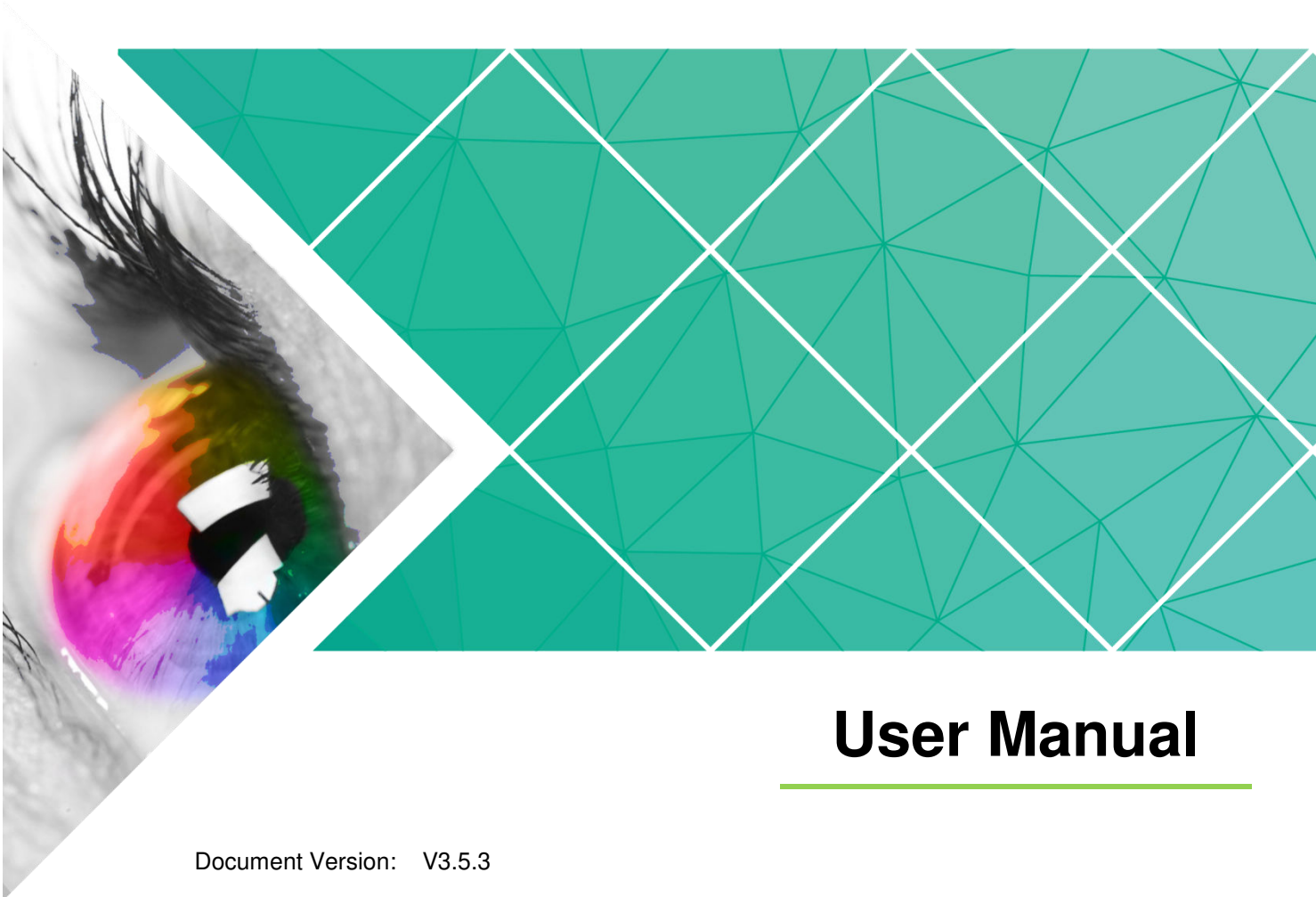




SmartLCT

Screen Configuration Software




User Manual

Document Version: V3.5.3

Copyright © 2020 Xi'an NovaStar Tech Co., Ltd. All Rights Reserved.

No part of this document may be copied, reproduced, extracted or transmitted in any form or by any means without the prior written consent of Xi'an NovaStar Tech Co., Ltd.

Trademark

 is a trademark of Xi'an NovaStar Tech Co., Ltd.

Statement

You are welcome to use the product of Xi'an NovaStar Tech Co., Ltd. (hereinafter referred to as NovaStar). This document is intended to help you understand and use the product. For accuracy and reliability, NovaStar may make improvements and/or changes to this document at any time and without notice. If you experience any problems in use or have any suggestions, please contact us via contact info given in document. We will do our best to solve any issues, as well as evaluate and implement any suggestions.

Change History

Version	Release Date	Description
V3.5.3	2020-06-17	Fixed 2 problems: <ol style="list-style-type: none">1. When SmartLCT is connected to the sending card that is not connected to the receiving card, if you adjust the brightness after screen configuration is done, SmartLCT quits unexpectedly.2. If the configuration file name contains English parenthesis, the configuration files cannot be added in batches.
V3.5.2	2020-04-27	Added 2 functions: <ol style="list-style-type: none">1. Support for the VX16s all-in-one controller2. Exporting screen configuration data to a JSON file Fixed 2 problems: <ol style="list-style-type: none">1. If the 2055IC chip is used, the screen becomes blurred when users adjust Gamma, the screen has color cast when users exit the seam brightness adjustment function, and the screen brightness changes too slowly when users adjust the brightness.2. The color temperature adjustment function and the calibration effect cannot work at the same time.
V3.5.1	2019-07-23	Fixed the compatibility problem with macOS 10.10.5.
V3.5.0	2019-06-28	Added 11 functions: <ol style="list-style-type: none">1. Recovering receiving card parameters from factory partition2. Ethernet port hot backup verification of online device3. Online software update4. Device properties5. Maintenance function under Help tab in the toolbar6. No Video Source mode on Seam Brightness Adjustment page7. Support for K16 and NovaPro UHD Jr all-in-one controllers8. Support for HDMI 10-bit input of MCTRL R59. Support for rotation backup function of MCTRL R510. Support for mirror backup function of MCTRL660 PRO11. Chapter 6 Troubleshooting Deleted 2 functions:

		<ol style="list-style-type: none"> 1. Monitoring function 2. Reset function in the V-Sender toolbar <p>Optimized 3 functions:</p> <ol style="list-style-type: none"> 1. Rotation in 90° Increments 2. Color temperature adjustment 3. Seam brightness adjustment
V3.4.2	2019-01-18	Deleted the Save button on the seam brightness adjustment page.
V3.4.1	2018-11-21	<ol style="list-style-type: none"> 1. Language setting is available only on the start page. 2. On the device properties page, deleted Position and changed Mapping Position to Offset. 3. The following functions are added in V-Sender: <ul style="list-style-type: none"> – Low latency (supported by the MCTRL4K and MCTRL660 PRO only) – Working as fiber converter (supported by the MCTRL660 PRO only) – 3D function (supported by the MCTRL4K only) – HDR (supported by the MCTRL4K only) 4. New cabinet connection patterns are added. 5. In the Advanced function on the Edit page, the configuration files can be sent at the same time. 6. In section 1.2 Configuration List, the supported driver chips are added.
V3.4.0	2018-08-03	<ol style="list-style-type: none"> 1. Color temperature and color gamut adjustment is added. 2. The advanced mode of hot backup function is visualized. 3. Batch adjustment function is added in the Device menu. 4. The Beacon function is deleted. 5. UI language supports only Chinese and English.
V3.2.0	2017-11-30	<ol style="list-style-type: none"> 1. Double seam brightness correction is added in Seam Brightness Adjustment. 2. Monitoring service and platform 3. Cabinets can rotate in 90° increments. 4. Beacon 5. Receiving card program and configuration information readback
V3.1.0	2017-05-25	<ol style="list-style-type: none"> 1. Test Tool is added in the Tools menu. 2. When the MCTRL R5 is selected, a rotating bar appears on each of the cabinets after you add cabinets and connect them. 3. The Batch Add button is added in the tool bar. 4. The Alignment button is added in the tool bar. 5. Simple Mode is added to the Hot Backup function. 6. The Factory Reset sub-menu is added in the Settings menu of V-Sender. 7. Operating wizard is added to the Simple Mode of hot backup.

V3.0.0	2017-01-20	First release
--------	------------	---------------

Contents

Change History	ii
Contents	v
1 Introduction.....	1
1.1 System Architecture.....	2
1.2 Configuration List.....	2
1.3 Notices	3
1.4 Software Installation	3
2 Language Settings.....	4
3 Offline Operation.....	5
3.1 User Interface	5
3.1.1 Function Area.....	6
3.1.2 Properties Area	6
3.1.3 Canvas.....	10
3.1.4 Loading Capacity Usage	10
3.2 New Project	10
3.3 Screen Configuration	13
3.3.1 Adding Cabinets.....	13
3.3.2 Cabinet Configuration	13
3.3.3 Setting Cabinet Offset.....	14
3.3.4 Rotating Cabinets	15
3.4 Adding Device.....	16
3.5 Hot Backup	17
3.5.1 Backup Within Device.....	17
3.5.2 Backup Between Devices	18
3.5.3 Switching Between Master and Slave Devices	18
3.6 Sending Configuration Information	19
4 Online Operation.....	21
4.1 User Interface	21
4.1.1 Function Area.....	22
4.1.2 Properties Area	23
4.1.3 Canvas.....	28
4.1.4 Loading Capacity Usage	29
4.2 New Project	29

4.3 Screen Configuration	30
4.3.1 Adding Cabinets.....	30
4.3.2 Cabinet Configuration.....	31
4.3.3 Setting Cabinet Offset.....	32
4.3.4 Rotating Cabinets	32
4.4 Hot Backup	33
4.4.1 Backup Within Device.....	33
4.4.2 Backup Between Devices	34
4.4.3 Switching Between Master and Slave Devices	35
4.4.4 Verification	35
4.5 Seam Brightness Adjustment	36
4.5.1 User Interface	36
4.5.2 Seam Brightness Parameter Adjustment	38
4.6 Batch Adjustment.....	38
4.6.1 User Interface	38
4.6.2 Procedure	40
4.7 Color Gamut Settings	40
4.8 Sending Configuration Information	41
4.9 V-Sender.....	41
4.9.1 Accessing V-Sender.....	41
4.9.2 Introduction to Tool Bar.....	42
4.9.3 Adding Devices	43
4.9.4 Information.....	43
4.9.5 Control	44
4.9.6 Template Settings	44
4.9.7 Device Properties	45
4.9.8 Picture in Picture (PIP)	46
4.9.9 Mosaic	47
4.10 Other Operations	48
4.10.1 Hot Backup	48
4.10.2 Mapping	48
4.10.3 3D Function	48
4.10.4 Working Mode.....	50
4.10.5 HDR	50
4.10.6 Low Latency.....	52
5 Features.....	54
5.1 Recovering Receiving Card Parameters from Factory Partion	54
5.2 Online Software Update.....	54
5.3 Replacing Receiving Card With One Click	55
5.4 Building Screens like Building Blocks.....	56
5.5 Rotating in 90° Increments	56

5.6 Full 360° Rotation	57
5.7 LED Display Test	59
5.8 Update and Readback of Receiving Card Configuration Parameters	60
5.9 Applying Effect to All Receiving Cards.....	60
5.10 Receiving Card Program Upgrade	61
5.11 Controller Program Upgrade.....	61
5.12 Exporting Screen Configuration Information as Image.....	61
6 Troubleshooting.....	65
6.1 Device Went Offline	65
6.2 Redundancy Information of Hardware Configuration Not Read Back.....	65
6.3 No Cabinet Offset Information in Readback Screen Information	65
6.4 Cabinet Display Becomes Abnormal After Mapping is Enabled	66
6.5 Unable to Connect to MCTRL660/MCTRL600 in SmartLCT of Mac Version.....	66
6.6 Some Cabinets Displaying Image Abnormally After Cabinet Configuration File Is Updated.....	67

1 Introduction

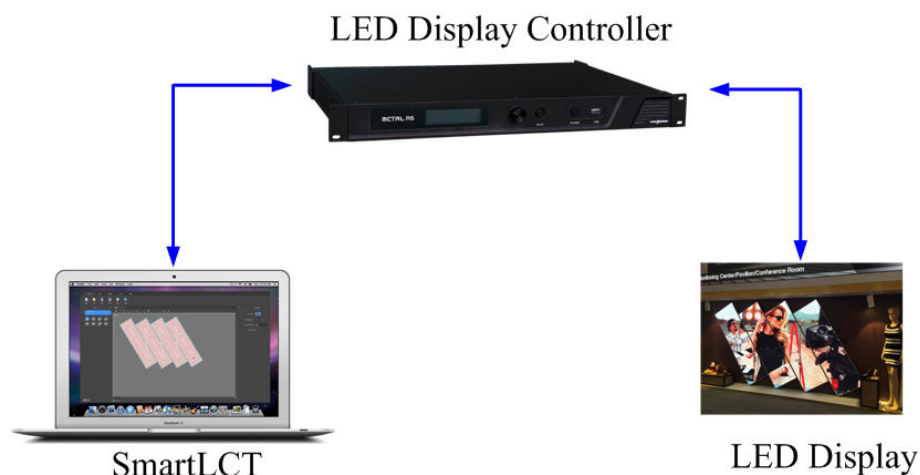
SmartLCT is the new generation of screen configuration software from NovaStar. Working with sending devices and receiving cards, it allows smart configuration of various complex LED displays, including building-block screen configuration, offline (online) design, seam brightness adjustment, cabinet rotation, etc. SmartLCT makes screen configuration much easier and further enhances user experience.

Key features:

- One-click replacement of receiving card
- Online software update
- Supports 18bit+.
- Supports ClearView.
- Screen configuration like building blocks
- Image rotation in 90° increments (working with Armor series receiving cards)
- Image rotation at any angle (working with the MCTRL R5)
- Readback of receiving card program and configuration information
- Seam brightness adjustment
- The functions of video controllers can be set in V-Sender.
- Supports cabinet brightness and chroma adjustment in batches.
- Supports hot backup.
- The canvas can be exported as an image.

Operating environment: macOS 10.10 or later, Windows 7 or later

1.1 System Architecture



1.2 Configuration List

Name	Version/Model	Function	Remarks
SmartLCT	V3.5.3	Operation platform	Required
Supported sending devices	<ul style="list-style-type: none"> Windows operating environment MCTRL300/MCTRL R5/MCTRL500/MCTRL600/MCTRL660 /MCTRL700/MCTRL4K/ MCTRL1600/Thunderview_S1/ MCTRL660 PRO macOS operating environment MCTRL300/MCTRL R5/ MCTRL600/MCTRL660 /MCTRL4K/ MCTRL1600/Thunderview_S1/ MCTRL660 PRO 	Send input signals to receiving cards via Gigabit Ethernet ports.	Optional
Supported all-in-one controllers	<ul style="list-style-type: none"> Windows operating environment 3D HD/NovaPro HD/ NovaPro UHD Jr VX2/VX2U/K2U/VX4/VX4S/VX4U/K4/K4S/K4U/V X5s/VX6s/V700/V800/V900/V900S/VX16s macOS operating environment 3D HD/NovaPro HD/ NovaPro UHD Jr/ K16 VX2/VX2U/K2U/VX4/VX4S/VX4U/K4/K4S/K4U/V X5s/VX6s/V700/VX16s 	Process input signals.	Optional
Supported receiving cards	MRV200/MRV210/MRV220/MRV270/MRV271/M RV275/MRV281 MRV300/MRV308/MRV316/MRV320/MRV328/M RV330/MRV336/MRV340/MRV350/MRV360/MRV 365/MRV366/MRV206/DH418/DH436/MRV266/A T20/RV17 XC100/XC150/XC200/ARN200	Drive the LED display.	Optional



	A4/A5/A7/A8/A4s/A5s/A7s/A8s/A9s/A10s		
Supported driver chips	MBI5036/SUM2017T/MBI5038/MY9862/TLC5929/MY9163/MBI5030/DM13H/MBI5042/SM16136/MBI5050/SM16027/SUM2018/P2510/RFT3630/SUM2030/SUM2130/MBI5034/MBI5040/MY9268/SCL8060/MBI5224/MBI5051/MBI5052/SM16158/MBI5053/MBI5153/MY9373/SM16159/MBI5252/MBI5155/MY9266/MY9366/MBI5042B/MBI5041B/MBIA043/MBI5043/SUM2028/MY9269/MBI5045/MBI5039/SUM2032/MBI5152/MBI5151	Support current gain.	Optional

1.3 Notices

- Mac computers currently do not support MCTRL500, MCTRL700, V800, V900 or V900S.
- Do not support LED display image offset adjustment of MCTRL4K when it works in multi-card mode.
- The V-Sender module does not support the Thunderview_S1, VX5s, VX6s, MCTRL700 or VX16s.
- Support the cabinet configuration files (rcfgx) exported from or converted by NovaLCT V4.6.0 or later.
- The Mac computer and the sending device must be set with the same IP address and gateway when they are connected by Ethernet cable.
- Close NovaLCT before using V-Sender to update hardware program of NovaPro HD.

1.4 Software Installation

Just like the installation of other common software, install SmartLCT by following the setup wizard.

	In case that antivirus software or firewall prompts pop up during the installation, please permit them because the serial driver may need to be installed.
	The installation program will update the serial driver on the customers' computer to the version of the driver in the installation package automatically if there is no serial driver or its version is too early.

2 Language Settings

SmartLCT is available in Chinese and English.

In the function section of the start page, click **Language** and select the language you prefer from the dialog box that appears.

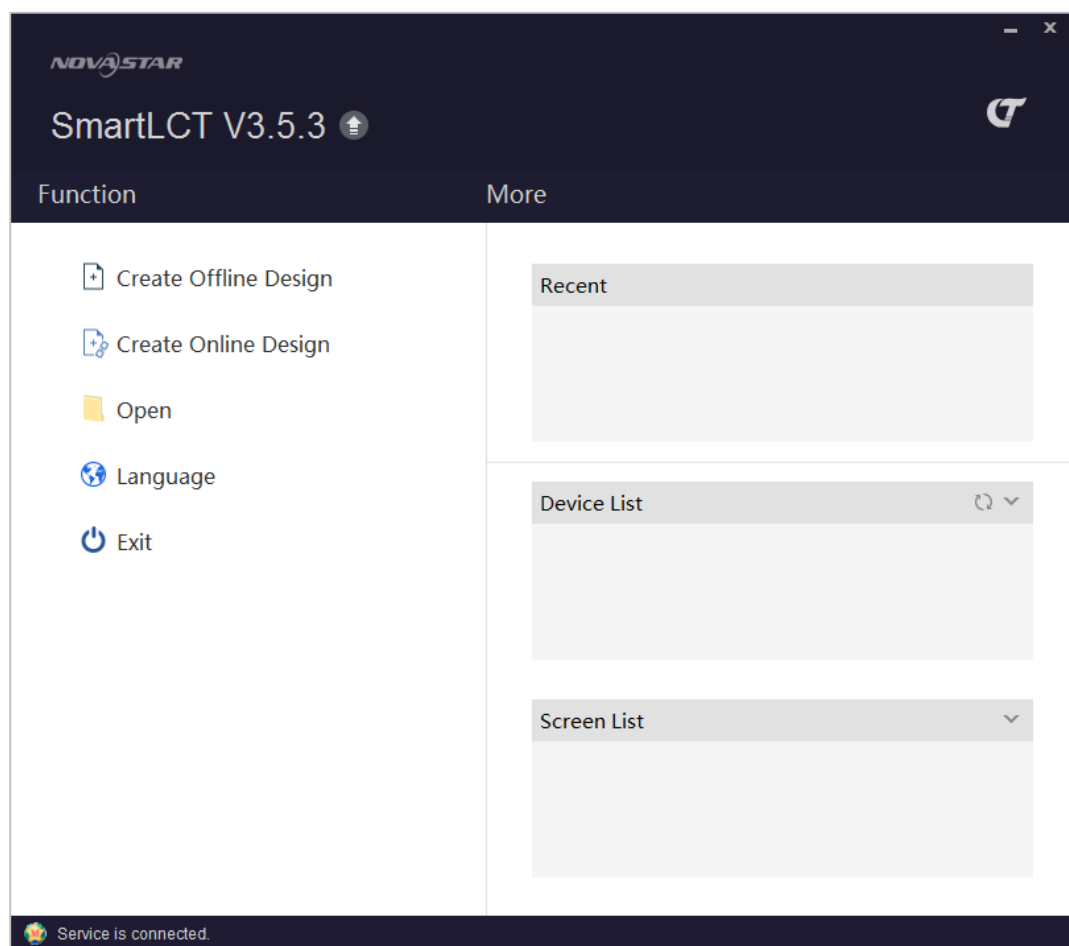


3 Offline Operation

3.1 User Interface

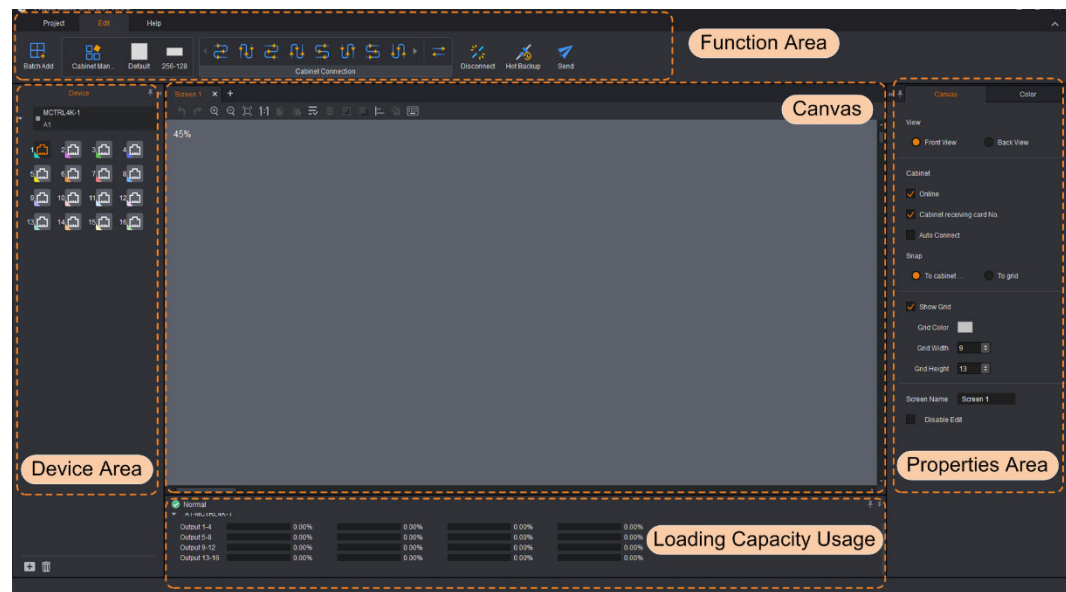
Run SmartLCT to enter its start page.

Figure 3-1 Start page



Create an offline project to enter the screen configuration page.

Figure 3-2 Screen configuration page



3.1.1 Function Area

Function Area		Description
Project	New/Open/Save/Save As/Export	Allows you to create, save and export a project.
Edit	Batch Add	Allows you to add multiple same cabinets at the same time.
	Cabinet Management	Allows you to manage the cabinet library, including adding cabinet.
	Cabinet Connection	Allows you to choose the cabinet connection type.
	Disconnect	Removes the connection lines between cabinets.
	Hot Backup	Backup between devices or backup between Ethernet ports of a device
	Send	Sends the display configuration information to hardware devices.
Help	Test Tool	An LED display test tool developed by NovaStar. It can be used for editing and testing the display window. It allows you to open a preview window on the desktop and view the result of the test.
	Serial Driver (available on Mac)	Connects to device.
	User Manual	User manual of SmartLCT
	About	Software information

3.1.2 Properties Area

Properties Area		Description
Canvas	View	Set the view of cabinet, including front view and back view.

	Cabinet	Set display status and connection type of cabinet. <ul style="list-style-type: none"> • Online • Cabinet receiving card No. • Auto Connect
	Snap	Include snapping to cabinet edge and snapping to grid.
	Grid	<ul style="list-style-type: none"> • Grid Color: Set the color of canvas grid. • Grid Width: Set the grid width (unit: pixel). • Grid Height: Set the grid height (unit: pixel).
	Screen Name	Customize the screen name.
	Disable Edit	Select this option to disable any operation on cabinet.
Color		Set the screen brightness, Gamma and color temperature. Full Screen is available for online operation.
Properties		View the cabinet properties, receiving card model, device name, communication port, cabinet No. and offset position of the top-left corner of a cabinet.

Canvas Properties

Click a blank area of canvas and edit the canvas properties on the **Canvas** tab page.

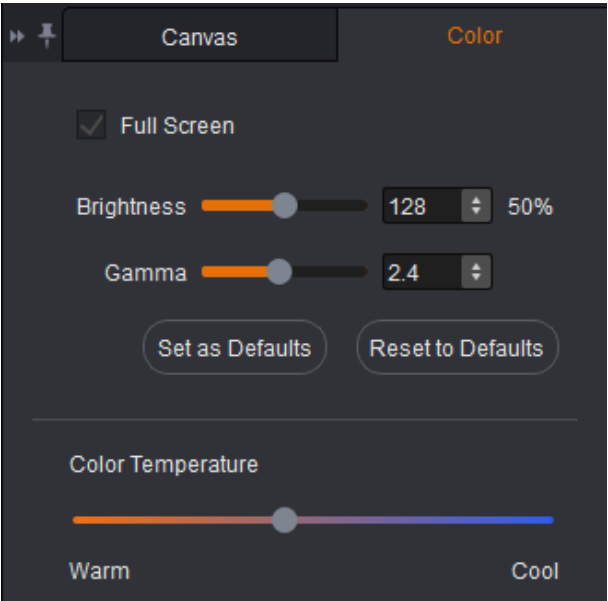
Figure 3-3 Canvas properties

The screenshot shows the 'Canvas' properties panel in the SmartLCT Screen Configuration Software. The panel has a dark background and is divided into several sections. At the top, there are two tabs: 'Canvas' (selected) and 'Color'. Below the tabs, the 'View' section contains two radio buttons: 'Front View' (selected) and 'Back View'. The 'Cabinet' section contains three checkboxes: 'Online' (checked), 'Cabinet receiving card No.' (checked), and 'Auto Connect' (unchecked). The 'Snap' section contains two radio buttons: 'To cabinet ...' (selected) and 'To grid' (unchecked). Below the 'Snap' section, there is a 'Show Grid' checkbox (checked). Underneath, there are three input fields: 'Grid Color' (a color picker showing a light gray color), 'Grid Width' (a numeric input field with the value '9'), and 'Grid Height' (a numeric input field with the value '13'). At the bottom, there is a 'Screen Name' input field with the text 'Screen 1' and a 'Disable Edit' checkbox (unchecked).

Color Adjustment

Set the screen brightness, Gamma and color temperature. **Full Screen** is available for online operation.

Figure 3-4 Color properties

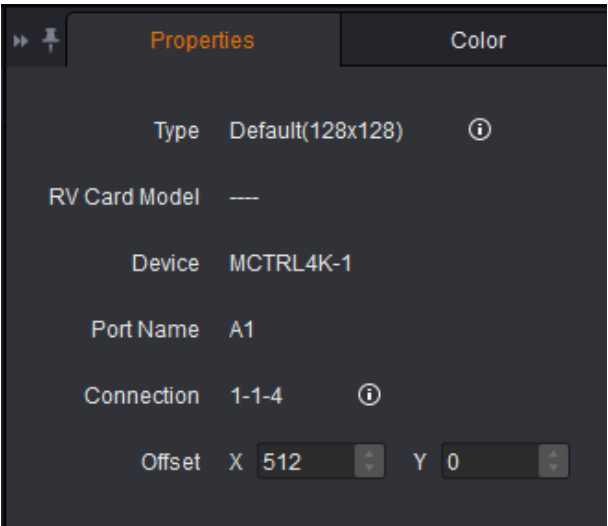


Cabinet Properties

Click to select a cabinet. Properties of the device and the selected cabinet are displayed on the **Properties** tab page.

You can view the cabinet properties, receiving card model, device name, communication port, cabinet No. and offset position of the top-left corner of a cabinet.

Figure 3-5 Cabinet properties



















Note:

Connection 1-1-4: Indicates that the sending card No. is 1, Ethernet port No. is 1, and the receiving card No. is 4.

3.1.3 Canvas

Configure the screen by editing cabinet information in canvas.

Icon	Description	Icon	Description
	Undo		Redo
	Select all		Zoom in
	Delete		Zoom out
	Group		Zoom to Fit
	Ungroup		Display canvas in 100%
	Alignment		Copy
	Offset		Paste
	Rotate		Keyboard shortcuts

3.1.4 Loading Capacity Usage

Note:

If you have set the connection type to **Auto Connect**, the cabinets beyond the loading capacity of the Ethernet ports cannot be connected. If you choose to manually connect the cabinets, the cabinets beyond the loading capacity of the Ethernet ports can be connected.

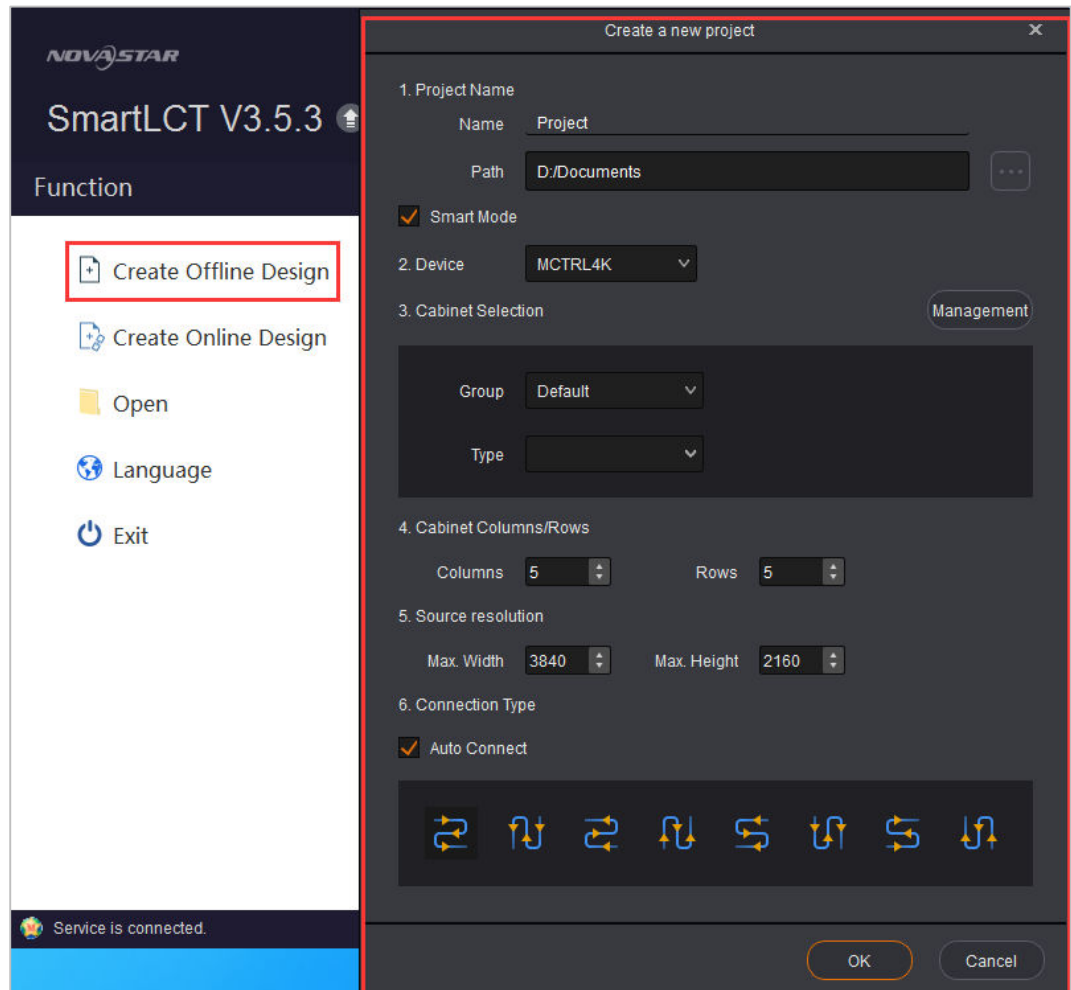
The **Loading Capacity Usage** section intuitively displays the usage of the loading capacity of Ethernet ports.

- Blue: The loading capacity is normal. When the loading capacity of the connected cabinets is within that of the Ethernet ports, the progress bar shows blue.
- Red: The loading capacity is beyond the limit. When the loading capacity of the connected cabinets exceeds that of the Ethernet ports, the progress bar shows red.
- Gray: The Ethernet ports are not loading any cabinet.

3.2 New Project

Run SmartLCT. In the function section of the start page, click **Create Offline Design** to enter the **Create a new project** page.

Figure 3-6 New project

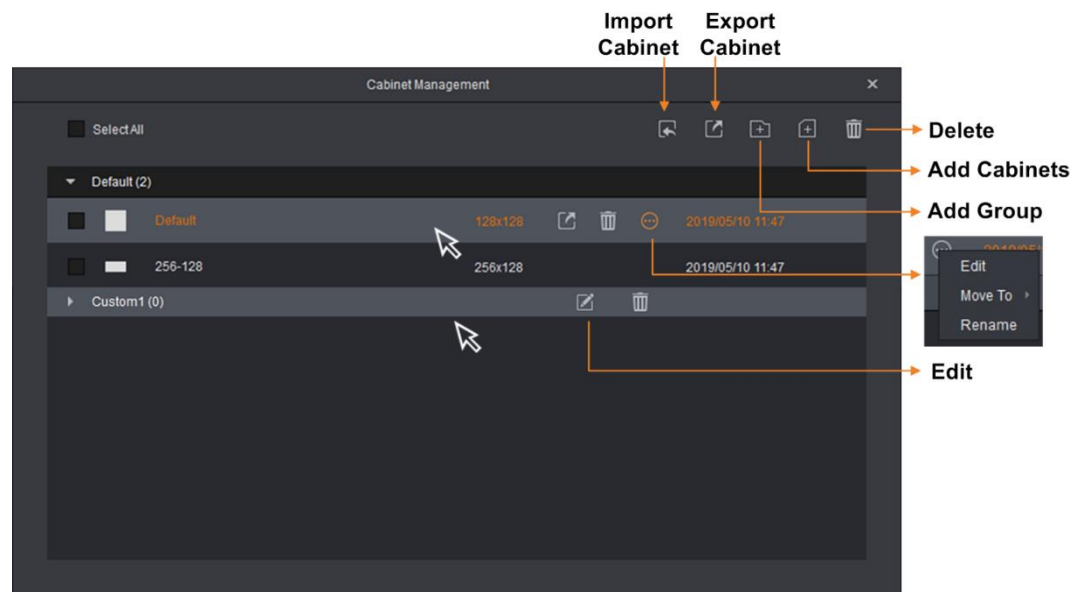


- **Project Name:** Name the project and choose a save path for the project.
- **Smart Mode:** Set the mode of creating a project.
- **Device:** Select a video controller.
- **Cabinet Selection:** Select the manufacturer and type of the cabinets.
- **Cabinet Columns/Rows:** Set the columns and rows of the cabinets.
- **Source resolution:** Set the maximum input resolution of the device, namely the maximum screen width and height that can be loaded by the device
- **Connection Type:** Select the connection type of the cabinets. You can select **Auto Connect**.

Cabinet Management

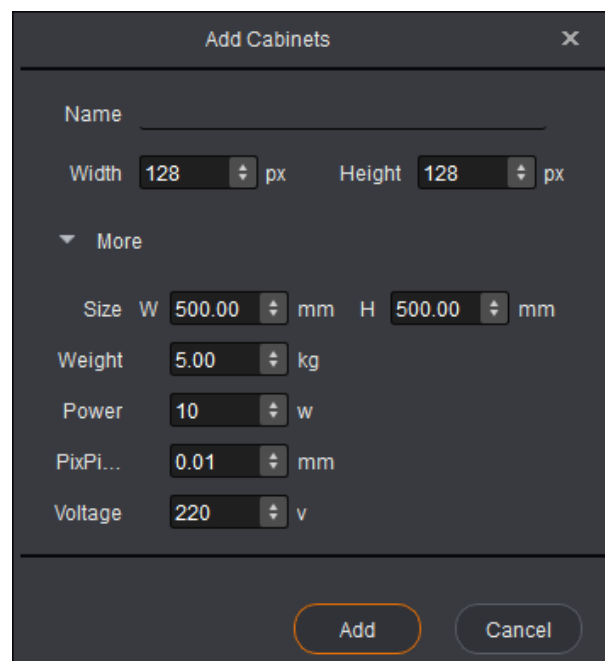
Add or edit cabinet information. You can edit a single cabinet or a single cabinet group.

Figure 3-7 Cabinet management



- Import Cabinet: Import a saved cabinet file (*.rcfgx). Batch import is available.
- Export Cabinet: Export the configuration information of a target cabinet as a file (*.rcfgx).
- Delete: Delete the selected cabinet file. You can delete multiple files.
- Add Cabinets: Edit cabinet related information and save it as a cabinet file.
- Add Group: Edit cabinet file.
- Edit: Edit the corresponding cabinet information or group name.

Figure 3-8 Adding cabinets



3.3 Screen Configuration

After an offline project is created, enter the **Edit** page.

3.3.1 Adding Cabinets

Step 1 Select device type and Ethernet port type.

Step 2 Under **Edit** tab, add cabinet by using any of the following methods:

- Click **Batch Add**, set information of added cabinets and click **OK**. Move the cursor to canvas and click to place cabinets.
- Click a target cabinet icon, move the cursor to canvas, click and drag left mouse button to place cabinet. Right click to stop adding cabinets.

3.3.2 Cabinet Configuration

Connecting Cabinets

Before configuring the screen, you must connect the cabinets by using any of the following methods.

Method I: Auto connect

On the **Create a new project** page, after you have set the cabinet rows and columns, select **Auto Connect** and select a connection type.

The cabinets beyond the loading capacity of a single Ethernet port cannot be connected.

Method II: Manually connect


- Add cabinets in the canvas and select the target cabinets. In the **Cabinet Connection** section of the tool bar, choose a cabinet connection type. If the loading capacity of the cabinets loaded by a single Ethernet exceeds the allowed loading capacity of that Ethernet port, the connection will stop.
- Add cabinets in the canvas. Click to select the center of the target cabinet and move cursor to the center of the next cabinet, and so forth.

Methods III: Connect cabinet with keyboard shortcuts

Use the mouse to select the first cabinet. Press **Shift**+Up/Down/Left/Right arrow key at the same time to select cabinets and connect them.

Only regular cabinets are supported.

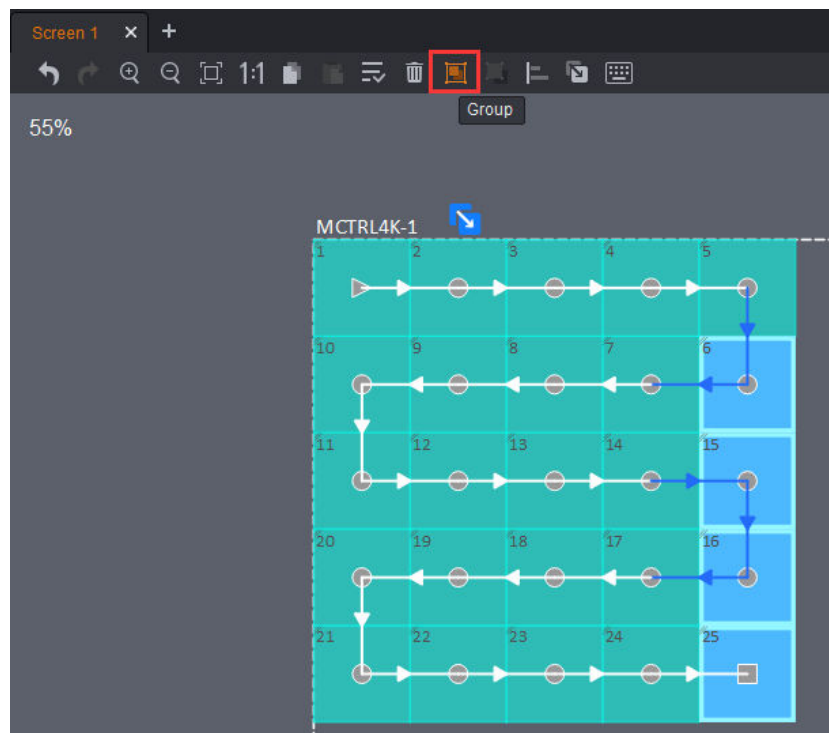
Grouping Cabinets

Step 1 In the canvas, select the target cabinets and click  (or right click to choose **Group**).

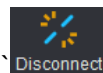
Step 2 Select the grouped cabinet. On the **Properties** page, set the group name, group color and position of grouped cabinets.

The grouped cabinets will be edited as a whole.

Figure 3-9 Grouping cabinets



Disconnecting Cabinets



Select the target cabinets and click **Disconnect** in the tool bar, or right click to choose **Delete Connection**.

3.3.3 Setting Cabinet Offset

After you have added cabinets and connected them, a dotted rectangle surrounding the cabinets will appear. The size of the dotted rectangle denotes the loading capacity of the currently connected device.

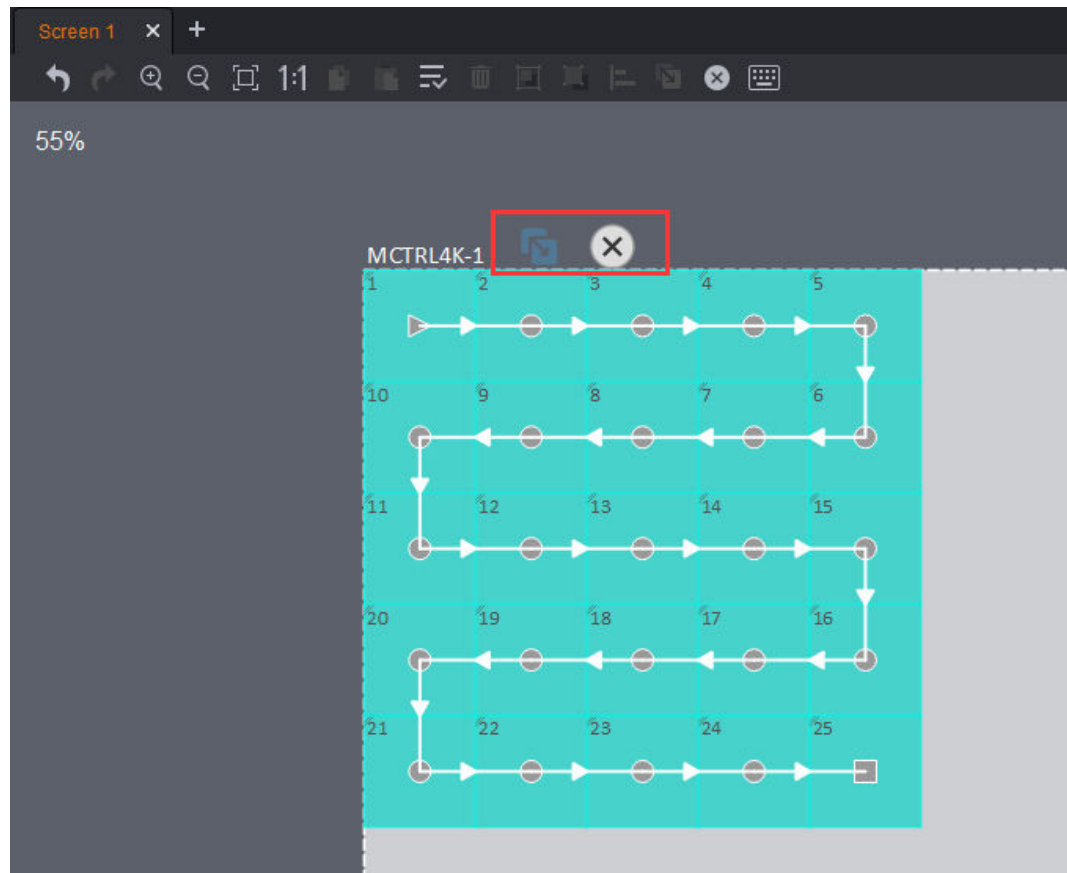


Step 1 Click  and drag a cabinet to change its position relative to the dotted rectangle.



Step 2 Click  to quit the edit.

Figure 3-10 Setting cabinet offset



3.3.4 Rotating Cabinets

When the added device supports rotation function (only the MCTRL R5 support cabinet rotation currently), you can rotate the cabinets to target positions.



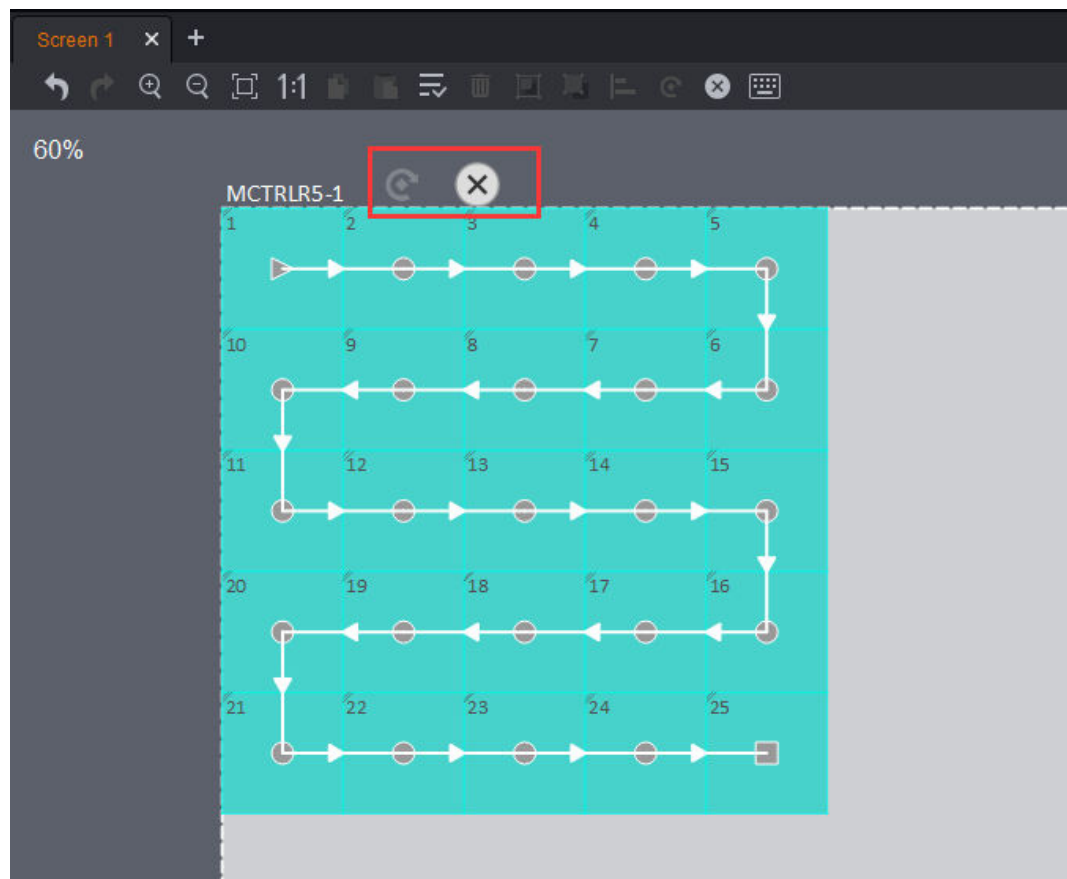
- Step 1 Click . Click and rotate the rotation bar (or set the rotation angle) to rotate the cabinets to the target position.
- Step 2 Click  to quit the edit.

Figure 3-11 Rotating cabinets



3.4 Adding Device


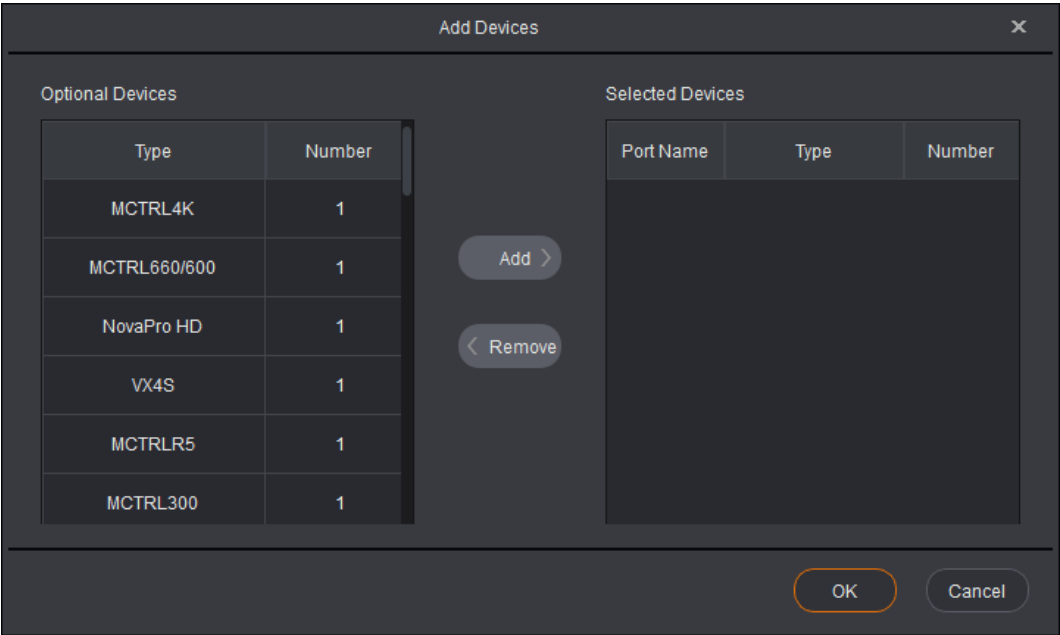
- Step 1 At the bottom left of the **Device** section, click .
- Step 2 On the displayed **Add Devices** dialog box, select device type, enter the number of the devices to be cascaded, and click **Add**.
- Step 3 Click **OK**.

Figure 3-12 Adding device



3.5 Hot Backup




On the **Edit** tab page, click **Hot Backup** to enter its page. You can follow the guidance on the hot backup page.

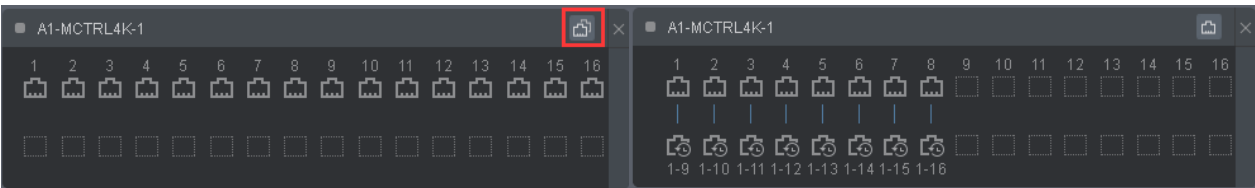
- Hot backup includes backup with device and backup between devices.
- Hot backup between devices is only available for the devices with the same communication ports.

3.5.1 Backup Within Device




Step 1 Click a device in the device area, drag the device to canvas and click to place the device.

Step 2 Click  on top right of device. The Ethernet ports will be backed up correspondingly by default, as shown in the figure below. You cannot change the backup.

Step 3 (Optional) Click to select the backup Ethernet port and drag it to the target Ethernet port to perform backup between Ethernet ports.



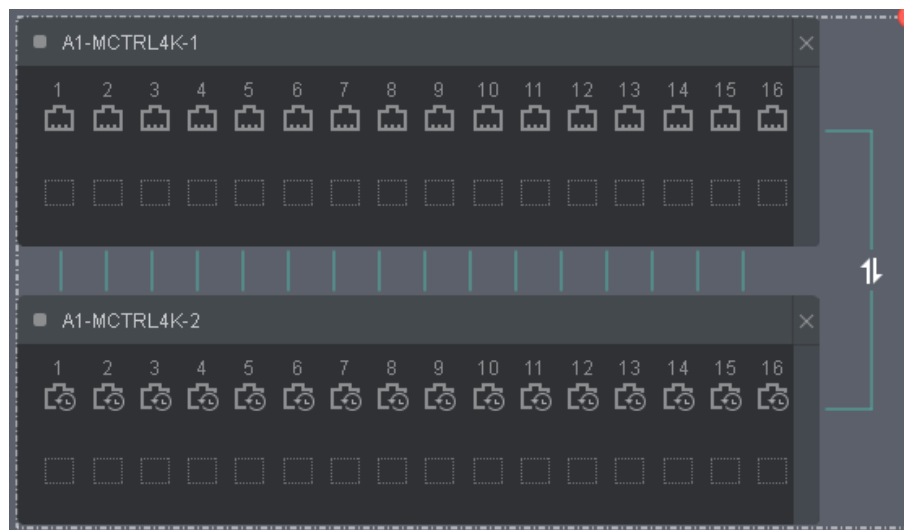
Note:

- When the Ethernet ports are backed up, click  at the top right of the device to remove the backup.
- Click  between two Ethernet ports to delete backup. Click  at the top right of the device to delete the device.




3.5.2 Backup Between Devices

Hot backup between devices is only available for the devices with the same communication ports.

- Step 1 Click a device in the device area, drag the device to canvas and click to place the device.
- Step 2 Drag another device to the target device. Backup between the two devices will be done automatically.
- Step 3 (Optional) Click to select the backup Ethernet port and drag it to the target Ethernet port to perform Ethernet port backup between devices.



Note:

- When the backup is done, the  icon appears on the line between the two devices. Click this icon to switch between master and slave.
- Click  at the top right of a device to delete the device.
- Click  at the top right of the dashed box to remove the backup.
- The slave device cannot be used for screen configuration.

3.5.3 Switching Between Master and Slave Devices

Before backup, click the toggle button on the right of a device to set it as the master device or backup device.

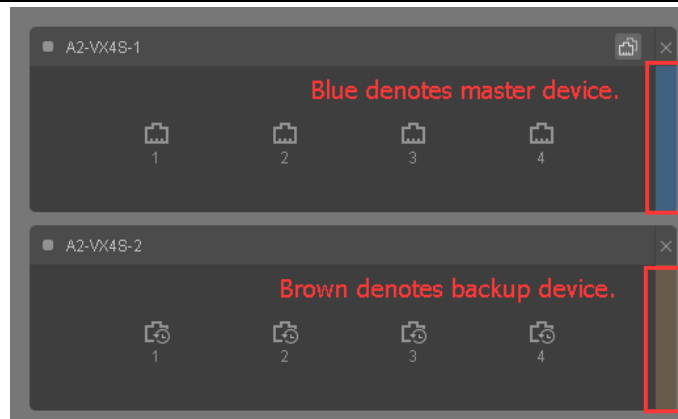


Table 3-1 Ethernet port description

Icon	Description	Icon	Description
	Connection of the primary port is not available.		The backup port is enabled.
	Backup device		Master device

3.6 Sending Configuration Information

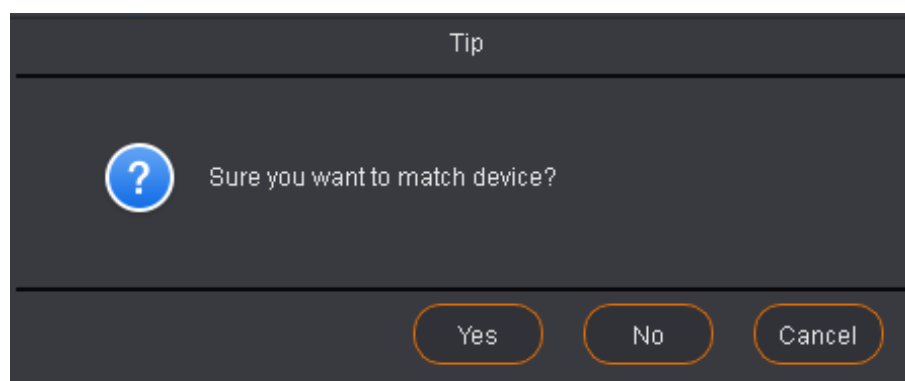
Send current configuration information to receiving card.



Step 1 On the **Edit** tab page, click .

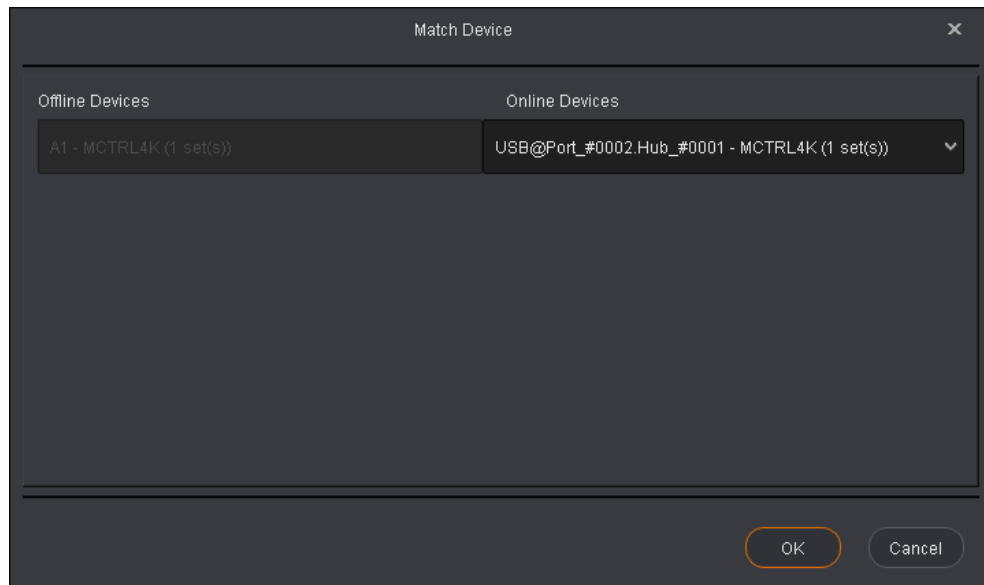
Step 2 Click **Yes** in the prompt box that appears.

Figure 3-13 Prompt box



Step 3 In the **Match Device** dialog box that appears, select the matched online device.

Figure 3-14 Matching device



Step 4 Click **OK**.

Note:

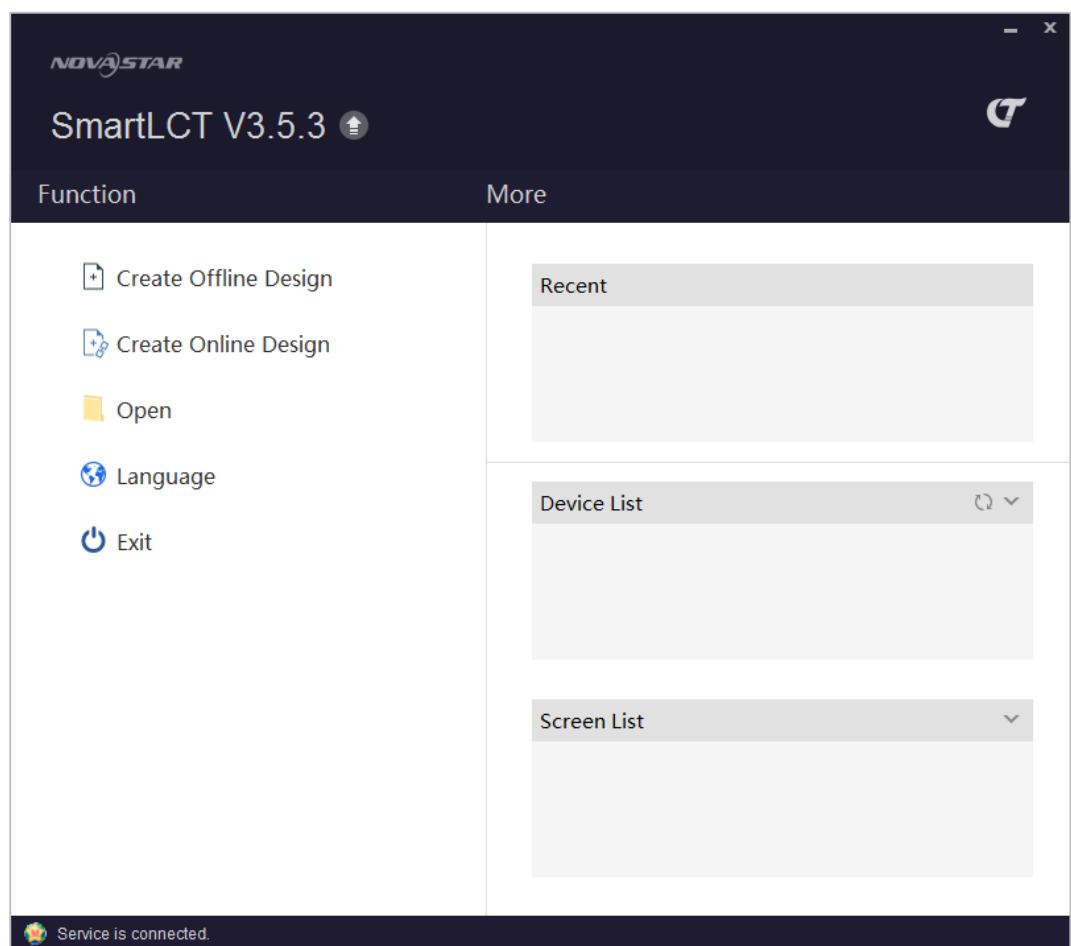
For cascaded devices, all the devices to which the configuration information will be sent to must be matched. The information will not be sent to unmatched online devices.

4 Online Operation

4.1 User Interface

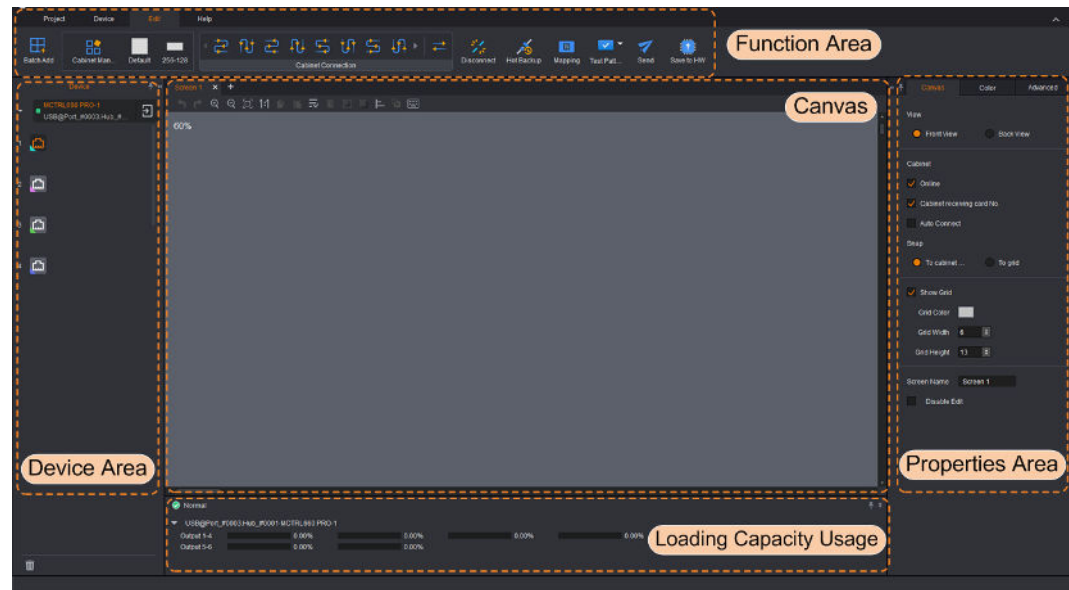
Run SmartLCT to enter its start page.

Figure 4-1 Start page



Create an online project to enter the screen configuration page.

Figure 4-2 Screen configuration page






4.1.1 Function Area

Function Area		Description
Project	New/Open/Save/Save As/Export	Allows you to create, save and export a project.
Device	Reconnect	Allows you to search for and reconnect a device, update hardware information and save it to the current file.
	Refresh	Reads the hardware information again.
	Seam Brightness	Adjusts the seam brightness of the LED display.
	Factory Reset	Resets the parameters to factory defaults.
	Brightness	Adjusts brightness of the screen.
	Batch	Adjusts cabinet brightness and chroma in batches.
Edit	Batch Add	Allows you to add multiple same cabinets at the same time.
	Cabinet Management	Allows you to manage the cabinet library, including adding cabinet.
	Cabinet Connection	Allows you to choose the cabinet connection type.
	Disconnect	Removes the connection lines between cabinets.
	Hot Backup	Backup between devices or backup between Ethernet ports of a device
	Send	Sends the display configuration information to hardware devices.
Help	Test Tool	A LED display test tool developed by NovaStar can be used for editing and testing the display window. It allows you to open the preview window on the desktop and view the result of the test.
	Maintenance	Set the reference receiving card and new receiving card and use the Replace function to copy the configuration file of reference receiving card to the new receiving card.

Function Area		Description
	User Manual	User manual of SmartLCT
	About	Software information

4.1.2 Properties Area

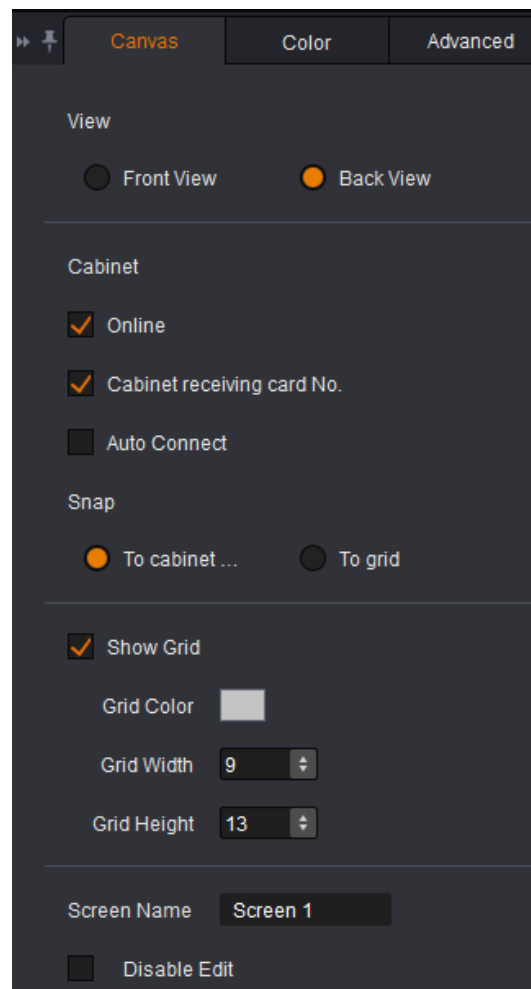
Properties Area		Description
Canvas	View	Set the view of cabinet, including front view and back view.
	Cabinet	Set display status and connection type of cabinet. <ul style="list-style-type: none"> • Online • Cabinet receiving card No. • Auto Connect
	Snap	Include snapping to cabinet edge and snapping to grid.
	Grid	<ul style="list-style-type: none"> • Grid Color: Set the color of canvas grid. • Grid Width: Set the grid width (unit: pixel). • Grid Height: Set the grid height (unit: pixel).
	Screen Name	Customize the screen name.
	Disable Edit	Select this option to disable any operation on cabinet.
Cabinet Properties	Cabinet	View the cabinet properties, receiving card model, device name, communication port, cabinet No. and offset position of the top-left corner of a cabinet.
	Test Pattern	Select a test pattern.
	Firmware Program	<ul style="list-style-type: none"> • Refresh, download and upgrade program version. <ul style="list-style-type: none"> : Read back the firmware version information of receiving card. This is used for single cabinet only. : Download firmware program of receiving card. This is used for single cabinet only. : Upgrade receiving card firmware program for a single or multiple cabinets. • View and refresh serial No. • View module details.
Device Properties	Switch Source	Switch the source of main screen.
	Input Resolution	<ul style="list-style-type: none"> • Select input source and data bits. • Select a preset resolution and refresh rate of current input source, or customize a preset resolution and refresh rate.

Color	Full Screen	Set the screen brightness and Gamma.
	Color Temperature	Adjust the color temperature.
	Display Function	<ul style="list-style-type: none"> • Enable 18-bit Mode • Enable ClearView
	Calibration Type	Select calibration type, including Off , Chroma Calibration and Brightness Calibration .
	Color Gamut Setting	Set color gamut. You can select a default mode, including PAL and NTSC.
Advanced	Sending Mode	Set the mode of sending the imported cabinet configuration file to receiving card. <ul style="list-style-type: none"> • Send at the same time • Don't send • Remind me every time
	Setting of pre-set image	<ul style="list-style-type: none"> • Choose Image (*.bmp/*.jpg/*.png) • Effect Settings: Set the effect of image. • Duration: Set the duration of startup screen image. • Set the usage of pre-stored image.

Canvas Properties

Click a blank area of canvas and edit the canvas properties on the **Canvas** tab page.

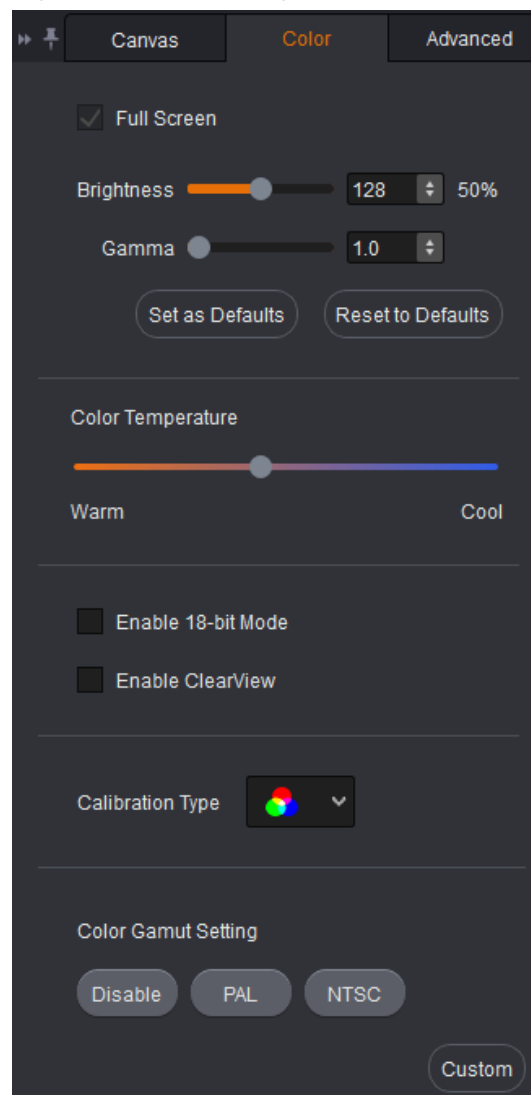
Figure 4-3 Canvas properties



Color Settings

- Set the screen brightness, Gamma and color temperature.
- Enable 18-bit mode.
- Enable ClearView.
- Select calibration type, including **Off**, **Chroma Calibration** and **Brightness Calibration**.
- Set color gamut.

Figure 4-4 Color settings



Cabinet Properties

Click to select a cabinet. Properties of the device and the selected cabinet are displayed on the **Properties** tab page. The MCTRL4K is taken as an example.

- View the cabinet properties, receiving card model, device name, communication port, cabinet No. and offset position of the top-left corner of a cabinet.
- Select a test pattern.
- Refresh, download and upgrade program version.
- Refresh serial No.
- View module details.

Figure 4-5 Cabinet properties

The screenshot displays the 'Properties' tab of the SmartLCT Screen Configuration Software. The interface is dark-themed with orange and white text. At the top, there are three tabs: 'Properties' (selected), 'Color', and 'Advanced'. Below the tabs, the settings are organized into sections. The first section includes 'Type' set to 'Default(128x128)' with an information icon, 'RV Card Model' set to '---', 'Device' set to 'MCTRL660 PRO-1', 'Port Name' set to 'USB@Port_#0003.Hub_#0001', and 'Connection' set to '1-1-5' with an information icon. The 'Offset' section shows 'X' at 512 and 'Y' at 0, both with up/down arrows. Below this is a 'Test Pattern' section with a blue checkmark icon and a dropdown arrow. The bottom section contains 'Program Version' (---) and 'Serial No.' (---), each with a refresh icon. At the very bottom, there is a 'Module details' section with a right-pointing arrow.

Property	Value	Icon
Type	Default(128x128)	Information
RV Card Model	---	
Device	MCTRL660 PRO-1	
Port Name	USB@Port_#0003.Hub_#0001	
Connection	1-1-5	Information
Offset X	512	Up/Down
Offset Y	0	Up/Down
Test Pattern	[Checkmark]	Dropdown
Program Version	---	Refresh
Serial No.	---	Refresh
Module details		Right Arrow

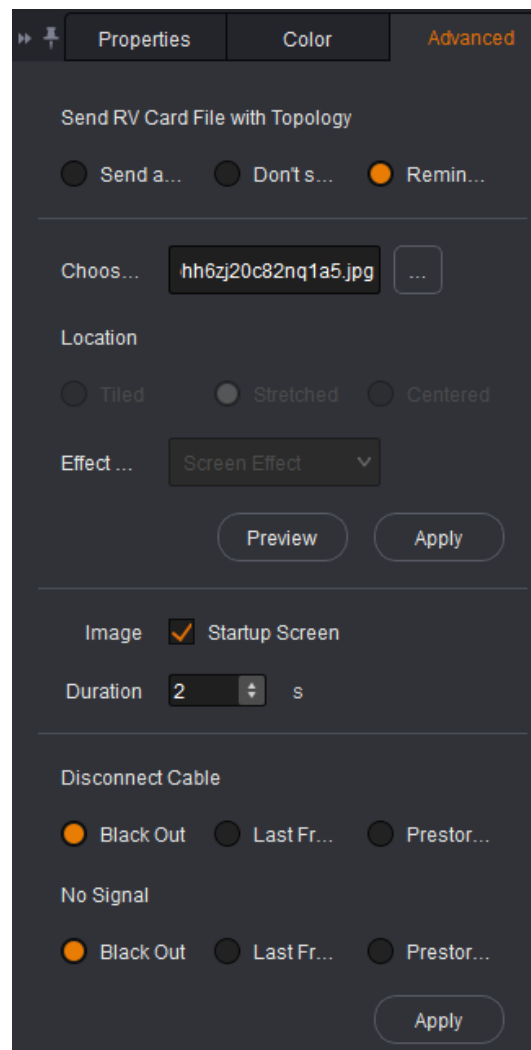
Note:

When the connected device supports rotation function (only the MCTRL R5 support cabinet rotation currently), you set the rotation center and rotation angle and other parameters to allow the display to rotate at any angle.

Advanced Settings













- Send the receiving card file.
- Set the pre-stored image.
 - Choose image.
 - Set the effect of image
 - Set the duration of startup screen image.
 - Set usage of pre-stored image.

Figure 4-6 Advanced settings



4.1.3 Canvas

Configure the screen by editing cabinet information in canvas.

Icon	Description	Icon	Description
	Undo		Redo
	Select all		Zoom in
	Delete		Zoom out
	Group		Zoom to Fit
	Ungroup		Display canvas in 100%
	Alignment		Copy

	Offset		Paste
	Rotate		Keyboard shortcuts

4.1.4 Loading Capacity Usage

Note:

If you have set the connection type to **Auto Connect**, the cabinets beyond the loading capacity of the Ethernet ports cannot be connected. If you choose to manually connect the cabinets, the cabinets beyond the loading capacity of the Ethernet ports can be connected.

The **Loading Capacity Usage** section intuitively displays the usage of the loading capacity of Ethernet ports.

- Blue: The loading capacity is normal. When the loading capacity of the connected cabinets is within that of the Ethernet ports, the progress bar shows blue.
- Red: The loading capacity is beyond the limit. When the loading capacity of the connected cabinets exceeds that of the Ethernet ports, the progress bar shows red.
- Gray: The Ethernet ports are not loading any cabinet.

4.2 New Project


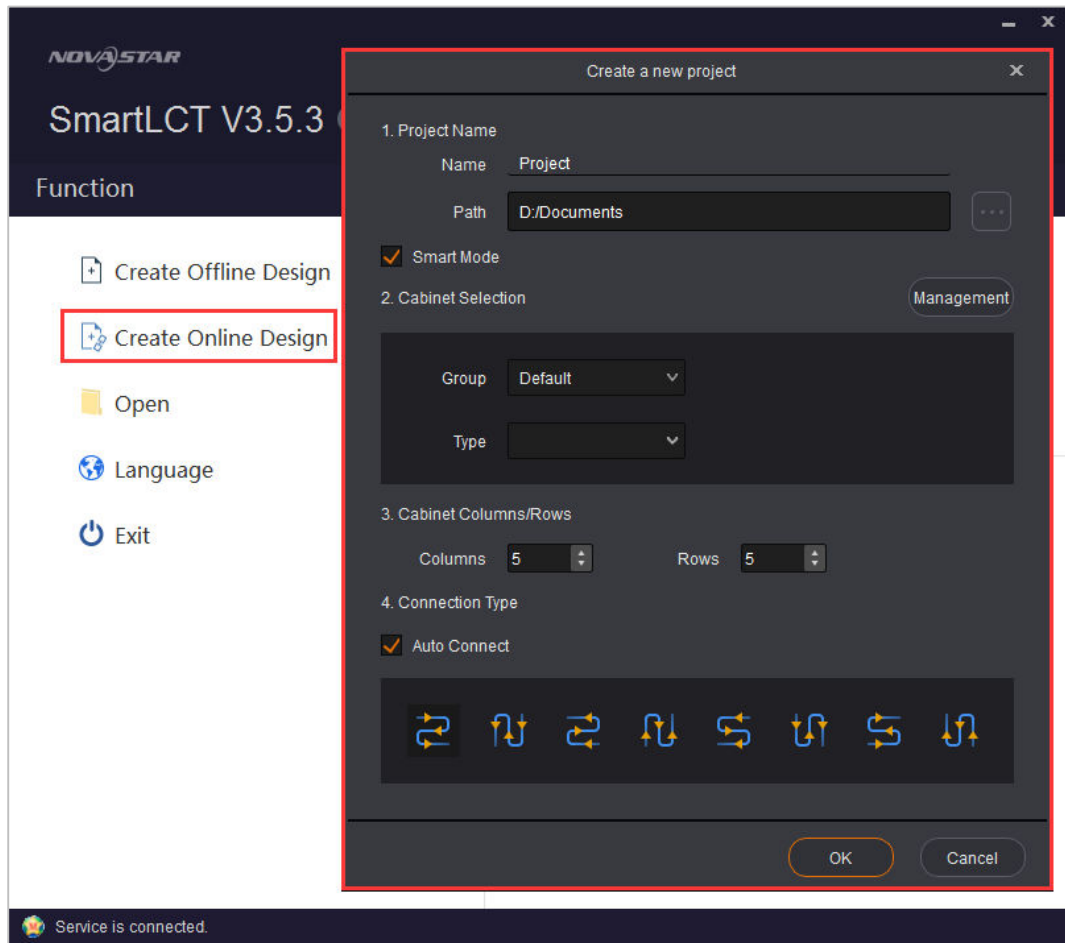
- Step 1 Run SmartLCT. On the start page, click  next to **Device List** to refresh device list.
- Step 2 In the **Function** section, click **Create Online Design** to enter the **Create a new project** page.

Figure 4-7 Start page



- **Project Name:** Name the project and choose a save path for the project.
- **Smart Mode:** Set the mode of creating a project.
- **Cabinet Selection:** Select the manufacturer and type of the cabinets.
- **Cabinet Columns/Rows:** Set the columns and rows of the cabinets.
- **Connection Type:** Select the connection type of the cabinets. You can select **Auto Connect**.

4.3 Screen Configuration

After an online project is created, enter the **Edit** page.

4.3.1 Adding Cabinets

Step 1 Select device type and Ethernet port type.

Step 2 Under **Edit** tab, add cabinet by using any of the following methods:

- Click **Batch Add**, set information of added cabinets and click **OK**. Move the cursor to canvas and click to place cabinets.
- Click a target cabinet icon, move the cursor to canvas, click and drag left mouse button to place cabinet. Right click to stop adding cabinets.

4.3.2 Cabinet Configuration

Connecting Cabinets

Before configuring the screen, you must connect the cabinets by using any of the following methods.

Method I: Auto connect

On the **Create a new project** page, after you have set the cabinet rows and columns, select **Auto Connect** and select a connection type.

The cabinets beyond the loading capacity of a single Ethernet port cannot be connected.

Method II: Manually connect


- Add cabinets in the canvas and select the target cabinets. In the **Cabinet Connection** section of the tool bar, choose a cabinet connection type. If the loading capacity of the cabinets loaded by a single Ethernet exceeds the allowed loading capacity of that Ethernet port, the connection will stop.
- Add cabinets in the canvas. Click to select the center of the target cabinet and move cursor to the center of the next cabinet, and so forth.

Methods III: Connect cabinet with keyboard shortcuts

Use the mouse to select the first cabinet. Press **Shift**+Up/Down/Left/Right arrow key at the same time to select cabinets and connect them.

Only regular cabinets are supported.

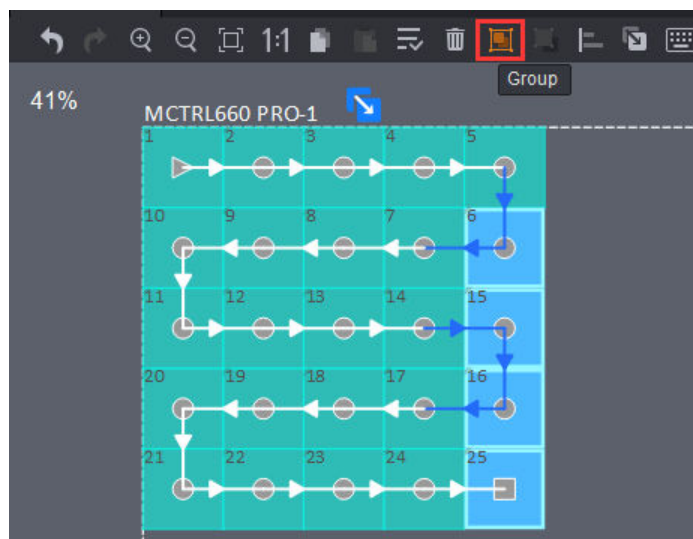
Grouping Cabinets

Step 1 In the canvas, select the target cabinets and click  (or right click to choose **Group**).

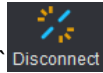
Step 2 Select the grouped cabinet. On the **Properties** page, set the group name, group color and position of grouped cabinets.

The grouped cabinets will be edited as a whole.

Figure 4-8 Grouping cabinets



Disconnecting Cabinets

Select the target cabinets and click  in the tool bar, or right click to choose **Delete Connection**.

4.3.3 Setting Cabinet Offset

After you have added cabinets and connected them, a dotted rectangle surrounding the cabinets will appear. The size of the dotted rectangle denotes the loading capacity of the currently connected device.



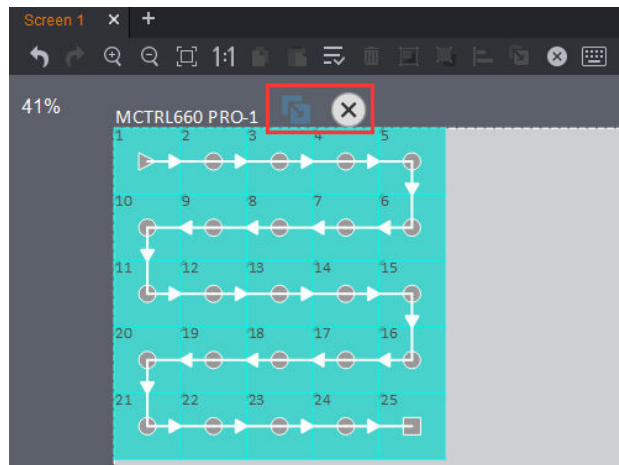
- Step 1 Click  and drag a cabinet to change its position relative to the dotted rectangle.
- Step 2 Click  to quit the edit.

Figure 4-9 Setting cabinet offset



4.3.4 Rotating Cabinets

When the added device supports rotation function, you can follow the steps below to rotate the cabinets. The MCTRL R5 is taken as an example.



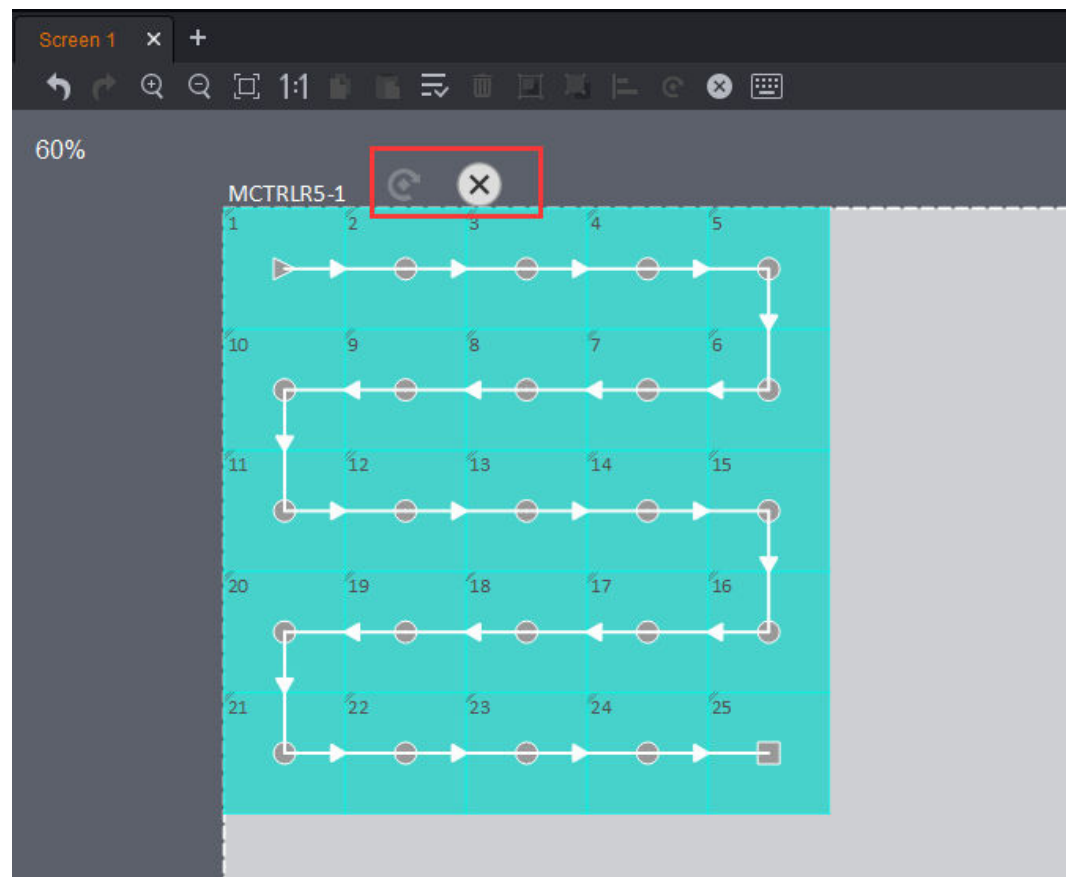
- Step 1 Click . Click and rotate the rotation bar (or set the rotation angle) to rotate the cabinets to the target position.
- Step 2 Click  to quit the edit.

Figure 4-10 Rotating cabinets



4.4 Hot Backup




On the **Edit** tab page, click **Hot Backup** to enter its page. You can follow the guidance on the hot backup page.

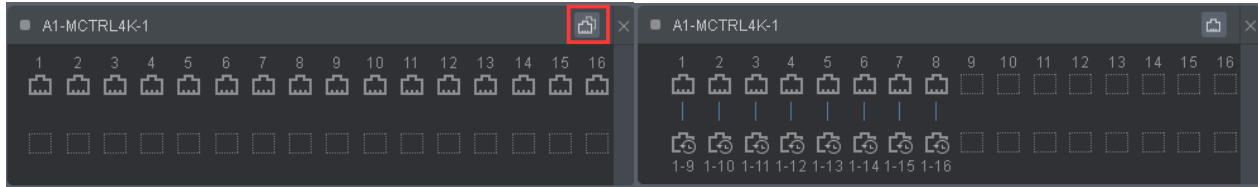
- Hot backup includes backup with device and backup between devices.
- Hot backup between devices is only available for the devices with the same communication ports.

4.4.1 Backup Within Device




Step 1 Click a device in the device area, drag the device to canvas and click to place the device.

Step 2 Click  on top right of device. The Ethernet ports will be backed up correspondingly by default, as shown in the figure below. You cannot change the backup.

Step 3 (Optional) Click to select the backup Ethernet port and drag it to the target Ethernet port to perform backup between Ethernet ports.



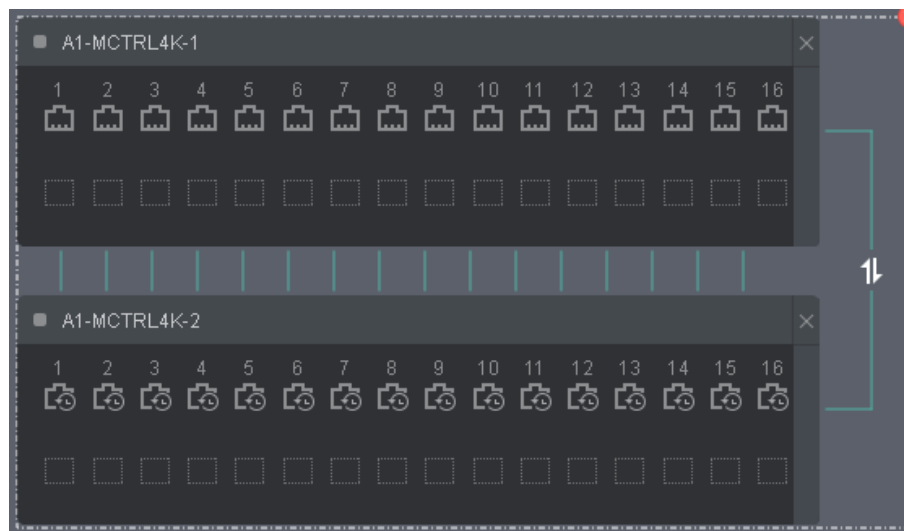
Note:

- When the Ethernet ports are backed up, click  at the top right of the device to remove the backup.
- Click  between two Ethernet ports to delete backup. Click  at the top right of the device to delete the device.




4.4.2 Backup Between Devices

Hot backup between devices is only available for the devices with the same communication ports.

- Step 1 Click a device in the device area, drag the device to canvas and click to place the device.
- Step 2 Drag another device to the target device. Backup between the two devices will be done automatically.
- Step 3 (Optional) Click to select the backup Ethernet port and drag it to the target Ethernet port to perform Ethernet port backup between devices.



Note:

- When the backup is done, the  icon appears on the line between the two devices. Click this icon to switch between master and slave.
- Click  at the top right of a device to delete the device.
- Click  at the top right of the dashed box to remove the backup.
- The slave device cannot be used for screen configuration.

4.4.3 Switching Between Master and Slave Devices

Before backup, click the toggle button on the right of a device to set it as the master device or backup device.

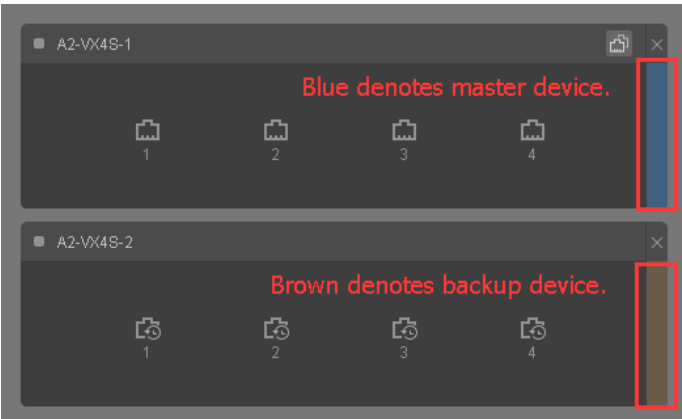


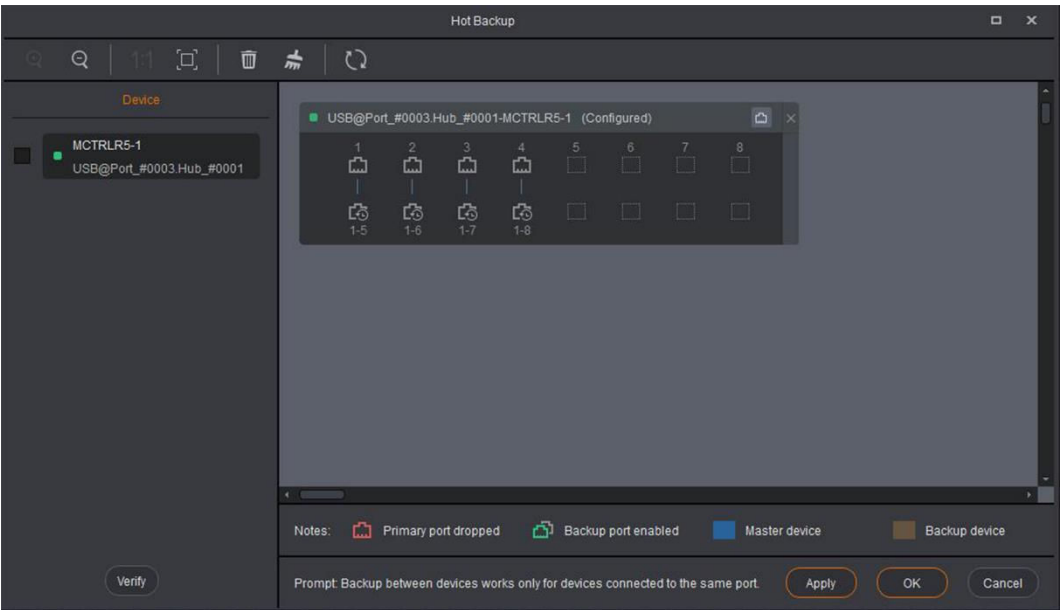
Table 4-1 Ethernet port description

Icon	Description	Icon	Description
	Connection of the primary port is not available.		The backup port is enabled.
	Backup device		Master device

4.4.4 Verification

Verify whether the hot backup between Ethernet ports has taken effect. This function is supported by the MCTRL4K (DATA_MCTRL4K_V1.2.4.0 or later) and MCTRL R5 (DATA_MCTRLR5_V1.0.3.0 or later) only.

- Step 1 After the Ethernet port backup setting is done, click **Apply**.
- Step 2 On the bottom left of the page, click **Verify**. On the displayed **Please Observe LED Screen** dialog box, click **OK**.



4.5 Seam Brightness Adjustment

Before you begin: Configure the LED display (that is, add cabinets and connect them) and save the configuration to receiving card.

4.5.1 User Interface

- **No Video Source:** You can perform seam brightness adjustment even when the sending card has no video source. This mode supports only AXs V4.5.0.0 and later versions. They cannot be used with other receiving cards together.
- **Save to HW:** Save seam brightness adjustment parameters to the sending device.

Figure 4-11 Seam brightness adjustment page

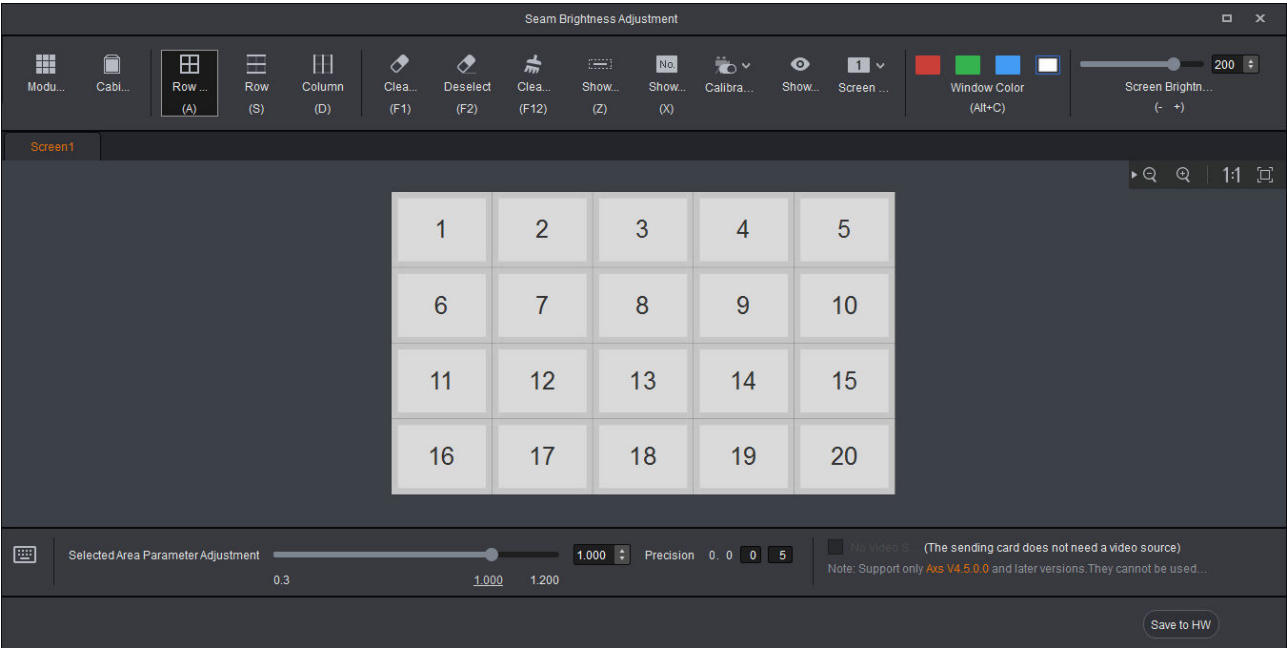
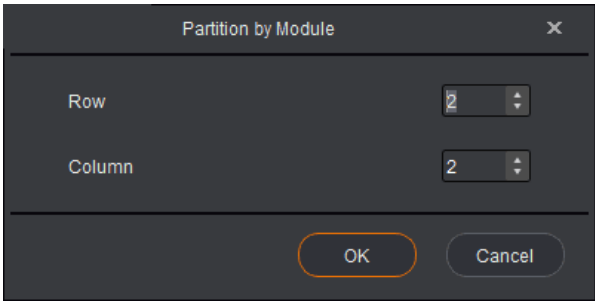


Figure 4-12 Tool bar introduction

Tools	Description
Module mode	Partition the added cabinet into different partitions by module. 
Cabinet mode	Recover the partitioned cabinet to unpartitioned.
Row & Column	Select the row seams and column seams of cabinet.


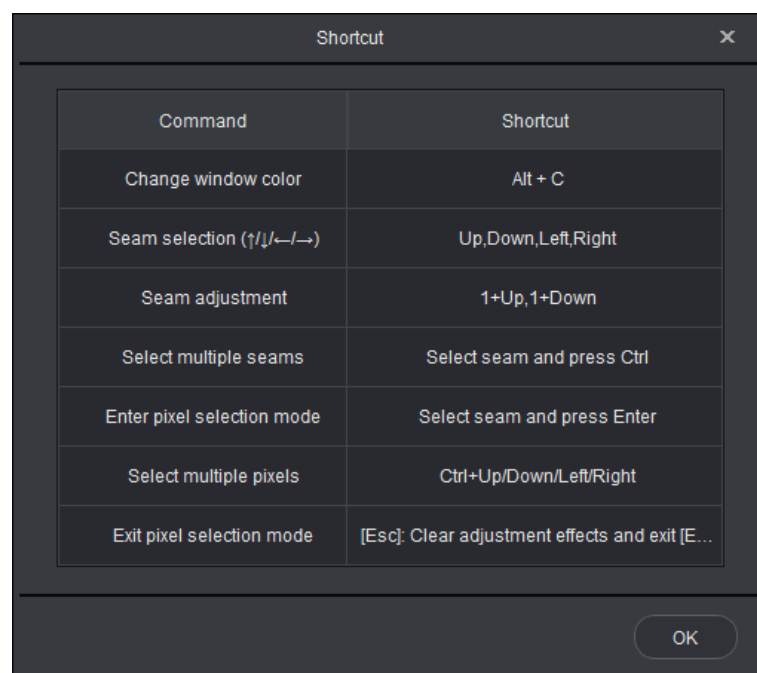
Row	Select only row seams.
Column	Select only column seams.
Clear Effect	Clear the seam effect of selected cabinet.
Deselect	Deselect the selected cabinet seam.
Clear All Effects	Clear all the cabinet seam effects.
Show Dashed Box	Show the dashed box of cabinet on the display image.
Show number	Show the cabinet No. on the display image.
Calibration Effect	Set the calibration effect to off, Chroma calibration or brightness calibration.
Show Display Window	Show/Hide display window.
Screen Display Position	Set the display window position to be on the main or extended display.
Window Color	Red/Green/Blue/White
Screen Brightness	Drag the slider or enter a number to adjust the brightness.
Keyboard Shortcuts	Click  . A dialog box will be displayed, as shown in Figure 4-13 .


Figure 4-13 Shortcut settings



Description of Border Colors

Gray	Indicates the LED is not selected and the parameter is not adjusted.	Blue	Indicates the LED is selected but the parameter is not adjusted.
Light green	Indicates the LED is not selected but the parameter is already adjusted.	Dark green	Indicates the LED is selected and the parameter is already adjusted.

4.5.2 Seam Brightness Parameter Adjustment

- Step 1 On the Device tab page, click  to enter the seam brightness adjustment page.
- Step 2 Select the target seam, and the seam will turn blue.
- Step 3 (Optional) Choose precision of the adjustment.
- Step 4 Drag the slider next to **Selected Area Parameter Adjustment** to adjust seam brightness parameters, and the borders will turn green.
- Step 5 Type “**admin**” to access the factory area and user area settings page.
- **Save to Factory Area:** Save seam brightness adjustment parameters to the factory area of the receiving card. These parameters will be used for maintenance after the cabinet is returned to factory.
 - **Save to User Area:** Save seam brightness adjustment parameters to the user area of the receiving card. These parameters will be used for on-site screen adjustment.
 - **Load Factory Area:** Restore seam brightness adjustment parameters to the parameters last saved in the factory area.
 - **Load User Area:** Restore seam brightness adjustment parameters to the parameters last saved in the user area.
- Step 6 Save seam brightness adjustment parameters to the sending device.

4.6 Batch Adjustment

This function is used to adjust the brightness and chroma of cabinets of different batches in order to ensure the images are displayed uniformly on LED screen.

4.6.1 User Interface

Before you begin: Configure the LED display and save the configuration parameters to hardware.

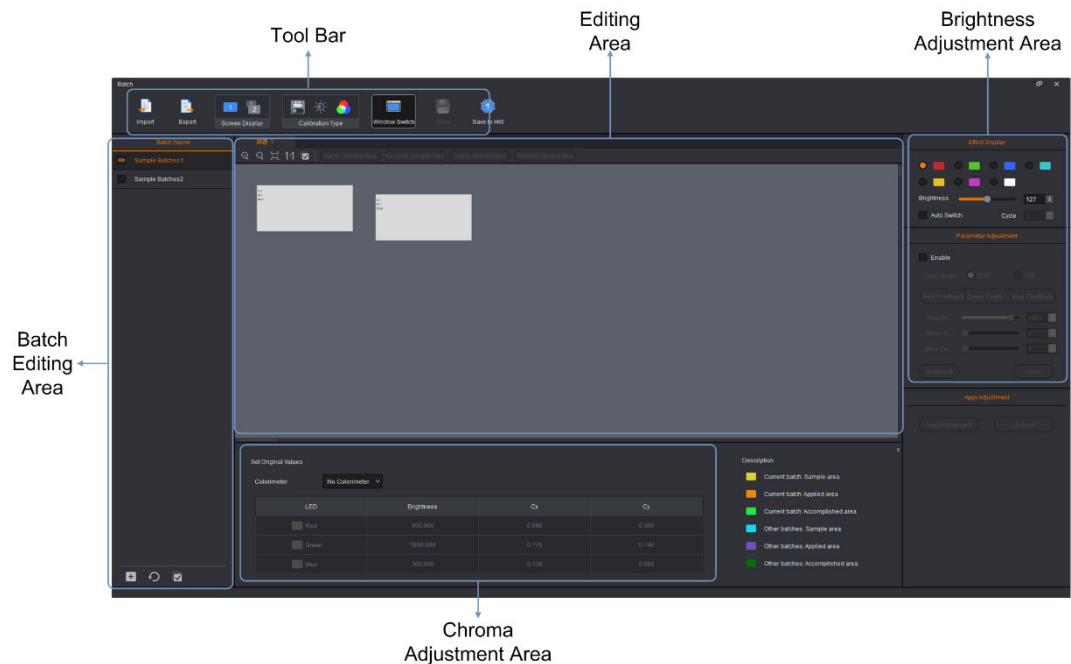




Table 4-2 Batch adjustment description

Area	Description
Tool Bar	<p>Import: Import the batch adjustment parameter file.</p> <p>Export: Save the adjustment parameters of current batch to local PC.</p> <p>Screen Display: Set the window to display on the main display or extended display.</p> <p>Calibration Type: Choose the type of display calibration.</p> <p>Window Switch: Show/Hide the display window.</p> <p>Save: Save the batch adjustment parameters as a file.</p> <p>Save to HW: Save the batch adjustment parameters to hardware.</p>
Editing Area	Edit the status of cabinets or modules (double-click on the cabinet to enter the module view) displayed in the area.
Batch Editing Area	<p>Two batches are added in this area by default when you perform batch adjustment for the first time.</p> <p>Click  to add a batch.</p> <p>Click  to select all batches. The statuses of cabinets in each batch are displayed on the display window.</p>
Brightness Adjustment Area	Adjust cabinet brightness parameters.
Chroma Adjustment Area	Adjust cabinet chroma parameters.

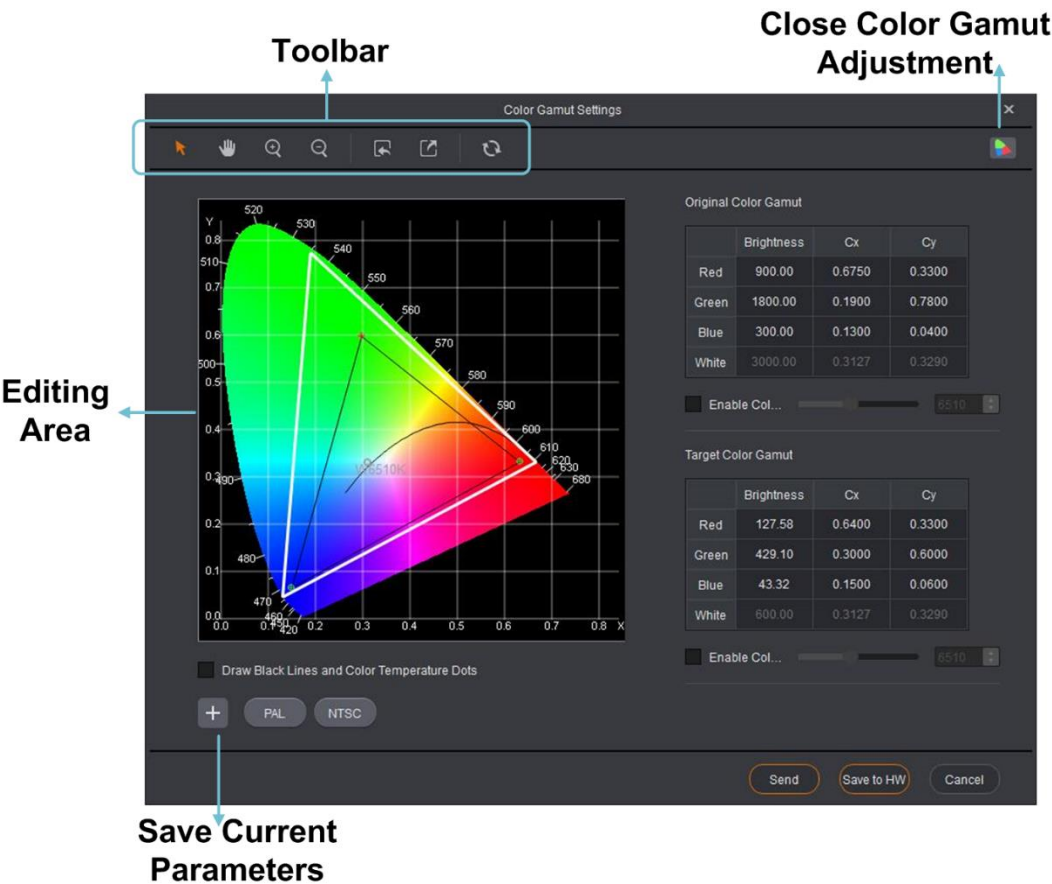
4.6.2 Procedure

- Step 1 Select a target batch.
- Step 2 In the editing area, select the target cabinets or modules, and click **Add to Sample Area**.
- Step 3 Adjust chroma and brightness.
- Step 4 Click **Apply Adjustment**.
- Step 5 Click **Save to HW**.


Note: Each batch must have the sample area information.









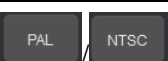
4.7 Color Gamut Settings

Figure 4-14 Color gamut settings




Introduction to UI of color gamut diagram

Name		Description
Tool bar		Enable the editing area to enter editing status.

		Disable the editing status of editing area.
		Zoom in the image in editing area.
		Zoom out the image in editing area.
		Import configuration file.
		Export current configuration parameters as a configuration file.
		Restore color information.
Editing area		Click and drag the enable point to set the target color gamut.
		Close color gamut adjustment.
		Save current color gamut parameters you have set.
		Two common video standards for TV and broadcast industries.
Send		Send color gamut parameters to user terminal.
Save to HW		Send color gamut parameters to sending device.

4.8 Sending Configuration Information

- Step 1 In the tool bar, click .
- Step 2 In the displayed prompt box concerning saving to HW , click **Save to HW**.
- Step 3 In the displayed prompt box concerning successful saving to HW, click **OK**.

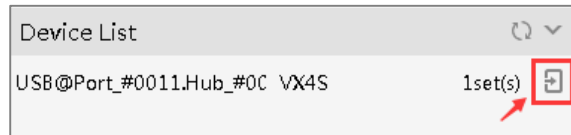
4.9 V-Sender

V-Sender allows you to set the status of the current device and operate the device on PC.


4.9.1 Accessing V-Sender

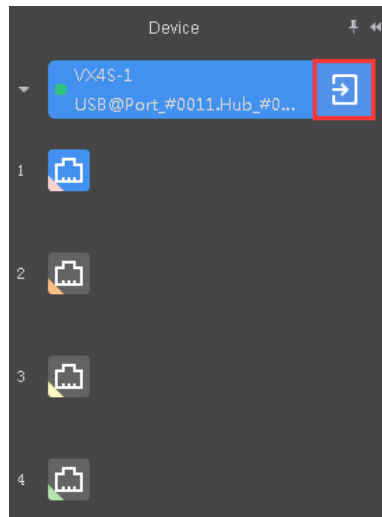
Method I

On the start page, click  in the **Device List** section to access V-Sender, as shown in the figure below.

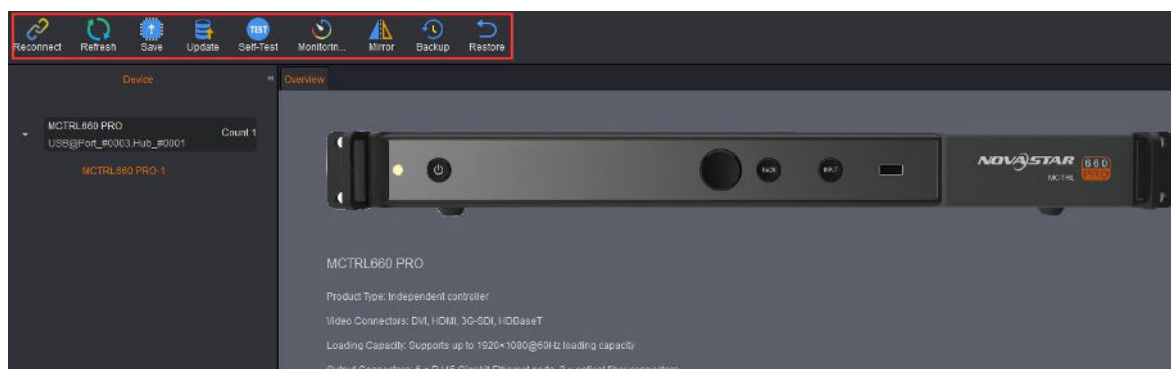


Method II

In the **Device** section of the editing page, click  to access V-Sender, as shown in the figure below.



4.9.2 Introduction to Tool Bar



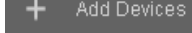
General functions:

- **Reconnect:** Reconnect the device after the device went offline.
- **Refresh:** Refresh the device information
- **Save:** Send current device information to the hardware device and save it.
- **Update:** Update the firmware version of current controller device.
- **Self-Test:** Test the display effect of the images displayed on LED screen.
- **Monitoring Threshold:** Set the temperature and voltage ranges for normal operating of current controller device.

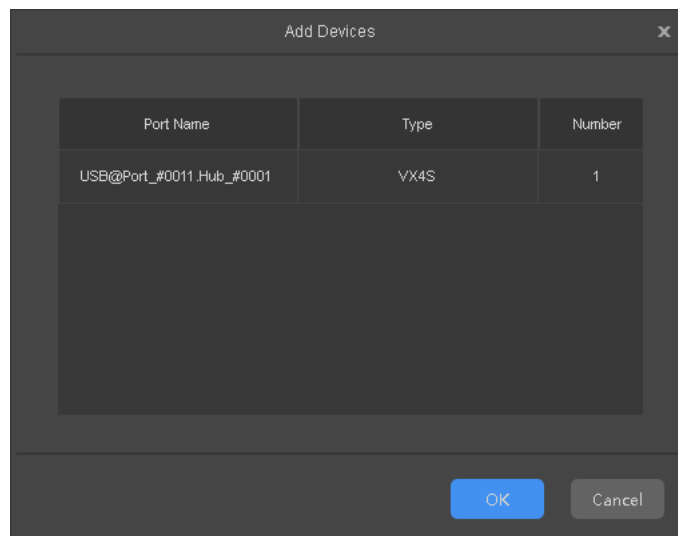
Dedicated functions for different devices (Take the MCTRL660 PRO for example.)

- **Mirror:** Set the display effect of the output image.
- **Backup:** Back up the system configurations of current device.
- **Restore:** Restore configurations of the system, receiving card and sending card.

4.9.3 Adding Devices

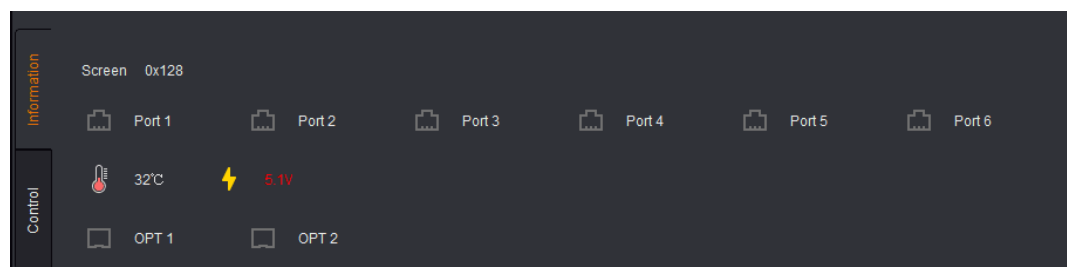
Step 1 At the bottom of the device list, click . The **Add Devices** page appears.

Step 2 Select the devices you want to add and click **OK**.







4.9.4 Information

At the bottom of the V-Sender page, the **Information** tab displays the port status, temperature and voltage alarms.



The working statuses of Ethernet ports:

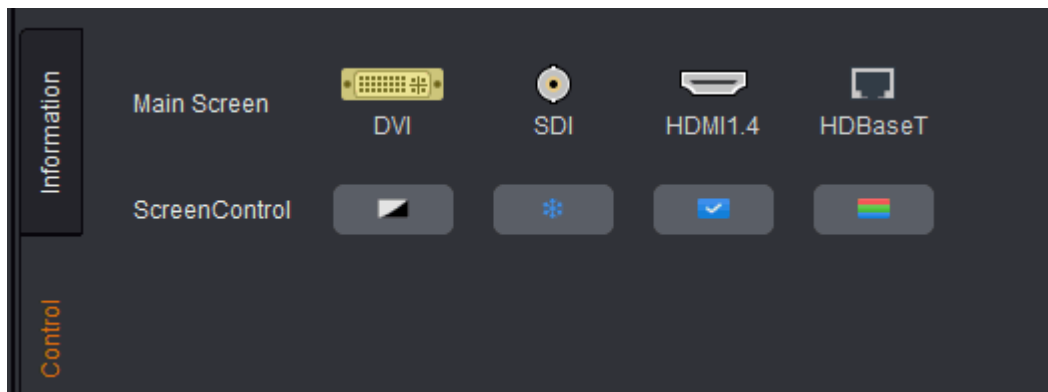
Icon	Description
	This Ethernet port is the primary port and it is connected.
	This Ethernet port is the backup port, but it is not connected.
	This Ethernet port is the backup port and it is connected, but the backup has not taken effect.
	This Ethernet port is the backup port, but it is not connected.







This Ethernet port is the backup port and it is connected. The backup has taken effect.

4.9.5 Control


Under the **Control** tab at the bottom of the V-Sender page, you can switch the input source type and set the screen control mode.



Screen control modes:



-  (**Black Out**): The screen goes black and does not display images.
-  (**Freeze**): Freeze current image being displayed.
-  (**Normal**): The screen displays images normally.
-  (**Test Pattern**): Use different test patterns to verify the display effect of current screen.

4.9.6 Template Settings

Select a template on the **Template** tab below the canvas and click  to save current configuration parameters as a template. You can save up to 10 templates by default.

Products that support this function: V800/V900/V900S/VX2/VX2U/VX4/VX4S/VX4U/K2U/K4/K4S/K4U



- Clicking  will save current configuration parameters to any of the templates.
- Clicking  will delete the selected template.

4.9.7 Device Properties

After you set the **Input**, **Color** and **Output**, clicking **Apply** will complete the settings.

Option	Description
Properties	Displays the device's type, communication port, ID, hardware program version. Change the device name and upgrade the firmware version of currently connected controller device.
Input	Set the type, data bits and resolution of the input source.
Color	Adjust the contrast, saturation, hue and sharpness of the displayed image.
Output	<p>Mosaic: If the number of the pixels of the LED display exceeds the loading capacity of the device, the mosaic function is required. For detailed operation, see 4.9.9 Mosaic.</p> <p>Note: When Mosaic is selected, the Disable Zoom and Auo Fit functions under Main Screen are disabled, and the Video Source Synchronization option under Main Screen is hidden.</p>
	Main Screen: Used for setting the parameters of the main screen, such as capture, output size, output position
	Minor Screen: Used for setting Capture parameters of the minor screen, such as size, position and transparency
	Video Source Synchronization: Syncs the parameters of input and output video sources.
System	<p>Used for system parameter settings</p> <p>Meanings of the parameters:</p> <ul style="list-style-type: none"> • LCD Lock: Locks the operation screen of the device. After the operation screen is locked, buttons on the device are disabled. • Smart Gray Scale: Adjusts the grayscale of the LED display. • Genlock: Generator locking • Deinterlace: Restores the interlaced video signal to progressive signal. • VGA Auto Adjusting: Adjusts the sampling parameters of VGA input signal automatically. • ADC Auto Calibration: Adjusts color cast, dimming and other display problems. • Low Latency: Reduce the latency of image output. (Supported by the MCTRL4K and MCTRL660 PRO only) • Fiber Converter: Convert optical signals into electric signals. (Supported by the MCTRL660 PRO only) • 3D: Set 3D function parameters. (Supported by the MCTRL4K only) • HDR: Improve the display effect. (Supported by the MCTRL4K only)
Audio	<p>Used for enabling and disabling audio output and adjusting audio output parameters</p> <p>Audio types:</p> <ul style="list-style-type: none"> • Following Mode: Uses the audio source of HDMI.

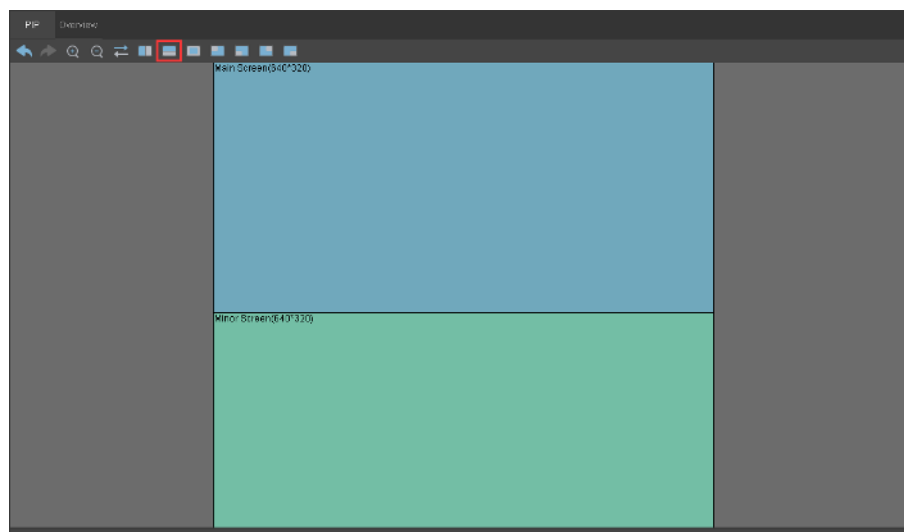
- **Constant Mode:** Uses the audio source that is suitable to fixed audio connector.

4.9.8 Picture in Picture (PIP)

Connect a video controller which supports PIP function. Then, enter the V-Sender page and select the **PIP** tab in the canvas.

Click the different icons in the tool bar to adjust the layout of the main screen and minor screen, as shown in the figure below.

Note: Move the mouse to the canvas. When the mouse cursor changes into a double arrow, click and drag to change the size of the main screen or minor screen.



Tool Bar	Icon	Description
Cancel		Cancels the results of a previous action.
Revert		Restores the results of a previous action that was canceled.
Zoom in		Zooms in view.
Zoom out		Zooms out view.
Main and Minor Screens Switching		Switches between main and minor screens.
Horizontal Layout		N/C
Vertical Layout		N/C
In the Middle		N/C
Upper Left Layout		N/C
Lower Left Layout		N/C
Upper Right Layout		N/C
Lower Right Layout		N/C

Main Screen Settings

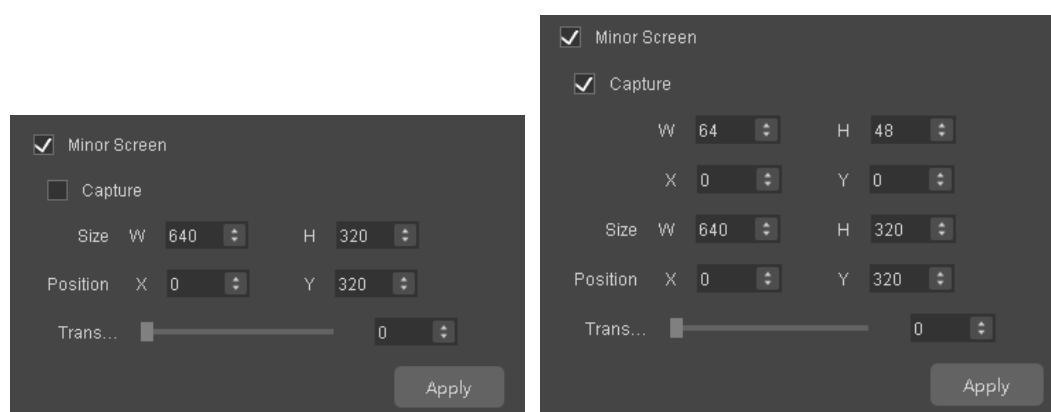
You can set the zoom status of the main screen. Three options are provided: **Disable Zoom**, **Customize Zoom** and **Auto Fit**.

- **Disable Zoom**: The size of input image is the same as the size of the output image and only the image offset position is settable.
- **Customize Zoom**: Allows you to set the start position and size for **Capture**. The captured content will be displayed on the LED display. **Output Size** is the size of the main screen in the canvas. **Output Position** is the start position of the current main screen in the canvas.
- **Auto Fit**: The input image is zoomed to fit the main screen automatically. This mode is suitable for full screen display.
- Selecting **Apply to All** will apply the settings to all the input sources.

After the settings are done, clicking **Apply** will send the current configuration information to the input source.

Minor Screen Settings

The size and position of the minor screen are editable. Selecting **Capture** allows you to set the size and start position of the content to be captured. The captured content will be displayed on the LED display.



After the settings are done, clicking **Apply** will send the current configuration information to the signal source.

Video Source Synchronization

Video source synchronization allows you to sync the input video source with the output video source.

4.9.9 Mosaic

Before you begin: When the pixels of the output image exceeds the loading capacity of a single device, the mosaic function will be required.

- Step 1 Access V-Sender. On the **Output** tab, select **Mosaic**.
- Step 2 Set parameters through any of the following methods.

- **Non-Equal Division:** When the loading capacities of each of the VX4S units are different, set the total number of pixels of the LED display, the loading area of current device and the start position.
- **Equal Division:** When the loading capacities of each of the VX4S units are the same, set the total number of pixels of the LED display, the number of mosaic rows and columns, and the start position of the loading area of the current device.

Step 3 After the parameter settings are done, click **Apply** to send the settings to hardware.

The image shows two side-by-side screenshots of the SmartLCT configuration interface. Both screenshots have a 'Mosaic' checkbox checked. The left screenshot shows the 'Non-Equal ...' radio button selected, with fields for 'Total W(H)' (128), 'Total H(V)' (128), 'Current Device Load Area Parameters' (Load Area W: 128, Load Area H: 64, Load Area X: 0, Load Area Y: 0), and an 'Apply' button. The right screenshot shows the 'Equal Division' radio button selected, with fields for 'Total W(H)' (128), 'Total H(V)' (128), 'Rows' (1), 'Columns' (1), 'Current Device Load Area Parameters' (Load Area Position: 1), and an 'Apply' button.

4.10 Other Operations

4.10.1 Hot Backup

For the detailed operation of hot backup, see [3.5 Hot Backup](#).

4.10.2 Mapping

SmartLCT supports the Mapping function.

Choose **Edit > Mapping**. The receiving card numbers and Ethernet port information are displayed on the cabinets of the screen.

4.10.3 3D Function

This function works with the independent controller that supports 3D function, the 3D emitter EMT200 and 3D glasses to allow users to experience 3D effects on LED screen. For detailed usage, see *3D Emitter EMT200 Quick Start Guide*.

Notes:

- Only the MCTRL4K supports 3D function.
- Using 3D function requires a 3D video source.
- After 3D function is enabled, if you re-assign the Ethernet ports to the DVI sources and re-configure the screen, you must adjust the right eye start position of current DVI source in V-Sender.
- When multiple devices are cascaded, if you click **Apply to All**, the current settings will be applied to all the cascaded devices.

Constraints

This function cannot be enabled with any of the following functions at the same time.

- Calibration function of bundled software
- Low latency
- Genlock

Operating Procedure

Step 1 Connect the hardware. See *3D Emitter EMT200 Quick Start Guide*.


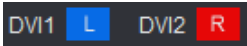
Step 2 Run SmartLCT.



Step 3 Enter the V-Sender page. See [4.9.1 Accessing V-Sender](#).

Step 4 On the **System** tab page, select **Enable 3D**.

Step 5 Click  to display the 3D function settings.

Step 6 Set the video source format, eye priority, DVI mode, right eye start, and signal delay time.

- **Video Source Format:** Includes side-by-side, top-and-bottom, and frame sequential. (Set the format same as that of the video source.)
- **Eye priority:** Includes right eye first and left eye first. (Set the priority according to the 3D glasses.)
- **DVI Mode Selection**
 - : The left and right eye images of each DVI source are displayed at the same time.
 - : DVI1 displays the left eye image and DVI2 displays the right eye image. When the input source is Dual DVI, you must set the DVI mode. When the input source is HDMI 2.0 or DP 1.2, there is no need to set the DVI mode.
- **Right Eye Star:** When you set the video source format as side-by-side or top-and-bottom, you must set the right eye start position. When you set it as frame sequential, you do not need to set the DVI mode or the right eye start position.
- **Signal Delay Time:** Set this time as required to make sure that the left and right eye image switching of the 3D glasses is in sync with the image switching on the display.

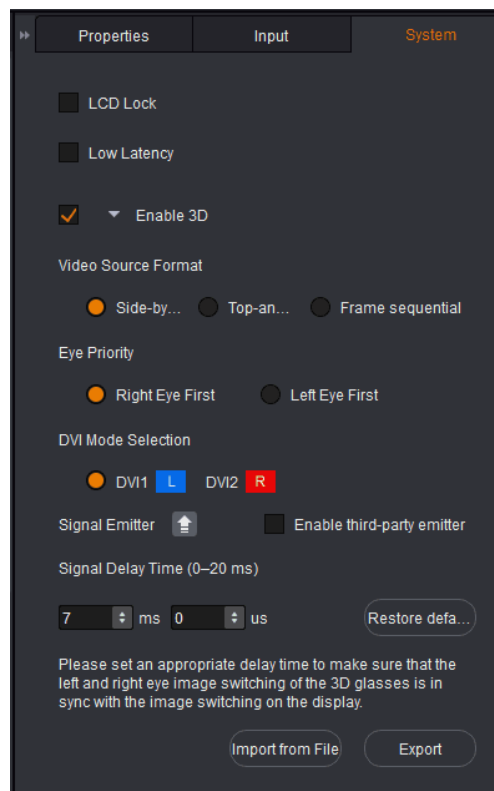
Step 7 (Optional) Click  to display the **Update Firmware of Signal Emitter** dialog box. Then, click  to select the firmware program path. At last, Click **Update**.

Step 8 (Optional) If you are using a third-party 3D emitter, select **Enable third-party emitter**.

Step 9 (Optional) Click **Import from File** to load a 3D configuration file (*.3DConfig) saved in PC.

Step 10 Click **Export** to export current configured 3D parameters as a file (*.3DConfig) to PC.

Figure 4-15 3D parameter settings



4.10.4 Working Mode

This function is used to set the working mode for the connected device as sending card or fiber converter.

Note:

- Only the MCTRL660 PRO supports the fiber converter mode.
- When multiple devices are cascaded, if you click **Apply to All**, the current settings will be applied to all the cascaded devices.

Operating Procedure

- Step 1 Connect the hardware. See the user manual of the connected device.
- Step 2 Run SmartLCT.
- Step 3 Enter the V-Sender page. See [4.9.1 Accessing V-Sender](#).
- Step 4 On the **System** tab page, select the target working mode under **Working Mode**.

4.10.5 HDR

This function works with the MCTRL4K independent controller and the A8s receiving card to greatly enhance the image quality of the display, presenting images with more vivid colors and clearer details.

Note:

- Only the MCTRL4K supports the HDR function.
 - Using the HDR function requires an HDMI 2.0 10-bit video source.
 - When multiple devices are cascaded, if you click **Apply to All**, the current settings will be applied to all the cascaded devices.
-

Constrains

This function cannot be enabled with any of the following functions at the same time.

- Calibration function of bundled software
- Low latency

Operating Procedure

- Step 1 Connect the hardware. See *MCTRL4K Independent Controller User Manual*.
- Step 2 Run SmartLCT.
- Step 3 Enter the V-Sender page. See [4.9.1 Accessing V-Sender](#).
- Step 4 On the **System** tab page, select **Enable HDR**.
- Step 5 Set the HDR standard (including HDR10 and HLG) and its parameters.

Figure 4-16 HDR10

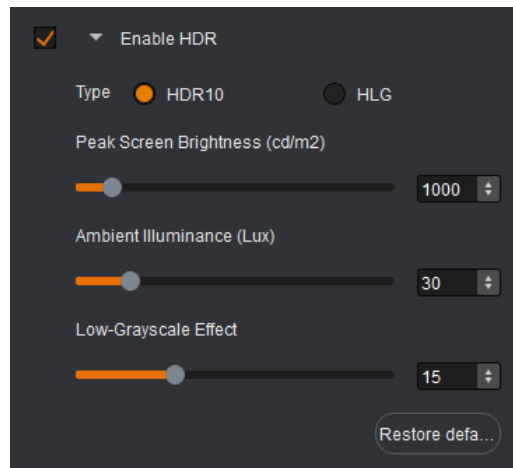
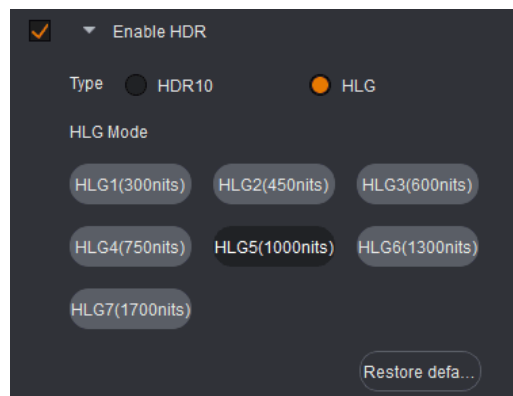


Figure 4-17 HLG mode



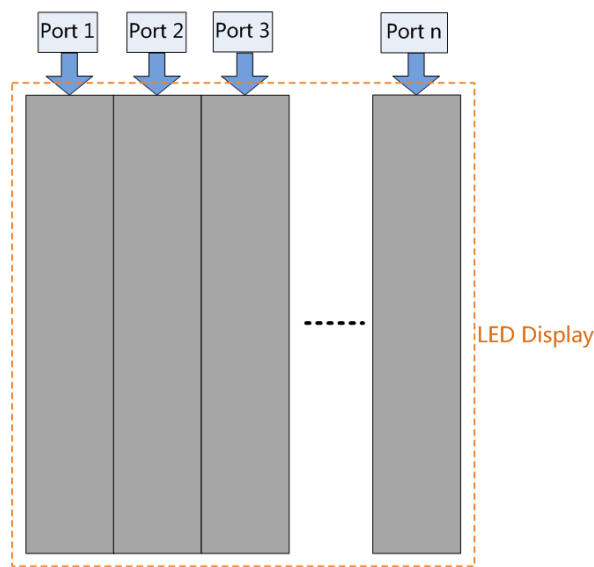
4.10.6 Low Latency

This function is used to reduce the latency from input to output of the video signal.

Note:

- Only the MCTRL4K and MCTRL660 PRO support low latency.
- During screen configuration, ensure that each Ethernet port loads the cabinets vertically, as illustrated in [Figure 4-18](#).
- When multiple devices are cascaded, if you click **Apply to All**, the current settings will be applied to all the cascaded devices.

Figure 4-18 Cabinet loading by Ethernet ports in low latency mode



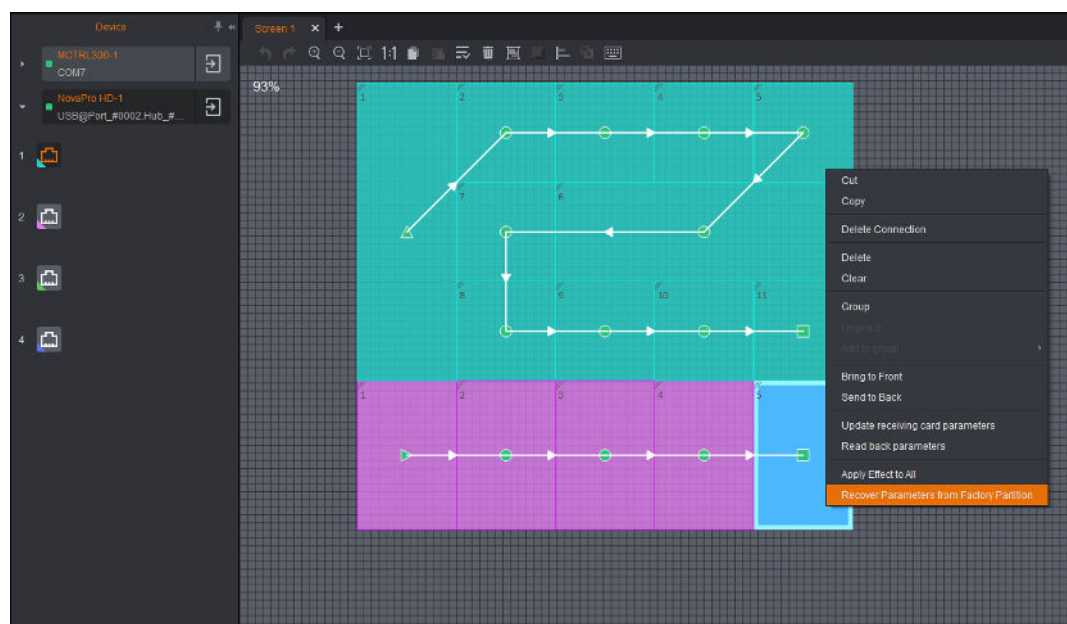
5 Features

5.1 Recovering Receiving Card Parameters from Factory Partition

Before you begin: Run SmartLCT, add cabinets, finish screen configuration, send all the configuration parameters to the hardware and save them to the receiving cards.

On the canvas, select a cabinet, right click on it, and click **Recover Parameters from Factory Partition**.

Figure 5-1 Recovering parameters from factory partition



5.2 Online Software Update


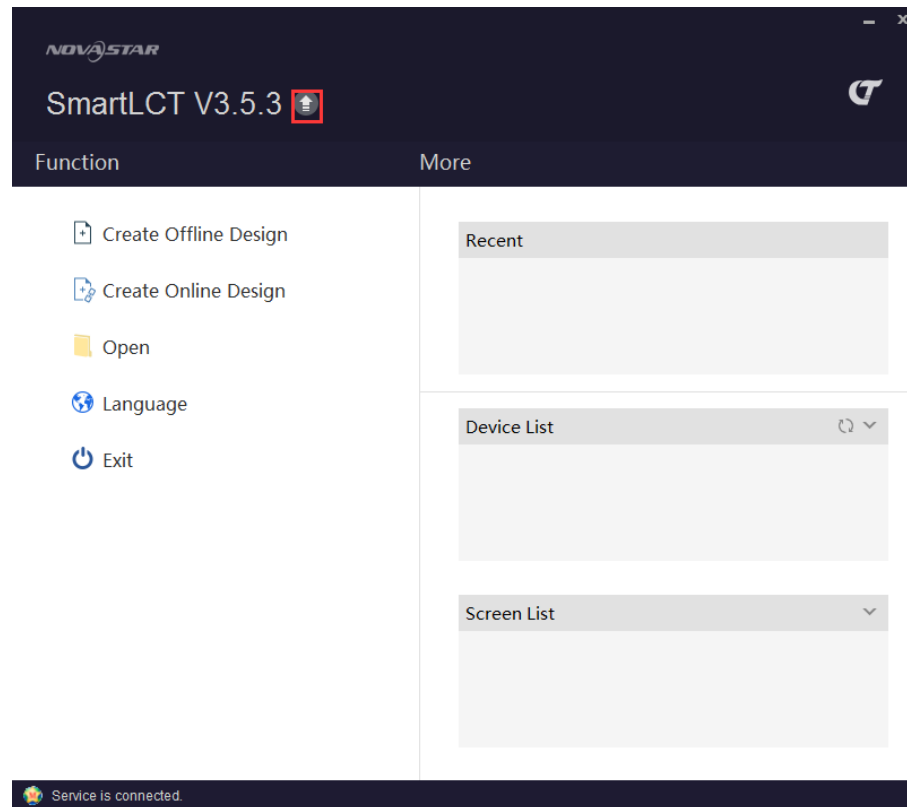
Run SmartLCT and click  on the start page to update the software version.

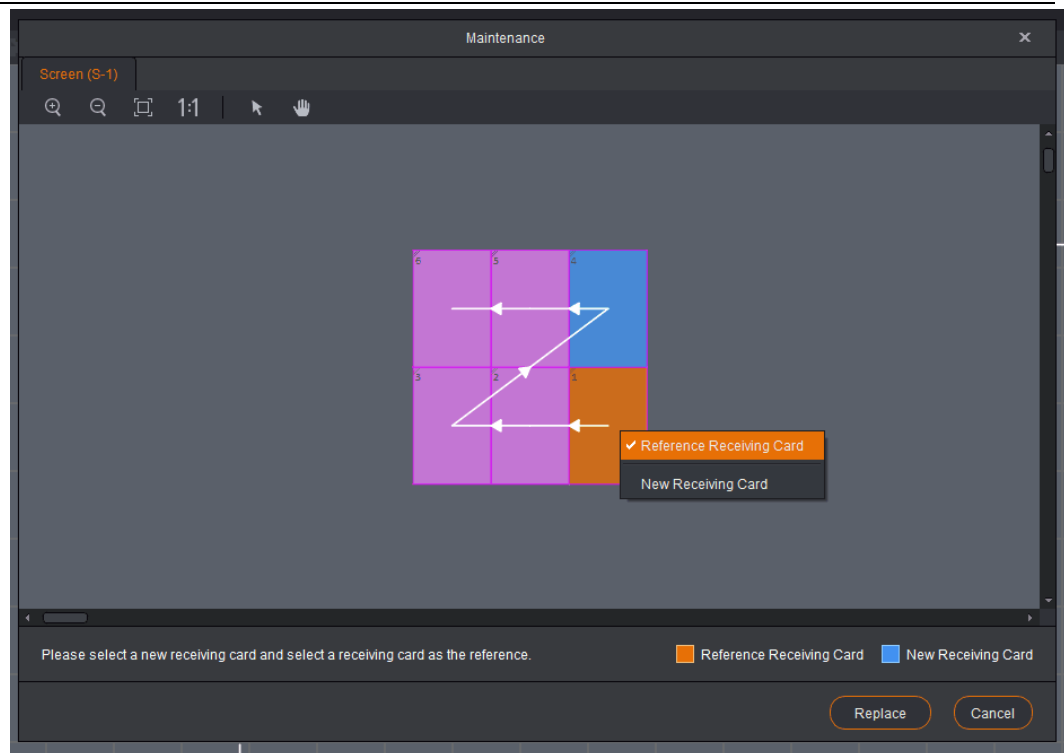
Figure 5-2 Online update





5.3 Replacing Receiving Card With One Click

Copy the parameters of reference receiving card and send them to the new receiving card. The parameters include program version, configuration file and calibration coefficients, etc. This function is used to maintain the faulty receiving card and update the configuration file of receiving card.

- Step 1 Run SmartLCT and create an online project. Choose **Help > Maintenance** to enter the maintenance page.
- Step 2 Select the cabinet you want to maintain: Click and select **New Receiving Card** from the drop-down box.
- Step 3 Select a cabinet as reference cabinet. Click and select **Reference Receiving Card** from the drop-down box.
- Step 4 Click **Replace**.



5.4 Building Screens like Building Blocks

- Step 1 In the **Device** section, select a device and Ethernet port.
- Step 2 In the tool bar, choose **Edit > Cabinet Management >**  or .
- Step 3 Move the mouse to the canvas and click to add cabinets.
- Step 4 Select one or multiple cabinets and move the mouse to change the position of the cabinet(s). Build different shapes of screens as required.

5.5 Rotating in 90° Increments

Notes:

Before you begin: Connect the receiving cards and controller that support rotation.

Receiving card that support rotation: A4/A4s/A5/A5s/A7/A7s/A8/A8s/A9s/A10s/B4s


- Step 1 In the canvas, select the target cabinet.
- Step 2 Click  next to **Rotation in 90 Increments** and select a rotation angle (0°, 90°, 180°, 270°) from the drop-down box.

Figure 5-3 Rotation in 90° increments



5.6 Full 360° Rotation

Before you begin: Connect the controller MCTRL R5 to SmartLCT, and the rotation function can be enabled.

Rotation of a Single Cabinet


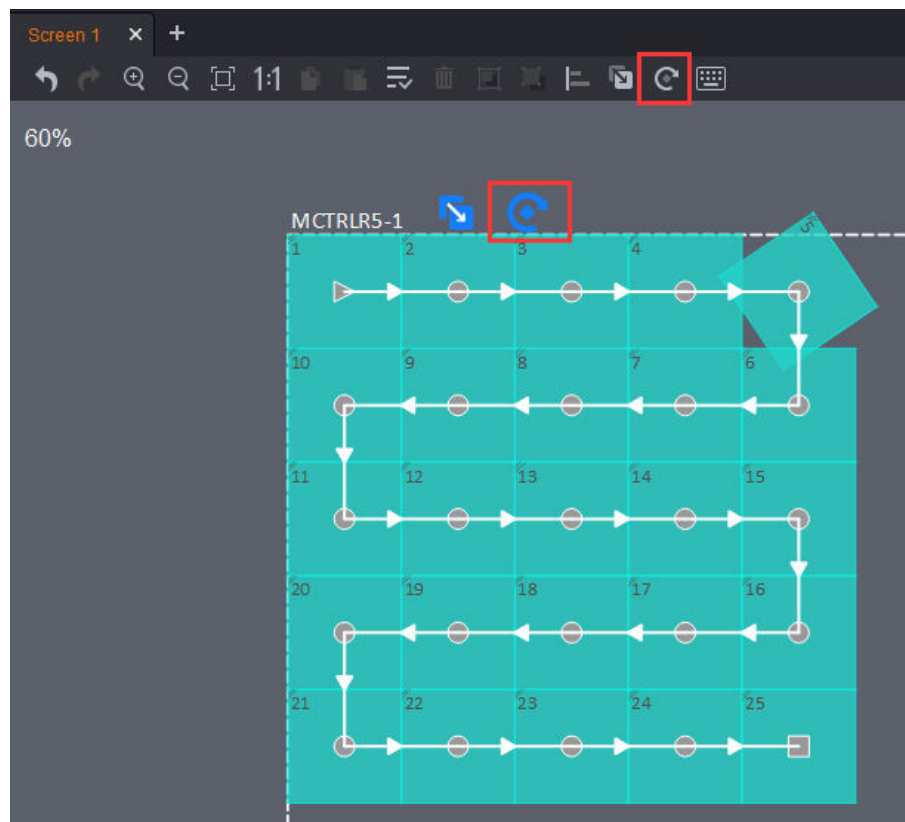
- Step 1 Click  and select the cabinets. A rotating bar appears on each of the cabinets.
- Step 2 Select any of the rotating bars and drag the mouse. The cabinet rotates around its rotation center.
- Step 3 (Optional) Set the rotation center and angles of rotation in the property section on the right.

Figure 5-4 Rotation



Rotation of Grouped Cabinets


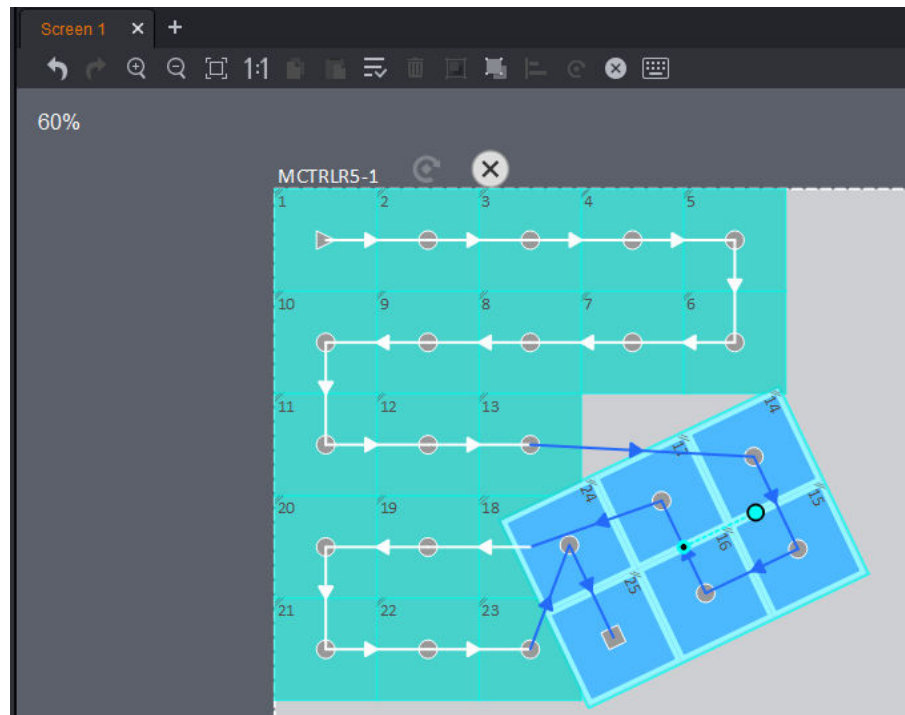
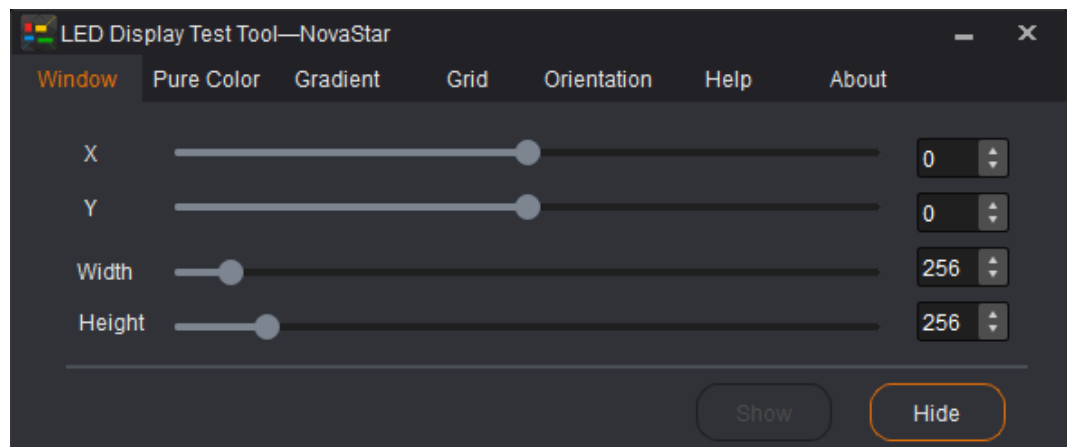
- Step 1 Click  and select the target cabinets.
- Step 2 Right click the cabinets and choose **Group**.
- Step 3 Click to select the grouped cabinets. A rotation bar appears on the rotation center of the grouped cabinets.
- Step 4 Click the rotation bar and drag the cabinets. The group of cabinets rotates around the rotation center.
- Step 5 (Optional) Set the rotation center and angles of rotation in the property section on the right.

Figure 5-5 Rotation after grouping

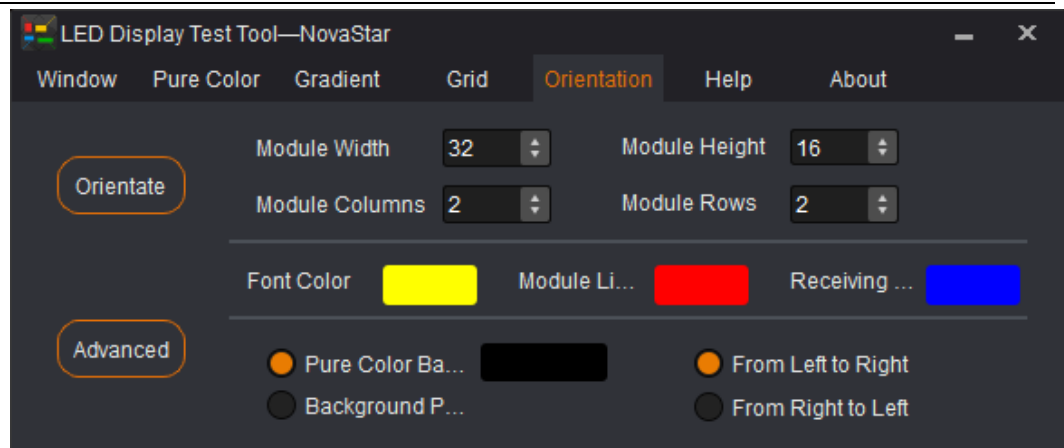


5.7 LED Display Test

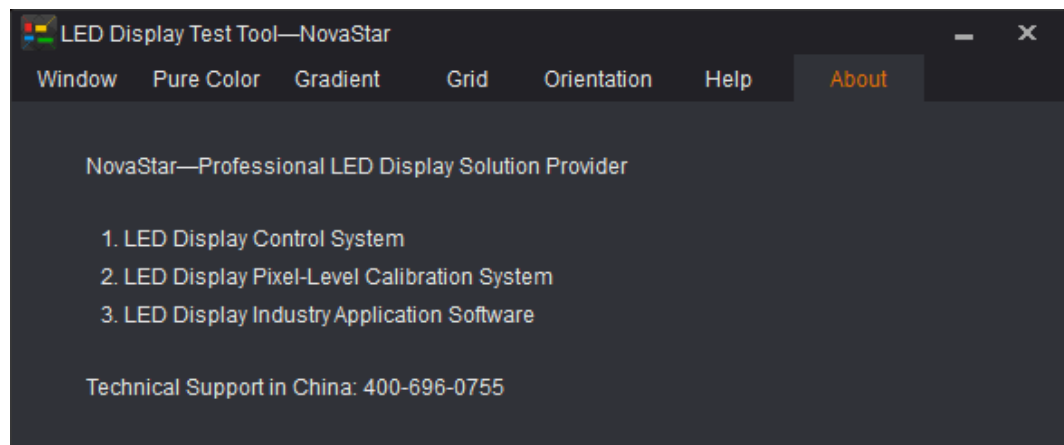
Choose **Help > Test Tool** to enter the display test tool page (that is, receiving card test page).



- **Window:** Set window position and size, or hide the window.
- **Pure Color:** Set window color (pure color), grayscale and refresh rate.
- **Gradient:** Set the gradient color and levels of the window.
- **Grid:** Set grid and color and other parameters of the window.
- **Orientation:** Set module size and the number of modules loaded by the scanning board. Detailed settings are shown in the figure below.



- **Help:** Keyboard shortcut for quick operations.
- **About:** LED display solutions. See details in the figure below.



5.8 Update and Readback of Receiving Card Configuration Parameters

Save receiving card parameter configuration files to the local PC.

Step 1 In the canvas, select the target cabinet(s).

Step 2 Right-click to select **Read back parameters/Update receiving card parameters** to read back or update local receiving card configuration parameters.

5.9 Applying Effect to All Receiving Cards

Apply configuration information of one receiving card to all receiving cards. The configuration information includes RGB, 18Bit+, ClearView, overall brightness, color temperature and Gamma value.


Step 1 Select the target cabinet.

Step 2 Right click and click **Apply Effect to All**.

5.10 Receiving Card Program Upgrade

Before you begin: Save the upgrade package of receiving card firmware program to the local PC.

Step 1 In the canvas, select the target cabinet(s) to enter the **Properties** tab page on the right.

Step 2 Click  next to **Program Version**.


Step 3 Select the path of the upgrade package to upgrade the firmware program.

5.11 Controller Program Upgrade

Before you begin: Save the upgrade package of the controller firmware program to the local PC.

Step 1 Enter V-Sender.

Step 2 Click **Update**, or select the **Properties** tab and click  next to **Program Version**.

Step 3 On the **Firmware Upgrade** window that appears, click  to select the path of the upgrade package.

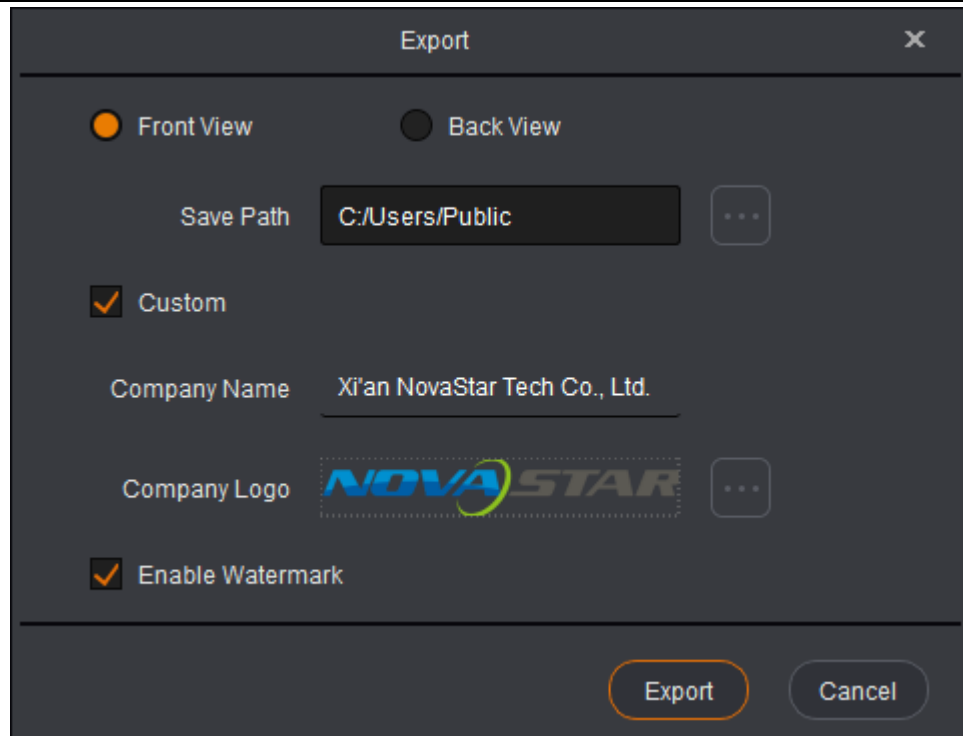
Step 4 Click **Update**.

5.12 Exporting Screen Configuration Information as Image

The screen configuration information can be exported as an image,

Step 1 Choose **Project > Export**. The **Export** page appears.

Step 2 Set export parameters and information.



Step 3 Click **Export** to export the image to the local PC.

Figure 5-6 Cabinet connection diagram

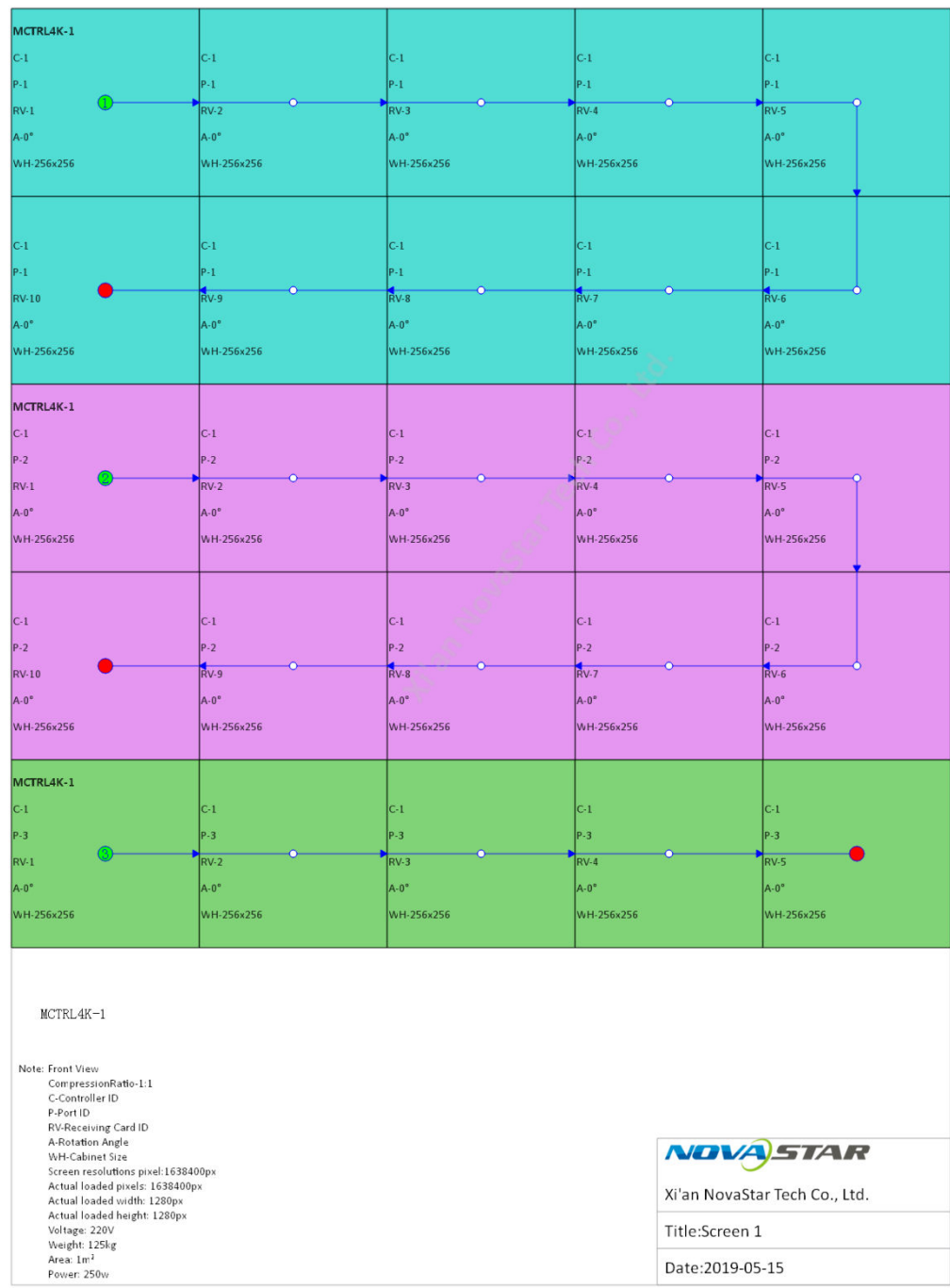


Figure 5-7 Device information

Device Connection Table

Port	No.	Device Name
A1	1	MC7804K

Device redundancy relation table

Port	Device Name	No.	Port1	Port2	Port3	Port4	Port5	Port6	Port7	Port8	Port9	Port10	Port11	Port12	Port13	Port14	Port15	Port16
A1	MC7804K	1	1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10	1-11	1-12	1-13	1-14	1-15	1-16

Xi'an NovaStar Tech Co., Ltd.

</

Note:

When both the cabinet width and height are 104 px or greater, detailed cabinet information can be shown in the exported image.

6 Troubleshooting

6.1 Device Went Offline

Step 1 Run SmartLCT. The device will be reconnected automatically.

- If the device become online, no further action required.
- If the device is still offline, go to [Step 2](#).

Step 2 Check whether hardware connection is stable.

- Unstable: Reconnect the hardware.
- Stable: Go to [Step 3](#).

Step 3 On the **Edit** page, click the **Device** tab and click **Reconnect**.

- If the device become online, no further action required.
- If the device is still offline, go to [Step 3](#).

6.2 Redundancy Information of Hardware Configuration Not Read Back

Note:

After hot backup is set on hardware, the redundancy information will not be read back on the hot backup page in SmartLCT. You must set hot backup again in SmartLCT.

For hot backup settings, see section [4.10.1](#) Hot Backup.

6.3 No Cabinet Offset Information in Readback Screen Information

Note:

After screen is configured and cabinet offset is set in SmartLCT, SmartLCT can read back the screen configuration topology. If there is no cabinet offset information in the readback information, you must set cabinet offset in SmartLCT again.

For cabinet offset settings, see section [3.3.3 Setting Cabinet Offset](#).

6.4 Cabinet Display Becomes Abnormal After Mapping is Enabled

Note:

After screen is configured and Mapping function enabled in SmartLCT, the cabinet display the image in red. That is abnormal. You must select **Normal** from the test pattern list.

Step 1 Run SmartLCT and click **Test Pattern** under **Edit** tab.

Step 2 Select **Normal** from the drop-down box.

6.5 Unable to Connect to MCTRL660/MCTRL600 in SmartLCT of Mac Version

Step 1 Check whether hardware connection is stable.

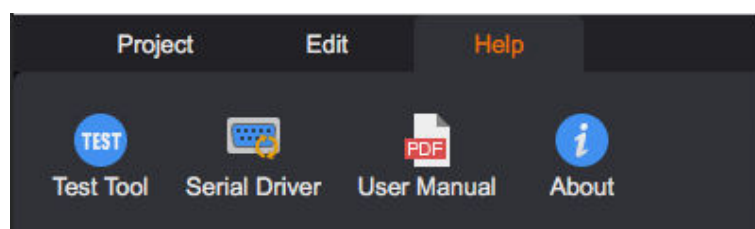
- Unstable: Reconnect the hardware.
- Stable: Go to [Step 2](#).

Step 2 On the **Edit** page, click the **Device** tab and click **Reconnect**.

- If the device become online, no further action is required.
- If the device is still offline, go to [Step 3](#).

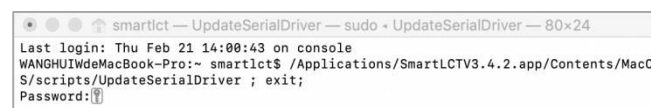
Step 3 Run SmartLCT. Under the **Help** tab, click **Serial Driver**.

Figure 6-1 Serial driver



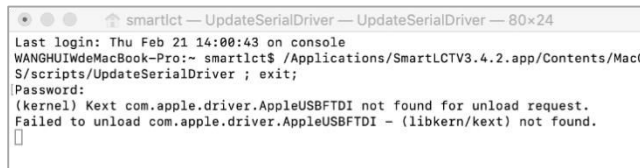
Step 4 On the displayed terminal page, enter the computer login password and close the page.

Figure 6-2 Terminal page



Step 5 (Optional) After you entered the password, if the driver is not found, it indicates that . Please close the terminal page.

Figure 6-3 Driver not found



```
smartlct — UpdateSerialDriver — UpdateSerialDriver — 80x24
Last login: Thu Feb 21 14:00:43 on console
WANGHUIWdeMacBook-Pro:~ smartlct$ /Applications/SmartLCTV3.4.2.app/Contents/MacOS/scripts/UpdateSerialDriver ; exit;
Password:
(kernel) Kext com.apple.driver.AppleUSBFTDI not found for unload request.
Failed to unload com.apple.driver.AppleUSBFTDI - (libkern/kext) not found.
```

6.6 Some Cabinets Displaying Image Abnormally After Cabinet Configuration File Is Updated

After the receiving card configuration files of cabinets with same size are updated using the same configuration file, some cabinets display the image abnormally.

- Step 1 Check whether the abnormal cabinet is a cabinet with data group exchange.
- No: The cabinet display is normal.
 - Yes: The cabinet display is abnormal. Go to [Step 2](#).
- Step 2 Right click the cabinet and select **Update receiving card parameters** from the drop-down list to update the corresponding configuration file again.