



LED Display (SC Series)

User's Manual



Foreword

This manual introduces the installation, functions and operations of the LED display (hereinafter referred to as "the Device"). Read carefully before using the device, and keep the manual safe for future reference.

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, reductions in performance, or unpredictable results.
 TIPS	Provides methods to help you solve a problem or save time.
 NOTE	Provides additional information as a supplement to the text.

Revision History

Version	Revision Content	Release Time
V1.0.0	First release.	December 2024

Privacy Protection Notice

As the device user or data controller, you might collect the personal data of others such as their face, audio, fingerprints, and license plate number. You need to be in compliance with your local privacy protection laws and regulations to protect the legitimate rights and interests of other people by implementing measures which include but are not limited: Providing clear and visible identification to inform people of the existence of the surveillance area and provide required contact information.

About the Manual

- The manual is for reference only. Slight differences might be found between the manual and the product.
- We are not liable for losses incurred due to operating the product in ways that are not in compliance with the manual.
- The manual will be updated according to the latest laws and regulations of related jurisdictions. For detailed information, see the paper user's manual, use our CD-ROM, scan the QR code or visit our official website. The manual is for reference only. Slight differences might be found between the electronic version and the paper version.
- All designs and software are subject to change without prior written notice. Product updates might result in some differences appearing between the actual product and the manual. Please contact customer service for the latest program and supplementary documentation.
- There might be errors in the print or deviations in the description of the functions, operations and technical data. If there is any doubt or dispute, we reserve the right of final explanation.
- Upgrade the reader software or try other mainstream reader software if the manual (in PDF format) cannot be opened.
- All trademarks, registered trademarks and company names in the manual are properties of their respective owners.
- Please visit our website, contact the supplier or customer service if any problems occur while using the device.
- If there is any uncertainty or controversy, we reserve the right of final explanation.

Important Safeguards and Warnings

This section introduces content covering the proper handling of the device, hazard prevention, and prevention of property damage. Read carefully before using the device, and comply with the guidelines when using it.

Operation Requirements



- Do not hit or scratch the screen with hard objects.
- Keep the device away from water.
- The screen must not face the air outlet of the air conditioner at a close distance.
- Do not expose the device to environments with volatile, corrosive or flammable chemicals.
- Do not clean the screen with water or chemical solvents.
- Make sure the screen and its accessories are properly grounded before use.
- Recommended ambient humidity is 35%–60%. When the humidity exceeds 60%, use a dehumidifier.
- Immediately cut the power if smoke or a strange smell comes from the device, or if there is an electrical leakage, the temperature of the device is too high or the device comes into contact with water. Make sure to contact the manufacturer.
- In normal weather, make sure the screen is lit up at least twice a week and for 2 hours each time. When the humidity is extremely high, light up the screen every day for at least 2 hours.
- Salt spray in the operating environment of the device might corrode its electronic components and cables. To ensure the normal operation of the device and prolong its service life, use the device in the outdoor environment that is 30 kilometers away from the sea.



Keep the ambient temperature in front of and behind the screen between 26 °C and 30 °C. The air conditioners in front of and behind the screen should be powered on and off at the same time to avoid condensed water forming on the screen surface caused by large shifts in the temperature.

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1 Overview

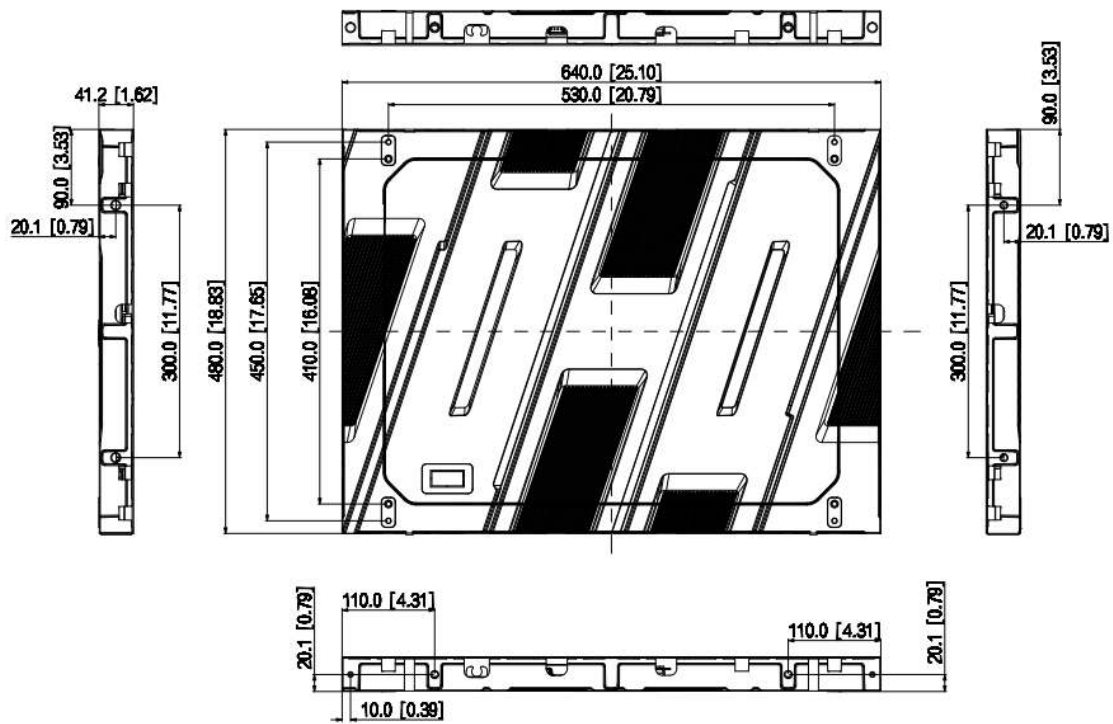
1.1 Introduction

SC-series products adopt die-cast aluminum alloy material for the housing, which has the advantages of lightweight, high precision, slim body, quick installation, and convenient maintenance. The products have a high refresh rate, low energy consumption, and low heat dissipation risk. The products are applicable to various indoor fixed installation scenarios, such as stage performances, studios, large conference halls, shopping malls, supermarkets, cinemas, command centers, smart cities, advertising screens in airports and railway stations, etc.

1.2 Features

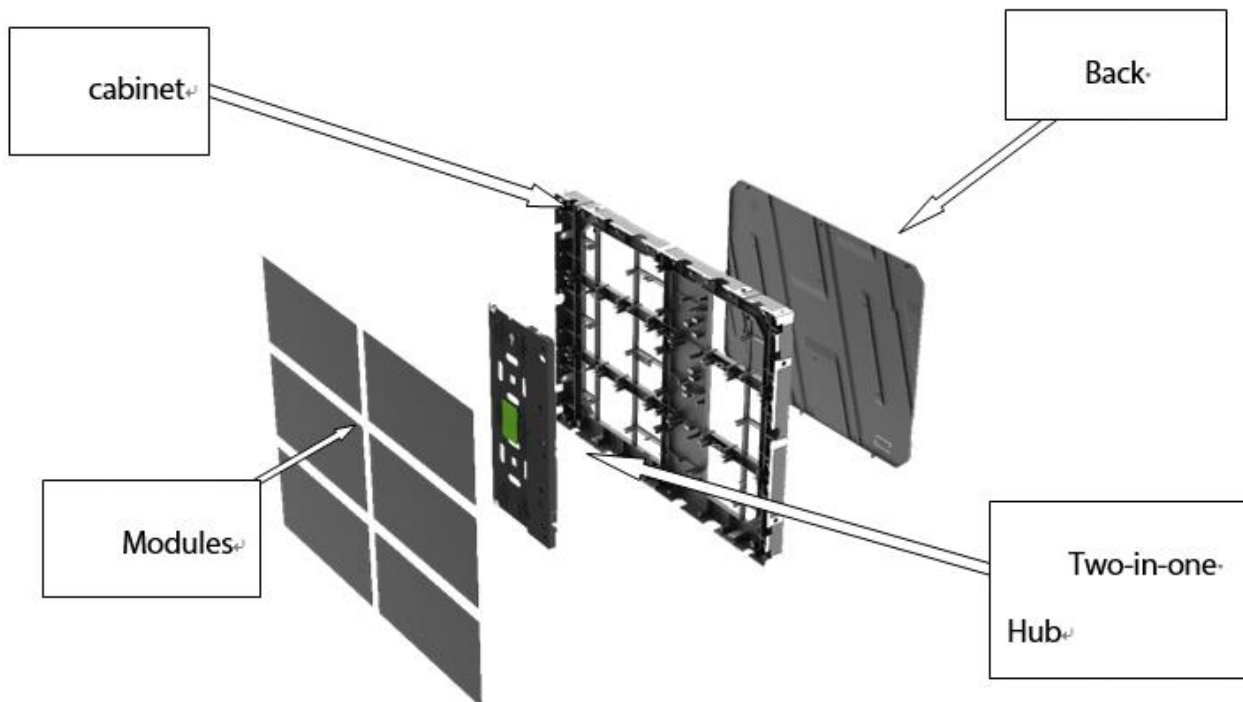
- The chassis is made of die-cast aluminum, which has high strength, strong toughness, and high precision.
- Integrated design of hard-wired HUB and power supply, hard-wired interface for HUB, 320×160 module without bottom shell, power supply with N+1 backup.
- The design of the casing is slim and lightweight, with a module thickness of only 2.5mm and a weight of only 0.3kg. The overall thickness has been reduced by 30% and the weight has been reduced by 10%.
- Two-in-one control board design: integration of HUB and power supply, enhancing stability and simplifying maintenance.
- Floating hard link module, stable signal transmission.
- Rated voltage of 100-240V, universally compatible worldwide, with better adaptability.
- Power N+1 backup, no black screen in case of power failure.

1.3 Dimensions



The Cabinet

1.4 Detailed Diagram of the Cabinet Structure



Power and Two-in One Hub

2 Installation Method

2.1 Installation Accessories

Installation Accessories			
Connector		Inner hexagon screw	
Connector Screws		Allen key	5mm

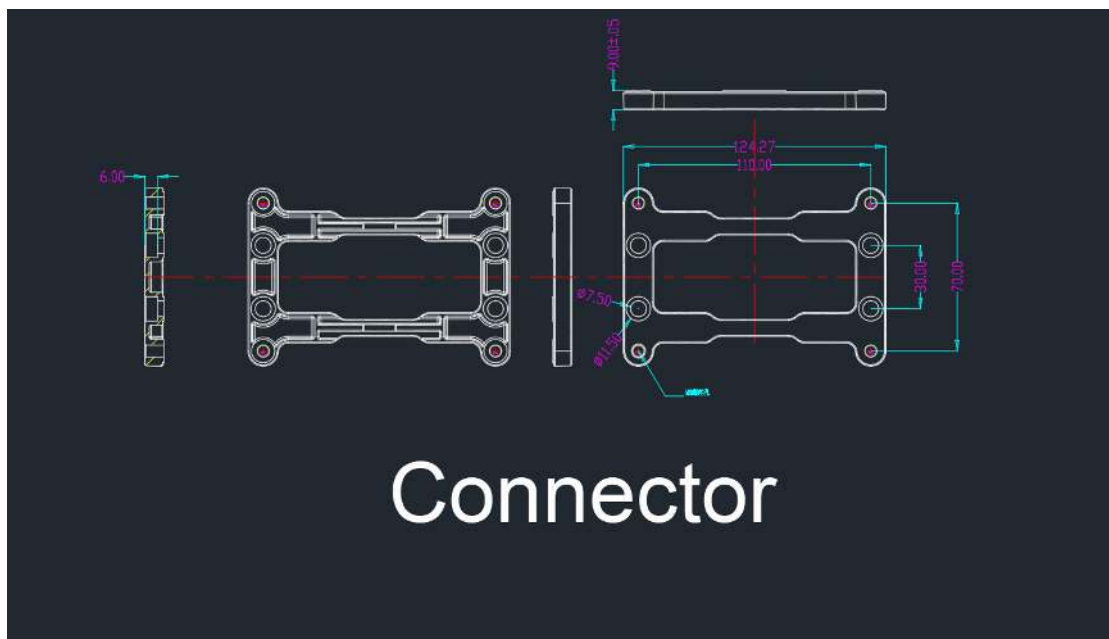


Photo of an Inner Hexagon Screw

Cabinet Connection Screws(M6*16)



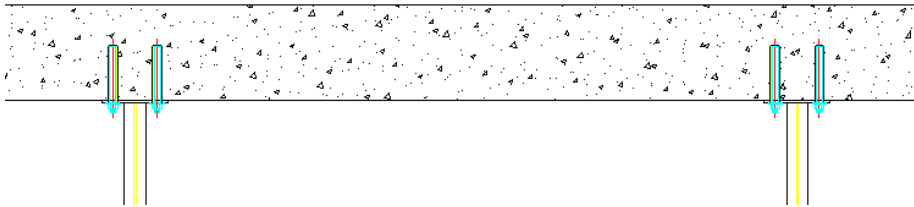
Connector Installation screw (M6*60).



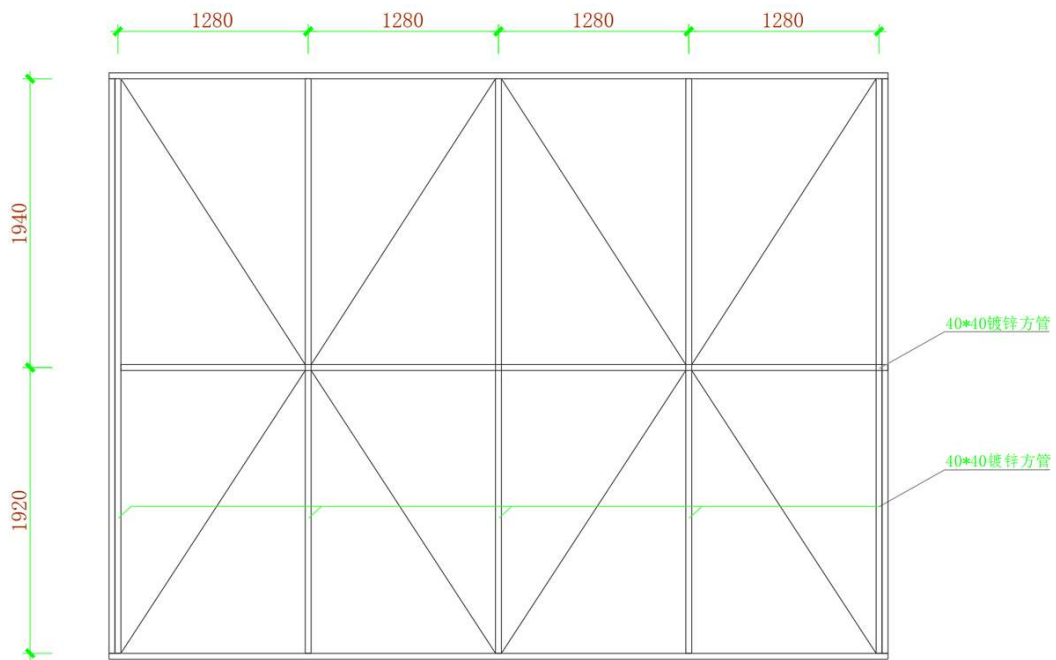
2.2 Steps for the Front Installation Method

Step 1: Weld the steel structure on site.

(1) Fix the embedded parts.

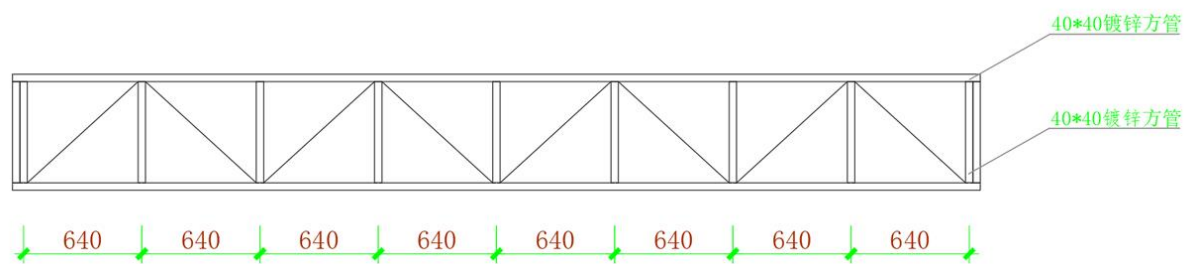


(2) Weld the steel structure.



Back View of the Steel Structure

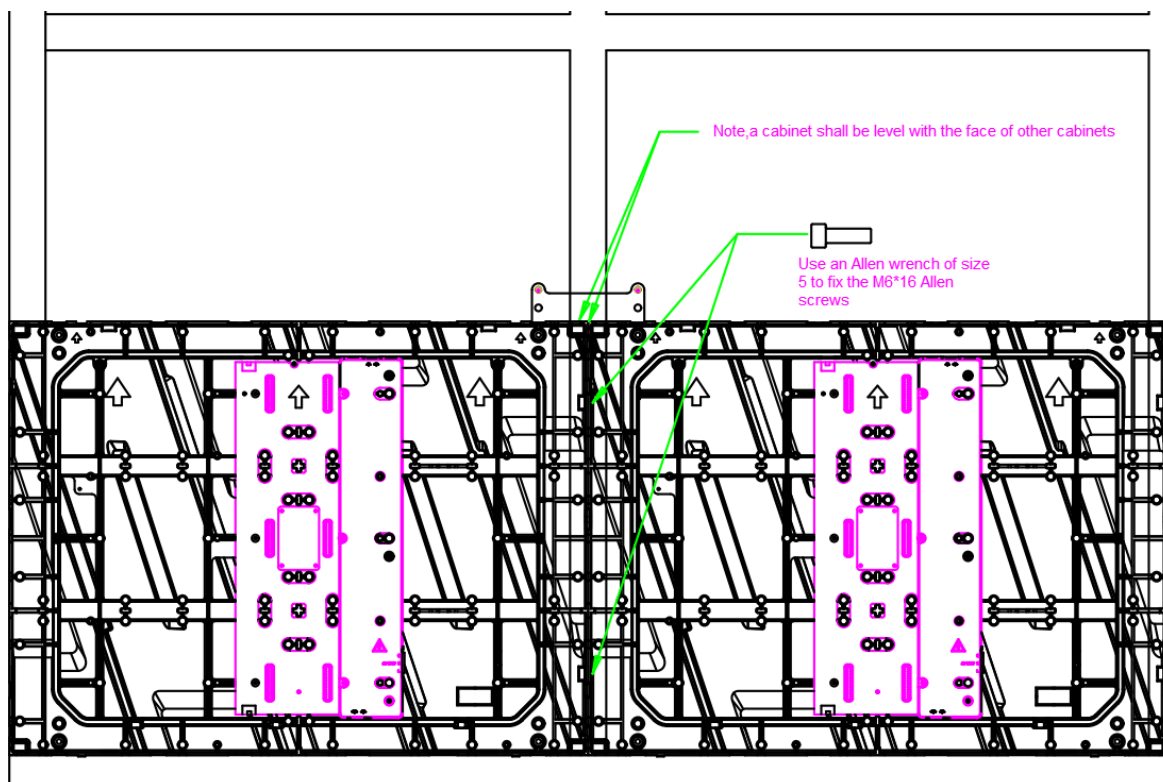
(3) Install the steel structure.



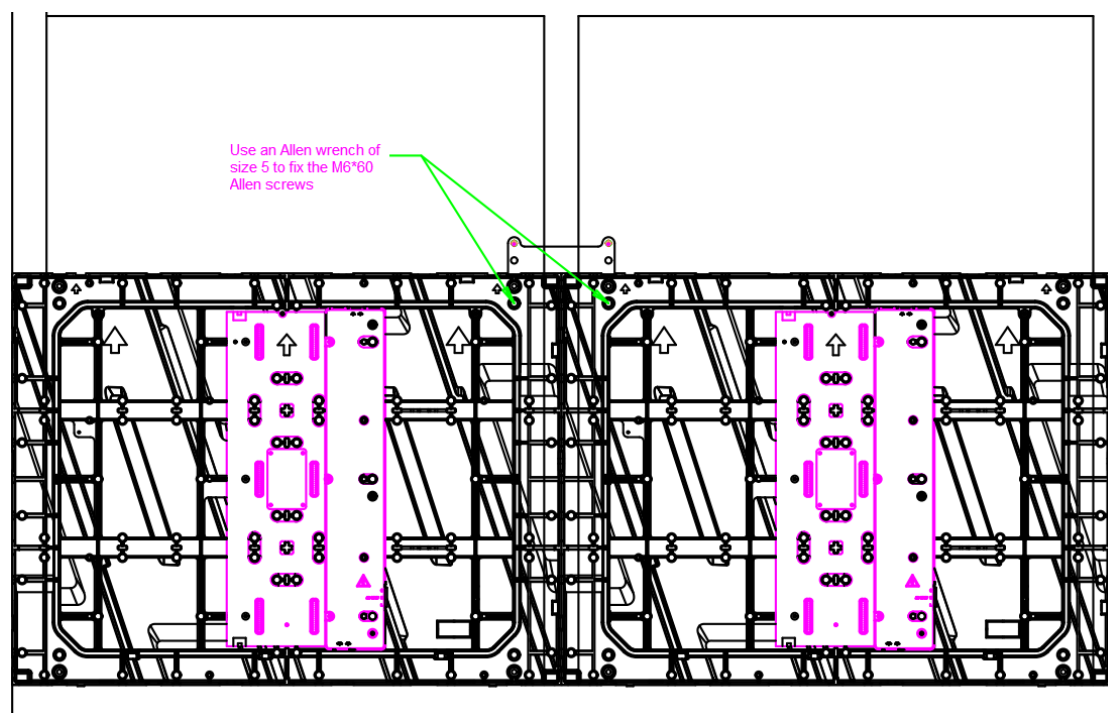
Top View of the Steel Structure

Step 2: Install the cabinet.

1. Use M6*16 to fix the left and right cabinets, as shown in the figure:

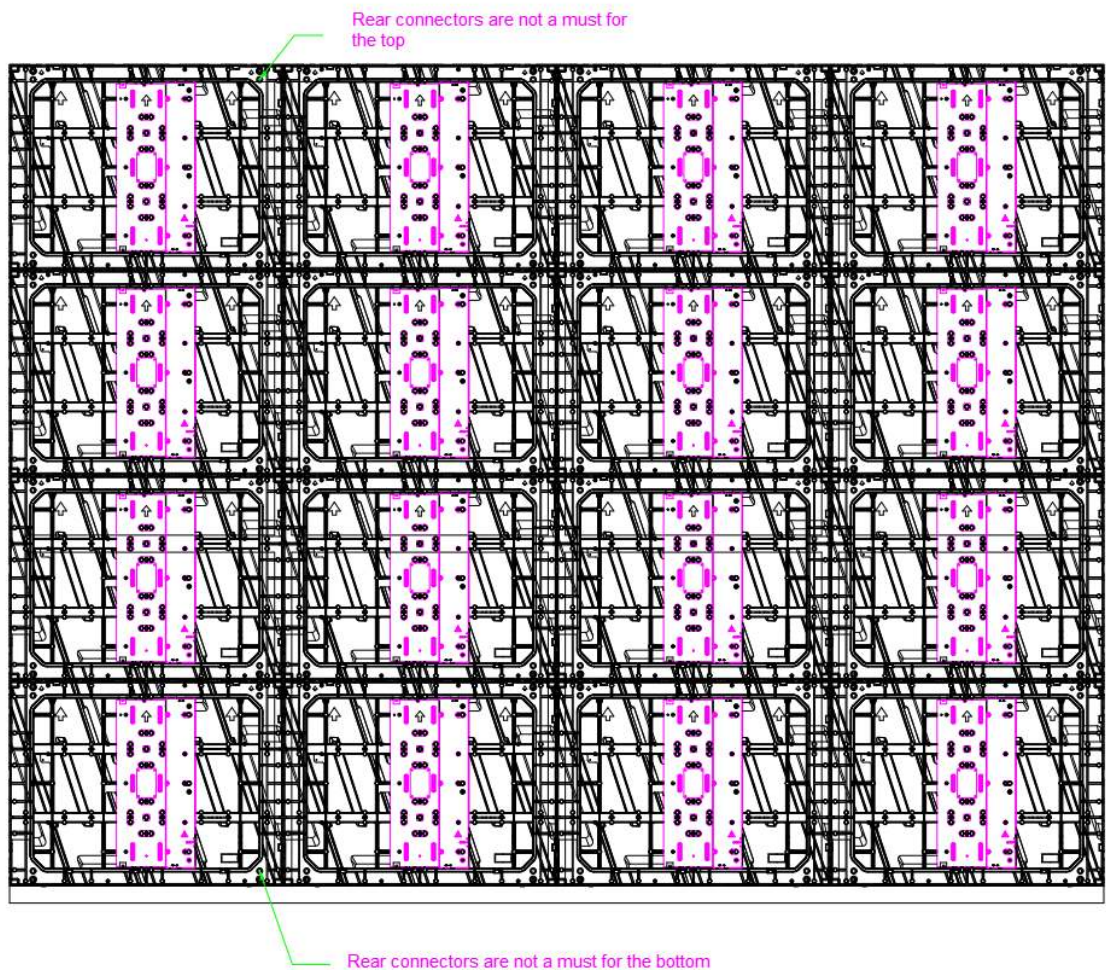


2. Use connectors and M6*60 screws to fix the cabinets, as shown in the picture



Note: During installation, ensure that the cabinets are flat with the face of other cabinets.

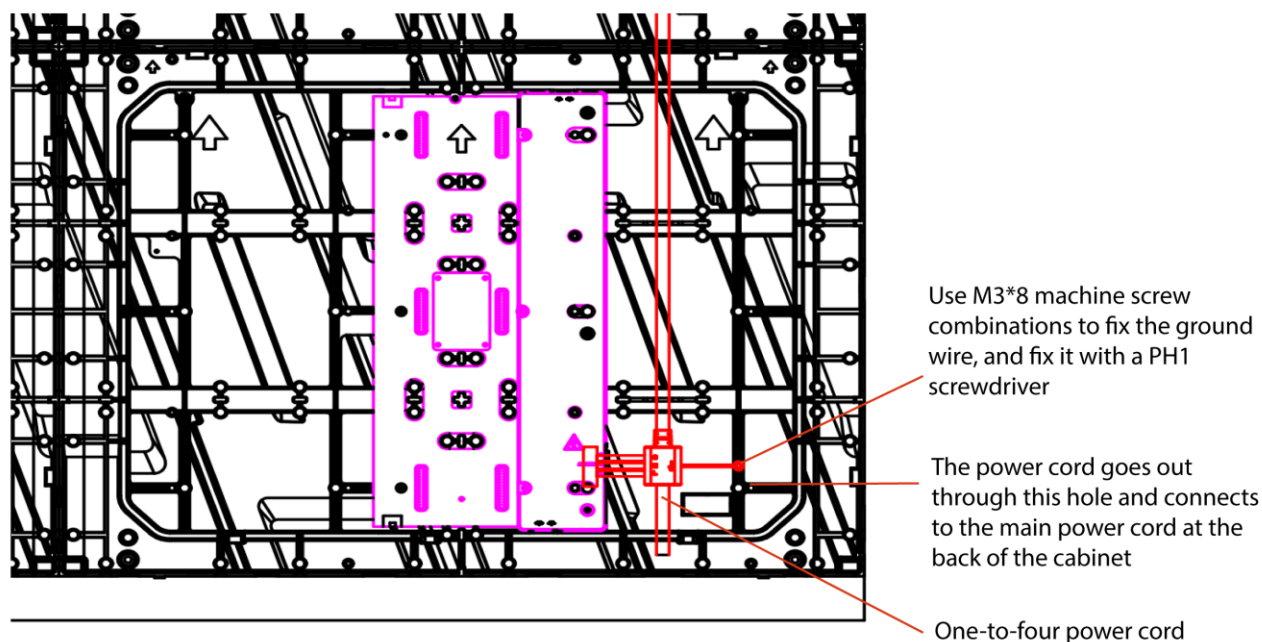
Install the cabinets in sequence, as shown in the picture:



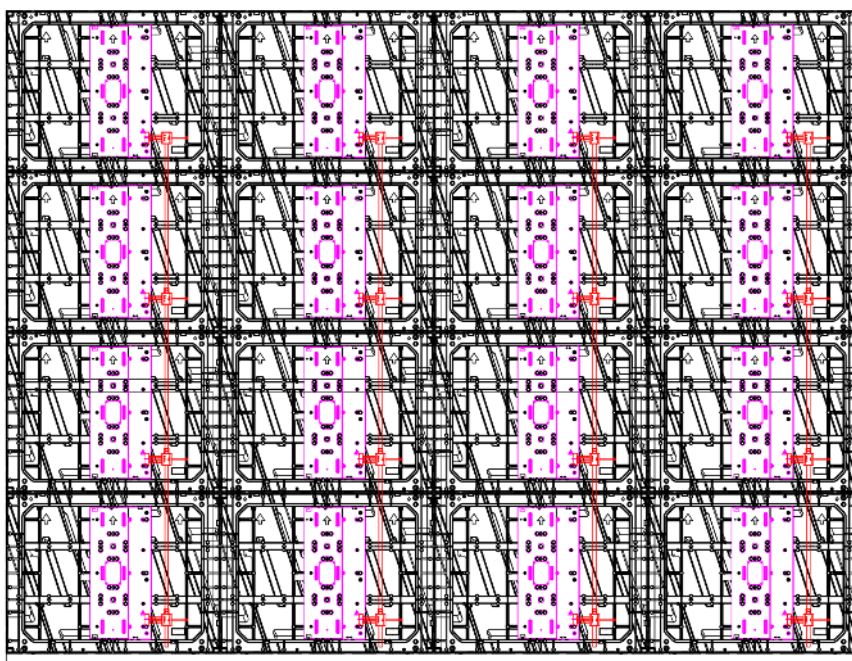
Note: The screws for fixing the rear connectors do not need to be tightened, while the chassis needs to be adjusted slightly.

Step 3: Install the power cord.

1. Power cord installation, as shown in the picture:

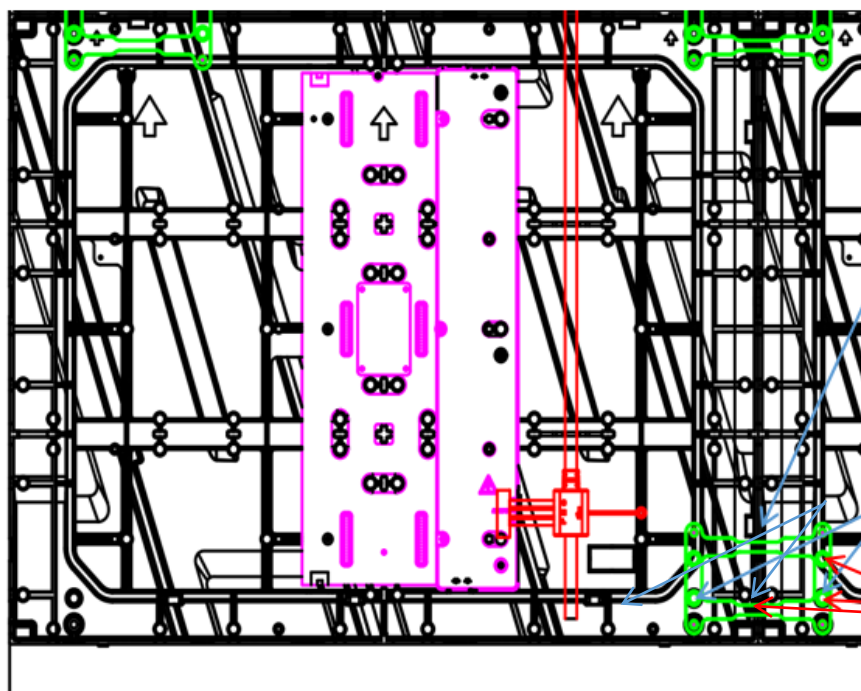


2. Repeat the operation to complete the installation of the power cord, as shown in the picture:



Step 4: Install the front-installation connector.

1. Use an Allen wrench of size 5 to secure the front-installation connector and the M6*16 Allen screws, as shown in the picture.



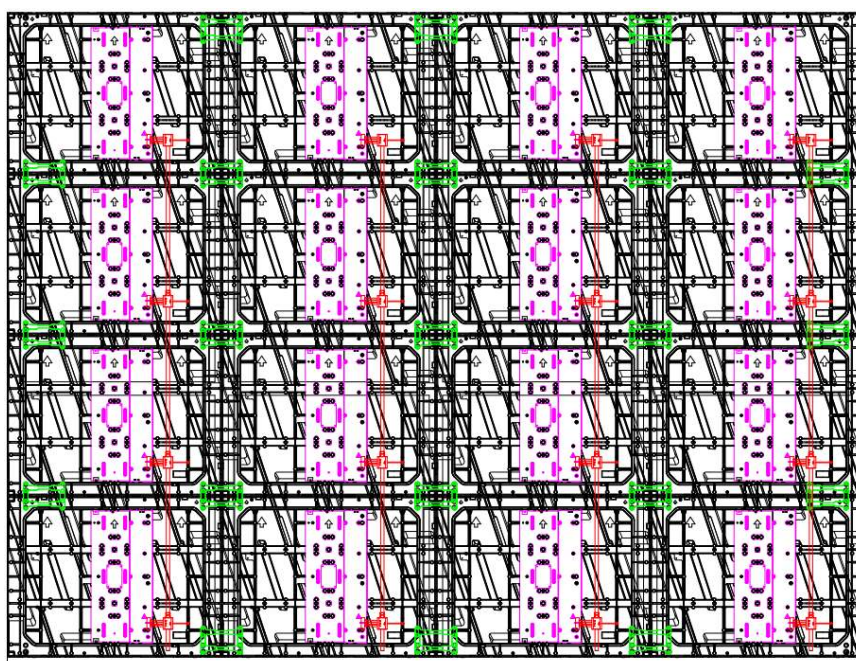
When fixing the front connector, the screw close to it needs to be loosened

The front connector and the M6*16 hex socket screws are fixed with an Allen wrench of size 5.

Note: The upper and lower front connectors of the display screen are fixed with this threaded hole.

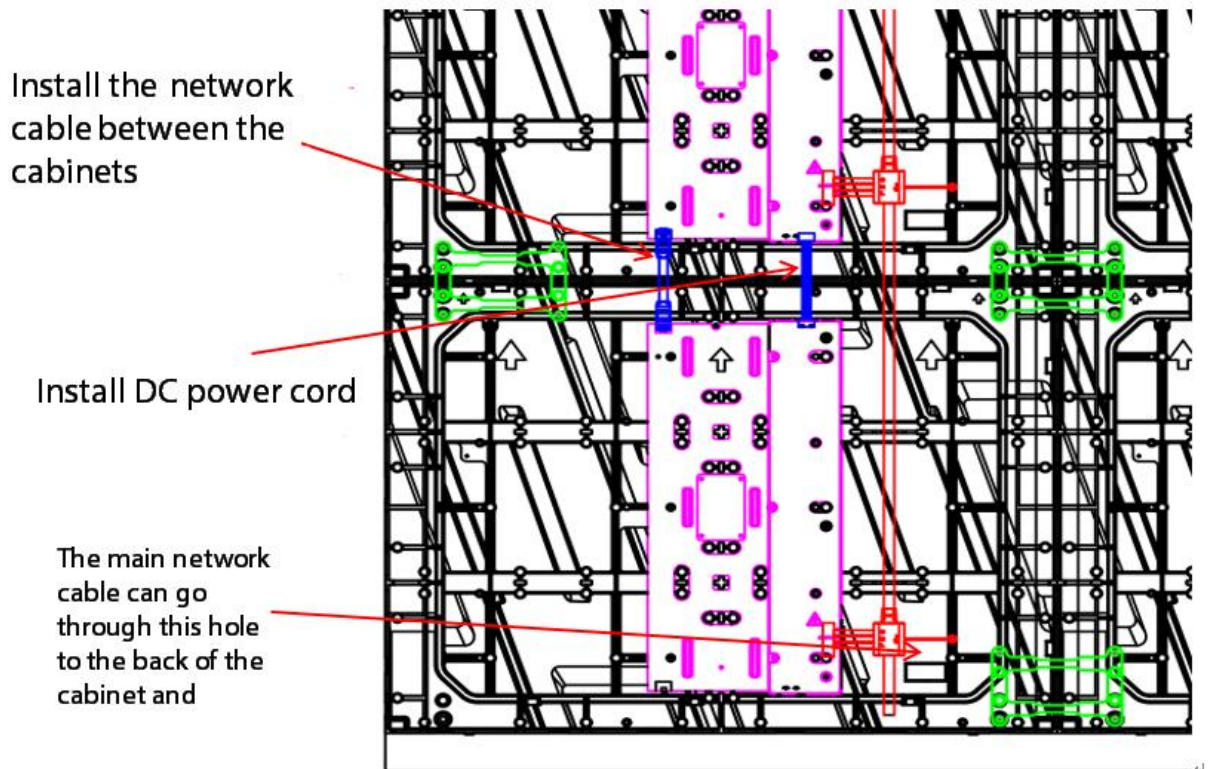
This threaded hole is used for the left, right and middle front connectors of the display screen

2. Repeat the above steps to install the connectors as shown in the picture.

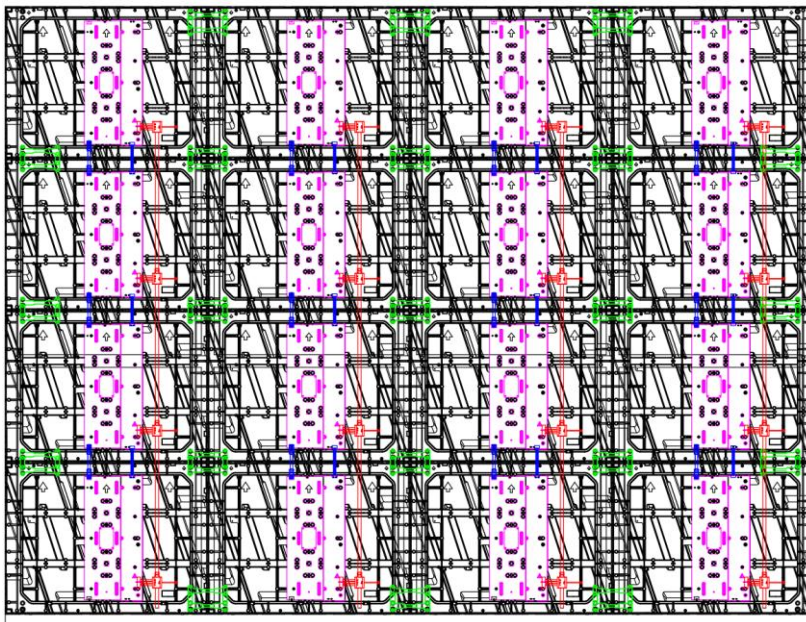


Step 4: Install the network cable and DC cable.

1. Install the inter-cabinet network cable and DC power cable in sequence, as shown in the picture.

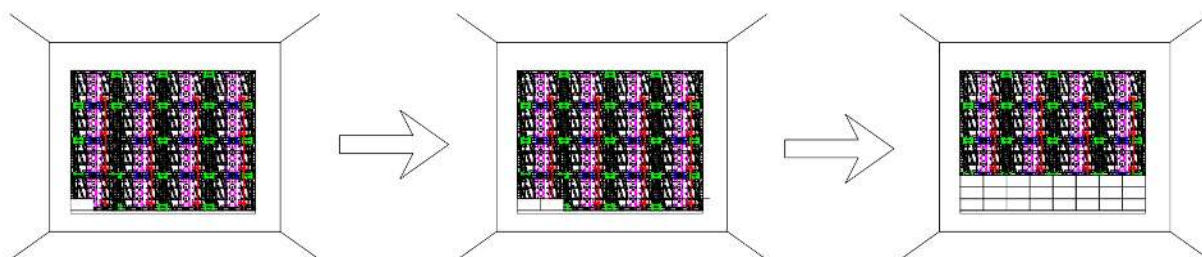
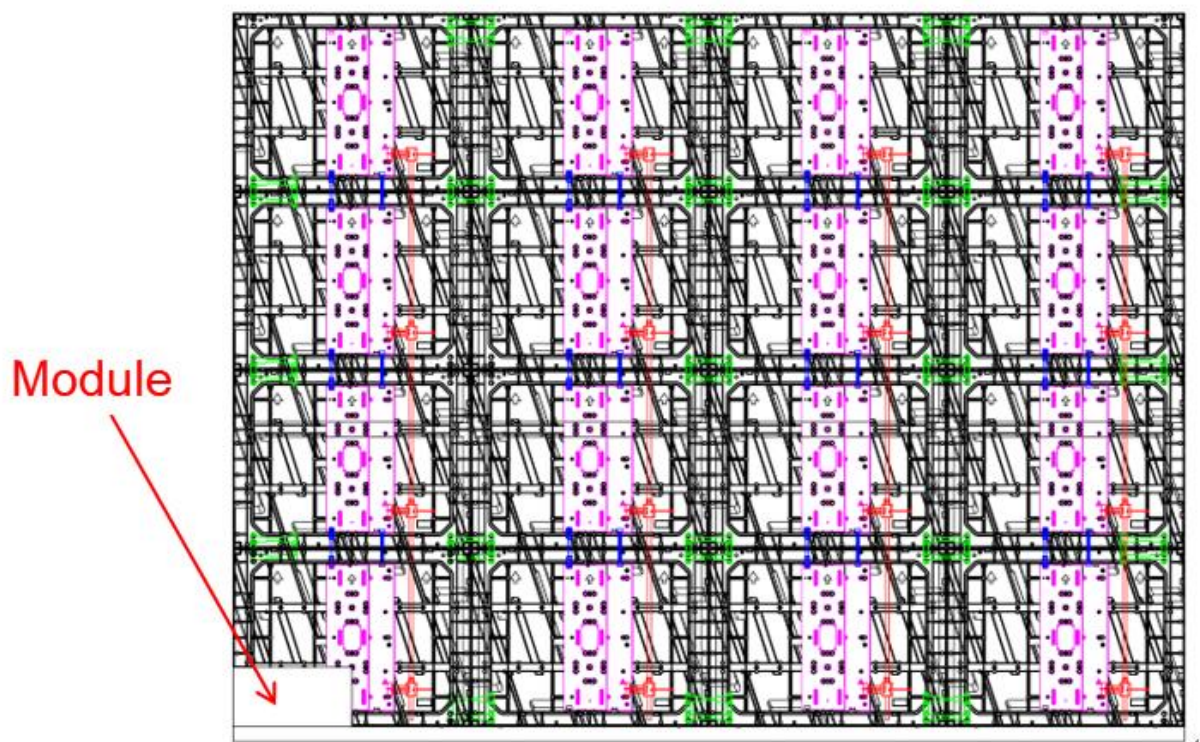


2. Repeat the above steps to complete the installation of the network cable and DC cable, as shown in the picture.

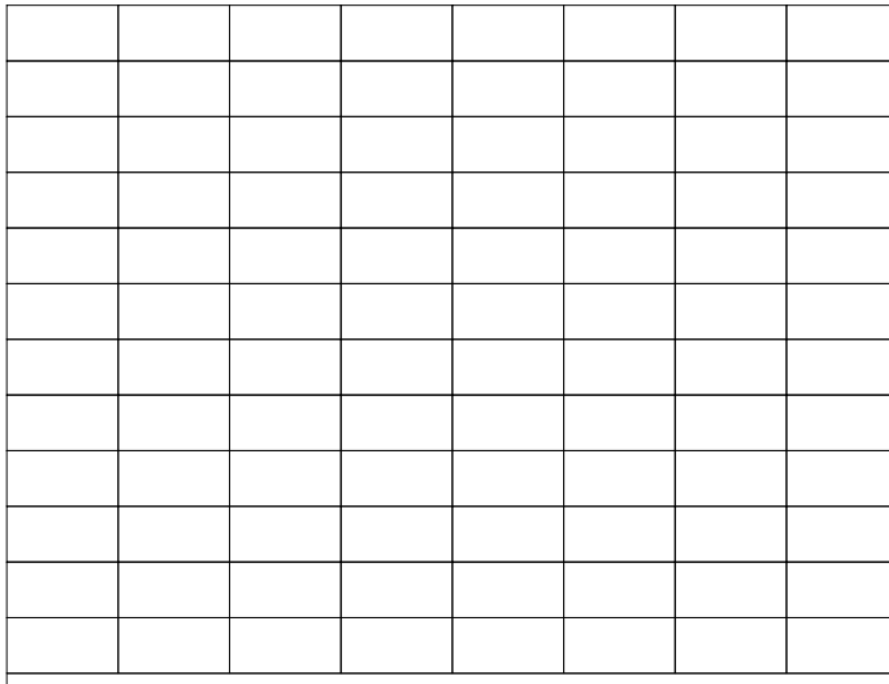


Step 5: Install the module.

1. Modules should be installed from left to right, and from bottom to top, as shown in the picture.



2. The module installation is completed as shown in the picture.



2.3 Steps for the Rear Installation Method

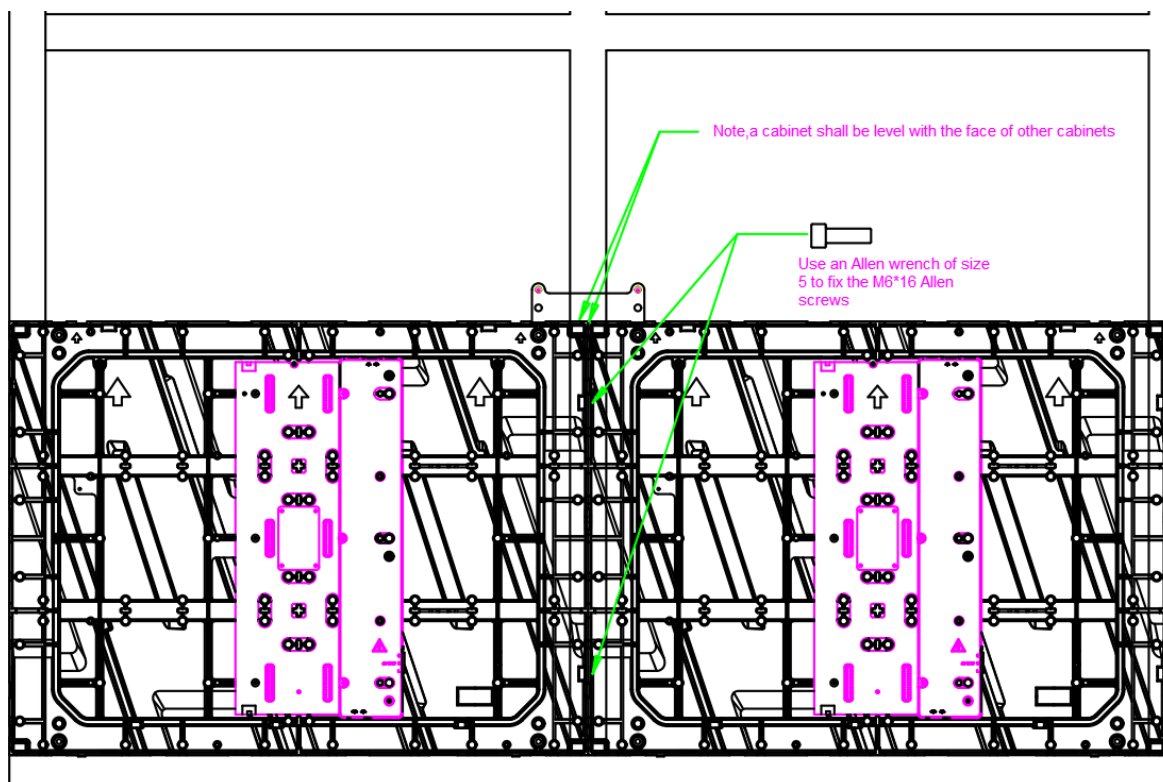
Step 1: Weld the steel structure on site.

The installation method is the same as before, please refer to Step 1 of 2.2. Steps for the Front Installation Method for details.

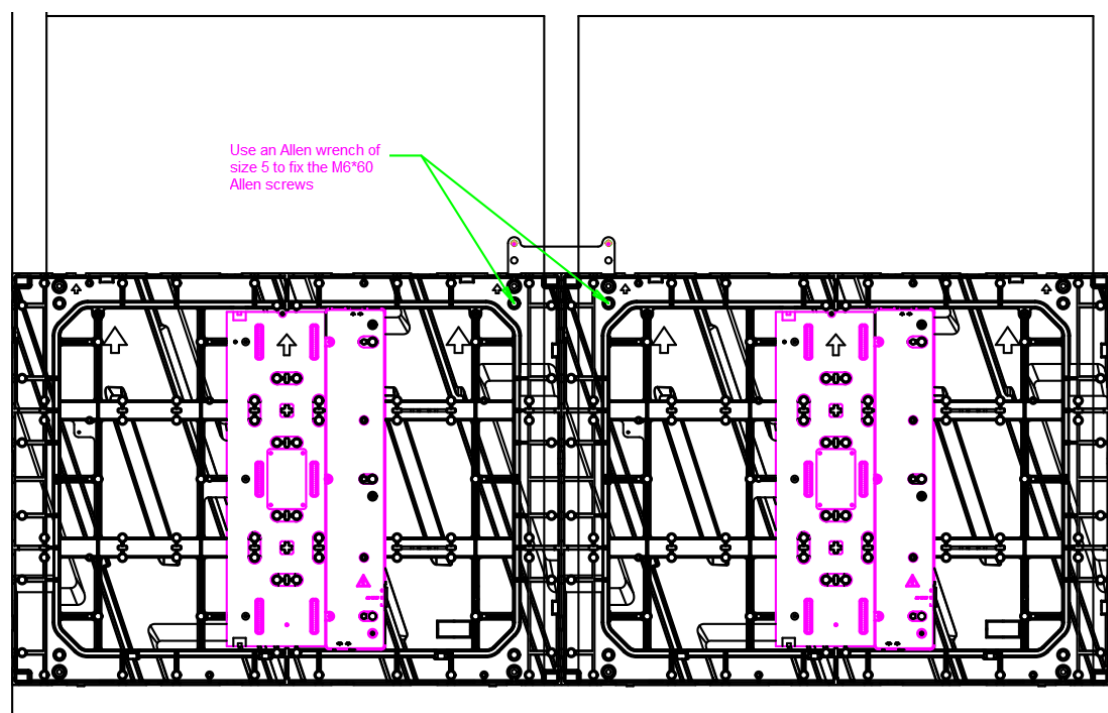
Step 2: Install the cabinets.

Note: The mounting holes for the rear installation are different from those for the front installation.

1. Use M6*16 to fix the left and right cabinets, as shown in the figure:

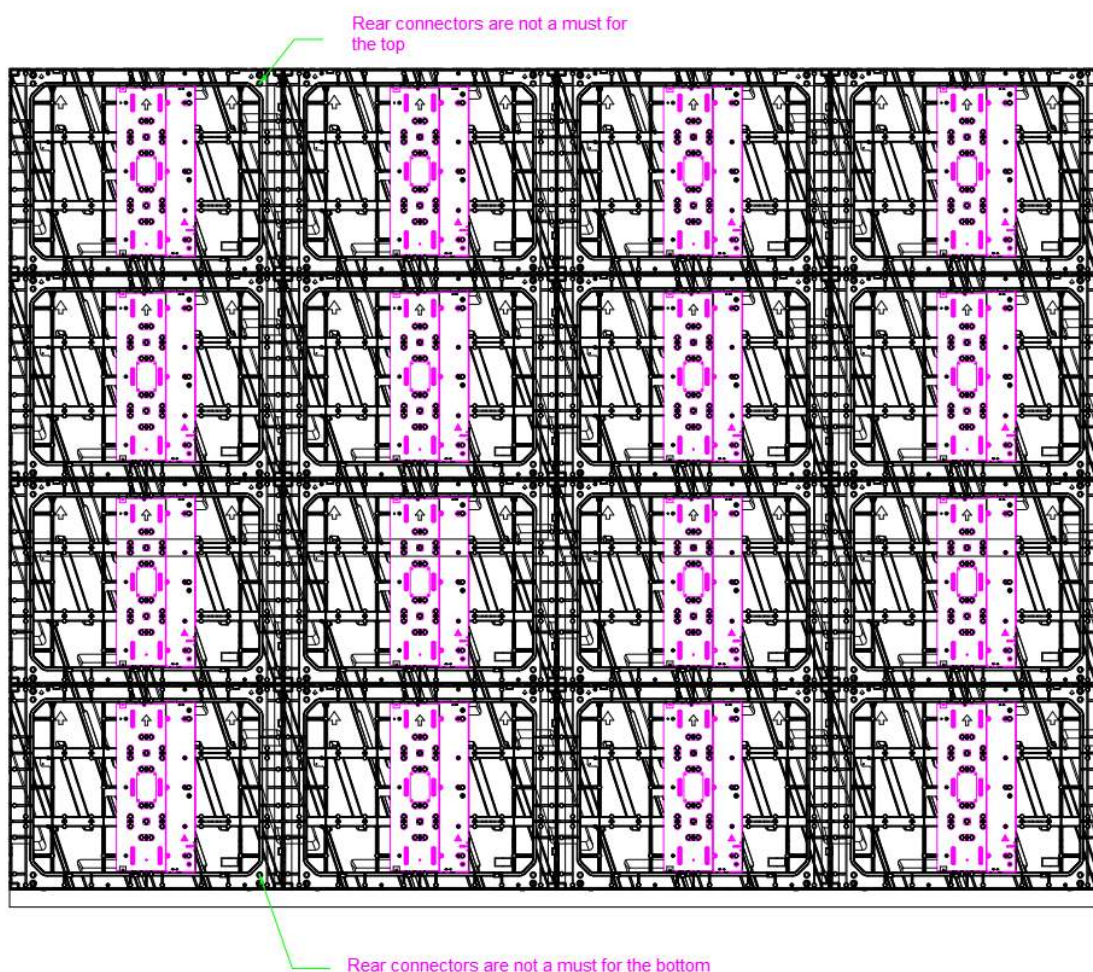


2. Use connectors and M6*60 screws to fix the cabinets, as shown in the picture



Note: During installation, ensure that the cabinets are flat with the face of other cabinets.

Install the cabinets in sequence, as shown in the picture:



Note: The screws for fixing the rear connectors do not need to be tightened, while the chassis needs to be adjusted slightly.

Step 3: Install the power cord.

The installation method remains the same as before, please refer to Step 3 of 2.2 Steps for the Front Installation Method for details.

Step 4: Connect the front connectors

The installation method remains the same as before, please refer to Step 4 of 2.2 Steps for the Front Installation Method for details.

Step 5: Install network and DC cables.

The installation method remains the same as before, please refer to Step 5 of 2.2 Steps for the Front Installation Method for details.

Step 6: Install the module.

The installation method remains the same as before, please refer to Step 6 of 2.2 Steps for the Front Installation Method for details.

3 Debugging the Software

3.1 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 should be prepared.

3.2 Installing the Software

Install NovaLCT (V5.4.4.6 or above) on your computer according to the setup wizard.



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

3.3 Installing the Device

Procedure

Step 1 Power on the computer and sending card.

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



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 HDMI 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 3-1 Ports on the sending card



3.4 Setting the Computer to Duplicate or Extend

After installation of the device, power on the LED display. Press the Windows key and 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 be displayed on the LED display.

Figure 3-2 Multiple displays

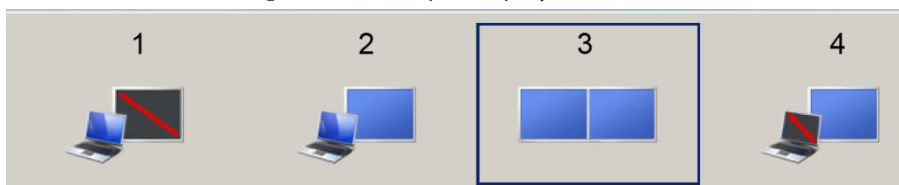


Table 3-1 Multiple displays

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

3.5 Detecting the Correct Number of Sending Cards

Procedure

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

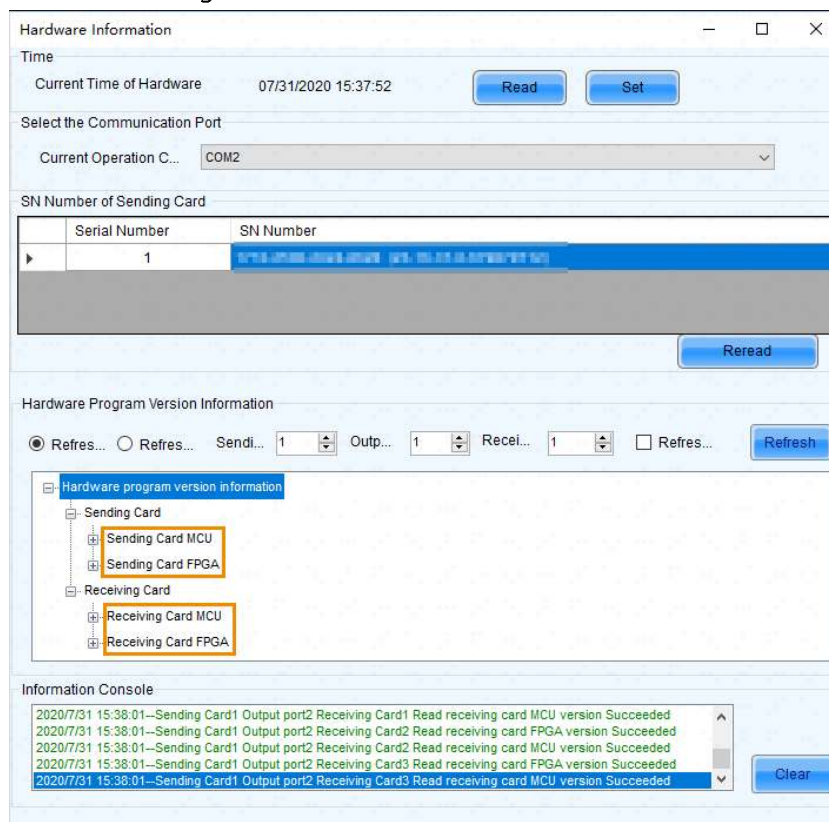
Step 2 Click + next to **Sending Card MCU**, **Sending Card FPGA**, **Receiving Card MCU** and **Receiving Card FPGA**.

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.

Step 3 Click + to get more details.

- 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.

Figure 3-3 Hardware information



The screenshot shows the 'Hardware Information' window. It includes sections for Time, Communication Port selection, SN Number of Sending Card, Hardware Program Version Information, and an Information Console. The 'SN Number of Sending Card' section contains a table with one row showing 'Serial Number' 1 and its corresponding 'SN Number'. The 'Hardware Program Version Information' section shows a tree view with 'Sending Card' and 'Receiving Card' categories, each containing 'MCU' and 'FPGA' sub-items. The 'Information Console' at the bottom displays a log of successful version reads for various cards.

Serial Number	SN Number
1	07310704000000000000000000000000

3.6 Configuring the Screen

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. For example, during debugging, when the display cannot show content due to wrong parameters, follow this section to restore to factory settings.

3.6.1 Configuring the Sending Card

Procedure

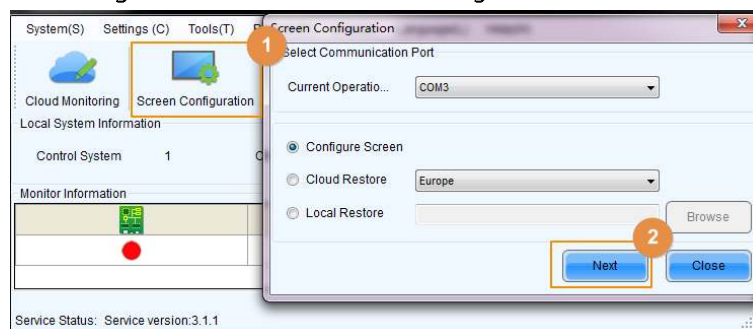
- Step 1** Select **User > Advanced Synchronous System User Login**, enter the password, and then click **Login**.



The password is **admin**.

- Step 2** Select **Screen Configuration > Next** to go to the screen configuration window.

Figure 3-4 Go to the screen configuration

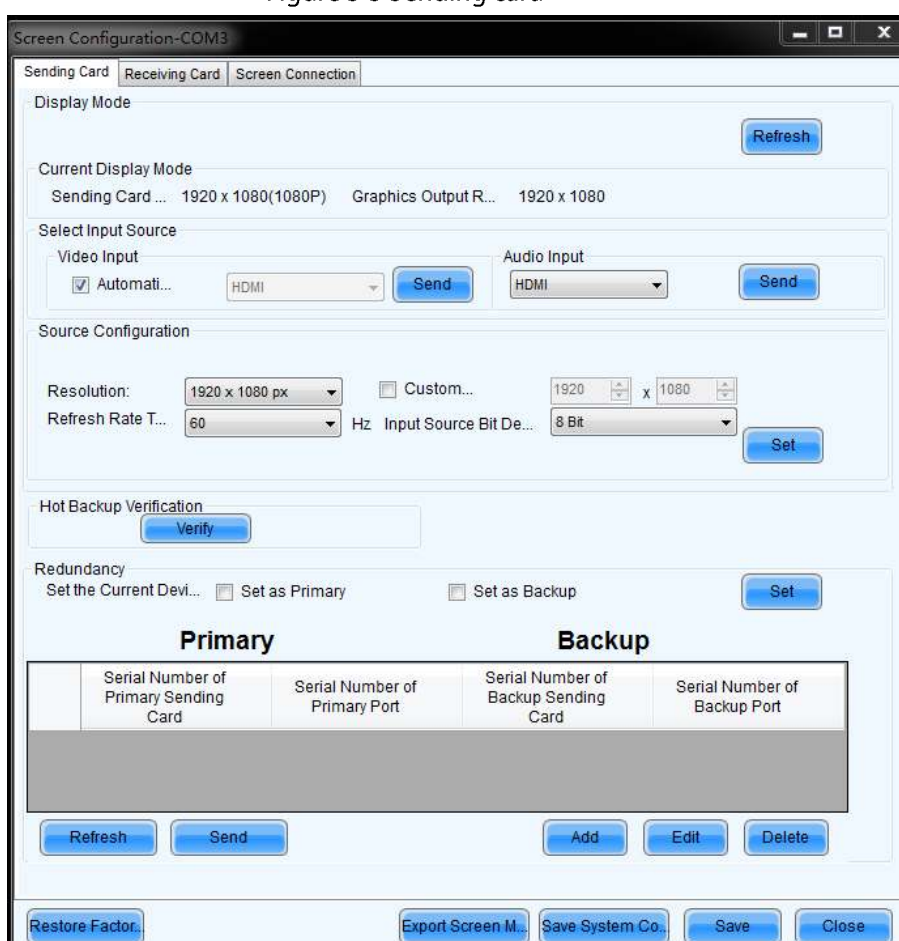


Step 3 Click **Sending Card** tab, and then select the actual video input source.



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

Figure 3-5 Sending card



Step 4 Set the resolution.

- Duplicate: Set the resolution of the sending card as the computer.
- Extend: Set the resolution of the sending card as the resolution of the computer or other values. 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.

Related Operations

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, it will cause screen content to be incomplete.

Figure 3-6 Incomplete content



3.6.2 Configuring the Receiving Card

Prerequisites

Prepare the *.rcfgx file first. 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 has gone through aging and other tests. If there are no other special requirements, do not reload the configuration file.

Procedure

Step 1 Select **User > Advanced Synchronous System User Login**, enter the password, and then click **Login**.



The password is **admin**.

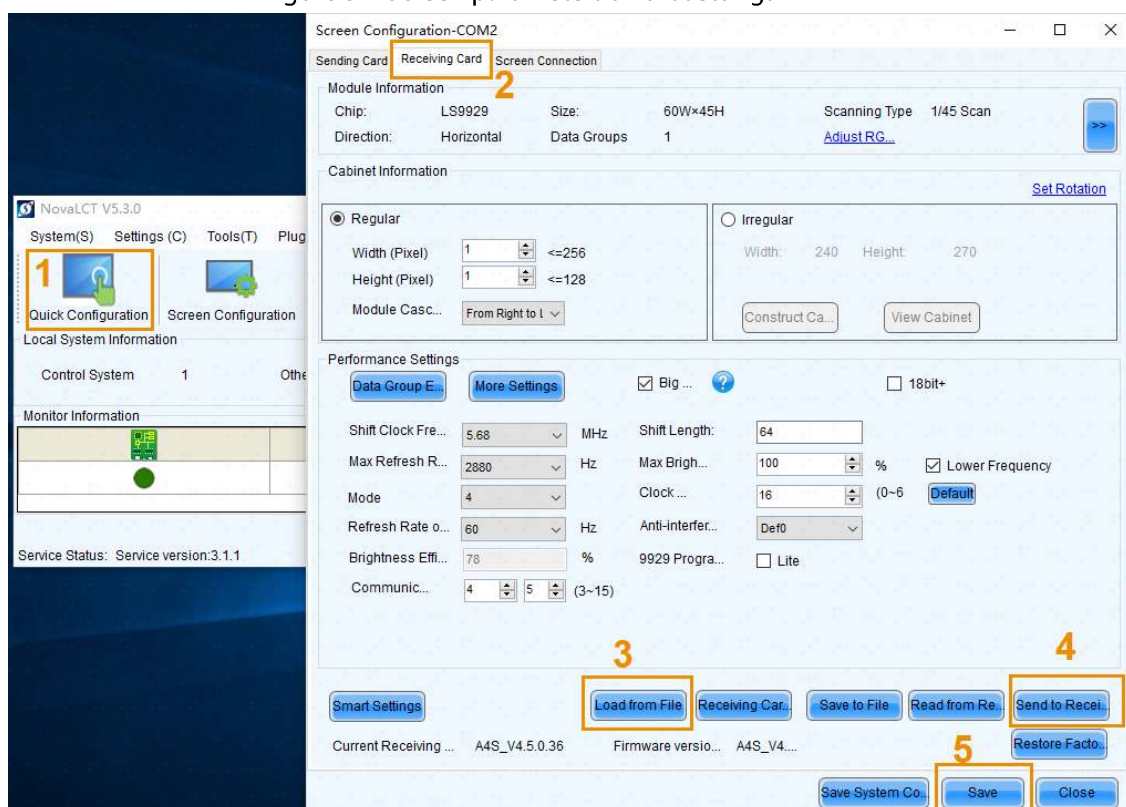
Step 2 Select **Screen Configuration > Receiving Card**.

Step 3 Click **Load from File**, and then select the correct *.rcfgx file.

Step 4 Click **Send to Receiving Card**.

Step 5 Click **Save**.

Figure 3-7 Screen parameters smart settings



Related Operations

Click **More Settings** > **Additional Function**, you can enable additional functions such as eliminating isolated pixel afterglow, opening or closing indicator light of receiving card, enabling brightness becomes strong slowly.

3.7 Adjusting the Brightness

Adjust brightness for each sending card through the following 2 methods:

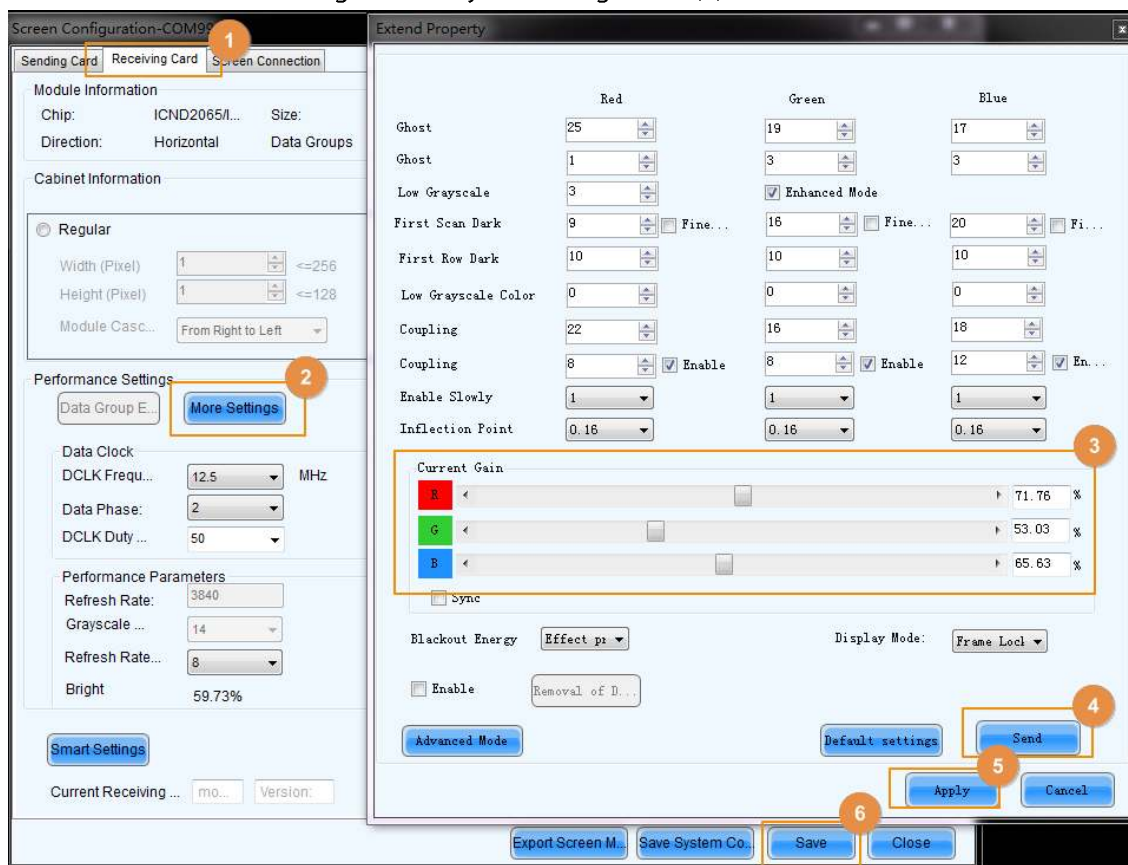
- Current Gain:
 1. Select **Receiving Card** > **More Settings**.
 2. Adjust the R, G, B value as needed.



The current gain has been adjusted to the appropriate brightness and color temperature before delivery. Please modify it with caution.

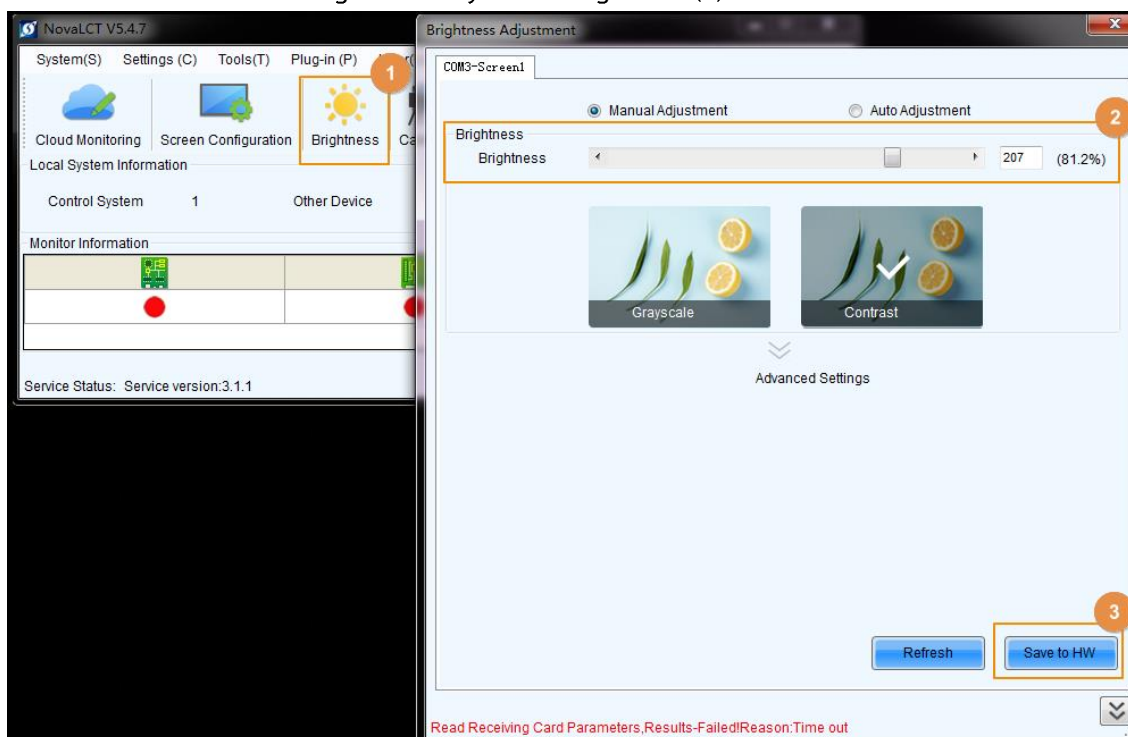
3. Click **Send**, and then click **Apply**.
4. Click **Save**.

Figure 3-8 Adjust the brightness (1)



- Homepage:
Go to the home page, click **Brightness**, drag the slider to set appropriate brightness, and then click **Save to HW** to finish the process.

Figure 3-9 Adjust the brightness (2)



4 Display-related Notes

- The LED lights used in the module are vulnerable to damage from ESD (Electrostatic Discharge). To prevent damage to the LED lights, please do not touch them while the equipment is in operation or when it is turned off.
- It should be avoided to turn on all load switches simultaneously, otherwise it is easy to cause the peak voltage to be too high. Avoid overloading the power cables to eliminate the potential fire hazard.
- Do not let any part of the display screen come into contact with any abrasive substances.
- Do not expose the display screen to extremely hot or extremely cold environments that exceed the temperature specifications.
- The product must be used in a manner that conforms to its design features. Regular inspections of the product must be carried out on a regular basis to check whether it is safe and reliable, whether there is wear, deformation, corrosion or other conditions that may affect the load handling capacity of the components.
- It is recommended to check all installed components regularly. For important components, the inspection frequency should be increased. If the components are damaged, in order to avoid reducing the load handling capacity, the damaged components must be removed immediately for repair or replacement.
- It is recommended that the LED display screen be equipped with a dedicated computer. Do not install software that is not related to the display screen. Regularly disinfect other storage devices such as USB flash drives. The working mode of the LED display screen is the copy mode, where the sound and image are displayed synchronously with the computer. Therefore, the computer should not be used for other purposes or to play or watch irrelevant videos on it, so as not to affect the playback effect. Non-professional staff shall not dismantle or move the equipment related to the display screen without authorization.
- Trial operation of new screens: For new screens that have been stored for less than three months, they can be played and used at normal brightness. For new screens that have been stored for more than three months, when the screen is turned on for the first time, set the screen brightness to 30%, run continuously for 2 hours, turn it off for half an hour, and then set the screen brightness to 100% when turning it on again, run continuously for 2 hours, and observe whether the LED screen is normal. After everything is normal, set the brightness of the screen body according to requirements.
- LED display screens are electronic products. It is recommended to turn on the screen body regularly for operation. For indoor display screens that have been installed but not turned on and have been idle for more than 15 consecutive days, when using them again, the brightness of the screen body should be reduced for video aging. The process refers to the trial operation of new screens. Do not operate with high brightness or continuously display white.

5 Screen Common Failures and Solutions

5.1 Front Modules Maintenance

The modules are designed with magnet suction, so they can be removed from the front using a wind suction tool. According to the sign, determine the direction of the module and replace it. As shown in the figure:



5.2 Front Two-in-One HUB Maintenance

Use a screwdriver to loosen the screws securing the power cover, remove the cover, then loosen the screws securing the HUB board. You can then remove the two-in-one HUB board. (We recommend loosening the screws from the bottom up to ensure your safety and the safety of the case.) As shown in the figure:



Figure 1 Power Cover



Figure 2 2-in-1 HUB

5.3 Troubleshooting Common Simple Faults

Phenomenon 1: Black screen

- Check whether the display screen is powered on and whether the indicator light of the switching power supply is normally on.
- Check whether the green signal light of the sending card is blinking.
- Check whether the settings of the graphics card are normal and whether the FPD is turned on.
- Check whether the signal lights on the receiving card are blinking normally.

Phenomenon 2: The display screen has screen artifacts or flickers.

- Check whether the DHMI cable is properly plugged in.
- Check whether the network cable has a short circuit or is broken.
- Check whether the screen refresh rate of the monitor is 60Hz.
- Check whether the transmission distance of the network cable exceeds the limit.

Phenomenon 3: A certain part of the display screen goes black.

- Check whether it happens that the position of just one receiving card is not lit. Check whether the voltage of the receiving card is 5V and whether the network cable input to the receiving card is normal.
- If one unit board is not lit, check whether the flat cable input to the unit board is loose.

Appendix 1 Security Commitment and Recommendation

Dahua Vision Technology Co., Ltd. (hereinafter referred to as "Dahua") attaches great importance to cybersecurity and privacy protection, and continues to invest special funds to comprehensively improve the security awareness and capabilities of Dahua employees and provide adequate security for products. Dahua has established a professional security team to provide full life cycle security empowerment and control for product design, development, testing, production, delivery and maintenance. While adhering to the principle of minimizing data collection, minimizing services, prohibiting backdoor implantation, and removing unnecessary and insecure services (such as Telnet), Dahua products continue to introduce innovative security technologies, and strive to improve the product security assurance capabilities, providing global users with security alarm and 24/7 security incident response services to better protect users' security rights and interests. At the same time, Dahua encourages users, partners, suppliers, government agencies, industry organizations and independent researchers to report any potential risks or vulnerabilities discovered on Dahua devices to Dahua PSIRT, for specific reporting methods, please refer to the cyber security section of Dahua's official website.

Product security requires not only the continuous attention and efforts of manufacturers in R&D, production, and delivery, but also the active participation of users that can help improve the environment and methods of product usage, so as to better ensure the security of products after they are put into use. For this reason, we recommend that users safely use the device, including but not limited to:

1. Account Management

1.1 Use complex 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: 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 repeating characters, such as 111, aaa, etc.

1.2 Change passwords periodically

It is recommended to periodically change the device password to reduce the risk of being guessed or cracked.

1.3 Allocate accounts and permissions appropriately

Appropriately add users based on service and management requirements and assign minimum permission sets to users.

1.4 Enable account lockout function

The account lockout function is enabled by default. You are advised to keep it enabled to protect account security. After multiple failed password attempts, the corresponding account and source IP address will be locked.

1.5 Set and update password reset information in a timely manner

Dahua device supports password reset function. To reduce the risk of this function being used by threat actors, if there is any change in the information, please modify it in time. When setting security questions, it is recommended not to use easily guessed answers.

2. Service Configuration

2.1 Enable HTTPS

It is recommended that you enable HTTPS to access Web services through secure channels.

2.2 Encrypted transmission of audio and video

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

2.3 Turn off non-essential services and use safe mode

If not needed, it is recommended to turn off some services such as SSH, SNMP, SMTP, UPnP, AP hotspot etc., to reduce the attack surfaces.

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

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

2.4 Change HTTP and other default service ports

It is recommended that you change the default port of HTTP and other services to any port between 1024 and 65535 to reduce the risk of being guessed by threat actors.

3. Network Configuration

3.1 Enable Allow list

It is recommended that you turn on the allow list function, and only allow IP in the allow list to access the device. Therefore, please be sure to add your computer IP address and supporting device IP address to the allow list.

3.2 MAC address binding

It is recommended that you bind the IP address of the gateway to the MAC address on the device to reduce the risk of ARP spoofing.

3.3 Build a secure network environment

In order to better ensure the security of devices and reduce potential cyber risks, the following are recommended:

Disable the port mapping function of the router to avoid direct access to the intranet devices from external network;

According to the actual network needs, partition the network: if there is no communication demand between the two subnets, it is recommended to use VLAN, gateway and other methods to partition the network to achieve network isolation;

Establish 802.1x access authentication system to reduce the risk of illegal terminal access to the private network.

4. Security auditing

4.1 Check online users

It is recommended to check online users regularly to identify illegal users.

4.2 Check device log

By viewing logs, you can learn about the IP addresses that attempt to log in to the device and key operations of the logged users.

4.3 Configure network log

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

5. Software Security

5.1 Update firmware in time

According to the industry standard operating specifications, the firmware of devices needs to be updated to the latest version in time in order to ensure that the device has the latest functions and security. If the device is connected to the public network, it is recommended to enable the online upgrade automatic detection function, so as to obtain the firmware update information released by the manufacturer in a timely manner.

5.2 Update client software in time

We recommend you to download and use the latest client software.

6. Physical protection

It is recommended that you carry out physical protection for devices (especially storage devices), such as placing the device in a dedicated machine room and cabinet, and having access control and key management in place to prevent unauthorized personnel from damaging hardware and other peripheral equipment (e.g. USB flash disk, serial port).

ENABLING A SMARTER SOCIETY AND BETTER LIVING

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