Colorlight

INSTRUCTIONS

iSet

USER MANUAL

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CHAPTER 1 Introduction

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1.1 Software overview

iSet is a Microsoft windows-based control system software that provides professional and intuitive display control, it helps Colorlight users to:

- Set up large-scale and complex LED display.
- Adjust brightness and color of LED display.
- Monitor LED display working status.

1.2 System requirements

iSet can run on Windows XP\Windows7\Windows8\Windows10 operation systems. Recommended minimal OS hardware configuration as below

- CPU 2.0 GHZ;
- RAM 1 GB;
- Independent graphic card with 512MB memory.

CHAPTER 2 Software installation

2.1 Installing the software

Double click the iset4.5_setup icon to display installation wizard, refer to figure 2.1-1:

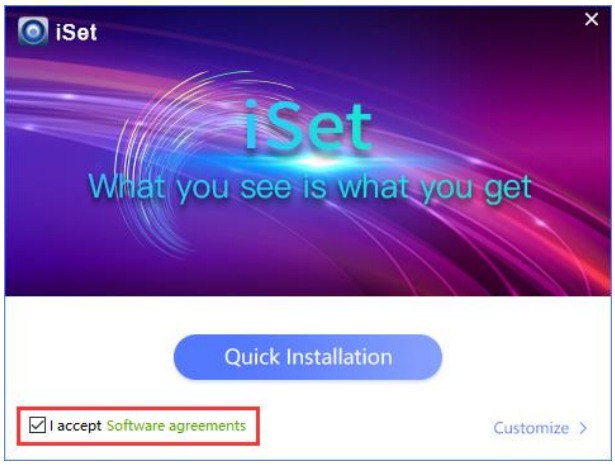


Fig 2.1-1 Installation wizard

Select “I accept Software agreements”.

For users who is first-time installing iSet to your computer, select “Customize”, the default installation path is C:\Program Files (x86) \iSet. “Dependent files” and “USB driver” must be checked, refer to figure 2.1-2;

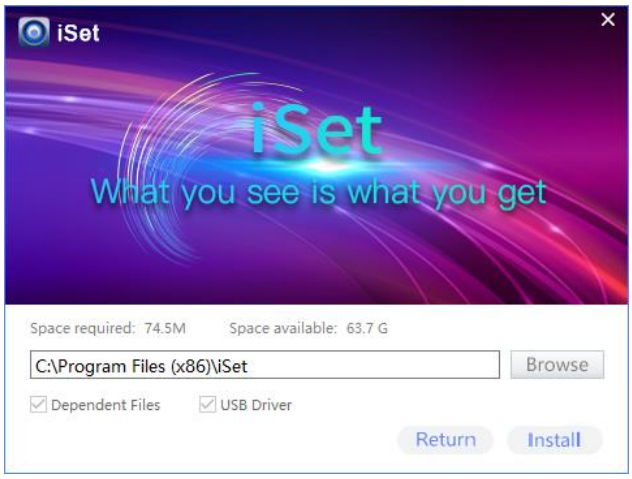


Fig 2.1-2 Customize installation

Click “Browse” to choose a destination folder, refer to figure 2.1-3.

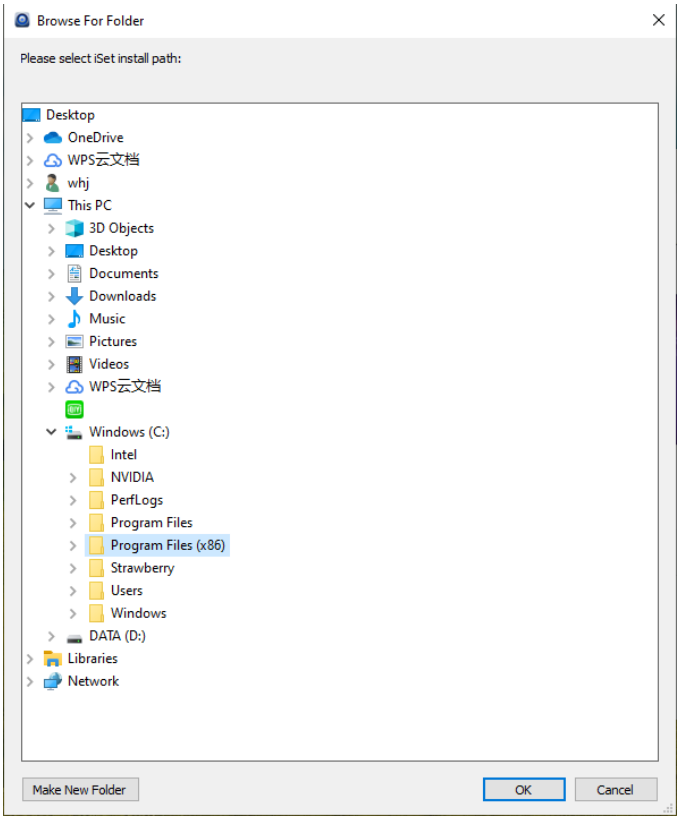


Fig 2.1-3 Choose a destination folder

Click” Install” to display “Device Driver Installation Wizard”, click “Next” and follow the wizard, refer to 2.1-4.

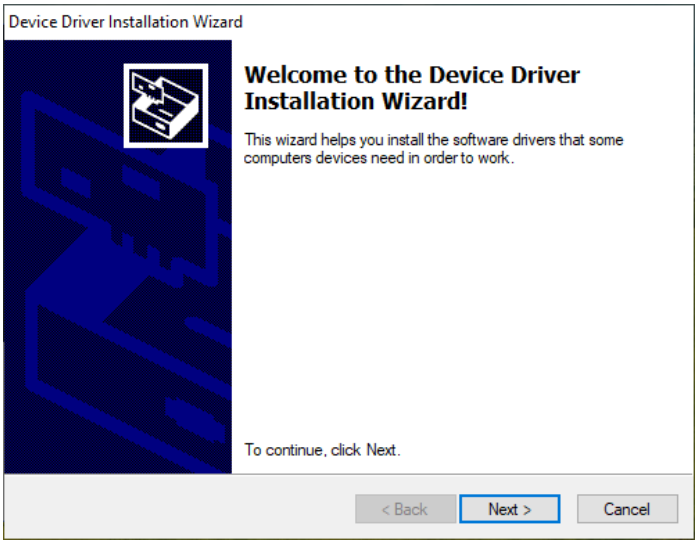


Fig 2.1-4 Device Driver Installation

The installation will be completed after going through the “Device Driver Installation Wizard”, refer to 2.1-5.

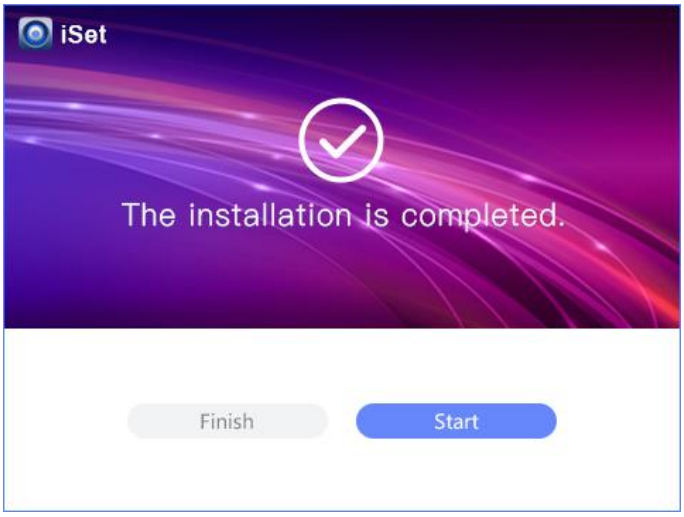


Fig 2.1-5 Installation completed

When “Quick Installation” method is selected, “Dependent files” and “USB driver” will be installed by default.

2.2 Uninstalling iSet

Double click uninst.exe in the installation folder, then click “Uninstall” button to start uninstallation.

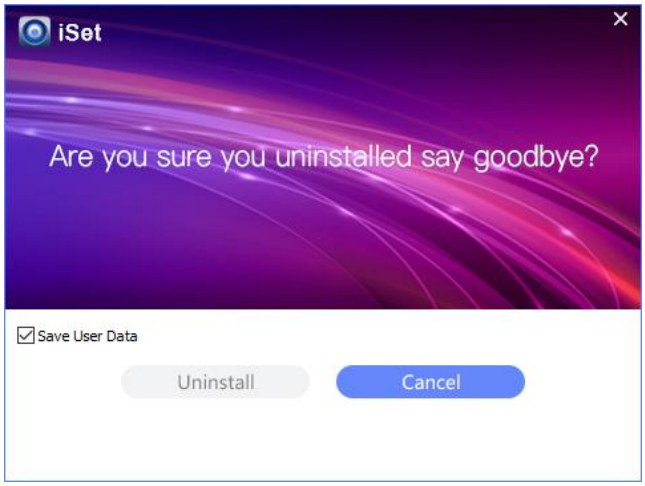


Fig 2.2-1 iSet Uninstallation

CHAPTER 3 iSet quick guide

3.1 Project Configuration

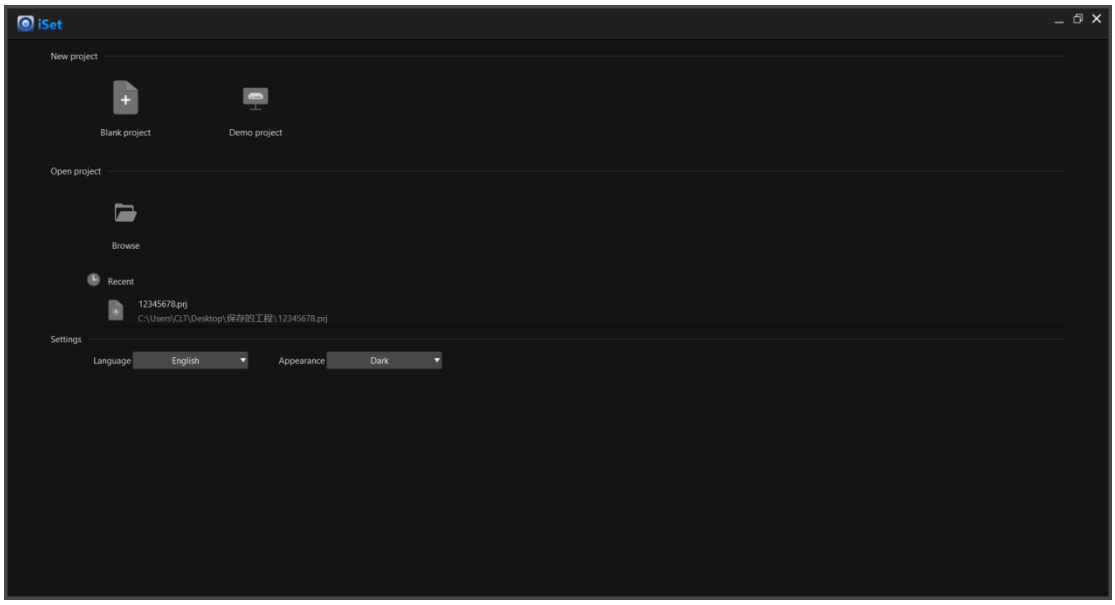


Fig 3.1-1 Project Setup

Project configuration screen will be displayed once iSet is launched, users can create a new project, demo project or import a project from local computer storage drive. When a blank project is created, the 3 tabs "Device information", "Control", and "Layout" will be displayed on the top of the software screen.

- **Device information**: displaying detected processor and receiver card information.
- **Layout**: mapping the LED cabinets and processors.
- **Control**: configuring processor parameters.

3.2 Device information

Processor information is listed in the left side of the screen; receiver card information is listed on the right side of the screen.

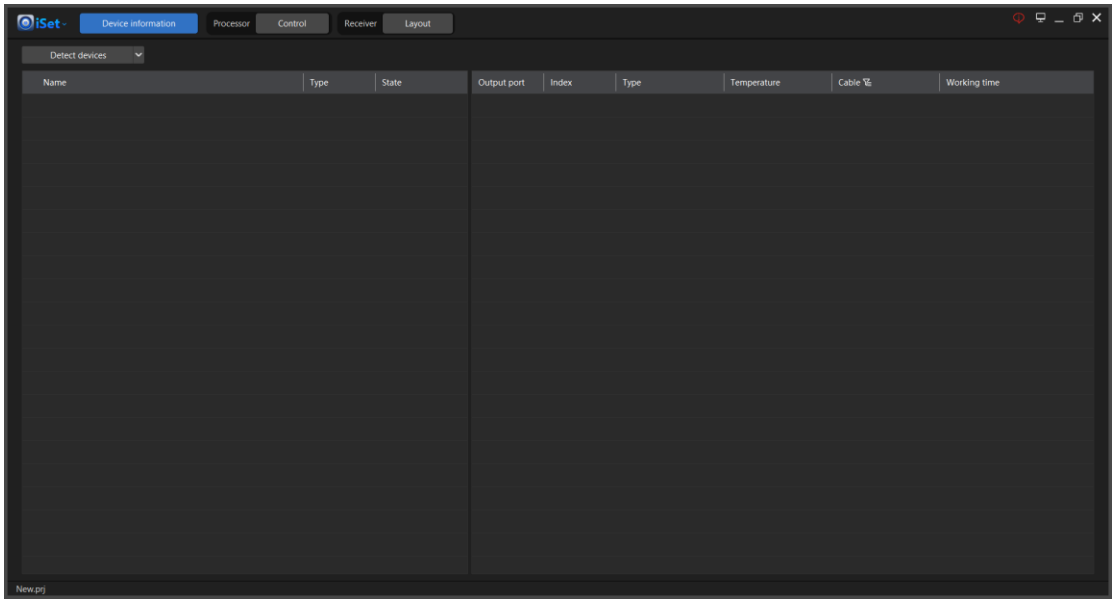
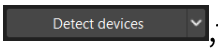


Fig 3.2-1 Device information interface

- **Processor information & Receiver card information**

  Click "Detect devices" button 

,the processor information section will show the processor name, model, and the number of receiver card (LED cabinet) that is connected to each output port of the processor; The processor output port number, receiver card index, receiver card model, temperature of receiver card, Ethernet cable state and receiver card working time will be shown in the receiver card information section, refer to fig 3.2-2.

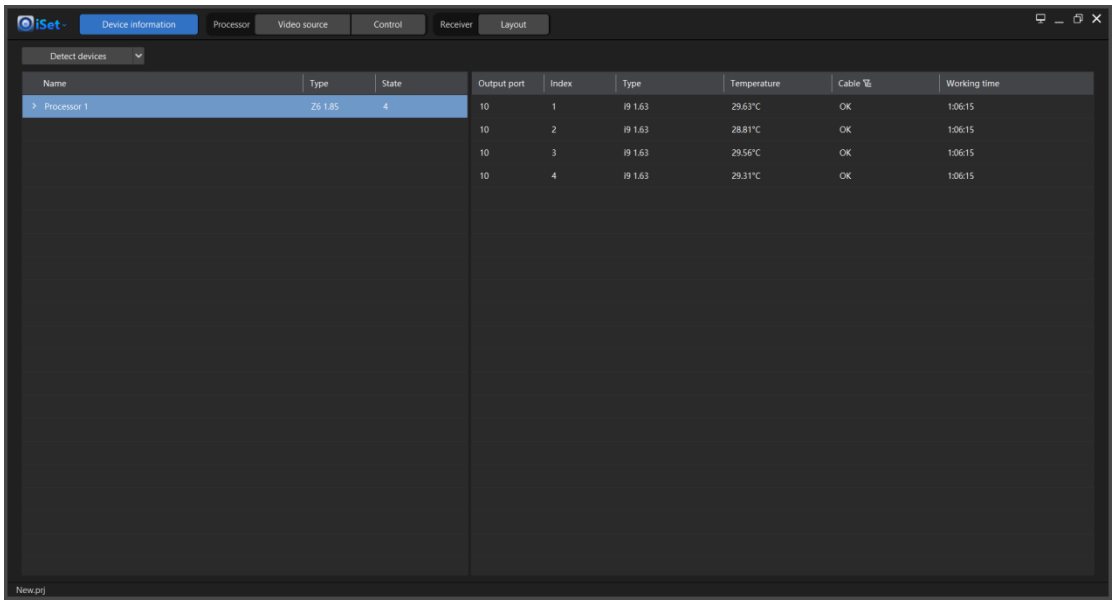


Fig 3.2-2 Processor and Receiver card information

- **Show unqualified cables**

  Click the filter icon besides "Cable" column, the icon form will be changed to , the receiver card (LED cabinets) that is connected with unqualified cable will be displayed in the cable column, click the icon to clear the filter state.

- **Reset the cable status**

  - **Unqualified Ethernet cable**

    If an unqualified cable is detected, this may be caused by damage connectors, environmental electrical interference or other problems in the signal chain. The iSet identify whether a cable is qualified through detecting the error data packets in the signal chain, if the error packet ratio in a cable is over one millionth, this cable will be determined as unqualified.

  - **Trouble-shooting**

    When iSet detects unqualified cables, plug in and out the cable, making new cable connectors, replacing with a new cable may fix the problem.

  - **Recount error packets**

    Right-click on any spot of receiver card column, in the context menu, users can select to recount error packet for all processors, all outputs or a particular output port of the processor.

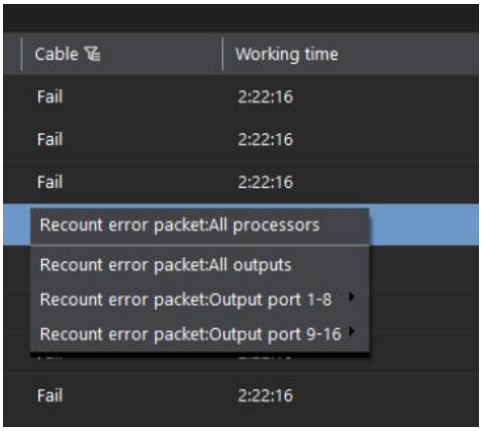


Fig 3.2-3 Recount error packets

3.3 Layout

Users can create mappings of LED cabinets (Receiver cards) and processor control zones in layout screen.

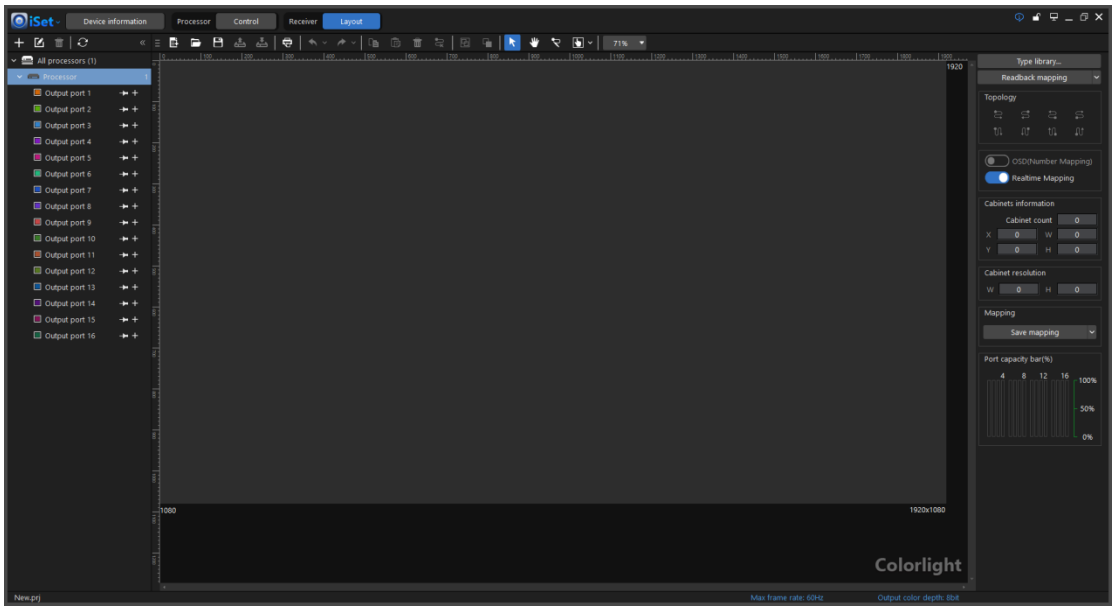


Fig 3.3-1 Layout screen

➢ **Add cabinet shape**

Follow these steps to add cabinet in the canvas: Select output port→ select cabinet type→ drop cabinet on the canvas.

◆ **Select output port**

Click plus icon aside an output port which you want to add cabinet to.

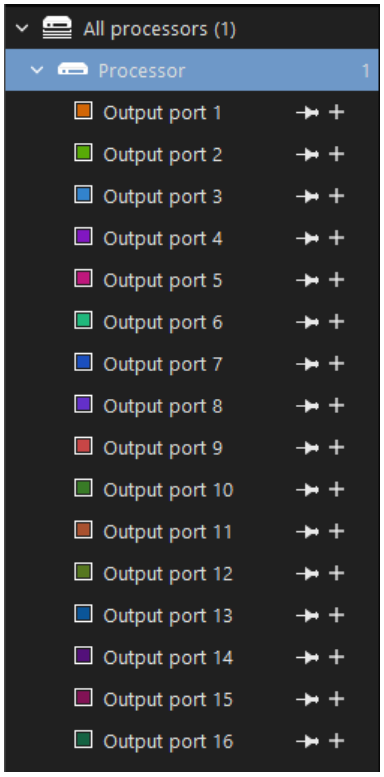


Fig 3.3-2 Output port selection

- **Select cabinet type**

  Cabinet type can be categorized into custom cabinet type and preloaded cabinet type.

  Custom cabinet type: custom define the cabinet resolution only; it does not contain any other configuration parameters (rcvbp file).

  Preload cabinet type: preloaded in the cabinet type library, it contains cabinet resolution and other cabinet configuration parameters (rcvbp file).

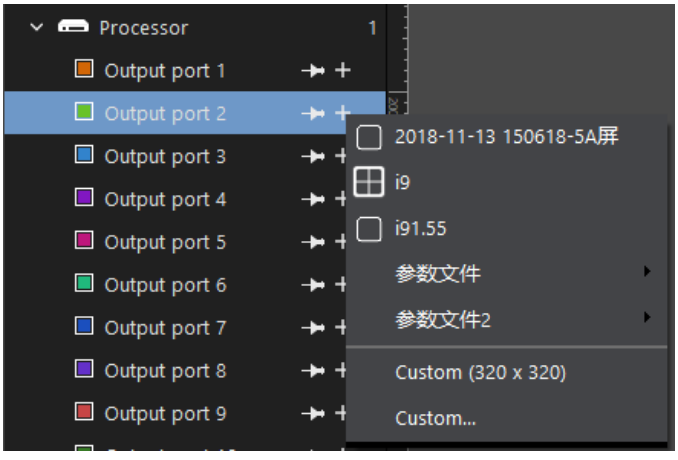
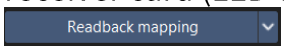


Fig 3.3-3 Cabinet type selection menu

- Add cabinet to the canvas

  Select a cabinet type and click on the canvas where you want to place it, drag the handle in the edge of the cabinet shape to draw cabinet array and cable topology.

  If the mapping of LED cabinets has been saved to the processor or receiver card (LED cabinets), you can click the button 

to readback the mapping file and display it in the canvas. LED cabinet mapping contains cabinet array and cable topology.

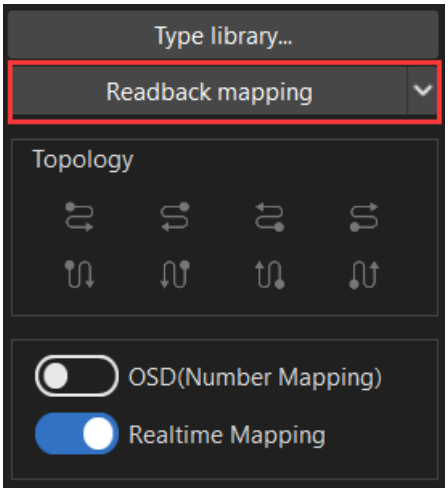


Fig 3.3-4 Readback mapping button

Cable topology

The iSet defaults cable topology when cabinet is being added to canvas, if the cable topology does not match the actual cabling, you need to modify it by either selecting a proper pre-defined topology or drawing a custom-defined topology.

- Pre-defined topology

  There are 8 types of pre-defined topology available for selection, refer to below figure.

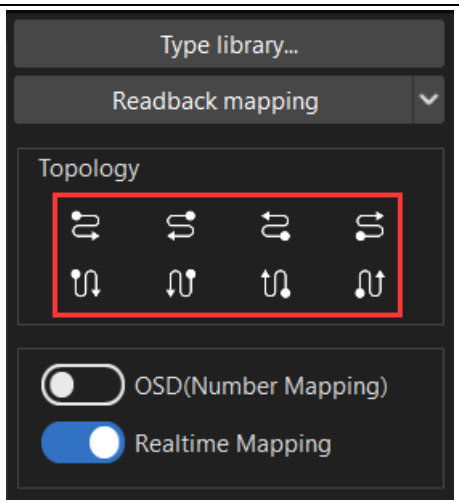


Fig 3.3-5 Pre-defined topologies

- **Custom-defined topology**

  Click the pen icon in the tool bar, the mouse cursor turns into a pen shape, click on the cabinet shapes to create a custom-defined topology.

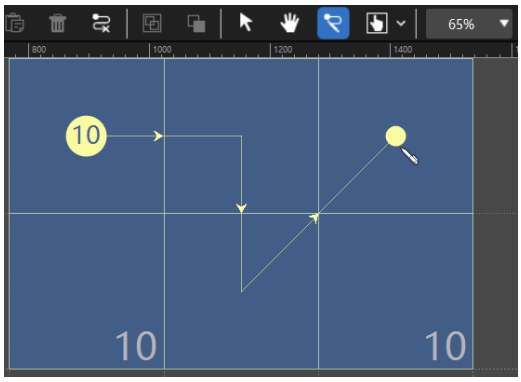
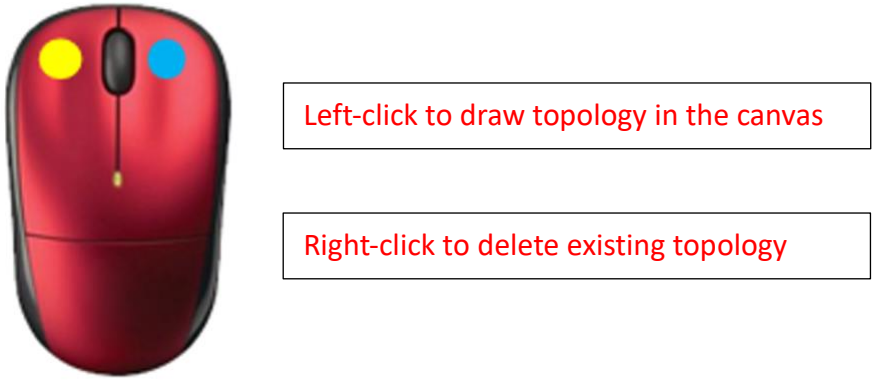


Fig 3.3-6 Custom-defined topology

- **Clear topology**

  There are two approaches to delete cable topology:

  1. Click custom topology button in the tool bar, and then right click on a cabinet to delete the cable topology for this cabinet and the cabinets connects afterwards to it.



3.3-7 Right click to clear existing topology

  2. Select a cabinet or group of cabinets in the canvas, and then click clear topology button in the tool bar to delete cable topology of selected cabinets.

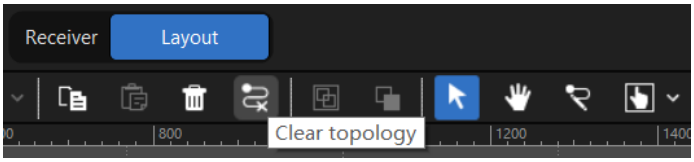


Fig 3.3-8 Clear topology button

The “Realtime mapping” and “OSD” is particularly useful for creating mapping of cabinets.

- **Realtime mapping**

  The array and topology changes made in the canvas will be effective in real-time on physical LED cabinets.

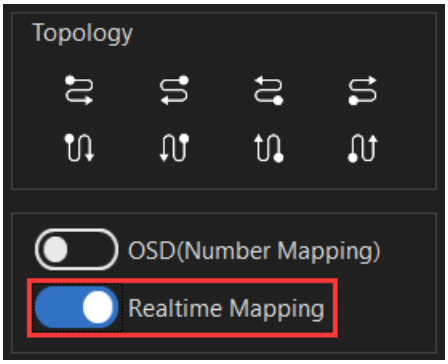


Fig 3.3-9 Realtime mapping toggle

- **OSD**

  OSD stands for On-Screen-Display, a number that indicates cabinet cabling order will be displayed on the cabinet itself.

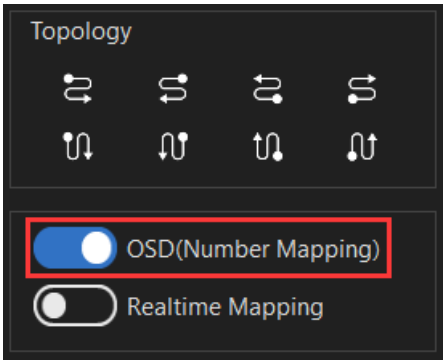


Fig 3.3-10 OSD toggle

➢ **Save mapping**

Save the current mapping to selected processor and LED cabinets (receiver cards) connects this processor. When there is more than one processor connected, click “All processors and cabinets” in the drop-down list to save the current mapping to all processors and cabinets in the system.

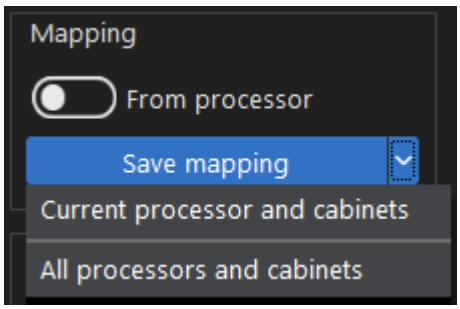


Fig 3.3-11 Save mapping drop-down list

- **Save/Open project**

  Except saving project to processor/receiver card (LED cabinets), projects can be also saved/opened to/from local storage drive.

  Click save project icon in the tool bar to save the current project to local storage drive.

  Conversely, clicking open project icon can open a project file from local storage drive.

Fig 3.3-12 Save/open project

- **Print**

  Cabinets mapping and processor control zones can be printed. Click "Print" button or use shortcut "Ctrl+P" to get into print settings window.

  The mapping of LED cabinets can be printed in front view and rear view.

  Rear view print is very helpful when users install cabinets or trouble shoot behind LED cabinets, the cabinets in the canvas will be horizontally flipped, as if view from behind of LED display.

  The project details such as designer, design date, processor name, auditor, output port pixel load is optional to show in printed drawing.

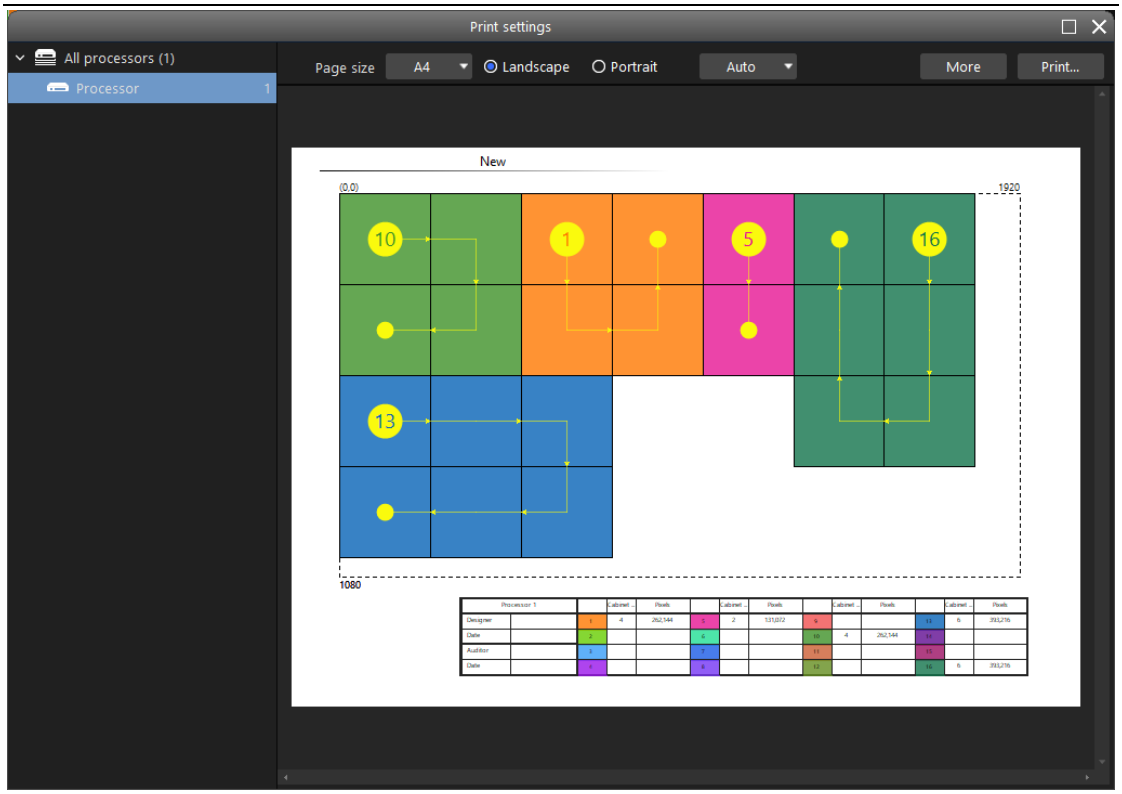


Fig 3.3-13 Print preview

3.4 Control tab

Brightness, color temperature, test pattern, freeze, blackout etc. settings are accessible from control tab.

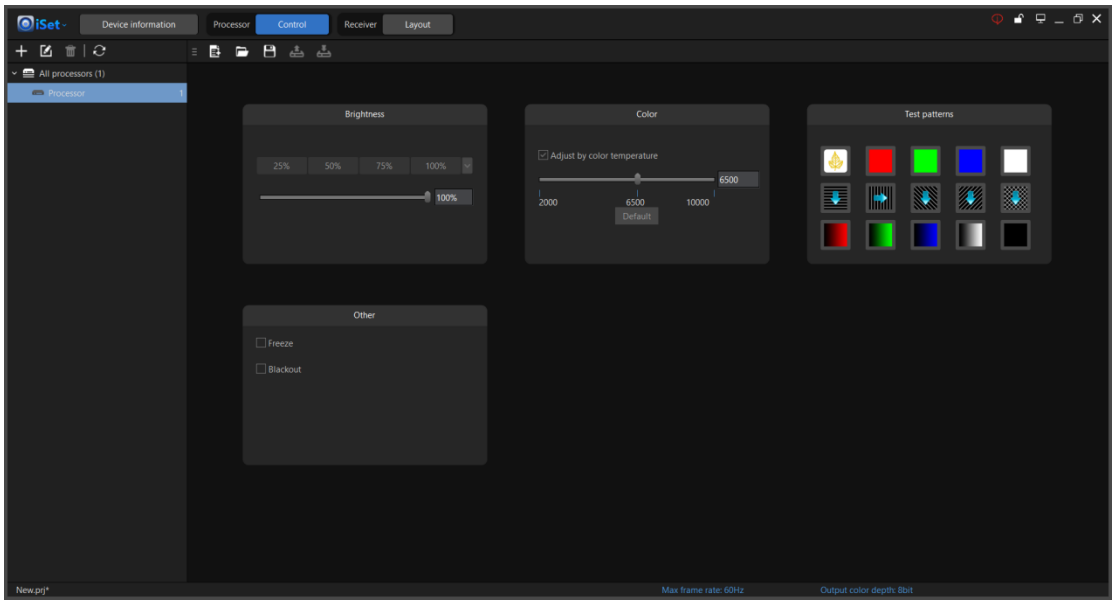


Fig 3.4-1 Control screen

- **Brightness adjustment**

  Click the four brightness percentage buttons or drag left and right of the slider bar to set global brightness for the LED cabinets that connects to current selected processor.

  Certain processors support brightness adjustment based on output port group.

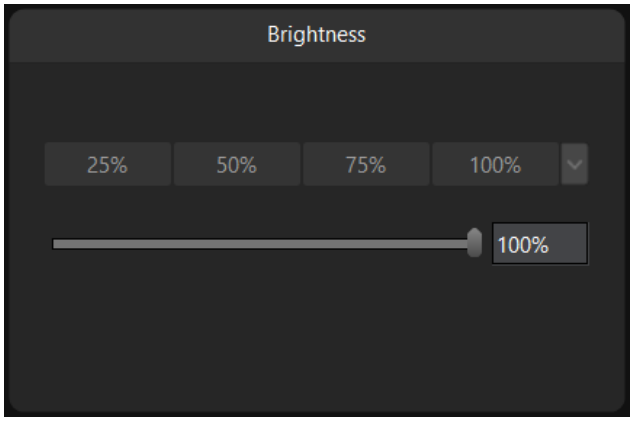


Fig 3.4-2 Brightness adjustment window in control tab

- **Color temperature adjustment**

  The range of adjustable color temperature is between 2000-10000 Kelvin. Clicking “Default” button can set the LED display color temperature to 6500K.

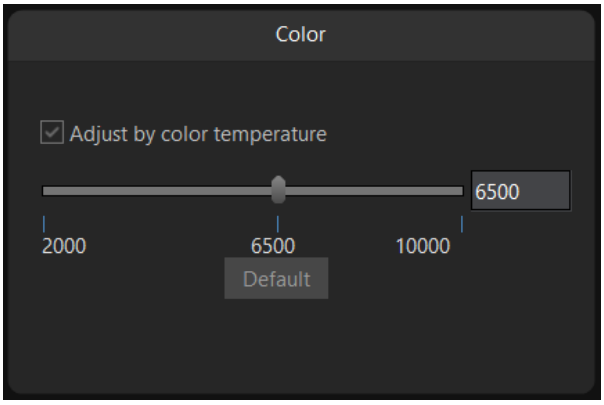


Fig 3.4-3 Color temperature setting window in control tab

When “Adjust by color temperature” option is unchecked, RGB gain can be adjusted by moving corresponding slider bars.

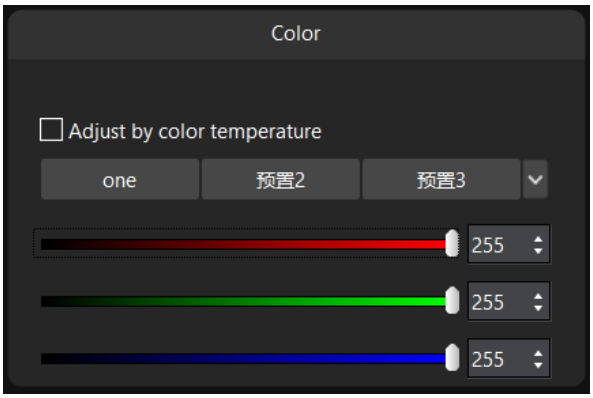


Fig 3.4-4 RGB gain adjustment sliders

➢ Test pattern

In test patterns window, users can select a range of internal test patterns that are pre-programed within the processor. Test pattern is particularly useful for verifying and diagnosing the LED display/cabinet performance.

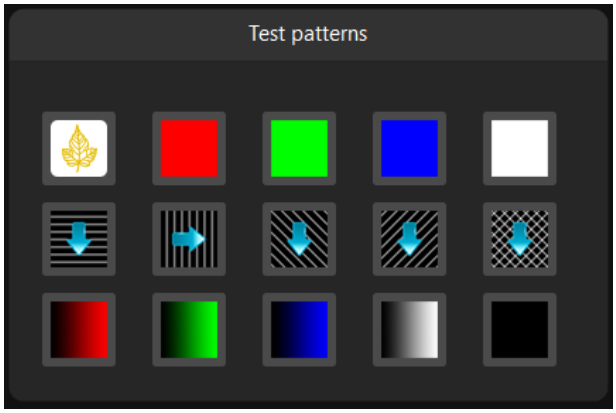


Fig 3.4-5 Test patterns window in control tab

- **Freeze, blackout**

  Freeze: hold the last frame of the input. Unfreezing will return to previous state if the input source is connected.

  Blackout: Turn off the connected LED cabinets at any point.

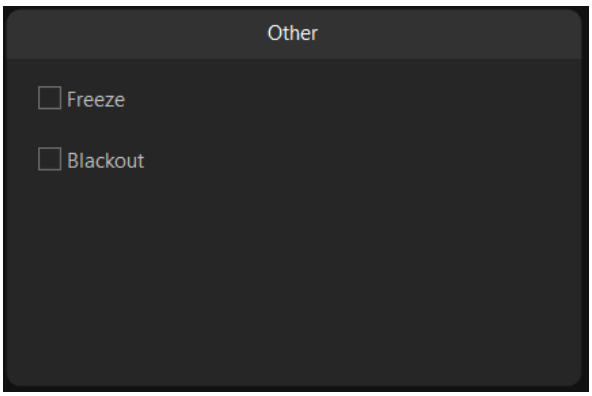


Fig 3.4-6 Freeze, blackout

Chapter 4 iSet user manual

4.1 Project Configuration

The project configuration screen will be displayed when iSet is launched, refer to 4.1-1. Users can create a blank project and demo project, select a recent used project or open an existing project file from local storage drive, switch languages and change appearance.

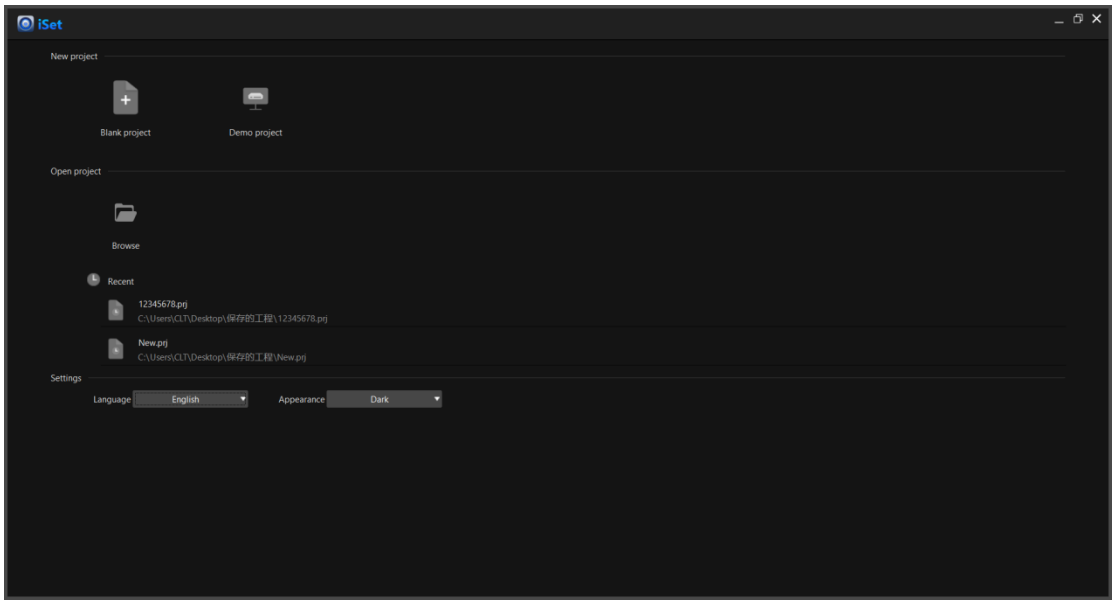


Fig 4.1-1 Project setup window

Blank project: to start a new project, click “Blank project” to get into project configuration wizard where users can configure canvas size, input resolution, frame rate and bit depth.

Demo project: used for exploring processor’s features, planning and mapping LED cabinets when there is no actual processor connected. There are five types of processor available for demo project: S6F, X16 PRO, Z4, Z6, Z6 PRO.

Browse: click to open a project file in local storage drive.

Recent: displaying the most four recent used projects.

Language: switch between Chinese, English, French, Japanese, Spanish, Korean, Portuguese and Russian.

Appearance: choose between two interface appearance styles: dark, light.

4.2 Tabs

After project configuration process is done, the iSet will bring users to its main screen where has three tabs by default: Device information, Control and Layout. Depending on the type of processor is connected and the software authorization setup, the number and type of tabs may vary. Users can choose to display or hide tabs in “Advanced authorization”.

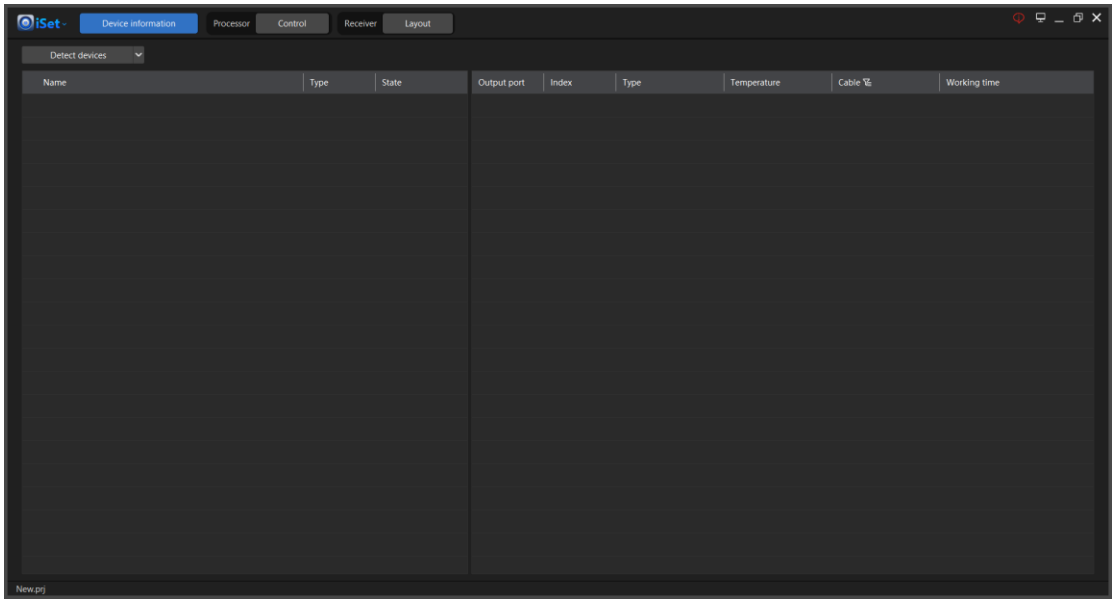


Fig 4.2-1 iSet main screen

4.3 Navigation menu

Click iSet logo iSet in the upper-left of the main screen to open iSet navigation menu, it contains following options: File, Language, Tools, Preferences, Advanced authorization, Recent projects, Hotkey table, Help, Release notes, about.

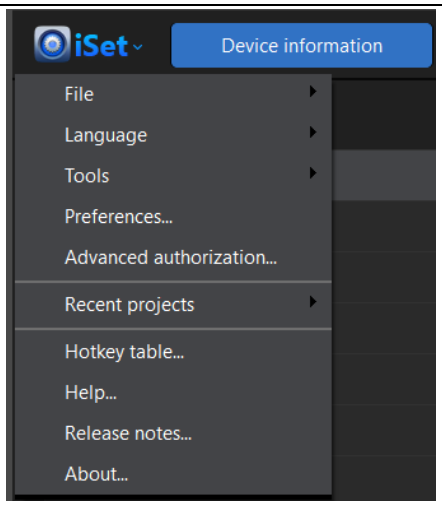


Fig 4.3-1 Options in iSet navigation menu

- **File**

  Users can create project, open project and save project in the file menu.

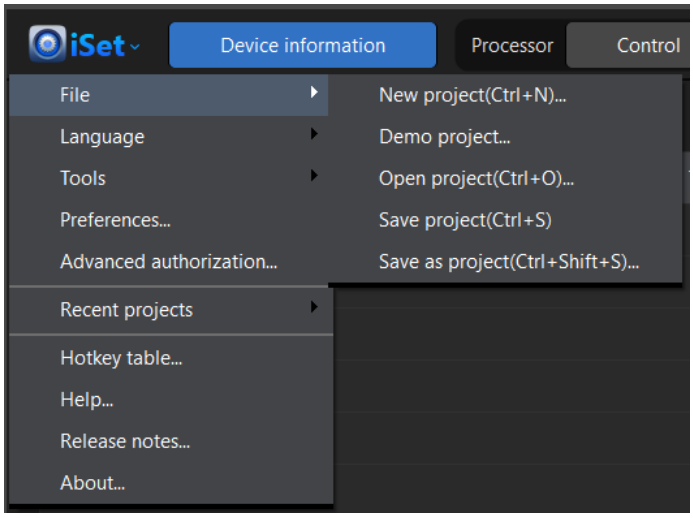


Fig 4.3-2 Options in file menu

- **Language**

  iSet will use the computer OS language by default when you first-time open iSet. Its interface language can be set to following: Chinese, English, French, Japanese, Spanish, Korean, Portuguese, Russian. The language settings remains even after iSet is rebooted.

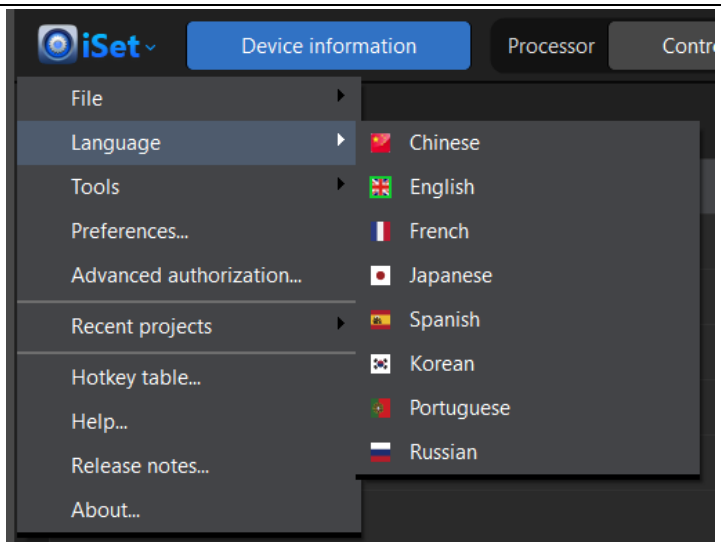


Fig 4.3-3 Available languages

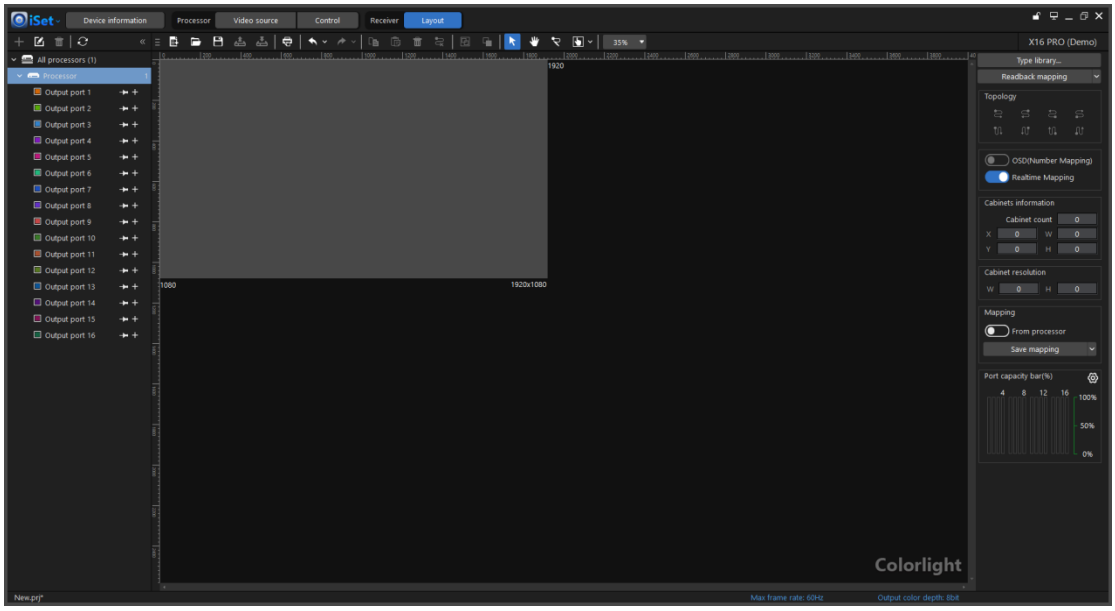


Fig 4.3-4 English user interface

- **Tools**

  Access to "Capacity calculator" tool, the horizontal pixel capacity of single output port will be affected when low latency mode is enabled.

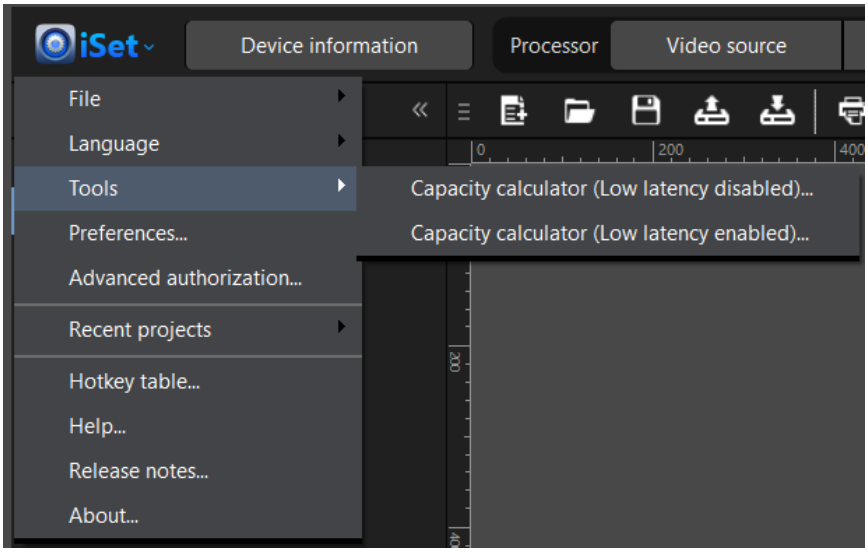


Fig 4.3-5 Tools

- **Capacity calculator (Low latency disabled)**

  Showing the bandwidth usage of a single output port at specific frame rate and color depth setting.

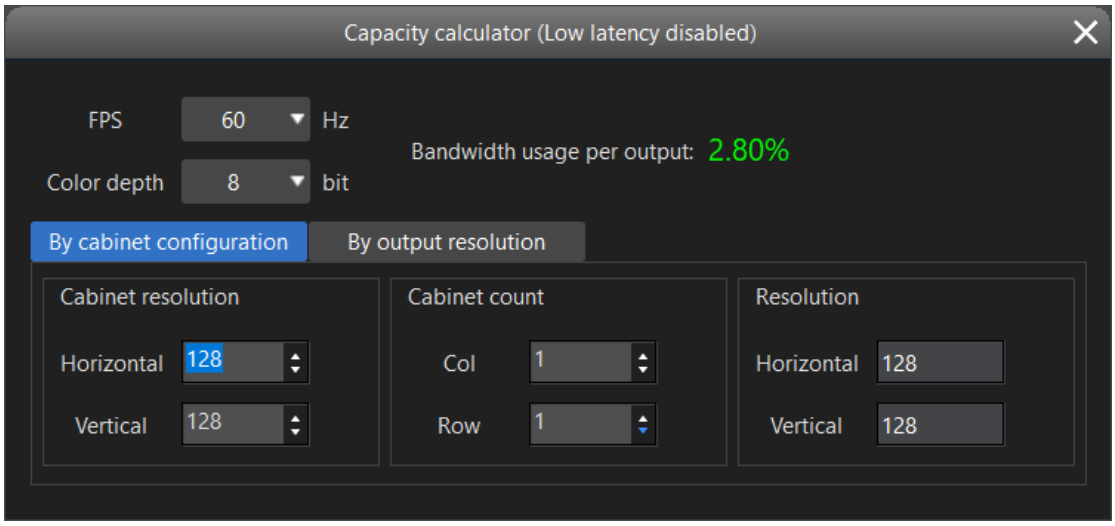


Fig 4.3-6 Output port capacity calculator

- **Capacity calculator (Low latency enabled)**

  Showing the maximal horizontal pixel capacity of a single output port at specific port bandwidth, input color depth, resolution and frame rate.

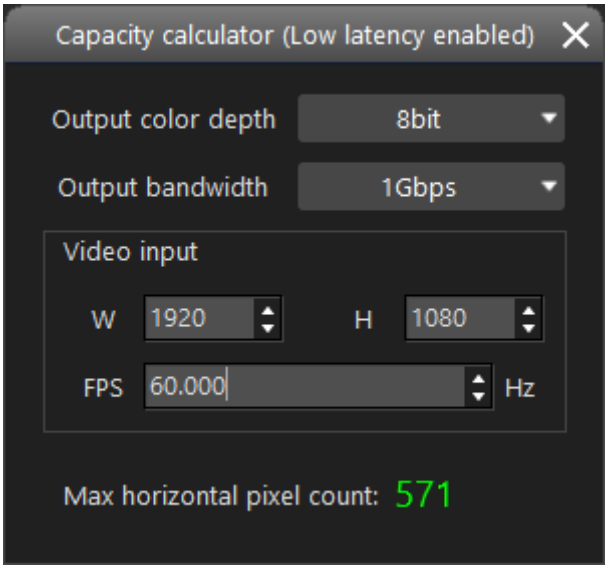


Fig 4.3-7 Horizontal pixel limitation when low latency mode is enabled

➢ Preferences

"Tab options" is hidden when advanced authorization is not in use.

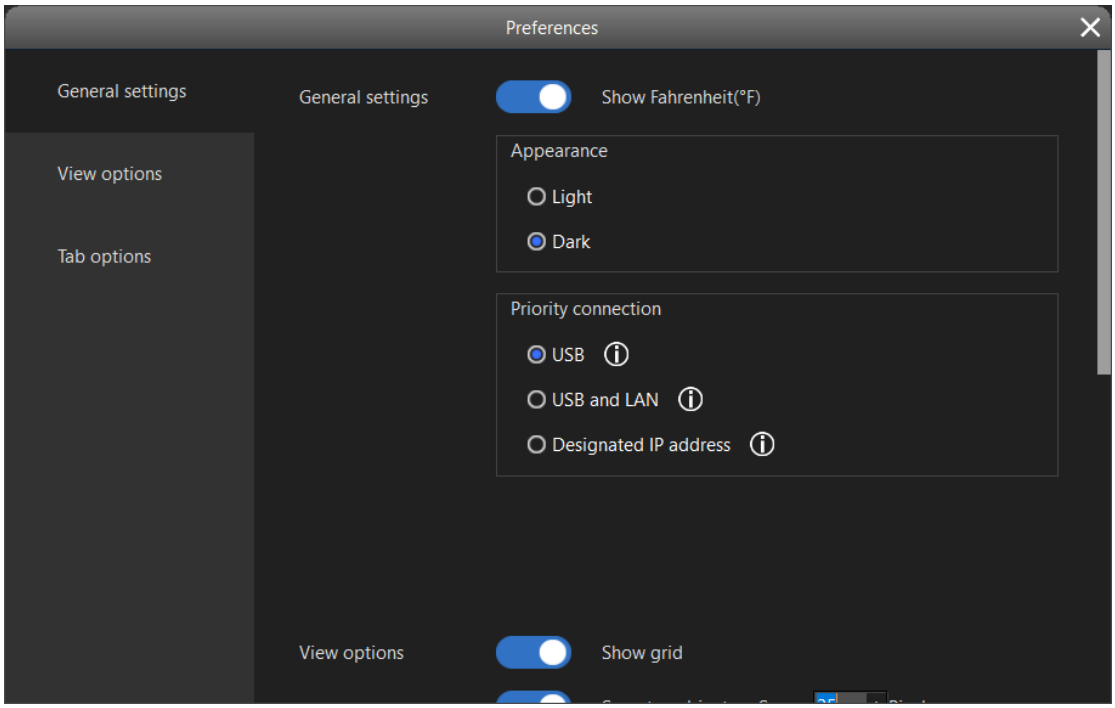


Fig 4.3-8 Preferences setting window

◆ General settings

When "Show Fahrenheit" is enabled, the temperature column in "Device information" uses Fahrenheit as temperature scale. Otherwise, it uses degree Celsius by default.

Output port	Index	Type	Temperature	Cable	Working time
10	1	i9 1.63	84°F	OK	3:01:43
10	2	i9 1.63	82°F	OK	3:01:43
10	3	i9 1.63	82°F	OK	3:01:43
10	4	i9 1.63	83°F	OK	3:01:43

Fig 4.3-9 Showing degree Fahrenheit in the temperature column

Appearance: Users can set the interface background as dark or light.

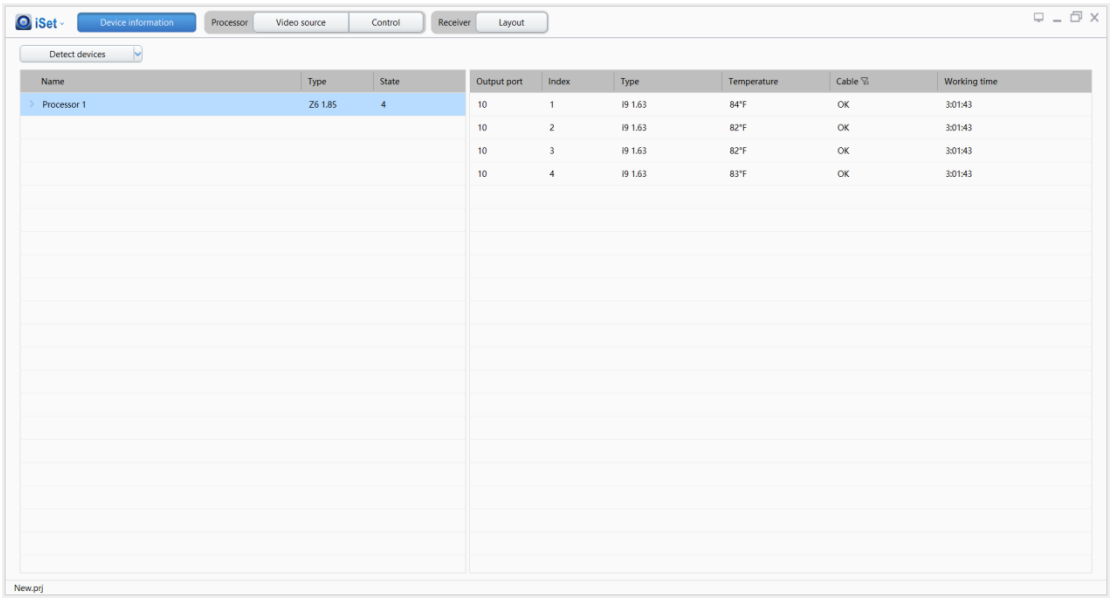


Fig 4.3-10 Device information interface with light background

Preferable connection: User can select a connection method according to the physical connection setup between computer and processor.

USB: Detect the processor which is connected via USB connection only, if there is no processor detected through USB connection, then iSet would try to detect processors via LAN connection.

USB and LAN: Detect processors of which connected via USB or LAN connection.

Designated IP address: Detect processors whose IP address has been associated in IP address management in “Device information” tab.

Hover the cursor on the blue circle to bring out helpful tips and information.

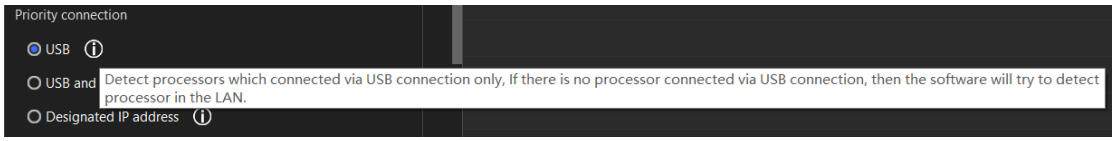


Fig 4.3-11 Preferable connection

- View options

  Show grid: Show gridlines in the project canvas. The grid size is identical to the smallest cabinet size in the canvas. Disable this option to hide the gridlines.

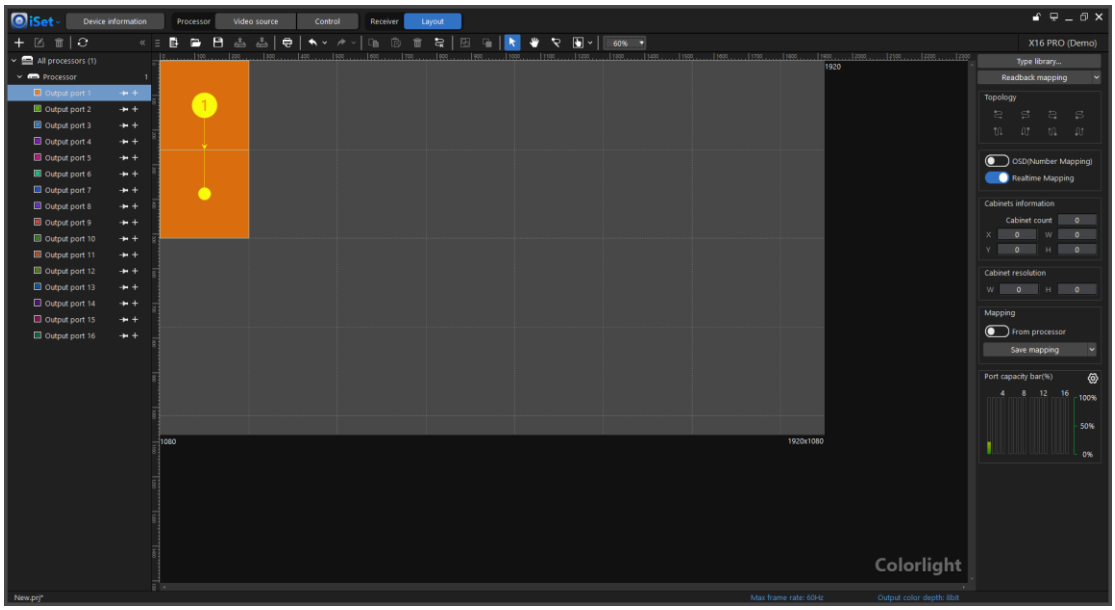


Fig 4.3-12 Show grid

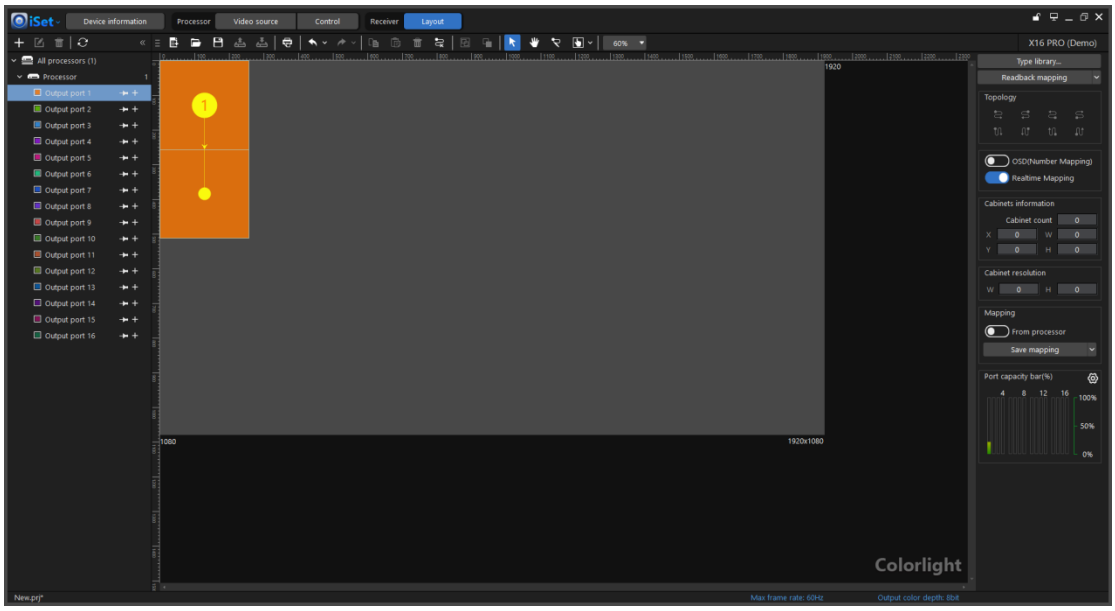


Fig 4.3-13 Hide grid

Snap to cabinet/grid: Align cabinets to the gridlines or other cabinets to prevent gaps or overlaps between cabinets in the canvas.

Readback parameters: Show "Readback parameters" option in the context menu when you right click the cabinets in the canvas, refer to below figure.

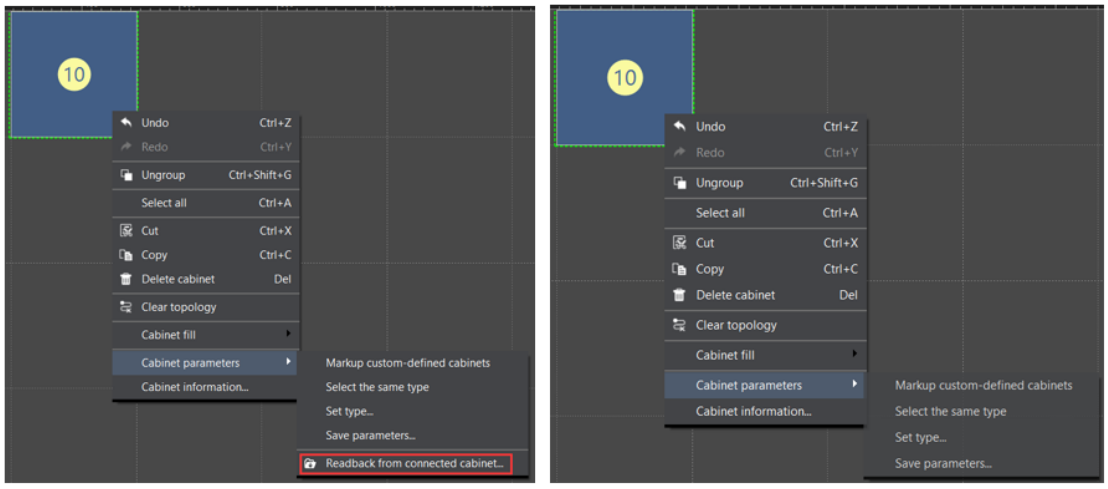


Fig 4.3-14 Readback parameters appear

Save parameters: Show "Select the same type cabinets", "Set type" and "Save the rcvbp file to selected cabinets" options when you right click the cabinets in the canvas, refer to below figure.

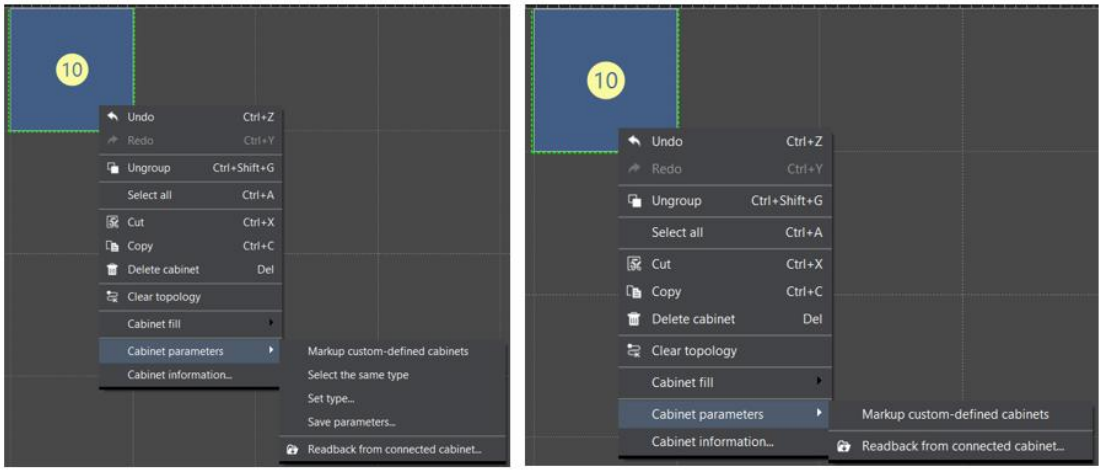


Fig 4.3-15 Save parameters

- **Tab options**

Show calibration: Toggle to show/hide the "Calibration tab".

Show soft edge: Toggle to show/hide the "soft edge" tab.

Show advanced soft edge: Toggle to show/hide the "Advanced soft edge" tab.

Show Color adjustment: Toggle to show/hide the "Color adjustment" tab.

Show monitoring: Toggle to show/hide the "Monitoring" tab.

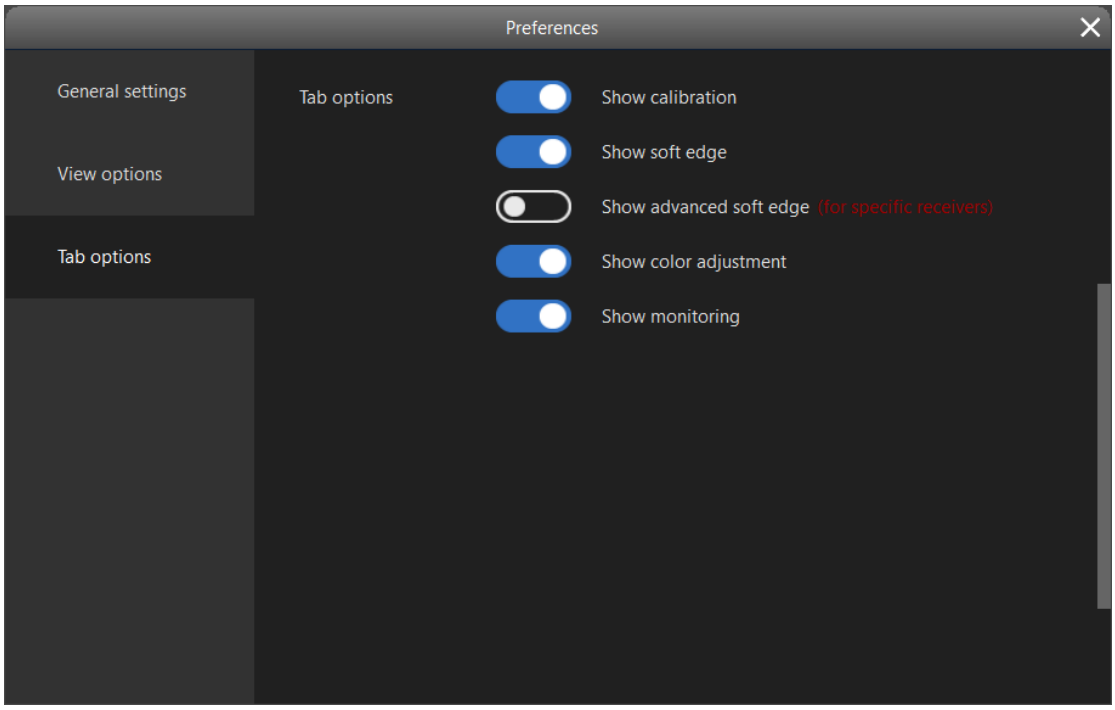


Fig 4.3-16 Tabs setting

- Recent projects

  Show the most four recent used projects.

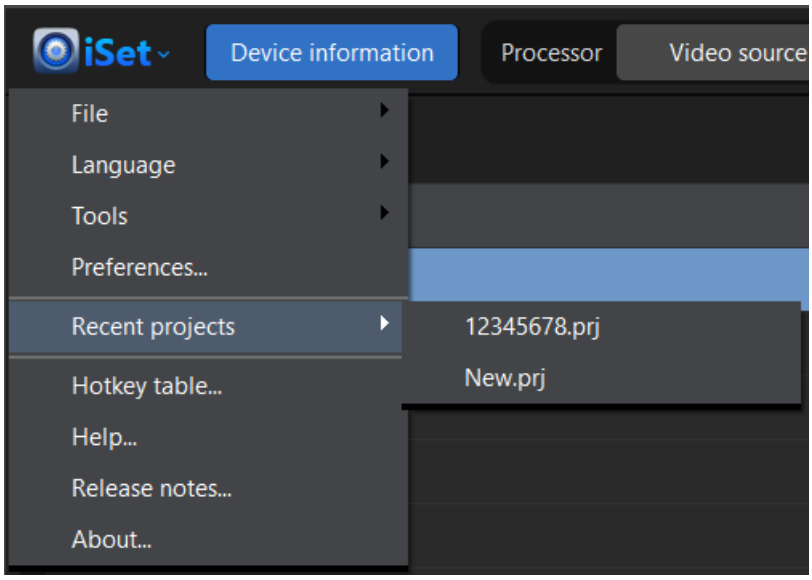


Fig 4.3-17 Recent projects

- Advanced authorization

When “Advanced authorization” is opened, “Show calibration”, “Show soft edge”, “Show advanced soft edge” and “Show monitoring” options will be available for toggle in “Tab options”.

Click “Advanced authorization”, type password “168” and click “OK” to open advanced authorization.

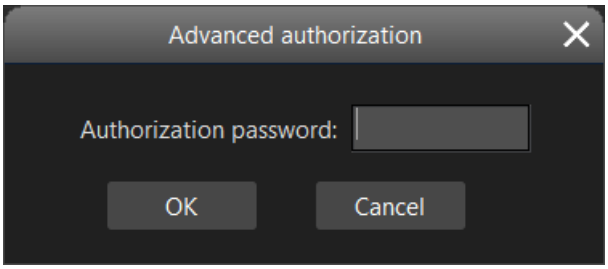


Fig 4.3-18 Advanced authorization

- **Keyboard shortcuts**

Keyboard shortcuts for the settings in “Layout”, “Calibration” and “Soft edge/Advanced soft edge” tab.

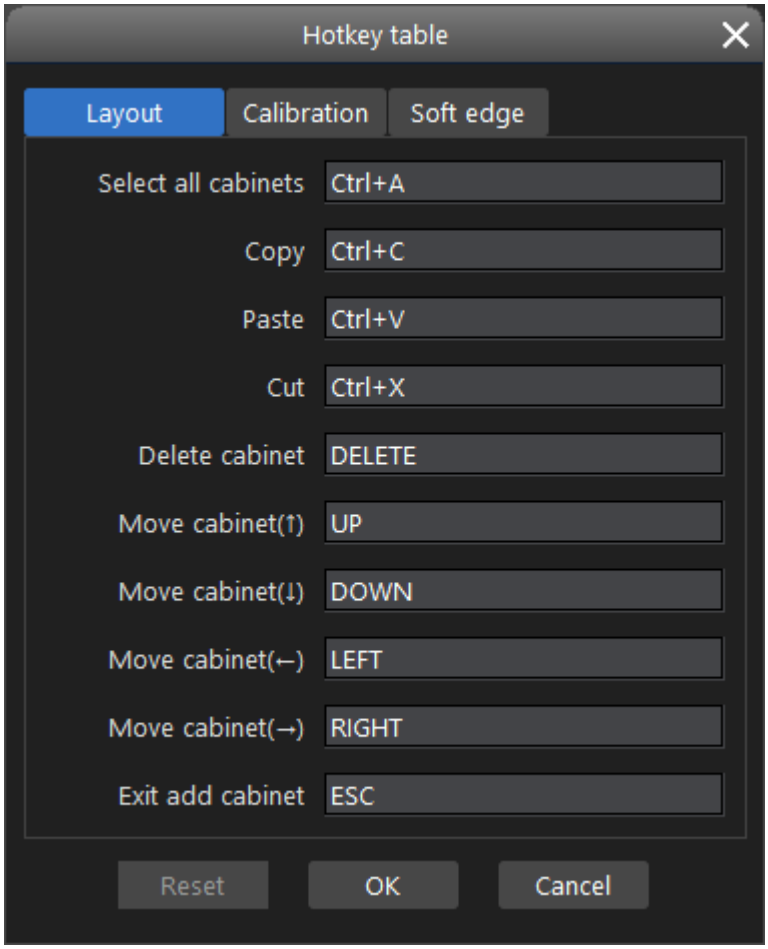


Fig 4.3-19 Keyboard shortcuts edit window

- **Help**

  Click to view the software user manual.

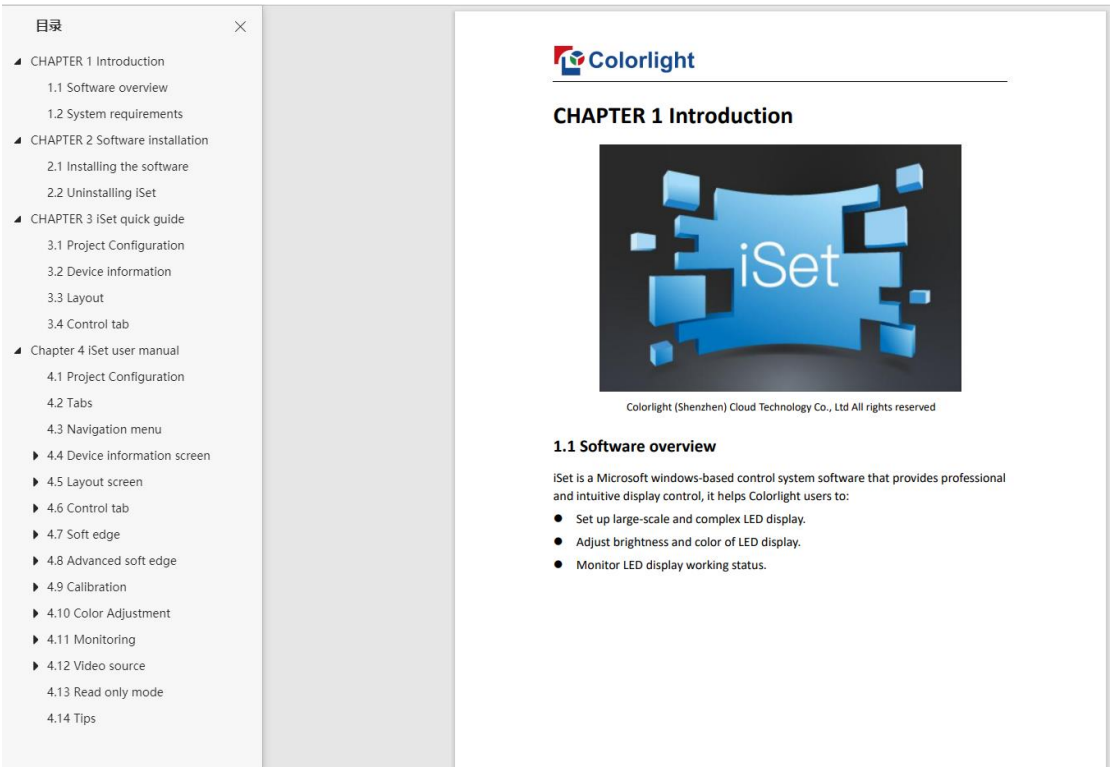


Fig 4.3-20 iSet built-in user manual

- **Release notes**

  Show the recent changes and bug fixes.

- **About**

  The "About" window contains information regarding software or firmware version currently in use, build number, build time, type version and the Colorlight website link.

Fig 4.3-21 About

4.4 Device information screen

The receiver card information displays on the right side of the screen, and the processor information displays on the left side the screen.

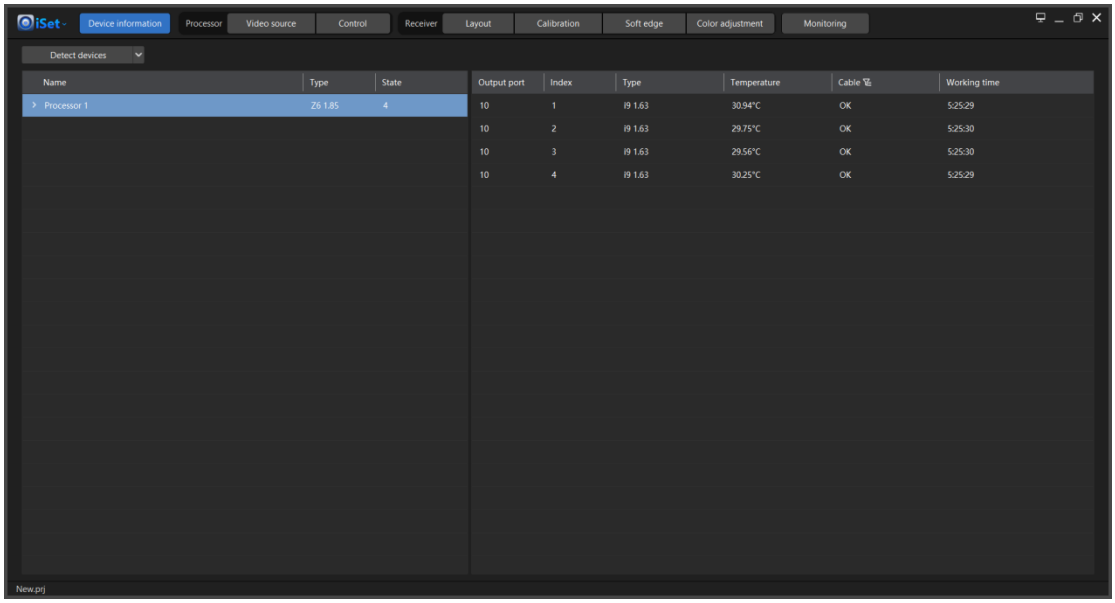


Fig 4.4-1 Device information screen

There are different approaches to connect processors:

（1） USB connection: Windows PC and processors are connected through USB cables;

（2） LAN-USB connection: The first processor is connected over LAN port and the other processors are daisy chained to the first processor over USB ports;

（3） Star topology connection: All nodes (processors) and the computer that is running iSet are connected to a central switcher. The USB daisy-chained processors would not show in star topology connections.

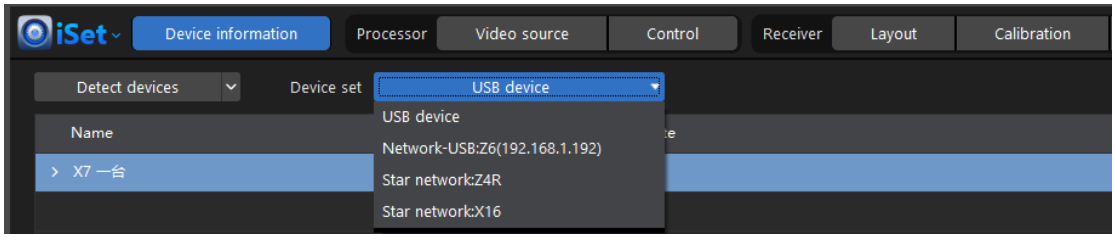
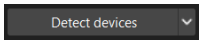


Fig 4.4-2 Connection type

4.4.1 Detect devices

Click 

button to obtain receiver cards and processors which are physically connected and show their information in the “Device information” screen.

Click the drop-down arrow to bring out a drop-down list that contains two options “All devices” and “Processor only”. If select “All devices”, device information screen displays both receiver card and processor information. If select “Processor only”, it only displays the processor information.

4.4.2 Processor information

The processor name, processor type and the number of receiver card connected to each output port can be displayed on the left side of the screen. The “IP address” column show up only when the processor is using star topology connection; The “Input” column show up only when a S series processor is connected.

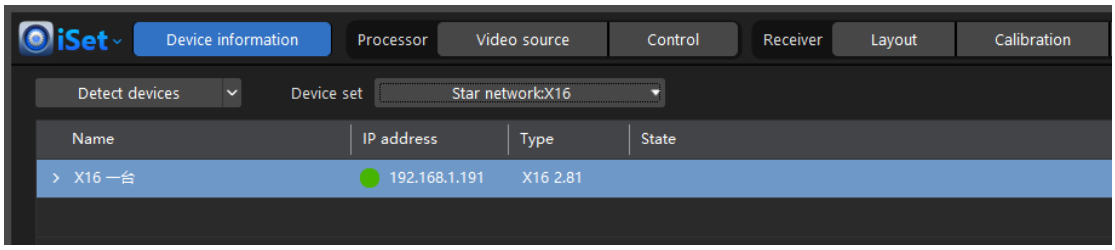


Fig 4.4-3 Processor information section

- **Name:** Show each processor name; Processor can be renamed in “Layout” tab.
- **IP Address:** Show IP address of each processor.
- **Type:** Show processor model.
- **Input:** Show the current received video input of the processor, Example: DVI 1920x1080@60Hz.
- **Number of receivers:** Show the number of receiver card that is connected to the output port of a processor.

4.4.3 Receiver card information

Show information related to the receiver card, refer to below figure.

Output port	Index	Type	Temperature	Cable	Working time
10	1	i9 1.63	30.94°C	OK	5:25:29
10	2	i9 1.63	29.75°C	OK	5:25:30
10	3	i9 1.63	29.56°C	OK	5:25:30
10	4	i9 1.63	30.25°C	OK	5:25:29

Fig 4.4-4 Receiver card information section

- **Output port:** The output port number (the output port number can be seen on the sheet metal of the processor or fiber distributor) that receiver card connects to. The output port number is sorted from top to bottom in the column.
- **Index:** Numerical order of a receiver card in an output string, the index of the first receiver card from output port is 1.
- **Type:** The receiver card model and its firmware version.
- **Temperature:** The temperature value that receiver card read from temperature sensor in LED cabinet. If the receiver card does not support temperature monitoring or the LED cabinet does not implement a temperature sensor, the temperature column will show "--".
- **Cable:** If the error packet ratio is below 1/1,000,000, the column would show word "OK", otherwise, the column shows word "unqualified".
- **Working time:** The total working time of receiver card. The clock will be reset after power cycle receiver card (LED cabinet).

4.4.4 Show unqualified cables

Click Filter icon in the "Cable" column, when the icon change to , 接收 the receiver cards which connects toa unqualified cable will show in the receiver card information section. Click the icon to clear unqualified cable selections from the filter.

4.4.5 Recount error packets

- **Unqualified Ethernet cable:** If an unqualified cable is detected, this may be caused by damage connectors, environmental electrical

interference or other problems in the signal chain. The iSet identify whether a cable is qualified through detecting the error data packets in the signal chain, if the error packet ratio in a cable is over one millionth, this cable will be determined as unqualified.

- **Trouble-shooting:** When iSet detects unqualified cables, plug in and out the cable, making new cable connectors, replacing with a new cable may fix the problem.
- **Recount error packet:** Right-click on any spot of receiver card column, in the context menu, users can select to recount error packet for all processors, all outputs or a particular output port of the processor.

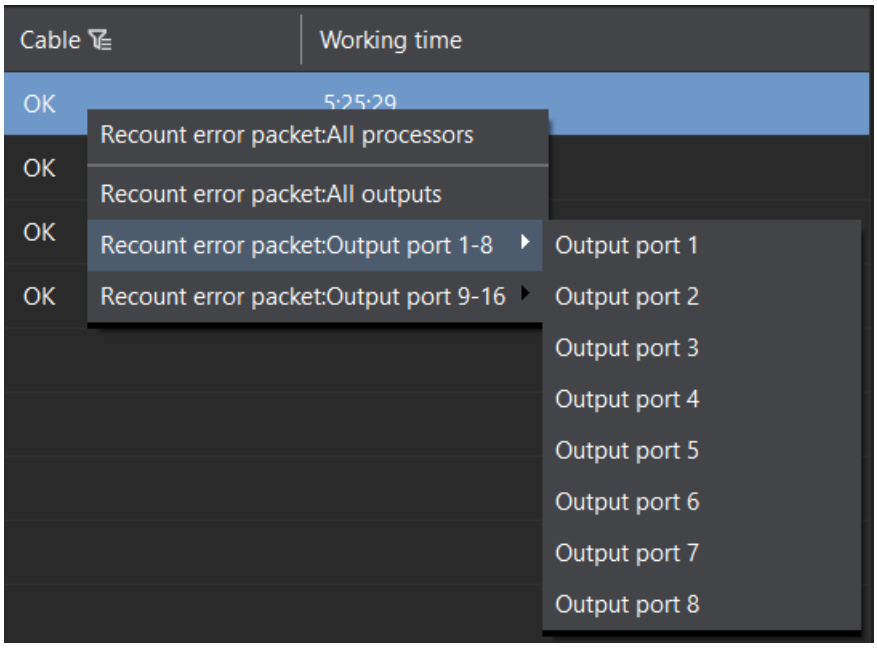


Fig 4.4-5 Recount error packet

4.5 Layout screen

The layout screen consists of four sections: ① Tool bar, ② Processor pane, ③Project canvas, ④Configuration pane. The layout screen is where users can setup the LED display mapping and cabinet configuration.

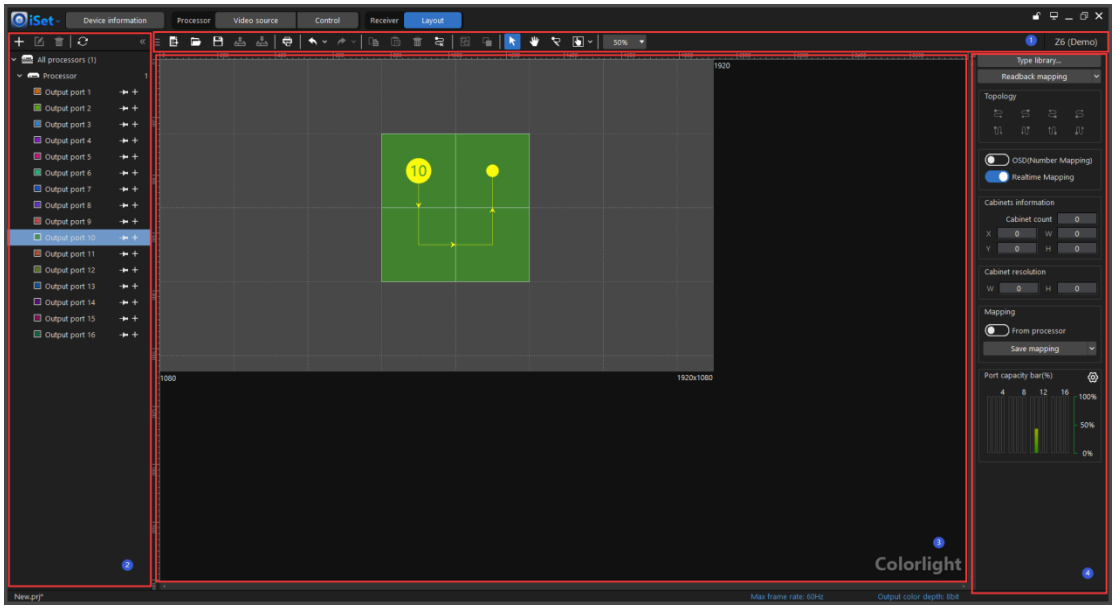


Fig 4.5-1 Layout screen

4.5.1 Tool bar

The tool bar allows users to quickly and easily set the LED wall mapping and save/ open a project, the available buttons in the tool bar as below:

Fig 4.5-2 Tool bar buttons

Form the left to the right of the bar: New project, Open project, Save project, Read project from processor, Save project to processor, Print, Undo, Redo, Copy, Paste, Delece cabinet, Clear topology, Group, Ungroup, Select, Hand（Pans over different part of the canvas）, Pen (custom topology), Highlight, Zoom.

- **New project**
  - Blank project

    Click “New project” button or use shortcut (Ctrl+N), “Project configuration” wizard window appears, follow the wizard to complete project properties configuration. The default project

name is New.prj. If the project has not been saved, iSet would pop a prompt window before creating another new project or closing the project. The project file contains the processor quantity, cabinet quantity, topology and so on and so forth.

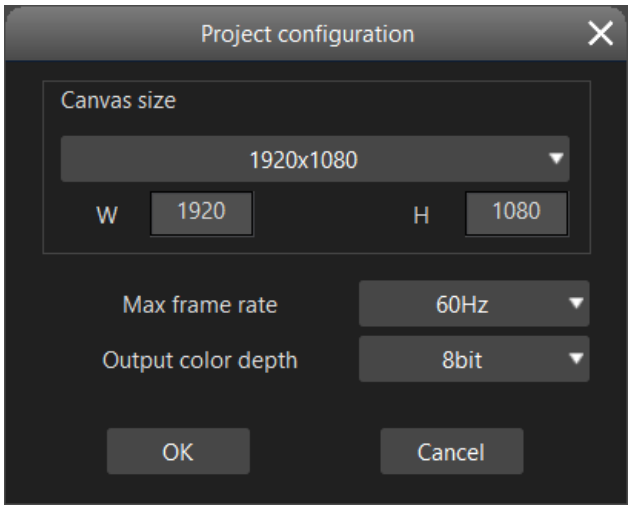


Fig 4.5-3 Project configuration wizard

- **Open project**

  Click "Open project" button or use shortcut (Crtl+O) to select and open a project file from local storage drive.

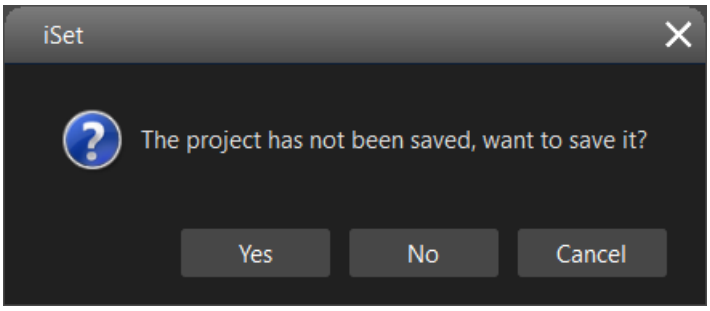


Fig 4.5-4 Prompt before current project is closed

- **Save project**

  Click "Save project" button or use keyboard shortcut (Ctrl+S) to save the project file to local storage drive, the file suffix is "prj", default file name is "New.prj".

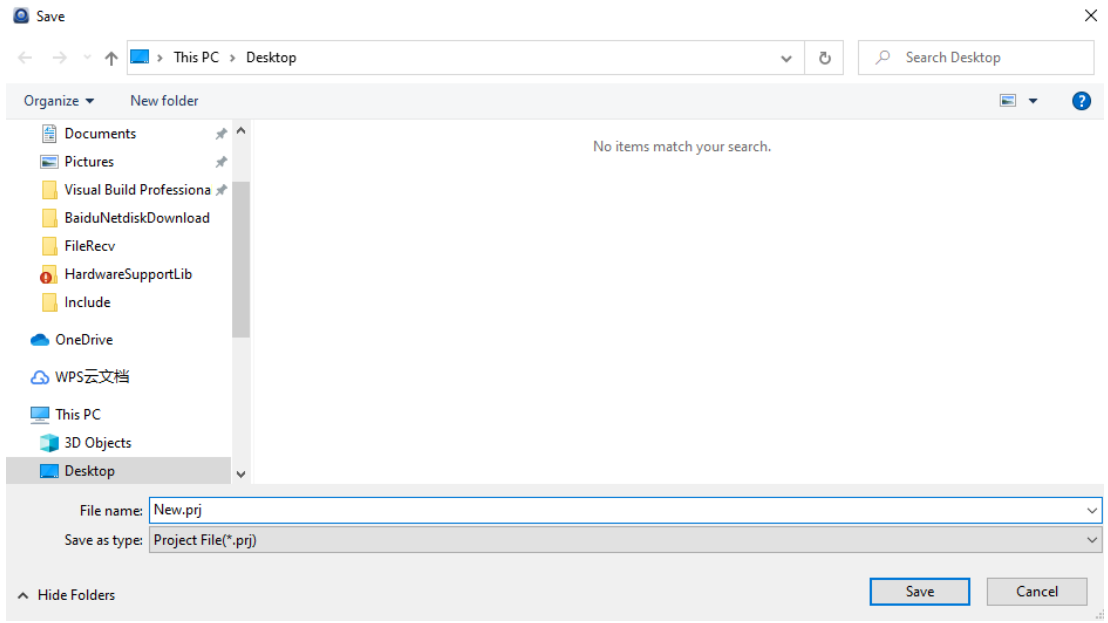


Fig 4.5-5 Save project to local storage drive

➢ Print

The array and topology of the cabinets and processor control zones can be printed. Click “Print” button or use keyboard shortcut “Ctrl+P” to get into print settings window.

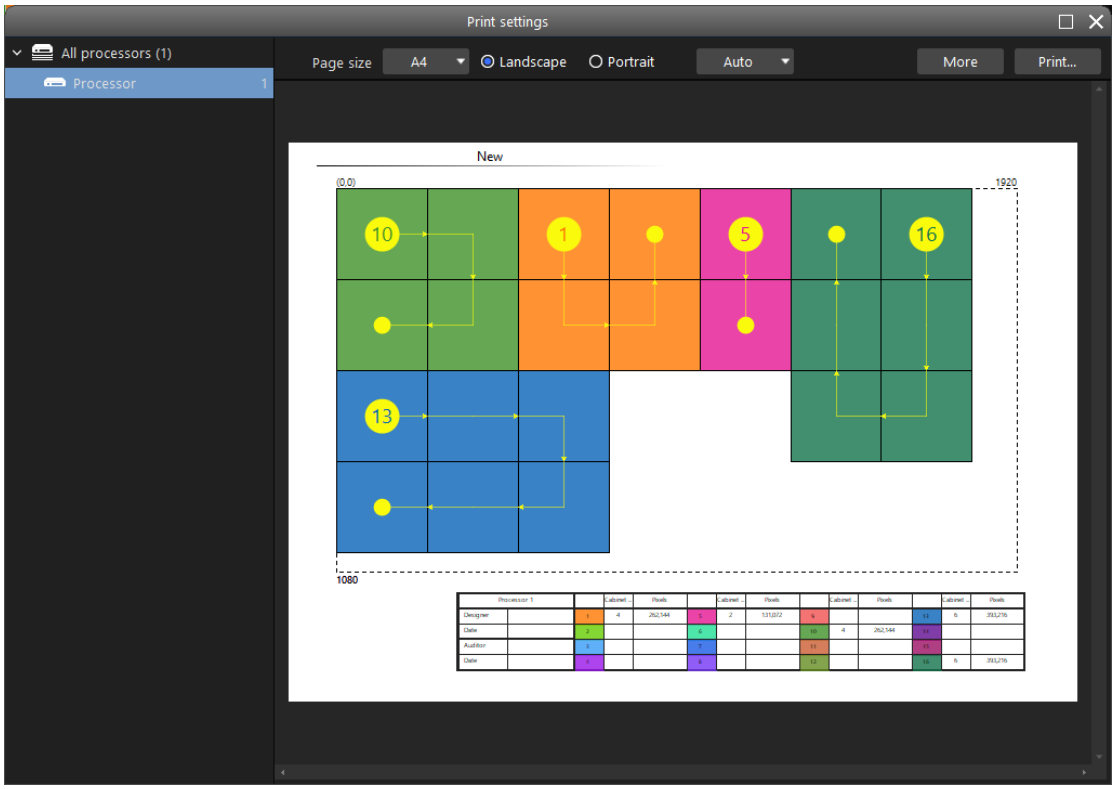


Fig 4.5-6 Print preview

Settings available in print settings window are as below:

【Page size】 The drop-down list provide selections for A3 and A4 page size.

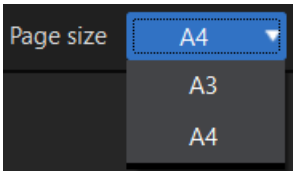


Fig 4.5-7 Page size selection

【Orientation】The contents in the page will auto scale to fit page orientation.

【Zoom】 Adjust the view of print preview to appear larger or smaller. Users can also use shortcut Crtl+weel to zoom in and out.

【More】 The "More" menu includes below options.

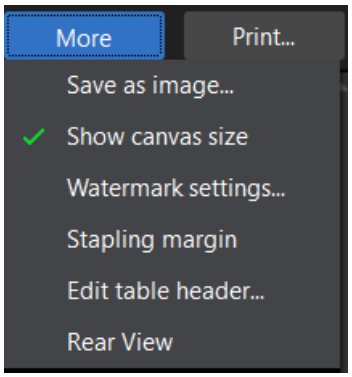


Fig 4.5-8 Options in "More" menu

- **Save as image:** Supported formats: bmp, png, jpg, the default format is bmp.
- **Show canvas size:** Show/hide the canvas size in the drawing.
- **Watermark settings**: Users can define custom watermark.

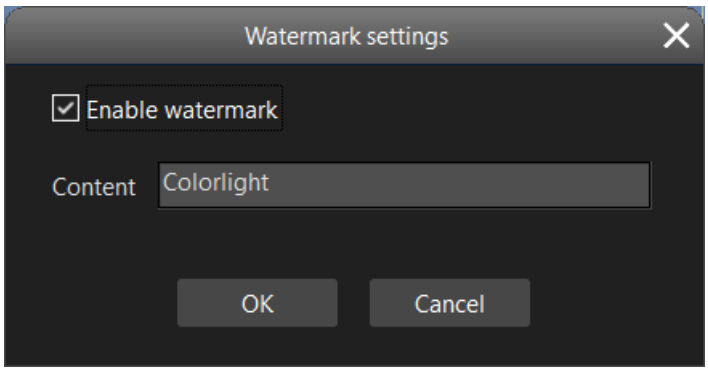


Fig 4.5-9 Watermark settings window

- **Stapling margin:** When stapling margin is checked, the whole view will slightly move towards right side of the page, it reserves space on the left side of the drawing for stapling papers together.
- **Edit table header:** Add processor name, designer, audit, designing date, audit date.

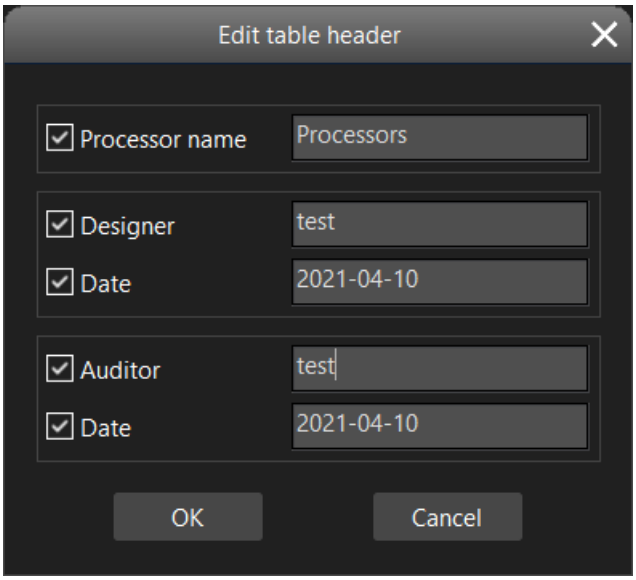


Fig 4.5-10 Table header edit

- **Rear view:** The cabinets in the canvas will be horizontally flipped, as if view from behind of LED display, this is very helpful when users install cabinets or trouble shoot behind the cabinets.

【Print】 Click "Print" button to print the drawing from an available printer or print the drawing to word, pdf format.

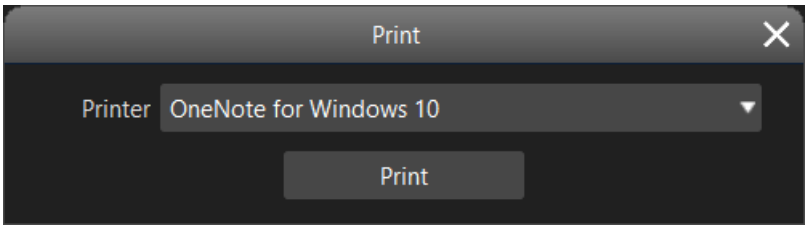


Fig 4.5-11 Printer selection drop-down button

Select a print method from drop-down menu, options in the drop-down list may vary depending on the software installing environment.

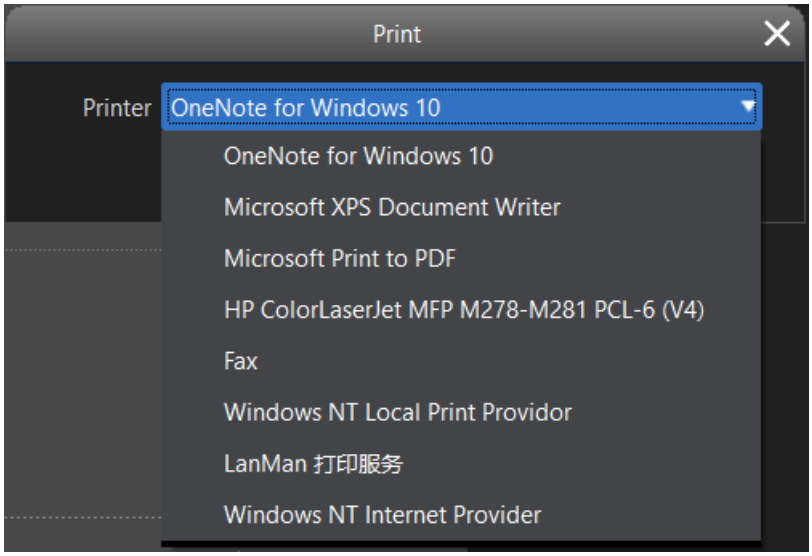


Fig 4.5-12 Print selection drop-down list

【Table information】 The information shown in the table header are: Processor name, output port number, cabinet count, pixels. Depending on the type of processor is connected, the columns in the table may appear different. Certain processors show columns of cabinets position(x,y), the width and height of port control area.

Processor 1			Cabin...	Pixels		Cabin...	Pixels		Cabin...	Pixels		Cabin...	Pixels
Designer		1	3	196,608	5			9			13		
Date		2			6			10	4	262,144	14		
Auditor		3			7			11			15		
Date		4			8			12			16	2	131,072

Fig 4.5-13 Table header

- **Undo**

  Undo the last action performed. Click the drop-down arrow to select the action you want to recover.

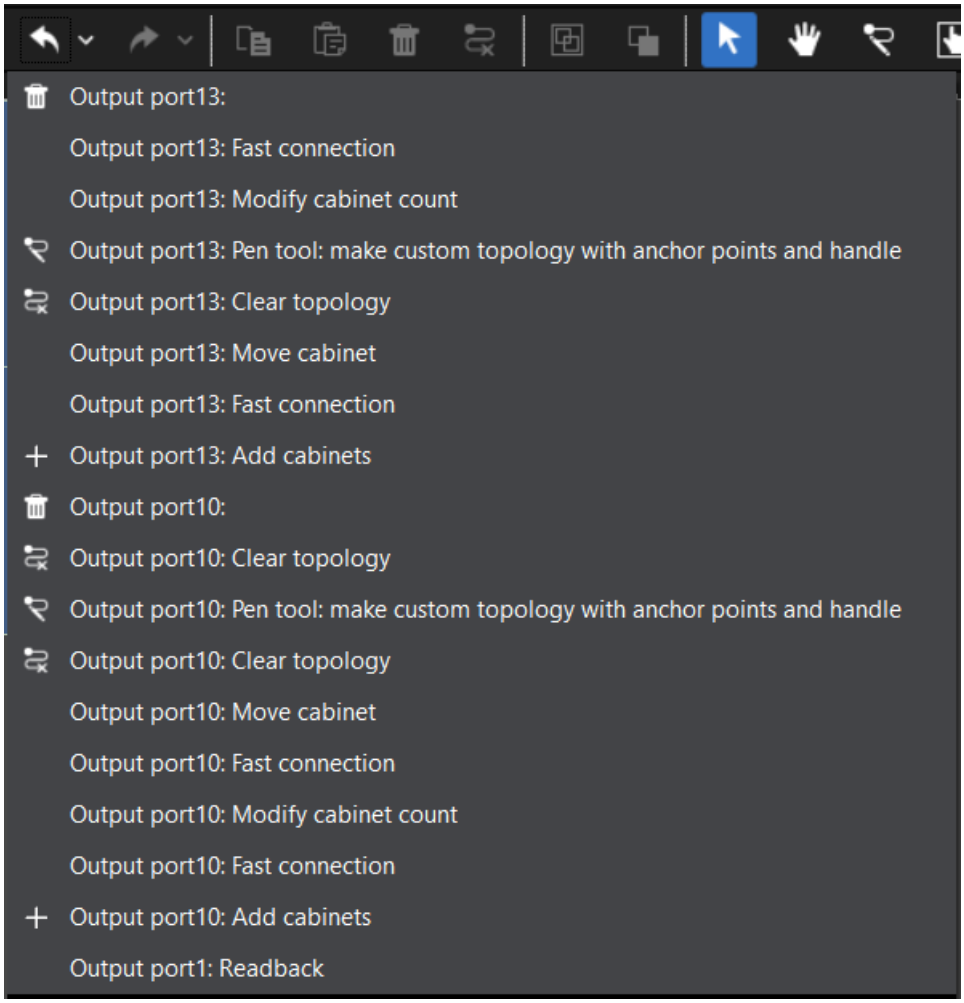


Fig 4.5-14 Undo drop-down list

- **Redo**

  Redo the last action performed.

- **Copy**

  Copy the selected cabinets or groups.

- **Paste**

  Place the copied cabinets in the canvas. Cabinets and groups can be copied and pasted between different processors or output ports.

- **Delete cabinet**

  Delete the selected cabinets or group.

- **Clear topology**

Delete the selected cabinets topology. By default, delete all cabinets topology under current processor when there is no cabinets selection made.

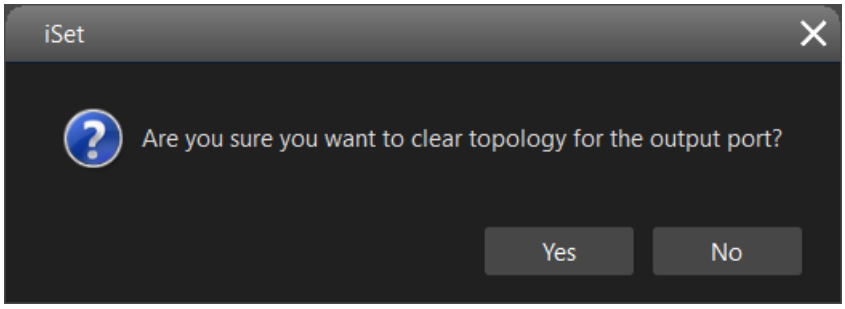


Fig 4.5-15 Delete topology dialog

- **Group**

  Group selected cabinets or merge multiple groups together, so you can move or edit them at the same time.

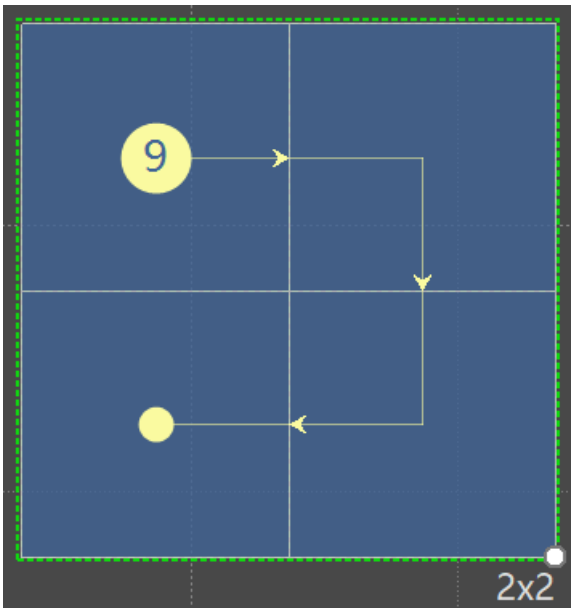


Fig 4.5-16 Creating group

- **Ungroup**

  Break the connection between grouped cabinets or groups so that you can move or edit them individually again.

  If a group consists of multiple sub-groups, sub-groups can be retained when break this group.

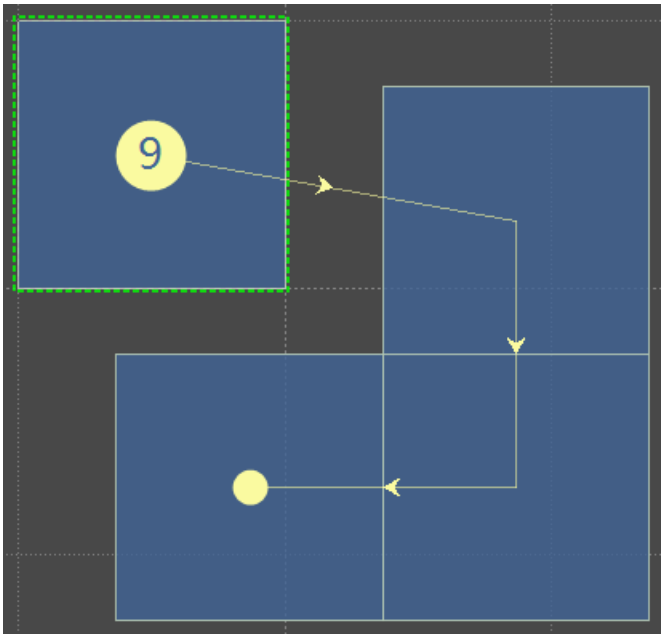


Fig 4.5-17 Ungroup

- **Select**

  Select, move, resize the cabinet in the canvas.

- **Hand**

  Select and drag to pan around the canvas.

- **Pen (Custom topology)**

  When click on Pen tool button, the cursor turns into pen shape. Users can then click on individual cabinets to make a custom topology, or hold the mouse left button and draw the topology over the cabinets on the canvas.

  When the cabinets topology already exists, right-click on a cabinet to delete the existing topology of this cabinet and the cabinets topology after it. Right-click on the first cabinet of a string of cabinets to delete the topology for the whole string.

- **Highlight**

  Click the "Highlight" button in the tool bar and then click on a cabinet in the canvas to highlight a cabinet on the physical LED wall. The highlighted cabinet alternately displays its identify test pattern (red, white, blue, green frames).

  The rear status LED or LCD screen of the highlighted cabinet flashes or show color that differ from other LED cabinets. This feature is particularly helpful for troubleshooting and installing a large LED wall.

Only one cabinet can be highlighted at a time. Clicking the blank area of the canvas or "Select" button in the tool bar can remove highlighting effects.

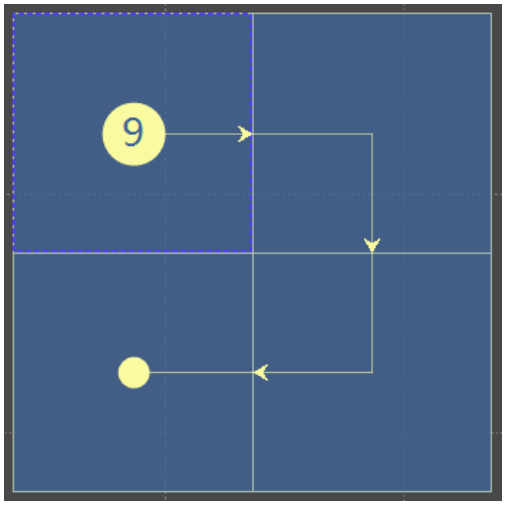


Fig 4.5-18 Highlighted cabinet in the canvas

- **Zoom**

  Use the keyboard shortcut Crtl+wheel to zoom in and out the view position of the canvas.

  Clicking the drop-down menu in the tool bar can also select a zoom scale.

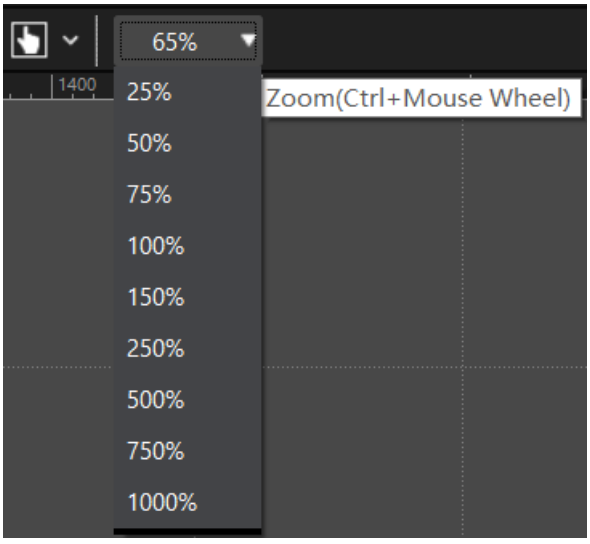


Fig 4.5-19 Zoom menu drop-down list

- **Processor type**

  Processor type is displayed on the upper-right of the screen.

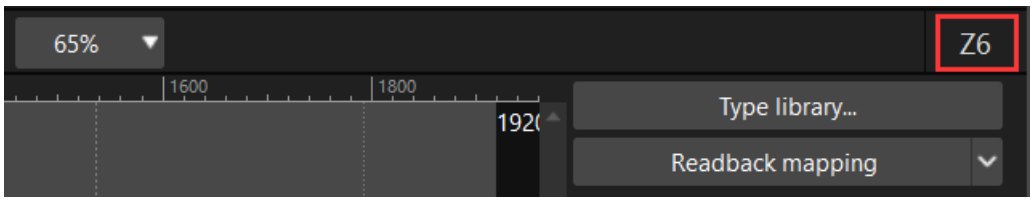


Fig 4.5-20 Processor type

4.5.2 Processor pane

The processor pane located in the left of the layout screen. The processor icon will be grayed out when the processor is offline, blue icon indicating the processor is online.

The processor pane must retain at least one processor, the processor cannot be deleted when there is only one processor in the pane. Processors can be grouped together for convenience. The maximal number of processors in a group is 255.

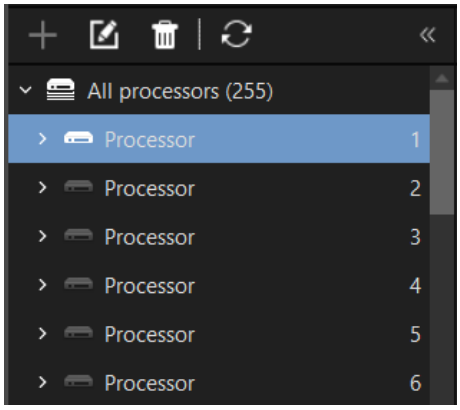


Fig 4.5-21 Processor tree

- **Processor, processor group selection**

  Click on the processor or processor group button to select them, the selected processor/processor group button style turn into light blue to differ from unselected ones.

- **Add**

  Add processor/processor group.

  - **Add processor**

    Click the "Add" icon ⊞ on the top of the tree pane to add processor, "Add 1 processor", "Add 2 processors" and "Custom add" options are available.

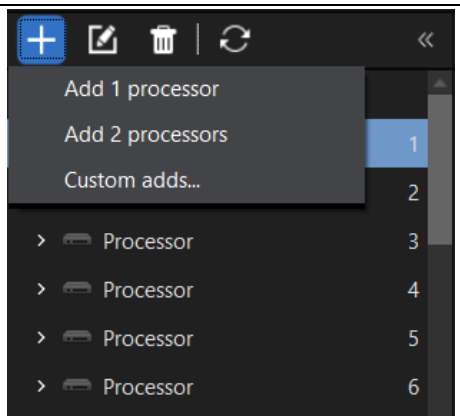


Fig 4.5-22 Add processor

- **Add processor group**

  Select all processors and then click the "Add" icon to add processor group.

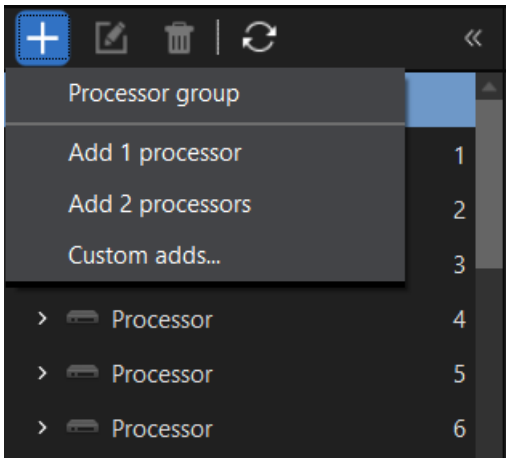


Fig 4.5-23 Add processor group

- **Delete**

  Delete processor/processor group.

  - **Delete processor**

    Select a processor in the tree pane, click the trash can icon or press the "Delete" key in the keyboard to delete the selected processor.

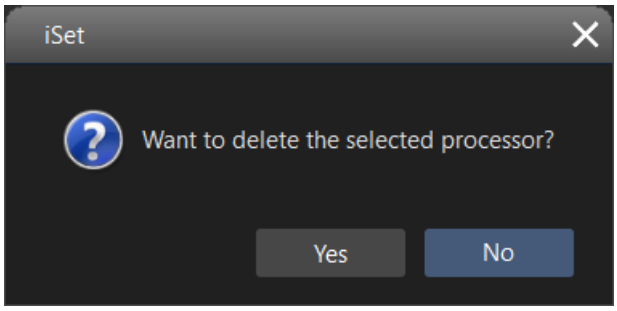


Fig 4.5-24 Delete processor

- **Delete processor group**

  Select a processor group in the tree pane, click the trash can icon or press the "Delete" key in the keyboard to delete the selected processor group, the processor/processors in this group will be still retained.

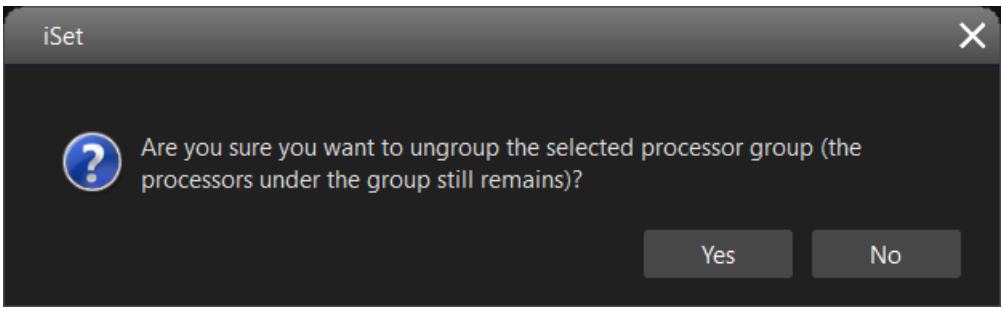


Fig 4.5-25 Delete processor group

- **Rename**

  Select a processor or a processor group in the tree pan, click icon or press F2 key in the keyboard to rename the selected processor/processor group. The default the name is "Processor".

- **Refresh**

  Refresh the processor list in the tree pane and the layout screen by clicking icon on the top of the tree pane.

- **Right-click menu**

  The options in the menu appear different depending on where you right-click at in the tree pane.

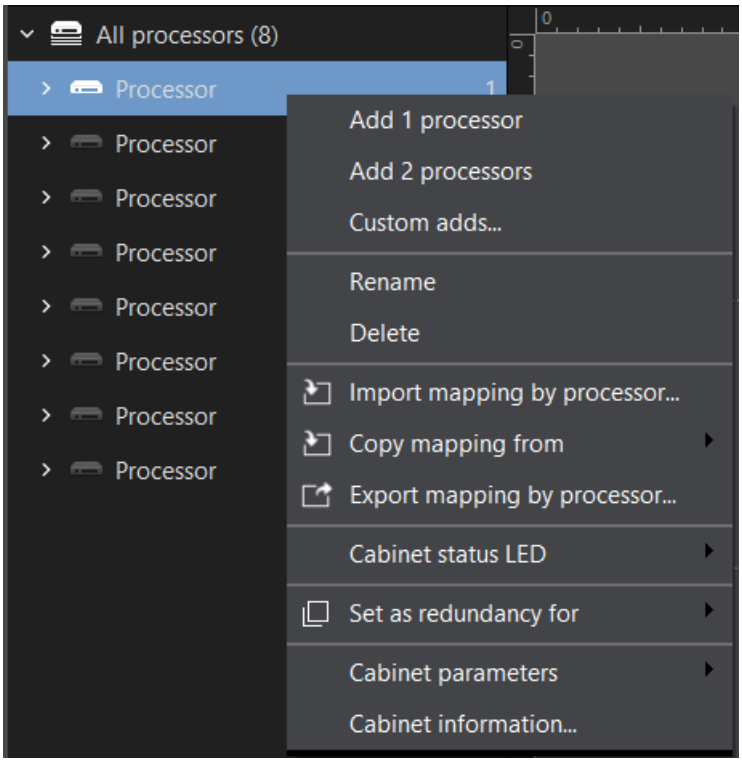


Fig 4.5-26 Right-click menu for online processor

The right-click menu of an offline processor is lacking of "Cabinet status LED" option comparing to the menu for online processor.

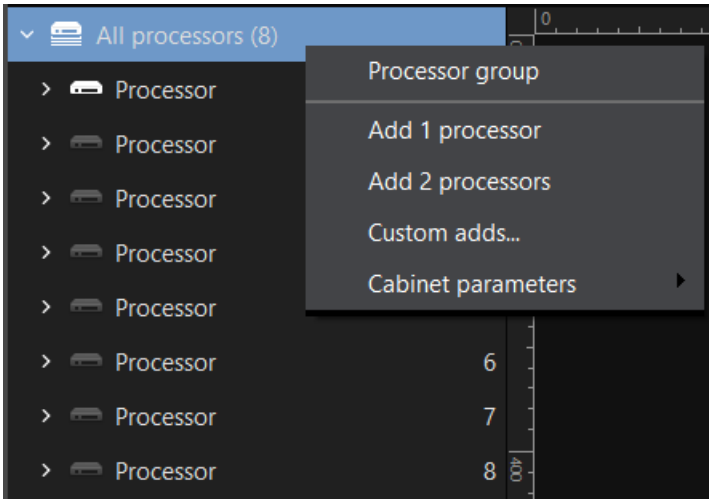


Fig 4.5-27 Right-click on All processors

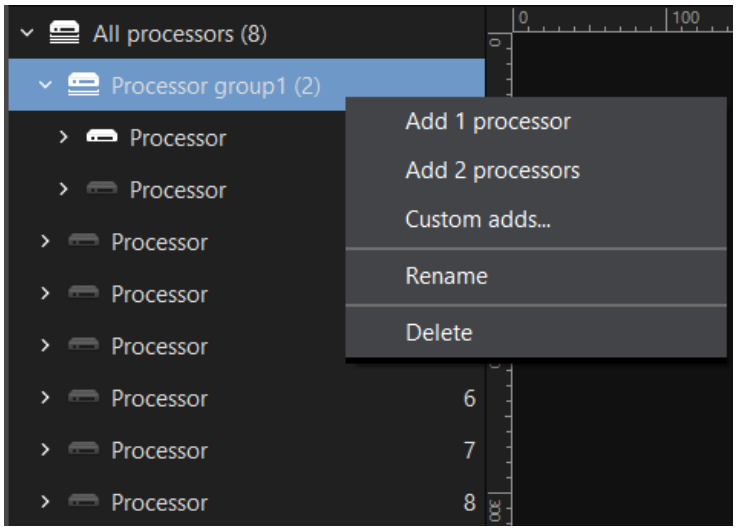


Fig 4.5-28 Right-click on Processor group

- **Import mapping by processor:** Load a previously-exported by processor mapping file that is formatted in “.sprj” from the local storage drive to the current project.
- **Export mapping by processor:** Export the mapping file of the current processor to local storage drive.
- **Copy mapping from:** Copy the mapping configuration from any of the processor in the tree pane to the selected processor.
- **Cabinet status LED**

  There are typically two status LEDs on the rear of the cabinet indicating the connection status and signal transmission status. Normally the connection status LED is always on in red light and the signal transmission status LED is blinking in green light. Users can turn off both LED by clicking “Off”.

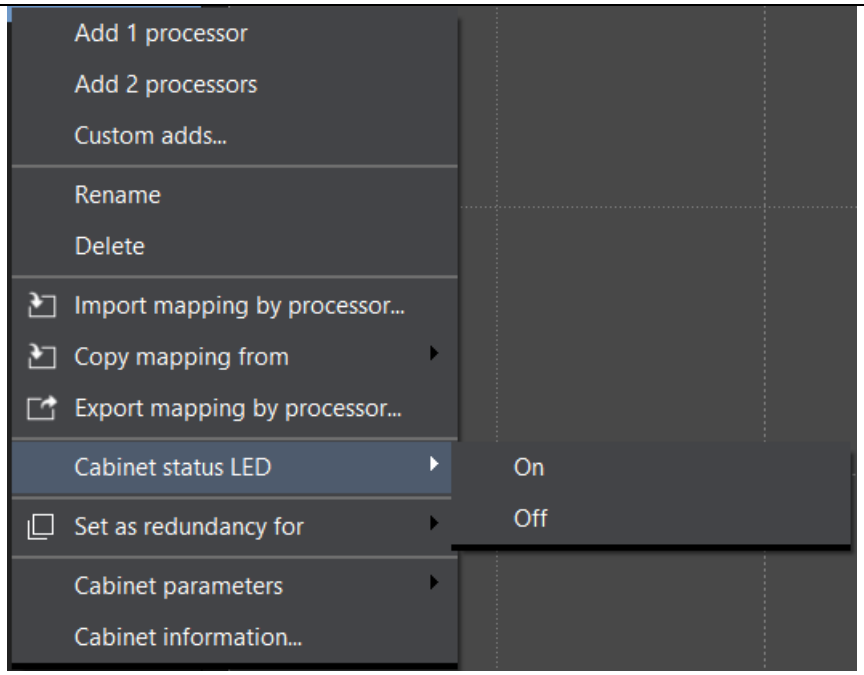


Fig 4.5-29 Cabinet status LED

- **Set redundancy processor**

  Icon indicates the processor is set as a redundant processor. Users can set redundant processor by right-clicking on the processor button and select "Set as redundant for" to make the current selected processor as a redundancy for the desired processor (except itself) in the tree pane.

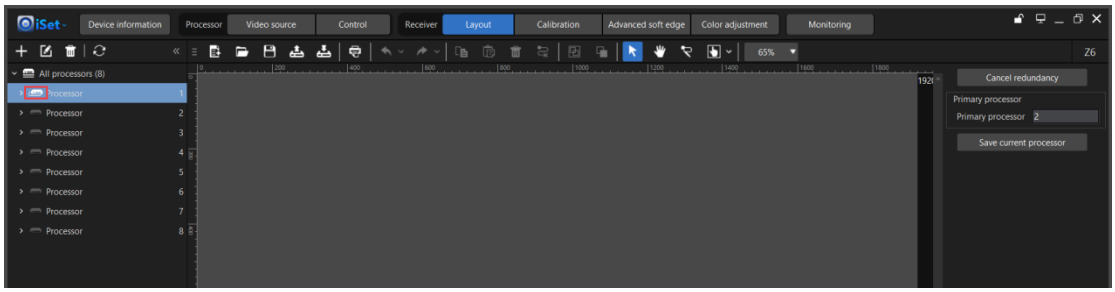


Fig 4.5-30 Redundant processor

Cabinet parameters

The “Cabinet parameters” option is only visible when the “Cabinet parameters modification” is enabled in the iSet preference settings.

Fig 4.5-31 Cabinet parameters

Markup custom-defined cabinets: Mark the custom-defined cabinets as light -gray to make them stand out. Users can specify a cabinet type that is loaded in the type library to custom-defined cabinet.

Save parameters: The cabinet parameters file is formatted in “rcvbp” which can be loaded to the type library as a cabinet type, the custom-defined cabinet type does not contain rcvbp file. Click “Save parameters”, the iSet will save the rcvbp file to the physical cabinet (or receiver card in each cabinet). So, if the cabinet on the canvas is a custom-defined cabinet, “Save parameters” will be not effective.

Note: If there is any custom cabinet shape in the canvas under current processor, when click “Save parameters”, message “Parameters cannot be saved to custom cabinets” will appear.

Users can also set gamma for selected cabinet type before saving parameters.

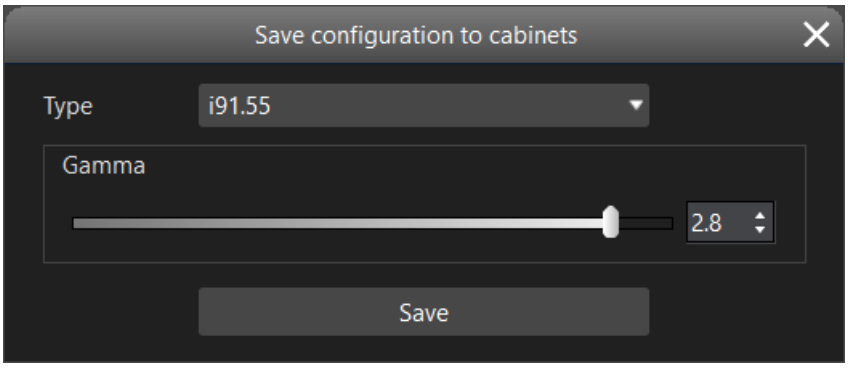


Fig 4.5-32 Save cabinet parameters

Cabinet information

Show the cabinet count, type and resolution.

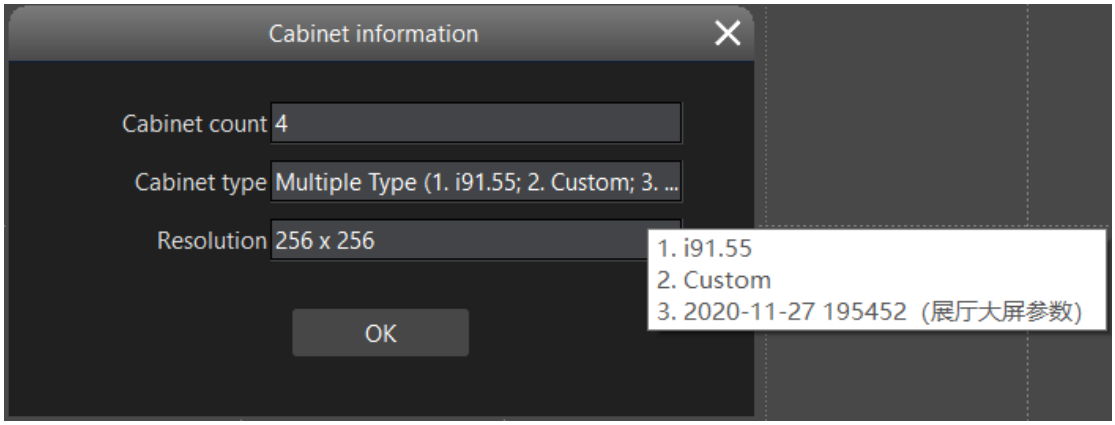


Fig 4.5-33 Cabinet information

Show "-" in resolution box when there is more than one type in the canvas.

- Output port configuration
  - Show output ports

    Click the arrow icon in the processor tree pane to expand and show output ports for the processor.

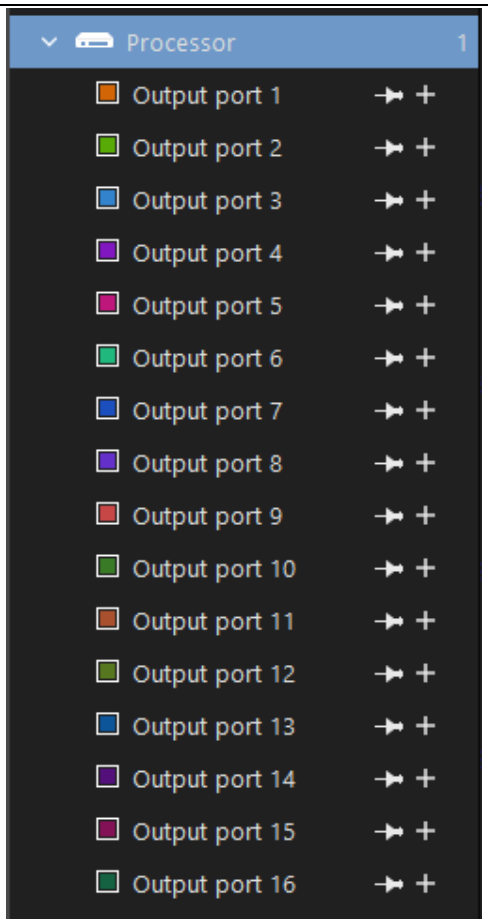


Fig 4.5-34 Output ports

- **Add cabinet**

  Click the plus icon ✚, available cabinet types (custom cabinet type and pre-loaded cabinet type) will appear for selection. The custom cabinet type width or height cannot be greater than 1024.

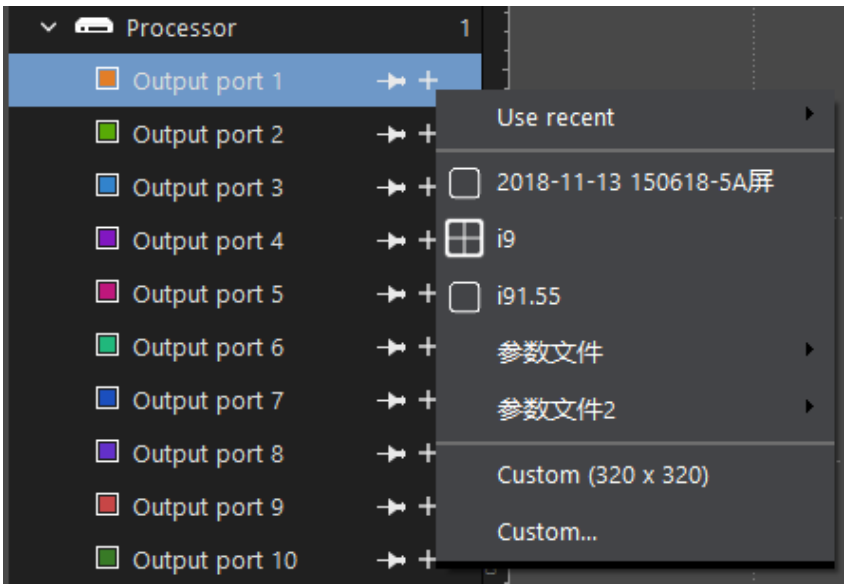


Fig 4.5-35 Add cabinet

- **Lock/Unlock the output port**

  Click the pin icon (refer to figure 4.5-36) to lock the output port. User cannot add, move, modify, read/write the cabinets under locked output port. Click the icon to unlock the output port.

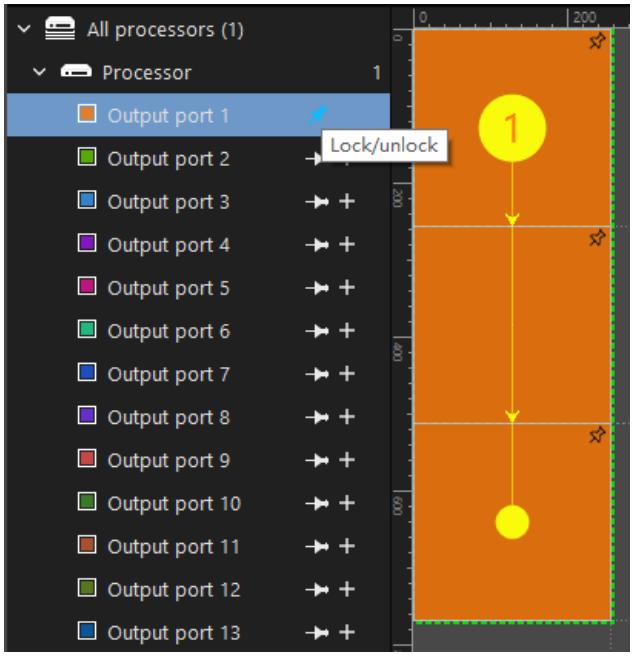


Fig 4.5-36 Locked output port

- **Right-click context menu**

  Right-click on the output port, a context menu will appear included following options: Add cabinet, Import mapping, Export mapping, Set as redundancy for, Lock options, Fill color, Cabinet configuration, Cabinet information.

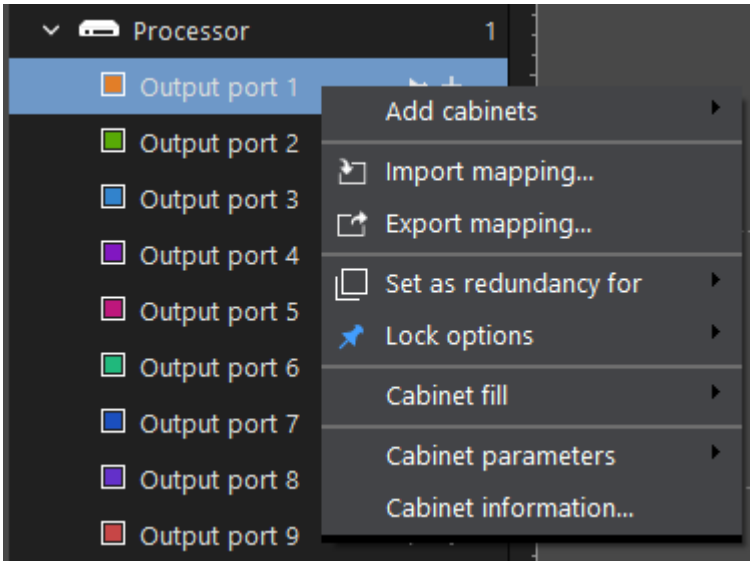


Fig 4.5-37 Right-click menu

Import mapping—Load mapping file from local storage drive to iSet current project.

Export mapping—Export the mapping under current output port to a local storage drive, the mapping file is formatted in "pprj".

Set as redundancy for—Set this output port as a redundancy port for any of the output port except itself.

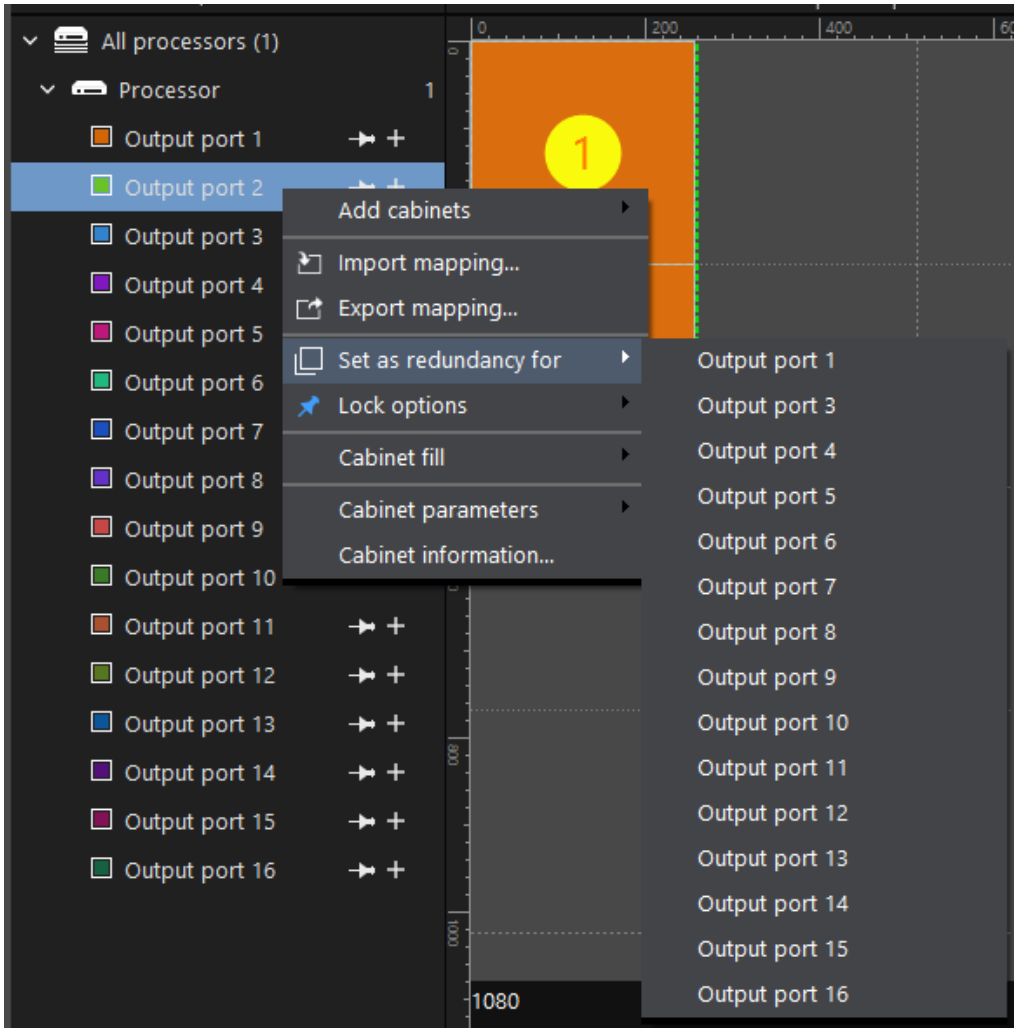


Fig 4.5-38 Set as redundancy

If the output port is successfully set as a redundancy port, the fill color for the cabinets under this output port will be the same with its primary port. The sign indicates redundancy output port.

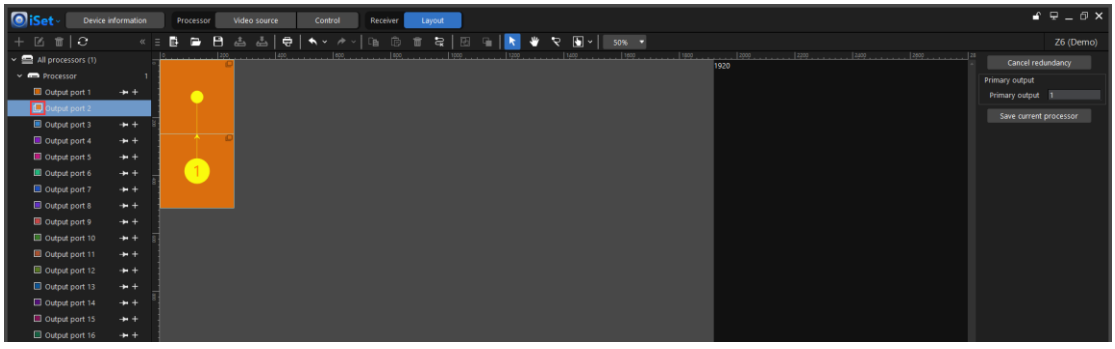


Fig 4.5-39 Redundancy output port

Lock options—Users can lock/unlock the current output port/processor/all processors in this menu.

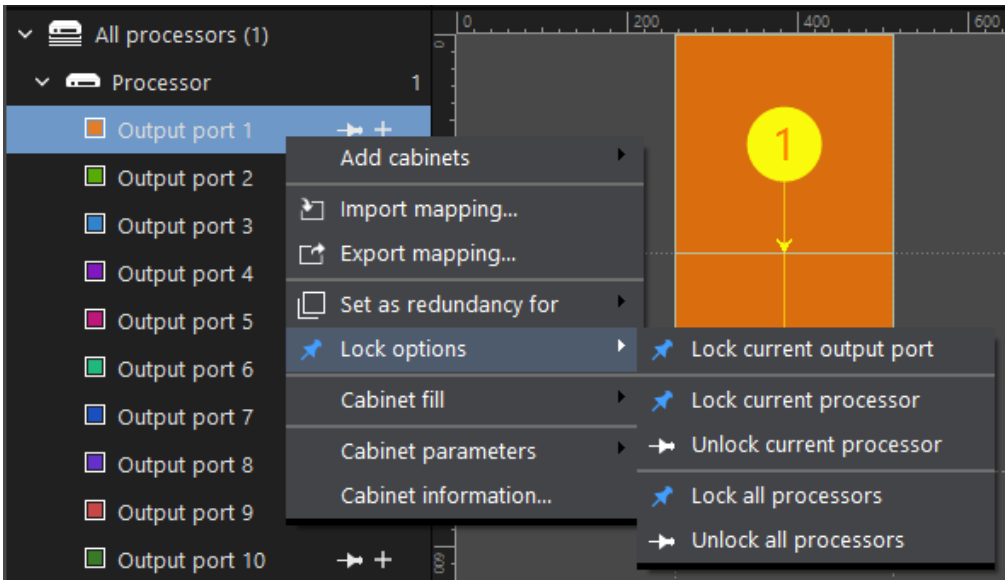


Fig 4.5-40 Lock options

Fill color— Users can set the cabinet fill color and transparency.

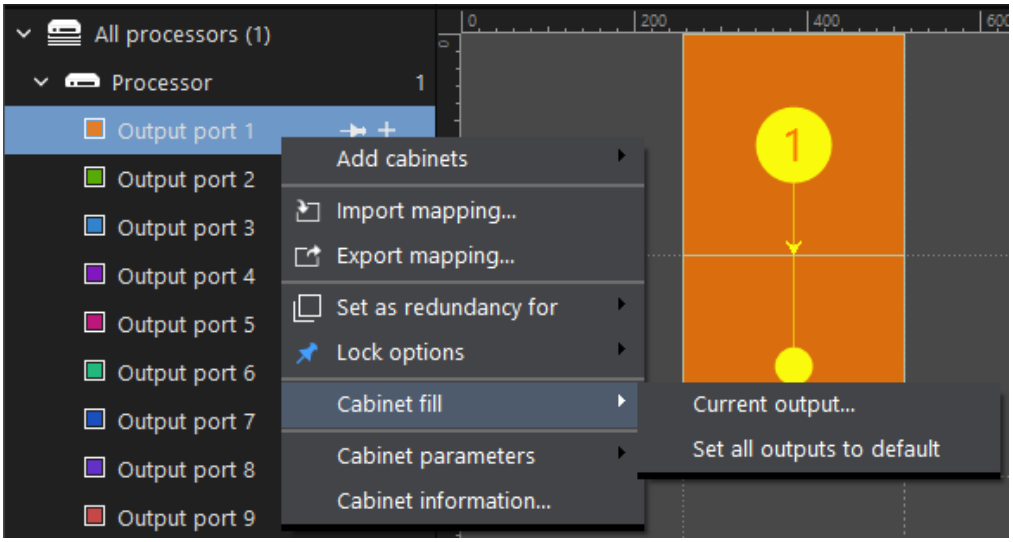


Fig 4.5-41 Cabinet fill context menu

Select "Current output" to get into the color settings window for the selected output port. Users can custom cabinet fill color and color transparency, this is particularly helpful for distinguishing cabinets on each port and viewing the project canvas background picture.

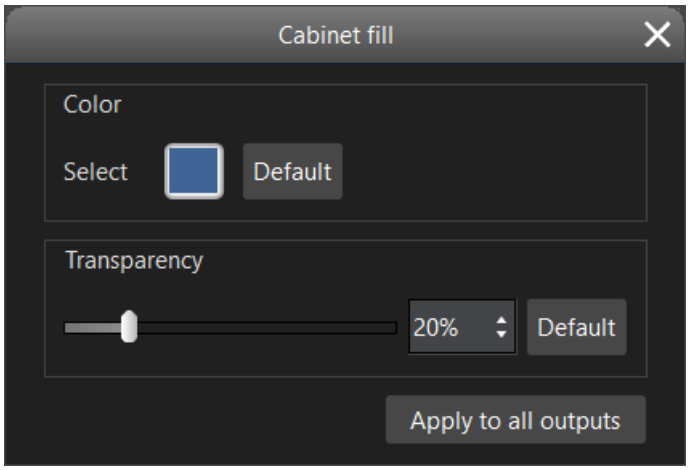


Fig 4.5-42 Cabinet color fill settings window

Click "Apply to all outputs" button to apply the fill setting to all cabinets under current processor.

Click "Set all outputs to default" button, all cabinets under the current processor use the iSet default cabinet fill setting.

Cabinet configuration—Refer to "Cabinet parameters" in page 51.

Cabinet information—Refer to "Cabinet information" in page 51.

4.5.3 Project canvas

➢ Project canvas view

The project canvas is a dark gray workspace that usually represents the LED display size, users can place/edit cabinets and draw topology to create mapping for the LED display on the project canvas.

Users can freely set the project canvas size by right-click on the blank area of the canvas, the project canvas size must be equal to or larger than the video input resolution.

Right-click on the blank area of the project canvas to set the frame rate and color depth, canvas size and canvas fill.

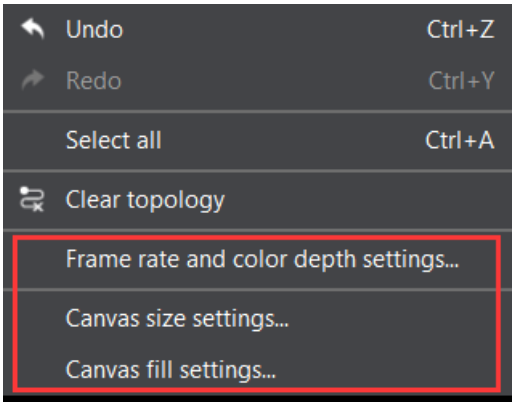


Fig 4.5-43 Right-click on the canvas

Each processor has its own project canvas. If the cabinets are out of the canvas area, the cabinet fill of the ones that beyond the canvas will turn into dark red.

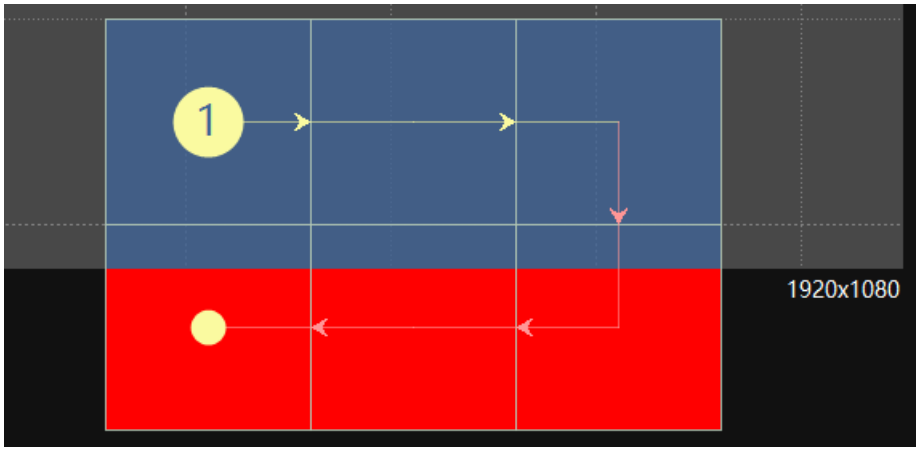


Fig 4.5-44 Cabinets out of the canvas

The maximum supported frame rate and color depth are displayed in the bottom of the software screen.

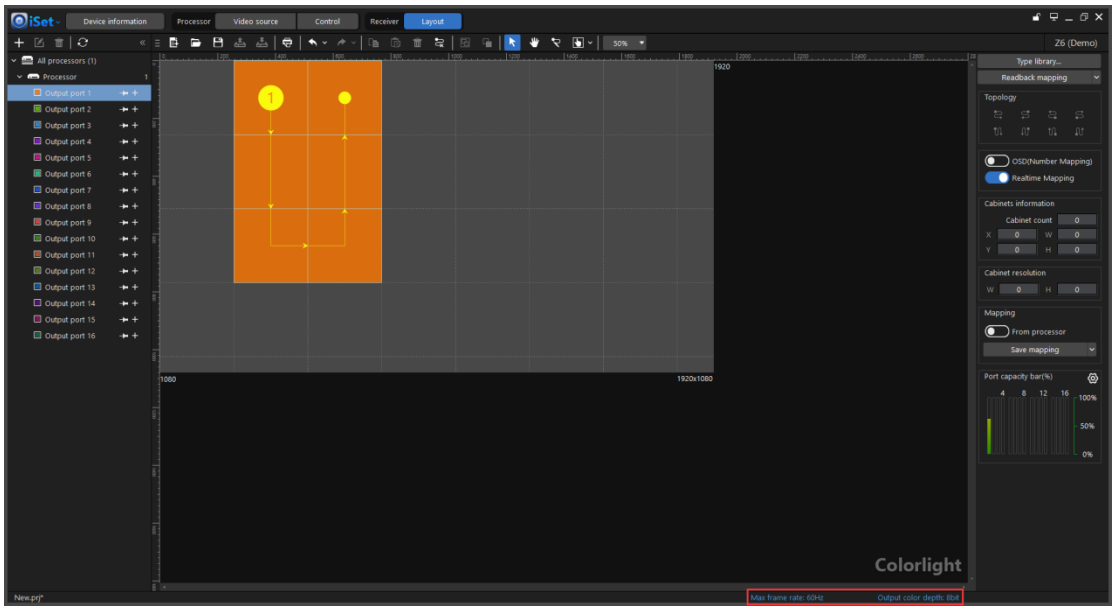


Fig 4.5-45 Maximum supported frame rate and color depth

- Edit cabinet on the project canvas
  - Cabinet selection

    Click cabinet on the canvas to select a cabinet.

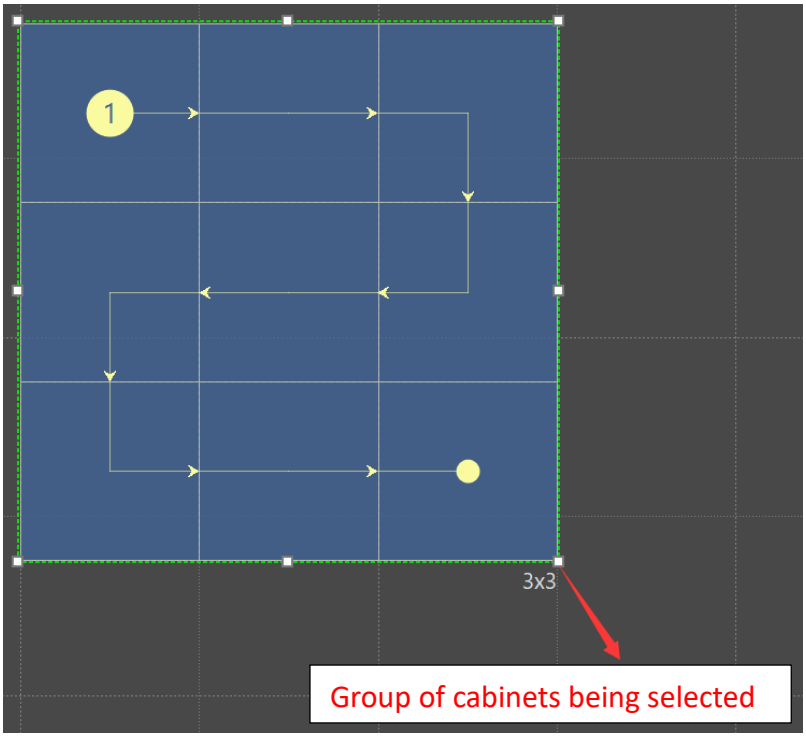


Fig 4.5-46A Group of cabinets is being selected

Double-click on a cabinet to select individual cabinet in a group, hold the Crtl key+ left- click can select multiple cabinets in a group.

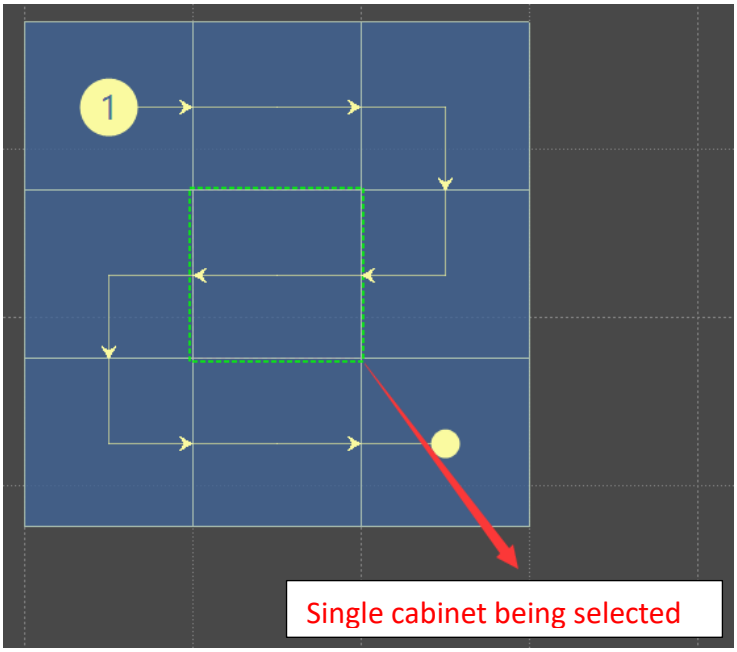


Fig 4.5-46B single cabinet is being selected

- **Move cabinet**

  Users can select and drag the cabinet on the canvas to move its position, or change the x,y coordinates in the configuration pane which can be edited when the cabinet is selected.

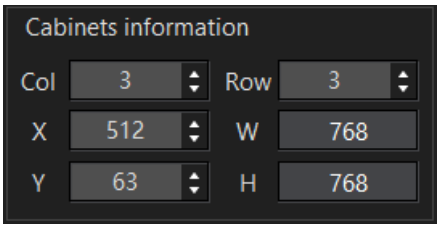


Fig 4.5-47 Cabinets information

If "Snap to cabinet/grid" is enabled in the software preference settings, cabinets will snap to the other cabinets or grid lines on the canvas to avoid overlapping or small gaps.

- **Add cabinet and change cabinet array**

  To add cabinets, click the plus icon on the output port that you want to connect cabinet and place the cabinet to the project canvas.

  If there is already a cabinet or group of cabinets in the canvas, select the cabinet or group, drag handles will appear, hover over the cursor on the handle, the cursor will change its form to double-

headed arrow, hold the left mouse button and drag to draw an array of cabinets. The topology is defined by the direction taken when drawing the array.

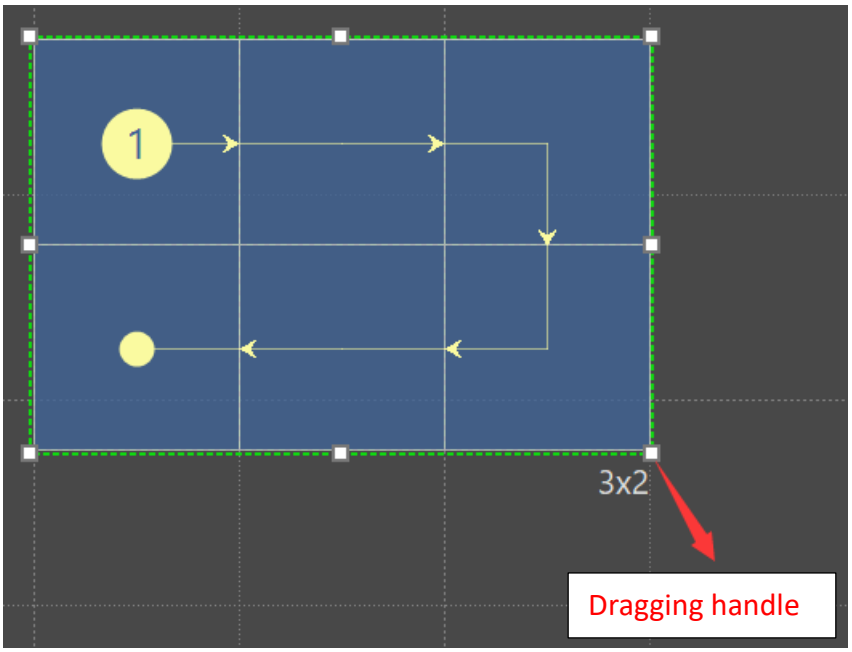


Fig 4.5-48 Draw cabinet array

- **Right-click on the cabinet**

  Select a cabinet or a group of cabinets, right-click on the cabinet to bring out a context menu, some actions in the context menu has a shortcut. The context menu includes below options:

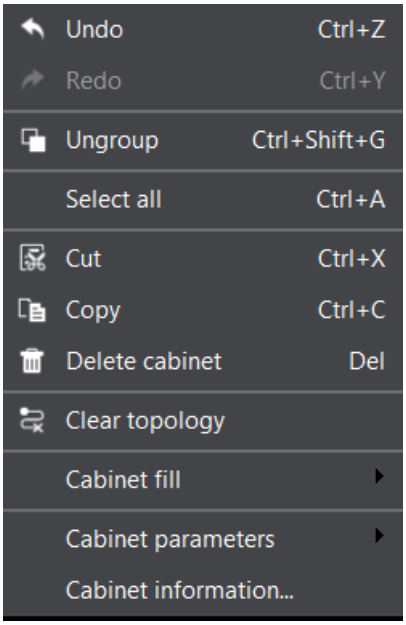


Fig 4.5-49 Cabinet context menu

Cabinet configuration: Users can specify or associate a cabinet parameters file (change cabinet type) to a selected cabinet or read the cabinet parameters back from a physically connected cabinet. Cabinet parameters can be only readback from single cabinet at a time.

Markup custom-defined cabinet: Mark the custom-defined cabinets fill on the canvas to light gray.

Select the same type: Select the same type cabinets under the current output port.

Change type: Change the selected cabinet type (cabinet parameters file). Users can select a cabinet type by clicking the drop-down menu in the change type window. (Types in the drop-down list are identical to the types in the type library).

Save parameters: Save the cabinet parameters to the cabinets (receiver cards) that is physically connected.

Readback from project: Readback the parameters file from the cabinet in the project and save it to local storage drive.

Readback from connected cabinet: Readback the parameters file from connected cabinet (receiver card) and save it to local storage drive.

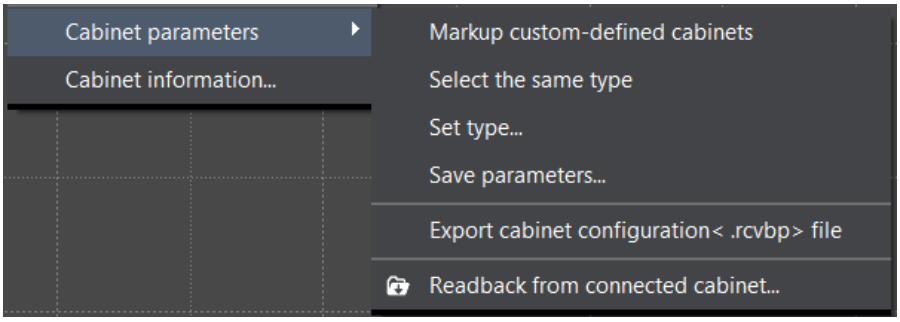


Fig 4.5-50 Cabinet configuration

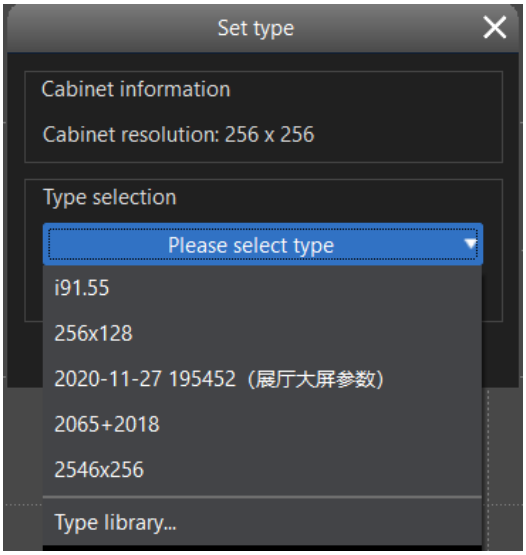


Fig 4.5-51 change type

Rick-click on the blank area of the canvas, a context menu will appear.

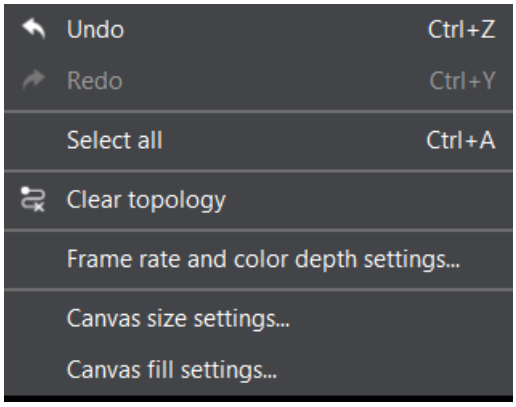


Fig 4.5-52 Right-click on the canvas

4.5.4 Layout configuration pane

When click on a processor in the processor tree pane, following options will appear in the configuration area: Type management, Readback mapping, Topology selection, OSD, real-time mapping, cabinet information, cabinet resolution, mapping from processor toggle, Port capacity bar.

When click on all processors in the processor tree pane, following options will appear: Processor status overview, Redundant processor view, processor control area map.

- **Type library**

Users can upload cabinet parameter files (formatted in “rcvbp”) to the type library; the cabinet parameter file also known as a cabinet type. Click “Type library” button on the top of the configuration pane to get into the type library window where users can add, delete or edit cabinet type.

- **Type library tool bar**

  The tool bar contains following buttons: New type group, import as folder, import cabinet type file, create multi-receiver’s cabinet type, rename, delete, clear all.

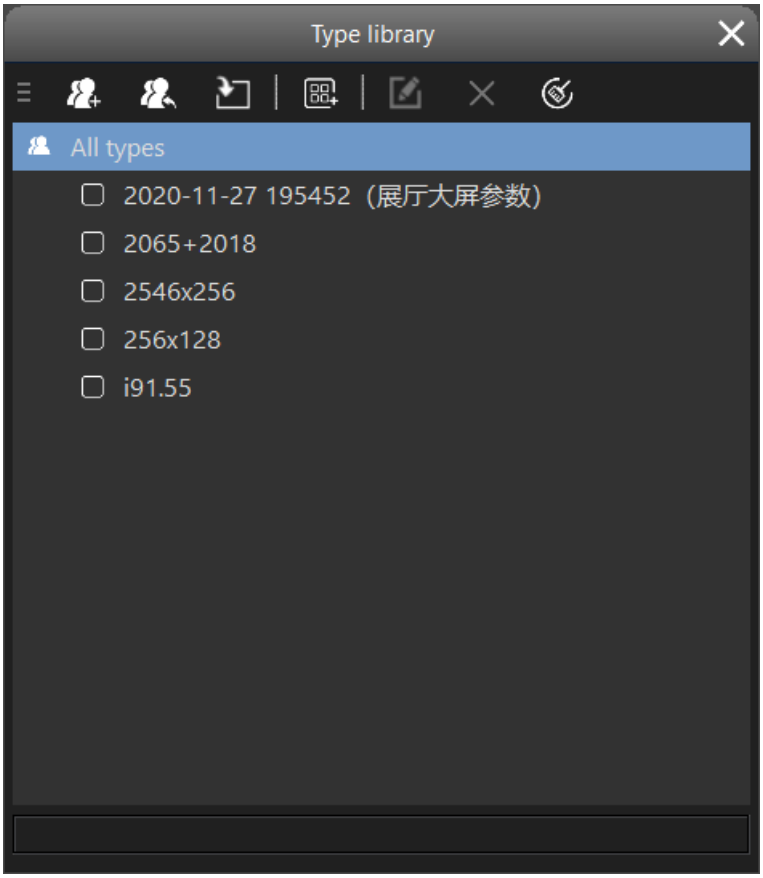


Fig 4.5-53 Type library window

New type folder:

Click icon or use keyboard shortcut Crtl+N to create a type group folder.

Import as folder:

Click icon or use keybaord shortcut Crtl+I to import a folder that may contain multiple cabinet type files.

Import cabinet type file:

Click icon or use keyboard shortcut Ctrl+A to import a cabinet type file.

Create multi-receiver cabinet type:

Click icon to open a wizard. Wizard 1/3: Select a cabinet type file and receiver cards array. Then click next, wizard 2/3: Set the internal data flow orientation of a cabinet by clicking “Specify orientation”. If the cabinet does not constrain the data flow orientation between receiver cards, then only need to choose the internal receiver card connection topology of this cabinet. Then clock next, wizard 3/3: enter the cabinet type name, weight, Power and working voltage range to create a cabinet label. And lastly, click OK to complete creating multi-receiver card cabinet type.

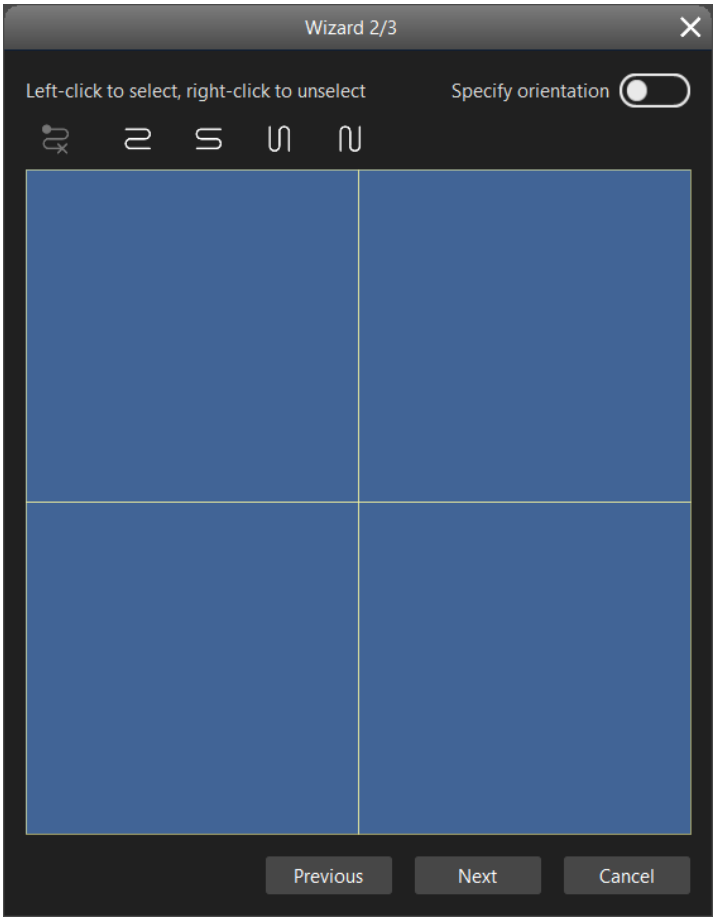


Fig 4.5-54 Create multi-receiver card cabinet type wizard 2/3

Rename:

Click rename icon or use keyboard shortcut to rename a selected cabinet type or type folder.

Delete:

Click cross icon ✕ or use "Delete" key to delete a selected cabinet type or type folder.

Clear all:

Delete all types and folders except the types which are being used in the current project.

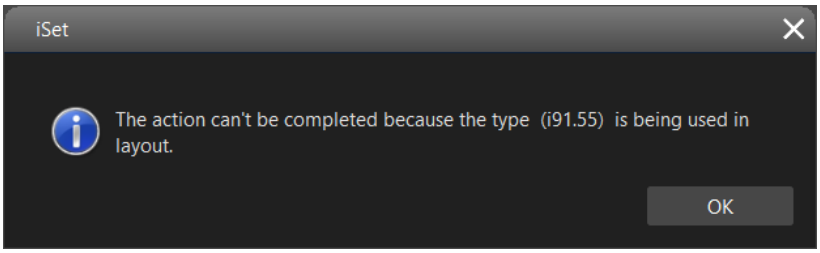


Fig 4.5-55 Prompt window when delete a cabinet type in use

Cabinet type file and cabinet type folder can be exported by right clicking on the type or folder.

Note: Cabinet types that comes with the iSet installer cannot be deleted and modified.

- **Readback mapping**

Click "Readback mapping" button, the iSet default to readback the mapping configuration for the cabinets connected to the current processor. The readback mapping drop-down list contains two option: Readback from current processor and readback from all cabinets. Readback from all cabinets option is only visible when there are more than one processor connected.

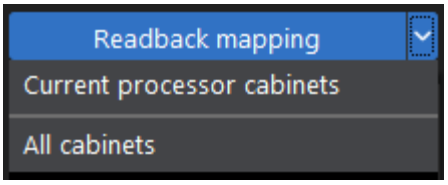


Fig 4.5-56 Readback mapping drop-down list

- **Topology Selection**

Except using the pen tool in the tool bar to custom the cabinet topology, the iSet also provides 8 selections of the typical cabinet topology.

Fig 4.5-57 Cabinet topology selection

- **OSD**

  OSD stands for On-Screen-Display, the LED displays show cabling order on each physical LED cabinet.

- **Realtime mapping**

  LED display responds the cabinet shape array and topology changes made in the canvas in real-time.

- **Cabinet information**

  Show the selected cabinets resolution, position.

- **Cabinet resolution**

  Modify the selected cabinets size in pixels.

- **From processor**

  Toggling the "From processor" button to enable/disable using mapping configuration that stored in the processor.

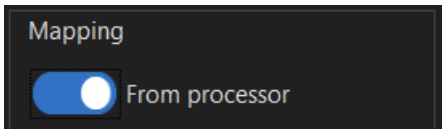


Fig 4.5-58 Mapping from processor

- **Save mapping**

  Save the cabinets mapping to current selected processor and cabinets (receiver cards) under this processor. When there is more than one processor connected, click "All processors and cabinets" in the drop-down list to save the cabinets mapping to all processors and cabinets in the system.

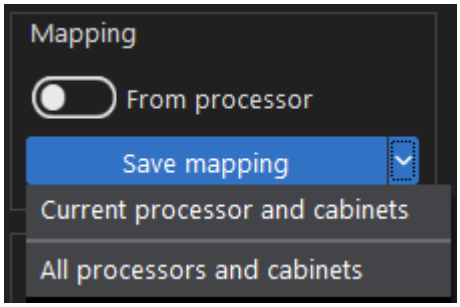


Fig 4.5-59 Save mapping drop-down list

- **Port capacity bar**

  Show the output capacity on each output port with vertical load bars. The green indicates the port used capacity. If the output port is overloaded, the whole bar will turn into red.

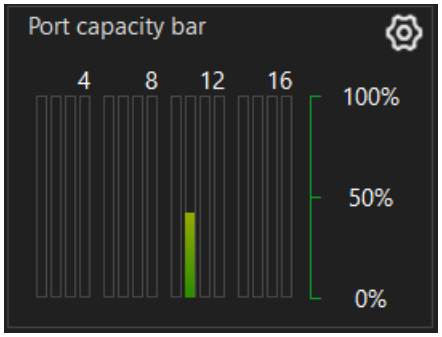


Fig 4.5-60 Output port capacity bar

➢ **Processor status overview**

Show the amount of processor and the number of online/offline processors.

Fig 4.5-61 Processor status overview

➢ **Redundant processor view**

When there is only one processor connected, the primary and redundant output ports will be shown in the sheet in the middle of the screen, the relationship between primary and redundant ports cannot be modified.

Click “Apply” button to apply this default redundancy setting to the processor.

Click “Reset all” button to reset all port redundancy settings.

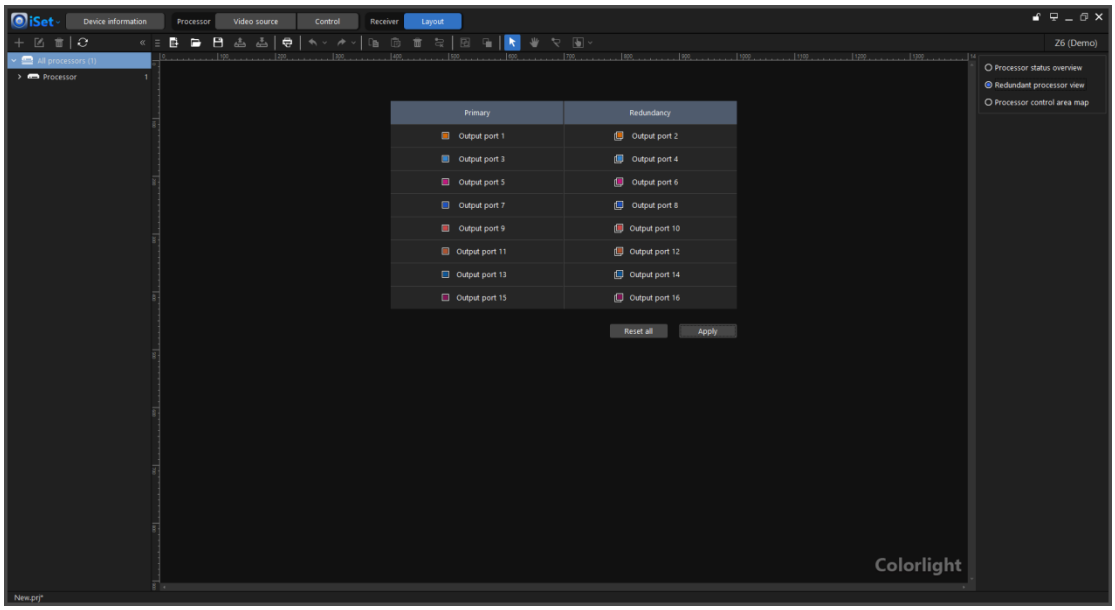


Fig 4.5-62 Output port redundant sheet

When there is more than one processor connected, select the “Redundant processor view”, a sheet will appear in the middle of the screen where shows the corresponding relation between primary and redundancy processors.

After locking this view by clicking the pin icon that is next to “Redundant processor view” on the right side of the screen, users can drag the processor from the processor tree view and drop to the cell in the sheet to set primary and redundant processors. It is also allowed to modify the primary and redundancy relations by dragging the cells around in the sheet.

Users can switch the screen to other interfaces when the “Redundant processor view” is unlocked.

There are three buttons above the sheet: Delete, clear, auto match.

Delete: Delete a selected processor in the cell, but the processor will still remain in the processor tree pane.

Clear: Delete all processors in the sheet.

Auto match: Fill the processors in the processor tree pane to the sheet to set a default redundancy configuration. If the total number of processors is an odd number, the processor in the bottom of the processor tree pane will be discarded.

Click the “Apply” button to apply the processor redundancy configuration to all processors.

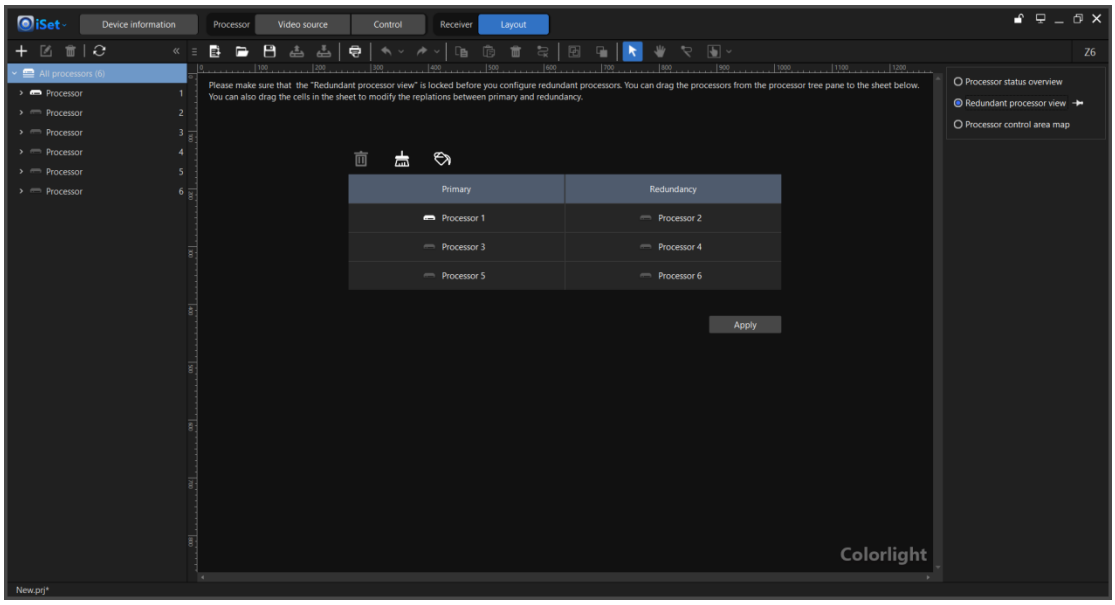


Fig 4.5-63 Redundancy configuration for multiple processors

➢ Processor control area map

Display the control area for each processor in the middle of the screen. Each shape represents the LED display driven by a single processor. Users can drag or offset these shapes to map a larger LED display driven by multiple processors.

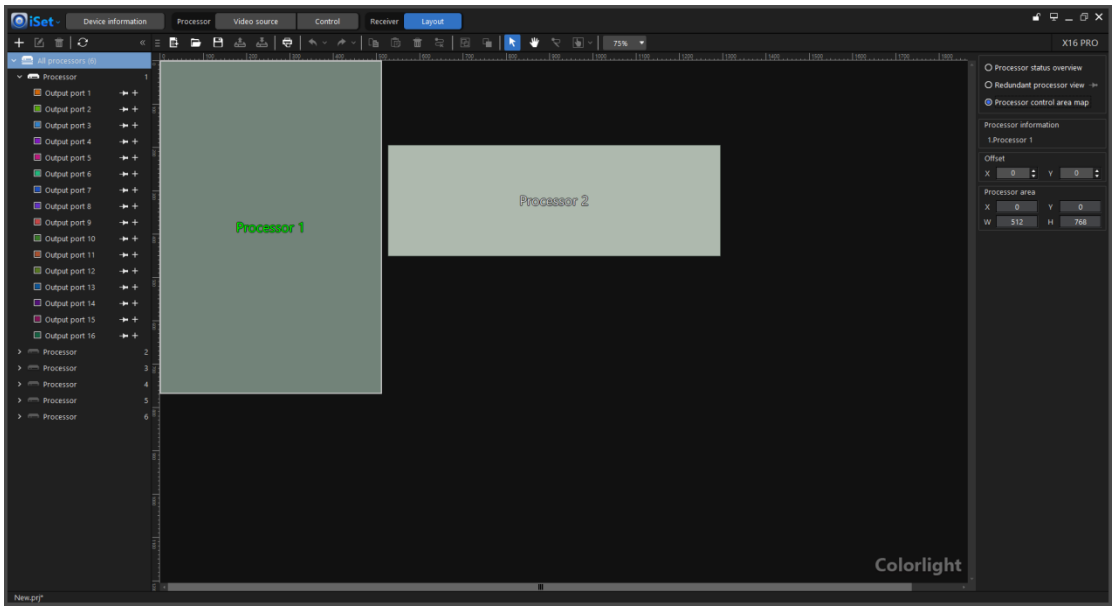


Fig 4.5-64 Processor control area map

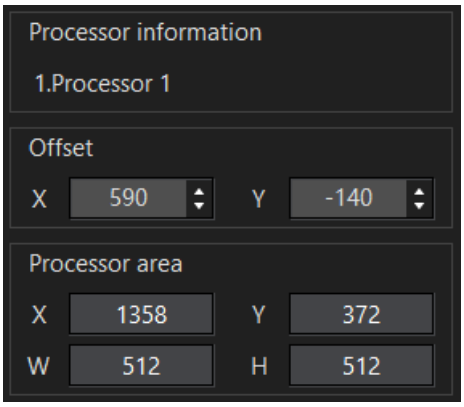


Fig 4.5-65 Processor control area offset

4.6 Control tab

The main screen of control includes following sections: Tool bar below the tabs, Processor pane on the left side of the screen, Processor parameter settings section in the middle of the screen. Users can click the parallelogram buttons in the bottom of the screen to switch between different processor parameters settings page.

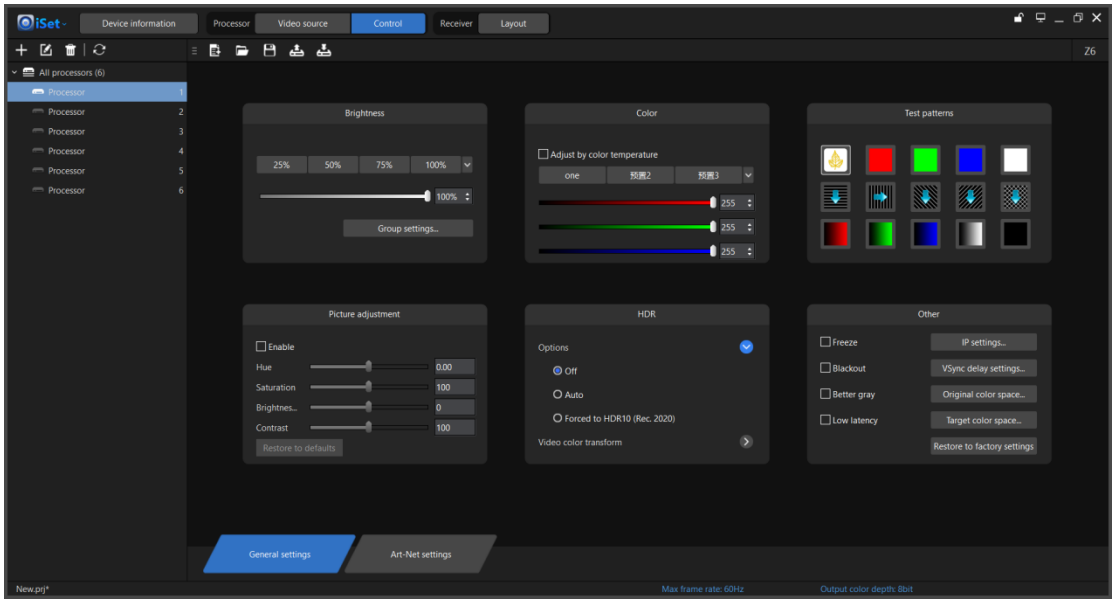


Fig 4.6-1 Control tab main screen

4.6.1 Tool bar

The tool bar has following buttons: New project, Open project, save project, read project from processor, Save project to processor.

4.6.2 Processor pane

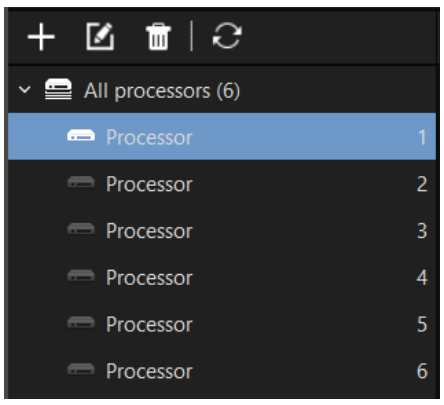


Fig 4.6-2 Processor pane

- **Add**

  Add processor or processor group. Refer to 4.5.2

- **Rename**

  Rename processor or processor group. Refer to 4.5.2

- **Delete**

  Delete processor or processor group. Refer to 4.5.2

- **Refresh**

  Click the refresh button , the iSet will detect the processors in the system again and the layout screen will be also refreshed.

- **Right-click context menu**

  The options in the right-click context menu varies depending on which button you click on.

  - **Right-click on all processors**

    Right-click on all processors button, the context menu contains: Add processor group, Add 1 processor, Add 2 processors, Custom adds, Import all processors parameters from file, Export all processors parameters to file, Restore all processors and screen to factory settings.

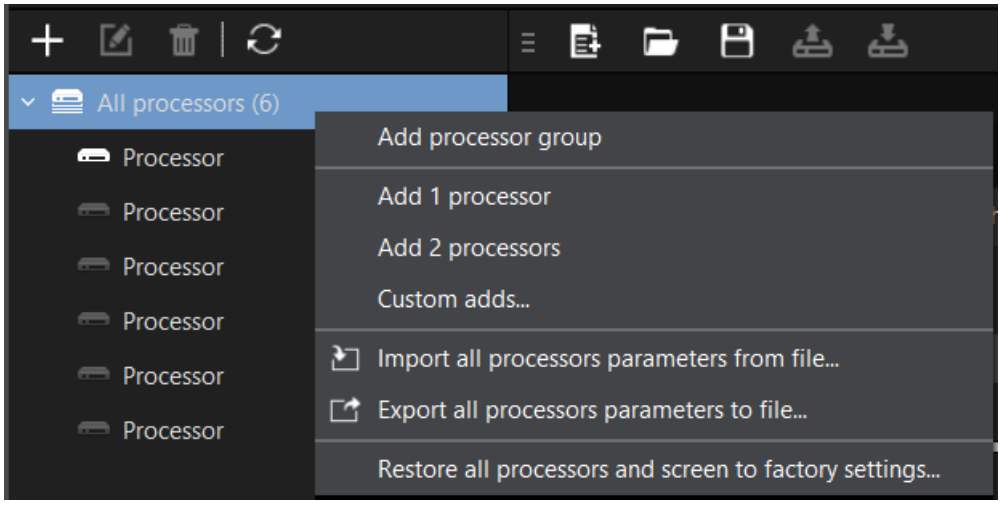


Fig 4.6-3 Context menu when right-click on “All processors”

Restore all processors and screen to factory settings— Not only restore all processors in the system to factory settings, it can also restore the settings of all receiver card (LED cabinets): disable the color adjustments and reset the seam corrections.

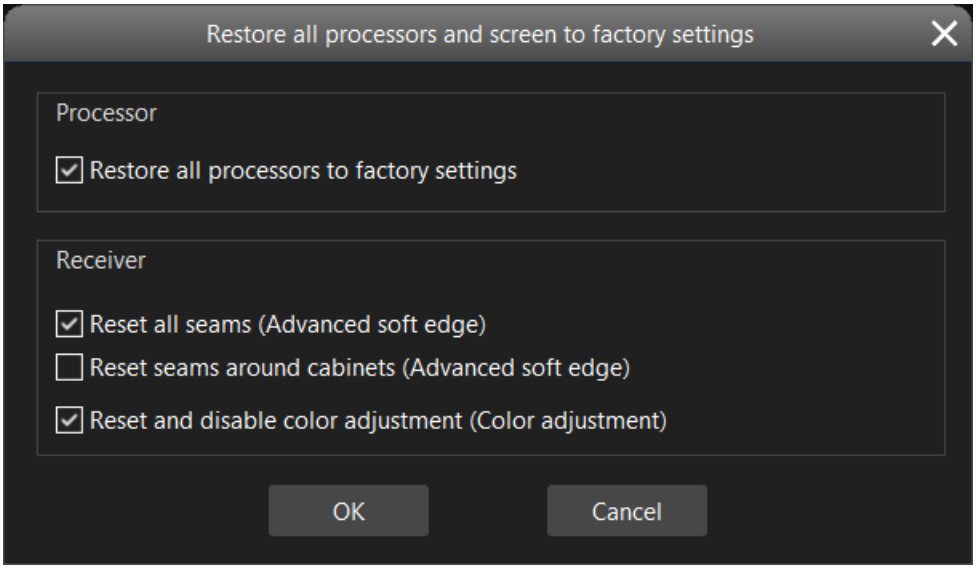


Fig 4.6-4 Restore to factoring settings window

- **Right-click on a processor button**

  Right-click on a processor, its context menu contains: Add 1 processor, Add 2 processors, Custom adds, Rename, Delete, Import parameters from file, Export parameters to file. If the processor has 3D feature, "Enable 3D" option will be visible.

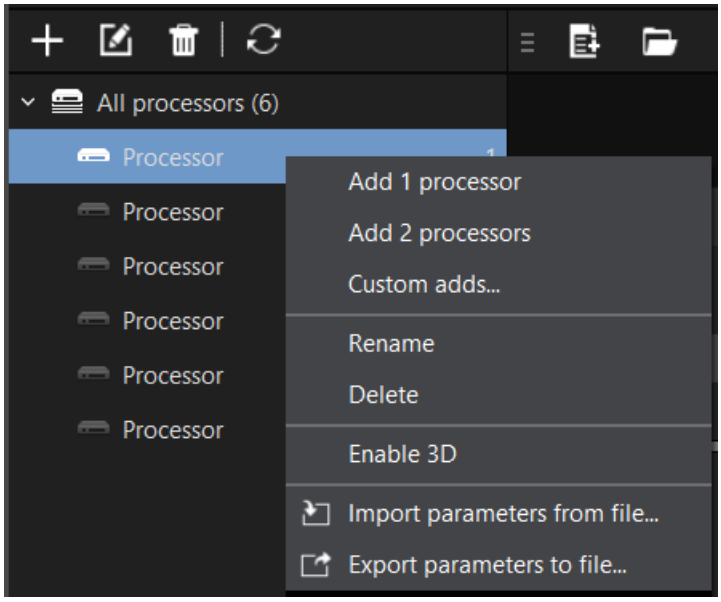


Fig 4.6-5 Right-click on a processor context menu

"Enable 3D" can only switch on/off the 3D function of a processor.

4.6.3 Parameters setting windows

Options in this section vary depending on the type of processor is connected. In this chapter, the Z6 and X16 pro processor are used as examples for description.

➢ **Window appearance under different selection**

◆ **All processors is selected**

When “All processors” is selected, the cabinets connected to the processors in the processor pane will take effect in real-time to the modifications made in the software.

Comparing to select a single processor, some setting options will not appear in this interface like IP settings, restore to factory settings etc. When “All processors” is selected.

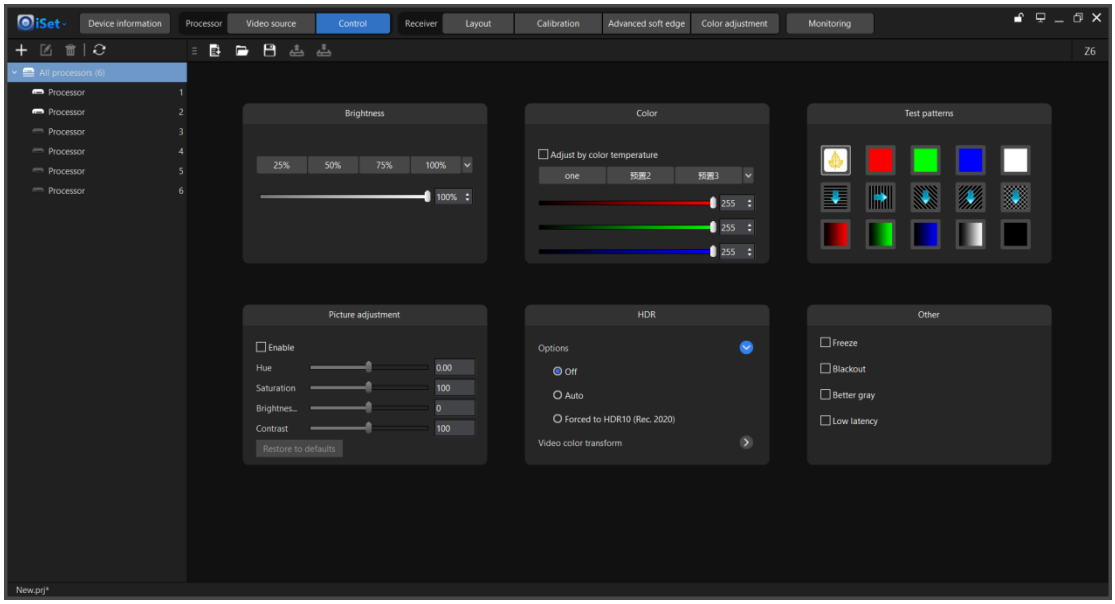


Fig 4.6-6 Processor parameters settings view when click “All processor”

◆ **Processor group is selected**

When a processor group is selected, the cabinets connected to the processors in this group will take effect in real-time to the modifications made in the software.

◆ **Single processor is selected**

When select a single offline processor, options in the processor parameters settings section will be grayed out.

When select a single online processor, the cabinets connected to

this processor will take effect in real-time to the modifications made in the software.

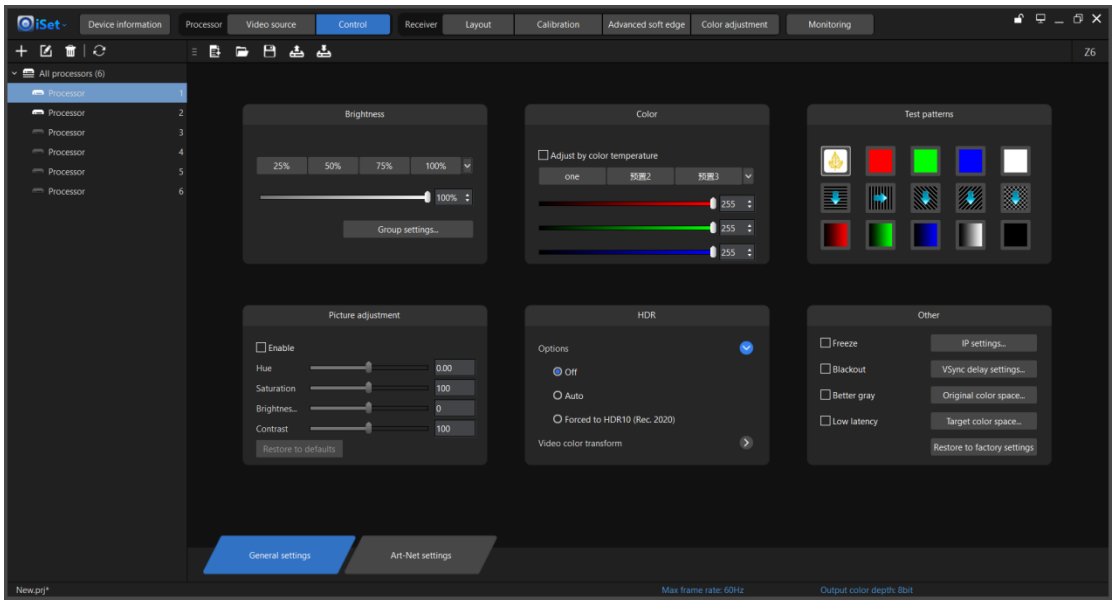


Fig 4.6-7 Options available for adjustment when a single processor is selected

➢ Brightness

Click on a percent value button or move the slider left or right to adjust the brightness settings. The value of four percent button can be customized by clicking the drop-down arrow.

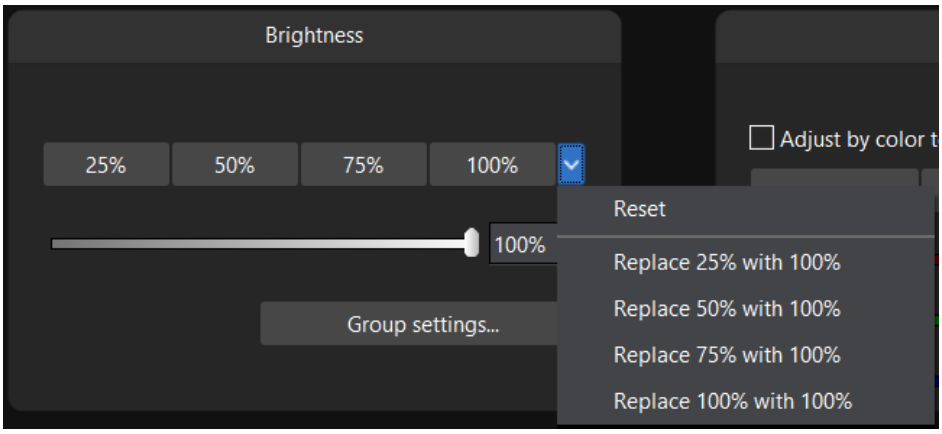


Fig 4.6-8 Brightness adjustment

The group settings button will appear when a processor supporting this feature is connected. Click this button to get into the group settings window where users can set the output ports up to 8 groups. So, the brightness of the LED display can be adjusted separately, adjusting the brightness of a group will not affect other groups. The

group brightness adjustment is based on the processor global brightness setting.

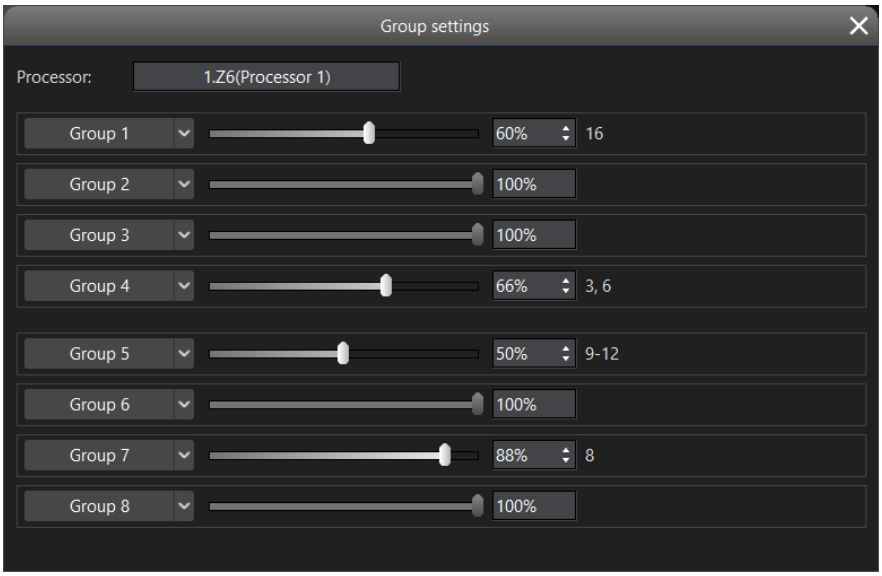


Fig 4.6-9 Group settings

- **Color temperature**

The range of adjustable color temperature is between 2000-10000 Kelvin. Clicking "Default" button can set the LED display color temperature to 6500K. When "Adjust by color temperature" option is unchecked, RGB gain can be adjusted by moving corresponding slider bars.

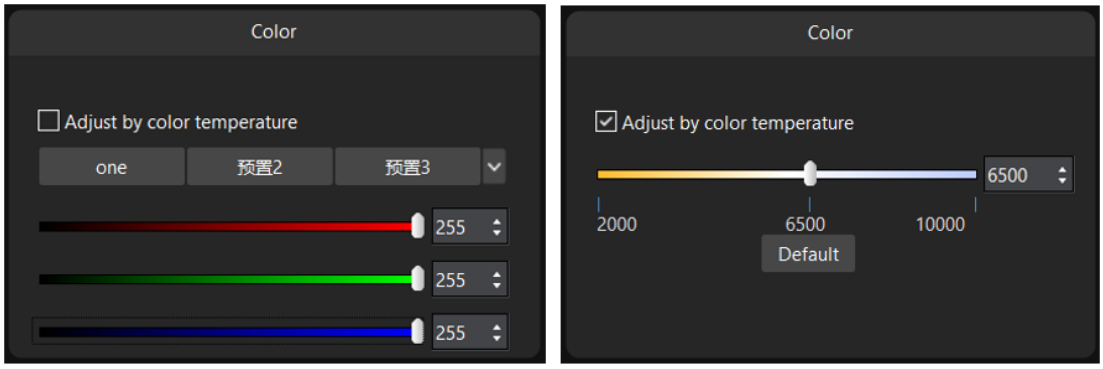


Fig 4.6-10 Color temperature mode and RGB gain mode

- **Test patterns**

All colorlight processors supports up to 14 built-in test patterns that can be used to check the performance of the LED cabinets, click the first button (shown in below fig 4.6-11) to disable test pattern.

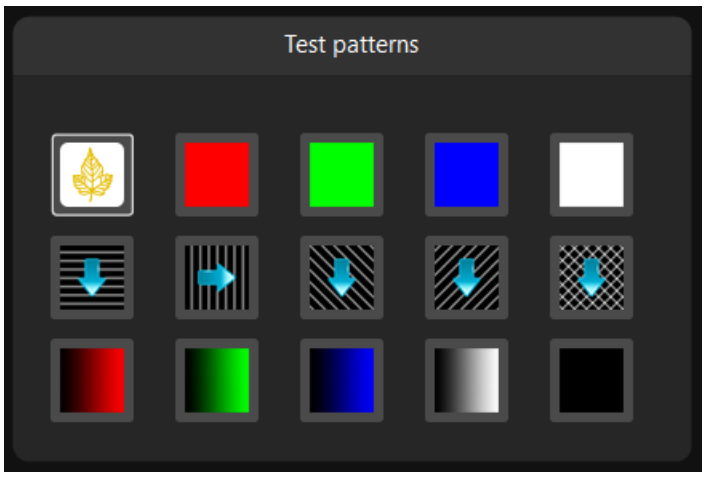


Fig 4.6-11 Test pattern buttons

- **Picture adjustment**

  Users can check the "Enable" tick box to adjust the processor output video hue, saturation, brightness compensation, contrast by moving the sliders or typing a value next to the slider. If the tick box is unchecked, the sliders cannot be moved and the "Restore to default" button will be grayed out.

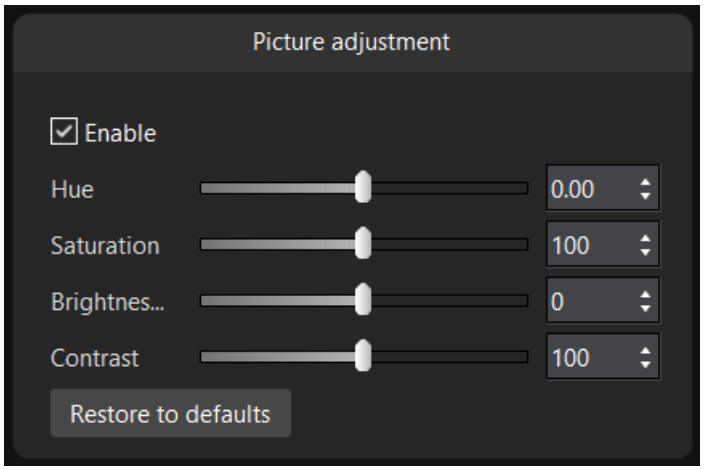


Fig 4.6-12 Picture adjustment window

➢ HDR

HDR on/off and other HDR related settings can be adjusted in this window.

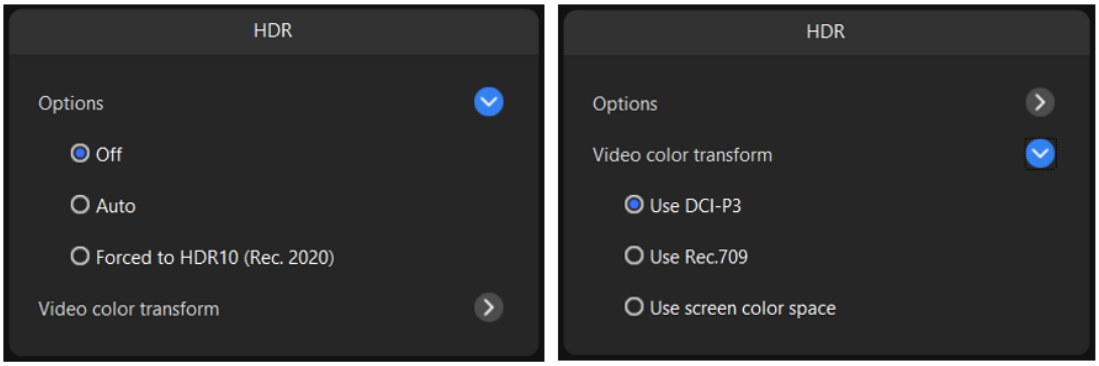


Fig 4.6-13 HDR

➢ Other

Options in the window appears different depending on the type of processor is connected. The fundamental options are: Freeze, blackout, Restore to factory settings. If a Z6 processor is connected, the window will have options: Freeze, blackout, better gray, low latency, IP settings, Vsync delay settings, original colorspace, target colorspace, restore to factory settings.

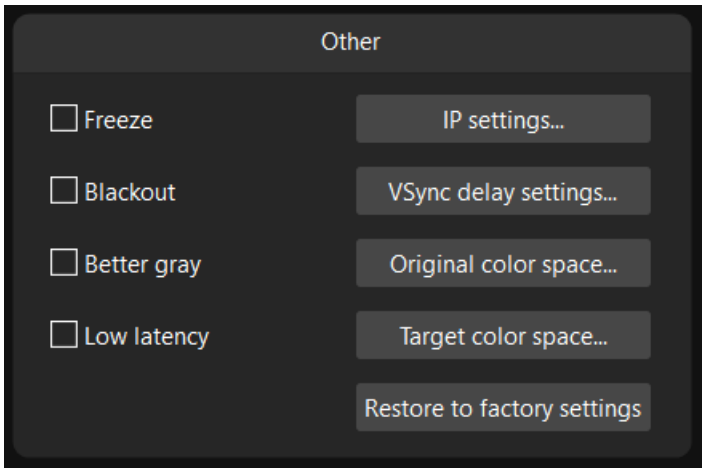


Fig 4.6-14 Other

◆ Freeze

Freeze will hold the last frame on the LED display. If the freeze tick box is checked, a red "Freeze" will appear in the lower-right of the software screen.

◆ Blackout

Turn the connected cabinets off at any point. If the freeze tick box is checked, a red "Blackout" will appear in the lower-right of the software screen.

- **Better gray**

  Improve the grayscale performance when the LED display running at low brightness.

- **Low latency**

  When low latency tick box is checked, the latency on the processor will be reduced.

- **IP settings**

  When the computer that is running iSet connects to a processor via network cable, users need to either manually set the IP address, subnet mast, gateway or enable "Obtain an IP address automatically" (DHCP).

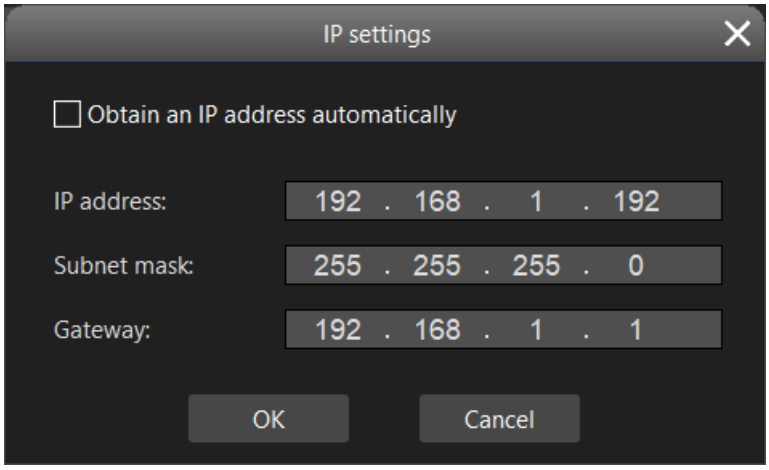


Fig 4.6-15 IP settings

- **V-Sync delay settings**

  The V-Sync delay is measured in microsecond (us), it adjusts the processor output delay.

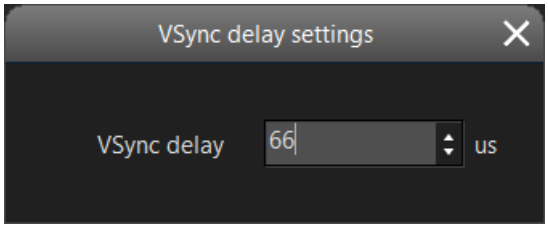


Fig 4.6-16 V-sync delay settings window

Original color space

Original color space represents the LED display nature color space of which is measured by color-meter.

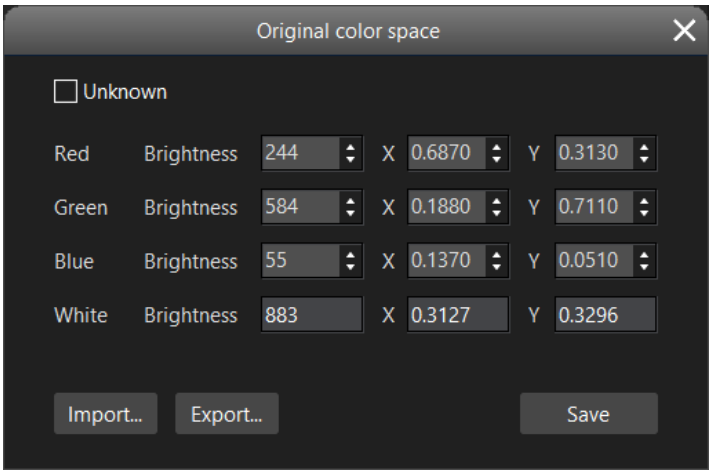


Fig 4.6-17 Original color space

Target color space

Set your LED display to use a desired color space. Users can select a standard preset color space or custom the target color space.

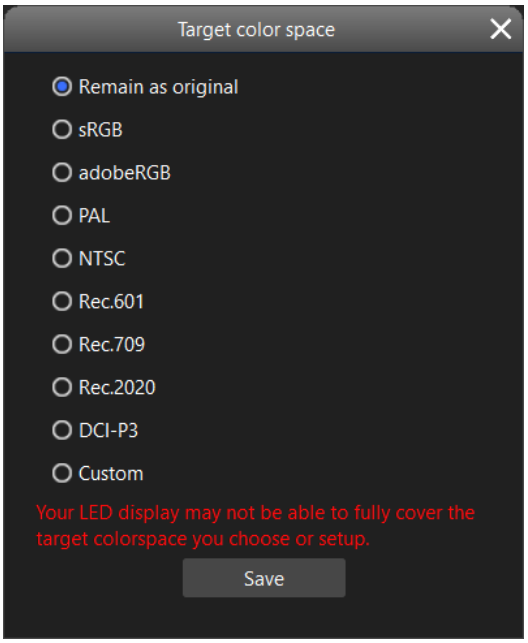


Fig 4.6-18 Target color space

The “Custom” option appears only when “Unknown” tick box is unchecked in original color space window, meaning that the users need to measure the original color space of the LED display

before use a custom target color space.

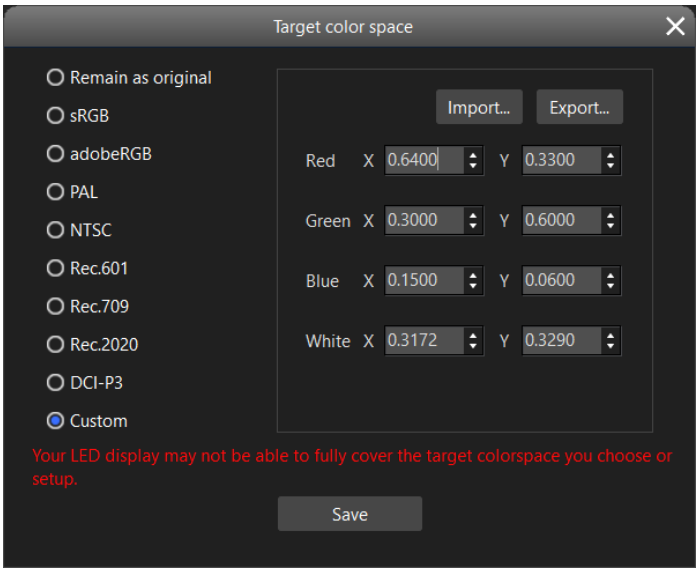


Fig 4.6-19 Custom target color space

- **Restore to factory settings**

  Restore the processor to factory default settings, all project files will be removed.

- **Art-Net settings**

  Click the "Art-Net" parallelogram button on the bottom of the screen to get into "Art-Net" settings screen where allow the users to modify the brightness, color, color temperature and test pattern of the processor using standard Art-Net protocol.

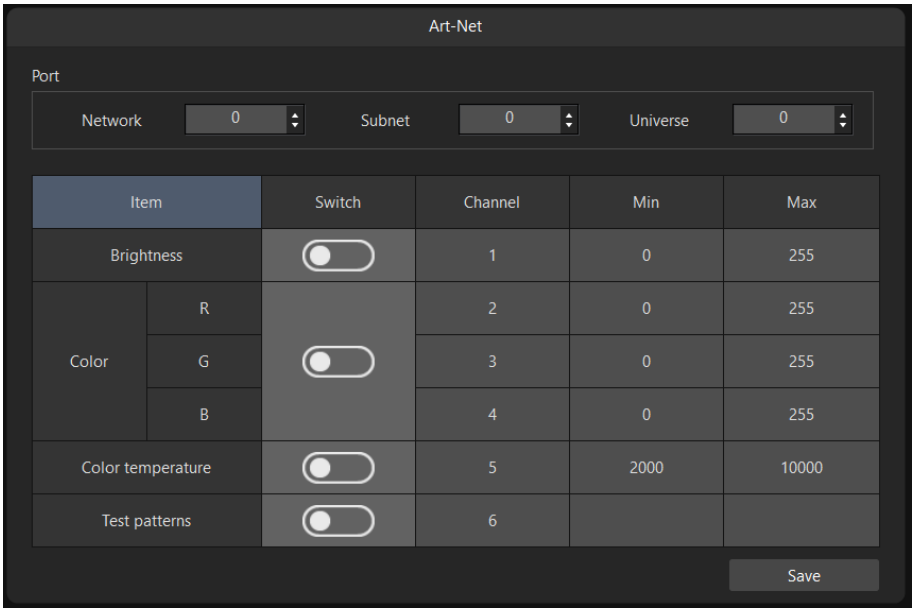


Fig 4.6-20 Art-Net Settings

3D Settings

With 3D mode enabled, the processor and its output port capacity will be halved due to the processor output frame rate is doubled.

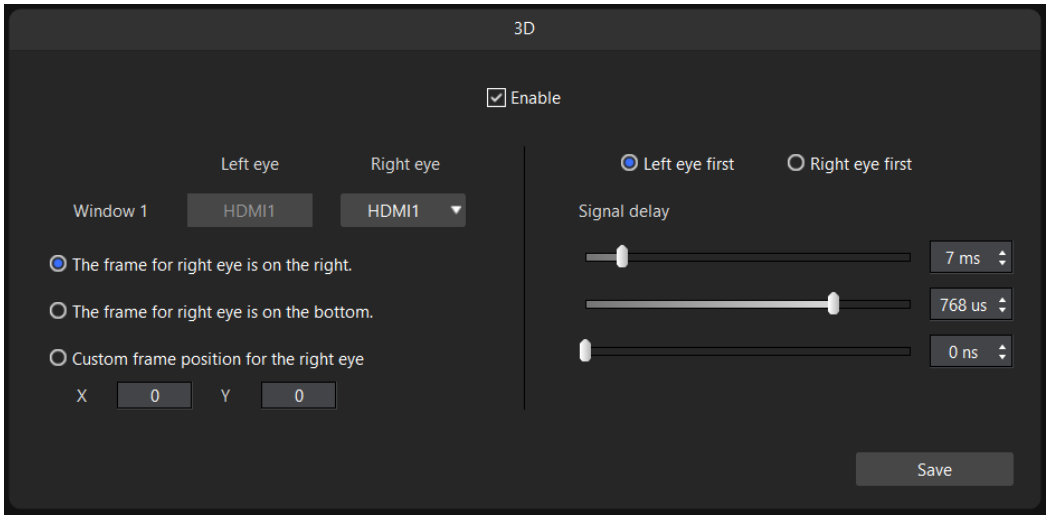


Fig 4.6-21 3D settings

Precise color management

The settings in “precise color management” overrides the settings in “Color adjustment”

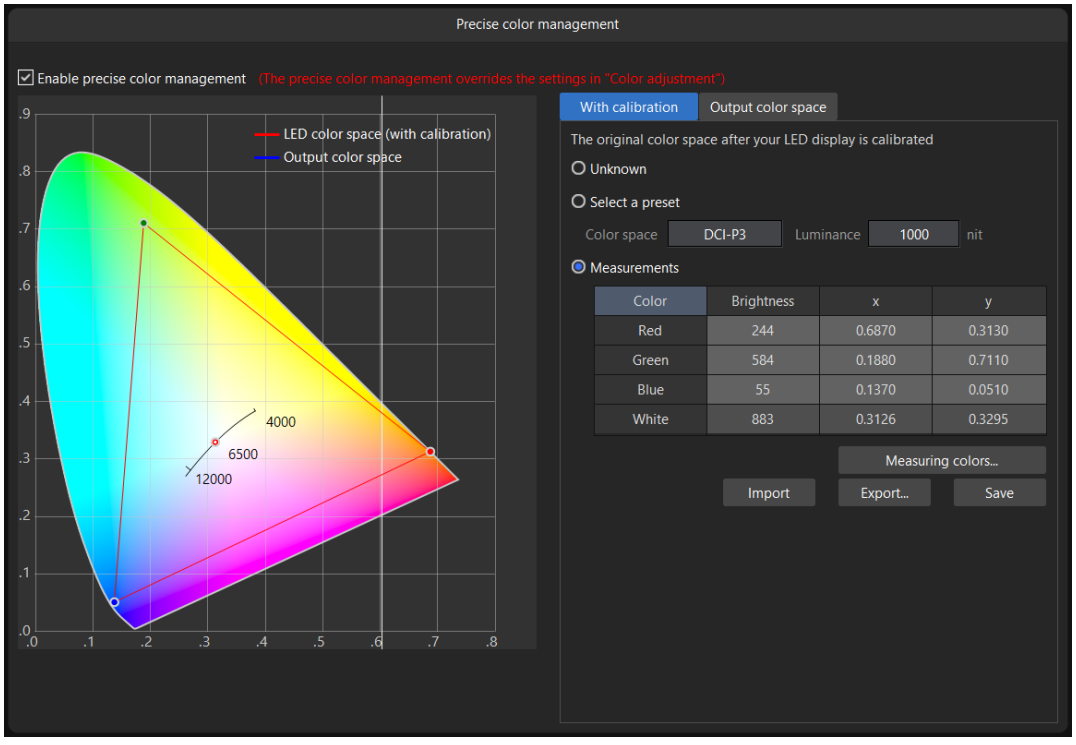


Fig 4.6-22 Precise color management

4.7 Soft edge

Seam problem could cause bright line or dim lines between modules or cabinets if they were installed to close to each other, or too far away respectively. This is a very common issue in small pitch screens and rental projects. Sometimes we don’ t have time, tools or necessary environment to calibrate the whole screen with camera.

“Soft edge” allows the user to correct luminance at seams between cabinets or between modules within cabinets in real-time, with an intuitive user interface. This process is effective and fast.

4.7.1 Tool bar

The buttons available in the tool bar are: import, export, individual seam correction mode, perimeter seam correction mode, custom seam selection, select, hand（pans around the canvas view）, zoom drop-down list.

Fig 4.7-1 Soft edge screen tool bar

- Import

  Import calibration coefficient file which formatted in *.3fCoef, *.3wCoef, *.3BCoef, *.9BCoef, *.9fCoef, *. ccCoef. Users can only import the coefficient file to a single processor at a time, if there is more than one processor please select the processor which you want to import to in the pane on the right side of the screen.

- Export

  Export calibration coefficient file which formatted in *.3fCoef、*.3wCoef、*.* to local storage drive. Users can only export the coefficient file from a single processor at a time, if there is more than one processor, please select the processor which you want to export from in the pane on the right side of the screen.

- Seam selection

  - Individual seam correction mode

    Left click at the seam between modules or cabinets.

  - Multiple seam selection

    Multiple seams can be selected by using Crtl+left click, another

selection method is that click on the ruler of the canvas. Seams can only be selected at one direction at a time.

- Custom seam selection

  Select a segment of a seam.

➢ Perimeter seam correction mode

Correct luminance for seams around selected cabinets. Cabinets can be selected in following methods:

1. Click on a cabinet in the canvas.
2. Click and drag the left mouse button to create a selection box around the cabinets.
3. Use Ctrl+click for multiple cabinets selection.

➢ Custom seam selection

Select a seam or multiple seams and then click the custom seam selection button in the tool bar or use shortcut “Ctrl+S”, a green circle and a white circle will appear in the ends of the selected seam, users can drag any of the circles to select desired length of the seam. Left click on other area of the canvas to cancel custom seam selection.

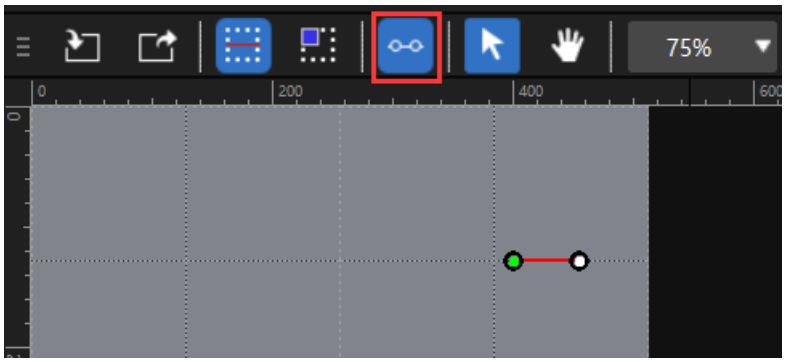


Fig 4.7-2 Custom seam selection

➢ Hand

Pans over different part of the canvas.

➢ Zoom

Adjust the canvas view to appear smaller or larger. The zoom scale range from 25%-1000%.

4.7.2 Seam correction canvas

➢ Canvas

Cabinet shapes arranged in the canvas will be same as physical cabinets array built. Cabinet shapes are split by dashed lines, LED modules in a cabinet are split by dotted lines. The cursor turns to crosshair in the canvas.

When a seam is selected, the seam on the canvas turns into red and a luminance adjustment window (3 plus icon buttons and 3 minus icon buttons) pops up. The selected seam on the physical LED wall will be flashing 3 times per click.

Click the central + and – or use shortcut to decrease or increase the overall luminance of the seam. If cabinets/modules are not parallel to each other can cause seams that look brighter at one end than the other. To compensate for this, users can click the +/- button to increase the luminance at the dimmer end and decrease luminance at the brighter end.

In perimeter correction mode, when a cabinet/module is selected, the cabinet/module shape fill turns into blue and the color of surrounding seams change to red.

Fig 4.7-3 Luminance adjustment window

- **Right-click context menu**

The context menu including below options:

a. Individual seam correction mode; b. Perimeter seam correction mode; c. Reset seams for selected cabinets; d. Reset all seams; e. Custom seam selection; f. Import（Ctrl+I）; g. Export（Ctrl+E）.

Options in the context menu varies depending on the correction and display mode is used.

（1）In normal display mode, the context menu only has f and g option.

（2）In seam display mode, if there is no seam selected on the canvas, the context menu show a,b,f,g options. If any one of the seams is selected, the “e” option will also appear in the context menu.

（3）In perimeter seam correction mode, if there is no seam selected, the context menu show a,b,d,f,g options. If any one of the cabinets/modules is selected, the “c” option will also appear in the context menu.

4.7.3 Soft edge configuration pane

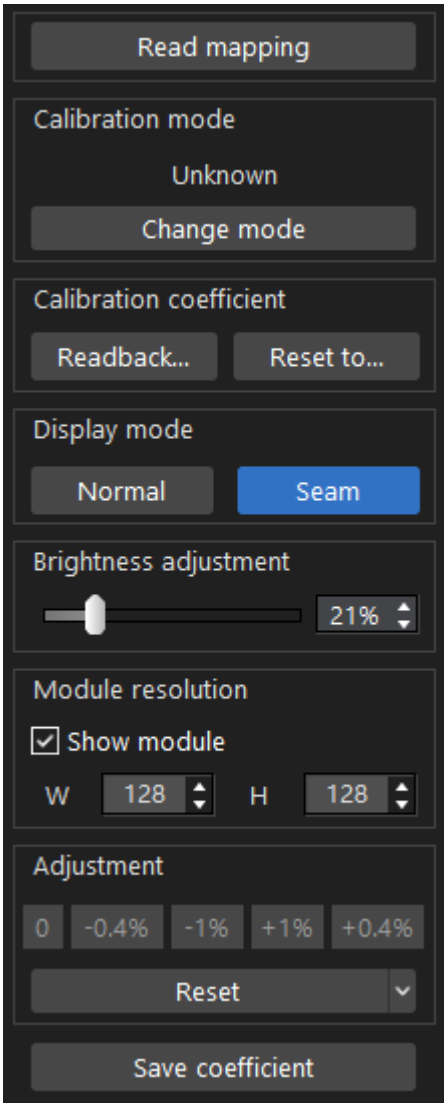


Fig 4.7-4 Configuration pane in the right side of the screen

- Processor selection
  - Processor selection drop-down list

    Display all processors in the drop-down list when click the button on the top of the right pane. Users can only do seam correction for the cabinets under a single processor at a time.
  - Read mapping

    Click to readback the actual cabinet layout and display the cabinets layout in the canvas.
- Calibration mode
  - Calibration status

    Clicking read mapping can also obtain the current calibration mode is used for the LED display, there are five possible calibration status may appear: disable calibration, enable brightness (from receiver), enable chroma (from receiver), enable brightness (from module), enable chroma (from module). Users can also manually change the calibration mode by clicking "Change mode" button. If the "Disable modification for module" is selected, the calibration coefficient stored in the module would not be affected by seam correction.

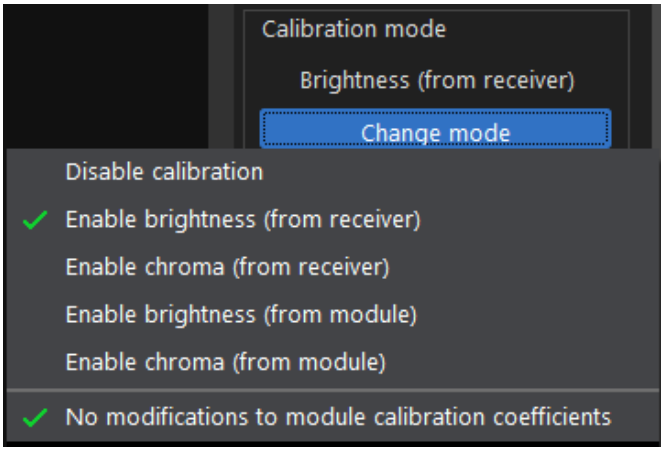


Fig 4.7-5A Calibration status

  - Disable calibration

    Turn off calibration, the LED cabinets does not show calibration effects.
  - Enable brightness calibration (from receiver)

    LED cabinets uses the brightness calibration coefficients stored in the receiver card.

- Enable brightness calibration (from module)

  LED cabinets uses the brightness calibration coefficients stored in the LED module flash.

- Enable chroma calibration (from receiver)

  LED cabinets uses the chroma calibration coefficients stored in the receiver card.

- Enable chroma calibration (from module)

  LED cabinets uses the chroma calibration coefficients stored in the LED module flash.

- Disable modification for module

  When “Disable modification for module” is checked, user is not allowed to modify calibration coefficients stored in the LED module flash, calibration coefficents will be saved to receiver card if clicking “Save coefficients”, refer to figure 4.7-5B. When “Disable modification for module” is unchecked, dialog window will appear when clicking “Save coefficients”, refer to figure 4.7-5C.

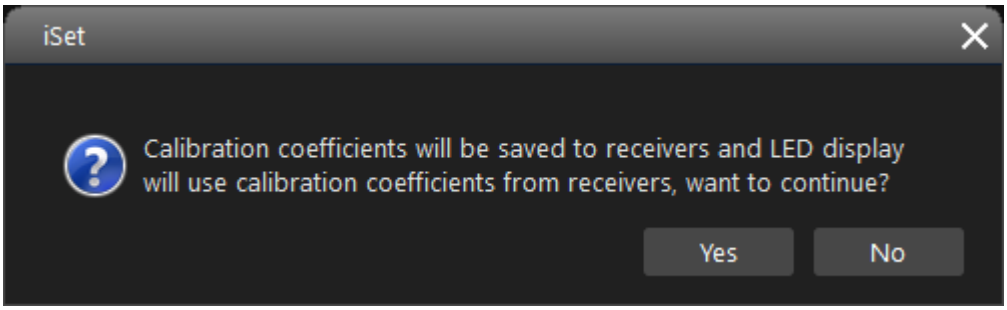


Fig 4.7-5B Calibration coefficients will be saved to receiver card

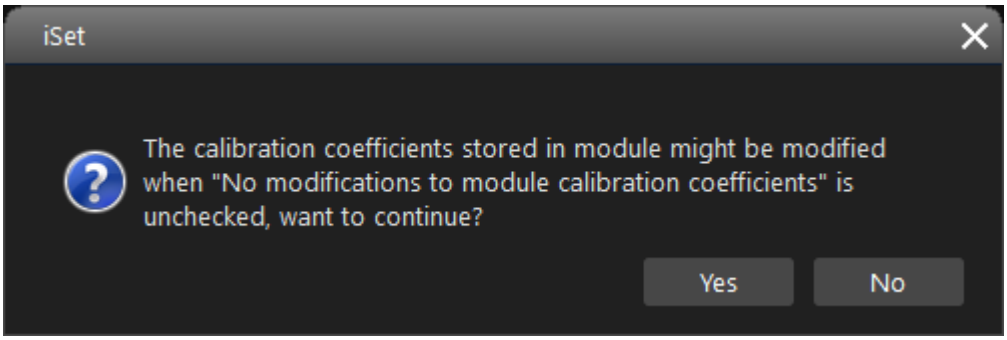


Fig 4.7-5C Modification might be made to module calibration coefficients

➢ Calibration coefficient

- Readback

Click the readback button and select readback from receiver, the software obtains the calibration coefficients which stored in the receiver card. If the LED modules has memory chip where can store calibration coefficients, "Readback from receiver" and "Readback from module" options will be given after click on the readback button. Select readback from module to obtain the calibration coefficients from LED modules.

- Reset to

  Set the coefficient values of each pixel to the following percentage of its original value: 85%,80%,75%,70%, custom percentage. This would cause decreasing of the overall brightness for the LED cabinets and overwrite the existing calibration coefficients.

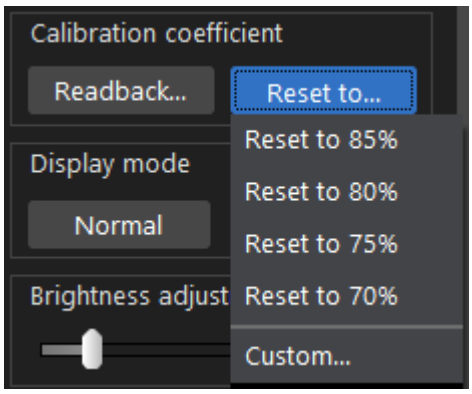


Fig 4.7-6 Reset to

➢ Display mode

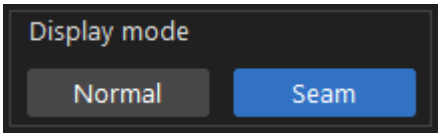


Fig 4.7-7 Display mode

- Normal

  LED cabinets display the processor input video signal.

- Seam

  LED cabinets display a solid white test pattern generated by the iSet for a better perception of bright or dark lines at the seams. Exiting the soft edge tab or iSet software will disable seam display mode.

➢ Brightness adjustment

Drag the slider left and right to adjust the brightness of the LED cabinets.

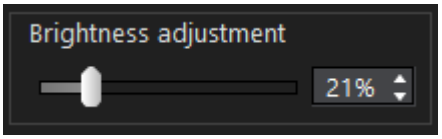


Fig 4.7-8 Brightness adjustment

- **Module resolution**

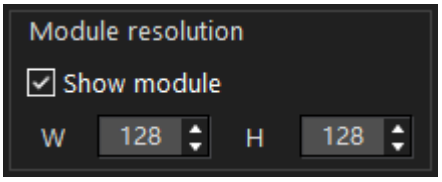


Fig 4.7-9 Module resolution

Check the tick box, the module shapes will appear in the canvas, modules are split by dotted lines in each cabinet shape. The default module width/height is 1/2 of the cabinet width/height. Users can also manually enter the module resolution, the module width and height must can be divided evenly by the cabinet width and height, otherwise, the canvas will not show the module shapes.

- **Adjustment**

Once seams have been selected, the luminance can be adjusted by clicking the 5 buttons (0, -0.4%, -1%, +1%, +0.4%) to decrease or increase luminance. The luminance at seams changes in real time.

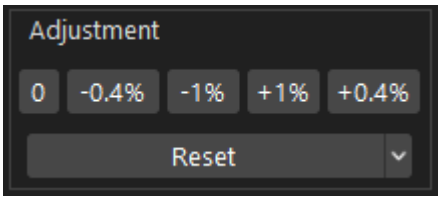


Fig 4.7-10 Adjustment

Only reset button can be clicked when perimeter seam correction mode is selected.

- **Reset**

Reset the calibration coefficient for each pixel to the default value “1.0”. The options contain in the reset drop-down list are:

① Reset selected seams: option is available when seams have been selected.

② Reset seams for selected cabinets: option is available when cabinets have been selected.

③ Reset all seams: Option is always available. Reset seams for the LED display under current processor.

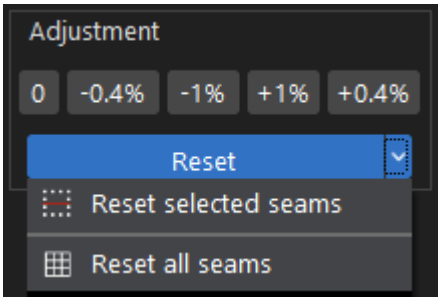


Fig 4.7-11 Drop-down list when seams have been selected

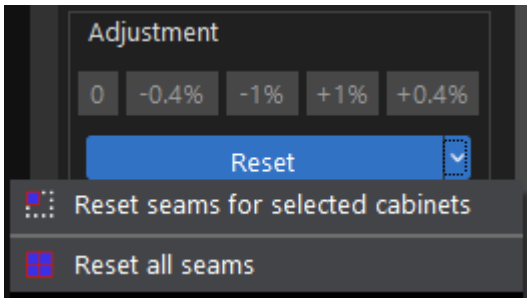


Fig 4.7-12 Drop-down list when cabinets have been selected

- **Save coefficient**

  Save the modifications to the receiver card (LED cabinets).

4.8 Advanced soft edge

Only i6 receiver card and later models supports advanced soft edge. The difference between advanced soft edge and soft edge is that modifications made in advanced soft edge does not overwrite the existing calibration coefficients.

4.8.1 Tool bar

The buttons available in the tool bar are: import, export, individual seam correction mode, perimeter seam correction mode, custom seam selection, select, hand（pans around the canvas view）, zoom drop-down list.

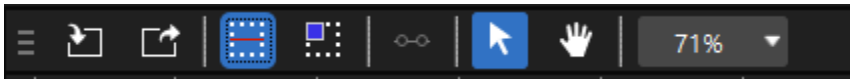


Fig 4.8-1 Advanced soft edge tool bar

- **Import**

  Supports importing seam correction files formatted in "SeamCoef" only. Users can select processors and processor groups which the files will be imported to.

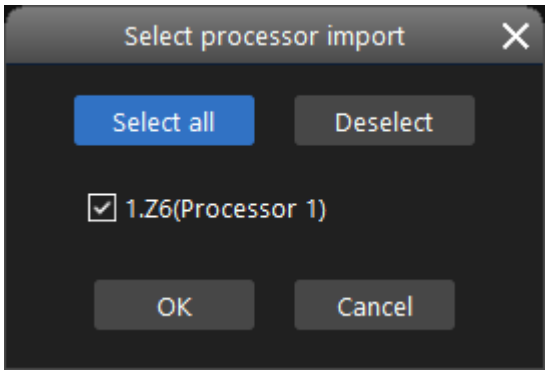


Fig 4.8-2 Processor selection when importing files

- **Export**

  Export the seam correction files formatted in "seamCoef" to local storage drive.

  If there is more than one processor connected, the processor selection window will appear, users can select the processor where the files will be exported from.

- **Seam selection**
  - **Individual seam selection mode**

    Left click at the seam between modules or cabinets.
  - **Multiple seam selection**

    Multiple seams can be selected by using Crtl+left click, another selection method is that click on the ruler of the canvas. Seams can only be selected at one direction at a time.
  - **Custom seam selection**

    Select a segment of the seams.

- **Perimeter seam correction mode**

  Correct luminance for seams around selected cabinets. Cabinets can be selected in following methods:

  1. Click on a cabinet in the canvas.
  2. Click and drag the left mouse button to create a selection box around the cabinets.

3. Use Ctrl+click for multiple cabinets selection.

- **Custom seam selection**

  Select a seam or multiple seams and then click the custom seam selection button in the tool bar or use shortcut “Ctrl+S”, a green circle and a white circle will appear in the ends of the selected seam, users can drag any of the circles to select desired length of the seam. Left click on other area of the canvas to cancel custom seam selection.

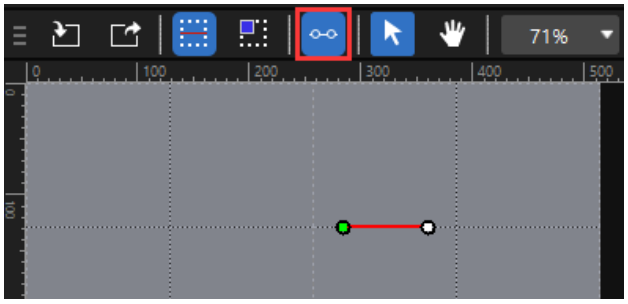


Fig 4.8-3 Custom seam selection

- **Hand tool**

  Pans over different part of the canvas.

- **Zoom**

  Adjust the canvas view to appear smaller or larger. The zoom scale range from 25%-1000%.

4.8.2 Seam correction canvas

- **Introduction**

  Cabinet shapes arranged in the canvas are same as the physical cabinets built in the actual LED wall. Cabinet shapes are split by dashed lines, LED modules in a cabinet are split by dotted lines. The cursor turns to crosshair in the canvas.

  When a seam is selected, the seam on the canvas turns into red and a luminance adjustment window (3 plus icon buttons and 3 minus icon buttons) pops up. The selected seam on the physical LED wall will be flashing 3 times per click.

  Click the central + and – or use shortcut to decrease or increase the overall luminance of the seam. If cabinets/modules are not parallel to each other can cause seams that look brighter at one end than the other. To compensate for this, users can click the +/- button to increase

the luminance at the dimmer end and decrease luminance at the brighter end.

In perimeter correction mode, when a cabinet/module is selected, the cabinet/module shape fill turns into blue and the color of surrounding seams change to red.

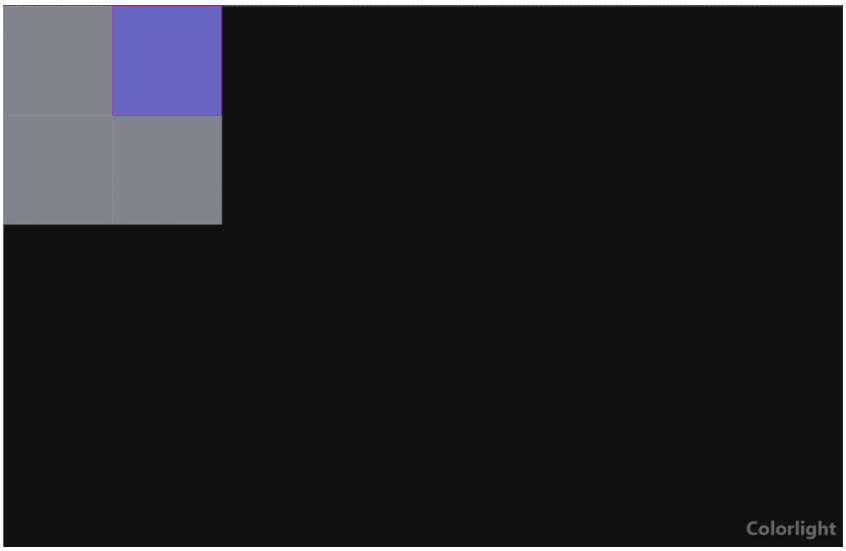


Fig 4.8-4 Luminance adjustment window

- **Right click context menu**

The context menu includes below options:

a.Individual seam selection mode; b. Perimeter seam selection mode; c. Reset seams for selected cabinets; d. Reset selected seams; e. Reset all seams; f.custom seam selection（Ctrl+S）; g.Import（Ctrl+I）; h.Export（Ctrl+E）.

Options in the context menu varies depending on the correction and display mode is used.

（1）In normal display mode, the context menu only has g and h option.

（2）In seam display mode, if there is no seam selected on the canvas, the context menu show a,b,g,h options. If any one of the seams is selected, the “e” option will also appear in the context menu.

（3）In perimeter seam correction mode, if there is no seam selected, the context menu show a,b,e,g,h options. If any one of the cabinets/modules is selected, the c and d options will also appear in the context menu.

4.8.3 Advanced soft edge configuration pane

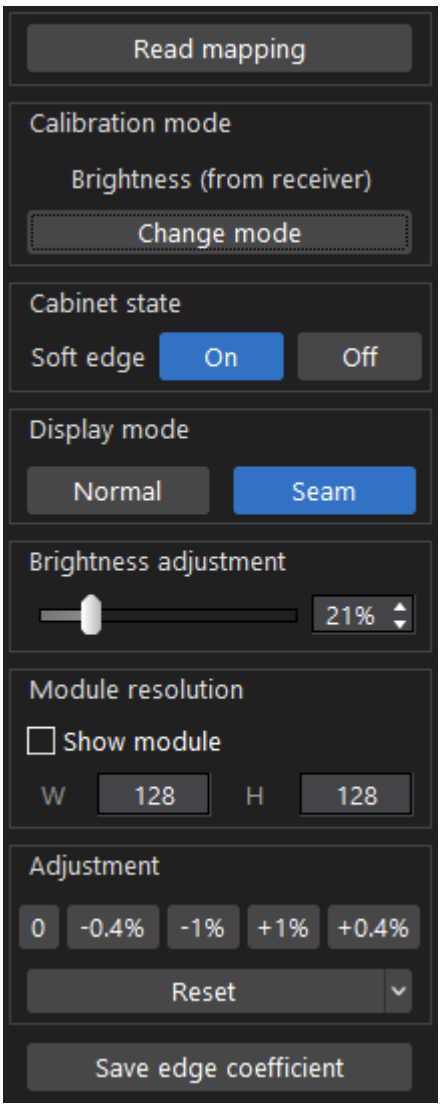


Fig 4.8-5 Configuration pane in the right side of the screen

- **Read mapping**

  Click to readback the actual cabinet layout and display the cabinets layout in the canvas.

- **Calibration mode**

  Show the current calibration mode that is used for the LED display. Advanced soft edge works even when calibration is disabled.。

- **Cabinet state**

  Turn on/off soft edge for the cabinets. The seam display mode is accessible only when soft edge is on.

The iSet will obtain soft edge state of the first receiver card(cabinet) in a string of cabinets at below conditions:

① Entry advanced soft edge tab.

②Check/uncheck processor in the processor selection menu.

③Click read mapping.

➢ **Display mode**

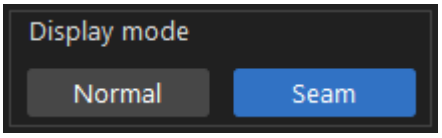


Fig 4.8-6 Display mode

- **Normal**

  LED cabinets display the processor input video signal.

- **Seam**

  LED cabinets display a solid white test pattern generated by the iSet for a better perception of bright or dark lines at the seams. Exiting the soft edge tab or iSet software will disable seam display mode.

➢ **Brightness adjustment**

Drag the slider left and right to adjust the brightness of the LED cabinets.

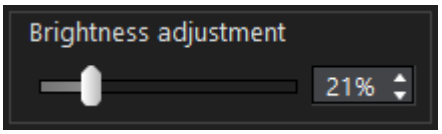


Fig 4.8-7 Brightness slider

➢ **Module resolution**

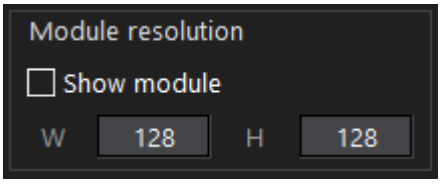


Fig 4.8-8 Module resolution

Check the tick box, the module shapes will appear in the canvas, modules are split by dotted lines in each cabinet shape. The default module width/height is 1/2 of the cabinet width/height. Users can also

manually enter the module resolution, the module width and height must can be divided evenly by the cabinet width and height, otherwise, the canvas will not show the module shapes.

- **Adjustment**

  Once seams have been selected, the luminance can be adjust by clicking the 5 buttons (0,-0.4%,-1%, +1%,+0.4%) to decrease or increase luminance. The luminance at seams changes in real time.

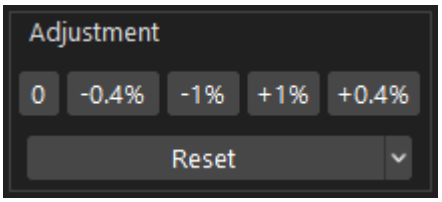


Fig 4.8-9 Adjustment buttons

Only reset button can be clicked when perimeter seam correction mode is selected.

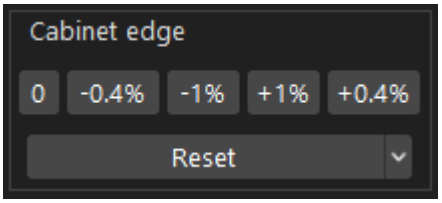


Fig 4.8-10 Cabinet edge

- **Reset**

  Reset the calibration coefficient for each pixel to the default value “1.0”. The options contain in the reset drop-down list are:

  ① Reset selected seams: option is available when seams have been selected.

  ② Reset seams for selected cabinets: option is available when cabinets have been selected.

  ③ Reset all seams: Option is always available. Reset seams for the LED display under current processor.

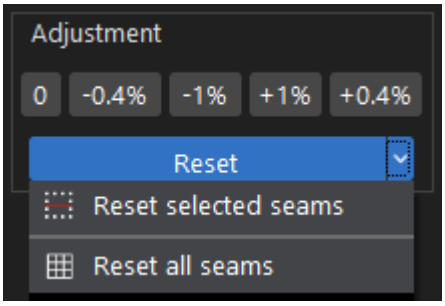


Fig 4.8-11 Reset seam correction

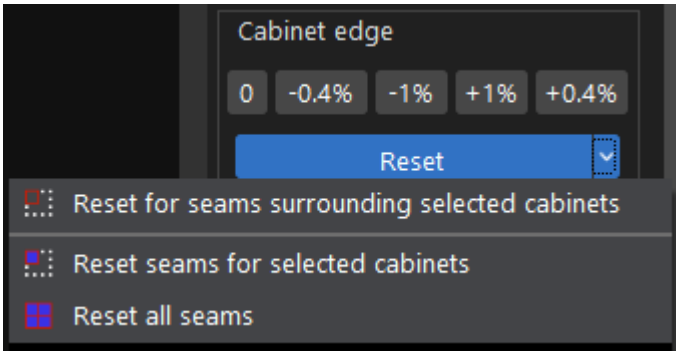


Fig 4.8-12 Reset seams for selected cabinets

➢ Save coefficient

Save the modifications to the receiver card (LED cabinets).

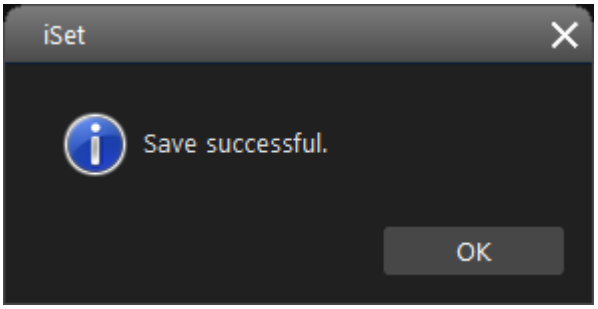


Fig 4.8-13 Save coefficient successfully

4.9 Calibration

Calibration coefficients of LEDs can be viewed, edited, imported and exported in calibration tab.

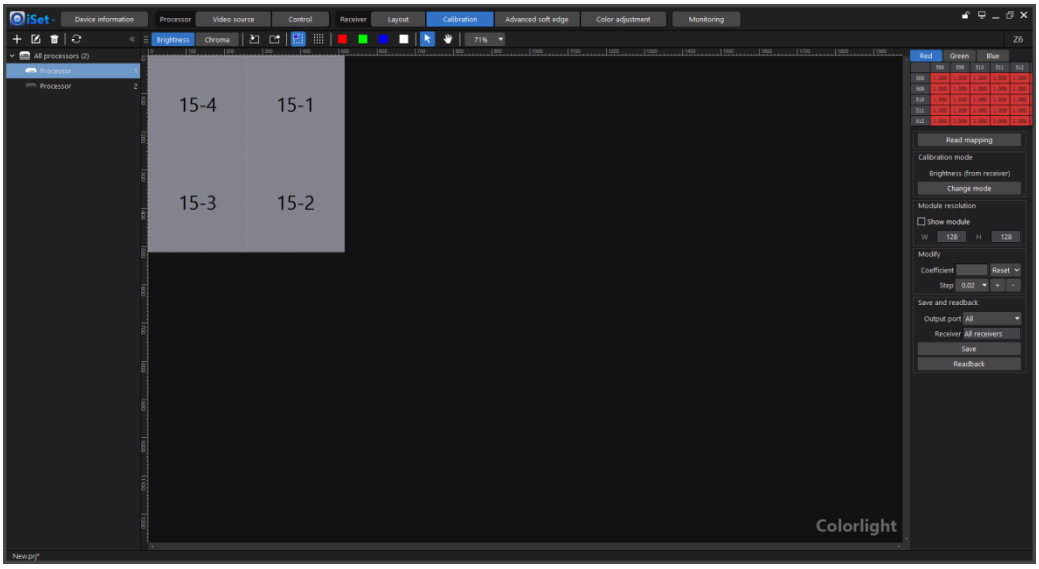


Fig 4.9-1 Calibration screen

4.9.1 Tool bar

Refer to figure 4.9-2, when “Cabinet edit mode” is selected, the buttons in the tool bar are: Brightness, Chroma, Import (Ctrl+I), Export (Ctrl+E), Cabinet edit mode (Ctrl+T), Pixel edit mode (Ctrl+T), Red test pattern (Ctrl+R), Green test pattern (Ctrl+G), Blue test pattern (Ctrl+B), White test pattern (Ctrl+W), Selection, Hand tool, Zoom (Ctrl+mouse wheel). When “Pixel edit mode” is selected, the selection,hand and zoom buttons are replaced with “Select area”, “Copy” and “Paste”, refer to 4.9-3.

Fig 4.9-2 Cabinet edit mode is selected

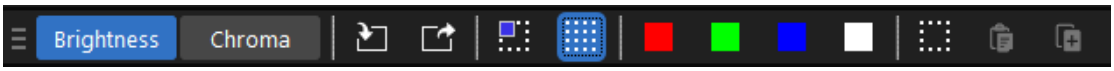


Fig 4.9-3 Pixel edit mode is selected

- **Brightness calibration**

  The brightness calibration coefficients of each pixel consist of 3 color components (RGB).

- **Chroma calibration**

  The chroma calibration coefficients of each pixel consists of 9 color components (Rr, Rg, Rb, Gr, Gg, Gb, Br, Bg, Bb). The definition of each color component are as below:

Rr: The amount of red light emitted in each pixel when LED display receives red signal.

Rg: The amount of green light emitted in each pixel when LED display receives red signal.

Rb: The amount of blue light emitted in each pixel when LED display receives red signal.

Gr: The amount of red light emitted in each pixel when LED display receives green signal.

Gg: The amount of green light emitted in each pixel when LED display receives green signal.

Gb: The amount of blue light emitted in each pixel when LED display receives green signal.

Br: The amount of red light emitted in each pixel when LED display receives blue signal.

Bg:The amount of green light emitted in each pixel when LED display receives blue signal.

Bb: The amount of blue light emitted in each pixel when LED display receives blue signal.

- **Import**

The calibration coefficients for pixels can be imported in four approaches of all pixels, specific area, per cabinet and per block. Format of calibration coefficients file can be different depending on the calibration system and mode were chosen, they are:

Colorlight system format

Brightness mode: *. 3fCoef、*. 3BCoef、*. 3wCoef

Chroma mode: *.9fCoef、*.9BCoef、*.9wCoef

Radiant system format

Brightness/chroma mode:.txt

Color-space system format

Brightness/chroma mode: ccCoef

Calibration coefficients can only be imported for LED cabinets under a single processor at a time, if there are multiple processors in the project, please select a processor which you want to import from first.

- **All pixels**

Import calibration coefficients for all pixels under current selected processor.

- Specific area

  Users can enter coordinates of a pixel as a starting point, the default ending point is the pixel in the lower-right in the pixel map.

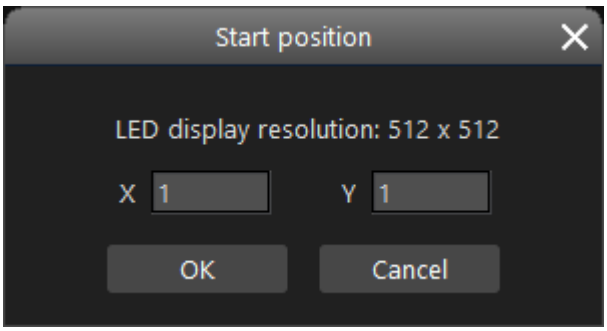


Fig 4.9-4 set start position

- Per cabinet

  Calibration coefficients files are separated per cabinet, each cabinet corresponds to a coefficients file.

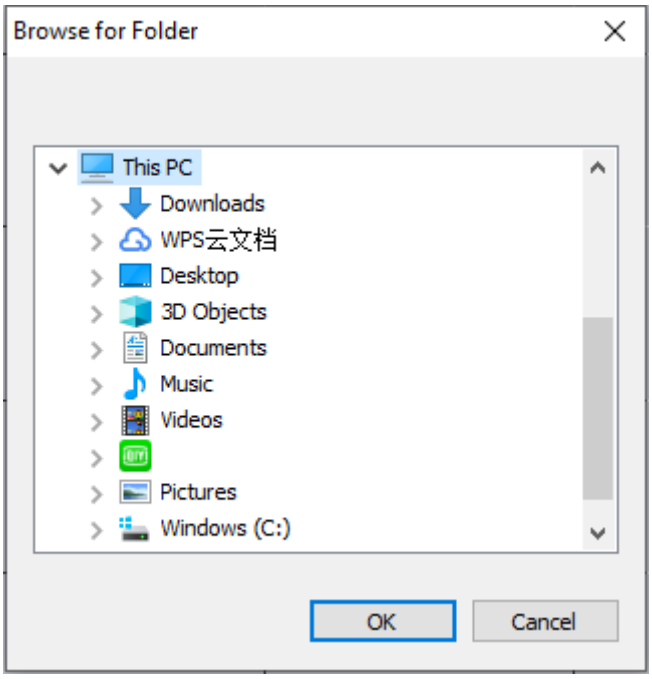


Fig 4.9-5 Import per cabinet

◆ Per block

Pixels of LED display can be arranged into multiple equal pixel blocks, each block has an individual calibration coefficients file. Click “Per block” to get into import by block settings window, refer to fig 4.9-6.

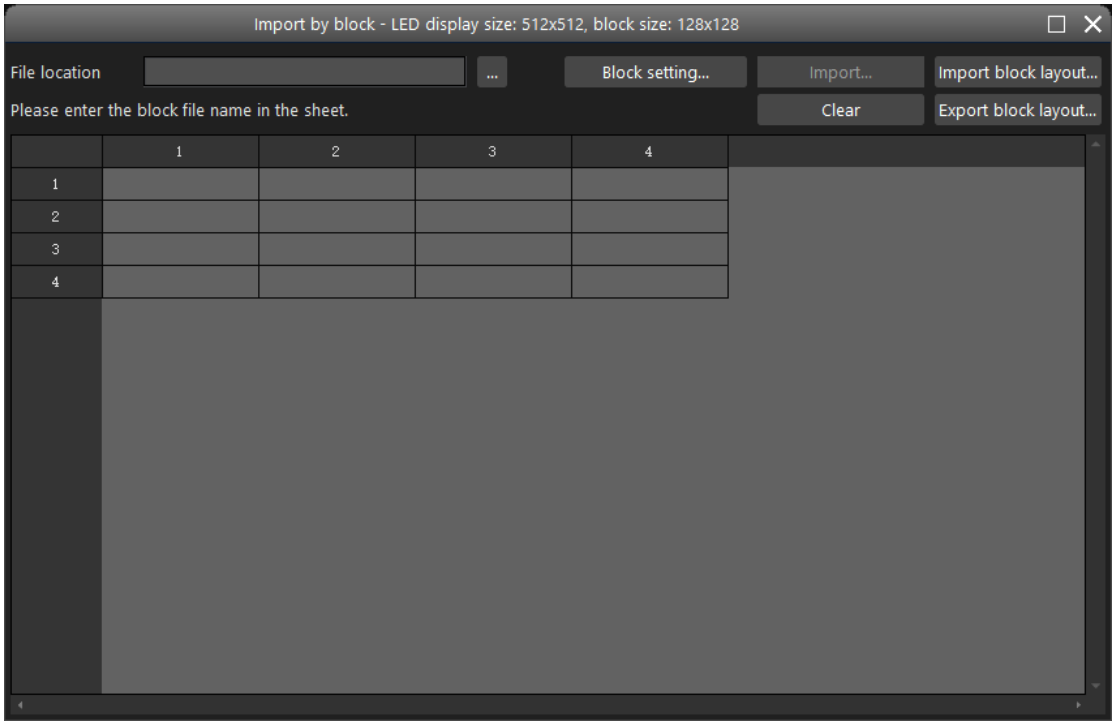


Fig 4.9-6 Import by block settings window

Click “Block setting” button to set block resolution (measured in resolution), the block resolution must match the pixel matrix size contained in each block calibration coefficients file.

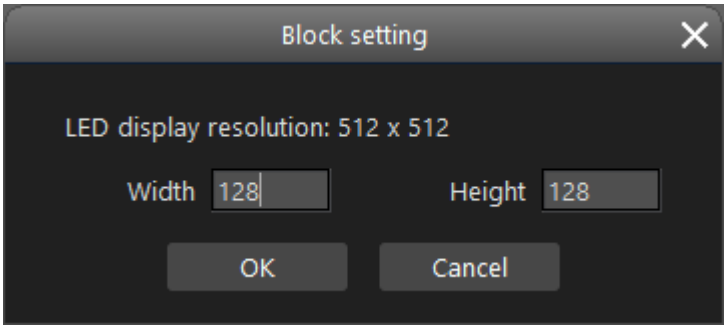


Fig 4.9-7 Block resolution setting

Each cell in the sheet represents a block of pixels, enter the block calibration coefficients file name in each cell (refer to fig 4.9-8), the files name in the sheet must match the name of the files in local

storage drive. If you already have the block layout formatted in xml, click import block layout button to load.

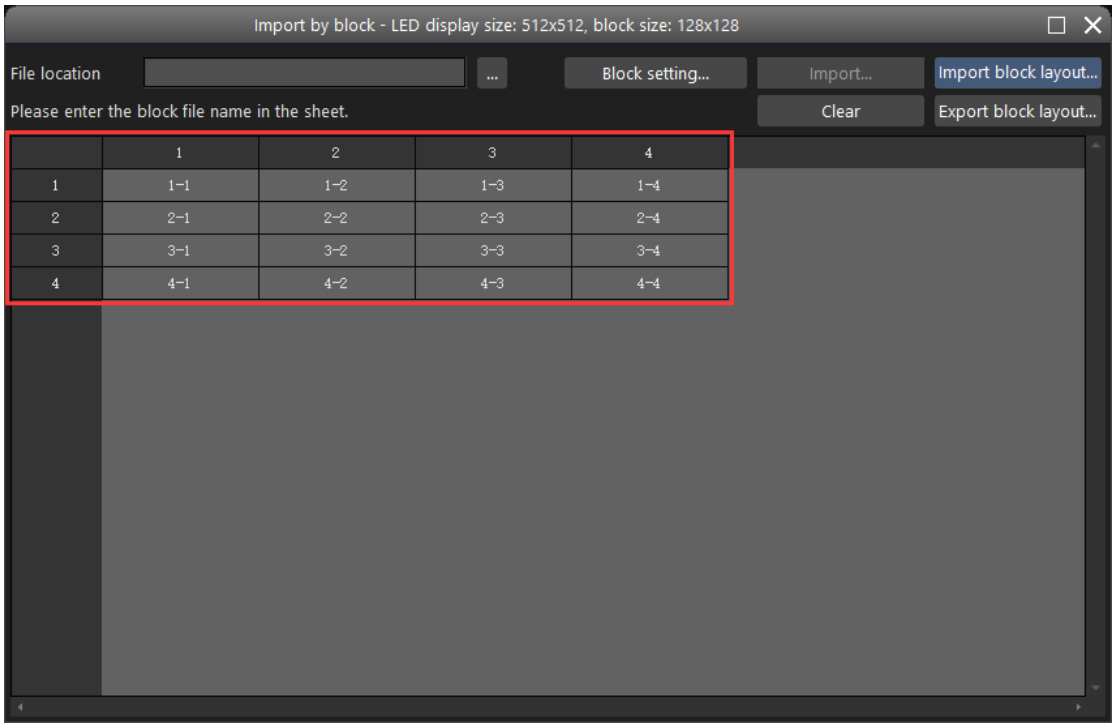


Fig 4.9-8 Block name

When all pre-configuration done, click import button to import block calibration coefficients files.

➢ Export

The calibration coefficients for pixels can be exported in four approaches of all pixels, specific area, per cabinet and per block. The format of exported file are same with import file.

◆ All pixels

Export calibration coefficients for all pixels under current selected processor.

◆ Specific area

Users can enter coordinates of a pixel as a starting point, the default ending point is the pixel in the lower-right in the pixel map.

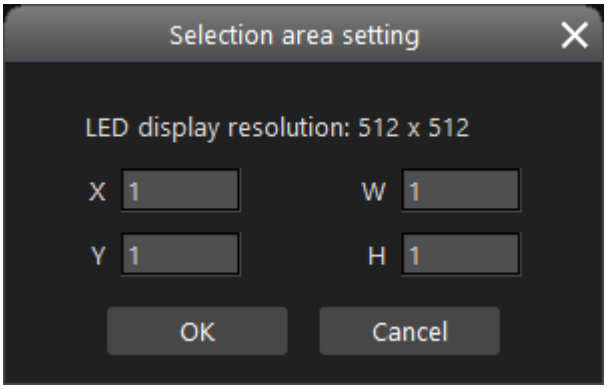


Fig 4.9-9 Starting coordinates of a pixel

- **Per cabinet**

  Calibration coefficients files are separated per cabinet, each cabinet corresponds to a coefficients file.

- **Per block**

  Pixels of LED display can be arranged into multiple equal pixel blocks, each block has an individual calibration coefficients file. Click "Per block" to get into export by block settings window, refer to fig 4.9-10. Each cell in the sheet represents a block of pixels, the block resolution can be set by clicking block setting button, once the block resolution has been set, a default block name will be assigned to each block, double-click on a cell can rename the block. Click export button to export block calibration coefficients to a local storage drive.

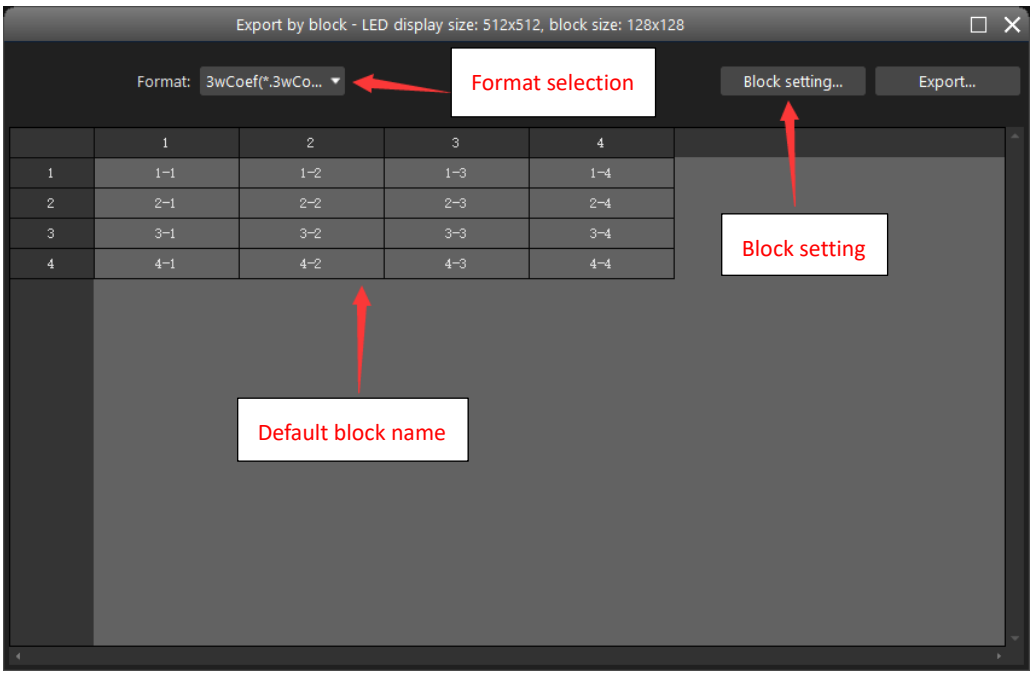


Fig 4.9-10 Export by block setting window

- **Cabinet edit mode**

  When cabinet mode is selected, the canvas shows all cabinets under current selected processor.

- **Pixel edit mode**

  When pixel mode is selected, the canvas shows a sheet, each cell in this sheet represents a pixel.

- **Test pattern buttons**

  iSet generates selected test patterns over the canvas, click "Display canvas" to project the canvas to LED display, refer to fig 4.9-11.

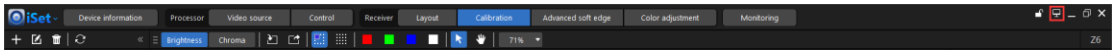


Fig 4.9-11 Display canvas

- **Hand**

  Pans over different part of the canvas, it is visible only when cabinet edit mode is selected.

- **Select area**

  "select area" button is visible only when pixel edit mode is selected. Click this button to display a selection area setting window where users custom pixel start position and area width and height, refer to figure 4.9-12.

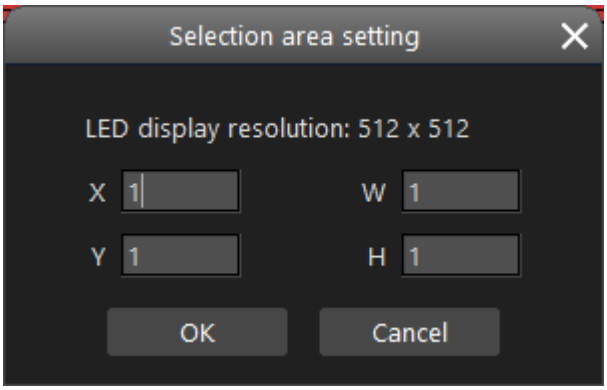


Fig 4.9-12 Selection area setting window

4.9.2 Calibration canvas

- **Canvas introduction**

Show LED display based on pixel level, module level and cabinet level. Users can select individual or multiple pixels, modules and cabinets depending on the edit mode and calibration mode is selected.

- **Brightness calibration mode**

  Brightness button turns into blue when brightness calibration mode is selected. The edit mode is defaulted to cabinet edit mode.

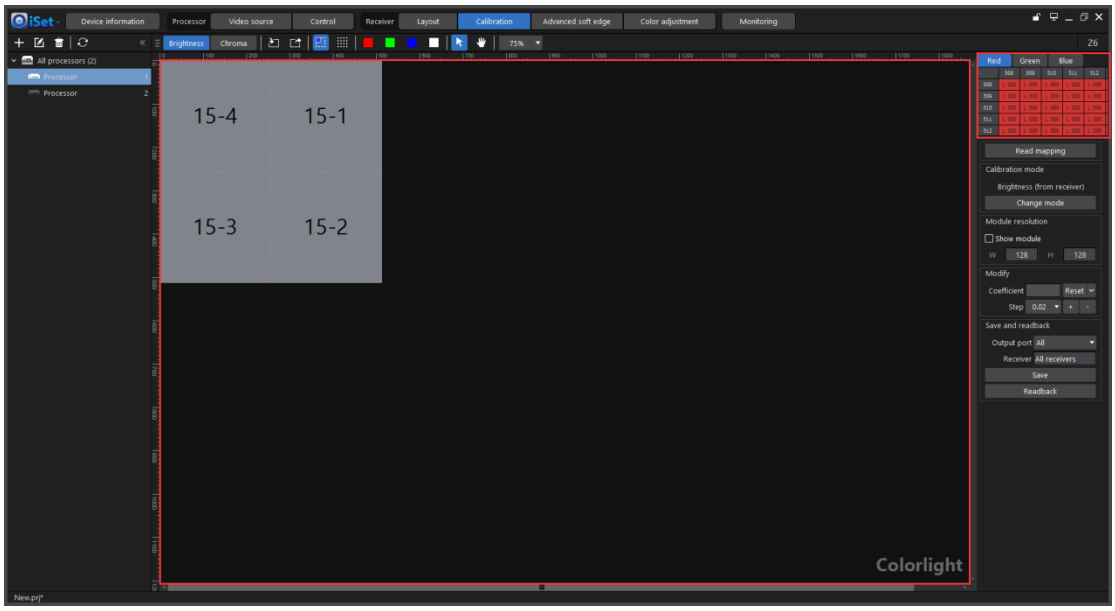


Fig 4.9-13 Cabinet edit mode (Brightness)

Cabinets layout will appear in the canvas, the cabinet shapes are separated by dotted lines; the cursor form turns into crosshair in the canvas. Click on the cabinet to select a cabinet, hold Ctrl+click for multi-cabinets selection, users can also drag a selection box to select cabinets, dragging left to right selects cabinet shapes that entirely inside the box, dragging right to left selects all cabinet shapes that at least partially inside the box, the fill of selected cabinets turns into blue-violet

Context menu when right click on cabinet:

1. **No cabinet selected**: No context menu when right click on cabinet.
2. **Single cabinet selected**: Context menu has options of copy, save to receiver, readback from receiver, export, import.
3. **Multi-cabinets selected**: Context menu has five options of save to receiver, readback from receiver.

Fig 4.9-14 Context menu when single cabinet is selected

The cells in the sheet on the upper-right of the screen represents the coefficients value for pixels surrounding the crosshair position. The three buttons above the upper-right sheet represents three color components, the adjustments can only be made for selected color component.

The canvas will show a sheet when pixel edit mode is selected, each cell in this sheet represents a pixel, the value of a cell represents pixel calibration coefficient, click the buttons in upper-right of the sheet to switch between different color components.

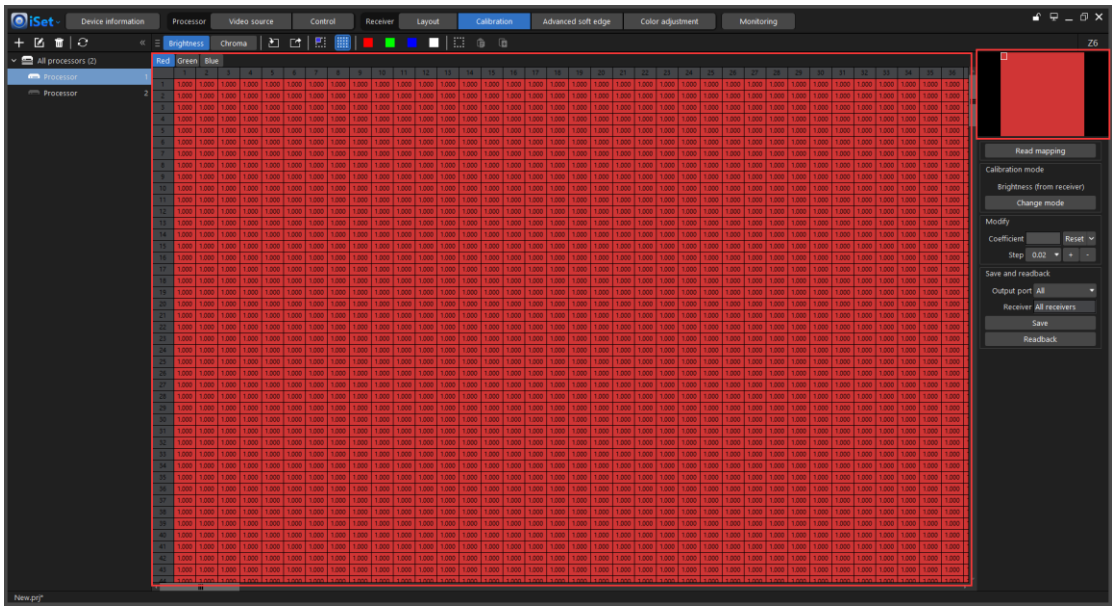


Fig 4.9-15 Pixel edit mode (Brightness)

Cell fill color changes with selected color component. Click on a cell for individual pixel selection, dragging in any direction can select multiple pixels. Right clicking on selected pixel/pixels or using shortcut Ctrl+C allows users to copy pixel coefficient value through the context menu. Use Ctrl+V or right click on the sheet to paste copied coefficient values to specific cells in the sheet.

The canvas navigator is located in the upper-right of the screen, it is a preview of the canvas is displayed, the white box showing the current visible canvas area, dragging the white box moves the canvas view.

- **Chroma calibration mode**

  The main difference is that chroma mode has 9 color components for each pixel whereas brightness only has 3. The setting process in chroma mode is pretty much similar to brightness mode, please refer to brightness calibration mode manual.

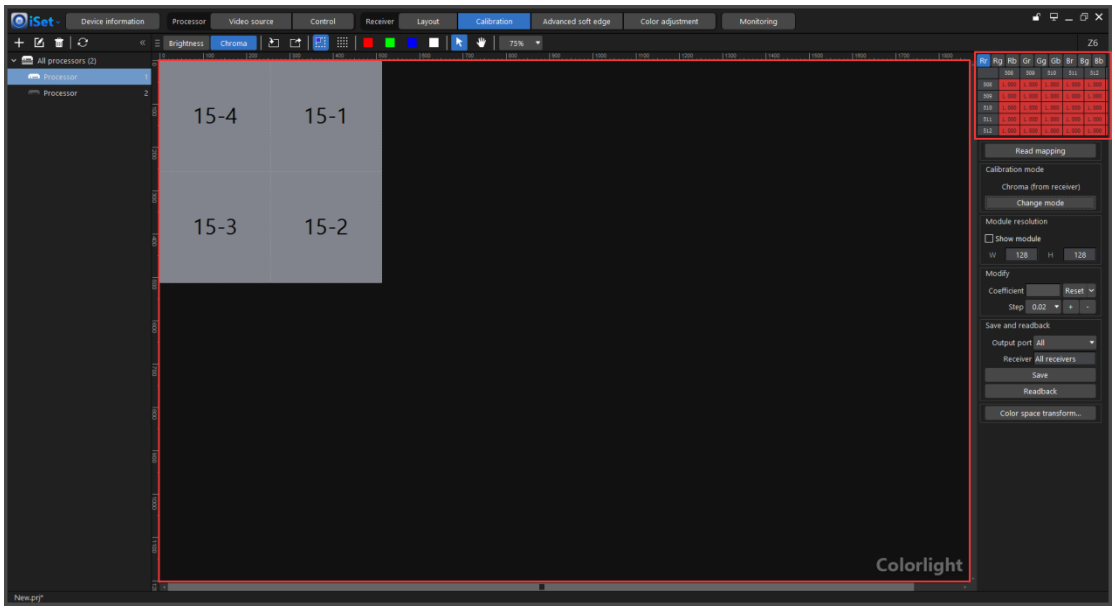


Fig 4.9-16 Cabinet edit mode (Chroma)

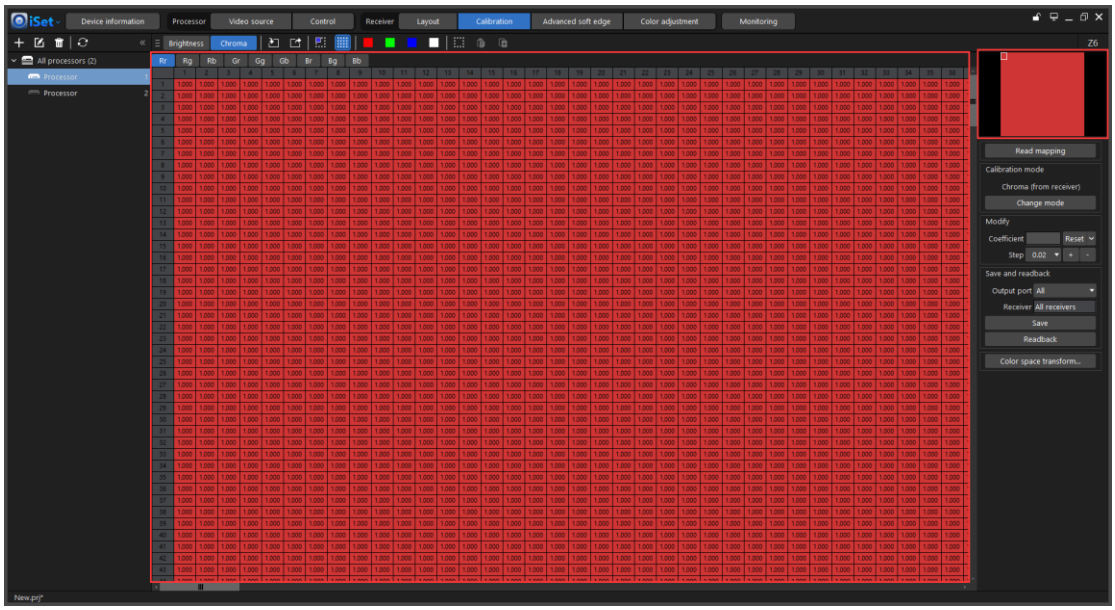


Fig 4.9-17 Pixel edit mode (Chroma)

4.9.3 Calibration configuration pane

Refer to figure 4.9-18, show module option appears only in cabinet edit mode, the color space transform button is visible only in chroma mode.

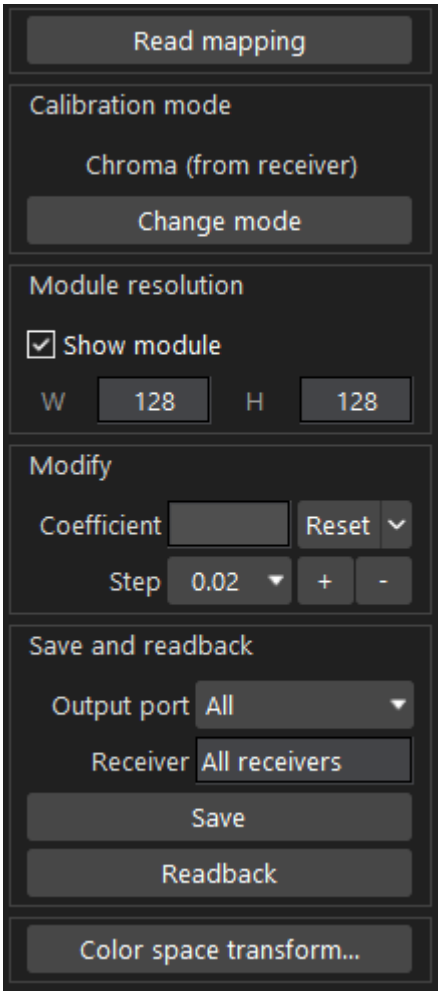


Fig 4.9-18 Options in the configuration pane

- Processor selection
  - Processor selection drop-down button

    All processors in the current project appears in the drop-down list, actions can only be made on one processor at a time.
  - Read mapping

    Readback cabinets mapping from processor/receiver card and display in the canvas.
- Calibration mode

  Clicking read mapping can also obtain current calibration mode setting from connected LED cabinets and display its current used mode, if the

calibration setting of LED cabinets does not match the calibration mode selection in the tool bar, the displaying font will be changed to red. To match the two, users can either change software calibration mode or click “Change mode” to set LED cabinets calibration mode. Depending on the calibration setting and type of LED cabinet is connected, options might be appearing when click “Change mode” button: Disable calibration, enable brightness calibration (from receiver), enable chroma calibration (from receiver), enable brightness calibration (from module), enable chroma calibration (from module), software simulation, disable modification on module. The “Disable modification on module” is checked by default, users cannot modify calibration coefficients stored on module when this option is checked.

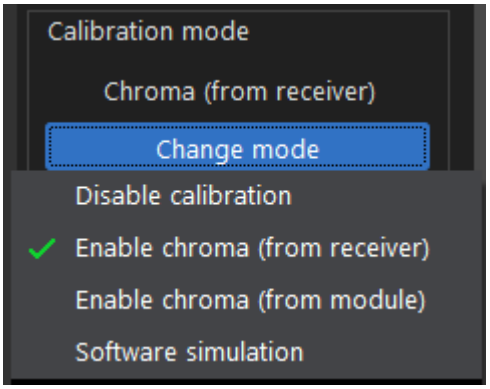


Fig 4.9-19 Calibration mode

- **Disable calibration**

  Turn off calibration, the LED cabinets does not show calibration effects.

- **Enable brightness calibration (from receiver)**

  LED cabinets uses the brightness calibration coefficients stored in the receiver card.

- **Enable brightness calibration (from module)**

  LED cabinets uses the brightness calibration coefficients stored in the LED module flash.

- **Enable chroma calibration (from receiver)**

  LED cabinets uses the chroma calibration coefficients stored in the receiver card.

- **Enable chroma calibration (from module)**

  LED cabinets uses the chroma calibration coefficients stored in the

LED module flash.

- Software simulation

  LED cabinets uses calibration coefficients in iSet software and take effects to the modifications made in real time.

➢ Show module

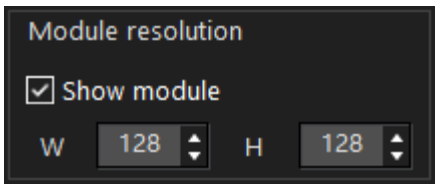


Fig 4.9-20 Module size setting

Check the tick box of show module, the LED module shapes will appear in the canvas, LED modules shapes are separated by dotted lines.

When "Show module" is checked, the default module resolution is a quarter of the cabinet resolution, users can modify module resolution by entering values or clicking up/down arrows in the W/H boxes.

If intelligent modules (LED module has memory for calibration coefficients storage) are detected, module resolution edit will be disabled. The displayed module resolution will be identical to the module resolution setting in intelligent module.

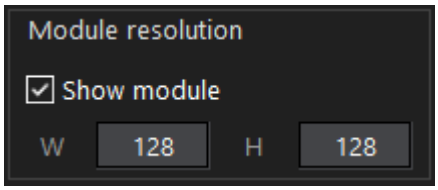


Fig 4.9-21 Module resolution edit disabled

The small square in the upper-right of each module indicates whether the module is intelligent module, there are two possible scenarios as below, refer to figure 4.9-22.

1. **None of the modules is intelligent module**: small square does not appear.
2. **Mix of regular module and intelligent module**: red square indicates regular module; green square indicates intelligent module.

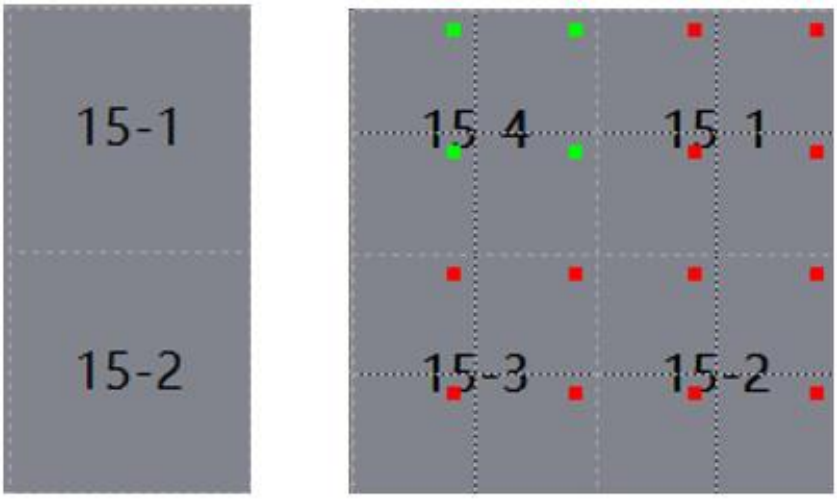


Fig 4.9-22 Intelligent module and regular module indication

- **Modify calibration coefficients**

  Users can either enter a calibration coefficient value in the box or click +/- button to modify selected pixels/cabinet/module calibration coefficient. The scale of the coefficient value is 0-1 and it can be set to 3 decimal places. Click reset button to display a drop-down list that contains options of 100%, 85%, 80%, 75%, 70%, custom, users can quickly set calibration coefficient of selected pixels/modules/cabinets to a desired percentage of the maximum coefficient value 1.

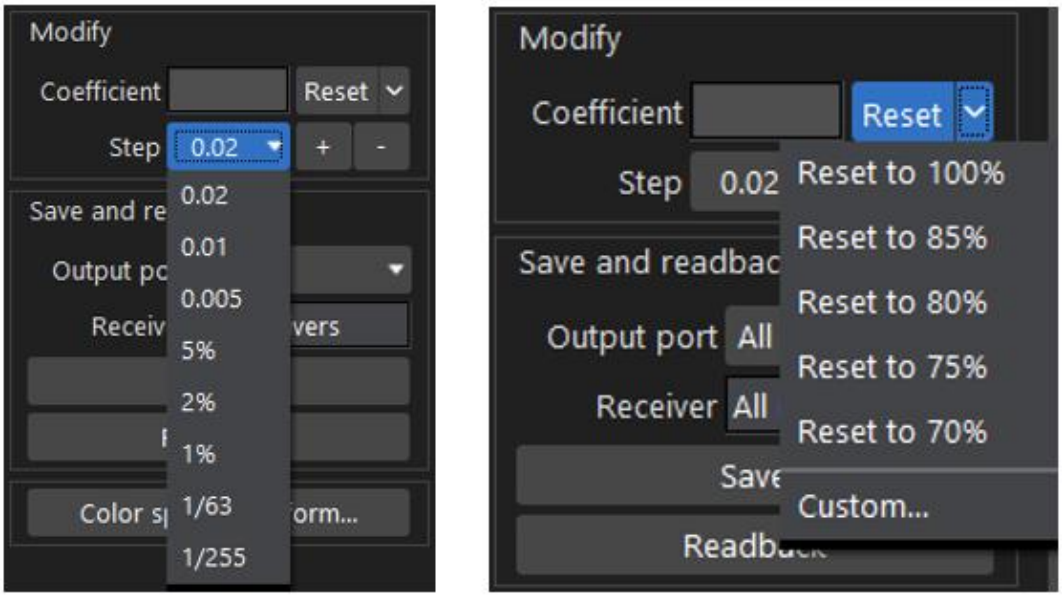


Fig 4.9-23 Modify calibration coefficient

- **Save and readback**

  Save/readback calibration coefficients to/from specific LED cabinets (receiver card).

- **Color space transform**

  Set a target color space for LED display.

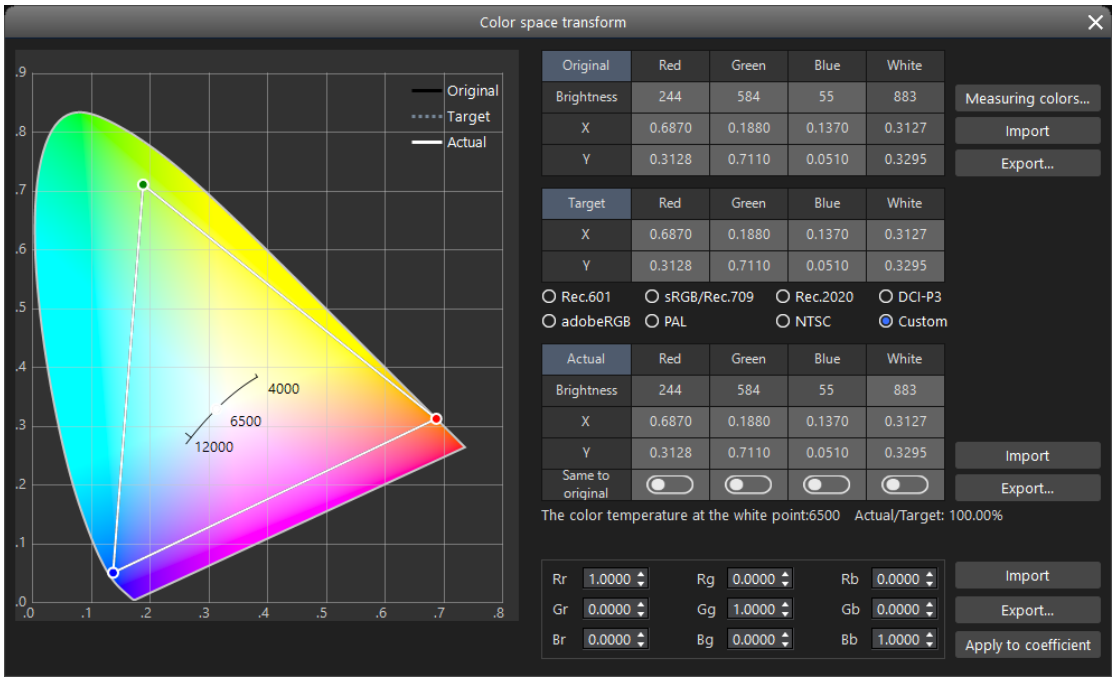


Fig 4.9-24 Colors space transform

4.10 Color Adjustment

The color adjustment screen is arranged in three sections, the tool bar on the top, canvas in the middle and the configuration pane on the right side.

4.10.1 Color Adjustment introduction

- **Color space**

  A color space is a specific organization of colors. The color space of a LED display describes the range of colors that this LED display can potentially reproduce. iSet uses CIE 1921 xy color map to represent available colors can be displayed of a LED display. The larger triangle on the map, the wider color space, the more available colors can be displayed.

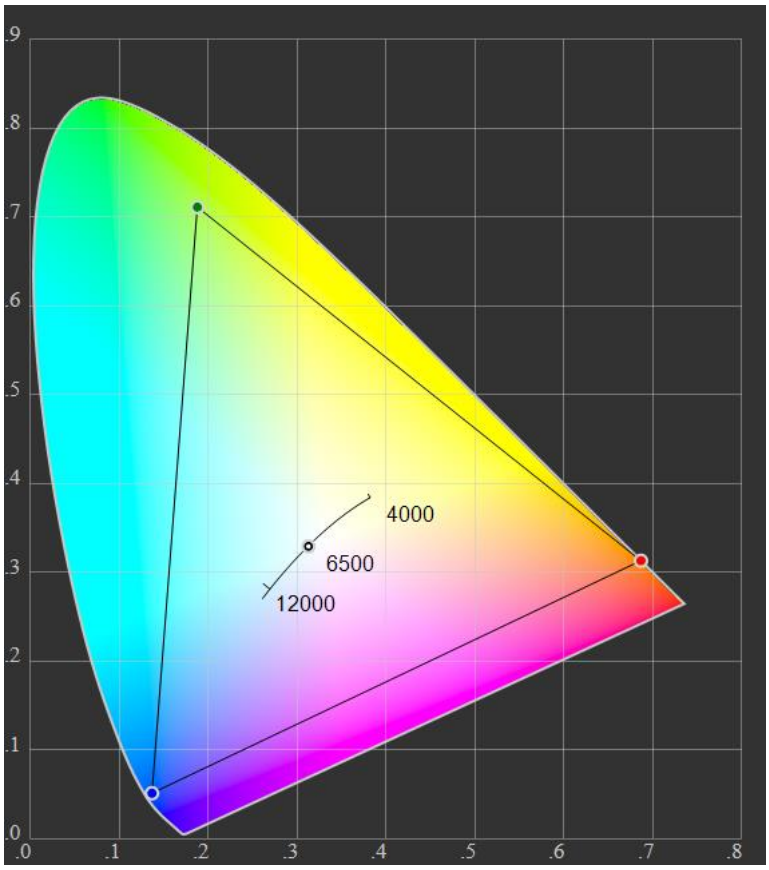


Fig 4.10-1 CIE 1931 map

- **The use of color adjustment**

1. Meet the needs of users for LED display color reproduction.

2. Match the color between different batches of LED cabinets.

- **Essential of color adjustment**

1. Target color space= Original color space × color components matrix.

2. Modify the value of the 9 color components to get a target color space.

Fig 4.10-2 Color components matrix

- **Supported receiver card type**

i9+ receiver card, i9 receiver card, specific versions of i6 receiver card.

4.10.2 Tool bar

Buttons in the tool bar: Select, hand tool, zoom.。

Fig 4.10-3 Tool bar

4.10.3 Canvas

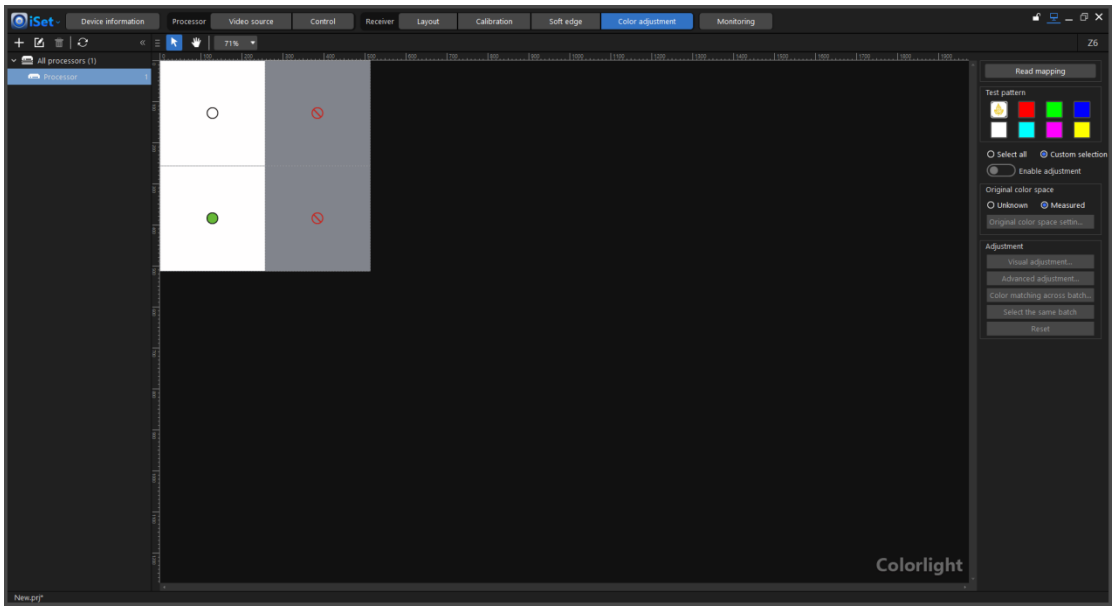


Fig 4.10-4 Color adjustment canvas

➢ **Contents shown in the canvas**

Cabinet shapes are arranged in the canvas, according to the icon and color of the cabinets in the canvas, users can quickly and easily distinguish whether the cabinets support color adjustments, whether the color adjustments are enabled or disabled and whether the cabinets are the same batch.

Click Read mapping button, the following icons may appear in the middle of each cabinet shape.

: The receiver card(cabinet) does not support color adjustment.

: Color adjustment is disabled.

: Color adjustment is enabled.

Different color fill of the cabinet shape represents these LED cabinets are having different original color space.

➢ **Right-click context menu**

The context menu contains 2 options: use a preset and select the same batch. Use a preset option only appears when there is an original color space preset existing. Click select the same batch to select the cabinets in the canvas which has the same original color space.

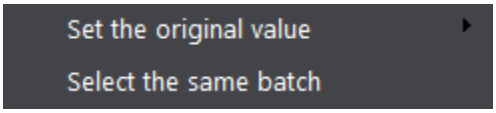


Fig 4.10-5 Options in the context menu

4.10.4 Color space configuration pane

Adjust the LED cabinets color settings.

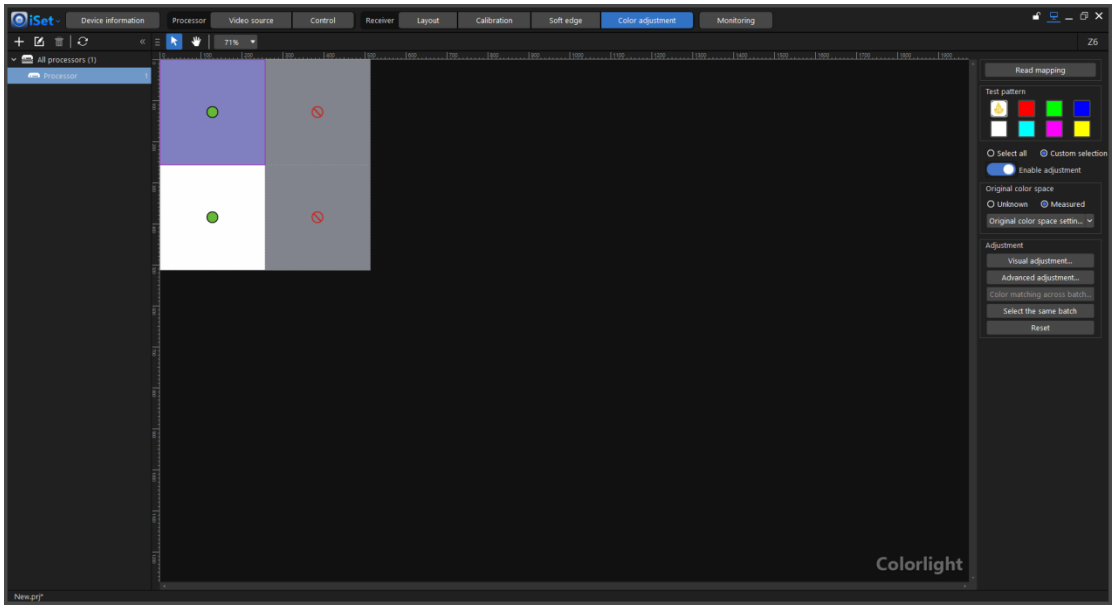


Fig 4.10-6 Configuration pane

➢ **Read mapping**

Click read mapping button, the iSet will obtain the information of connected processors and receiver cards and display the cabinets array in the canvas.

➢ **Test pattern**

Click to a button to show a corresponding pattern on the LED display. Available test patterns vary depending on the type of processor is currently connected.

➢ Cabinet selection

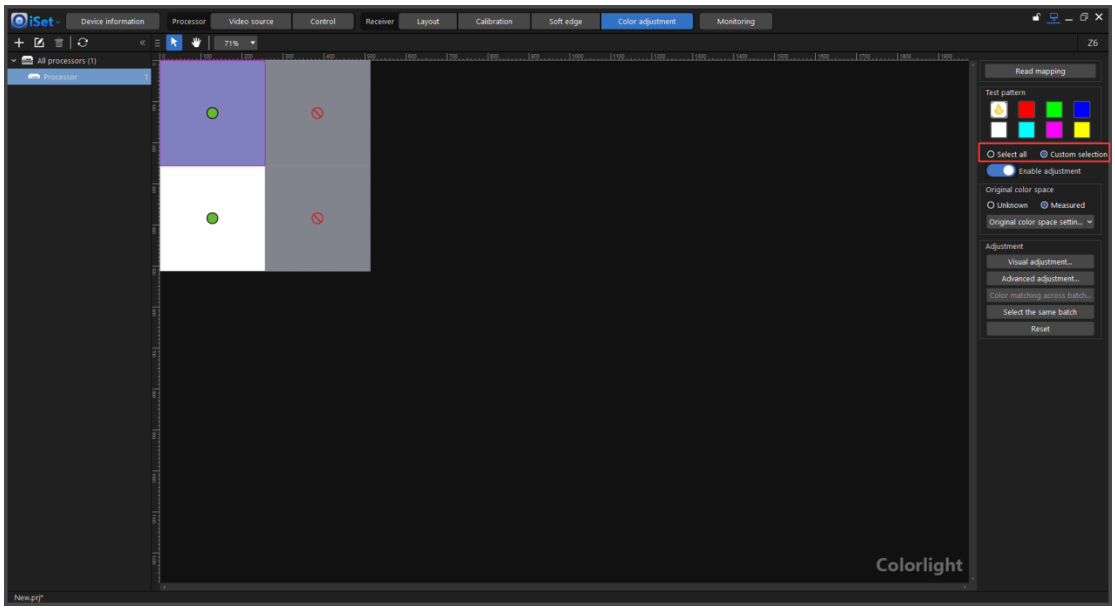


Fig 4.10-7 Cabinet selection

◆ Select all

Select “Select all” to select all cabinets in the canvas. If there is more than one batch of cabinets in the canvas. The “Select all” option will be grayed out.

◆ Custom selection

In “Custom selection” mode, users can click cabinets on the canvas to select cabinets. If there is no cabinet selected, buttons under adjustment will be grayed out.

➢ Enable adjustment

Toggle the button to enable/disable color adjustment. Modifications can be made to the cabinets only when color adjustment is enabled.

➢ Original color space setting

◆ Unknown

The color space has not been measured for the cabinets. When “Unknown” is selected, the “Original color space settings”, “advanced adjustment”, “Color matching across batches” “Select the same batch” buttons will be hidden.

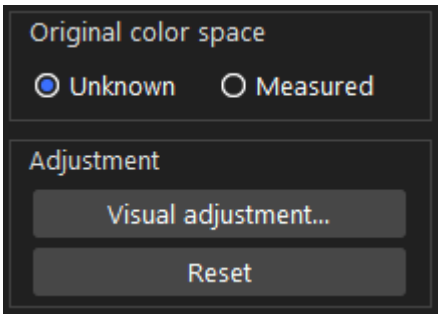


Fig 4.10-8 available buttons when “Unknown” is selected

- **Measured**

  The color space has been measured for the cabinets or the users already have the LED display color space specs.

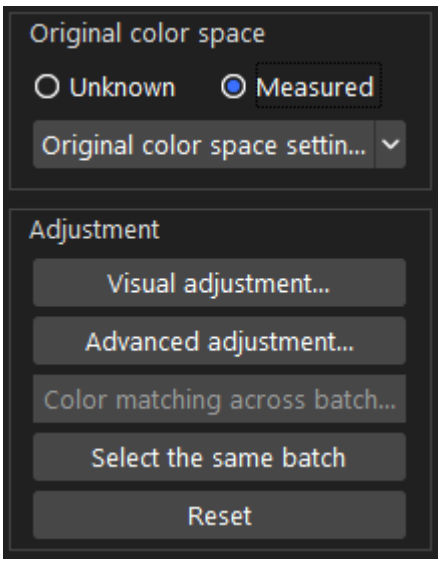


Fig 4.10-9 Available buttons when “Measured” is selected

Click the “Original color space settings” button to get into the original color space settings window.

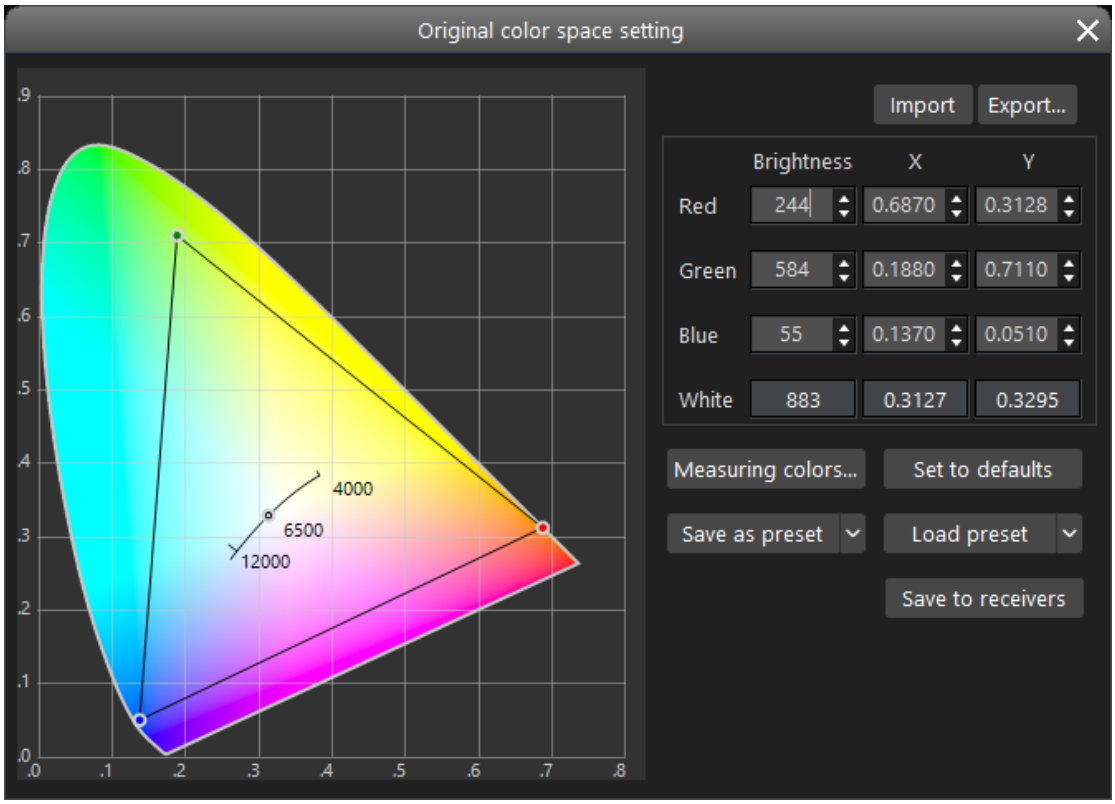


Fig 4.10-10 Original color space setting window

Users can manually enter the brightness, xy coordinates values into the boxes to set the LED cabinets original color space. The triangle on the left CIE 1931 map simultaneously changes its size that indicates the available colors can be displayed on the cabinets.

The iSet can also communicate with certain third-party color meters via USB connection. Point the color meter to a LED cabinet which you want to measure and connect the color meter to the computer which is running iSet via USB cable. Then click the "Measuring colors" button, the LED cabinets will sequentially display red, green and blue pattern, in the meantime, the color meter would measure each color and feed the measurements to the iSet software. The white values are figured out based on red, green and blue measurements.

Click "Set to defaults" button to set all values to software defaults. The software default color space is not complied to any of the standard color spaces.

Users can import/export the original color space parameter file for

convenience.

Click “Save as preset” to save the current values as a preset in the iSet, up to 4 presets can be saved. Click “Load preset” to recall a desired preset.

Click “Save to receivers” to save the original color space settings to the receiver cards.

- Adjustment
  - Visual adjustment

The LED cabinets takes effects in real time to the modifications made in visual adjustment window. Its user interface appears different according to the selection of “Unknown” and “Measured”.

When “Unknown” is selected, its user interface shown as below figure.

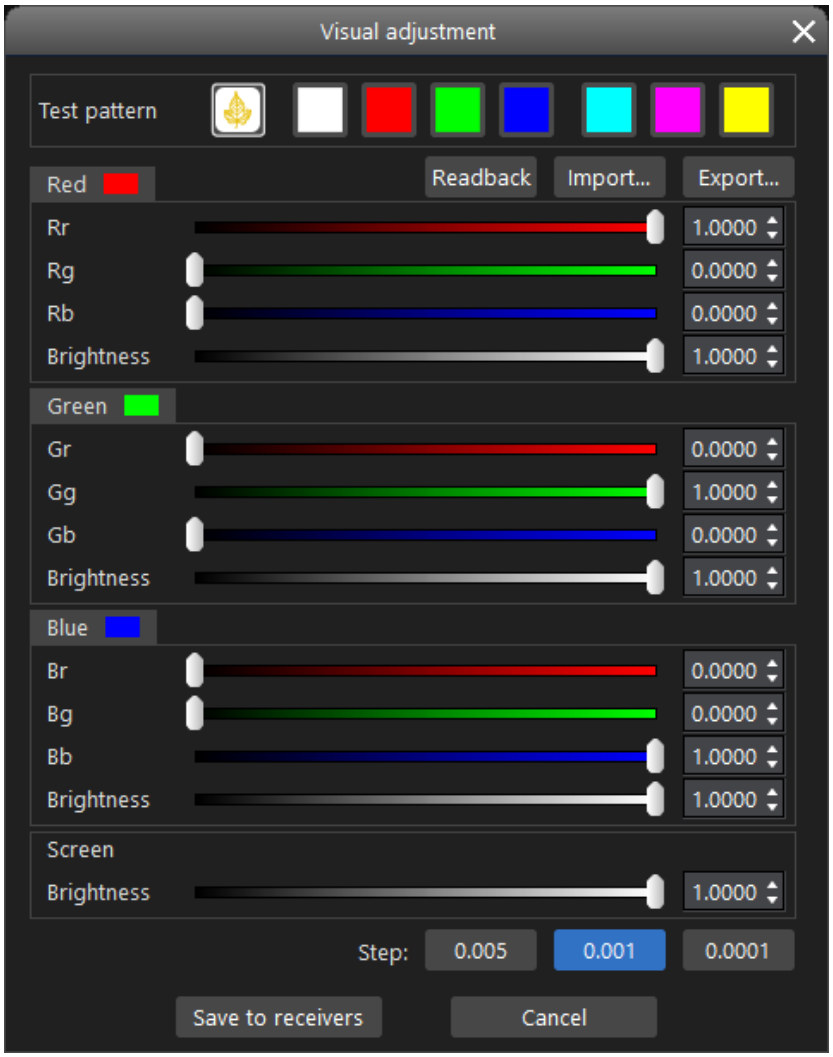


Fig 4.10-11 Visual adjustment window when “Unknown” is selected

Click the buttons on the top of the window to display a desired test pattern on LED display. The available test patterns vary depending on the type of processor is connected. Up to 7 test patterns are available for selection.

Users can either move the slider bars or click up and down arrow in the box to change the value of up to 9 color components. The color component value is on a scale from 0 to 1, the default value of Rr,Gg and Bb is 1. Below is the meaning of each color component.

Rr: The amount of red light emitted in each pixel when LED display receives red signal.

Rg: The amount of green light emitted in each pixel when LED display receives red signal.

Rb: The amount of blue light emitted in each pixel when LED display receives red signal.

Gr: The amount of red light emitted in each pixel when LED display receives green signal.

Gg: The amount of green light emitted in each pixel when LED display receives green signal.

Gb: The amount of blue light emitted in each pixel when LED display receives green signal.

Br: The amount of red light emitted in each pixel when LED display receives blue signal.

Bg:The amount of green light emitted in each pixel when LED display receives blue signal.

Bb: The amount of blue light emitted in each pixel when LED display receives blue signal.

The color component is associated with the selected test pattern. For example, if the cyan test pattern is selected, only the color components under green and blue can be edited, because cyan is the combination of green and blue.

When “Measured” is selected, the user interface visual adjustment shown as below figure. The CIE 1931 map appear on the left side of the window, the black triangle represents the color space of current LED display.

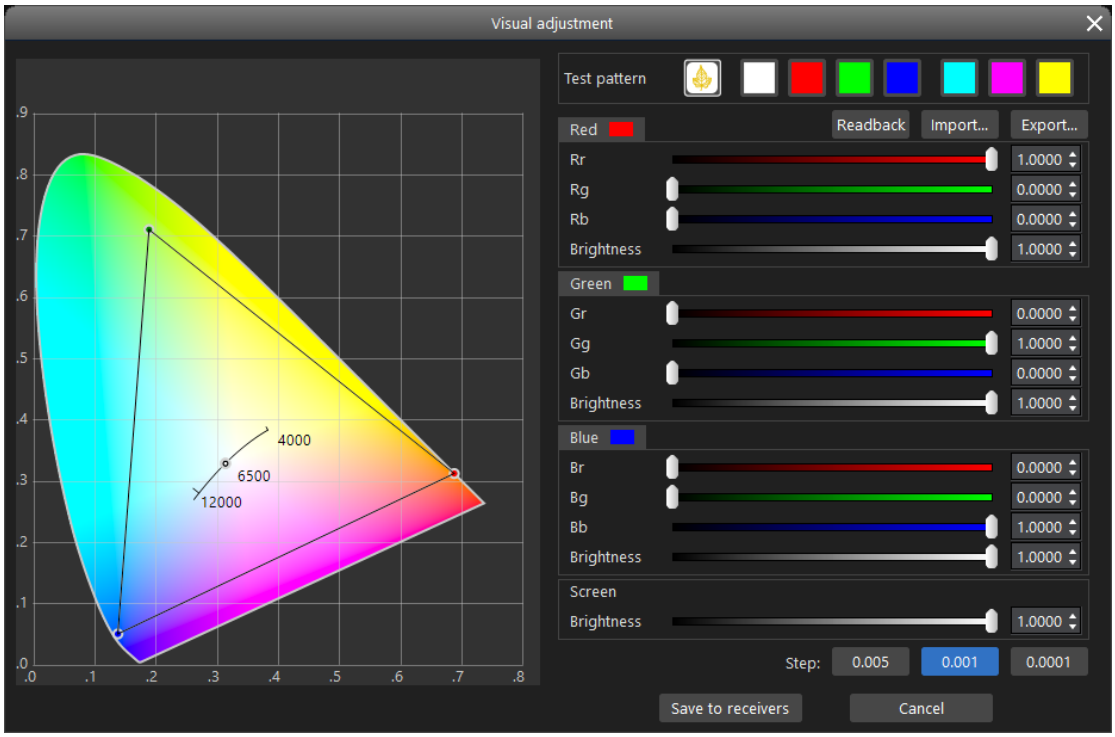


Fig 4.10-12 User interface when “Measured” is selected

The adjusted color space will be simultaneously reflected in the size of the white triangle in the CIE map.

- **Advanced adjustment**

  The advanced adjustment approach is particularly useful when you have the coordinates of a target color space.

  Users can also select a standard preset color space such as: Rec.601, sRGB/Rec.709, Rec.2020, DCI-P3, adobeRGB, PAL, NTSC.

  Once a target color space is selected or set, a dotted gray triangle will appear in the CIE map which represents the target color space. The target color space coordinates will be also populated in the target color space sheet.

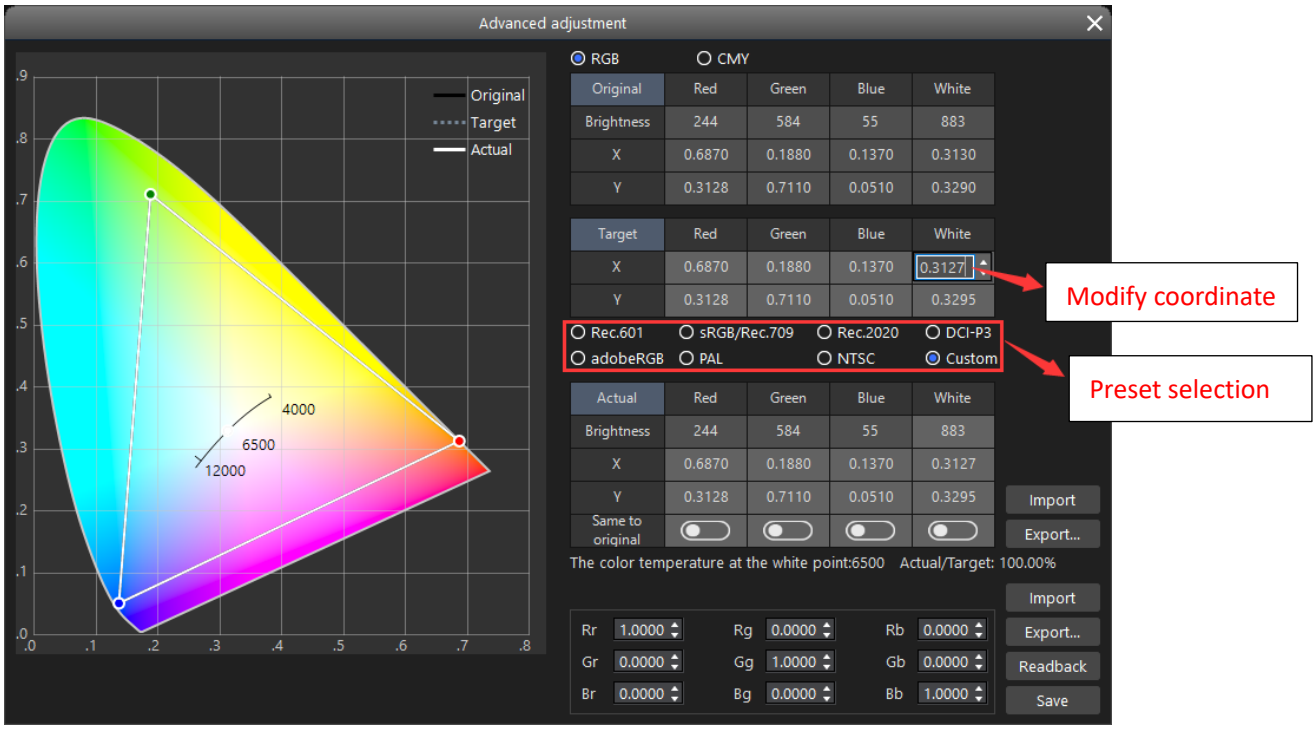


Fig 4.10-13 Target color space setting

Ideally, the original color space of your LED display should cover the target color space, but in reality, the original color space of many LED displays may not entirely cover the target color space. So, the "Actual color space" concept was introduced that describes color space that is actually used on the LED display when original color space of a LED display cannot hit the target color space. The white triangle in the CIE map represents actual color space.

When the target color space is set, a default actual color space will be given that is calculated by iSet according to the gap between original color space and target color space. Users can also manually adjust the actual color space:

a. Drag the vertex of the white triangle in the CIE map.
b. Enter the actual color space coordinates in the actual color space sheet.
c. Change the target color space.

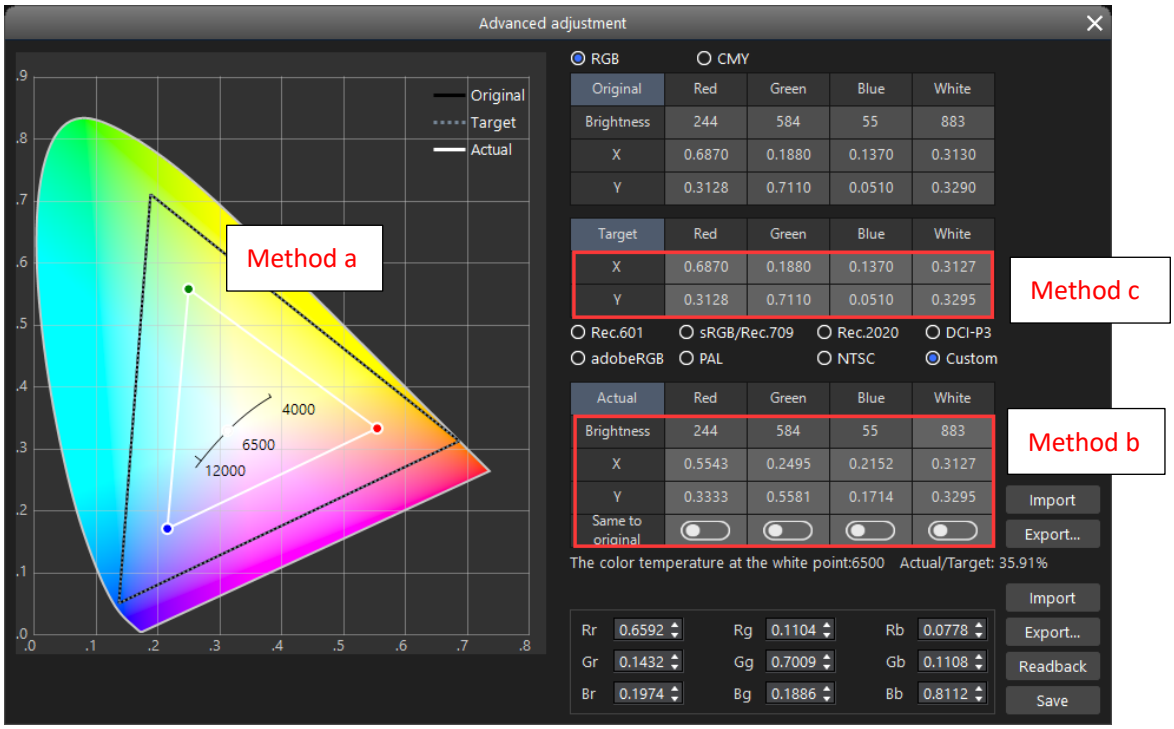


Fig 4.10-14 Actual color space adjustment

Click the toggle buttons in the line of “Same to original” in actual color space sheet can quickly set the actual color space that same as the original color space. The actual color space coordinates can be exported by clicking “Export” button next to actual color space sheet.

After the actual color space is set, the value of each color component will be given in the bottom of the window. The color components value matrix can also be exported, imported and readback.

Fig 4.10-15 Color components value matrix

- ## Color matching across batches

Different batches of the same type LED cabinets may have different in brightness and color. Using color matching across batches enable users to quickly match LED cabinets.

Whether the LED cabinets are coming from the same batch is

determined by the original color space of LED cabinets. LED cabinets from the same batch must have the same original color space. So, Color matching across batches is essentially set the different batches of LED cabinets to use the same color space.

Color matching across batches function is only available when both below conditions are satisfied:

1. “Measured” (where the original color space is set) is selected.
2. Cabinets with different original color space are selected in the canvas.

The process of matching LED cabinets is very simple and intuitive. Select the cabinets in the canvas which you want to match. Click “Color matching across batches” button to get into the color matching adjustment window. Triangles which represent the original color space for each batch appears in the CIE map on the left side of the window, click “Auto merge” button, the software will calculate the common color space that all batches of LED cabinets can achieve. Clicking “Save to receivers” can save the modifications to the receiver card.

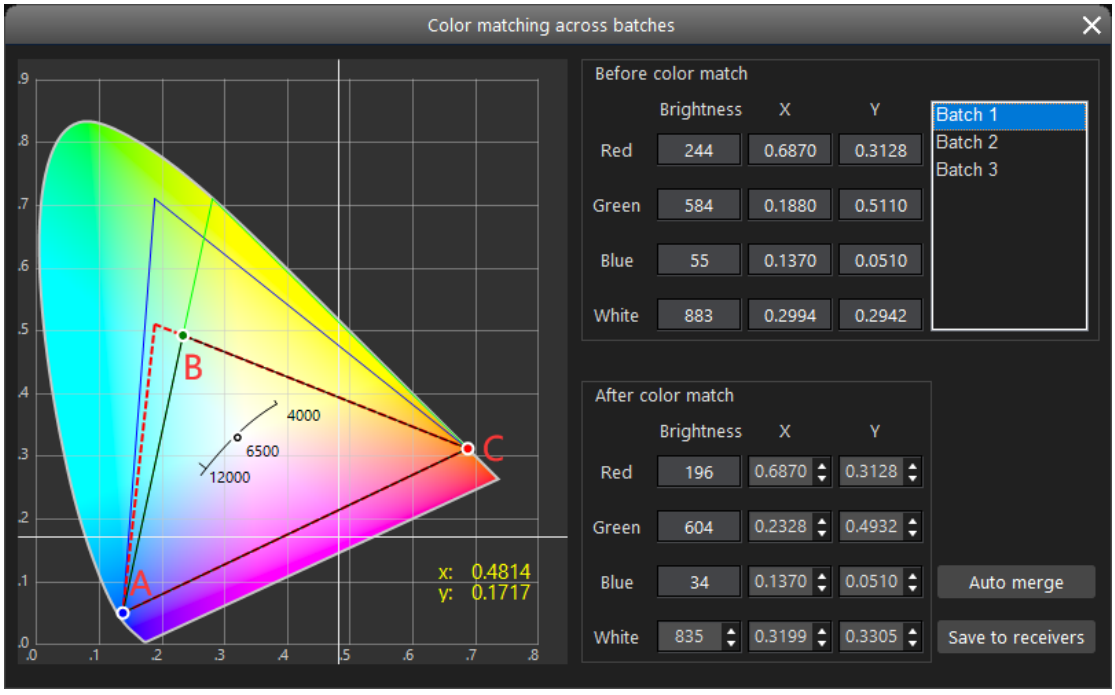


Fig 4.9-16 Color matching across batches

- **Select the same batch**

  The “Select the same batch” button will be highlighted when

there is any one of the cabinets has the same original color space settings with the current selected cabinet in the canvas.

- Reset

  Reset all modifications made in color adjustment tab to default. Reset does not affect LED cabinet existing calibrations.

4.11 Monitoring

The monitoring function is designed to ensure the processor and receiver card are functional as expected. The system would report to the users via email if there is any errors or defected hardware detected in the system.

4.11.1 Tool bar

The buttons from left to right in the tool bar are: Open project, Save project, Read project from processor, Save project to processor, Monitoring settings, Start monitoring, Stop monitoring, Select, Hand tool, Log, Navigator.

Fig 4.11-1 Tool bar

- Open project

  The button will be grayed out after monitoring is started. Click the button or use shortcut (Ctrl+O) to open an existing project from local storage drive.

- Save project

  The button will be grayed out after monitoring is started. Click the button or use shortcut (Ctrl+S) to save the current project to local storage drive as a file formatted in prj. The default file name is New.prj.

- Read project from processor

  The button will be grayed out after monitoring is started. Click the button to readback project from currently connected processor. If there is no project file existing in the processor, iSet will prompt users whether to save current project to processor.

- Save project to processor

  The button will be grayed out after monitoring is started. Click the button to save current project to processor. If there is already a project

existing in the processor, iSet will prompt users whether to overwrite the existing project.

➢ **Monitoring settings**

Click the gear icon to get into monitoring settings window where users can toggle available monitoring options.

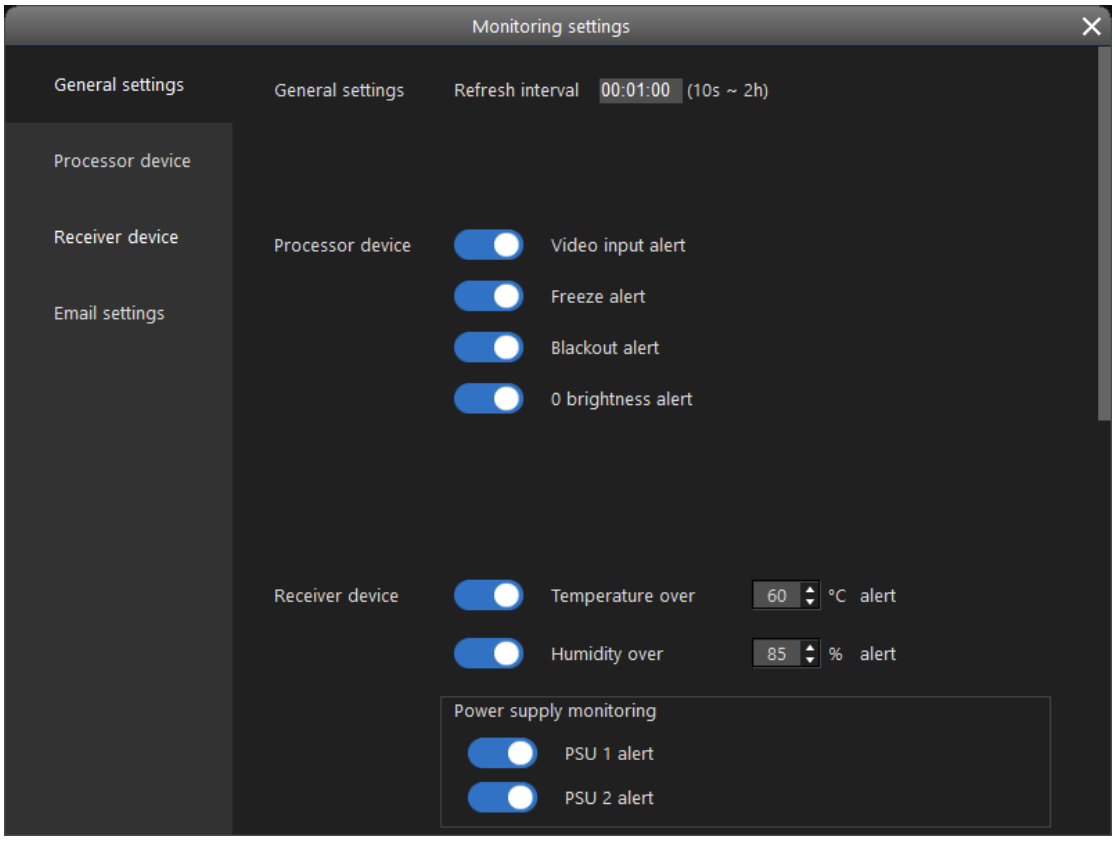


Fig 4.11-2 Monitoring settings window

◆ **General settings**

The receiver cards (LED cabinets) and processor reports the status to iSet software at a fixed interval. Users can custom refresh interval range from 10 seconds to 2 hours.

◆ **Processor device**

The following settings or parameters of the processor can be monitored: Video input, Freeze, blackout, 0 brightness.

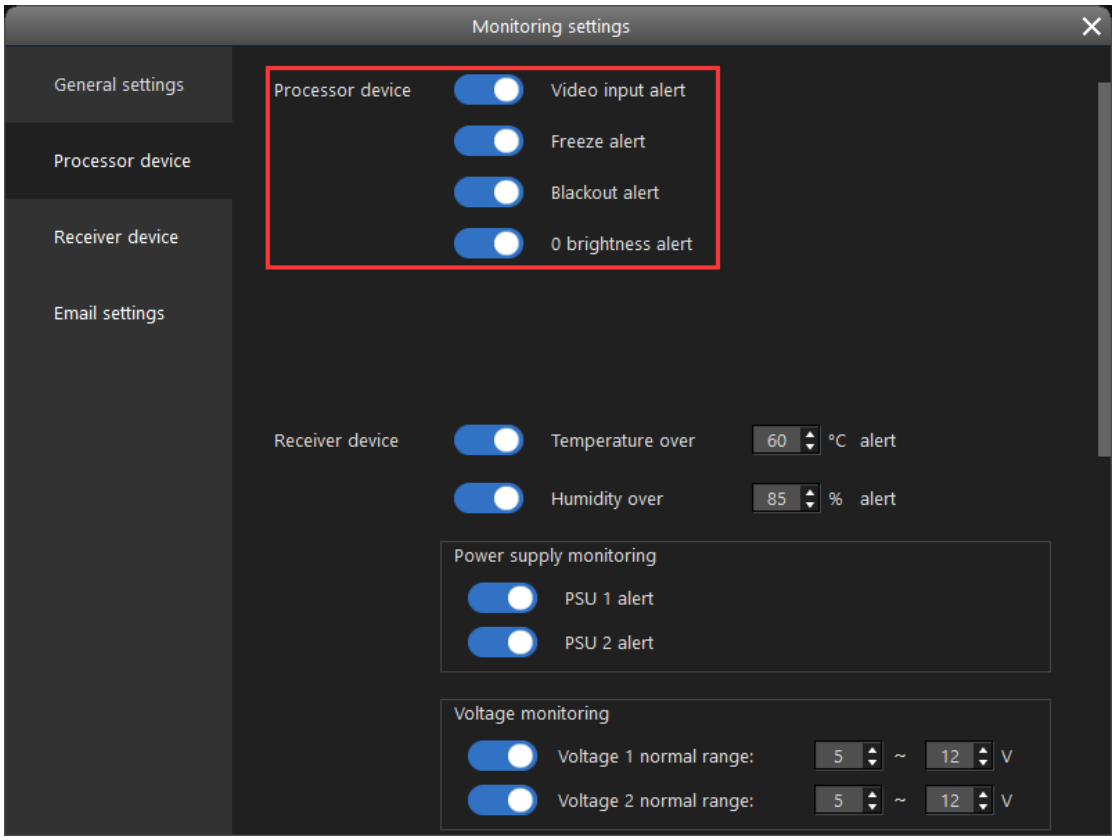


Fig 4.11-3 Processor monitoring settings

- ## Receiver device

  The following settings or parameters of receiver card and cabinet can be monitored: Temperature, humidity, power supply and power supply output voltage. When any one of the followings: temperature, humidity, PSU output voltage is over a chosen value, corresponding alerts will be triggered.

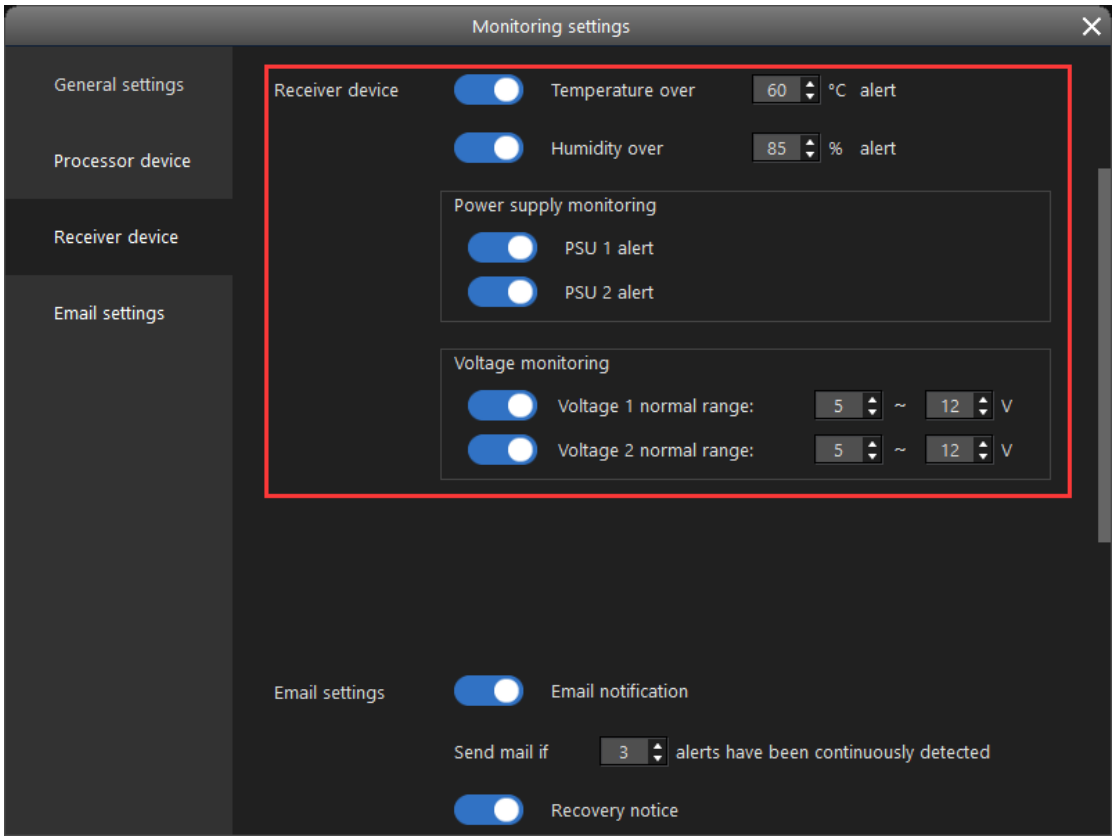


Fig 4.11-4 Receiver monitoring settings

- **Email settings**

  Any alerts can be sent to specific recipients via email notification, multiple recipients can be added to email notification. Users can turn on/off email notification in monitoring settings window, and configure sending email notification when alerts are detected over certain times as well as enable/disable recovery notice.

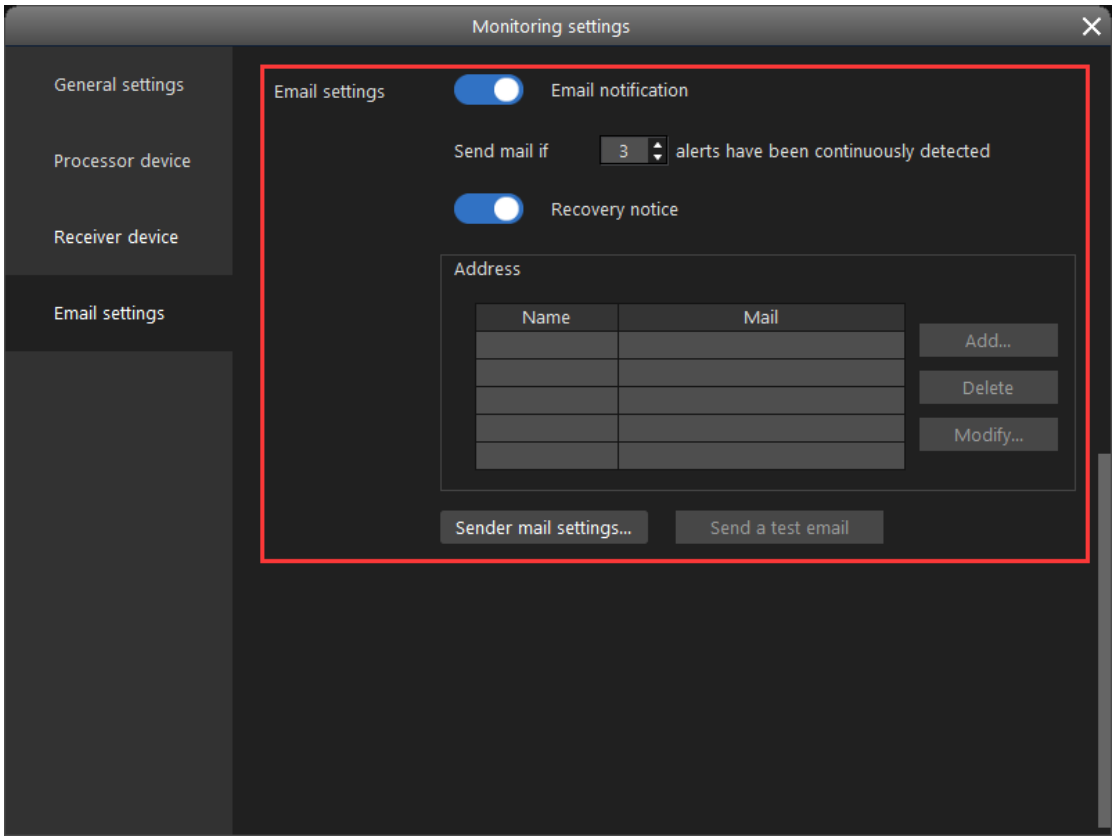


Fig 4.11-5 Email settings

- **Start monitoring**

  The system starts monitoring faults and logging alerts.

- **Stop monitoring**

  The system stops monitoring faults and logging alerts.

- **Hand tool**

  Pans over different part of the canvas.

- **Log**

  All alerts are logged to the system. Click the log button to open a log calendar, the date font would be bold if there is any alert logged in that date.

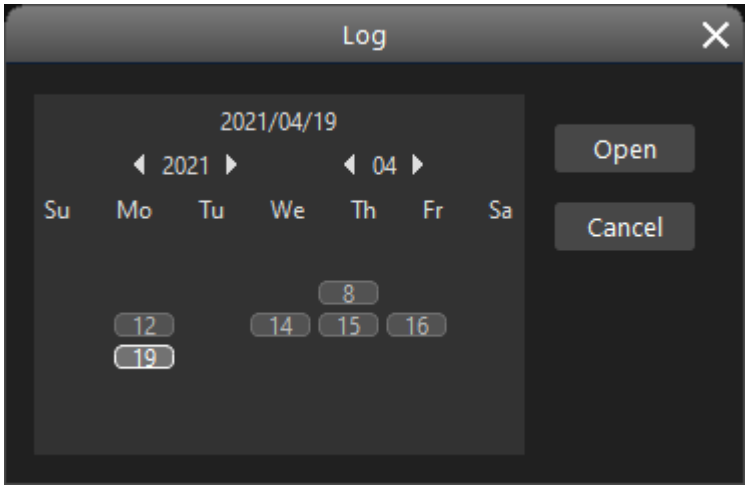


Fig 4.11-6 Alert log

- **Navigator**

  Click navigator button to hide/show a navigator map in the lower-right of the canvas. The rectangle in the center is a preview of current processor control area, the yellow box splits the control area between multiple processors, the red area indicates where fault LED cabinets (receiver card) are detected, the dark gray area indicates where LED cabinets (receiver cards) are disconnected. Switch to the monitoring screen of processor by clicking on the navigator map.

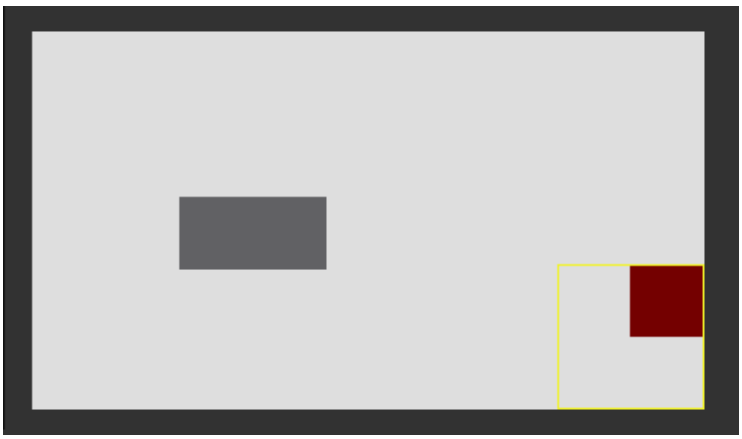


Fig 4.11-7 Navigator map

4.11.2 Processor pane

The processor pane is located in the left side of the monitoring screen. Users can click on processor buttons in the pane to make a selection. Start/stop monitoring action is effective only for selected processors. Grayed out processor icon indicates the processor is offline, highlighted processor icon

indicates the processor is online.

The processor icon will turn into red if there is any of alerts from the processor or receiver cards (LED cabinets) under this processor.

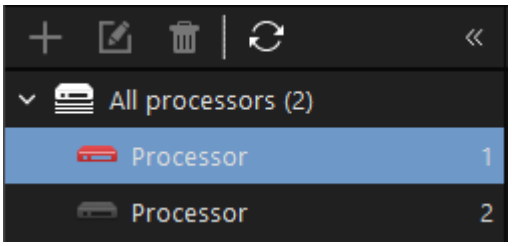


Fig 4.11-8 Processor icon when alert is found

4.11.3 Monitoring selection buttons

The monitoring selection buttons are located in the right side of the monitoring screen. Click the camera icon to set and show video input monitoring. Click the receiver card icon to hide/show receiver(LED cabinet) related monitoring information.

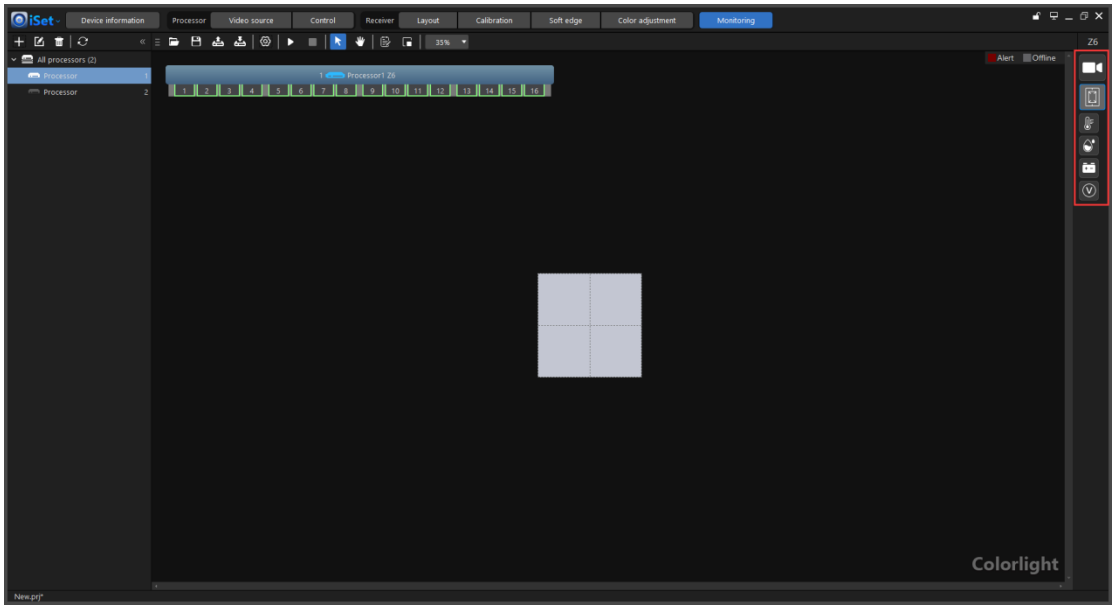


Fig 4.11-9 Monitoring object buttons

➢ Video input monitoring

The camera icon will appear when the "Video input alert" is turned on in monitoring settings window.

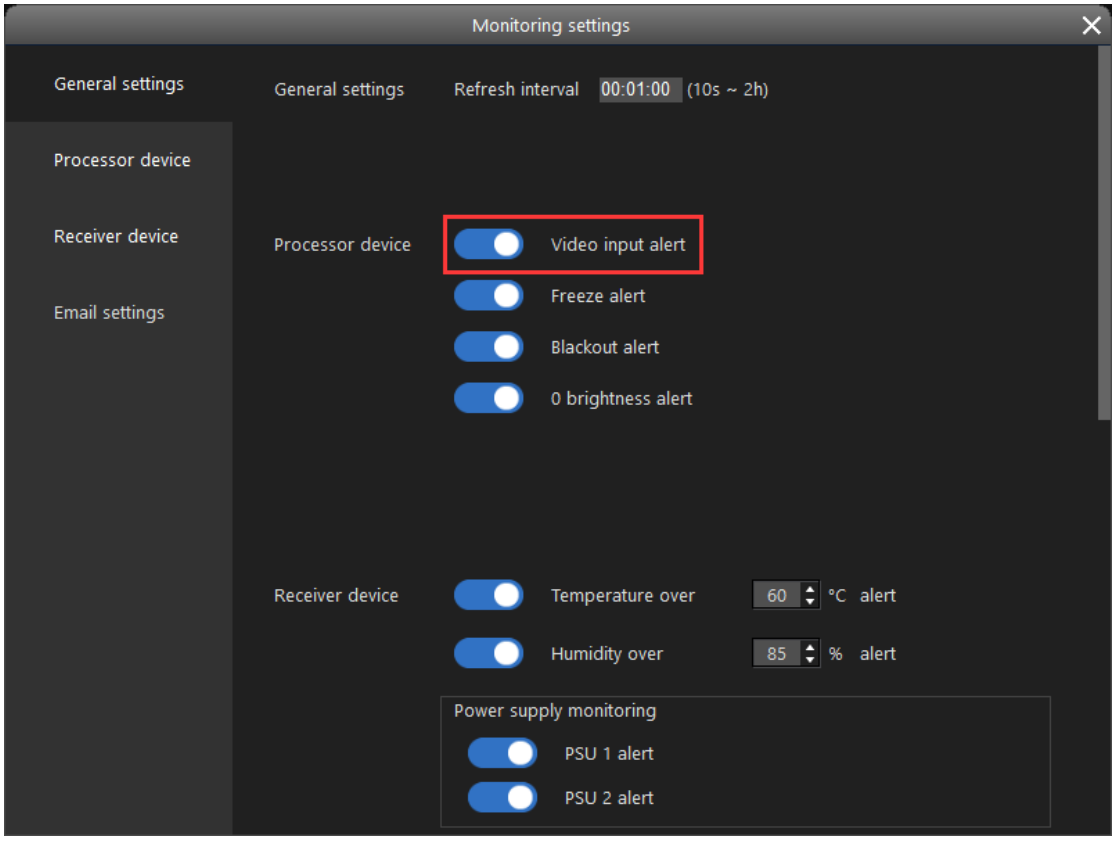


Fig 4.11-10 Video input alert toggle and show video input monitoring info button

A red dot will appear next to the camera icon if any of the video input faults is found in the system.

➢ Receiver cards/LED cabinets related monitoring

Receiver card (LED cabinet) related monitoring includes: temperature, humidity, PSU status, PSU output voltage status. These buttons are only visible when the corresponding toggle is turned on in monitoring settings window.

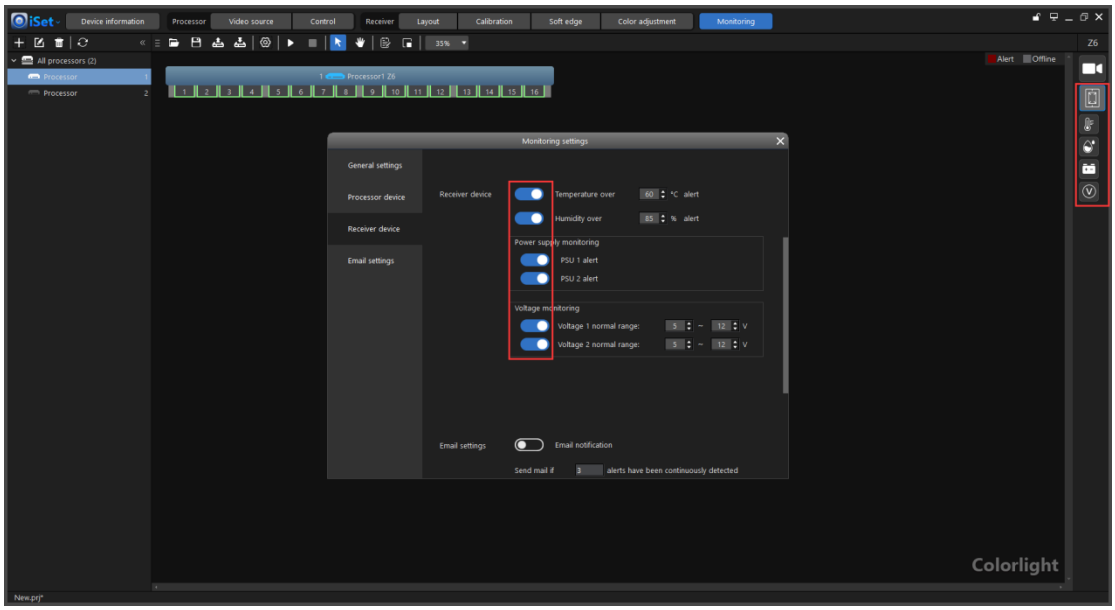


Fig 4.11-11 Receiver card related monitoring toggles

A red dot will appear next to the button if a corresponding fault is found in the system.

4.11.4 Monitoring canvas

The monitoring canvas shows the processor current status. If all “processors” is selected in the processor pane, the canvas will show status for all processors, otherwise, it only shows selected processor.

➢ “All processors” is selected

Click “All processors” in the processor pane, the current connected processors will appear in the canvas. If monitoring has been started, alert sign might appear on the processor icon when any of the faults is found on this processor or on the receiver card (LED cabinet) under this processor.

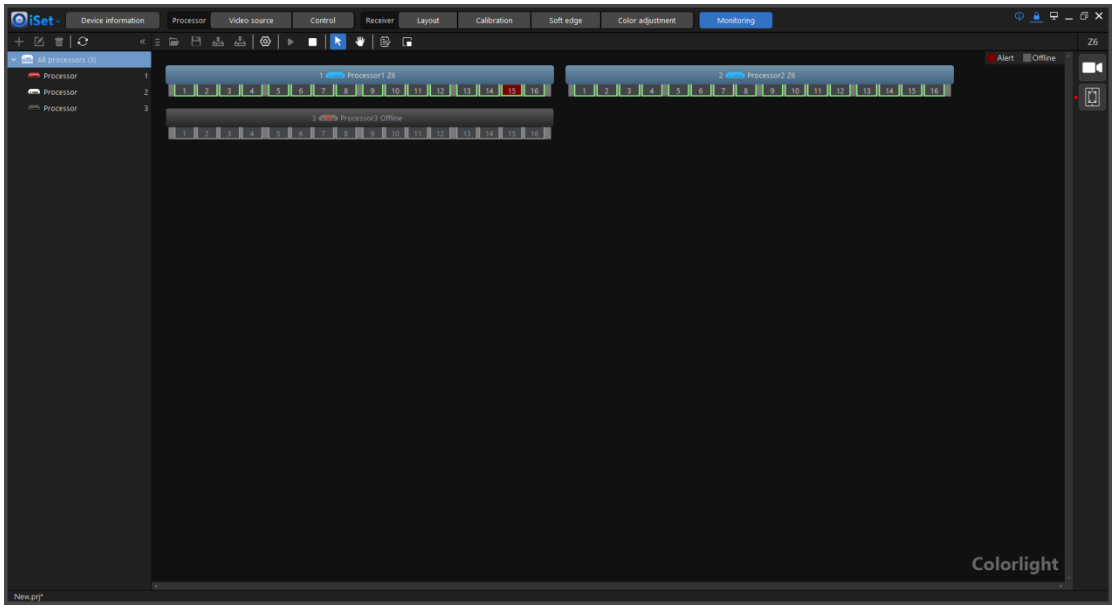


Fig 4.11-12 Canvas view when all processor is selected

➢ Specific processor is selected

When a single processor is selected, the monitoring canvas only shows the selected processor and LED cabinets (receiver cards) under this processor. Click the camera icon on the right side of the screen, the canvas will show the video input settings and monitoring information of selected processor. Click the receiver card icon on the right side of the screen, receiver card (LED cabinets) related monitoring information will be shown on the canvas.

◆ Video input monitoring

The video input monitoring button (camera icon) will appear when “Video input alert” is turned on in monitoring settings window. Click the video input monitoring button, the video input monitoring items will appear in the canvas. Video input monitoring information is invisible when processor is offline. Video input monitoring settings button is grayed out when the processor is being monitored.

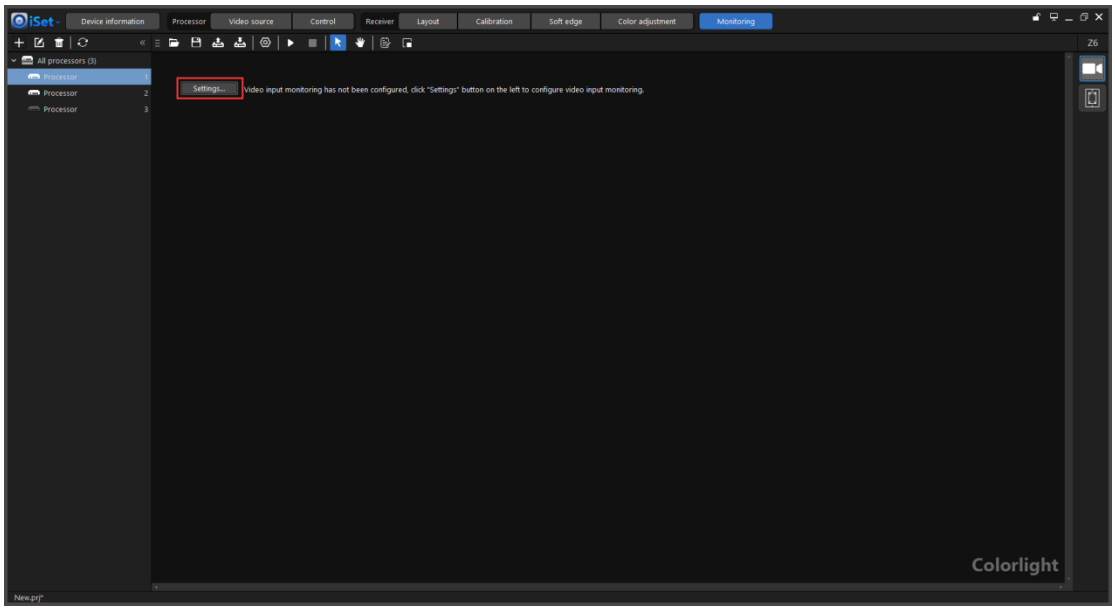


Fig 4.11-13 Video input monitoring

Users can enable/disable and set monitoring for each video input of the processor.

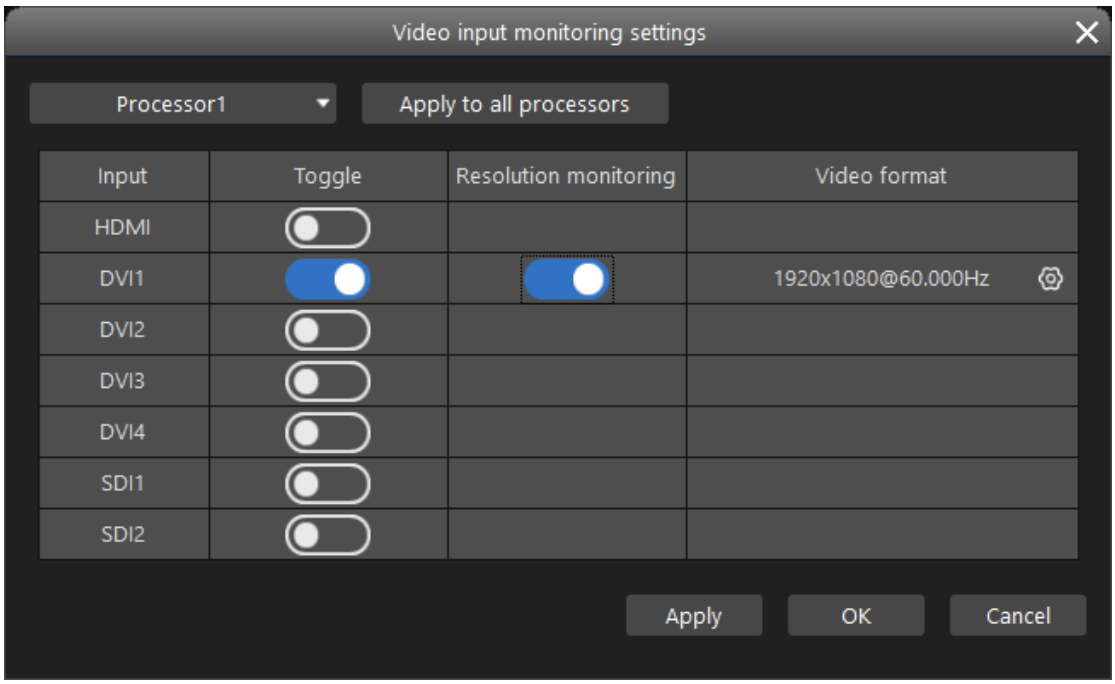


Fig 4.11-14 Video input monitoring setting

When video input monitoring is enabled, users can see whether the video input is disconnected and whether the video input format(resolution and frame rate) is as expected.

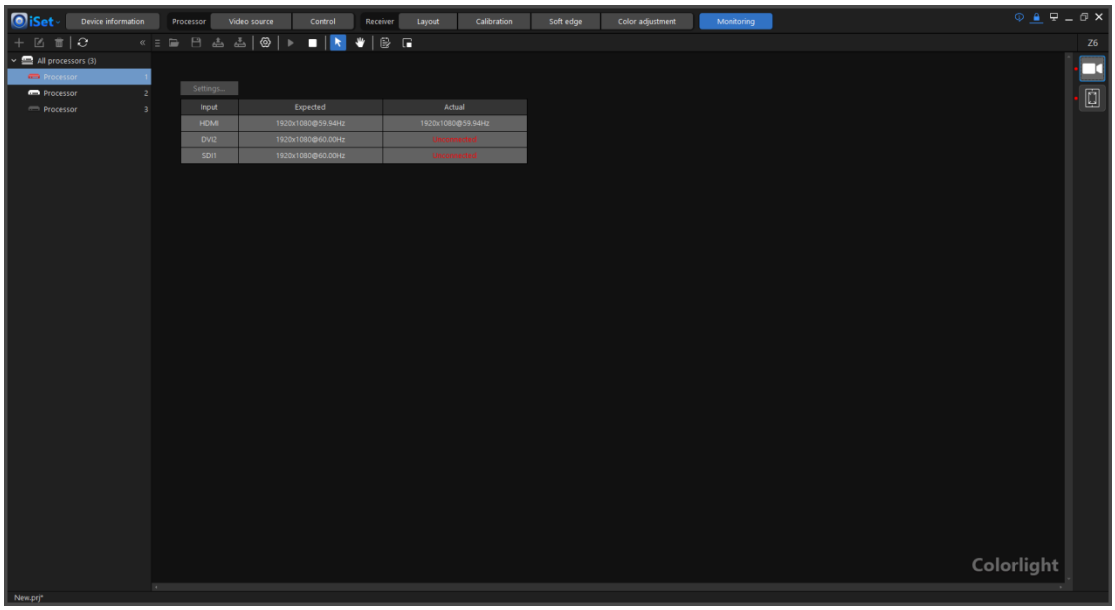


Fig 4.11-15 Video input is disconnected

- **Receiver card (LED cabinet) related monitoring**

  Click the receiver monitoring button (receiver card icon) on the right side of the screen, the canvas will show the selected processor icon and LED cabinet shapes (receiver card) under this processor.

  Hover over the cabinet shapes, the cable topology will appear for corresponding cabinets.

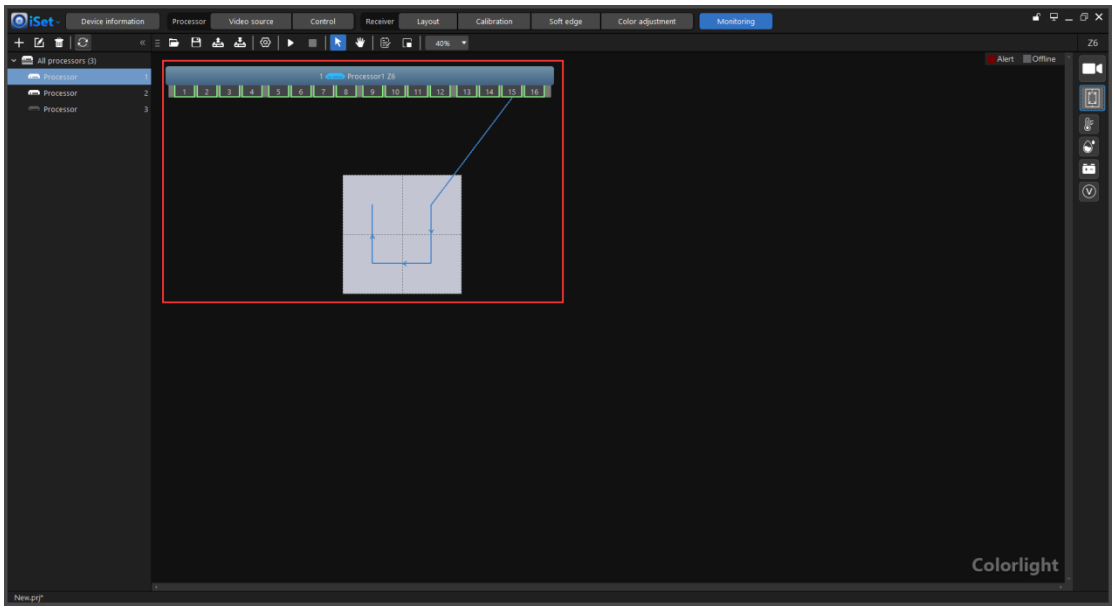


Fig 4.11-16 Cable topology

When there is a fault found in the system, the cabinet shape fill and

output port fill on the processor turns into red. Hover over the red area, the corresponding alert prompts will show up. If hover over the receiver card icon, all alert prompts that related to the receiver card (LED cabinet) will show up. In the meantime, a red dot will also flash next to the receiver card icon.

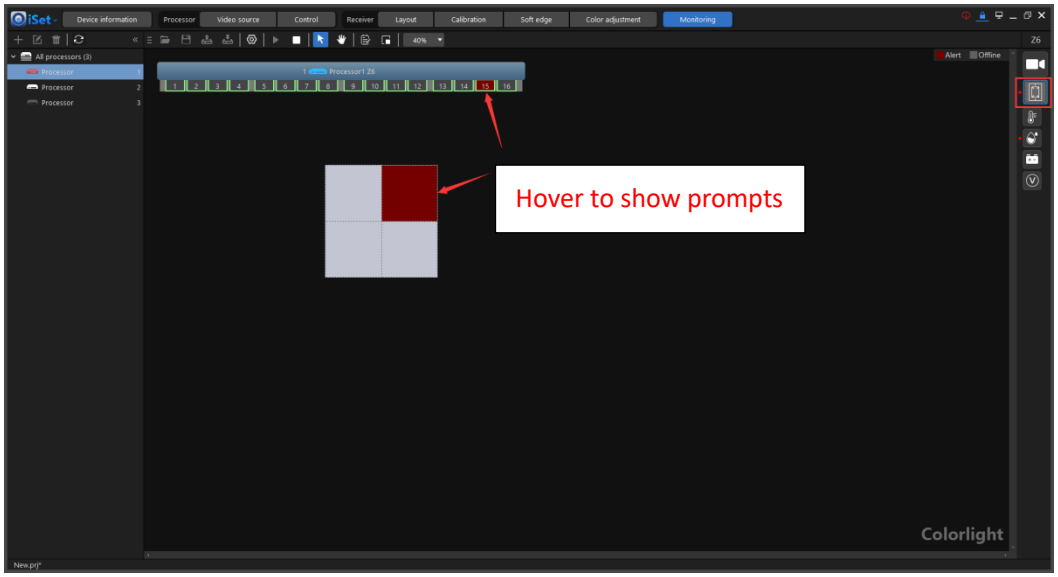


Fig 4.11-17 Cabinet shapes and output port of the processor turns into red

(1) Temperature monitoring

Click the temperature monitoring button (thermometer icon), temperature measurement for each receiver card (LED cabinet) will show up on the cabinet shapes. When a receiver card (LED cabinet) temperature is over a chosen value, the corresponding cabinet shape and the output port on the processor that connects to this receiver card (LED cabinet) will turn into red.

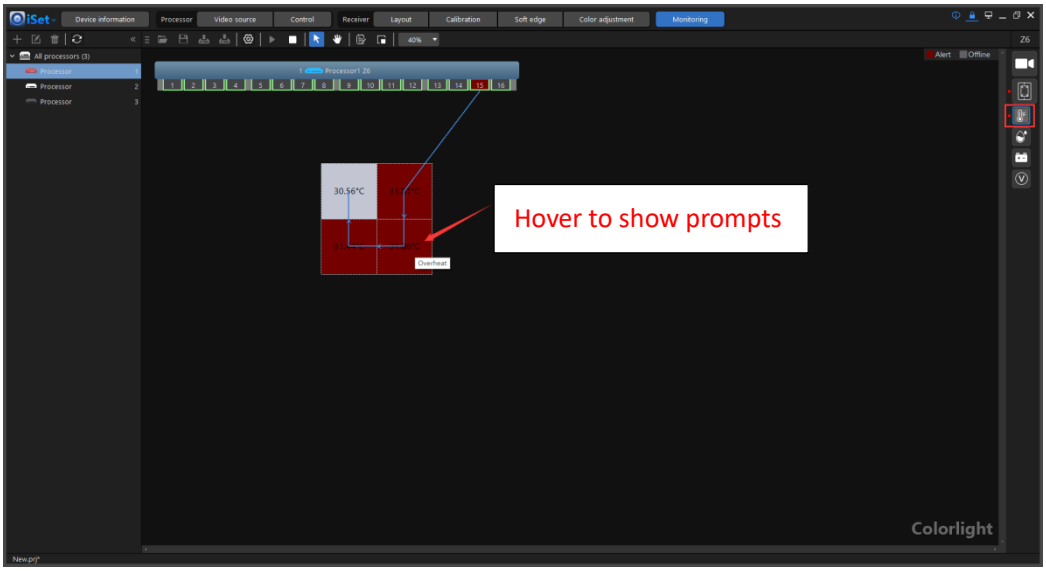


Fig 4.11-18 Temperature monitoring

(2) Humidity monitoring

Click the humidity monitoring button (water drop icon), humidity measurement for each receiver card (LED cabinet) will show up on the cabinet shapes. When a receiver card (LED cabinet) humidity is over a chosen value, the corresponding cabinet shape and the output port on the processor that connects to this receiver card (LED cabinet) will turn into red.

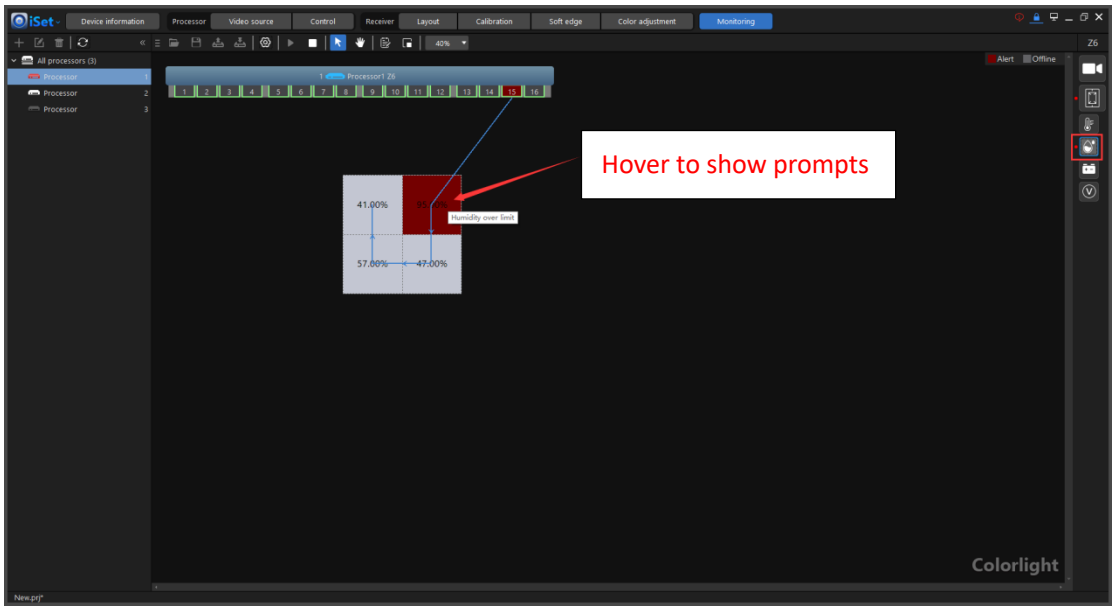


Fig 4.11-19 Humidity monitoring

(3) PSU monitoring

Click the PSU monitoring button (battery icon), the PSU status for each receiver card (LED cabinet) will show up on the cabinet shapes, maximum 2 PSUs for a single cabinet/receiver card can be monitored at a time. When either PSU of a receiver card (LED cabinet) is determined as fault, the corresponding cabinet shape and the output port on the processor that connects to this receiver card (LED cabinet) will turn into red.

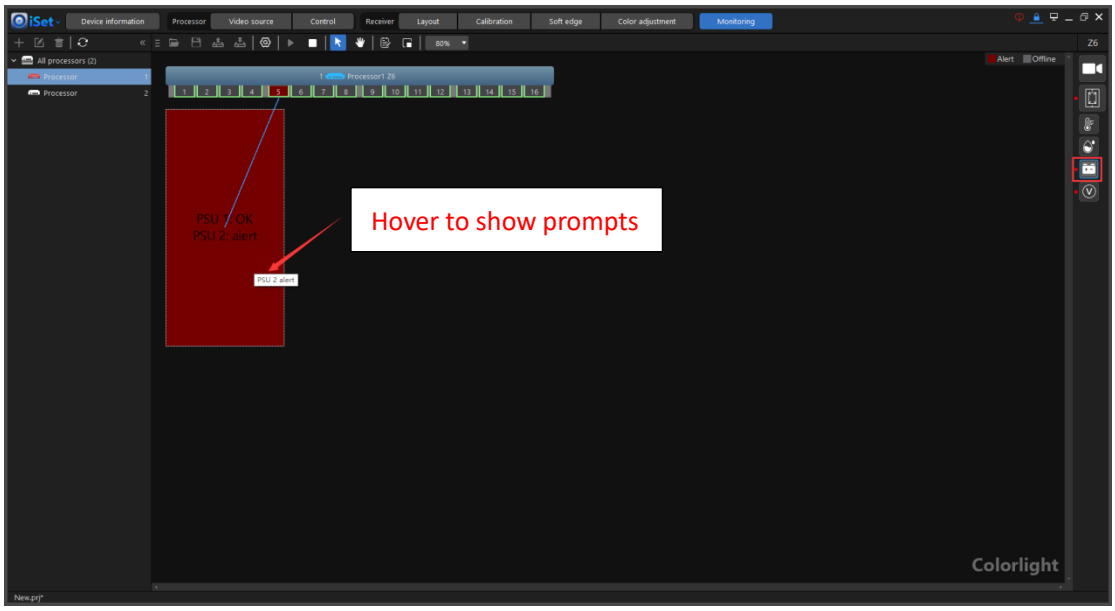


Fig 4.11-20 PSU monitoring

(4) Voltage monitoring

Click the voltage monitoring button (V icon), the output voltage of the PSU for each receiver card (LED cabinet) will show up on the cabinet shapes. When the output voltage of any of the receiver cards (LED cabinets) is out of normal range, the corresponding cabinet shape and the output port on the processor that connects to this receiver card (LED cabinet) will turn into red.

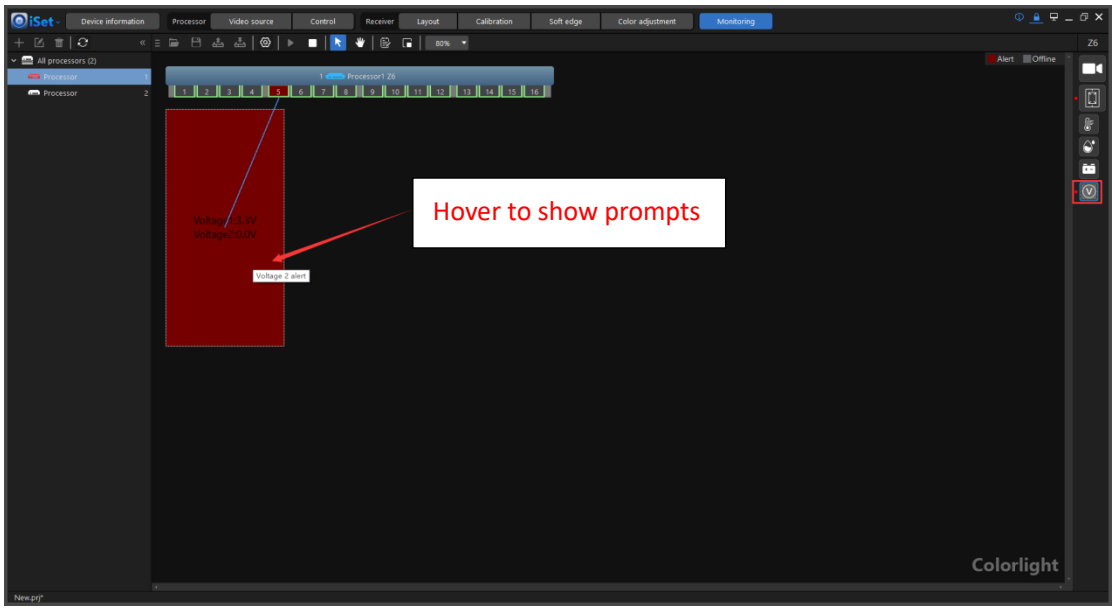


Fig 4.11-21 Voltage monitoring

4.11.5 Redundancy status monitoring

➢ Redundant processor

If there is a processor set as a redundancy for another in the project, the redundancy icon will appear on each output ports and in the processor pane for the redundant processor. The monitoring canvas always show both redundant and primary processors no matter either of processors is selected.

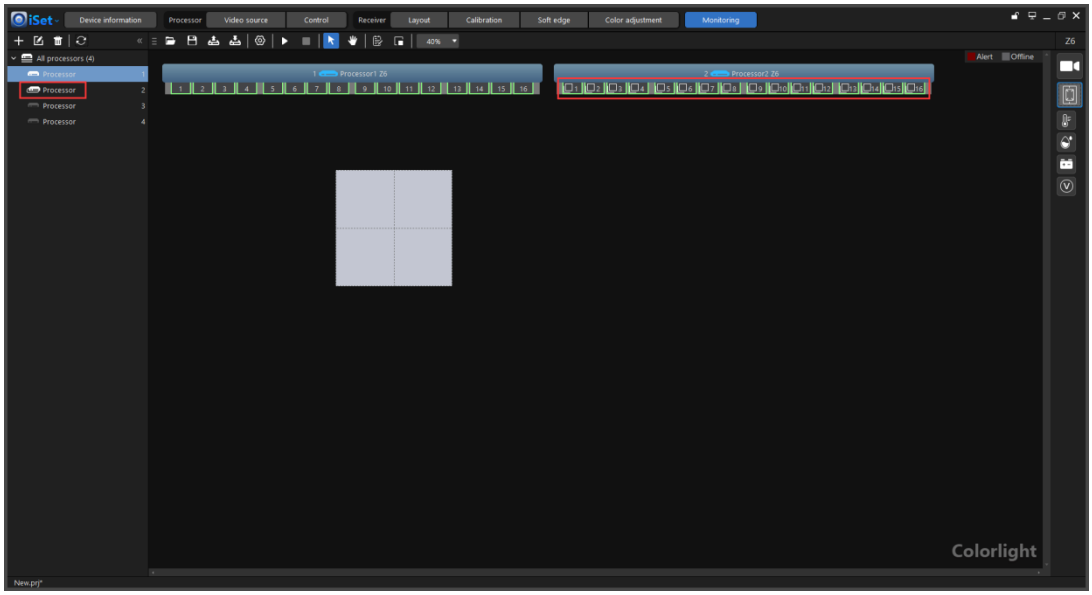


Fig 4.11-22 Redundancy icon

Hover over the cabinet shapes, the primary and redundancy cable topology appear.

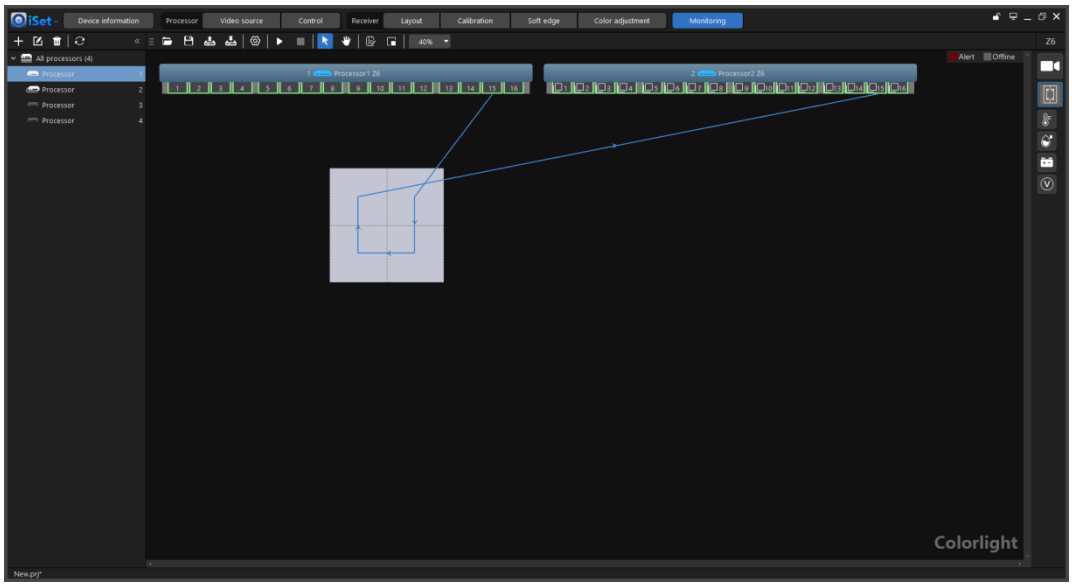


Fig 4.11-23 Primary and redundancy cable topology

When there is a fault found in the LED cabinet (Receiver card), the fault cabinet shape fill will turn into red as well as the output ports that connects to this LED cabinet on both primary and redundancy processors.

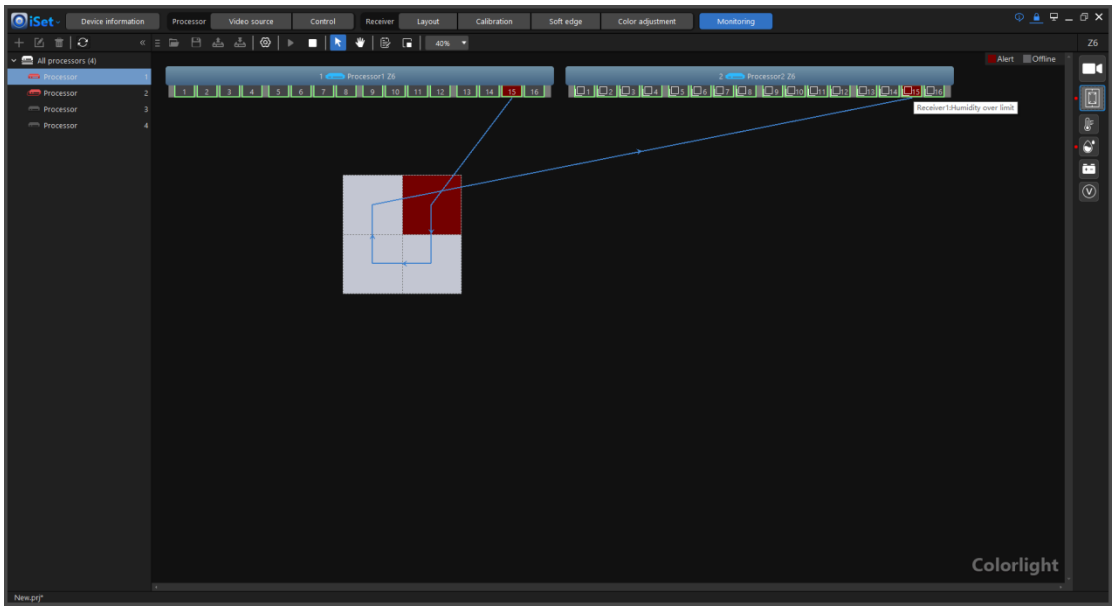


Fig 4.11-24 Fault found in the receiver card (LED cabinet)

If the fault is that the receiver cards (LED cabinets) is disconnected from redundant processor, a red cross icon will appear in the position

where the disconnection at.

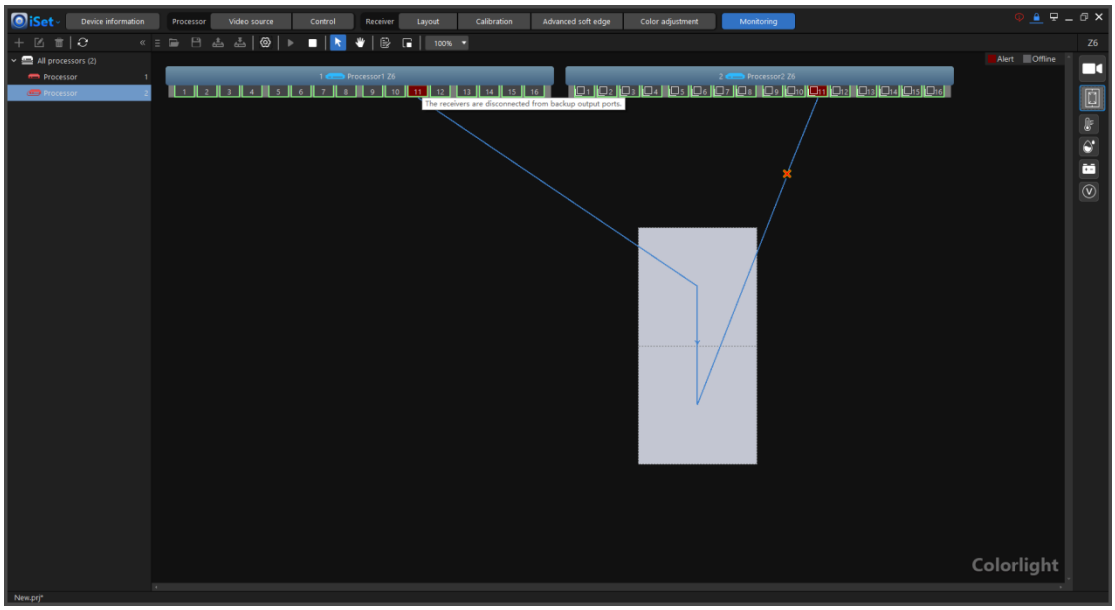


Fig 4.11-25 Receiver card (LED cabinet) disconnected from redundant processor

➢ Redundant output port

Any of the two output ports in a colorlight processor can be set as redundant pair. If an output port is set to a redundant port, the redundancy icon will appear on the output port. Output port 2 is set as a redundancy for output port 1 in below example.

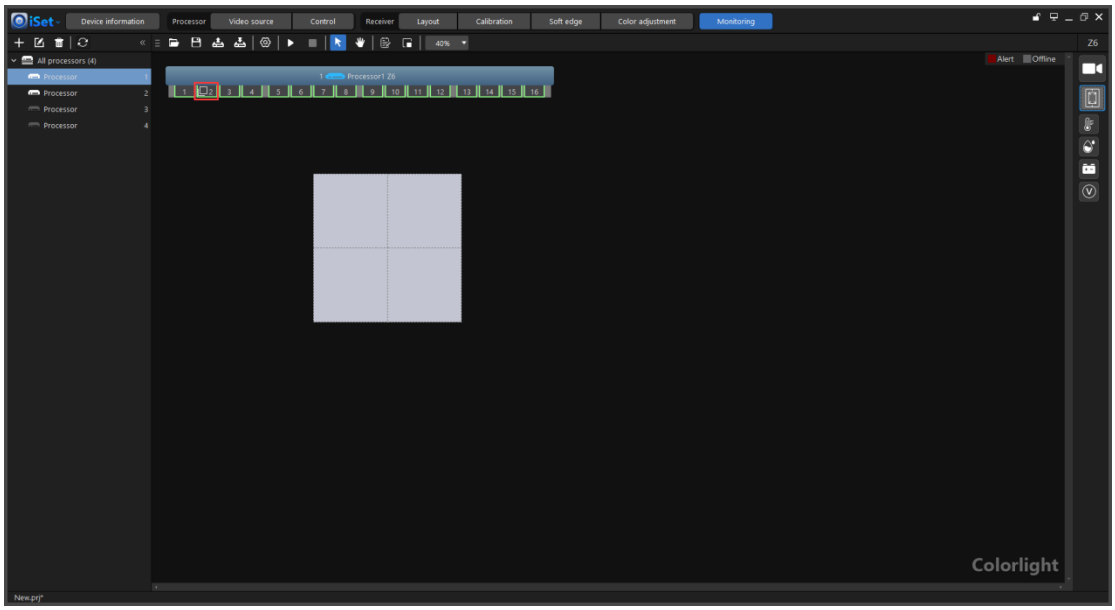


Fig 4.11-26 Output redundancy icon

Hover over the cabinet shapes, the primary and redundancy cable topology appear.

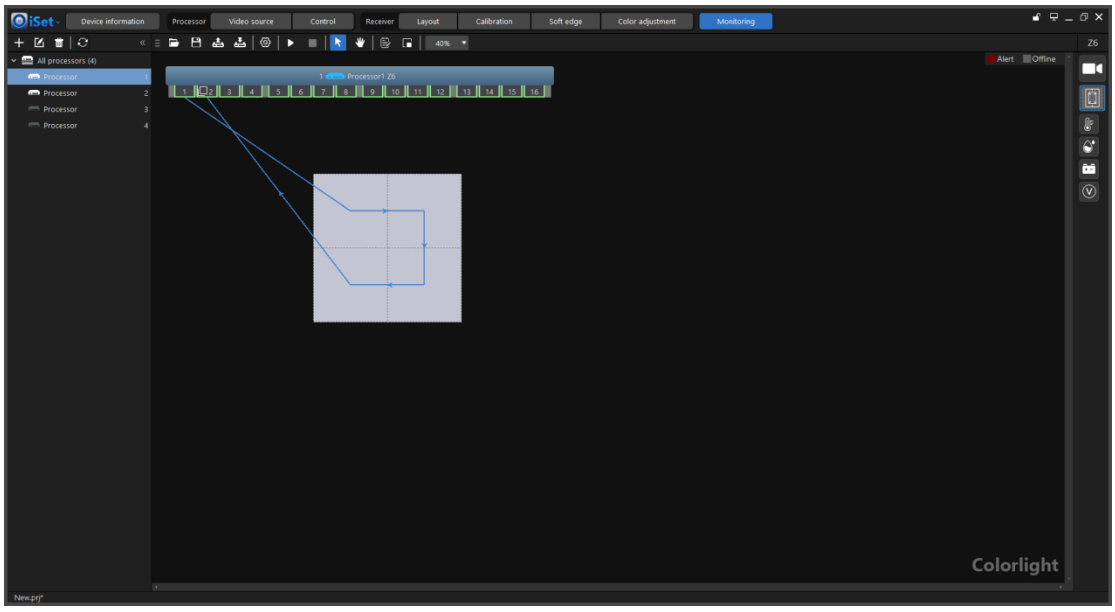


Fig 4.11-27 Output port redundancy

When there is a fault found in the LED cabinet (Receiver card), the fault cabinet shape fill will turn into red as well as the primary and redundant output ports that connects to this LED cabinet (Receiver card).

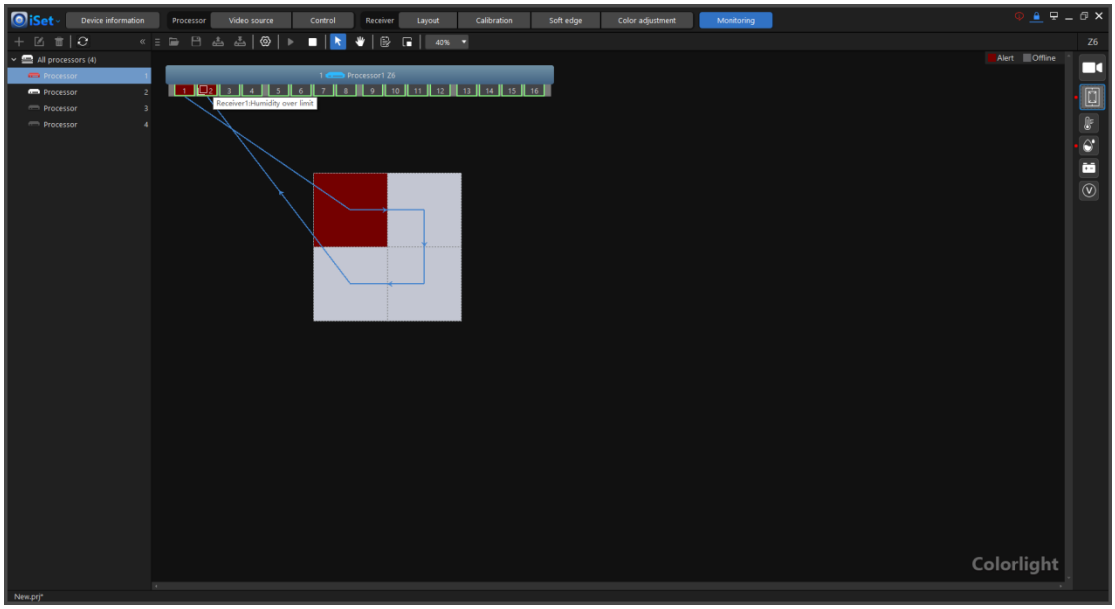


Fig 4.11-28 Fault found in the receiver card (LED cabinet)

If the fault is that the receiver cards (LED cabinets) is disconnected from primary/redundant output port, a red cross icon will appear in the position where the disconnection at.

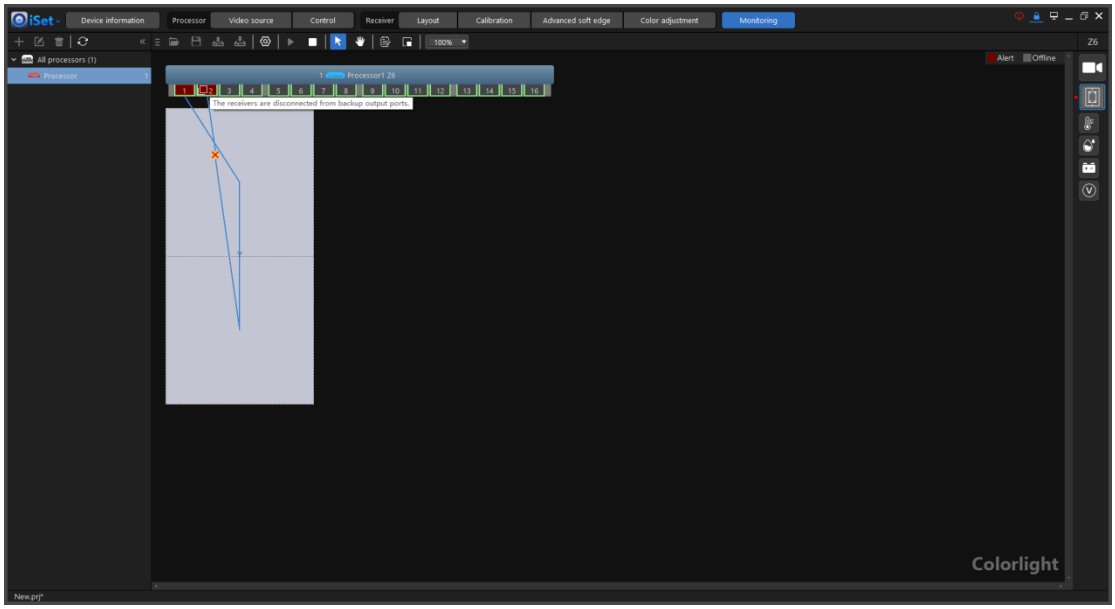


Fig 4.11-29 Receiver card (LED cabinet) disconnected from output port

4.12 Video source

The video source tab is only visible when specific type of processor is connected. In this screen, users can upscale/downscale, crop, and set PIP to the processor video inputs.

The video source screen consists of 4 sections: tool bar, processor pane, video canvas, configuration pane.

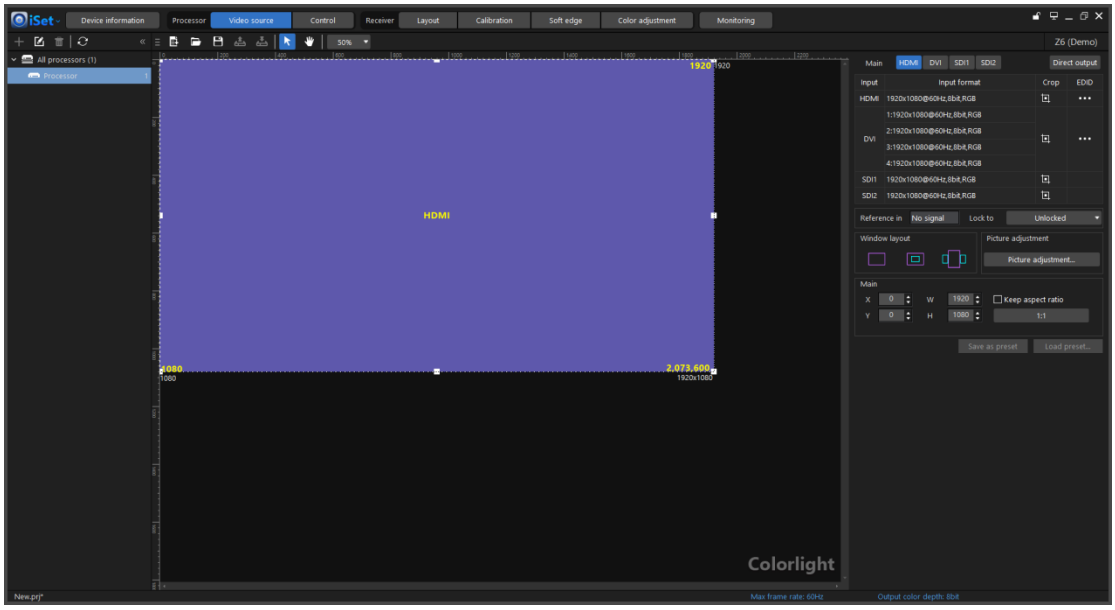


Fig 4.12-1 Video source settings screen

4.12.1 Tool bar

New project, open project, save project, read project from processor, save project to processor, selection tool, hand tool and zoom buttons in the tool bar.

Fig 4.12-2 Tool bar

4.12.2 Processor pane

Processor selection, delete, rename, add.

4.12.3 Video canvas

The output video layout and resolution of the selected processor can be displayed in the video canvas. Users can drag the video window (also known as PIP) to resize the window and the window position. Use Ctrl+mouse wheel or zoom options in the tool bar to zoom in/out the video canvas. The video source screen appearance varies depending on the type of processor is connected. Below examples are using the Z6 and X16 pro processor for description in detail.

➢ **Z6 video canvas**

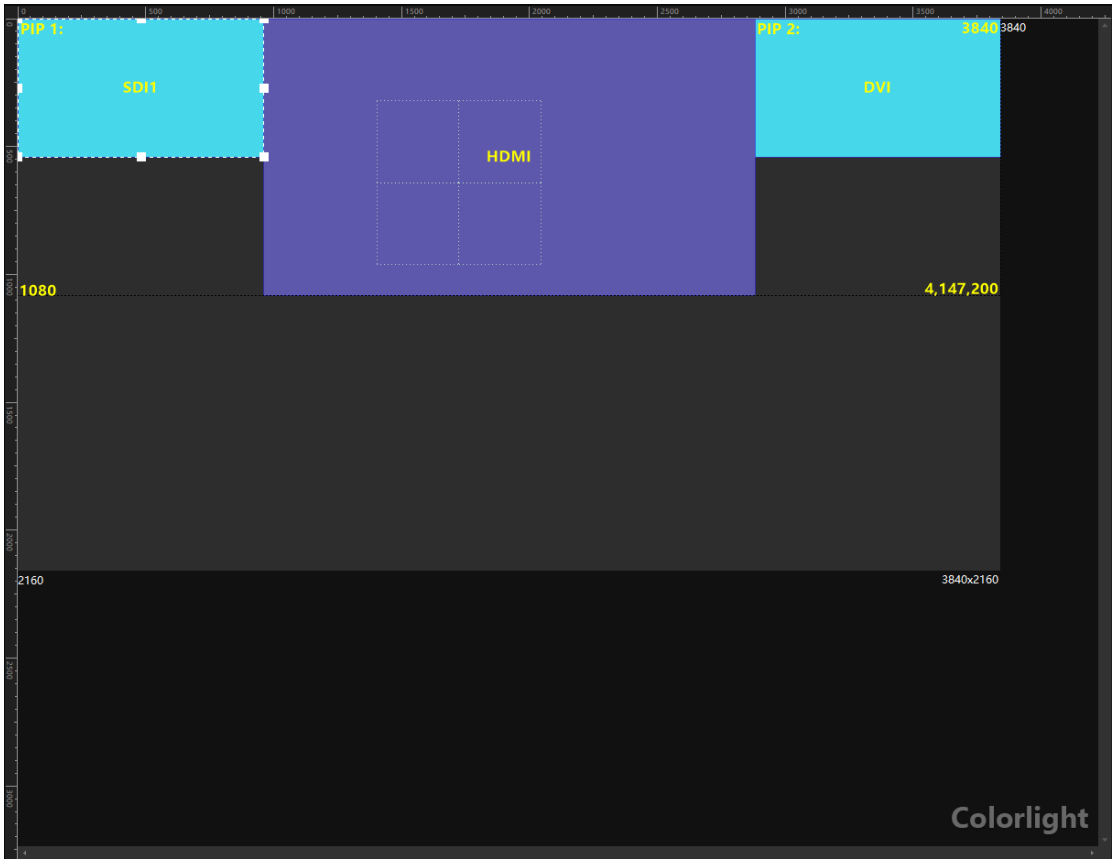


Fig 4.12-3 Z6 video canvas

Depending on the window layout mode is selected, the canvas may show a single window or multiple windows. The main window which filled in blue-purple is defaulted in the bottom layer, the sub window is filled in cyan. Sub windows can be overlapped on the main window. The dotted shapes represent the LED cabinets position in the canvas.

Right click on the canvas to display a context menu that contains following options: “Frame rate and color depth setting”, “Canvas

size settings”, and “Canvas fill settings”.

➢ X16PRO video canvas

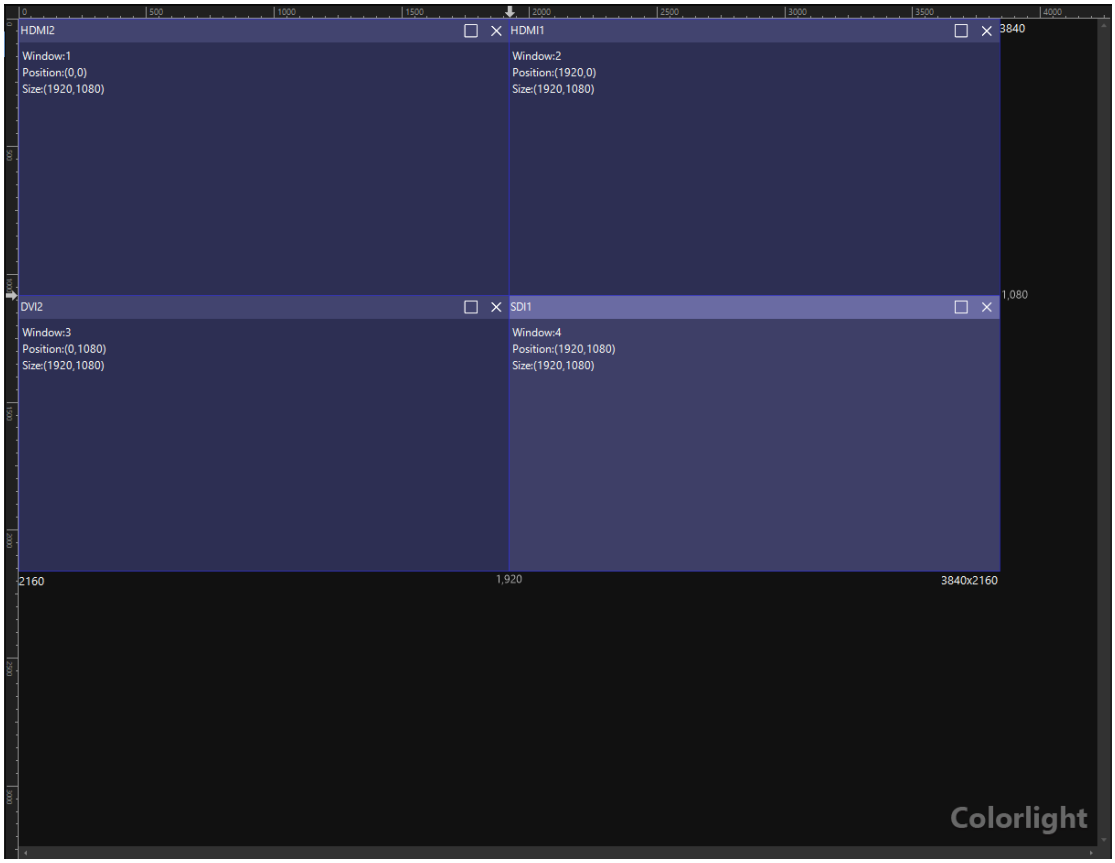


Fig 4.12-4 X16 PRO video canvas

Right click on the window to display a context menu that contains following options: “Bring to front”, “Send to back”, “Zoom in”, “Zoom out”, “Fill to canvas”, “Lock”, “Set as”, “Set window size”.

◆ Bring to front

Move a selected window to the very top of the canvas, this option is available when there are multiple windows in the canvas and the numerical order of the selected window must not the largest. The larger numerical order, the upper layer on the canvas. Example: refer to figure 4.12-4, right click on HDMI1 window and select bring to front, the numerical order of HDMI (Window:2) will turn to 4, “Window:4” turn to “Window:3”, and “Window:3” turn to “Window:2”.

◆ Send to back

Move a selected window to the very bottom of the canvas, this

option is available when there are multiple windows in the canvas and the numerical order of the selected window must not the smallest. The smaller numerical order, the lower layer on the canvas. Example: refer to figure 4.12-4, right click on HDMI1 window and select send to back, the numerical order between HDMI 1 and HDMI2 is swapped.

- Zoom in

  The selected window fills the canvas partition that is separated by guide lines. Refer to fig 4.12-5, the zoom in option is highlighted only when right click on HDMI 1 window, because other windows have already filled in its partition.

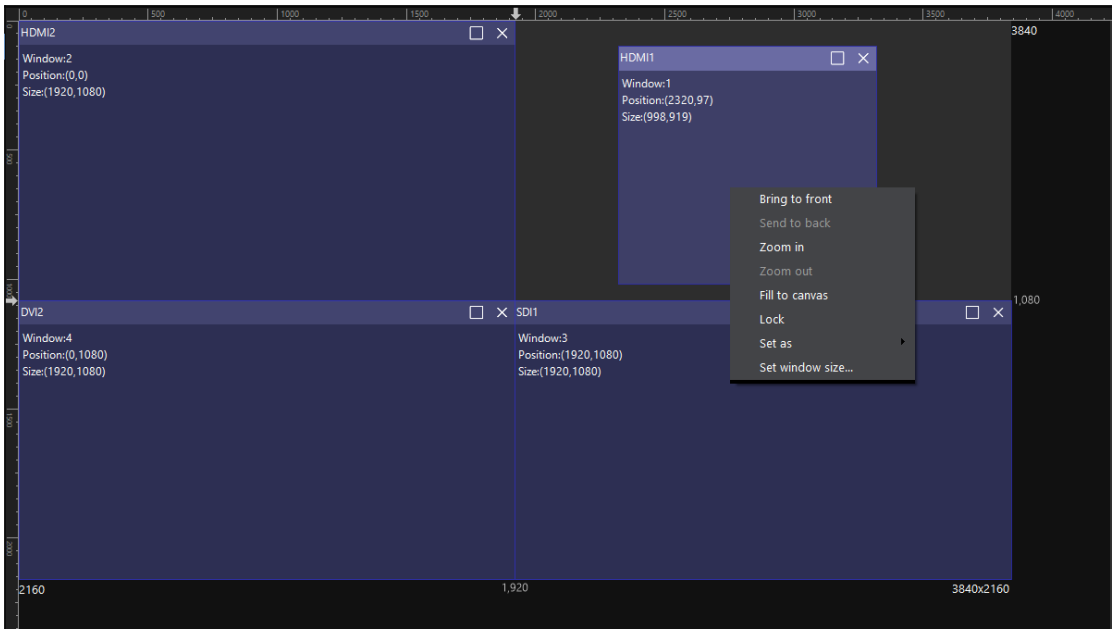


Fig 4.12-5 Zoom in

- Zoom out

  This option is highlighted in the context menu only when the window fills the canvas partition which separated by guide lines. Select zoom out to restore a window size to its previous state.

- Fill to canvas

  Fill the selected window to canvas.

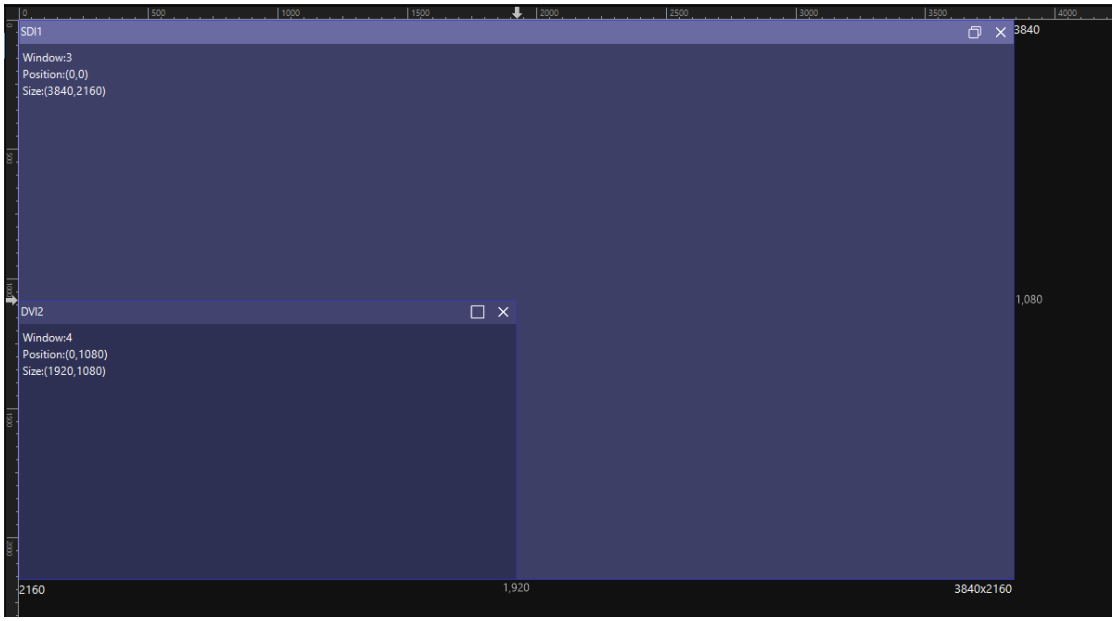


Fig 4.12-6 Fill to canvas

- **Lock**

  When a window is locked, a pin icon will appear on the upper-right, the window is unable to be zoom in/out, moved, resized etc. But video input can be still changed for lock windows.

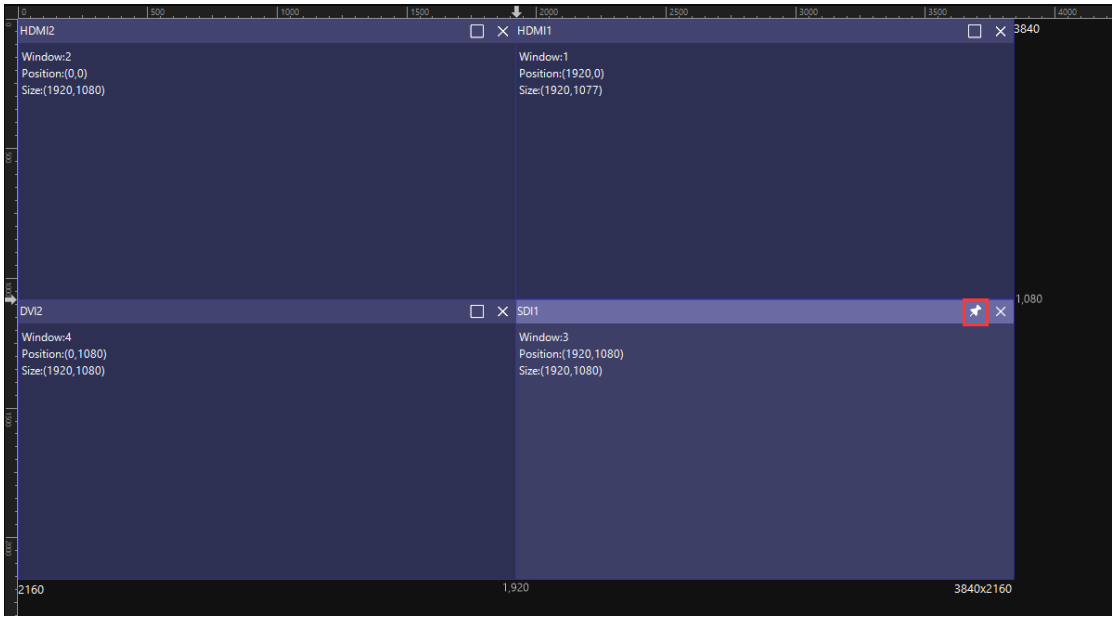


Fig 4.12-7 Locked window

- **Set as**

  Set the current window to use other available video input.

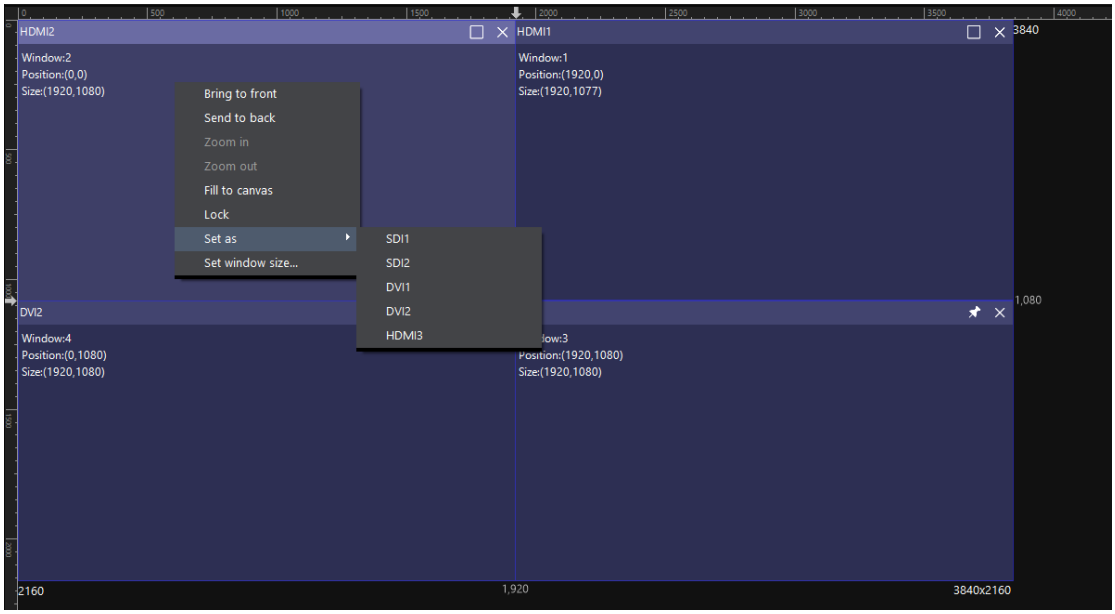


Fig 4.12-8 Set as context menu

- **Set window size**

  Change the window position and size in the canvas.

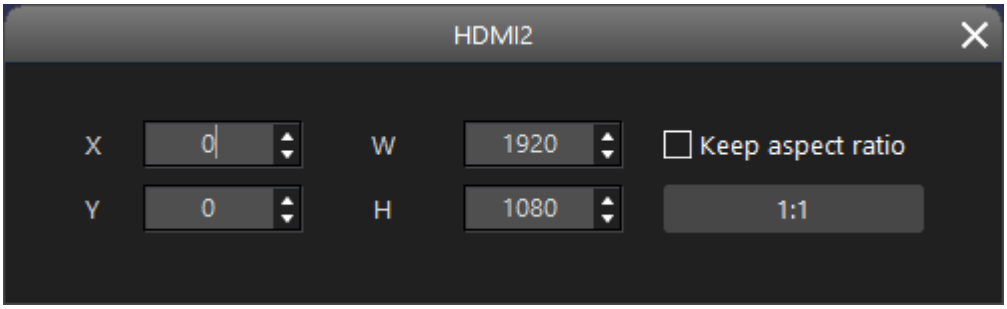


Fig 4.12-9 Set window size

4.12.4 Configuration pane

The configuration pane varies depending on the type of processor is connected. Below examples are using the Z6 and X16 pro processor for description in detail.

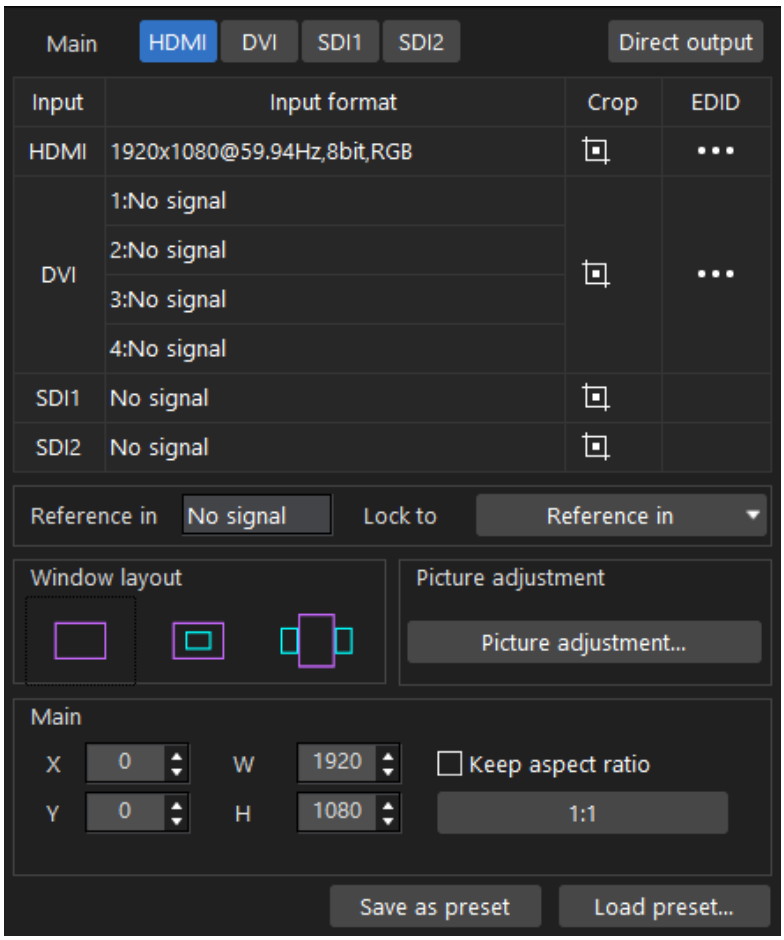


Fig 4.12-10 Z6 configuration pane

- **Video input selection**

  Depending on the window layout is selected, users can assign a video input for the main window or the PIP window.

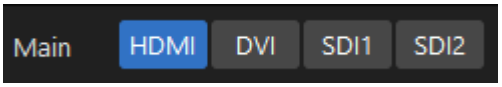


Fig 4.12-11 Video input selection

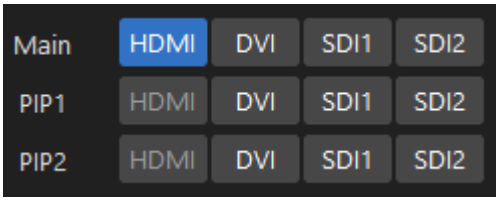


Fig 4.12-12 Video input selection

Select a window in the canvas and click on a video input selection button, then this window is set to use the corresponding video input. The main window and PIP window cannot be set to the same video input. The video input button that has been associated to a window will be grayed out.

- **Video input information**

  All available video inputs of the processor are listed in a sheet. Users can see the input format and crop information or set EDID for connected video input.

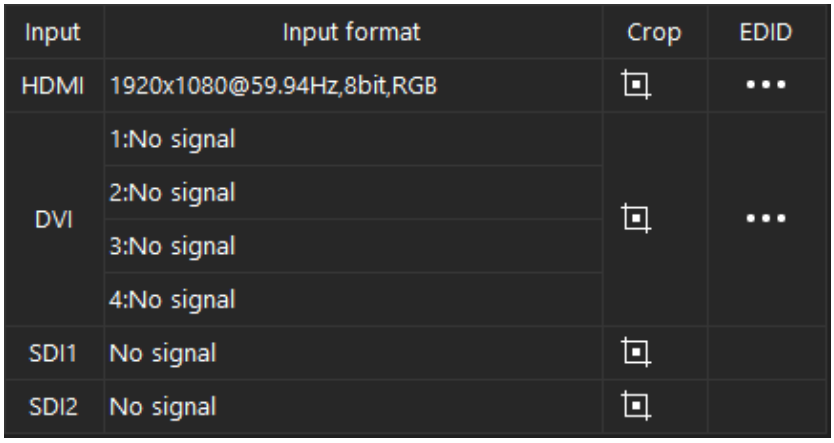


Fig 4.12-13 Video input information sheet

Depending on the type of processor is connected, the video input information sheet may appear different. When a Z6 processor is connected, the first column shows all available video inputs, the second column shows format information for all connected video input, the third column is crop setting for each video input, the fourth column is EDID setting for each type of video input.

➢ Crop

Click the crop icon to display crop setting window.

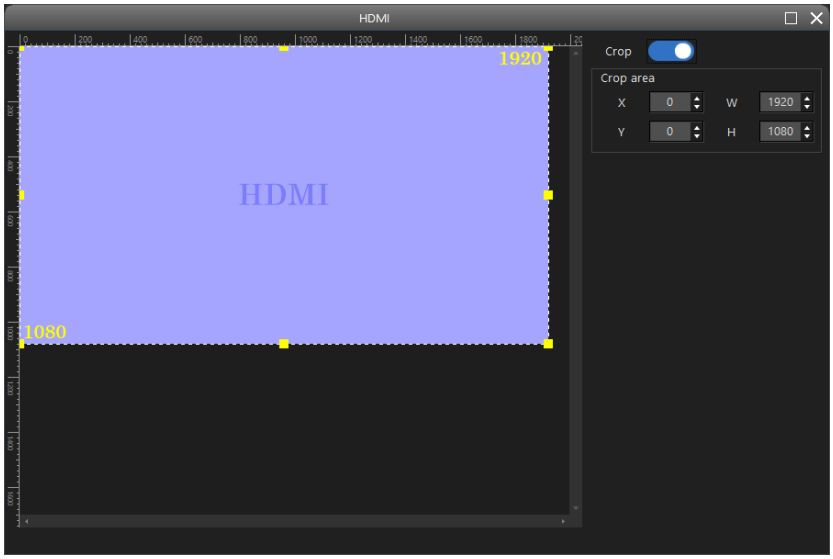


Fig 4.12-14 Z6 HDMI crop setting window

Cropping is disabled by default. Users can use crop function to remove the unwanted areas from the video input.

Turn on crop by clicking crop toggle, dashed lines will appear on the edge of the colored canvas area which represents the incoming feed. Drag the square handle or enter a X/Y/H/W value to resize the dashed box. The parts of the incoming feed that outside of the dashed box will not be displayed on the LED cabinets.

Hold Ctrl + mouse wheel to zoom the crop canvas on the left side.

Click icon in the EDID column to set the video input EDID. Users can select a standard resolution from the drop-down list or enter a custom resolution. If select custom resolution, please take consideration into the resolution limitation for the processor.

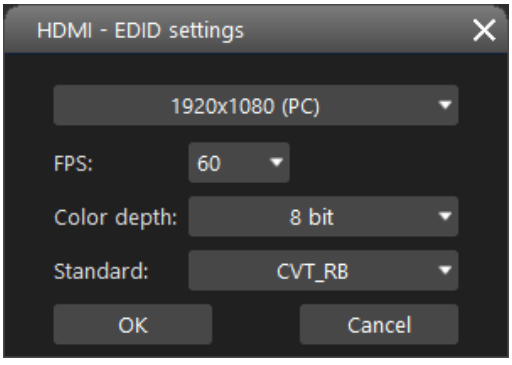


Fig 4.12-15 Z6 HDMI EDID settings window

- **Reference in**

  Reference in signal status and “lock to” drop down button will be visible if the current connected processor supports genlock.

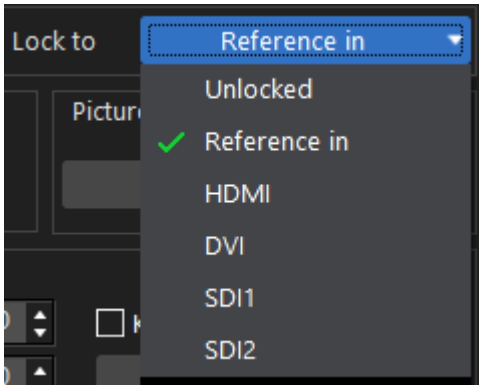


Fig 4.12-16 Z6 lock to drop-down list

- **Window layout**

  The Z6 has 3 window layout modes as below

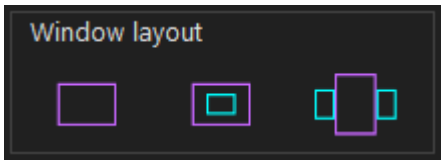


Fig 4.12-17 Z6 window layout

- **Preset**

  Configurations can be saved as a preset to the processor, up to 16 presets capacity is available for a single Z6 processor. The configurations contained in a preset are: 3D settings, window layout, video input selection for window, window size, crop setting, picture adjustment, transparency. Click load preset button to recall a preset from a processor, if there are multiple processors connected, click load preset, each processor will recall its corresponding preset.

Fig 4.12-18 Preset

- Save as preset

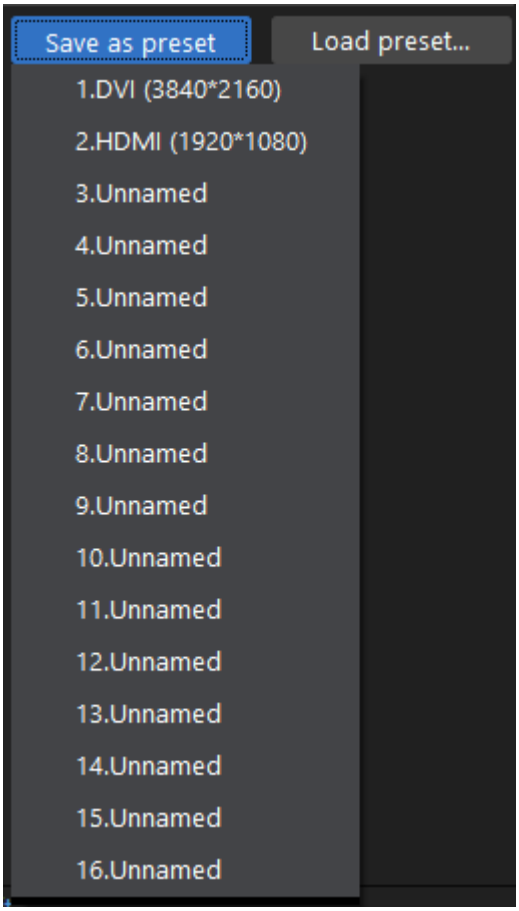


Fig 4.12-19A Save as preset

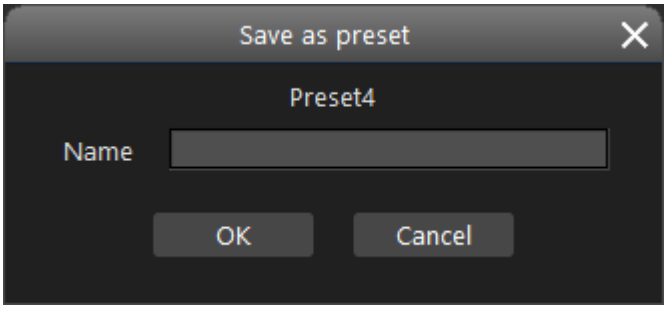


Fig 4.12-19B Rename preset

- Load preset for a single processor

There are two approaches to load a preset:

（1）Click a specific processor in the processor pane, and click load preset button in the configuration pane to choose a preset.

（2）Click “All processors” in the processor pane, and select a processor in the canvas, the selected processor will have yellow

frame on the shape. Then click a preset button below the canvas to load a desired preset.

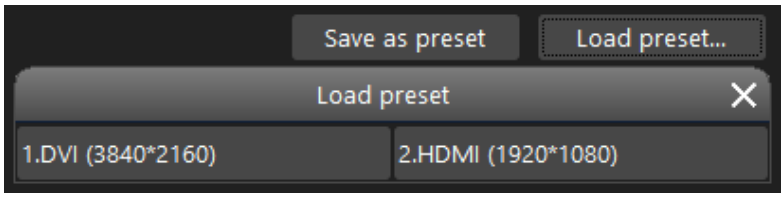


Fig 4.12-20A Load preset method (1)

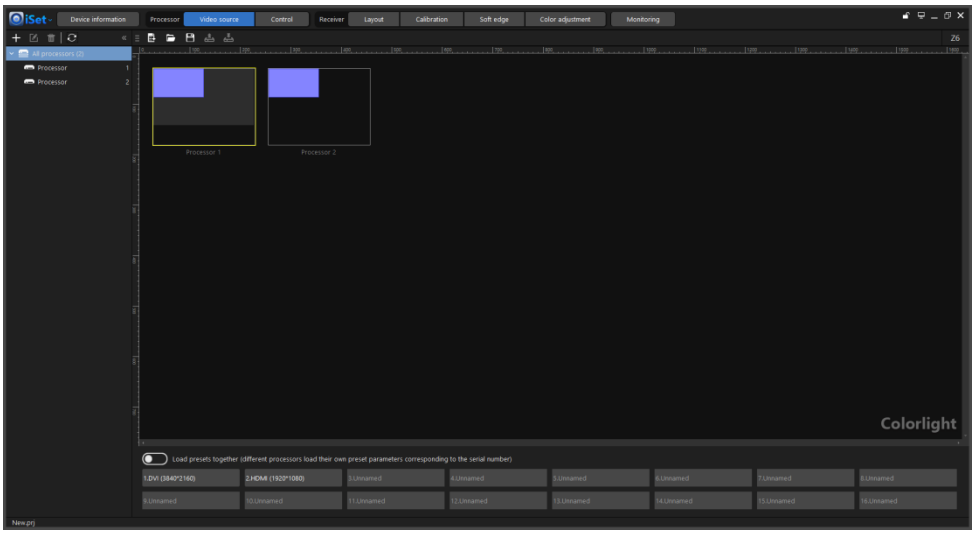


Fig 4.12-20B Load preset method (2)

- **Load preset for multiple processors**

  Click “All processors” and turn on “Load preset for all processors”, then click a preset button to load presets. Each processor recalls the preset of selected preset ID that stored in itself only.

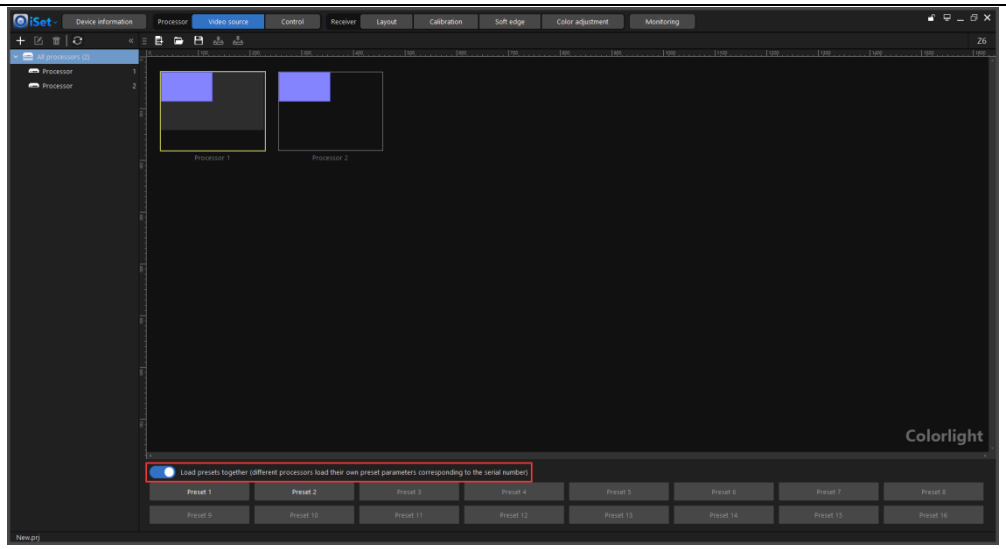


Fig 4.12-21 Load preset for multiple processors

➢ Picture adjustment

Move the slider bars to adjust hue, saturation, brightness compensation, contrast.

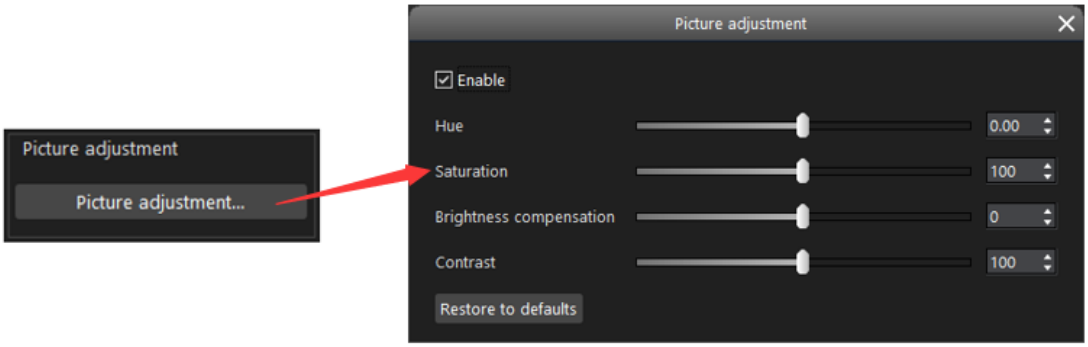


Fig 4.12-22 Picture adjustment

➢ Window size and position

There are different approaches to set window size and potion depending on the type of processor is connected. One of the approaches is click the window in the canvas, and enter the window size and position coordinates in corresponding boxes referring to below screenshot.

Fig 4.12-23 Set window size and position

- **Direct output**

  Enable low latency mode and disable PIP and crop.

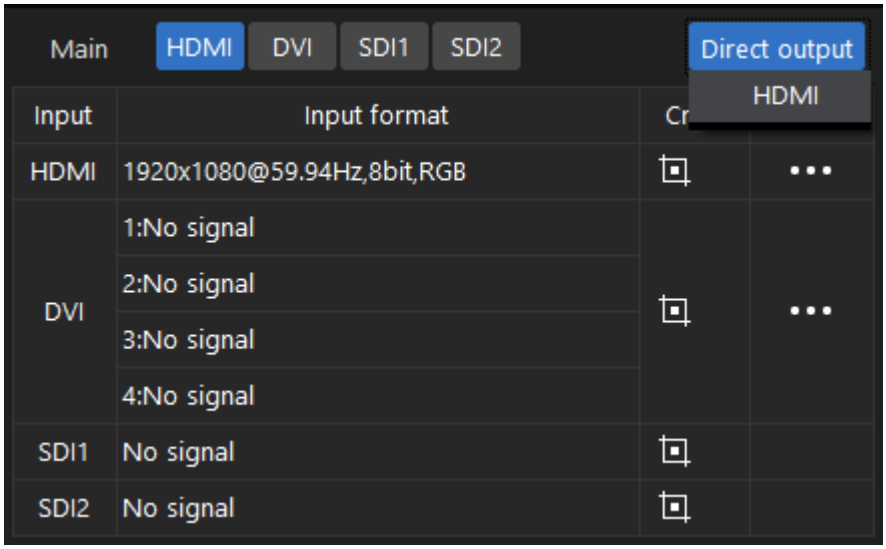


Fig 4.12-24 Z6 Direct output

X16 PRO processor video source configuration pane

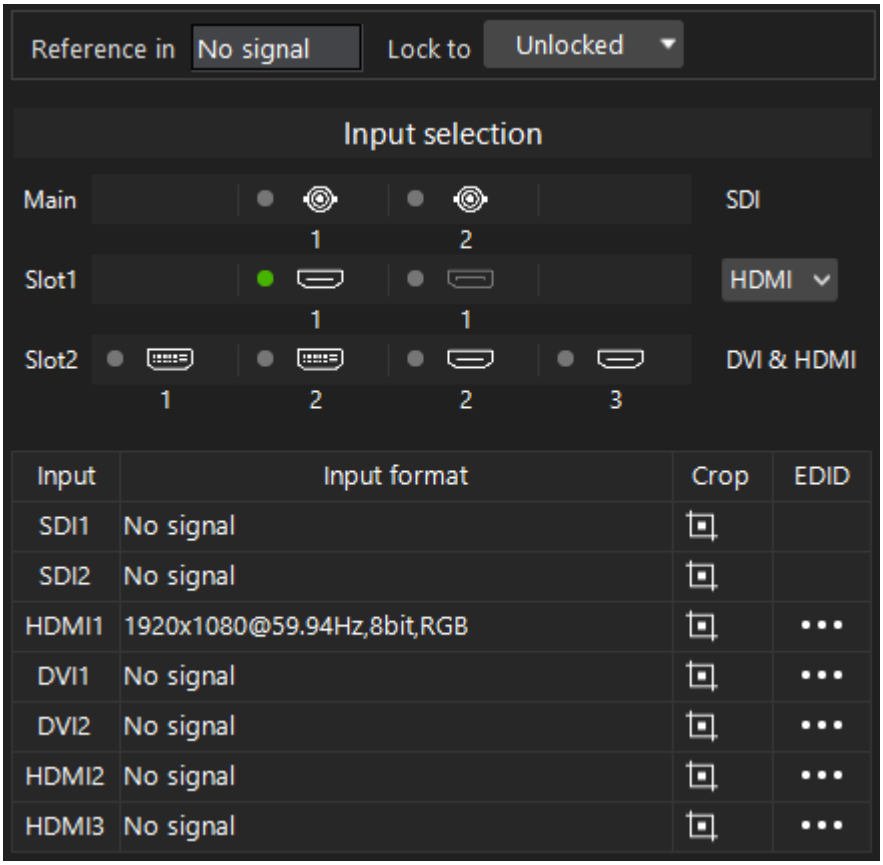


Fig 4.12-25 X16 PRO video source configuration pane

Compared with the tool bar of Z6, X16 PRO’ s tool bar contains more functions: Add window, Delete all windows, Set window size, Picture adjustment, Preset.

- **Add window**

  Click the plus icon to add an input window that supported by current processor to the canvas.

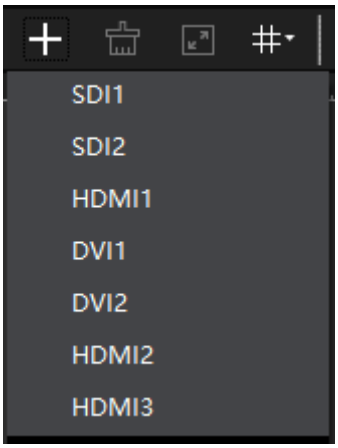


Fig 4.12-26 Add window

- **Delete all windows**

  Clear all existing windows in the canvas.

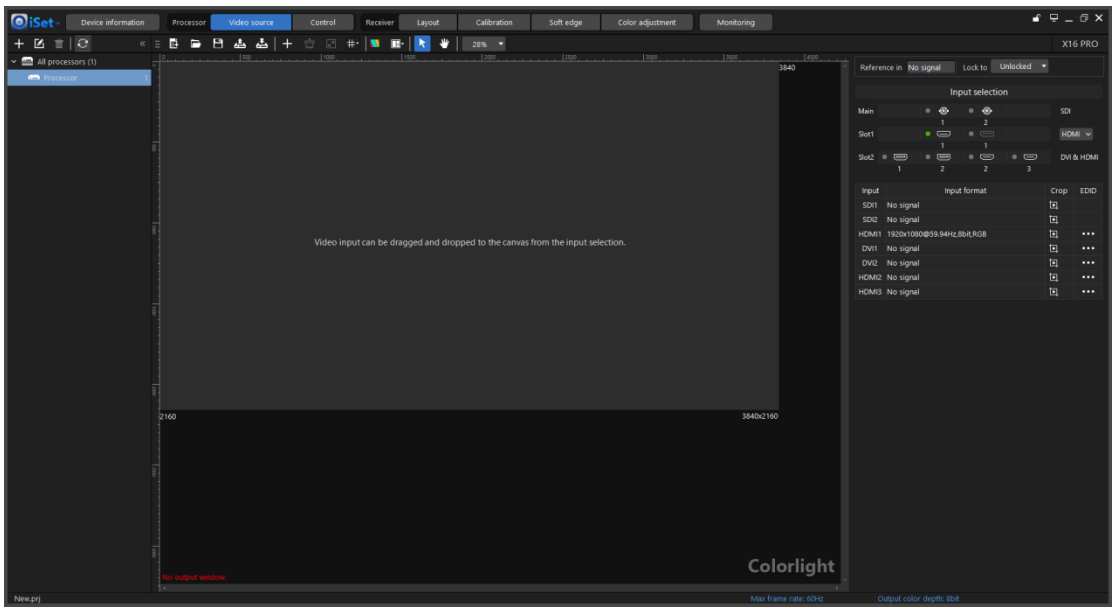


Fig 4.12-27 Delete all windows

➢ Set window size

Click the "set window size" icon to set the current selected window size and position in the canvas.

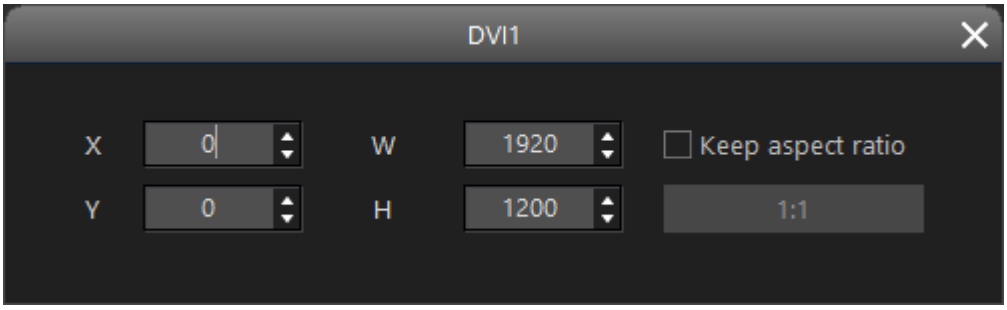


Fig 4.12-28 Set window size and position

➢ Picture adjustment

Click "picture adjustment" icon to adjust the global hue, saturation, brightness compensation, contrast for current selected processor.

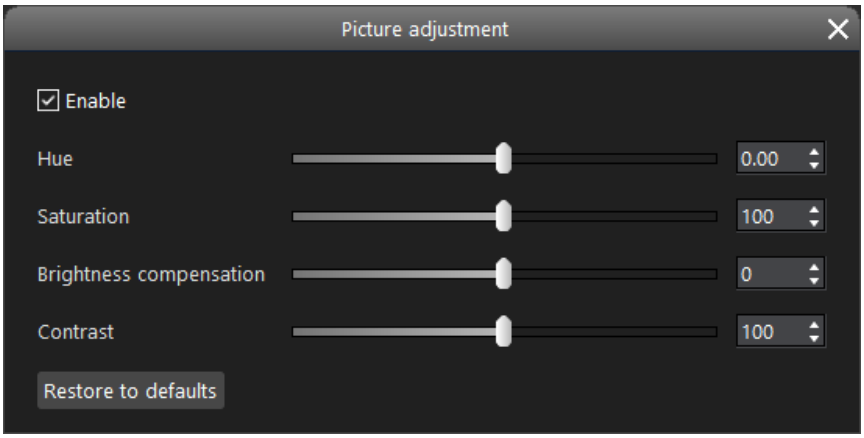


Fig 4.12-29 Picture adjustment

➢ Guides

Show guide lines in the canvas for window placement, the guide lines make it easy for you to align window with a particular area in the canvas. When drag and drop a window to a guide line area, the window will automatically fill to the guide line area.

Click the "guides" icon , a drop-down menu will appear where users can add, delete guide lines. The options in the drop-down menu will be highlighted only when the first option "guides" is checked (green check marker will show is this option is checked).

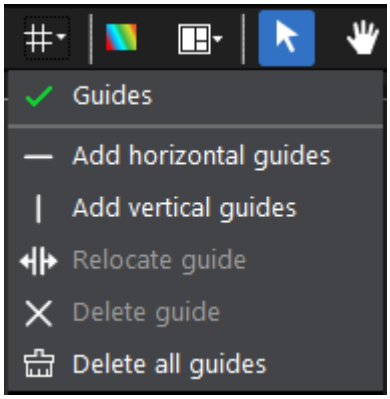


Fig 4.12-30 Guides

Drag input from the input selection and drop to the canvas, the window will automatically fill to the dropped area that split by guide lines.

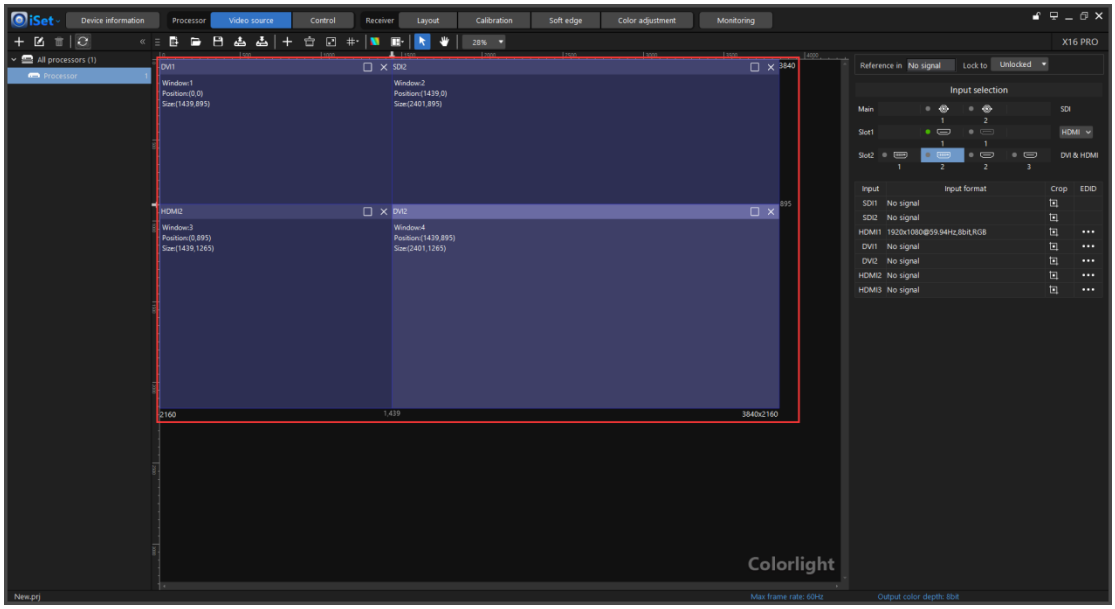


Fig 4.12-31 Guide lines in canvas

- **Preset**

Click the "preset" icon to display preset settings menu.

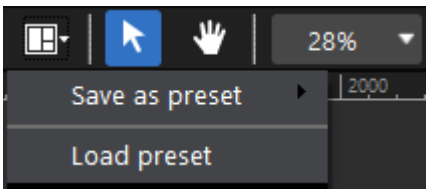


Fig 4.12-32 Preset

For preset settings, please refer to Z6 preset.

➢ Input selection

Show the input slots of the current selected processor. Users can drag an input and drop to the canvas; this action has the same effect with clicking the add window button. The HDMI+DP input slot shares one input channel, in another words, the HDMI and DP input of a single slot can only create one window, users can click the drop-down button located on the right side of the slot to switch the input for the window.

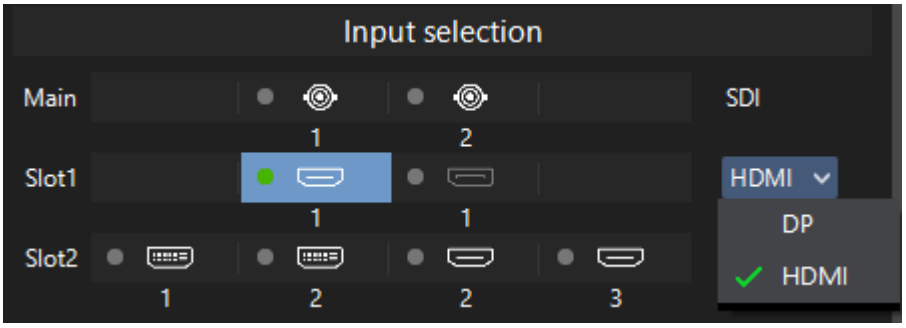


Fig 4.12-33 Switch between DP and HDMI input

➢ Video input information

All available video inputs of the processor are listed in a sheet. Users can see the input format and crop information or set EDID for connected video input.

Input	Input format	Crop	EDID
SDI1	No signal		
SDI2	No signal		
HDMI1	1920x1080@59.94Hz,8bit,RGB		•••
DVI1	No signal		•••
DVI2	No signal		•••
HDMI2	No signal		•••
HDMI3	No signal		•••

Fig 4.12-34 Video input information

For crop and EDID settings, please refer to the Z6 crop and EDID settings manual page.

4.13 Read only mode

In read only mode, the settings can be viewed but not modified. You can independently set tabs to read only mode, meaning that setting a tab in read only mode does not prevent making modifications in other tabs.

Click the lock icon in the upper-right of the software screen to toggle read only mode.

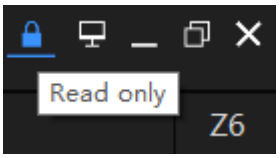


Fig 4.13-1 Read only toggle

Read only mode setting remains when save project, create project and close project.

4.14 Tips

Tips window appears when hover on tip icon in the upper-right of the screen.

- **No processor is connected**

  Refer to figure 4.14-1.

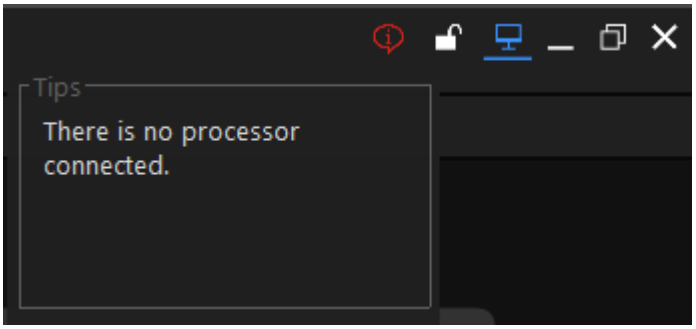


Fig 4.14-1 No processor is connected tip window

- **Blackout triggered**

  Refer to figure 4.14-2, users can click “Disable blackout” button in the tip window to wake up the LED display.

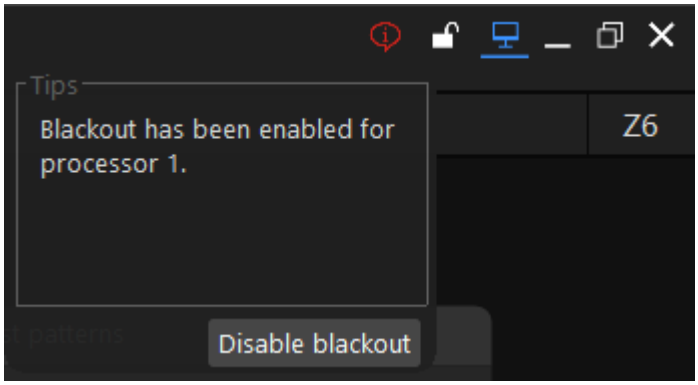


Fig 4.14-2 Blackout tip window

- **Freeze triggered**

  Refer to figure 4.14-3, users can click “Unfreeze” button in the tip window to unfreeze the LED display.

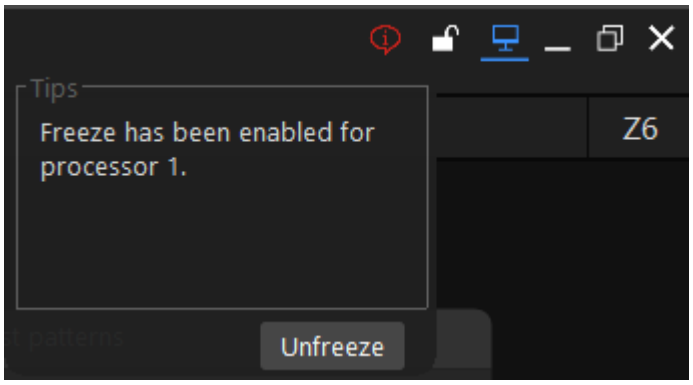


Fig 4.14-3 Freeze tip window

- **Brightness is set to 0%**

  Refer to figure 4.14-4, tip appear when brightness of LED display is set to 0% in control/softedge/advanced softedge tab.

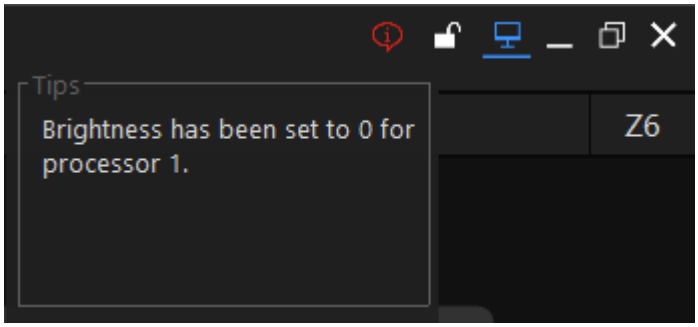


Fig 4.14-4 Brightness is set to 0% tip

- **Different timing**

  Tip appear when the project frame rate setting does not match the processor actual receiving frame rate. Example shows the project frame rate setting is 50hz and the actual receiving frame rate for processor 1 is 60hz.

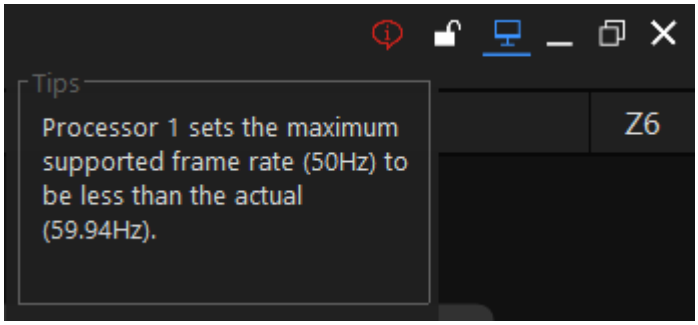


Fig 4.14-5 Unmatched frame rate

- **Black test pattern triggered**

  Tip appear when black test pattern is triggered. Users can click “Set to normal” in the tip window to disable black test pattern.

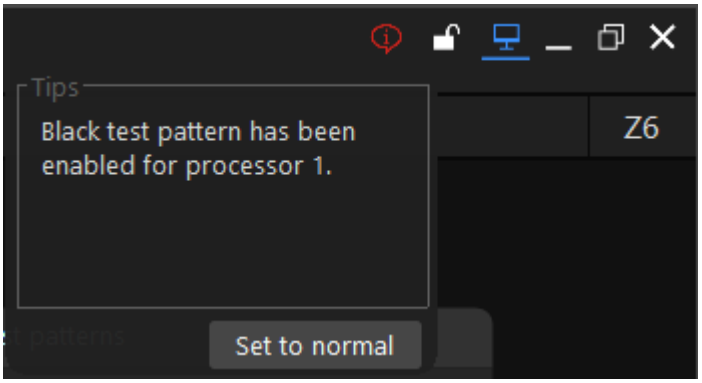


Fig 4.14-6 Black test pattern triggered tip

- **Scaler is in use when correcting seams in soft-edge**

  Scaling would modify soft-edge canvas and cause position mismatch between seams displayed in the canvas and in the real LED display. It only affects the process of seam correction in soft-edge, users can use scaler when seam correction is done.

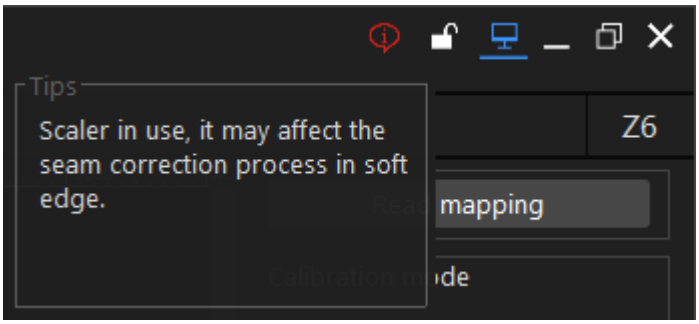


Fig 4.14-7 Scaler in use tip window

- **Default detected in monitoring**

  Tip appear when there is a fault detected in monitoring, tab, click “Go to monitoring” button to view detailed information in monitoring tab.

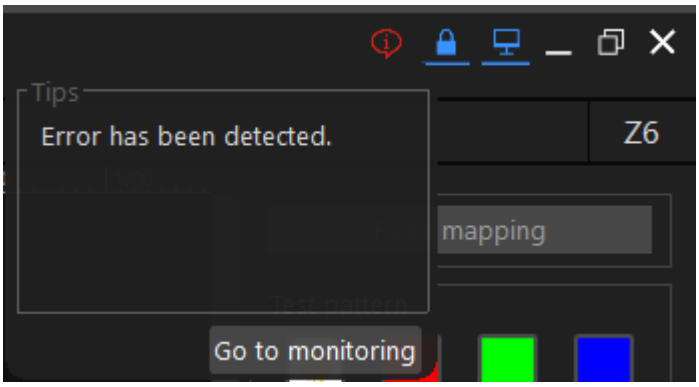


Fig 4.14-8 Monitoring tip window

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