Product specification

SPECIFICATION
(Indoor series 250X250mm)

Product name: P3.91 20S cell board for indoor high-definition display

Specification and model: P3.91 (2020)-43S-250X250-V*_ _

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Fiction:	Audit:	Ratification:

Disclaimer: This information is accurate, but there may still be errors. It is for reference only, and the material object shall prevail. If the product information is updated, please refer to the latest version of the specification without prior notice.

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1. Precautions for product use

• Packaged products should be placed in a dry environment, and the humidity should be controlled below 60%RH. If the humidity exceeds 60%RH, it should be dehumidified, especially in spring or rainy weather. The ambient temperature should be controlled below 30℃; if it exceeds 30℃, it should be cooled down;

• The product has been stored for more than one month, and it needs to be aged for 6 hours before it can be used normally. The aging mode is: full brightness is set at 10% 1H, full brightness is set at 30% 1H, full brightness is set at 60% 2H, full brightness is set at 80% 1H, and full brightness is set at 100% 1H (brightness is gradually aging);

• During use and transportation, the unit board shall not be dropped, pushed, squeezed or pressed to avoid damaging the display screen;

• Display screen used in special environment (1, seaside, swimming pool, bathing place, basement, tunnel; 2. Chemical environment, vulcanization environment and halogen environment; 3. Dust and dusty environment; 4. Strong ultraviolet environment; 5, strong electromagnetic field environment; 6, less than -20 degrees, more than +40 degrees environment), need to inform before placing an order;

• Personnel who contact products must be equipped with electrostatic bracelets and gloves, and various tools must be strictly grounded during assembly;

• Before unpacking, confirm whether it is the same batch of modules. Products with different batch numbers can't be put on one screen, otherwise the color block (mosaic) phenomenon will occur on the display screen;

• When installing the module, please pay attention to check the correct wiring of the power port, and the positive and negative poles must correspond to each other before it can be powered on. If the module connected with the positive and negative poles will be burned, it must be powered off in time to avoid fire. Use the special switching power supply for LED display screen, the limit working voltage of the module is less than 5V, and it is not allowed to directly connect to 220V, otherwise the whole screen module will be burned;

• When wiring the power supply, it is necessary to ensure that the terminal connector screws are tightened, so as to prevent wire burning or product damage caused by loose contact resistance. The torque of M4 screw is 6-8kgf/cm, and that of M3 screw is 4-6kgf/cm;

• It is forbidden to assemble the unit board when the power is on, and the unit board should be assembled on the upper wall when the main power input is disconnected. It is not allowed to assemble the power line and signal line with plug-in.

• It is forbidden for people to touch and touch the LED display screen when lighting, so as to avoid the static electricity generated by human friction from breaking down LED lamps and chips and other components;

• The installation angle and height should be appropriate, and the sharp corners should be packaged to prevent the hard shell from harming the human body;

• In the range of 10% ~ 65% RH relative humidity, it is recommended to turn on the display screen once a day and use it normally for more than 4 hours each time to remove the moisture on the display screen; When the humidity is higher than 65%RH or in damp weather, it is necessary to dehumidify the use environment, and it is recommended to use it normally for more than 8 hours every day, and close the relevant doors and windows at night to prevent the display screen from being affected by moisture.

• When the display screen is not used for a long time, it is necessary to reduce the brightness of the whole screen by 50% for 12 hours in advance, and preheat it for "dehumidification" for 12 hours to avoid damaging the lamp tube after the LED screen is wet.

• In order to ensure the service life of LED, please do not display only static pictures or static characters for a long time, resulting in serious brightness attenuation of the lamp or the lights are dead in batches. Please play the scrolling picture or text.

• Sweat or other liquid should not drip on the display screen during disassembly and assembly. If it does, it will drip on the dripping position of the product that needs alcohol cleaning, so as to prevent the product from being damaged due to liquid corrosion.

2. Scope of application

It is mainly used in military exercise command system, public safety display command system, studio, radio and television media display system and other fields.

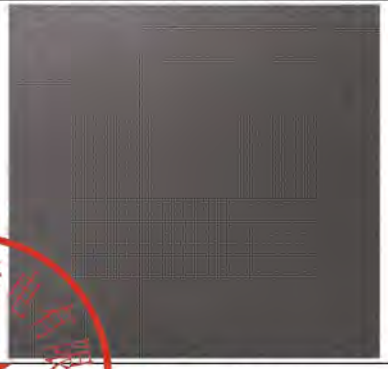
3. Product description

- Product version: The refresh rate of this product is divided into regular version (3840Hz) and TOP version (7680Hz). See 5.4 for details.
- Indoor D series has uniform kit size and hole position, and box hole position can be universal; Can be spliced at right angles with bevel kit;
- Select high-quality surface sticker 1515 special lamp, the ink color of the screen body is uniform and consistent, and the color of the screen body is more truly restored;
- Special driver chip for LED high-density full-color screen: eliminate ghost and open cross, increase the frequency doubling refresh rate by 2/4/8 times, improve the functions of low gray color cast, low gray pockmark and dark first line, and have excellent anti-interference ability;

• High-definition display: high resolution brings high-definition and exquisite display effect, and can achieve the effect of real-time display from pixel to pixel without flicker and graininess;

- Super-large viewing angle: the horizontal viewing angle can reach more than 165, and the display effect is consistent from all directions;
- High gray scale, ultra-wideb and loading: the gray scale is adjustable from 14 to 22 bits, the display quality is clear and true, and the playback effect is bright and smooth;
- Good flatness: the multi-reinforced structural bottom shell independently developed and produced is not easy to deform;
- Easy installation and maintenance: the bottom shell of the unit plate adopts a quick-release magnetic back cover, which is easy to install.

Unit board picture

front	back
	

(Note: The pictures are for reference only, and everything is subject to the real thing.)

500x250mm

750x250mm

1000x250mm

Different panel size are available, which makes whole led screen size more options.

4, product technical parameters

Technical parameters of unit plate					
Pixel spacing	3.906mm	Input voltage (DC)	4.2-5.0V	Module weight	0.43 ± 0.01kg
Pixel composition	1R1G1B	Unit board power	≤ 18.5W	Kit material	Polycarbonate PC
Length * width * height	250*250*15mm	maximum current	3.4 ± 0.3A	copper nut	6*8*M4
design feature	Combination of light and drive	pixels per inch	65536Dots/㎡	type of drive	1/20 sweep constant current drive
Lamp type	SMD2020	Unit plate resolution	6 4 *6 4 =4096 Dots	Protect Level	IP43
Optional control card	Keshida G612C, Colorlight E80,..., Nova DH7516, Lingxingyu Rv908M32.				
Color temperature (k)	3000-15960 adjustable	Unit area (㎡)	0.0625	LED Tech.	GOB

Box technical parameters			
Recommended box size	500mm*500mm*70mm 1000mm*500mm*70mm 1000mm*250mm*70mm (length * width * height)	Box material	Die casting aluminum/magnesium alloy
Box resolution	128*128=16, 384 Dots 256*128=32, 768 Dots 256*64=16, 384 Dots	Maximum power consumption	≤ 100W 200W 100W
Box area	0.25 ㎡ 0.5 ㎡ 0.25 ㎡	Average power consumption	≤40W ≤80W ≤40W
Box weight	4.1 ± 0.05kg ,8.2 ± 0.05kg ,4.1 ± 0.05kg	Protect Level	IP43

Technical parameters of screen body			
Brightness range	650 - 1000cd/㎡	Note: Too much praise for high brightness will seriously sacrifice the life of the display screen.	
Horizontal and Vertical viewing angle of screen body	H:160 ± 10° V:160 ± 10°	Contrast Ratio	7000:1 - 10000:1
Optimum sight distance	3.9m	operational environment	indoor

Maximum power per square module	≤ 410w/m²	Brightness uniformity	≥ 97%
Average power per square module	≤140w/m²	Input Voltage	AC100-240 V

System control parameters

grey scale	Red, green and blue 14-20bits	Display color	4,398 billion species
frame frequency	≥ 60 frames/second	Refresh frequency	≥ 3840Hz -7680Hz(full gray field)
Control mode	Computer control, point-to-point correspondence, video synchronization Real time display	brightness control	Class 256 Manual/ Automatic
input signal	DVI/VGA, video (multiple formats), RGBHV, composite video signal, S-VIDEO, Ypbpr(HDTV).		

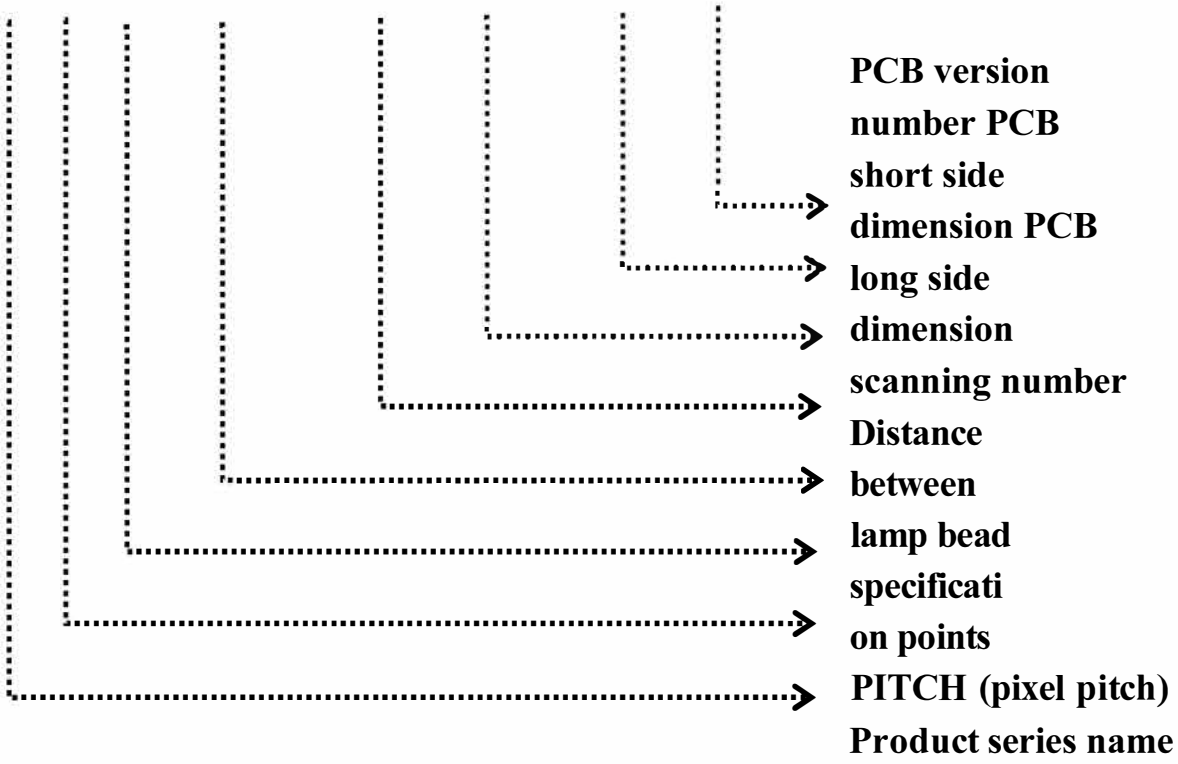
System working characteristics

Theoretical service life	≥ 100,000 hours	MTBF	≥ 5,000 hours
Attenuation rate (working for 3 years)	≤15%	Continuous runaway point	0
operating temperature range	-20 to 50℃	Blind spot rate	＜0.0001
Horizontal flatness of screen	＜1mm/㎡	Operating humidity range	10% to 90%RH (no condensation)
Vertical flatness of screen	＜1mm/㎡	Certification	CE,ETL,FCC,ROSH

5, PCB introduction

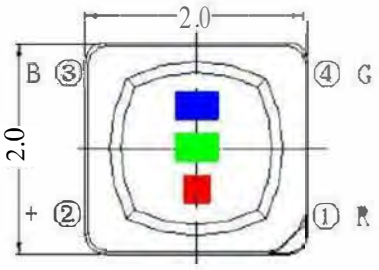
5.1 PCB naming

X - P XX (XXXX) - XXS- XXX x XXX - XX

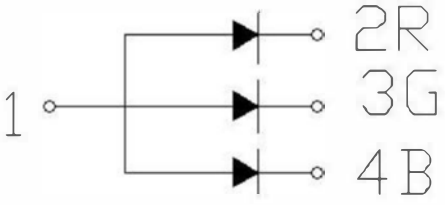


5.2 LED die parameters (2020 lamp beads)

Luminous color	Wavelength (nm)		Luminous intensity (mcd)		reverse current IR （uA）	test condition	Luminous angle (Typ.)	direct voltage (v)(Typ.)
	MIN	MAX	MIN	MAX	When VR = 9V			
R	617	627	11	25	0.2	IF=5MA	110°	1.8-2.2
G	515	545	45	95	0.2	IF=3MA	110°	2.8-3.2
B	455	475	seven	twenty	0.2	IF=3MA	110°	2.8-3.2



2020 lamp bead product rules



2020 lamp bead polarity representation

5.3 Pin definition of pin arrangement signal (HUB75)

Remarks: the signal is input from left to right, so you can choose either side when using it.

Foot map				Foot position function description					
PIN bitmap				Foot position number	function	remarks	Foot position number	funct ion	remarks
1	•	•	2	1	R1	Red data signal	2	G1	Green data signal
3	•	•	4	3	B1	Blue data signal	4	GN D	Power supply ground
5	•	•	6	5	R2	Red data signal	6	G2	Green data signal
7	•	•	8	7	B2	Blue data signal	8	GN D	Power supply ground
9	•	•	10	9	A	A-scan signal	10	B	B-scan signal
11	•	•	12	11	C	C-scan signal	12	GN D	Power supply ground
13	•	•	14	13	CLK	Clock latch signal	14	LAT	Shift latch signal
15	•	•	16	15	OE	Enable signal	16	GN D	Power supply ground

5.4 Driving IC

Constant current drive IC: 4K refresh rate

This chip is a driver IC specially designed for full-color LED display screen. It has 16 PWM constant current outputs and supports 1~64 arbitrary sweeps. Precise current control technology is adopted in the chip, which makes the current error between chips less than 2.0% and the channel error less than 2.0%. Different external resistors can be selected to adjust the current of the output stage and accurately control the luminous brightness of LED.

Regular version	TOP version
High gray independent display, high refresh rate	Low gray and high brush, higher contrast
Eliminate open caterpillar and bad cross	Eliminate open caterpillar and bad cross
Integrated lamp bead protection circuit to reduce lamp bead damage.	Effectively solve the problems of high contrast coupling and cross-plate color difference
Improve the low gray block and the dark first line.	Effectively solve the problems of low gray block, color cast, pitting and dark first line.
	Dynamic energy saving, eliminating useless power consumption

Row driving IC

This row driver chip is a row driver specially designed for LED scanning screen, which integrates serial decoding circuit and power PMOS tube, adopts SOP16 package type, and integrates the functions of anti-burning power tube, ghost elimination, and LED lamp bead protection and so on.

Characteristic

Integrated serial decoding circuit

Integrated 8 power PMOS output pins

Supports a maximum continuous current of 2.5A

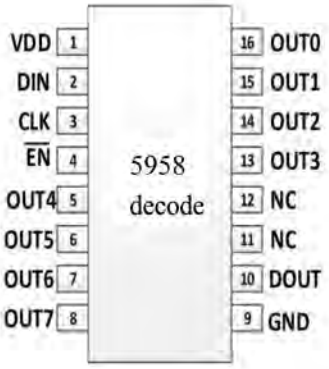
8-step adjustable extinction potential

Display Coating

AG (Anti-Glare), AR (Anti-Reflection), Glossy (No Coating), Hard-Coated Anti-Glare (HAG), Anti-Fingerprint Coating, Anti-Reflective Hard Glass, Matte Screen, Blue Light Reduction Coating, UV Protection Coating, Anti-Smudge & Anti-Grease, Self-Healing Coating, Indoor Viewable Coating, Antimicrobial Coating

5.5 Pin definition

Constant current drive IC

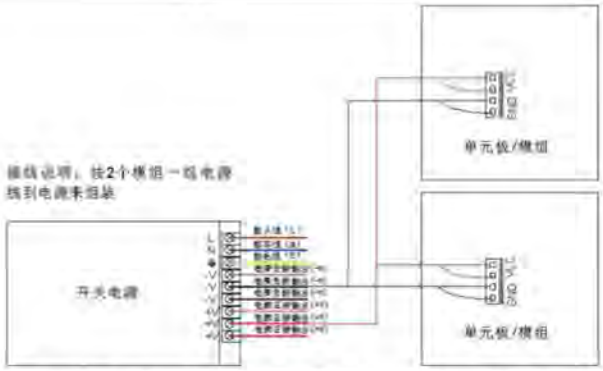


Row driving IC

Pin description

name	Function introduction of constant current drive IC
GND	Chip ground
SIN	Shift register serial data input port
SCLK	Shift register clock input port
LE	According to the latch end of the instruction, different LE lengths represent different instructions.
OUT0～OUT15	Constant current source output port
GLK	Display clock
SDO	Shift register serial data output port
R-EXT	Constant current setting port, external resistor to ground to set the maximum current value of constant current source.
VDD	Power supply terminal
name	**Introduction to the function of line driver IC**
VDD	Power supply terminal
DIN	Shift register serial data input port
EN	Enable control terminal
CLK	Shift register input clock
OUT0~OUT7	8-channel power output port
GND	ground terminal
DOUT	Shift register serial data output port
NC	hang in the air

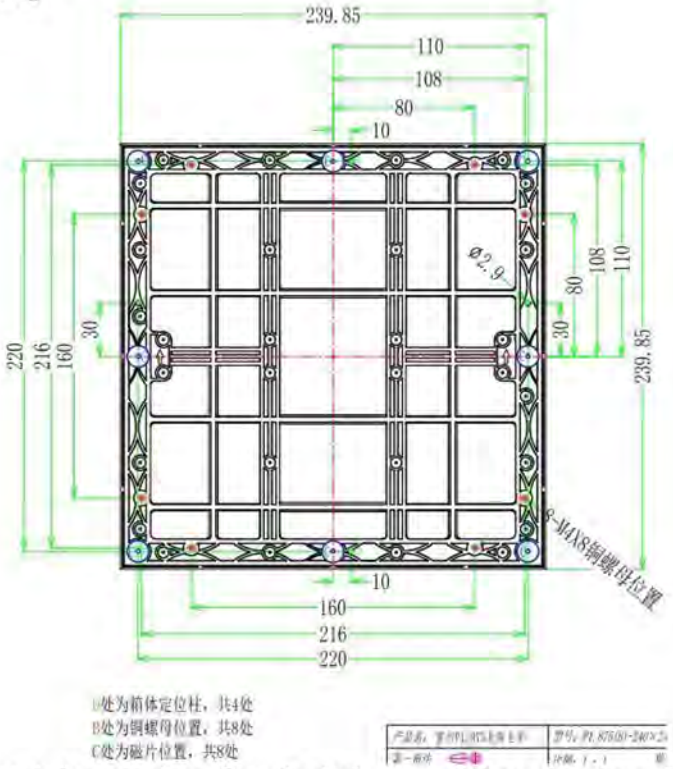
6. Power supply and control card recommended being loaded.

Power supply recommended.		Unit plate brightness	Suggested number of loaded sheets
Recommendation 1	4.5V 40A	350 - 400cd/㎡	6~8
Recommendation 2	4.2V 40A	350 - 400cd/㎡	6~8
			

Note: It needs to be loaded according to the standard loader.

Kaishida			
G612C recommended loading		G616C recommended loading	
1 width and 4 height	208*416 points	1 width and 6 height	208*624 points
Kallet			
5A75E Recommended loading			
1 width and 8 height	208*832 points		
Nova			
DH7512 recommended loading		DH7516 recommended loading	
1 width and 8 height	208*832 points	1 width and 6 height	208*624 points

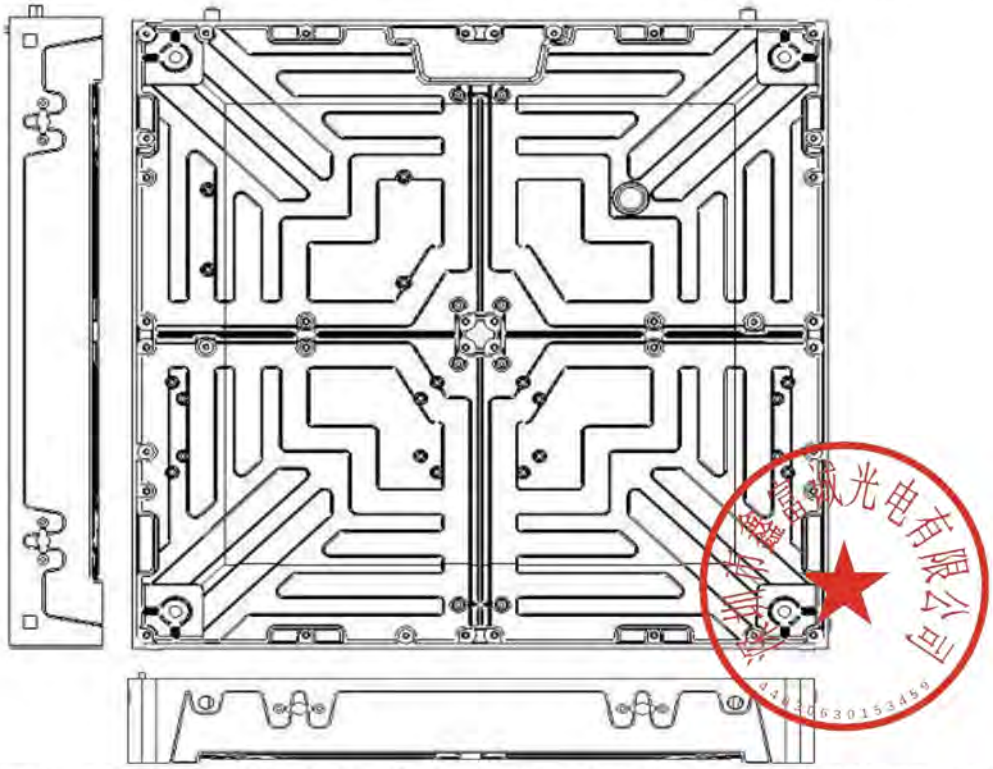
7. Installation hole bitmap



Remarks: If the box is made, please inform and confirm the hole map of the ordered product in advance. See the CAD drawing for details. All dimensions are in mm.

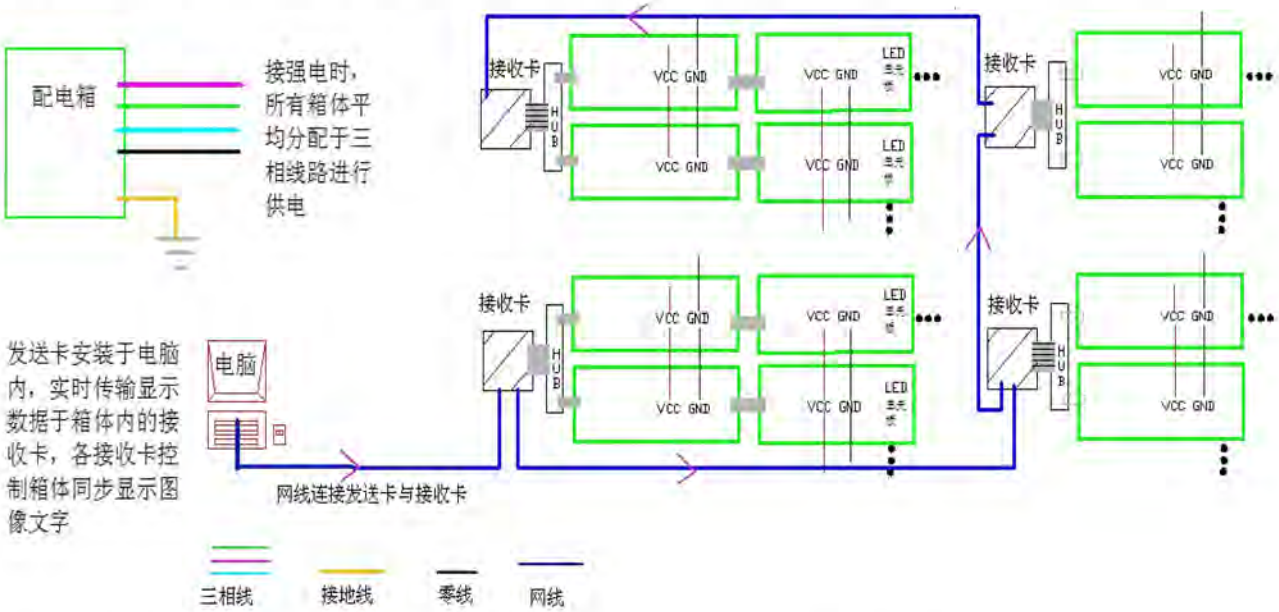
8. Box Diagram

It is recommended to use 500*500mm box hole bitmap.



Remarks: the unit plate and box body adopt magnetic attraction and pre-maintenance technology, which is convenient for disassembly; All dimensions are in mm. maintenance can do front and rare

9. Simple schematic diagram of electrical connection of display screen



10, the whole screen acceptance requirements and methods

- Brightness of the screen: set the screen to full brightness; adjust the brightness in the test software to 80% effectively on the computer, and measure the brightness of the screen with a light gun within 10 minutes. When measuring brightness, it is required that the light gun should be aimed at the screen. It is best to keep the light gun level with the screen when measuring, to ensure that the black position of the observation window covers more than 16 pixels, and to adjust the focal length so that you can clearly see the luminous point before measuring and reading.
- Viewing angle: when measuring, people stand at the position of 160 left and right of the screen body, and the viewing angle of the screen body is 80 (that is, the vertical viewing angle of the screen body is 160). It is required that the screen body has no obvious black spots and dark blocks;
- Grounding: The shell, box and screen of the switching power supply are properly grounded, and the grounding point is correctly marked. The grounding resistance is required to be $\leq 10\Omega$, and the spot check is conducted once every six months;
- Lightning protection treatment: buildings are required to have lightning rod or lightning belt facilities and be effectively grounded, and distribution boxes are required to be equipped with surge protectors. Lightning protection facilities are inspected once every six months.
- Installation can be Fixed on Wall mounting, Back-strip, Hanging, stacking or can be installation in rental mode on mobility stand and trolly