver cards connected to the selected sender. The mapping will be displayed in drawing area on the right side.
- Cabinet settings: Configure Cabinet Type, with 4 available options - 1 Receiver per Cabinet, 2 Receivers per Cabinet, 4 Receivers per Cabinet, and 6 Receivers per Cabinet.
- **Model 1**/**Model 2**: Double-click to import a local brightness/chrome model. Once imported, the model is saved to your user profile and can be previewed immediately. To view the model's effects under different colors, switch between the icons of **Red**, **Green**, **Blue**, and **White**. Click to delete the imported model.
- **Read Back**: Read back the model of the selected receiver card.
- **Save**: Save the model from the current interface to the selected receiver card.
- Toolbar

: Select all receiver cards.

: Unselect all receiver cards.

: Highlight the selected receiver card.

- **Temperature Drift Test**: Collect color gamut information of the display screen under different temperatures.

- Measurement mode: Support 2 modes, namely, **Measure Original Data** and **Effect Verification**.

📖 Prerequisites for Measurement

1. Disable color gamut adjustment and dynamic color temperature adjustment using Colorlight’ s ColorAdept. Adjust the color temperature to 6500K.
2. Enable **Infi-Bit**, **Grayscale Refinement**, and **Calibration**.

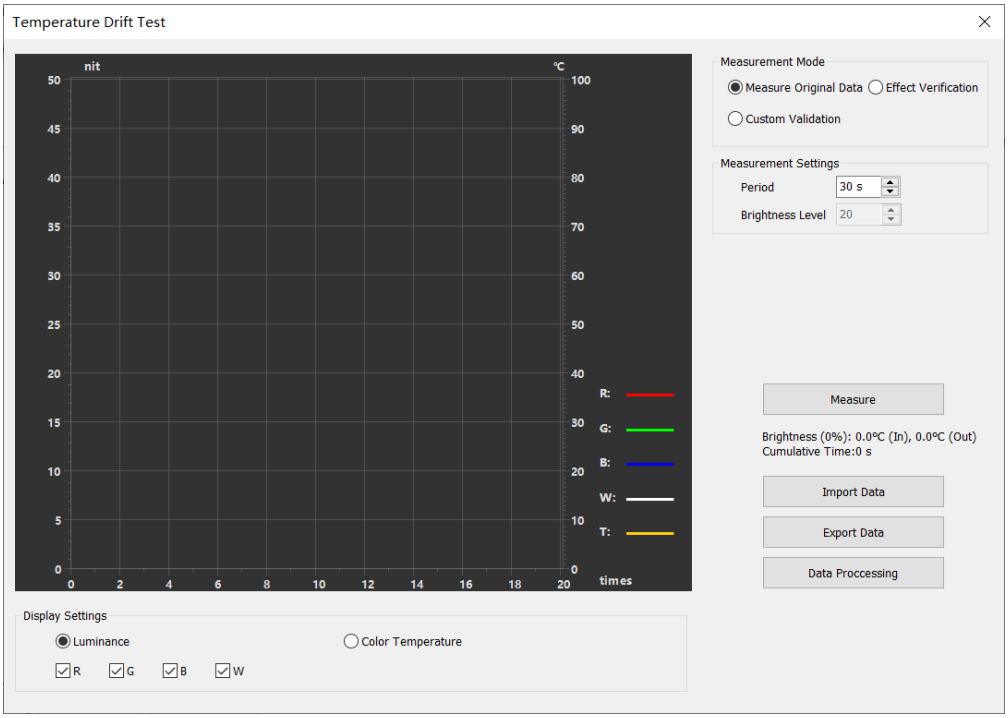


Fig 6.3.4.5 Temperature drift test

- Drawing Area

Left vertical axis: Indicates **Luminance** (nits) or **Colour Temperature** (K). The step per grid is dynamically displayed based on the cabinet’ s measured maximum and minimum values.

Right vertical axis: Indicates temperature (°C) ranging from 0°C to 100°C. Each grid represents 10°C.

Horizontal axis: Indicates measurement time (min) calculated based on measurement period and times.

Curves: Display the brightness curves for red, green, blue, and white in-corresponding colors. The temperature curve (T) is displayed in yellow.

Coordinate grid: 10×10 by default. You can drag your mouse to adjust the coordinate

accuracy.

- Display

◆ Measure Original Data

Luminance: The coordinate system displays the relation curve between temperature and **Luminance**, supporting separate display of red, green, blue, and white curves.

Colour Temperature: The coordinate system displays the relation curve between temperature and **Colour Temperature**.

◆ Effect Verification

Luminance: The coordinate system displays the relation curve between temperature and **Luminance**, supporting separate display of white only.

Colour Temperature: The coordinate system displays the relation curve between temperature and **Colour Temperature**.

◆ Custom Verification

Luminance: The coordinate system displays the relation curve between temperature and **Luminance**, supporting separate display of red, green, blue, and white curves.

Colour Temperature: The coordinate system displays the relation curve between temperature and **Colour Temperature**.

- Measurement Settings

◆ Measure Original Data

Period: Set the time interval for a single measurement.

Brightness Level: The default value is 20 and cannot be adjusted. This setting divides the sender’ s brightness range into 20 levels.

◆ Effect Verification

Period: Set the time interval for a single measurement.

Count: Set the total number of measurements.

◆ Custom Verification

Period: Set the time interval for the measurements.

Count: Set the total number of measurements.

Red, **Green**, **Blue**, **White**: Set the grayscale of these 4 colors during the measurement.

- **Measure**: Click to start measurement as set. Click again to stop the measurement.

◆ Measure Original Data

The brightness and temperature of the screen, as well as accumulative time for measurement are shown under the **Measure** button.

◆ Effect Verification

The remaining time for measurement is shown under the **Measure** button.

◆ Custom Verification

The remaining time for measurement is shown under the **Measure** button.

- **Import Data**: Import the measurement data from a local file.
- **Export Data**: Export the measurement data to a local file.
- **Data Processing**: The software fits tristimulus values across 0~100°C in 1°C increments for different colors based on measurement data. The data will be exported and saved as a local file.

Calibration Coefficient Rotation

After selecting the checkbox, the coefficient automatically rotates with the cabinets.

Deseam in Low Grayscale

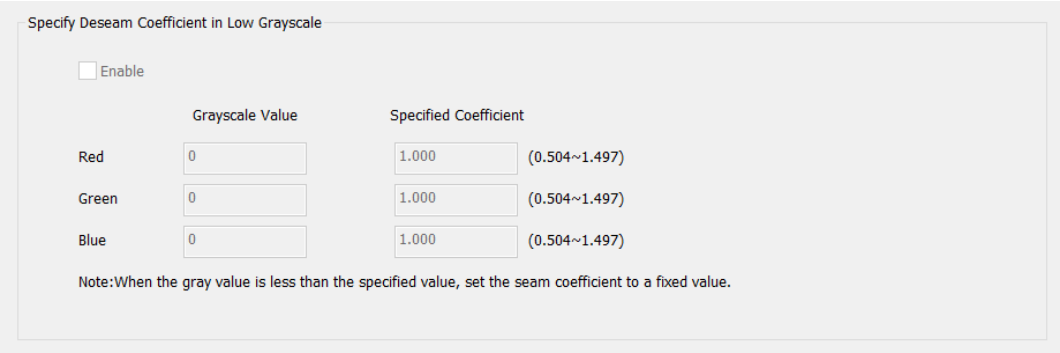


Fig 6.3.4.6 Specify deseam coefficient in low gray

- **Specify Deseam Coefficient in Low Grayscale**: When the gray value displayed on the screen is less than the gray value set by the software, the coefficient will be used.
- **Enable**: Enable or disable the function of Specify Deseam Coefficient in Low Grayscale.
- **Grayscale Value**: Set the interval in which the specified coefficients for deseam in low grayscale take effect for red, green, and blue.
- **Specified Coefficient**: Specify coefficients for deseam in low grayscale.

Multi Layer Deseam

Set the gray scale interval in which the **Multi Layer Deseam** coefficients take effect.

Fig 6.3.4.7 Multi layer deseam

6.3.5 Display Adjustment

White Balance

You can modify the proportion of red, green, and blue colors to optimize the white effect of the display screen.

Fig 6.3.5.1 White balance

Color Exchange

Color exchange is used to adjust the order of the red, green, and blue signal outputs from the video source to the physical pins of the receiver card.

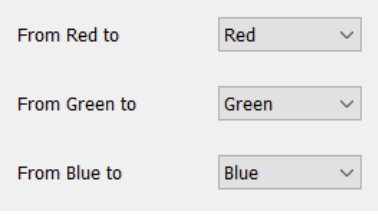


Fig 6.3.5.2 Color exchange

Photo Optimization

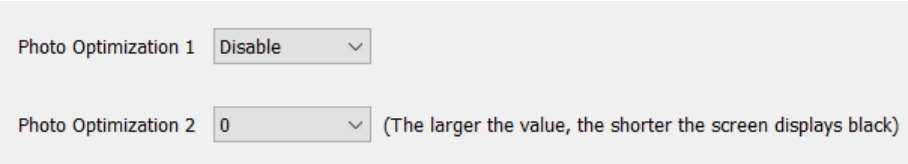


Fig 6.3.5.3 Photo optimization

- This can be used to optimize the photos taken with the camera.
- **Photo Optimization 1**: Enable or disable the photo optimization function.
- **Photo Optimization 2**: Optimize the black field time during LED screen swap scan.

6.3.6 Other Settings

Phase Adjustment

By adjusting SCLK, LAT, swap scan signal, R, G and B phase parameters, the signal frequency is changed to avoid abnormal screen display caused by the same frequency of the signal output from the receiver card.

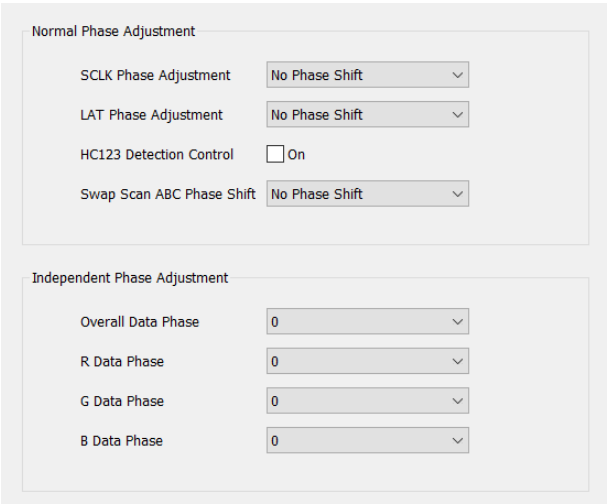


Fig 6.3.6.1 Phase adjustment

Scan Order

Scan order can be applied to change the scanning mode of the row selection signal of screen output, which supports progressive scanning and interlaced scanning and needs to be supported by the receiver card program.

Data Remapping

After importing the file, select **Enable Custom Data Remapping Table** for the remapping of the imported data.

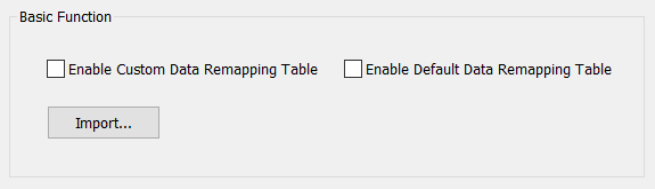


Fig 6.3.6.2 Data Remapping

EMC

By adjusting the system clock phase shift and SCLK phase shift, EMC strengthens the immunity of hardware devices to electronic magnetic fields.

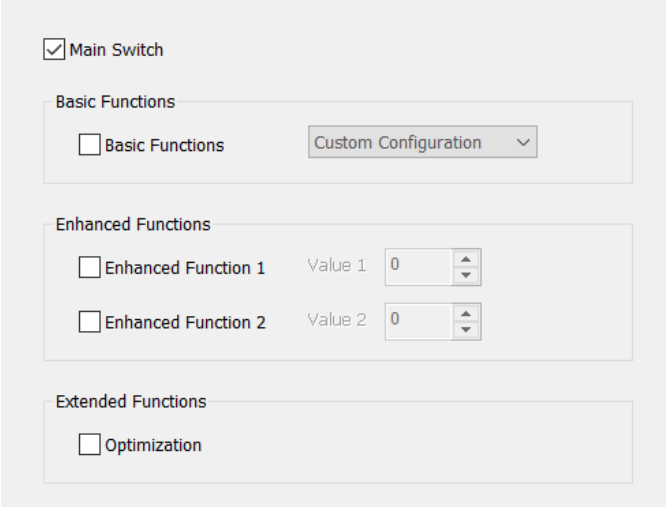


Fig 6.3.6.3 EMC

Independent Settings

Set the on/off state of the green indicator on the receiver card.

6.3.7 Intelligent Settings

Configure the parameters of the receiver card to light up the modules with intelligent settings.

Prerequisite: The **Intelligent Settings** function needs to be supported by the program of receiver card to display the intelligent settings effect.

- This software supports 3 types of module parameter configurations: **Single Type Module**, **Multi-Type Module**, and **Irregular Module**.
- **Single Type Module**: Within a single module, it supports only one data group and one regular routing.
- **Multi-Type Module**: Within a single module, it supports multiple data groups and multiple regular routings.
- **Irregular Module**: Within a single module, it supports multiple data groups and multiple irregular routings.

Single Type Module

➢ Wizard 1

Click the intelligent settings button to enter **Wizard 1**, and select **Single Type Module** as the cabinet type.

➢ Wizard 2

In **Wizard 2**, you can set the cabinet information, module size, and module information for a single type module.

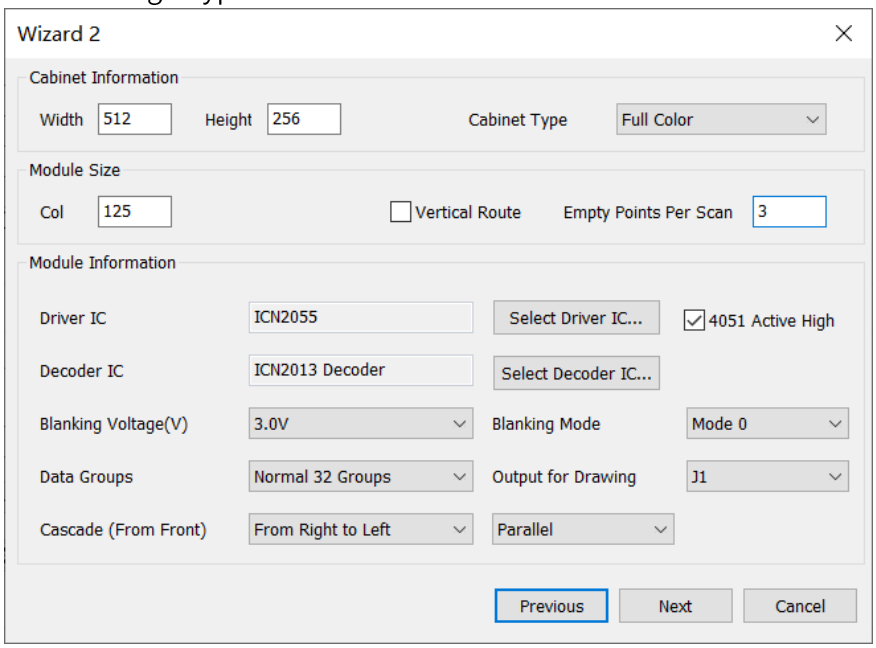


Fig 6.3.7.1 Guide 2 for single type module

Options available in **Wizard 2** of the single type module are described in Table 6.3.7-1.

Table 6.3.7-1 Wizard 2 - Single Type Module

Feature	Description
Width	Set the width to match the actual cabinet width.
Height	Set the height to match the actual cabinet height.
Cabinet Type	Support 3 cabinet types: Full Color, Monochrome Screen, and Dual-Color Screen.
Col	Set columns of a single data group in the module.
Vertical Route	This function is enabled when the module routes vertically.
Empty Points Per Scan	Set the number of empty points per scan which can be up to 128. After setting the empty points, Guide 8 will show the empty point configuration and other functions.
Driver IC	Select the corresponding driver IC according to module.
Decoder IC	Select the corresponding decode IC according to module.
Data Groups	Set the number of data groups to be output from the receiver card.
Output for Drawing	Select the physical J-port position of the receiver card shown in Intelligent Settings effect.
Cascade	When the cabinet position is incorrect, use this function to make the screen display normally.
Data Type	Set the data type of the module: parallel, serial (R16G16B16), and serial (R1G1B1).
Previous	Click the button to return to the previous Guide.
Next	Click the button to go to the next Guide.
Cancel	Click the button to cancel the intelligent settings.

➢ Wizard 3

Wizard 3 is applied to set the data polarity of modules. Switch state 1 and 2 to select the corresponding option according to the display state of the module.

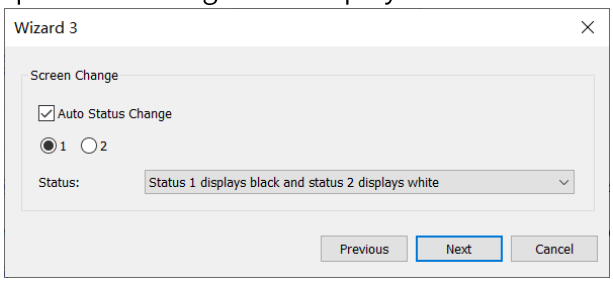


Fig 6.3.7.2 Guide 3 for single type module

➢ Wizard 4

Wizard 4 can be used to set the OE polarity of modules. Switch state 1 and 2 to select the corresponding option according to the display state of the module. Guide 4 will be displayed only when the driver IC is a normal chip.

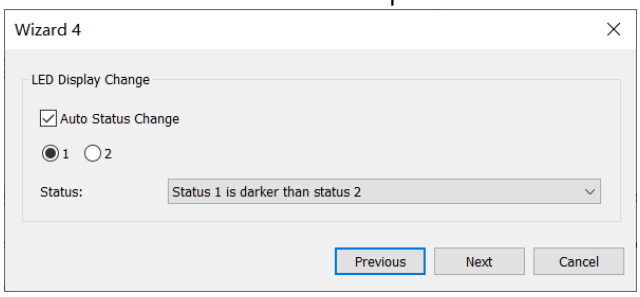


Fig 6.3.7.3 Guide 4 for single type module

➢ Wizard 5

Wizard 5 is designed to set the signal output order of red, green, and blue from the video source to the physical pins of the receiver card. Switch state 1, 2, 3, 4 and select the corresponding option according to the module display status.

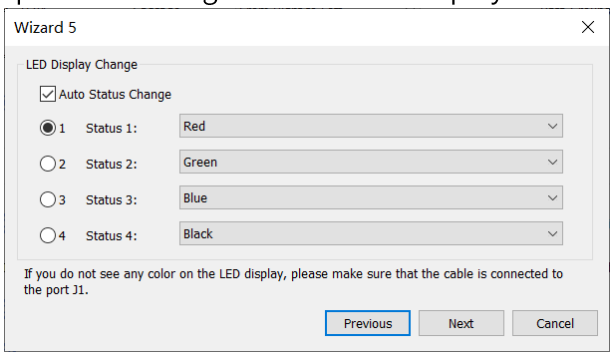


Fig 6.3.7.4 Guide 5 for single type module

➢ Wizard 6

Set the height of individual data groups according to the number of rows displayed on the module.

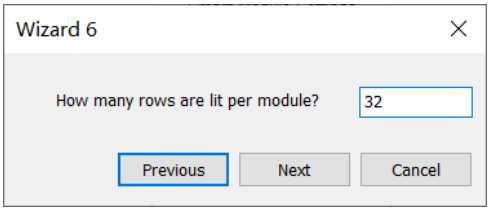


Fig 6.3.7.5 Guide 6 for single type module

➢ Wizard 7

Wizard 7 can be used to set the number of rows displayed for each scan of a single data group according to the number of rows on the module.

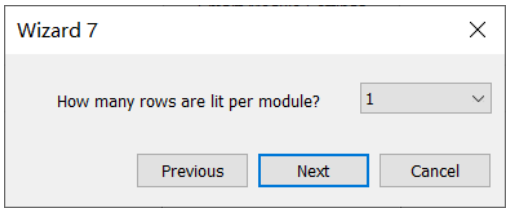


Fig 6.3.7.6 Guide 7 for single type module

➢ Wizard 8

Wizard 8 is designed to set the drawing information and routing for a single type module. The window is divided into a function bar and a drawing area.

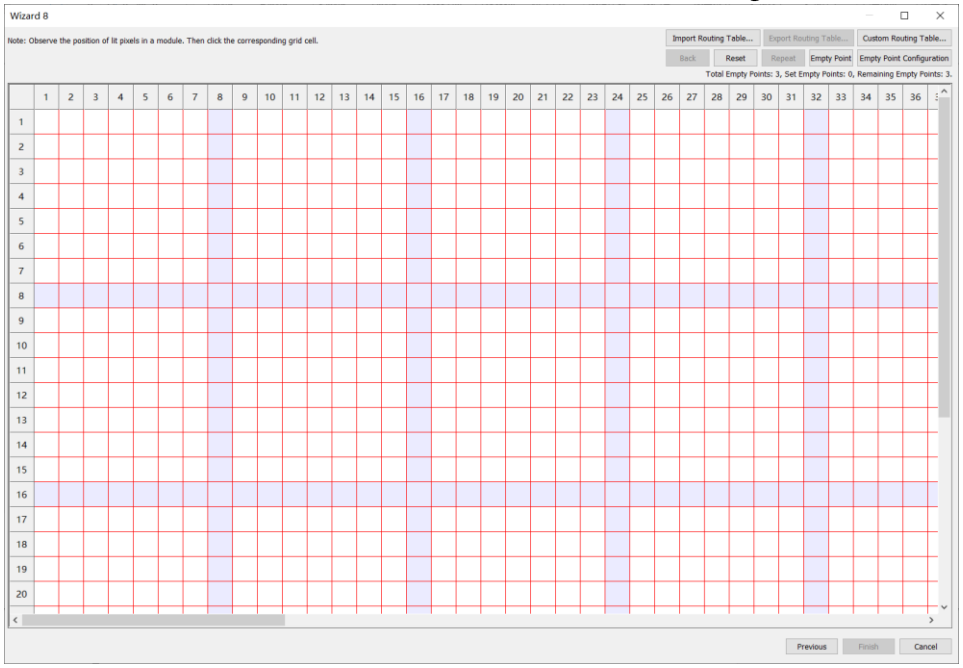


Fig 6.3.7.7 Guide 8 for single type module

- Function Bar

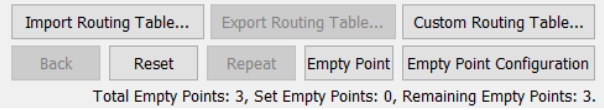


Fig 6.3.7.8 Function bar

The function bar features are described as shown in Table 6.3.7-2.

Table 6.3.7-2 Function bar

Feature	Description
Import Routing Table...	Click the button to import the local routing table.
Export Routing Table...	After finishing drawing points, click the button to export the routing table to a local file.
Custom Routing Table...	Click the button to open the **Routing Table (Manual)** dialog box and draw randomly.
Back	Return to the previous step of drawing.
Reset	Reset the drawing information in the drawing area.
Repeat	Support repetition of the current drawing.
Empty Point	Click the button to add an empty point at the current position.
Empty Point Configuration	Click the button to open the **Empty Point Configuration** dialog box.
Previous	Click the button to return to the previous Guide.
Finish	Click on the button to complete the intelligent settings and synchronize the information in basic parameter interface.
Cancel	Click the button to cancel the intelligent settings.

- **Routing Table (Manual)**: This mode is used when there is a difference in drawing points between scans in the routing table.

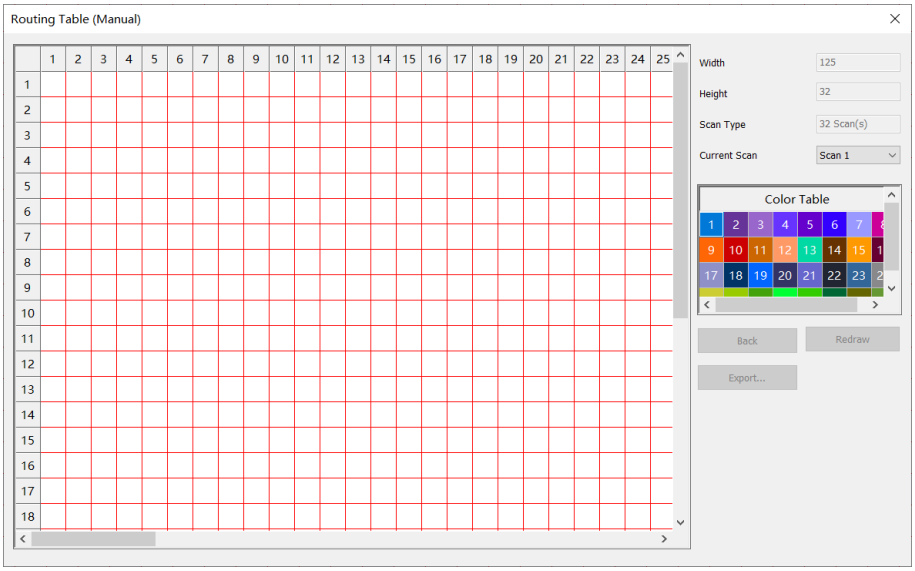


Fig 6.3.7.9 Routing table (manual)

The functional fields and buttons in **Routing Table (Manual)** window are described in Table 6.3.7-3.

Table 6.3.7-3 Manual routing

Feature	Description
Width	Same as the number of module columns set in **Wizard 2**.
Height	Same as the number of module rows set in **Wizard 6**.
Scan Type	Same as the result of dividing the number of rows in **Wizard 6** by the number of rows in **Wizard 7**.
Current Scan	Select the number of scans for drawing.
Color Table	Select the number of scans for drawing.
Back	Return to the previous step.
Redraw	Reset the drawing points of the drawing area.
Export...	When drawing is finished, click the button to export the routing table to a local file.
Drawing area	Draw pixels for each scan which will be automatically overwritten to the drawing area of **Wizard 8** when finished.

- **Empty point configure**: Configure the position of the empty point for the first

scan and repeat the empty point for the other scans.

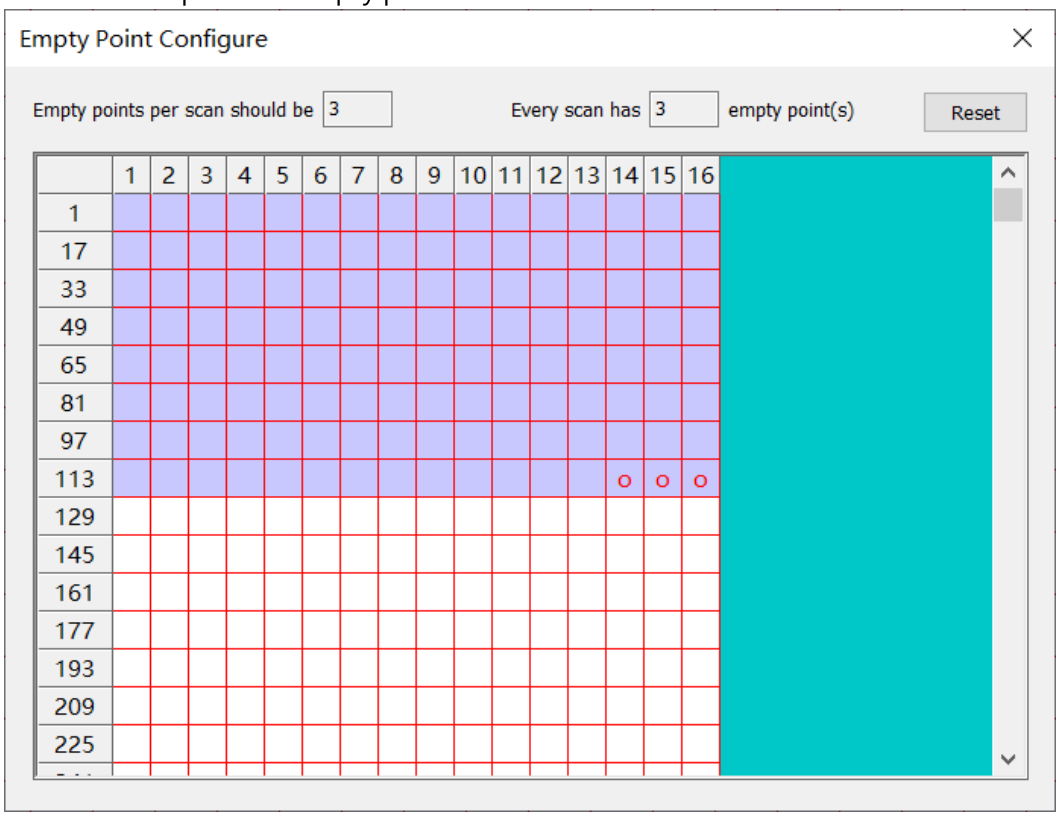


Fig 6.3.7.10 Empty point configure

- **Reset**: Click the button to reset the empty point.
- Empty point drawing area: Click to cancel the empty point and click to set the empty point.
- Drawing area: It displays the trace information for the module. You can trace points following the "blinking dot" displayed on the module.
- Draw: When the points are not drawn, click in the drawing area to draw points manually.
- Draw scan: After completing the first scan, click on the drawing area to draw the scans.

Multi-Type Module

➢ Wizard 1

Click the **Intelligent Settings** button to enter **Wizard 1** and select **Multi-Type Module** as the cabinet type.

➢ Wizard 2

Set the driver/decoder IC and module information for multi-type module.

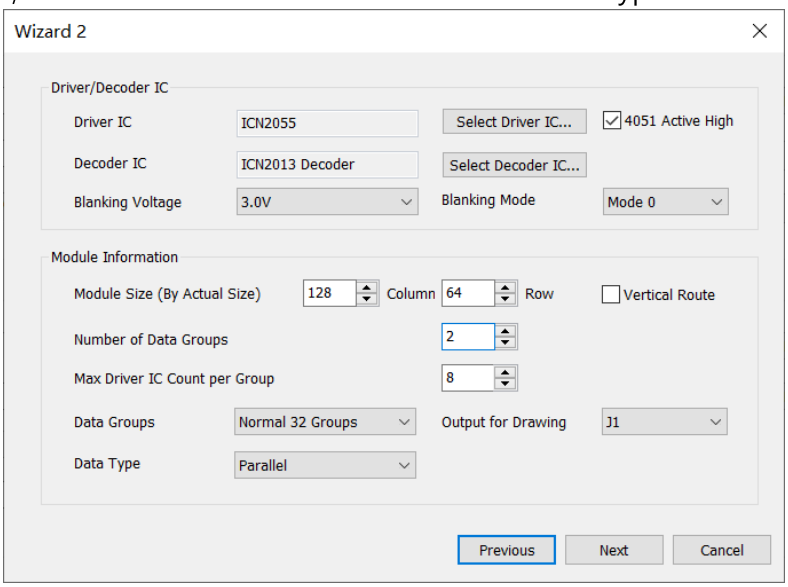


Fig 6.3.7.11 Wizard 2 for multi-type module

The multi-type module functions are described as shown in Table 6.3.7-4.

Table 6.3.7-4 Multi-type module description

Feature	Description
Driver IC	Select the corresponding driver IC according to the module.
Decoder IC	Select the corresponding decoder IC according to the module.
Module Size	Set the number of columns and rows of the module according to the actual size of the module.
Vertical Route	Enable this function when the route of the module is in vertical direction.
Number of Data Groups	Set the number of data groups in the module which is up to four.
Max Driver IC Count per Group	Set the number of data group chips that occupy the most pixels in one scanning among all data groups in the module.
Data Groups	Set the number of data groups output from the receiver card.

Output for Drawing	Select the physical J-port position of the receiver card displayed in the **Intelligent Settings** effect interface.
Data Type	Set the data type of the module, which supports three types: **Parallel**, **Serial (R16G16B16)** and **Serial (R1G1B1)**.
Previous	Click the button to return to the previous Wizard.
Next	Click the button to go to the next Wizard.
Cancel	Click the button to cancel the intelligent settings.

- Wizard 3

Set the data polarity of the modules, please refer to "Single Type Module Wizard 3" for details.

- Wizard 4

Set the OE polarity of the modules, please refer to "Single Type Module Wizard 4" for details.

- Wizard 5

Wizard 5 is designed to set the signal output order of red, green, and blue from the video source to the physical pins of the receiver card. Refer to "Single Type Module Wizard 5" for more details.

- Wizard 6

Set the height of individual data groups according to the number of rows displayed on the module. Refer to Single Type Module Wizard 6 for more details.

- Wizard 7

Wizard 7 can be used to set the number of rows displayed for each scan of a single data group according to the number of rows on the module. Refer to Single Type Module Wizard 6 for more details.

- Wizard 8

Wizard 8 is designed to set the trace information and route for a multiple type module. The window is divided into a function bar and a drawing area.

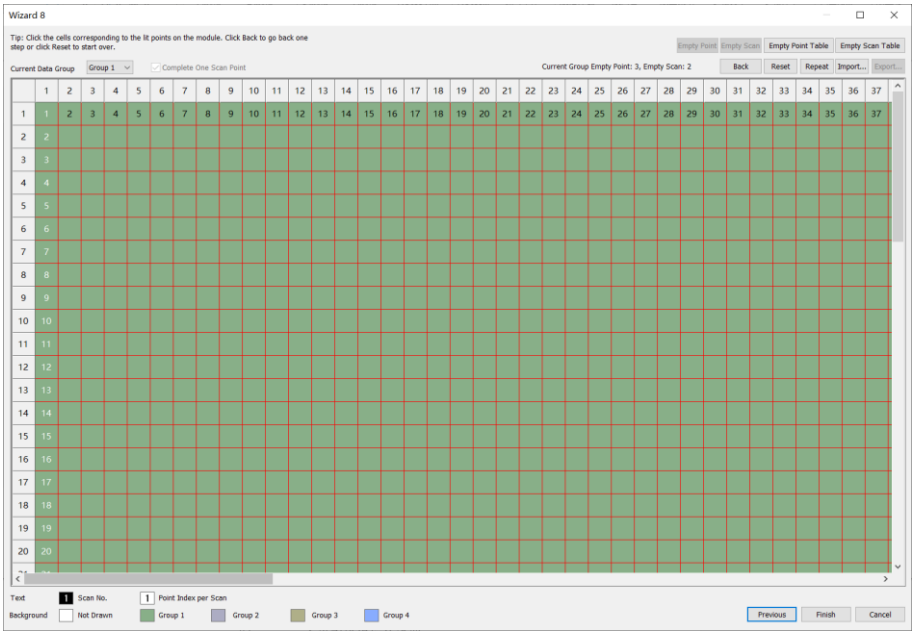


Fig 6.3.7.12 Multiple type module intelligent settings

- Current data group: Click the drop-down box to switch data groups and open the **Step 1: Confirm target module** dialog box.

Step 1: Set the index of the current data group.

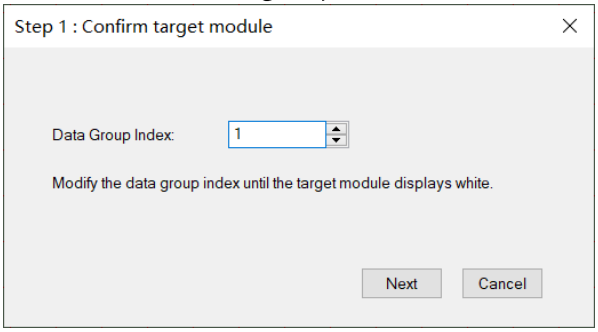


Fig 6.3.7.13 Confirm target module

Step 2: Input the number of corresponding ICs following the operation steps.

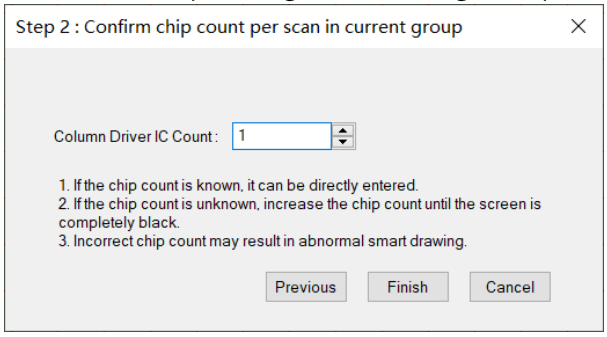


Fig 6.3.7.14 Confirm one scan IC counts

- Function Bar

The multiple type module function bar is described as shown in Table 6.3.7-5.

Table 6.3.7-5 Multiple type module function bar

Feature	Description
Draw Scan 1	Select the checkbox to complete the first scan point.
Empty Point	Click the button to add an empty point to the current position.
Empty Scan	Click the button to add an empty scan to the current position.
Empty Point Table	Click the button to open the **Empty Point Settings** popup window.
Empty Scan Table	Click the button to open the **Empty Scan Settings** popup window.
Back	Return to the previous step of point trace.
Reset	Click the button to reset the drawing information of the current data group or all data groups.
Repeat	Copy the drawing points completed in the previous data group and apply them to the current data group.
Import	Click the button to import the local routing table.
Export	After completing the drawing, click the button to export the routing table to a local file.
Previous	Click the button to return to the previous Wizard.
Finish	Click the button to complete the intelligent settings and synchronize them to the basic parameter interface.
Cancel	Click the button to cancel the intelligent settings.

- **Empty Point Settings**: Configure the position and number of empty points for the First Scan and repeat the empty points for other scans.

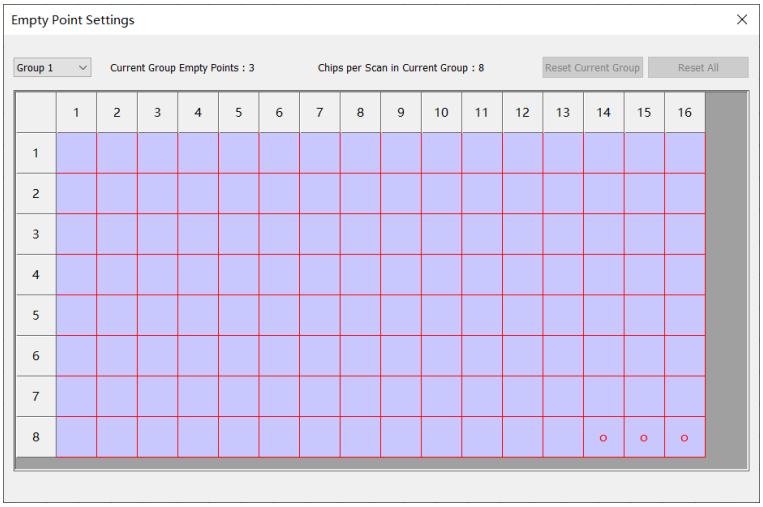


Fig 6.3.7.15 Empty point setting

The **Empty Point Settings** function is described as shown in Table 6.3.7-6.

Table 6.3.7-6 Empty point settings function

Feature	Description
Data group	Select data groups.
Reset Current Group	Reset the empty point of the current data group.
Reset All	Reset empty points of all data groups.
Empty point drawing area	Set the position and number of empty points.

- **Empty Scan Settings**: Configure the position and number of empty scans for the data group.

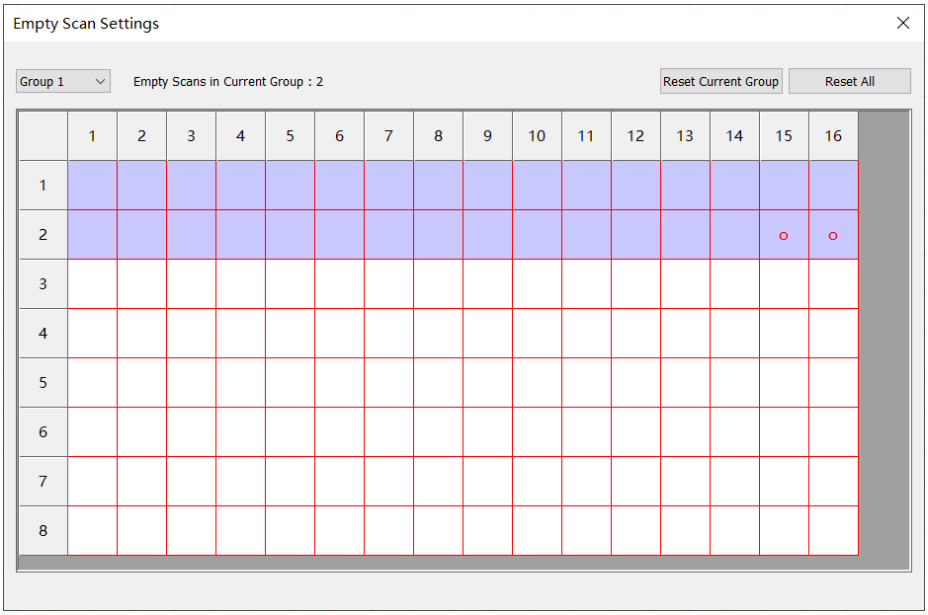


Fig 6.3.7.16 Empty scan settings

The **Empty Scan Settings** function is described as shown in Table 6.3.7-7.

Table 6.3.7-7 Empty scan settings function

Feature	Description
Data group	Select data groups.
Reset Current Group	Reset the empty point of the current data group.
Reset All	Reset empty points of all data groups.
Empty point drawing area	Set the position and number of empty points.

- Drawing area: It displays the drawing information for the module. You can draw points following the “blinking dot” displayed on the module.
- Draw point: Before points are drawn, click on the drawing area to draw points manually.
- Draw scan: After completing the first scan, click on the drawing area to draw the scans.

Irregular Module

➢ Wizard 1

Click the intelligent settings button to enter **Wizard 1** and select **Irregular Module** as the cabinet type.

➢ Wizard 2

In **Wizard 2**, you can set the module size, and module information for the irregular module.

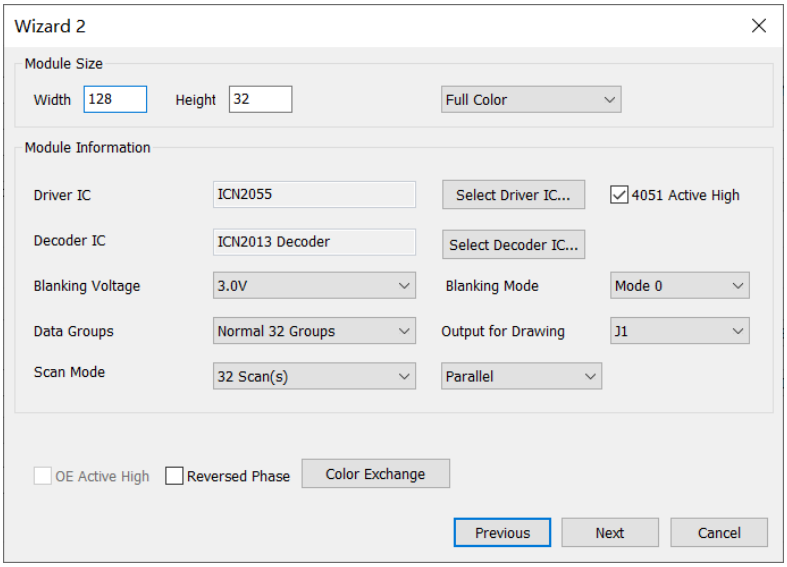


Fig 6.3.7.17 Wizard 2 for shaped module

The irregular module Wizard 2 features are described in Table 6.3.7-8.

Table 6.3.7-8 Guide 2 for shaped module function

Feature	Description
Module Size	Set the width and height of the module.
Cabinet Type	Support three cabinet types: Full color, Monochrome Screen, and Dual-Color Screen.
Driver IC	Select the corresponding driver IC according to module.
Decoder IC	Select the corresponding decoder IC according to module.
Data Groups	Set the number of data groups to be output from the receiver card.

Output for Drawing	Select the physical J-port position of the receiver card shown in the **Intelligent Settings** effect interface.
Scan Mode	Set the number of scans for the module.
Data Type	Set the data type of the module, which supports **Parallel**, **Serial (R16G16B16)** and **Serial (R1G1B1)**.
OE Active High	Set the OE polarity of the module.
Reversed Phase	Set the data polarity of the module.
Color Exchange...	Set the order of red, green, and blue signal outputs from the video source to the physical pins of the receiver card.
Previous	Click the button to return to the previous Wizard.
Next	Click the button to go to the next Wizard.
Cancel	Click the button to cancel the intelligent settings.

➢ Wizard 3

After adding a route type, add a data group to the drawing area to construct the cabinet. The **Wizard 3** interface is divided into the route type and cabinet construction area.

Routing Type

Routing type is allowed to be added, edited, and viewed, and up to 128 types can be added.

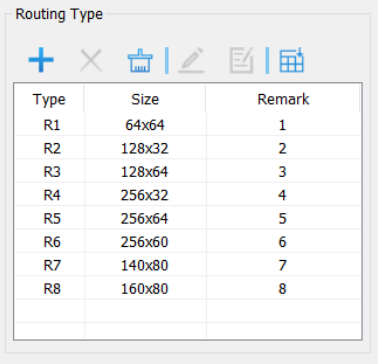


Fig 6.3.7.18 Route type list

- : Click the button to open the **Add Module Routing Type** dialog box. You can set the parameters of the route type, then click the **OK** button to enter the interface for drawing points.

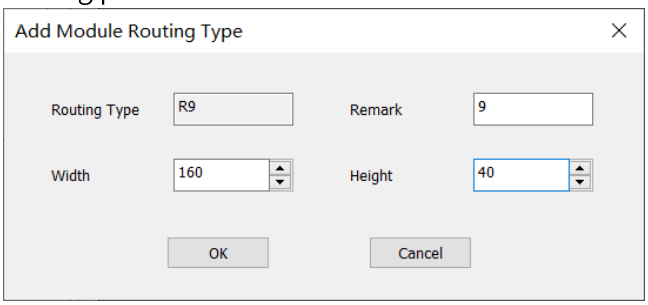


Fig 6.3.7.19 Add module routing type

- : Click the button to delete the selected routing type.
- : Click the button to delete all routing types.
- : Click the button to enter the interface for drawing points of the selected routing type.
- : Click the button to modify the remark of the selected routing type.
- : Click the button to import the drawing point file of irregular screen and add a new routing type to the list.
- List: Display the added routing types and you can double click the routing type to enter the interface for drawing points.

Cabinet Structure Area

The interface can be divided into toolbar and drawing areas.

- Toolbar: The data groups in the drawing area can be added, deleted, aligned, or swapped, etc.

Fig 6.3.7.20 Toolbar of Guide 3

Toolbar is described as shown in Table 6.3.7-9.

Table 6.3.7-9 Toolbar description

Feature	Description
Data Groups	Set the number of data groups output from receiver card.
	Click to undo the previous step.
	Click to redo the previous step.
	Add a data group to the drawing area.
	Delete the data group selected in the drawing area.
	Clear all data groups in the drawing area.
	Select multiple modules to align the module layout.
	Select multiple modules to number the modules.
	Click the button to enter the **Data Group Swap** window.
	Export the routing of the cabinet to a local file.
	Export the routing of the local irregular modules' parameter files in batch.
	Open the **Help** document.
Zoom	Zoom by switching the drop-down box options or the Ctrl + mouse wheel.

- Drawing area: Add and edit data groups to construct cabinets. Click **Finish** to complete the intelligent settings, which will be synchronized in basic parameters interface.
- **Selected Data Group Information:** Select a data group and display the selected data group information on the left of the drawing area.

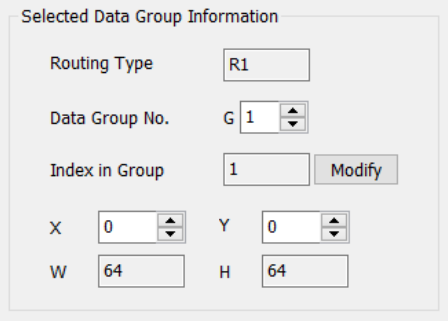


Fig 6.3.7.21 Selected data group information

Interface for Drawing Points

In **Wizard 2**, you are allowed to choose **Parallel** as the **Data Type** to go to the parallel drawing interface and choose **Serial** to go to the serial drawing interface.

- Parallel drawing interface: Draw points of the parallel modules and the software interface includes toolbar and drawing area.
- Toolbar

A description of the parallel drawing toolbar is shown in Table 6.3.7-10.

Table 6.3.7-10 Parallel trace toolbar

Feature	Description
	Undo the last action performed.
	Reset the drawing in the drawing area.
	Verify the data group sequence number for the module and the number of ICs in one scan.
	When the drawing is completed, click the button to export the routing table as a local file. Support export directly or after rotation.
	Click the button to import the local routing table.
Empty point	Click the button to add an empty point to the current position.
	Click the button to open the **Empty Point Configuration** dialog box.
Scan Point by	Once selected, each point in one scan can be individually drawn.

Point	
	Click the button to open the **Help** document.
OK	Click the button to complete the drawing and synchronize with the list of routing types.
Cancel	Click the button to cancel the drawing.

■ Empty Point Configuration

If the **Scan Point by Point** is not selected, you can configure the position and number of empty points in the First Scan.

If the **Scan Point by Point** is selected, you can configure individual empty points for Each Scan.

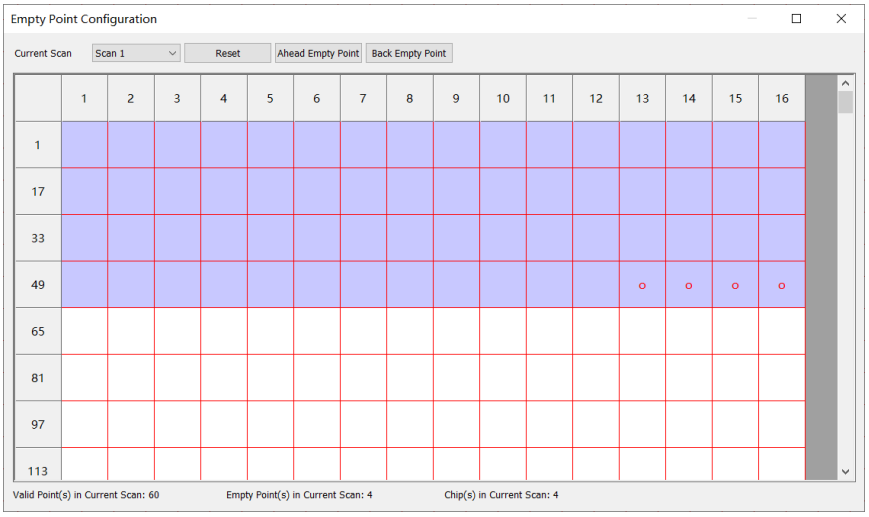


Fig 6.3.7.22 Empty point configuration

The **Empty Point Configuration** window is described in Table 6.3.7-11.

Table 6.3.7-11 Empty point configuration window

Feature	Description
Current Scan	Select the number of scans for empty point configuration.
Reset	Reset the empty points of the current data group.
Ahead Empty Point	Move forward the empty points at the end of the current and all scans.

Back Empty Point	Move backward the empty points at the beginning of the current and all scans.
Empty point drawing area	Click to cancel empty point and click to draw empty point.

- Drawing area: If **Scan Point by Point** is not selected, please refer to the single type module for the trace. If the **Scan Point by Point** is selected, you can configure individual points for each scan by switching **Current Scan**.

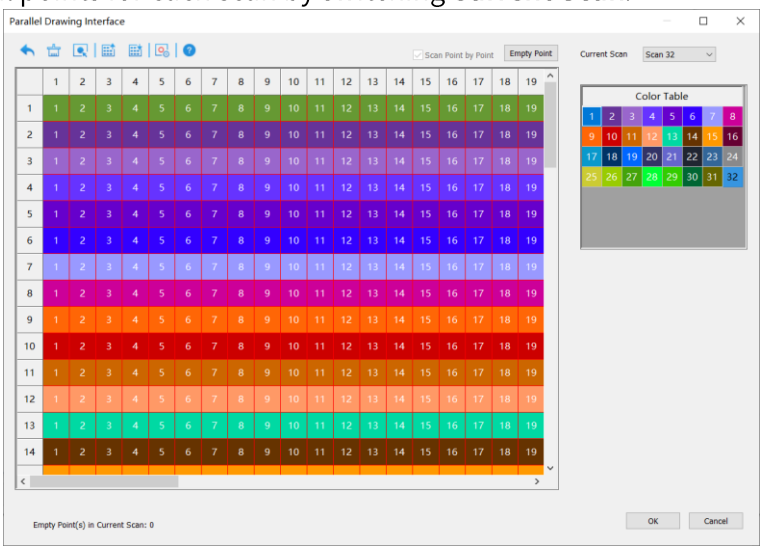


Fig 6.3.7.23 Drawing area

- Serial drawing interface: Draw the serial module. Please see the introduction to the parallel module drawing interface for reference.

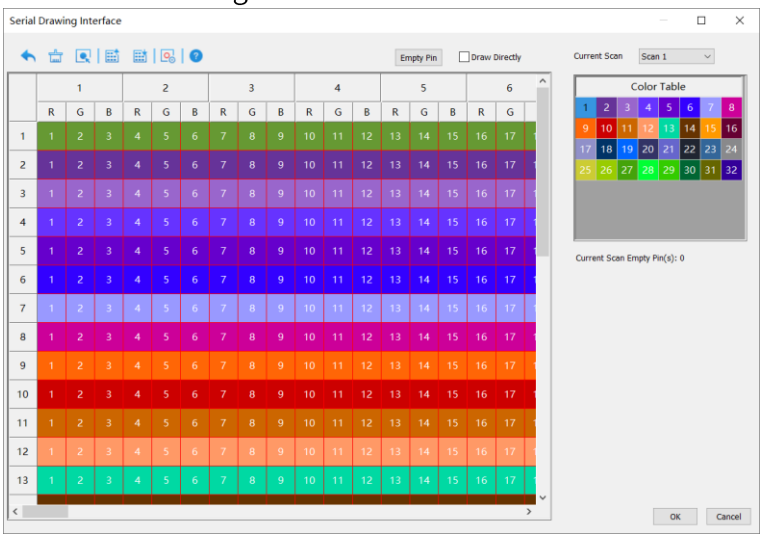


Fig 6.3.7.24 Serial drawing interface

6.3.8 Function Button

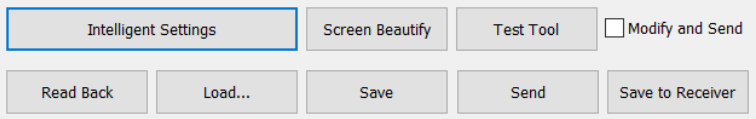


Fig 6.3.8.1 Function buttons

Function buttons are described as shown in Table 6.3.8-1.

Table 6.3.8-1 Function buttons

Feature	Description
Intelligent Settings	Click the button to open **Intelligent Settings**. Please refer to Section 6.3.7 for details.
Screen Beautify	Click the button to open **Screen Beautify**. See relevant description below.
Test Tool	Click the button to open **LEDTester**. Please refer to Chapter 7.
Modify and Send	When selected, the modification of parameters will be sent to the receiver card in real-time.
Read Back	Read back the receiver card parameters and load them onto the software.
Load...	Click the button to load the local/cloud parameter files.
Save	Save the display parameters as a local/cloud file.
Send	Send real-time parameters to the receiver card, which will be lost after power cycling.
Save to Receiver	Click to save parameters to the receiver card, which will be valid after power cycling.
	Right click to specify the receiver card saving and parameters readback.

Screen Beautify

The driver IC in **Receiver Parameters** supports **Screen Beautify** and displays the **Screen**

Beautify button.

Screen Beautify walks you through the chip parameter configuration, thus delivering better display effects.

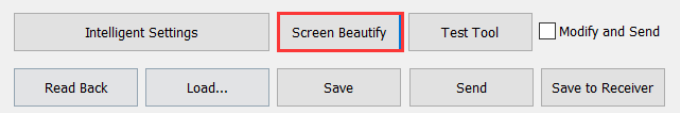


Fig 6.3.8.2 Screen optimizer

- Quick Start

Step 1: After configuring **Intelligent settings**, the screen is lit up. Select the **Screen Beautify** button to open the **Screen Beautify** dialog box.

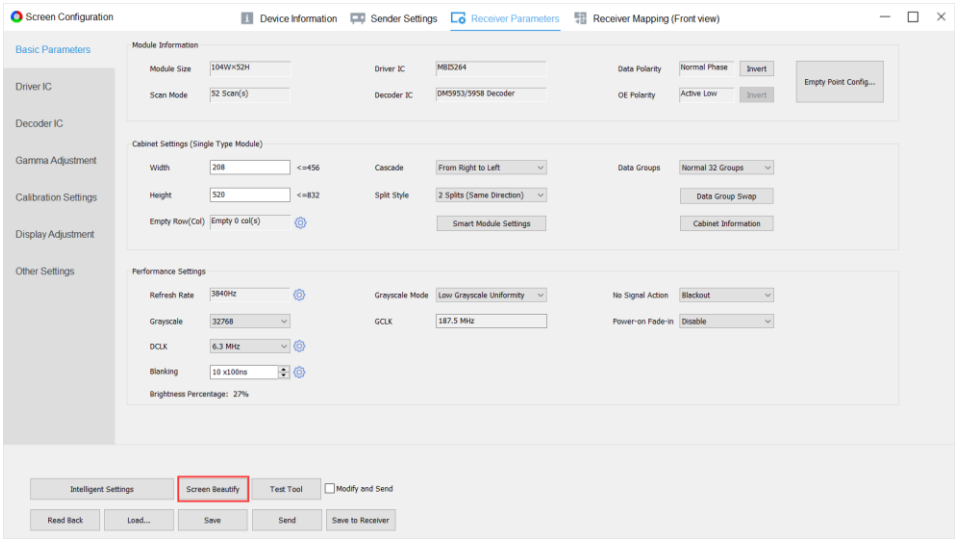


Fig 6.3.8.3 Open the Screen Beautify dialog box

Step 2: Select the blue sentence under **Step 1** to open the **Screen Settings** dialog box, and set the position and size of the playback canvas.

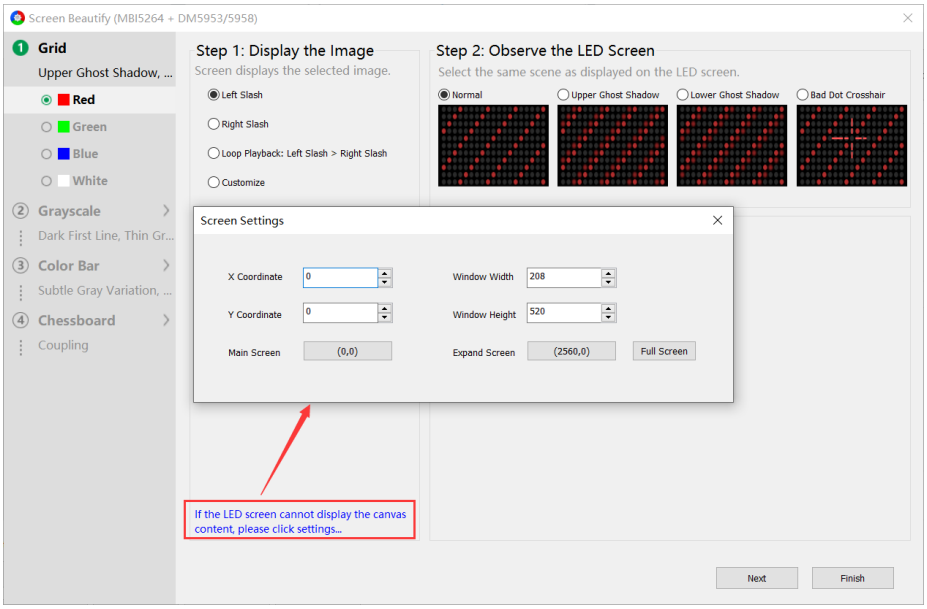


Fig 6.3.8.4 Reposition and resize the playback canvas

Step 3: Access Guide 1. Switch to **Assistant Guide** (red-green-blue-and-white) and select options under **Step 1** to change the display effects. View the changes and select options under **Step 2**, then adjust parameters for normal display effects according to the on-screen instructions.

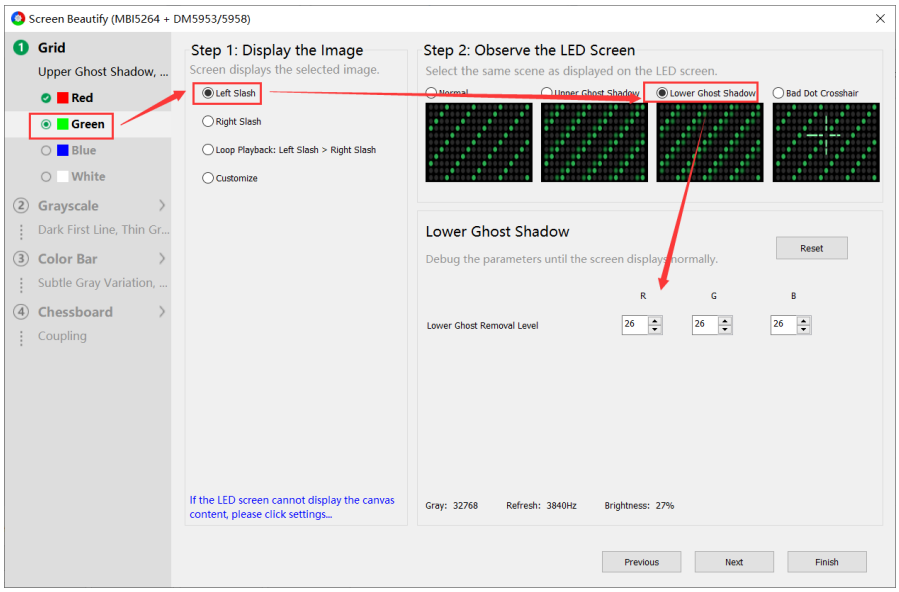


Fig 6.3.8.5 Guide 1

Step 4: Access Guide 2. Switch to **Assistant Guide** (red-green-blue-and-white) and select options under **Step 1** to change the display effects, then view the changes. If the display effect is normal, select **Next** to access the next guide; if the display effect is abnormal, select options under **Step 2**, and adjust parameters for normal display

effects, then access the next guide.

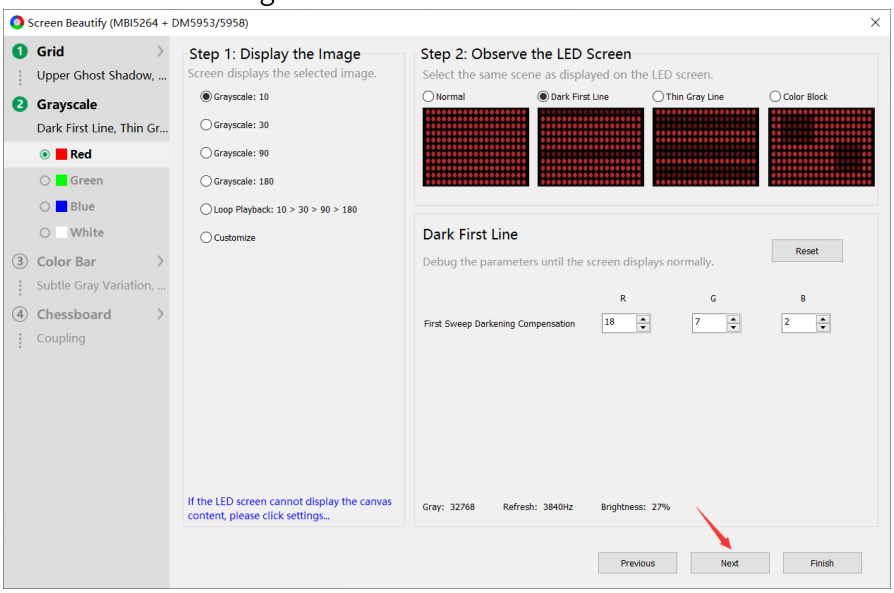


Fig 6.3.8.6 Guide 2

Step 5: If testing is done through all guides and the display effects are normal, select **Complete** to exit the **Screen Beautify** and update parameters.

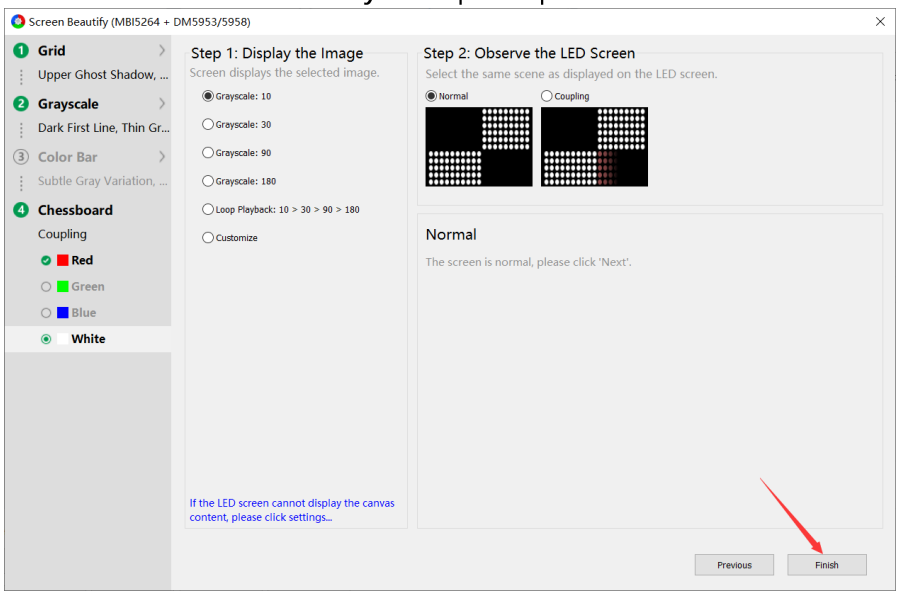


Fig 6.3.8.7 Complete settings in screen optimizer

- Description

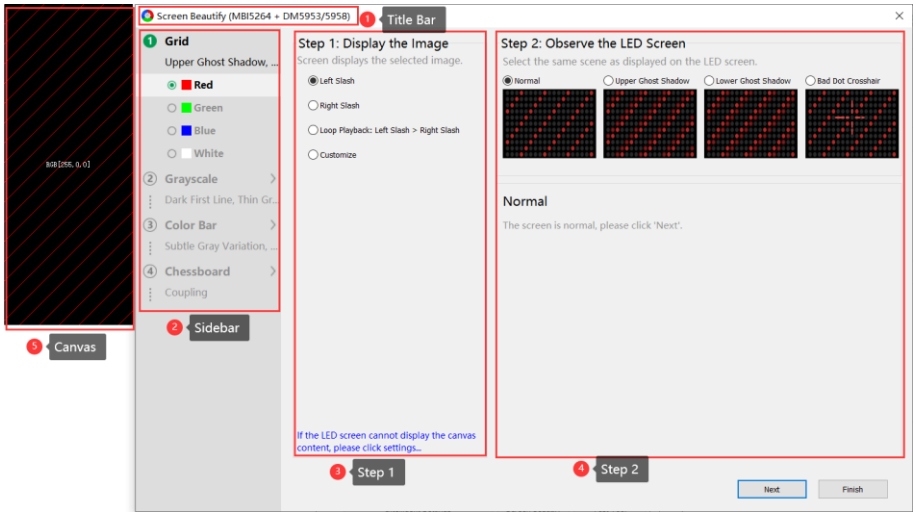


Fig 6.3.8.8 Screen Beautify

■ Title bar

Display **Screen Beautify** (driver IC+decoder IC).

■ Side bar

Master guide: Change the playback canvas style, including grid, grayscale, band, and chessboard.

Assistant guide: Change the playback canvas color, including red, green, blue, and white.

■ Step 1

Set the image style: Support changing preset styles and custom styles, and the display effects will change in real time.

Set the screen position and size: Select the blue sentence to open the **Screen Settings** dialog box, and set the position and size of the playback canvas.

■ Step 2

Select the display changes: Select the options according to the display changes and reference pictures.

Parameter configuration: Adjust the chip parameters and apply the changes in real time. The screen will change correspondingly.

■ Playback Canvas

Keep the aspect ratio of the original playback canvas size with the cabinet size in **Basic Parameters** when you access the **Screen Optimizer** interface every time.

Playback canvas context menu: Right-click the playback canvas to display the playback canvas context menu.

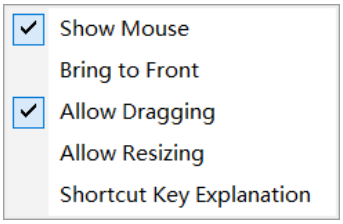


Fig 6.3.8.9 Playback canvas context menu

The playback canvas context menu is described in Table 6.3.8-2.

Table 6.3.8-2 Playback canvas context menu functions

Feature	Description
Show Mouse	The checkbox is selected by default. Navigate to the playback canvas and show the mouse.
Bring to Front	Select the **Bring to Front** checkbox to pin playback canvas.
Allow Dragging	Select the **Allow Dragging** checkbox and drag the position of the playback canvas with mouse.
Allow Resizing	Select the **Allow Resizing** checkbox and resize Screen by dragging screen frame with mouse.

Shortcut Key Explanation	Select the **Shortcut Key Explanation** checkbox to display the shortcuts description in the lower-left corner of the playback canvas.

■ Function Keys

Previous, **Next**: Click the button and switch between the previous and next (Master/Assistant) guide.

Finish: Click the button to exit **Screen Beautify** and update chip parameters.

X: Click the button to exit **Screen Beautify**, restore chip parameters, and apply the changes in real time.

Parameters Backup

Back up the display parameters. Enter "dkbf" in basic parameters interface to display the **Read Back Backup**, **Save to Backup**, and **Restore Backup** button.

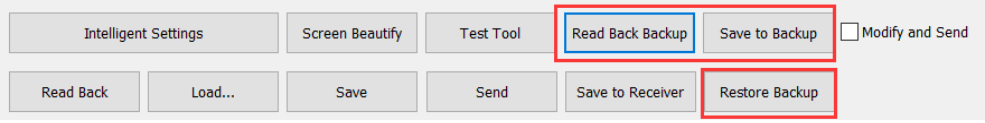


Fig 6.3.8.10 Parameters backup

The parameter backup features are described in Table 6.3.8-3.

Table 6.3.8-3 Parameter backup function

Feature	Description
Read Back Backup	Click to read back the parameters in the receiver card backup area.
	Right-click to read back the parameters in the specified receiver card backup area.
Save to Backup	Click to save the parameters to the backup area of the receiver card.
	Right-click to save the parameters to the backup area of the specified receiver card.
Restore Backup	Click to override the backup area parameters of the receiver card to the application area.

	Right-click to override the backup area parameters of the specified receiver card to the application area.

Specified Receiver Card

According to the graphic location or list location, specify the receiver card firstly and do not close the **Specify Receivers Operation** dialog box. Then, you can perform intelligent settings, data group swap, sending parameters, saving parameters, read parameters and other specified receiver card operations.

In basic parameters interface, right-click **Save** and open the **Read and save from the specified receivers** dialog box. Click **Advanced Settings** to open the **Specified Receivers Operations** dialog box, which is divided into two tabs **Graphic Location** and **List Location**.

- **Graphic Location**: You are allowed to specify receivers using the graphic location.

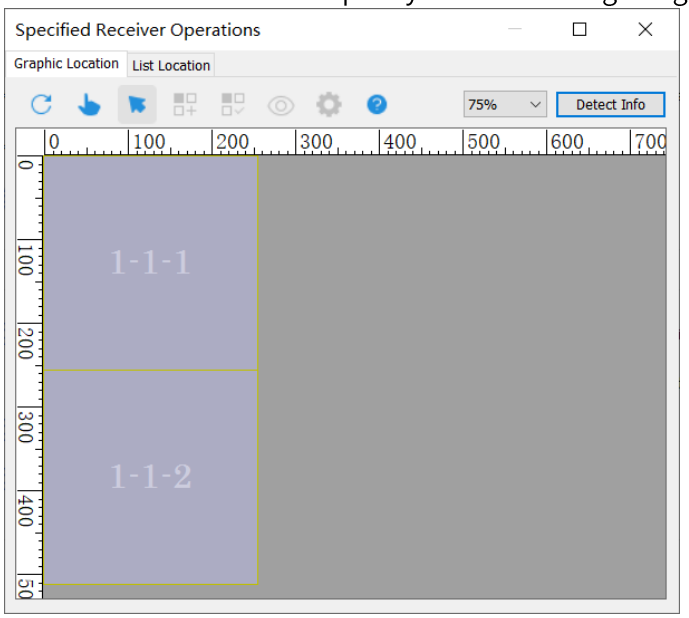


Fig 6.3.8.11 Graphic location

- **List Location**: You can specify receivers by entering parameters in the list.

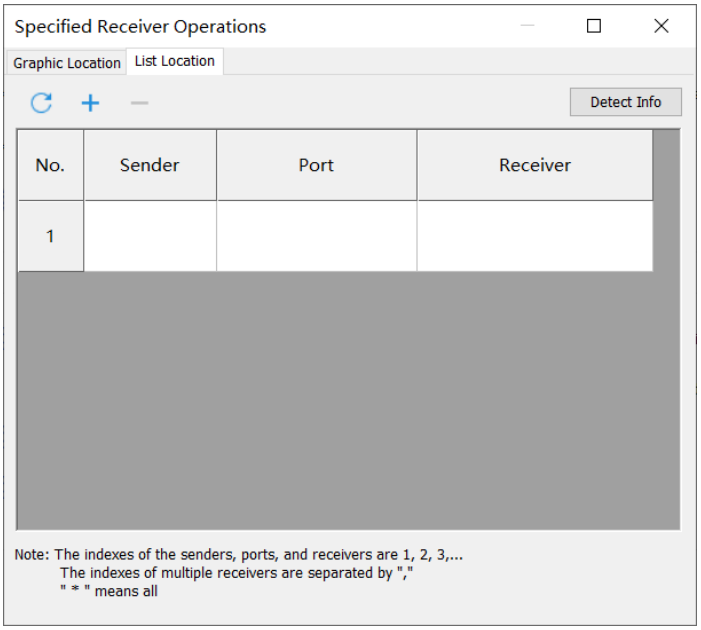
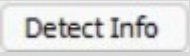


Fig 6.3.8.12 List location

Tab page of **List Location** is described as shown in Table 6.3.8-4.

Table 6.3.8-4 Tab page of list location

Feature	Description
	Click to reset all information in the table.
	Click to add a row to the table.
	Click to reduce a row from the table.
	Detect information on all senders and receiver cards.

6.4 Connecting a Display

Set the mapping of the receiver cards that are connected to sender’s ports according to cabinet count and physical connection mode with support for Standard and Complex mode.

Device List

Show cascading sender count, sender’s Ethernet ports count, and Ethernet payload.

- Device: Switch a device and set its mapping.

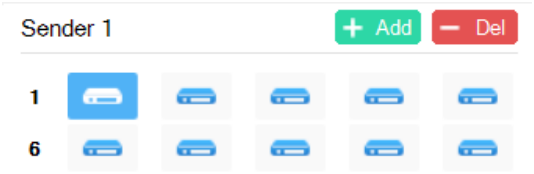


Fig 6.4.1.1 Device information

- Port: Switch Ethernet port and set its mapping.

Fig 6.4.1.2 Port information

- **Reset**: Select to clear selected Ethernet port’ s mapping diagram.
- **Load Capacity**: Show the Ethernet port’ s loading status of the selected device.

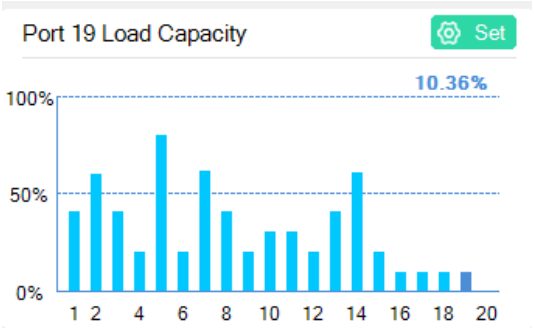


Fig 6.4.1.3 Ethernet port’ s loading status

- Port area settings: Select **Set to allow the Port Area Settings** dialog box with support for Auto Calculate and Manual Input.
- **Auto Calculate**: Calculate automatically sender’ s Ethernet port control area according to the mapping diagram.
- **Manual Input**: Enter parameters manually to set sender’ s Ethernet port control area.

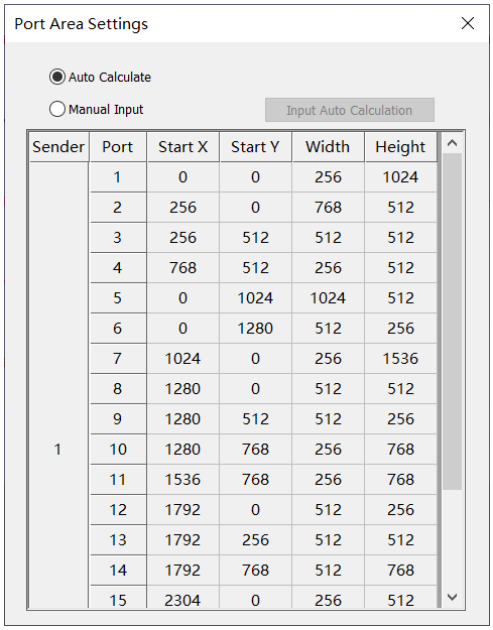


Fig 6.4.1.4 Port area settings

6.4.1 Standard

Quick Start

Step 1: To add receiver cards to the drawing area, set **Receiver Count** and **Selected Receiver Info** according to the actual cabinets (see Figure 6.4.2.1 below).

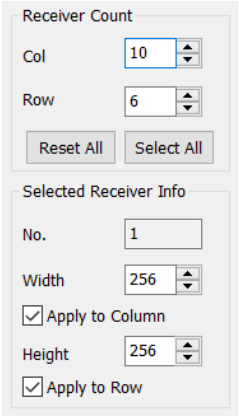


Fig 6.4.2.1 Add receivers

Step 2: Draw each sender Ethernet ports' mapping diagram using **Port Numbering** and **Receiver Numbering** according to the actual mapping of receiver cards (see Figure 6.4.2.2 below).

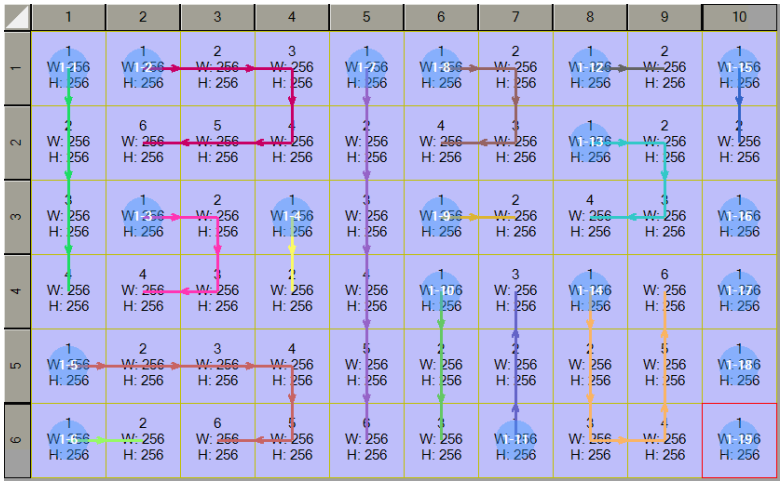


Fig 6.4.2.2 Mapping diagram

Step 3: Click **Send** and view the screen.

Toolbar

Set display’s mapping diagram using **Port Numbering**, **Receiver Numbering**, and **Highlight**.

Fig 6.4.1.3 Standard - toolbar

For details of Standard toolbar, see Table 6.4.1-1.

Table 6.4.1-1 Standard toolbar

Function	Description
	Select to back.
	Select to undo last.
	Select to reset selected Ethernet port’s mapping diagram.
	Select to reset all Ethernet ports’ mapping diagram.
	Select to reset the drawing area.
	Select from Full Screen Numbering, Port Numbering, Sender Numbering, and write numbering library.
	Select to enable **Highlight** and highlight the selected receiver cards.

	Enable **Normal Mode** by default to control receiver cards in the drawing area.
	Select to set selected receiver cards to be void cards and disable mapping.
	Select a single receiver card, click the button, the **Output Data Offset** dialog box appears.
	Select to open the **Help** documentation.
Zoom	Zoom by selecting options from the drop-down menu, or holding Ctrl while scrolling mouse wheel.

- **Output Data Offset**: Ensure normal display using **Output Data Offset** to offset data output of receiver cards when cabinet modules are biased during the actual installation.

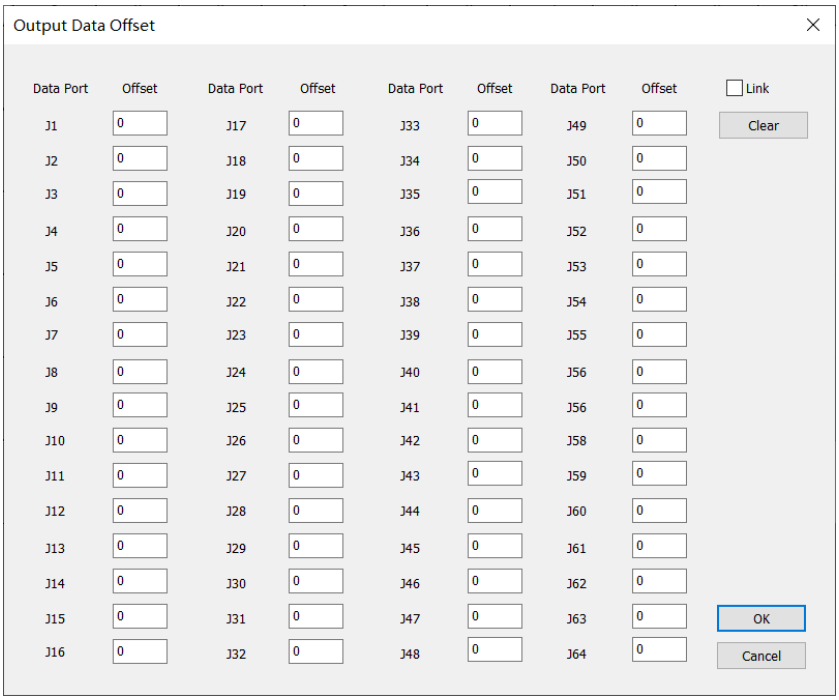


Fig 6.4.1.4 Output data offset

For more information about **Output Data Offset**, see Table 6.4.1-2.

Table 6.4.1-2 Output data offset

Function	Description
Data Port	J1-J64 Data Port.
Offset	Set offset pixels for the corresponding data port.
Link	Select the **Link** checkbox to offset all output data.
Clear	Reset offset of all data ports.
OK	Select to enable the offset.
Cancel	Close the dialog box.

Cabinet Configuration

Draw mapping diagram in the drawing area, and set receiver count and size.

- **Show Routing**: Select the **Show Routing** checkbox to show mapping diagram in the drawing area.
- **Receiver Count**: Set the count of the receiver cards in the drawing area.

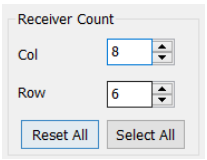


Fig 6.4.1.5 Receiver count

- **Reset All**: Select to reset the count of receiver cards in the drawing area.
- **Select All**: Select all receiver cards in the drawing area.

- **Selected Receiver Info**: You can view the number of selected receiver cards and enter values in the width and height fields to resize the cards.

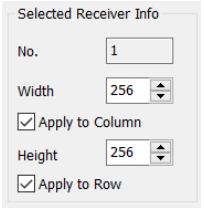


Fig 6.4.1.6 Selected receiver information

- **Apply to Column**: Select the **Apply to Column** checkbox, enter values in the width and height fields to apply them to all receivers in the column where the selected receiver card is located.
- **Apply to Row**: Select the **Apply to Row** checkbox, enter values in the width and height fields to apply them to all receivers in the row where the selected receiver card is located.
- **Mapping Settings**: Select the **Mapping Settings** button, select receiver cards in the drawing area to draw mapping diagram.

Drawing area

Drawing area shows all receiver cards' mapping diagram, size, and index. You can distinguish senders and Ethernet ports by colors and numbers. See the **Help** documentation to find out shortcuts of the drawing area.

6.4.2 Complex

Quick Start

Step 1: Select sender's port according to actual cabinets, select , set the position, count, size, and selected style of the receiver cards that are connected to corresponding Ethernet ports to draw mapping diagram (See Figure 6.4.2.1 below).

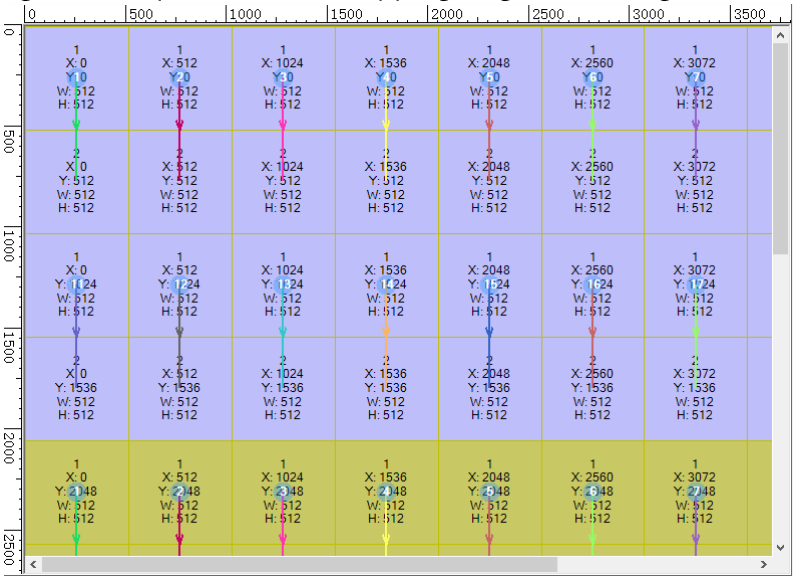


Fig 6.4.2.1 Mapping diagram

Step 2: Adjust parameters in cabinet configuration area on the right using **Port**

Numbering and **Receiver Numbering**, Keeping receiver cards' mapping order and physical mapping order consistent.

Step 3: Click **Send** and view the screen.

Toolbar

Fig 6.4.2.2 Toolbar

- : Select an Ethernet port, click the button to allow **Add Receiver** dialog box. Configure parameters and then click **Add** to draw the port's mapping diagram.

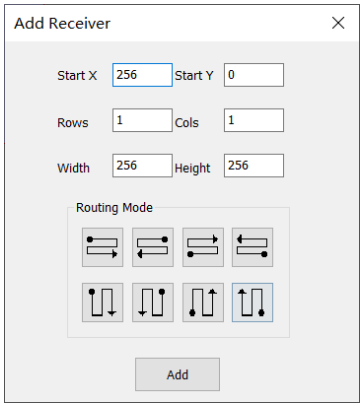


Fig 6.4.2.3 Add receiver card

- : Click the button to delete the selected receiver card in the drawing area.
- : Select and align multiple receiver cards.
- : Select and sort multiple receiver cards.
- Other functions: You can find out other functions in Standard - Toolbar.

Cabinet configuration area

Set the size and position of the selected receiver card.

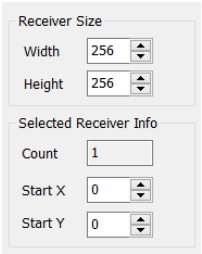


Fig 6.4.2.4 Cabinet configuration area

- **Show Routing**: Select this checkbox to show mapping diagram in the drawing

area.

- **Receiver Size**: Resize the selected receiver card.
- **Selected Receiver Info**: Show the count of the selected receiver card and set its position.

Drawing area

Drawing area shows all receiver cards' mapping diagram, position, size, and index. You can tell senders and Ethernet ports by colors and numbers. See the **Help** documentation to find out shortcuts of the drawing area.

Function keys

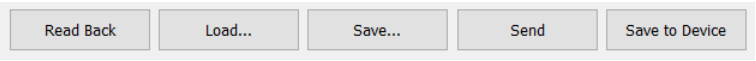


Fig 6.4.2.5 Function keys

To learn more about function keys, see Table 6.4.2-1.

Table 6.4.2-1 Function keys

Function	Description
Read Back	Read the receiver card's mapping diagram and load it on LEDSetting.
Load...	Click the button to load local parameter file of mapping diagram.
Save...	Save receiver card's mapping diagram as local files.
Send	Send real-time mapping diagram to all receiver cards. The parameters will be invalid after power cycling.
Save to Device	Save parameters of mapping diagram to all receiver cards. The parameters will remain valid after power cycling.

7. LEDTester

Test LED display by entering parameters in LEDTester to change display effect of the playback canvas in LEDSetting.

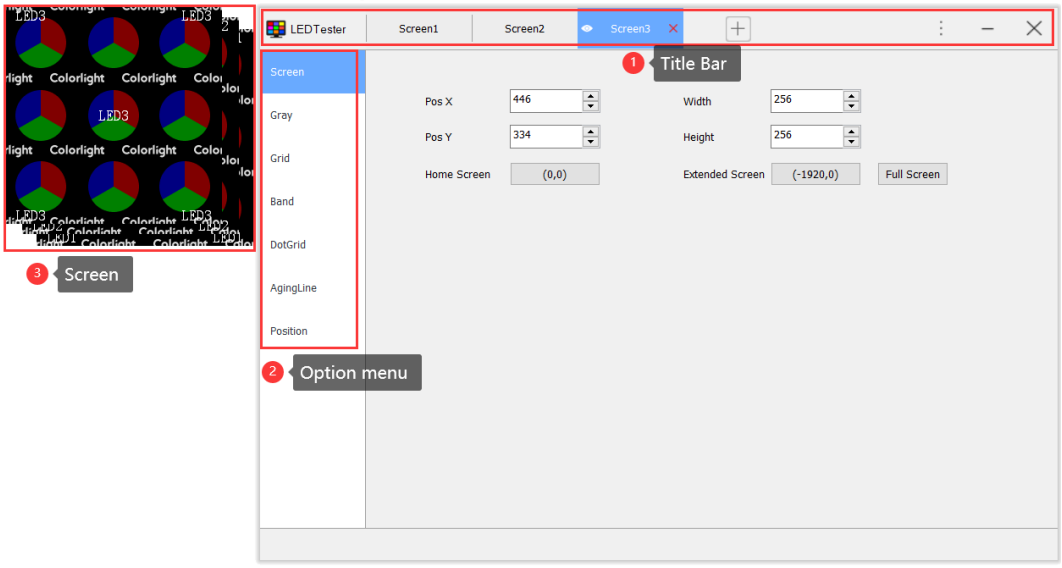


Fig 7.1 Test tool (LEDTester)

➢ Title bar

- Screen management: Add, delete, switch screens. Show/Hide LEDSetting playback canvas.
  - Add screen: Click ⊞ to add screens.
  - Delete screen: Click ⊗ to delete the selected screens.
  - Screen switching: Select screen name and switch to the corresponding screen from option menu to pin playback canvas.
  - Show/Hide screen: Select 👁 to hide the playback canvas, select 👁 to show the playback canvas.
- Shortcut menu: Select ⋮ to open the pop-up menu.

➢ Option menu

Screen

Adjust the position and size of LEDSetting playback screen.

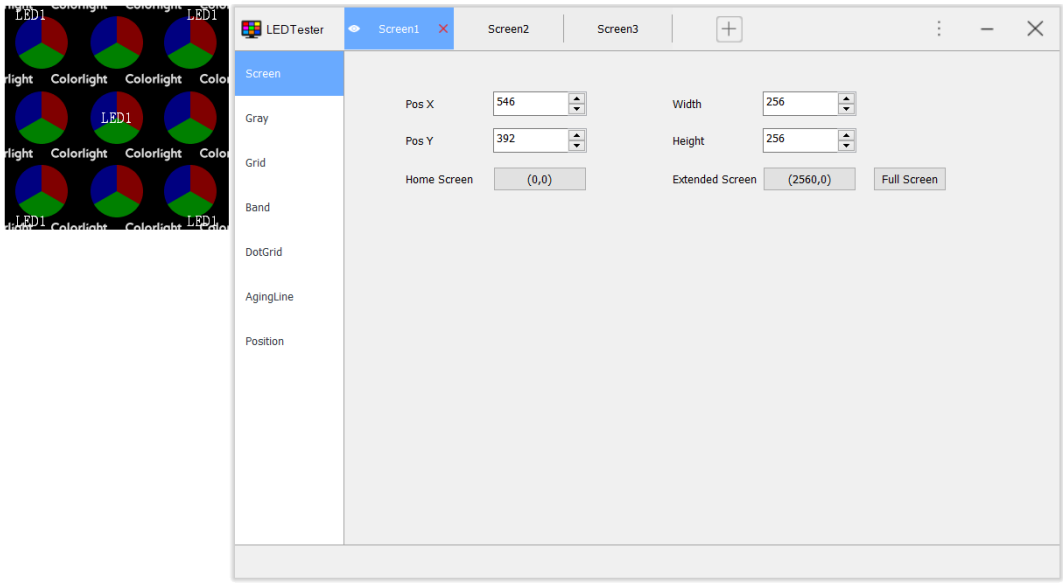


Fig 7.2 Screen

To know how to change screen settings, see Table 7-1.

Table 7-1 Screen settings

Parameter	Description
Pos X	Set the horizontal coordinate of the playback canvas.
Pos Y	Set the vertical coordinate of the playback canvas.
Width	Set the width of the playback canvas.
Height	Set the height of the playback canvas.
Home Screen	Click **(0, 0)** to set the coordinate of the playback canvas as (0, 0).
Extended Screen	Click **(1920, 0)** to set the coordinate of the playback canvas as (1920, 0).
Full Screen	Click **Full Screen** to set the size of the playback canvas to match your computer screen resolution.

Gray

Test LED display in solid color view.

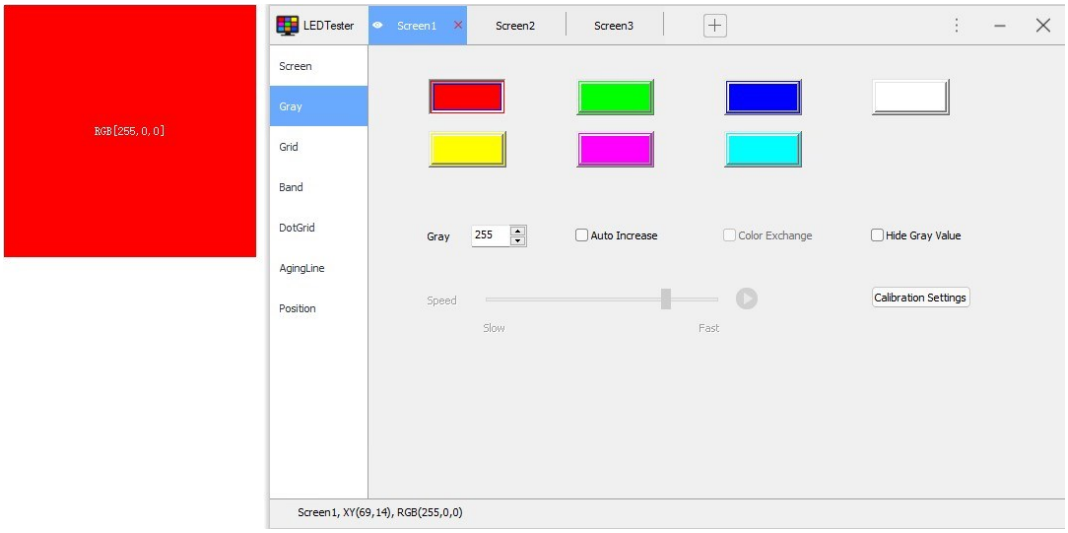


Figure 7.3 Gray

For detailed information about Gray, see Table 7-2.

Table 7-2 Gray

Parameter	Description
Color button	Click the clock blocks Red, Green, Blue, White, Yellow, Purple, or Cyan to switch the color of the playback canvas.
Gray	Enter value in the field provided to adjust grayscale of the playback canvas.
Auto Increase	Select the checkbox, the grayscale of the playback canvas does cyclic increment automatically in the range of 0~255.
Color Exchange	Select the checkbox, the playback canvas switches the grayscale cyclic display sequentially in color order.
Hide Gray Value	Show/Hide gray value on of the playback canvas.
Speed	Adjust the speed of **Auto Increase** on the playback canvas, click to enable **Auto Increase**.
Calibration Settings	Enable or disable calibration.

Grid

Test LED display in the Grid view.

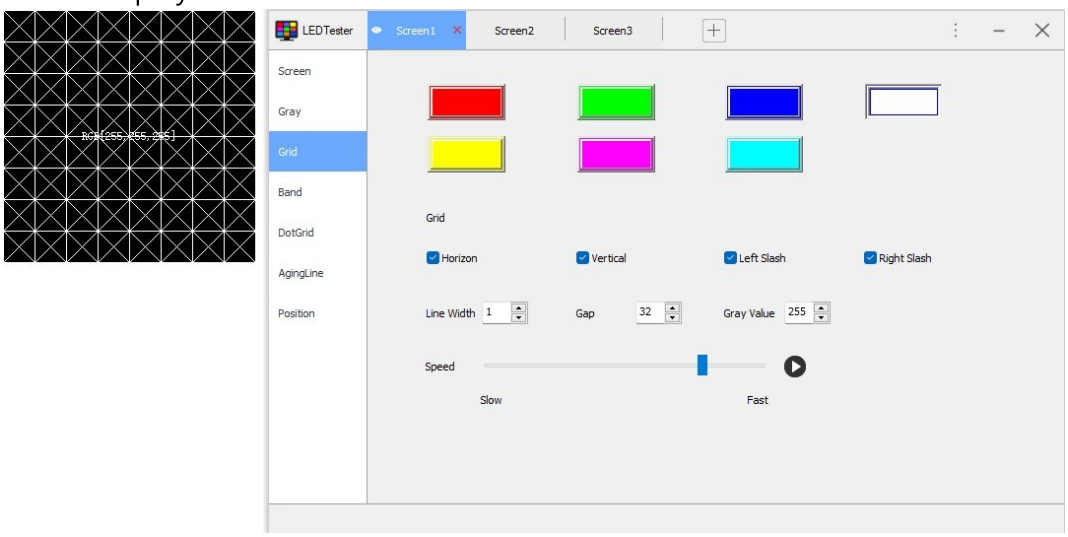


Fig 7.4 Grid

For details of **Grid**, see Table 7-3.

Table 7-3 Grid

Parameter	Description
Color button	Click the color blocks Red, Green, Blue, White, Yellow, Purple, or Cyan button to switch the grid color of the playback canvas.
Horizon	Hide/Show grid horizontal lines of the playback canvas.
Vertical	Show/Hide vertical lines of the playback canvas grids.
Left Slash	Show/Hide left slash of the playback canvas grids.
Right Slash	Show/Hide right slash of the of the playback canvas grid.
Line Width	Enter values in the field to adjust the line width of the Screen grid.
Gap	Enter values in the field to adjust the gap of the Screen grid.
Gray Value	Enter values in the field to adjust the gray value of the Screen grid.
Speed	Move the slider to adjust the speed of the playback canvas grid movement, click to move grid.

Band

Test LED display by setting screen gradient Band.

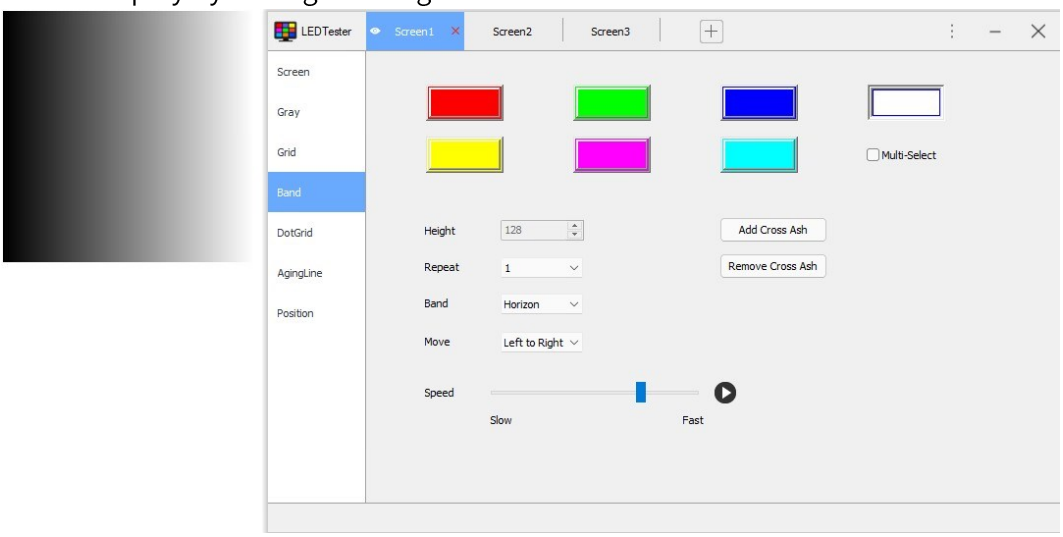


Fig 7.5 Band

For more information about **Band**, see Table 7-4.

Table 7-4 Band

Parameter	Description
Color button	Click the color blocks Red, Green, Blue, White, Yellow, Purple, or Cyan button to switch band color of the playback canvas.
Multi-Select	Select the **Multi-Select** checkbox to simultaneously display multiple color bars on the playback canvas.
Height	Select the **Multi-Select** checkbox, and enter values in the field to adjust band height.
Repeat	Select different values in the drop-down to change the number of pixel points in the same grayscale of the tablecloth color bar.
Band	**Horizon**: Playback canvas band fades from left to right on a 0-255 gray scale. **Vertical**: Playback canvas band fades from top to bottom on a 0-255 gray scale.
Move	Select options from the drop-down menu to change the moving

	direction of the playback canvas band.
Speed	Move the slider to change the moving speed of the playback canvas band, and click ▶ to start moving.
Add Cross Ash	Click **Add Cross Ash**, navigate over the playback canvas to add cross cursor markers.
Remove Cross Ash	Click **Remove Cross Ash** to clear cross cursor on the playback canvas.

Dot Grid

Test LED display by setting Dot Grid.

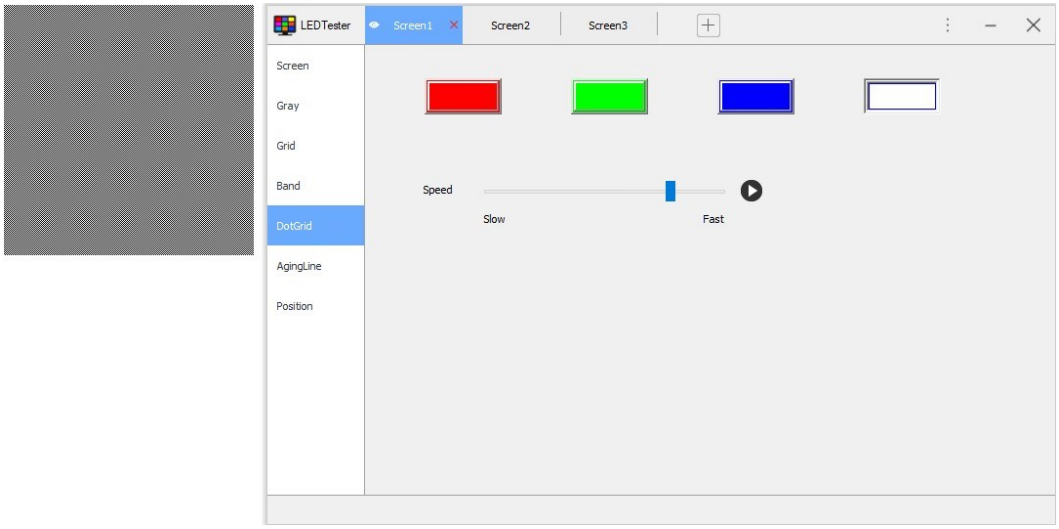


Fig 7.6 Dot grid

To learn more about **Dot Grid**, see Table 7-5.

Table 7-5 Dot grid

Parameter	Description
Color button	Click the color blocks Red, Green, Blue, White, Yellow, Purple, or Cyan button to switch the color of dot grid on the playback canvas
Speed	Move the slider to change the flickering speed of dot grid on the playback canvas, and click to start flickering.

Aging Line

Test LED display by setting **Gray**, **Band**, **Grid**, and **Picture**.

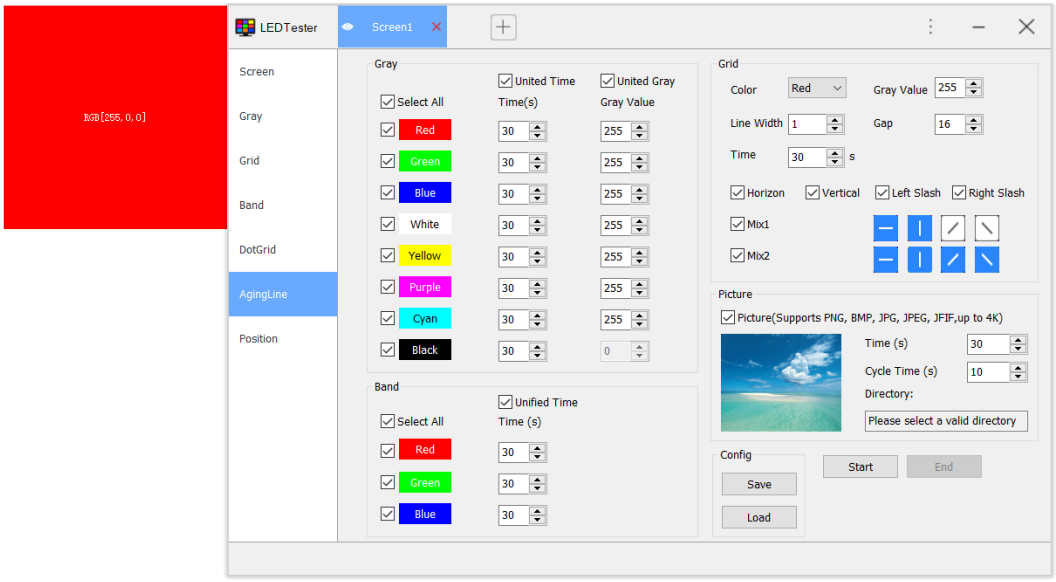


Fig 7.7 Aging line

To know how to configure aging line, see Table 7-6.

Table 7-6 Aging line

Parameter		Description
Gray	Color Options	Select the checkbox(es) to pick which grayscale color(s) will appear in the loop.
	Time(s)	Set the display time for each grayscale color. Or, select the **United Time** checkbox to apply the same display time to all grayscale colors.
	Gray Value	Set the gray value for each grayscale color. Or, select the **United Gray** checkbox to apply the same gray value to all grayscale colors (except black).
Band	Color Options	Select the checkbox(es) to pick which band color(s) will appear in the loop.
	Time(s)	Set the display time for each band color. Or, select the **Unified Time** checkbox to apply the same display time to all band colors.
Grid	Color	Select an option from the drop-down menu to change the color of the playback canvas grid.
	Gray Value/Line Width/Gap	Enter values in corresponding fields to adjust gray value, line width, and gap of the playback canvas grid.
	Time	Enter a value in the field to adjust the time interval at which the grid line style switches on the playback canvas.
	Horizon/Vertical/Left Slash/Right Slash	Show/Hide playback canvas grid.
	Mix1/Mix2	Select and show multiple grid line styles.
Picture	Picture Option	Select the **Picture** checkbox to display one or more pictures in the loop.

	Picture Preview	Support preview of the first picture in the current directory. Click the preview picture to choose a new directory path. Once a new directory is selected, the display field will update to show the chosen path.
	Time(s)	Set the total display time for all pictures under the selected directory.
	Circle Time(s)	Set the display time for each picture under the selected directory.
Config	Save	Save the parameter settings from the **AgingLine** interface to a local file.
	Load	Load a local file to display the previously saved parameter settings on the **AgingLine** interface.
Start		Click to display the grayscale, band, grid, and picture sequentially based on the configured settings. During the loop, the **Cycle Count** and **Cycle Time** will be shown below the **Start** button.
End		Click to stop the loop.

Position

Configure parameters according to actual cabinets and module information, mark the location of modules.

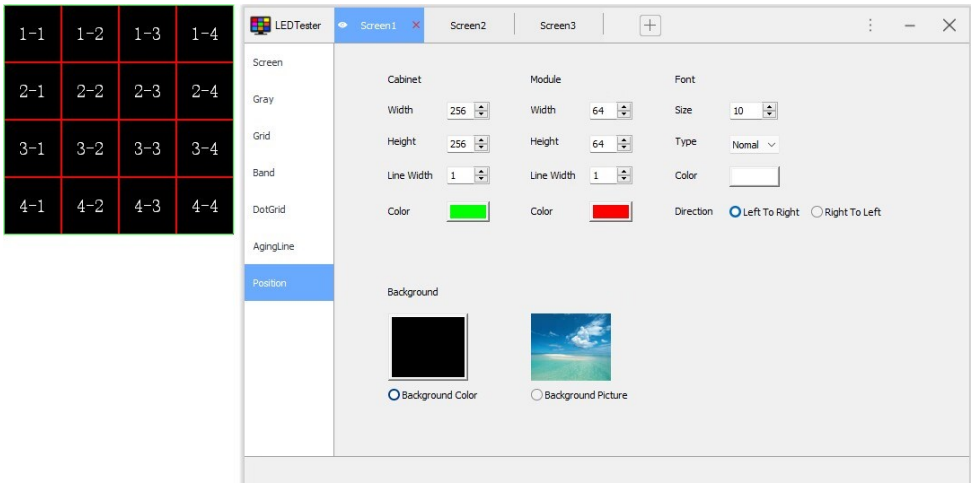


Fig 7.8 Position

For detailed information about **Position**, see Table 7-7.

Table 7-7 Position

Parameter	Description
Width	Set the width of cabinets and modules.
Height	Set the height of cabinets and modules.
Line Width	Set the line width of cabinets and modules.
Color	Set the color of cabinets and modules.
Size	Set the font size of module index.
Type	Set the font type of module index.
Color	Set the font color of module index.
Direction	Set the order of module index.
Background	Sets the screen background. Supports for solid color background and custom background.

➢ Context Menu

Right-click playback canvas to open context menu and do quick action.

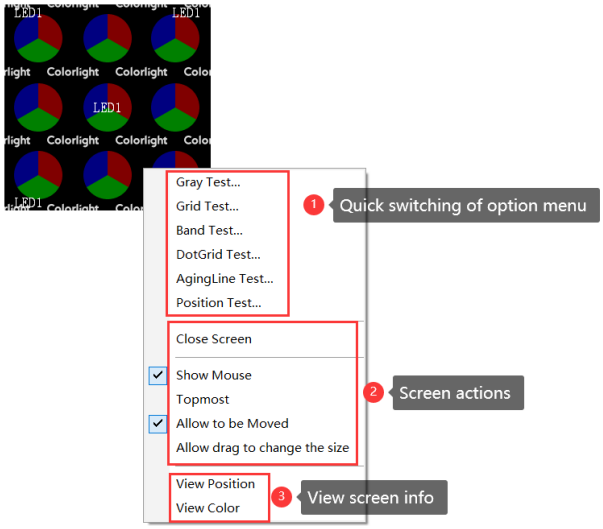


Fig 7.9 Context menu

- Quick switching of option menu: Click to switch option menu, and the screen switches to corresponding test mode.
- Screen operation: See Table 7-8 to learn about screen menu options.

Table 7-8 Menu Item

Menu Item	Description
Close Screen	Close playback canvas and delete corresponding screens in LEDTester.
Show Mouse	Select the **Show Mouse** checkbox to show cursor on the playback canvas.
Topmost	Select the **Topmost** checkbox to pin playback canvas.
Allow to be Moved	Select the **Allow to be Moved** checkbox and drag the position of the playback canvas with mouse.
Allow drag to change the size	Select the **Allow drag to change the size** checkbox and resize Screen by dragging Screen frame with mouse.

- Screen information viewing: Click options from the menu, navigate over the playback canvas to see the coordinate and color of the cursor.

8. Pixel-by-pixel Calibration

Title Bar

The title bar includes:

- An LEDSetting icon
- An interface title
- 4 tabs: By Pixel, By Cabinet, By Module and Deseam
- An option to select either Brightness Calibration or Chroma Calibration
- 2 Buttons: Minimize and Close

Fig 8.1 Title bar

- Switch between Calibration Modes: Click the ⋮ icon to quickly switch between **Brightness Calibration** and **Chroma Calibration**.

8.1 Quick Operations

8.1.1 Brightness/Chroma Calibration

Step 1: Go to the **By Pixel** tab and click **Getting Screen Information**, as shown in Figure 8.1.1.1.

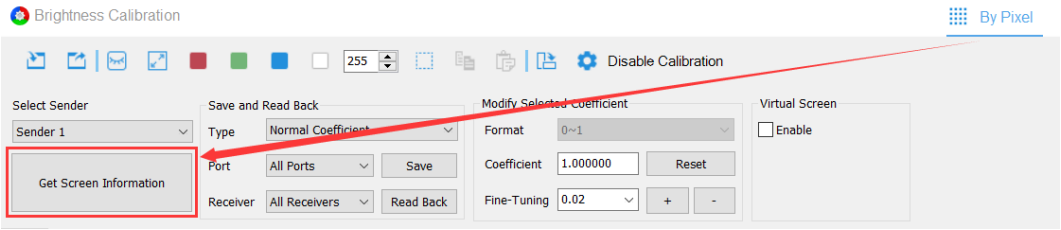


Fig 8.1.1.1 Getting screen information

Step 2: Click ⤢ to set the size and coordinates of the calibration canvas according to the actual screen, as shown in Figure 8.1.1.2.

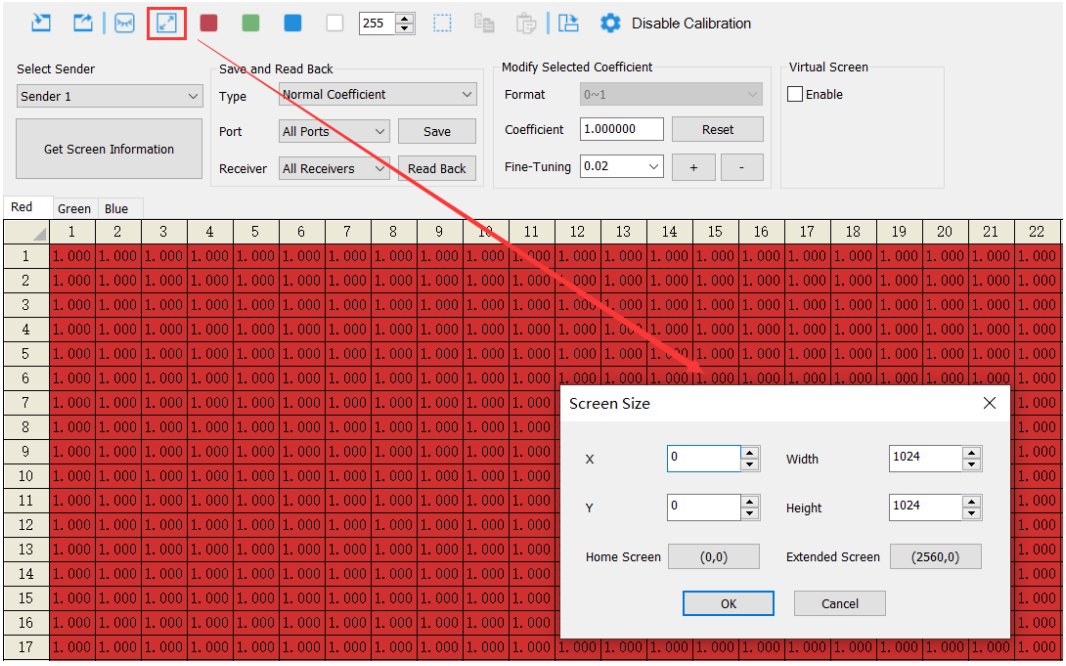


Fig 8.1.1.2 Set screen size and coordinates

Step 3: Click the **Import** icon to import brightness calibration coefficients. Alternatively, manually set coefficients in the coefficient adjustment area, as shown in Figure 8.1.1.3.

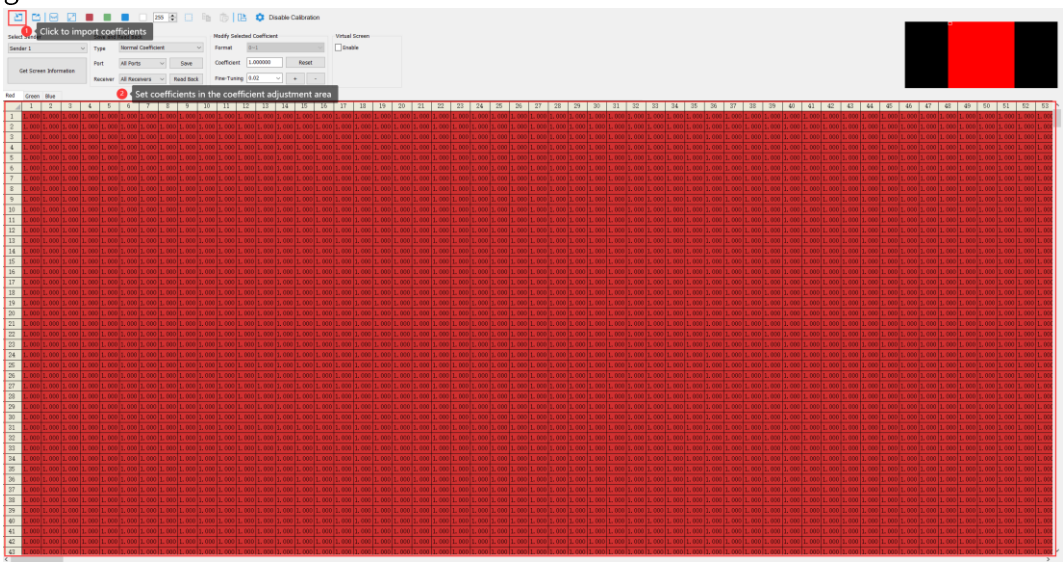


Fig 8.1.1.3 Set brightness calibration coefficient

Step 4: Click , and select **Set Calibration Switch** to open the **Calibration Settings** dialog box. Then, select the desired options under **Calibration Source** and **Calibration Mode**. As shown in Figure 8.1.1.4.

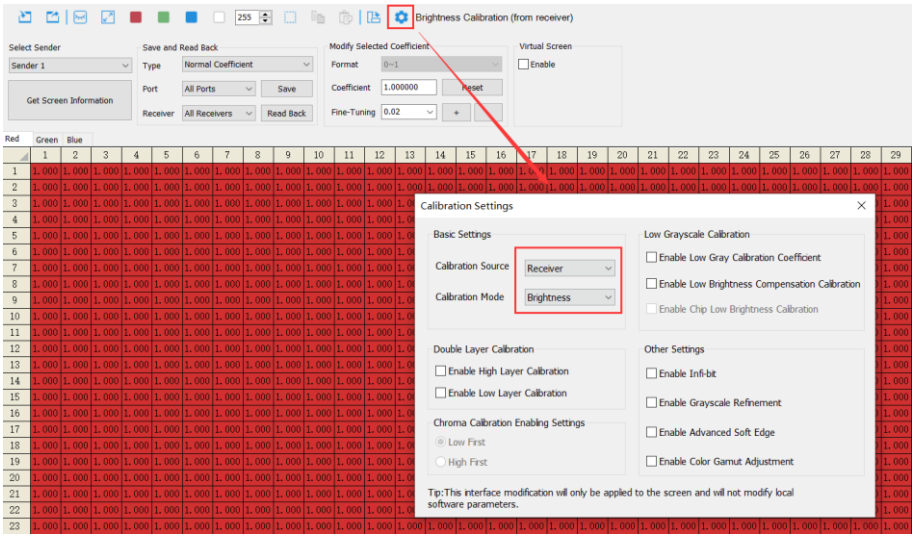


Fig 8.1.1.4 Enable brightness calibration of receiver card

Step 5: Select **Normal Coefficient** under **Save and Read Back**. Then, click **Save** to save the normal calibration coefficients, as shown in Figure 8.1.1.5.

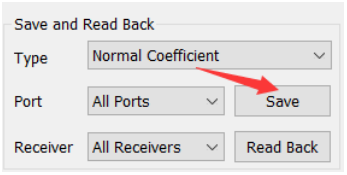


Fig 8.1.1.5 Save calibration coefficient

Step 6: Check the screen and enable calibration.

8.1.2 Gradient Adjustment

Step 1: Go to the **By Cabinet** tab and click **Get Screen Information**.

Step 2: Click  to set the size and coordinates of the calibration canvas according to the actual screen.

Step 3: Click **Read Back** to retrieve the calibration coefficients, and select the receiver card you want to adjust the gradient for. Right-click the selected receiver card to open the context menu, then select **Gradient Adjustment**.

Step 4: Under **Gradient Adjustment**, enter the desired coefficient value. Click the **Apply Gradient** button to save the new coefficient values, as shown in Figure 8.1.2.1.

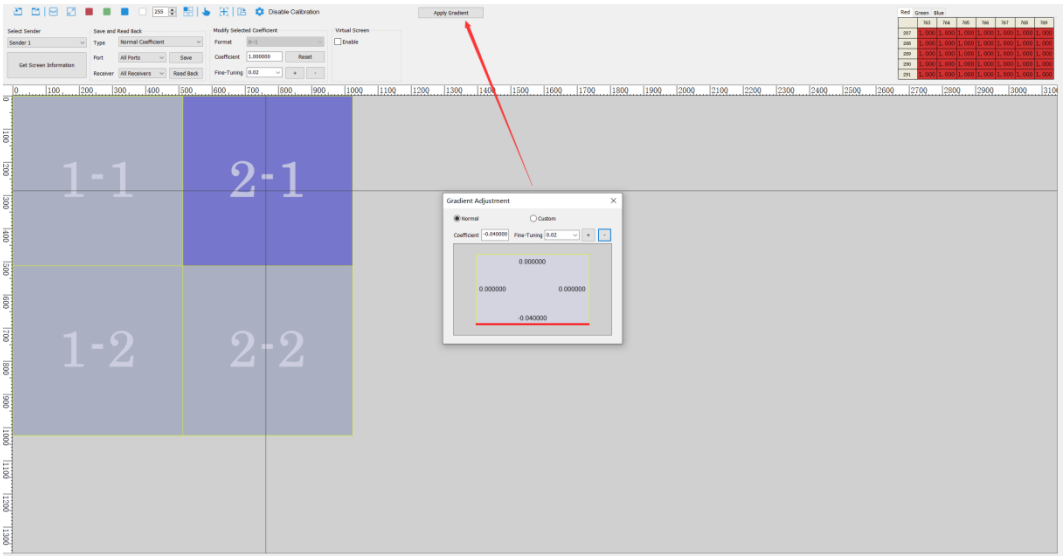


Fig 8.1.2.1 Set gradient adjustment coefficients

Step 5: Click , and select **Set Calibration Switch** to open the **Calibration Settings** dialog box. Then, select the desired options under **Calibration Source** and **Calibration Mode**.

Step 6: Under the **Save and Read Back** settings, select **Normal Coefficient** from the **Type** drop-down menu. Then, click **Save** to save the normal calibration coefficients, as shown in Figure 8.1.2.2.

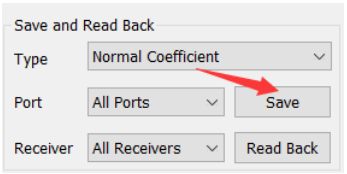


Fig 8.1.2.2 Save gradient adjustment coefficients

Step 7: Check the screen and enable calibration to view the effect after gradient adjustment.

8.1.3 Deseam

Step 1: Go to the **Deseam** tab and click **Get Screen Information**.

Step 2: Click to set the size and coordinates of the calibration canvas according to the actual screen.

Step 3: Click to open the **Module Size** dialog box. Select the **Enable Module** checkbox, then set the module size as required, as shown in Figure 8.1.3.1.

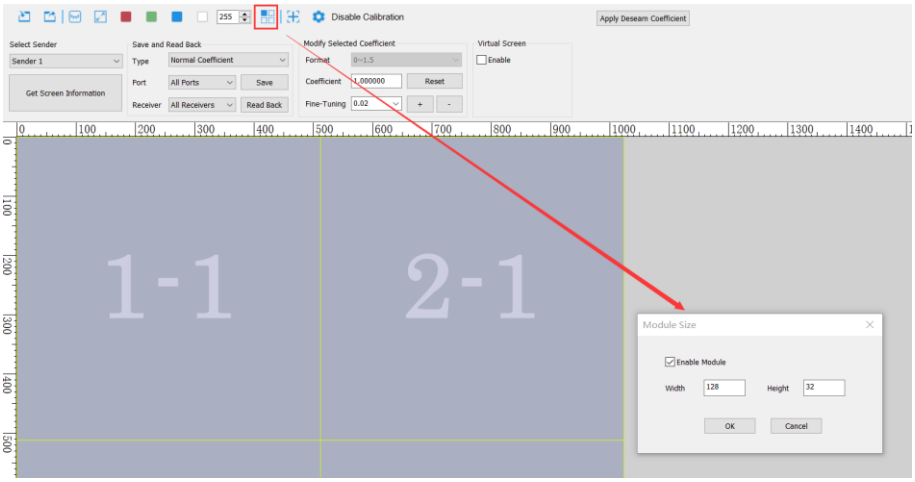


Fig 8.1.3.1 Set module size

Step 4: Click **Read** to retrieve the calibration coefficients, and select a seam. Under **Modify Selected Coefficient**, set coefficients as required. Then click **Apply Deseam Coefficient** to save the new coefficient value for the selected seam, as shown in Figure 8.1.3.2.

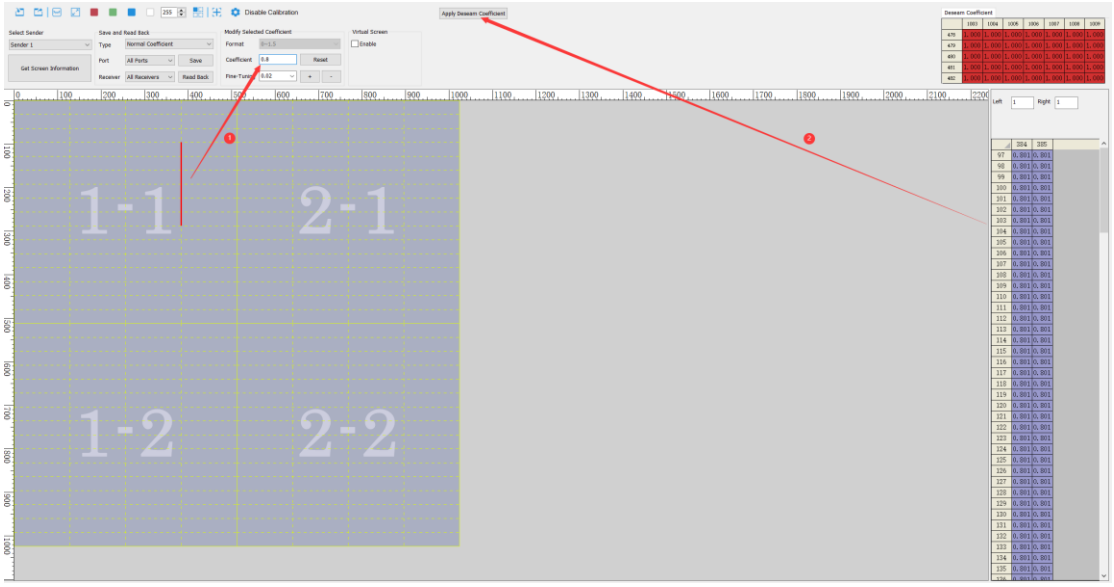


Fig 8.1.3.2 Set deseam coefficient

Step 5: Click , and select **Set Calibration Switch** to open the **Calibration Settings** dialog box. Then, select the desired options under **Calibration Source** and **Calibration Mode**.

Step 6: Under the **Save and Read Back** settings, select **Normal Coefficient** from the **Type** drop-down menu. Then, click **Save**, as shown in Figure 8.1.3.3.

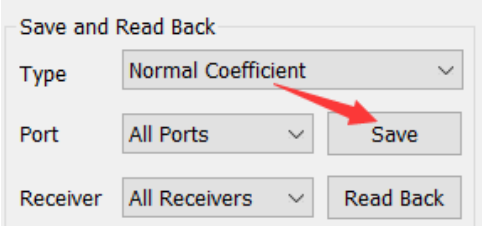


Fig 8.1.3.3 Save deseam coefficient

Step 7: Check the screen and enable calibration to view the effect after deseam adjustment.

8.2 Brightness Calibration

Brightness Calibration ensures highly consistent calibrated brightness of the screen by adjusting the brightness of the LED display. During adjustment, the maximum brightness of most LEDs needs to be lowered to an appropriate level. The brightness calibration coefficient has 3 components: R, G, and B.

8.2.1 By Pixel

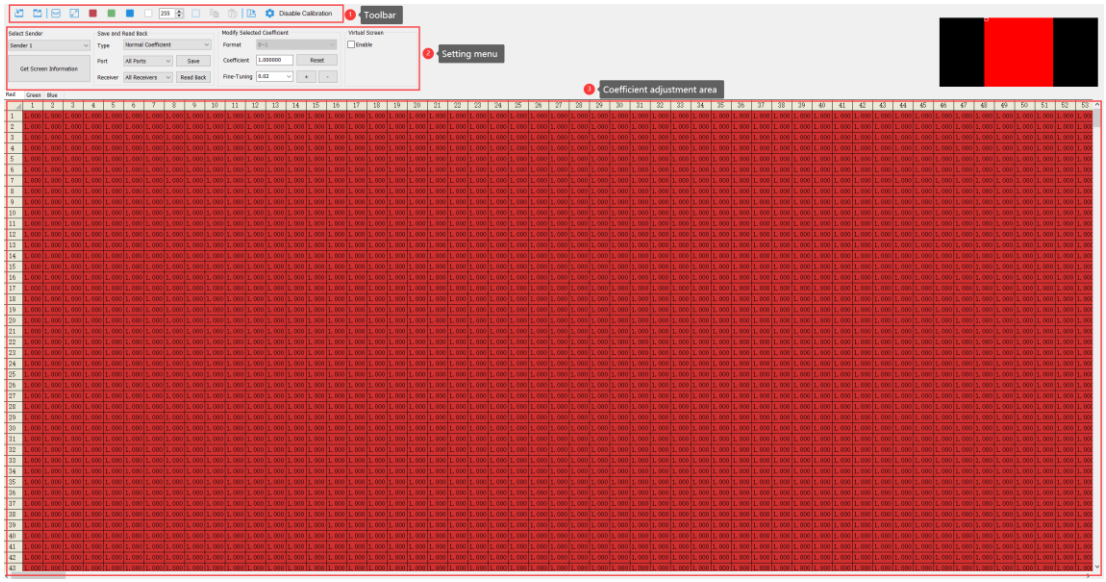


Fig 8.2.1.1 By Pixel

Toolbar

: Click to open the drop-down menu, and select a desired option to import a local calibration coefficient file.

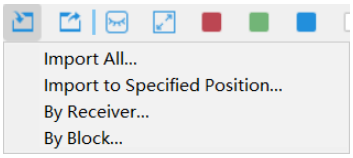


Fig 8.2.1.2 Import

The available options in the **Import** drop-down menu are described in Table 8.2.1-1 below.

Table 8.2.1-1 Description of options in import drop-down menu

Option	Description
Import All	Import all calibration coefficients, which will be automatically cropped to match the calibration canvas size.
Import to Specified Position	Set initial coordinates and import the coefficients to the specified position.
By Receiver	Import the calibration coefficients by receiver cards. The results will be displayed in the list.
By Block	Import the calibration coefficients by block. The imported coefficients will be assigned to their matching areas.

- Procedures for Importing by Block

■ Step 1: Click ... to load a coefficient file, as shown in Figure 8.2.1.3.

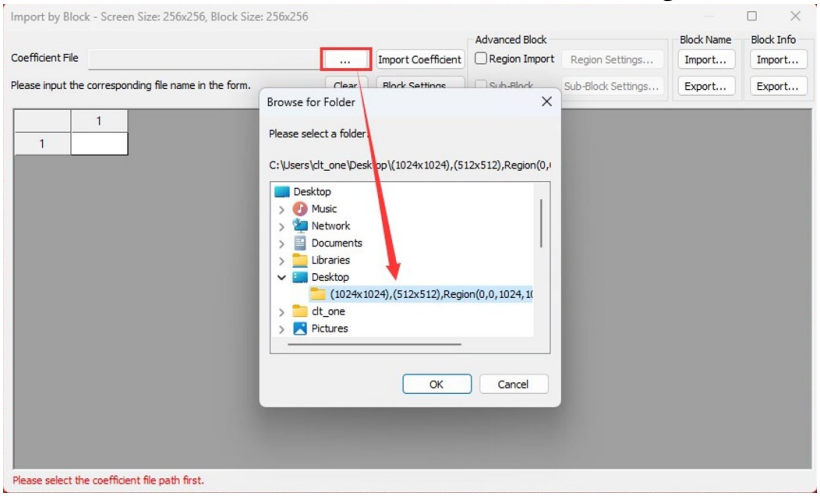


Fig 8.2.1.3 Load a coefficient file

- Step 2: Enter parameter values in **Block Settings**, **Region Settings**, and **Sub-Block Settings** respectively, as shown in Figure 8.2.1.4.

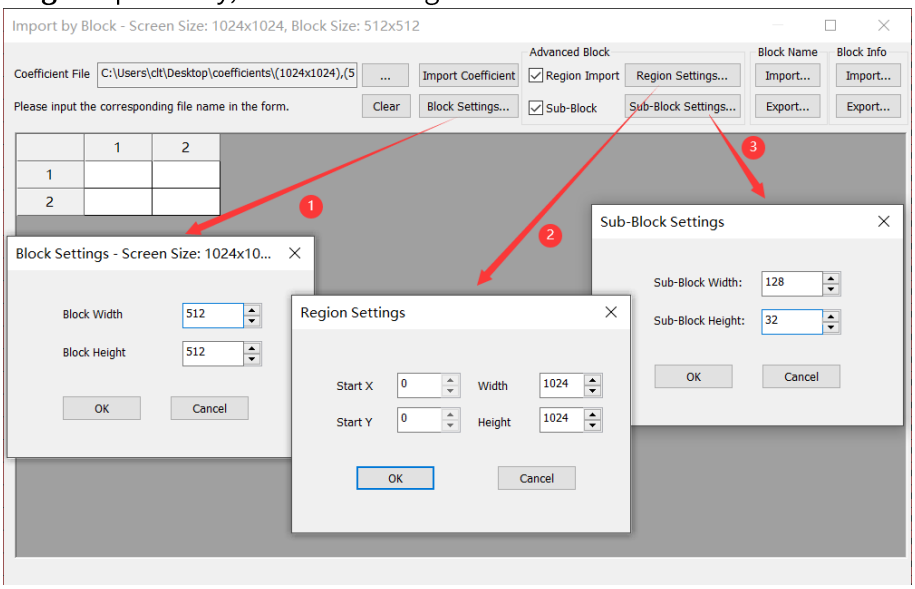


Fig 8.2.1.4 Set blocks

📖 Notes:

1. If the coefficient file you are loading contains certain regions or sub-blocks, the **Region Settings** and **Sub-Block Settings** must be set.
2. The block width and height cannot be larger than the coefficient file’s block size.
3. The sub-block width and height cannot be smaller than the coefficient file’s sub-block size.

- Step 3: Click the **Import** button under **Block Name** or **Block Info** to import relevant files. Then click **Import Coefficient**, as shown in Figure 8.2.1.5.

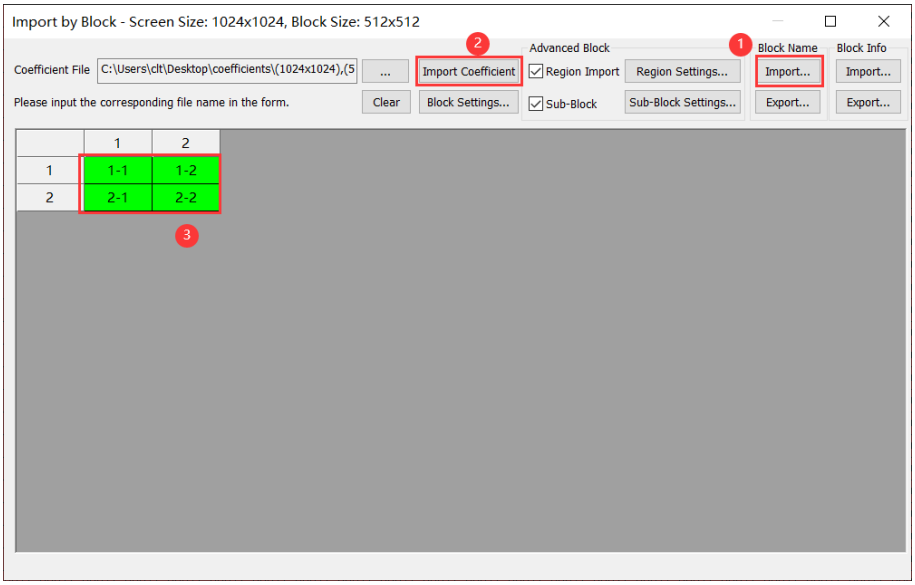


Fig 8.2.1.5 Import coefficients

📖 Note:

Successfully imported areas will have a green grid background; areas where import failed will have a red grid background.

: Click to open the drop-down menu, and select a desired option to export the calibration coefficients to a local file.

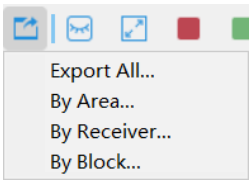


Fig 8.2.1.6 Export

The available options in the **Export** drop-down menu are described below in Table 8.2.1-2.

Table 8.2.1-2 Description of options in export drop-down menu

Option	Description
Export All	Export all coefficients.
By Area	Export the coefficients from a selected area.
By Receiver	Export all coefficients by receiver card, with the coefficient file name being “Port No. - Receiver No.”.

By Block	Click **By Block** to open the dialog box. Set the block parameters and export the block coefficients to a local file.

: Click to show calibration canvas, and click to hide calibration canvas.

: Click the icon to open the **Screen Size** dialog box, and enter parameter values to adjust the size and position of the calibration canvas.

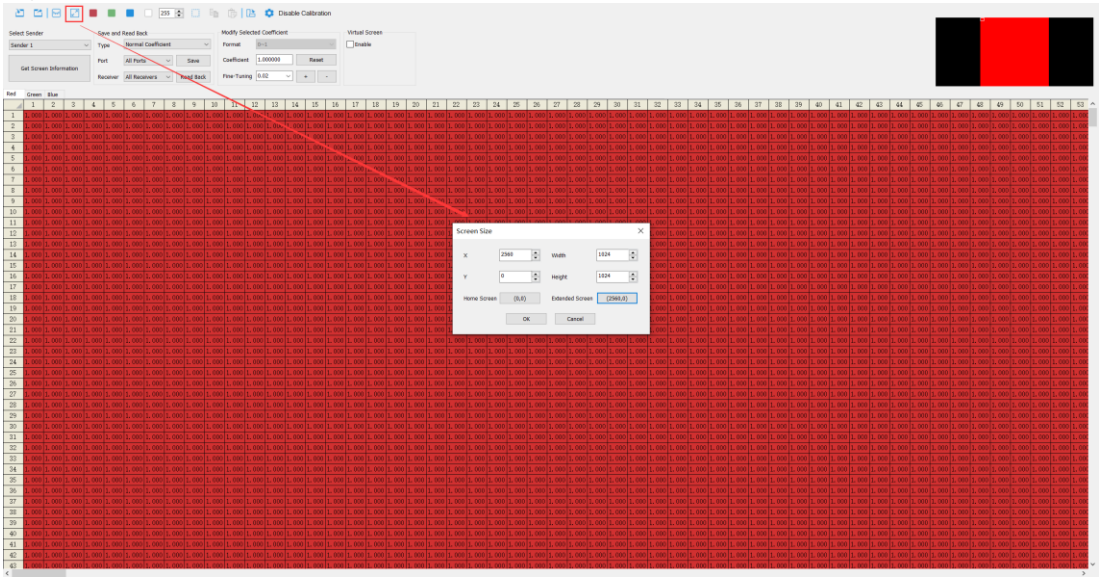


Fig 8.2.1.7 Set screen size and coordinates

: Click to switch the corresponding color for the calibration canvas.

: Enter values in the input field to adjust the grayscale of the calibration canvas.

: Click to open the **Area Selection** dialog box, and enter values in the coordinate and size fields. Then, choose an area to apply the configuration.

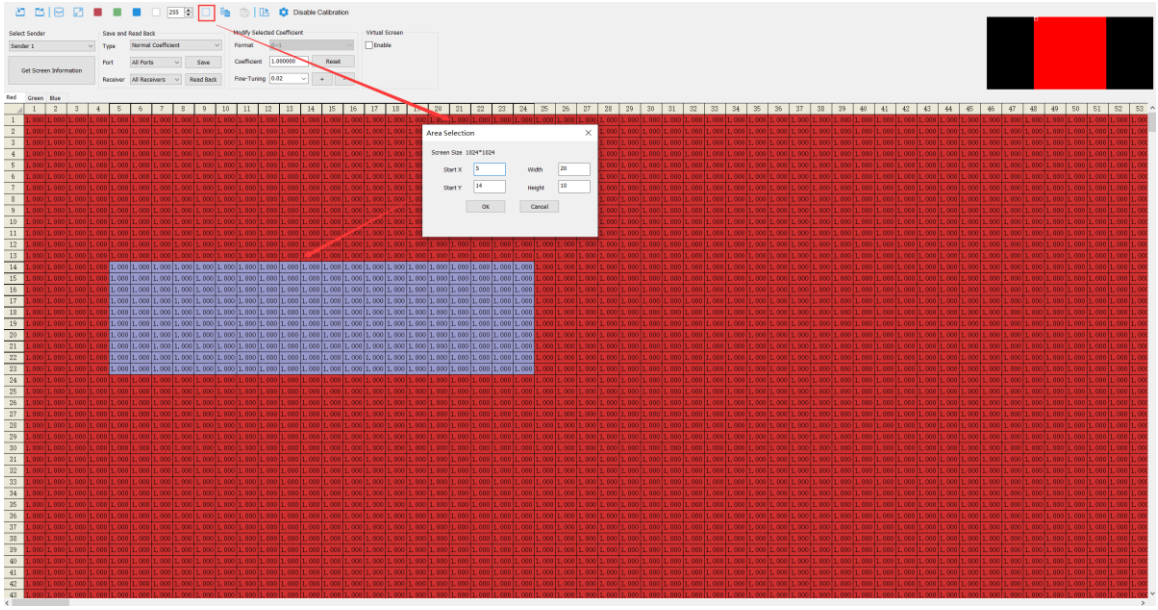


Fig 8.2.1.8 Area selection

: After selecting a desired coefficient adjustment area, click this icon to copy the real-time coefficients of the selected area.

: After copying the coefficients, click this icon to paste the copied real-time coefficients.

: Click to open the **Rotate Calibration Coefficient** dialog box. Select a desired rotation option to load the coefficient file, and then click **OK** to generate a new coefficient file with the selected rotation applied.

- The size of the coefficient file must match that of the current screen.

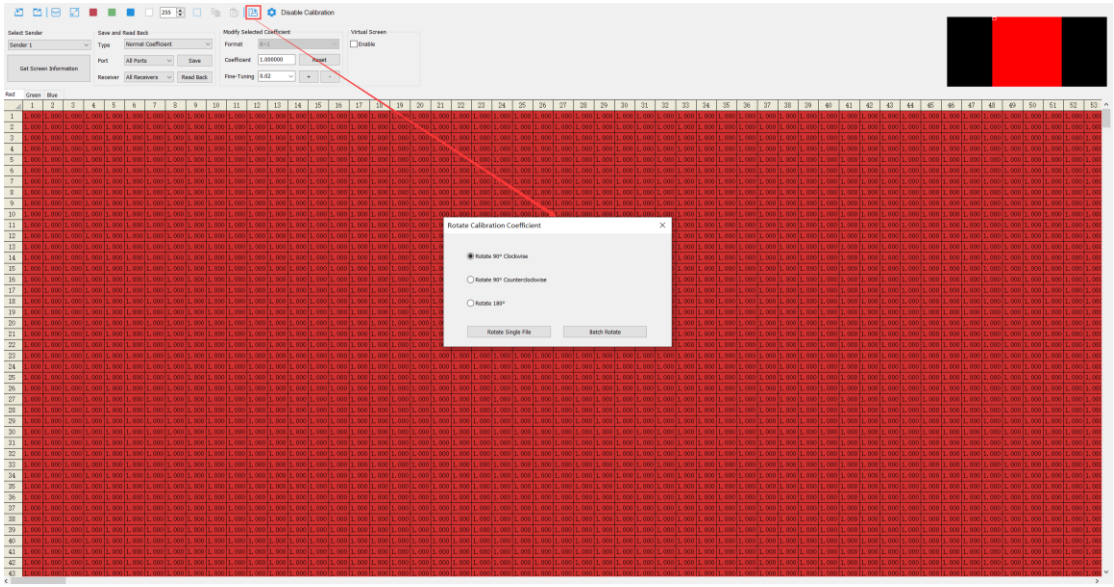


Fig 8.2.1.9 Rotate calibration coefficient

: Click to configure **Calibration Settings**. The calibration status will be displayed on the right side of the icon.

- **Disable Calibration** Before getting screen information, the status of **Disable Calibration** is displayed; after getting screen information, the options of **Calibration Mode** and **Calibration Source** are displayed for the current LED screen.
- : Click this icon to open a drop-down menu with 2 options: **Set Calibration Switch** and **Enable Simulate by PC**.
  - **Set Calibration Switch**: Click to open the **Calibration Settings** dialog box and select the checkbox for the desired calibration.

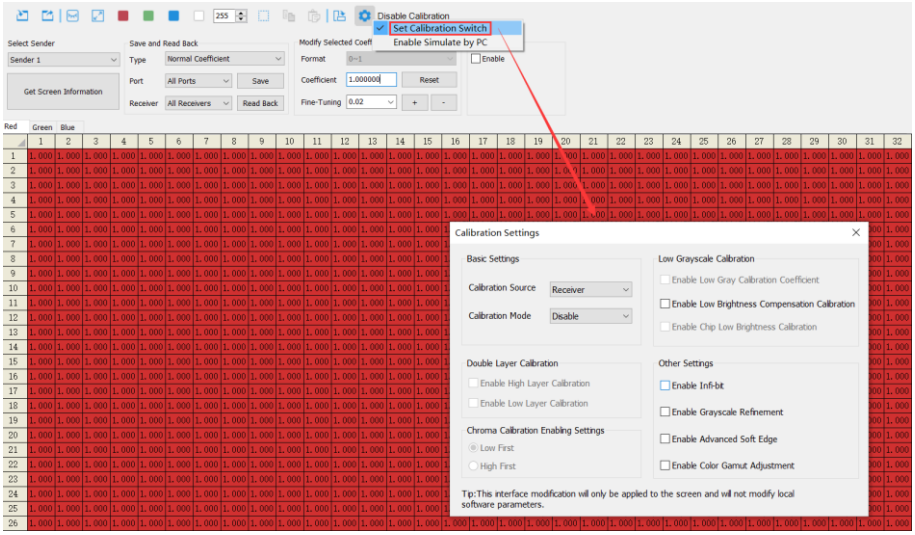


Fig 8.2.1.10 Calibration settings

- **Enable Simulate by PC:** Select this option to view a simulated image on the calibration canvas according to the calibration coefficients set in the coefficient adjustment area.

Settings Menu

- Select Sender
  - **Select Sender**: Select a sender as required from the drop-down menu.
  - **Get Screen Information**: Click this button to get screen information.

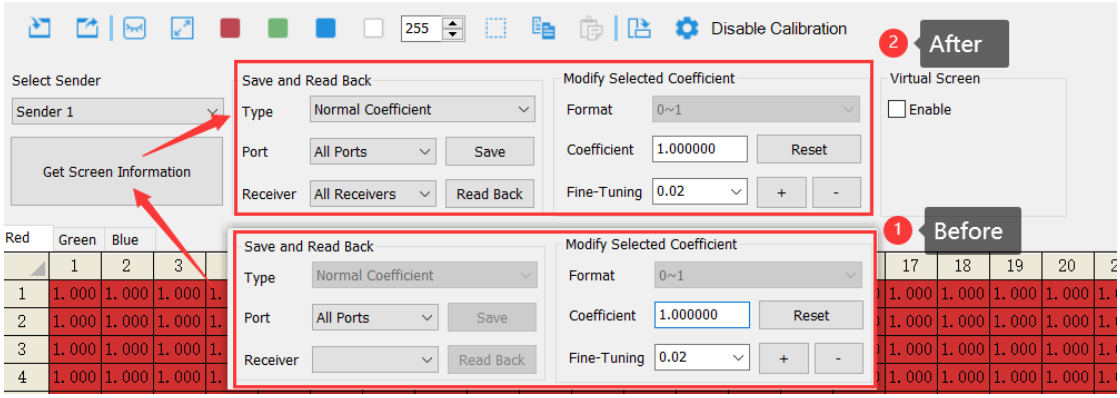


Fig 8.2.1.11 Get screen information

- Save and Read Back
  - **Type**: Select a calibration coefficient type.
  - **Port**: Select a port from the drop-down menu.
  - **Receiver**: Select a receiver card from the drop-down menu.
  - **Save**: Save calibration coefficients to the receiver card.
  - **Read Back**: Read back calibration coefficients from the receiver card and load them into the software.

- Modify Selected Coefficient
  - Format:
    - ✧ When **Normal Coefficient** or **Low Layer Coefficient** is selected as the **Type**, the **Format** is set to 0~1 by default. The **Format** field will be grayed out and cannot be modified.
    - ✧ When **Low Brightness Compensation Coefficient** is selected as the **Type**, select an option from the **Format** drop-down menu to change the format of the calibration coefficients.

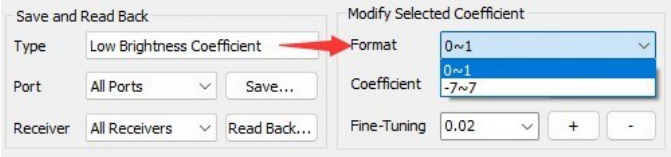


Fig 8.2.1.12 Set format for low brightness compensation coefficient

- ✧ When **Chip Low Brightness Coefficient** is selected as the **Type**, select an option from the **Format** drop-down menu to change the format of the calibration coefficients.

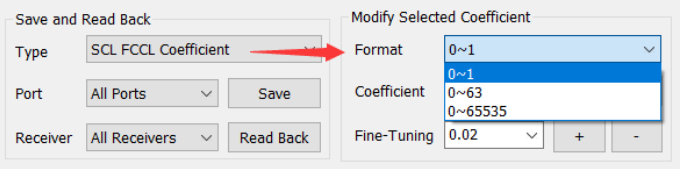


Fig 8.2.1.13 Set format for chip low brightness coefficient

📖 Notes:

1. When changing the **Format** from 0~1 to -7~7, the following formula is used for coefficient conversion:

Extended coefficient = (Original coefficient - 0.5) * 14

2. When changing the **Format** from 0~1 to 0~63, the following formula is used for coefficient conversion:

Extended coefficient = Original coefficient * 64

(When the **Format** is set to 0~63, each adjustment of the coefficient will increase or decrease the value by 1. The result will be rounded to the nearest integer.)

- **Coefficient**: Modify the coefficient in the input field; click **Reset** to reset all coefficients to their default values.
- **Fine-Tuning**: Modify the step in the input field or select a value from the drop-down options to adjust the fine-tuning step, then click + or - to adjust the selected coefficients.

- Virtual Screen

Procedures

Step 1: Select the **Enable** checkbox under **Virtual Screen** to turn on virtual screen calibration. This will display **Pixel Configuration Rule** and **Virtual Green** button in the interface, as well as the **Virtual Green** tab as shown in Figure 8.2.1.14.

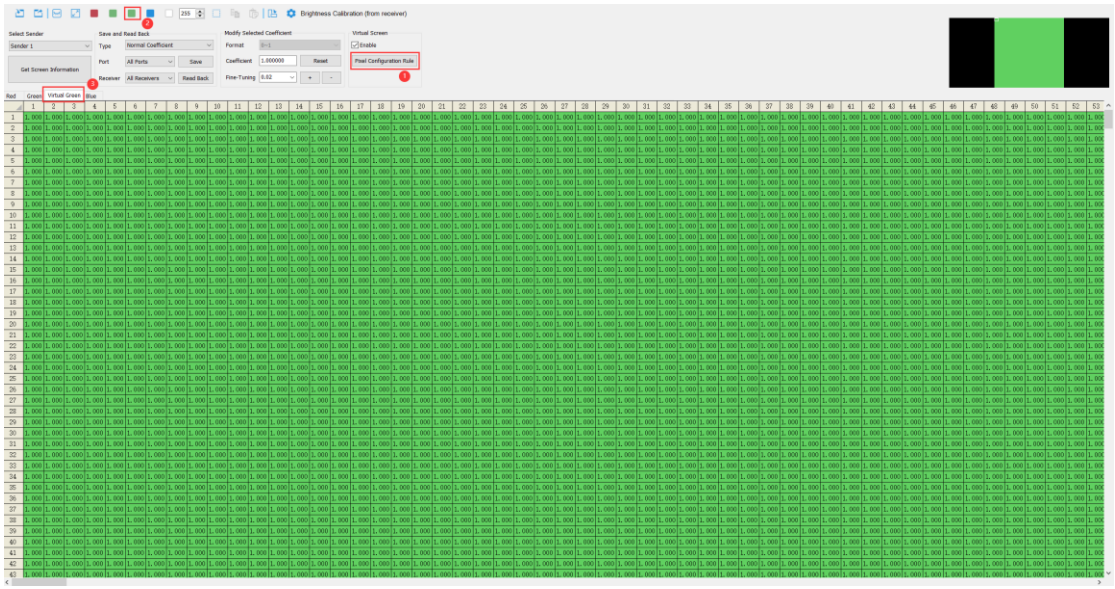


Fig 8.2.1.14 Enable virtual screen

Step 2: Click **Pixel Configuration Rule** to open the dialog box and select one of the rules as shown in Figure 8.2.1.15.

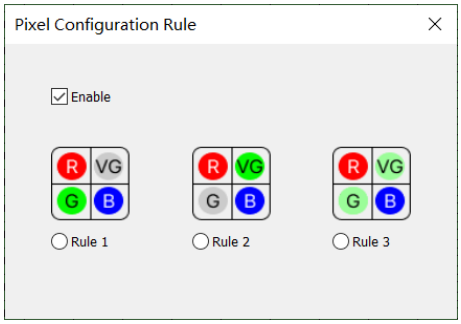


Fig 8.2.1.15 Pixel Configuration Rule

Step 3: Set the calibration coefficients and click **Save** to check the display effect.

Calibration Coefficient Adjustment Area

Each “cell” in the coefficient adjustment area represents a single pixel.

- Click a pixel: Select the coefficient for that pixel.
- Double-click a pixel: Edit the coefficient for the selected pixel.
- Keyboard shortcuts
  - CTRL+A: Select all coefficients.
  - CTRL+C: Copy the real-time coefficients of the selected area.
  - CTRL+V: Paste the previously copied real-time coefficients.

8.2.2 By Receiver

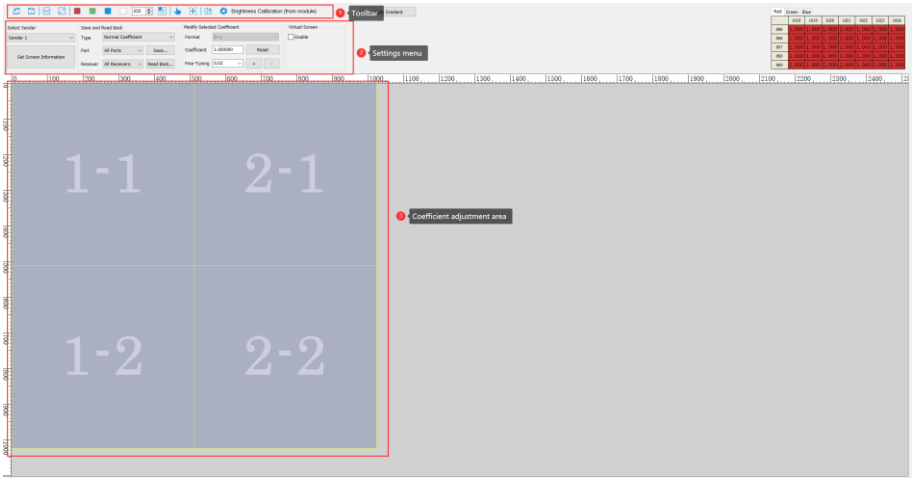


Fig 8.2.2.1 By receiver

Toolbar

The toolbar includes: Import, Export, Show/Hide Screen, Screen Size, 4 buttons for switching screen colors (Red, Green, Blue, White), Grayscale adjustment, Rotate, and Calibration Settings. For related functions, see Chapter 8.2.1 **By Pixel**.

: Click to open the **Module Size** dialog box, then enter the width and height.

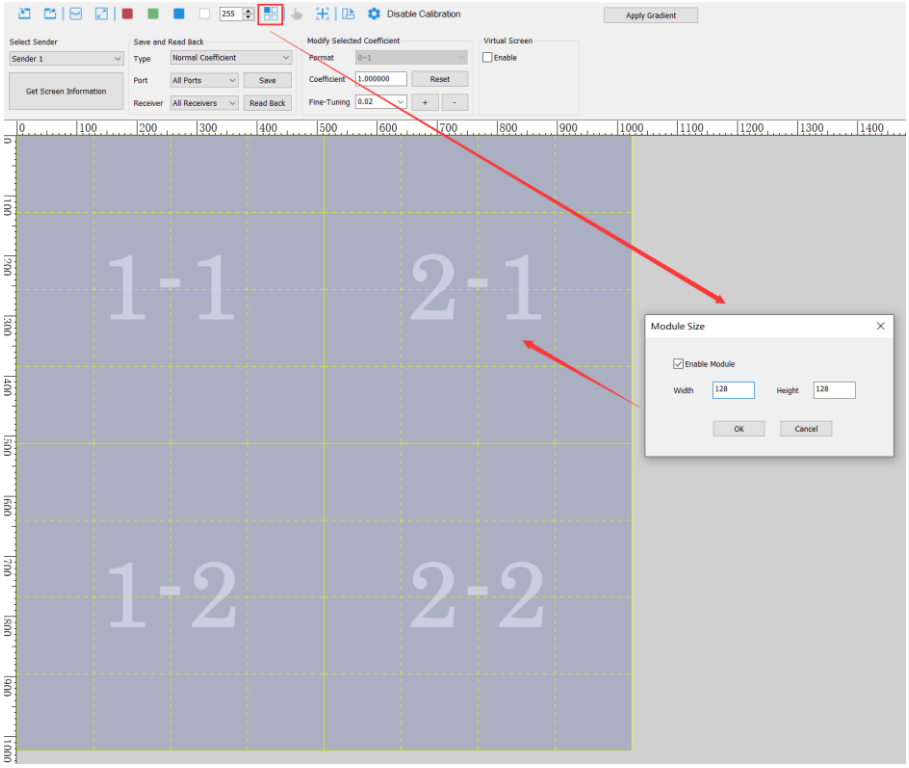


Fig 8.2.2.2 Set module size

: Click this icon and select a receiver card. The selected receiver card will be displayed in highlight mode.

: Click this icon to display a cross cursor in the coefficient adjustment area. The values of the coefficients where you place the cross cursor will be shown in the top-right preview area.

Settings Menu

The functions are the same as the **By Pixel** settings menu. See Chapter 8.2.1 **By Pixel** for details.

- **Apply Gradient**: After making gradient adjustments to the coefficients in the selected area, click **Apply Gradient** to apply the gradient coefficients to the calibration coefficients.

Coefficient Adjustment Area

- If **Enable Module** is unselected:

Select a receiver card area, then right-click to display the menu.

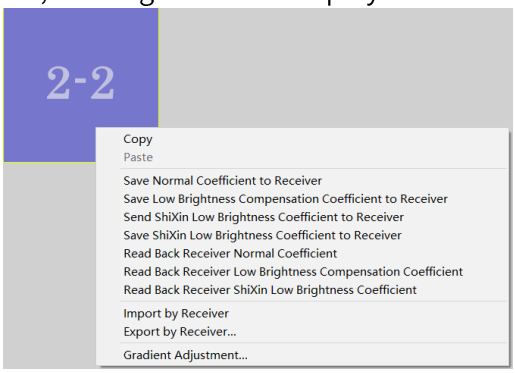


Fig 8.2.2.3 Receiver card context menu

The options under the context menu of the receiver card are described in Table 8.2.2-1.

Table 8.2.2-1 Description of receiver card context menu

Option	Description
Copy	Copy the real-time coefficients of the selected receiver card area.

Paste	Paste the copied real-time coefficients.
Save Normal Coefficient to Receiver	Save the normal coefficient to the selected receiver card.
Save Low Brightness Compensation Coefficient to Receiver	Save the low brightness compensation coefficient to the selected receiver card.
Send Chip Low Brightness Coefficient to Receiver	Send the chip low brightness coefficient to the selected receiver card.
Save Chip Low Brightness Coefficient to Receiver	Save the chip low brightness coefficient to the selected receiver card.
Read Back Receiver Normal Coefficient	Read back the normal coefficient of the selected receiver card.
Read Back Receiver Low Brightness Compensation Coefficient	Read back the low brightness compensation coefficient of the selected receiver card.
Read Back Receiver Chip Low Brightness Coefficient	Read back the chip low bright coefficient of the selected receiver card.
Import by Receiver	Import the coefficients to the selected receiver card area.
Export by Receiver	Export the coefficients from the selected receiver card area and save them to a local file.
Gradient Adjustment	Perform gradient adjustments on the coefficients of the selected receiver card area.

- If **Enable Module** is selected:

Select an area for the module, then right-click to display the menu.

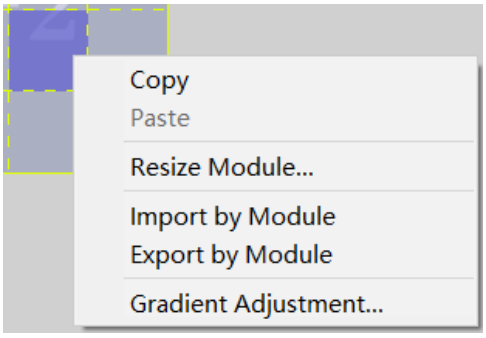


Fig 8.2.2.4 Module context menu

The options in the Module context menu are described in Table 8.2.2-2.

Table 8.2.2-2 Description of module context menu

Option	Description
Copy	Copy the real-time coefficients of the selected receiver card area.
Paste	Paste the real-time coefficients of the copied area.
Resize Module	Open the **Module Size** dialog box.
Import by Module	Import the coefficients to the selected module area.
Export by Module	Export the coefficients from the selected module area and save them to a local file.
Gradient Adjustment	Perform gradient adjustments on the coefficients of the selected module area.

8.2.3 By Module

Prerequisite: The receiver card program supports writing the module UID, and the receiver card parameters are correctly configured for smart modules.

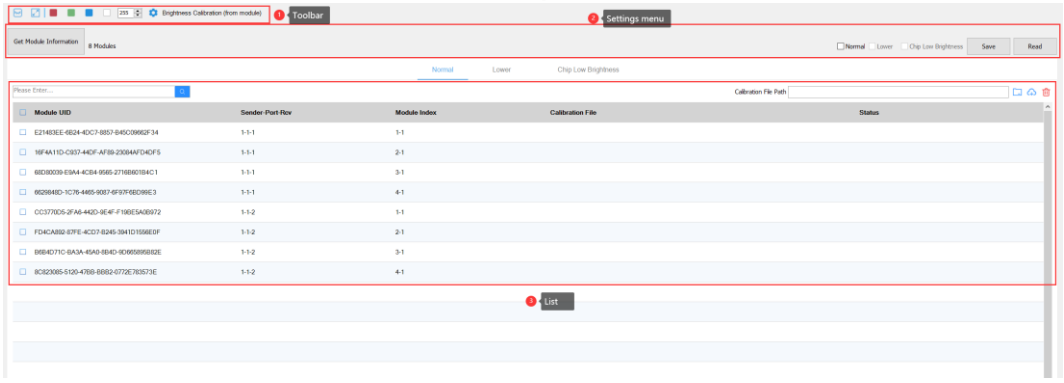


Fig 8.2.3.1 By Module

Toolbar

See Chapter 8.2.1 **By Pixel** for details.

Settings Menu

- **Get Module Information**: Click to get the screen and smart module information, which will be displayed as text to the right of the button.
- Calibration coefficient types: Support 3 types - **Normal**, **Lower**, and **Chip Low Brightness**.
- **Save**: After loading a local calibration coefficient file, click **Save** to save the calibration coefficients of a designated type to the selected module.
- **Read**: Read back the calibration coefficients of a designated type from the selected module, and save them to a local folder.

List

- Tab switching: Switch between the 3 tabs, namely, **General**, **Lower**, and **Chip Low Brightness,** to view the corresponding module information.
- Search: Enter a keyword in the search box and click  to find all modules that match the criteria. The results will be displayed in the list.
- **Calibration File Path**: Display the path of the loaded calibration coefficient folder.
-  : Click to select a local calibration coefficient folder that you want to load.
-  : Click to download the calibration coefficient file from the server.
-  : Delete the loaded correction coefficient file.
- List: Display the obtained module information, as shown in Table 8.2.3-1.

Table 8.2.3-1 Description of module information

List Field	Description
Module UID	Display module UID information.
Sender-Port-Rcv	Display the physical connection location of the modules.
Module index	Consistent with the module indexes as configured in **Receiver Parameters – Smart Module Settings**.
Calibration file	Match the calibration coefficient files from the loaded calibration folder based on the module UID information.
Status	Display readback and saving status of calibration coefficients.

8.2.4 Deseam

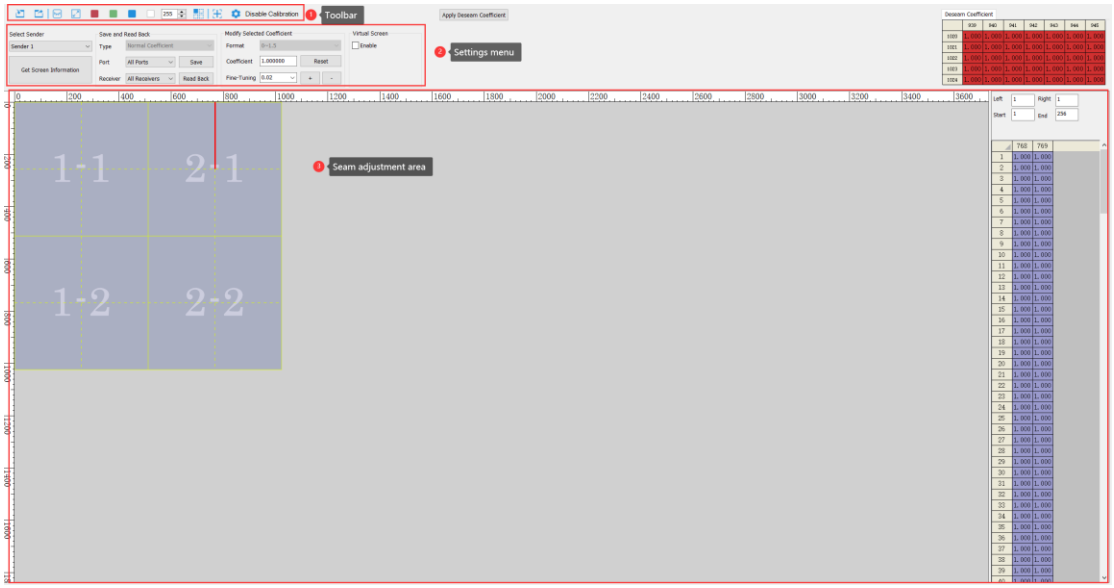


Fig 8.2.4.1 Brightness Calibration – Deseam

Toolbar

See Chapters 8.2.1 **By Pixel** and 8.2.2 **By Receiver** for details.

Settings Menu

See Chapter 8.2.1 By Pixel for details.

- **Reset**: Reset the deseam coefficients of all seams or selected seams.
- **Apply Deseam Coefficient**: After adjusting the coefficients for the selected seam, click **Apply Deseam Coefficient** to apply the deseam coefficients to the calibration coefficients.

Coefficient Adjustment Area

- Deseam settings: Select a seam to adjust its settings for range and coefficients.
- Deseam range settings: The **Seam Settings** area is located to the right or below the coefficient adjustment area. Here, you can enter desired values for **Left**/**Right** to adjust the width of the seam range, and enter desired values for **Start**/**End** to adjust where the seam is positioned.

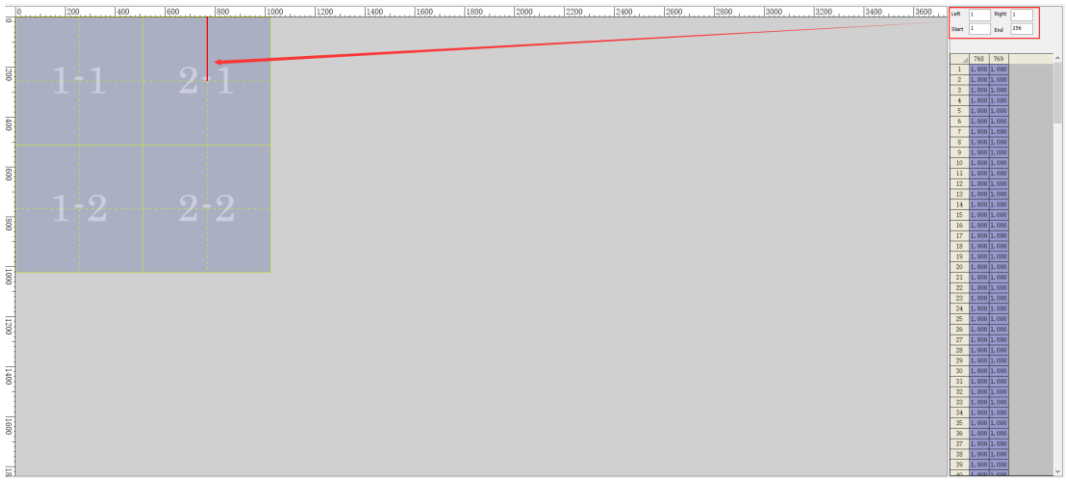


Fig 8.2.4.2 Deseam range settings

- Deseam coefficient settings: Under **Modify Selected Coefficient**, enter values in the input filed of **Coefficient** to set the deseam coefficient.

Fig 8.2.4.3 Deseam coefficient settings

- Context menu: Select a seam and right-click to display the context menu.

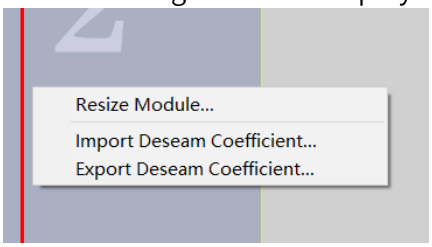


Fig 8.2.4.4 Seam context menu

The options under the seam context menu are described in Table 8.2.4-1.

Table 8.2.4-1 Description of seam context menu

Option	Description
Resize Module	Open the **Module Size** dialog box.
Import Deseam Coefficient	Import deseam coefficients to the position where the selected seam is located.
Export Deseam Coefficient	Export deseam coefficients to a local file.

📖 Note:

- When exporting deseam coefficients, the corresponding seam positions will be automatically saved with the coefficients.
- When importing deseam coefficients, you need to manually enter the deseam positions to match the correct locations.

8.3 Chroma Calibration

Chroma calibration is based on the fundamental principle of chroma compensation, which involves compensating for each primary color by two additional primary colors and adjusting the colors through mixing. Chroma calibration consists of 9 components: Rr, Rg, Rb, Gr, Gg, Gb, Br, Bg, and Bb.

This chapter only introduces the functions of **Color Gamut Adjustment** and **Batch Adjustment**. For the remaining functions, see Chapter 8.2 **Brightness Calibration**.

- Color Gamut Adjustment

: Go to the **By Pixel** tab and click this button to open the **Color Gamut Adjustment** dialog box.

- Step 1: Click the **Original Value** tab to obtain the color gamut of the current screen.

As shown in Fig 8.3.1, there are 4 ways to obtain the color gamut of the receiver card:

- Edit the input values in the table.
- Click **Measure** to measure the color gamut using a colorimeter.
- Import color gamut data.
- Read back data directly from the receiver card.

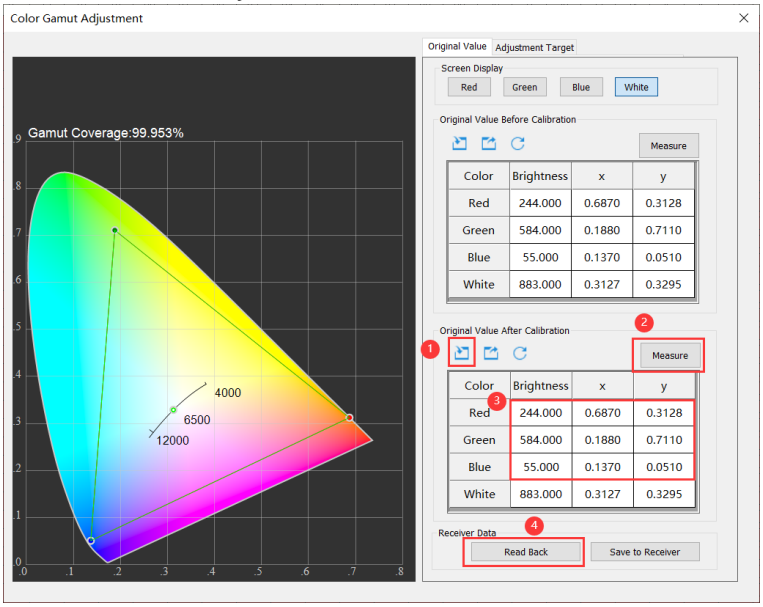


Fig 8.3.1 Obtain original color gamut

📖 Note:

If the screen is already calibrated, first read back the calibration coefficients before adjusting the color gamut. Then, determine whether calibration needs to be performed again based on your specific needs. After that, you can proceed with adjusting the color gamut.

The original value before calibration doesn’ t affect matrix calculation during color gamut adjustment. The matrix calculation is based on the original value after calibration and target color gamut.

■ Step 2: Select the **Adjustment Target** tab to set the target color gamut.

As shown in Fig 8.3.2, there are 3 ways to set the target gamut:

- Choose a target color gamut option.
- Edit the input values in the table.
- Import a target color gamut.

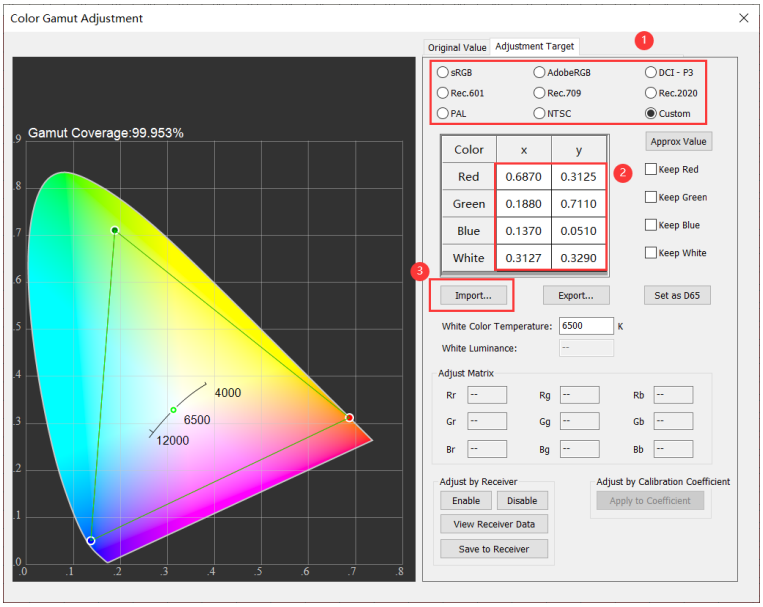


Fig 8.3.2 Set target color gamut

- Step 3: Click **Approx Value** and select the checkboxes for **Keep Red, Keep Green, Keep Blue, Keep White,** or **Set as D65** based on your actual requirements. This will automatically generate an adjust matrix, as shown in Figure 8.3.3.

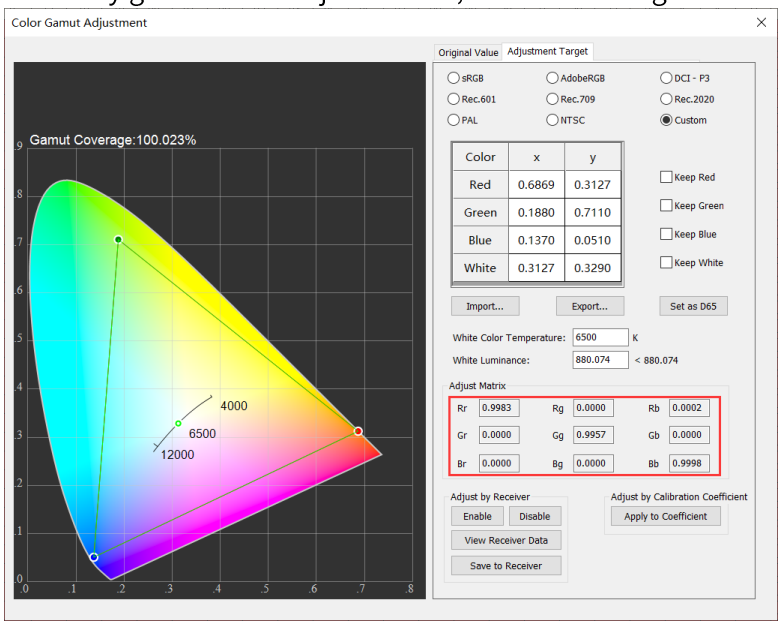


Fig 8.3.3 Generate adjust matrix

- Step 4: Select a desired mode between Adjust by Receiver and Adjust by Calibration Coefficient.

◆ Adjust by Receiver:

- Click **Enable**, then click **Save to Receiver** to complete the color gamut

adjustment for the receiver card. Check the screen to see the effect of the color gamut adjustment, as shown in Figure 8.3.4.

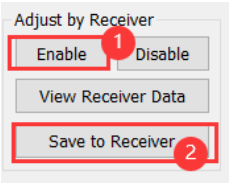


Fig 8.3.4 Adjust by receiver

◆ Adjust by Calibration Coefficient:

- Click **Apply to Coefficient,** then enable **Chroma** and click **Save Calibration Coefficient** to save the adjusted coefficient. Check the screen to see the effect of the color gamut adjustment.

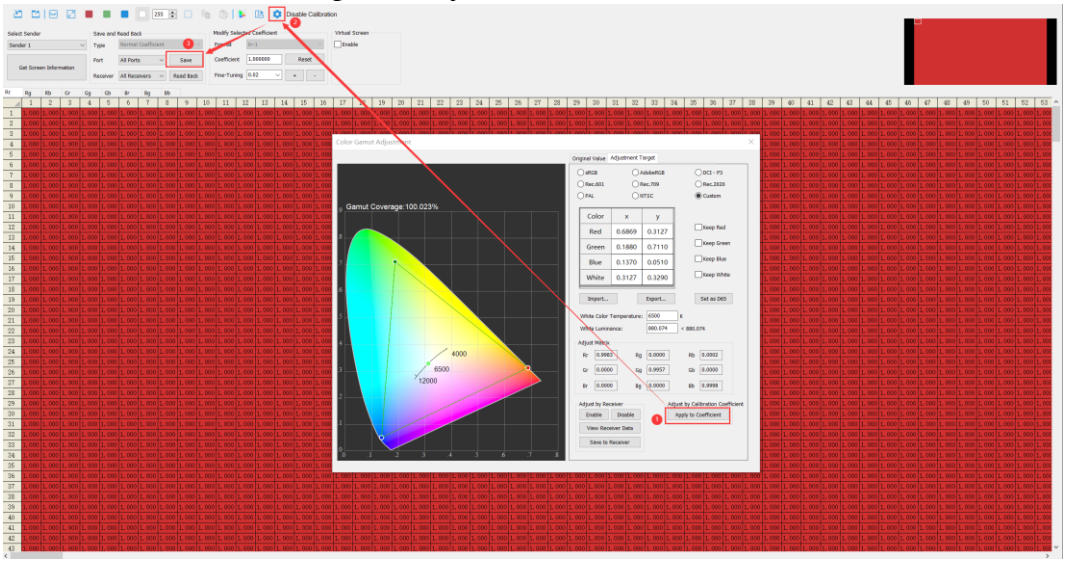


Fig 8.3.5 Adjust by calibration coefficient

● Batch Adjustment

: Go to the **By Cabinet** tab and click this icon to open the drop-down menu. Batch adjustments can be made in **Settings**.

■ Step 1: Click and select **Settings** to open the **Batch Adjustment Settings** dialog box. Select an adjustment mode, add a batch, and modify input values or import batches to set batch information, as shown in Figure 8.3.6.

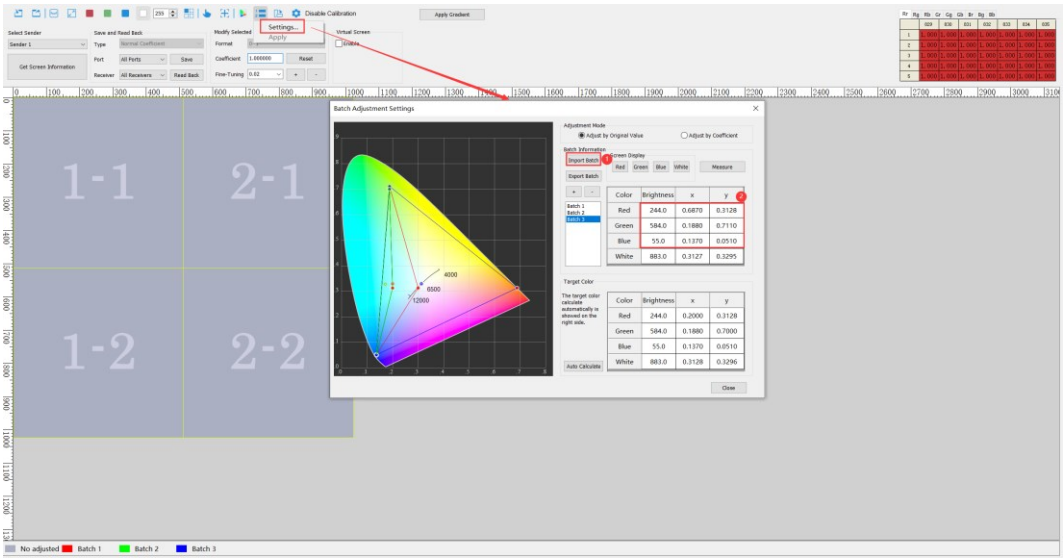


Fig 8.3.6 Set batch information

📖 Note:

If the screen is already calibrated, first read back the calibration coefficients before making batch adjustments. Then, determine whether calibration needs to be performed again based on your specific needs. After that, you can proceed with making batch adjustments.

- Step 2: Close the **Batch Adjustment Settings** dialog box. Then, select a receiver card, right-click and select **Specify Batch** to perform batch designation on the selected card, as shown in Figure 8.3.7.

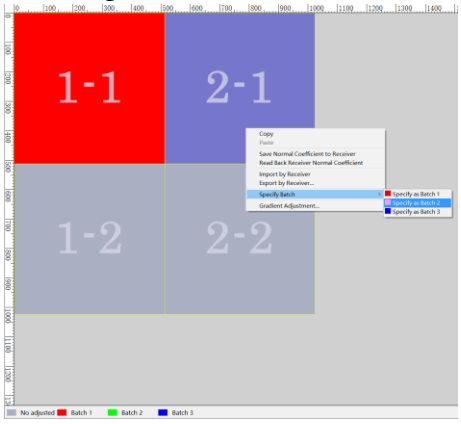


Fig 8.3.7 Specify batch

- Step 3: Click and select **Apply** to apply the batch adjustment to the specified calibration coefficients, as shown in Figure 8.3.8.

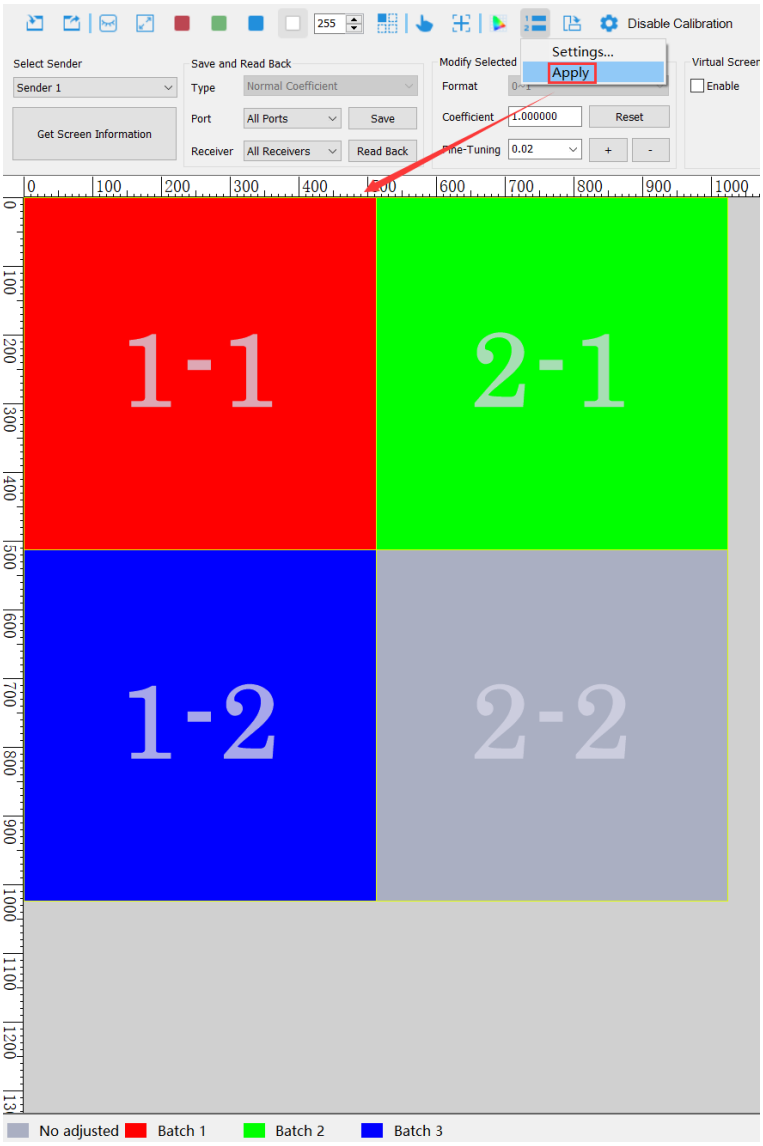


Fig 8.3.8 Apply batch adjustment

- Step 4: Enable **Chroma** and click **Save Calibration Coefficient** to save the adjusted coefficient. Check the screen to see the effect after adjusting the color gamut.

8.4 Special Calibration

8.4.1 Double Layer Calibration

- Brightness Calibration

Step 1: Go to Receiver Parameters > Calibration Settings to enable Low Layer Grayscale and High Layer Grayscale under Double Layer Calibration. Specify the threshold values under Brightness Threshold Adjustment. Then click Save to Receiver,

as shown in Figure 8.4.1.1.

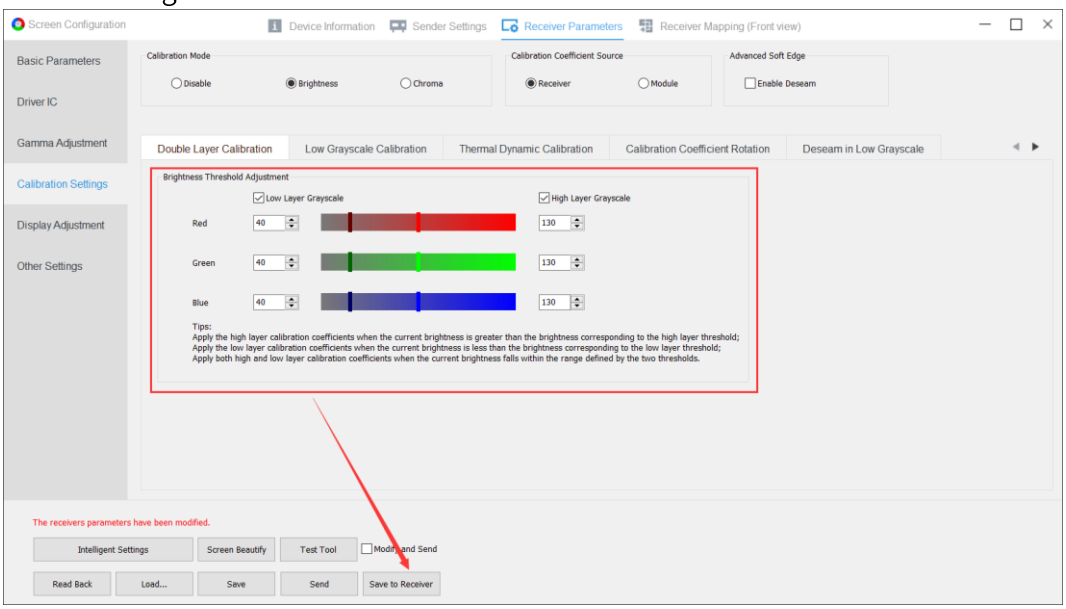


Fig 8.4.1.1 Brightness – Enable double layer calibration

Step 2: Go to Pixel-by-pixel Brightness Calibration, and click Get Screen Information.

To set the high layer coefficient:

- Select the Normal Coefficient type.
- Click **Save** to apply the high layer coefficient.

To set the low layer coefficient:

- Select the Low Level Coefficient type.
- Click **Save** to apply the low layer coefficient.

As shown in Fig 8.4.1.2.

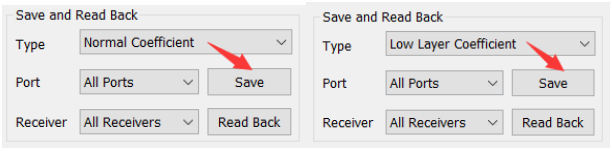


Fig 8.4.1.2 Save high/low level coefficients

Step 3: Adjust the grayscale range for corresponding threshold values and check the display effect.

■ Chroma Calibration

After enabling **Double Layer Calibration**, you can choose **High First** or **Low First** under **Chroma**. The display effect is as follows:

◆ For main components (Rr, Gg, and Bb): The display matches the threshold

settings you configured.

◆ For minor components (Rg, Rb, Gr, Gb, Br, and Bg):

If you select **Low First**: The minor components use only the low layer calibration coefficients.

If you select **High First**: The minor components use only the high layer calibration coefficients.

8.4.2 Low Brightness Compensation Calibration

Step 1: Click **Get Screen Information**. To set the calibration coefficients, select **Low Brightness Coefficient** as the type, then click **Save**, as shown in Figure 8.4.2.1.

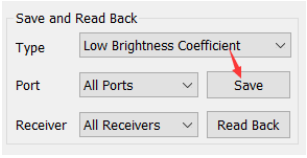


Fig 8.4.2.1 Save low brightness compensation coefficient

Step 2: Click and select **Set Calibration Switch** to open the **Calibration Settings** dialog box. Select the checkbox for **Enable Low Brightness Compensation Calibration**, as shown in Figure 8.4.2.2.

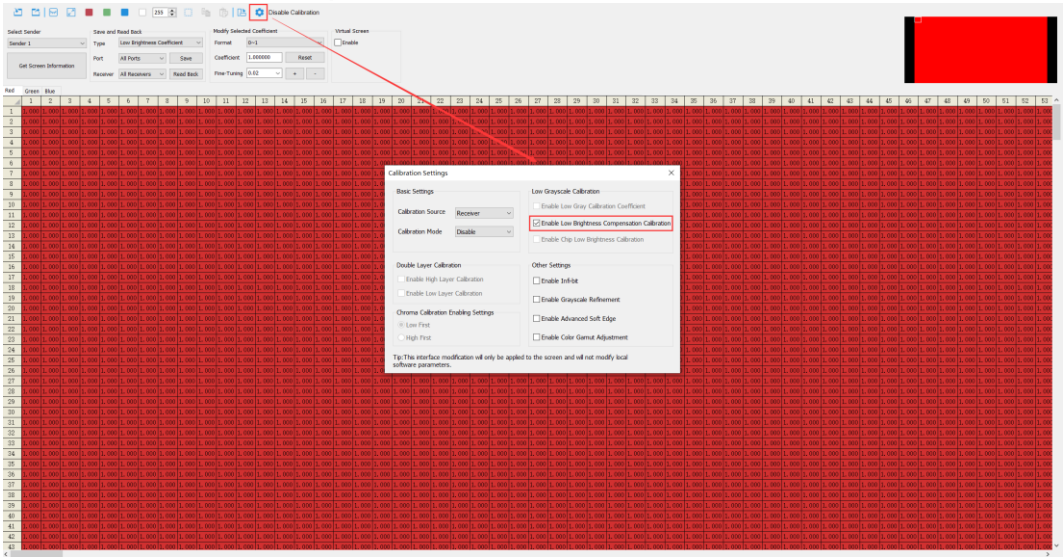


Fig 8.4.2.2 Enable low brightness compensation calibration

Step 3: View the effect of **low brightness compensation calibration** on the screen in low grayscale.

8.4.3 Chip Low Brightness Calibration

Step 1: Click **Get Screen Information**. To set the calibration coefficient, select **Chip Low Brightness Coefficient** as the type, then click **Save**, as shown in Figure 8.4.3.1.

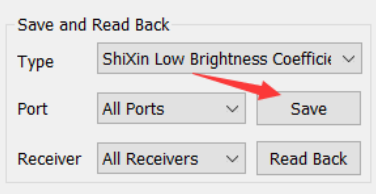


Fig 8.4.3.1 Save chip low brightness coefficient

Step 2: Click and select **Set Calibration Switch** to open the **Calibration Settings** dialog box. Select the checkbox for **Enable Chip Low Brightness Calibration**, as shown in Figure 8.4.3.2.

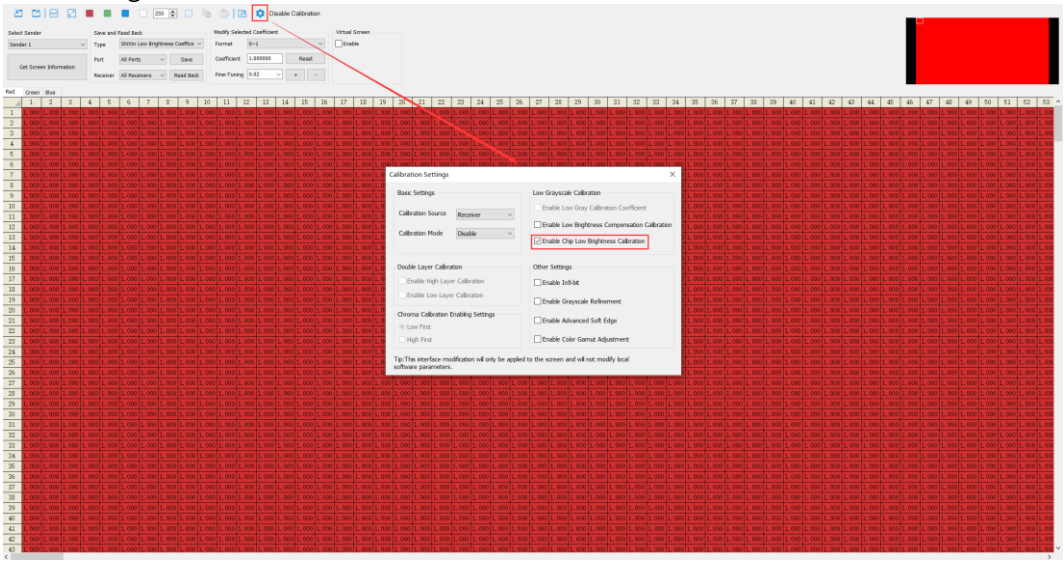


Fig 8.4.3.2 Enable chip low brightness calibration

Step 3: View the effect of chip low brightness calibration on the screen in low grayscale.

8.4.4 Coefficient Backup

Coefficient Backup allows you to save a copy of the calibration coefficients in the backup area of the receiver card.

If the coefficients in the application area of the receiver card get changed, you can click **Restore Backup** to restore the coefficients from the backup area back to the application area. This will restore the calibration effect.

- Enable Coefficient Backup

Enter “dkbf” under **Basic Parameters** and press **Enter** to enable the coefficient backup function in **Brightness Calibration**, as shown in Figure 8.4.4.1.

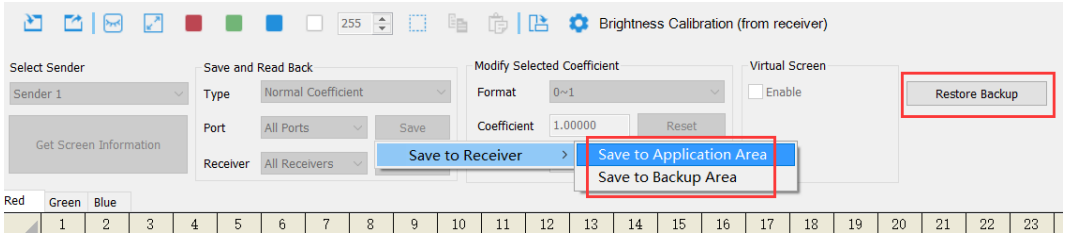


Fig 8.4.4.1 Enable coefficient backup

📖 Note:

For a receiver card program that supports coefficient backup, a **Restore Backup** button will appear under the calibration settings area.

8.4.5 Sender Cascading Calibration

Step 1: Double-click on **Brightness/Chroma** under **Pixel-by-Pixel Calibration** in the main interface to set parameters under **Sender Offset Setting**. Then, click **OK** to access the **Brightness/Chroma Calibration** interface, as shown in Figure 8.4.5.1. (Note: Normally, no offset adjustment is required. Only if the physically connected LED display has an offset do you need to adjust the offset value to match your particular setup.)

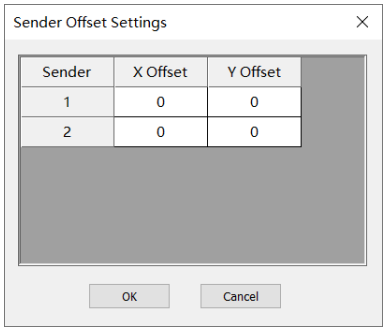


Fig 8.4.5.1 Sender offset setting

Step 2: Click **Get Screen Information**. Then click to set the size and coordinates of the calibration canvas according to the actual screen.

Step 3: Select the desired options under **Type** and **Format** for calibration coefficients.

Step 4: Import the calibration coefficients, or set the calibration coefficients in the coefficient adjustment area.

Step 5: Click and select **Set Calibration Switch** to open the **Calibration Settings**

dialog box. Then, select the desired options under **Calibration Source** and **Calibration Mode**.

Step 6: Switch between different senders and save its calibration coefficients to the corresponding receiver card. Then, check the display effect on the corresponding LED screen, as shown in Figure 8.4.5.2.

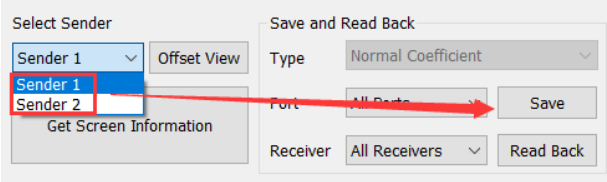


Fig 8.4.5.2 Save calibration coefficients for different senders

9. Multi-function Card

The iM9 Multi-function Card is an important accessory of the Colorlight control system for environmental monitoring and remote control. iM9 can monitor the operating environment of the LED displays in real time. This chapter introduces version 2.0 of the iM9.

9.1 Sensor Information

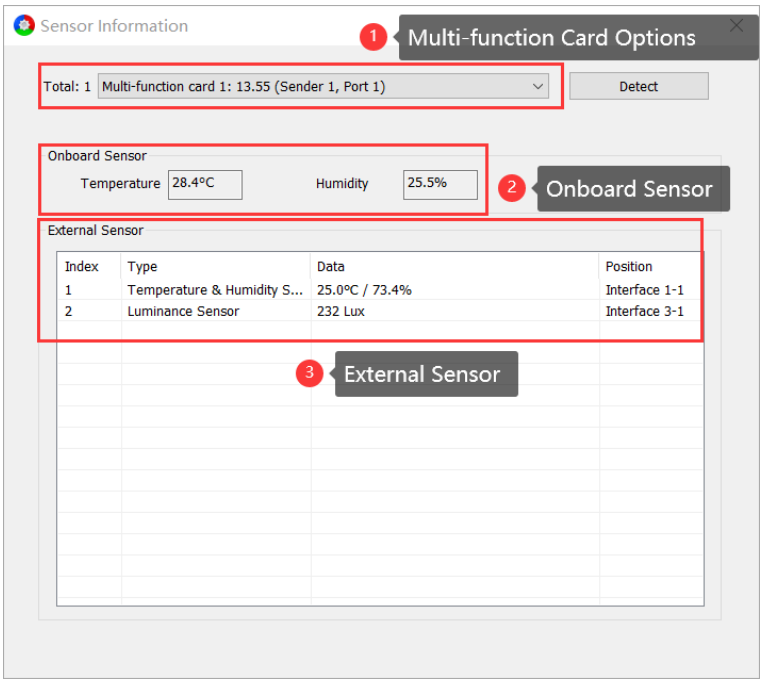


Fig 9.1.1 Sensor information

Multi-function Card Options

- Quantity: Display the total number of connected multi-function cards.
- Dropdown menu: Switch between the dropdown options, with the interface displaying the corresponding sensor information for the selected multi-function card.
- Detect: Click to detect multi-function cards and refresh the interface.

Onboard Sensor

The multi-function card contains built-in onboard sensors that measure temperature and humidity. The software automatically reads data from these sensors.

External Sensor

The description for items under **External Sensor** is shown in Table 9.1-1.

Table 9.1-1 Description of external sensor

Item	Description
Index	Display the external sensor index.
Type	Display the sensor type. The supported sensors include brightness sensors, temperature and humidity sensors, noise sensors, smoke sensors, and air quality sensors.
Data	Display the environmental information detected by the external sensors.
Position	Display the physical interface positions for the external sensors on the multi-function card.

9.2 Relay Control

Multi-function Card Time

This feature is used for the timing control function of Relays J9~J12 on the multi-function card.

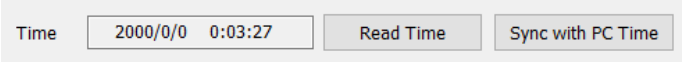


Fig 9.2.1 Multi-function card time

- **Time**: Show the internal clock from the selected multi-function card.
- **Read Time**: Read the current time from the selected multi-function card and update with the latest time.
- **Sync with PC Time**: Sync the selected multi-function card with the local PC time.

Factory Reset

Click **Factory Reset** to clear the commands that have been set for the multi-function card.

Screen Power

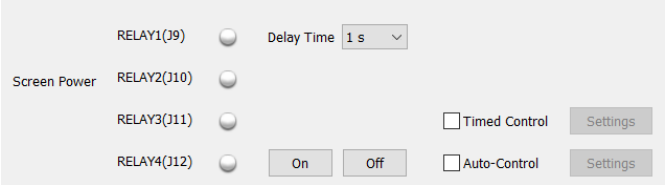


Fig 9.2.2 Screen power

- Click the **On/Off** button to turn on/off screen power manually. Select an option from **Delay Time** to change the time intervals for manually closing/opening J9~J12.
- **Timed Control**: Enable **Timed Control** to set timed control commands.
- Timed control command: Relays J9~J12 will execute the command at the time specified in **Timed Command**.

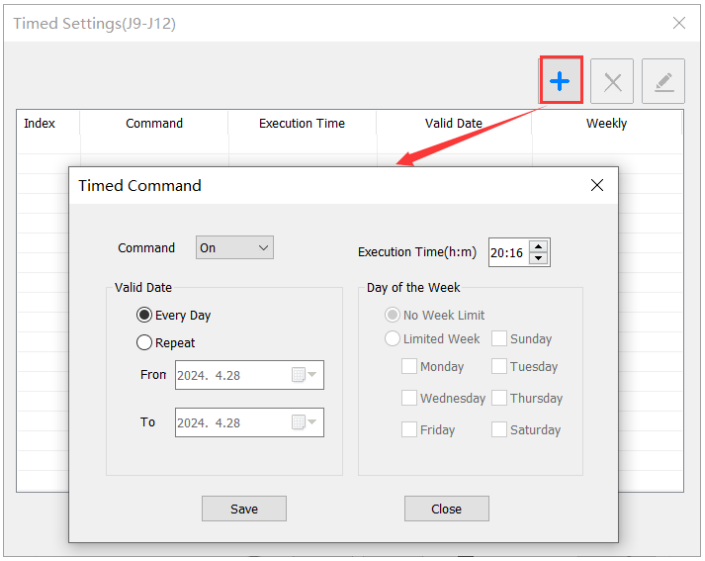


Fig 9.2.3 Set timed command

- Auto-Control: Enable **Auto-Control** to set an automatic control demand.

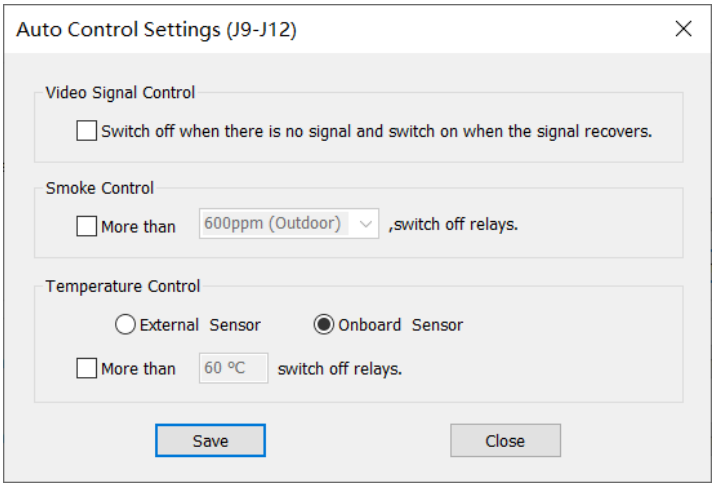


Fig 9.2.4 Auto-control settings (J9-J12)

J13-J16

Fig 9.2.5 J13~J16

- Click the **On/Off** button to control the relay to turn on/off.
- **Auto-Control**: Enable **Auto-Control** to set an auto-control command for the designated relay.

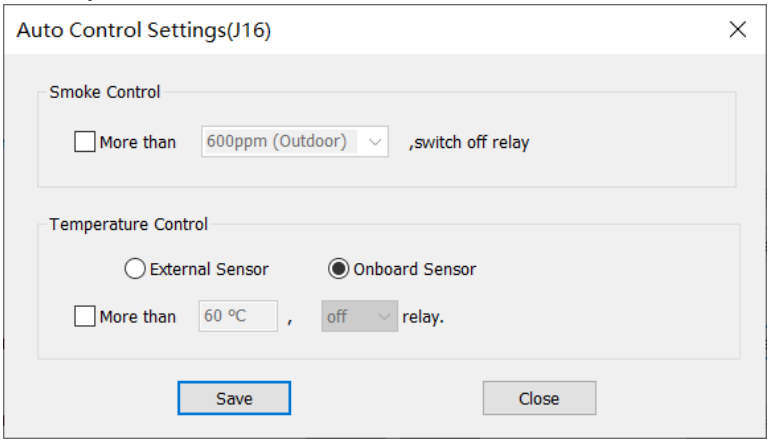


Fig 9.2.6 Auto-control settings

9.3 Auto Brightness Adjustment

Auto Brightness Adjustment

Select the checkbox for **Enable Automatic Adjustment** to enable auto brightness adjustment. When environmental illumination cannot be collected, the display brightness will be adjusted to the level set under **Cannot Collect Illumination, Set The Brightness To**:

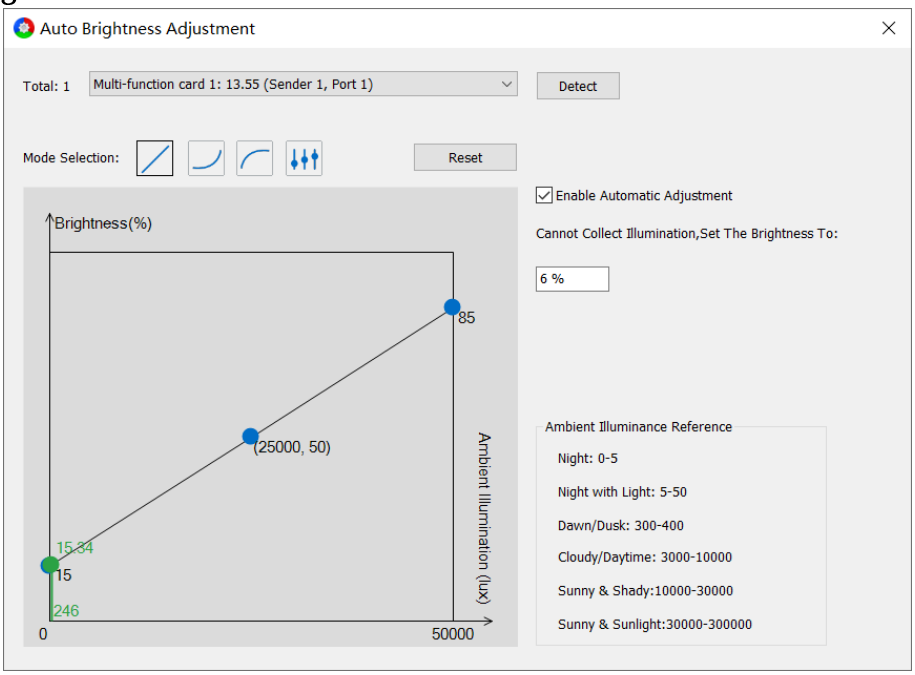


Fig 9.3.1 Enable automatic brightness adjustment

- **Mode Selection**: Click one of the 4 mode icons  to apply corresponding brightness adjustment curve: Linear, Gamma, Anti Gamma, and Custom.
- **Reset**: Click to reset the curve under the corresponding mode.
- Curve adjustment panel: The horizontal axis represents **Ambient Illumination** levels, while the vertical axis represents **Brightness** levels. You can drag the blue dot points on the curve to modify the automatic brightness adjustment curve.

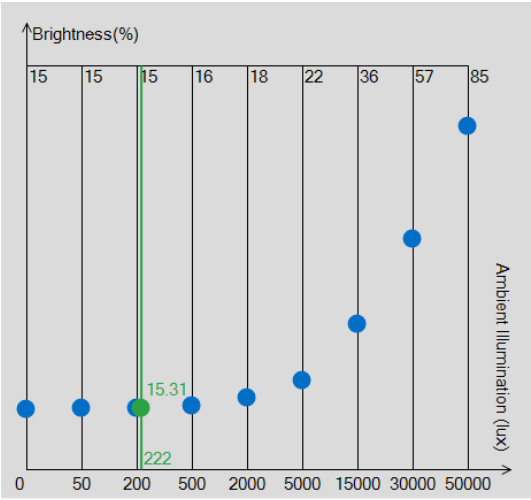


Fig 9.3.2 Curve adjustment panel

- Blue curve: Edit the shape of the **Ambient Illumination** – **Brightness** curve.
- Green line: Show the detected illumination level and the corresponding brightness level of the sender on the automatic adjustment curve.

9.4 Troubleshooting

- Issue 1: After commands are sent from the controller or serial port, the commands are not executed.

1. Use a serial debugging assistant (for example, UartAssist) to check and configure the serial port settings:
   - Select a COM number from the **PortNum** drop-down menu.
   - Configure the serial port parameters, as shown in Figure 9.4.1.

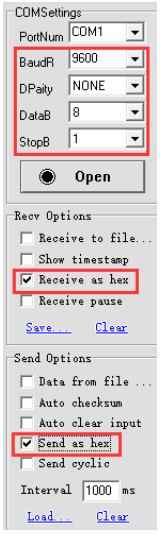


Fig 9.4.1 Set serial port parameters

2. To check if the serial port driver is installed:
   - Go to This PC > Manage > Device Manager > Ports (COM & LPT);
   - Confirm that the serial port listed under **Ports** corresponds to the port selected in the serial debugging assistant, as shown in Figure 9.4.2.

Fig 9.4.2 Serial port number identification

3. Disable Auto-control command on the multi-function card;
4. If commands are issued via the serial port and a correct return value is received but the command is not executed, there are 2 possibilities to check:
   - The same command is being sent repeatedly.
   - The relay is damaged.
5. Manually turn the relay on/off to check if the relay is functioning properly.
6. Ensure the serial port cable is within the 10 meters limit.
7. Adopt the correct wiring method if an adapter cable is used.

- Issue 2: The screen brightness level does not change automatically after configuring **Auto Brightness Adjustment**.

1. Check if the automatic brightness adjustment curve of the multi-function card is configured correctly.
2. Check the sensor information on the multi-function card to determine:
   - If the brightness sensor can be detected correctly.
   - If ambient illumination levels can be measured accurately.
3. Confirm that the multi-function card is connected to Port1 on Sender1.

- Issue 3: Relays J9~J12 are not responding as expected to control signals from the host computer.

1. Check the multi-function card and verify if it can communicate properly with the sender.
2. Check the video source interface of the sender and modify parameters under the icon  if necessary.
3. Manually turn the relay on/off to check if the relay is functioning properly.

- Issue 4: The timed control controls set for the multi-function card are not

functioning.

1. Confirm that the internal clock is working properly by reading the date and time from the multi-function card multiple times.
2. Confirm that the timed commands have been successfully saved to the multi-function card.
3. Manually turn the relay on/off to check if the relay is functioning properly.

10. Monitor

The **Monitor** interface is comprised of 4 key components: Settings, log, toolbar, and information preview area. Its primary function is to monitor connected devices and ensure they are operating normally. The interface constantly monitors device activity, and if any abnormalities are detected, the user is immediately notified via email. This feature helps prevent adverse consequences that may result from device malfunctions.

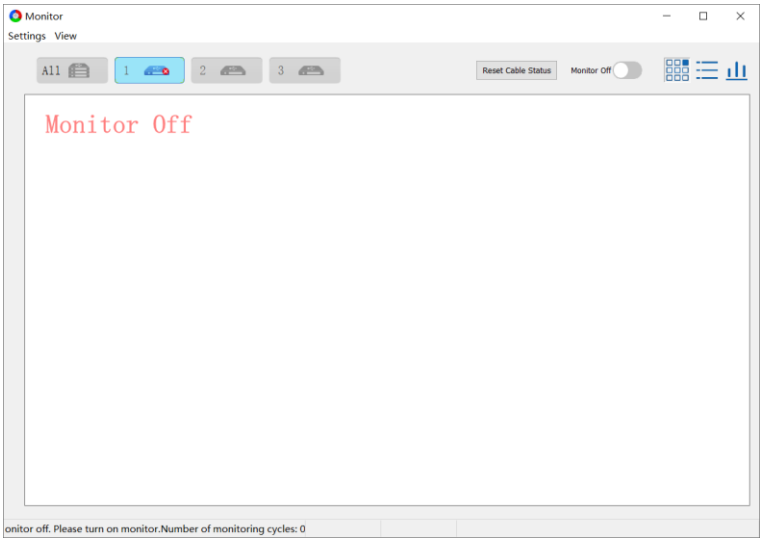


Fig 10.1 Monitor interface

Step 1: Navigate to the **Monitor** interface to turn Monitor on. Then confirm that all devices are connected well.

Step 2: Click **Settings** to open the **Monitoring Settings** dialog box. Configure the settings for **Monitoring Item, Parameter Range** and **Email Settings**, as shown in Figure 10.2.

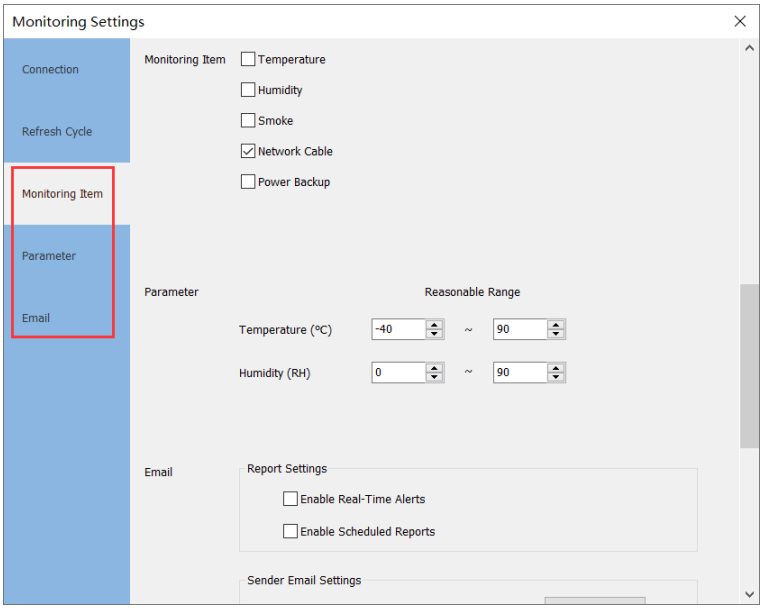


Fig 10.2 Set monitoring item

Step 3: Navigate back to the **Monitor** interface to access and view the monitoring information of the connected devices.

10.1 Toolbar

The toolbar includes a sender selection area, **Reset Cable Status** button, Monitor on/off switch, and 3 icons for preview modes.

Fig 10.1.1 Monitor configuration

- Sender selection area: Display all cascaded senders. Select a sender to view its monitoring information. If a sender is not connected, the  icon will be displayed. If a sender has no signal, the  icon will be displayed.
- **Reset Cable Status**: Click this button to reset the network packets and error packets for the receiver under the selected sender.
- Monitor Off (Default): Click  to turn on Monitor.
- 3 preview modes available: Graphics, List, and Briefing.

10.2 Monitor Preview Area

The preview area displays the information of every connected device. If any device issues are detected, a status banner will scroll at the bottom of the preview area,

showing the total number of monitors as well as the number of abnormal monitors.

- Graphics mode: Display the mapping diagram of the receivers, showing the cascading order of senders from top to bottom in the preview area.

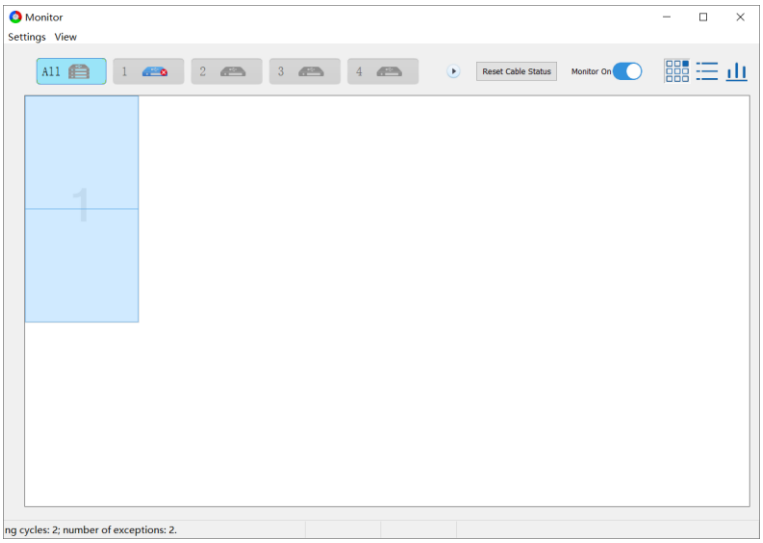


Fig 10.2.1 Graphics mode

- List mode: Display the receiver information in a list organized by the cascading order of their corresponding senders and network port numbers. When abnormalities are monitored, the corresponding list items for those receivers will be highlighted in red.

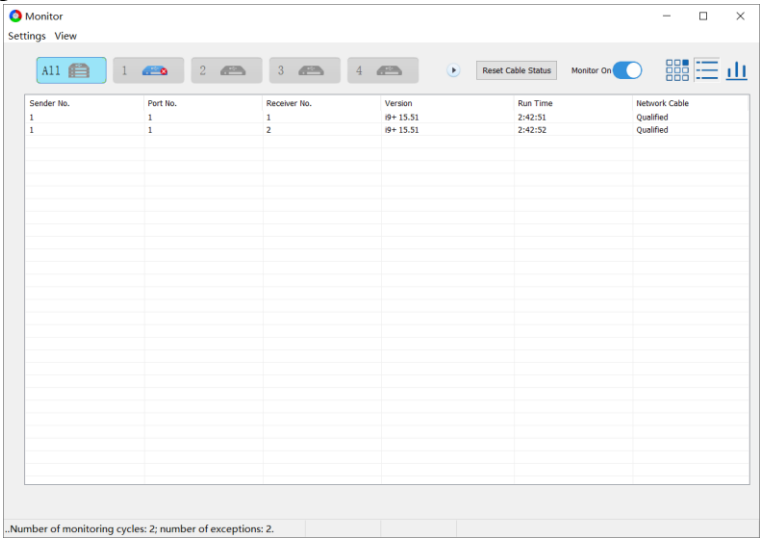


Fig 10.2.2 List mode

- Briefing mode: Display port information in a briefing format organized by the cascading order of their corresponding senders.

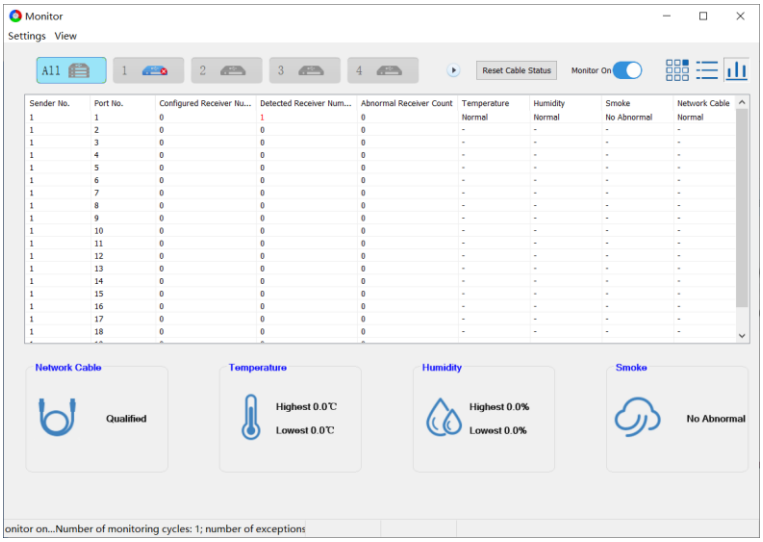


Fig 10.2.3 Briefing mode

10.3 Monitoring Settings

It includes Connection Settings, Refresh Cycle, Monitoring Item, Parameter Range, and Email Settings.

Connection Settings

It supports setting the number of cascaded senders and viewing the number of receivers connected to each sender.

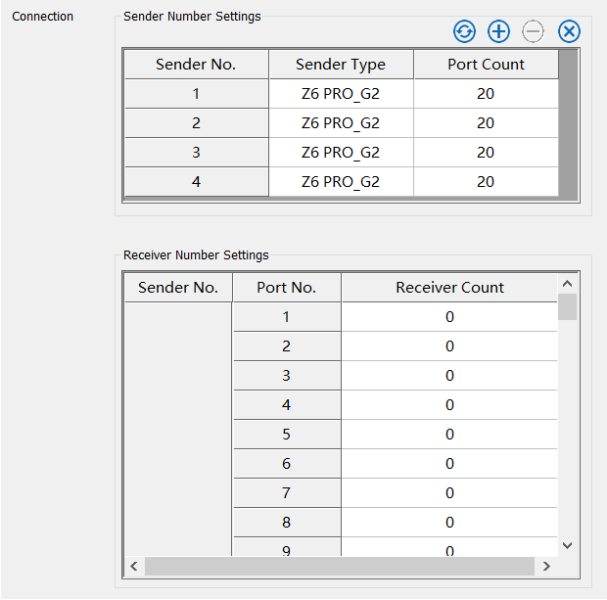


Fig 10.3.1 Connection settings

- : Click this icon to refresh the **Connection Settings** interface.
- : Click this icon to open the **Sender Connection Settings** dialog box, and set

the type and number of the sender.

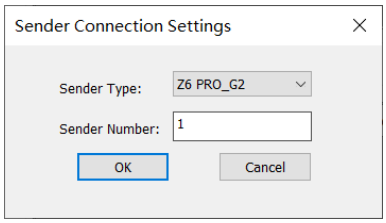


Fig 10.3.2 Sender connection settings

- ⊖: Click this icon to delete the selected sender.
- ⊗: Click this icon to delete all senders.

Refresh Cycle

Set the time for the software to automatically detect the monitoring information.

Monitoring Item

To monitor temperature, humidity, smoke, network cable, and power backup, select the corresponding checkboxes.

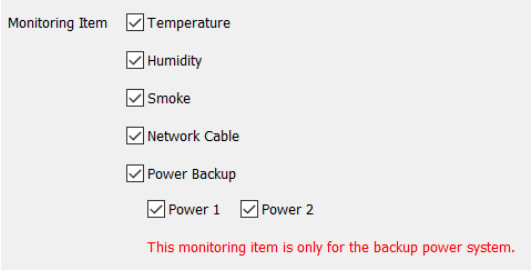


Fig 10.3.3 Monitoring item

Parameter Range

Specify the range for monitoring temperature and humidity.

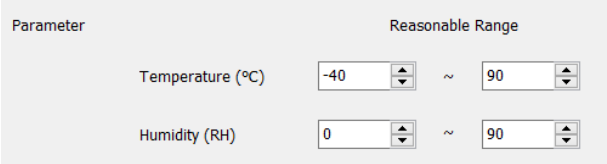


Fig 10.3.4 Parameter range

Email Settings

Monitoring results can be notified to users via email, reminding users to follow up in

time. This allows users to choose between 2 notification modes: **Enable Real-Time Alerts** and **Enable Scheduled Reports**.

- **Enable Real-Time Alerts**: Select this option to receive an email notification if any monitored items exceed their exception thresholds.
- **Enable Scheduled Reports**: Select this option to receive regular monitoring reports by email on a scheduled basis.
- **Sender Email Settings**: Set the Sender’ s email information.

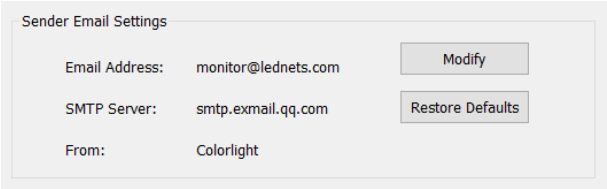


Fig 10.3.5 Sender email settings

- Receiver Email Settings: Enter the user’ s email address.

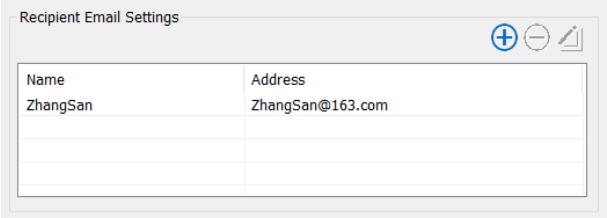


Fig 10.3.6 Recipient email settings

- **Send Test Email**: Click this button to send a test email to the receiving party’ s inbox.

10.4 View History Exceptions and Email Log

Click **View** and then select **View History Exceptions**. This will display the abnormal information of the device recorded after enabling monitor.

Receiver

This feature allows you to view the exceptions monitored by the receiver during a specified time period.

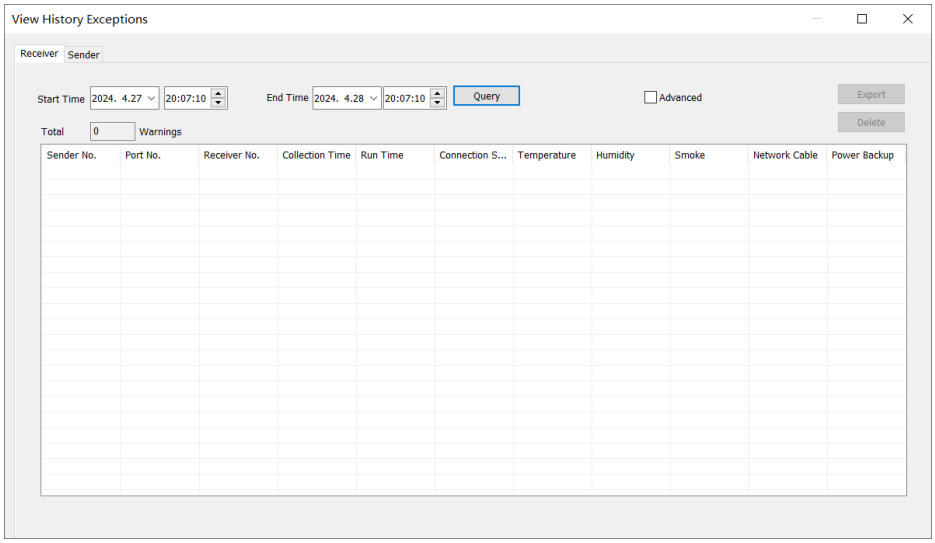


Fig 10.4.1 Exceptions from the receiver

- **Query**: Set **Start Time** and **End Time**, click **Query** to view abnormal information of the receiver within this time period.
- **Advanced**: Select the checkbox for **Advanced** to specify the port the sender should use for queries.
- **Export**: Click the button to export the information in the table and save it to a local file.
- **Delete**: Click the button to delete all contents in the table.

Sender

This feature allows you to view the exceptions monitored by the sender between selected dates/times.

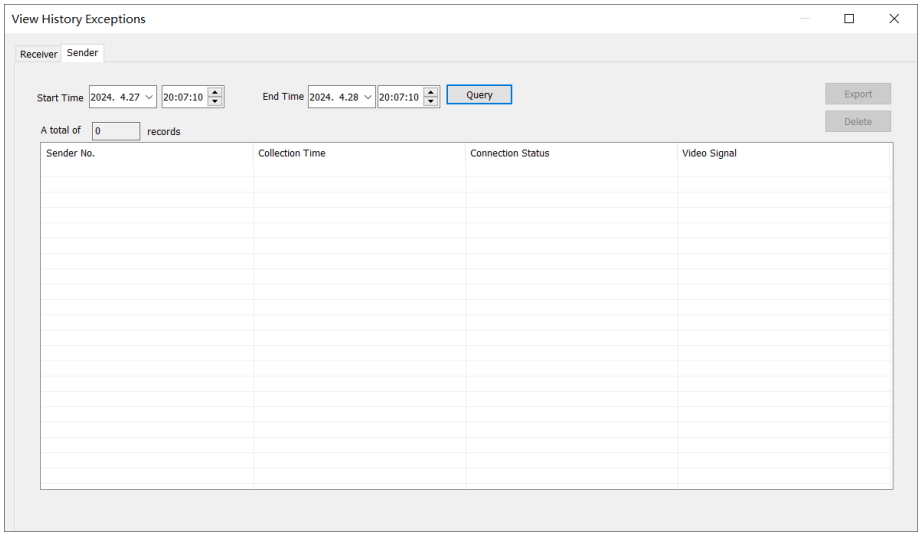


Fig 10.4.2 Exceptions from sender

View Email Log

Click **View** and then select **View Email Log**. This will display all emails sent during monitoring.

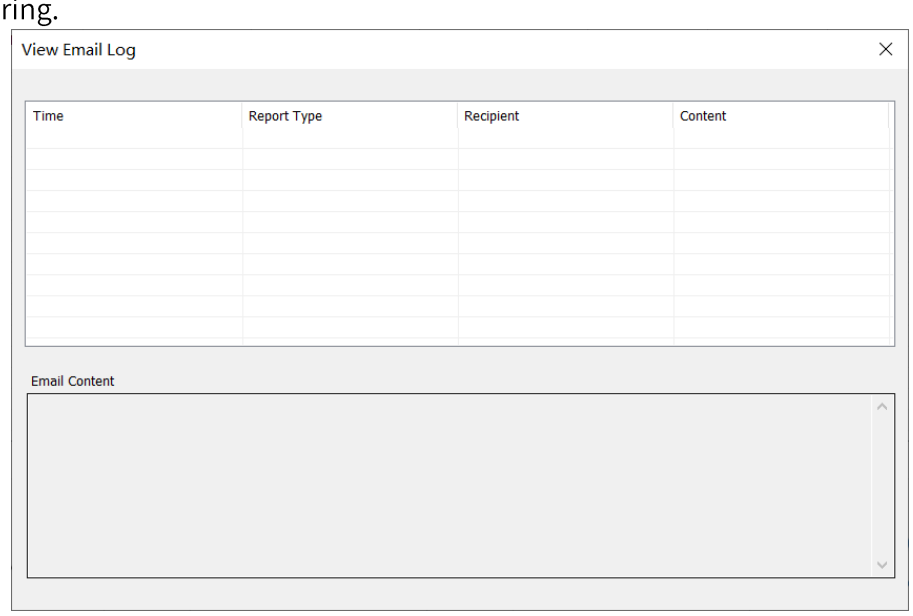


Fig 10.4.3 Email log

11. Smart Module

11.1 Screen Connection

Prerequisite: Go to **Screen Configuration** > **Receiver Parameters** > **Smart Module Settings**. Enter the desired parameter values and then save them to the receivers.

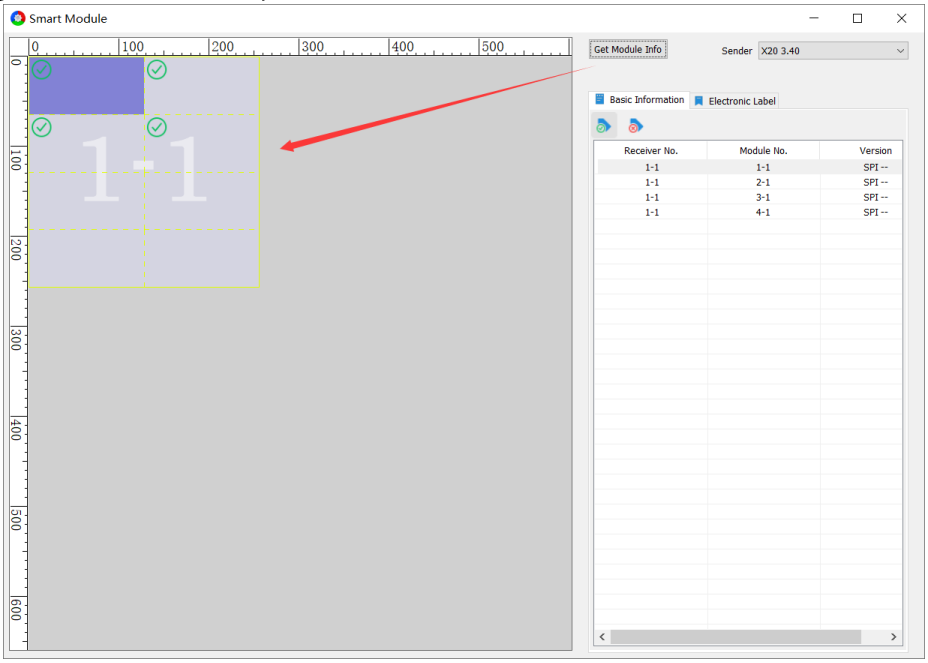


Fig 11.1.1 Smart module information

- **Get Module Info**: Click this button to get the smart module information of the selected sender.
- Drawing area: Show the detected smart modules. Modules that are valid and working properly can be selected. Modules that are invalid or not working will be grayed out and cannot be selected.

11.2 Basic Information

: Click , and the icon of will appear at the top left corner of any valid module within the drawing area.

: Click , and the icon of will appear at the top left corner of any invalid module within the drawing area.

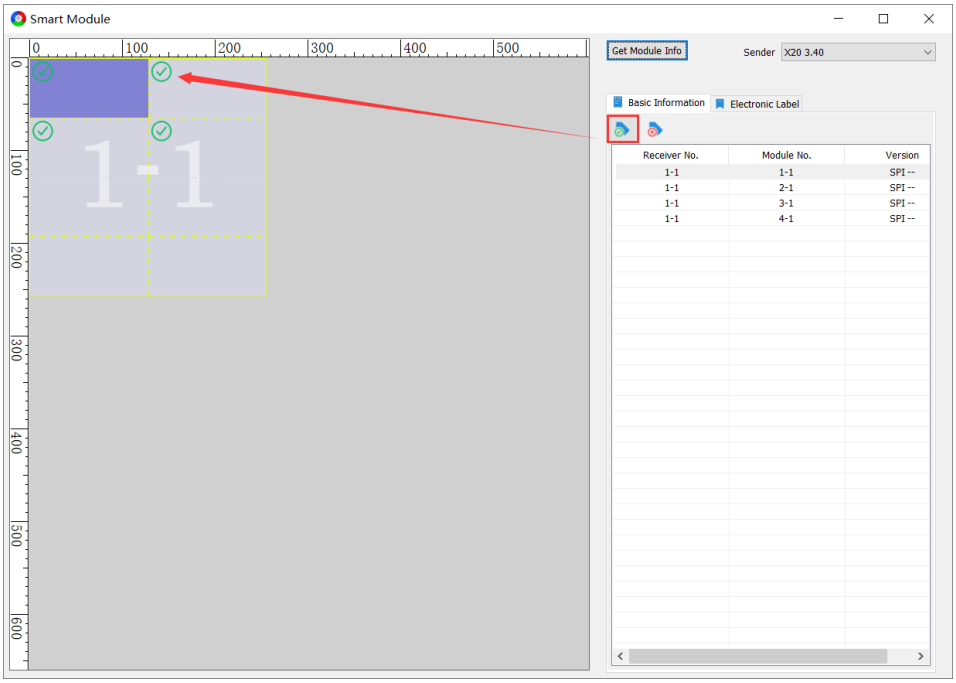


Fig 11.2.1 Mark valid module

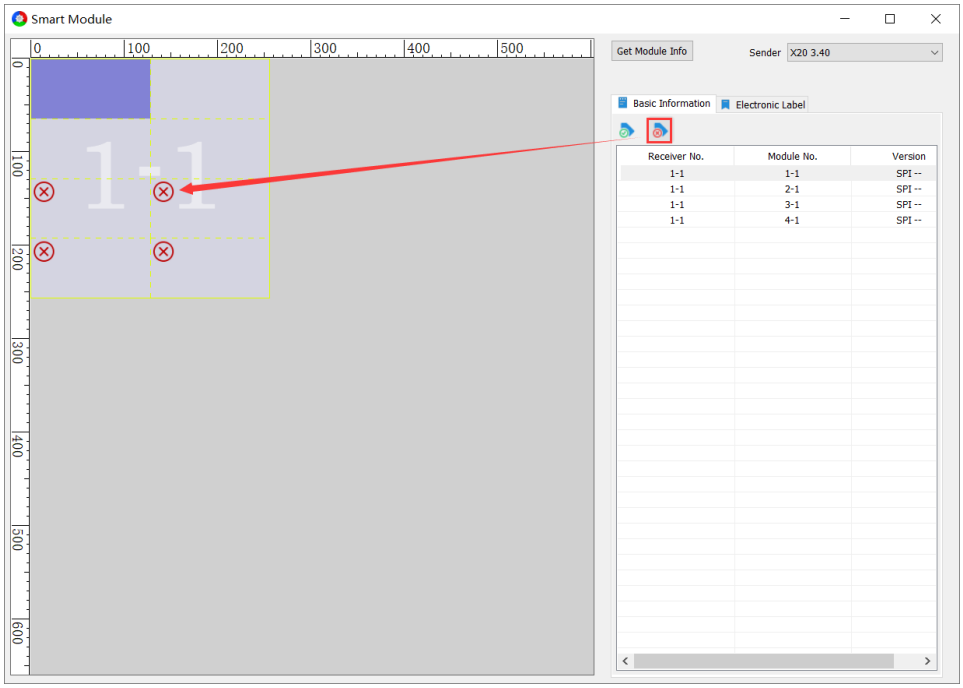


Fig 11.2.2 Mark invalid module

The list on the right side displays information of valid modules. The description of the list field is shown in Table 11.2-1.

Table 11.2-1 Description of list field

List Field	Description
Receiver No.	Display the sender’ s “Port No. –Receiver No.”.
Module No.	Consistent with the smart module number set in **Receiver Parameters**.
Version	Display the version of smart modules.

11.3 Electronic Label

Click Electronic Label to switch to the **Electronic Label** tab.

- Functions

: Select a smart module, then click the icon to import the electronic label from a local file.

: Select a smart module, then click the icon to export the electronic label of a smart module to a local file.

Delete All: Click to delete the electronic labels of all smart modules.

Write: Click to write the electronic label to the selected smart module.

Descriptions of the electronic labels are shown in Table 11.3-1.

Table 11.3-1 Description of electronic labels

Parameter	Description
Module ID	Enter an intelligent module ID.
Brightness and Color (Before Calibration)	Enter the desired brightness and color parameters before calibrating the screen.
Brightness and Color (After Calibration)	Enter the desired brightness and color parameters after calibrating the screen.
Note	Enter a remark for the selected smart module.

- Electronic Labels Writing Procedures

Step 1: Select a module and click **Read**, as shown in Figure 11.3.1.

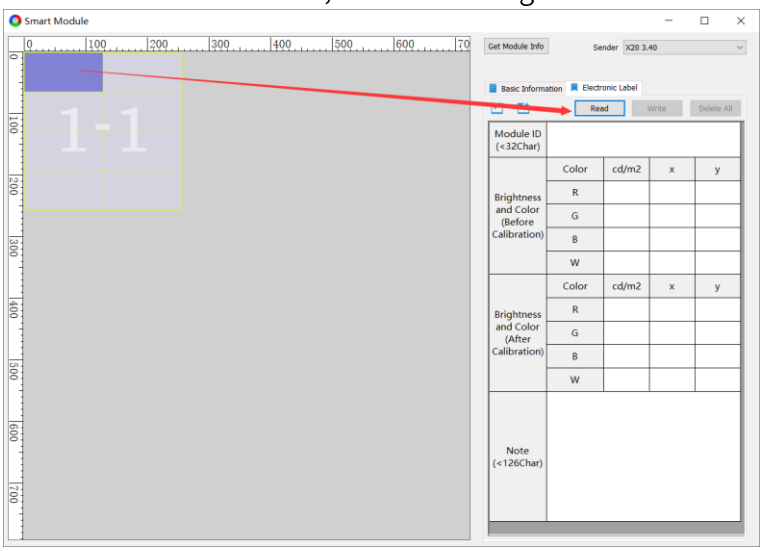


Fig 11.3.1 Read module label

Step 2：Click the **Import** icon above the table or enter the label information directly in the table, as shown in Figure 11.3.2.

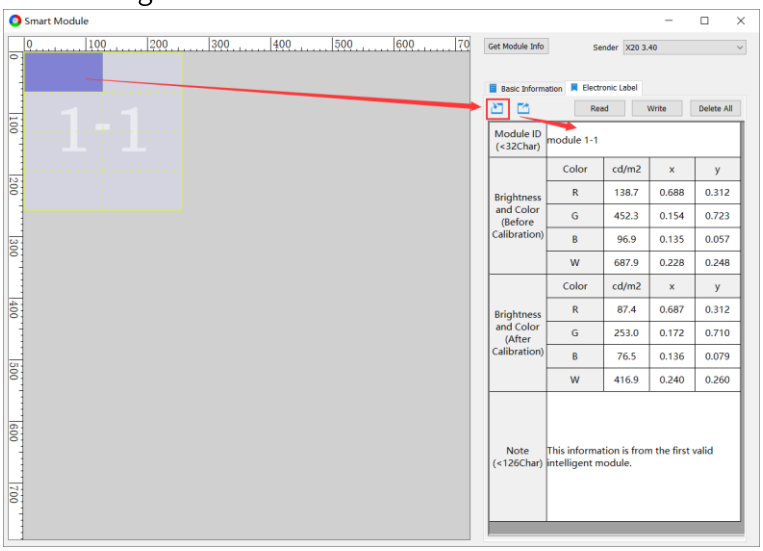


Fig 11.3.2 Import electronic labels

Step 3: Click **Write** to write the electronic label to the selected module. Once the label is written, the icon will be displayed at the top left of the module in the drawing area, as shown in Figure 11.3.3.

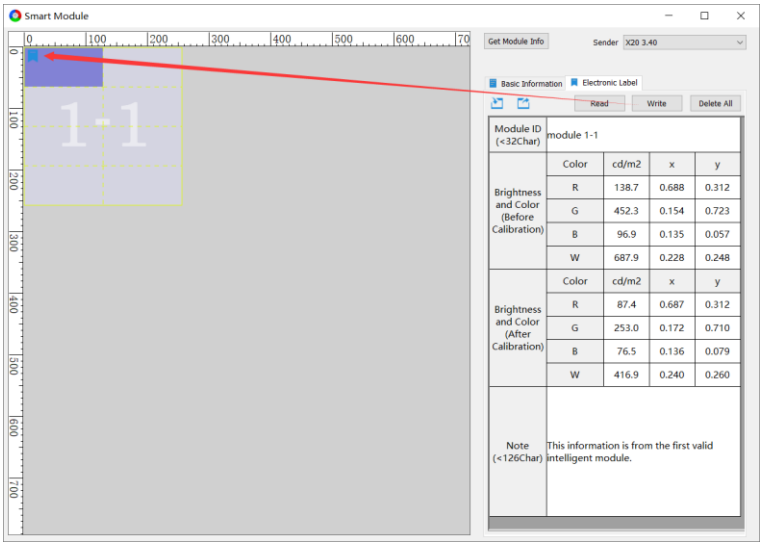


Fig 11.3.3 Write electronic labels

12. Pixel-by-Pixel Detection

This feature allows for detecting if any LED beads are malfunctioning. It will display the number of red, green, and blue beads detected as dead pixels in the **Dead Pixels Detected** list. To use this function, you need a compatible LED cabinet and the receiver program.

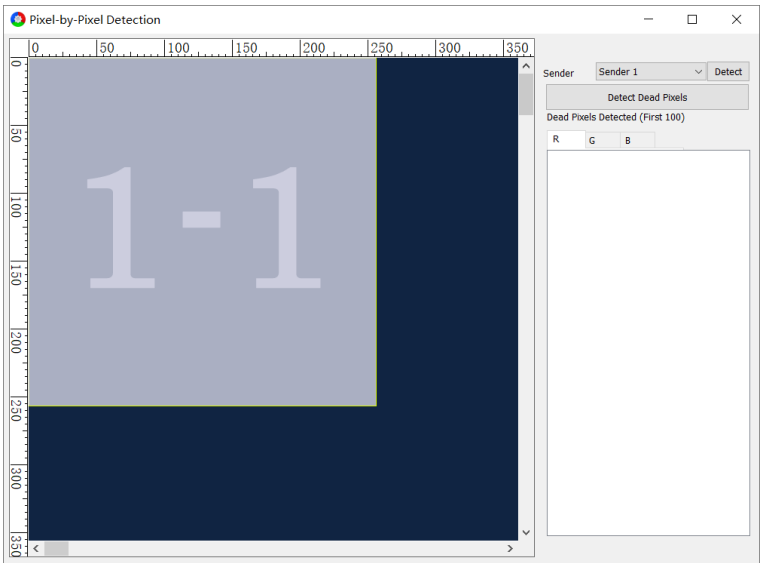


Fig 12.1 Pixel-by-pixel detection

- **Detect**: Detect all senders.
- **Detect dead pixels**: Click this button to perform a pixel-by-pixel detection of the selected sender, and display the number of malfunctioning LED beads.
- Information area: Display the number of malfunctioning LED beads detected for the selected sender. The totals are shown under the R, G, and B categories respectively.
- Preview area: Display the mapping diagram of the currently senders.

13. Prestored Image

13.1 Prestore Screenshot

- Unselect the checkbox next to **LEDSetting is generating prestored image**. Click the **Capture** button to save the last displayed frame (still frame) as a prestored image.
- Select the checkbox next to **LEDSetting is generating prestored image**. Click the **Capture** button to save the image loaded by LEDSetting as a prestored image.

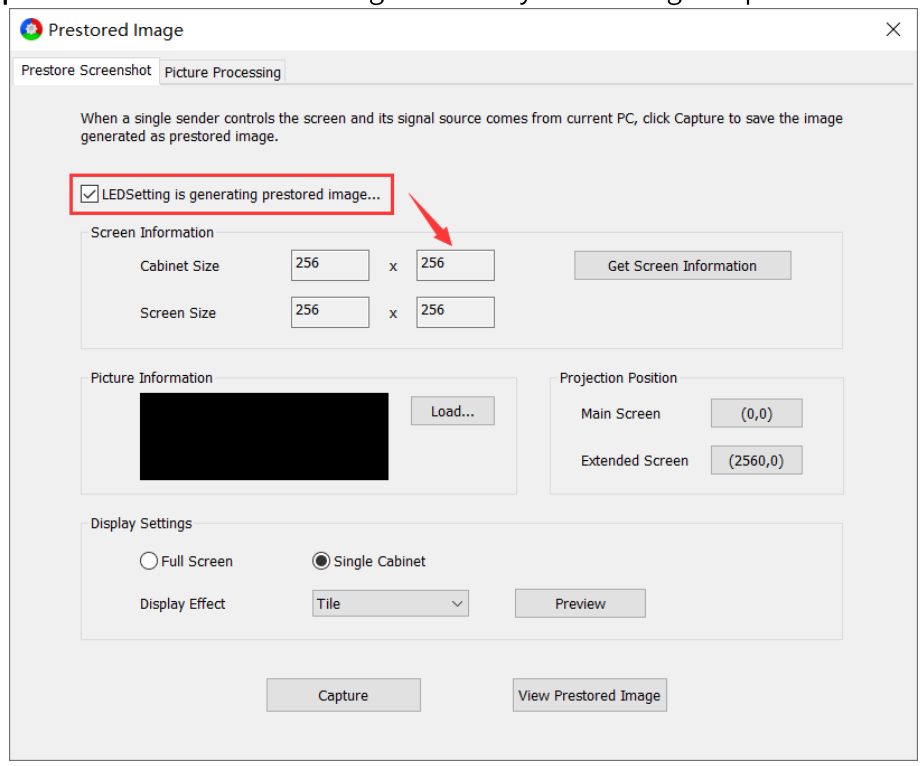


Fig 13.1.1 Prestore screenshot

Procedures

Step 1: Click **Get Screen Information** to view the cabinet size and screen size.

Step 2: Click **Load** to load a picture to be captured.

Step 3: Choose a desired projection position and the picture will be displayed on the corresponding area of the screen.

📖 Notes:

To choose where the picture is displayed:

1. Selecting **Main Screen** under **Projection Position** will show the picture on the computer’s duplicate screen.

2. Selecting **Extended Screen** under **Projection Position** will show the picture on the computer’s extended screen.

Step 4: After setting the picture display mode and effect, click **Preview** to view the picture effect.

Step 5: Click **Capture** to save the loaded picture as a prestored image.

Step 6: Click **View Prestored Image** to view the prestored picture on the screen.

Functions

The functions of **Prestore Screenshot** are described as shown in Table 13.1-1.

Table 13.1-1 Description of prestore screenshot

Area	Parameter/Button	Description
Screen Information	Cabinet Size	Display the width and height of the cabinet.
	Screen Size	Display the width and height of the screen.
	Get Screen Information	Get the screen information by updating the cabinet size and screen size values.
Picture Information	Load	Load a picture from a local file. The selected picture will appear in the preview area on the left side of the interface.
Projection Position	Main Screen/Extended Screen	Switch the projection position between **Main Screen** and **Extended Screen**.
Display Settings	Full Screen/Single Cabinet	Switch the display mode of a selected picture between **Full Screen** and **Single Cabinet**.
	Display Effect	Switch the display effect of a selected picture between **Tile** and **Stretch**.
	Preview	Preview the picture’s effect at the chosen projection position.

Button	Capture	Save the captured picture as a prestored image.
	View Prestored Image	Display the prestored image on the screen.

13.2 Picture Processing

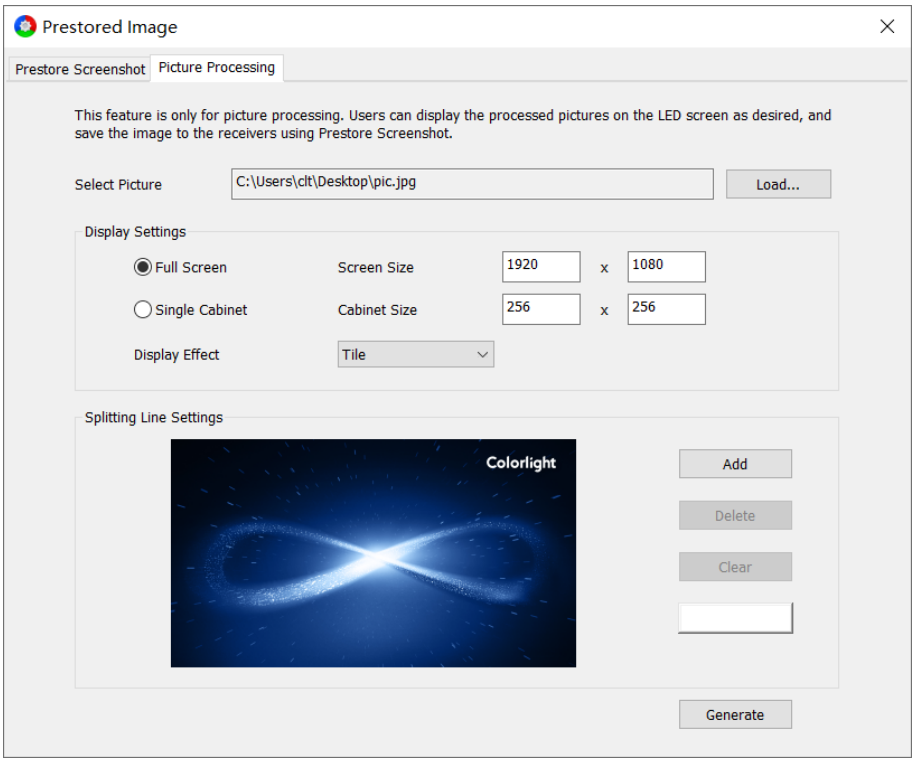


Fig 13.2.1 Picture processing

Procedures

Step 1: Click **Load** to load a picture.

Step 2: Enter the desired screen size and cabinet size. Then, choose a display mode and an effect for the picture.

Step 3: Add splitting lines where you want to divide the picture.

Step 4: Click **Generate**. This will split the image along the lines you added under **Splitting Line Settings** and save the pieces to local files.

Functions

The functions of **Picture Processing** are prescribed as shown in Table 13.2-1.

Table 13.2-1 Description of picture processing

Area	Parameter/Button	Description
Select Picture	Load	Load a picture from a local file, and its file path will display in the text field.
Display Settings	Full Screen/Single Cabinet	Switch the display mode of a selected picture between **Full Screen** and **Single Cabinet**.
	Display Effect	Switch the display effect of a selected picture between **Tile** and **Stretch**.
	Screen Size/Cabinet Size	Adjust the width and height of the screen and the cabinet.
Splitting Line Settings	Left Side Preview Area	Display the display effect of a selected picture.
	Add	Add a splitting line, and adjust its direction and position.
	Delete	Delete the most recently added splitting line.
	Clear	Clear all splitting lines.
	Splitting Line Settings	Click  to select a desired color for splitting lines.
Button	Generate	Split the picture along the lines you added under **Splitting Line Settings** and save the pieces to local files.

14. 3D Function Box

Detect the model, connection status, program, and mainboard temperature of the 3D function box.

Note: LEDVISION does not support connecting to sender via LAN port and detecting 3D function box.

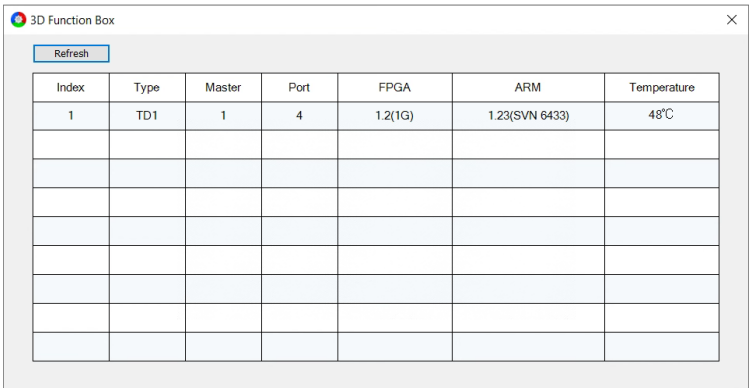


Fig 14.1 Detect 3D function box

15. Timing Command

The timing command table is a function in LEDSetting software, and the timing commands can only be executed in the main interface of LEDSetting, timing command dialog box, and test tool dialog box.

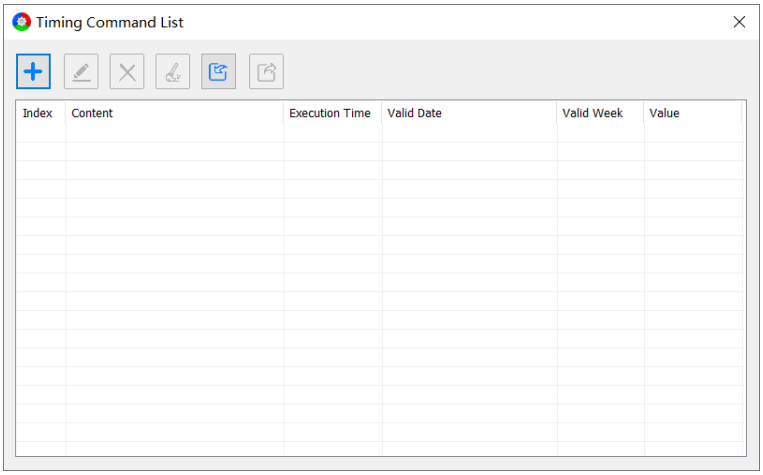


Fig 15.1 Timing command list

Timing Command Content

Enable/disable screen power: Work with the multi-function card to control the screen power supply via multi-function card relay.

Enable/disable screen display: Set the blackout status of sender.

Set the screen brightness/color temperature: Set the brightness/color temperature of the sender.

Timing Command Execution

Select a command in the list, and the command can be executed as long as the execution duration is within 15 seconds; If not selected, the command will not be executed.

If there are multiple commands with the same execution time, within a time frame of 15 seconds, execute the commands sequentially every 3 seconds according to the order in the list. After 15 seconds, no further commands will be executed.

16. Player Mode

Go to Screen Configuration > Device Information, and select Player next to Select Sending Mode.

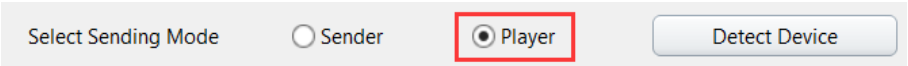


Fig 16.1 Switch to player mode

Main Interface

Access the main interface in the **Player** mode.

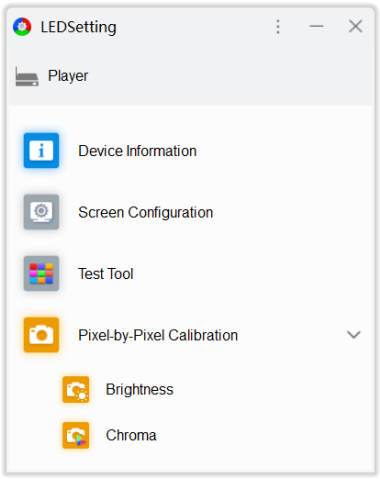


Fig 16.2 Main interface

- The main interface contains 4 default modules: Device Information, Screen Configuration, Test Tool, and Pixel-by-Pixel Calibration.
- Use the Software Module and Software Settings tools to:

1. Configure the display status of main interface modules.
2. Arrange the order of modules displayed in the main interface.

Screen Configuration

- Device Information

Display information for all connected devices.

Fig 16.3 Device information

- **Detect Device**: Click to display a list of information about the connected devices.

- List: Sender/Player information is displayed on the left side, while the receiver information is displayed on the right side. See Chapter 4 **Device Information** for details.

- Player Settings

: Click this icon to detect a player and refresh the interface.

Device List: When two or more players are cascaded together, all connected players will be shown in the device list. You can select a player icon to access that device and configure its settings.

For more advanced player configuration options, we recommend downloading the "PlayerMaster" software.

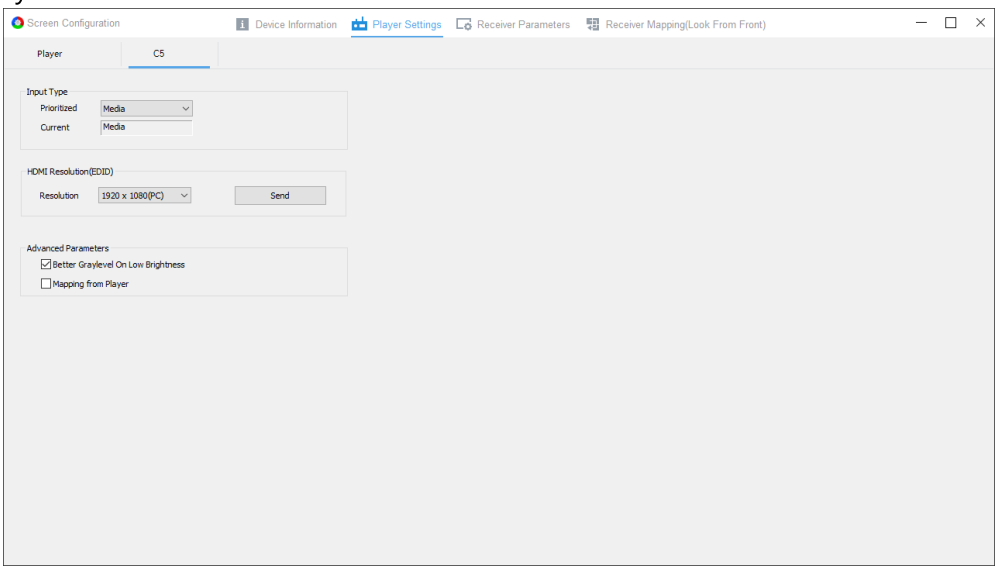


Fig 16.4 Player settings

- Receiver Parameters

When two or more players are cascaded together, select a desired device under **Player Settings**, and set its parameters in **Receiver Parameters**. Then, click the **Save to Receivers** button to apply the new parameter settings to the receiver connected to the selected player. See Chapter 6.3 for parameter configuration.

- Receiver Mapping

When two or more players are cascaded together, switch a desired device in **Player Settings**, and draw the mapping diagram in **Receiver Mapping**. Then, click the **Save**

to Devices button to apply the mapping diagram to the receiver connected to the selected player. See Chapter 6.4 for drawing the mapping diagram.

Statement

This guide is for reference only and does not constitute any form of commitment. Please refer to the actual products (including but not limited to color, size, screen display, etc.

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