VMP

Vision Management Platform

User Manual

Contents

1 Software Introduction

VMP, short for Vision Management Platform, is an application in the brand-new control system COEX series. Featuring innovative interaction design and plenty of practical functions, such as project management, screen configuration, input settings, display correction, color processing, screen settings, system backup, monitoring and maintenance, screen brightness schedule, and preset management, it provides users with an efficient and easy operation and control experience.

- **Easy and convenient management at screen level**

  Devices of the same model and version can be added to the same screen for management, allowing for batch operations and greatly increasing work efficiency.

- **Fast and flexible configuration**

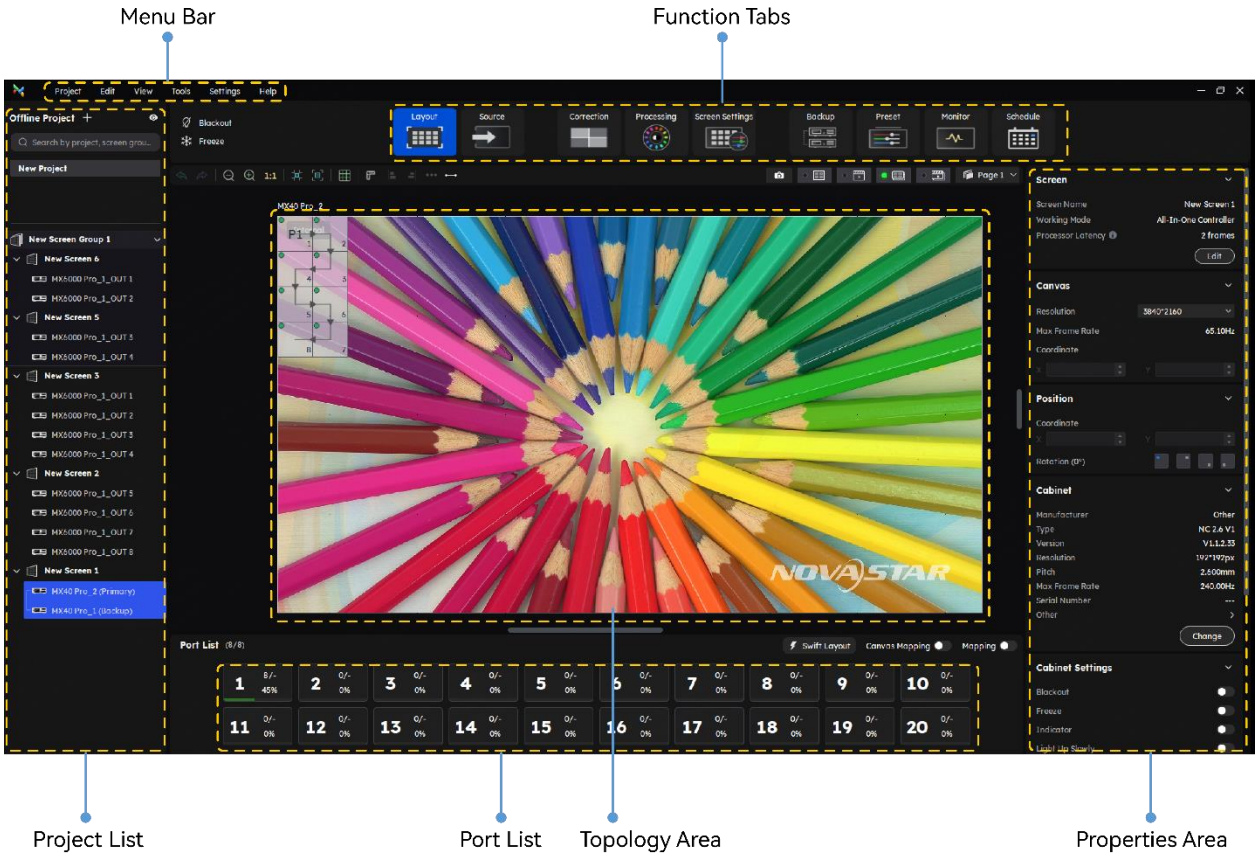
  The cabinets can be quickly connected, flexibly arranged and aligned, significantly simplifying screen configuration.

- **Distinct topology area and properties areas**

  The screen topology is clear at a glance, the input source can be previewed in real time in the topology area and various properties can be easily set.

2 UI Introduction

Figure 2-1 UI Introduction



Note:

All the figures in this document use operations in Windows10 as examples.

3 Install VMP

3.1 Windows

Prerequisites

- The VMP software package is prepared.
- A computer meeting the following requirements is available.
  - OS: Windows 10 (64-bit) or later
  - CPU: i5 or later
  - RAM: 8 GB or greater

Note:

ARM-based Windows computers are not supported.

Installation Method

Run the **Coex VMP Setup.exe** and follow the setup wizard to complete the installation. If a firewall prompt appears, choose to allow the installation.

Installation Result

If the installation is successful, the VMP software shortcut  appears on the desktop.

3.2 MacOS

Prerequisites

- The VMP software package is prepared.
- A computer meeting the following requirements is available.
  - OS: MacOS 10.15 or later
  - CPU: Intel i5 or Apple M1 or later
  - Memory: 8GB and above

Installation Method

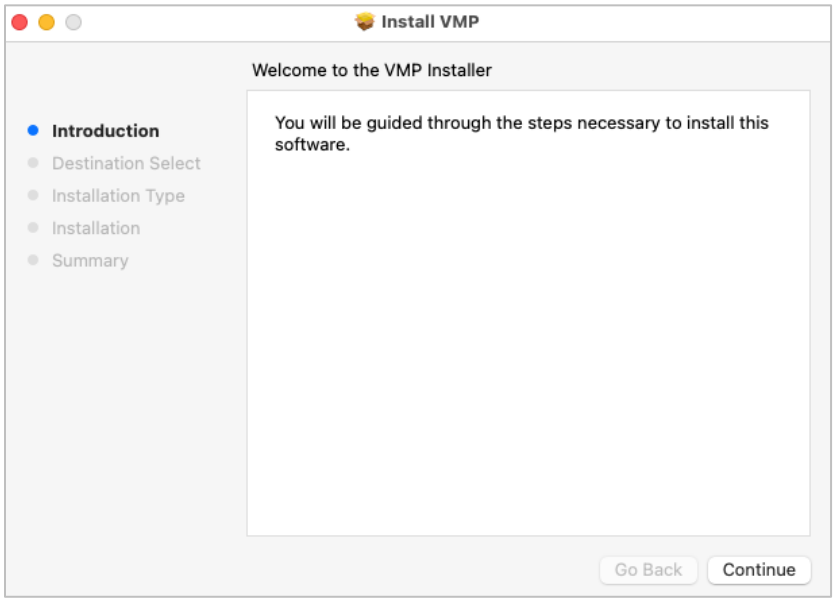
Step 1 After the installation package is downloaded, click **Finder** on the desktop, enter the **Downloads** page, and double-click the package to open VMP.dmg.

Step 2 Hold down the control key, click  and select **Open**.

Figure 3-1 VMP for Mac

Step 3 In the **Install VMP** window, follow the installation guide to complete installation.

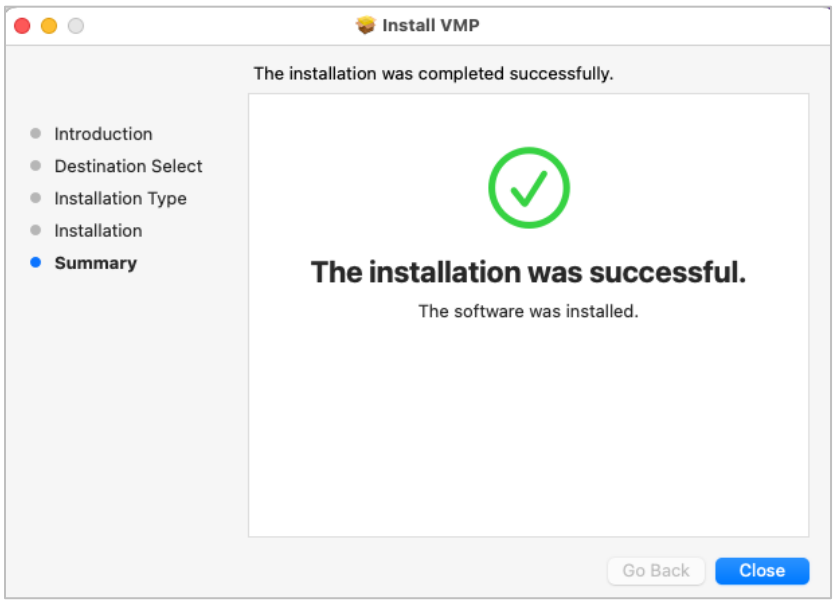
Figure 3-2 Install VMP



Installation Result

If the installation is successful, the following window is displayed and the VMP software shortcut  appears in Launchpad.

Figure 3-3 Successful installation



4 Device Management

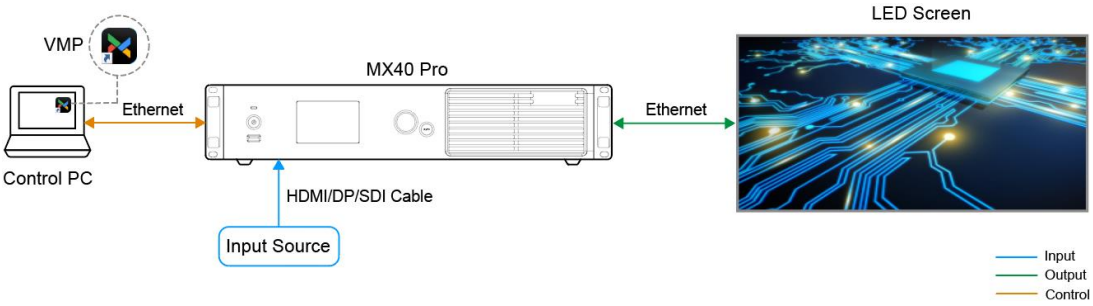
4.1 Connect Online Controllers

Via Ethernet Cable

Connect the controller and the control PC directly via Ethernet cable and set a static IP address for the controller to let the controller and control PC be on the same network segment. The MX40 Pro LED display controller is used as an example in this section.

Step 1 Follow Figure 4-1 to complete the hardware connection.

Figure 4-1 Connecting devices via Ethernet cable



Step 2 Press the knob of the controller to enter the menu and choose **Communication Settings** > **Network Settings**.

Step 3 Set **Mode** to **Manual**.

Step 4 Set **IP Address**, **Subnet Mask** and **Default Gateway** and ensure the controller and control PC are on the same network segment.

To reset the network settings to the default values, please select **Reset** and press the knob.

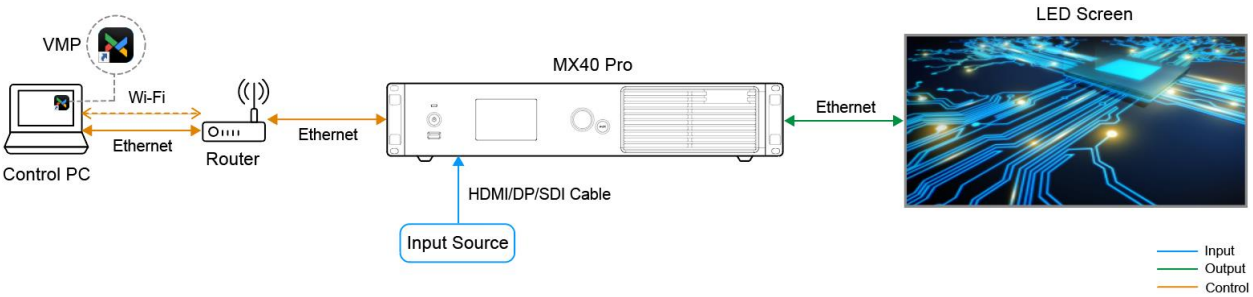
Step 5 After the settings, select **Apply** and press the knob.

Via LAN

Connect the controller and the control PC to the same LAN via a router and set the controller to automatically obtain an IP address. The MX40 Pro LED display controller is used as an example in this section.

Step 1 Follow Figure 4-2 to complete the hardware connection.

Figure 4-2 Connecting devices via LAN



Step 2 Press the knob of the controller to enter the menu and choose **Communication Settings** > **Network Settings**.

Step 3 Set **Mode** to **Auto**.

Step 4 Select **Apply** and press the knob.

Related Information

- If the controller and the control computer are on the same LAN but on different subnets, the controller may not appear in the project list after connecting. To resolve this, you can search for the controller by its IP address and add it to the project list. For detailed instructions, please refer to 4.3.2 Adding Controllers via IP Search.
- The online controllers that are connected will be categorized according to the projects, screen groups, and individual screens of each controller. Any new controllers will be shown in the default project.
- For card-based controllers like the MX6000 Pro and MX2000 Pro, you can install different models of output cards for the same controller. However, output cards with different Ethernet port bandwidths (1G/5G) do not support loading the same screen.

4.2 Add Offline Controller

Before the LED screen is constructed on-site, you can add offline controllers and pre-configure the screen settings. You can then easily import the pre-configured project settings for swift and hassle-free usage of the LED screen.

Operating Procedure

Step 1 From the menu bar, choose **Tools** > **Offline Mode** > **Enter Offline Mode**.

Step 2 Click  at the top left and then select **Add Controller** to add offline controllers.

Step 3 Add one or multiple devices as needed.

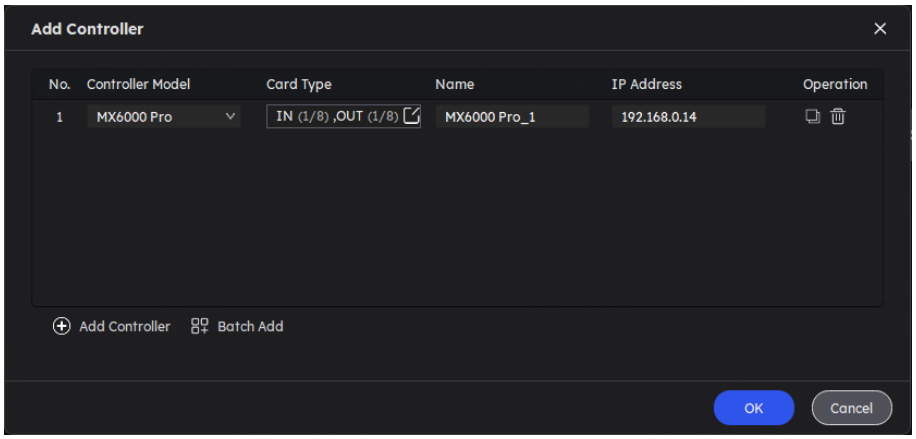
You can add up to 100 offline controllers in VMP, only 25 controllers can be operated at the same time. For card-based controllers, you can run up to 4 fully-configured MX6000 Pro or 12 fully-configured MX2000 Pro at the same time.

When the number of controllers exceeds the limit, some controllers will enter sleep mode. You can wake them by clicking on the sleeping controller or its associated screen, which will also wake up any offline controllers linked to that screen. Meanwhile, the system will put the controllers that haven't been used for the longest time into sleep mode.

Step 4 Click **Add Controller** in the pop-up window.

To add multiple controllers of the same model, click **Batch Add**.

Figure 4-3 Add controller



Step 5 Enter the controller model, controller name, and IP address.

For card-based controllers like the MX6000 Pro and MX2000 Pro, click  to enter the input/output card model. You can install different models of output cards for the same controller. However, output cards with different Ethernet port bandwidths (1G/5G) do not support loading the same screen.

Click  to copy the current controller and click  to delete it.

Step 6 Click **OK** once you are done.

Related Information

- The added offline controllers will be displayed at the bottom of the selected project/screen.
- When no target is selected, added offline controllers will be displayed at the bottom of the Default Project.
- In offline mode, when configuring the screen, it's possible to mix cabinets of different sizes with the same model receiving cards.
- To exit offline mode, choose **Tools** > **Offline Mode** > **Exit Offline Mode**, or close VMP and reopen it.

4.3 Manage Project List

The project list is categorized into four levels: project, screen group, screen, and controller. Screen groups, screens, and controllers can be added to the project for centralized management and batch operations.

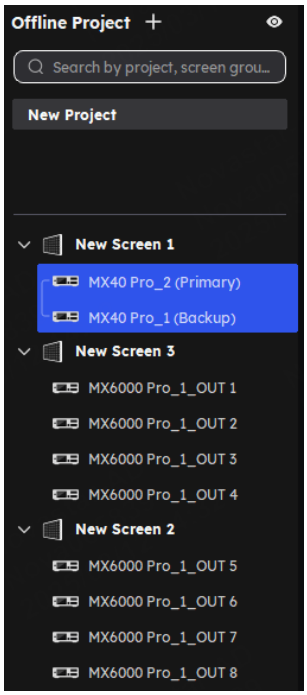
This chapter will introduce the operations related to the project list by using the example of creating a new project and screen.

4.3.1 New Project/Screen Group/Screen

Step 1 To create a project, click  and then select **New Project** from the pop-up menu.

To delete a project, right-click the project and then select **Close** from the pop-up menu.

Figure 4-4 Project list



Step 2 To create a screen/screen group, click  and then select **New Screen Group**/**New Screen**.

- When you have multiple screens in the project, you can drag a screen to overlap with another one and create a screen group.
- You can drag and drop a screen group or screen to another project.

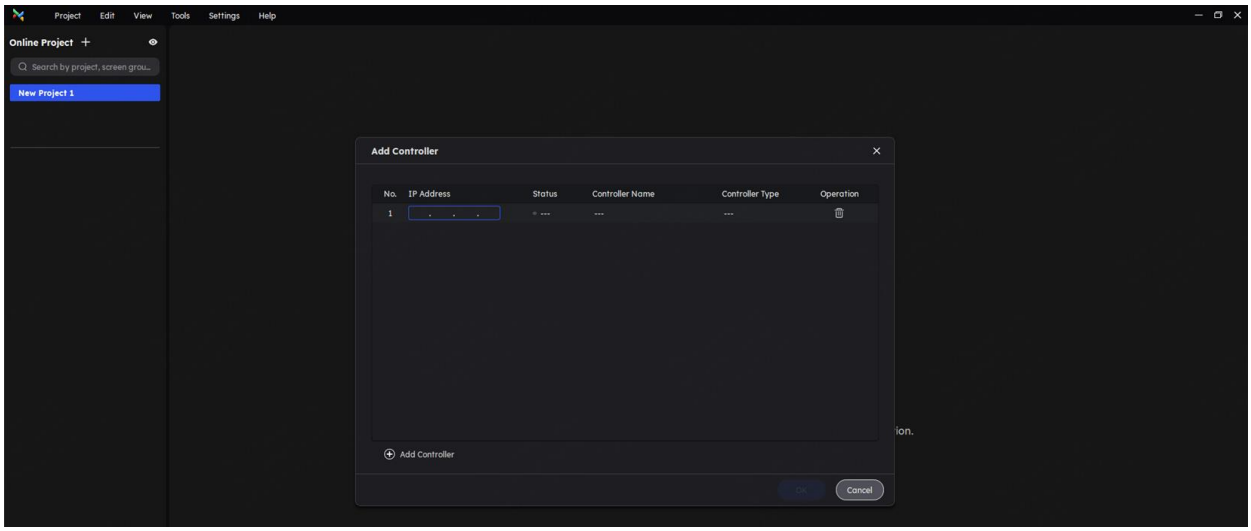
Step 3 You can also drag and drop a controller to another screen.

- Controllers and output cards of different models or firmware versions cannot be added to the same screen.
- Dragging a controller to a new screen will apply all the sending card parameters of that screen.
- Click the  icon at the top right of the list to hide controllers and only show projects, screen groups, and screens.

4.3.2 Adding Controllers via IP Search

If the controller and the control computer are on the same LAN but on different subnets, the controller may not appear in the project list after connecting. To resolve this, you can search for the controller by its IP address and add it to the project list.

Step 1 Click  and then select **Add Controller** from the pop-up menu.



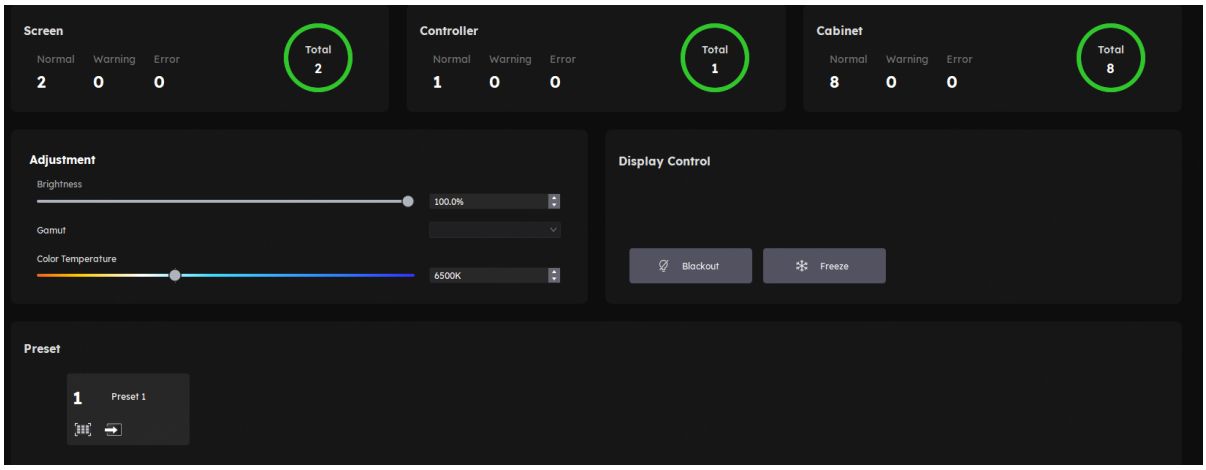
Step 2 Enter the IP address and verify the controller's status, name, and model.

Step 3 Click **OK** to add the controller to the project list.

4.3.3 Unified Settings Adjustment for Projects/Screen Groups

By selecting a project or screen group, you can uniformly control the screens within the group/project and perform various batch operations.

- View the number of screens, controllers, and cabinets, along with their current operating status.
- Adjust image quality settings, such as brightness, color temperature, and color gamut.
- Control the display, including functions like blacking out the screen or freezing the image.
- Easily switch between saved preset configurations.



4.3.4 Rick-click Menu

Rename

Right-click a project/screen group/screen/controller and then select **Rename** from the pop-up menu.

Screen Control

Right-click a project/screen group/screen/controller and then select **Blackout** or **Freeze** from the pop-up menu.

Enable Mapping

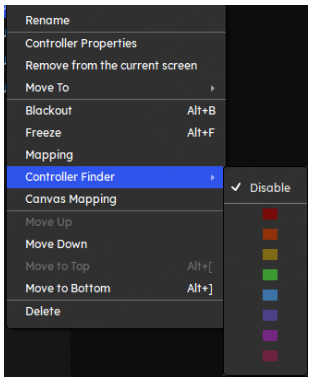
Right-click on a screen/controller and select **Mapping**, **Controller Identify**, and **Canvas Mapping** from the pop-up menu.

- **Mapping**

  Activating the Mapping feature allows you to clearly identify the location and wiring path of the receiving cards.

- **Controller Identify**

  Turn on the controller identify feature and set the display color on the controller's LCD. This will help you quickly identify the controller.

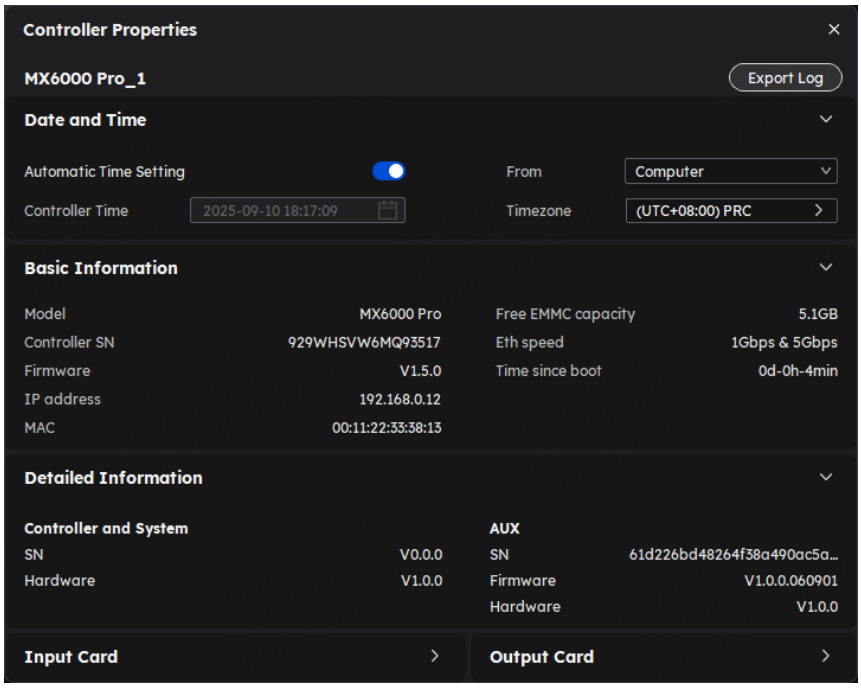


- **Canvas Mapping**

  Enable the canvas mapping feature to quickly view the position of the canvas on the LED screen.

Controller Properties

Right-click a controller and then select **Controller Properties** to open the corresponding interface.



- **Date and Time**
  - Auto Sync:

    1. Toggle on **Automatic Time Setting** ( ). You can choose to sync from either the **Computer** or an **NTP Server**.
       - If you select **Computer**, the controller's time will be synchronized with the control computer's time.
       - If you select **NTP Server**, you can manually enter the NTP server address and select your timezone and daylight saving settings to obtain the correct time for the chosen timezone.
    2. Click **Sync Now** to complete the time setting.

  - Manual Adjustment:

    Toggle off **Automatic Time Setting** ( ) and click **Controller Time** to manually adjust the time.
- **Basic Information**

  Check the controller model, SN, firmware version, IP address, MAC address, etc.
- **Detailed Information**

  Click to expand the panel and check the detailed controller hardware and software information.
- **Input/Output Card Information**

  Check the input/output card name, model, SN, firmware version, hardware version and other information when connecting to card-based controllers (MX6000 Pro and MX2000 Pro).
- **Export Logs**

  Click **Export Log**, select a location, set the file name, and click **Save**.

4.4 Export and Import Project

Export the project files (.nprj) so that you can import the files to apply the configuration data to the same kind of controllers, improving the configuration efficiency.

Prerequisites

The project file can be imported to a controller that is of the same model. For card-cased controllers (MX6000 Pro and MX2000 Pro), you also need to make sure the card slot and model in the file match the controller.

- If the project file version is higher than that of the controller, you will be prompted to upgrade the controller firmware during the import. Please note that the features of the new version will not be supported by the controller.
- If the project file version is lower than that of the controller, you can import it without any issues.

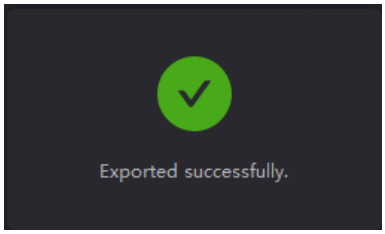
Export Project Files

Step 1 From the menu bar, choose **Project** > **Export** and select a project.

You can also right-click a project and select **Export** from the pop-up menu.

Step 2 Select a local directory and click **Save**.

Figure 4-5 Successful export



Import Project Files

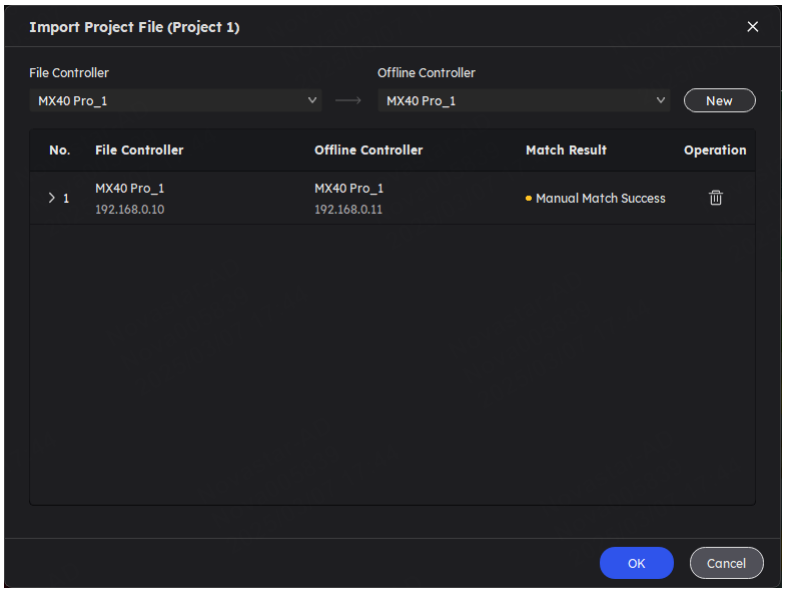
Step 1 From the menu bar, choose **Project** > **Import** and select a device or device group.

You can also right-click a project and select **Import** from the pop-up menu.

Step 2 Select a local project file and click **Open**.

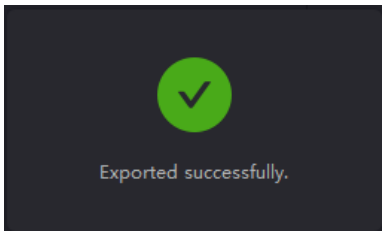
After successful device matching, a dialog box as shown in Figure 4-6 is displayed.

Figure 4-6 Matching devices



Step 3 Click **OK**. After importing, the original screen and controller names will be overwritten.

Figure 4-7 Successful import



4.5 Manage Peripherals

VMP supports detecting all 3D emitters, multifunction cards, and light sensors connected to the project controllers, as well as enabling power control through the multifunction cards.

Applicable Products

- 3D emitters: EMT200, EMT200 Pro
- Multifunction card: MFN300
- Light sensor: NS060

Notice

- When system backup is set, only the primary controller/card/Ethernet port can detect and read information from multifunction cards and light sensors. Backup controller/card/Ethernet port does not support detecting or reading this information.
- It is recommended to connect the multifunction card to port 1 of the controller. For the multifunction card MFN300-B V4.4.2.0 and above, connect to any of the first 16 ports of the controller.

- If multiple controllers with light sensors are connected to the same screen and are placed in environments with different brightness levels, ensure proper communication between the controllers when adjusting screen brightness via the brightness strategy table. Otherwise, inconsistencies in screen brightness may occur.

Related Information

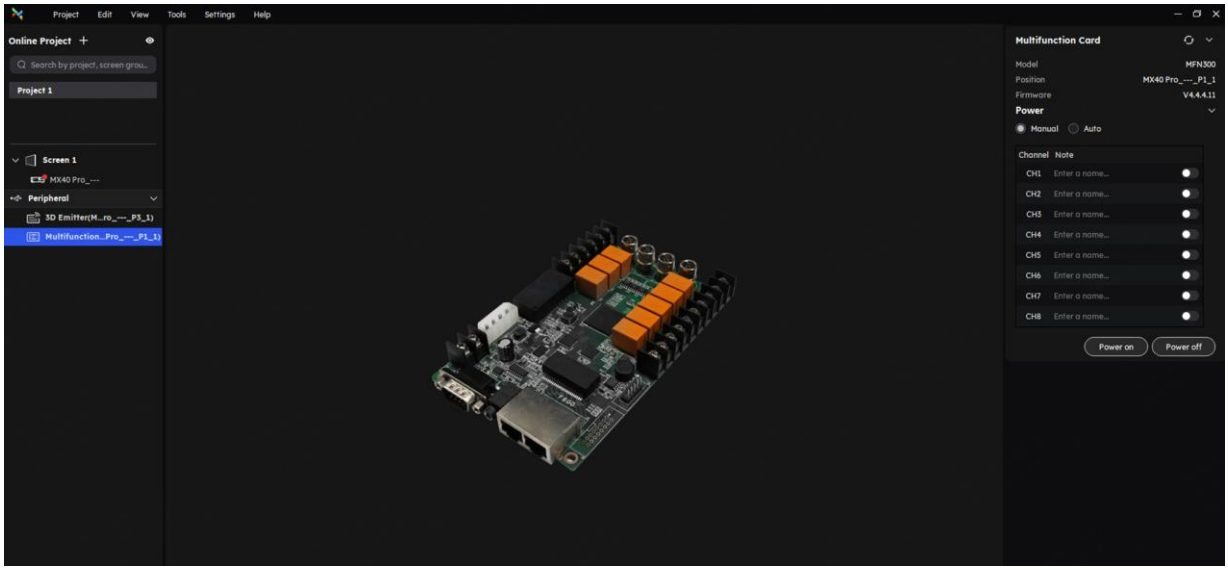
- Light sensor ambient brightness rules: The light sensor checks the brightness every 10 seconds and adjusts every minute. During adjustment, it discards the highest and lowest values from the five most recent readings and calculates the average to determine the ambient brightness.
- A single controller can connect to multiple multifunction cards, with each card supporting up to four light sensors. When multiple light sensors are connected, the average ambient brightness from all sensors is used.

Operating Procedure

Step 1 Select a project from the project list.

Step 2 In the **Peripheral** section of the project list, you can check the 3D emitters and multifunction cards connected to all the controllers within the project, as well as the light sensors connected to the multifunction cards.

Figure 4-8 Check peripheral (multifunction card)



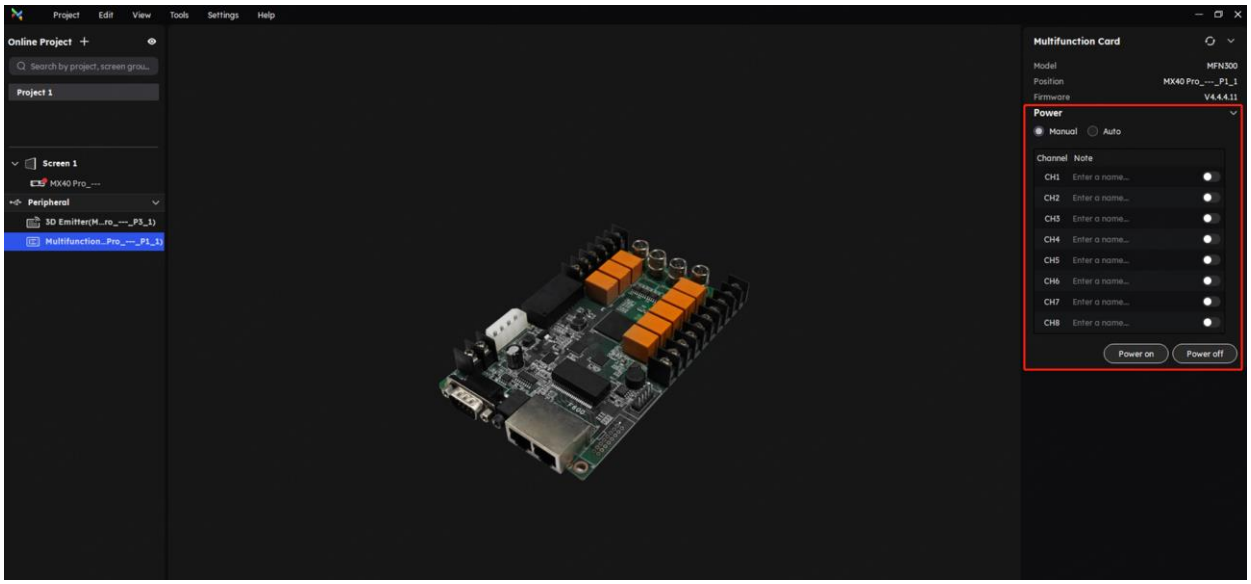
Step 3 Select a peripheral to view its information in the properties area on the right.

- 3D emitter: You can view the model, position, and firmware version.
- Multifunction card: You can view the model, position, and firmware version.
- Light sensor: You can view the position and ambient brightness.

  Light sensor ambient brightness rules: The light sensor checks the brightness every 10 seconds and adjusts every minute. During adjustment, it discards the highest and lowest values from the five most recent readings and calculates the average to determine the ambient brightness.

Step 4 Perform power control operations as needed.

Figure 4-9 Power control



Select a multifunction card and set the power control mode in the properties area on the right. You can choose between the auto and manual mode. You can also click **Power on** or **Power off** to control the state of all power channels.

- Manual mode: Set the state of each individual power channel.
- Auto mode: Different start and shutdown times can be set for each power channel, with default times retrieved from the multifunction card.

4.6 Art-Net Control

Enable the Art-Net protocol switch to realize control via third-party controller.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Prerequisites

To apply the Art-Net protocol, make sure the transmitter ends (such as console and control PC) and the receiver ends (such as LED display control system and lighting system) are on the same LAN.

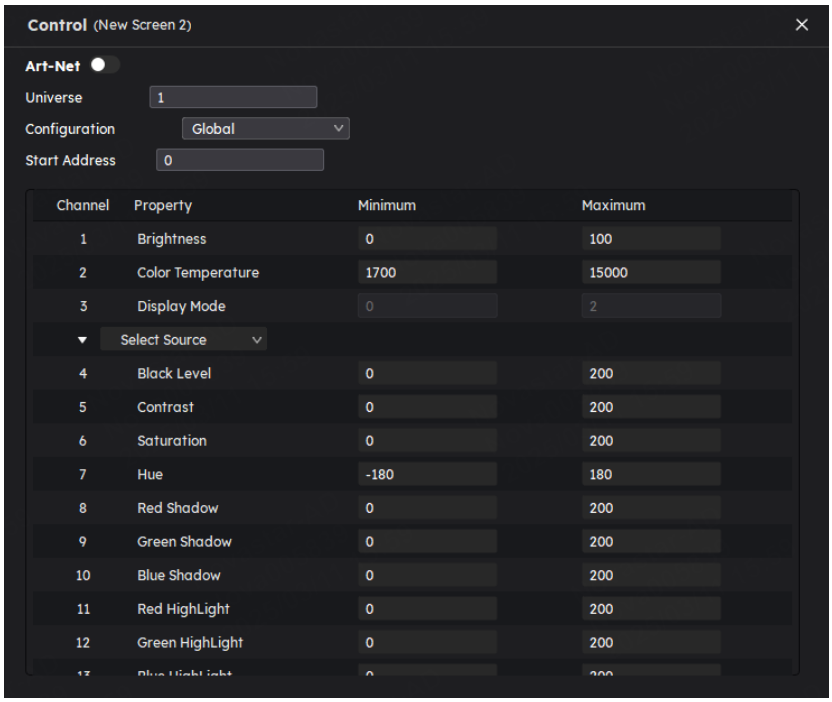
Related Information

After the Art-Net protocol switch is enabled, the configured parameters cannot be modified. For the protocol details, see *Art-Net Protocol Instructions*.

Operating Procedure

From the menu bar, choose **Tools** > **Control**, enable the Art-Net switch. Set the **Start Address** and complete the **Source**, **Image Quality** and **Preset** parameter configurations.

Figure 4-10 Art-Net



5 Screen Configuration

5.1 Edit Screens

Edit the settings of the selected screen.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Operating Procedure

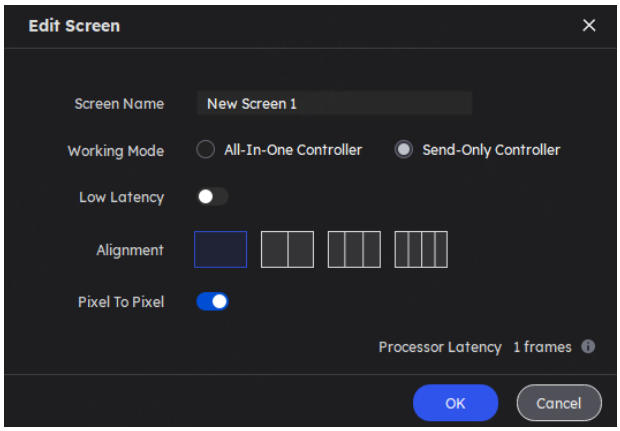
Step 1 Select a screen from the project list and then select **Layout**.

Figure 5-1 Layout

Step 2 Click **Edit** in the properties area on the right.

Step 3 Enter a screen name on the pop-up window.

Figure 5-2 Edit screen



Step 4 Select a **Working Mode**. When operating as a **Send-Only Controller**, the display latency is reduced by 1 frame.

Step 5 Set **Low Latency**.

When low latency is set to , the latency at the data sending end is reduced by 1 frame.

Step 6 When a card-based controller (MX6000 Pro or MX2000 Pro) operates as a **Send-Only Controller**, you also need to do the following.

1. Choose a layer alignment from the four options.

   For , , or , you can adjust the layer size by dragging the layer divider, or setting a value under the **Canvas Size** section.

2. Set the state of **Pixel to Pixel**.

   When **Pixel to Pixel** is enabled (), it will output the display based on the size of the input source in a pixel-to-pixel manner.

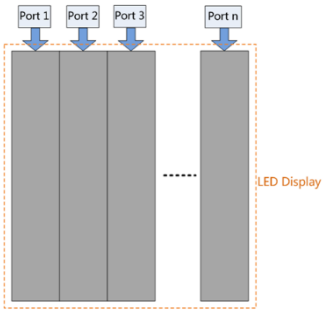
   When **Pixel to Pixel** is disabled (), the input source will automatically scale to fill the layer based on the configured layer size.

Step 7 Click **OK** once you are done.

Note

Please note the following when using the low latency function:

- Low latency, frame multiplication, and 3D cannot be enabled at the same time.
- When low latency is enabled, the sync source cannot be set to Genlock.
- To enable low latency, please make sure all Ethernet ports load the cabinets vertically and share the same Y coordinate. Free screen configuration (for example, Ethernet port 2 loads cabinets horizontally, or its Y coordinate is different from that of Ethernet port 1) will reduce the load capacity. For specific calculations, please contact NovaStar technical support.



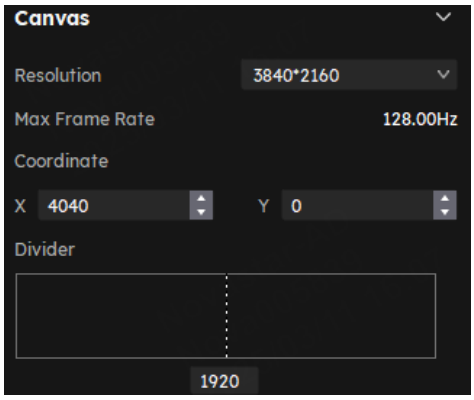
5.2 Set Canvas Size

Step 1 Select a screen from the project list and then select **Layout**.

Step 2 In **Canvas** section, select a pre-defined resolution from the drop-down list or customize the width and height of the canvas. The maximum supported setting is 16,384.

The system will automatically calculate the maximum frame rate for the canvas based on the current resolution.

Figure 5-3 Canvas



Step 3 Select the canvas in the canvas area and enter the X and Y coordinates to adjust the canvas starting position.

Step 4 When a card-based controller (MX6000 Pro or MX2000 Pro) operates as a **Send-Only Controller**, you can set the layer divider.

For  ,  , or  , you can adjust the layer size by dragging the layer divider, or setting a value for the divider.

5.3 Configure Screen Topology

Configure the cabinet topological diagram to complete the logical connection of the cabinets.

Prerequisites

The controller is connected and cabinets are connected to the controller.

Operating Procedure

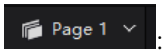
Step 1 Select a controller from the project list and then select **Layout**.

Figure 5-4 Layout

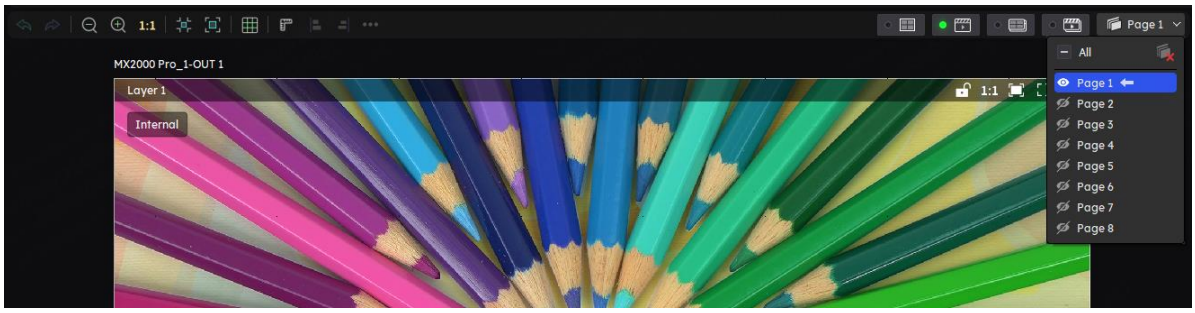
Step 2 Select a view for the topology area, and choose what to display on the topology.

Select a view or switch pages by clicking one of the icons in the top right corner of the topology area:

-  : Show the cabinets only.
-  : Show the preview image of the input source only.
-  : Show both the cabinet and the input source preview, with the cabinet on top.
-  : Show both the cabinet and the input source preview, with the input source on top. In this view, you can click 

to navigate to the Source interface, then click and hold the left mouse button within the topology to select and move layers.
-  : Click to enable **Source Snapshot**. When this is enabled, the source playback in VMP will freeze on the last frame and the display on the LED screen will not be affected. Users can then adjust screen settings based on the frozen image without needing to look at the LED screen. To disable **Source Snapshot**, simply click the icon again.
- 

: Click to switch pages in the dropdown menu. VMP supports a fixed total of 8 pages. When multiple screens are displaying the same content, you can configure screen layout at different pages and choose to show or hide them as needed. Click  to clear all topologies.



In the topology area, you can choose to display the cabinet topology, cabinet status, group names, source tags, and overlapping cabinets.

Step 3 Select an Ethernet port at the bottom and then drag or click the mouse in the topology area to add cabinets.

Note

Offline projects created in In VMP V1.5.0 allow a single Ethernet port to support 512 cabinets. However, for projects created in versions prior to V1.5.0, the maximum number of cabinets per port remains capped at 32.

The cabinets will be automatically connected when you are adding them, as shown in Figure 5-5. The Ethernet port's load capacity information will be displayed, as shown in Figure 5-6. The properties area will display the cabinet specifications, as shown in Figure 5-7. You can also select a custom cabinet and click **Edit** to modify the specifications of the cabinet.

Figure 5-5 Cabinets connected automatically

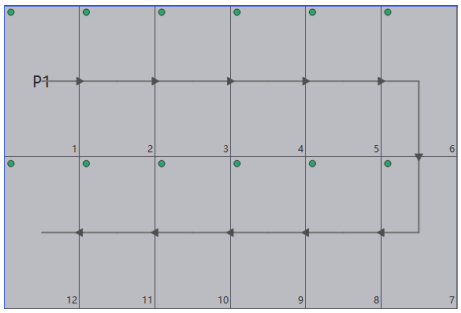
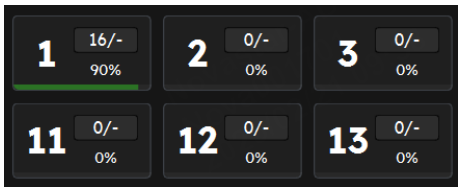
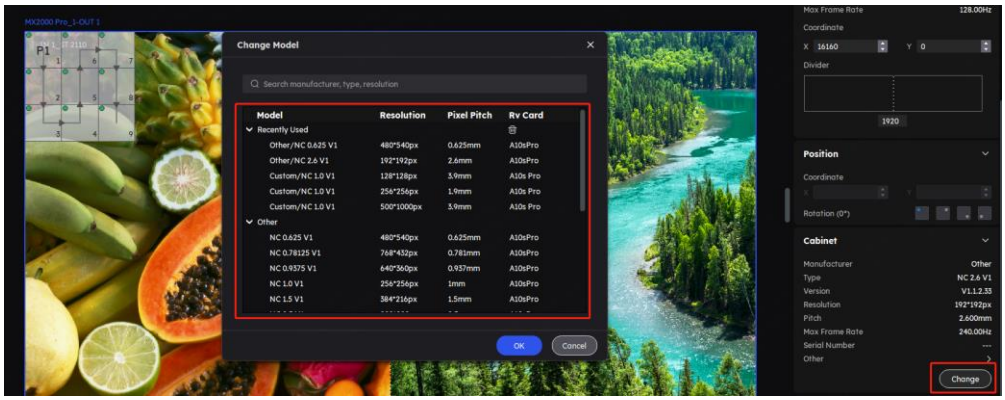


Figure 5-6 Ethernet port capacity



- 16/-: Indicates that Ethernet port 1 has 16 cabinets added to the topology.
- 90%: Indicates these 16 cabinets have used 12% of the Ethernet port's capacity.

Figure 5-7 Change cabinet model (only available in offline mode)



Note

- Swift Layout: To use the Swift Layout feature, all Ethernet ports must have cabinets with the same model, resolution, quantity, and topology. Additionally, there should be no single cabinet completely outside the canvas. When these conditions are met, the Swift Layout feature can quickly add and connect cabinets for all Ethernet ports.
- Operating procedure: Click Swift Layout and then drag the mouse on the canvas to add cabinets that match the actual requirements. In the properties area, select a layout and click **Done**.

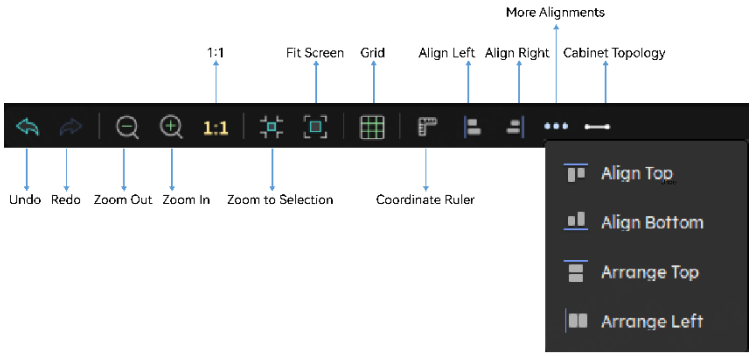
Step 4 Select other Ethernet ports and continue to add cabinets until all cabinets are connected.

Step 5 For cabinets that have the same size and consecutive serial numbers, if you want to change the cabinet connection topology, select the cabinets and then select a quick topology under Quick topo in the properties area, as shown in Figure 5-8. For other cabinets, skip this step.

Figure 5-8 Quick topology

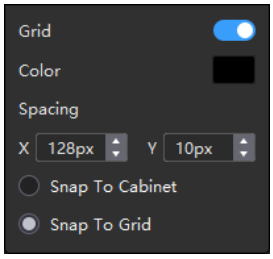
Step 6 Do any of the following to arrange, align, or copy the cabinets and cabinet groups to let the cabinet positions meet the display requirements.

Use the function buttons



- 1:1: The canvas size equals to the input source resolution.
- Zoom To Selection: The selected element is zoomed and displayed in the center of the canvas.
- Fit Screen: The canvas size is automatically adjusted to fit the topology area size.
- Coordinate Ruler: Show coordinate ruler on the left and top sides of the canvas.

Click  to show its drop-down menu shown below. The menu can be used to set the canvas grid.

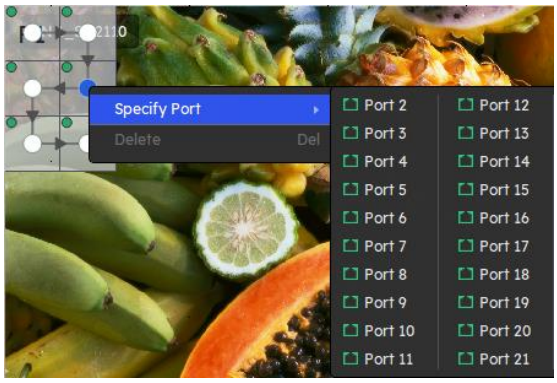


- Grid: When the switch is in the  status, a grid is displayed on the canvas. If you do not need to display the grid, set the switch to  .
- Color: Set the grid color.
- Spacing: Set the spacing of horizontal and vertical lines of the grid. The spacing is set to the resolution of the first cabinet by default.
- Snap to Cabinet: When positioning a cabinet near another one, the cabinet being moved will automatically align and snap to the edge of the adjacent cabinet, effectively eliminating gaps.
- Snap to Grid: The cabinet will be snapped to the grid.

Click  to enable the manual cabinet topology adjustment.

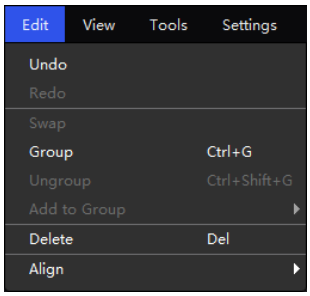
- Left-click a cabinet to manually connect any unconnected cabinets or to adjust or remove existing connections.
- Right-click a cabinet to assign an Ethernet port to the selected cabinet.

  Only unused Ethernet ports can be assigned, and once assigned, all cabinets in the connection will be redirected to the new port.

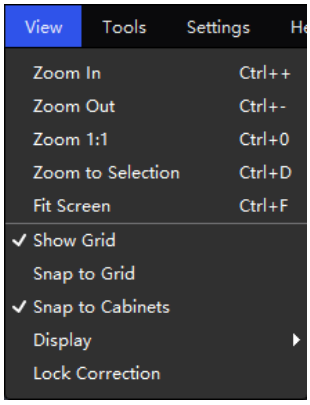


- **Use the function menus on the menu bar**

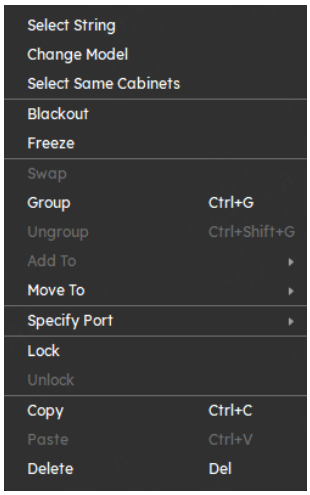
  - **Edit** menu



  - **View** menu



- **Right click the cabinet**



Select String: Select all the cabinets on the connection line of the current cabinet.

Swap: Swap the positions of the two selected cabinets.

Group: Group the selected cabinets. To set the group name and color, please select the group and set them in the properties area.

Ungroup: Ungroup the cabinets.

Add to: Add the selected cabinets to a group.

Move to: Move the selected cabinets to the chosen page (only supports selecting cabinets from the same string).

Specify Port: Move the selected cabinet to the chosen Ethernet port (only supports selecting cabinets from the same string).

Copy: Duplicate the selected topology, including the cabinets and connection.

Paste: Insert the copied topology.

- **Set cabinet coordinates and rotation**

  Select a cabinet and set its coordinates and rotation angle in the properties area. After the cabinet is rotated, the input source will be rotated by the set angle and displayed.

  The cabinet rotation in 90° increments feature is only supported by certain models of receiving cards, as detailed below:

Table 5-1 Receiving cards supporting cabinet rotation

Model	Description
XA50 Pro, CA50E, A10s Pro and its derivative cards.	Supported by all versions.
A5s Plus, A7s Plus, A8s-N, A8s Pro and its derivative cards.	Supported by V4.9.0.0 or later.

5.4 Set the Cabinet

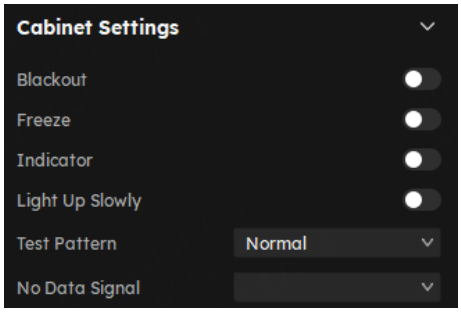
Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Operating Procedure

Navigate to **Layout** and select a screen. Do any of the following operations in the cabinet settings area.

Figure 5-9 Cabinet settings



- **Control Display Status**

Set the **Blackout** or **Freeze** switch to .

- **Enable Indicator**

  If the cabinet has a running status indicator, you can set the Indicator switch to .

  - Green: The cabinet is fully within the canvas, with normal temperature and voltage.
  - Yellow: The cabinet is partially outside the canvas, with temperature or voltage warnings.
  - Red: The cabinet is completely outside the canvas, with temperature or voltage faults.
  - Gray: The cabinet is offline.

- **Enable the Light Up Slowly Function**

  Set the **Light up slowly** switch to so that after the screen is powered on, the display brightness will slowly change from 0 to the target value.

- **Set Test Pattern**

  Select a test pattern from the drop-down list of **Test Pattern** to perform screen aging test and troubleshoot problems.

- **Set Image for Abnormal Situations**

  Select an option from the **No data signal** drop-down list.

  - Blackout: The screen displays a black image.
  - Last Frame: The screen always displays the last frame.

5.5 Set OPT Ports

Applicable Products

MX40 Pro

Operating Procedure

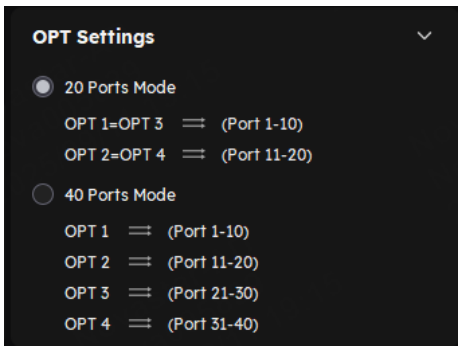
Step 1 Select a screen from the project list and then select **Layout**.

Step 2 Set the output mode of the OPT ports under OPT Settings. You can choose either **20 Ports Mode** or **40 Ports Mode**.

- 20-port mode:
  - OPT 1 transmits the data of Ethernet ports 1 to 10. OPT 3 is the copy channel of OPT 1.
  - OPT 2 transmits the data of Ethernet ports 11 to 20. OPT 4 is the copy channel of OPT 2.
  - You can use the optical port alongside the physical Ethernet port, with priority given in the following order: OPT 1/2 > OPT 3/4 > Ethernet ports 1–20.
- 40-port mode:
  - OPT 1 transmits the data of Ethernet ports 1 to 10.
  - OPT 2 transmits the data of Ethernet ports 11 to 20.
  - OPT 3 transmits the data of Ethernet ports 21 to 30.

- OPT 4 transmits the data of Ethernet ports 31 to 40.
- You can use the optical port alongside the physical Ethernet port, with priority given in the following order: OPT 1/2 > Ethernet ports 1–20.

Figure 5-10 OPT settings



Note

- When both the optical and Ethernet ports are used simultaneously, please do NOT connect the controller's Ethernet port with the same number as the one of the optical port to the receiving card at the same time. If they are connected simultaneously, the display effect of the optical port will take precedence.
- When Ethernet port backup is enabled in 40-port mode, the last 20 Ethernet ports are backed up by the first 20 Ethernet ports. When switching to the 20-port mode, please remember to remove the loop backup setup of the receiving card.
- While in the 40-port mode, additional Ethernet ports can be used to create easier screen topology without reducing the controller's maximum load capacity.

6 Input Source Configuration

6.1 Set Layers

Add layers and set the layer properties.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Prerequisites

- For single-card controllers (MX40 Pro, MX30, MX20, KU20, CX40 Pro), the Layers function is only available while under All-In-One Controller mode. Please refer to 5.1 Edit Screens for more details.
- For card-based controllers (MX6000 Pro and MX2000 Pro), the Layers function is available for both All-In-One Controller and Send-Only Controller modes.
  - All-In-One Controller supports free layer layout.
  - Send-Only Controller follows a fixed layer layout with a predetermined layer quantity.

Related Information

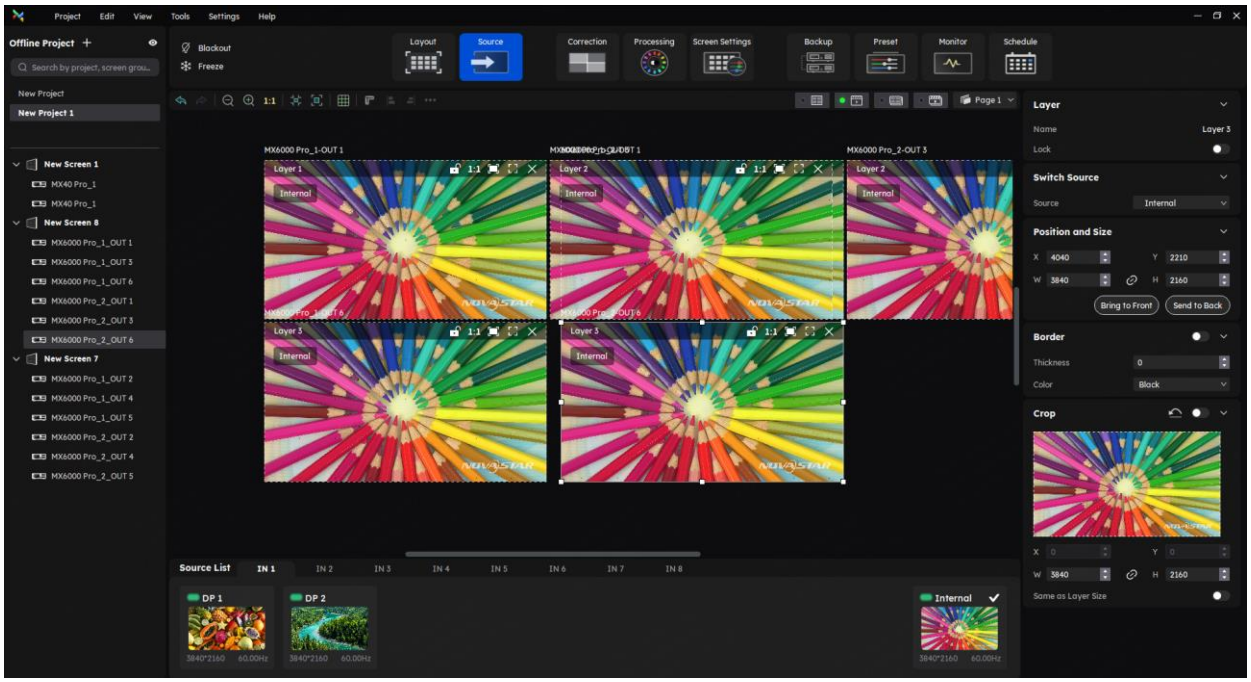
The maximum number of layers that can be added depends on the connected controller. When the supported layer quantity is 1, layer position, border, input crop and other operations are not supported.

Controller Model	Number of Supported Layers
MX40 Pro	4
MX30	3
MX20	3
KU20	1
CX40 Pro	3
MX6000 Pro	(Each input card supports 4 layers, and up to 8 input cards can be used at the same time.)
MX2000 Pro	(Each input card supports 4 layers, and up to 2 input cards can be used at the same time.)

Operating Procedure

Step 1 Select a controller from the project list and then select **Source**.

Figure 6-1 Input source



Step 2 Select an input card at the bottom of the page when there are multiple input cards.

Step 3 Double-click the thumbnail of the input source or drag the input source to the target position to add a layer.

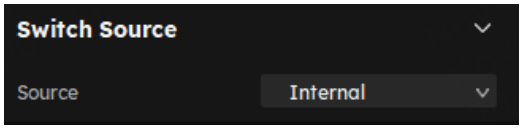
You can check the source status according to the source indicator:

- Green: The input source is connected.
- Red: The input source is being used for the screen but not connected.
- Gray: The input source is not connected.

Step 4 Make layer adjustments as needed.

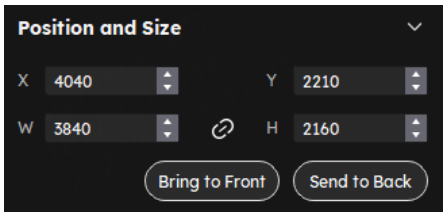
- **Lock layer**

- **Switch source**
  - Select a layer and select another source in the properties area.



  - Right-click a layer, select **Source** from the displayed menu, and select another source.

- **Adjust layer size and position**
  - Select a layer and set the layer size and coordinates in the properties area. You can also bring the layer to front or send it to back.



- Right-click a layer and select **Bring to Front**, **Send to Back**, **Bring Forward** or **Send Backward** from the displayed menu.
- At the top right of a layer, click a function icon to set the layer.

  : Lock the layer.

  : Unlock the layer.

  : The layer size is the same as the input source resolution.

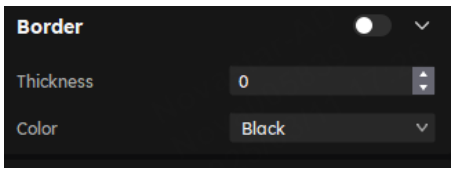
  : The layer automatically fill the screen.

  : The layer size changes automatically according to the canvas size.

  : Delete the layer.

Set borders

Select a layer and enable or disable the layer borders function in the properties area. After enabling the function, you can set the border thickness and color.



Crop the input source

Select a layer and enable or disable the **Crop** function in the properties area. Then, you can set the crop size and position on the thumbnail of the layer. You can also make adjustments by setting the parameter values below the thumbnail. When **Same as Layer Size** is set to , the input source image will be cropped according to the layer size.

6.2 Set External Sources

Select a controller from the project list and then select **Source**. Select an external source from the source list and do the following as required.

6.2.1 Set Connector Capacity

When installing an 8K input card in a card-based controller, it is necessary to configure the connector capacity for the input source in order to calculate the layer resources of the input connectors.

Applicable Products

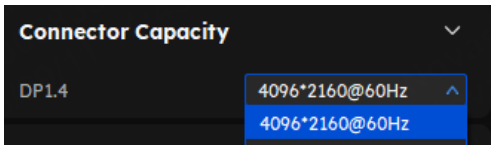
MX6000 Pro, MX2000 Pro

Operating Procedure

Select an option from the drop-down list and the system will automatically calculate the layer resources. Below takes the MX_2xDP1.4 input card as an example.

- 4096*2160@60Hz: Up to 4 layers can be added.
- 8192*2160@60Hz: The maximum number of layers that can be added is determined based on the size of the input source used in the currently enabled layers of the input card. For example:
  - When using two input sources of 8192×2160@60Hz, a maximum of two layers can be added.
  - When using one input source of 8192×2160@60Hz and two input sources of 4096×2160@60Hz, a maximum of three layers can be added.

Figure 6-2 Connector capacity



6.2.2 Set Resolution and Refresh Rate

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Related Information

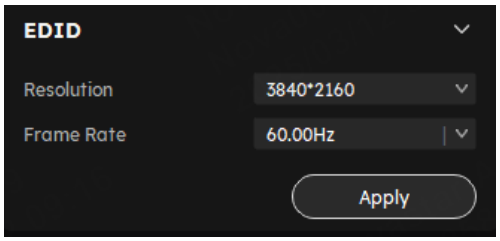
If the resolutions of the input source and screen are the same, the image can be displayed pixel to pixel.

A lower frame rate may result in image flickering, while a higher refresh rate helps stabilize the display image.

Operating Procedure

Select a value from the drop-down lists of **Resolution** and **Refresh Rate** and click **Apply**.

Figure 6-3 EDID



6.2.3 Adjust the Color

Applicable Products

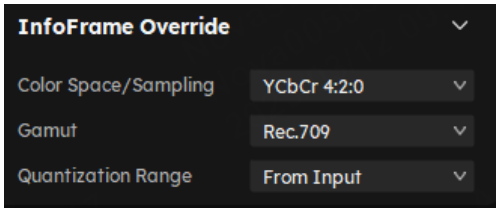
MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Operating Procedure

Step 1 In the **InfoFrame Override** area, select a value from the drop-down lists of **Color Space/Sampling**, **Gamut** and **Quantization Range**.

The override parameter will be used in the calculation of color adjustment. Select **From Input** and the software will read the attribute value that comes with the input source.

Figure 6-4 InfoFrame override



Note

When selecting the color space/sampling as YCbCr 4:2:0, the input source resolution's height must be an even number, and the width must be a multiple of 8.

Step 2 In the **Color** area, drag the sliders to adjust the parameter values.

Figure 6-5 Color

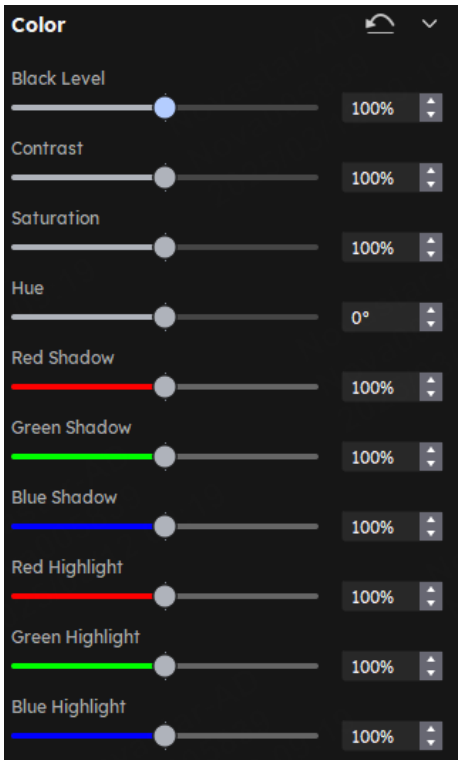


Table 6-1 Descriptions of color adjustment parameters

Parameter	Description
Black Level	It is used to adjust the brightness of the dark areas of the image. The smaller the value, the darker the dark part of the screen.
Contrast	It is used to adjust the brightness of the highlight areas of the image. The greater the value, the brighter the highlight part of the screen. Contrast and black level together affect the overall contrast of the image.
Saturation	It is used to adjust the color purity of the image. The greater the value, the more vivid the color.
Hue	It is used to adjust the color effect of the displayed image color. Generally, it is divided into warm, cool and intermediate tones.
Red Shadow/Green Shadow/Blue Shadow	It is used to adjust the brightness of the dark areas of the image. The principle is the same as that of black level, but only the RGB components are adjusted.
Red Highlight/Green Highlight/Blue Highlight	It is used to adjust the brightness of the highlight areas of the image. The principle is the same as that of contrast, but the RGB components are adjusted.

6.2.4 Set HDR Parameters

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, CX40 Pro

Related Information

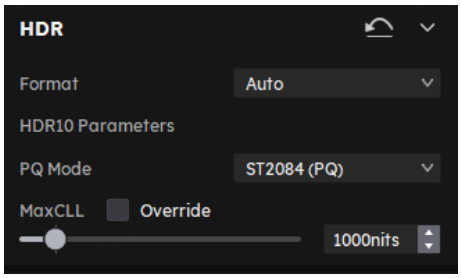
Supports automatic parsing and manual setting of HDR. For 12G-SDI, DP1.2, and non-standard HDR sources, they can only be set to HDR properties manually.

Using the HDR function together with receiving cards including the CA50E, XA50 Pro, and A10s Pro and its derivatives will not reduce the Ethernet port load capacity by half. For details, see the COEX series LED display controller specifications.

Operating Procedure

Select an HDR format from the drop-down list of **Format** and set related parameters. Select **Auto** and the software will read the attribute value that comes with the input source.

Figure 6-6 HDR



HDR10 parameters:

- PQ Mode: The mapping method of video source brightness.
  - ST2084 (PQ): This mode 1:1 maps the brightness of the video source. The part that exceeds the maximum screen brightness will still be displayed as the maximum screen brightness.
  - ST2086 (Linear mapping): This mode linearly maps the brightness of the video source. It globally adjust the video source brightness according to the maximum screen brightness to ensure that the ratio of the brightness of the entire source content remains unchanged.
- MaxCLL: The override value of the maximum video source brightness. MaxCLL takes effect when **Override** is selected.

Note

When HDR is enabled, the gamma value cannot be adjusted. In PQ mode, if HDR 2084 is selected, brightness adjustment is also not supported.

HDR 2084 and brightness schedule cannot be enabled at the same time. If HDR 2084 is selected while the brightness schedule is already enabled, the brightness schedule will take precedence.

6.2.5 Set ST 2110 Parameters

When installing ST 2110 input cards in card-based controllers like the MX6000 Pro and MX2000 Pro, you need to configure the relevant parameters.

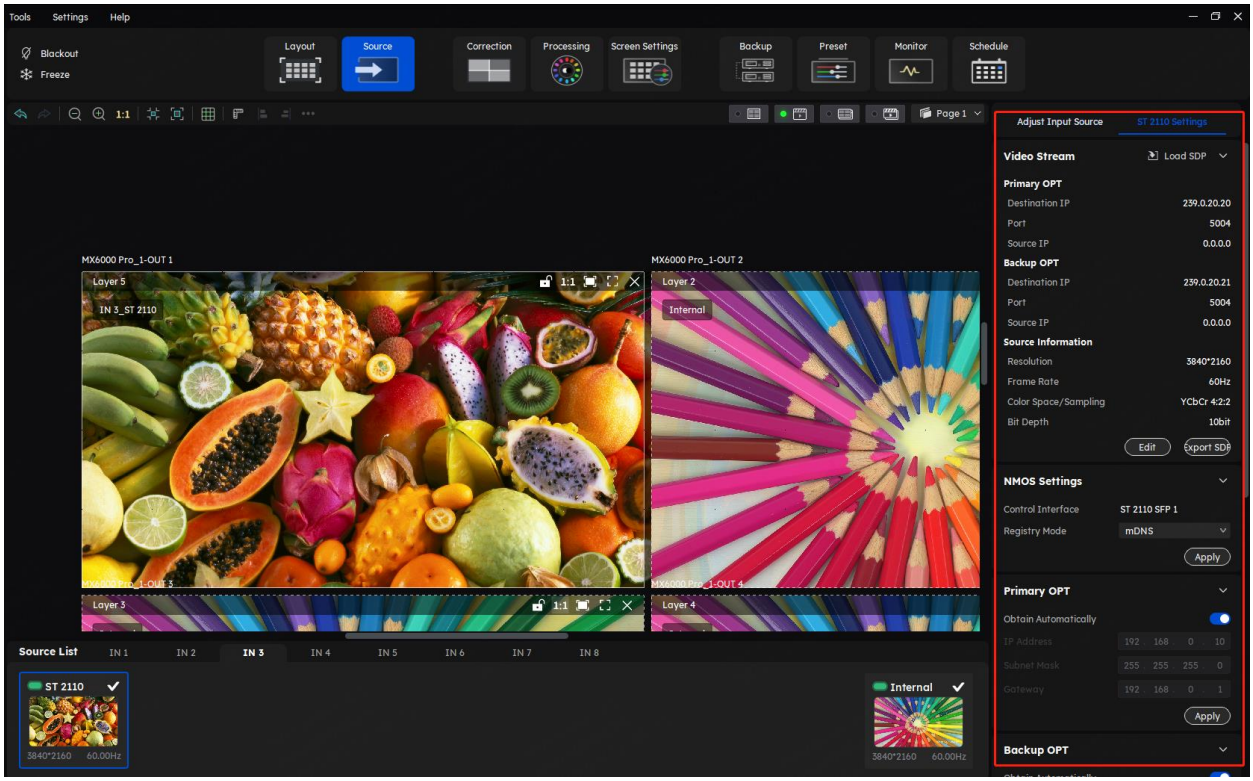
Applicable Products

MX6000 Pro, MX2000 Pro

Operating Procedure

Step 1 Select the ST 2110 input card from the source list and navigate to the **ST 2110 Settings** in the properties area on the right.

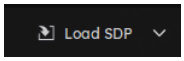
Figure 6-7 ST 2110 settings



Step 2 When using the MX_1×ST 2110 (100G) input card, you need to configure the channel in the **Interface Settings** area.

- 1*8K UHD: The maximum resolution for a single channel is 7680×4320@60Hz.
- 4*4K UHD: The maximum resolution for a single channel is 4096×2160@60Hz.

Step 3 Under the **Video Stream** section, you can set the ST 2110 port information using either of the following two methods.

- Method 1: Click 

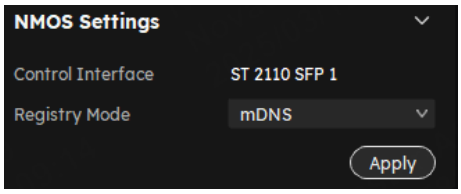
to load the SDP file for configuration.
- Method 2: Click **Edit** and fill in the below parameters to complete the OPT configuration. Once the setup is complete, you can export the current parameters as an SDP file.
  - Destination IP (primary/backup OPT ports)
  - Port (primary/backup OPT ports)
  - Source IP (primary/backup OPT ports)

- Select an option from the drop-down lists of **Resolution**, **Refresh Rate**, **Color Space/Sampling**, and **Bit Depth**. You can also set a custom resolution.

Step 4 In the **NMOS Settings** section, set the NMOS control interface and registry mode, then click **Apply**.

- Control Interface: Options include ETHERNET or ST 2110 SFP1.
- Registry Mode: Options include mDNS, DNS-SD, and Static.

Figure 6-8 NMOS



Step 5 Set the primary and backup OPT IP addresses for the ST 2110 input card under the **Primary OPT IP** and **Backup OPT IP** sections.

You can enter the IP address manually or simply toggle on **Obtain Automatically**. Remember to click **Apply** once you are done.

Notes

Please assign different subnet IP addresses to the optical ports on the ST 2110 card. Failure to do so may result in NMOS malfunctions due to network card routing issues.

Example: (SFP1: 192.168.0.20, SFP2: 192.168.1.20).

Step 6 Configure the input source synchronization under the **PTP** section.

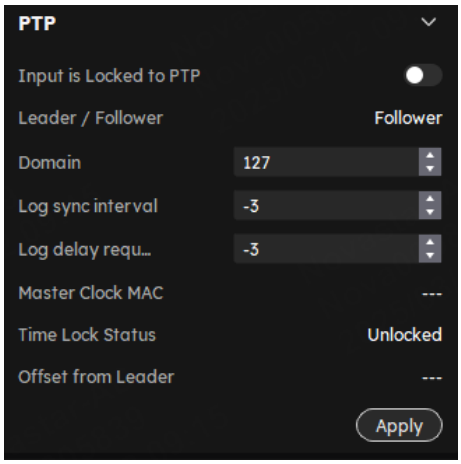
1. Enable or disable **Input is Locked to PTP**. Enabling this option allows for high-precision synchronization with the network's primary clock.
2. Configure the PTP parameters, including **Domain**, **Log sync interval**, and **Log delay request interval**.
3. Review the PTP status, which includes the **Master Clock MAC**, **Time Lock Status**, and **Offset from Leader**.

Note

If the **Time Lock Status** shows **Unlocked**, enabling **Input is Locked to PTP** may result in display abnormalities.

4. Remember to click **Apply** once you are done.

Figure 6-9 PTP



Step 7 Adjust the on/off status for **FEC Settings**.

Enabling this feature allows for automatic error detection and correction during data transmission, enhancing the reliability of video signal transmission.

Note

- Only supported by the MX_1×ST 2110 (25G) and MX_1×ST 2110 (100G) input cards.
- The FEC feature must be configured on the switch before it can be used.

Figure 6-10 FEC settings

Step 8 Review the IGMP multicast protocol version.

6.3 Set Internal Sources

Select the internal source and set the related parameters for screen testing and troubleshooting.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Operating Procedure

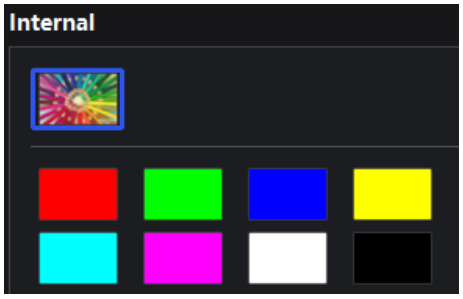
Step 1 Select a controller from the project list and then select **Source**.

Step 2 Double-click the thumbnail of internal source in the source list at the bottom of the page, or select **Internal Source** from the drop-down list next to **Select Source** in the properties area on the right.

Step 3 Select an image and set the **Grayscale**, **Gradient Stretch**, **Speed**, and **Space**. The adjustable parameters for each image may vary based on the interface.

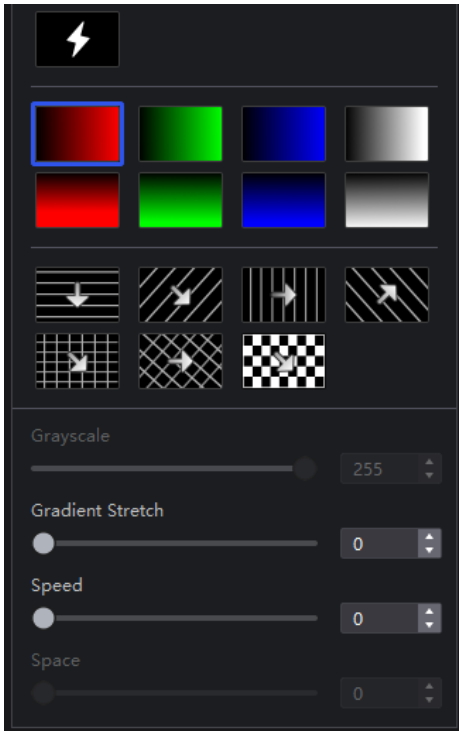
- Static images

These images come with VMP, as shown in the figure below.

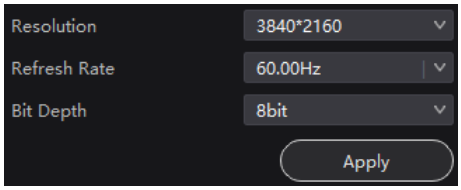


- Dynamic images

  These images come with VMP, as shown in the figure below.



Step 4 Set the resolution, frame rate and bit depth for the internal source.



Step 5 After the settings, click **Apply**.

7 Display Correction

This chapter describes output configuration with one device selected.

7.1 Seams

7.1.1 Correct Seams

Adjust the seams between cabinets or modules to improve the display effect.

Related Information

If brightness correction has been done for the screen, the screen brightness can be adjusted in nits. Otherwise, it can be adjusted only in percentage.

Operating Procedure

Step 1 Select a screen from the project list and then select **Correction**.

Step 2 On the **Seams** tab in the properties area, toggle on the **Seam Correction** ( ).

Note

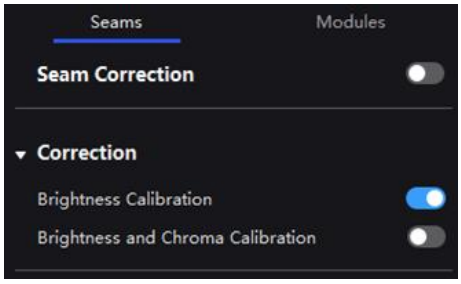
Currently, apart from the A10s Pro receiving card and its derivatives, the **Seam Correction** switch will not be displayed on this interface. In such case, simply toggling on the **Brightness Calibration** or **Brightness and Chroma Calibration** will ensure that the seam correction takes effect.

Step 3 Toggle on **Brightness Calibration** or **Brightness and Chroma Calibration** to view the correction effect.

- Brightness Calibration: Set the **Brightness Calibration** switch to to make the screen apply the calibration effect made by the calibration platform.
- Brightness and Chroma Calibration: Set the **Brightness and Chroma Calibration** switch to to make the screen apply the calibration effect made by the calibration platform.

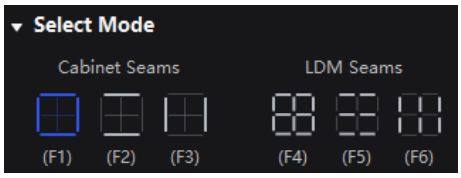
The **Brightness Calibration** and **Brightness and Chroma Calibration** are mutually exclusive.

Figure 7-1 Correction (seams)



Step 4 Select a correction mode.

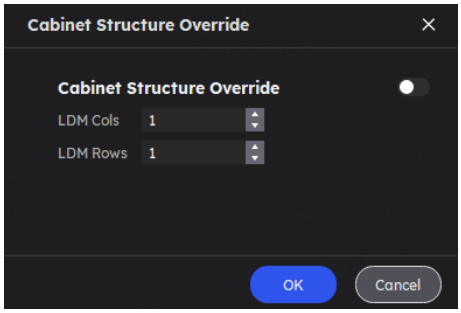
Figure 7-2 Select mode (seams)



- Cabinet Seams: Correct the seams of cabinets.
- LDM Seams: Correct the seams of modules.

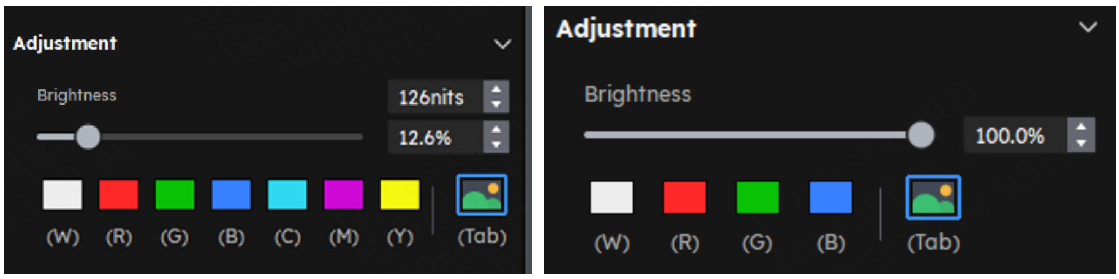
Step 5 When correcting the module seams, if you need to override the numbers of module columns and rows, click the ••• icon next to **Select Mode** and then perform the settings on the **Cabinet Structure Override** window. Otherwise, skip this step.

Figure 7-3 Cabinet structure override



Step 6 Set the screen display parameters and check the seam correction effect.

Figure 7-4 Adjustment (7-color/4-color)



- Brightness: Adjust the display brightness.
- Display image: Set the image displayed on the screen. By default, the current input source is being displayed ( ). You can switch to a monochrome display. The available colors depend on the model and version of the receiving card in use. Additionally, you can use the corresponding shortcut keys to switch between display modes.

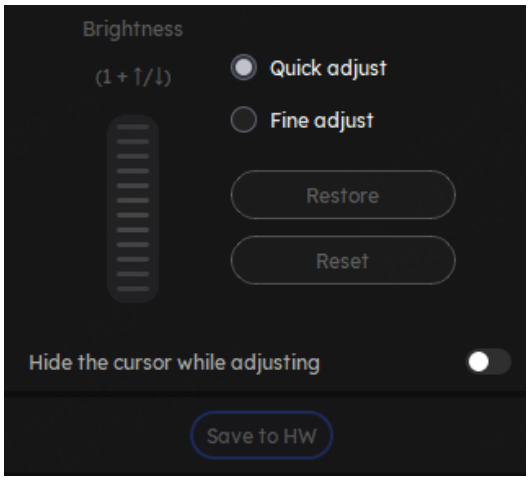
Note

You can only configure the displayed image for the currently selected page. All other pages will show a black screen.

Step 7 In the topology area, click or click and drag the mouse to select the seams to be corrected.

Step 8 Set the adjustment parameters.

Figure 7-5 Set the parameters



- Quick adjust: Has a large range of adjustment.
- Fine Adjust: Has a large range of adjustment.
- Hide cursor on screen: When this is enabled ( ), the cursor will not be displayed on the screen while adjusting brightness and chroma.

Step 9 Place the mouse on the scroll wheel icon and adjust the brightness by dragging the wheel icon up or down, scrolling the mouse wheel, or using the keyboard shortcuts **1**+**↑**/**↓**.

- Restore: Restore the configuration to the last saved.
- Reset: Reset the configuration to factory defaults.

Step 10 After the settings, click **Save**.

7.1.2 Erase Seam Correction

Related Information

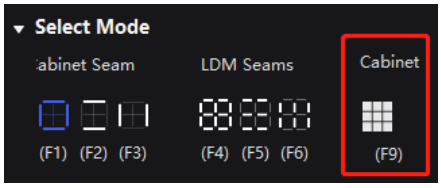
If there are any changes made to the cabinets, such as moving a receiving card from one cabinet to another or replacing the cabinet module, it may cause bright or dark lines that had been previously corrected to appear in the middle of the cabinet or module. In such cases, you have the option to remove the seam correction that was applied.

Operating Procedure

Step 1 Select a screen from the project list and then select **Correction**.

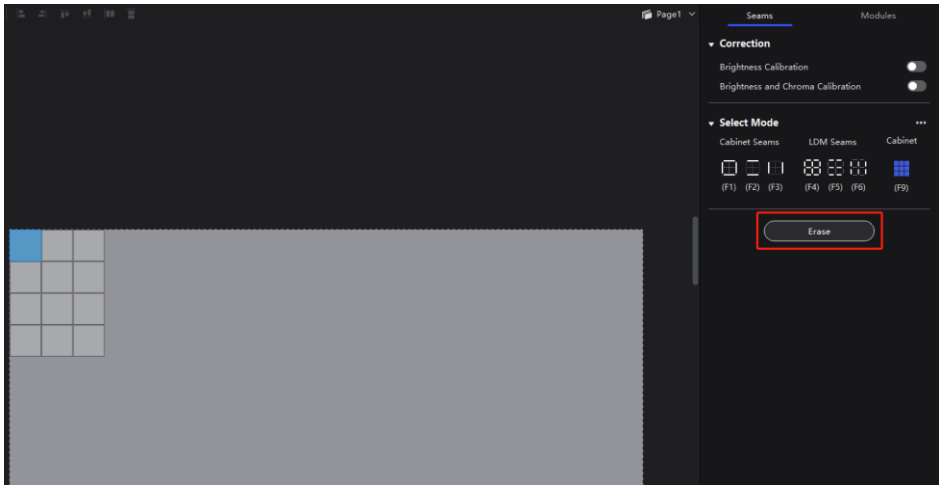
Step 2 Select the **Cabinet** mode.

Figure 7-6 Select mode (cabinet)



Step 3 Select the target cabinets and then click **Erase** to remove the seam correction that was applied to them. The erasion will be automatically saved to the hardware once you are done.

Figure 7-7 Erase seam correction



7.2 Correct Multi-Batch Cabinets/Modules

Adjust the chroma of cabinets or modules from multiple batches to make the overall chroma of the display more balanced and uniform.

Applicable Products

The adjustable range varies depending on the model and version of the receiving card.

- 7-color multi-batch adjustment: Supported by XA50 Pro, CA50E, A10s Pro and its derivatives (version V1.5.3.0 and above).
- 4-color multi-batch adjustment: Supported by A5s Plus, A7s Plus, A8s-N, A8s Pro and its derivatives, and B6s (version V1.3.0.0 and above).

Related Information

- When performing the adjustments, note that the 7-color multi-batch adjustment uses an independent matrix adjustment and will not affect the calibration coefficients. In contrast, the 4-color multi-batch adjustment is coupled with the calibration coefficients, and adjustments may slightly influence these coefficients.
- If brightness correction has been done for the screen, the screen brightness can be adjusted in nits. Otherwise, it can be adjusted only in percentage.

7-color Multi-batch Adjustment

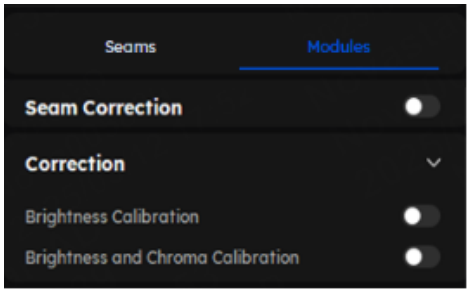
Step 1 Select a screen from the project list and then select **Correction**.

Step 2 On the **Modules** tab in the properties area, toggle on **Multi-batch** ( ).

Step 3 Toggle on **Brightness Calibration** or **Brightness and Chroma Calibration** to view the correction effect.

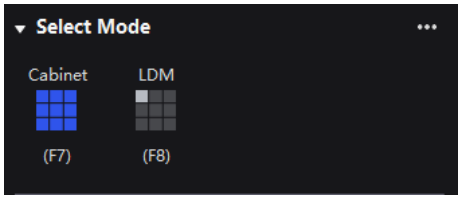
- Brightness Calibration: Set the **Brightness Calibration** switch to to make the screen apply the calibration effect made by the calibration platform.
- Brightness and Chroma Calibration: Set the **Brightness and Chroma Calibration** switch to to make the screen apply the calibration effect made by the calibration platform.

Figure 7-8 Correction (modules)



Step 4 Select a correction mode.

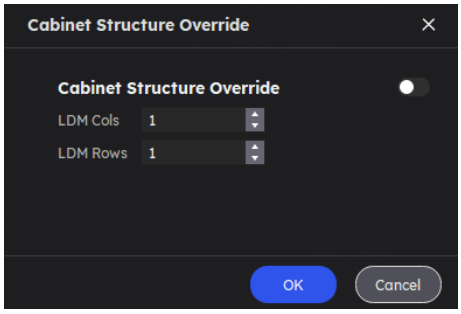
Figure 7-9 Select mode (modules)



- Cabinet: Correct the multi-batch cabinets.
- Module: Correct the multi-batch modules.

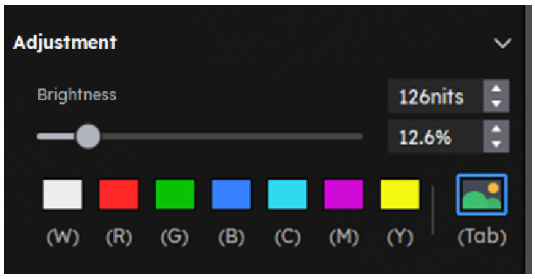
Step 5 When correcting multi-batch modules, if you need to override the numbers of module columns and rows, click the icon next to **Select Mode** and then perform the settings on the **Cabinet Structure Override** window. Otherwise, skip this step.

Figure 7-10 Cabinet structure override



Step 6 Set the screen display parameters and check the display effect.

Figure 7-11 Adjustment (modules)



- Brightness: Adjust the display brightness.
- Display image: Set the image displayed on the screen. By default, the current input source is being displayed ( ). You can switch to a monochrome display in white, red, green, blue, cyan, magenta and yellow. To do so, simply press the shortcut keys W, R, G, B, C, M, Y, and Tab.

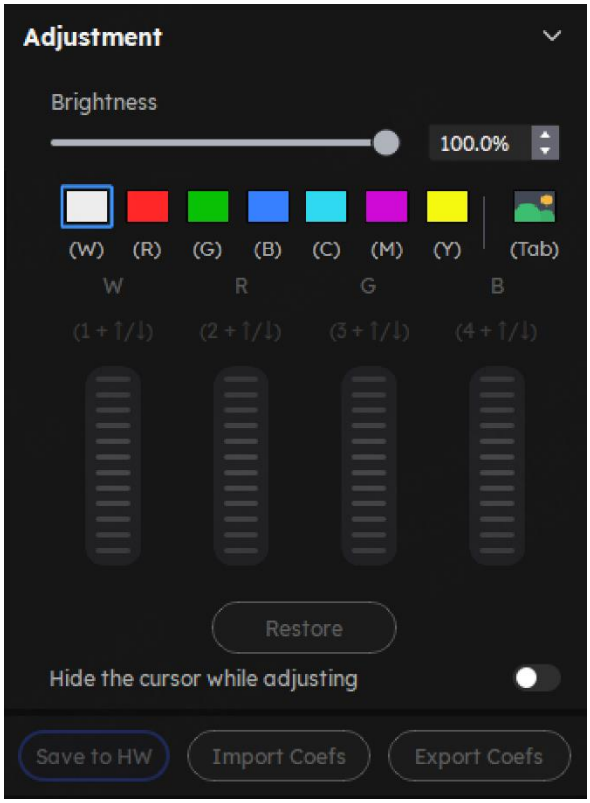
Note

You can only configure the displayed image for the currently selected page. All other pages will show a black screen.

Step 7 In the topology area, click or click and drag the mouse to select the cabinets or modules to be corrected.

Step 8 Adjust the parameters. Different colors have different adjustment parameters. Place the mouse on the scroll wheel icon and adjust the brightness by dragging the wheel icon up or down, scrolling the mouse wheel, or using the keyboard shortcuts **1**+↑/↓.

Figure 7-12 Adjustment (White/Red/Blue/Green/Cyan/Magenta/Yellow)



- Restore: Restore the configuration for the current color to the last saved.
- Restore All: Restore the configuration for all colors to the last saved.

- Restore to Last Saved: Restore the configuration to the last saved.
- Hide cursor on screen: When this is enabled ( ), the cursor will not be displayed on the screen while adjusting brightness and chroma.
- Import Coefs: Import the existing correction coefficients to the current cabinet/module.
- Export Coefs: Export the correction coefficients of the current cabinet/module.

Once a cabinet's parameters are set, you can right-click to copy the current cabinet's parameters and paste them to other cabinets. Alternatively, use the shortcuts **Ctrl+C** to copy and **Ctrl+V** to paste.

Step 9 Click **Save** once you are done to save the configuration to the receiving card.

4-color Multi-batch Adjustment

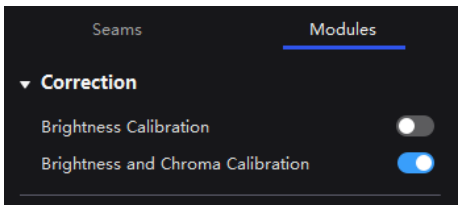
Step 1 Select a screen from the project list and then select **Correction**.

Step 2 On the **Modules** tab in the properties area, you can enable the correction switches including **Brightness Calibration** and **Brightness and Chroma Calibration** to view the correction effect.

- Brightness Calibration: Set the **Brightness Calibration** switch to to make the screen apply the calibration effect made by the calibration platform.
- Brightness and Chroma Calibration: Set the **Brightness and Chroma Calibration** switch to to make the screen apply the calibration effect made by the calibration platform.

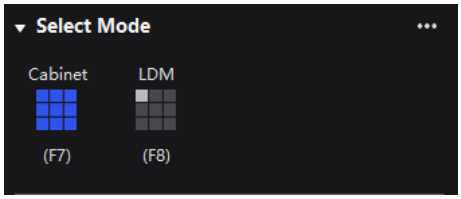
The **Brightness Calibration** and **Brightness and Chroma Calibration** are mutually exclusive.

Figure 7-13 Correction (modules)



Step 3 Select a correction mode.

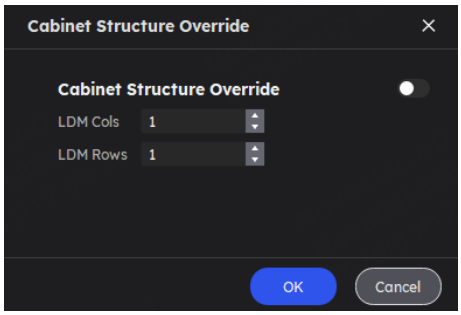
Figure 7-14 Select mode (modules)



- Cabinet: Correct the multi-batch cabinets.
- Module: Correct the multi-batch modules.

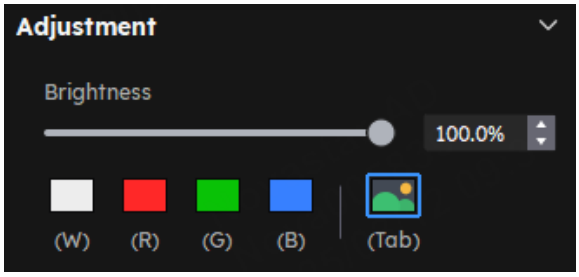
Step 4 When correcting multi-batch modules, if you need to override the numbers of module columns and rows, click the ••• icon next to **Select Mode** and then perform the settings on the **Cabinet Structure Override** window. Otherwise, skip this step.

Figure 7-15 Cabinet structure override



Step 5 Set the screen display parameters and check the display effect.

Figure 7-16 Screen Control



- Brightness: Adjust the display brightness.
- Display image: Set the image displayed on the screen. By default, the current input source is being displayed. You can switch to a monochrome display in white, red, green, and blue.

  To do so, simply press the shortcut keys W, R, G, B, and Tab.

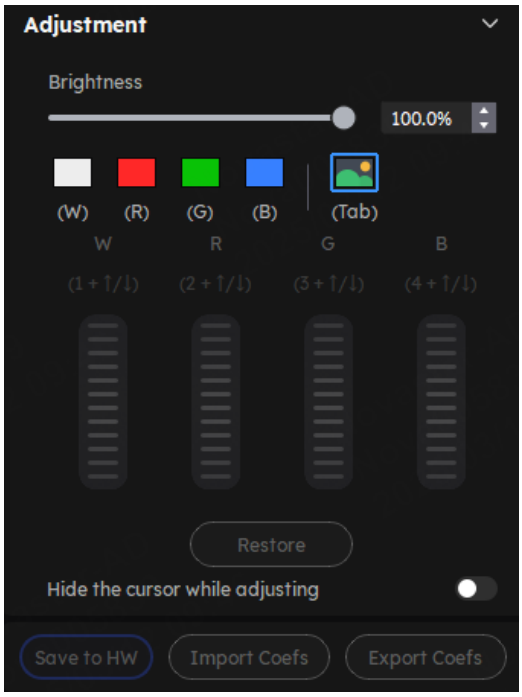
Note

You can only configure the displayed image for the currently selected page. All other pages will show a black screen.

Step 6 In the topology area, click or click and drag the mouse to select the cabinets or modules to be corrected.

Step 7 Adjust the parameters. Different colors have different adjustment parameters. Place the mouse on the scroll wheel icon and adjust the brightness by dragging the wheel icon up or down, scrolling the mouse wheel, or using the keyboard shortcuts **1**+↑/↓.

Figure 7-17 Adjustment (White/Red/Blue/Green)



- Restore to Last Saved: Restore the configuration to the last saved.
- Hide cursor on screen: When this is enabled ( ), the cursor will not be displayed on the screen while adjusting brightness and chroma.
- Import Coefs: Import the existing correction coefficients to the current cabinet/module.
- Export Coefs: Export the correction coefficients of the current cabinet/module.

  Once a cabinet's parameters are set, you can right-click to copy the current cabinet's parameters and paste them to other cabinets. Alternatively, use the shortcuts **Ctrl+C** to copy and **Ctrl+V** to paste.

Step 8 Click **Save** once you are done to save the configuration to the receiving card.

8 Color Processing

This chapter describes output configuration with one device selected.

8.1 Color Replacement

Replace a color with another color according to the settings.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, CX40 Pro

Notice

Replacement of highly saturated colors is recommended for better effect.

Operating Procedure

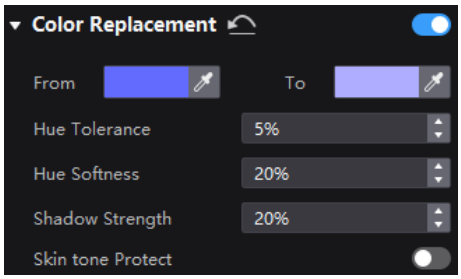
Step 1 Select a screen from the project list and then select **Processing**.

Step 2 Set the **Color Replacement** switch to .

Step 3 Set the colors before and after replacement.

- Method 1: Click the color area in to open the color palette and set a color.
- Method 2: Click the eyedropper in and select a color in the topology area.

Figure 8-1 **Color replacement**



Step 4 Set **Hue Tolerance**, **Hue Softness**, **Shadow Strength**, and **Skin Tone Protect**.

- Hue Tolerance: Indicates the hue range of the color to be replaced. The larger the value, the larger the replacement area
- Hue Softness: Indicates the hue softness of the transition area.
- Shadow Strength: Indicates the gradient parameter of the highlight or shadow area. The larger the value, the smoother the gradient.
- Skin Tone Protect: Keeps the skin tone as original as possible.

8.2 14Ch Color Correction

Precisely adjust the hue, saturation and brightness of black, white, and the 12 derived standard colors of the red, green and blue primary colors.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, CX40 Pro

Operating Procedure

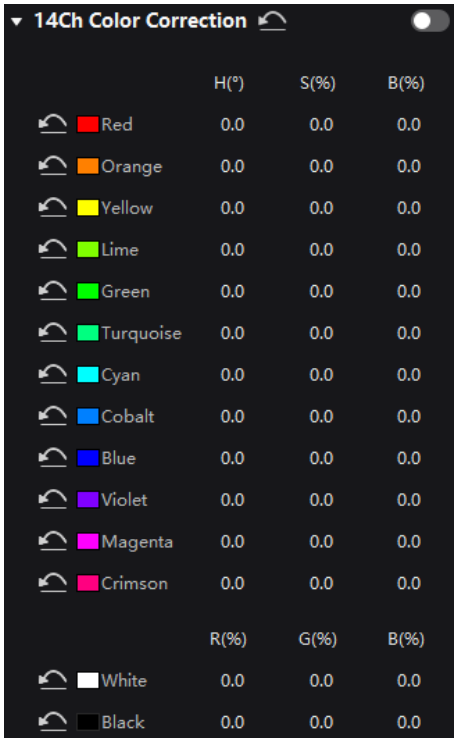
Step 1 Select a screen from the project list and then select **Processing**.

Step 2 Set the **14h Color Correction** switch to .

Step 3 Click a value of a color to enable the editing status and change the value.

Parameter	Change Trend
Hue (H)	Positive value: The hue angle changes counterclockwise.
	Negative value: The hue angle changes clockwise.
Saturation (S)	Decrease to -100%: The 12 colors are gradually diluted.
	Increase to +100%: The 12 colors are more vivid and rich.
Brightness (B)	Decrease to -100%: The 12 colors gradually darken.
	Increase to +100%: The 12 colors are brighter, and the colors seems to be diluted.

Figure 8-2 14Ch color correction



8.3 Set Color Curves

This feature allows you to quickly adjust image brightness and color tone, customize the response curves for red, green, blue, and white, and fine-tune highlights and shadows independently. It ensures that highlights are not overexposed and that low-grey areas retain rich details. Additionally, you can use this feature to make precise tweaks to the screen display, compensating for variations due to ambient light or camera performance.

Applicable Products

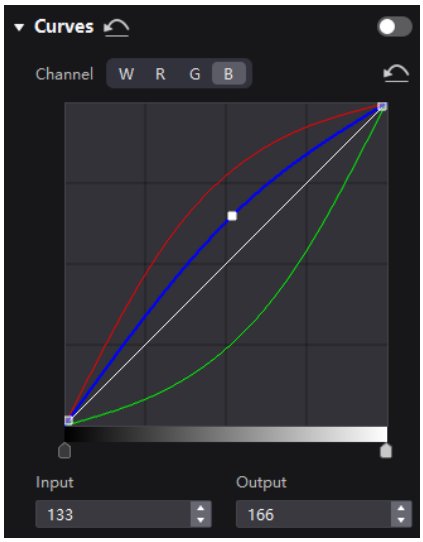
MX6000 Pro, MX2000 Pro, MX40 Pro, CX40 Pro

Operating Procedure

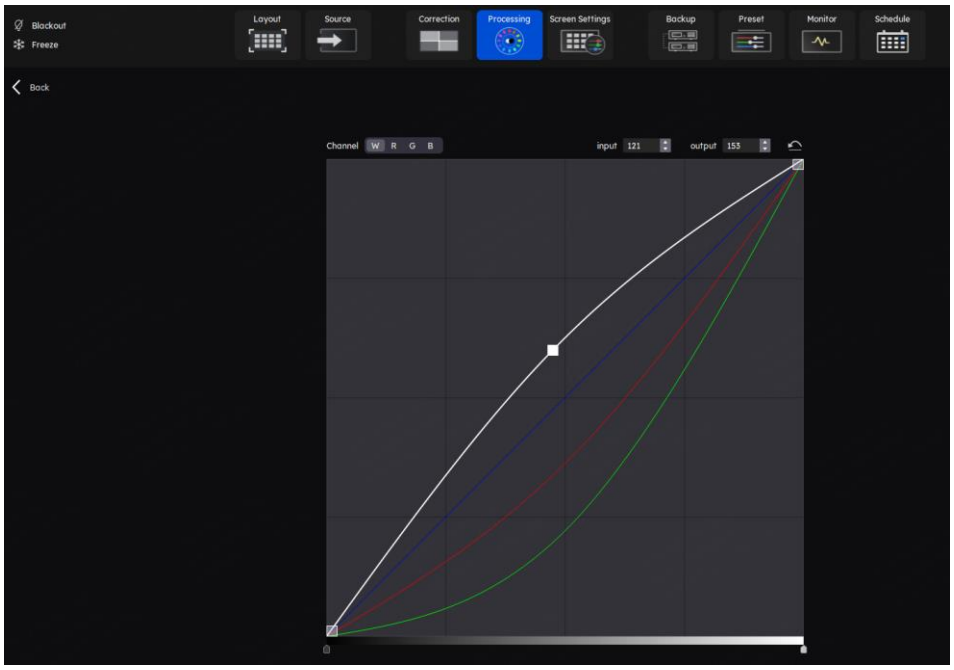
Step 1 Select a screen from the project list and then select **Processing**.

Step 2 Set the **Curve** switch to .

Figure 8-3 Curves



Step 3 (Optional) Click to enter full-screen mode. This will expand the curve adjustment section to the center of the screen, making it easier to fine-tune details.



Step 4 Select the white, red, green or blue channel.

Step 5 Drag the slider at the bottom of the curve diagram to set the curve adjustment range.

Step 6 Click anywhere on the curve to add an adjustment point and drag the point to adjust the curve.

Input and **Output** indicate the absolute coordinates of the adjustment point in the curve diagram.

To delete the adjustment point, drag the point outside the curve diagram, or select the point and press **Delete**.

Click the icon at the right of **Channel** to reset the curve of the current channel. Click the icon next to **Curves** to reset all the curves.

8.4 Enable 3D LUT

A set of mapping relationships are defined in the 3D LUT file (.cube) to adjust the colors of the video source. It is commonly used in the film and image processing industries. With this feature, you can change target colors without affecting neutral gray and other colors, which eliminates the issue of layer merging and maintains smooth color transitions. Additionally, this feature provides precise control over the entire color space, offering more accurate colors and enhancing the overall effect.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, CX40 Pro

Prerequisites

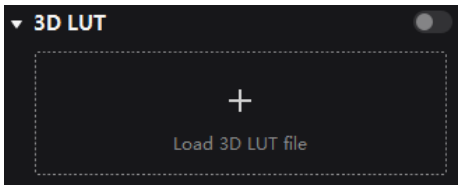
Please prepare a 3D LUT file in the .cube format with a file precision of either 17×17×17, 33×33×33, or 65×65×65.

Operating Procedure

Step 1 Select a screen from the project list and then select **Processing**.

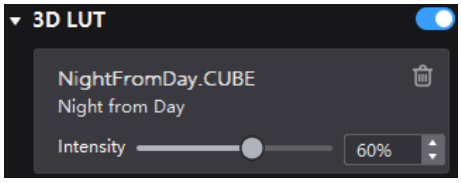
Step 2 Click anywhere in the **Load 3DLUT File** area, select a file and open it.

Figure 8-4 Loading 3D LUT file



Step 3 Set the **3D LUT** to and drag the slider to adjust the strength of the 3D LUT.

Figure 8-5 Adjusting intensity



To delete the file, click .

8.5 Enable Dynamic Booster

Dynamic Booster can significantly improve the display contrast and image details for better visual experience and effectively control and lower the display power consumption.

Applicable Products

- LED display controllers: MX40 Pro, CX40 Pro
- Receiving cards: XA50 Pro, CA50E, A10s Pro and its derivatives.

Prerequisites

Before the operation, color gamut and brightness correction by using the CA410-VP427, CA410-P427 or CA410-P427H colorimeter must be done. Otherwise, the Dynamic Booster switch is grayed out and the function is unavailable.

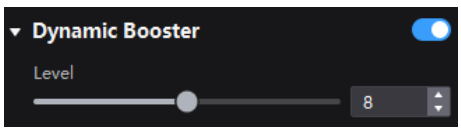
Operating Procedure

Step 1 Select a screen from the project list and then select **Processing**.

Step 2 Set the **Dynamic Booster** switch to .

Step 3 Drag the slider to adjust the intensity of applying the Dynamic Booster.

Figure 8-6 Dynamic Booster



9 Screen Settings

9.1 Adjust Image Quality

9.1.1 Adjustment Mode

Switch the cabinet display mode to let the screen of the same specifications have the optimal display effect under different application scenarios.

Prerequisites

The NCP file is uploaded, and the NCP files of the receiving card and the controller must match. For details, see 16.2 Manage Cabinet Library.

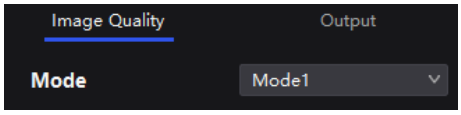
Operating Procedure

Step 1 Select a screen from the project list and then select **Screen Settings**.

Step 2 On the **Image Quality** tab, select a mode based on the application scenario to let the screen have the optimal display effect.

Support mode switching when using different sizes of cabinets of the same batch with different specifications under a single Ethernet port.

Figure 9-1 Mode



9.1.2 Adjust Brightness and Gamma

Manually adjust the screen brightness, gamma, and brightness components to change the brightness performance of the display in real-time. You can also set the maximum brightness as needed and toggle Brightness Overdrive on or off.

Prerequisites

To use the brightness overdrive function, please make sure the NCP file is uploaded, and the NCP files of the receiving card and the controller must match. For details, see 16.2 Manage Cabinet Library.

Related Information

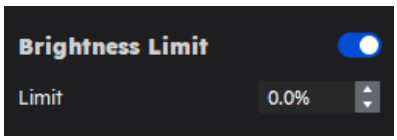
If brightness correction has been done for the screen, the screen brightness can be adjusted in nits. Otherwise, it can be adjusted only in percentage.

Operating Procedure

Step 1 Select a screen from the project list and then select **Screen Settings**.

Step 2 On the **Image Quality** tab, click ••• to open the pop-up window. Here, you can enable or disable the Brightness Limit and set the limit value.

Figure 9-2 Brightness limit



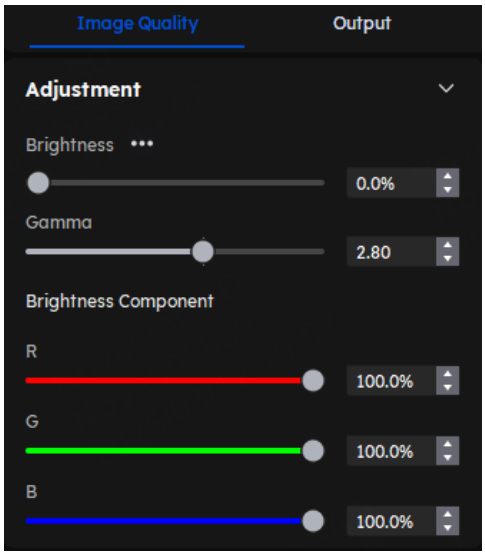
Step 3 Enable or disable **Brightness Overdrive** based on on-site needs.

After calibration, some brightness is usually lost. By enabling Brightness Overdrive, the screen's brightness can be restored to its pre-calibration levels. If higher brightness is desired for improved HDR effects, this feature can compensate for the lost brightness, making specific content like starry skies appear especially bright.

Step 4 Adjust the values for brightness, gamma, and the RGBW brightness components.

Only receiving cards such as XA50 Pro, CA50E, A10s Pro and its derivatives (version V1.5.3.0 and later) support RGBW component adjustment.

Figure 9-3 Adjustment



9.1.3 Set LED Image Booster

Set the LED Image Booster function to improve the delicacy and accuracy of the image color and gradation and realize free switching of the display color gamut.

Applicable Products

- LED display controllers: MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro
- Receiving cards: A10s Pro and its derivatives, A8s, A8s-N, XA50 Pro, CA50E

Prerequisites

Before the operation, color gamut and brightness correction by using the CA410-VP427, CA410-P427 or CA410-P427H colorimeter must be done.

Operating Procedure

Step 1 Select a screen from the project list and then select **Screen Settings**.

Step 2 Select the **Image Quality** tab on the **Screen Settings** page. In the **LED Image Booster** area on the right, select an output color gamut from the **Gamut** drop-down list.

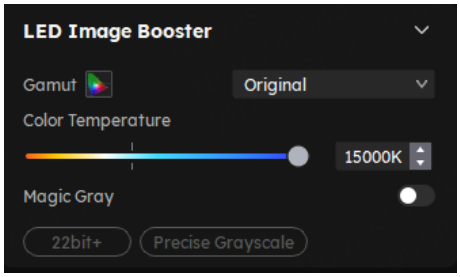
The output gamut options include standard gamuts, custom gamuts, the original screen gamut and the input gamut (**From input**).

To set the custom gamut, click  , select a gamut in the properties area on the color gamut diagram, and adjust the red, green, blue and white parameters based on the selected gamut. The custom gamut name can be changed.

Step 3 Drag the slider to adjust color temperature.

Step 4 Enable or disable **Magic Gray** as needed.

Figure 9-4 LED Image Booster



9.1.4 Set Thermal Compensation

Adjust the application intensity of the thermal coefficients.

Applicable Products

- LED display controllers: MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro
- Receiving cards: A10s Pro and its derivatives, A8s, A8s-N, XA50 Pro, CA50E

Prerequisites

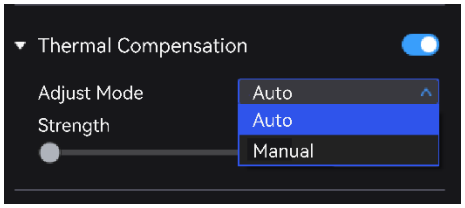
Before operation, it is necessary to complete the thermal calibration of the screen. Use the Cabinet Tool to create an NCP file containing thermal coefficients and upload it. The thermal compensation interface may vary depending on the receiving card model and the settings in the NCP file.

Operating Procedure

Step 1 Select a screen from the project list and then select **Screen Settings**.

Step 2 On the **Image Quality** tab, set the **Thermal Compensation** switch to .

Figure 9-5 Thermal Compensation - Auto/Manual



Step 3 Adjust the thermal compensation coefficient using either manual or automatic mode.

- Automatic: The system automatically generates the thermal coefficient application strength based on the screen status, eliminating the need for manual adjustments.
- Manual: Adjust the application strength of the thermal coefficient by dragging the slider.

9.1.5 Adjust EOTF

Applicable Products

- LED display controllers: MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro
- Receiving cards: A10s Pro and its derivatives, A8s, A8s-N, XA50 Pro, CA50E

Related Information

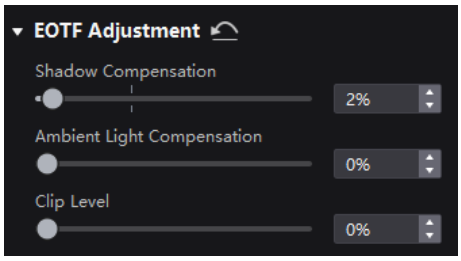
The supported adjustment parameters depend on the HDR settings.

Operating Procedure

Step 1 Select a screen from the project list and then select **Screen Settings**.

Step 2 In the **Image Quality** tab, drag the sliders to adjust the values of **Shadow Compensation**, **Ambient Light Compensation** and **Clip Level**.

Figure 9-6 EOTF adjustment



9.2 Set Output

9.2.1 Set Video Parameters

Set the output bit depth and additional frame latency.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20 (output bit depth is fixed at 8-bit), CX40 Pro

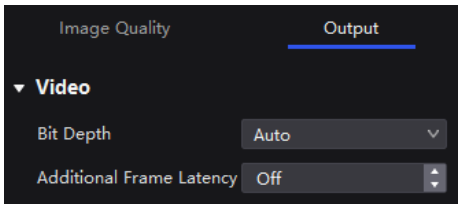
Operating Procedure

Step 1 Select a screen from the project list and then select **Screen Settings**.

Step 2 In the Output tab, select an option from the drop-down list of **Bit Depth**.

If **Auto** is selected, the output bit depth is the same as the input bit depth.

Figure 9-7 Output bit depth



Step 3 Set a value for **Additional Frame Latency**.

When the controller works with high-latency devices, you can set additional frame latency.

Note

It is not possible to set Additional Frame Latency when Low Latency is enabled.

9.2.2 Set Sync Parameters

Set the sync source and phase offset.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

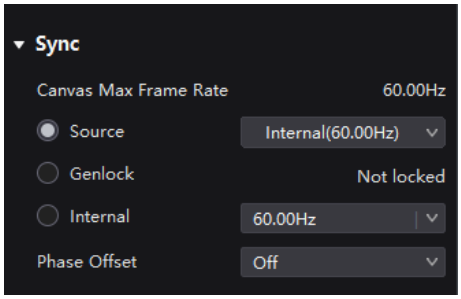
Operating Procedure

Step 1 Select a screen from the project list and then select **Screen Settings**.

Step 2 Select the **Output** tab.

Step 3 Select a synchronization signal for the display frame rate and set the phase offset.

Figure 9-8 Sync



- Canvas Max Frame Rate: This displays the maximum frame rate of the current output card's canvas. If all canvases have the same maximum frame rate, it will show the value. If the frame rates are different, it will display **Mix**.
- Source: Sync with the frame rate of the active source.
- Genlock: Sync with the frame rate of the Genlock signal. When the shutter fit function of the controller is effective, please select this option. In addition, the controller and the camera need to use the same Genlock signal generator.
- Internal: Sync with the frame rate of the controller's internal clock.

Note

- When low latency is enabled, setting the sync source to Genlock and adjusting phase offset are not supported.
- The Genlock parameter adjustment only takes effect on the selected controller, while other output adjustments applies to all controllers of the screen.

9.2.3 Set Frame Multiplication

Frame multiplication can make the screen output multiple frames within the original one frame time and provide them to different cameras.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, CX40 Pro

Related Information

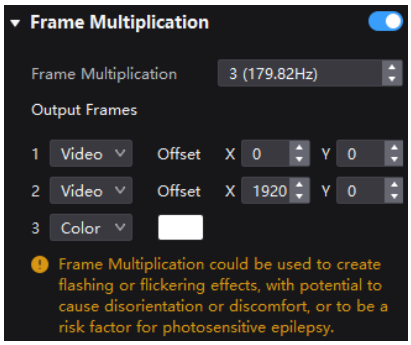
- Frame multiplication, low latency, and 3D cannot be enabled at the same time.
- MX6000 Pro and MX2000 Pro are capable of supporting a max frame rate of 480 Hz when using the XA50 Pro, CA50E, and A10s Pro and its derivatives receiving cards.
- MX40 Pro is capable of supporting a max frame rate of 240 Hz when using the A10s Pro and its derivatives receiving cards.
- CX40 Pro is capable of supporting a max frame rate of 240 Hz when using the XA50 Pro and CA50E receiving cards.
- The specific maximum frame rate that can be set is related to the hardware configuration of the screen.

Operating Procedure

Step 1 Select a screen from the project list and then select **Screen Settings**.

Step 2 Select the **Output** tab and set **Frame Multiplication** to .

Figure 9-9 Frame multiplication



Step 3 Set the number of frames and the display mode of each frame.

Take the above figure as an example. The parameters are described as follows:

- Frame Multiplication: After the current frame rate (59.94) is multiplied by 3, it is 179.82 Hz. Three frames are output in 1/59.94 second.
- Video: The first and second frames display the input source image. The first frame displays the image from the coordinates (0, 0) and the second frame displays the image from the coordinates (1920, 0).
- Color: The third frame displays a pure white image.

9.2.4 Set Shutter Fit

Adapt the screen and camera shutter to produce better filming results.

Applicable Products

- LED display controllers: MX6000 Pro, MX2000 Pro, MX40 Pro, CX40 Pro
- Receiving cards: XA50 Pro, CA50E, A10s Pro and its derivatives.

Prerequisites

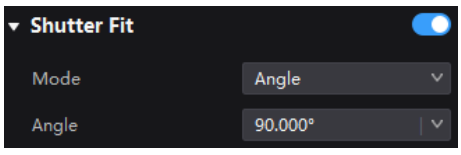
It requires that the sync signal must be Genlock and the controller and camera need to use the same Genlock signal generator.

Operating Procedure

Step 1 Select a screen from the project list and then select **Screen Settings**.

Step 2 Select the **Output** tab and set **Shutter Fit** to .

Figure 9-10 Shutter fit



Step 3 Set the relevant parameters.

9.2.5 Enable 3D Function

Enable the 3D function and set the related parameters for users wearing 3D glasses to view stereoscopic images.

Applicable Products

- LED display controllers: MX6000 Pro, MX2000 Pro, MX40 Pro, CX40 Pro
- 3D emitters: EMT200 Pro (5G/1G), EMT200 (1G)

Notice

The 3D function and the low latency or frame multiplication function cannot be enabled at the same time.

Related Information

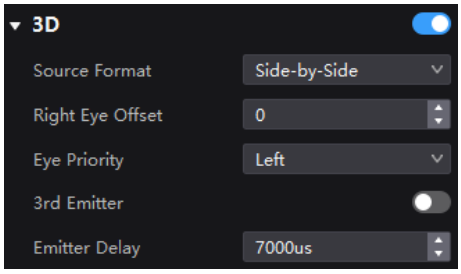
To use the 3D function, specified 3D glasses are needed. Please contact NovaStar technical support.

Operating Procedure

Step 1 Select a screen from the project list and then select **Screen Settings**.

Step 2 Select the **Output** tab and set **3D** to .

Figure 9-11 3D



Step 3 Set the parameters.

- Source Format: Set the format of the 3D video source. Set the format to **Side-by-side**, **Top-and-bottom** or **Frame sequential** according to the format of the accessed video source.
- Right Eye Offset: Set the start position of the right eye image. When the video source format is side-by-side or top-and-bottom and the left and right eye images are provided, this parameter can be set.
- Eye Priority: Set which image is sent first, the right eye image or the left eye image. Wear the 3D glasses to watch the display. If the display is abnormal, set the parameter value to the other one. If the display is normal, the setting is done.
- Custom Emitter: When a third-party 3D signal emitter is used, set the switch to .
- Emitter Delay: Set the delay time of sending the synchronization signal from the 3D signal emitter to the 3D glasses. This setting ensures that the switching between left and right eye images of the 3D glasses is in sync with the switching between the left and right eye images on the display. This parameter is applicable to both the NovaStar and third-party emitters.

9.2.6 Enable SPDIF Audio

You can select one of the connected input sources for audio output.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Please note that some interfaces/input cards may not support SPDIF audio output on certain controllers. The specifics are as follows:

Controller	Interface/Input Card	Audio Output
KU20	HDMI1.3	Supported
MX20	HDMI1.3	Supported
	3G-SDI	Not supported
MX30	HDMI2.0, HDMI 1.4, DP 1.1	Supported
	3G-SDI	Not supported
MX40 Pro	HDMI 2.0_2, HDMI 2.0_3	Supported
	HDMI 2.0_1, DP 1.2, 12G-SDI	Not supported
CX40 Pro	HDMI 2.0_2	Supported
	HDMI 2.0_1, DP 1.2, 12G-SDI	Not supported
MX6000 Pro, MX2000 Pro	4×HDMI 2.0, 4×DP 1.2, 2×HDMI 2.1, 2× DP 1.4, 1×HDMI 2.1+ 1×DP 1.4	Supported
	1xDP 1.4 (8K@60 Hz), 4x12G SDI, 1xST 2110 (25G), 2xST 2110 (25G), 1xST 2110 (100G)	Not supported

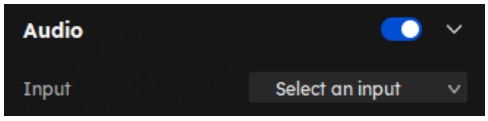
Operating Procedure

Step 1 Select a screen from the project list and then select **Screen Settings**.

Step 2 Select the **Output** tab and set **Audio** to .

Step 3 Click the drop-down menu next to **Input** and select one of the connected input sources as output audio.

Figure 9-12 Audio



9.2.7 Check the Load

Check the capacity usage of each Ethernet port of the controller.

Applicable Products

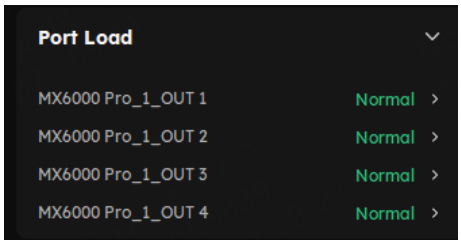
MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Operating Procedure

Step 1 Select a screen from the project list and then select **Screen Settings**.

Step 2 Select the **Output** tab. Under **Port Load**, click › next to the controller information to check the usage of the controller's load capacity.

Figure 9-13 Port load



10 Backup Settings

10.1 Controller Backup

You can configure controller-level hot backup for controllers within the same screen, enabling the backup controller to take over as the primary controller in case of a failure.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Prerequisites

- A primary controller can only have one backup controller.
- The primary and backup controllers must be of the same model and firmware version. For card-cased controllers (MX6000 Pro and MX2000 Pro), please also make sure the number, slot, model, and firmware version of the daughter cards also match.
- Controller backup and Ethernet port backup are mutually exclusive. You can only configure one type of backup at a time. For card-cased controllers (MX6000 Pro and MX2000 Pro), controller backup, card backup, and Ethernet port backup are all mutually exclusive. However, controllers that have not been backed up support simultaneous configuration of card backup and Ethernet port backup.

Related Information

- Controller backup parameter synchronization:

  1. When creating a controller backup, the backup controller will synchronize with the primary controller's data.
  2. Upon power cycling the primary/backup controller, it will sync data with the counterpart device.

  Note

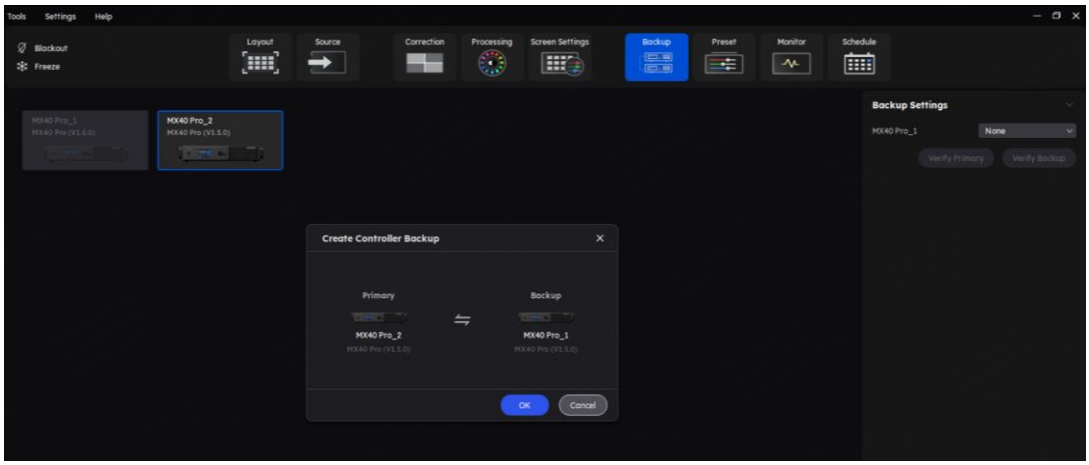
  If a controller goes offline and back online due to a disconnected Ethernet cable, the parameters will not be synchronized between the controllers.

- When controller backup is set up, only the primary controller can detect multifunction card and light sensor information. The backup controller does not support detecting or reading this information.

Operating Procedure

Step 1 Select a screen from the project list and then select **Backup**.

Figure 10-1 Controller backup



Step 2 All controllers of the screen will be shown in the canvas area. You can drag and drop a controller onto another to establish a backup relationship.

The controller being dragged is considered the backup, while the one being dropped onto becomes the primary. Upon dropping, a pop-up window will appear showing information about the primary and backup controllers. If everything is correct, simply click **OK**.

Step 3 Click **Verify Primary** or **Verify Backup** to examine whether the controllers are working properly.

- Verify Primary: Disconnect the backup and examine whether the primary is working properly.
- Verify Backup: Disconnect the primary and examine whether the backup is working properly.

10.2 Card Backup

You can configure card-level hot backup for output cards within the same screen, enabling the backup card to take over as the primary card in case of a failure.

Applicable Products

MX6000 Pro, MX2000 Pro

Prerequisites

- The primary and backup output cards must be of the same model and firmware version.
- Controller backup and card backup are mutually exclusive. You can only configure one type of backup at a time.

Related Information

When backup is set for the cards, only the primary card can detect multifunction card and light sensor information. The backup cards cannot detect or read this information.

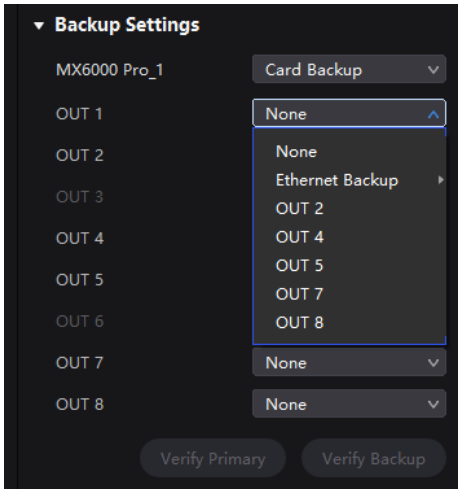
Operating Procedure

Step 1 Select a screen from the project list and then select **Backup**.

Step 2 In the **Backup Settings** section, select **Card Backup** from the dropdown menu.

Step 3 Set a backup card for the primary.

Figure 10-2 Card backup



Step 4 Click **Verify Primary** or **Verify Backup** to examine whether the controllers are working properly.

- Verify Primary: Disconnect the backup and examine whether the primary is working properly.
- Verify Backup: Disconnect the primary and examine whether the backup is working properly.

10.3 Ethernet Port Backup

You can configure Ethernet port hot backup within the same controller or output card, enabling the backup port to take over as the primary port in case of a failure.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Prerequisites

Controller backup and Ethernet port backup are mutually exclusive. You can only configure one type of backup at a time.

Related Information

When Ethernet port backup is set up, only the primary port can detect multifunction card and light sensor information. The backup ports cannot detect or read this information.

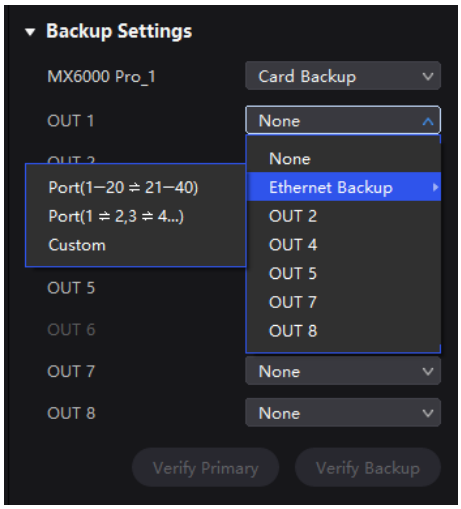
Operating Procedure

Step 1 Select a screen from the project list and then select **Backup**.

Step 2 In the **Backup Settings** section, select **Ethernet Backup** from the dropdown menu.

For card-cased controllers (MX6000 Pro and MX2000 Pro), you need to first select **Card Backup** before configuring Ethernet port backup for the cards.

Figure 10-3 Ethernet port backup



Step 3 Select an option from the sub-menu of **Ethernet Backup**.

- Port (1~20) ⇌ (21~40): Split Backup where Ethernet ports 21 to 40 are the backups to Ethernet ports 1 to 20.
- Port (1 ⇌ 2, 3 ⇌ 4...): Sequential Backup where Ethernet port 2 is the backup to Ethernet port 1, Ethernet port 4 is the backup to Ethernet port 3, and so on.
- Custom: Select a controller or output card from the project list, and then you can drag and drop the port icon in the port list to customize the backup settings. You can also select a backup mode first and then adjust the backup settings according to your needs.

Figure 10-4 Port list

Note

You can click **Split Backup** or **Sequential Backup** on the right side of the port list to switch between backup modes.

When hovering the mouse over the line between the Ethernet ports, you will see an icon ( ). Click the icon to delete the backup relationship between the ports.

Step 4 Click **Verify Primary** or **Verify Backup** to examine whether the controllers are working properly.

- Verify Primary: Disconnect the backup and examine whether the primary is working properly.
- Verify Backup: Disconnect the primary and examine whether the backup is working properly.

11 Preset Management

11.1 Save Presets

After completing the display effect adjustment, you can save the data on the **Source**, **Layout**, **Processing** and **Screen Settings** pages as presets so that these data can be directly applied in the future. Up to 128 presets can be saved in VMP.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Related Information

The preset of a specific controller can only be applied by this controller itself and the preset of a screen can be applied by all the controllers of the screen.

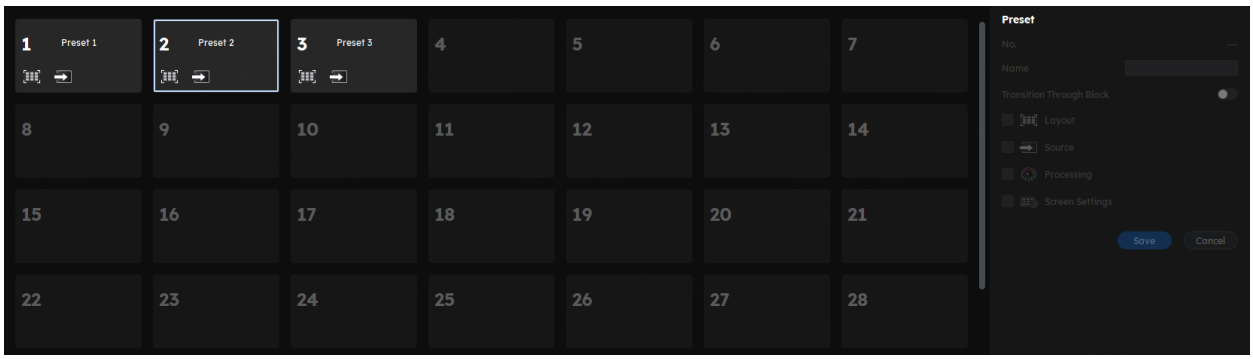
Operating Procedure

Step 1 Select **Preset**.

Step 2 On the preset management page, click + to enter the page shown in Figure 11-1.

To go back to the preset management page, click a blank area in the properties area.

Figure 11-1 Preset management



Step 3 Click the icon of a preset.

Step 4 Select the data you need to save. You can also enable **Transition Through Black** as needed.

If the preset you selected is not empty, the original data will be overwritten.

Step 5 Click Save.

11.2 Apply Presets

Apply a saved preset to quickly complete settings of the parameters on the **Source**, **Layout**, **Processing** and **Screen Settings** pages.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Related Information

The preset of a specific controller can only be applied by this controller itself and the preset of a screen can be applied by all the controllers of the screen.

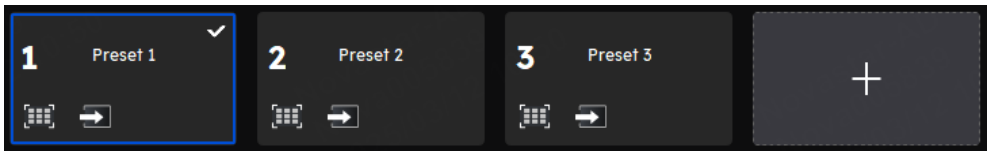
Operating Procedure

Step 1 Select **Preset**.

Step 2 On the preset management page, double-click a preset and wait it to finish loading.

The preset that is being used has a ☑ at the top right.

Figure 11-2 Apply presets



11.3 Manage Presets

Select **Preset** and do the following operations as needed.

Modify a Preset

Select a preset. In the properties area, change the related information and click **Save**.

Delete a Preset

- Right-click a preset and select **Delete** from the pop-up menu.
- On the preset management page, select a preset and click **Delete** in the properties area.

Clear Presets

Right-click a preset and select **Delete All** from the pop-up menu.

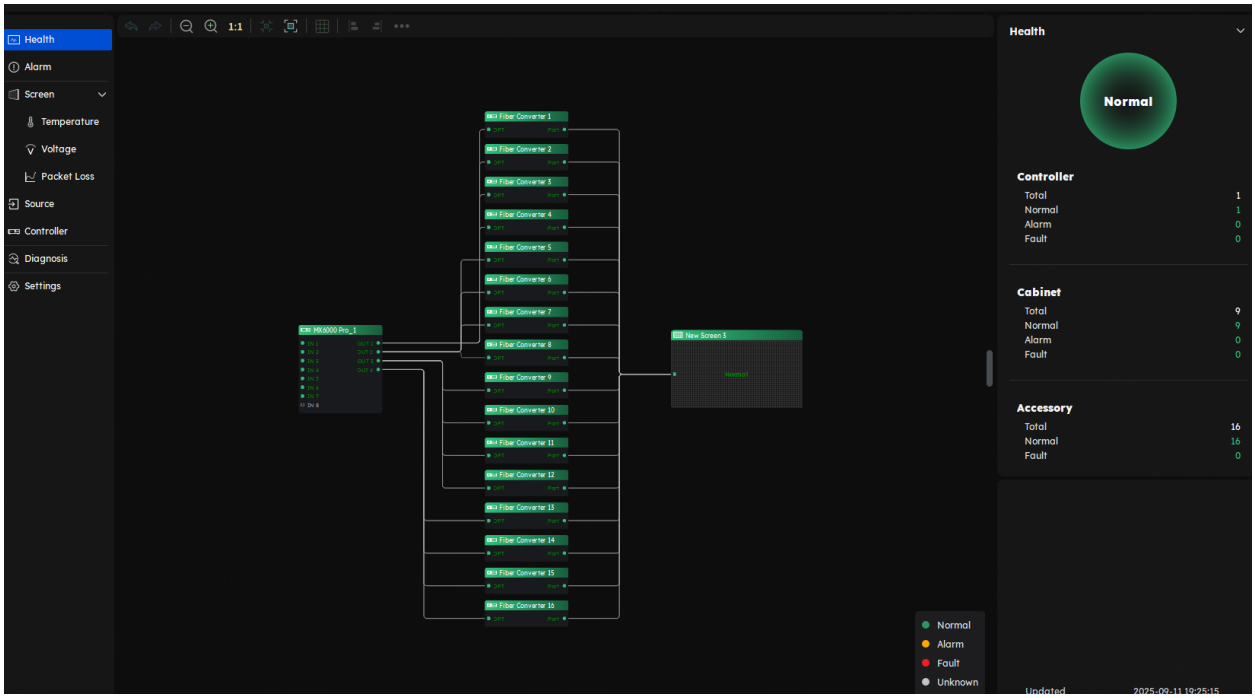
12 Screen Monitoring

12.1 Overall System Health

You can assess the operational status of each component within the entire LED display system.

Operating Procedure

Navigate to **Monitor** > **Health** to access the relevant information. The figure below uses the MX6000 Pro as an example:



- **System Link Diagram**

  This diagram provides a clear visual representation of the connection status and locations of the controllers and fiber converters within the selected screen. A green indicator signifies normal operation; yellow indicates an alarm; red denotes a fault; and gray represents unknown status. This allows you to quickly pinpoint any issues if they arise.

- **Health**

  Shows the overall system health status. It displays **Normal** if all controllers, cabinets, and accessories are operating without issues. If there are alarms but no faults, it shows **Alarm**. If any faults are detected, it displays **Fault**.

  - Controller

    Shows the total number of controllers and provides a breakdown of those in normal operation, those with alarms, and those with faults.

  - Cabinet

    Displays the total number of cabinets and their status, indicating the number in normal operation, those with alarms, and those with faults.

- Accessory

  Lists the total number of accessories, along with the count of those functioning normally, those with alarms, and those experiencing faults.

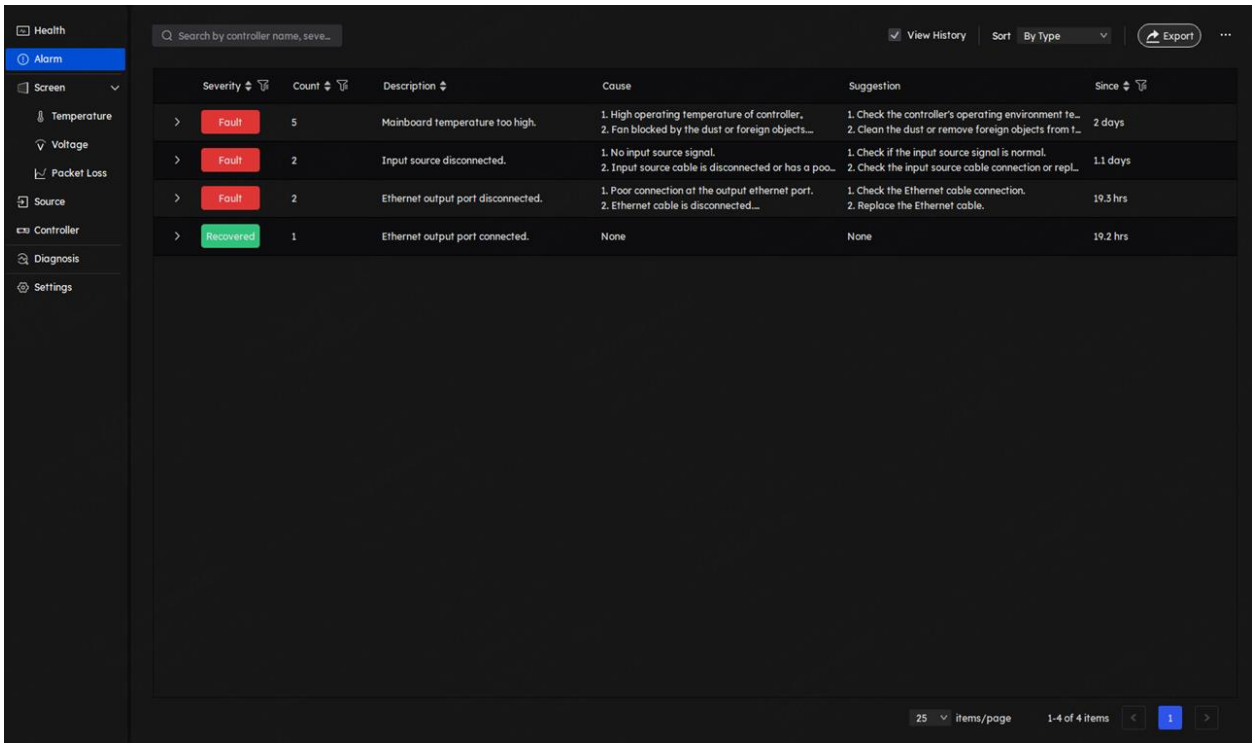
12.2 View Alarm Information

You can view the system alarm records.

Operating Procedure

Navigate to **Monitor** > **Alarms** to check the current alarms. You will see details such as severity, count, summary, time elapsed, possible causes, and recommended actions. Perform the necessary actions based on this.

Figure 12-1 Alarms



- **Search records**

  You can search by controller name (including IP), controller type, exception level, summary, or problem description.

- **View history**

  Select **View History** to display all past alarms. If unselected, only unresolved alarms are shown.

- **Sort alarms**

  Choose **By Type** or **By Time** from the drop-down menu to organize the alarm records.

- **Reset records**

  Click ••• , then select **Reset** in the popup window to clear existing records, refresh to the latest status, and generate alarm information.

- **Export records**

Click **Export** to save all alarm records of the screen. The file will be in .CSV format.

12.3 Monitoring Status

12.3.1 Screen Monitoring

You can monitor the LED screen's receiving cards, cabinets, and modules from multiple metrics to confirm the operational status of the screen.

Prerequisites

Certain screen monitoring tasks require cooperation with receiving cards and accessories. The specifics are as follows.

<table>
<tr><th>Monitoring</th><th>Receiving Card Requirements</th><th>Other Requirements</th></tr>
<tr><td>Cabinet HUB board temperature</td><td>Must work with receiving cards including XA50 Pro, CA50E, or A10s Pro and its derivatives (version V1.5.3.0 or later) for effective monitoring.</td><td>N/A</td></tr>
<tr><td>Receiving card PHY temperature</td><td>Must work with receiving cards including XA50 Pro or CA50E (version V1.5.3.0 or later) for effective monitoring.</td><td>N/A</td></tr>
<tr><td>Module wiring</td><td colspan="2">Monitoring is supported if the module is a smart module or is equipped with the TBS614S chip.</td></tr>
<tr><td>Module temperature</td><td rowspan="5">Support for monitoring requires custom versions of the XA50 Pro, CA50E, A10s Pro and its derivatives. For more details, please contact NovaStar tech support.</td><td>The module must have a temperature sensor.</td></tr>
<tr><td>Module voltage</td><td>The module must have a voltage sensor.</td></tr>
<tr><td>Cabinet humidity</td><td>The cabinet must be connected to a humidity sensor.</td></tr>
<tr><td>Cabinet power supply</td><td>N/A</td></tr>
<tr><td>Cabinet smoke</td><td>The cabinet must be connected to a smoke detector.</td></tr>
</table>

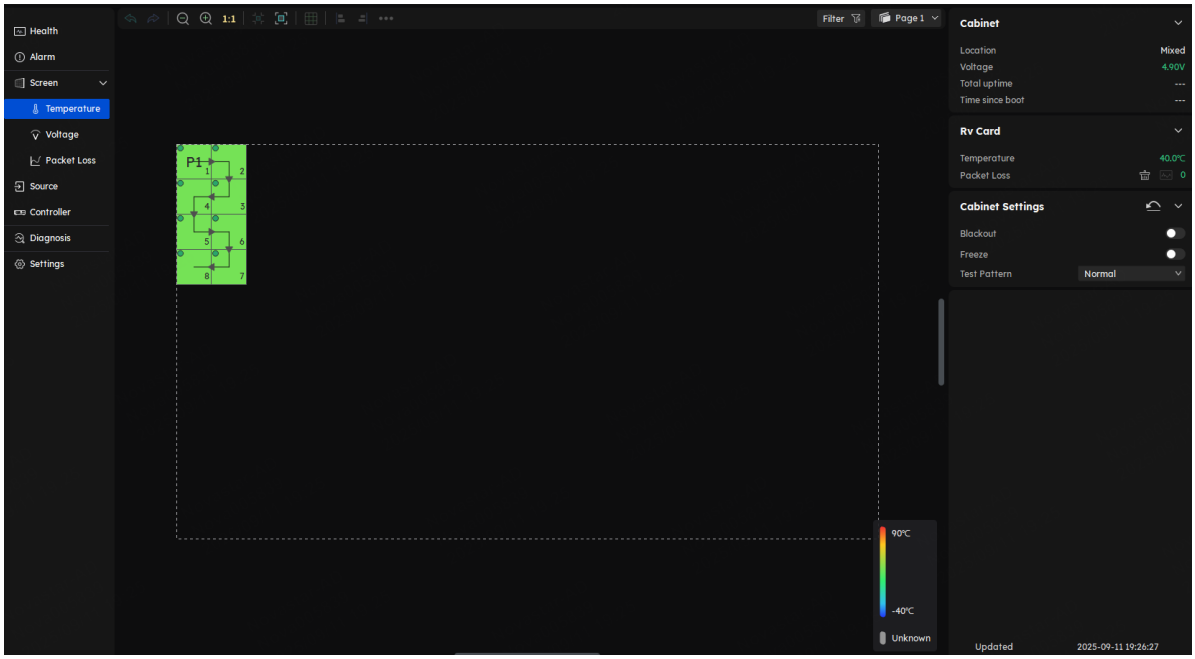
Related Information

When collecting data effectively, the topology diagram uses color to distinguish the status. You can view the legend in the bottom right corner of each tab: green indicates normal, yellow for alarms, red for faults, and gray for unknown. Hovering the cursor over a cabinet will also display detailed monitoring values.

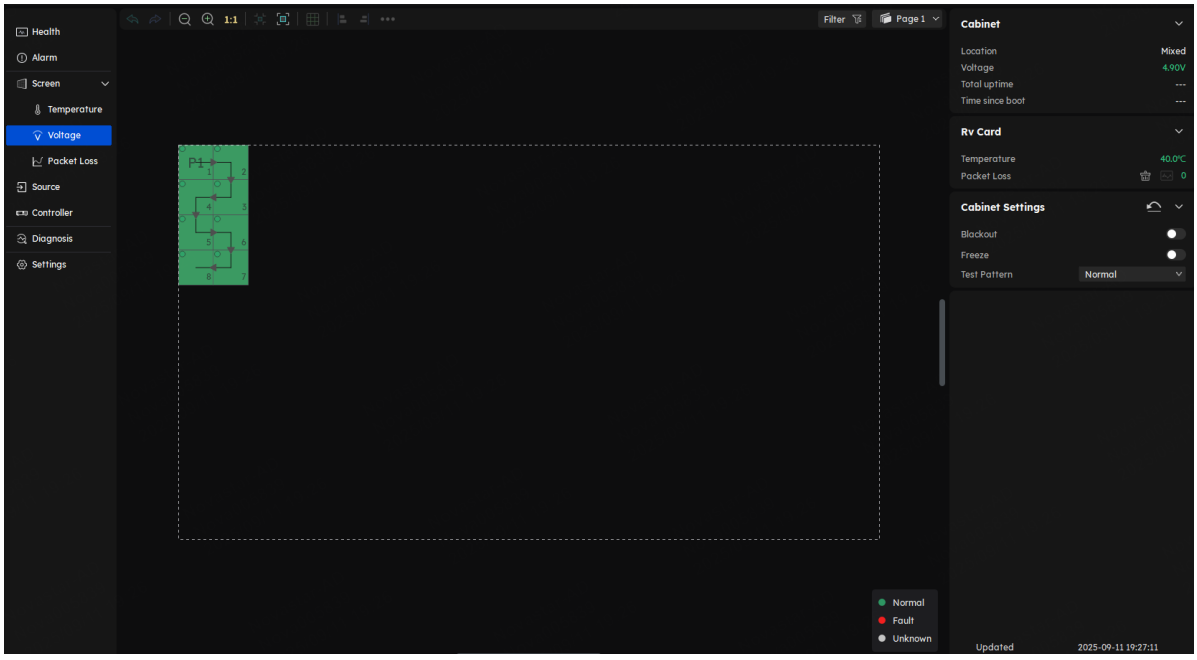
Operating Procedure

Navigate to **Monitor** > **Screen**. Depending on your needs, perform the following actions to view screen monitoring information:

- Switch to the **Temperature** tab to view screen temperature details. Specific values are shown in the properties area.
  -  : The receiving card temperature.
  -  : The operating temperature of the cabinet's HUB board.
  -  : The module temperature.
  -  : The receiving card PHY temperature.



- Switch to the **Voltage** tab to view screen voltage details. Specific values are shown in the properties area.
  -  : The cabinet voltage.
  -  : The module voltage.



- Switch to the **Cabinet Power** tab to monitor the status of the cabinet's power supply. In the properties area, you can check the status of each power supply.

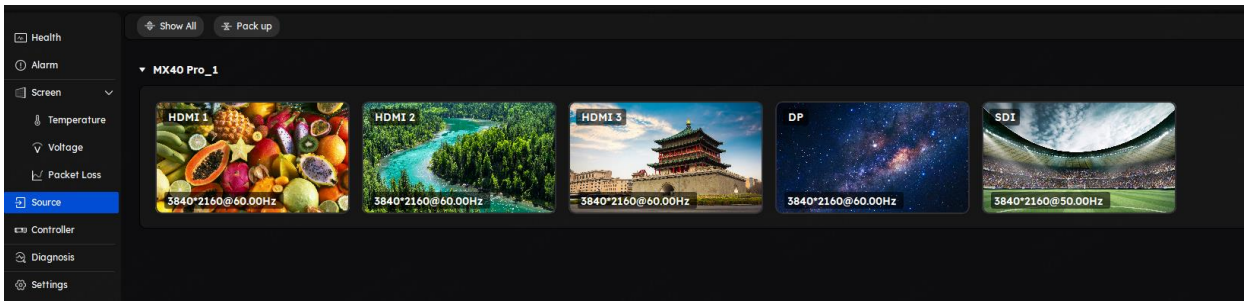
- Switch to the **Packet Loss** tab to monitor accumulated bit errors on the receiving cards. Any abnormal receiving card will appear in yellow on the topology with the error count indicated. You can view specific cumulative errors in the properties area. Click  to reset the error count and start monitoring again, and click  to view the packet loss curve.
- Switch to the **Module Wiring** tab to monitor the wiring of modules.
- Switch to the **Cabinet Humidity** tab to monitor the ambient humidity of the cabinet. In the properties area, you can check the humidity level. Excessive humidity can lead to oxidation and corrosion of the internal circuit boards and components in the cabinet, potentially reducing performance or even causing damage to the device.
- Switch to the **Cabinet Smoke** tab to monitor the cabinet for smoke. Smoke acts as a warning signal for electrical component short circuits. By monitoring it, short-circuit issues can be quickly identified, allowing for timely replacement of components and effectively preventing fires.

Note

- By selecting a target in the topology diagram, you can view detailed values for screen monitoring items, cabinet location, total runtime, and current runtime in the properties area.
- In the **Cabinet Settings** area, you can set the cabinet to black out, freeze the display, or show a test pattern.

12.3.2 Input Source Monitoring

Navigate to **Monitor** > **Source** to view details about the number of currently connected input sources, the type of interface, resolution, and frame rate for your primary and backup controllers. You can also click to enlarge the input source preview.



12.3.3 Controller Monitoring

Navigate to **Monitor** > **Controller** to access the relevant information. The figure below uses the MX6000 Pro as an example:

Figure 12-2 Controller Monitoring

- Check the status of the connectors on the rear panel of the controller.
- Check the controller's name, current uptime, total uptime, mainboard temperature, mainboard voltage, and fan status.
- Check the temperature and voltage of the cards.
- Enable or disable **Controller Finder**. You can identify the controller by toggling on the switch ( ). In the project list, right-click on the controller to set the LCD display color from the pop-up menu.

12.4 System Diagnostic

Perform diagnostics on the selected screen. You can choose to diagnose various items including LED error detection, origin data comparison, controller self-check, monitoring items, and receiving card signal interruptions.

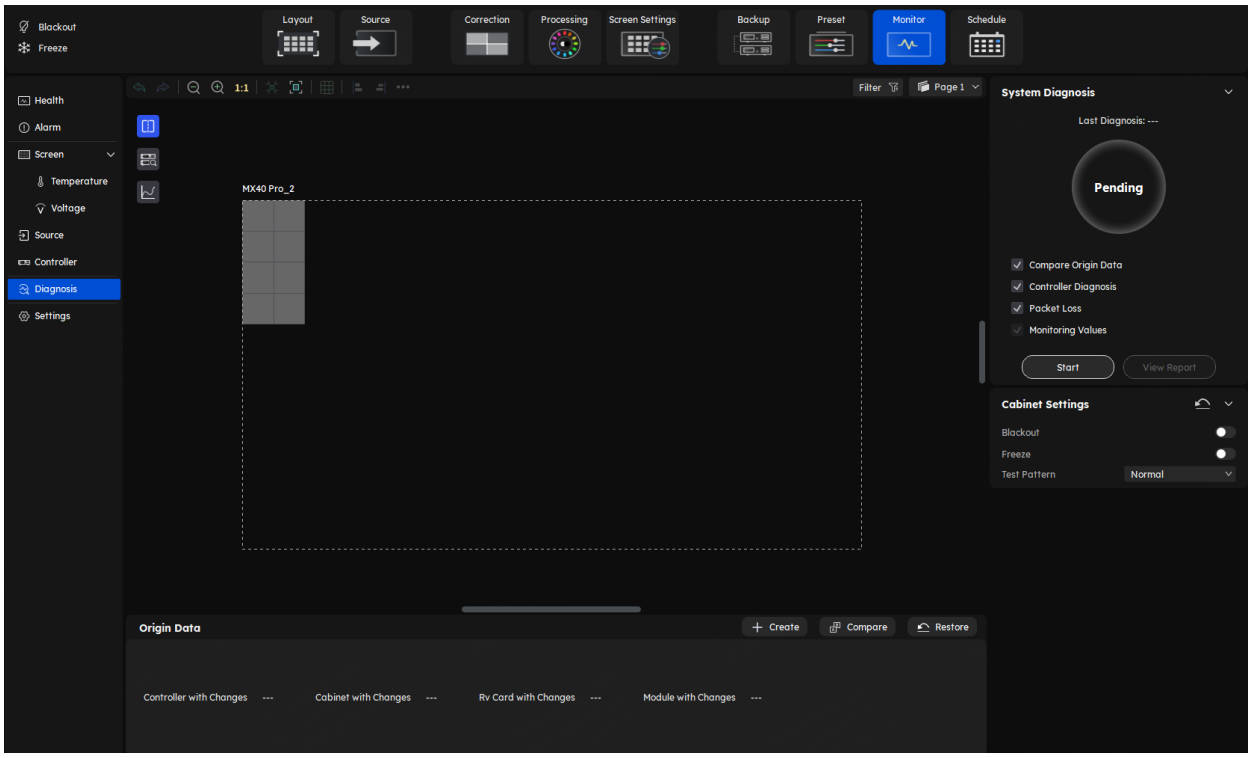
Prerequisites

Before conducting LED error detection, ensure the following:

- The module is a smart module.
- The receiving card firmware supports LED error detection.
- LED error detection is enabled in Cabinet Tool.

Operating Procedure

Step 1 Select a screen from the project list and then go to **Monitor** > **Diagnostics**.



Step 2 In the **System Diagnostics** on the right, select the diagnostic items you wish to perform.

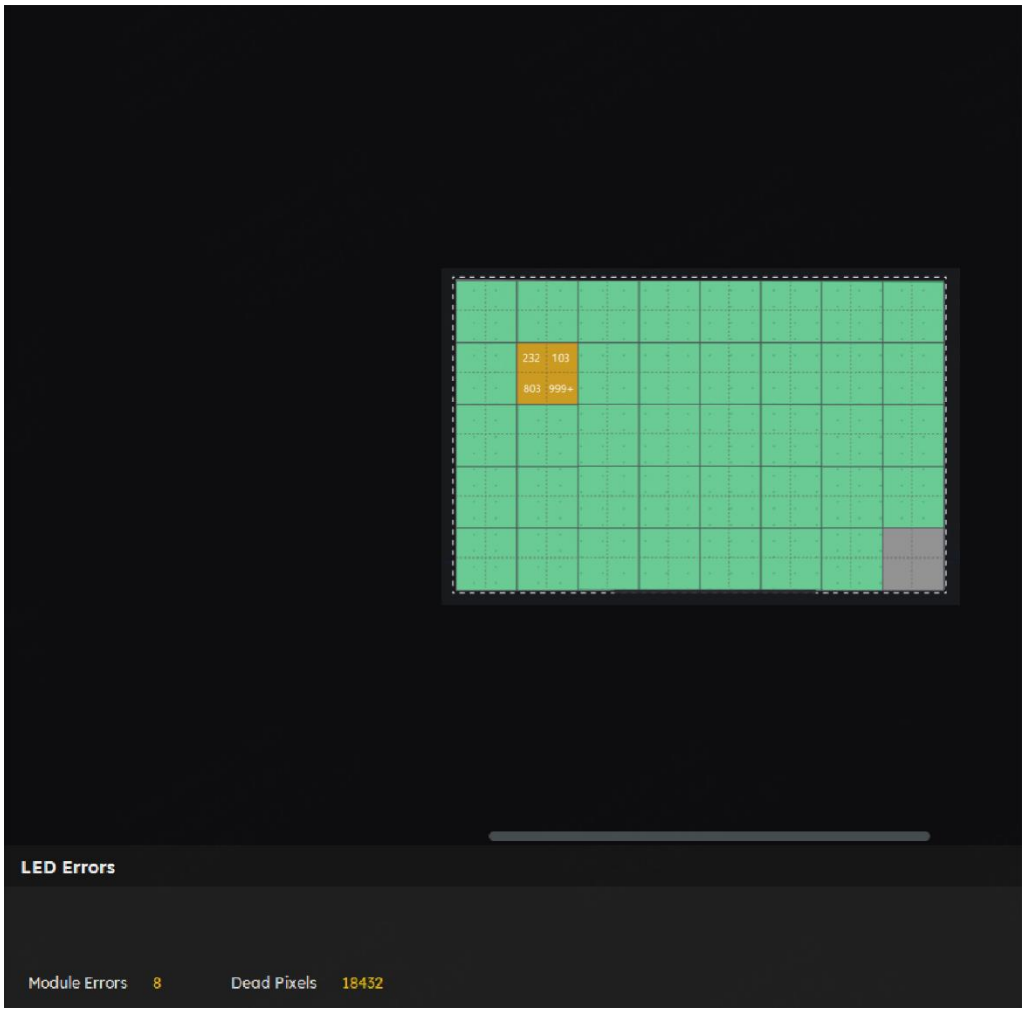
- LED Errors: Diagnoses the number of dead pixels in each module.
  - When a cabinet is selected in the topology, diagnostics are based on the selected cabinet.
  - If no cabinet is selected, diagnostics are performed on all cabinets by default.
- Compare Origin Data: Compares whether the saved origin data values differ from the current values.
- Device Diagnostics: Performs a self-check on the controller, with results categorized as Normal, Alarm, or Fault.
- Monitoring Values: Diagnoses current results of monitoring item values to determine if there are any anomalies in the system.
- Receiving Card Signal Interruptions: Counts the number of times a receiving card experiences signal interruptions without going offline.

Step 3 Click **Start** to carry out the system diagnostics based on the selected options.

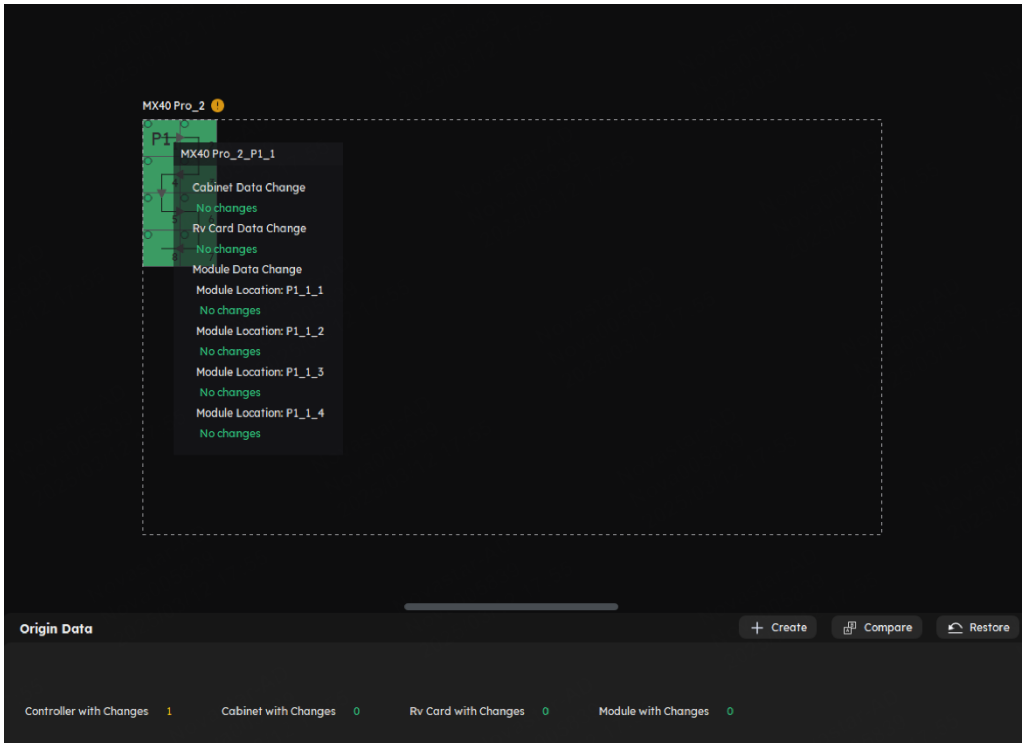
Step 4 Click **View Report** to obtain a diagnostic report file (.pdf) for the selected screen.

Step 5 Click the function icons on the left to view corresponding diagnostic results.

- : LED error detection. The topology will display faulty modules in yellow with the number of dead pixels labeled. At the bottom of the interface, you can check the specific number of faulty modules and dead pixels.



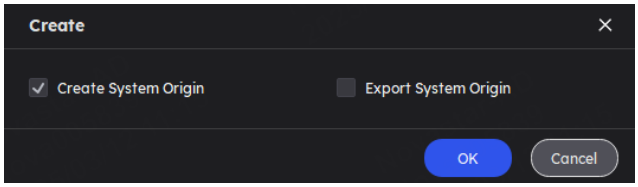
- : Origin data comparison. View specific data changes for controllers, cabinets, receiving cards, and modules at the bottom of the interface and perform the necessary actions.



  - Click Create to select **Create System Origin** or **Export System Origin**. Selecting both will export the saved origin data.

Create System Origin lets you manually save the current data as origin data, overwriting the existing values.

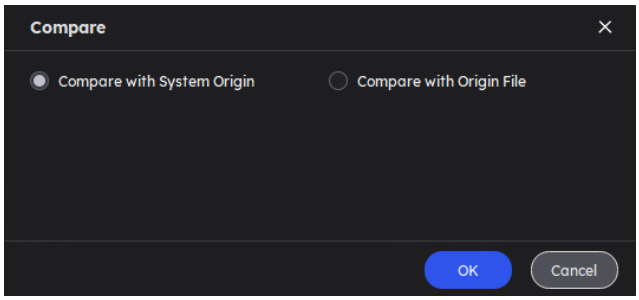
Export System Origin allows exporting the current origin data as a file (.opd).



- Click Compare to select **Compare with System Origin** or **Compare with Origin File**. Upon completion, a comparison file (.CSV) is generated.

  Compare with System Origin compares the current data values with the latest saved system origin values.

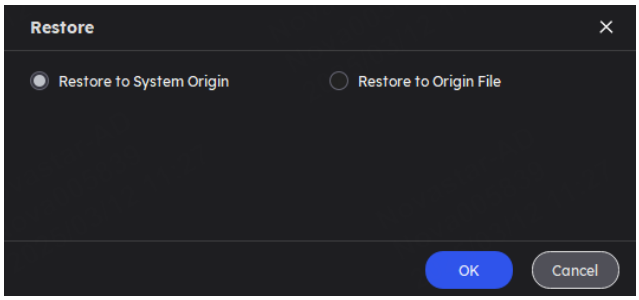
  Compare with Origin File compares the current data values with a selected origin file's values.



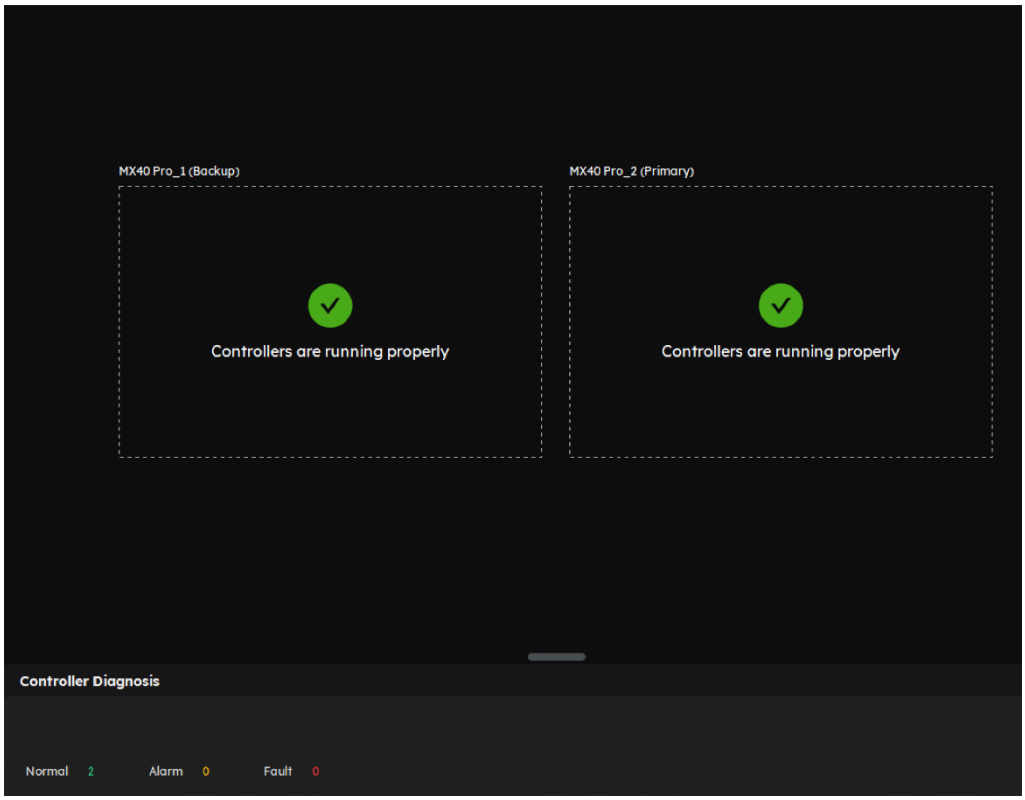
- Click Restore to select **Restore to System Origin** or **Restore to Origin File**.

  Restore to System Origin reverts the current data values back to the latest saved system origin values.

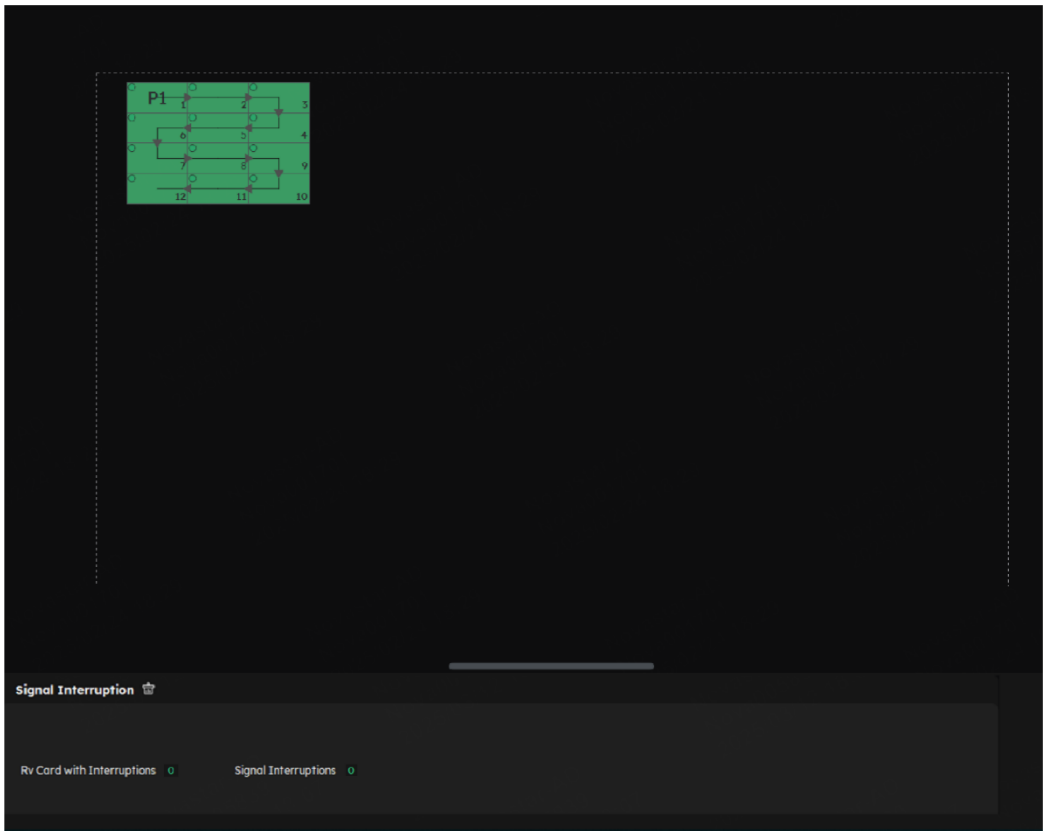
  Restore to Origin File reverts the current data values to a selected origin file's values..



- : Device diagnostics result. The bottom of the interface shows the counts of controllers categorized as normal, alarm, or fault.



- : Receiving card signal interruptions. After diagnosis, faulty receiving cards are shown in yellow on the topology with the interruption count labeled. The interface displays the specific count of receiving cards with signal interruptions and the number of interruptions. Click to reset the interruption count to zero and start a new count.



Note

You can also blackout, freeze, or enable test patterns for cabinets under the **Cabinet Settings** section.

12.5 Monitoring Settings

12.5.1 Monitoring Items

Select a screen from the project list, then choose **Monitor** > **Settings**. Then, toggle on or off **Packet Loss** as needed.

- On: The screen monitoring page will show and monitor packet loss on the receiving cards.
- Off: The screen monitoring page will not include packet loss monitoring.

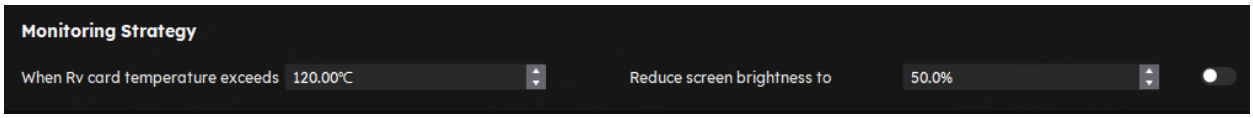
12.5.2 Monitoring Strategy

To configure the monitoring strategy, select a screen from the project list and go to **Monitor** > **Settings**. In the **Monitoring Strategy** section, you can set actions to be automatically taken when abnormal values are detected, temporarily reducing risk. The specific monitoring strategies available depend on the capabilities of the receiving card being used.

1. If the cabinet or receiving card temperature exceeds the set threshold, the screen brightness will automatically reduce to the specified level to prevent overheating.
2. If smoke is detected in the cabinet, the system will automatically power off the screen.
3. If there is a power failure in one of the cabinet's power supplies, the screen brightness will automatically reduce to the set level.

Note

When the Brightness Limit feature is enabled, the resulting brightness application in the monitoring strategy will be based on a percentage of the brightness limit.

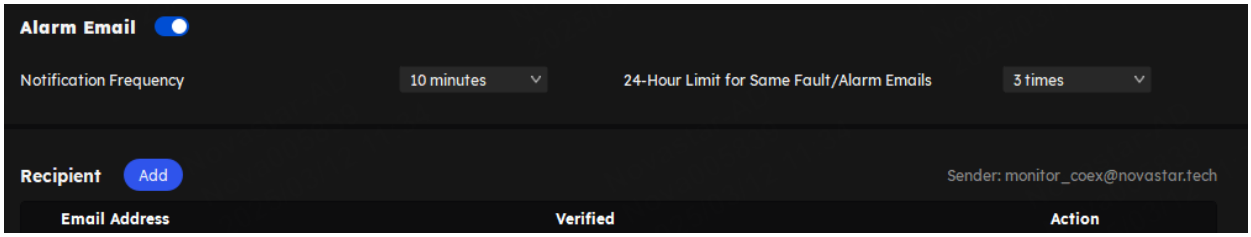


12.5.3 Email Alarms

Email alarms can be configured to notify you via email whenever there are changes in the system, such as when an alarm is triggered, a fault occurs, or normal operation is restored.

Step 1 Select a screen from the project list and then go to **Monitor** > **Settings**.

Step 2 Toggle the email alarms on or off in the **Alarm Email** section.

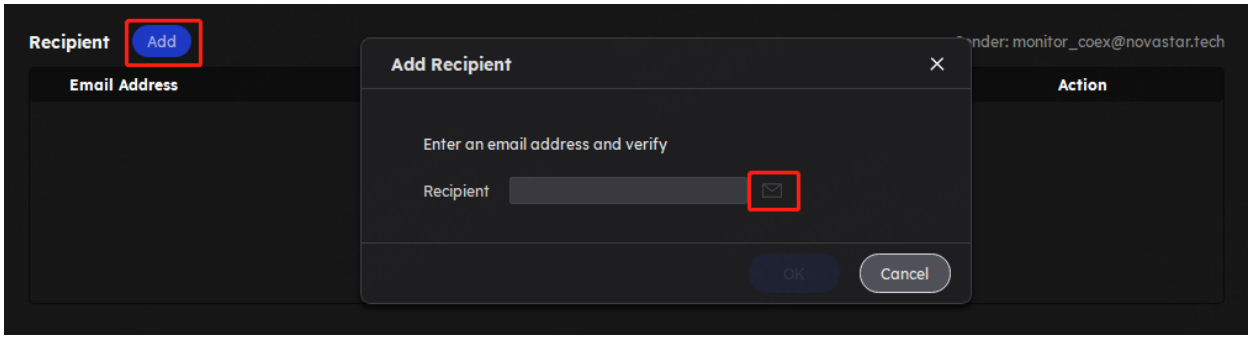


Step 3 Configure the email notification settings and check the sender email address:

- Notification Frequency: Options include **Immediate**, **3 minutes**, **5 minutes**, **10 minutes**, **30 minutes**, **1 hour**, or a custom frequency.
- 24-Hour Limit for Same Fault/Alarm Emails: Options include: **1 time**, **3 times**, **5 times**, **7 times**, **10 times**, and **No limit**.

Step 4 Set recipient email addresses, with a maximum of 5 recipients allowed.

1. Click the **Add** button, and then enter the email address in the pop-up window.
2. Click  to send a verification email to the specified address and complete the verification by checking your email.
3. After the settings, click **OK**.



13 Display Schedule

13.1 Create Brightness Schedule

You can create a brightness adjustment schedule for the LED display screen. When a light sensor is connected to the system, it can automatically adjust the brightness of the LED screen based on the real-time ambient light conditions. This adjustment occurs within a predetermined time frame, with the sensor measuring the ambient light brightness and referring to a mapping policy that correlates the LED display brightness with ambient light levels.

Applicable Products

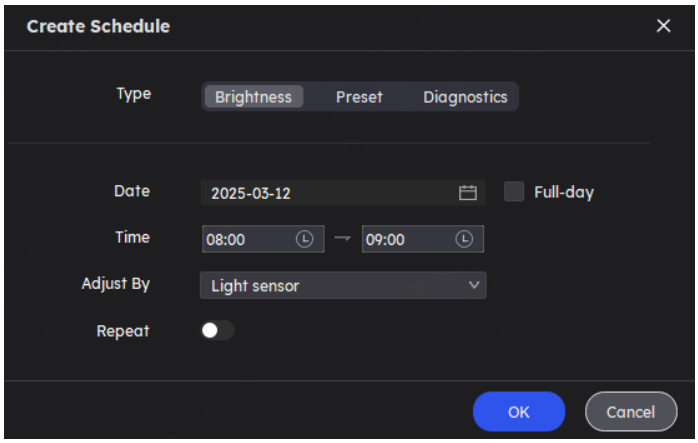
MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Operating Procedure

Step 1 Select a screen from the project list and then select **Schedule**.

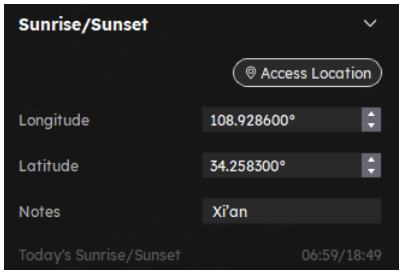
Step 2 Click **Create Schedule**, select the **Brightness** tab, and then set the date and time range.

Figure 13-1 Create brightness schedule



Step 3 Set the screen's active time. You can either input custom times or use the local sunrise and sunset times for scheduling.

In the **Sunrise/Sunset** section, click **Access Location** to retrieve the current screen's latitude and longitude along with the local sunrise and sunset times. You can also add notes for the location.



Step 4 Specify how the brightness is adjusted, by **Light sensor**, or by **Specified brightness**.

If you choose to adjust by a light sensor, remember to configure the brightness schedule on the right side of the interface (refer to Step 5 to Step 6).

Step 5 Select one of more light sensors under the **Automatic Brightness** section.

Selectable Range: Light sensors connected to multifunction cards on each controller/output card that are online in the current project.

Note

When multiple light sensors are selected, the system calculates the average ambient brightness from all sensors to adjust the screen brightness according to the brightness schedule.

If multiple controllers connected to light sensors are placed in environments with differing brightness levels under the same screen, ensure proper communication between controllers to prevent inconsistent screen brightness.

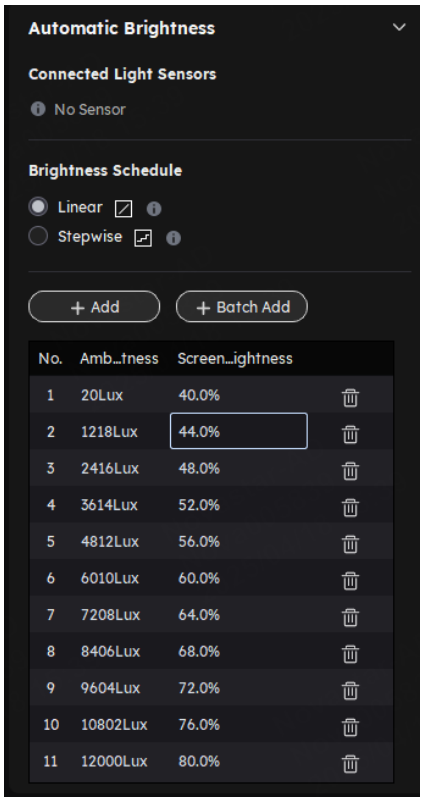
Step 6 In the **Brightness Schedule** section, set up the mapping between ambient brightness and screen brightness. When the light sensor detects a specific ambient brightness, the screen brightness will adjust to the corresponding value.

1. Choose the brightness adjustment method: **Linear** or **Stepwise**.

   - Linear: Continuously calculates the average brightness between two adjacent ambient levels based on the measurement rules and adjusts the screen brightness according to the brightness schedule.

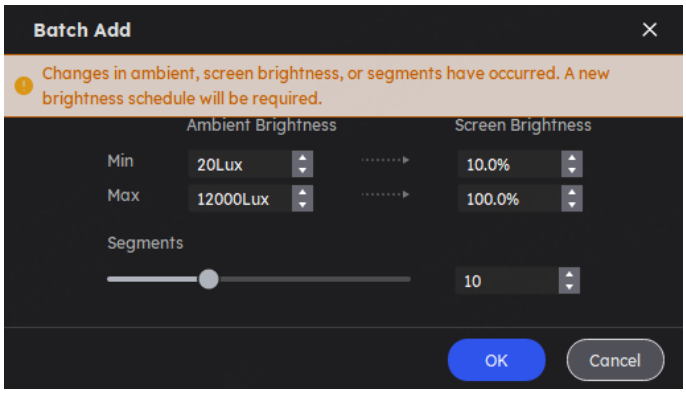
- Stepwise: Adjusts the screen brightness only at the endpoints of two adjacent ambient levels per the brightness schedule.

Figure 13-2 Brightness schedule

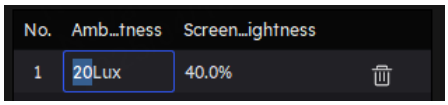


2. Add new brightness schedules, with up to 29 entries supported. You can choose **Add** or **Batch Add**.

- Batch Add: Click **Batch Add**, then set **Ambient Brightness**, **Screen Brightness**, and the number of segments in the pop-up window.



- Add: Click **Add** to create a new brightness schedule and the adjust the values for **Ambient Brightness** and **Screen Brightness**.

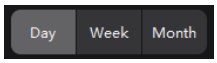


Note

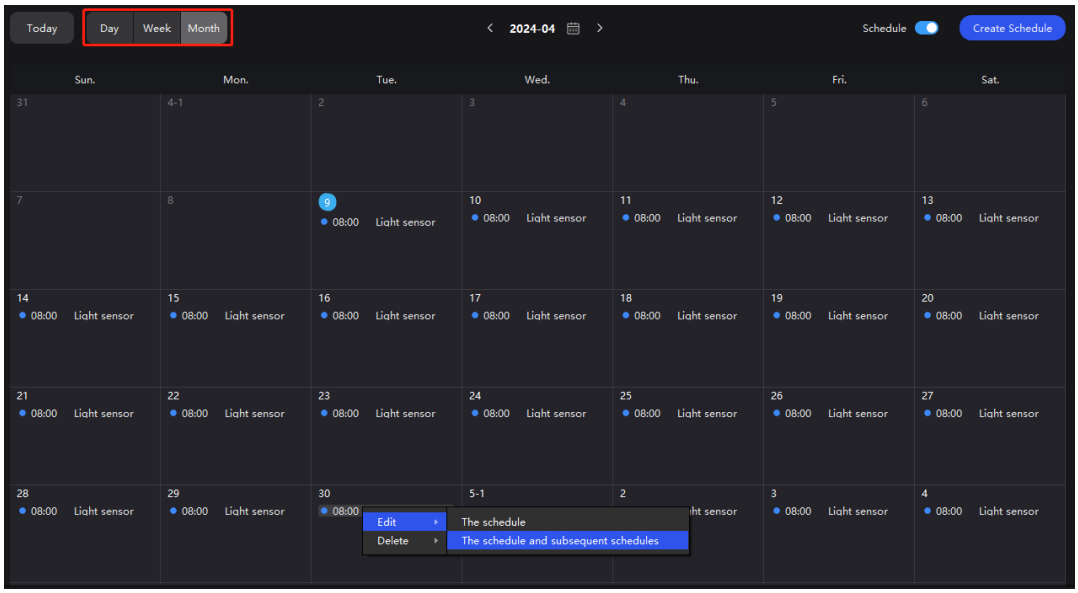
When all the cabinets of the screen support the multi-mode function and use the same NCP file, you can manually link the brightness schedule to the multi-mode and display data based on the maximum brightness of the multi-mode.

Step 7 Specify if the schedule should repeat and provide the end time for the repetition.

Step 8 Click **OK** once you are done. The created schedule will be displayed in the schedule chart.

You can click 

on the top-left corner to switch between daily view, weekly view, and monthly view to review the overall schedule plan.



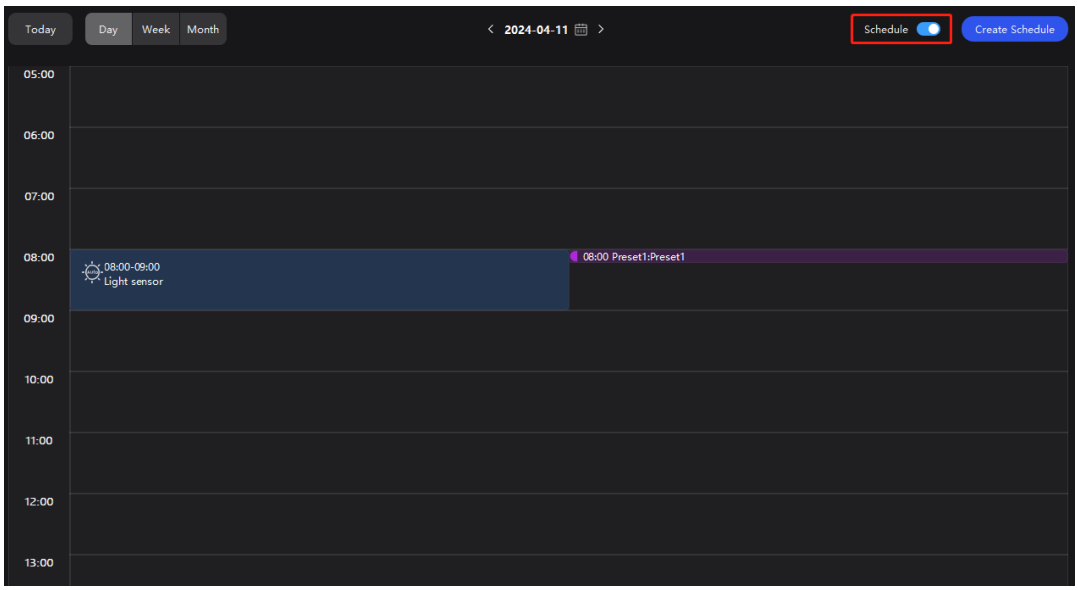
Step 9 Right-click a schedule in the chart to **Edit** or **Delete** it.

Edit: You can edit the **Current schedule** or **Current and follow-up schedules**.

Delete: You can delete the **Current schedule**, Current and follow-up schedules, or **All schedules**.

Step 10 To activate the schedule, please toggle on **Schedule** in the upper right corner of the chart.

Figure 13-3 Schedule



Note

Brightness schedule and HDR 2084 cannot be enabled at the same time. If brightness schedule is enabled after HDR 2084 is selected, the HDR function will be disabled.

13.2 Create Preset Schedule

You can create a predetermined schedule for the LED screen, enabling automatic switching of different presets according to the specified timetable.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

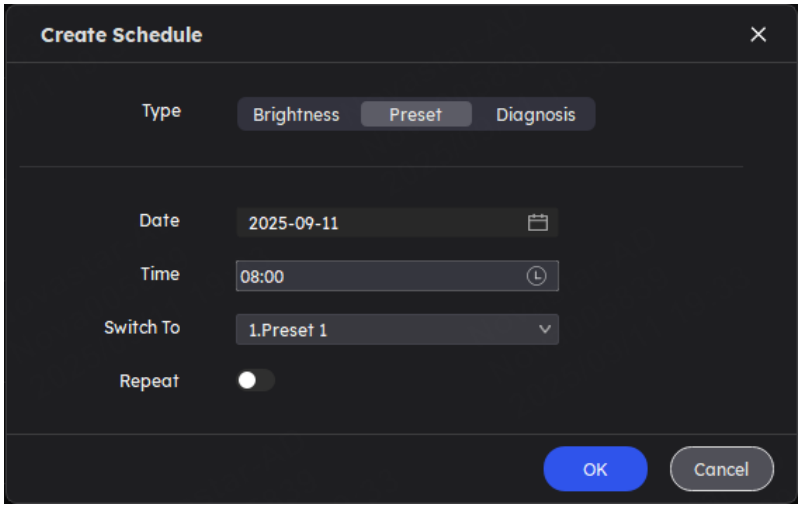
Prerequisites

You need to save a preset for the screen before creating a preset schedule.

Operating Procedure

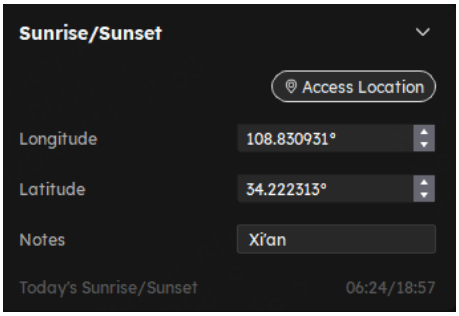
Step 1 Select a screen from the project list and then select **Schedule**.

Step 2 Click **Create Schedule**, select the **Preset** tab, and then set the start date.



Step 3 Set the start time for the schedule, with options to enter it manually or use local sunrise/sunset times.

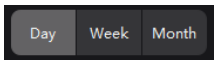
In the **Sunrise/Sunset** section, click **Access Location** to obtain the current screen's latitude, longitude, and sunrise/sunset times. You can also add notes for the location.



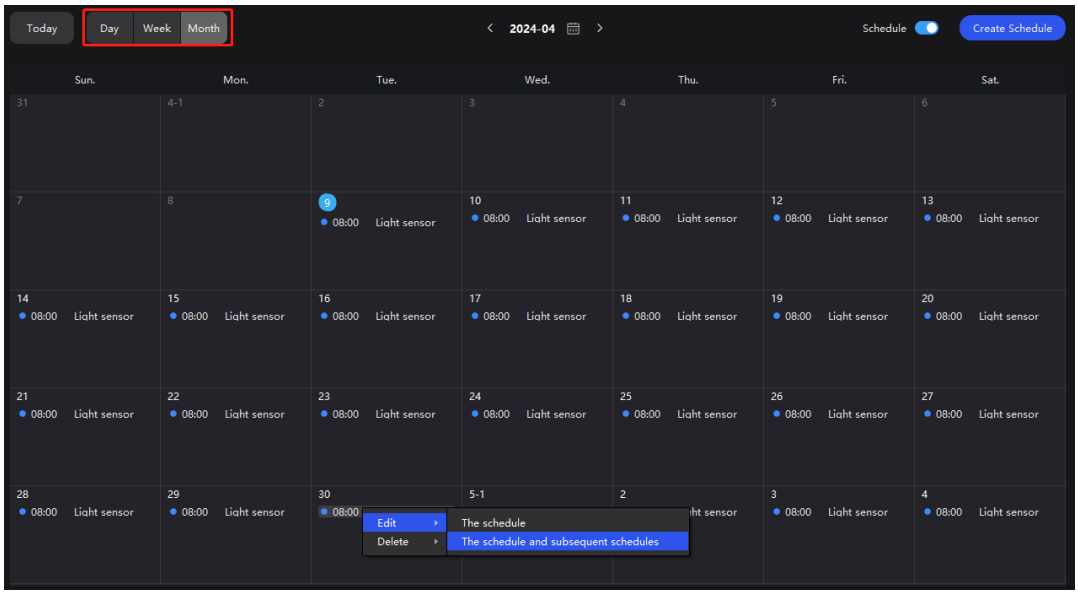
Step 4 Select the preset to be applied.

Step 5 Specify if the schedule should repeat and provide the end time for the repetition.

Step 6 Click **OK** once you are done. The created schedule will be displayed in the schedule chart.

You can click 

on the top-left corner to switch between daily view, weekly view, and monthly view to review the overall schedule plan.



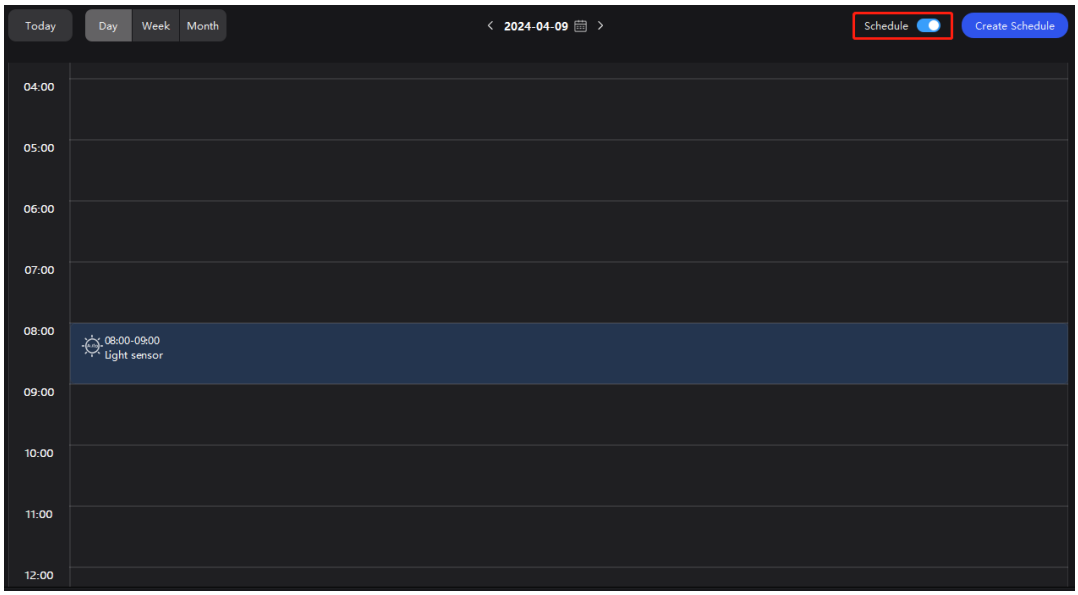
Step 7 Right-click a schedule in the chart to **Edit** or **Delete** it.

Edit: You can edit the **Current schedule** or **Current and follow-up schedules**.

Delete: You can delete the **Current schedule**, Current and follow-up schedules, or **All schedules**.

Step 8 To activate the schedule, please toggle on **Schedule** in the upper right corner of the chart.

Figure 13-4 Schedule



13.3 Create Diagnostic Schedule

You can set up a diagnostic schedule for LED screen to conduct regular diagnostics based on a defined schedule and selected diagnostic items.

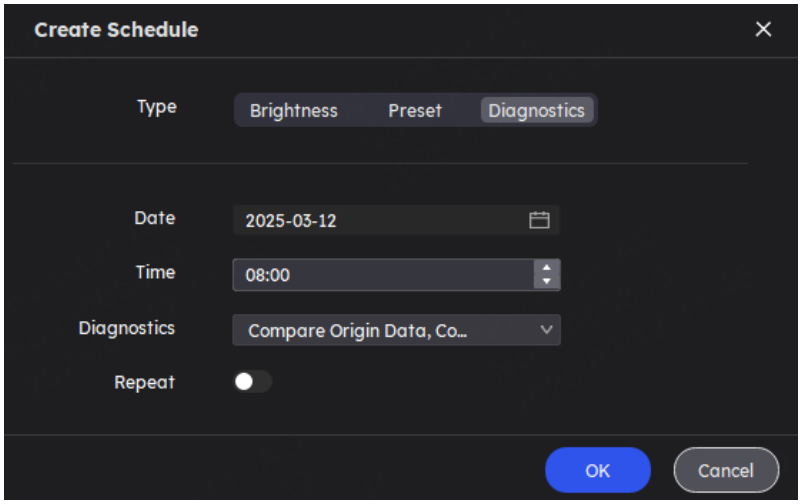
Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Operating Procedure

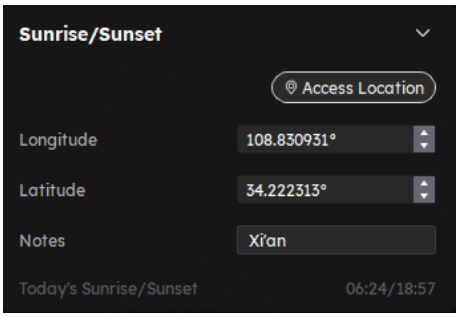
Step 1 Select a screen from the project list and then select **Schedule**.

Step 2 Click **Create Schedule**, select the **Diagnostics** tab, and then set the start date.



Step 3 Set the start time for the schedule, with options to enter it manually or use local sunrise/sunset times.

In the **Sunrise/Sunset** section, click **Access Location** to obtain the current screen's latitude, longitude, and sunrise/sunset times. You can also add notes for the location.

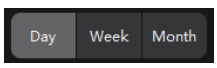


Step 4 Configure the diagnostic items, including: **LED Errors** (only supported by smart modules), **Compare Origin Data** (optional), **Device Diagnostics** (optional), and **Monitoring Values** (mandatory).

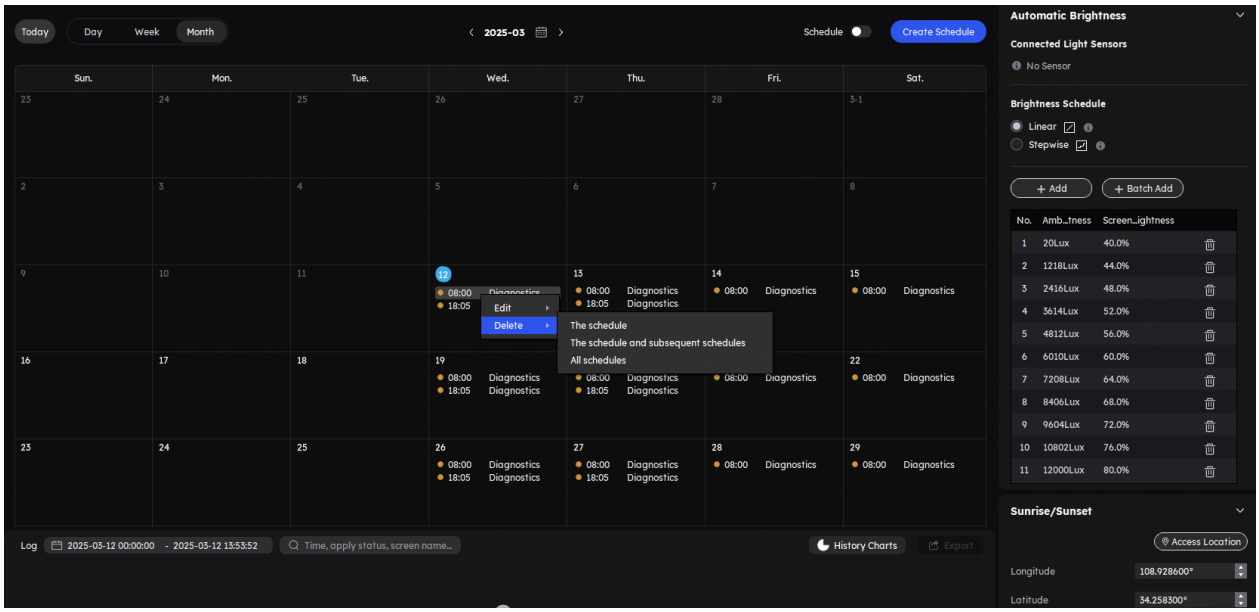
Step 5 Specify if the schedule should repeat and provide the end time for the repetition.

Step 6 If email alarms are set up on the monitor page, you can opt to send diagnostic results via email.

Step 7 Click **OK** once you are done. The created schedule will be displayed in the schedule chart. When setting multiple diagnostic schedules, ensure there is at least a 5-minute gap between each.

You can click 

on the top-left corner to switch between daily view, weekly view, and monthly view to review the overall schedule plan.



Step 8 Right-click a schedule in the chart to **Edit** or **Delete** it.

Edit: You can edit the **Current schedule** or **Current and follow-up schedules**.

Delete: You can delete the **Current schedule**, Current and follow-up schedules, or **All schedules**.

Step 9 To activate the schedule, please toggle on **Schedule** in the upper right corner of the chart.

Figure 13-5 Schedule

13.4 Check Schedule Log

You can check the schedule log and history charts.

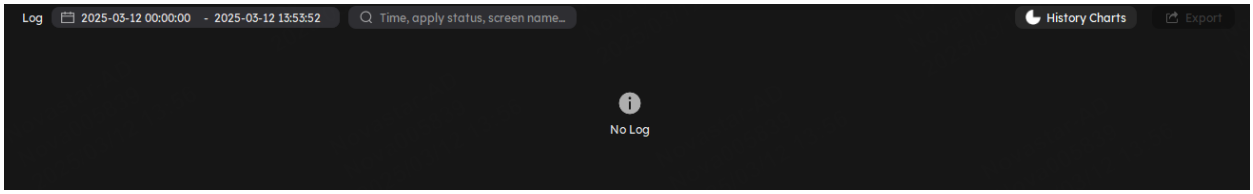
Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Operating Procedure

Select **Schedule** and at the bottom of the page, do the operation as needed.

Figure 13-6 Log



- **Search records**

  Enter the key words in the search box.

- **Query records**

  Click the time widget and set the start and end time.

- **History charts**

  Click History Charts and select a specific date to access the history charts displaying the brightness schedule, preset schedule, and diagnostics schedule log. Please note that you can only view the history on a daily basis.

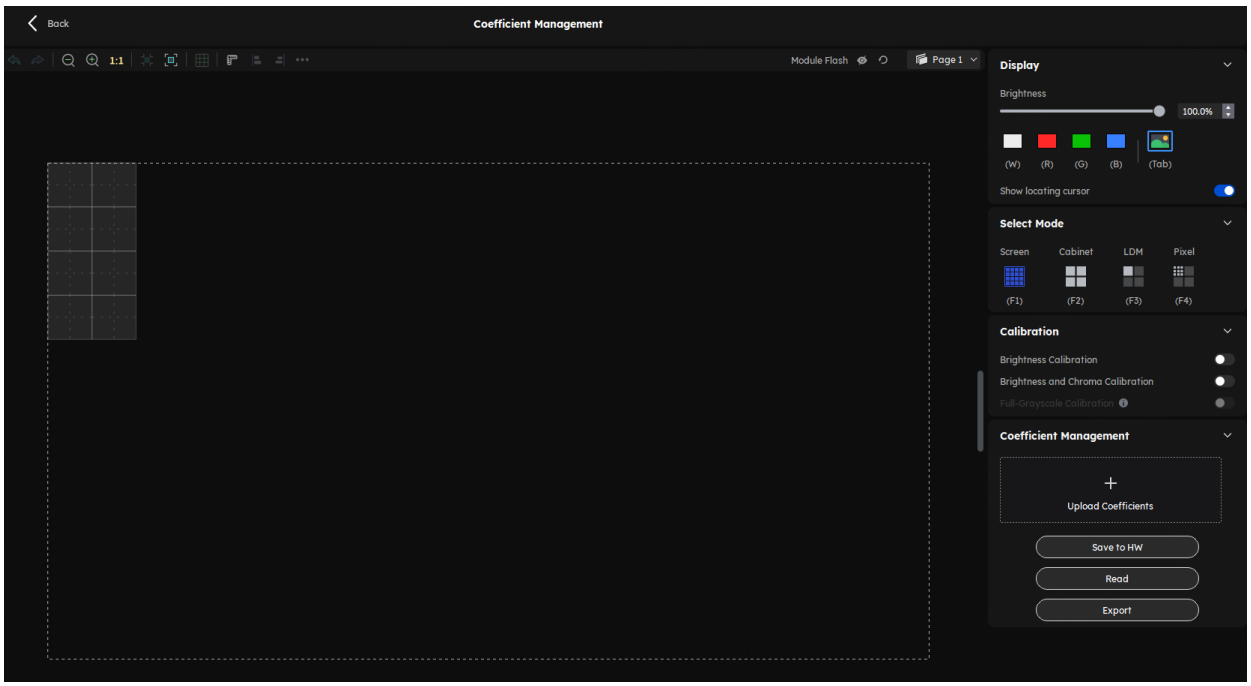
Figure 13-7 History charts

- **Export records**

  Click **Export**, select a file page, set a file name, and click **Save**.

14 Calibration Coefficient Management

From the menu bar, choose **Tools** > **Coefficient Management** and do operations such as uploading, saving, adjusting and reading the coefficients. You can also check the module flash status.



14.1 Check Module Flash Status

When replacing modules or reading back coefficients from the module flash, you have the option to visually inspect the status of the module flash.

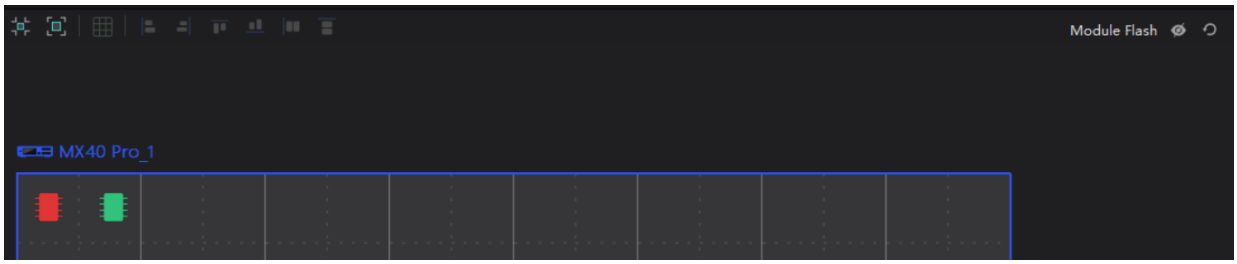
Step 1 Select a screen from the project list.

Step 2 From the menu bar, choose **Tools** > **Coefficient Management**.

Step 3 On the canvas, click  to display the module flash status. Click  again to hide the module status. Click  to refresh the module status.

-  : Module flash is abnormal.
-  : Module flash is normal.

Figure 14-1 Check module flash status



14.2 Upload Calibration Coefficients

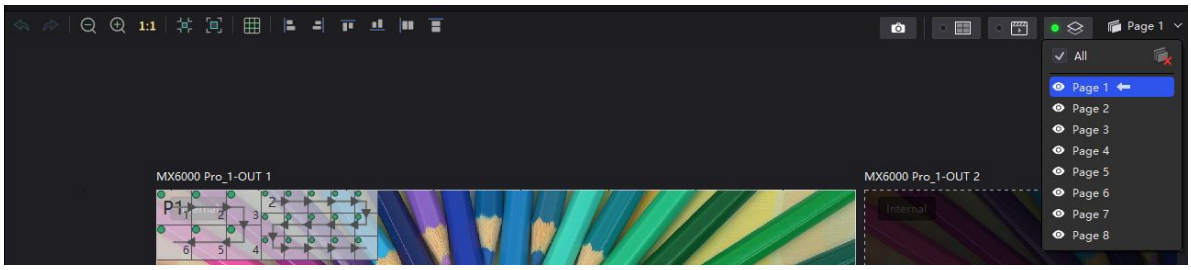
Upload the local calibration coefficient file to the current screen, cabinet or module and apply the coefficients to the display effect.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Prerequisites

- You can only upload coefficients from page 1.



- To upload screen coefficients, make sure:
  - The screen configuration is done, the cabinets are not rotated, and there are no cabinet gaps or overlapping.
  - The configured screen must be rectangular, and the top-left-corner coordinates of the circumscribed rectangle of the configured screen must be (0, 0).
  - To use the database file, you should prepare it in advance, and the resolutions of the configured screen and the screen in the database must be the same and the database must be a screen database.
- To upload cabinet coefficients, make sure:

  The target cabinets have cabinet IDs. You will need to configure cabinet ID manually if the target cabinets have no ID.

Notice

During coefficient uploading, if the controller and/or receiving cards go offline, the uploading will fail.

If the coefficient uploading fails, the coefficients will not be saved automatically. You can manually save them as needed.

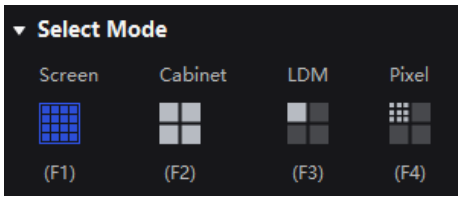
Operating Procedure

Step 1 Select a screen from the project list.

Step 2 From the menu bar, choose **Tools** > **Coefficient Management**.

Step 3 In the **Select Mode** area, select the uploading range. The options include **Screen**, **Cabinet** and **LDM**.

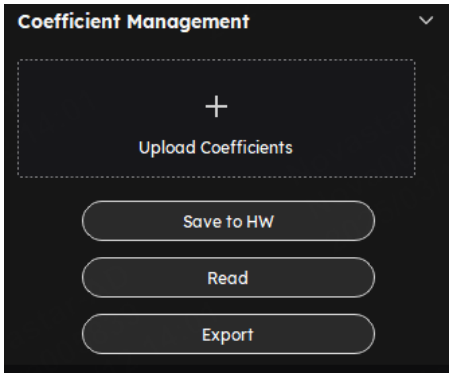
Figure 14-2 Select mode



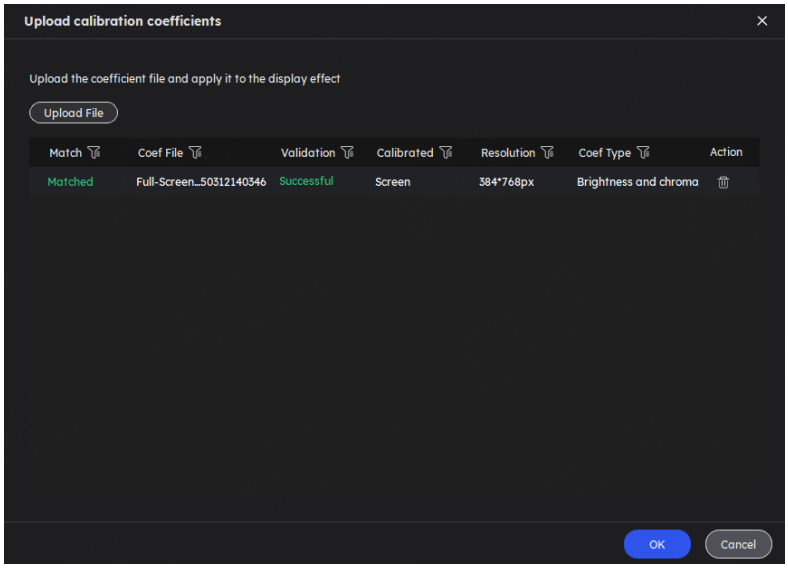
Step 4 In the **Coefficient Management** area, click + and select one or more target calibration data files (.db) from the local computer.

You can select and batch import multiple coefficient files at once. When importing calibration coefficients for cabinets or modules, the system will automatically match and upload according to the corresponding cabinet/module ID.

Figure 14-3 Upload calibration coefficients

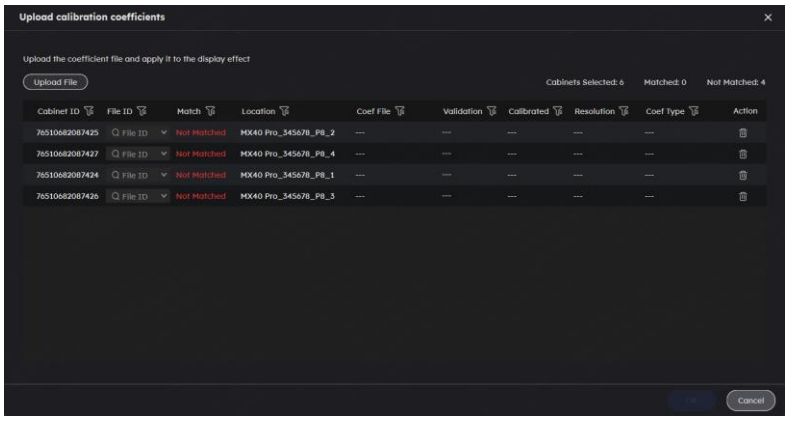


- When importing calibration coefficients for cabinets or modules, the system will automatically match and upload them using the corresponding cabinet or module ID.



- When trying to import the cabinet/module calibration coefficient, but the cabinet/module ID does not match the ID in the coefficient file, you'll need to manually select and upload.

  In this case, the **Match** will show as not matched and **File ID** will be empty. You'll need to click the **File ID** dropdown menu and select the appropriate file ID manually. Ensure that the selected coefficient file is compatible with the cabinet or module before making a selection.



Step 5 Click **OK** to upload the coefficients to receiving cards.

14.3 Edit Calibration Coefficients

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Prerequisites

- Calibration coefficients are available.
- Cabinet configuration is done and the cabinets stay online.

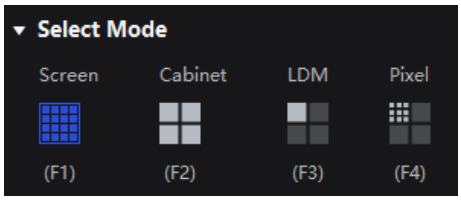
Operating Procedure

Step 1 Select a screen from the project list.

Step 2 From the menu bar, choose **Tools** > **Coefficient Management**.

Step 3 In the **Select Mode** area, select **Pixel**.

Figure 14-4 Select mode



Step 4 In the topology, click to select a cabinet.

Step 5 In the displayed window, select the target pixels and enter the parameters in the **Coefficient Management** area to adjust the proportion relationship of the red components, green components and blue components in RGB.

The calibration coefficients of the selected pixels will be overridden and changed to the values you set.

Figure 14-5 Pixel calibration coefficients

Table 14-1 Parameter relationship and value range

/	Red-R	Green-G	Blue-B
Red-R	RR (512 - 2047)	GR (0 - 255)	BR (0 - 127)
Green-G	RG (0 - 255)	GG (512 - 2047)	BG (0 - 255)
Blue-B	RB (0 - 127)	GB (0 - 127)	BB (512 - 2047)

Table 14-2 Icon description

Icon	Function
	The step of single increase or decrease. Use it together with  .
	Increase or decrease the coefficient value of the selected pixel.
	Click to close the pixel topology.

14.4 View Calibration Effect

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Related Information

If brightness correction has been done for the screen, the screen brightness can be adjusted in nits. Otherwise, it can be adjusted only in percentage.

Set the Display Content

In the Display area, you can adjust the screen brightness to clearly see the actual calibration effect change at each grayscale. You can also switch the color to see the uniformity of a single color and the entire display image.

Figure 14-6 Set display content

- Brightness: Adjust the screen brightness.
- Display image: Set the image displayed on the screen. By default, the current input source is being displayed ( ). You can switch to a monochrome display in white, red, green, and blue.

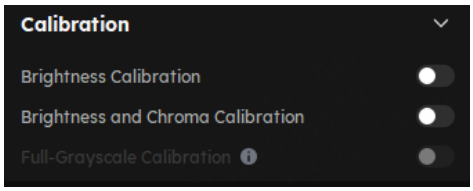
  To do so, simply press the shortcut keys W, R, G, B, and Tab.
- Show locating cursor: When the switch is set to , the selected area on the screen will display blue borders. This helps you quickly identify the cabinets, modules or pixels that you are currently operating.

Enable and Disable Calibration Effect

In the **Calibration** area, you can turn on or off the calibration switches and then view the display effects before and after the calibration.

The calibration switches include **Brightness Calibration**, **Brightness and Chroma Calibration**, **Full-Grayscale Calibration** and **Low-Grayscale Calibration**. The actual displayed switches depend on the existing coefficient types of the screen.

Figure 14-7 Calibration switches



The **Brightness Calibration** and **Brightness and Chroma Calibration** are mutually exclusive and cannot be enabled at the same time.

14.5 Save Calibration Coefficients

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Notice

During coefficient saving, if the receiving cards go offline, the saving will fail.

Related Information

To manage changes to the factory calibration coefficients, users can contact NovaStar tech support to apply for a license and set a valid period. During the valid period, coefficients can be saved in the module's flash memory. Otherwise, they can only be saved in the user area of the receiving card's flash memory.

To activate the license, place the file in the directory:

- Windows: C:\Users\YourUsername\AppData\Roaming\VMP\Datas
- Mac: /Users/Your User Name/Library/Application Support/VMP/Datas

Operating Procedure

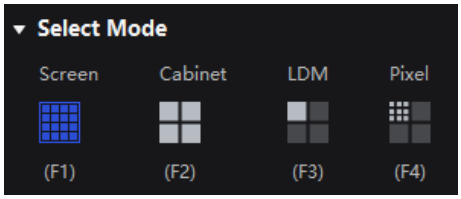
Save the calibration coefficients of the current screen, cabinet or module to the receiving card to avoid calibration effect loss due to power failure.

Step 1 Select a screen from the project list.

Step 2 From the menu bar, choose **Tools** > **Coefficient Management**.

Step 3 In the **Select Mode** area, select the saving range as needed, including **Screen**, **Cabinet**, **LDM** and **Pixel**.

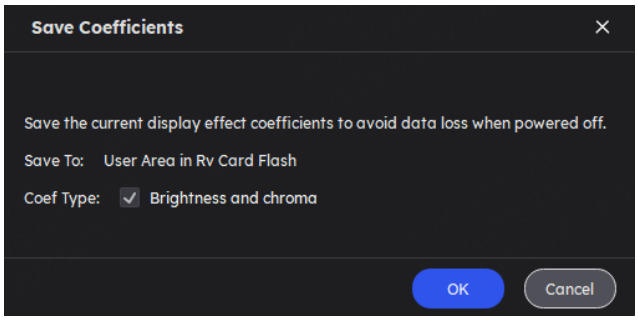
Figure 14-8 Select mode



Step 4 In the **Coefficient Management** area, click **Save** to save the current display effect coefficients to the receiving card.

The system automatically identifies the screen's coefficient types and saving locations. With an active license within its validity period, you can save coefficients in the module's flash memory. Otherwise, they are saved in the user area of the receiving card's flash memory. You can choose the extent of saving according to your needs.

Figure 14-9 Save coefficients



Step 5 Click **OK**.

14.6 Read Back Calibration Coefficients

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Notice

During coefficient readback, if the receiving cards go offline, the readback will fail.

Operating Procedure

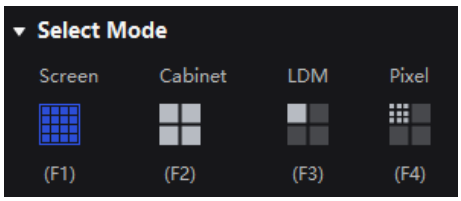
Read back the calibration coefficients saved in the receiving card and apply them to the current screen.

Step 1 Select a controller from the project list.

Step 2 From the menu bar, choose **Tools** > **Coefficient Management**.

Step 3 In the **Select Mode** area, select the reading range as needed, including **Screen**, **Cabinet**, **LDM** and **Pixel**.

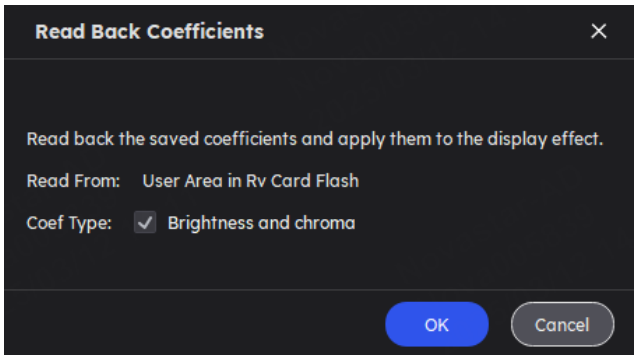
Figure 14-10 Select mode



Step 4 In the **Coefficient Management** area, click **Read** to read the saved coefficients and apply them to the display effect.

The system will automatically read the current screen's display effect coefficients. If the cabinet has module flash, coefficients can only be read back from the module flash. If there is no module flash, they can only be read back from the user area of the receiving card's flash memory.

Figure 14-11 Read back coefficients



Step 5 Click **OK**.

14.7 Export Calibration Coefficients

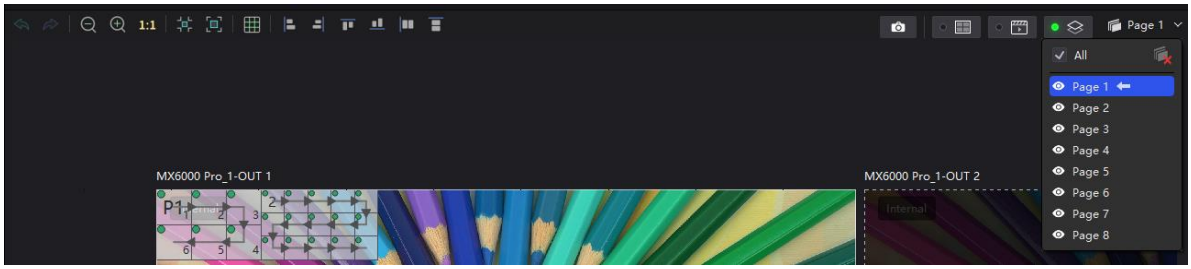
Export the calibration coefficients of the current screen, cabinet or module to the local computer. When the receiving card is replaced or the new screen has the same specifications, you can upload the exported calibration coefficients directly to use.

Applicable Products

MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, CX40 Pro

Prerequisites

- You can only export coefficients from page 1.



- To export screen coefficients, make sure:
  - The screen configuration is done, the cabinets are not rotated, and there are no cabinet gaps or overlapping.
  - The configured screen must be rectangular, and the top-left-corner coordinates of the circumscribed rectangle of the configured screen must be (0, 0).
- To export cabinet coefficients, make sure:

  The target cabinets must have cabinet IDs.

Notice

During coefficient exporting, if the controller and/or receiving cards go offline, the exporting will fail.

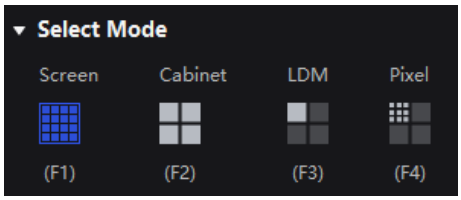
Operating Procedure

Step 1 Select a screen from the project list.

Step 2 From the menu bar, choose **Tools** > **Coefficient Management**.

Step 3 In the **Select Mode** area, select the export range as needed, including **Screen**, **Cabinet**, **LDM** and **Pixel**.

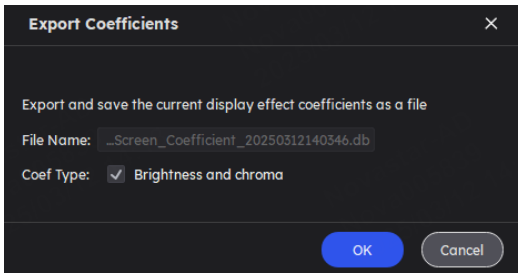
Figure 14-12 Select mode



Step 4 In the **Coefficient Management** area, click **Export** to export the current display effect coefficients as a file (.db).

The system will automatically read the existing coefficient types of the screen, allowing you to choose whether or not to export them based on your needs.

Figure 14-13 Export coefficients



Step 5 Click **OK**.

15 Screen Maintenance

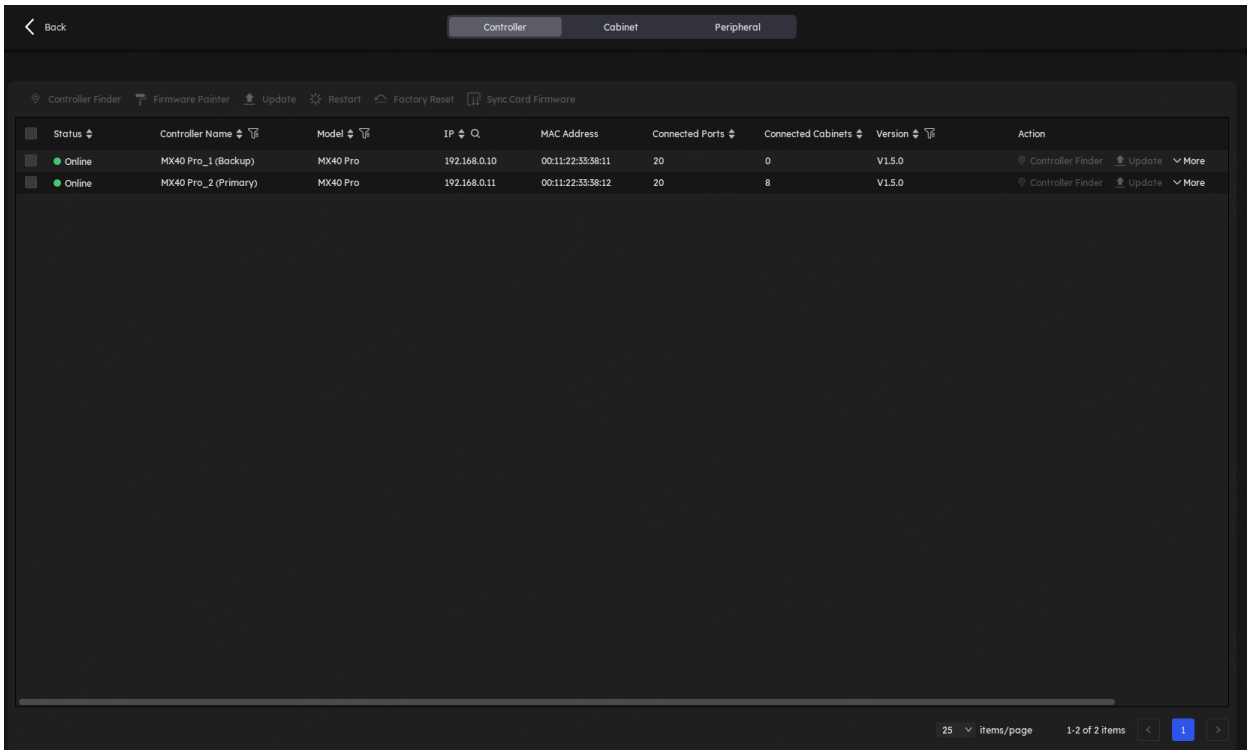
15.1 Maintain Controllers

Step 1 From the menu bar, choose **Tools** > **Maintain** and select the **Controller** tab.

Step 2 Select a screen from the project list on the left.

Step 3 Select the target controllers and perform the following operations as needed.

Figure 15-1 Controller maintenance



- **Controller finder**

  Click **Controller Finder** and the LCD screen of the controller becomes green (default), which helps you identify the controller quickly.

- **Firmware painter**

  a. Click **Firmware Painter**, select a single controller to start the firmware readback process.

  b. Once the readback is successful, the system will automatically enter the firmware upgrade mode. Select one or more controllers and click **Start** to update them so that they share the same firmware version as the current controller.

- **Factory reset (proceed with caution)**

  Click **Factory Reset**, then select one or more controllers. This action will restore all user settings to their default values. Confirm by clicking **OK** to proceed with the reset.

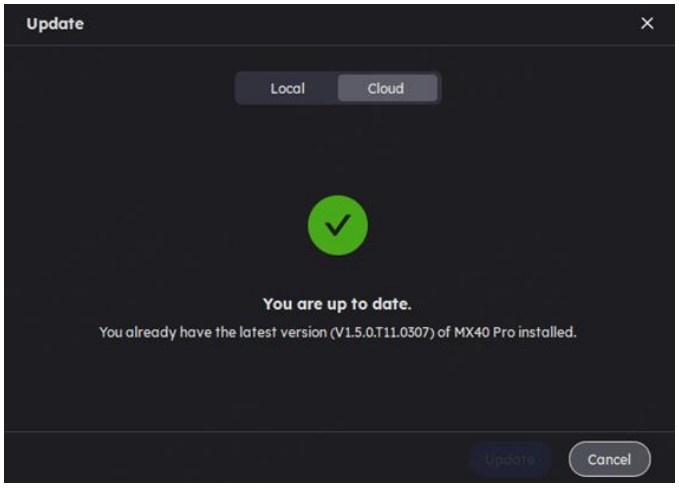
- **Sync card firmware**

If the card firmware version does not match with the controller firmware version, you can click **Sync Card Firmware** to sync the controller firmware to the card. Alternatively, you can resolve this issue by upgrading the firmware.

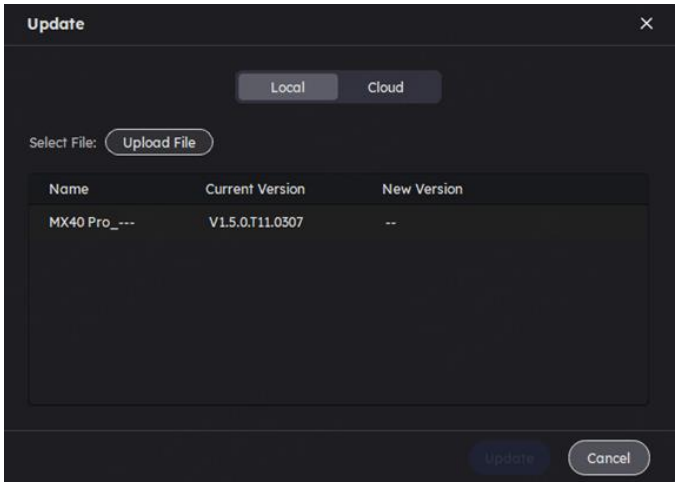
- **Update firmware**

  Click **Update** to update the controller's firmware by downloading from the cloud or uploading a local file.

  - Select the **Cloud** tab to view the latest version release notes and click **Update** to download and automatically install the package.



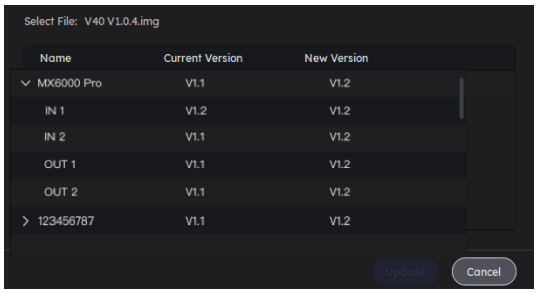
  - Choose the **Local** tab, click **Upload File**, and select either a firmware file (.img) or a compressed file (.zip) from the pop-up folder. Verify the file name and version number, then click **OK** to proceed with the update.



  During the upgrade process, the controller will automatically restart. In addition, please do not close VMP or switch to another controller until the update is complete.

Note:

- When updating firmware, it's recommended to use a wired network. During the upgrade, connect the PC and controller via a wired network. If you need to update via the cloud, ensure the PC is connected to the internet.
- All the controllers of a screen must be updated at the same time.
- When upgrading card-based controllers (MX6000 Pro and MX2000 Pro), all of the cards must be updated at the same time. If the cards span across different screens, the controllers that are under the same screen as the card must also be updated together.



- **Restart controller**

  Click **Restart** and click **OK**.

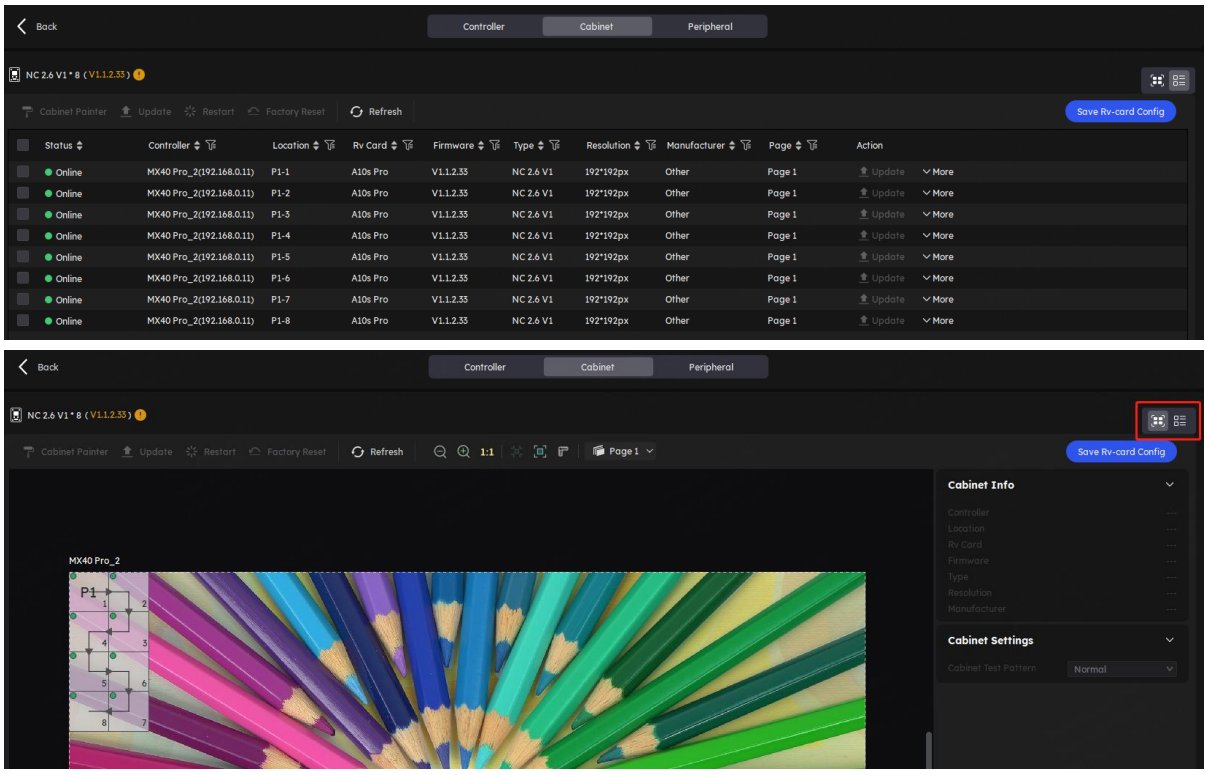
15.2 Maintain Cabinets

Step 1 From the menu bar, choose **Tools** > **Maintain** and select the **Cabinet** tab.

Step 2 Select a screen from the project list on the left.

Step 3 (Optional) Switch between the list and topology views by clicking the icon in the upper right corner, depending on your preference.

Figure 15-2 Cabinet maintenance – list/topology view



Step 4 Select the target cabinets and perform any of the following operations.

- **Check the cabinet information**

  Check the associated controller, daughter card (only applicable for card-based controller), location, receiving card model, receiving card firmware, cabinet model, and cabinet manufacturer.

- **Cabinet display settings (topology view only)**

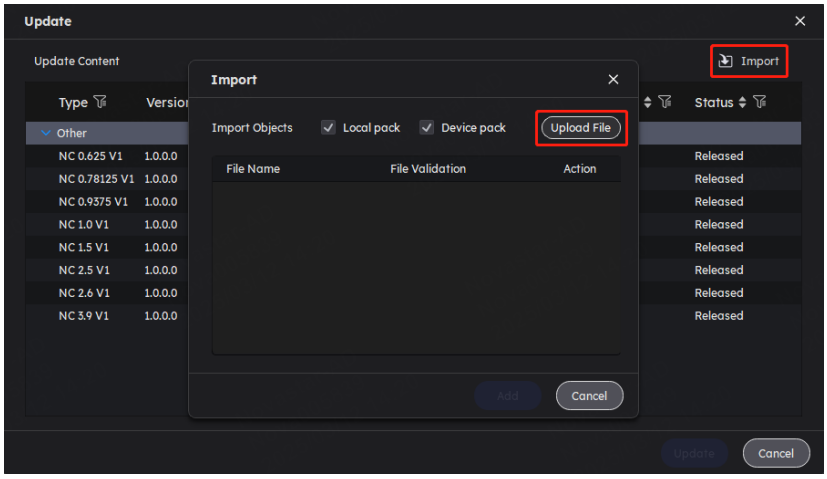
Select a cabinet through the topology view. In the **Cabinet Settings** section, click the **Cabinet Test Pattern** dropdown menu and choose the display for the cabinet.

- **Cabinet painter**

  Click **Cabinet Painter** and select one or more cabinets so that other cabinets can have the same firmware program and configuration file as the selected cabinet.

- **Update cabinet configuration file**

  On the **Cabinet** tab, select one or multiple cabinets and click **Update**.



In the pop-up window, either select an existing cabinet data or click **Import** to upload a new NCP file.

- Select an existing file: Choose an NCP file from the pop-up window and click **Update**.
- Import a new file: Click **Import** to upload a new NCP file. You can select the import objects (multiple selections are possible) from **Local pack** or **Device pack**. Once the upload is complete, return to the **Update** interface, select the imported NCP file, and click **Update**.

Note:

- It is recommended to perform the update using a wired network.
- When COEX series controllers work with the XA50 Pro, CA50E, A10s Pro and its derivative cards, as well as A8s Pro and its derivative cards, you can only perform the update using (.ncp) files.
- When updating using NCP files, if the firmware of the receiving card matches the NCP file, you have the option to update only the cabinet configuration file to enhance the update speed.

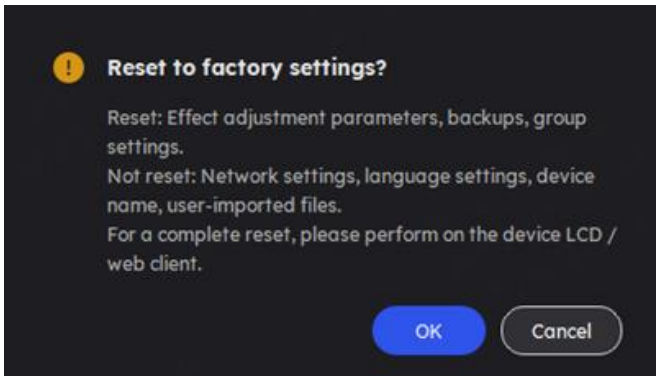
- **Restart cabinet**

  Click **Restart** and click **OK**.

- **Factory reset (proceed with caution)**

  The factory reset function is only supported on XA50 Pro, CA50E, A10s Pro and its derivative cards (version 1.5.3.0 and above).

  Select one or more receiving cards. If the selected receiving cards support the factory reset function and have default parameters in the factory area, you can click **Factory Reset** to restore all user parameters to their default values. Any receiving cards that do not support this function will be automatically skipped, and a reason will be provided.



- **Refresh information**

  Click **Refresh**.

15.3 Maintain Peripherals

Applicable Products

- 3D emitters: EMT200 Pro
- Multifunction card: MFN300

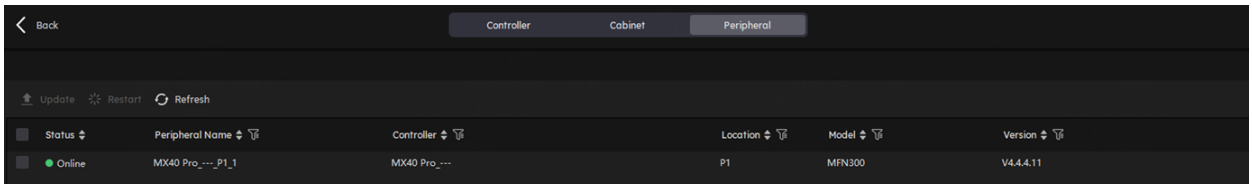
Operating Procedure

Step 1 From the menu bar, choose **Tools** > **Maintain** and select the Peripheral tab.

Step 2 Select a screen from the project list on the left.

Step 3 Select the target peripherals and perform the following operations as needed.

Figure 15-3 Peripheral maintenance



- **Check peripheral information**

  Check the status, name, associated controller (daughter card), location, model, firmware version, and other details of the peripheral.

- **Update peripheral**

  Click **Update**, select the firmware file (.img) or compressed file (.zip), and click **Open**. Verify the file name and version number in the pop-up window, and click **OK** to proceed with the update.

- **Restart peripheral**

  Click **Restart** and click **OK**.

- **Refresh information**

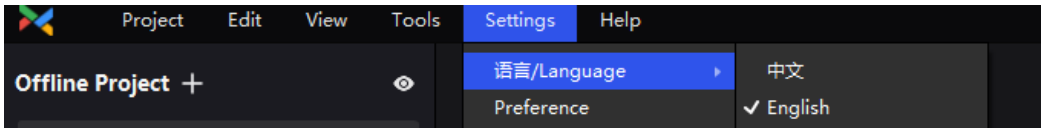
  Click **Refresh**.

16 Software Settings

16.1 Change Language and Temperature Scale

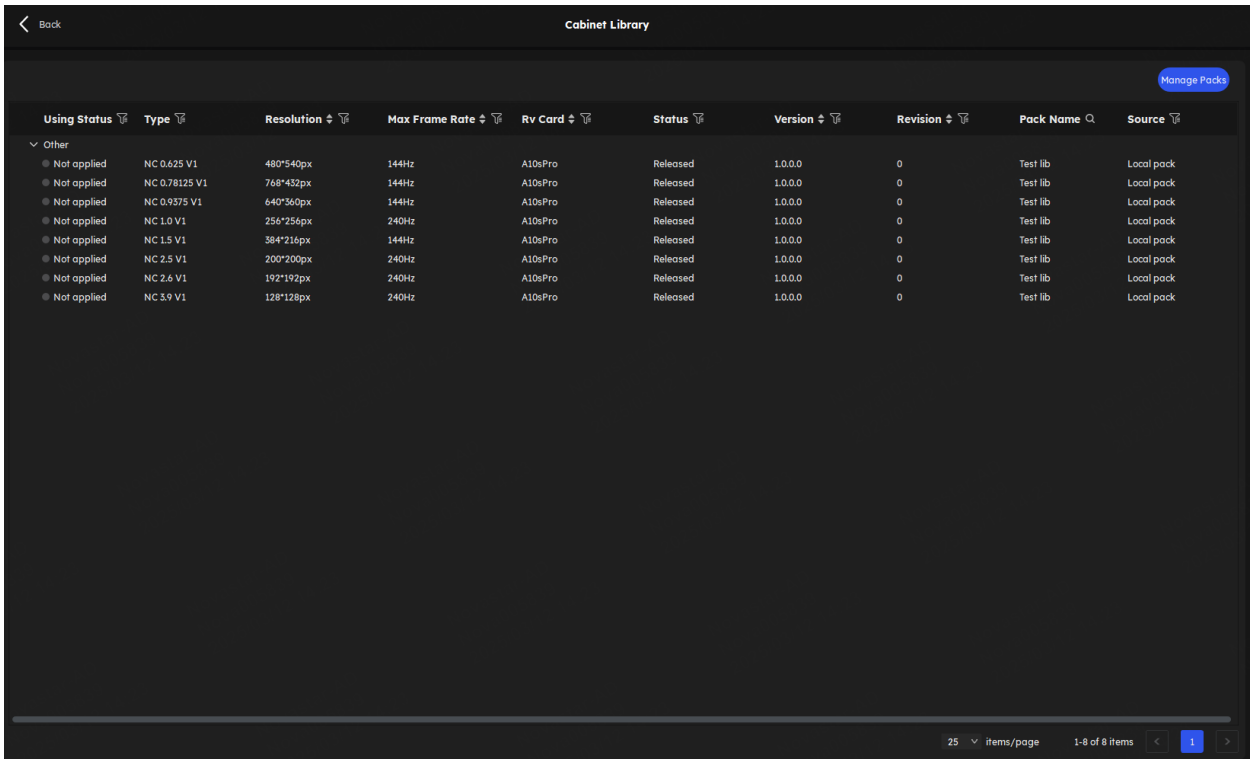
- From the menu bar, choose **Settings** > **语言/Language**, and then select the desired language option.
- From the menu bar, choose **Settings** > **Preference**, and then select the desired temperature scale.

Figure 16-1 Changing the language/temperature scale



16.2 Manage Cabinet Library

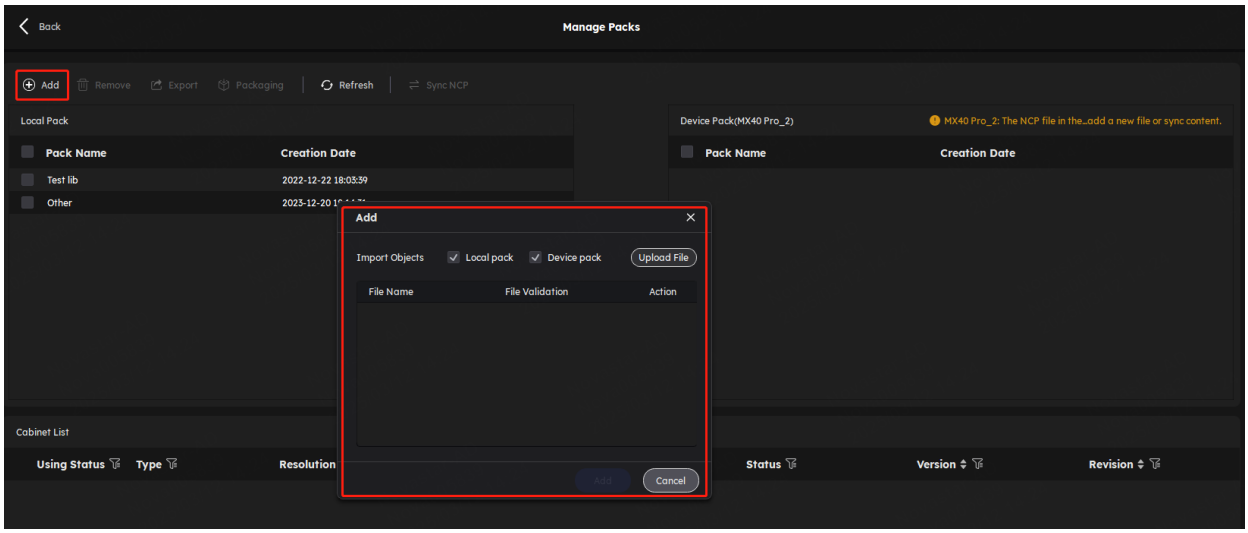
From the menu bar, choose **Settings** > **Cabinet Library**. Click **Manage Packs** and do the following operations as needed to manage the cabinet library files.



Upload NCP File

Step 1 Click **Add**. On the displayed window, click **Upload File**.

Figure 16-2 Adding NCP file



Step 2 Select the targets to be imported (multiple targets can be selected).

- When Local pack is selected, the imported NCP file will be saved under the VMP installation directory.
- When Device pack is selected, the imported NCP file will be saved in the LED controller's storage space.

Step 3 Select one or more NCP files to be imported from the local computer and click **Add**.

After the file is selected, you can click **Delete** to delete the uploaded file.

You can also click **Refresh** to refresh the NCP file list.

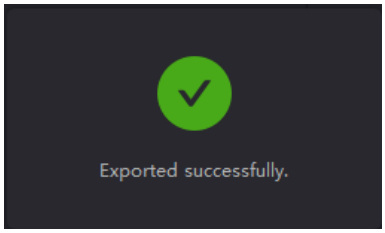
Export NCP File

Step 1 Select one or more (up to 40) NCP files on the Manage Packs screen and then click **Export**.

For batch export, multiple files will be compressed as a .zip file and exported.

Step 2 Select a local directory and click **Save**.

Figure 16-3 Successful export



Packaging NCP File

Step 1 Select one or more NCP files on the **Manage Packs** screen and then click **Packaging**.

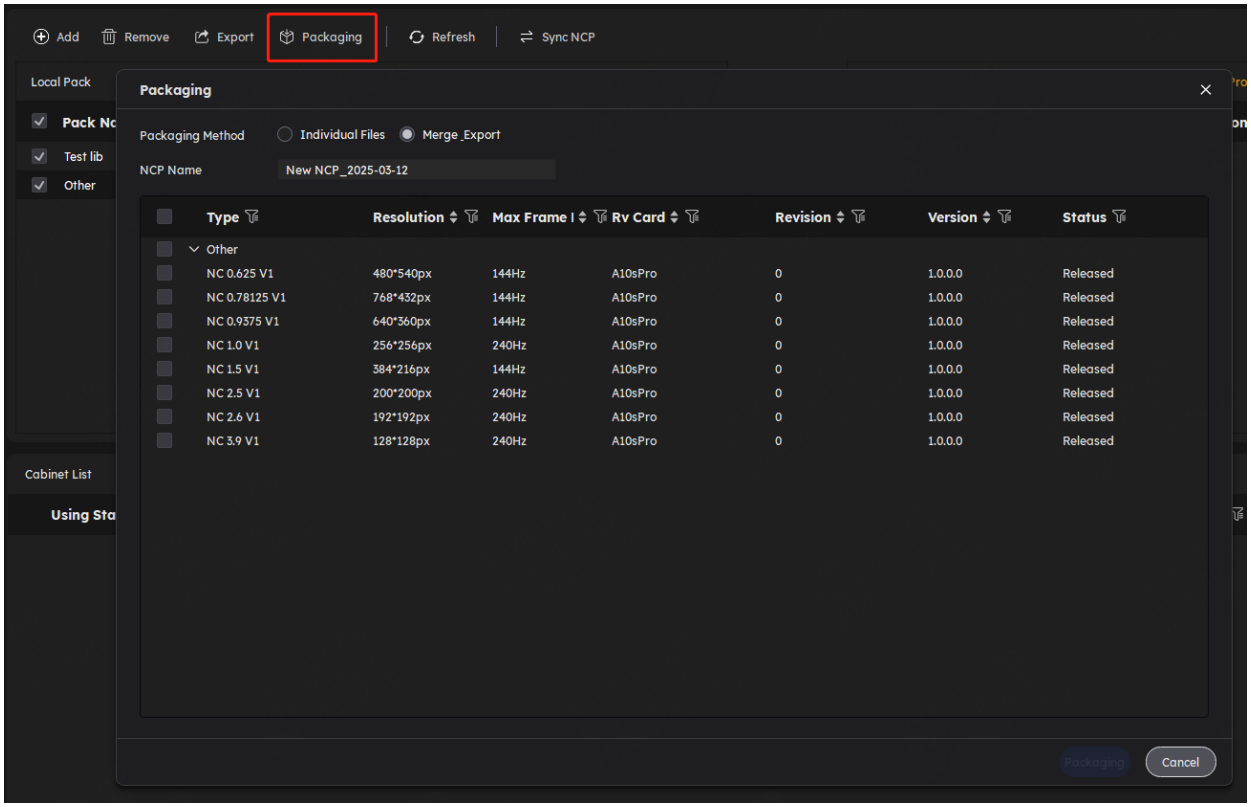
Step 2 Choose a packaging method. You can select either **Individual Files** or **Merge Export**.

- If you choose **Individual Files**, multiple individual NCP files will be exported.
- If you choose **Merge Export**, the selected cabinet files from multiple NCP files will be reorganized into a single new NCP file.

Step 3 Select one or more files you need to package and click **Packaging**.

Step 4 Select a local directory and click **Save**.

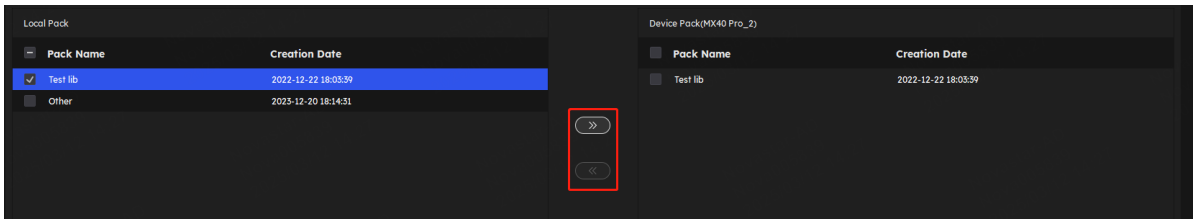
Figure 16-4 Packaging NCP file



Sync NCP File

- Sync NCP files between the device and local computer

  Select the files to be synced (multiple files can be selected), and click  .

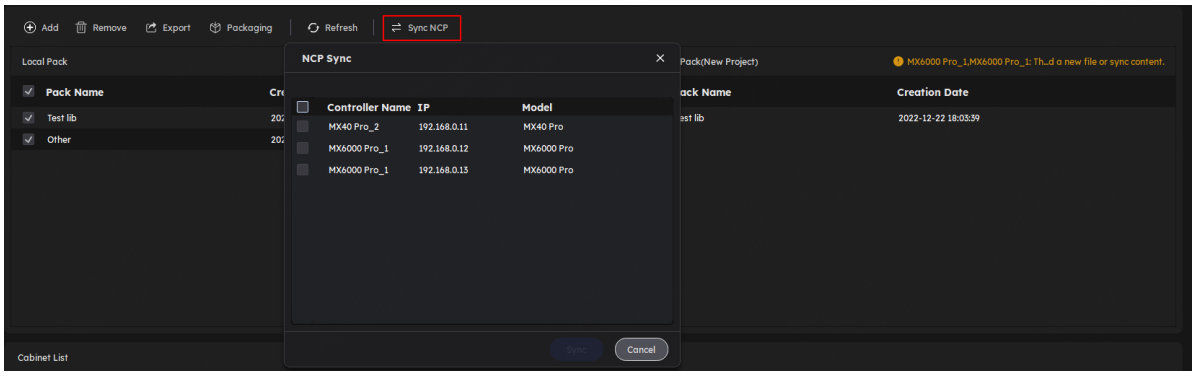


- Sync NCP files between devices

  a. Select the files to be synced (multiple files can be selected), and click **Sync NCP**.

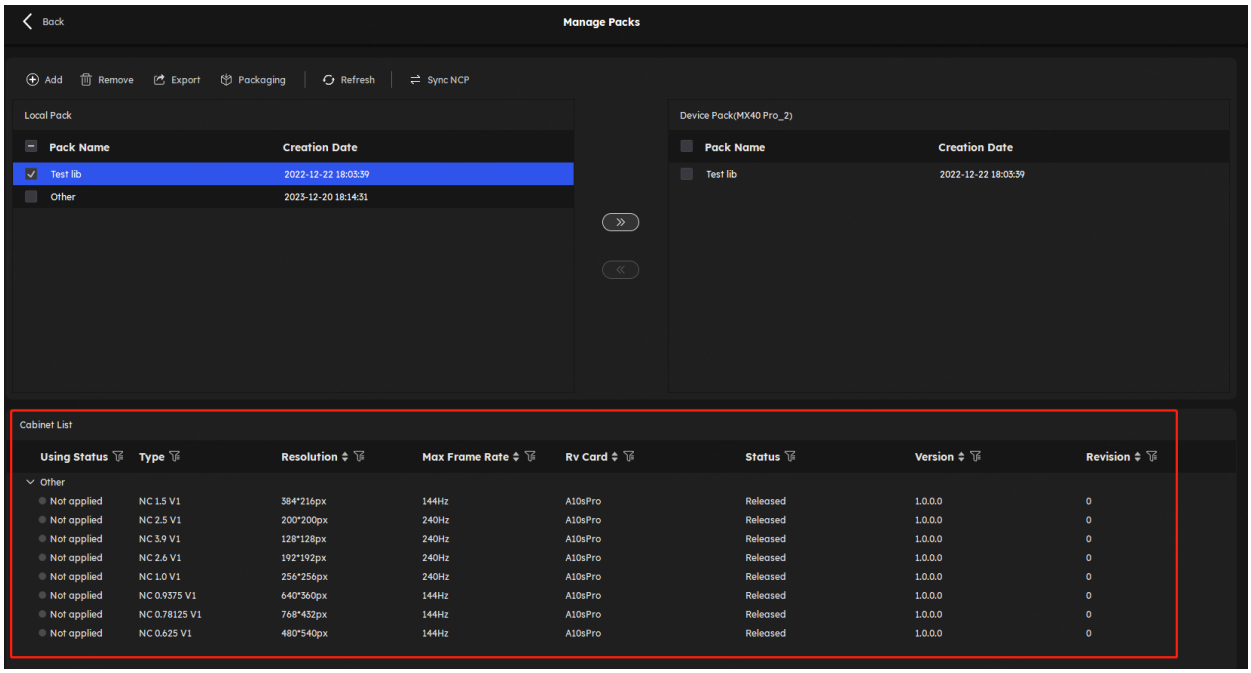
  b. On the displayed window, select the devices to which the files are synced (multiple devices can be selected).

  c. Click **Sync**.



Check NCP File Information

Select an NCP file, and the information about all the cabinets that use this NCP file will be displayed in the **Cabinet List** area below. The information includes application status, cabinet type, resolution, maximum frame rate, receiving card type, release status, version and revision.



16.3 Check for Version Updates

Prerequisites

- Only supported on V1.5.0 or later.
- Ensure that the computer is connected to a network to automatically check for updates. It is recommended to use a wired connection.

Notice

If the controller version does not match the VMP version, VMP cannot be used.

Operating Procedure

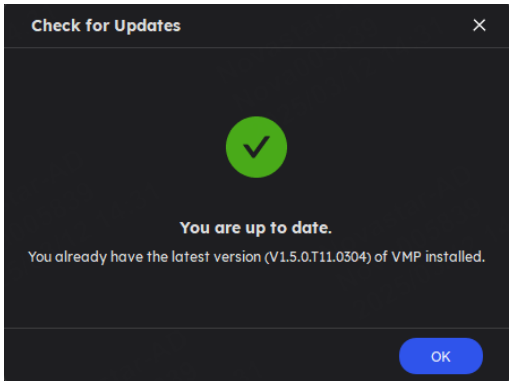
When you run VMP, the system will automatically check the current version information of VMP and the controller. If a new VMP version is available, a notification window will pop up. For non-mandatory updates, you can choose to skip the new version. However, you can still check for updates during the use of the current version by following these steps:

Step 1 From the menu bar, select **Help** > **Check for Updates** to see if VMP is up to date.

Step 2 If a new version is available, click **Update** to begin the download and update process.

Important updates for VMP will be enforced automatically.

Figure 16-5 Check for updates



Update Steps

VMP V1.5.0 must be paired with LED display controller V1.5.0. First, update VMP to V1.5.0. Then, using VMP, update the controller to V1.5.0. Ensure you check the current version of the controller before updating VMP.

- Controllers with version V1.4.0 support direct updates to V1.5.0.
- Controllers prior to V1.4.0 require sequential updates as detailed below.

Product Type	Product Model	Update Steps
Software	VMP	Directly install the V1.5.0 software package.
Controller	MX6000 Pro	1. Before updating to V1.5.0, the firmware must be at V1.4.0. 2. If the firmware is an earlier version than V1.4.0, first update to V1.4.0 using VMP (V1.4.0).
	MX2000 Pro	
	MX40 Pro	1. Before updating to V1.5.0, the firmware must be at V1.4.0. 2. If the firmware version is at V1.2.3, first update to V1.4.0 using VMP (V1.4.0). 3. If the firmware is an earlier version than V1.2.3, first update to V1.2.3 using VMP (V1.2.3). Then, use VMP (V1.4.0) to update the controller to V1.4.0. 4. For systems running version B14, use VMP (V1.2.3) to update the controller to V1.0.0, and then proceed to update to V1.2.3 and V1.4.0.
	MX30	1. Before updating to V1.5.0, the firmware must be at V1.4.0.

		2. If the firmware version is at V1.1.0, first update to V1.4.0 using VMP (V1.4.0). 3. If the firmware is an earlier version than V1.1.0, first update to V1.1.0 using VMP (V1.2.3). Then, use VMP (V1.4.0) to update to V1.4.0.
	MX20	1. Before updating to V1.5.0, the firmware must be at V1.4.0. 2. If the firmware is an earlier version than V1.4.0, first update to V1.4.0 using VMP (V1.4.0).
	KU20	1. Before updating to V1.5.0, the firmware must be at V1.4.0. 2. If the firmware version is at V1.2.1, first update to V1.4.0 using VMP (V1.4.0). 3. If the firmware is an earlier version than V1.2.1, first update to V1.2.1 using VMP (V1.2.3). Then, use VMP (V1.4.0) to update to V1.4.0.
	CX40 Pro	1. Before updating to V1.5.0, the firmware must be at V1.4.0.B5. 2. If the firmware version is at V1.1.0, first update to V1.4.0.B5 using VMP (V1.4.0.CTM0210). Then, perform a factory reset on the controller and select "Full Reset." 3. If the firmware is an earlier version than V1.1.0, first update to V1.1.0 using VMP (V1.2.3). Then, use VMP (V1.4.0.CTM0210) to update to V1.4.0.B5. When updating to V1.1.0, please ensure that the receiving card CA50E is updated to V1.3.0.0 or later.

Note:

After upgrading the controller, it's generally advised not to downgrade, as it might cause device issues. Try to avoid this action during use. If you have questions or encounter problems, feel free to contact NovaStar technical support for assistance.

16.4 Check User Manual

From the menu bar, choose **Help** > **User Manual** to open and check the VMP user manual.

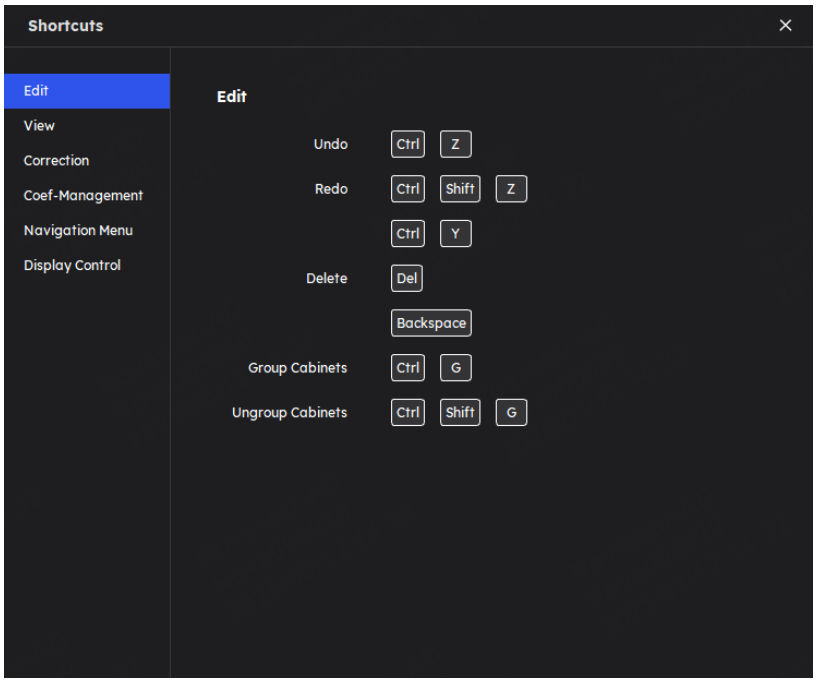
16.5 Check Software Information

From the menu bar, choose **Help** > **About** and check the software information.

16.6 Check Keyboard Shortcuts

From the menu bar, choose **Help** > **Shortcuts** and check the commonly used software operation shortcuts.

Figure 16-6 Shortcuts



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