LianTronics

Display All You Want !

LED Rental Display RC Serial Product
User Manual

This manual is only for operating instructions and dose not serve as repairing service.

Changes

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LIANTRONICS CO., LTD

Add: Liantronics Building, No.1 Liuxian 3rd Road, Section 68,
Baoan District, Shenzhen, China
Postcode: 518101
E-mail: oversea@liantronics.com; service@lcjh.com
Visit us at the web: www.liantronics.com

Contents

1. SAFETY

This chapter contains important information to prevent personal injury and product damage when you install the display. Read this chapter and keep it properly. Ensure that you understand and follow all the safety instructions and warnings in this chapter before installing.

Personal Protection

⚠️	**Warning:** Ensure that you understand and follow all the safety instructions, warnings mentioned in this manual.
⚡	**Warning:** Pay attention to electric shock.
🪖	**Warning:** Wear a hard hat to reduce the risk of personal injury.
⚠️	**Warning:** Be aware of suspended loads.
⚠️	**Warning:** Mind your fingers while dealing with heavy loads.

Personnel of installation and maintenance

The installation and maintenance of this product must be performed by authorized and qualified technical personnel only. The manufacture dose not take responsibility for the results caused by incorrect, improper, irresponsible and unsafe actions.

GND and Lightning protection

Do not underestimate the safety protection of grounding plug/socket. If the supplied plug/socket is defective, replace the defective parts. Ground the product correctly to avoid electric shock caused by large electricity leakage.

Disconnect the power in the time of lightning, or provide other suitable lightning protection device. Disconnect the power plug when the product is not used in a long period.

Ambience of installation and use

- The ambient temperature for LED display: max 40°C, min 0°C.

- Ensure that the ventilation is good. Do not jam or drop metal particles and cable pieces into ventilation opening. Keep the ventilation surface clear without foreign matters like wrapping materials. False actions may lead to poor ventilation and cause fire, malfunction and error.

- Install LED display far away from radiator, heater, furnace and other equipments hindering ventilation and heat dissipation (including but not limited to amplifier, laser, ultrasonic vibration devices), flammable materials (like curtains) and other unsafe devices.

- I/O signal cables should be shielded to restrain the high-frequency interference.

- LED display can not contact with any corrosive and abrasive matter. Do not use LED display in moist ambience, in ambience containing airborne contaminant, dust, oily fume, corrosive gas and flammable gas, and in ambience with vibration and shock.

- This LED indoor product is designed only for indoor use. Never install and use it in outdoor environment and keep it far away from direct sunlight, dust and moisture.

ESD and LED:

LED components are ESD (Electro-static Discharge) sensitive. Do not touch LED components when the display is in operation or switched off.

Disconnect device:

When the appliance inlets of the individual tiles are not accessible, the socket outlets supplying the rack shall be installed near the equipment and be easily accessible, or a readily accessible general disconnect device shall be incorporated in the fixed wiring.

Mounting parts:

The mounting parts are only used to install LED display. Do not repair or copy. Only use parts appointed by the manufacturer. Contact LIANTRONICS if you want customized application.

Product care:

Inspect all installations on a routine basis to check security, wear, deformation, corrosion or any other situation that reduces load-carrying capability. Increase inspection frequency for key parts. Keep structural and mounting parts dry, clean, lubricated (only if recommended), coated properly, and maintain complying with part design. Defective parts must be removed or replaced at once.

Installation and wiring:

Install the display and connect cables following the manual instructions. The installation and wiring must be secure. Poor connection may lead to malfunction. Do not step on power/data cable or squeeze plug, socket and power/data cable. Do not suspend any items on cables or the back of LED display. Connect or disconnect the cables of data communication, extension module or control unit after the power is off to prevent product damage or malfunction.

Risk of electric shock:

- To avoid electric shock and damage , do not dismantle the inside electrical parts.
- Do not hot plugging the cables to prevent electric shock or circuit damage.
- Keep clean after installing and cabling. Be ensure all the devices and terminals are covered before tune on the power.
- Do not touch the terminals when power is on. Clean and screw the terminals when power is off.

Moving or transporting product:

Do not hit the corners of LED tiles when installing or dismantling LED tiles. Be careful when moving or transporting the product to prevent any damage.

LED tiles can not be transported in containers other than LIANTRONICS flight cases or packaging. Even the use of LIANTRONICS packaging does not guarantee the LED tiles against damage due to excessive force of impacts. All warranty claims regarding damaged modules due to incorrect packing will be rendered invalid.

2. INSTALLATION REQUIREMENTS

This chapter specifies the requirements for safety, mechanism, electricity and control software of RC series LED display.

Warning: This LED indoor product is designed only for indoor use. Never install and use it in outdoor environment and keep it far away from direct sunlight, dust and moisture.

2.1 Mechanical Requirements

Weight

Warning: Do not underestimate the weight of a complete RC series LED display. Be sure that the floor or truss installation on which the RC series display has to be installed is capable of handling five (5) times the complete load of the display. For floor mounting, conclude the weight of any other load.

Caution: one RC series tile weighs approximately 11kg (or 46kg per square meter).

Horizontal surface

For floor installation, the floor on which RC series display is installed must be horizontal. Never install

LED display on a slant surface.

Ballast

Depending on the height of the display and the position of the LED display upon the foot beams (somewhere between front and middle) , additional weight (ballast) will be required. Consult professionals of LIANTRONICS to calculate the minimum ballast you require for safe installation of the LED display.

Truss beam

The truss beam has to be provided and installed by the customer. Pay attention to following points for installation design and preparation. Calculate precisely for on individual basis.

Weight tolerances: Ensure that the truss beam and the ceiling against which the truss beam has to be installed is able to handle the complete weight of the RC series LED display.

Ceiling stability.

Installation ambience

Environmental conditions: humidity, ventilation, temperature, etc.

Location: Altitude, etc.

Front clearances: for optimal effect, ensure that enough free space is supplied in front of the LED. display and respect the minimum viewing distance

Comply with local regulations regarding such installations.

Warning: Suspending installation is limited to a height of 20 RC series tiles.

2.2 Electrical Requirements

Power requirements

The displaying area of one RC series tile is 0.238 m². RC series LED tiles have different pixel densities (see Appendix A – technical specifications). For different pixel densities, one RC series tile may need power supply of 0.6 amps to1.5 amps at 220 VAC, 200-240 VAC, 50-60 Hz. Each RC series tile has one input and one output socket of AC power. The power is distributed to display tiles by power split cables from power distributor. However, one power split cable can be connected with 8 – 20 tiles in parallel. So, one power split cable has to be provided for every 8 – 20 tiles.

Protect every power cable by a circuit breaker or fuses rated 16 A / 250 VAC (15 A / 250 VAC in the USA and America). LIANTRONICS provides a range of power distributor to satisfy the demands of your LED display. See more details for power distributor of LED display in Power Distribution Section. Contact LIANTRONICS for more information.

Power system

It is recommended to use power distribution system with a separate neutral and grounding conductor) to avoid large current loops due to voltage differences in the neutral conductor.

•Protect the electrical installation by switch, circuit breaker, over-voltage protector, defective-grounding circuit breaker with proper rated power.

•Install the display in accordance with local electrical installation standards. In Europe, comply with EN 60364, the standard for electrical installation of buildings. In Germany, comply with EN 60364. In America, comply with National Electrical Code ANSI/NFPA 70.

Protective grounding

To prevent against the risk of electric shock, the installation should be properly grounded. Defeating the purpose of grounding will expose you to the risk of electric shock.

2.3 System Requirements

Before you begin, it is assumed that you are familiar with the Windows XP operating software. The CD-ROM in your package contains a Windows 7-based installation program. You can install the software from the CD-ROM.

System requirements

Minimum specifications:

- **l** Hardware
  - **n** PC Pentium IV 2.0 GHz or equivalent
  - **n** 1 GB RAM
  - **n** Free hard disk space: 10GB
  - **n** XGA resolution (1024 x 768)
  - **n** Serial communication port
  - **n** Ethernet connection
- **l** Software
  - **n** Windows 7 Professional

Recommended specifications:

- **l** Hardware
  - **n** PC Intel i5 processor or above
  - **n** 4GB RAM
  - **n** Free hard disk space: 500 GB
  - **n** SXGA resolution (1280 x 1024), with 512MB video memory
  - **n** Serial communication port
  - **n** Ethernet connection
- **l** Software
  - **n** Windows 7 Professional

3. SYSTEM INTRODUCTION

3.1 Brief Introduction

RC series series is the LED indoor display product of LIANTRONICS that uses die-casting aluminum frame with CNC high precision machining techniques. With its compact, light and handy exterior, the LED tile is easy to install and disassemble. As the tile dimension is of very high precision, so the whole display keeps in high flatness and seamless.

3.1.1 Key Benefits

•High resolution and high pixel density, reproducing reality of high definition video

•Uniform color and high contrast, ensuring clear and sharp picture

•High precision die-casting aluminum tile, achieving high flatness and seamless matching of the whole display

•Fan-less design with good heat dissipation, achieving noise-free

•Light and slim tile, easier to handle and transport

•Hanging pole and side lock design, for quick and convenient installation

•High stability and reliability, prolonging lifespan of the display

3.1.2 Applications

Indoor hall, multi-functional conference hall, performing hall, theater, stage, command and control center and so on.

3.2 System Components

RC series series LED display system includes the following basic components:

•**LED Display:** RC series series LED display tiles, power supply cables, signal cables, connectors

•**Control System:** control computer, LED display controller, distributor, control system software

•**Power Distribution System:** power distribution box, power cables

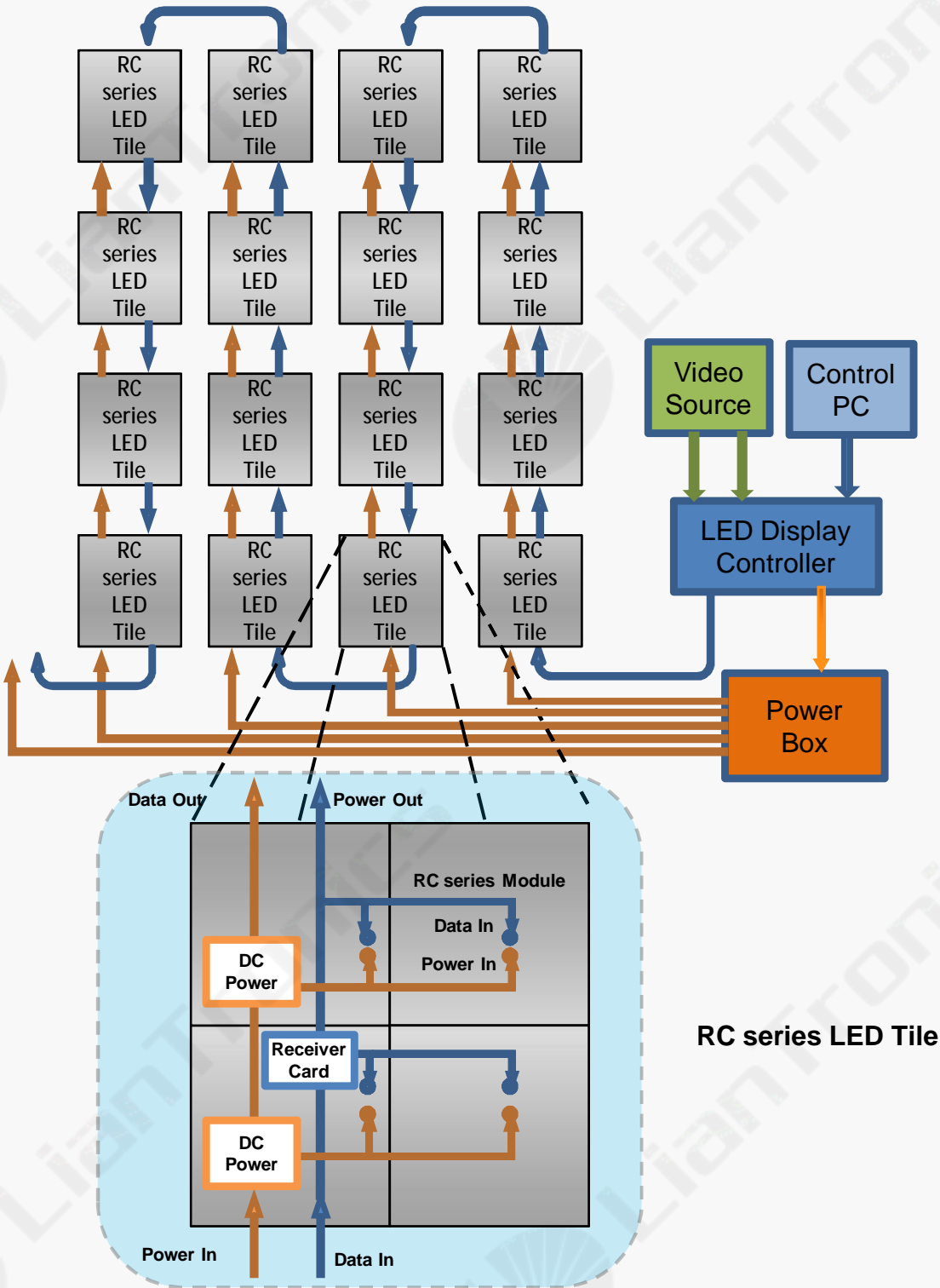•**Peripheral Devices:** video processor, optical fiber transmitter

Image 3-1 Block diagram of RC series LED display system

LED Display Components List

Number	Name	Function /Explanation
LED Display Components		
1	RC series series display tile	Tile size: 488mm X 488mm, Weight: 11 kg
2	Power cord plug and socket	Used for power supply loop between tiles; the plug is for output, and the socket is for input.
3	RJ45 data cord plug and socket	Used for data link between tiles; the plug is for output, and the socket is for input.
Control System Components		
1	LED display control computer	Industrial control computer
2	Controller	Convert and send video signal
3	Distributor	Distribute the data signal to different tiles
4	DVI output graphics card	Support the output of multiple screens
5	Light sensor	Adjust brightness automatically according to the environment brightness
6	Receiver card	One card for one tile
7	Power management board	Support remote power supply
8	LED control system software	1.Control, set and play video list on LED display 2.Support calibration on-site 3.Support manual and automatic brightness adjustment 4.Support turning on/off LED display through remote network
Power Distribution System Components		
1	Power distribution cabinet	Support remote control power supply
2	Power distribution box	Support remote control power supply
3	Lightning arrester	International brand, to avoid lightning
4	Power cable	Comply with international standards
Peripheral Devices		
1	Video processor	Different models of Voao or Magnimage are available.
2	Optical fiber transmitter	Both single mode and multiple modes optical fiber transmitter can be used; multiple modes transmitter for 500M, and single mode transmitter for 20KM.
3	Optical fiber	8 cores optical fiber with premium brand
4	Heat sink devices	Axial flow fan can be chosen according to the heat dissipation space and the environment temperature.

⚠️ **Warning**: LED display modules can be easily damaged, so the original packing materials are needed for the maintenance of the display modules. All the warranty claims are invalid for the damage caused by wrong package.

3.3 LED Display Components

RC series Tile

RC series series LED display is built with RC series tiles. A tile consists of die-casting aluminum frames in high accuracy, RC series display modules, switching power supply, receiver cards, and some other mechanical and electrical connection parts. The RC series die-casting aluminum frame adopts one time die-casting and CNC precision processing technology with high quality aluminum to ensure the high accuracy of the frame and the uniformity of the whole display.

The introduction of the main components of RC series tile is shown as below with related images.

3.3.1 Die-Casting Aluminum Frame

Each die-casting aluminum frame is installed with four RC series display modules. There are LED signal receiver cards and low voltage DC switching power supply inside the frame, and they all have electrical connection with 4 RC series display modules. There are special designs for fixing and connecting the tiles at each side of the die-casting aluminum frame. The frame has attachment points at the back and four corners. The attachment points are to fix the tiles to the supports like steel structures and buildings.
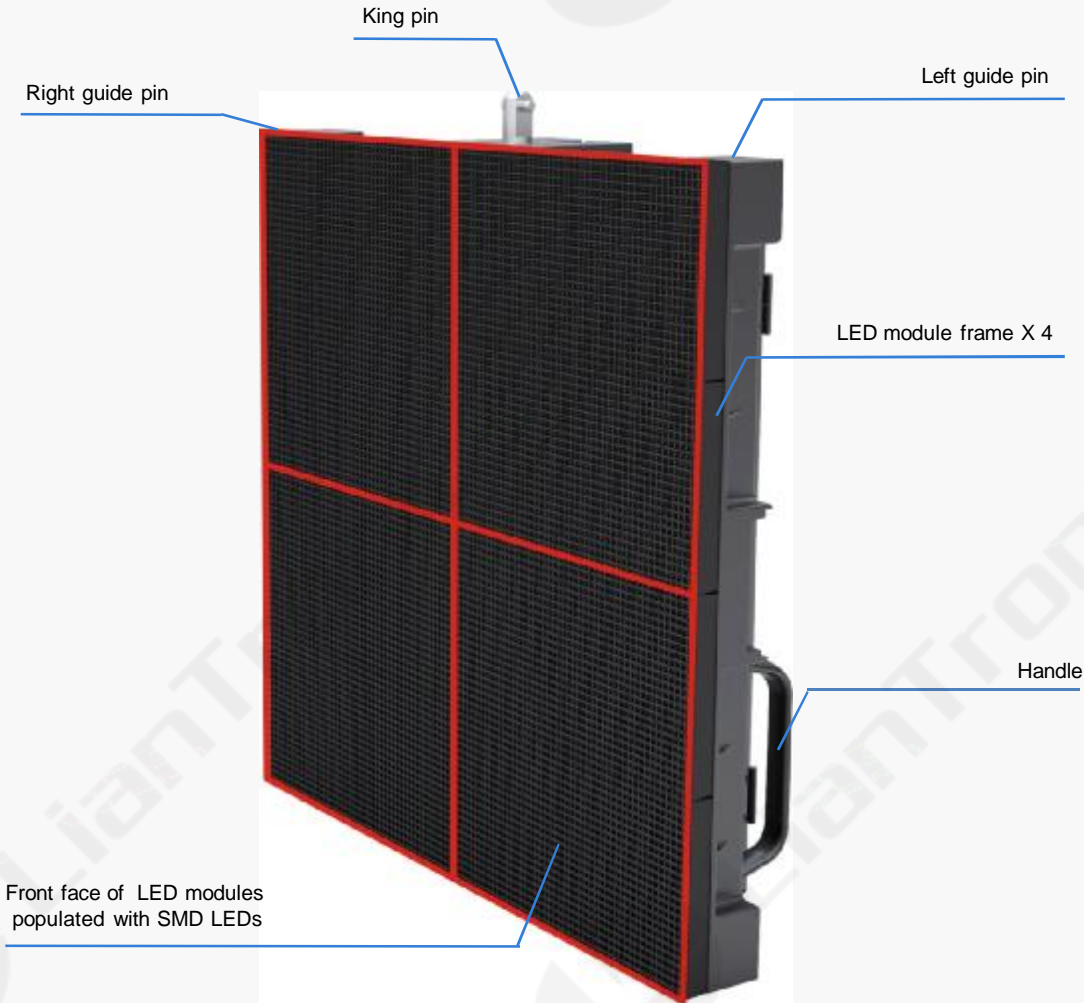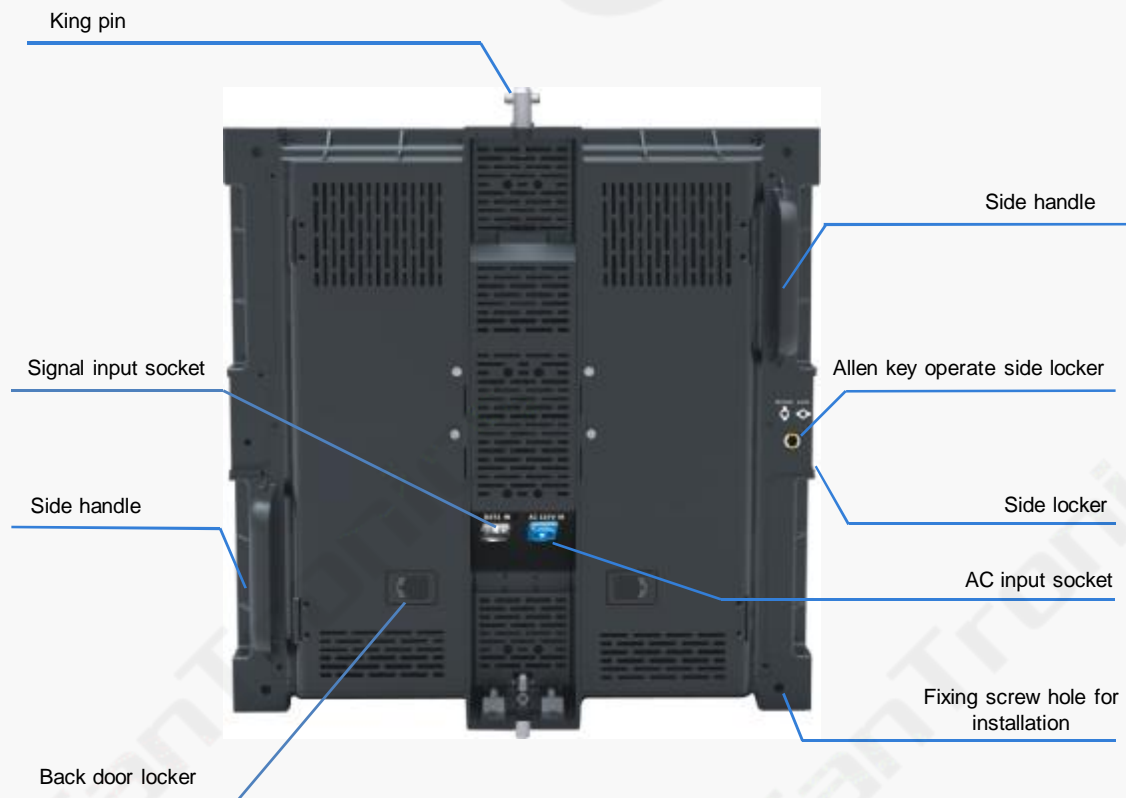
Image 3-2 The front face of RC series display tile

1. RC series tile has 4 grids for 4 modules to be fixed in. Each grid has 8 screw holes to fix one module. The precise positioning of the screw holes ensures the precise positioning of all modules. Keep screw holes clean to achieve smooth installation of the modules and avoid seams between tiles and uneven pixel pitches. There are also materials for eliminating the seam between tiles to ensure the smooth and uniformity of the whole display.

2. There is a pair of power/data sockets and a pair of power/data plugs at the back of each RC series tile. The sockets are for inputting power/data, and the plugs are for outputting of power/data.

3. Each RC series display tile can be equipped with thermal speed controlled fans to make sure the normal working temperature of the tile under high temperature conditions.

4. Each of the four corners at the back of RC series die-casting aluminum frame has a fixed screw hole to support the installation. Each side of the upper frame has a pin used for the precise connection between the upper and lower tiles.

> ⚠ **Warning:** A maximum of 20 tiles are limited to stack up or suspend without the external support.

King pin

Side handle

Signal input socket

Allen key operate side locker

Side handle

Side locker

AC input socket

Fixing screw hole for installation

Back door locker

Image 3-3 The back face of RC series display tile

3.3.2 RC series Module

RC series module includes plastic base frame, PCBA, plastic mask, etc. At the back of the plastic base frame, two copper screw holes are inlaid at each side to fix the module to the die-casting aluminum frame. The black LED lamp array lies in front of PCBA. Over the lamps, replaceable masks are equipped to protect the LED lamps and PCB and increase the light efficiency of the display. LIANTRONICS adopts the black full color SMD LED lamps. The use of black organic silicone and diffuser makes the black LED lamps darker to improve the contrast of the display significantly.

RC series tile includes 2×2 RC series display modules. Each module has four kinds of pixel pitch (mm): PH 3.81, PH 5.08mm, PH 6.09mm, PH 7.62mm with the corresponding module resolution (pixel) of 64×64, 48×48, 40×40, 32×32. The weight of each display module is about 1kg.

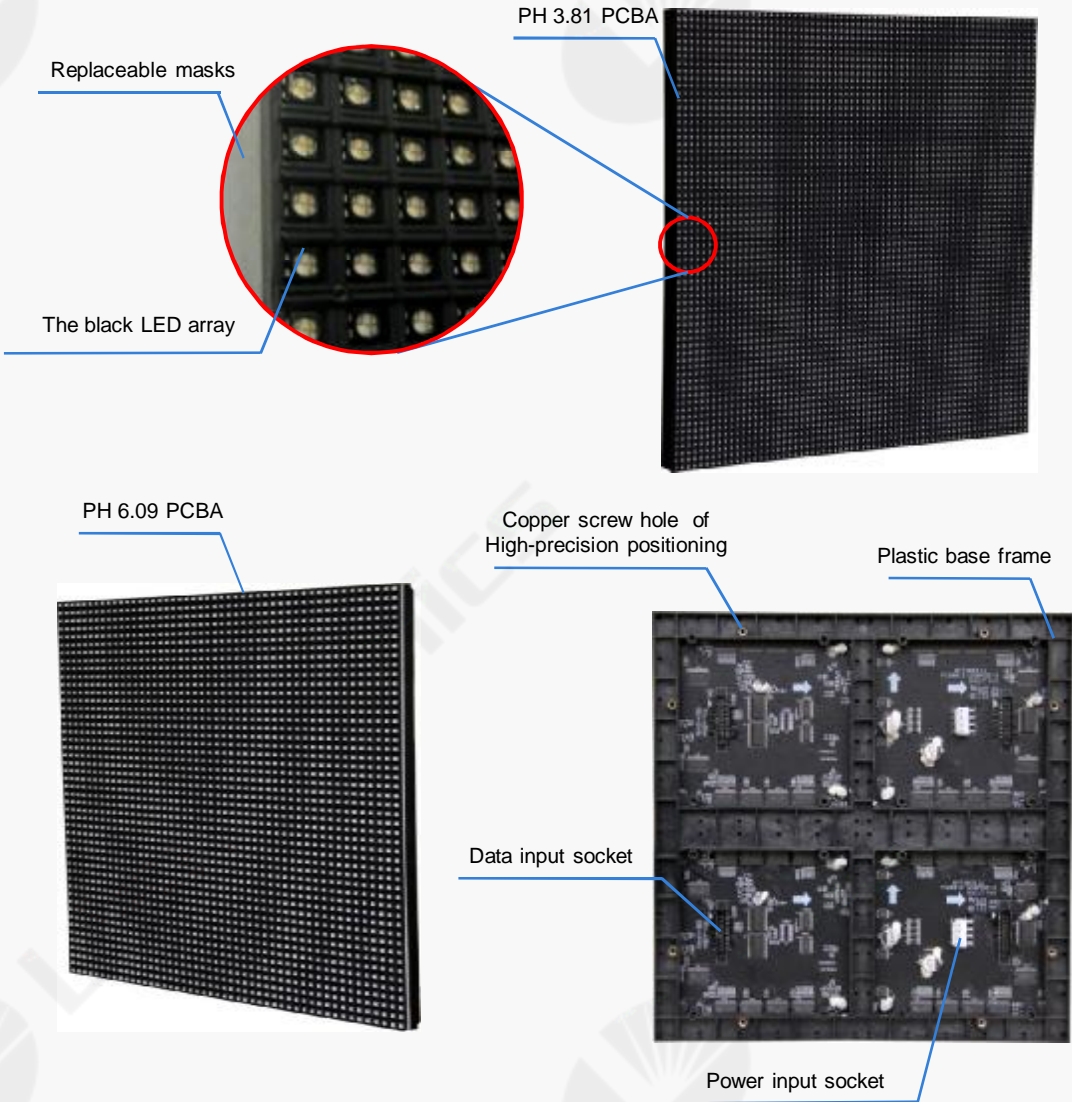**Warning:** RC series die-casting aluminum frame can only install RC series display modules.

Replaceable masks

The black LED array

PH 3.81 PCBA

PH 6.09 PCBA

Copper screw hole of
High-precision positioning

Plastic base frame

Data input socket

Power input socket

Image 3-4 The components of RC series display module

3.3.3 Socket and Plug for Power and Data Connection

The following two types of socket and plug are respectively used for the power and data connection between RC series display tiles. The power socket and plug is for the loop power connection between upper and lower tiles, and the data socket and plug is for the loop data connection between tiles.

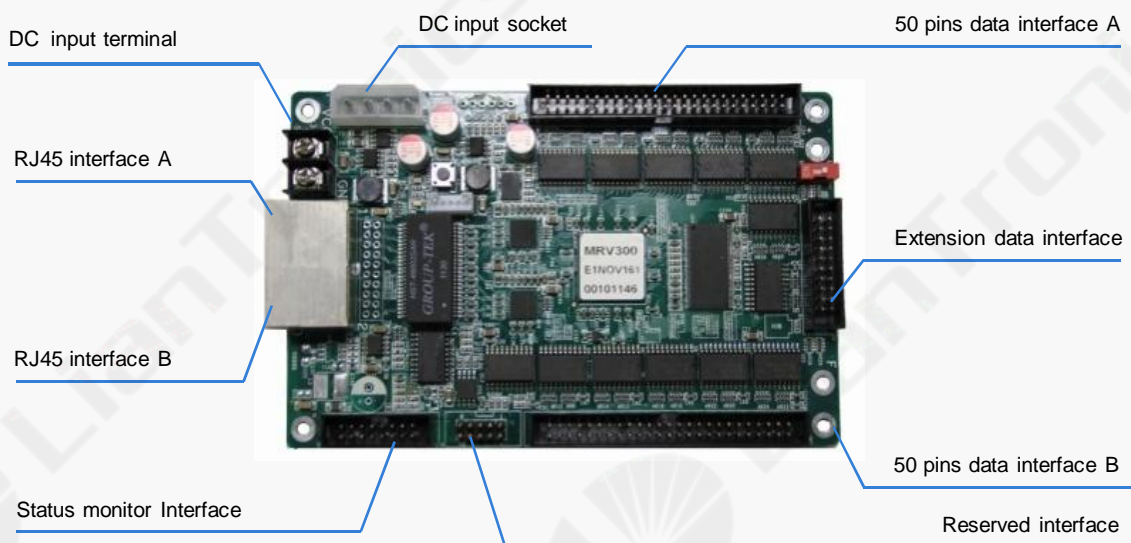**Image 3-5** Power and data plug and socket

Image 3-6 Power and data plug and socket

3.3.4 LED Receiver Card

Each RC series tile has one MRV300 receiver card for receiving and transmitting the data of LED display. The functions of the MRV300 receiver card are shown as below:

- Power supply: 3.3 - 5.0V
- Temperature monitoring (standard feature)
- Power supply voltage monitoring (standard feature)
- Working status monitoring (standard feature)
- 16 RGB data groups output (it can be extended to 32 groups.)
- Load capacity of single receiver card up to 256×128
- Support pixel level brightness/color calibration

DC input terminal
DC input socket
50 pins data interface A
RJ45 interface A
Extension data interface
RJ45 interface B
Status monitor Interface
50 pins data interface B
Reserved interface

Image 3-7 MRV300 receiver card

3.4 LED Control System

This chapter introduces the control system and software of RC series display.

3.4.1 MCTRL300 Controller

MCTRL300 is LED controller with autonomous power supply. The main functions are shown as below:

1. DVI interface for video input

2. USB interface for instruction communication

3. Resolutions supported: $1024\times1200,1280\times1024,1600\times848,1920\times712,2048\times668$

4. Two serial interfaces

5. Light sensor interface integrated

6. Audio input interface integrated

Image 3-8 MCTRL300 controller

3.4.2 MSD300 Transmitter Card

1.DVI interface for video input

2.USB interface for instruction communication

3.Audio input interface

4.Resolutions supported:1024*1200, 1280*1024, 1600*848, 1920*712, 2048*640

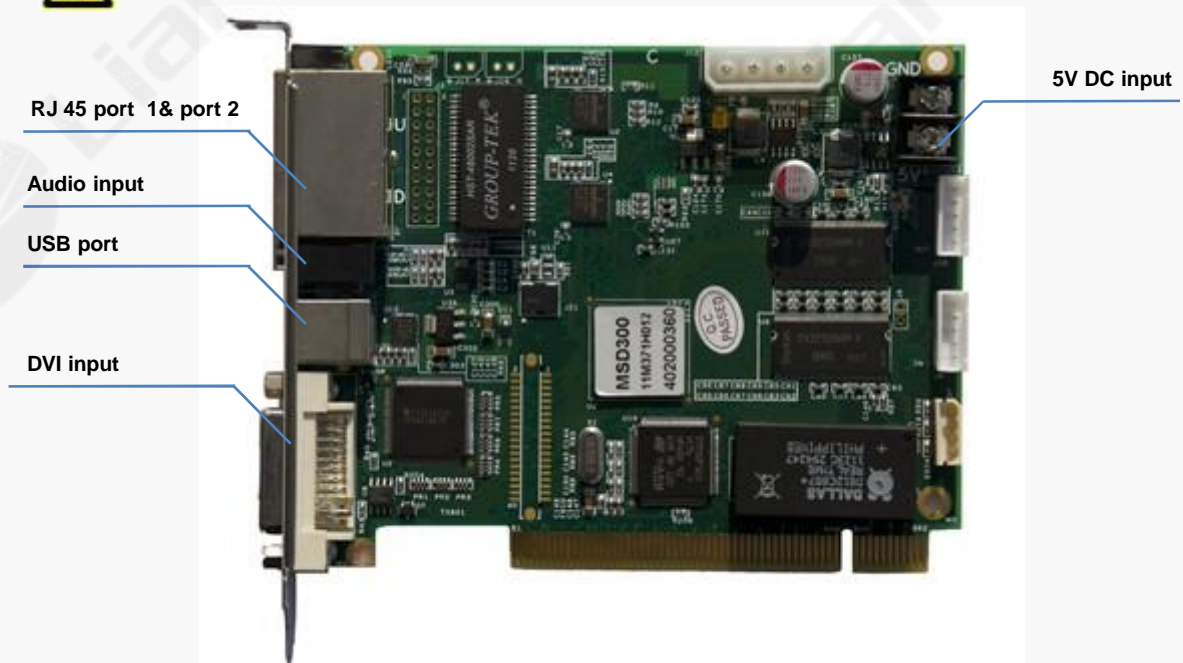⚠️ **Caution:** A multifunction card is required for audio output.

RJ 45 port 1& port 2

Audio input

USB port

DVI input

5V DC input

Image 3-9 MSD300 sending card

3.4.3 MCTRLR Controller

1.Two DVI interfaces for cascade (video input and output)

2.Audio input interface

3.Optional data output interfaces (4 RJ45 Ethernet ports or 4 optical fiber ports) to scan boards (receiver cards)

4.RS232 serial ports for cascading instruction communication

5.Maximum load capacity: 1920×1200

Image 3-10 MCTRLR controller

3.4.4 MFN300 Multifunctional Card

1.RJ45 ports for connection with receiver cards

2.serial ports for connection with the control computer

3.Support 8 power supply control

4.Support light sensors

5.Support temperature and humidity monitoring

6.Audio input interface

⚠️ **Caution:** The best connect position of function card should be between sending card and the first receiving card， either terminal or socket can be chosen for DC input.
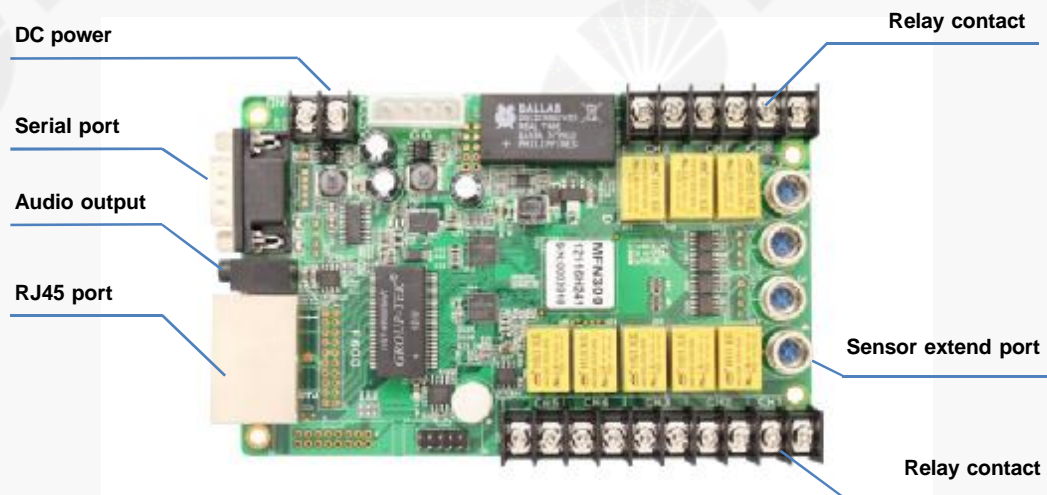

DC power

Serial port

Audio output

RJ45 port

Relay contact

Sensor extend port

Relay contact

Image 3-11 MFN300 multi-function card

3.4.5 NS048C Light Sensor

1.For environment brightness monitoring

2.Connect to controllers(MSD300, MCTRL300) or multifunction cards (MFN300)

3.The cable of standard configuration is 5 meters. With a special ordered cable, the working distance can be extended up to 100 meters.

Image 3-12 NS048C light sensor

ℹ️ **Note:** Consult the controller manual for more information about installation and usage guidelines.

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3.5 LED System Control Software

NovaL CT-Mars control software is used to configure and control LED display through PC. Software ware interface as follow：
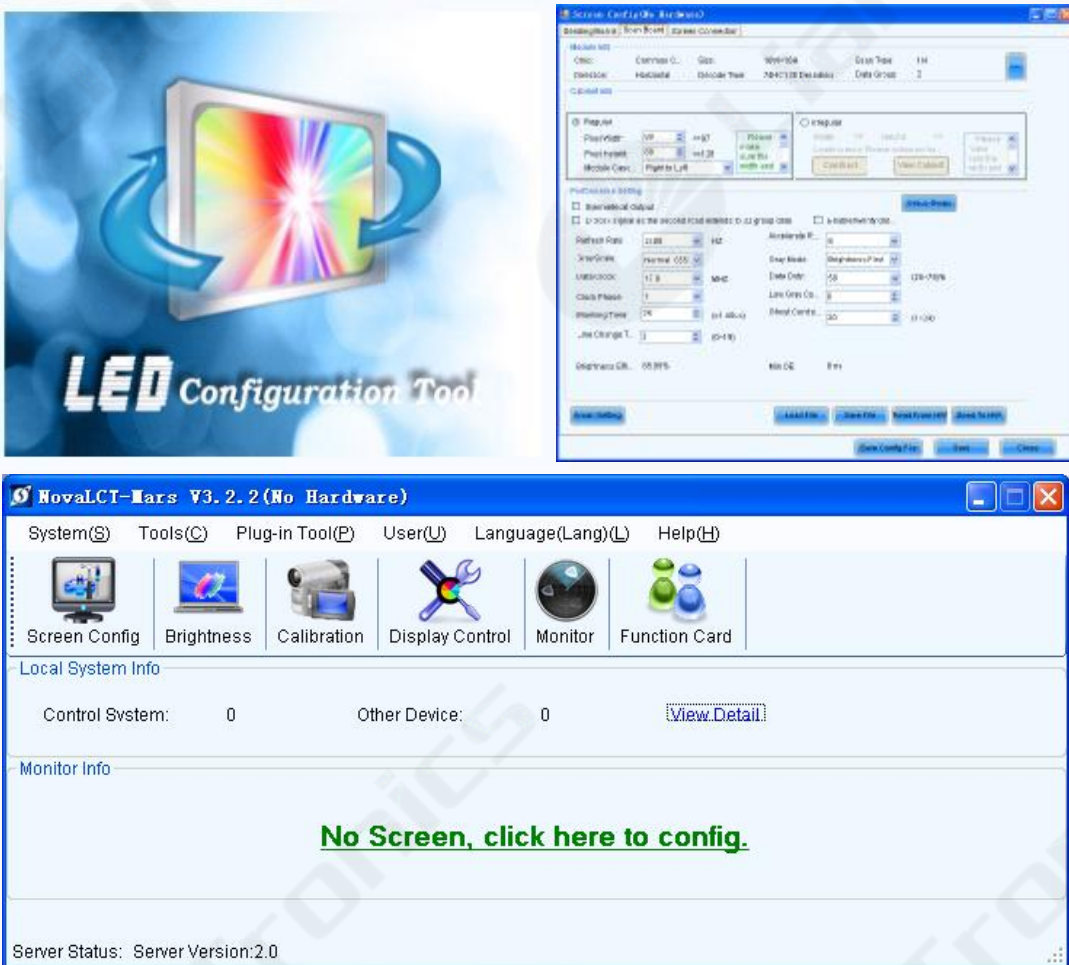

Image 3-13   NovaL CT-Mars control software interface

> **Note:** For more information about installation and instruction of control software, consult Nova LED Display Control System –Mars 3 User Manual.

3.6 Peripheral Device

M3 CVT310/CVT320 (EO converter)

When the distance between LED display and the controller is beyond 100 meters, optical converter is needed to ensure the stable signal transmit and high quality. LianTronics offers two complete solutions of optical fiber transmission including transmitter, receiver and optical fiber. Your choice depends on the required cable length.

Main Features:

•Use optical fiber of multimode, double cores and LC interface. Transmission distance up to 300m.

•One RJ45 Ethernet port for data input

•Power supply: 100 - 240V AC

•Use in pair.

Image 3-14 LC-LC fiber cable

Status indicators

RX Port

TX Port

RJ45 port

Power switch

AC Input

**Image 3-15 CVT 310 transmitter, receiver and optical fiber**

Note: Consult control system manual for more information about installation and usage guidelines.
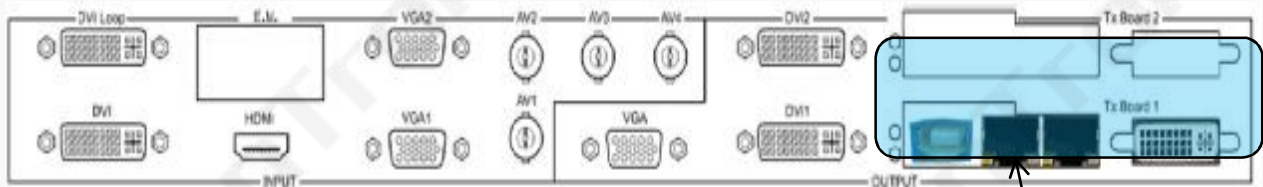
Video Processor
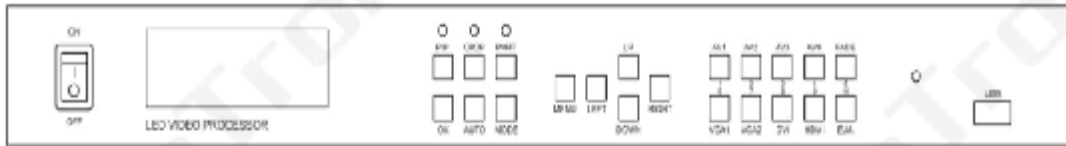
Image 3-16 Video processor front view

| Menu Key Functions			
PIP	Picture in picture function key	1/AV1	Numerical1/select AV1
CROP	Picture cropping key	2/AV2	Numerical2/select AV2
PART	Partial/Full display switch	3/AV3	Numerical3/select AV3
OK	Confirmation key	4/AV4	Numerical4/select AV4
AUTO	Automatic pixel location alignment key	5/FADE	Numerical5/fading transition
MODE	Preset mode call-out	6/VGA1	Numerical6/select VGA1
MENU	Main menu key, or up to previous key	7/VGA2	Numerical7/selectVGA2
LEFT	Moving cursor to left	8/DVI	Numerical8/select DVI
UP	Moving cursor to top	9/HDMI	Numerical9/select HDMI
DOWM	Moving cursor to bottom	10/E.M.	Numerical10
RIGHT	Moving cursor to right		
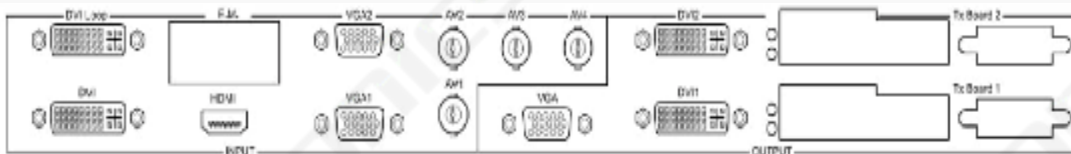
Image 3-17 Video processor rear side

Video Inputs		Video Outputs	
AV1~AV4	4 video inputs	DVI1~DVI2	2 DVI outputs (DVI-D single link)
VGA1~VGA2	2 VGA inputs	VGA	1 VGA output
DVI	1DVI input (DVI-D single link)	DVI Loop	1DVI loop output
HDMI	1 HDMI input	Tx Board1/ Tx Board2	Slots for 2 Tx Boards
E.M.	Extension module		

Video processor with one transmitter card

Transmitter card seated
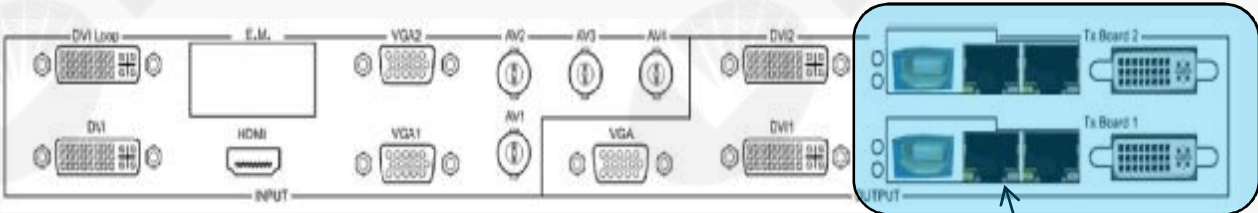
Video processor with two transmitter cards

Transmitter cards seated

Image 3-18 Video processor with sending card installed

3.7 Power Distribution System

Power Distribution Tile

The use of proper AC distribution system is necessary to make sure the safe operation to RC series LED display. Although the third party solution is available, LIANTRONICS offers power distribution solutions with various sizes and types. As for the small system, "single-phase power box" can be used, while for the medium system, each of the custom power boxes solutions can be used.

Image 3-19 Single-phase power box

Image 3-20 Three-phase power cabinet

Note: Consult the power box manual for more information about installation and usage guidelines.

Power Supply Location

Install power distribution cabinet in the control room outside of the display structure. Install a control box inside the display structure, which can control the display power supply independently, and control the maintenance of sockets and the lighting equipment. If it is 3-phase power supply, each phase should bear equally.

Power Distribution System

The power distribution cabinet has air switch, leakage protection switch, fuses, AC contactors, power lightning arrester. The door of the cabinet is also equipped with current-voltage testing meters, knob switches and signal lights. The distribution cabinet has protection of lightning, overvoltage, overcurrent, undervoltage, short circuit, open circuit and leakage. The main switches in the power distribution cabinet are made of the Schneider devices and all other accessories and wires has "CCC" certification.

3-Phase 5-Wire Power Line

Image 3-21 Typical power supply system diagram
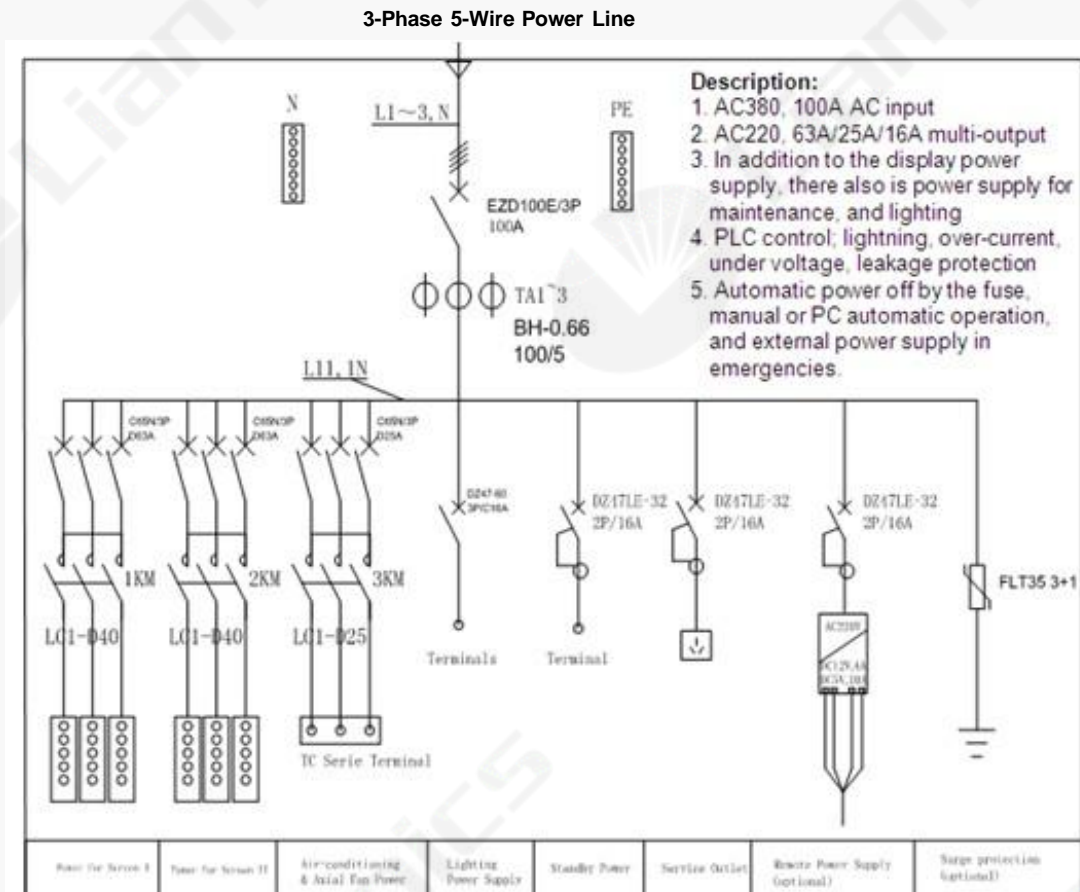
Selecting and layout of the power line

- LED display is supplied with AC220V power with good grounding and requires that the grid voltage fluctuation is less than 10%.

- Determine the diameter of the power cord according to the power of the display (Unit: mm^2, the cross-sectional area of the power cord).

- Power lines: set aside 5-10m between the power distribution box and the display. Cable: set aside 5-10m between the control room and the display.

The power supply has three-wire system (live, neutral and earth) or five-wire system (3 live wires, neutral and earth). When the maximum power consumption of the LED large-display is less than 10 KW, generally use single-phase three-wire power supply , and vice versa use the three-phase five-wire power supply.

4. SETUP PROCESS

This chapter describes the process of suspended installation and standing installation of RC series LED display.

⚠️ **Warning:** Safety first. Fence off the installation area before starting to install. Ensure you read, understand and follow the safety instructions mentioned in the chapter "Safety" of this installation manual. Furthermore, make sure that all the installation requirements are fulfilled.

The truss beam and level system used in this chapter are pure instructive, and assumes the truss beam and level system have been installed and answers to the flatness requirements. The customer is free to install his own truss beam and level system according to his own wishes but answering to the mechanical requirements mentioned in this installation manual.

4.1 Tile Check and Installation Preparation

Package Check

•Product Item Number —— Confirmed
•Package —— Perfect
•Complete Screen Appearance —— No Scrape

Cabinet Off-line Test

RC series cabinet supports off-line test. Users can test each RC series cabinet without connecting with LED control system. The test steps are as below:

1.Make sure that the receiving cards are connected with each of the LED modules but not connected with CAT5 data cable.

2.Turn on the LED screen, the tiles show nothing.

3.Press the black switch on the receiver card seven times. Then the display contents on the LED tile will be changed to Diagonal, Grey, Red, Green, Blue, White and Black in order.
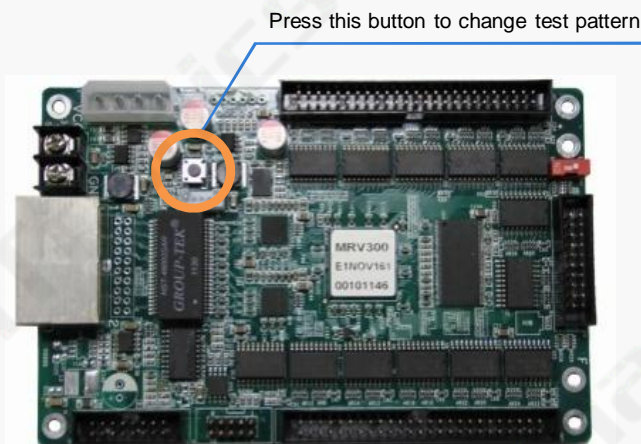
Press this button to change test pattern

Image 4-1 Off-line Test button on receiver card

Installation Preparation

Good viewing angle and good sight for the surroundings

•Favorable ventilation conditions
•Safe and stable rating input voltage
•Suitable size, firm and stable installation table-board
•Rear maintenance access is at least 800mm.

Tools list for installation (choice depends on the practical jobsite)

1. Diagonal cutting pliers	2. Combination pliers	3. Screw drivers
Cut the wire	Cut the steel wire rope	Install tiles and power supply
4. L shape spanners	**5. End wrench tool set**	**6. Adjustable wrench**
Tighten or loosen the screw	Tighten or loosen the screw	Install tiles
7. Socket wrench	**8. Digital multi-meter**	**9. Rubber hammer**
Assemble the screen	Measure voltage or current	Adjust the gap between tiles

Other tools for installation (choice depends on the practical jobsite)

Tools	Quantity	Function
Electric drill	1pc	Drill holes on the wall or frame
Rivet drill	1pc	Fix the cabinet in place
Electric adhesive plaster	Several	Isolate electricity after wire connected
Tape measure	1pc	
High-brightness flashlight	1pc	Used in the dark area
Safety rope	Ref.	Personal safety, very important
220V power outlet board	1pc	Power supply
Level & vertical ruler	1pc	Test the level of the frame

4.2 Setup Process of Suspended Installation

⚠️ **Warning:** RC series display is limited to a height of 20 RC series display tiles and the display surface has to obtain the flatness within a tolerance zone of +/-0.2 mm and keep perpendicular to the reference surface.

Setup Process

1. Assemble five RC series tiles to be the center tiles of the whole display and level them out using a bubble level. Turn the side lock with hexagon screw to connect the left and right tiles horizontally, shown as the image 4-2.
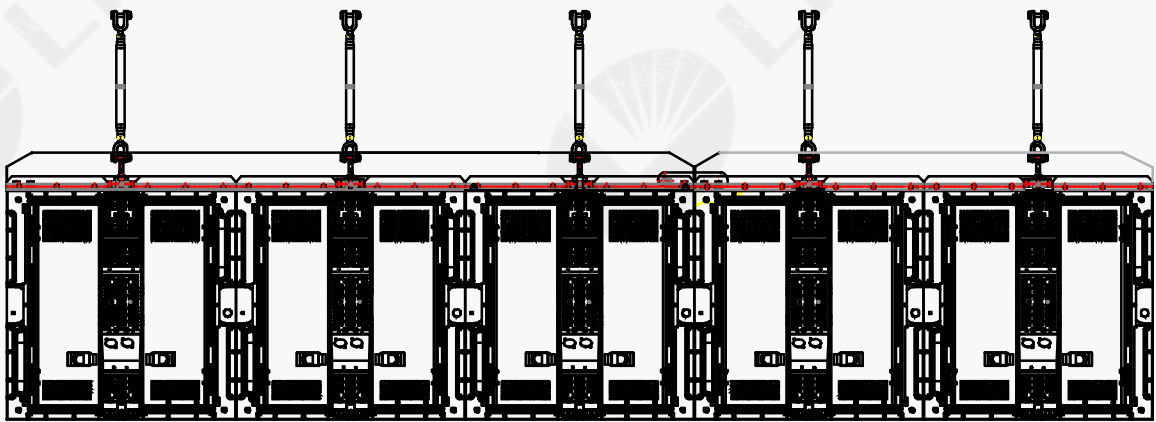

Image 4-2　Five RC series tiles installed in the horizontal line

Tiles horizontally connected with side locker
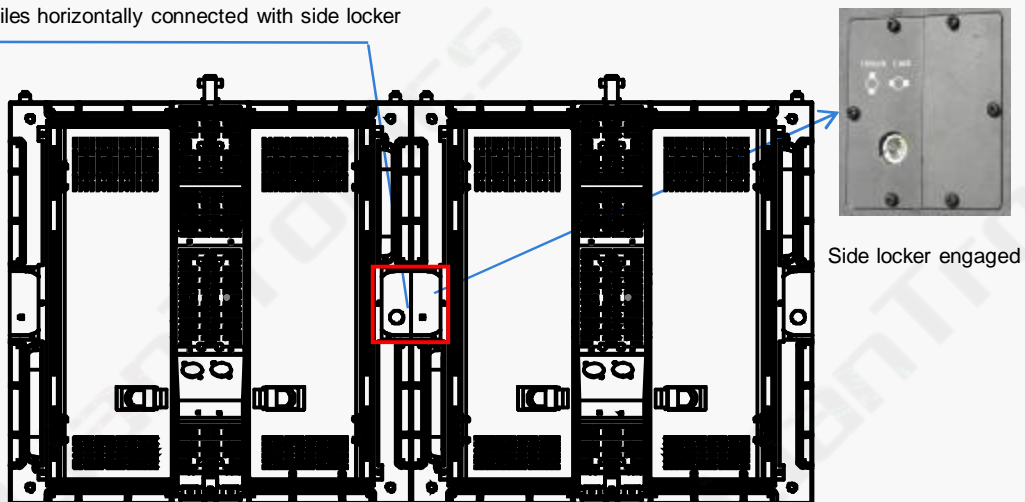

Side locker engaged

Image 4-3　Tiles horizontally connected with side locker

2. Assemble four RC series tiles in the vertical direction as illustrated below and level them out using bubble level.
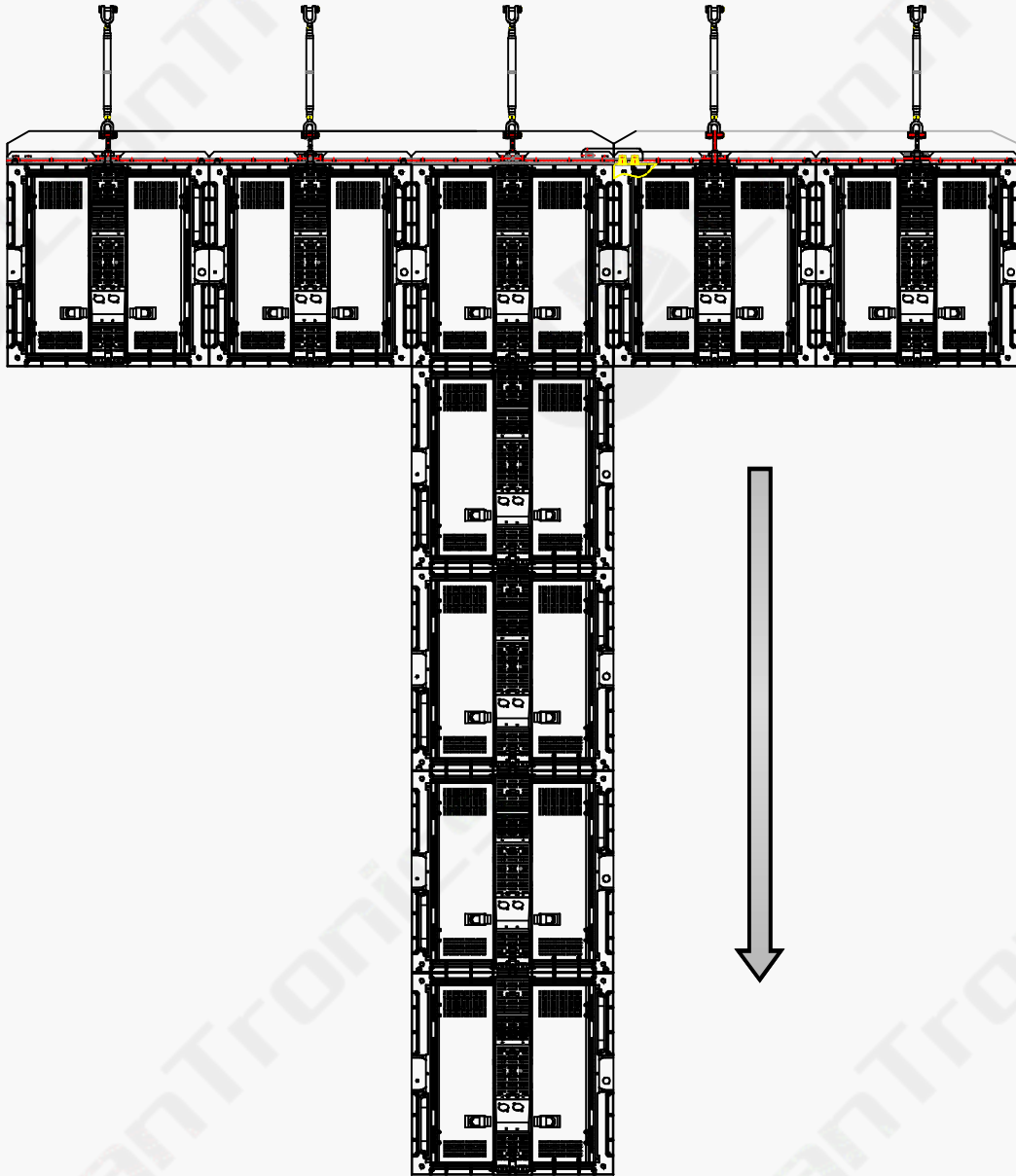

Image 4-4 Five RC series tiles installed in the vertical direction

3. The upper and lower tiles are vertically connected by matching mechanism. Pull the handle of suspended lock outward, and turn it clockwise to unlock. After fixing the tile, turn the handle counter clockwise to lock again, so the upper and lower tiles are securely connected.

The suspended locker is fastened when the tile is locked.

Pull the handle outward to loosen the suspended locker.
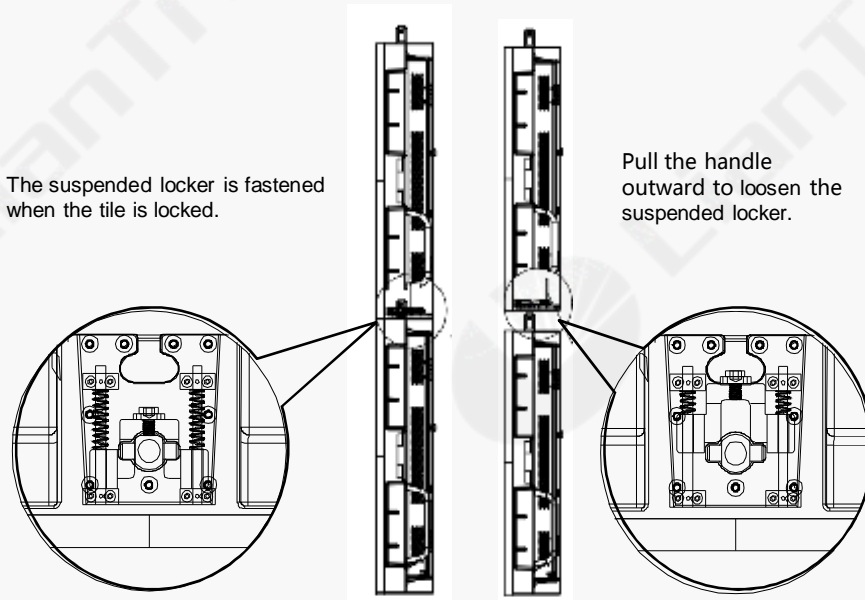
Image 4-5 Upper and lower tiles vertically connected by matching mechanism

4. Fix the corners of four adjacent tiles with connecting plats and corresponding screws, and make the appropriate adjustments if necessary to ensure the smooth and seamless surface of the RC series display.
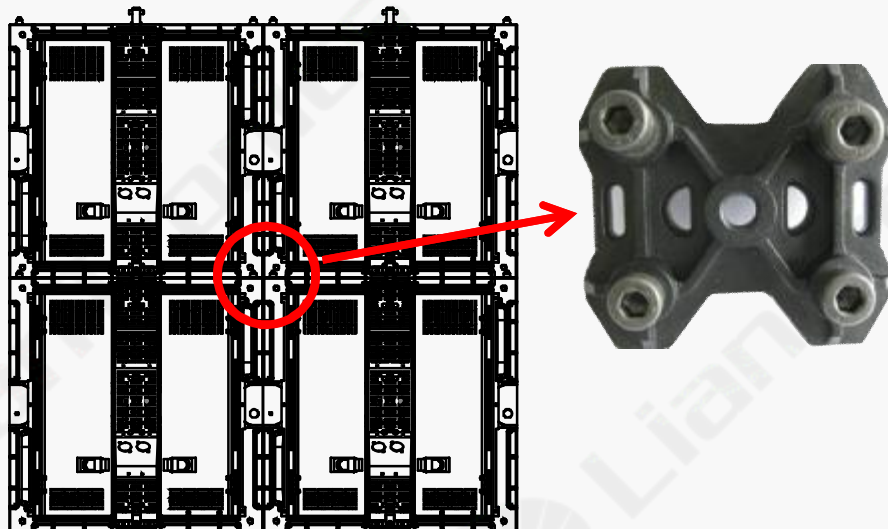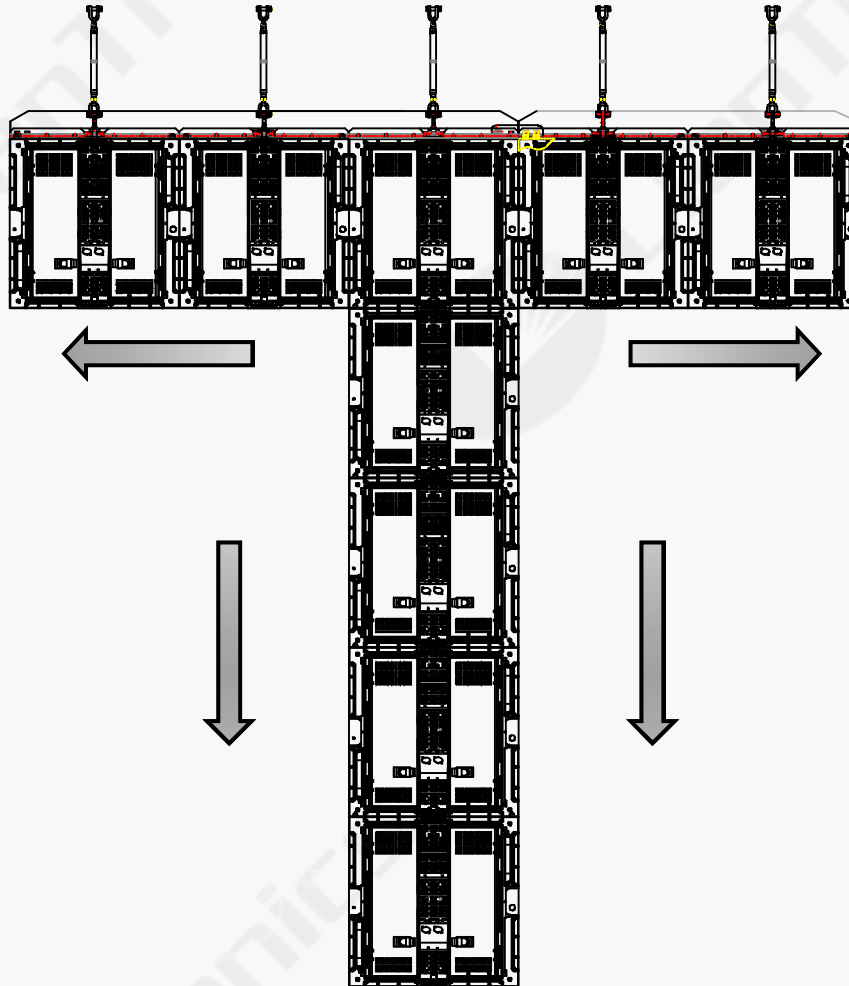

Image 4-6 Fix the corners of four adjacent tiles with connecting plats

5. Continue to assemble RC series tiles from center to both sides, and then from up to down. Connect the tiles one by one.
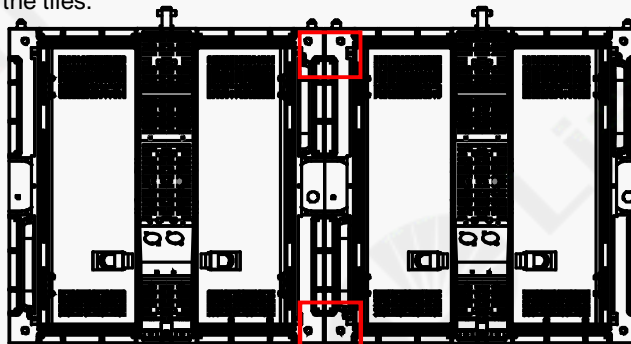
⚠ **Caution:** Before assembling the next tile, make sure the whole display smooth and seamless.

Image 4-7 Assemble the tiles from center to sides and up to down

6. Fix all the corners of RC series tiles at the bottom and flanks with connecting plats after assembling all the tiles.

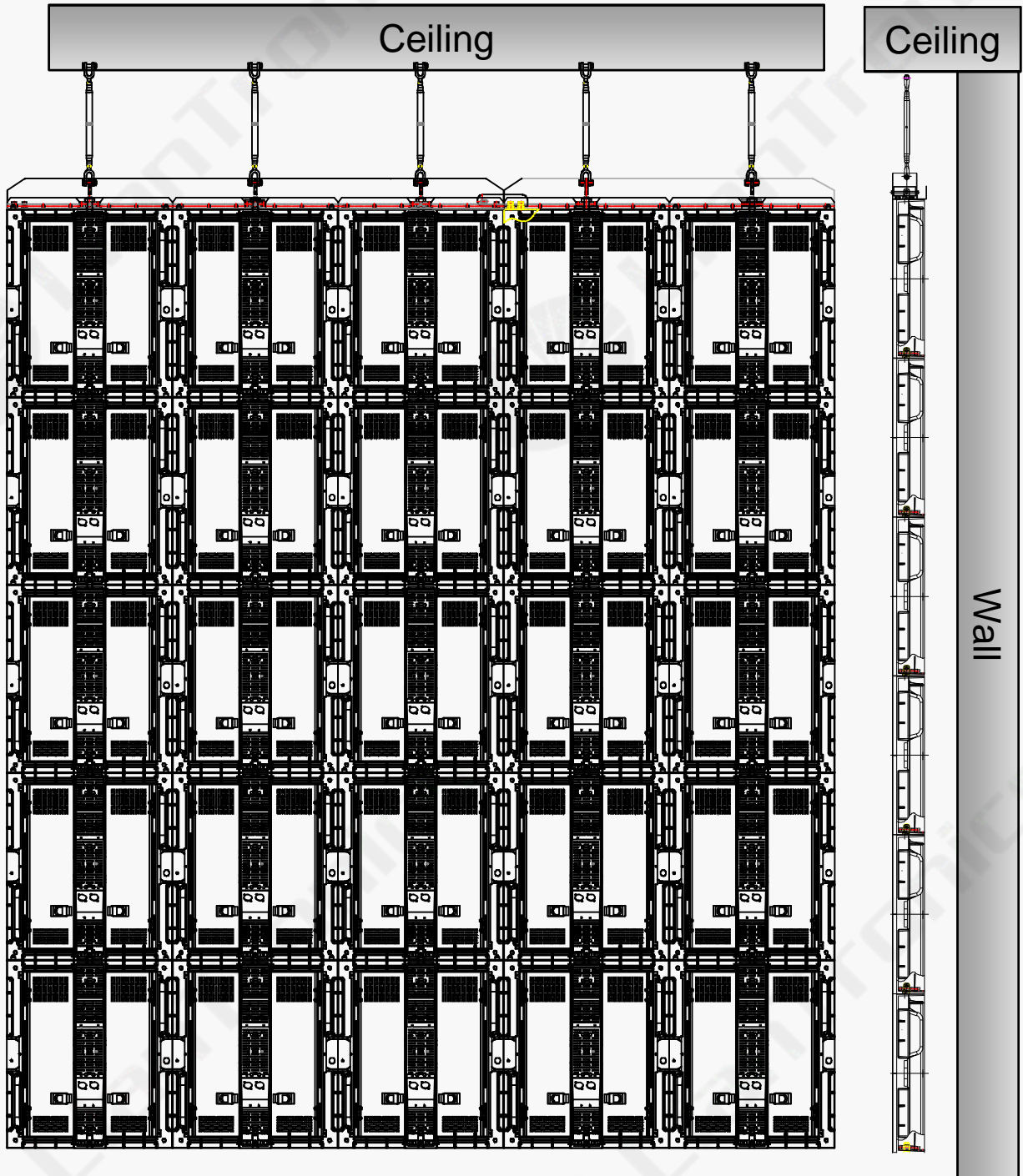**Image 4-8 Fix all the corners of the RC series tiles at the bottom and flanks**

Image 4-9 Example of suspended installation with truss beam (5 X 5 tiles)

4.3 Setup Process of Standing Installation

⚠️ **Warning:** RC series display is limited to a height of 20 RC series display tiles and the display surface has to obtain the flatness within a tolerance zone of +/-0.2mm and keep perpendicular to the reference surface.

Setup Process

1.Assemble five RC series tiles to be the center tiles of the whole display and level them out using a bubble level. Turn the side locker with hexagon screw to connect two tiles horizontally.

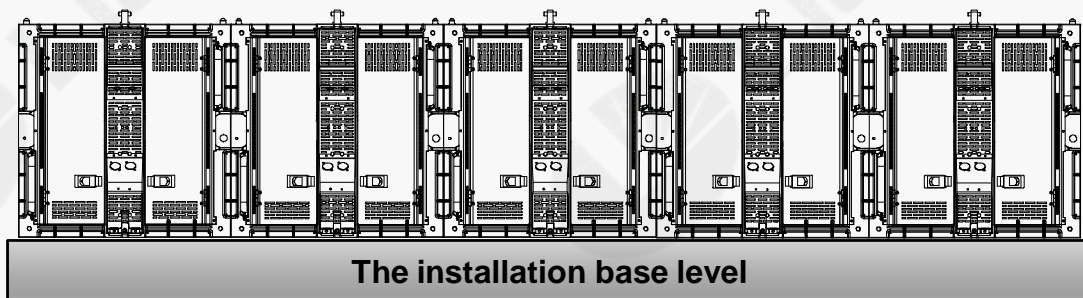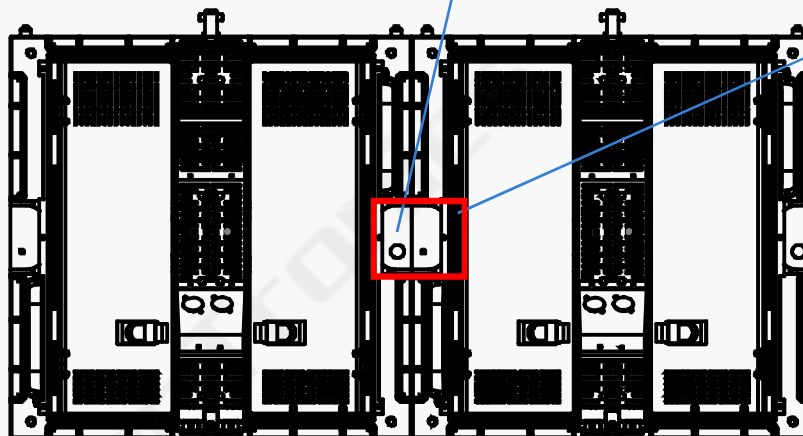**The installation base level**

Image 4-10 Five RC series tiles are installed in the horizontal line

Two tiles horizontally connected with side locker

Side locker engaged

Image 4-11 Two tiles horizontally connected with side locker

2. Assemble the RC series tiles at the center in the second row. The upper and lower tiles are vertically connected with matching mechanism as shown in image 4-12, and level them out using bubble level.

The installation base level
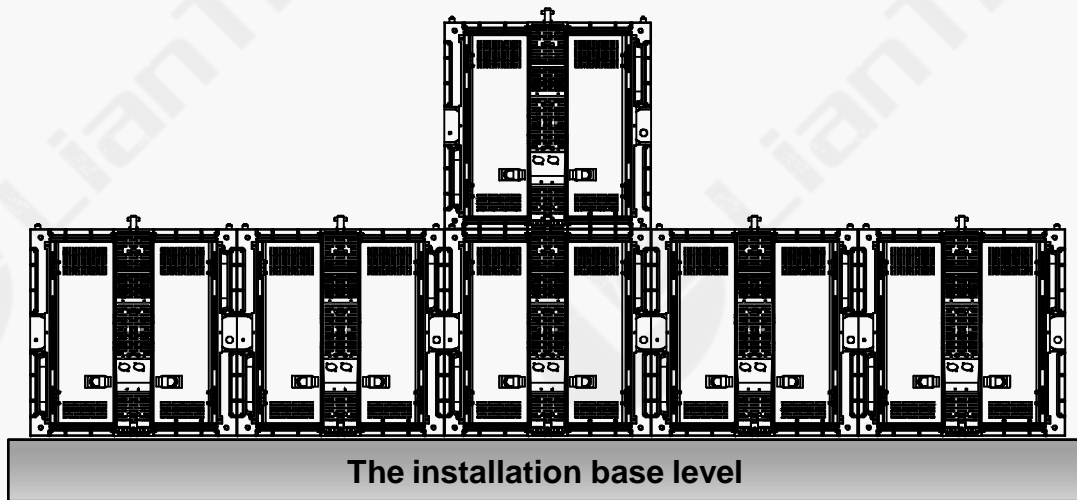
Image4-12 Assemble the RC series tile in the center of the second line

3. Continue to assemble the other RC series tiles at the second row from center to double sides. The corners of every two tiles at the bottom are fixed with special connecting plats. Fix the connecting plats to the supporting steel structure at the back of the display. (See the steel structure design and installation image for more details.)

The installation base level

Image 4-13 Tiles vertically connected with matching mechanism

4. Fix the corners of four adjacent tiles with connecting plats and corresponding screws, and make appropriate adjustments if necessary to ensure the smooth and seamless surface of the RC series display.

Image 4-14 Fix the corners of four adjacent tiles with linking plats

5. Continue to assemble the RC series display tiles from down to up row after row. Connect the tiles one by one.

⚠️ **Caution:** Before assembling the next tile, make sure the whole display smooth and seamless.

The installation base level
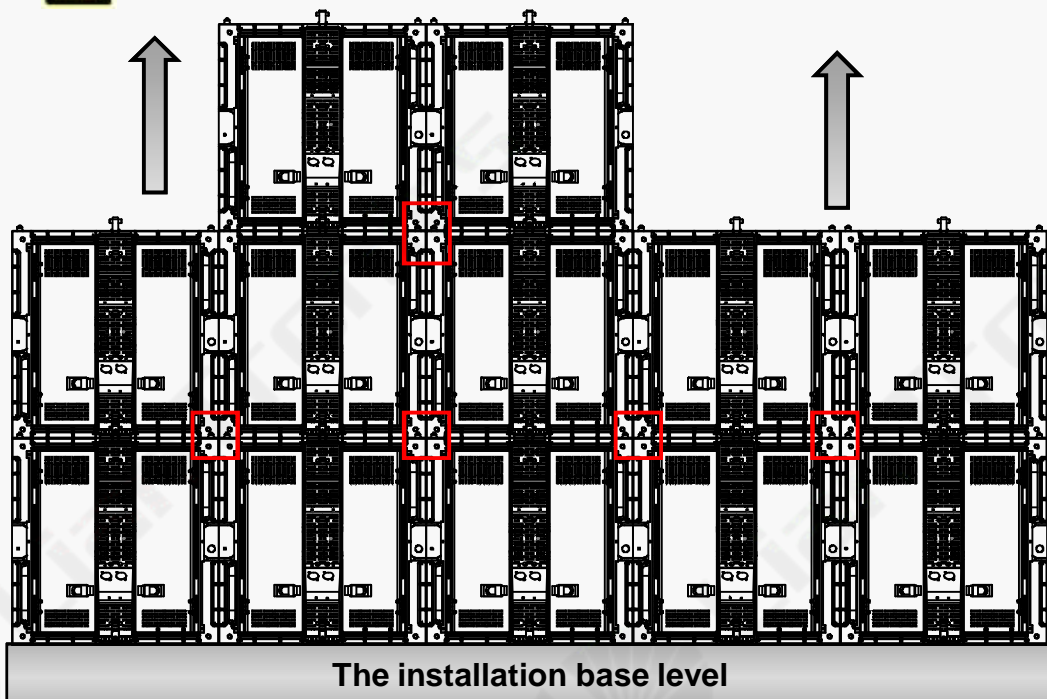
Image 4-15 Increase the tiles from down to up

6. Fix all the corners of the RC series tiles at the bottom and flanks with connecting plats. Fix the connecting plats to the supporting steel structure at the back of the display. (See the steel structure design and installation image for more details.)
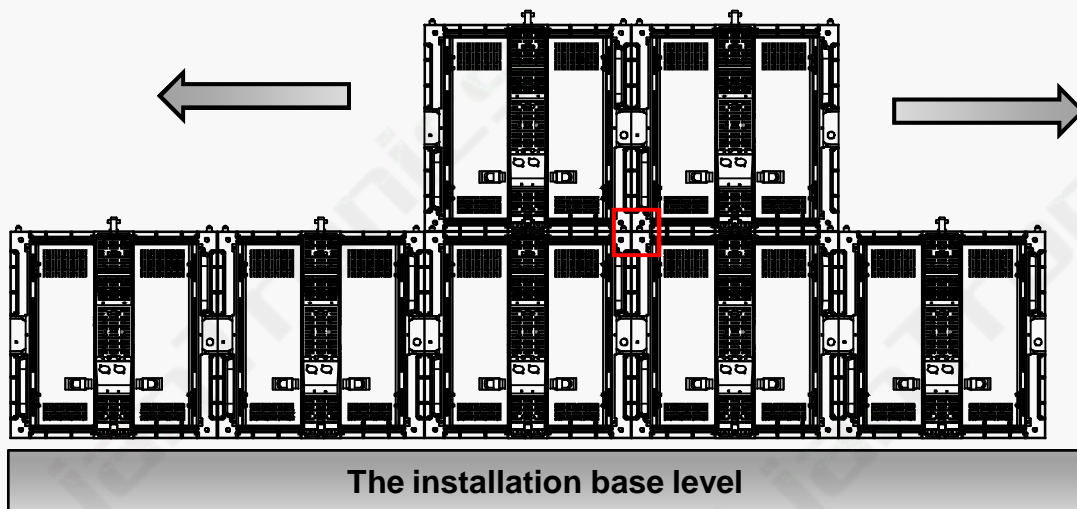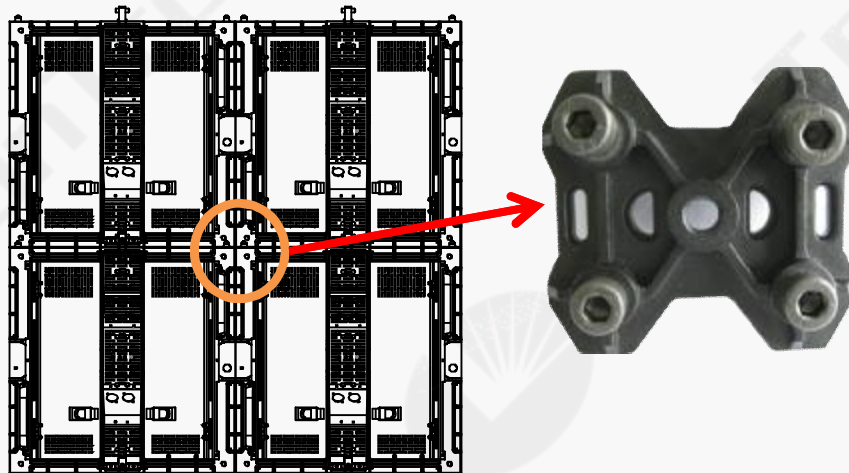

Tile

Press lock

Linking plats

Steel structure connecting bolts

Supporting steel structure

Ground beam

Ground beam
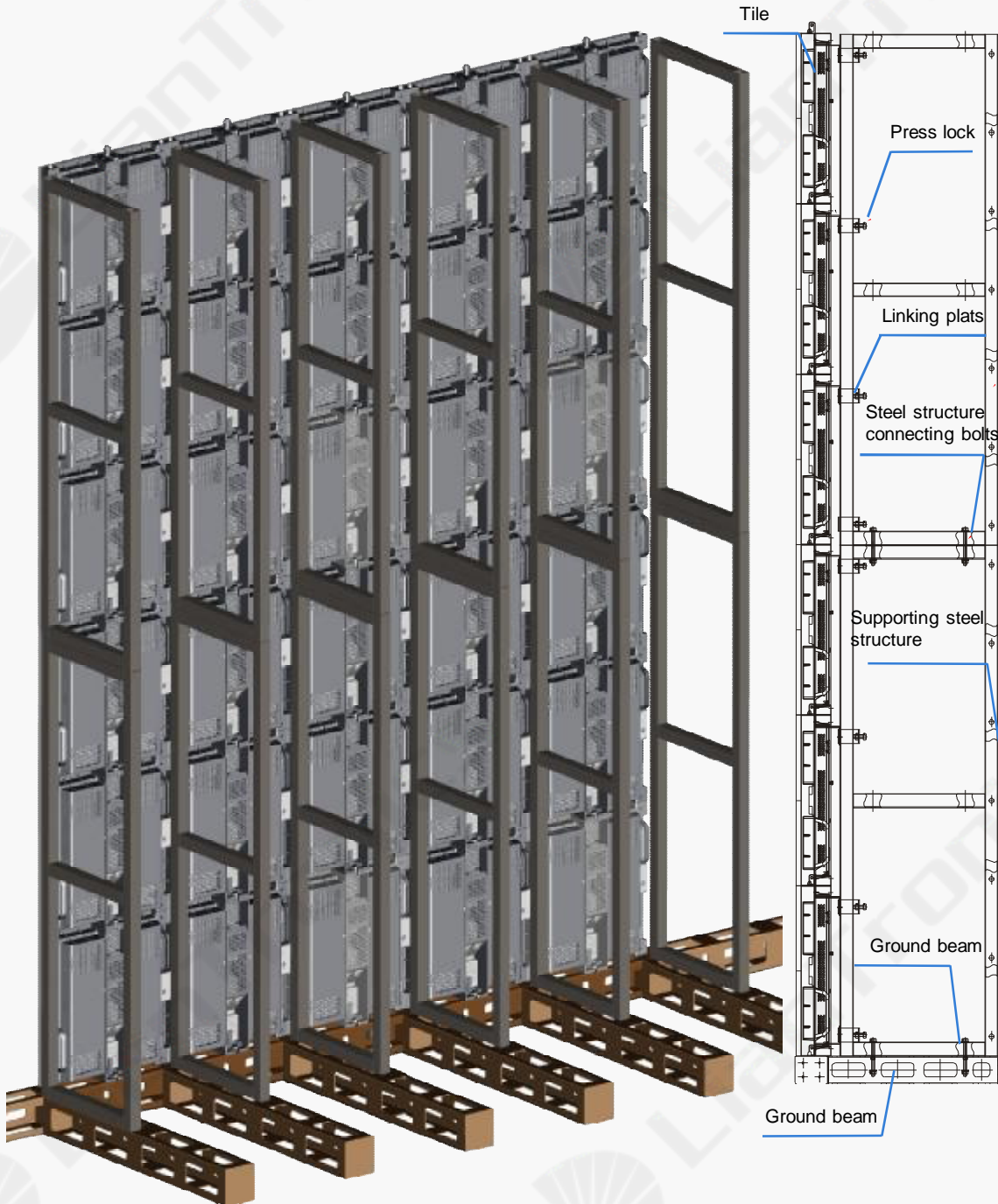
Image 4-16 Example of stacked installation (5 X 6 tiles)

4.5 Data Cabling

Before distributing the data cable, see the section 3.3 about "RC series Display Tile" for detailed information of the data cord's socket and plug and their locations in M10 display tile.

⚠️ **Warning:** Pay attention to the cabling direction in the following image.

The image below shows data cabling seen from the rear of RC series display of 5 tiles wide and 8 tiles high. The data link cable goes vertically and starts from the lower left corner (seen from the rear). The settings in the control software refer to the display seen from the front. So, the first tile in the data path indicates the lower right tile of the display.
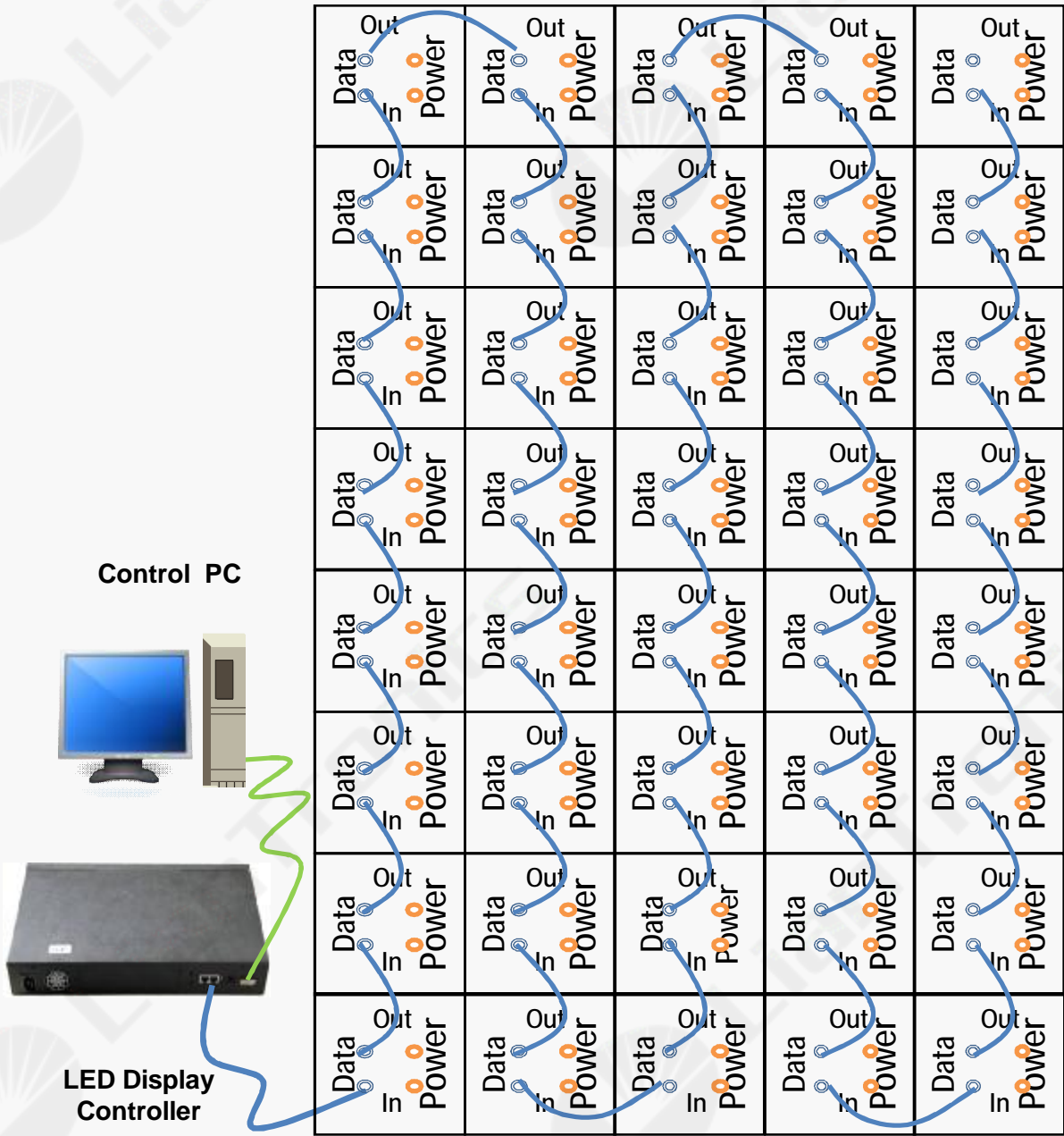
Image 4-17 Example of data cabling

4.6 Power Cabling

Before distributing the power cable, see the section 3.3 about "RC series Display Tile" for detailed information of the power cord's socket and plug and their locations in RC series display tile.

Warning: Pay attention to the direction of the alignment in the following image.
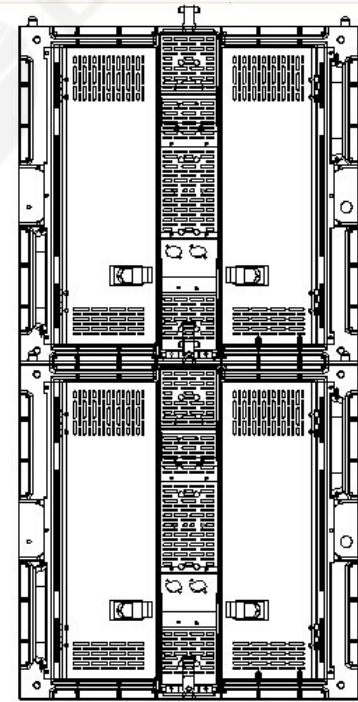
A rear view picture of data cabling and power cabling

Spider Connector with Fuse

Spider Connector with Fuse

Power Distributer Box   **To AC Power**
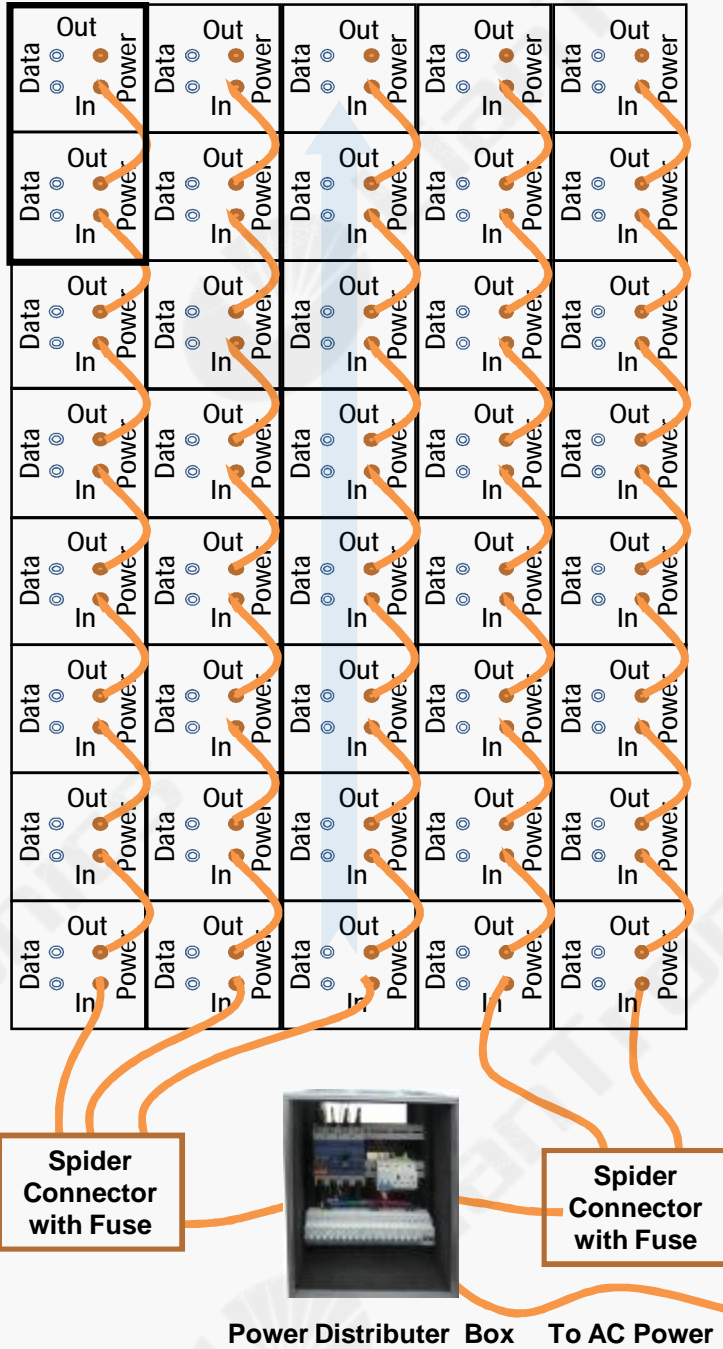
Image 4-18 Example of power cabling

4.6 System Connection

Tile 11	Tile 12	...	Tile 1N
Tile 21	Tile 22		...
	...		...
Tile M1	Tile M2	...	Tile MN

A display is constructed by tiling LED tiles. This diagram shows an array of m-row by n-column of LED tiles. Dashed blue lines show data signal wiring.

Cat-5 Cable

UTP cat5e cable carries video signal from transmitter card to display tiles, as shown in this diagram. The coverage distance of the first jump (from LED controller to the first tile) is 100 meters.

DVI-D Cable

Control PC

DVI cable feeds video signal into LED controller . Acceptable signal for LED controller is DVI-D. Largest video size is 1280*1024 (SXGA). Video source can be from PC, DVD, TV tuner, etc.
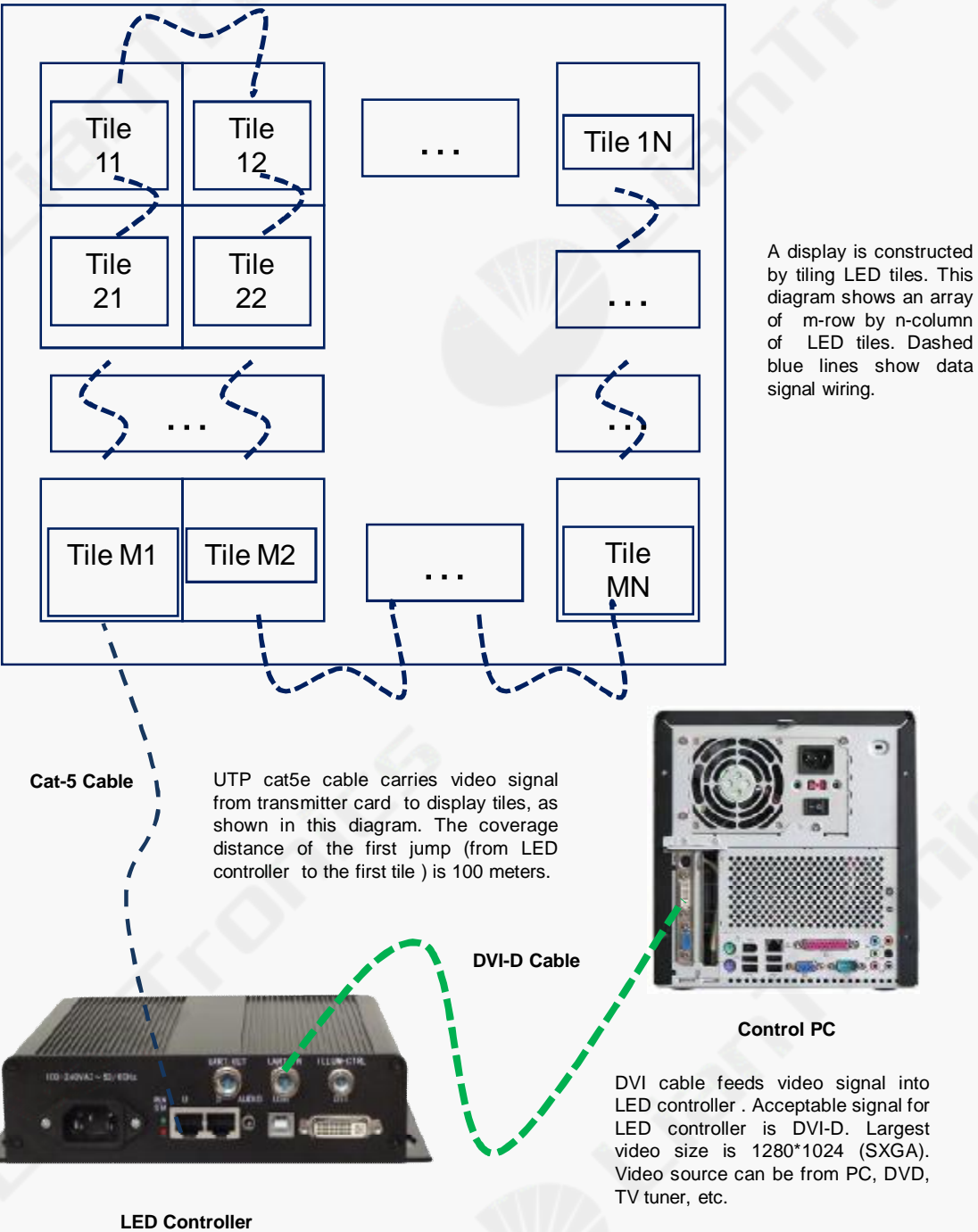
LED Controller

Image 4-19 System connection diagram of a typical LED display

5. START-UP OF THE SYSTEM

5.1 Software Installation

Before you run the software, please make sure all connection are ready (From PC to sending card, from sending card to LED screen). Put the LED system installation CD into CD-ROM.

1.Double click [NovaLCT-Mars Setup.exe icon] to start LED control software installation.

2.Follow the installation instruction until the installation procedure has finished.

5.2 System Operation

First, power on the control system computer, and switch on the power of LED display. follow the procedures and instructions as below :

1.Start Nova LCT control software

Install "**Nova LCT control software**", double click the icon (image 5-1) to open Nova LCT Mars control software, and the computer will enter to the interface as image 5-2. "**Local system info**" shows the real system connection information. when it shows "**Control System: 1**", it means the USB serial port connection is ready for communication between PC and controller . If not it shows "**Control System: 0**"for the connection is not good with no communication. If there is no image on LED screen (green indicator of sending card not flicking), please check DVI cable from graphic card to sending card, then check multi-display mode from control computer. Keep display mode under duplicate mode.

Image 5-1

Image 5-2

2. User Login
User login—This menu is for user to login. It is necessary for the configuration of the LED screen.
Click "**User**",--"**Advanced Log-in**", enter password"**666**"or"**admin**".

Image 5-3 Login interface

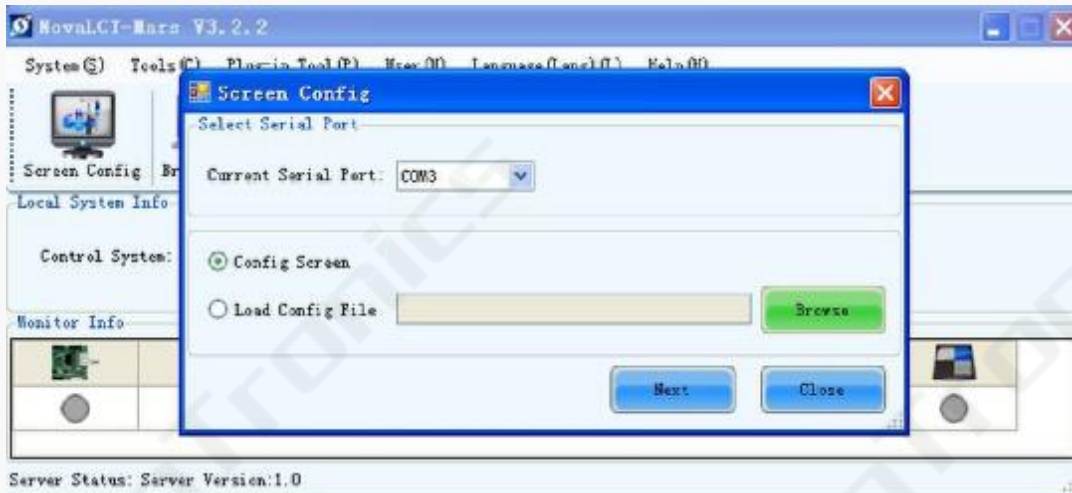Select "**Config Screen**" directly to follow the next step:

Image 5-4 Configuration interface

3.Go to sending board configuration : As is Shown in image 5-5, select proper resolution for sending card, and it should be close to graphic card. Click "**Save**" to save parameter on HW.
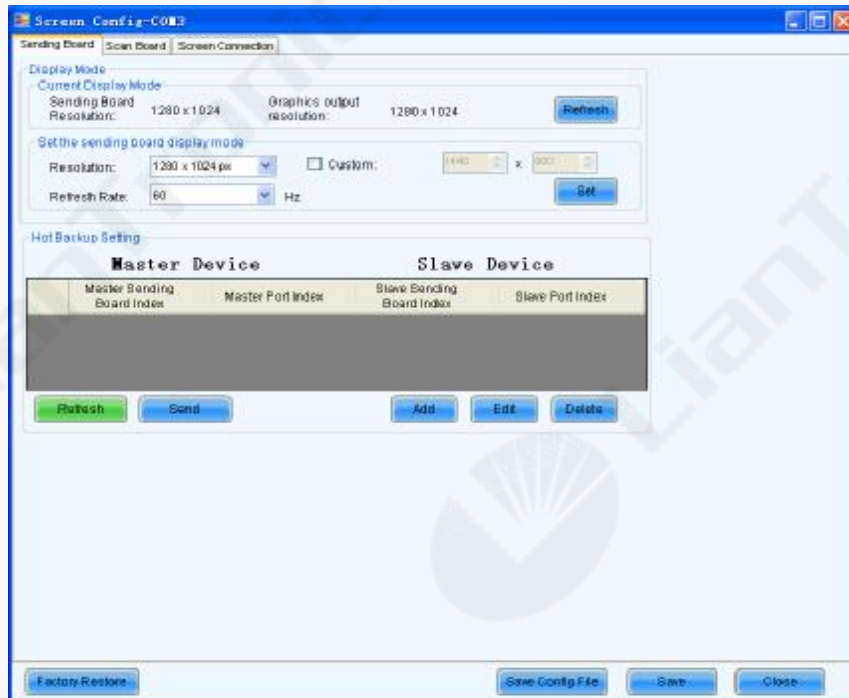
Image 5-5 Sending board configuration interface

4.Go to scan board configuration： As is shown in image 5-6, select "**Load File**", down load "*.**rcfg**" file from delivered CD. Click "**Send To HW** ", and then the file will be send to each scan board (receiving card). Click "**Save**" and save all files in hardware, when restart power ,files is no need to send again. **If tiles shows correct images before loading file, skip this step and directly jump to step 5.**
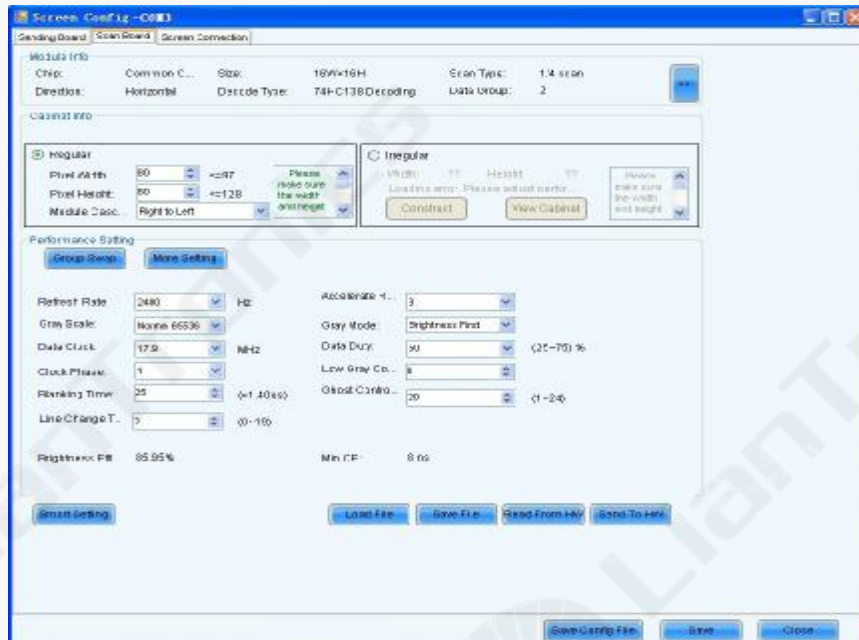
Image 5-6 Scan board configuration interface

5. Screen connection

According to the data cabling of your LED Display, fill in the actual value of columns and rows. Choose right ports and fill right scan board size as below. Select correct direction of signal cable cascading. Image 5-7 shows the front view of screen. "S" for the first tile and "E" for the last one. Choose "**Send to HW**" and "**Save**".
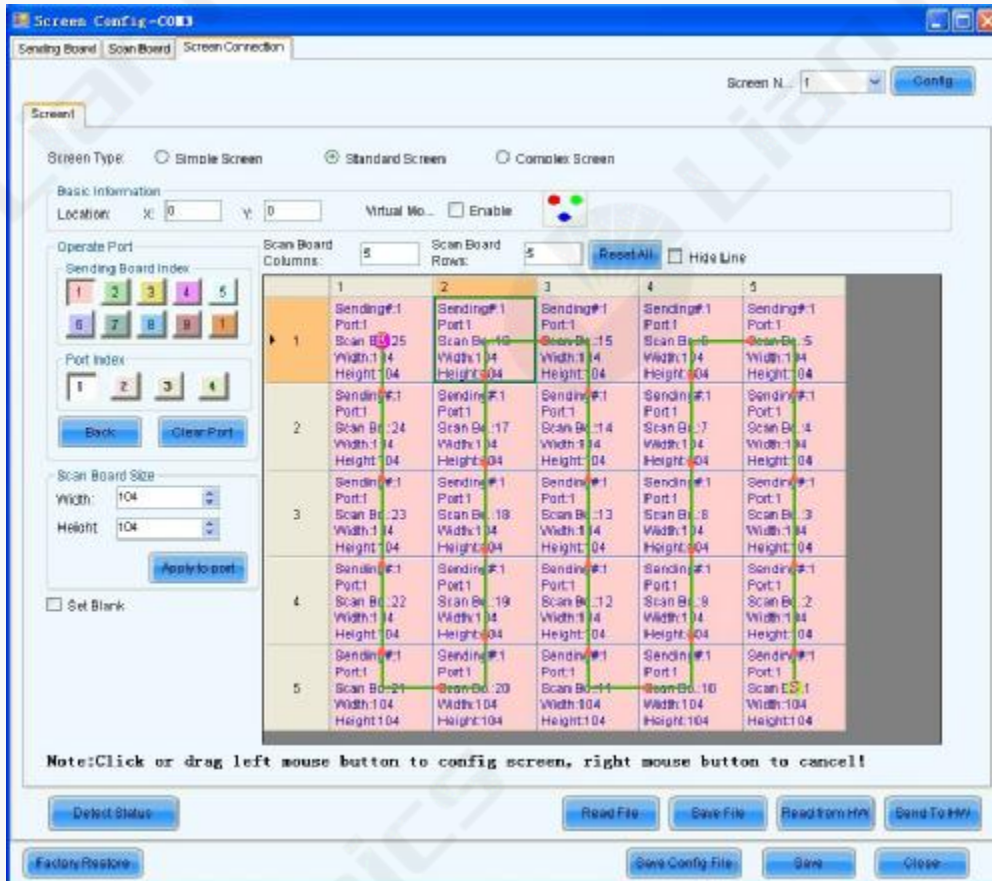

Image 5-7 Screen connection interface

6. TROUBLE SHOOTING

6.1 Software Trouble

Problem type	Problem description	Solution	Reason	Analysis
Nova LCT	Unable to open NovaLCT	Replace LCT software	Software problem	
	System notice：NovaLCT.exe-error	Install Microsoft .NET Framework 2.0	Computer is not installed with .NET Framework software	1.Computer is not installed with .NET Framework 2. Already installed, but may be damaged
	LCT system connection fails	Check the RS-232 connection and communication	The RS-232 communication is not connected or not get through	
		Replace LCT	LCT communication is not stable	Nova LCT version may be changed, confirm that you use the right version.
	display brightness is not uniform	Set values of R, G, B brightness on the all controllers as the same	Controller's R,G,B brightness values are not the same	1. Brightness values not the same. 2. Data is not saved successfully after setting.
		The calibration mode of controllers did not set to "On".	The brightness is different before and after calibration	1. Calibration mode is not "On". 2.All the calibration modes are "On", but not successfully saved after setting
		Change the brightness adjusting mode	Brightness adjusting modes are different between different controllers	1. Brightness adjusting modes are not set as the same 2.The setting is not saved successfully
		Check Gamma value of different controllers and resend the database	Gamma values are different for different controllers	
		If brightness adjusting is in auto modes and controlled by sensor, new update need to wait for 30 seconds	Brightness sensor action need to wait for 30 seconds.	
	LCT software monitor shows wrong status	Change and re-install LCT software	Software problem	
	One area of receiver card is black	Check the row and column setting in LCT	Map setting in the LCT is wrong	
Nova Studio	The whole display is black	Close the play time schedule	Time schedule setting is wrong	
		Check the media source	Media source is lost or stopped	

6.2 System Hardware Trouble

Problem type	Problem description	Solution	Reason	Analysis
Controller	Black screen	No DVI signal output from the graphics card in PC	No DVI signal to the controller	
		Check the power of the controller	No power for the controller	
		Re-start the controller		
Divider	Divider driving area is black	Check **RUN** status on the divider. If it blinks 2 seconds once, it means no data from the fiber cable.	There is no data from the controller or the fiber cable is not well connected	Divider is working when **RUN** lamp blinks 2 times per second. The lamp blinking 2 seconds per time means no data is output from controller or the fiber is broken
		Check the power of the divider	No power for the divider	
Receiver card	Receiver card problem causes black display on single tile	Check data input from upper receiver card(**RUN** lamp blinks 2 times per second). If the data in is ok but problem still exists, replace the receiver card	Hardware problem	
		If there is no data input from the cat5, check the cat5 connection or no data output from the upper receiver card	Poor Cat5 connection or output data problem of the upper receiver card	
	One row of the module in the tile is black or messed up	Check the hub card connection with the scan card, or the ribbon cable connection between the hub card and module. If connection is no problem, replace the hub card	Connection problem or hardware problem	

6.3 Module Problems

Problem type	Problem description	Solution	Reason	Analysis
LED lamp	Blind lamps	Replace the module	The lamp is dead or soldering is not good	
LED pixel	The pixel area is black or loses color	Replace the module	The driving IC/resistor is bad soldered or out of work	
LED module	One or several whole LED modules in the same row are black or defective	Check the ribbon cable and power cable connection on the module	Cable is not connected or not well connected	

6.4 Power Problems

Problem type	Problem description	Solution	Reason	Analysis
Tile power	The whole tile is black	Check power connection with the tile and the breaker in the tile	Power to the tile is not well or the breaker is turned off	
Power supply	The whole tile is black	Replace the defective power supply	The power supply feeding the receiver cardis defective	
Power supply	Several nearby module areas are black	Replace the defective power supply	The power supply feeding the module area is defective	

6.5 Data Transfer Problems

Problem type	Problem description	Solution	Reason	Analysis
Fiber	The display is black	Check the fiber connection and the data I/O order	The fiber cable is broken or the data I/O order is wrong	
Cat 5	The whole column of the display is black	Check the data connection between the divider and the first scan card	The connection is not good or the cat5 is defective	
Cat 5	One or several tiles in column are black	Check the cat5 connection between the tiles	The connection is not good or the cat5 is defective	
Cat 5	All the display light up but the columns are not in right order	Check and correct the Cat5 connection order in the divider	The connection order is wrong	

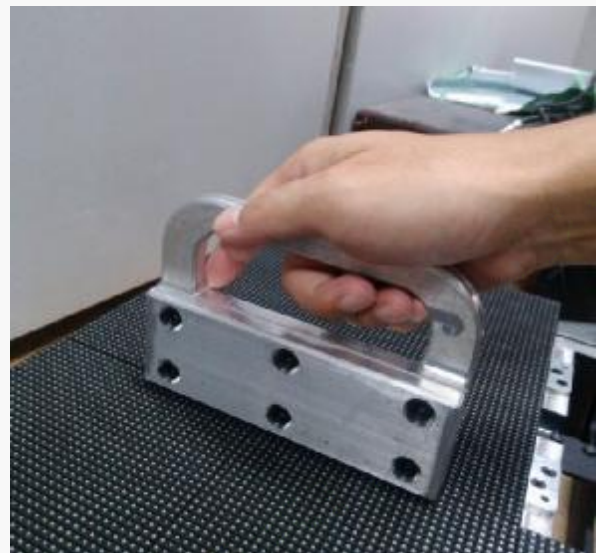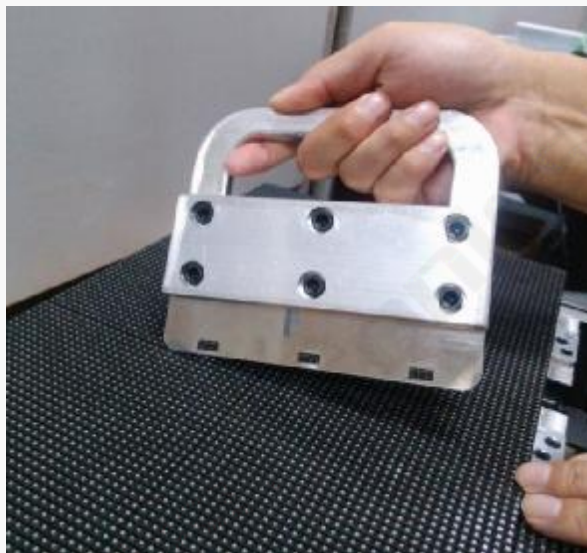## 7 MAINTENANCE

Routine maintenance

1. Make sure the LED display is well ventilated, dry and running in suitable temperature.

2. Regularly check the internal cables inside the LED display are in stable connection, the power supplies are working well, the ground wires are connected well, and the lightning arrester is running well.

3. Regularly wipe the dust on the surface of the LED tile with a soft cloth, and keep the LED display surface clean to avoid brightness differences between clean and unclean LED tiles.
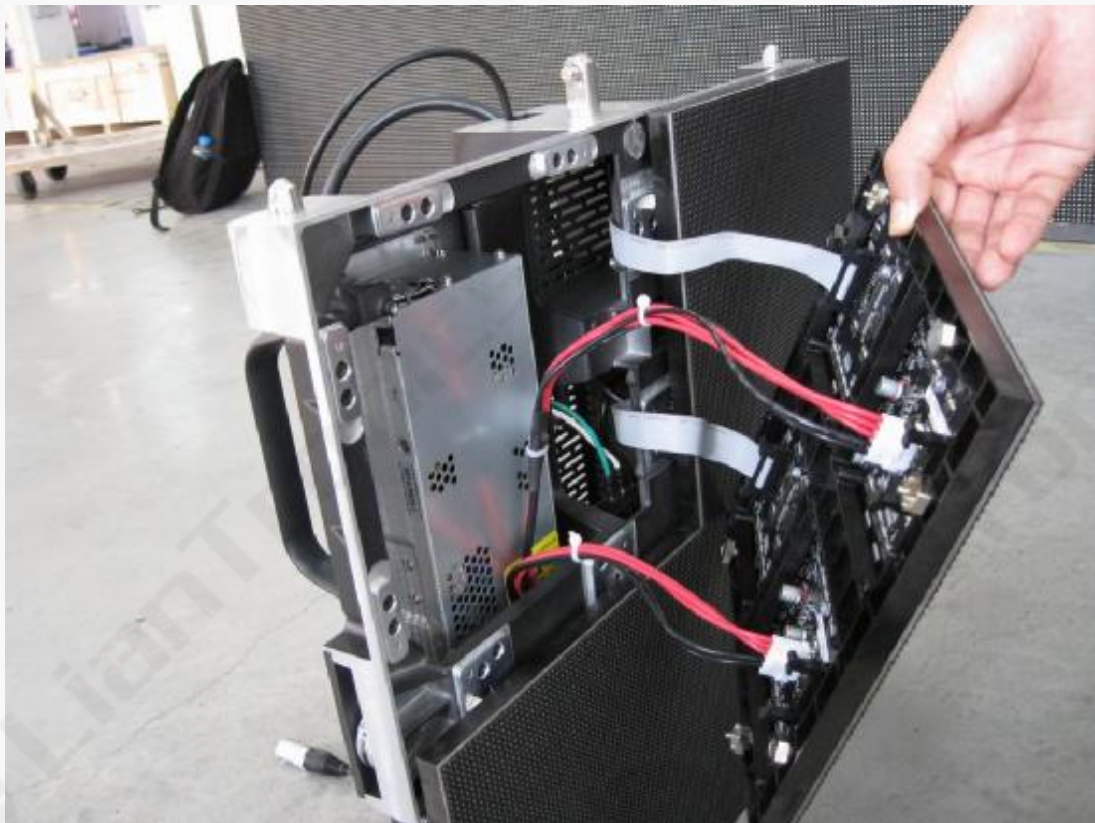
Cautions for use

1. Before power on the LED display, start your computer first, and then turn on the power of LED display.

2. Before turn off the display system, first turn off the power of LED display, and then turn off the computer.

3. When you are editing video playlist, you had better to keep the LED display closed.

4. When failure appears, first turn off the power of LED display, then contact with service department of LIANTRONICS for technical support.

Change modules

1. Insert the special tool into the gape between two modules.

2. Then pull the tool out. The module will be pulled out at the same times.

7   MAINTENANCE

Routine maintenance

1. Make sure the LED display is well ventilated, dry and running in suitable temperature.

2. Regularly check the internal cables inside the LED display are in stable connection, the power supplies are working well, the ground wires are connected well, and the lightning arrester is running well.

3. Regularly wipe the dust on the surface of the LED tile with a soft cloth, and keep the LED display surface clean to avoid brightness differences between clean and unclean LED tiles.

Cautions for use

1. Before power on the LED display, start your computer first, and then turn on the power of LED display.

2. Before turn off the display system, first turn off the power of LED display, and then turn off the computer.

3. When you are editing video playlist, you had better to keep the LED display closed.

4. When failure appears, first turn off the power of LED display, then contact with service department of LIANTRONICS for technical support.

Appendix A: Technical Specification

| Item	RC series (indoor)			
Pixel pitch (mm)	3.8	5.0	6.0	7.6
Pixel Density (pixels/㎡)	68889	38750	26962	17222
Pixel configuration	SMD 1R1G1B			
Viewing Angle (deg.)	140(H)/140(V)			
Brightness (nits)	1200	2500	1500	2500
Grey Level (bit)	16			
Refresh Rate (Hz)	1920			
Panel Size (mm)	488(W)×488(H)			
Panel Size (inch)	19.21(W)×19.21(H)			
Panel Resolution (pixels)	128×128	96×96	80×80	64×64
Panel Type and Material	Die-casting Aluminum			
Panel Weight (kg)	11			
Module Size (mm)	244(W)×244(H)			
Module Size (inch)	9.61(W)×9.61(H)			
Module Resolution (pixels)	64×64	48×48	40×40	32×32
Protection Grade (Front/Rear)	IP32/IP32			
Serviceability	Rear			
Voltage (V)	AC110/220			
Avg. Power Consumption (W/㎡)	250	300	170	290
Max. Power Consumption (W/㎡)	750	900	510	870
Brightness Adjustment	Manual/Auto/Programmable			
Operating Temp/Humidity(℃/%RH)	-10~+50/10~95			
Storage Temp/Humidity(℃/%RH)	-40~+85/10~95			
Lifetime (hours)	≥50000(Nomal Temp)			
Compliant Standard	CE ,FCC, ROHS			

Appendix B: Tile Dimensions

488

488

112

56
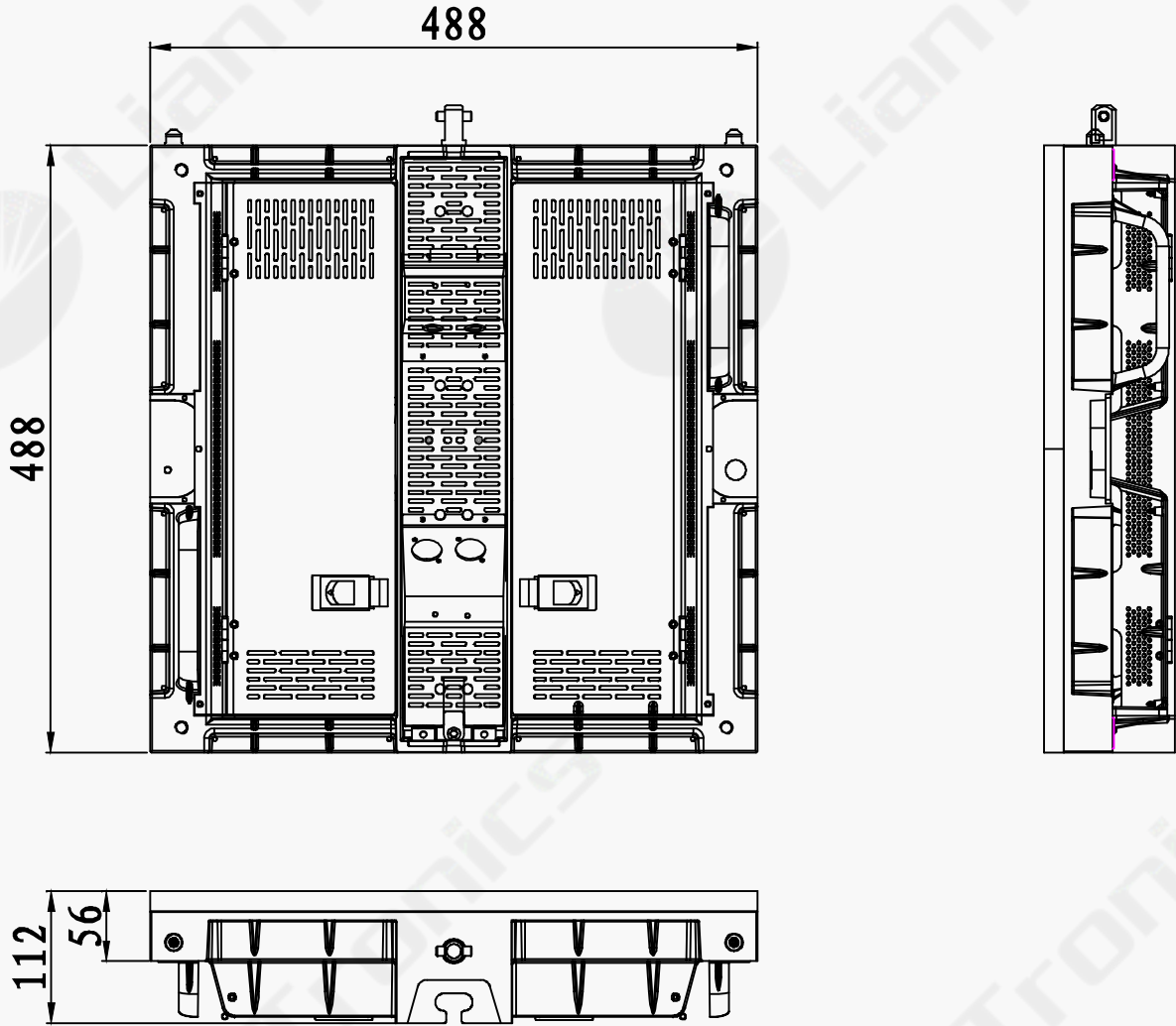
Appendix C: Package

Flight case:

Dimension(mm): 924(L) X 524(W) X 600(H)
Volume (m^3): 0.29 (approx.)
Capacity: 6 tiles of RC series
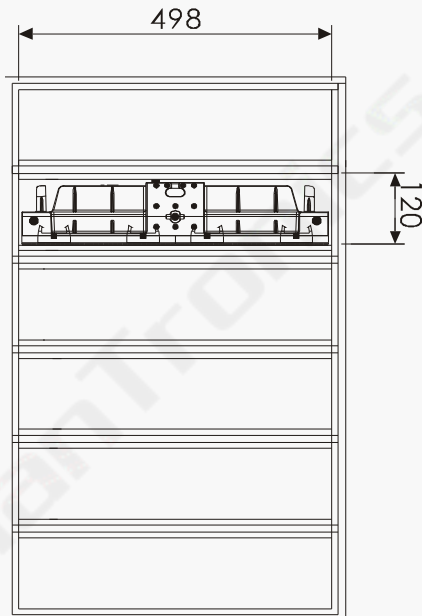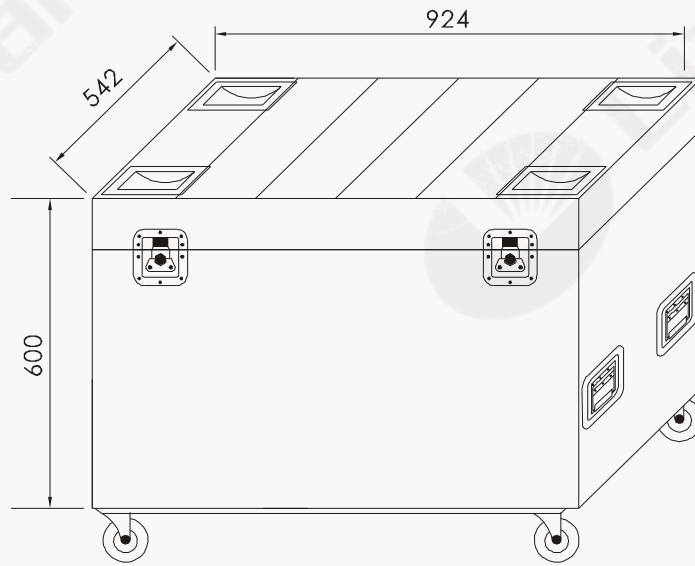
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