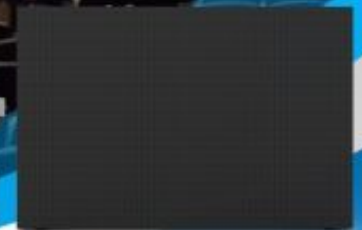# LianTronics

Display All You Want !

LED Display VA Series Product

User Manual

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

Changes

The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Liantronics provides this manual 'as is' without warranty of any kind, either expressed or implied, including but not limited to the implied warranties or merchantability and fitness for a particular purpose. Liantronics may make improvements and/or changes to the product(s) and/or the program(s) described in this publication at any time without notice.

This publication could contain technical inaccuracies or typographical errors. Changes are periodically made to the information in this publication; these changes are incorporated in new editions of this publication.

Regulatory

The product has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the product is operated in a commercial environment. The product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of the product in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense.

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 50°C, min -20°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 VA 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 VA series LED display. Be sure that the floor or truss installation on which the VA 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 VA series tile weighs approximately 8 kg.

Horizontal surface

For floor installation, the floor on which VA 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 VA 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.**

2.2 Electrical Requirements

Power requirements

The displaying area of one VA series tile is 0.2025m². VA series LED tiles have different pixel densities (see Appendix A – technical specifications). For different pixel densities, one VA series tile may need power supply of 0.6 amps to1.5 amps at 220 VAC, 100-250 VAC, 50-60 Hz. Each VA series tile has only one input 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 4 tiles in parallel.

Protect every power cable by a circuit breaker or fuses rated 16 A / 250 VAC (15 A / 110 VAC in the USA and Canada). 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 operating software.

System requirements

Minimum specifications:

- Hardware
  - PC Intel i3 processor or above 1 GB RAM
  - Free hard disk space: 100GB
  - SXGA resolution (1280 x 1024)
  - Serial communication port
  - Ethernet connection
- Software
  - Windows 7 Professional

Recommended specifications:

- Hardware
  - PC Intel i7 processor or above
  - 8GB RAM
  - Free hard disk space: 500 GB
  - FHD resolution (1920 x 1080), with 512MB video memory
  - Serial communication port
  - Ethernet connection
- Software
  - Windows 7 Professional

3. System Introduction

3.1 Brief Introduction

VA 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

- More Flexible Matching: With an aspect ratio of 16:9, panels are easy to be pieced together to play standard 4:3 and 16:9 videos

- Support for front installation and maintenance

- Seamlessness: Die-casting aluminum panel, high-precision design and CNC processing minimize the error within 0.05mm

- Long Lifespan: Low-voltage power supply with high-efficiency causes little temperature rise, which helps to prolong the life of LED display in stable use

- Noise-free Effect: Efficient drive IC, optimized PCB layout and fan-less design all contribute to silent operation

- Perfect Image: No flicker, no bright line or dark line ensures the LED display to take on more perfect image

- Industrialized Production: Patented technology, independent die sinking, precise welding and automatic processing all take the lead in LED industry

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

VA series LED display system includes the following basic components:

- **LED Display:** VA 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

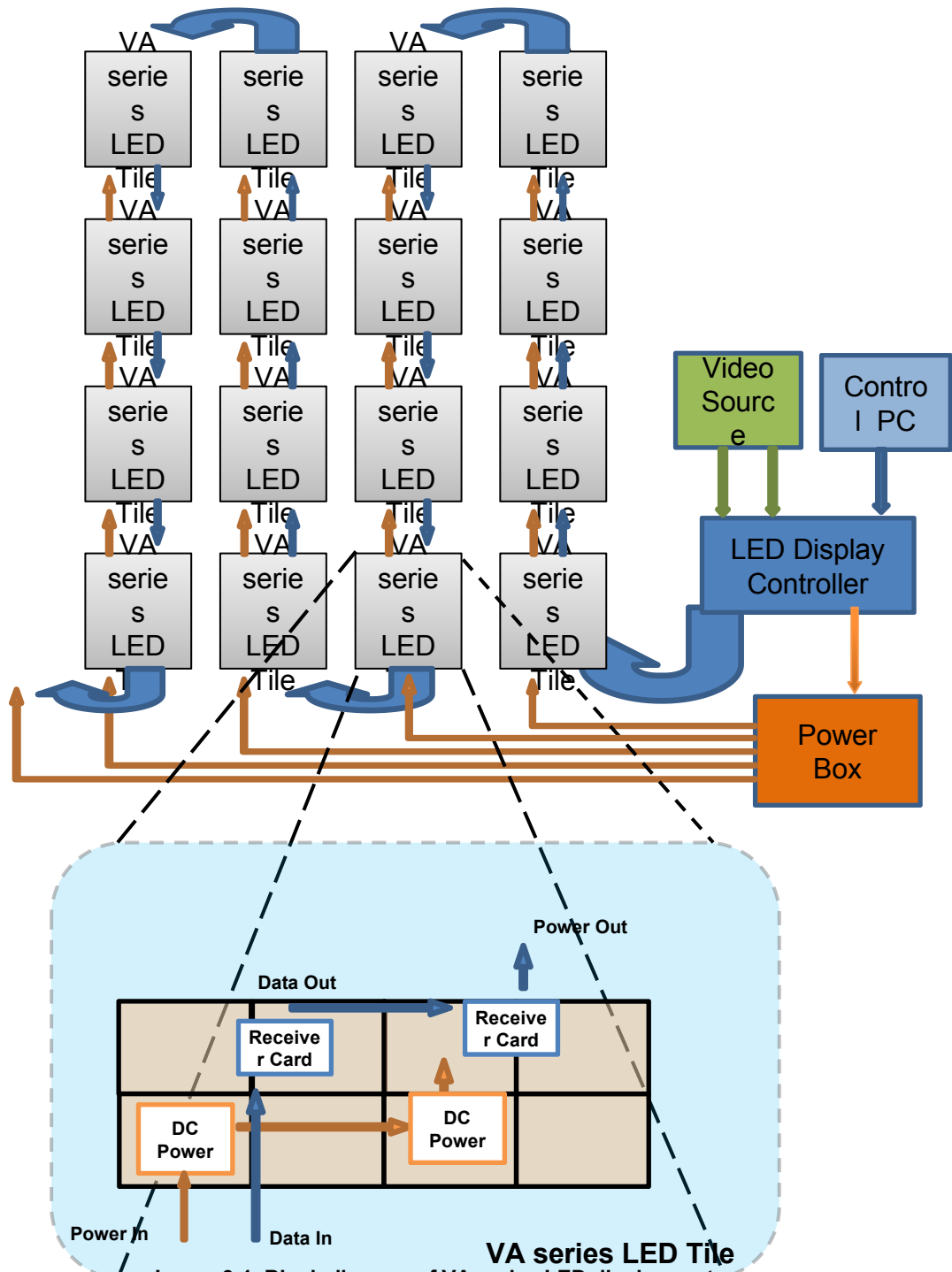- **Peripheral Devices:** video processor, optical fiber transmitter

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

LED Display Components List

Number	Name	Function /Explanation
LED Display Components		
1	VA series display tile	Tile size: 600mm X 337.5mm, Weight: 8 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 VMeM, 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

VA series Tile

VA series LED display is built with VA series tiles. A tile consists of die-casting aluminum frames in high accuracy, VA series display modules, switching power supply, receiver cards, and some other mechanical and electrical connection parts. The VA 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 VA series tile is shown as below with related images.

3.3.1 Die-Casting Aluminum Frame

Each die-casting aluminum frame is installed with twelve VA 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 2 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 wall mounted and structures.
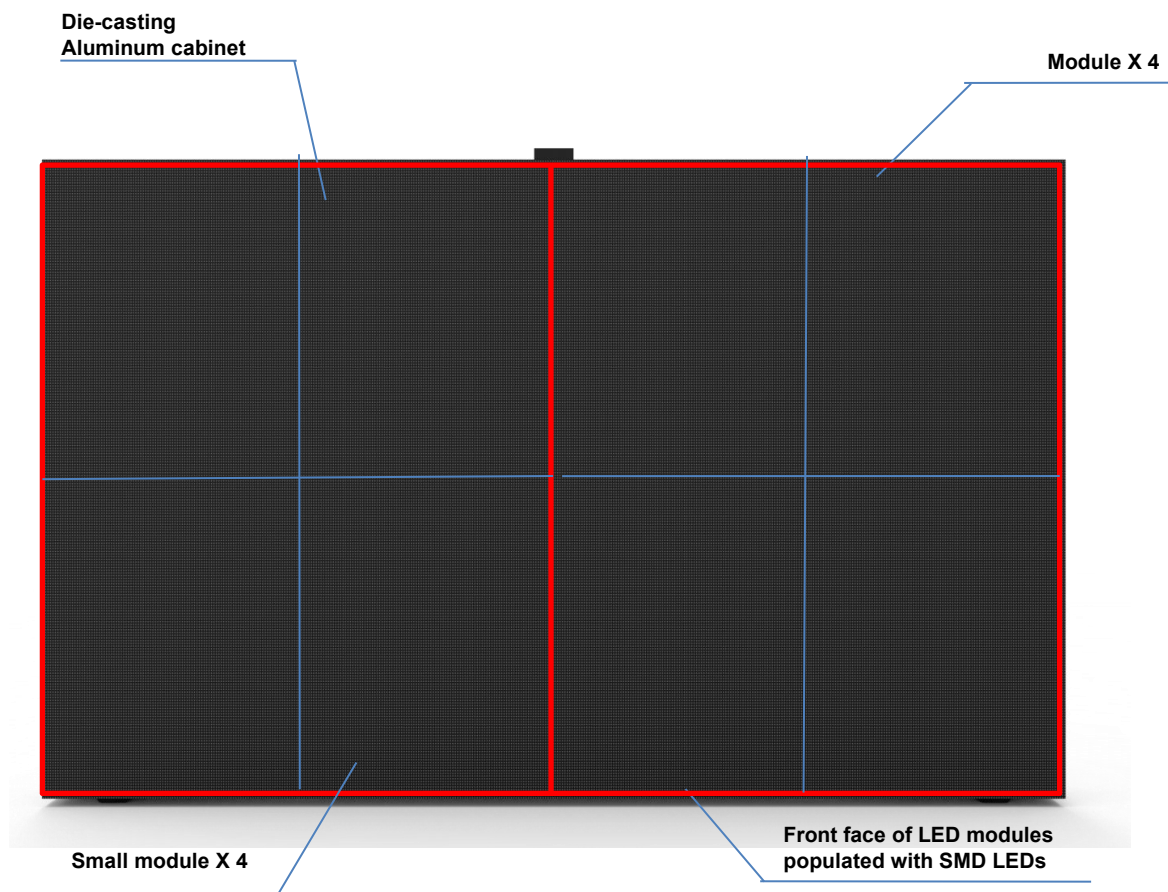

Image 3-2 The front of VA series display tile

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1. VA series tile has 8 grids for 2 big modules to be fixed in and each big module have 4 samll modules . The precise positioning ensures the precise positioning of all modules. Keep magnets clean to achieve smooth installation of the modules and avoid seams between tiles and uneven pixel pitches.

2. There are two pair of data sockets at thetop of each VA series tile. One of the socket is for inputting and outputting data, another one is for backup.

3. Each of the four corners at the back of VA 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.
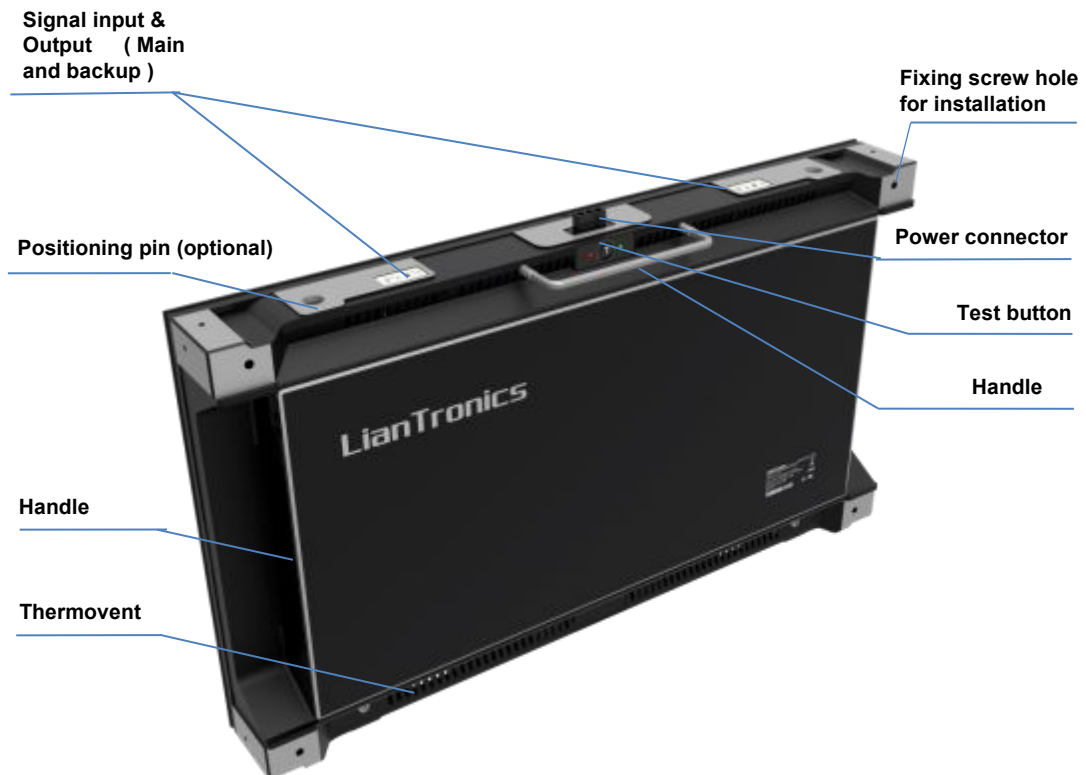

Image 3-3 The back face of VA series display tile

3.3.2 VA series Module

VA series module includes PCBA, LED, connectors, etc. At the back of the module, 3 groups of copper screw holes are inlaid at each side to fix the module to the backboard. The LED lamp array lies in front of PCBA. 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.

VA series tile includes 2×1modules. Each module has four kinds of pixel pitch (mm): P 1.2 mm with the corresponding module resolution (pixel) of 240×270 .

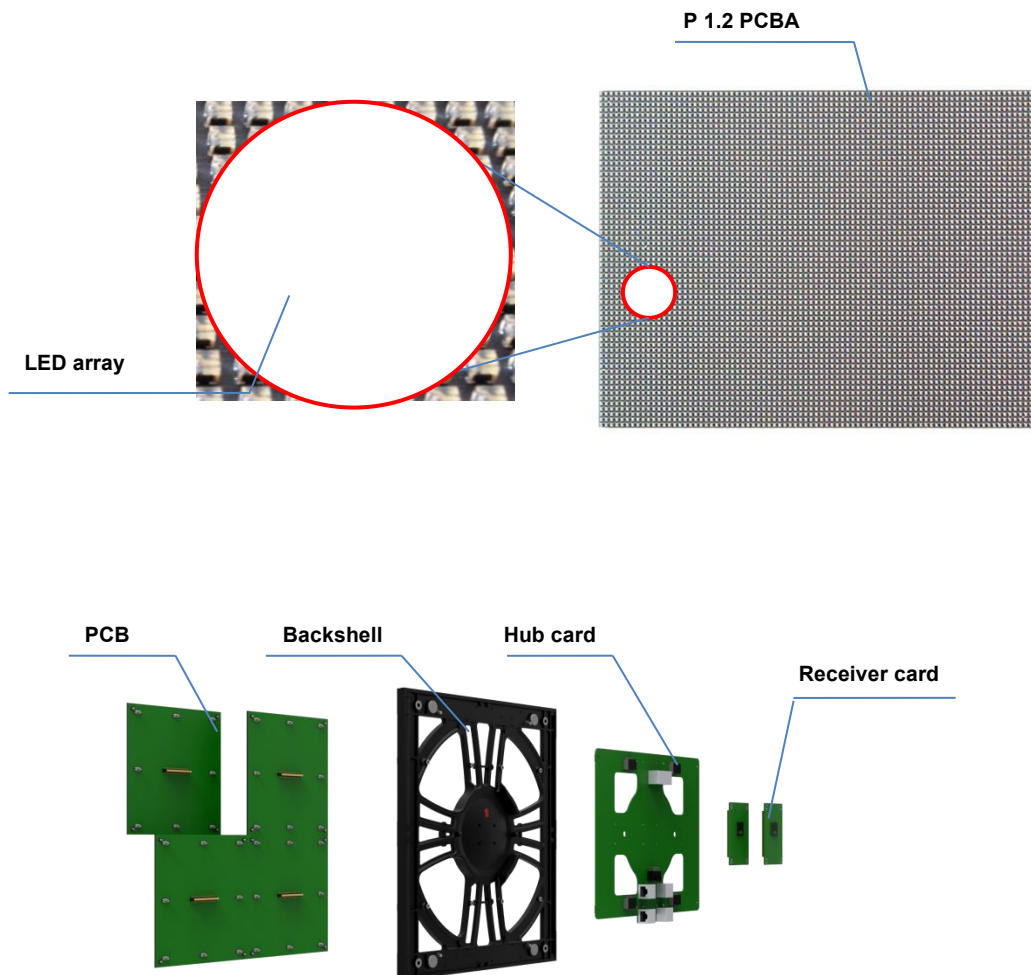**Warning:** VA series die-casting aluminum frame can only install VA series display modules.

P 1.2 PCBA

LED array

PCB   **Backshell**   **Hub card**

Receiver card

Image 3-4 The components of VA series display module

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3.3.3 Socket and Plug for Power and Data Connection

The following socket and plug are respectively used for data connection between VA series display tiles. The data socket and plug is for the loop data connection between tiles.

Image 3-5 Signal / Power plug and socket

3.3.4 LED Receiver Card

Each VA series tile has one receiver card for receiving and transmitting the data of LED display . The functions of the A8S (Optional) 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)

- •32 RGB data groups output

- •Load capacity of single receiver card up to 256×256

- •Support pixel level brightness/color calibration

Image 3-6 A8S receiver card

3.4 LED Control System

This chapter introduces the control system and software of VA 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: 1024×1200,1280×1024,1600×848,1920×712,2048×668

4. Two serial interfaces

5.Light sensor interface integrated

6.Audio input interface integrated

Image 3-7 MCTRL300 controller

3.4.2 MCTRL500 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 3-8 MSD500 transmitter card

3.4.3 MCTRL660 Controller

MCTRL660 is LED controller with autonomous power supply. The main functions are shown as below:

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

2.Audio input interface: HDMI/3.5mm

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

4.USB ports for cascading instruction communication

5.Maximum load capacity: 1920 × 1200, 2048 × 1152 ， 2560 × 960(width and height can be specially defined by customers)
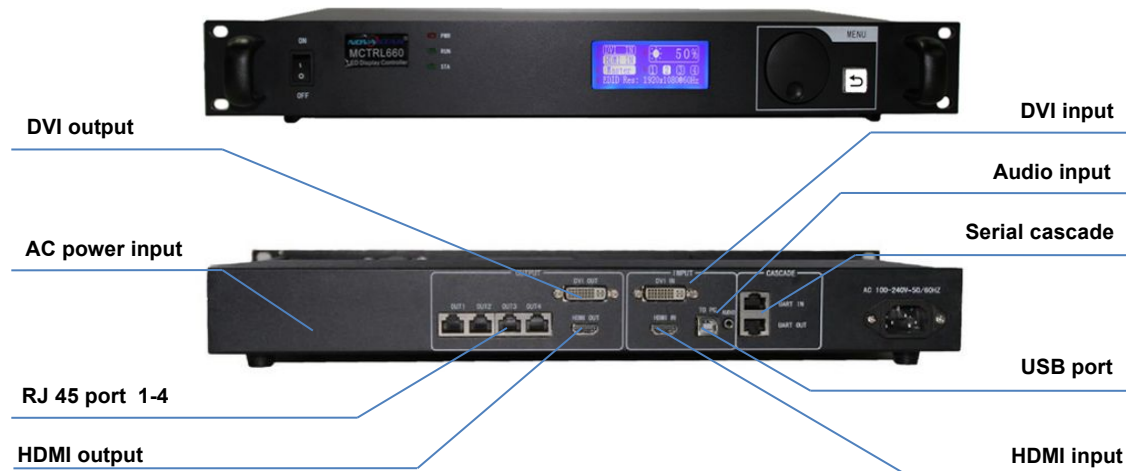

Image 3-9 MCTRL660 controller

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:** For audio output, the multifunctional card needs to be connected between receiver cards or at the end of the cascading chain.
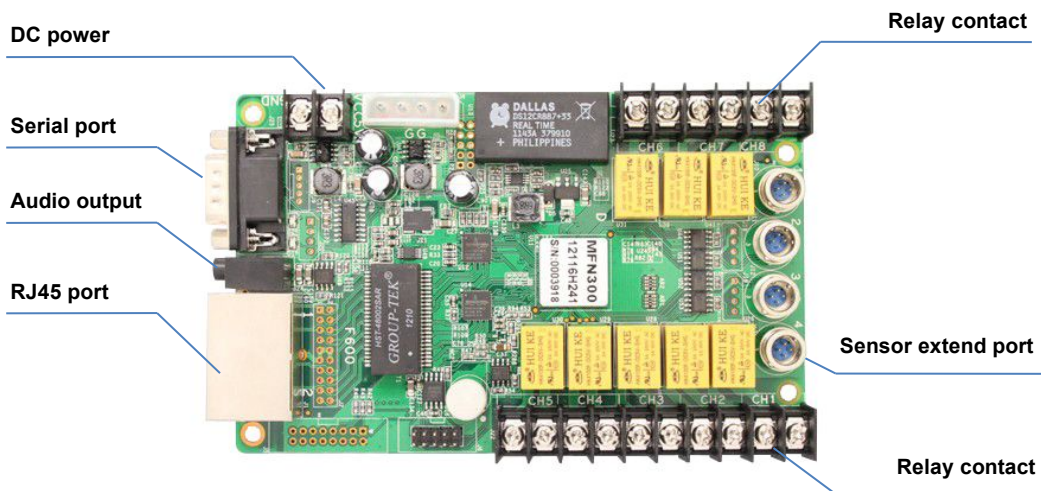

Image 3-10 MFN300 multifunctional card

3.4.5 NS048C Light Sensor

1.For environment brightness monitoring

2.Connect to receiver cards (MSD300, MCTRL300) or multifunctional 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 3-11 NS048C light sensor

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

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3.5 LED System Control Software

NovaLCT-Mars control software is used to configure and control LED display through PC in Graphics User Interface.

Image 3-12 NovaLCT-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 5 meters, optical converter is needed to ensure the complete signal and reliable system. 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
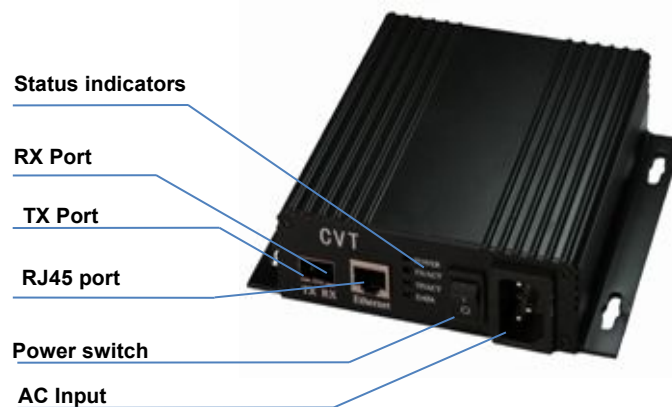
•Use in pair.

Image 3-13 LC-LC fiber cable

Status indicators

RX Port

TX Port

RJ45 port

Power switch

AC Input

Image 3-14 CVT 310 transmitter, receiver and optical fiber

Note: Consult control system manual for more information about installation and usage guidelines.
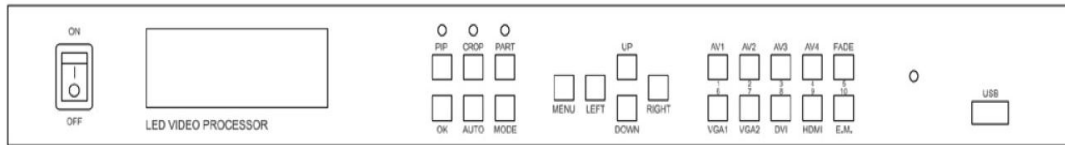
Video Processor

Image 3-15 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		
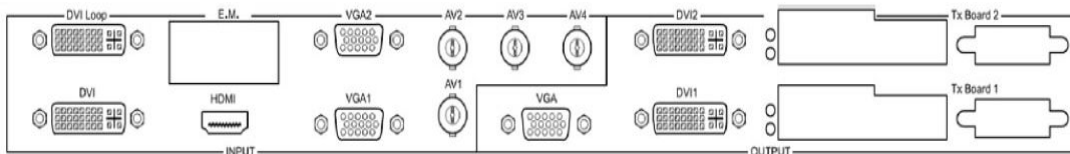
Image 3-16 Video processor rear side

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
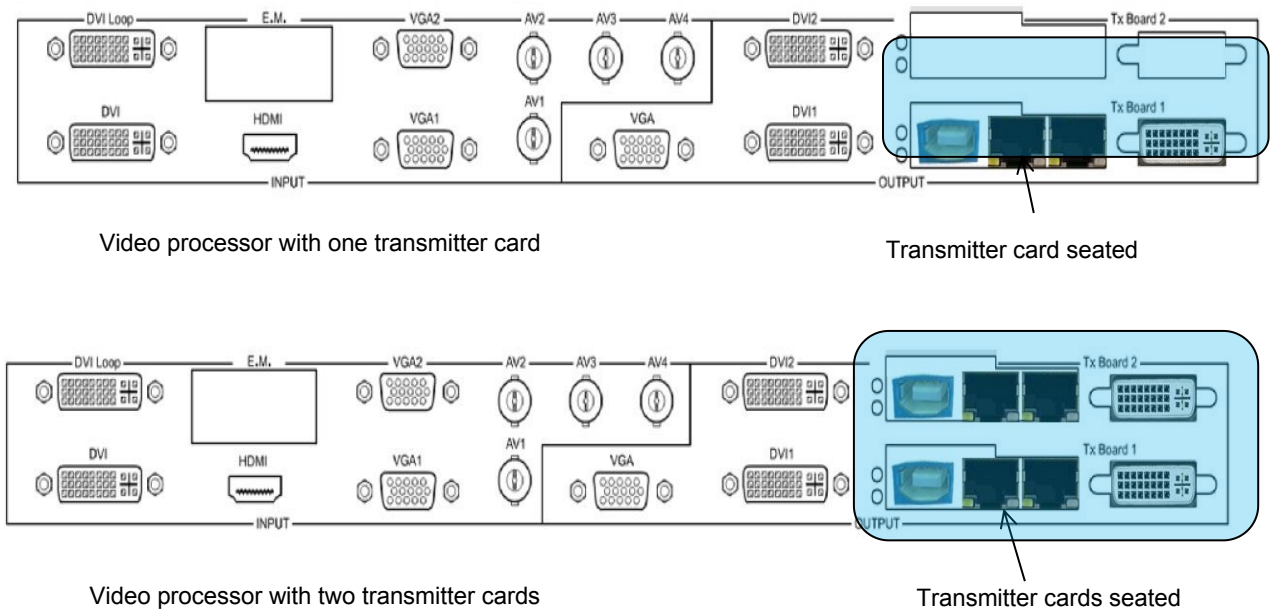
Transmitter cards seated

Image 3-17 Video processor with transmitter 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 VA 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 3-18 Single-phase power box

Image 3-19 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.
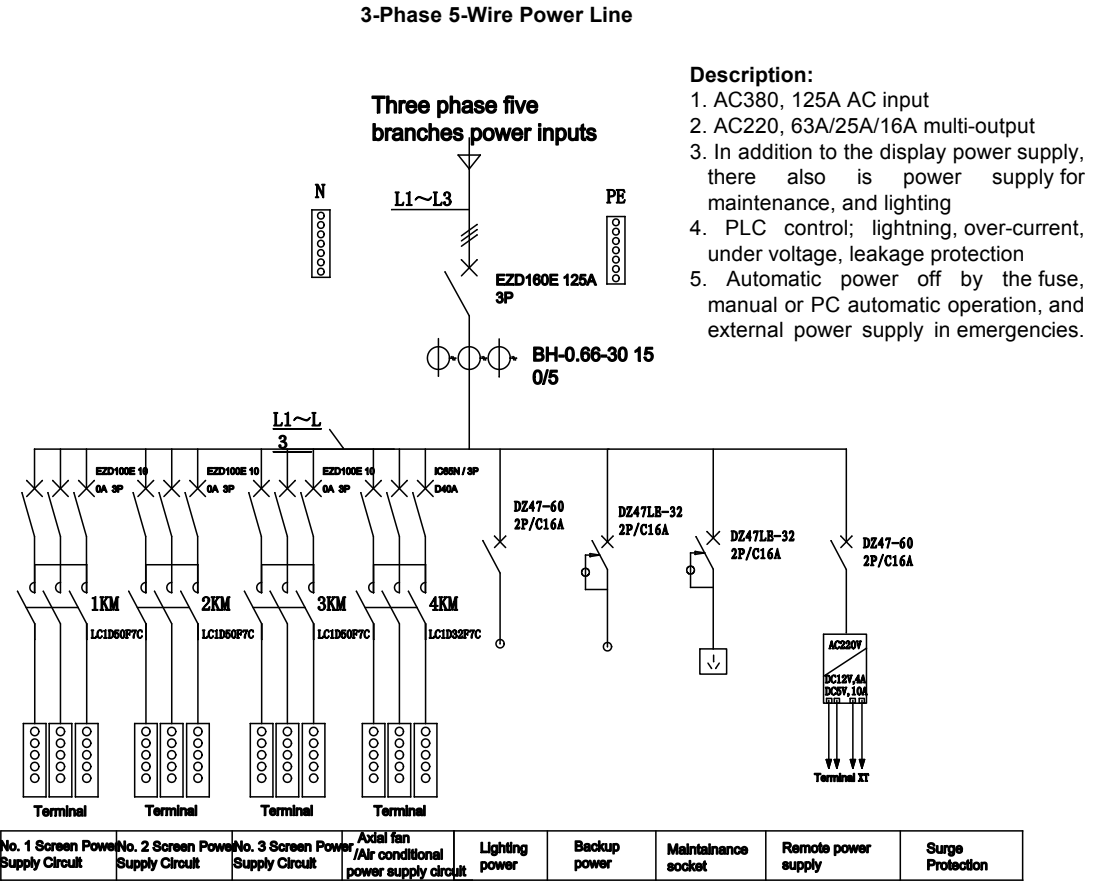
3-Phase 5-Wire Power Line

Description:
1. AC380, 125A AC input
2. AC220, 63A/25A/16A multi-output
3. In addition to the display power supply, there also is power supply for maintenance, and lighting
4. PLC control; lightning, over-current, under voltage, leakage protection
5. Automatic power off by the fuse, manual or PC automatic operation, and external power supply in emergencies.

Image 3-20 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: mm², 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.

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4. Setup Process

This chapter describes the process of suspended installation and standing installation of VA 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 Installation Preparation

Package Check

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

Cabinet Off-line Test

VA series cabinet supports off-line test. Users can test each VAseries 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.
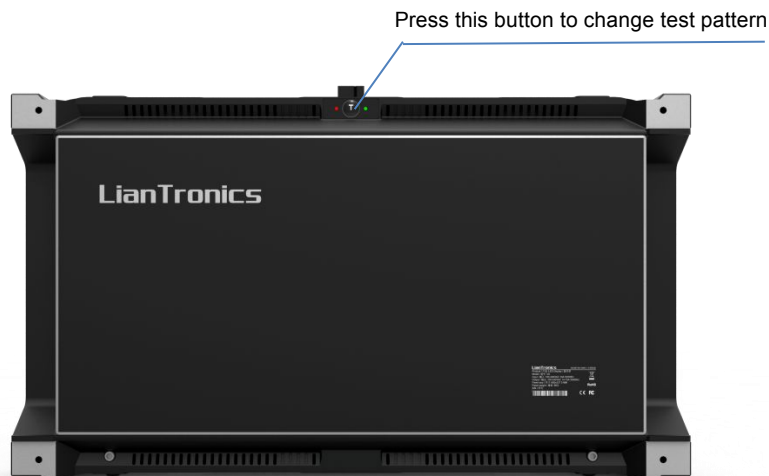

Press this button to change test pattern

Image 4-1 Off-line Test button on tile

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 space is more than 800mm from front to back.

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

1. Diagonal cutting plier	2. Combination plier	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. . Magnetic handle
Tighten or loosen the screw	Tighten or loosen the screw	Front service tool
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 Set up Process of Wall-mounted Installation

Wall-mounted Installation have to let frame and module installed separately and wall installation
screen thickness can be achieved within 100mm

Setup Process
1.Fixing the connecting pieces on the wall.
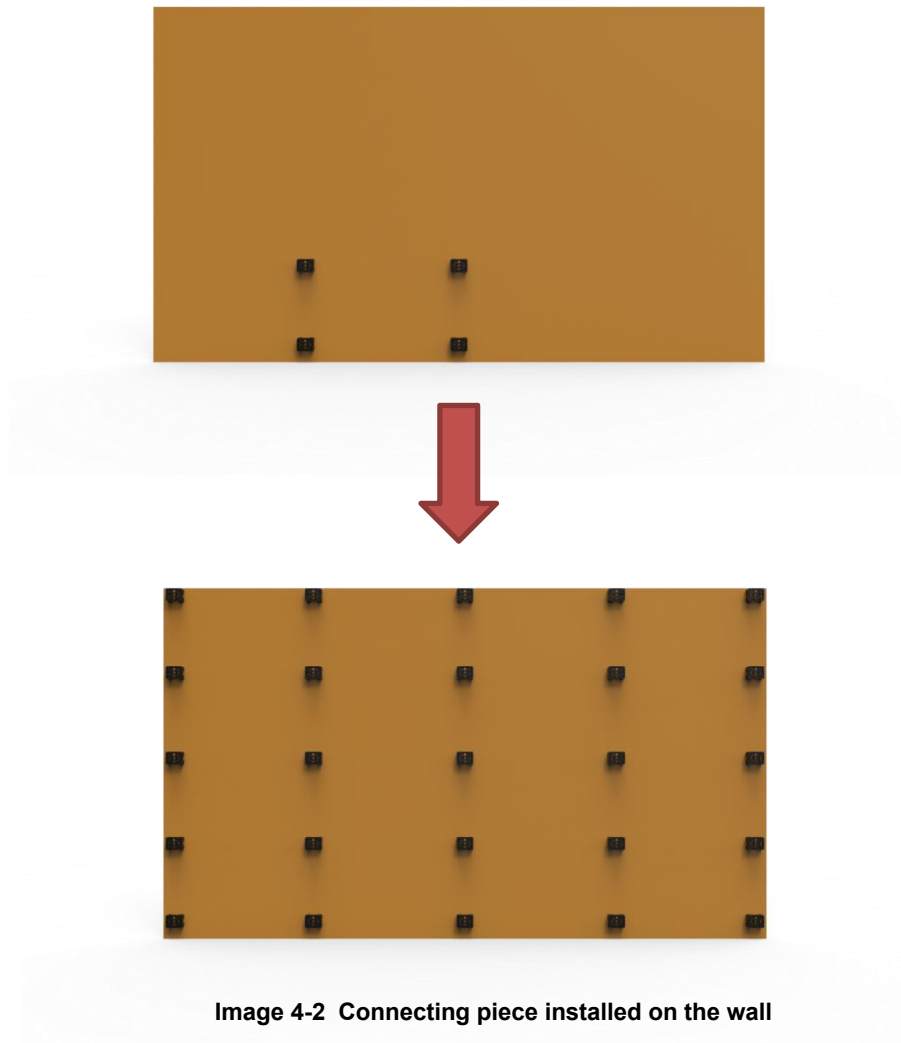

Image 4-2 Connecting piece installed on the wall

Left and right fastening holes

Up and down Fasten holes

Left and right fastening holes

Fasten holes for corner protection

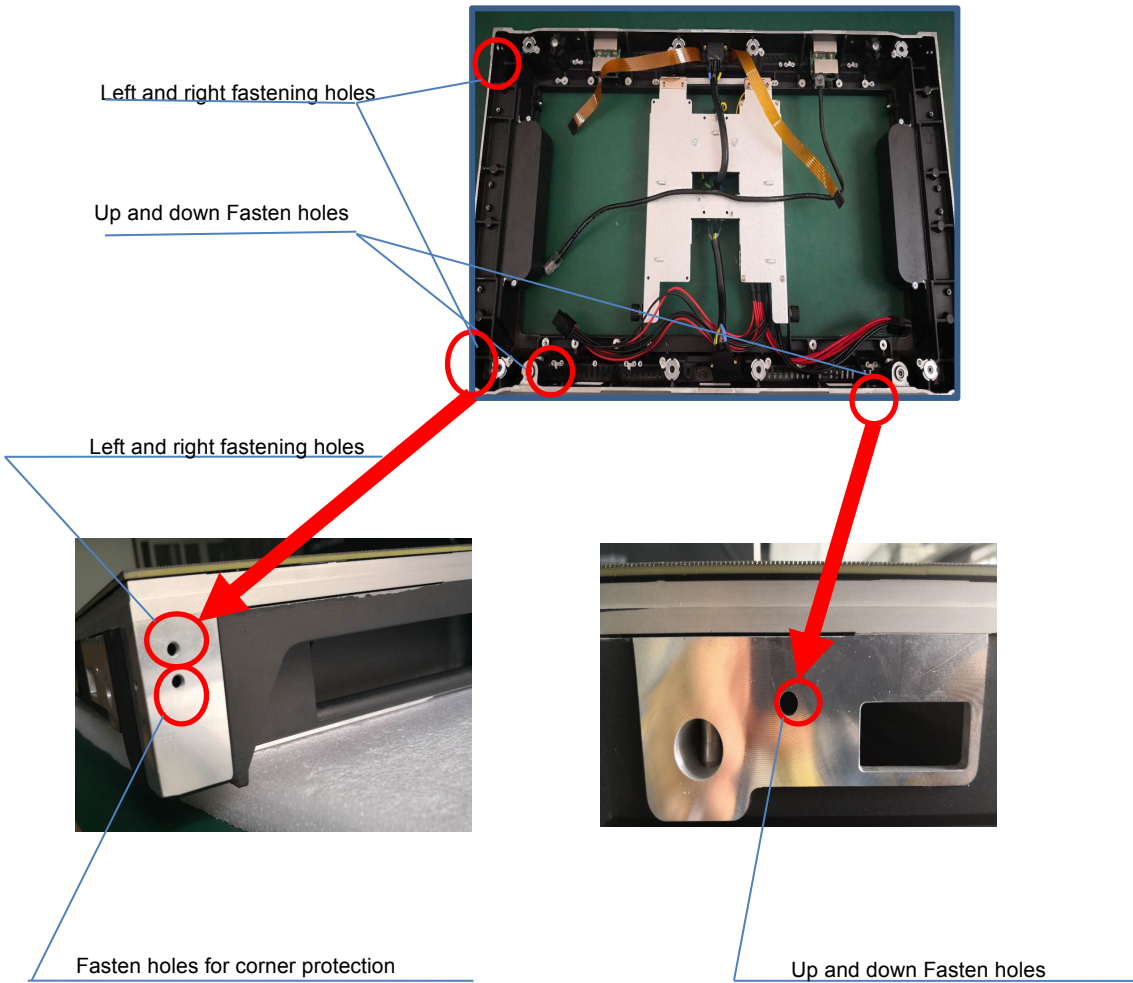Up and down Fasten holes

Image 4-3 fasten holes

2. Installing the rear frames with screws on the wall. Connecting it one by one.
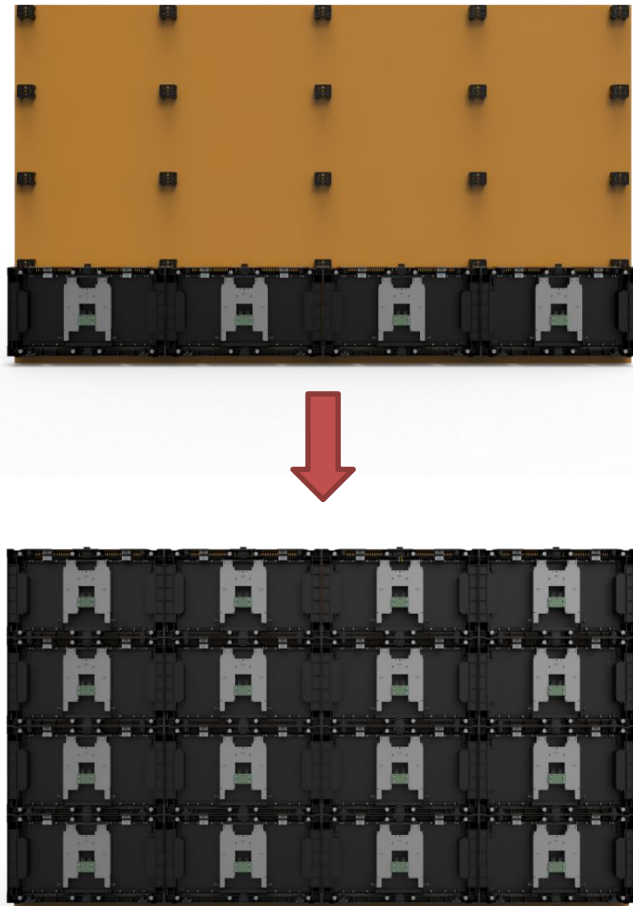
Image 4-4 Rear frame are installed on the wall

Master signal in

Slave signal in

AC power cable in

Test button cable

DC power cable out
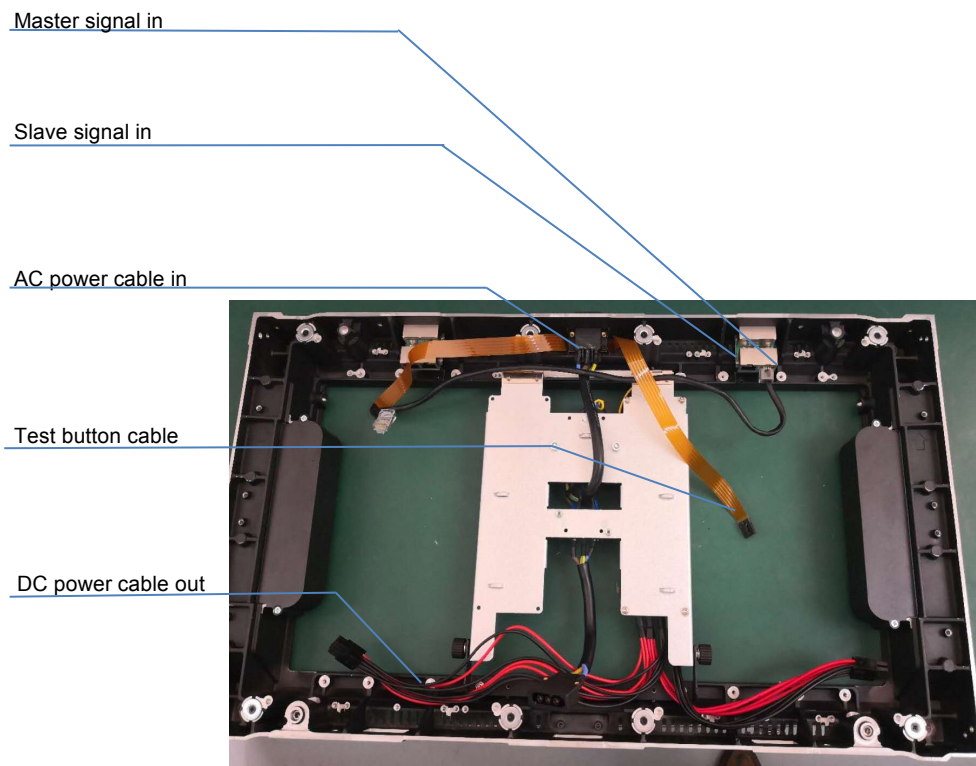
Note :fist connect the power cord according to the load requirements

Image 4-5 internal cable

The master power-bit

The slave power-bit
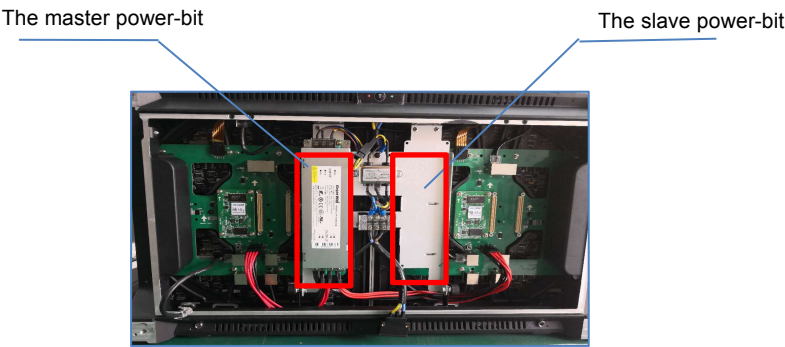
Image 4-6 power supply position

Master receive signal in

Slave receive signal in

The mast receive card

Slaave receive card

Master signal out

Master recive signal in

Slave receive signal out

Slave receive signal in
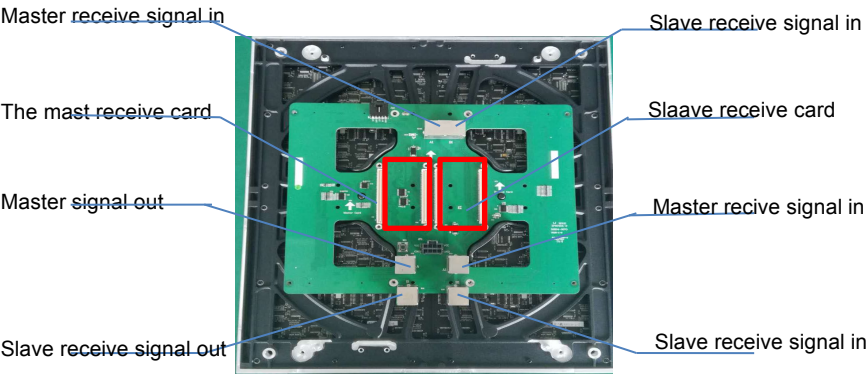
Image 4-7 receive card position

Mastersignal in

To next cabinet
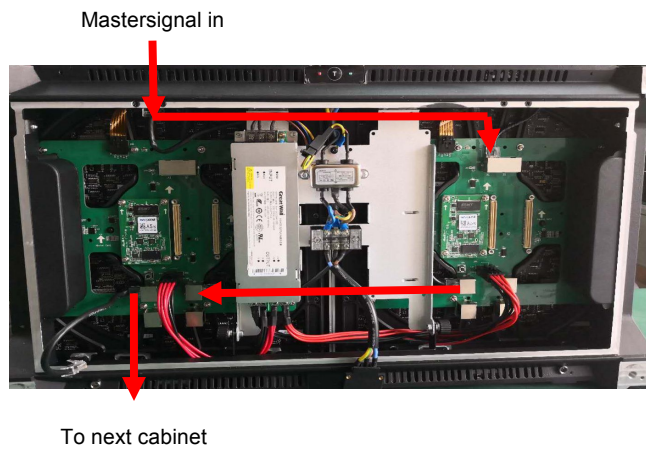
Note:This figure is back view

Image 4-8 No backup connection diagram

Master receive signal in   Slave receive signal in

Master receive signal out

Slave receive signal out
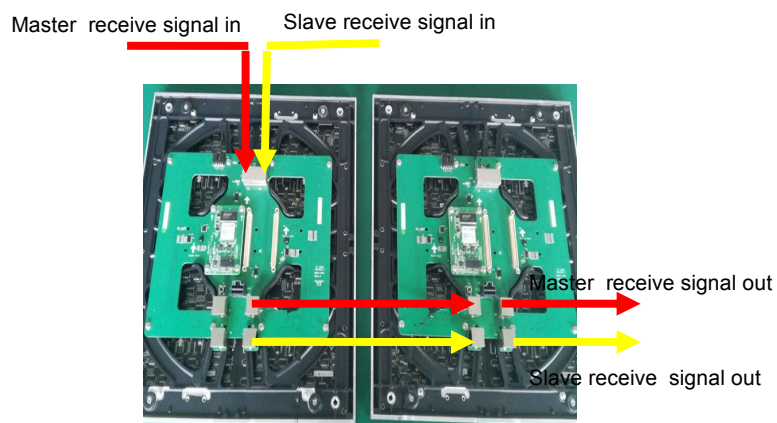
Note:For ease of wiring,it is recommended to install the left module first

Image 4-9 backup connection diagram

3. Attach modules to the rear frames.Continue to assemble the VA series display tiles from down to up row after row. The magnet on the module makes the installation easy.

Image 4-10 The module installed in the rear frame.

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

4.VA aslo can be used for standing installtion and hanging installtion , arc installation (Seeing the installation image for more details.)

Image 4-11Traditional installation
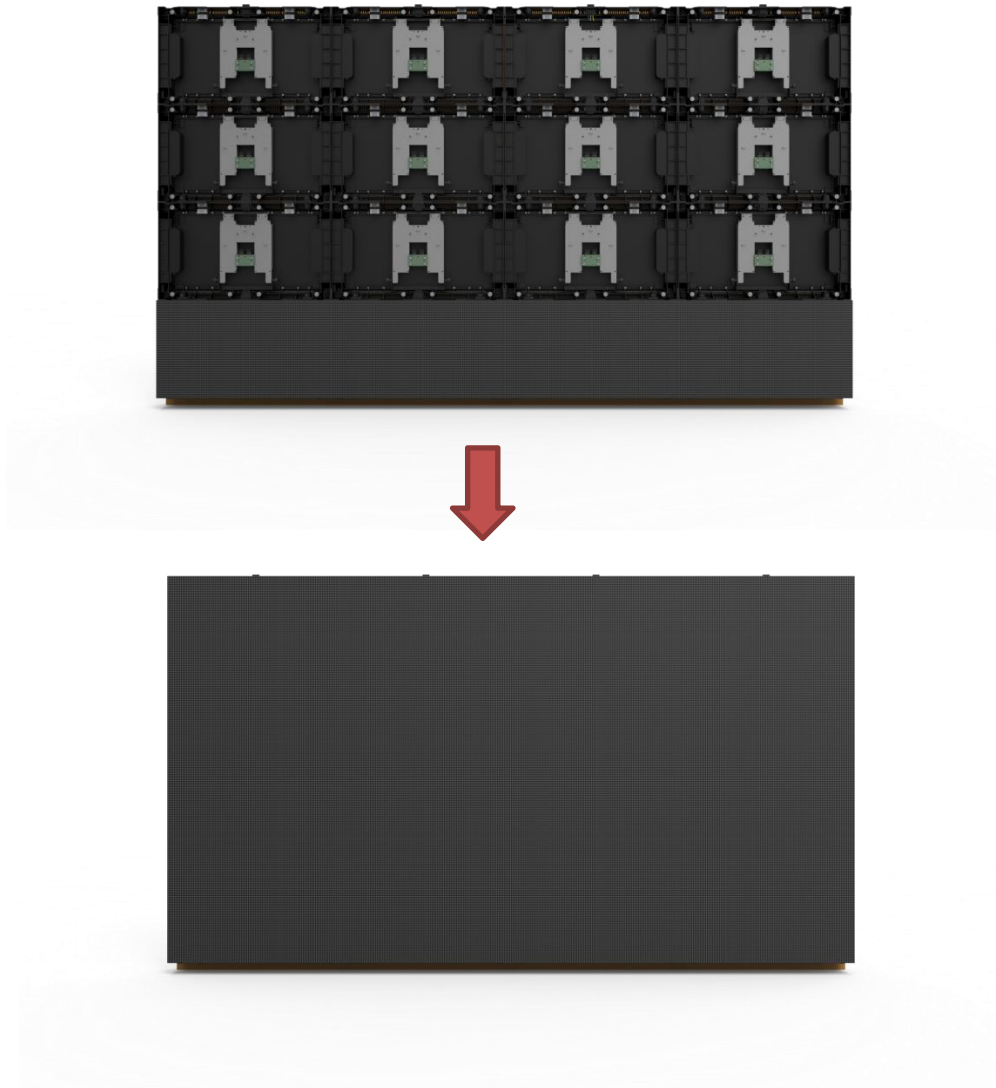
4.3 Data Cabling

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

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

The image below shows data cabling seen from the rear of VA 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.
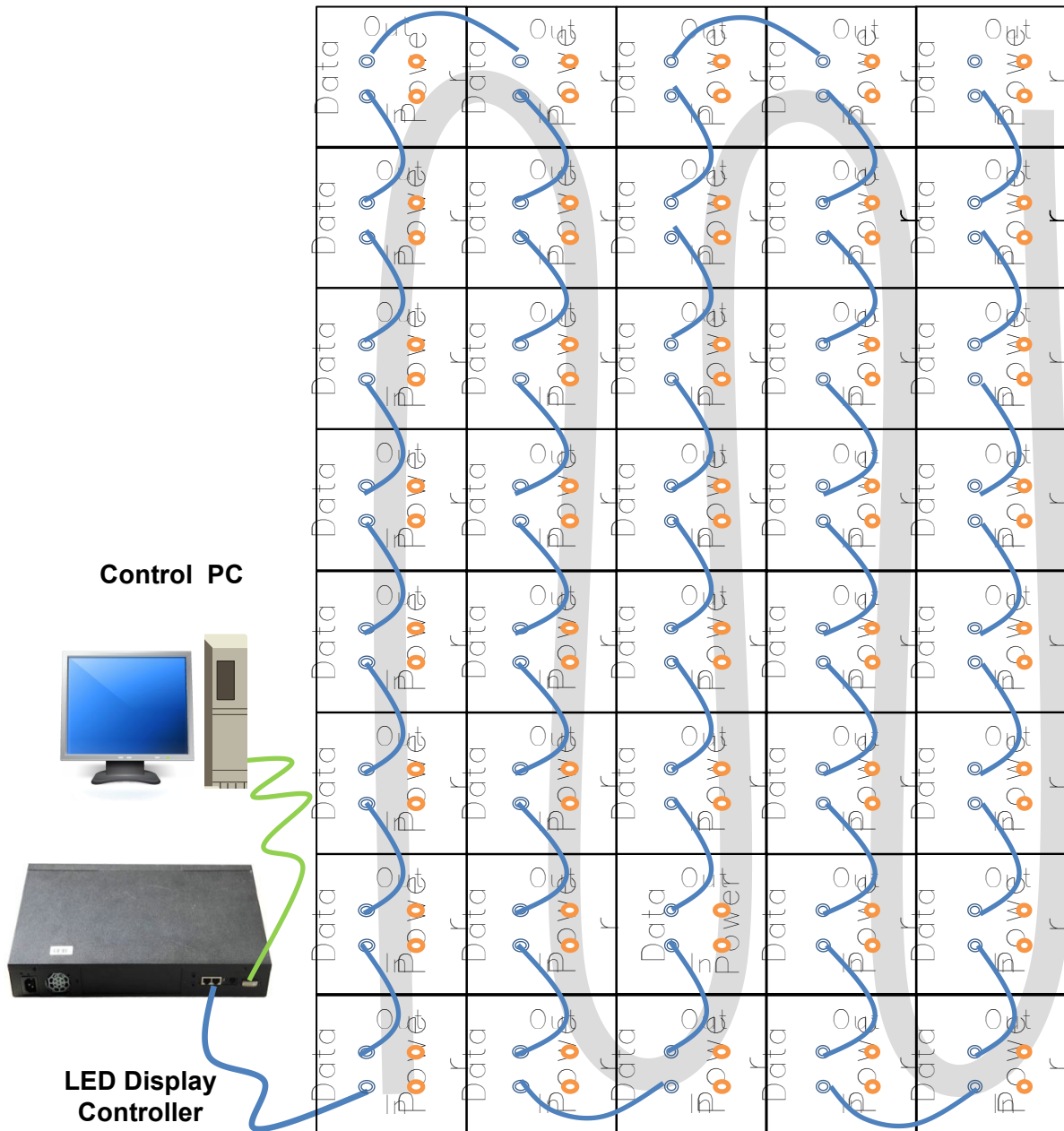

Image 4-12 Example of data cabling

4.4 Power Cabling

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

Warning: Pay attention to the direction of the alignment in the following image.
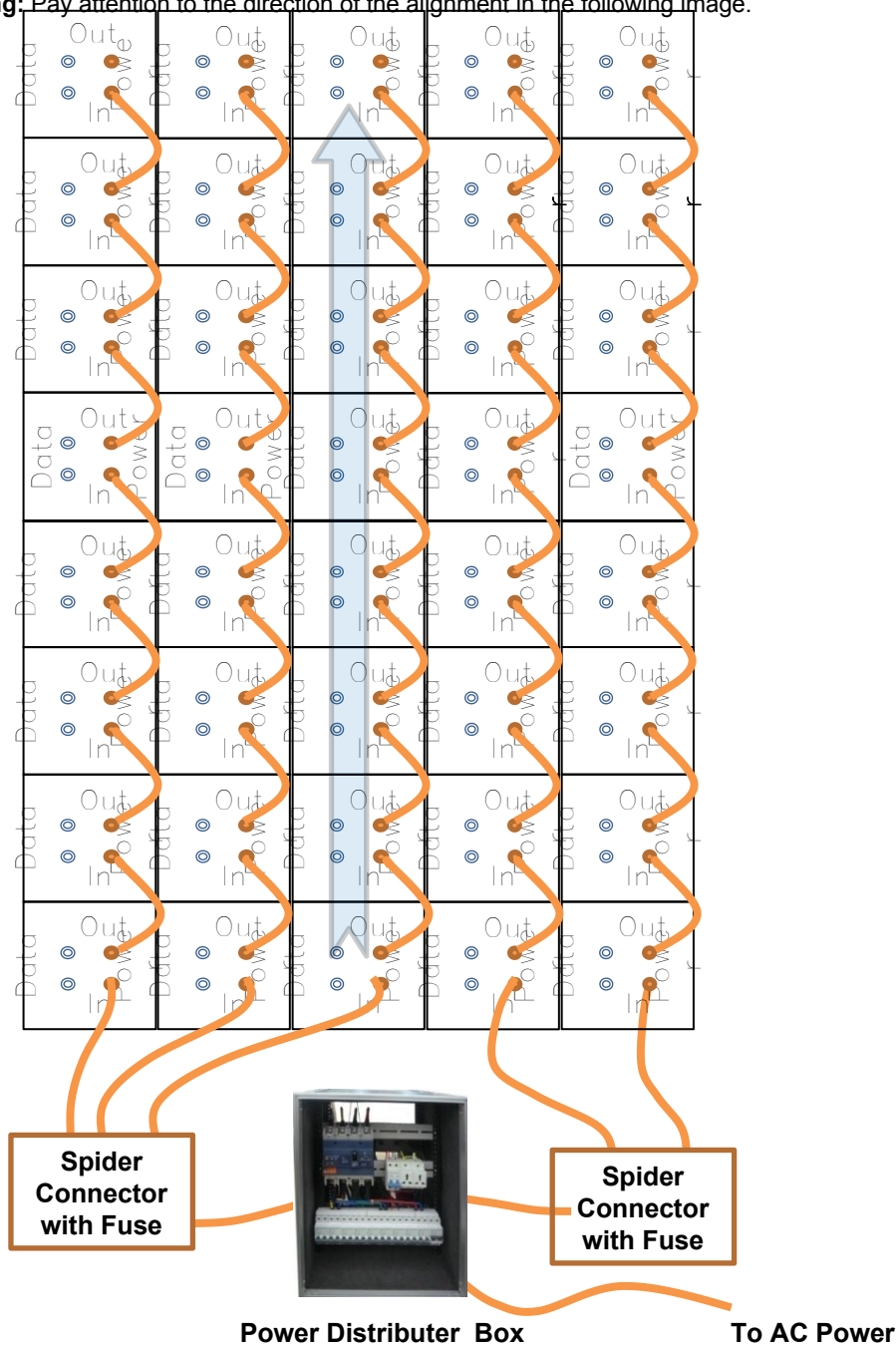
Image 4-13 Example of power cabling

4.5 System Connection

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.

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 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.
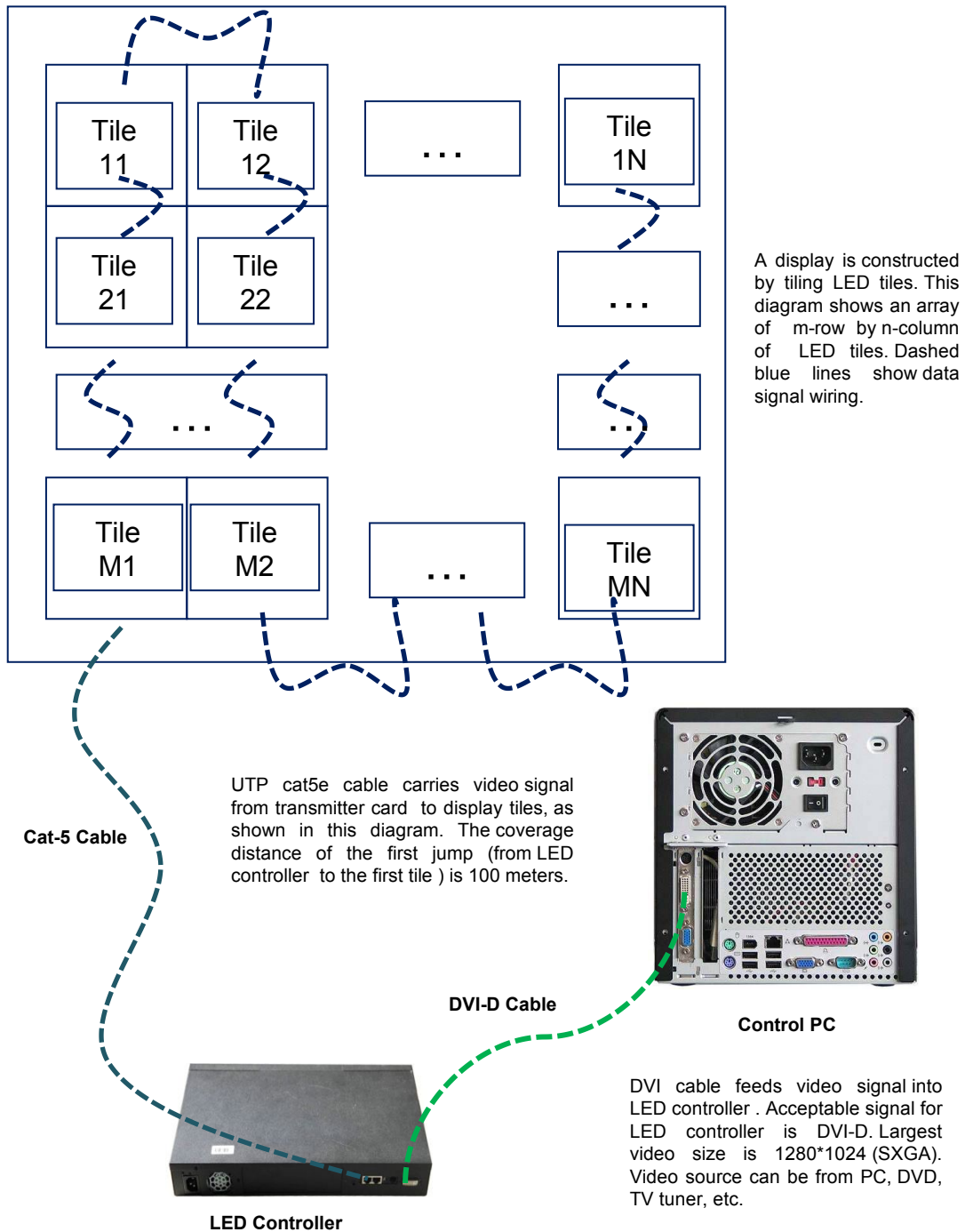
Image 4-14System connection diagram of a typical LED display

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
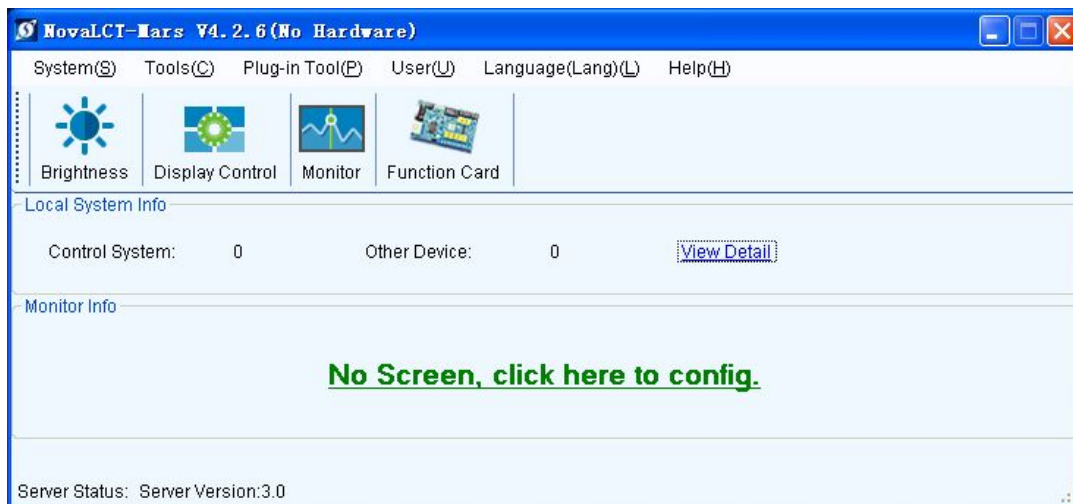
Image 5-2

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.
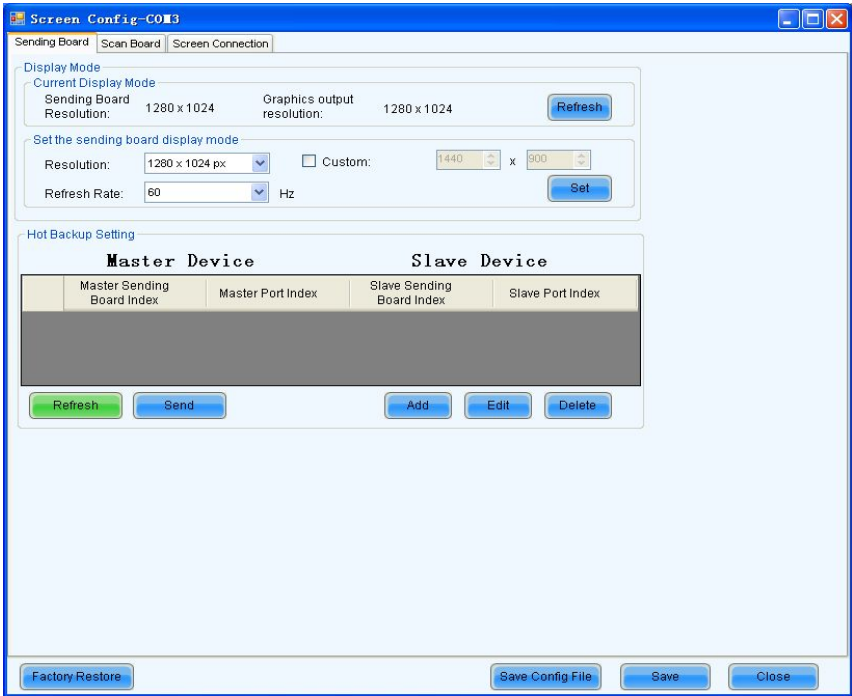
Image 5-5 Sending board configuration interface

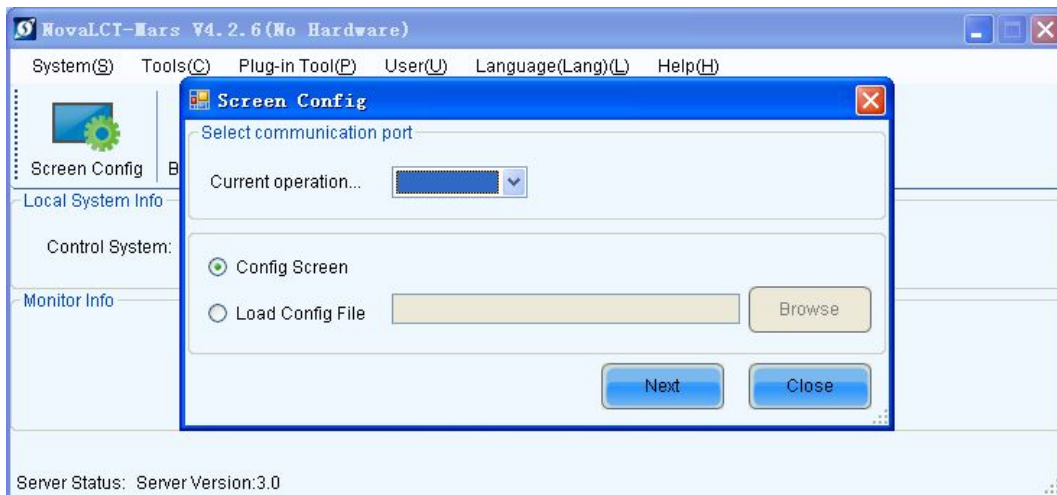**4.Go to scan board configuration：** As is shown in image 5-6, select "**Load File**", down load "***.rcfg**" file from delivered CD. Click "**Send To HW** ", and then the file will be send to each scan board (receiving card). Click "**Save**" and save all files in hardware, when restart power ,files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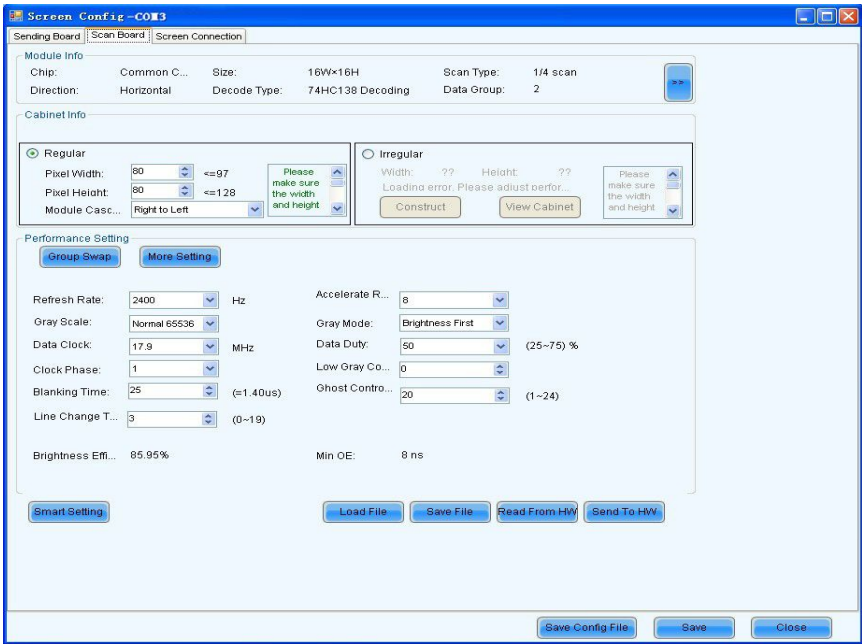
Image 5-6 Scan board configuration interface

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**".
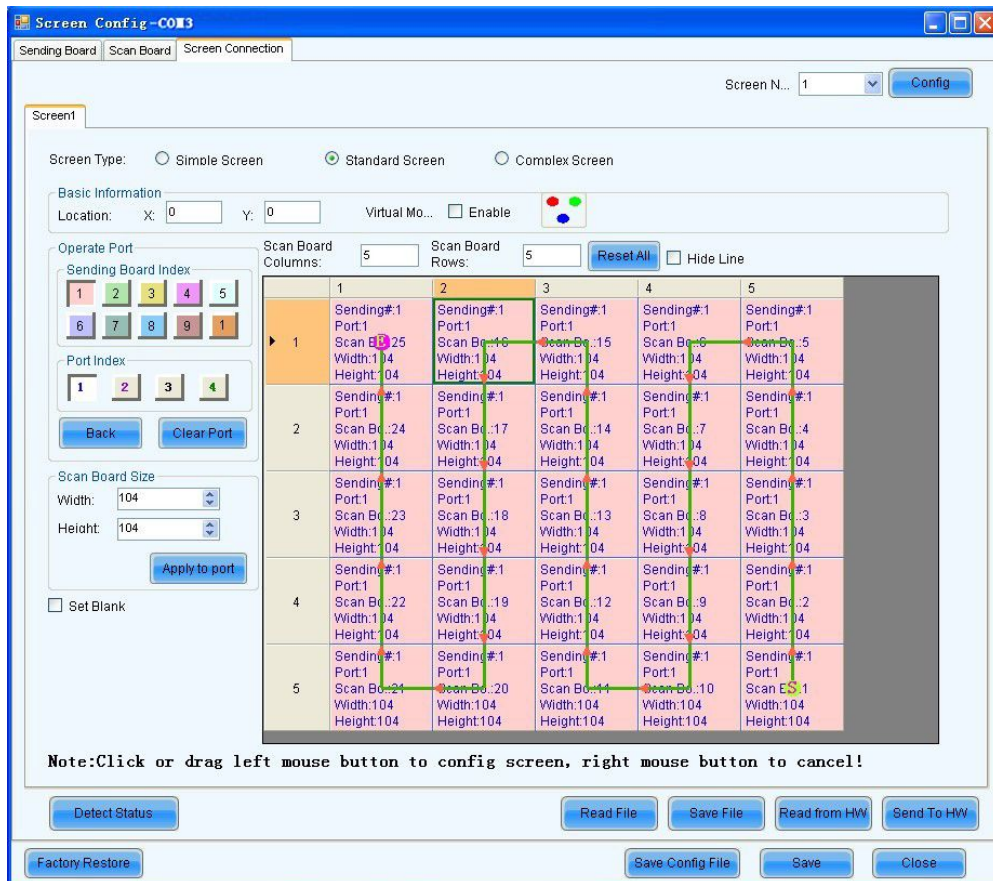

Image 5-7 Screen connection interface

6. Trouble Shooting

6.1 Software Trouble

Problem type	Problem description	Solution	Reason	Analysis
Nova LCT	Unable to open NovaLCT	Reinstall "Recover.reg"	Bin files damaged	Virus influenced
	System notice：NovaLCT.exe-error	Install Microsoft .NET Framework 2.0	Computer is not installed wit h .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	

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6.3 Module Problems

Problem type	Problem description	Phenomenon & 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	Phenomenon & 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 card is 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	Phenomenon & 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.
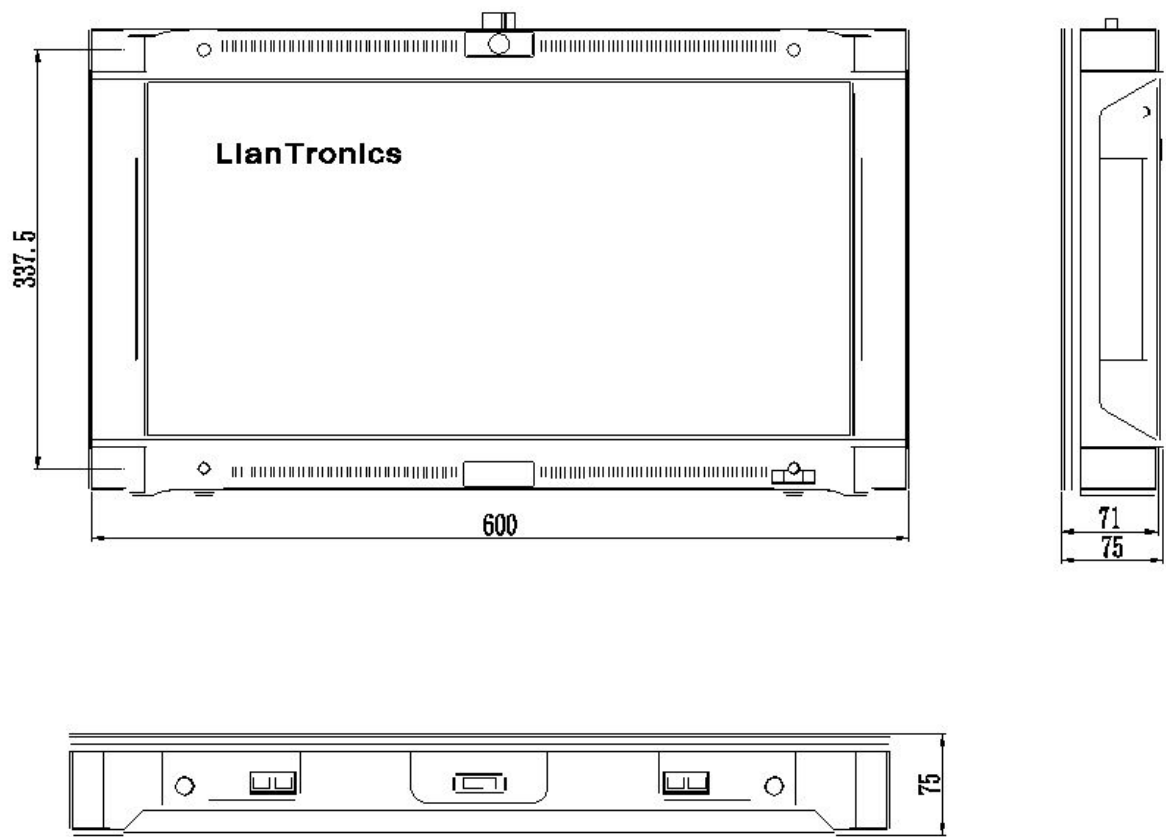
Cautions for use

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.

Appendix A: Technical Specification

Item	VA Series			
Pixel pitch (mm)	VA 0.9	VA 1.2	VA 1.5	VA 1.8
Pixel configuration	1R1G1B			
Brightness (nit)	600-800			
Contrast	8000:1			
Viewing angle	H:160°; V:160°			
Pixel density (pixel/m²)	113778	640000	40960	28445
Module resolution (pixel)	320*180	240*270	162*216	160*180
Tile size (mm)	600x337.5x76			
Tile resolution (pixel)	640*360	480*270	384*216	320*180
Tile type and material	Die-casting aluminum cabinet			
Tile weight (Kg)	8			
Average power consumption (W/m²)	263	230		
Max power consumption (W/m²)	790	690		
Refresh rate(Hz)	1920/2880/3840			
Frame rate(Hz)	60			
processing	12/14/16 bit/color			
Voltage (V)	AC 100-240			
Serviceability	front/rear			
Protection grade	IP30			
Operation/storage temperature and humidity	Operation temperature: -20℃~+50℃; Operation humidity : 10~90%RH Storage temperature: -40℃~+60℃; Storage humidity : 10~90%RH			
Life span (hrs)	100000			
MTBF (hrs)	≥3000			
Source compatibility	CVBS,YC,YUV,RGB,HDMI,DVI,SDI,HD-SDI			

Appendix B: Tile Dimensions

LianTronics