



Small-pitch LED Display

User's Manual








Foreword

General

This manual introduces the functions and operations of the small-pitch LED display (hereinafter referred to as the "Device").

Safety Instructions

The following categorized signal words with defined meaning might appear in the manual.

Signal Words	Meaning
 DANGER	Indicates a high potential hazard which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a medium or low potential hazard which, if not avoided, could result in slight or moderate injury.
 CAUTION	Indicates a potential risk which, if not avoided, could result in property damage, data loss, lower performance, or unpredictable result.
 TIPS	Provides methods to help you solve a problem or save you time.
 NOTE	Provides additional information as the emphasis and supplement to the text.

Revision History

Version	Revision Content	Release Time
V1.0.0	First release.	August 2020

Important Safeguards and Warnings

To avoid risks, improve product life cycle and reduce unnecessary loss, comply with the following rules when using the Device:

- Do not hit or scratch the screen with hard objects.
- Keep the Device from water.
- Do not place the air outlet of the air conditioner close and direct to the Device.
- Do not place or use the Device in an environment with volatile, corrosive or flammable chemicals.
- Do not use water and chemical solvents to clean the Device.
- Do not expose the Device to direct sunlight or heat source.
- Properly ground the Device and accessories before use.
- We recommend using the Device in an environment of under 60% humidity. When the humidity exceeds 60%, use a dehumidifier to keep the humidity between 35% and 60%.
- If any abnormality is found in use, such as strange smell, smoke, electrical leakage, high temperature, contact with water, cut off the power immediately and contact the manufacturer.
- In normal weather, power on the Device at least twice a week and for 2 hours each time; when the humidity is extremely high, power on the Device every day for at least 2 hours.
- The ambient temperature of the Device should be between 26°C to 30°C. The air conditioners in front of and behind the Device should be powered on/off at the same time. This is to avoid temperature difference and the resulting water condensation on the Device surface.

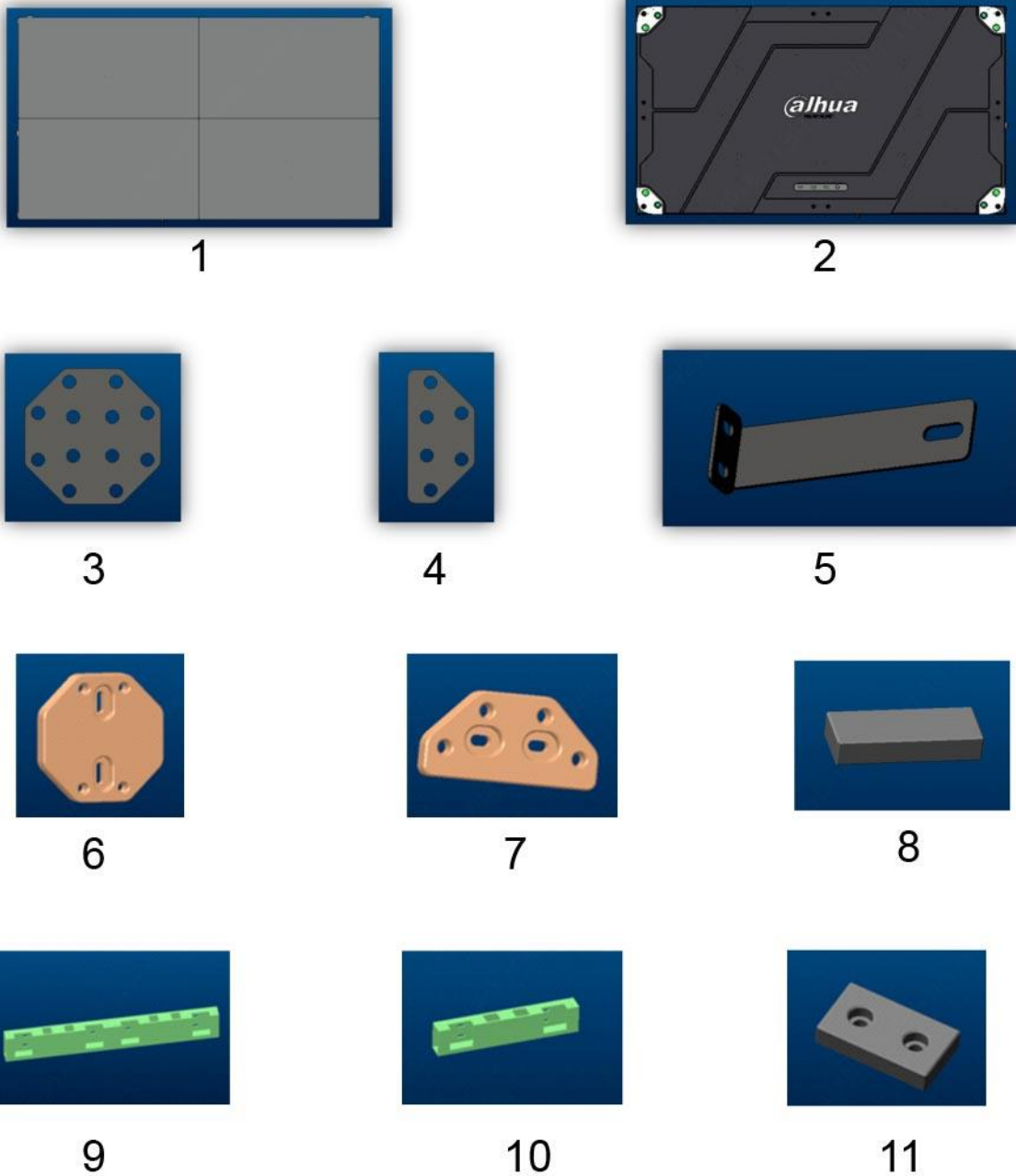
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1 Installing the Display

1.1 Products and Accessories

Figure 1-1 Products and accessories





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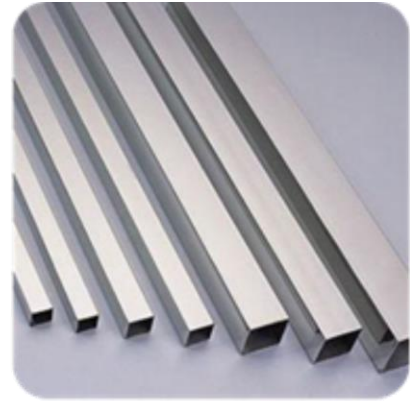
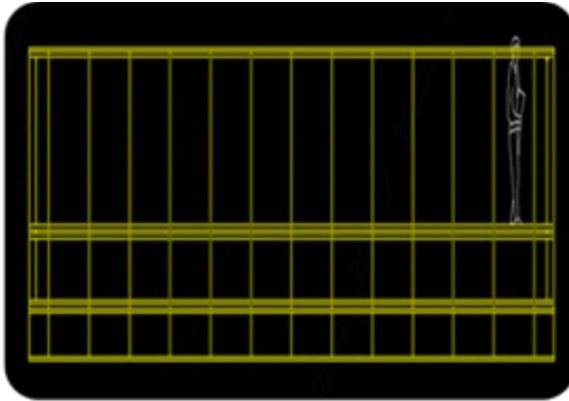
Table 1-1 Products and accessories

No.	Item Name	No.	Item Name
1	The front of the Device.	14	Hook 2.
2	The back of the Device.	15	Connector component 1.
3	Whole connector.	16	Connector component 2.
4	Half connector.	17	M10 × 80 expansion bolt.
5	L connector.	18	M8 × 16 inner hexagon screw.
6	Profile whole connector.	19	M8 × 35 inner hexagon screw.
7	Profile half connector.	20	ST4.8 × 20 hexagon self-tapping dovetail screw.
8	Cabinet aluminum pad.	21	6 mm inner hexagon wrench.
9	Bottom beam 1.	22	5 mm inner hexagon wrench.
10	Bottom beam 2.	23	Rubber hammer.
11	Bottom beam connector 1.	24	Hand drill.
12	Bottom beam connector 2.	25	Magnet removing tool.
13	Hook 1.	26	Front maintenance removal tool.

1.2 Welding a Steel Frame

- Cut the steels and weld together a steel frame with enough precision.
- Small-pitch LED requires a structure with high precision. According to the drawings based on actual situation, precision must be guaranteed when welding and no deformation should occur. In addition, the first row of cross beams should be leveled by using a laser level before welding.
- Additional frame can be applied by using aluminum frame.

Figure 1-2 Drawings of the steel frame



1.3 Installing Cabinets

This section introduces three types of cabinet installation. During installation, pay attention that:

- Install the cabinets from the middle to either side to get optimal effect of the completed display.
- When attaching two cabinets, make sure to even up the gap.

1.3.1 Installing the Frame

Step 1 Place two aluminum pads under each cabinet of the last row of cabinets (each at the center of two cable outlets). Use connectors, M8 inner hexagon screws and self-tapping dovetail screws to connect the cabinet as shown and the frame.

Figure 1-3 Connect bottom cabinets and the frame



Table 1-2 Connect bottom cabinets and the frame

No.	Item Name
1	Cable outlets.
2	The front of the cabinet.
3	Each of the two aluminum pads should be placed in the middle of two cable outlets.
4	M8 inner hexagon screws go through connectors. Use a 6 mm inner hexagon wrench to fix them into the screw thread of the cabinet.
5	Use a hand drill and self-tapping dovetail screws to fix the connector onto the frame.

Step 2 Use speed locks, inner hexagon screws and connectors to firmly connect cabinets.

- 1) Slide the spring pin and completely attach the left and right cabinet. Insert a 5 mm inner hexagon wrench into the adjusting hole and turn the speed locks clockwise to tighten both cabinets.
- 2) Repeat the previous step to tighten the upper and lower cabinets.
- 3) Firmly connect the cabinets in the middle with one whole connector and four M8 inner hexagon screws.
- 4) Firmly connect the surrounding cabinets with half connectors and two M8 inner hexagon screws.

Figure 1-4 Connect and fix cabinets

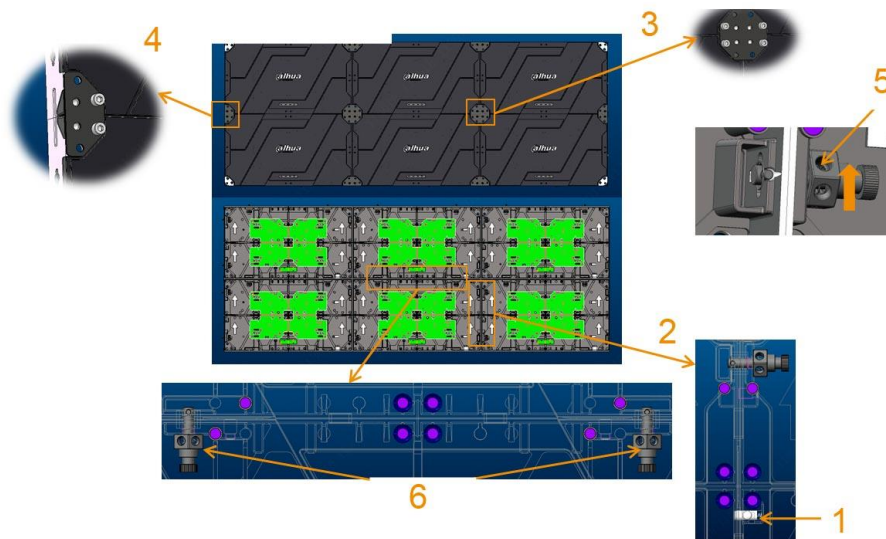


Table 1-3 Connect and fix cabinets

No.	Item Name
1	Slide the spring pin.
2	Install the speed lock indicated by the figure. Insert a 5 mm inner hexagon wrench into the adjusting hole and turn clockwise to tighten the speed lock to fix both cabinets.
3	Use one whole connector and four M8 inner hexagon screws to tighten cabinets in the middle.
4	Use one half connector and four M8 inner hexagon screws to tighten cabinets on either side.
5	Adjusting hole.
6	Speed lock.

1.3.2 Wall-mounted Installation with a Frame

- Step 1** Use profile whole connectors, profile half connectors and M8 inner hexagon screws to connect the first row of cabinets. Fix the profile whole connectors and profile half connectors on the frame with self-tapping dovetail screws.



Refer to "1.3.1 Installing the Frame" to tighten the cabinets and place two aluminum pads under each cabinet in the first row.

Figure 1-5 Connect and fix the first row of cabinets

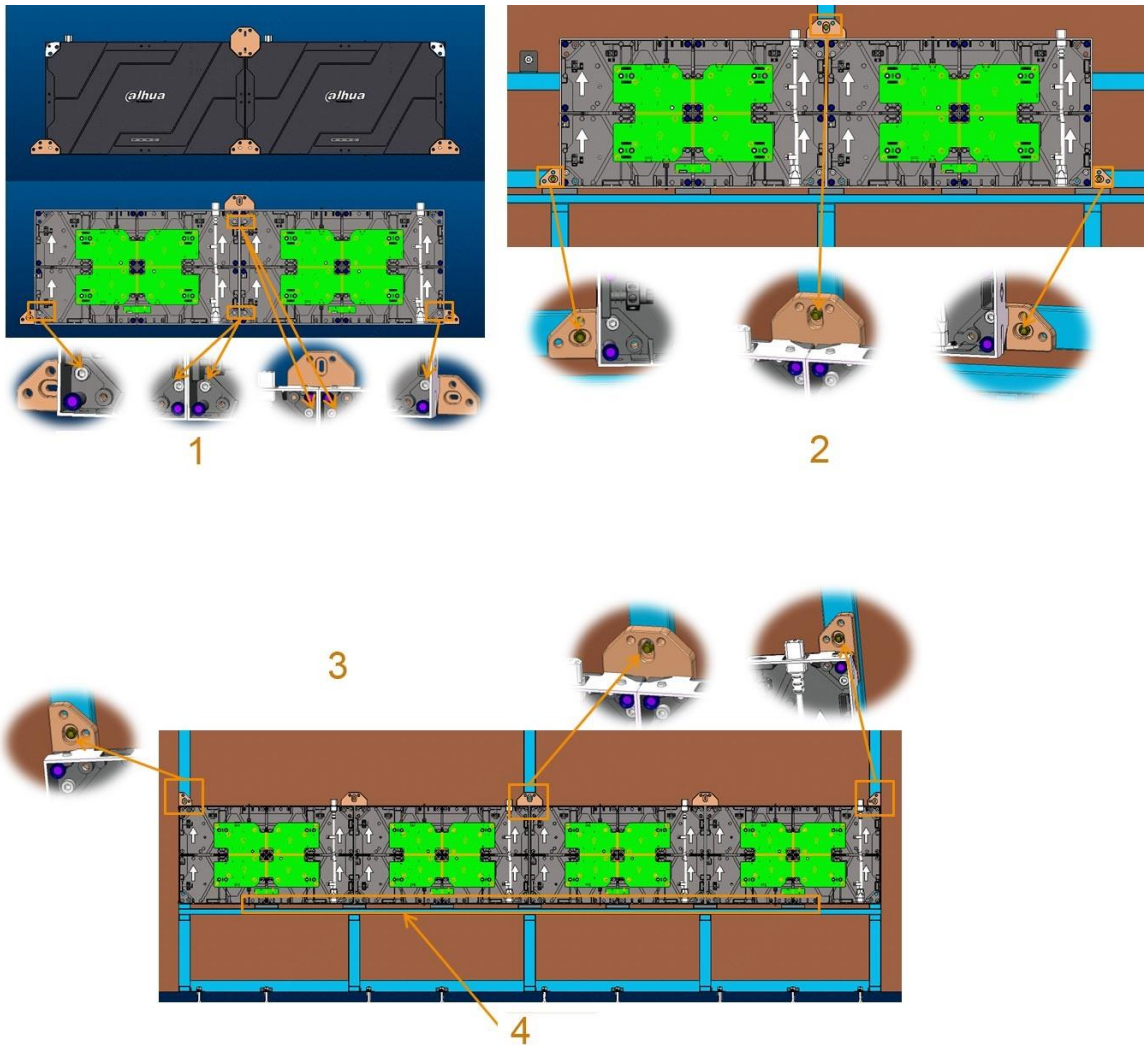


Table 1-4 Connect and fix the first row of cabinets

No.	Item Name
1	Use profile connectors and M8 screws to connect two cabinets. Install profile half connectors on the lower-left and -right corners in advance.
2	Use self-tapping dovetail screws to fix the cabinets onto the frame.
3	Install cabinets from the middle to either side. After fixing the connectors, use self-tapping dovetail screws to fix the cabinets onto the frame.
4	Aluminum pad.

Step 2 When installing cabinets in the second to last and to top rows, use profile whole connectors and M8 inner hexagon screws to connect cabinets of one row first. Then use self-tapping dovetail screws to fix this row of cabinets onto the wall. Refer to "1.3.1 Installing the Frame" to tighten two cabinets.

Figure 1-6 Connect and fix other cabinets except the top row

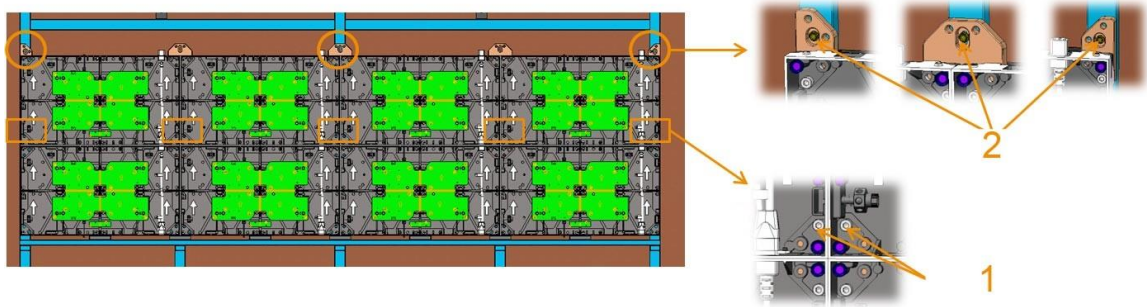


Table 1-5 Connect and fix other cabinets except the top row

No.	Item Name
1	Use M8 Screws to tighten cabinets and connectors.
2	Insert self-tapping dovetail screws into the frame.

Step 3 When installing the top row of cabinets, use profile half connectors and M8 inner hexagon screws to connect cabinets first. Then use M8 inner hexagon screws to fix this row of cabinets on the connectors of the next row of cabinets.

Figure 1-7 Connect and fix the top row of cabinets

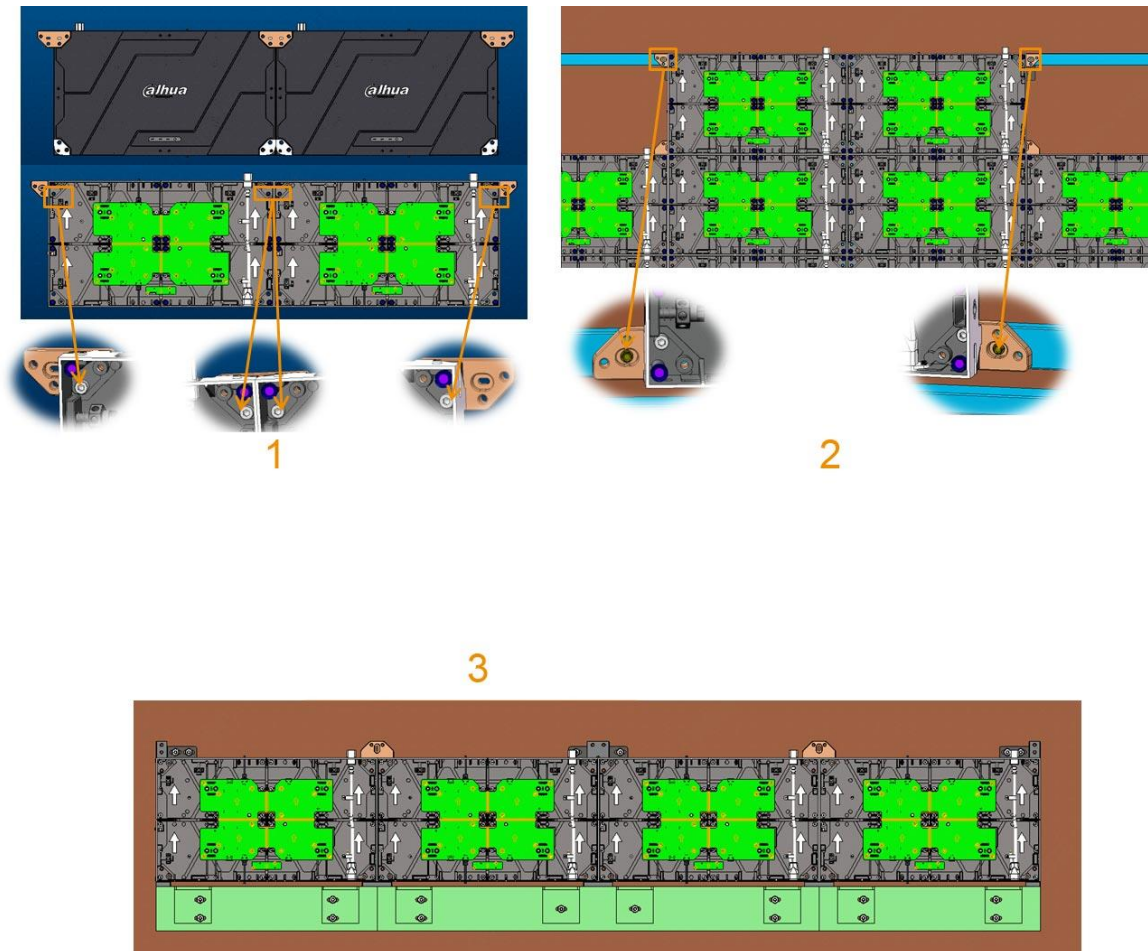


Table 1-6 Connect and fix the top row of cabinets

No.	Item Name
1	Use profile connectors and M8 screws to connect two cabinets and install profile half connectors on the lower-left and -right corners.
2	Install cabinets above the next row of cabinets. Use self-tapping dovetail screws and fix the cabinets to the frame.
3	Install cabinets from the middle to either side and use M8 screws to tighten cabinets and connector components.

1.3.3 Wall-mounted Installation with Hooks and Bottom Beams

- Step 1 Drill holes on the wall according to dimension of each item. Use bottom beam connectors to connect needed bottom beams. Use expansion bolts to fix the bottom beams horizontally onto the wall.

Figure 1-8 Fix the bottom beam

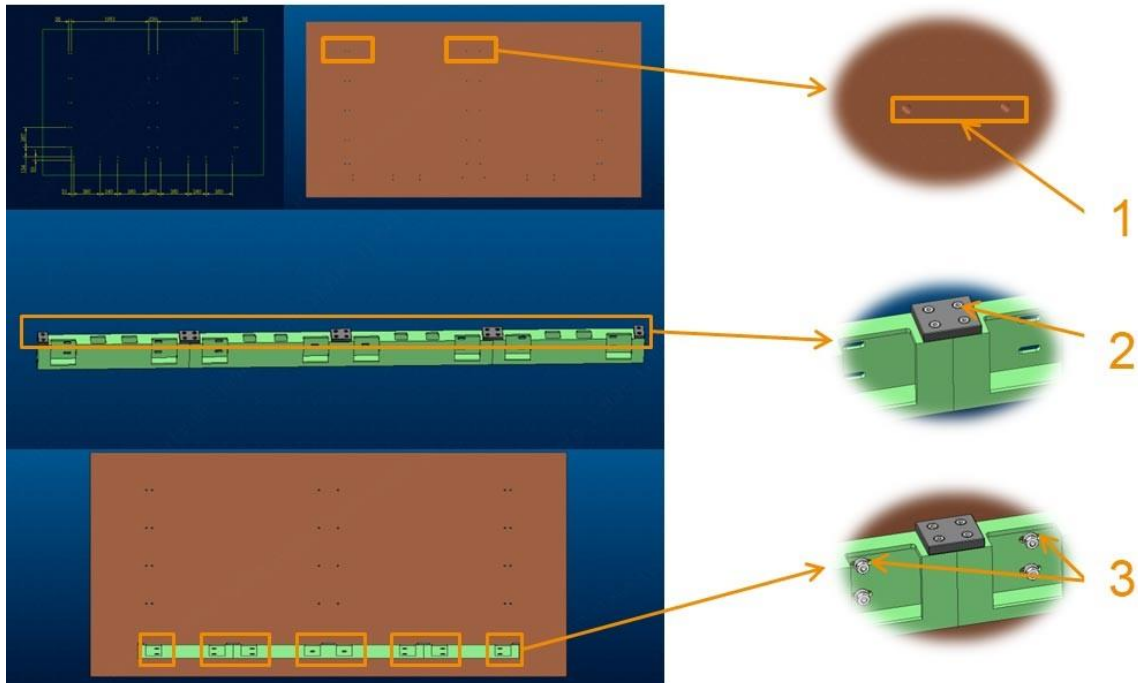


Table 1-7 Fix the bottom beam

No.	Item Name
1	Holes.
2	Fix it with M8 screws.
3	Use M10 × 80 expansion bolts to fix the bottom beams.

Step 2 Use M10 × 80 expansion bolts to fix hook 1 and hook 2 onto the wall. Use hook 1 for the left and right columns and hook 2 for columns in the middle. Do not tighten the hooks for later adjustment of the cabinets. Hang connector component 2 onto the hooks on the left and right columns and connector component 1 onto the hooks on the middle columns.

Figure 1-9 Install the hooks

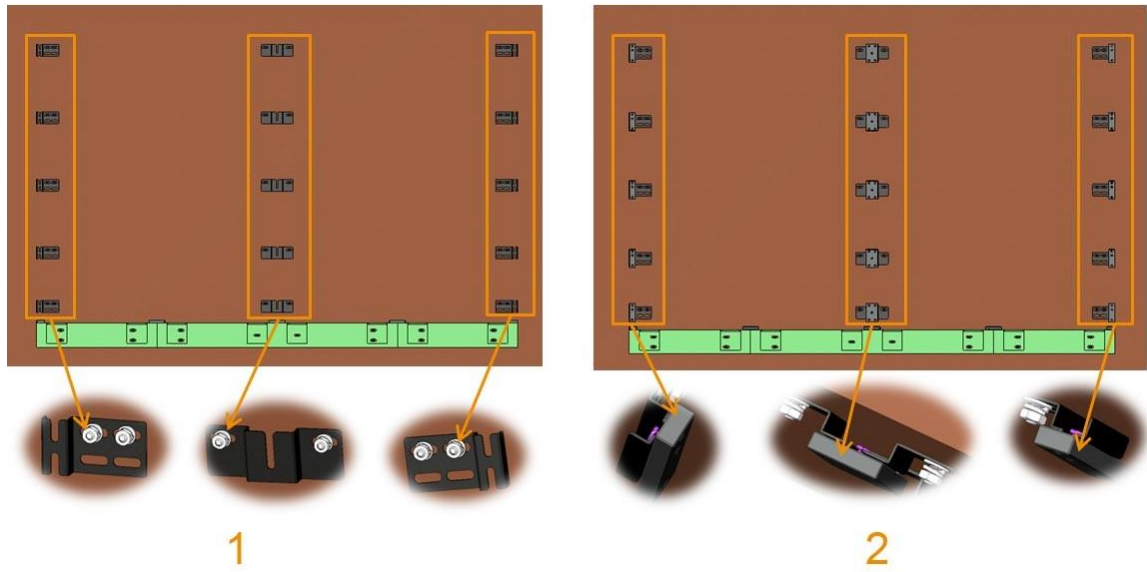


Table 1-8 Install the hooks

No.	Item Name
1	Use M10 × 80 expansion bolts to fix hook 1 and 2 onto the wall.
2	Install connector component 1 and onto the hooks.

Step 3 Install the first row of cabinets: Use profile whole connectors, profile half connectors and M8 inner hexagon screws to connect two cabinets. From the middle to either side, use M8 screws to fix every two cabinets to the connector components on the wall (Refer to "1.3.1 Installing the Frame" to tighten two cabinets).

Figure 1-10 Install the first row of cabinets

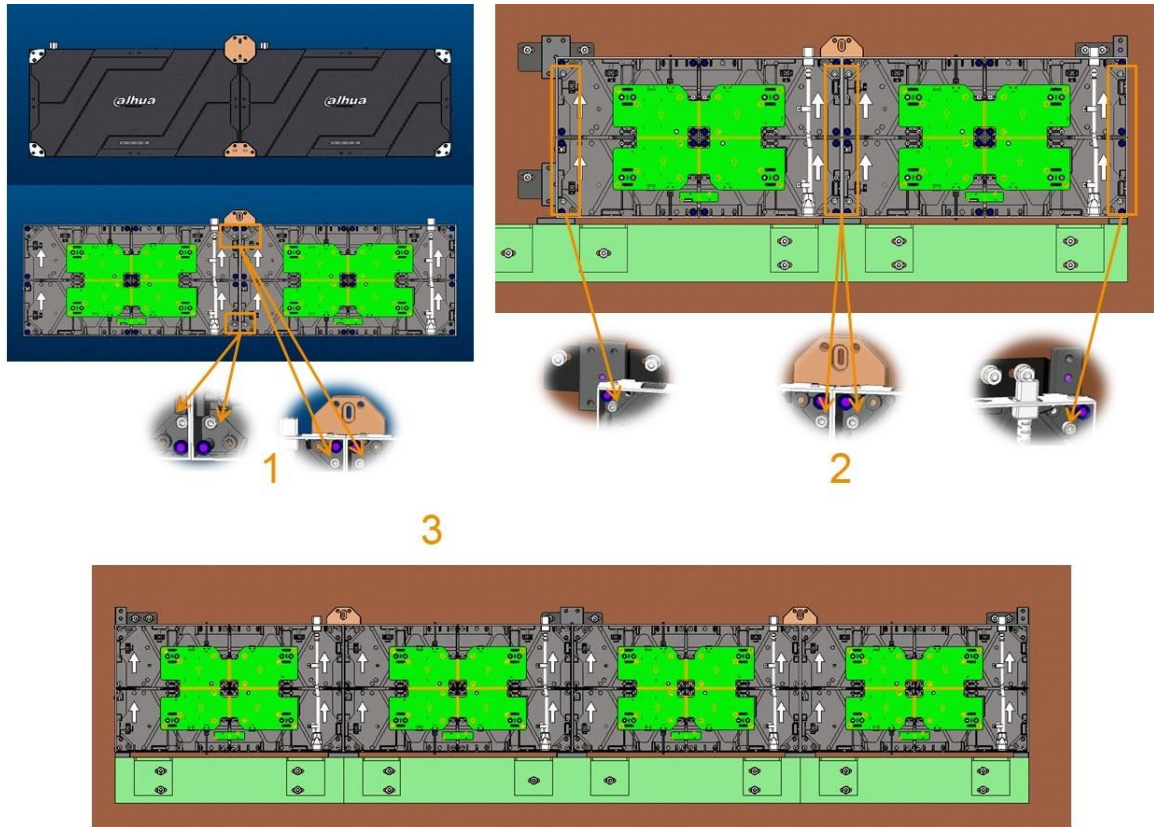


Table 1-9 Install the first row of cabinets

No.	Item Name
1	Use profile connectors and M8 screws to connect two cabinets.
2	Use M8 screws to fix cabinets onto the connector components.
3	Install the cabinets from the middle to either side. Use M8 screws to tighten cabinets and connector components.

Step 4 Installing cabinets in the second to last and to top rows of cabinets: From the middle to either side, use M8 inner hexagon screws to fix cabinets to profile whole connectors and connector components (Refer to "1.3.1 Installing the Frame" to tighten two cabinets).

Figure 1-11 Install the second to last and to top rows of cabinets

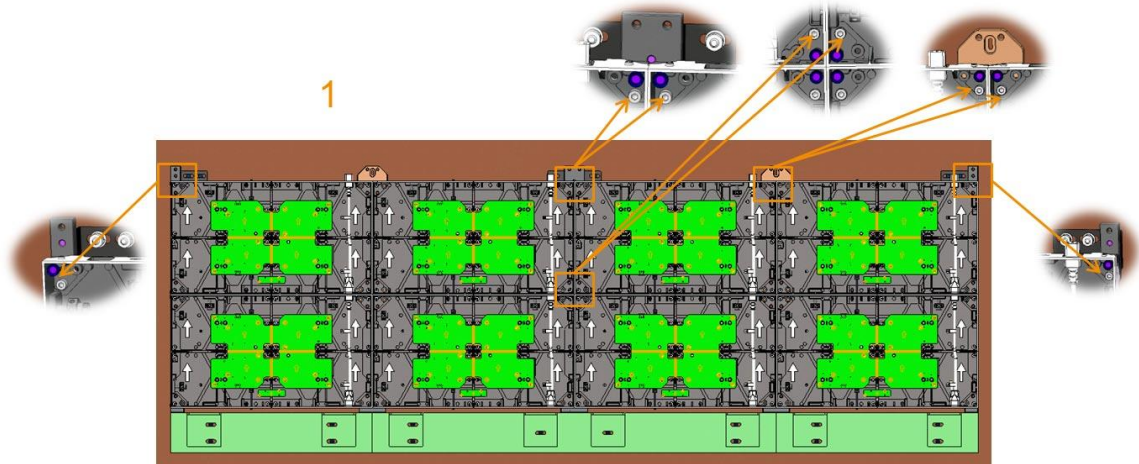


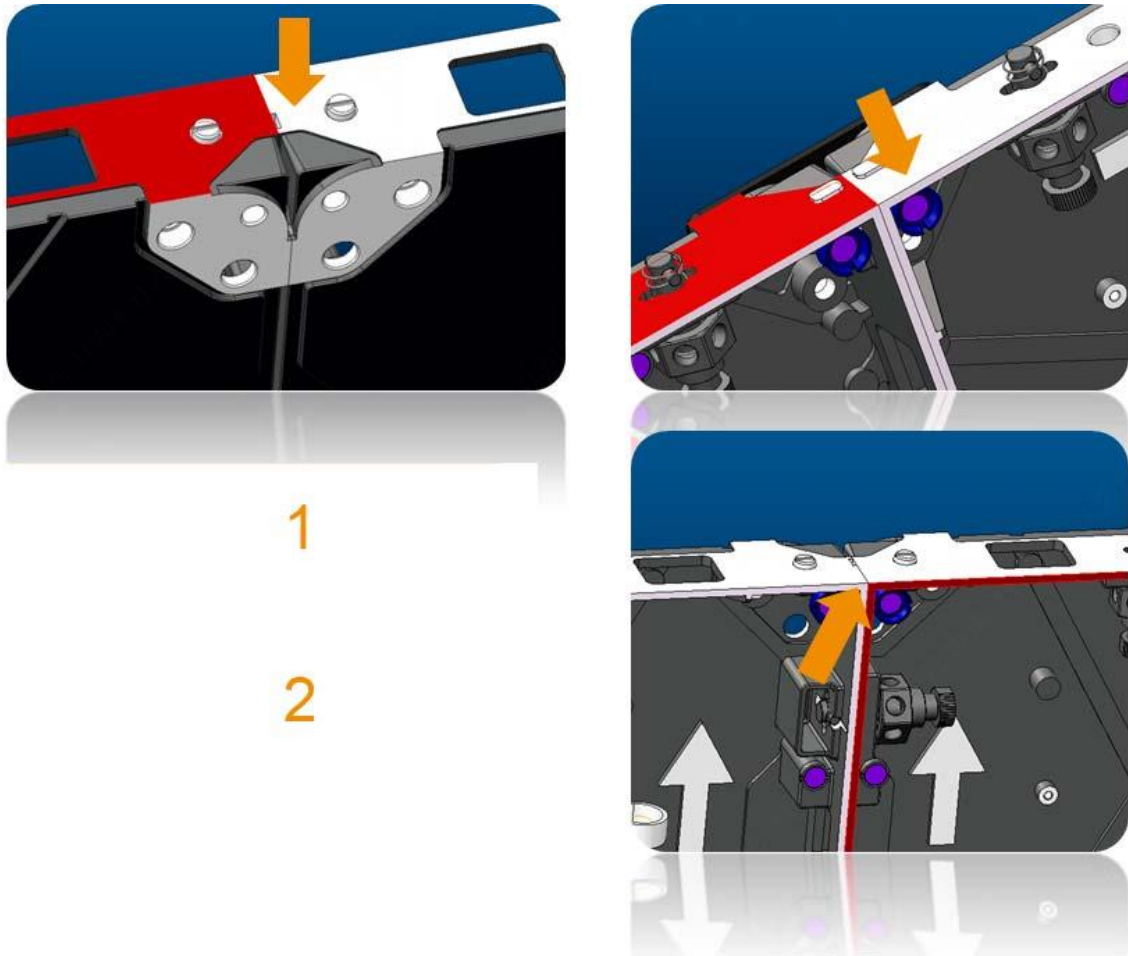
Table 1-10 Install the second to last and to top rows of cabinets

No.	Item Name
1	Install the cabinets from the middle to either side. Use M8 screws to fix cabinets to the profile connectors and connector components.

Step 5 When installing the top row of cabinet: From the middle to either side, use M8 inner hexagon screws to fix cabinets to profile half connectors and connector components (Refer to "1.3.1 Installing the Frame" to tighten two cabinets).

1.3.4 Adjusting the Flatness between Two Cabinets

Figure 1-12 Adjust the flatness between two cabinets



Step 1 Use rubber hammer to knock at the protruded cabinet to even up the gap.

Step 2 Loosen the speed lock, apply pressure with both hands to even up the gap and lock the speed lock.

1.4 Installing Light Modules

Step 1 Install light modules on the cabinet through the magnets.



Pay attention that the arrow on the light module should face the same direction as the arrow on the side of the cabinet. After installation, make sure that it is completely flat around the light module. The entire surface should be flat and the gap between two light modules less than 0.1mm.

Figure 1-13 Install the light modules

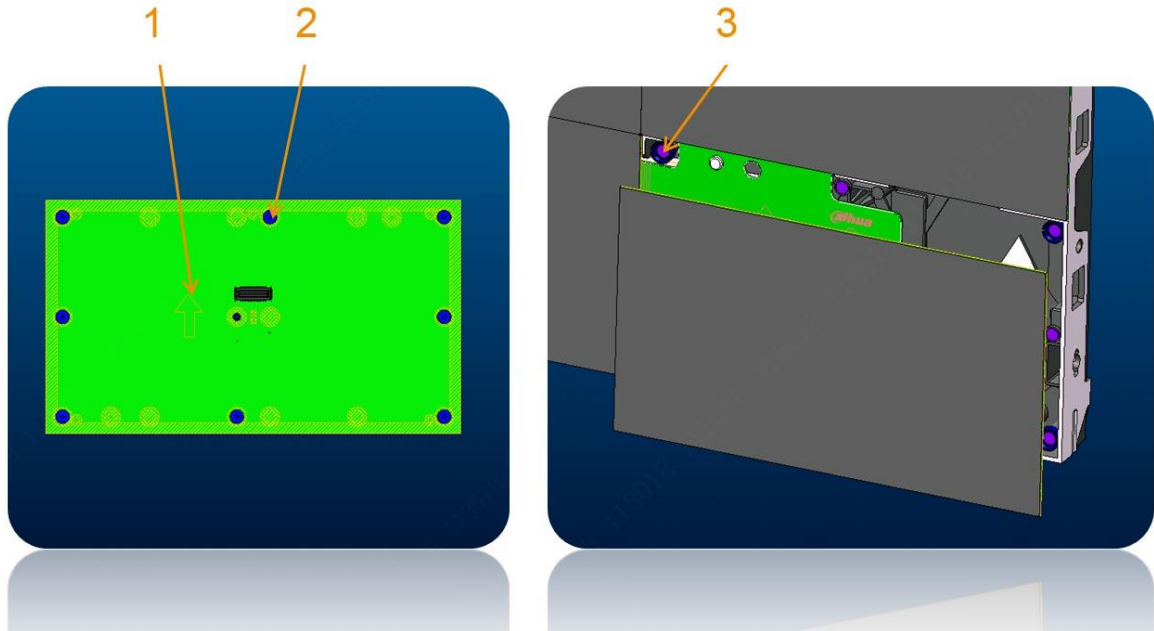


Table 1-11 Install the light modules

No.	Item Name	No.	Item Name
1	Arrow direction	3	Magnet
2	Magnetic screw	—	—

Step 2 Adjust the flatness around the light.

Figure 1-14 Adjust the flatness around the light module

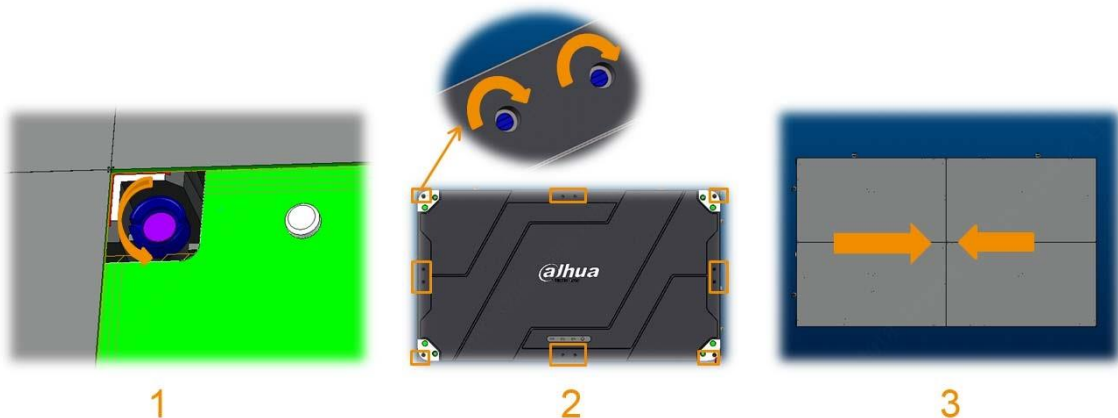


Table 1-12 Adjust the flatness around the light module

No.	Item Name
1	Use the tool for magnet removing and installation to turn the magnet counter-clockwise to adjust the flatness of the light.
2	Insert a straight screwdriver in the back of the magnet and turn clockwise to adjust the flatness of the light.

No.	Item Name
3	Use both hands and apply pressure in this direction to check whether the gap is too big.

1.5 Use of Front Maintenance Unit Removal Tool

1.5.1 Front Maintenance Unit Removal Tool

Front Maintenance Unit Removal Tool consists of a handle, switch, indicator light and sucker.

- Handle: Where your hand should hold
- Switch: Turns on the motor to remove air.
- Indicator light: Indicates the running status of the tool.
- Sucker: Attaches to the unit.

Figure 1-15 Front Maintenance Unit Removal Tool



Table 1-13 Front Maintenance Unit Removal Tool

No.	Item Name	No.	Item Name
1	Switch.	3	Indicator light.
2	Handle.	4	Pull it out horizontally.

1.5.2 Operation Procedures

Step 1 Place the sucker in the center of the light module. Turn on the switch and the indicator light is on. The motor starts working and removes the air inside the sucker. The sucker

firmly attaches to the module due to air pressure difference.

Step 2 Hold the handle with your right hand. Use your left hand to horizontally pull out the tool. The module will detach with the tool from the display.



- If any part of the module does not detach completely, put the module back and try again horizontally.
- If the module does not budge when pulling out, you can try remove the lights around the module.
- If there is no other module on the left, right, up or down, you can grab the module with your fingers to make it easier to pull it out.

Step 3 When pulled out, hold the module and then turn off the switch. Remove the module when the indicator light is off.

1.5.3 Notes to Operation

- Pay attention that the Front Maintenance Unit Removal Tool is heavy before use.
- Before use, check if the battery is enough to avoid halfway detachment of the module.
- During use, be careful and avoid LED falling off of the module.
- After use, protect the sucker for later use.

2 Software Debugging

2.1 Equipment for Turning on the Display

A LED display, signal cable (DVI or HDMI), power cable, sending card, USB cable and computer with a DVI or HDMI port.

2.2 Installing the Software

Install NovaLCT-Mars on your computer according to the install wizard.



NovaLCT-Mars imports files in .rcfgx (configuration) and .scr (screen connection relationship) format for turn-on test.

2.3 Installing the Device

Step 1 Power on the computer and sending card.

Step 2 Connect the USB cable to the sending card USB_IN port and computer USB port.



USB cable transmits signals between the computer and sending card when configuring parameters.

Step 3 Connect the LED display network cable to the sending card network port OUT1–OUT4.

Step 4 Use a DVI or HDMIA signal cable to connect the computer and sending card.



Connect HDMI cable to the sending card HDMI_IN port, or connect the DVI cable to the sending card DVI_IN port.

Figure 2-1 Ports on the sending card



Depending on the display size, the number of sending cards for cascade will vary. After installation, the manufacturer will provide a document on cascade wiring mode for maintenance purposes.

2.4 Setting the Computer to Duplicate or Extend

After installation of the device, power on the LED display. Press the Windows logo key + P on your keyboard to check whether it is set to Duplicate or Extend.

- Duplicate: the LED display shows the content on the upper-left of the computer.
- Extend: the LED display shows an extension of the computer desktop. The content on the computer desktop will not displayed on the LED display.

Figure 2-2 Multiple displays

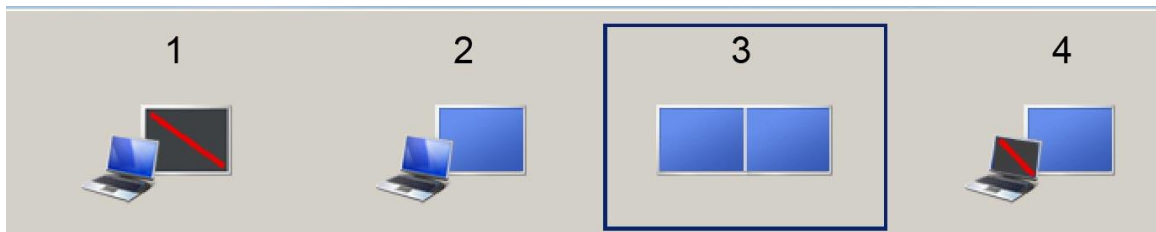


Table 2-1 Multiple displays

No.	Item Name	No.	Item Name
1	PC screen only	3	Extend
2	Duplicate	4	Second screen only



If set to **PC screen only**, the LED display will be black.

2.5 Detecting the Correct Number of Sending Cards

Step 1 In the menu, select **Settings > Hardware information**.

Step 2 Click the "+" in front of **Sending Card MCU**, **Sending Card FPGA**, **Receiving Card MCU** and **Receiving Card FPGA**.

You can learn about the number and software version of the sending card or receiving card. Make sure that the number of sending cards detected matches the number defined by the network ports of the actual LED display.

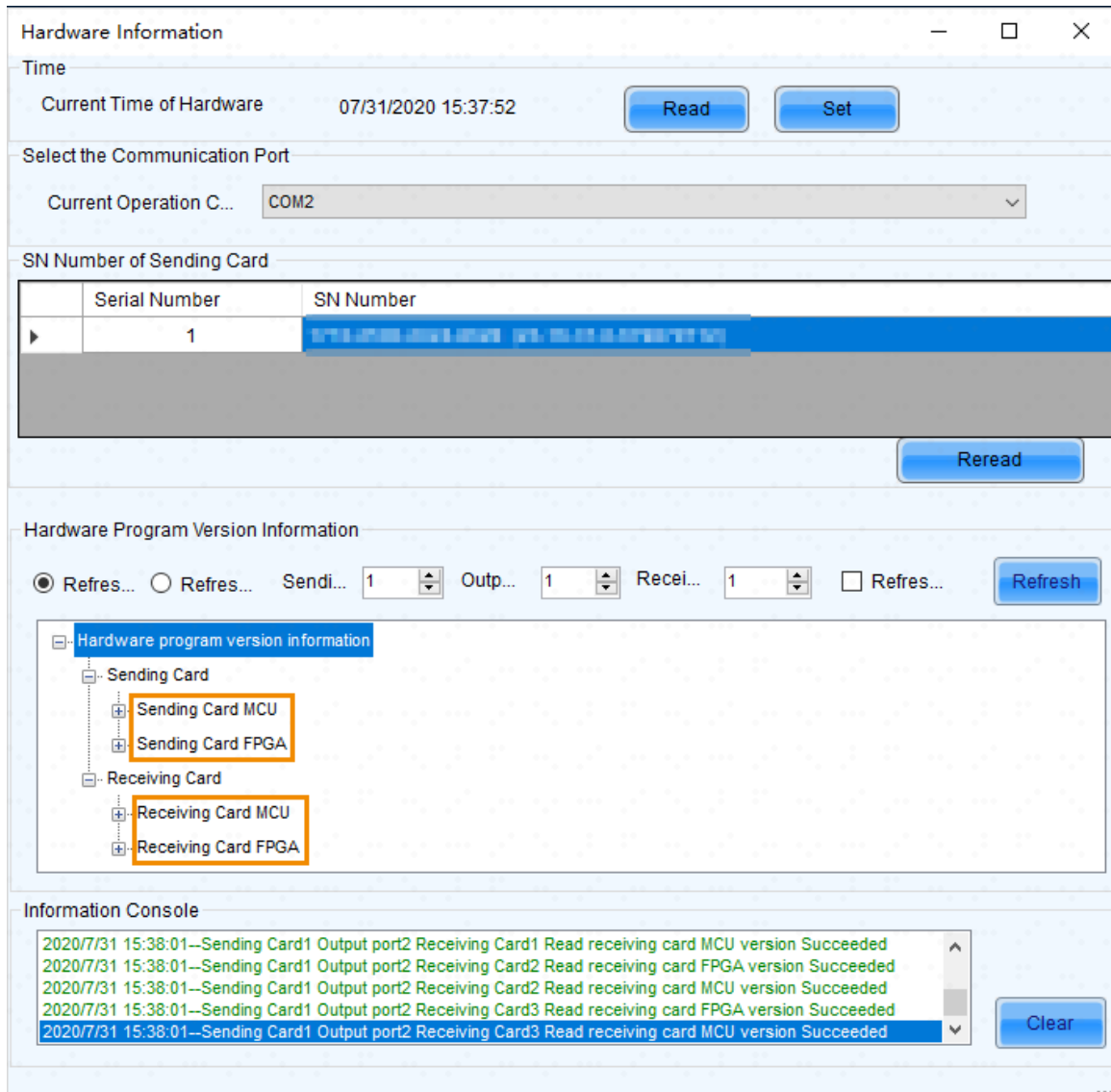
This section takes a display of 1080P (1920 × 1080) resolution for example.

- Full Front Maintenance P1.2 cabinet with resolution of 480 × 270 and one receiving card inside that can carry 480 × 270. A 1080P display needs 16 cabinets. As a result, there are 16 receiving cards. Each network port can carry four cabinets, which equal to four receiving cards.
- Full Front Maintenance P1.2 cabinet with resolution of 384 × 216 and also one receiving card inside that can carry 384 × 216. A 1080P display needs 25 cabinets. As a result, there are 25 receiving cards. Each network port can carry five cabinets, which equal to five receiving cards. Because there are only four network ports in one sending box, two sending boxes are needed to carry a 1080P display.

Click "+" and learn more details to locate problems.

- If the number of receiving cards detected is incorrect, it is necessary to check the wiring of where the number is incorrectly detected, and whether the corresponding display or receiving card is working properly.
- If the first network port incorrectly detects 3 receiving cards when it should be 4, it should be the third or fourth cabinet that is not working properly, and then troubleshoot the problem.
- If no receiving card is detected, see "4.8 No Receiving Card Detected or Incorrect Number of Receiving Cards Detected".

Figure 2-3 Hardware Information interface



2.6 Screen Configuration

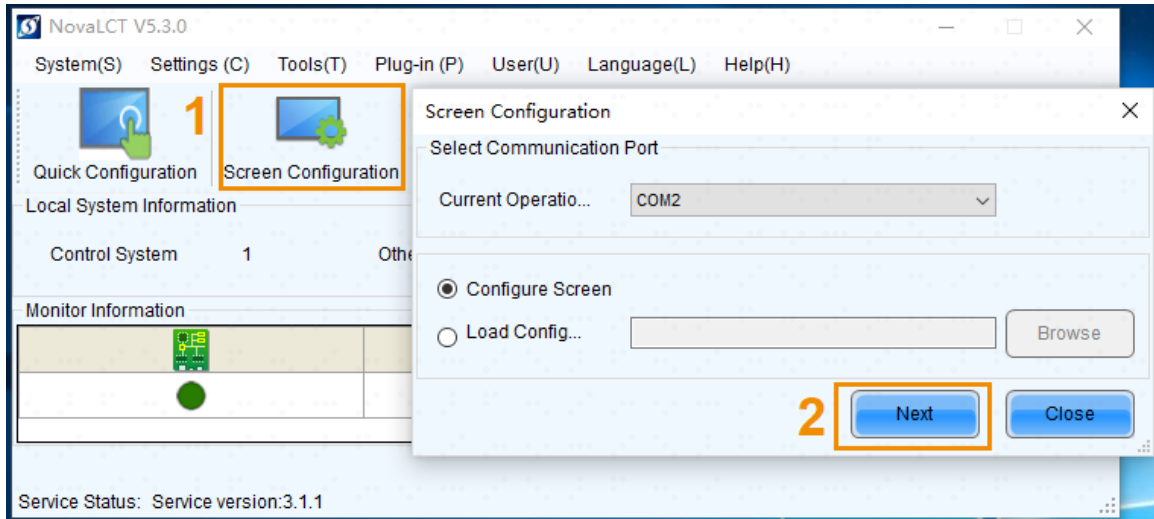


- If LED display shows complete content after power-on, the following procedures are not needed.
- This section applies to configuring receiving card when parameters are abnormal. Generally, the display will go through aging test with parameters configured before delivered out of factory. There is no need to go through this section. If during debugging the display cannot show content due to wrong parameters, follow this section to restore to factory settings.

2.6.1 Configuring the Sending Card

- Step 1 Select **User > Advanced Synchronous System UserLogin**, enter the password **admin** and click **Login**.
- Step 2 Select **Screen Configuration > Next** to go to the screen configuration interface.

Figure 2-4 Go to the screen configuration interface

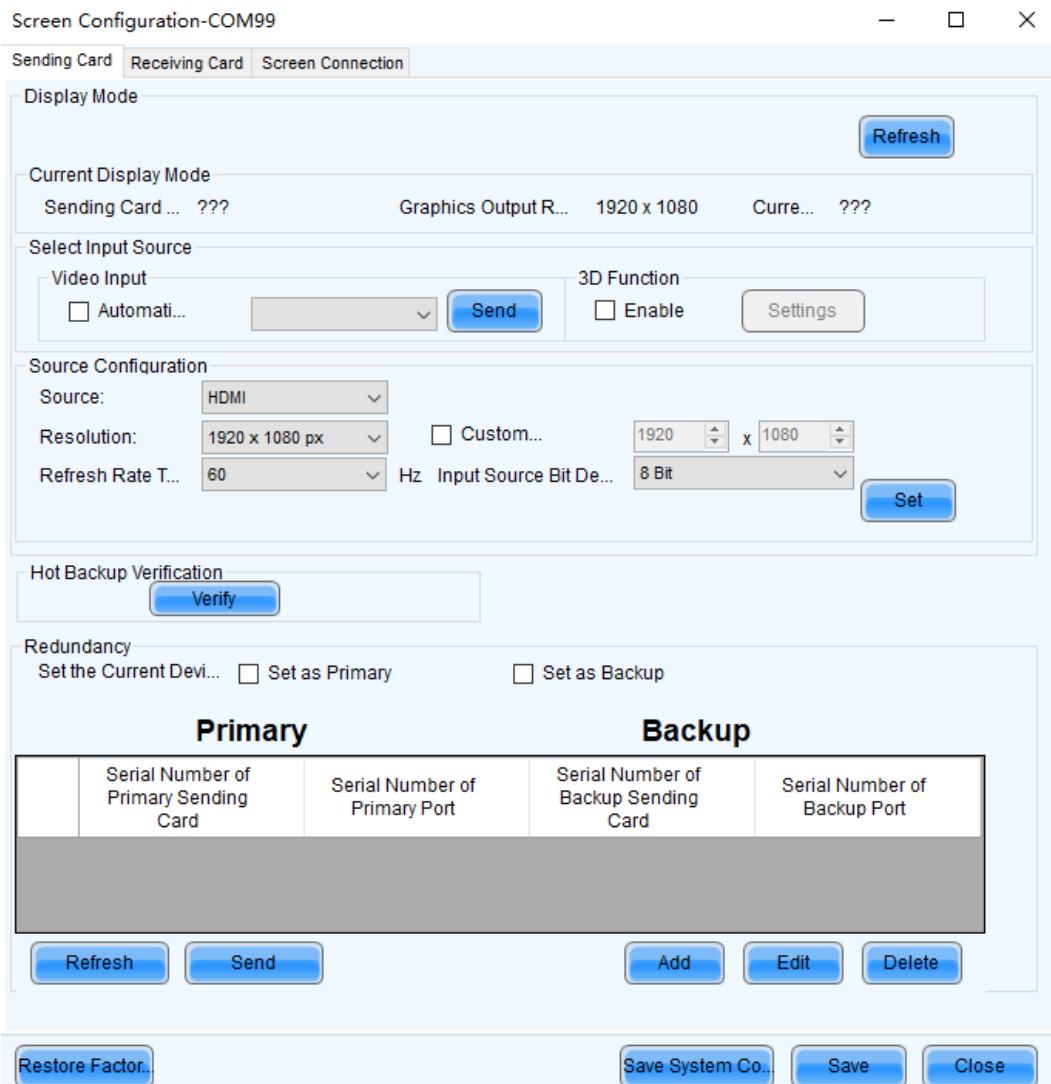


Step 3 On the **Sending Card** interface, you can select the actual video input source.



Select **Automatic Selection** to automatically recognize the input source.

Figure 2-5 Set the resolution of the sending card



Step 4 Set resolution.

- In Duplicate: set the resolution of the sending card as the computer.
- In Extend: the resolution of the sending card can be the same as the computer or other resolutions. Generally, set the resolution according to the actual display. Otherwise, problems such as incomplete content will occur.

Step 5 Click **Save** to save all settings to the sending card.

The following figure shows what happens when the resolution of the sending card is incorrect: This 2 × 2 cabinet is configured according to the 1366 × 768 resolution of the manufacturer computer. If the resolution is changed will cause screen content to be in complete.

Figure 2-6 Incomplete content



2.6.2 Configuring the Receiving Card

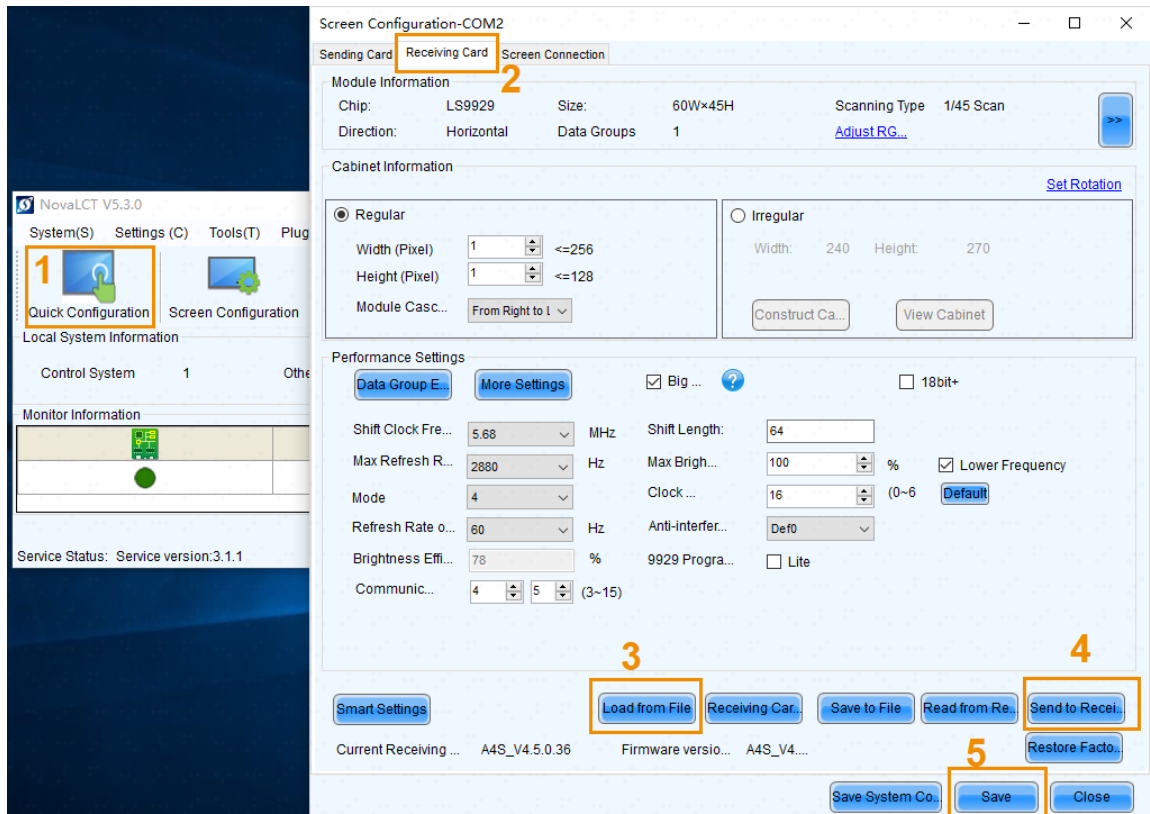
Generally, you do not need to configure the receiving card parameters and only need to load the configured file.

Step 1 Click **Load from File** and select the correct *.rcfgx file.

Step 2 Click **Send to Receiving Card**.

Step 3 Click **Save**.

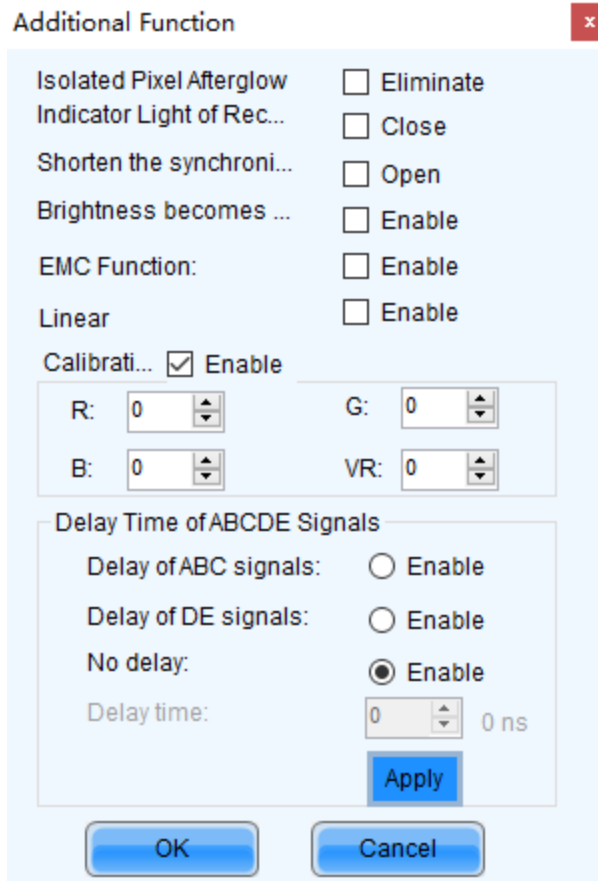
Figure 2-7 Screen parameters smart settings



If there is no *.rcfgx file available, use a cabinet that can work properly (usually a backup cabinet). Connect the backup cabinet to the sending box 1 as the first cabinet, click **Read from Receiving Card** and click **Save System Configuration File** to get a working configuration file. The display delivered to customers has gone through aging and other tests. If there is no other special requirement, customers must not reload the configuration file.

Click **More Settings > Additional Function**. In this interface, you can enable additional functions, such as eliminating Isolated Pixel Afterglow, opening or closing Indicator Light of Receiving Card, enabling Brightness becomes strong slowly.

Figure 2-8 Additional function



2.7 Connecting the Display

Connect the display according to the wiring order and pixel-carrying capacity of each network port.

Figure 2-9 Wire P1.2 cabinets from the bottom

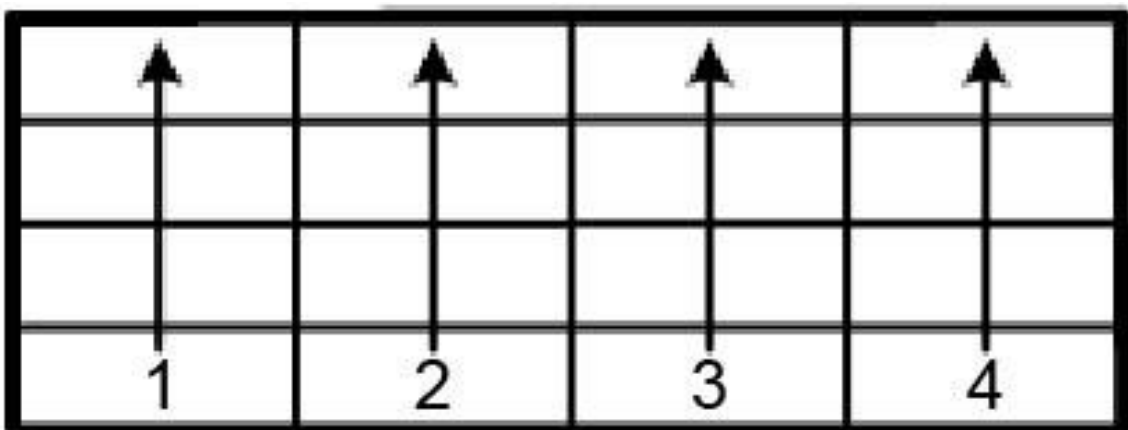


Table 2-2 Wire P1.2 cabinets from the bottom

No.	Item Name
1	Sending box 1 network port 1.
2	Sending box 1 network port 2.

No.	Item Name
3	Sending box 1 network port 3.
4	Sending box 1 network port 4.

Figure 2-10 Wire P1.5 cabinets from the bottom

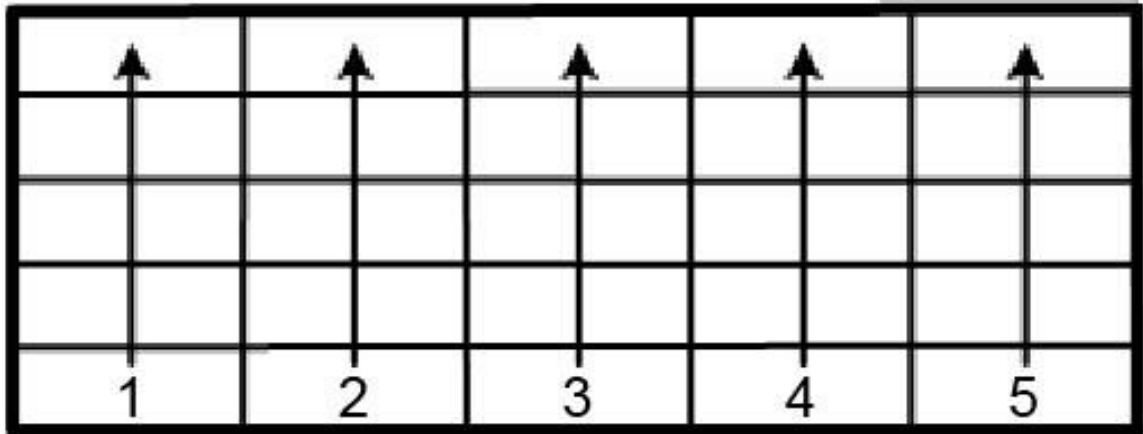


Table 2-3 Wire P1.5 cabinets from the bottom

No.	Item Name
1	Sending box 1 network port 1.
2	Sending box 1 network port 2.
3	Sending box 1 network port 3.
4	Sending box 1 network port 4.
5	Sending box 2 network port 1.
6	Wiring P1.5 cabinets from the bottom.



Make sure that you are facing the front of the display when following the wiring and configuration procedure.

Set the size of the receiving card.

- For P1.2 cabinets, each cabinet has one receiving card that can carry resolution of 480 × 270.
- For P1.5 cabinets, each cabinet has one receiving card that can carry resolution of 384 × 216.

Facing the front of the display, cables run upward from the bottom. The network port on the cabinet bottom is IN and the one on the top is OUT.

Figure 2-11 Connect and configure cabinets wired from the bottom

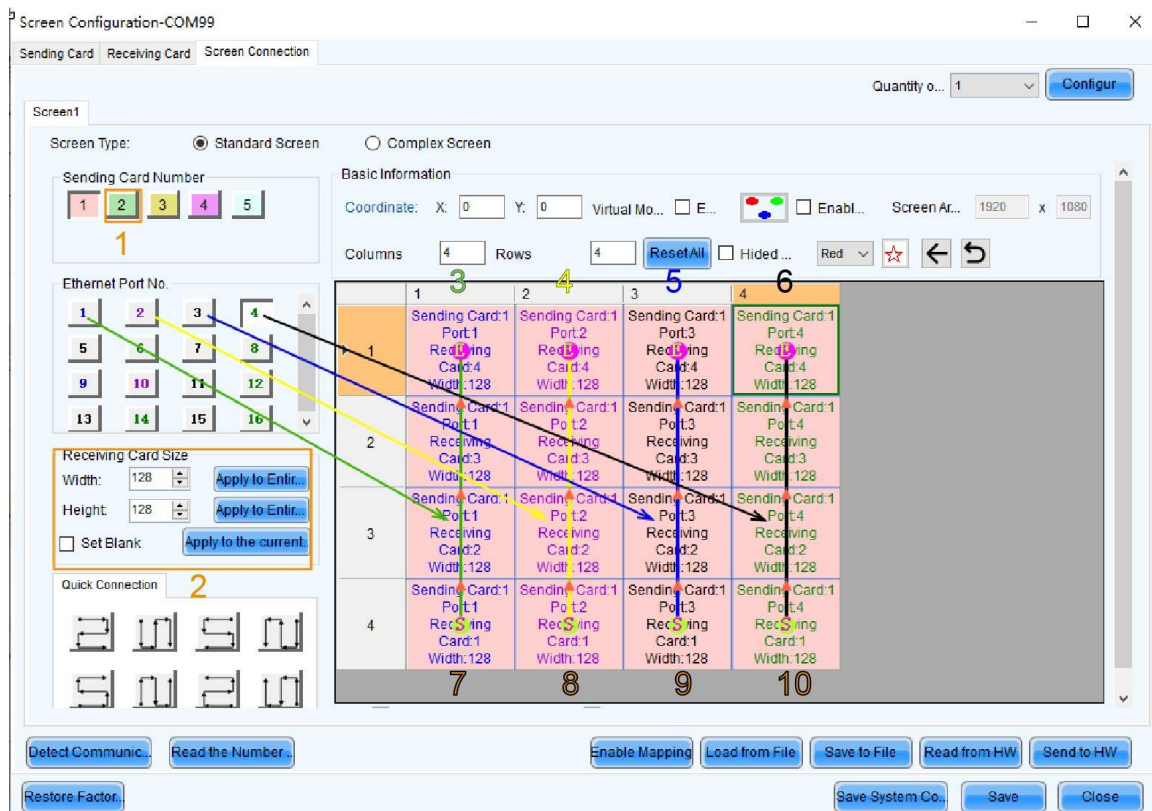


Table 2-4 Connect and configure cabinets wired from the bottom

No.	Item Name
1	For P1.5 cabinets, a second sending box should be configured.
2	For P1.5 cabinets, change the size to 192 x 216.
3	First row of cabinets.
4	Second row of cabinets.
5	Third row of cabinets.
6	Fourth row of cabinets.
7	Network port 1.
8	Network port 2.
9	Network port 3.
10	Network port 4.

According to the connection of the display on-site, installation staff will provide a file in .scr format for maintenance purposes. When performing maintenance, click **Load from File** and select the file in .scr format, and then click **Send to HW > Save** to finish the connecting process.

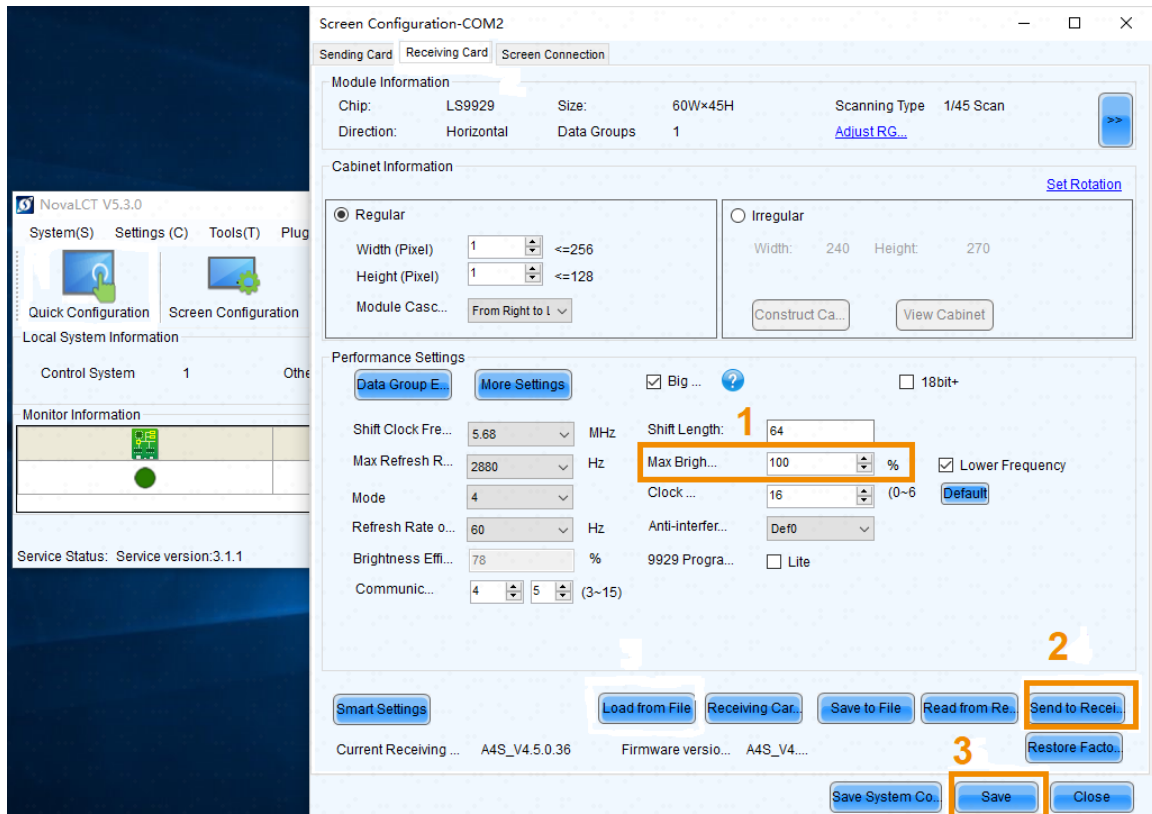
2.8 Adjusting Brightness



Adjust brightness for each sending card.

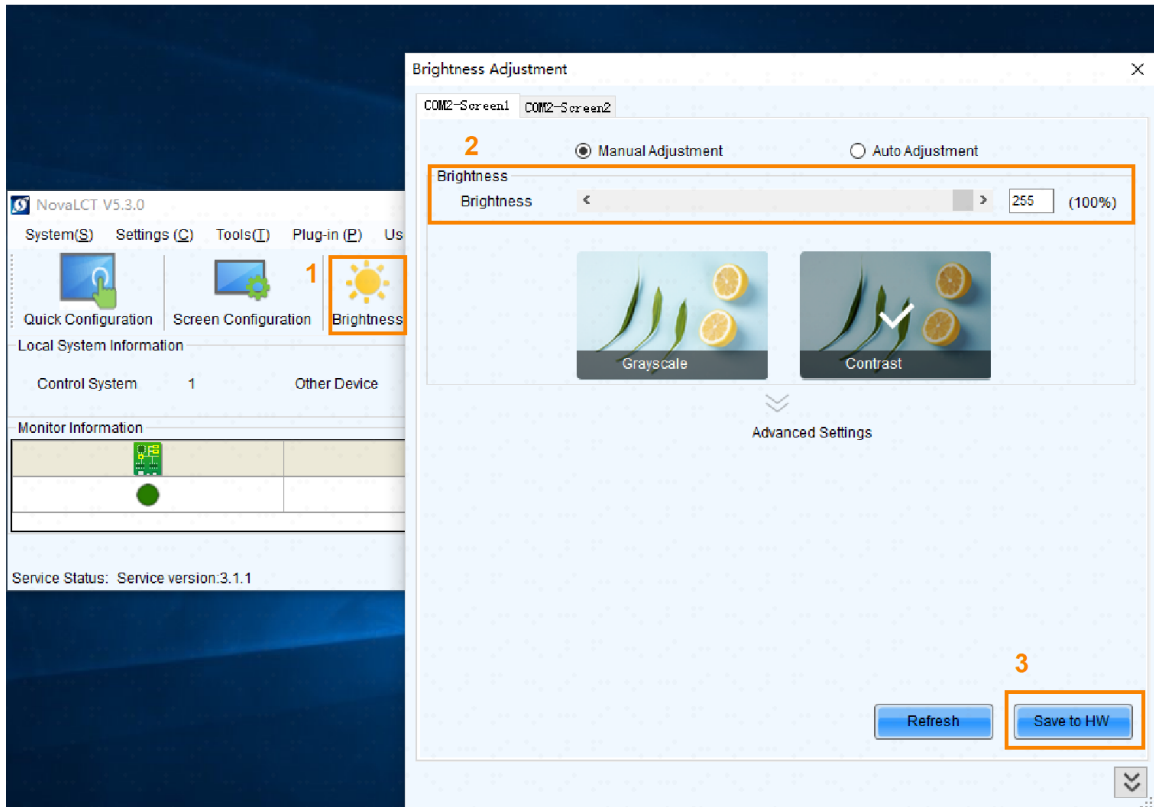
Because small-pitch LED is usually for indoor use, brightness can be set to about 50%. On **Receiving Card** configuration interface, enter the appropriate percentage in the **Maximum Brightness** field, click Send to Receiving Card and click Save to finish the process.

Figure 2-12 Adjusting brightness (1)



If you cannot adjust brightness on the **Receiving Card** interface, you can go to the main interface, click **Brightness**, drag the slider to set appropriate brightness and click **Save to HW** to finish the process.

Figure 2-13 Adjusting brightness (2)

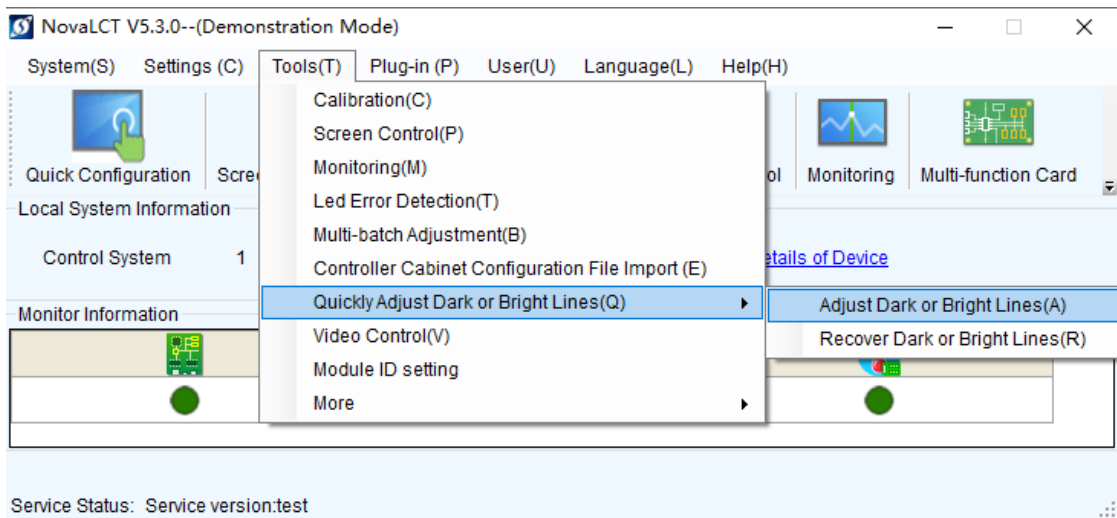


3 Quickly Adjusting Dark or Bright Lines

This function helps you adjust the seams of the display to get the best effect.

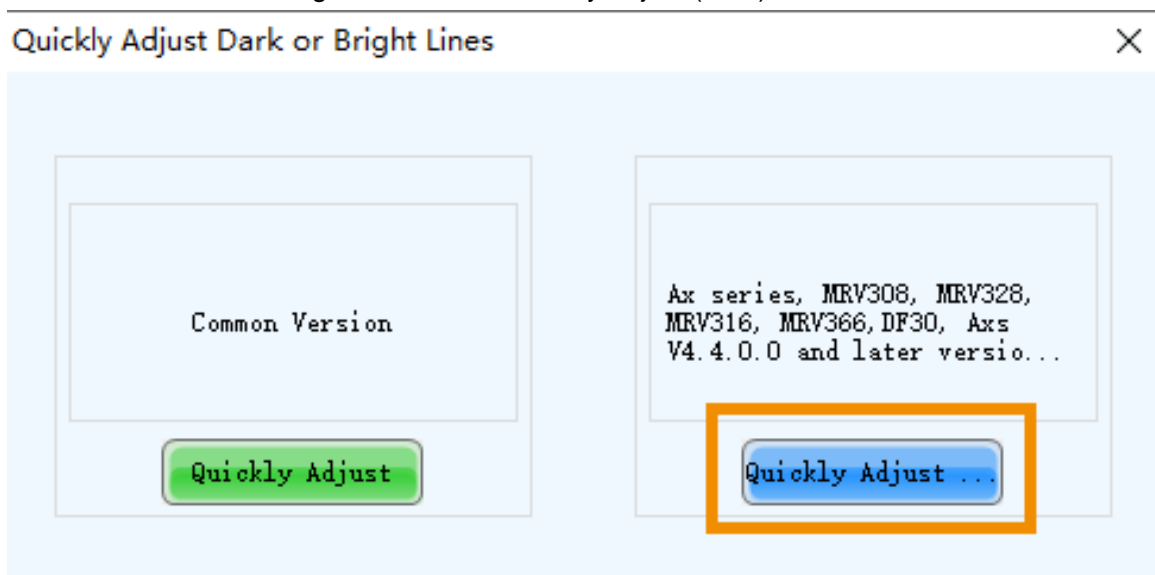
Step 1 Select **Tools** > **Quickly Adjust Dark or Bright Lines** > **Adjust Dark or Bright Lines**.

Figure 3-1 Select Adjust Dark or Bright Lines



Step 2 Select **Quickly Adjust (New)**.

Figure 3-2 Select Quickly Adjust (New)



Step 3 Select the mode as needed.

Figure 3-3 Select the mode as needed

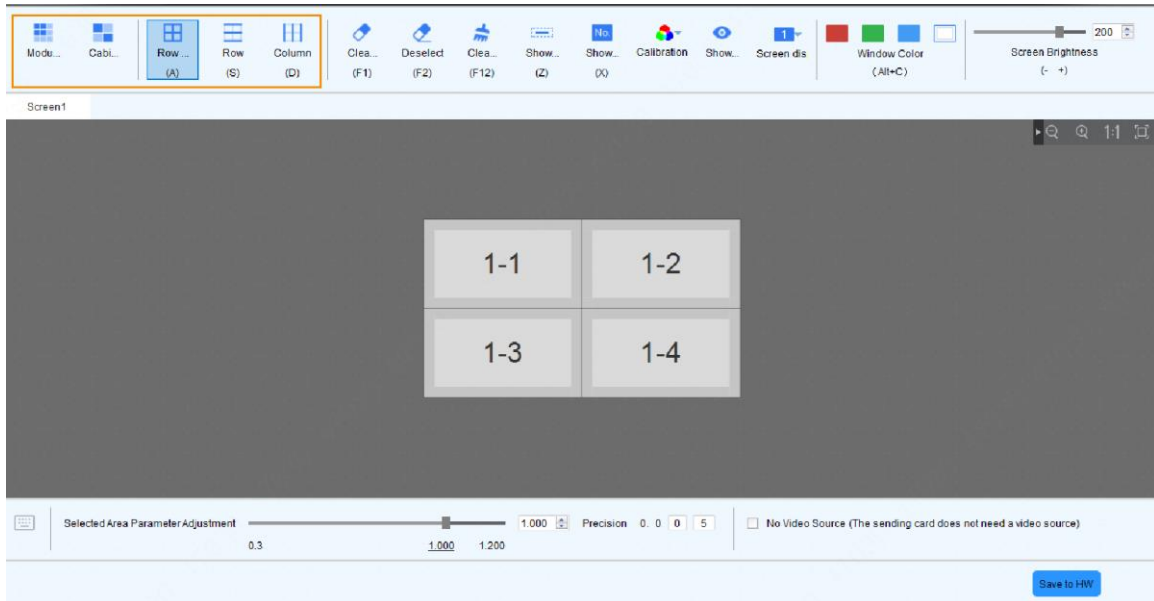


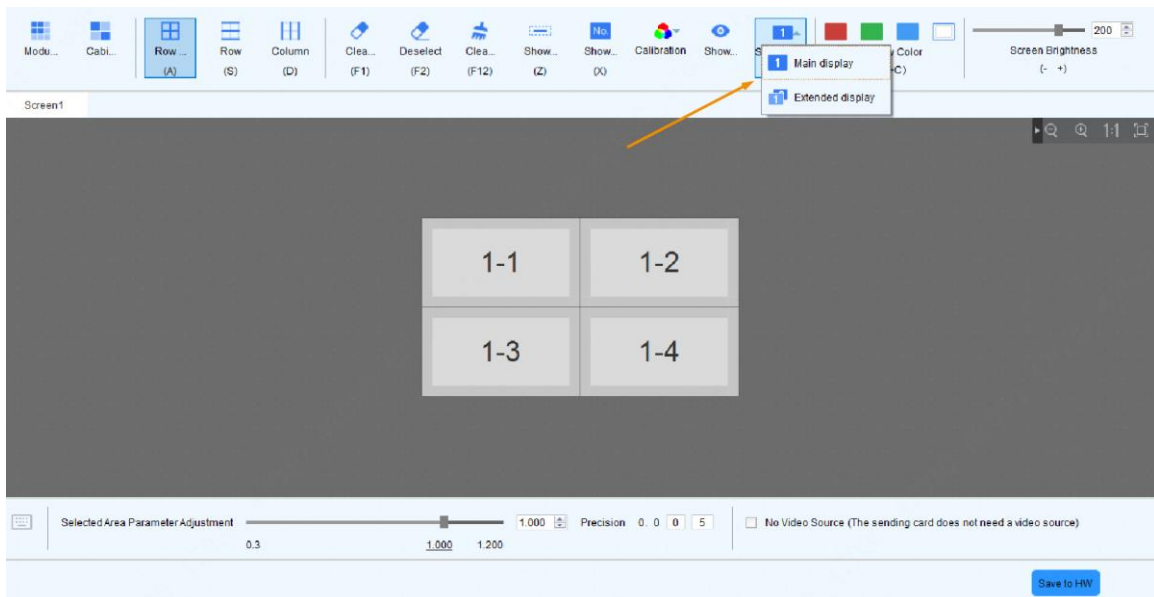
Table 3-1 Select the mode as needed

Mode Icon	Description	Mode Icon	Description
	Module Mode		Row
	Cabinet Mode		Column
	Row & Column	—	—

Step 4 Set a functional area.

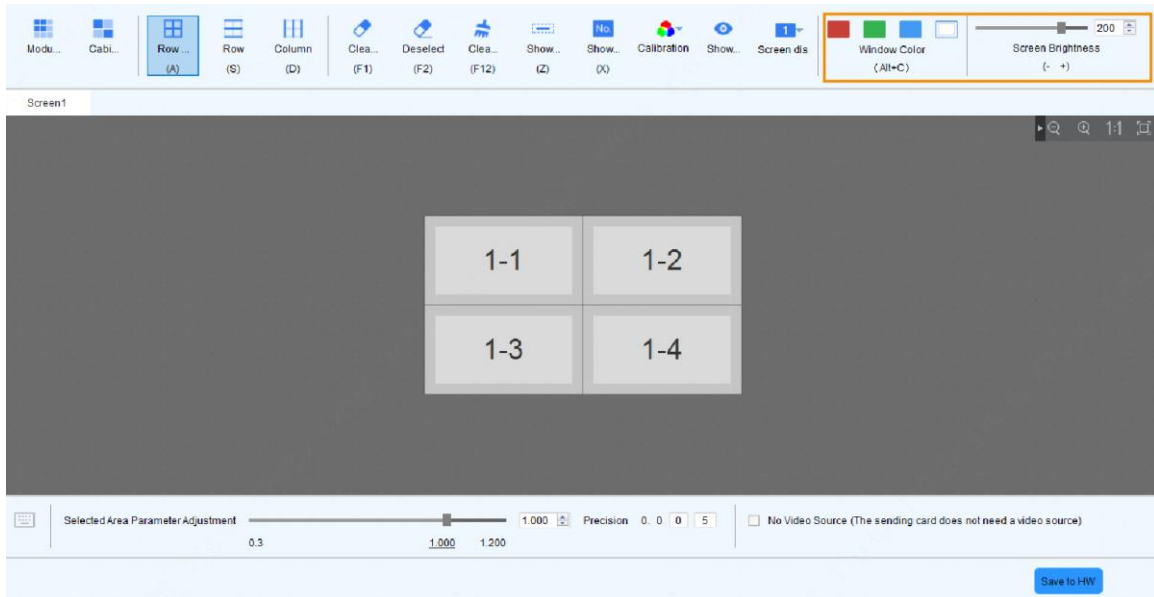
- 1) Click and choose the main display or extended display from the drop-down list.

Figure 3-4 Choose the main or extended display



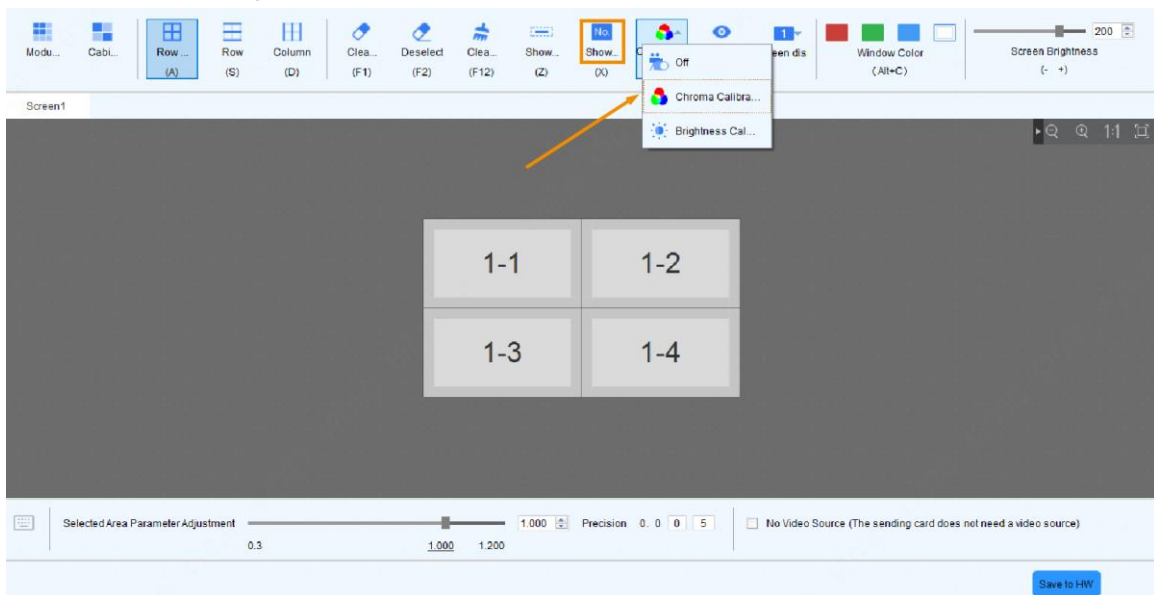
- 2) Select red, green, blue or white **Window Color** (screen color) and adjust corresponding **Screen Brightness**.

Figure 3-5 Select different screen color and adjust screen brightness



- 3) Click **No** first to locate the cabinet you want to adjust, and then click to select **Chroma Calibration**, **Brightness Calibration** or **Off** to disable calibration.

Figure 3-6 Select a calibration mode or disable it



Step 5 Adjust the seams.

- 1) Select the seam you want to adjust and it will appear as blue.
- 2) Enter an appropriate precision parameter according to the width and brightness of the seam.
- 3) Drag the slider or click to adjust the seam you selected.

Figure 3-7 Adjust the seams

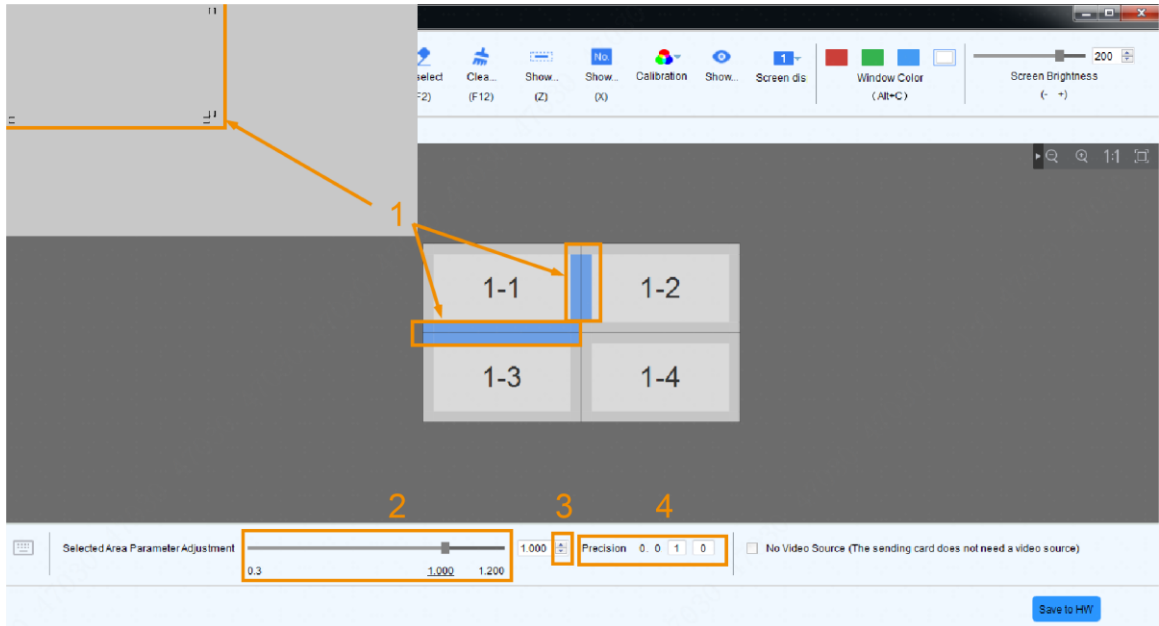


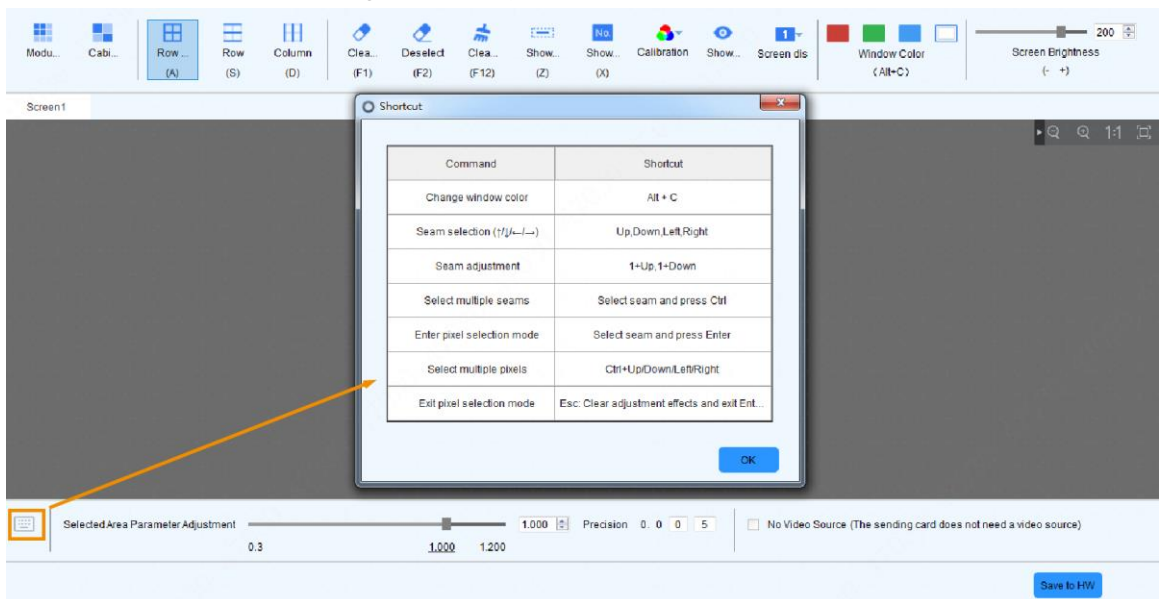
Table 3-2 Adjust the seams

No.	Item Name
1	The seams you selected.
2	Drag the slider to adjust the brightness of the selected seams.
3	Click the arrows to adjust the brightness of the selected seams.
4	Enter an appropriate precision parameter.



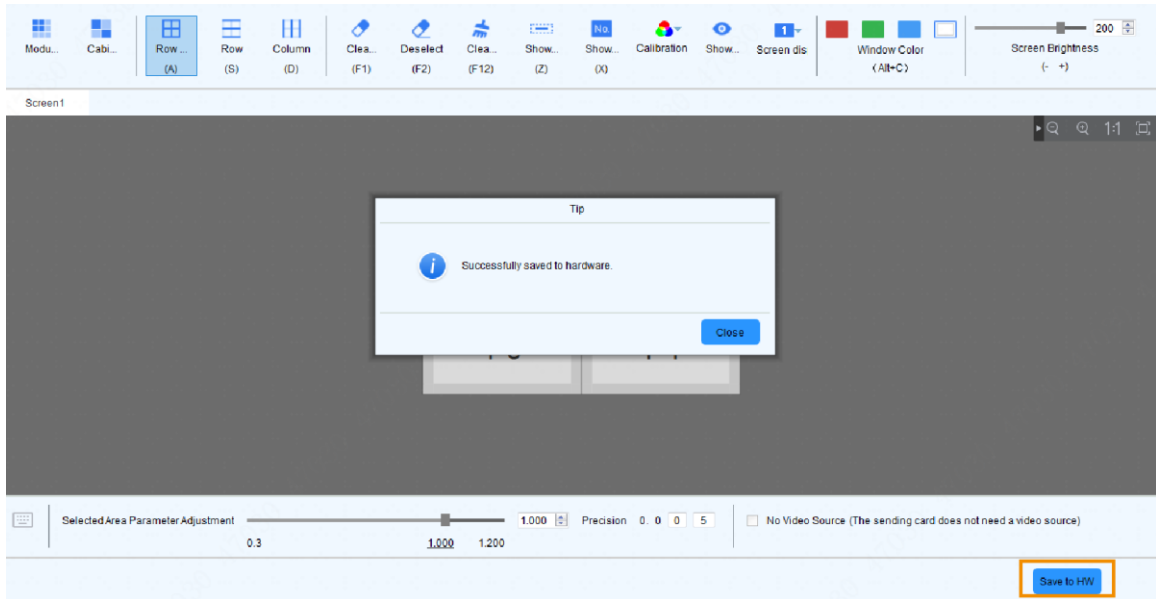
When adjusting seams, you can use keyboard shortcuts.

Figure 3-8 Keyboard shortcuts



Step 6 Click **Save to HW** to finish the process.

Figure 3-9 Save the effect



Step 7 When adjusting the seams, you can click:




-  to clear the effect of the selected seam.
-  to clear the effects of all seams.
-  to cancel the selection.

Figure 3-10 Clear the effect of the selected seam

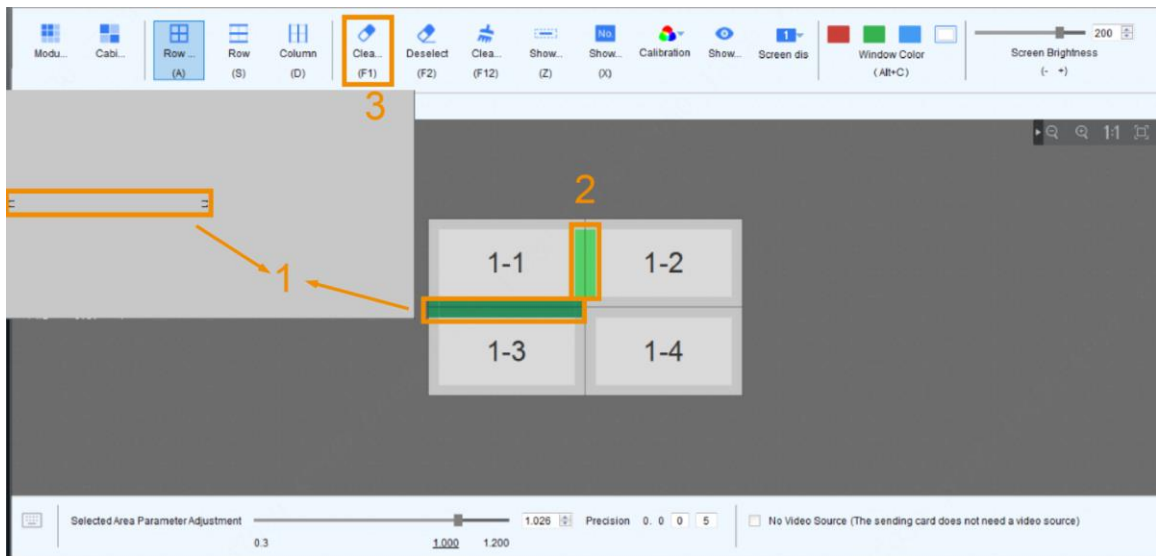
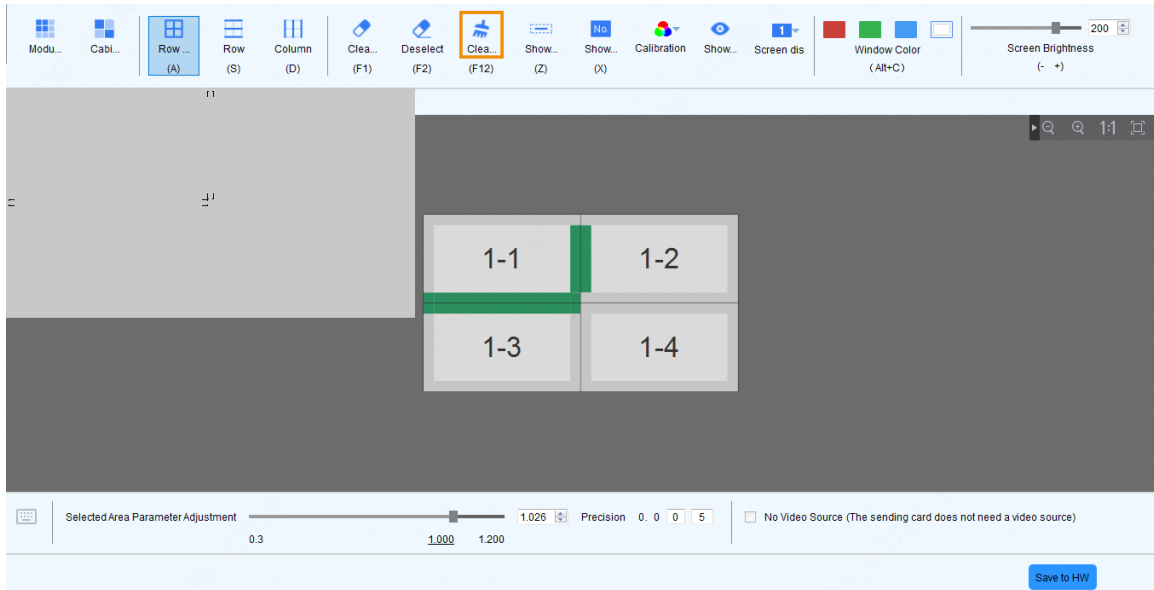


Table 3-3 Clear the effects of the selected seams

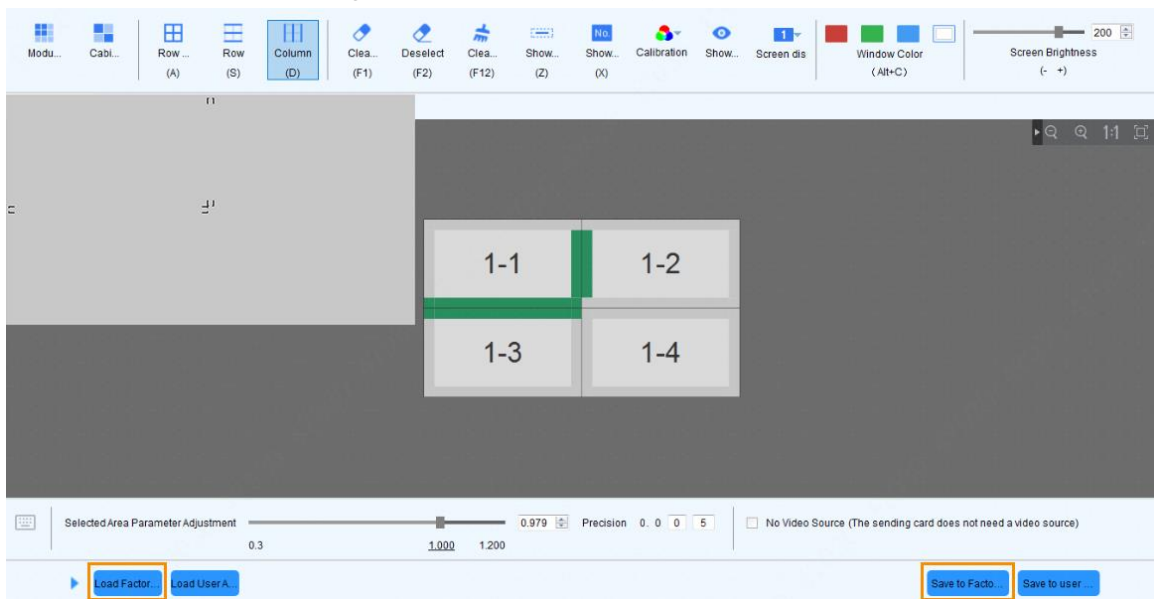
No.	Item Name
1	The seam selected.
2	The seam not selected will appear as light green.
3	Click it to clear the effect of the selected seam.

Figure 3-11 Clear the effects of all seams



- Step 8** Enter "admin" to enable Factory Area, which helps you reload the effects when you mistakenly clear them.
1. Click **Load Factory Area** to apply the effects to the cabinet.
 2. Click **Save to Factory Area** to save the effects.

Figure 3-12 Enable Factory Area



4 FAQ

4.1 Black Screen

Possible Reasons

1. There is no power to the display or control devices.
2. There is no signal input to the display.
3. The controlling computer is in Sleep mode or graphics card settings are incorrect.

Solutions

1. Check whether there is power to the display or control devices.
2. Check whether the computer is in Sleep or Screen Saver mode. If the computer is in Sleep mode, click **Control Panel > Power Options > Choose when to turn of the display** and set **Turn off the display** and **Put the computer to sleep** to **Never**. The computer will not go in Sleep mode and the display will work properly. If the computer is not in Sleep mode, check if the DVI or HDMI cable is broken or properly connected to the computer and the control card.
3. If all cables are correctly connected, press the Windows logo key + P on your keyboard to check whether it is set to Duplicate or Extend.
4. Check if the graphics card is working properly.

4.2 Content Incomplete or Position Incorrect

Possible Reason

The screen configuration file is incorrect.

Solutions

1. Check if the loaded file in .rcfgx format is correct.
2. If the content position is incorrect, check if the parameters in **Screen Connection** and **Receiving Card Size** match the actual screen size.

4.3 Content Incomplete with Black Screen on Edges

Possible Reason

The resolution of the sending card is incorrect.

Solution

Select **Screen Configuration > Sending Card** to set correct resolution.

4.4 Flickering or Shaking

Possible Reasons

1. The DVI/HDMI port of the graphics card or computer is not working properly.
2. DVI/HDMI cable is of poor quality or loose.
3. The network cable is not properly connected to the network port of the sending card.
4. The input signal resolution and display resolution does not match.

Solutions

1. Check all the cable connection. For example, the DVI and network cables are loose or the signal cable length exceeds the maximum transmission distance.
2. Check if the resolutions of the graphics card, sending card and video processor are appropriate.

4.5 Any Light Module Not Working or Flickering

Possible Reasons

1. The adapter board is not working.
2. The light module is not working.
3. The HUB board is not working.
4. The light module is in poor contact with the cabinet.

Solutions

Knock at the light module to properly connect it to the interface.

- If the issue remains, replace it with another light module.
- If the issue is solved, it is the bad circuit that causes the issue.
- If the issue remains the same after replacing the light module, change the adapter board.
- If the issue remains the same after replacing the adapter board, change the HUB board.

4.6 Any Cabinet Not Working

Possible Reasons

1. The power supply or receiving card of the cabinet is malfunctioning.
2. The signal output of its previous cabinet is bad.

Solutions

1. Remove the light and use a multimeter to check if the DC power inside the cabinet has a +4.6V voltage output. In normal situation, the red indicator light on the receiving card inside the cabinet is on.
2. Check if the receiving card inside the cabinet is properly connected.

4.7 No Sending Card Detected

Possible Reasons

1. The sending card is not powered on.
2. The computer and sending card is not connected by a USB cable.

Solutions

1. Check if the sending card is powered on.
2. Connect the USB cable.

4.8 No Receiving Card Detected or Incorrect Number of Receiving Cards Detected

Possible Reasons

1. The network cable is not connected to the sending card.
2. The sending card is not powered on.
3. The computer and sending card are not connected by a USB cable.
4. There are cables missing among cabinets.

Solutions

1. See "3.7 No Sending Card Detected" first. If the sending card can be correctly detected and no receiving card is detected, it might be caused by no network cable connected, network cable not working properly or first cabinet not powered on.
2. If all network ports can detect receiving cards but the number is incorrect, check for missing cables.
3. When all network cables are properly connected but certain network ports detect no receiving card, check if the network cables are broken during transportation, the connectors of the network cables are deformed or the first cabinet connected to these network ports is not working properly.

Appendix 1 Cybersecurity Recommendations

Cybersecurity is more than just a buzzword: it's something that pertains to every device that is connected to the internet. IP video surveillance is not immune to cyber risks, but taking basic steps toward protecting and strengthening networks and networked appliances will make them less susceptible to attacks. Below are some tips and recommendations on how to create a more secured security system.

Mandatory actions to be taken for basic device network security:

1. Use Strong Passwords

Please refer to the following suggestions to set passwords:

- The length should not be less than 8 characters;
- Include at least two types of characters; character types include upper and lower case letters, numbers and symbols;
- Do not contain the account name or the account name in reverse order;
- Do not use continuous characters, such as 123, abc, etc.;
- Do not use overlapped characters, such as 111, aaa, etc.;

2. Update Firmware and Client Software in Time

- According to the standard procedure in Tech-industry, we recommend to keep your device (such as NVR, DVR, IP camera, etc.) firmware up-to-date to ensure the system is equipped with the latest security patches and fixes. When the device is connected to the public network, it is recommended to enable the "auto-check for updates" function to obtain timely information of firmware updates released by the manufacturer.
- We suggest that you download and use the latest version of client software.

"Nice to have" recommendations to improve your device network security:

1. Physical Protection

We suggest that you perform physical protection to device, especially storage devices. For example, place the device in a special computer room and cabinet, and implement well-done access control permission and key management to prevent unauthorized personnel from carrying out physical contacts such as damaging hardware, unauthorized connection of removable device (such as USB flash disk, serial port), etc.

2. Change Passwords Regularly

We suggest that you change passwords regularly to reduce the risk of being guessed or cracked.

3. Set and Update Passwords Reset Information Timely

The device supports password reset function. Please set up related information for password reset in time, including the end user's mailbox and password protection questions. If the information changes, please modify it in time. When setting password protection questions, it is suggested not to use those that can be easily guessed.

4. Enable Account Lock

The account lock feature is enabled by default, and we recommend you to keep it on to guarantee the account security. If an attacker attempts to log in with the wrong password several times, the corresponding account and the source IP address will be locked.

5. Change Default HTTP and Other Service Ports

We suggest you to change default HTTP and other service ports into any set of numbers between 1024~65535, reducing the risk of outsiders being able to guess which ports you are using.

6. Enable HTTPS

We suggest you to enable HTTPS, so that you visit Web service through a secure communication channel.

7. MAC Address Binding

We recommend you to bind the IP and MAC address of the gateway to the device, thus reducing the risk of ARP spoofing.

8. Assign Accounts and Privileges Reasonably

According to business and management requirements, reasonably add users and assign a minimum set of permissions to them.

9. Disable Unnecessary Services and Choose Secure Modes

If not needed, it is recommended to turn off some services such as SNMP, SMTP, UPnP, etc., to reduce risks.

If necessary, it is highly recommended that you use safe modes, including but not limited to the following services:

- SNMP: Choose SNMP v3, and set up strong encryption passwords and authentication passwords.
- SMTP: Choose TLS to access mailbox server.
- FTP: Choose SFTP, and set up strong passwords.
- AP hotspot: Choose WPA2-PSK encryption mode, and set up strong passwords.

10. Audio and Video Encrypted Transmission

If your audio and video data contents are very important or sensitive, we recommend that you use encrypted transmission function, to reduce the risk of audio and video data being stolen during transmission.

Reminder: encrypted transmission will cause some loss in transmission efficiency.

11. Secure Auditing

- Check online users: we suggest that you check online users regularly to see if the device is logged in without authorization.
- Check device log: By viewing the logs, you can know the IP addresses that were used to log in to your devices and their key operations.

12. Network Log

Due to the limited storage capacity of the device, the stored log is limited. If you need to save the log for a long time, it is recommended that you enable the network log function to ensure that the critical logs are synchronized to the network log server for tracing.

13. Construct a Safe Network Environment

In order to better ensure the safety of device and reduce potential cyber risks, we recommend:

- Disable the port mapping function of the router to avoid direct access to the intranet devices from external network.
- The network should be partitioned and isolated according to the actual network needs. If there are no communication requirements between two sub networks, it is suggested to use VLAN, network GAP and other technologies to partition the network, so as to achieve the network isolation effect.
- Establish the 802.1x access authentication system to reduce the risk of unauthorized access to private networks.
- Enable IP/MAC address filtering function to limit the range of hosts allowed to access the device.

ENABLING A SAFER SOCIETY AND SMARTER LIVING

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