



Shenzhen Lingduren Optoelectronic Technology Co., Ltd.

SHENZHEN LEADER OPTOELECTRONICS TECHNOLOGY CO.,LTD

Product Specification Book

(Outdoor Soft Module Series)

Outdoor Flexible LED Moudule


product name: Outdoor full-color LED display soft module

product model: P2.5

specifications and models: R-128*64-16S-1415 (without mask)

document number : _____

version number: V1.1

Fiction :	Examine and verify :	Approval: (Seal)
		

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1. Scope of Application

1.1 Scope of Application: This technical manual applies exclusively to the **Soft Module Series – Outdoor Full-Color LED Display Soft Module P2.5-R-128*64-16S-1415**. The following specifications represent the standard configuration; customized versions are available upon request. Should the specification documentation be updated, the latest version shall prevail without further notice.

1.2. Scope of application:Magnetic installation method, cabinet installation method

Especially under the following installation conditions:

- ①. The screen must have curvature requirements, including but not limited to inner curved display surfaces, outer curved display surfaces, and corner curved display surfaces.
- ②. The screen requires high brightness and must be waterproof.
- ③. The screen has a design that seamlessly combines aesthetics with functionality.
- ④. The screen offers good cost-effectiveness and combines both rigid and flexible modules.

2. Matters Need Attention

Project	Description	
Environmental Considerations	Environmental Requirements	Storage temperature range: -10°C to 30°C; cooling is required when temperatures exceed 30°C. Working temperature range: -20°C to 40°C; for other temperature ranges, additional temperature control equipment is required. The lights remain operational during module operation. Surface temperature: ≤85°C; temperature exceeding this limit requires installation of temperature control equipment.
	Temperature requirement	Storage humidity range: 10% RH–60% RH; if humidity exceeds 60% RH, dehumidification is required. Operating humidity range: 10% RH–90% RH; if humidity exceeds this range, the environment must be dehumidified before normal use.
	Corrosion-resistant gases	In environments where corrosive gases mixed with salts or acidic compounds are present in the air, they can cause corrosion of electronic components, crystallization-induced leakage currents, and other related issues.
	Electrostatic hazards and lightning protection	The metal components of the panel, the casing of the switching power supply, and the enclosure must be properly grounded, with a grounding resistance ≤ 10 Ω and a zero-ground voltage ≤ 2 V. This prevents damage to electronic components caused by static electricity and avoids electric shock hazards to personnel.
Important Operating Notes:	Electrostatic protection	Installation personnel must wear electrostatic wristbands and electrostatic gloves, and all tools must be strictly grounded during the assembly process.
	Screen Protection	After completing the full-screen installation, ensure that no water enters the interior of the screen. Apply waterproof sealant around the screen edges, on the housing body, and at all connection points to achieve rigorous waterproofing.
	Product Batch Control	Products from different batch numbers should not be displayed on the same screen; otherwise, color patches (mosaic effect) may occur. There may be noticeable variations in ink density when combining old and new modules on a display.
	Product Wiring	The module cannot be directly connected to 220V; the positive and negative terminals must not be connected in reverse. The 5V and 4.5V power supplies are interchangeable; the common-source configuration (2.8V + 3.8V) is also compatible with the single-channel 3.8V supply.
	Disassembly, assembly, and transportation process	Do not drop, push, squeeze, or press the module to avoid damaging the display screen. For intermediate disassembly or factory repair, use the original packaging and ensure it is wrapped with a pearl fiber spacer strip. An isolation plate must be installed between the light surfaces of the modules; otherwise, place them back-to-back.
	Installation Torque Control	When wiring the power supply, ensure that all terminal connections are securely tightened to prevent loosening, which could lead to high contact resistance causing wire burnout or product damage. The recommended torque is 6.0–8.0 kgf·cm for M4 screws and 4.0 kgf·cm for M3 screws. —6.0 Kgf. cm。

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It is prohibited to perform work on live electrical circuits.	Modular assembly under powered conditions is prohibited; wall installation must be performed only after disconnecting the main power supply. Assembly with power or signal cables connected is strictly forbidden.
Play System Selection	The module is compatible with standard control cards available on the market, including but not limited to Lingxingyu, Nova, Grayscale, and Callet; for other control cards, please consult the respective manufacturers of control cards, chips, or modules.
Loading Program Selection	Use the corresponding system card for debugging and upgrade the control card as required. Request the technician to provide the appropriate configuration file for quick debugging to prevent performance anomalies during the process.
Play control	Do not display static images or text for extended periods, as this may cause severe brightness degradation of the light tubes, inconsistent output brightness, or batch light failures. Play scrolling images or text instead.
Environmental monitoring	A temperature and humidity sensor must be installed at the display installation site, along with a smoke detector to continuously monitor the surrounding environment. After heavy rainfall, promptly inspect the interior of the display for signs of moisture, water droplets, or condensation. During high-temperature conditions, regularly check the internal temperature of the display. Periodically assess and maintain the aging status of all display cables to eliminate potential risks.
Avoid secondary construction work.	No further construction work shall be performed after the LED display is installed to prevent damage from high-current impacts or dust exposure, such as operations involving welding equipment or electric saws.

3. Product Description

3.1. The display screen is primarily composed of red, green, and blue LED chips packaged into individual pixels arranged in a matrix, which are then mounted onto a plastic housing.

3.2. The display unit comprises a drive chip and an input buffer chip, which are connected to the LED display control system to display videos, images, text information, and more.

3.3. By systematically controlling the driver chips of red, green, and blue LEDs, 439.8 billion distinct color variations can be achieved.

3.4. **The outdoor soft module can only be assembled horizontally; vertical or inverted installation may cause water leakage. Please note this.**

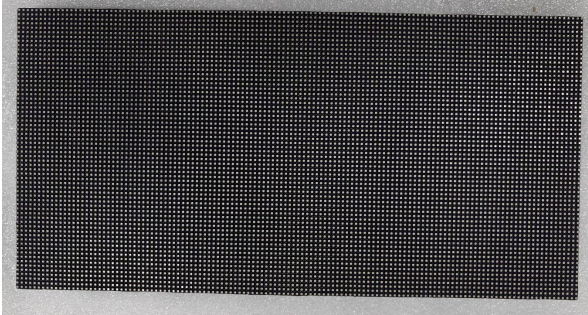
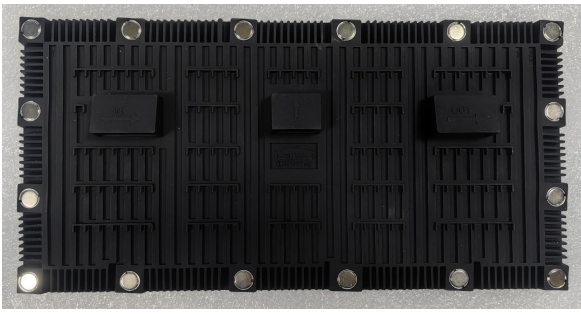
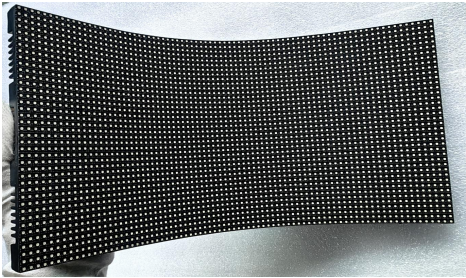
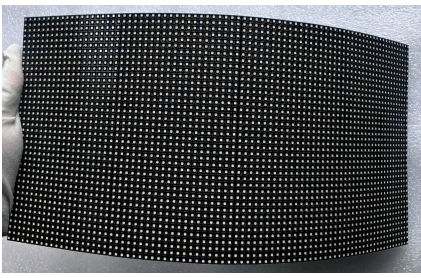

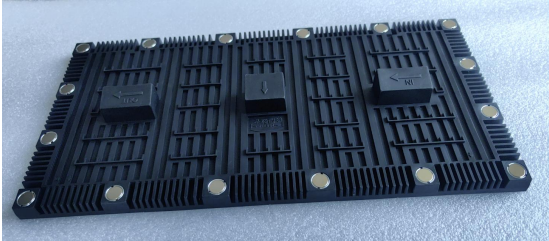
3.5. Product Features:

- High-quality light beads for outdoor flexible modules, featuring efficient luminous efficacy while ensuring extended lamp lifespan. Supported brands include but are not limited to Guoxing, Jingtai, Hongsheng (Ruisheng), and Xinda; Hongsheng (Ruisheng) light beads are standard equipment.
- The outdoor flexible module comes standard with a custom PCB, featuring optimized circuit design, thicker board material, and increased copper trace density to effectively eliminate via blockage risks while enhancing thermal and electrical conductivity.
- The outdoor soft module comes standard with an LLR private mold kit, utilizing high-quality silicone material to enhance stability and flexibility. The mask features a specialized design that effectively prevents plastic component shrinkage or expansion caused by extreme temperatures, which could lead to issues such as light distortion, color deviation, or light failure.
- The outdoor soft module utilizes renowned IC driver chips to control LEDs, delivering excellent performance with support for brands including Mingwei, Jichuang, Fuman, and Juji, among others, and comes standard with Mingwei chips.
- The outdoor soft module features a built-in waterproof back cover with dedicated signal and power ports, effectively preventing water ingress from the rear while facilitating wiring connections.
- High contrast achieves excellent display performance.


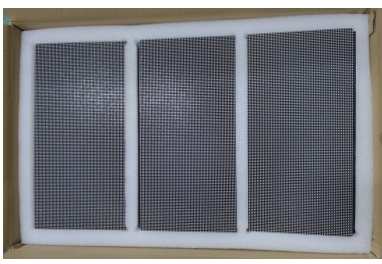
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- Lightweight, easy to install and disassemble.
- Customizable safety rope to prevent falls from heights.
- Supports single-point and single-lamp maintenance at low cost.

3.6. Module Image:



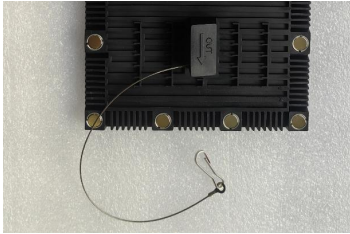
Front elevation	Dorsal view
	
Inner Arc Diagram	External Arc Diagram
	
Side view from above	Side view
	

3.7. Packaging Schematic Diagram:

Outer packaging box	Box Internal Diagram	Packaging Parameters	
		Carton size	L59*W38*H28.5 cm
		Total box weight	17 kg
		Number of Modules	30 Zhang
		Accessory Packaging Method	Pack separately
		Accessories Quantity	30 cable runs + 15 power cables
		Weight kg	

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fittings of a machine :

Standard configuration : 1 Zhang Module Configuration: 1 patch cord + 0.5 "One-to-two" power cables	Optional: (Only for custom production) 1 Zhang module: 1 safety rope
 排线 (1条)  电源线 (一拖二)	

4. Product Technical Requirements

4.1. Screen Technical Specifications:

Luminance	$\geq 4000\text{cd}/\text{m}^2$	Brightness Uniformity	> 0.95
Screen Horizontal View	140 ± 10 degrees	Vertical Screen View	130 ± 10 degrees
Optimum viewing distance	$\geq 2.5\text{m}$	Service environment	Outdoors
Maximum power per square module	$\leq 586\text{W}/\text{m}^2$	Average power per square module (1/3)	$\leq 196\text{W}/\text{m}^2$
Distribution Power (Maximum Power per Square Meter \div 78% \div 85%)	$\leq 884\text{W}/\text{m}^2$		
Grey scale	Red, green, and blue each have 14–16 bits	Display color	4,398 billion species
Repetition frequency	≥ 60 frames per second	Refresh Frequency	Normal refresh rate: 960Hz–1920Hz; High refresh rate: 1920Hz–3840Hz
Control method	Computer-controlled, point-to-point correspondence, video synchronization, real-time display	Brightness control	256 Level: Manual/Auto
Incoming signal	DVI/VGA/HDMI/DP, composite video signal, S-VIDEO, YpbPr (HDTV)		
Life length	$\geq 100,000$ hours	Mean free error time	$\geq 10,000$ hours
Attenuation Rate (After 3 Years of Operation)	$\leq 15\%$	Continuous Loss of Control Point	0
Discrete loss of control point	< 0.0001 ; factory value is 0	Blind Spot Rate	< 0.0003 ; factory value: 0
Operating temperature range	$-20\text{--}40^\circ\text{C}$	Working Humidity Range	10%–90% RH
Barrier property	Overtemperature/Overload/Power loss/Image compensation/Various correction techniques/Overcurrent/Overvoltage/Lightning protection (optional)		
Screen Level Flatness	$< 1\text{mm}/\text{m}^2$	Screen Vertical Flatness	$< 1\text{mm}/\text{m}^2$

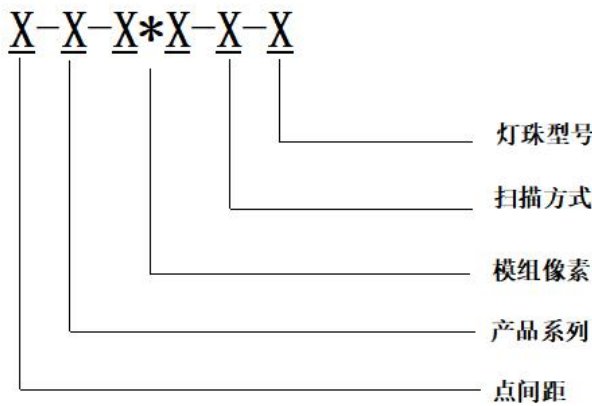
4.2. Module Technical Parameters:

Pixel spacing	2.5mm	Pixel Density	160000Dots/ m^2
Pixel Composition	1R1G1B	Light Tube Packaging	SMD1516 (1415)
Size (Length * Width * Height)	320*160*12.55mm	Weight	0.52kg \pm 0.01kg
Design feature	Light Beam Combination One	Module Resolution	128*64=8192Dots
Input Voltage (DC)	$5 \pm 0.1\text{V}$	Maximum current	$\leq 6\text{A}$
Module Power	$\leq 30\text{W}$	Driving Method	1/16 Constant Current Drive
Number of modules in the 40A power supply	4–5 pieces	Number of modules in the 50A power supply	5–6 pages
Number of modules in the 60A power supply	5–7 sheets	Number of modules in the 80A power supply	7–9 sheets

4.3. Module Signal Interface Definition: (HUB75 Interface)

Pin	Signal	Function	Pin	Signal	Function
1	RD1	Red Data Signal	2	GD1	Green Data Signal
3	BD1	Blue Data Signal	4	GND	Power Supply Location
5	RD2	Red Data Signal	6	GD2	Green Data Signal
7	BD2	Blue Data Signal	8	GND	Power Supply Location
9	A	Send power control signal	10	B	Send power control signal
11	C	Send power control signal	12	D	Provide power signal
13	CLK	Clock signal	14	LAT	Data latch signal
15	OE	Enable signal	16	GND	Data Area

5. Product Model Naming Rules



for instance :

Outdoor full-color LED display module P2.5-HG-128*64-16S-1516

Interpretation: P2.5 = spacing of 2.5 mm

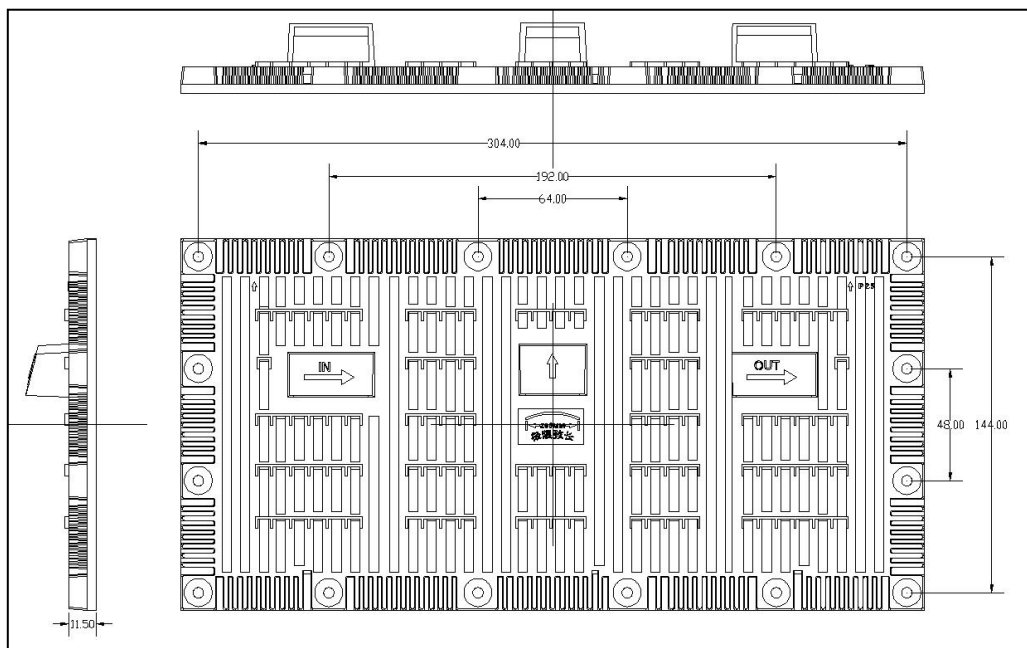
HG = Series with rear cover (HG rear cover, ECO energy-saving version, R soft module).

MT (main header), PRO (premium quality);

"缺失" indicates standard setting. Resolution: 128×64 = module pixels; W128×H64 dots; Scan duration: 1/16 second; Constant current drive.

1516 = The LED is of the SMD1516 model.

6. Module Hole Layout Diagram

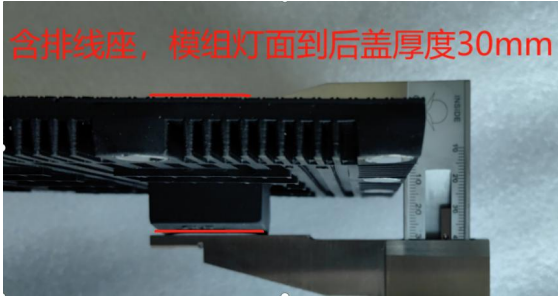



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Note: "If a housing is required, please notify the sales team in advance and confirm the product hole layout; see the CAD drawings for details." All dimensions are measured in mm.

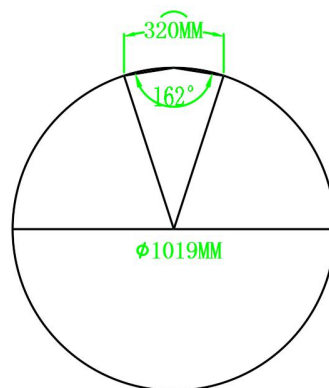
7. Installation Guide

7.1 Reference data for magnetic mounting and housing installation (Magnetic model: M4-1417 reinforced magnet)

Module thickness (excluding the rear cover)	Module thickness (including the rear cover)
	

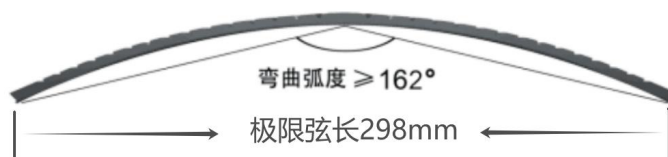
7.2. Curvature Range:

A、 The inner arc and outer arc are composed of 12 modules, resulting in a minimum cylinder diameter of ≥ 1222.34 mm.



最小弯曲直径
Minimum bending diameter

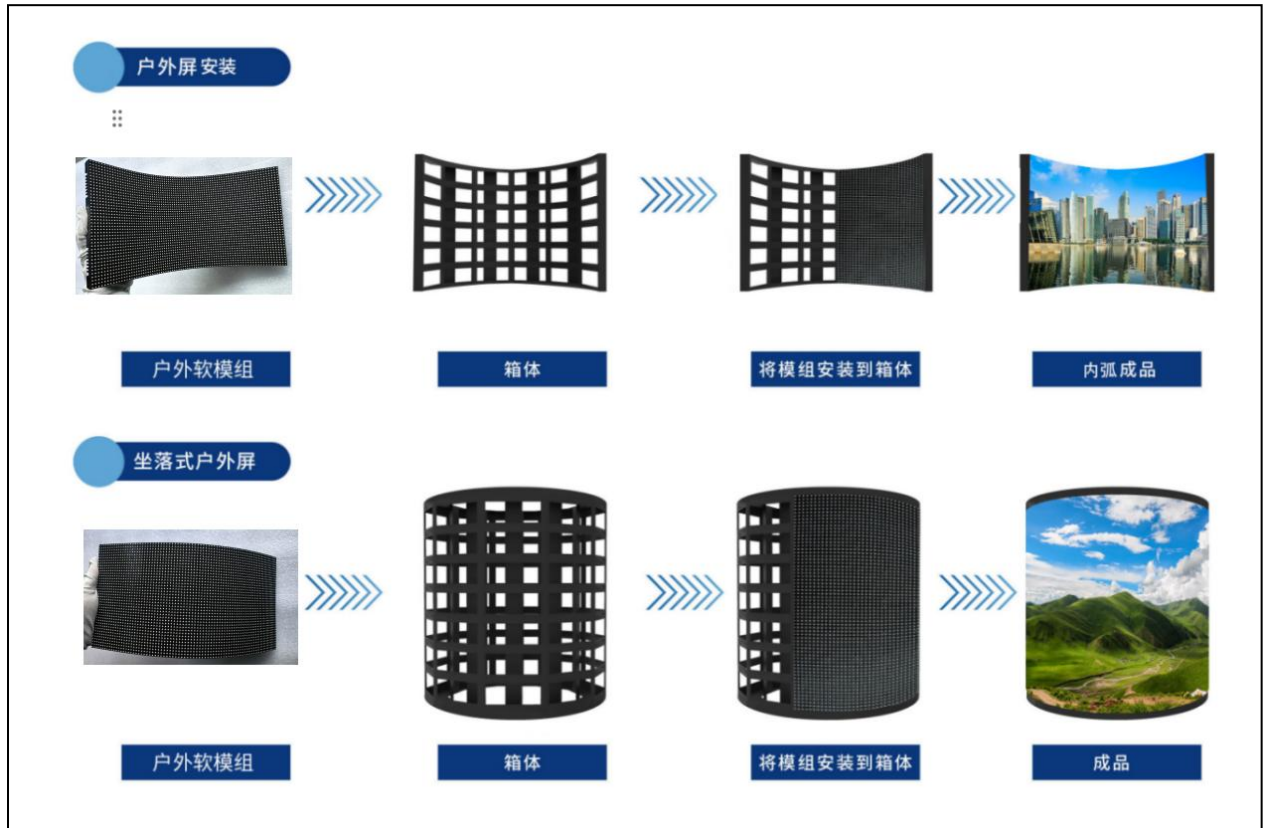
B、 Schematic Diagram of Module Bending Curvature: The Inner and Outer Arcs Can Be Bent by $\geq 162^\circ$, With the Maximum Chord Length of the Outer Arc ≤ 298 Mm.




Note: Avoid Excessive Bending to Prevent Module Damage!

Vertical assembly is prohibited due to waterproofing requirements.

7.3 Installation Schematic:



7.4. Guidelines for Module Installation and Disassembly:

Model Module	
<p>During soft module installation, align the magnet with the designated mounting position on the housing frame to ensure uniform magnetic attachment without any suspension.</p>	
Form Removal Module	

Step 1:

Select the area near the edge of the module and gently press until the raised foot of the module lifts.



Step 2:

Gently bend the protruding part of the module with your hand.



Step 3:

Gently remove the soft module from the screen until it is completely detached. Do not pull forcefully during removal, and avoid pressing against adjacent modules to prevent damaging the lights.


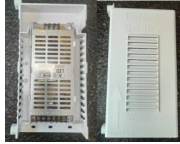




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Important Note:

		
禁止外弧暴力弯曲	禁止内弧暴力弯曲	禁止在方通管上暴力拉扯

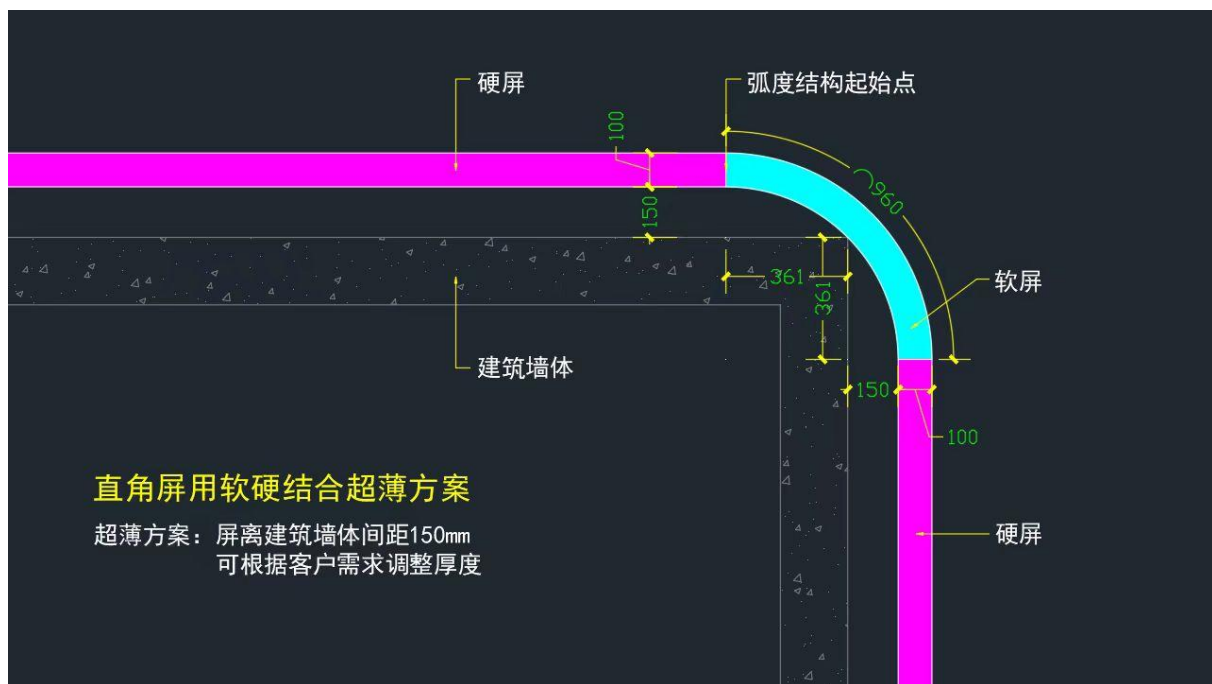
7.5 Other Installation Components and Precautions:

Project		Specification Model (for reference only)	Picture	Remarks
Source	Input voltage	AC 110/220V		We recommend using our rain-resistant power supply directly.
	Service frequency	50HZ/60HZ		
	Output voltage	Standard DC 5V /Energy-saving 3.8+2.8V		
	Output power	200W/300W		
	External Dimensions	Can accommodate standard power supplies with dimensions $\leq L190*W82*H30$		Due to the structural characteristics of the soft module, both the front and back surfaces of the module are waterproof. However, water may enter through the module gaps and accumulate inside the housing; therefore, the power supply must be equipped with waterproofing measures.
Control System	Send Card	Lingxingyu / Nova / Callet / Grayscale, etc.		
	Receiving card	Lingxingyu / Nova / Callet / Grayscale, etc.		Due to the structural characteristics of the soft module, both the front and back surfaces are waterproof. However, water may enter through the module gaps or accumulate inside the housing; therefore, it is recommended to apply waterproofing treatment to the receiving card. An additional rain-resistant card box from our company can be purchased.

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Processor	2-in-1 Video Processor	Lingxingyu / Nova / Callet / Grayscale, etc.		
Box	Metal sheet boxes; Iron boxes	Cylindrical box body / Curved surface box body / Corner-shaped screen box body		The top of the box must be sealed to prevent direct water ingress.

7.6 Installation recommendations for corner screens using a combination of soft and hard modules: (Three soft modules can form a 90-degree right angle.)

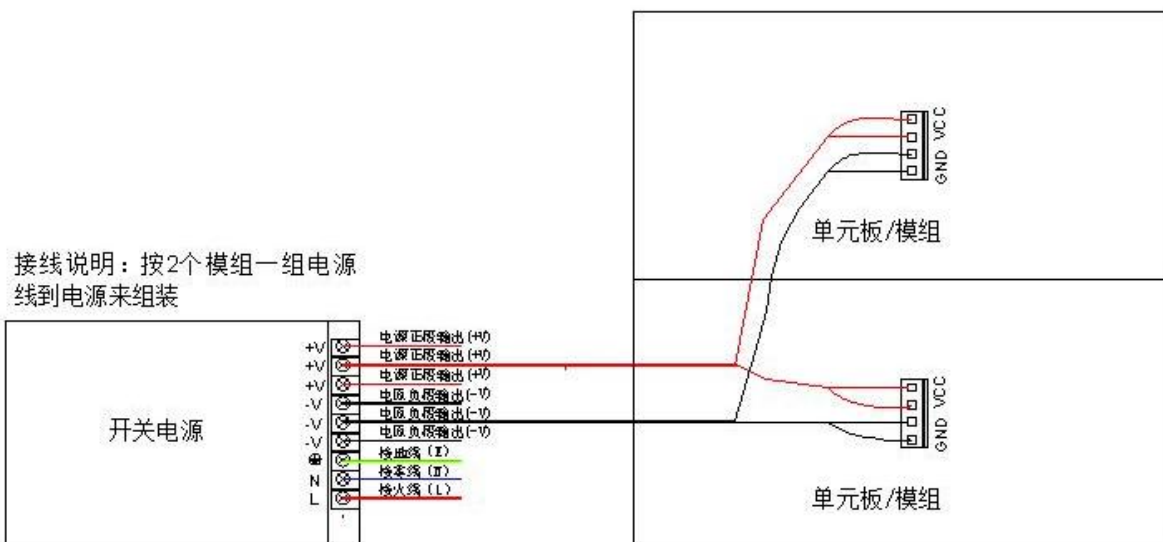
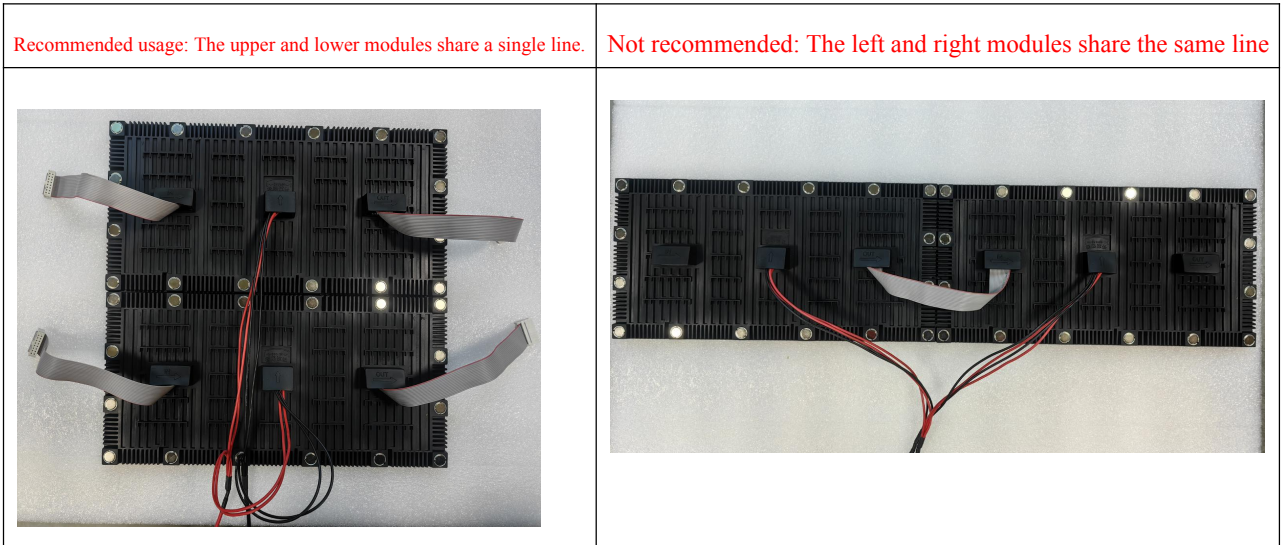


Note: 1. For energy-saving products, heat dissipation issues may be disregarded.

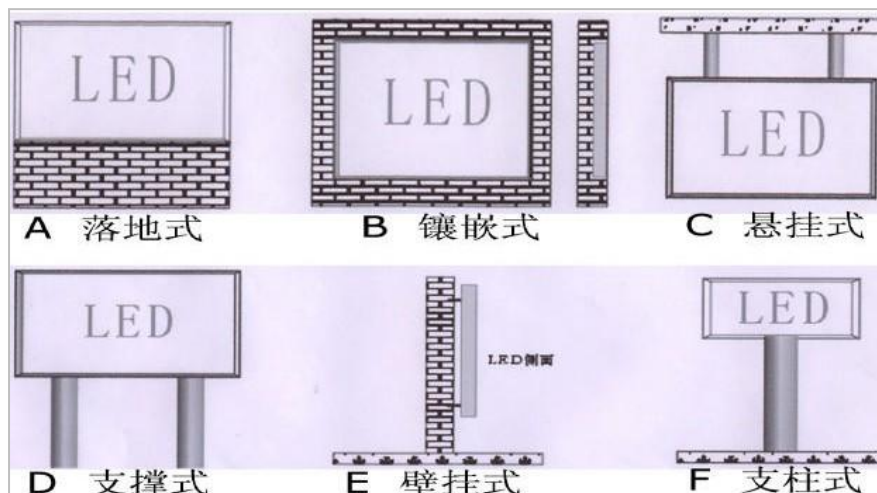
2. For non-energy-efficient products, proper ventilation and heat dissipation measures must be implemented.



7.7 Module wiring schematic diagram: (using a 1-to-2 power cable as an example)



7.8 Box Installation Method



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Note: The above outlines the six commonly used installation methods for display screens. Indoor displays typically employ the A/B/C/D configuration, while all of these methods are applicable to outdoor displays. Installation should begin from the bottom layer; incorrect installation can compromise the screen's performance. Ensure the base layer is perfectly level before installing subsequent layers, and apply waterproof adhesive at all connections between units. After completing full-screen calibration, rigorous waterproofing must be applied around the entire screen structure.

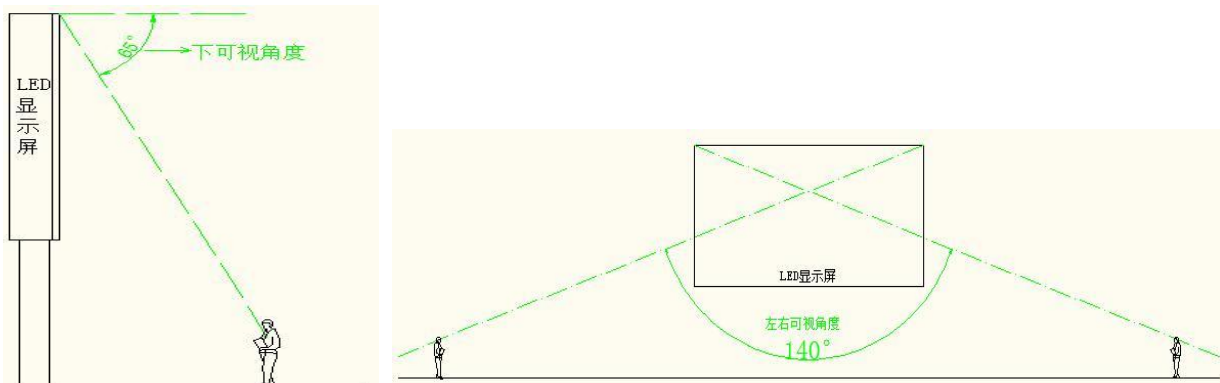
8. Display Screen Acceptance Requirements and Methods:

8.1 Screen Brightness:

Set the screen to full brightness, adjust the brightness setting in the testing software to 100%, and measure the screen brightness using a light gun within 10 minutes. To measure accurately, align the light gun precisely with the screen—preferably keeping it level—to ensure the black area of the observation window covers more than 16 pixels. Adjust the focal length accordingly. After testing, restore the brightness to the system's default value, typically 76%.

8.2 View Angle:

During measurement, the subject should stand at a position 140° to both sides of the screen and view it from a bottom angle of 65° . The screen must be free from noticeable black spots or dark patches.



Screen left-right viewing angle

Screen Top and Bottom View

8.3 Grounding: The switch-mode power supply's housing, cabinet, and panel structures must be properly grounded with correct grounding points marked; conduct semiannual inspections.

8.4. Lightning protection measures: Buildings must be equipped with lightning rods or lightning belts and properly grounded; distribution boxes must have surge protectors; lightning protection systems shall undergo semi-annual inspections.

Note: Our company will continue to upgrade and improve existing products. Any specification changes will not be notified separately, and all rights remain with our company.

Version V1.1, updated on April 15,2025

This product series is our patented item. Do not infringe the rights!

Product Patent Number: ZL202021995128.3/ZL202330806988.0/ZL202330806936.3/ZL202330807024.8