Product Specification

Product Name: P4 Outdoor Full Color Module

Manufacturer: Shanxi High-tech Huaye Electronics Group Co.,Ltd

Specification: PM4-O

File No.: HJ-03-RD-I-010

Version No.: A0

Designed by	Reviewed by	Authorized by
Document release date: Sep 13rd, 2022		

CONTENTS

1. PRODUCT INSTRUCTION

1.1. Scope of application

This product specification is only applicable to the outdoor P4 full-color module, specification model: PM4-O.

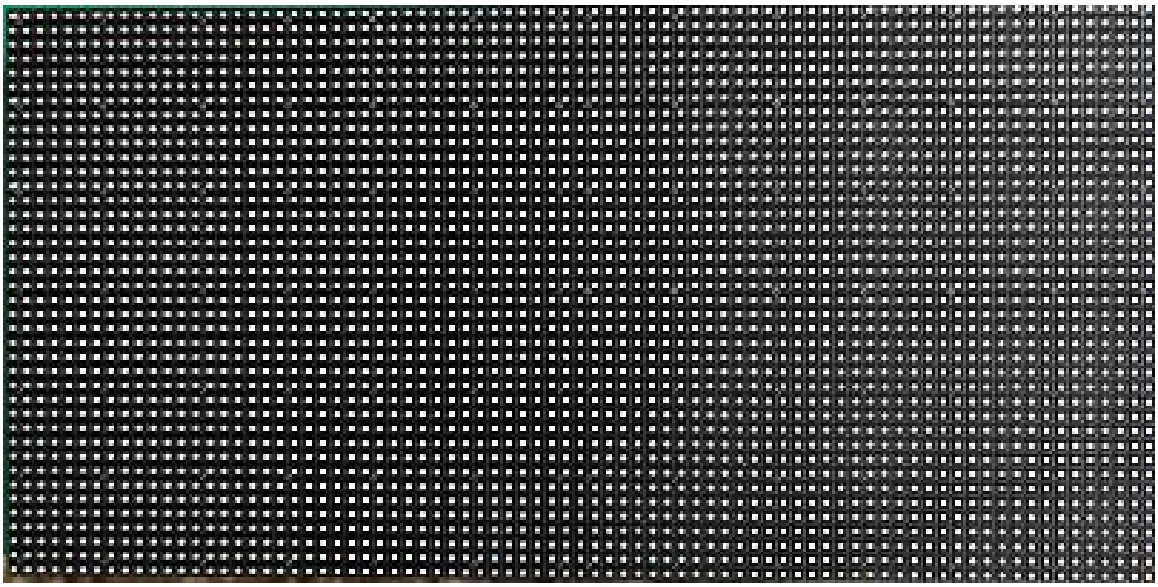
1.2. Product description

This product uses self-packaged SMD 1921 lamp beads, and each of the red, green and blue chips is packaged in the lamp bead. The 1921 lamp bead is welded on the PCB board by surface mount technology (SMT).

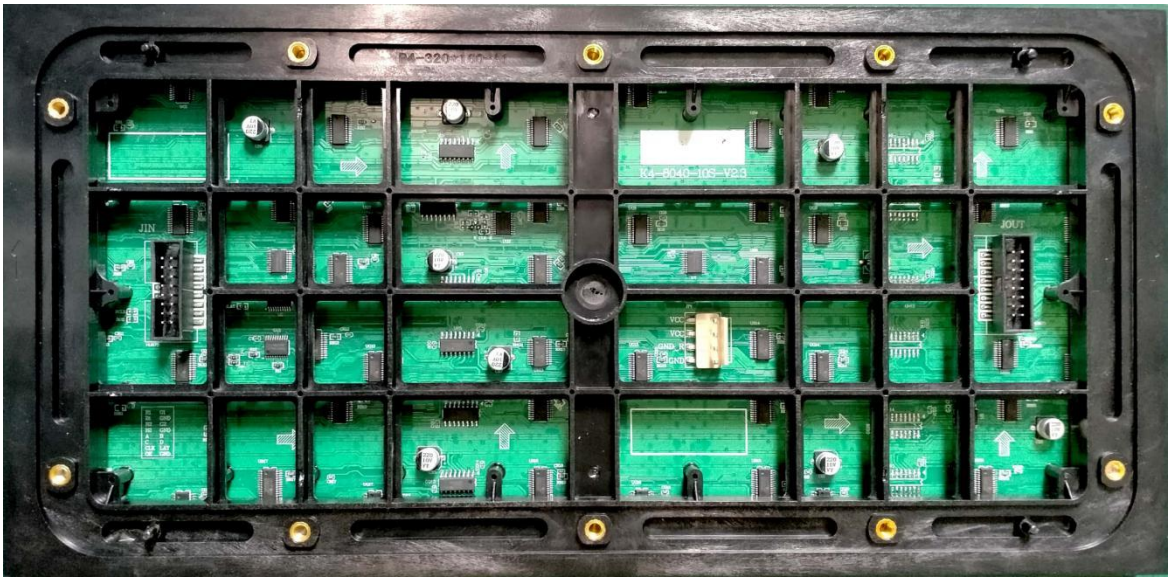
This product uses double latch driver IC chip and integrated row driver chip to control by computer; the display angle is wide, the color is pure and consistent, the brightness is stable and uniform, and the text, image and video are clear.

The lamp beads and chips are mounted on the PCB to form a unit board, and then installed on the bottom case to form a module. It has the characteristics of preventing direct sunlight, dustproof, waterproof, high temperature resistance, etc. Its appearance is exquisite and beautiful, and it is durable.

The bottom case has M4 threaded holes for installing modules. Use screws to fix the module on the cabinet, and then splice the cabinets into a whole screen.



Front view



Back view

Lamp beads parameters

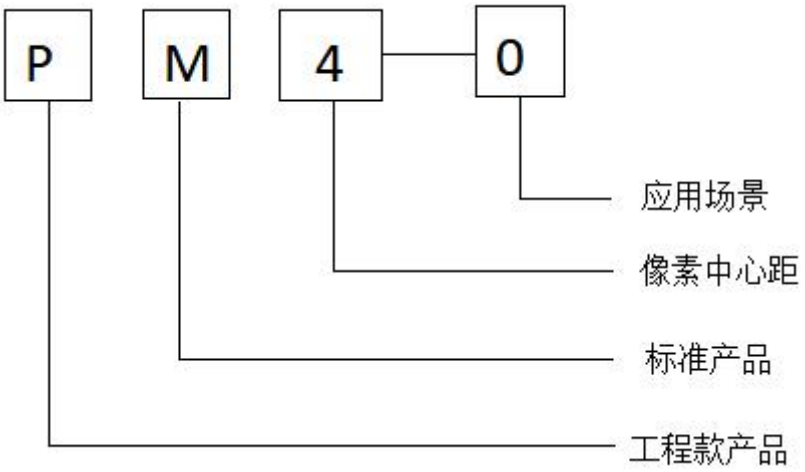
Item	Unit	R	G	B
IF	mA	20	15	10
wavelength	nm	618.5-623.5	518-523	467-472
lv	mcd	465-674	852-1150	148-200
Vf	V	1.9-2.4	2.9-3.4	2.9-3.4

1.3. Interface definition

R1	1	2	G1
B1	3	4	GND
R2	5	6	G2
B2	7	8	GND
A	9	10	B
C	11	12	D
CLK	13	14	LAT
OE	15	16	GND

Pin	Signal	Function	Pin	Signal	Function
4、8、16	GND	Ground	9、10、11、12	A、B C、D	Line control
15	OE	Light control	14	LAT	Data latch
1、2、3	R1 G1 B1	First group data of red, green and blue	5、 6、7	R2 G2 B2	Second group data of red, green and blue
13	CLK	Clock signal			

1.4. Specification definition



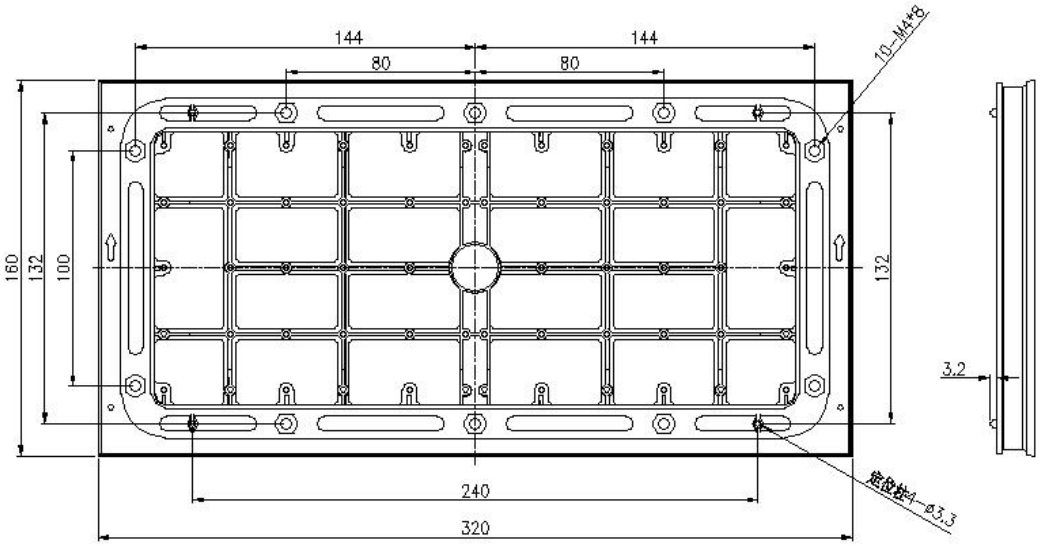
1.5. Module technical parameters

No.	Item	Parameter
Unit module		
1	LEDSMD	SMD 1921 three-in-one surface mount
2	Horizontal viewing angle	H≥160°
3	Vertical viewing angle	V≥140°
4	Pixel composition	1R1G1B
5	Pixel pitch	4mm
6	Scan method	1/10
7	Drive mode	Constant current drive
8	Resolution	80×40
9	Module size	320mm×160mm×19mm
10	Weight	455±5g
11	Type	Light drive in one
12	Working voltage	5V
13	Maximum current	6.5A
14	Average power	17W
15	Maximum power	33W
Whole screen		
1	Use environment	outdoor

2	Ingress protection	IP65（front）
3	White balance brightness	≥4500cd/m^2
4	Color temperature	3000-18000K
5	Average power	323W/m^2
6	Maximum power	645W/m^2
7	Brightness uniformity	≥97%
8	Chromatic uniformity	±0.003Cx，within Cy
9	Pixel density (dots/m^2)	62500
10	Power supply	AC200-240V,50/60Hz
11	Earth leakage current	≤3.5mA/m^2
12	Working temperature	-20℃～+60℃ Support up to -40° C by adding heating facilities
13	Working humidity	10%～80% no condensation
14	Storage environment temperature	-20℃～60℃
15	Storage environment humidity	10%～80% no condensation
16	Frame rate	60Hz
17	Refresh rate	≥1920Hz
18	Viewing distance	≥4m
19	Signal processing depth	16384
20	Grayscale/Color	281 trillion
21	Brightness adjustment software	Software 16-level adjustment/16-level automatic
22	Control method	Synchronized display with computer display
23	Effective communication distance without relay	The maximum transmission distance of unshielded twisted pair is 100 meters, the transmission distance of multi-mode fiber can reach 500 meters, and the transmission distance of single-mode fiber can reach 15 kilometers
24	Computer operating system	Windows(XP、Vista)、Win7、Win8、Win10

25	Video signal	VGA、DVI、RF、S-Video、RGBHV YUV、YC、COMPOSITION etc,.
26	Mean time between failures	≥10000H
27	Service life	≥100000H
28	Whole screen pixel runaway rate	≤1/10000
29	Regional pixel runaway rate	≤3/10000
30	Stability	Support 7*24H continuous work
31	Flame retardant (fireproof)	The flame retardant grade of PCB reaches UL94 V-0 grade
32	Kit Material	PC+fiber
33	Decay rate (working 3 years)	≤15%

1.6.Module installation hole diagram



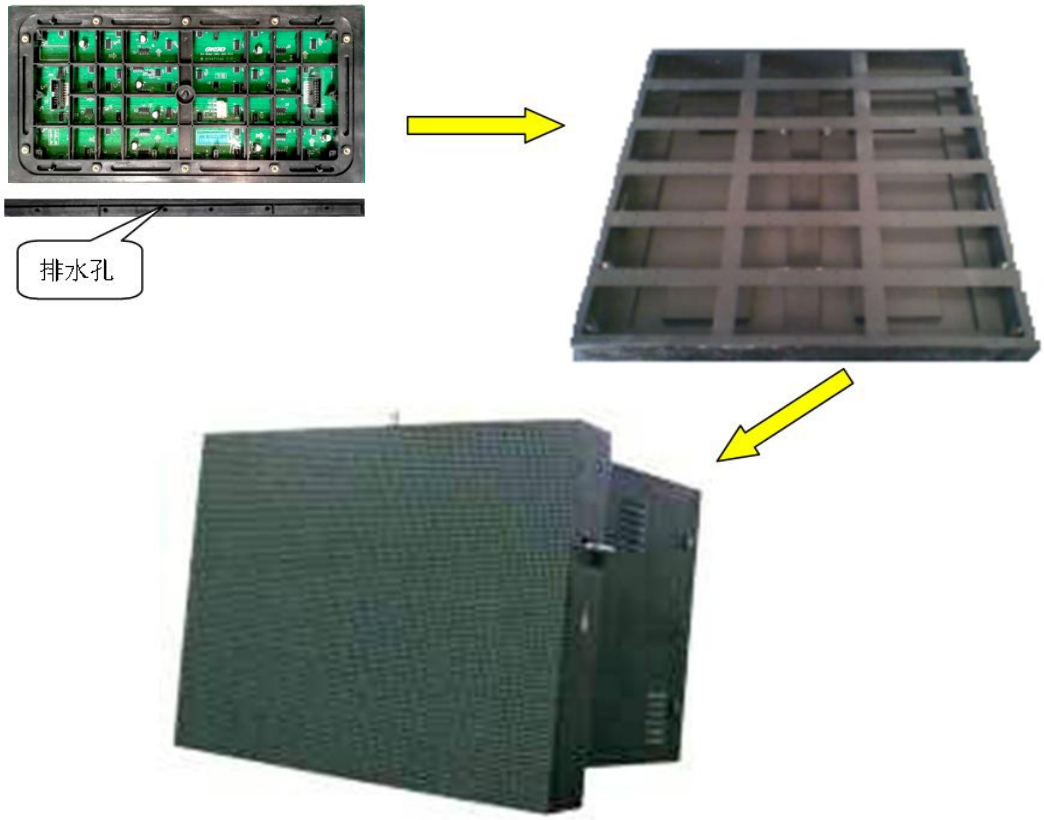
Unit: mm

2. Installation and maintenance guidance

2.1.Module waterproof installation

Put the waterproof rubber ring into the groove on the back of the module. The drain hole of the module faces the lower

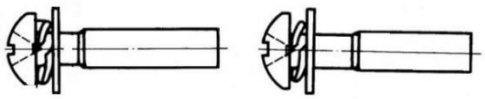
direction of the display screen, the mounting threaded holes on the back of the module are aligned with the corresponding mounting holes of the cabinet, and the module is fixed on the cabinet from the inside of the cabinet with M4 screws. The waterproof rubber ring should be pressed flat, and there should be no gap between the waterproof rubber ring, the module and the box, otherwise rainwater may leak into the box from between the module and the box.



2.2. Fixed module screws

The screws used to fix the module are M4 screws, and the

length of the screws passing through the box should not exceed 5mm. It is recommended to use GB9074.4 screws (as shown in the figure below, spring pads, washers and screws are inseparable), which can reliably fix the module. For screw selection and naming methods, refer to the corresponding national standards.



M4 GB9074.4 with locking screw

2.3.Module installation clearance

The module mask and the shell will expand when heated, and a gap of 0.1mm to 0.15mm should be left between the modules. If no gap is reserved, the mask may bulge when heated.

Note that the hole position of the box refers to the processing of the hole position of the module. When the temperature in winter is lower than 10° C, the size of the product will shrink, and the distance between the modules should be calculated according to the actual measured size of the product.

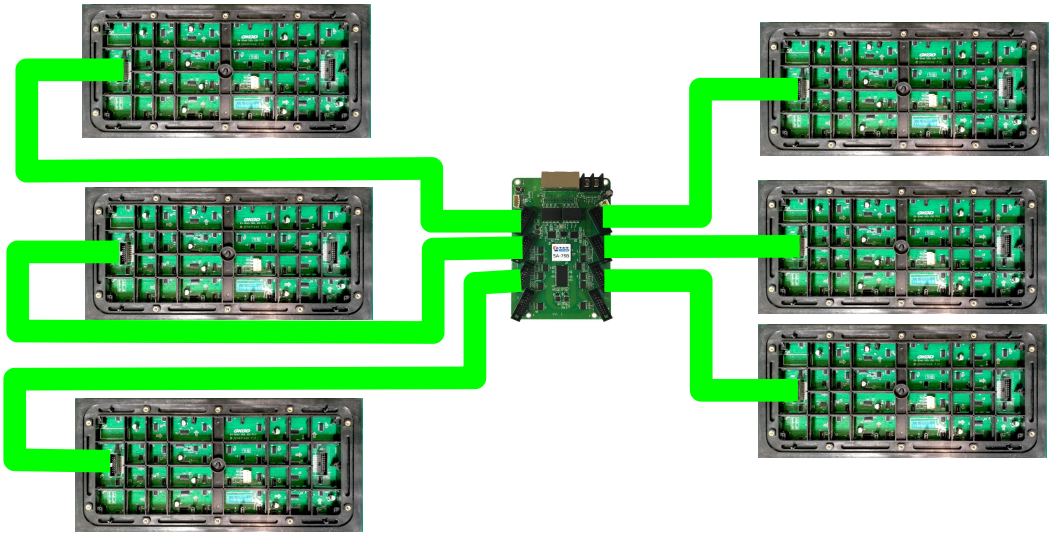
Note: When splicing the cabinet and the cabinet, it is also necessary to leave the gap between the modules according to the above requirements! The die set shall not bear extrusion force in any direction.

2.4.Connection method of module signal line

There are two ways to install signal cables: horizontal cascading and split connection. Horizontal cascading is to connect the horizontal modules with cables, and the rightmost module (facing the module) is connected to the receiving card with a long cable.

Split connection is the way to make full use of the receiving card. As shown in the figure below, each row of modules uses a long cable to connect to the receiving card. When there are many modules, the modules can continue to expand in the way of horizontal cascading. Compared with the horizontal cascading method, the split method can provide a higher refresh rate and better display effect. When conditions permit, split connection should be adopted.

Module horizontal cascading

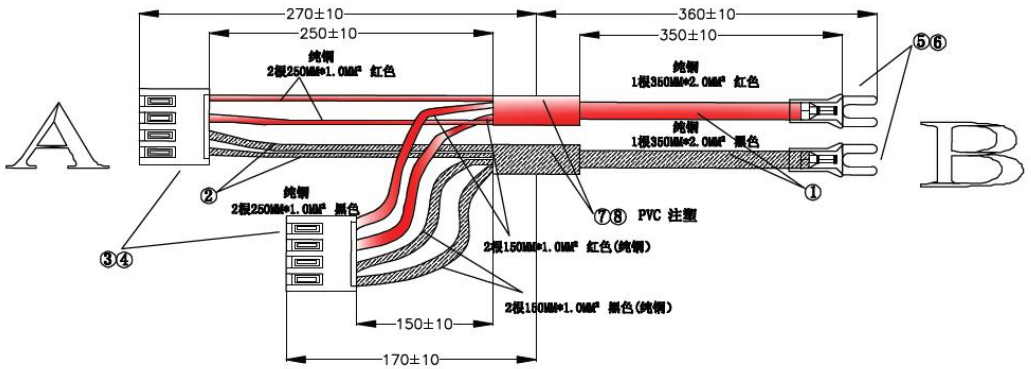


Module split connection

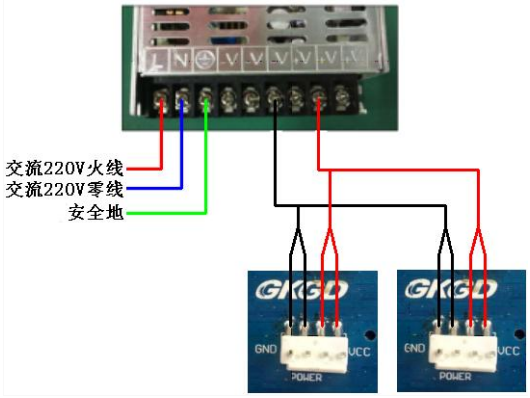
2.5.Module power configuration

switching power supply	single module current	Number of modules
5V 40A	6.5A	3-4 pcs
5V 80A		7-9pcs

Power cord model: one for two / pure copper / total length 630mm / main line length 350mm / sub-line length 250mm / 150mm / 2-4U terminal at one end / VH4 wire head at one end

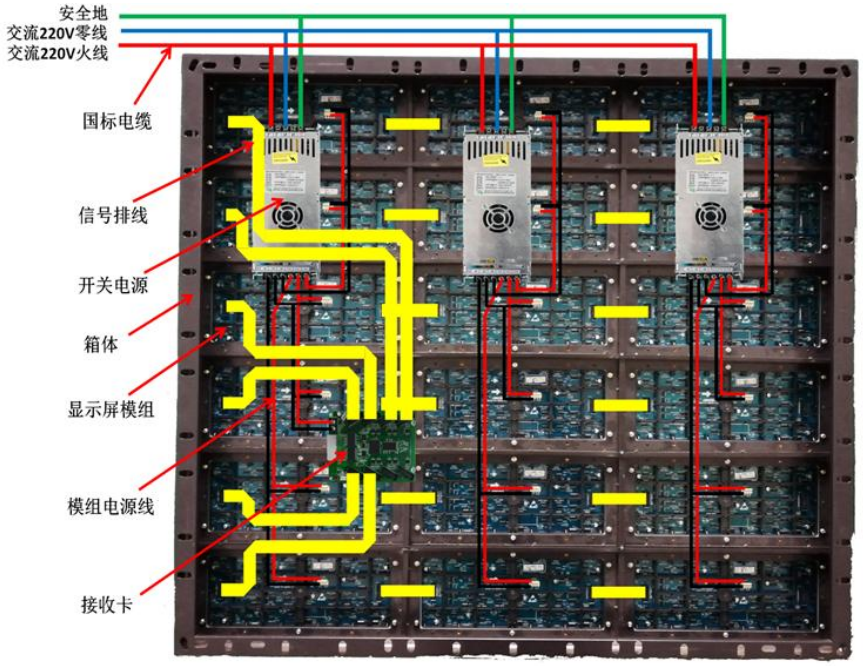


Power Cord Diagram



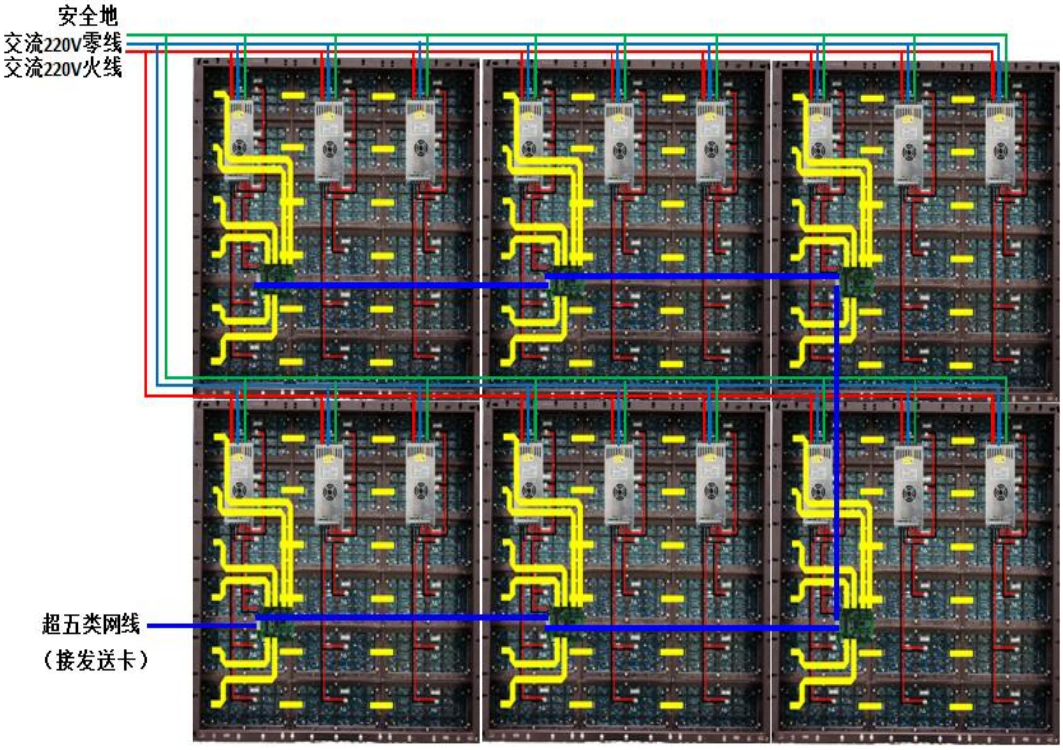
Power Connection Diagram

2.6. Cabinet installation



Cabinet installation diagram

This figure is only used for the wiring diagram of the simple box; the connection method of the die-casting box is the same, but the power supply can be connected to the box with a power cord with an aviation plug;

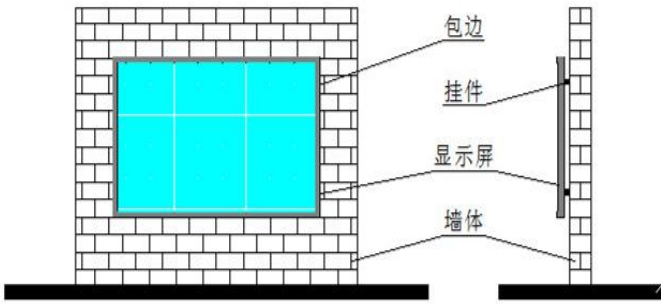


Cabinet Connection Diagram

This figure is only used to illustrate the wiring between simple cabinets; the connection method of die-casting cabinets is the same, but the power cords with aviation plugs at both ends are used between the cabinets;

2.7. Display installation method

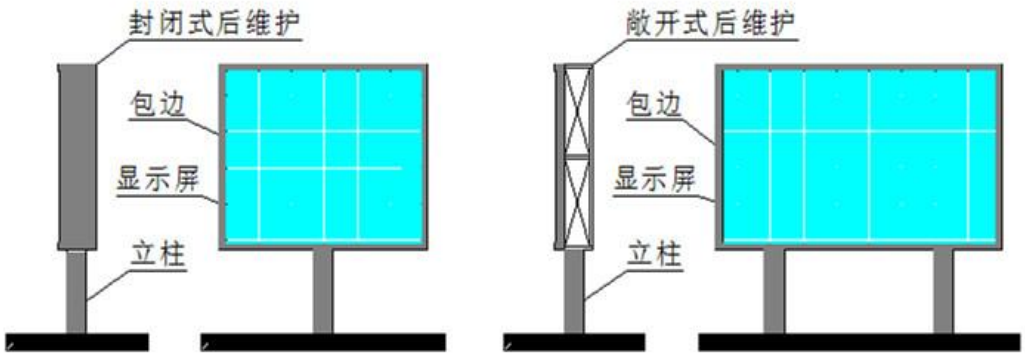
1. Wall-mounted installation



1) This installation method is generally used for building entrances, building wall advertisements, etc.

2) When the screen area is small, there is generally no room for maintenance access, and the entire screen is removed for maintenance, or it is made into a foldable integrated frame.

2. Column installation



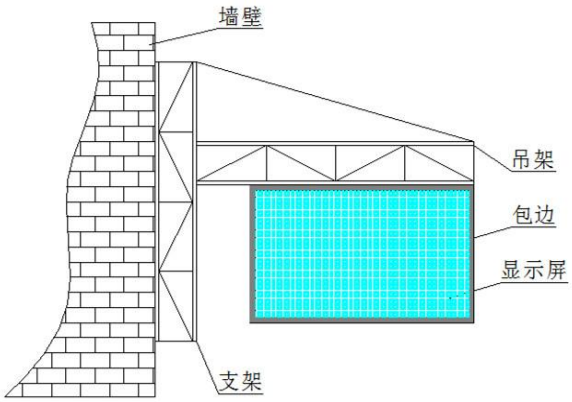
1) Single column installation method: suitable for small screen applications;

2) Double column installation method: suitable for large screen applications;

3) Closed maintenance channel: suitable for simple cabinets;

4) Open maintenance channel: suitable for standard waterproof cabinets.

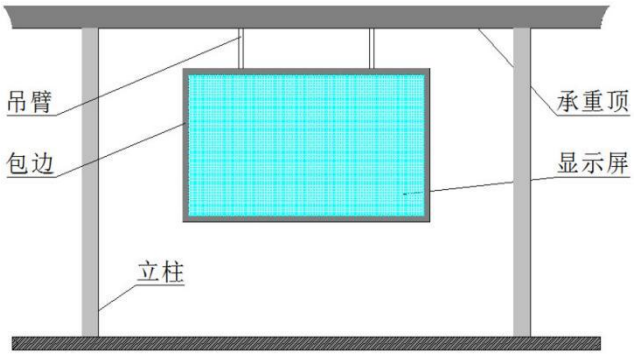
3. Cantilever installation



1) This method is generally used for traffic guidance on roads, railways, and expressways;

2) The screen design generally adopts an integrated cabinet design, or a hoisting structure design.

4. Hanging installation



This installation method is similar to the cantilever installation method, and the screen adopts an integrated cabinet design.

Note: If the end user uses beyond the above recommended installation methods (such as horizontal upward installation,

horizontal downward installation), be sure to contact the engineering research and development department of the manufacturer in writing in advance, and install it under professional written guidance, otherwise the product will fail quickly!

2.8. Protection requirements

The display screen is installed outdoors, often exposed to the sun and rain, the wind blows the dust cover, and the working environment is harsh. Wet or severely damp electronic equipment can cause short circuits or even fires, causing malfunctions or even fires, resulting in losses. It is required that the joint between the screen body and the building must be strictly waterproof and leak-proof; the screen body must have good drainage measures.

When the display screen is working, it will generate a certain amount of heat. If the ambient temperature is too high and the heat dissipation is not good, the integrated circuit may not work properly, or even be burned, so that the display system cannot work normally. It is required to install ventilation equipment to cool down, so that the internal temperature of the screen is between -20° C and 60° C. A

temperature-controlled axial flow fan is installed above the back of the screen to discharge heat.

2.9. Software installation

Display screen control and program production software, as well as the software instruction manual, can be downloaded from the official website of the control system. Install and use the software according to the software instruction manual. If you have any questions about the use of the software, please consult our company's after-sales service or the control system manufacturer's after-sales service.

The receiving card program used by the control system can be downloaded from the official website of GKGD. Different module column driver ICs may require different versions of control and program production software, and may also require upgrading the firmware of the receiving card to a specified version. Incorrect versions of the control and program production software and the firmware of the receiving card will lead to abnormal display, or the performance cannot be adjusted to the ideal state. For specific requirements, please refer to the prompts on the official website of GKGD or consult the after-sales service telephone of GKGD.

2.10. Installation electrostatic protection requirements

Strict attention must be paid to electrostatic protection during the use of LED modules. Personnel who touch the modules must wear grounded electrostatic wristbands or electrostatic gloves.

To prevent lightning or surge from damaging the chip or LED. During the module assembly process, all kinds of electric tools must be well grounded, and the switching power supply shell and screen in the box are required to be properly grounded (separated from the strong electric ground).

2.11. Module cleaning requirements

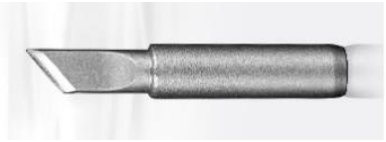
To clean the module, use a clean soft rag dipped in alcohol to gently wipe the surface of the module. Do not wipe with unknown chemical liquids, so as not to damage or corrode the plastic parts of the module, the LED shell or the glue on the LED lamp surface. After cleaning, wait until the surface of the module is completely dry before using the display with power.

2.12. Maintenance requirements

When repairing LED modules, use a constant temperature electric soldering iron or a constant temperature heat gun and ground them well. The soldering iron tip generally uses a knife-shaped soldering iron tip. When soldering LED

surface-mounted components, the temperature of the electric soldering iron is generally 300-360° C, the soldering time should not exceed 3s, and the number of soldering times should not exceed three times, and the air gun should not be used during surface-drive welding; when the lamp surface is repaired, the temperature of the air gun should generally be set At around 260-280° C, lightly shake the air gun clockwise against the lamp bead, and perform maintenance operations after the solder is completely melted.

It is recommended to install remote monitoring and protection facilities for installation methods that are not easy to repair and maintain.



knife tip

Tapered tip

2.13. Anti-collision requirements

During the installation and transportation of the module, do not drop, push, squeeze, or press the package to prevent the module from falling and bumping, so as to avoid problems such as kit rupture, lamp bead falling off, lamp bead damage, pad falling off, and components falling off.

2.14. Power connection requirements

A dedicated switching power supply for LED displays must be used. The total current of multiple modules connected to a single switching power supply cannot exceed 80% of the rated maximum output current of the power supply. The wire connecting the module and the power supply needs to use high-quality copper wire, and ensure that the voltage U range at the module power socket is U±0.2V. When connecting the power supply, you must pay attention to the correspondence between the positive and negative poles of the module power socket and the output terminal of the switching power supply. If the positive and negative poles are connected reversely, the module will be burned, or even a fire may occur.

The module must not be connected to AC 220V, which will cause the module to be burned immediately.

When connecting the power supply, it is necessary to ensure that the module plug and socket are connected reliably, and the terminal screws of the switching power supply socket are tightened. Loose plugs, sockets and screws will lead to increased contact resistance and cause burnout or product damage. The ground terminal of the power input must be connected to a qualified ground wire. Poor grounding will cause abnormal

signal, unstable display, and even burn-in problems.

2.15. Standard Operation

When the whole screen is powered off, connect the signal cable and power cable, check the connection is good and then power on the whole screen, if the display is found to be bad, immediately power off the whole screen, rectify the wiring and then power on the whole screen for inspection.

In order to avoid serious attenuation or dead lights of local LED lamp beads, so that the display screen can reach the designed service life, it is not allowed to display still pictures or texts for a long time, and dynamic pictures or texts must be played.

2.16. Live installation operation

]When live installation is required, it must be operated in the following order: first connect the signal input cable, then connect the signal output cable, and finally connect the 5V power plug. The modules must be installed and debugged one by one, and it is not allowed to continuously install multiple modules that display abnormalities before debugging.

3. Requirements and methods for full screen acceptance

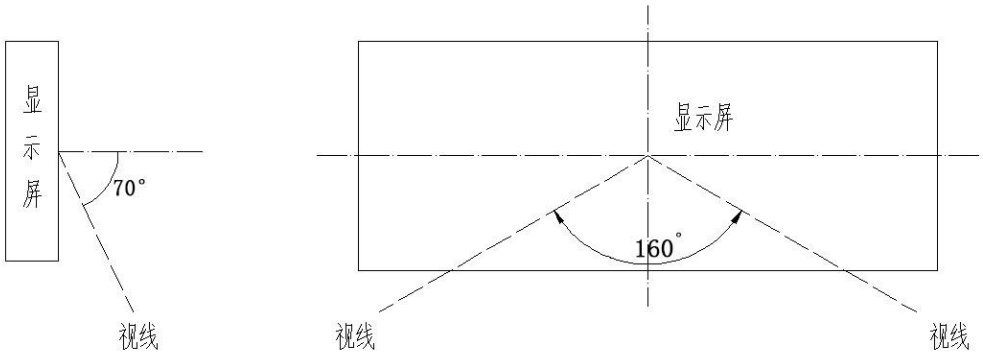
3.1.Display brightness acceptance

Turn the display to full brightness, and use a luminance

meter to measure the brightness of the display within 5 minutes. When measuring brightness, the optical axis of the brightness meter is required to be perpendicular to the screen. Adjust the distance between the luminance meter and the display to ensure that the black dots or circles in the eyepiece of the luminance meter cover more than 16 pixels, adjust the focal length so that the LED lamp beads can be clearly seen in the eyepiece, and then measure and read the brightness data.

3.2. Acceptance of viewing angle

As shown in the figure below, when viewed at a position of 80° left and right of the screen and a viewing angle of 70° below the display screen, it is required that the screen body has no obvious black spots or dark spots.



3.3. Grounding check

The switching power supply shell, cabinet, and display frame must be well grounded, and the grounding resistance is required to be ≤10 ohms. Check the grounding resistance every

six months.

3.4. Inspection of Lightning Protection Facilities

Buildings are required to have lightning rods or lightning protection facilities and be reliably grounded, and distribution boxes are required to be equipped with surge protectors. Lightning protection facilities should be inspected every six months. Avoid using the display in thunderstorm weather.

3.5. The display is not normal when the whole screen is in use

If the user finds that the display is abnormal during use, especially if the entire line is highlighted, the entire screen should be powered off immediately and repaired to avoid prolonged power supply in this case.

4. After-sales service contact information

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Zip code: 046000

Email : gkgd@gkgd.com

Website : www.gkgd.com

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