MGS Series Outdoor Full Color Fine Pitch LED Display Unit

Product Installation Manual

Copyright Statement

Copyright ©

- **Leyard Optoelectronics is the legal owner of the right to exercise this copyright in accordance with the law. This publication may not be excerpted, reproduced, copied, translated, edited, published or stored in a retrieval system for any other use by any individual or organization in any form without the signed permission of Leyard Optoelectronics.**
- **The contents of this Manual are subject to change without notice**

Revision History

No.	Brief description of the amendments	Revision date	Revised by
1	The product manual issued for the first time	2023-04-26	Xia Lingke
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			

Made by: 夏令柯 Checked by: _____ Approved by: _____

Catalogue

1.0、 Product overview

MGS series products are a new generation of outdoor fine-pitch display units, full flip light-emitting chips, low power consumption, high luminous efficiency, widely used in square advertising, shopping mall windows, bus stations and so on.

MGS Unit appearance

MGS series products are full front maintenance products, supporting front and rear installation.

MGS series product features are as follows:

- ✧ Front and rear installation, full front maintenance;
- ✧ Die-cast aluminum cabinet, high splicing accuracy, not easy to deform,
- ✧ High contrast, excellent heat dissipation performance;
- ✧ Fully flip light-emitting chip, low power consumption, high luminous efficiency;
- ✧ The power signal adopts IP65 full outdoor air plug connection;
- ✧ Optional single/dual power input, single/dual signal redundant backup technology, never

black screen

1.11 Technical parameters

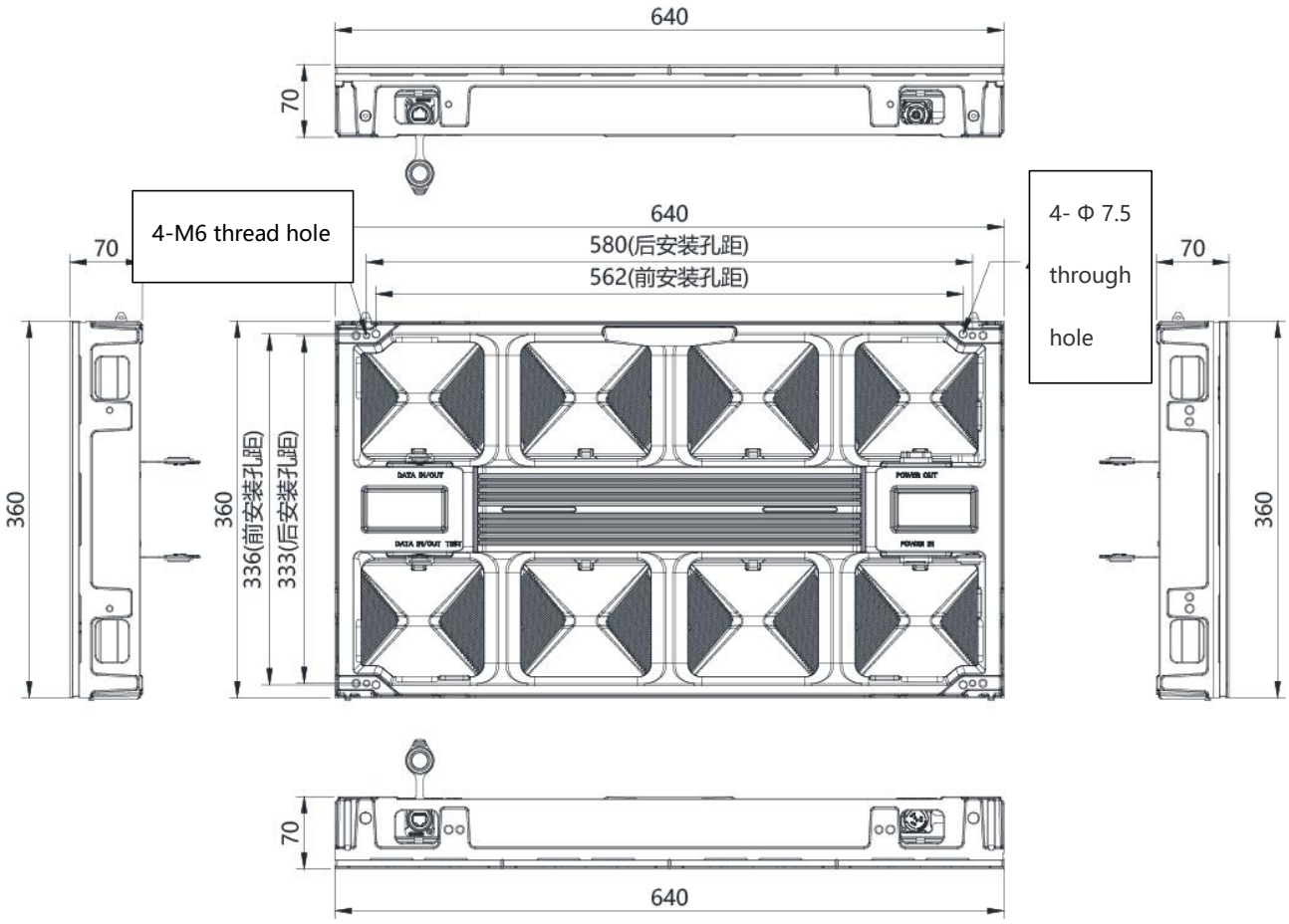
Item		MGS1.2	MGS1.3	MGS1.5	MGS1.6	MGS1.8	MGS2.0
Module composition	LED Configuration	Fully flipped 3-in-1	Fully flipped 3-in-1	Fully flipped 3-in-1	Fully flipped 3-in-1	Fully flipped 3-in-1	Fully flipped 3-in-1
	Pixel pitch（mm）	1.25	1.33	1.53	1.67	1.86	2.0
	Module resolution (W×H)	128×288	120×270	104×232	96×216	86×192	80×180
	Module dimension (mm)	160（W）×360（H）×20（D）					
Cabinet composition	Module composition（W×H）	4×1					
	Cabinet resolution (W×H)	512*288	480*270	416×232	384*216	344×192	320*180
	Cabinet dimension (mm)	640（W）×360（H）×70（D）					
	Cabinet area（m^2）	0.2304					
	Conventional weight (kg/cabinet；kg/㎡)	8.5；36.9					
	Pixel density (pixel/㎡)	640,000	562,500	418,888	360,000	286,666	250,000
	Cabinet flatness (mm)	≤0.1					
Optical parameter	Single-point brightness calibration	Yes					
	Single-point color calibration	Yes					
	White balance brightness（nits）(after calibration)	3000-4000 *					
	Color temperature (K)	3000—10000 adjustable					
	Horizontal viewing angle（°）	170					

	Vertical viewing angle（ °）	170
	Deviation of LED Luminance Center (after calibration)	<3%
	Brightness uniformity (after calibration)	≥97%
	Color uniformity (after calibration)	No more than ±0.003Cx,Cy
	Contrast ratio	10000:1
Electrical parameters	Peak power consumption (W/m^2)	150；651
	Average power consumption (W/m^2)	50；217
	Input voltage requirements	AC100~240V（50/60Hz）
	Current leakage (single cabinet)	＜1mA；
	Power supply configuration	Single power supply (optional dual power supply) *
Processing performance	Driving method	Constant current PWM drive
	Backup mechanism	Loop backup(optional dual receiving card, dual loop)*
	Gray scale（bit）	16
	Frame rate（Hz）	50&60
	Refresh rate（Hz）	3840
Application parameters	Lifetime (hrs)	100,000
	IP Level On cabinet LED surface	IP65
	IP Level On cabinet back side	IP65
	Operation Temperature (℃)	-20 -- 40

	Storage Temperature (℃)	-30 -- 60					
	Operation Humidity (RH)	10 -- 80% no condensation					
	Storage Humidity (RH)	10 -- 85% no condensation					
Installation	Front installation, rear installation	✓	✓	✓	✓	✓	✓
Maintenance	Full front maintenance (module, power supply, receiving card)	✓	✓	✓	✓	✓	✓
Product certification	CCC，EMC-ClassA，ROHS2.0，Low blue light						
Remarks	1, white balance full white 100% brightness (nits)(after calibration) taking 3000-4000 brightness range, have specific brightness requirements please confirm with the manufacturer; 2，The system supports single power, optional dual power and dual power inputs； 3，The system supports single receiving card,optional dual receiving cards；						

1.12 Display unit structure function analysis

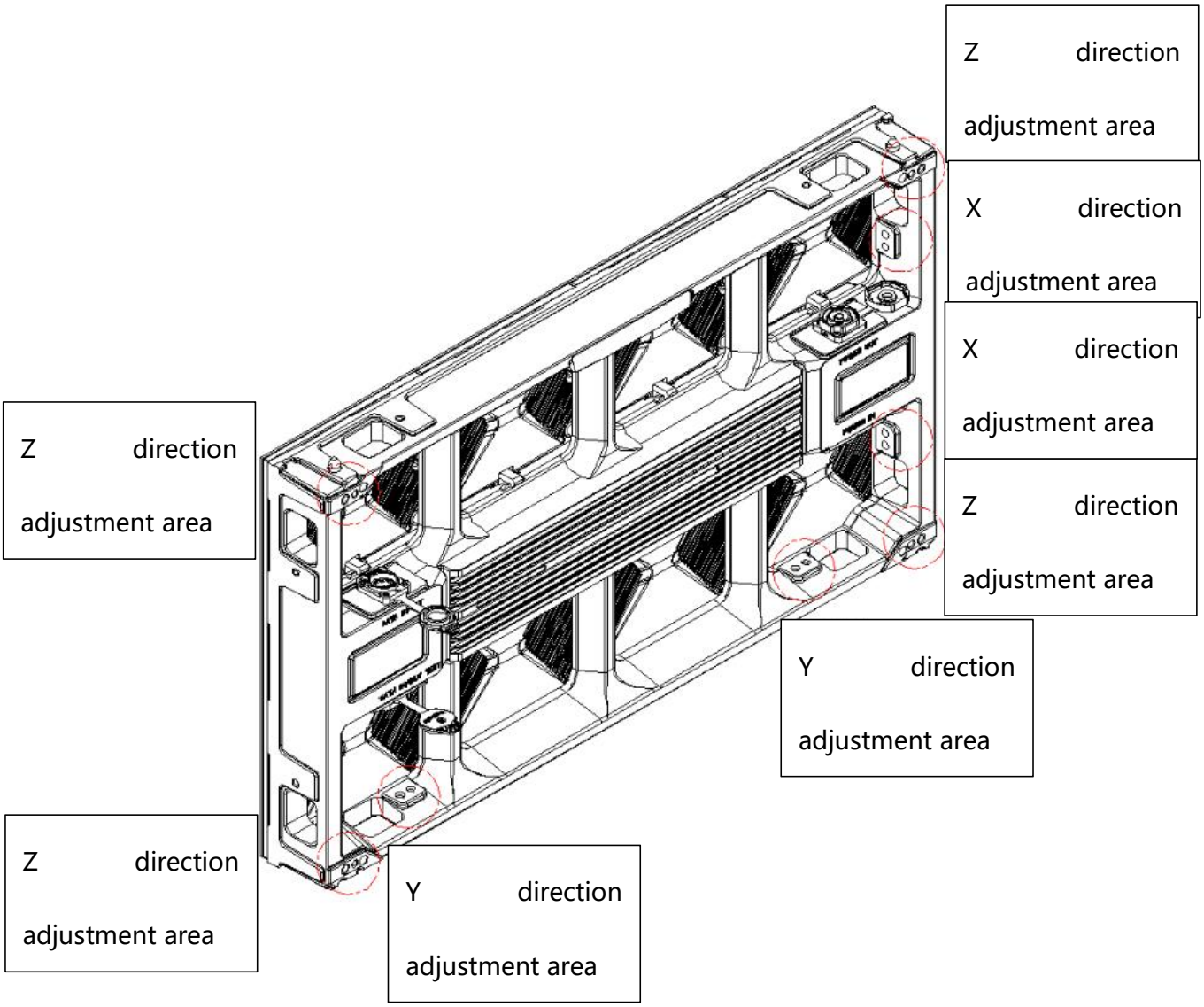
■ **display unit size diagram (in units: mm)**



As shown in the figure, the display unit cabinet has two kinds of mounting holes- front and rear mounting holes. Standard front-installation applies M6 x 16 mm hexagonal cylinder head screws; There are two ways of rear-installation: the connecting plate is not mounted across the square tube, or the connecting plate is mounted across the square tube. When The connecting plate is not mounted across the square tube, the standard is applying M6 X 16mm hexagonal cylinder head screw.When the connecting plate is mounted across the square tube, you need to consider the square tube depth dimension. The mounting screws of this installation method are equipped by the engineering personnel, or the engineering personnel submit the screw model, and the factory equips the screws on their behalf.

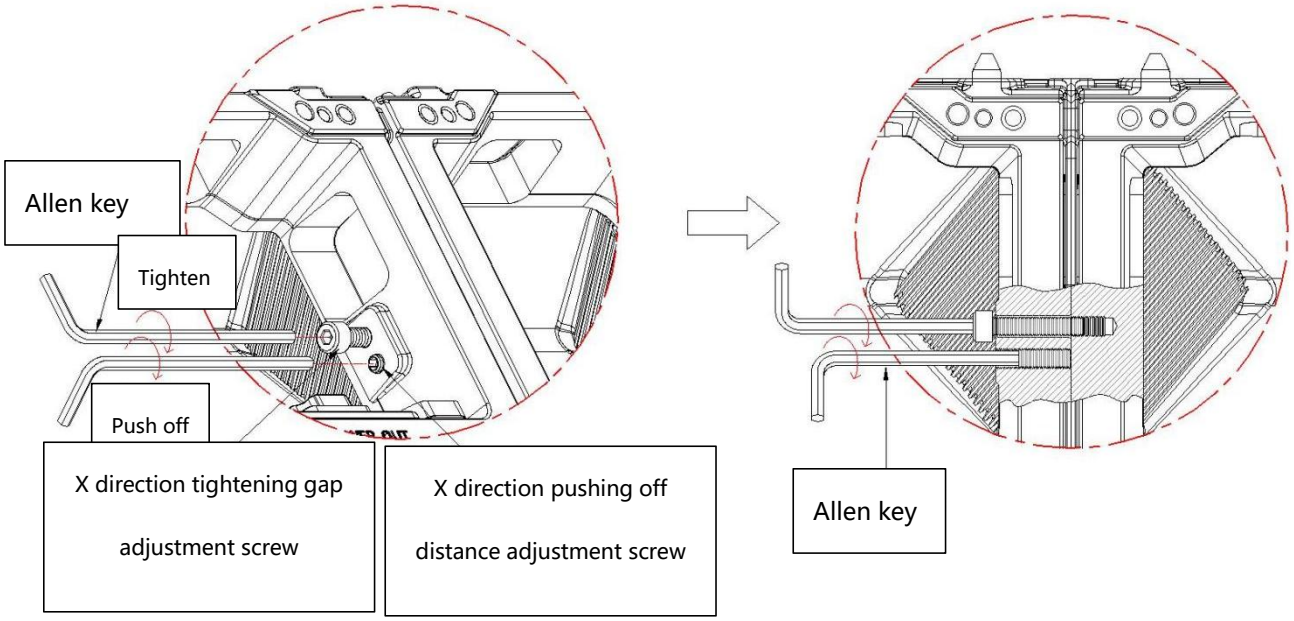
■ 6 axis adjustment function introduction

As shown in the figure below, inside the red coil is adjustment of all directions of 6 axis adjustment function.

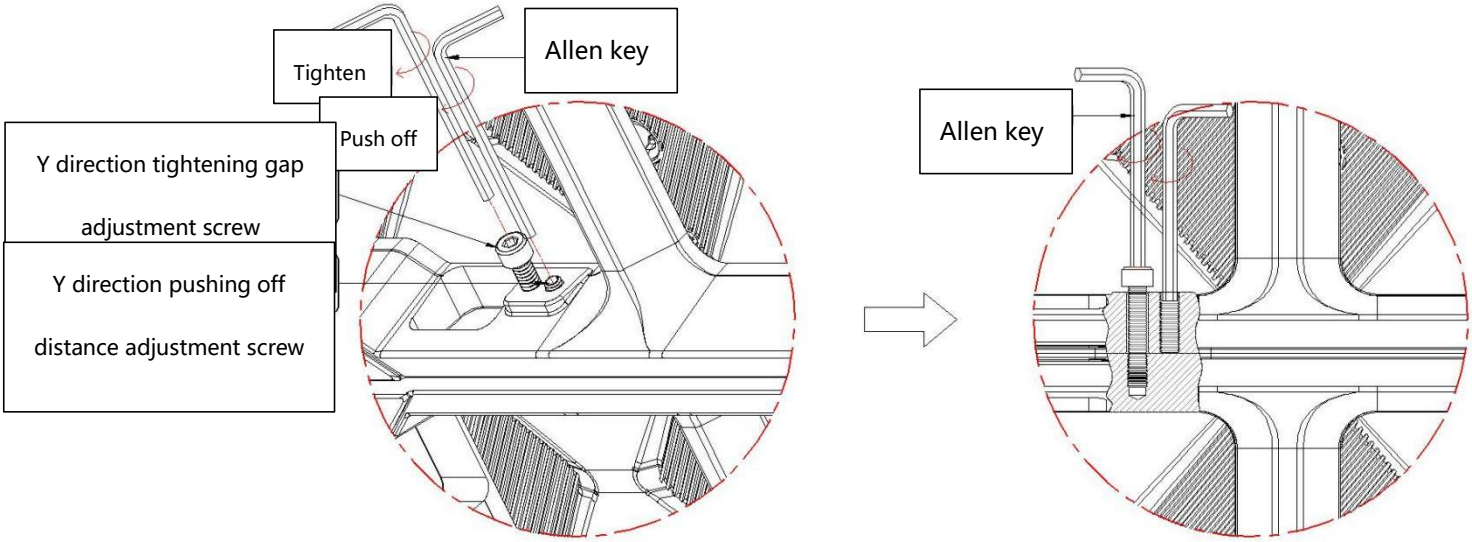


In the installation process, the use of 6 axis adjustment function can effectively improve the installation accuracy of LED screen; The following is a detailed description of the 6 axis adjustment:

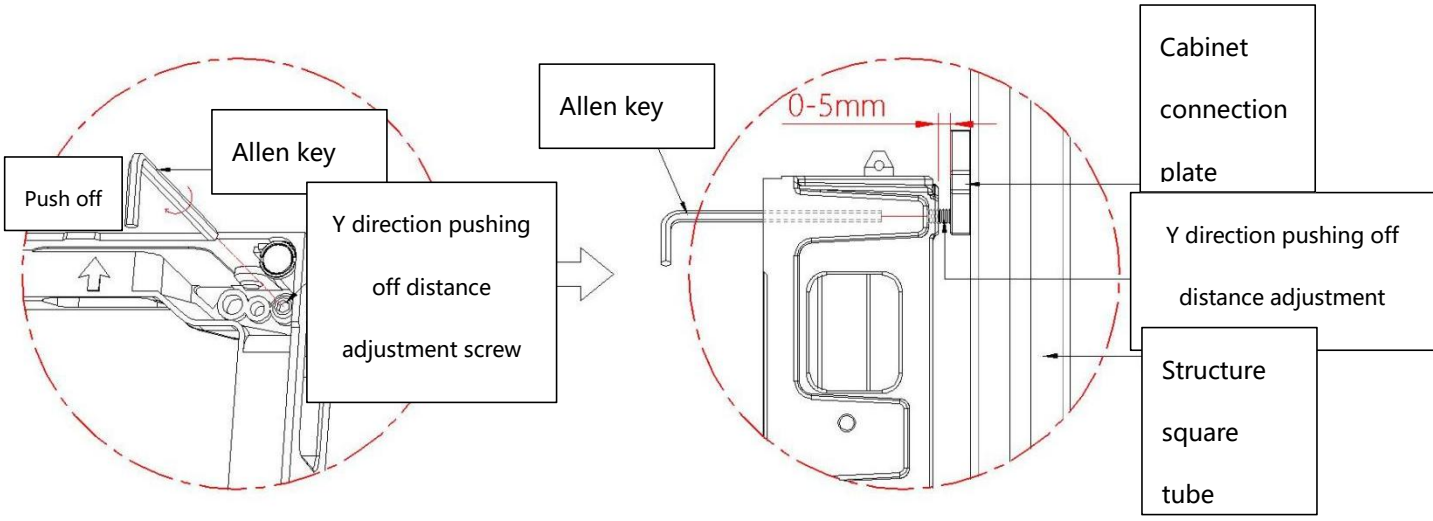
① X direction adjustment. There is one M6 x 35mm cylindrical head screw and one M6 hexagonal Kimi screw on the upper right and lower right sides of the display unit respectively. The two screws are both X direction adjustment screws. The X-direction adjustment can adjust the gap between the left display unit and right display unit during the installation process, the specific adjustment method is shown in the figure below:



② Y direction adjustment. The lower left and lower right sides of the display unit are respectively provided with a M6 * 35mm round head screw and a M6 hexagonal Kimi screw, both of which are Y-direction adjusting screws. The Y-direction adjustment function mainly adjust the gap between the upper and lower display units during the installation of the display screen,the specific adjustment method is shown in the figure below:



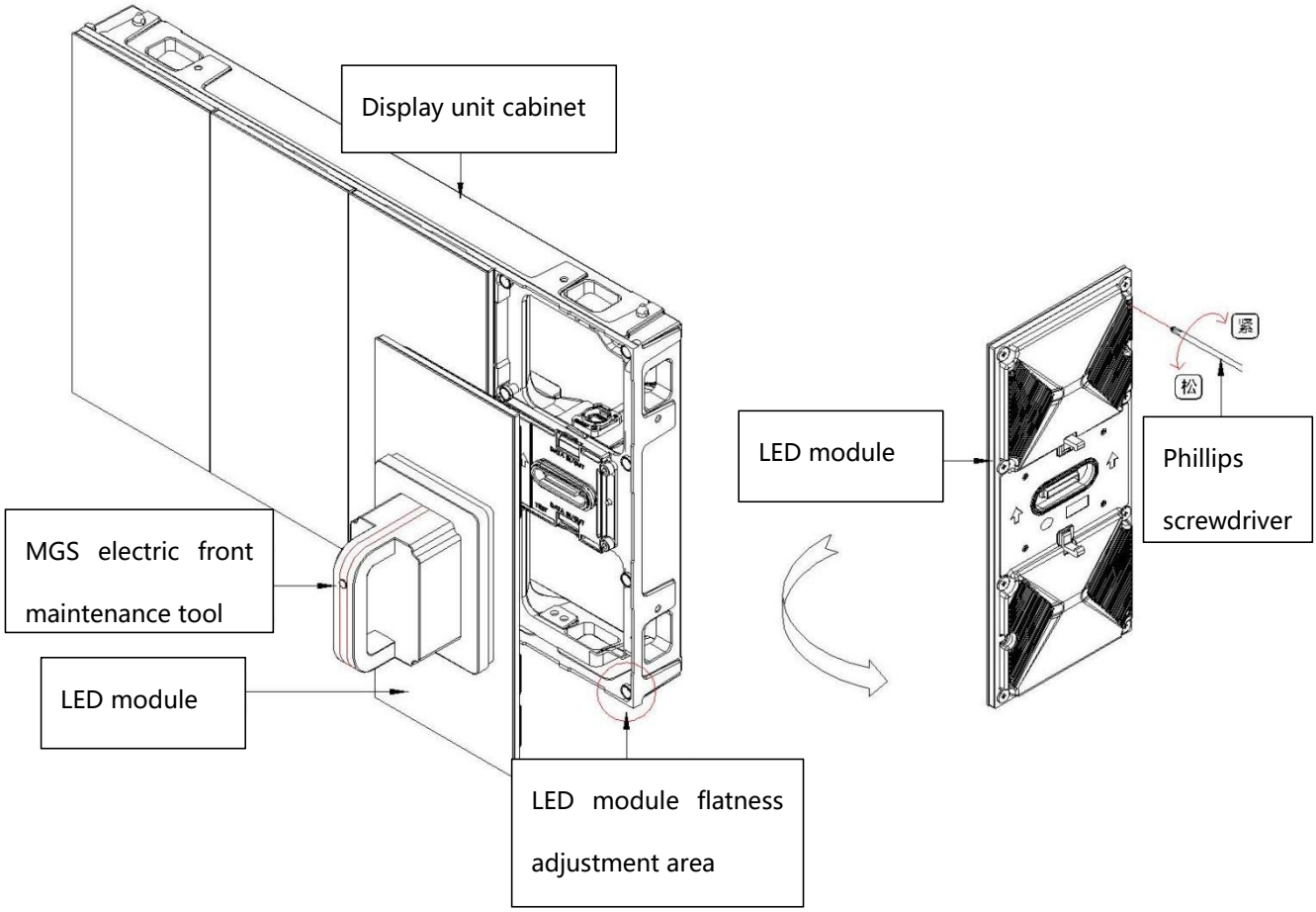
③ Z direction adjustment, the 4 corners of the cabinet mounting hole have the Z direction adjustment function. This function can adjust display unflatness between unit cabinets caused by installation environment problems. The adjustment range is 0-5mm,the specific adjustment method is shown in the figure below:



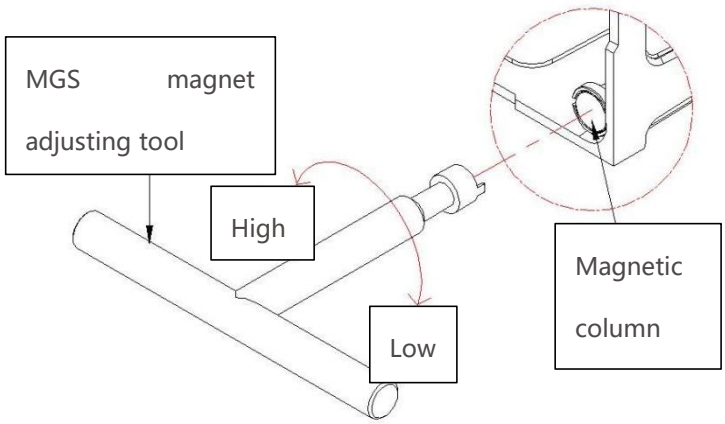
1.13 Introduction to product maintenance

This product is full-front maintenance products, the following is the detailed operation steps of the front-maintenance:

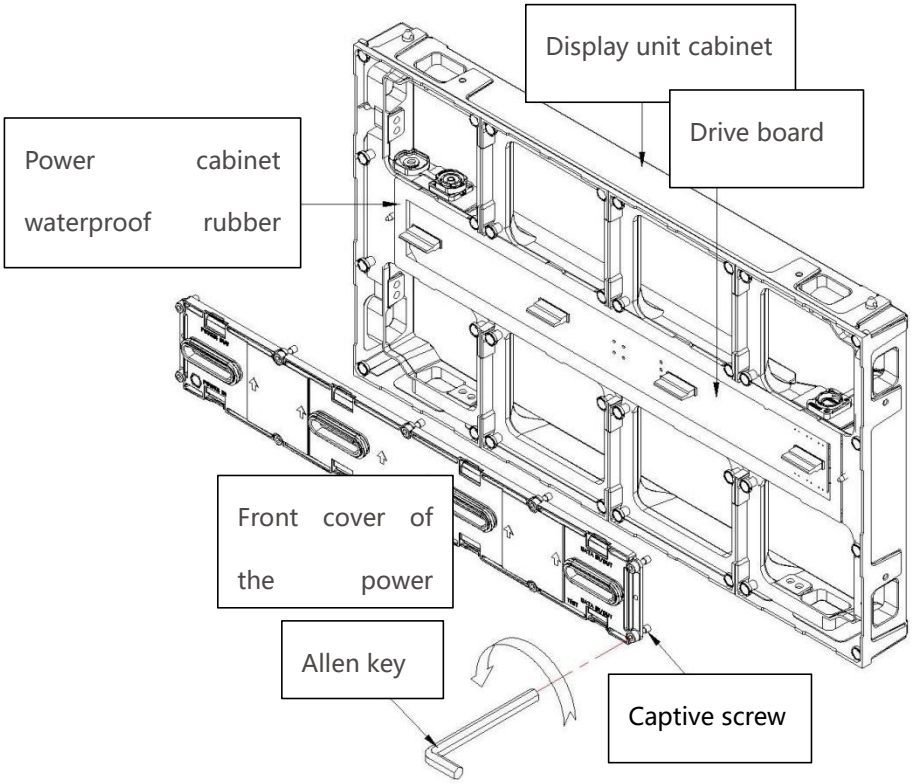
First, remove the LED module from the front of the display unit cabinet with the MGS electric front maintenance tool，remove the back cover of the LED module with a Phillips screwdriver，repair the internal components of the module；See below for details：



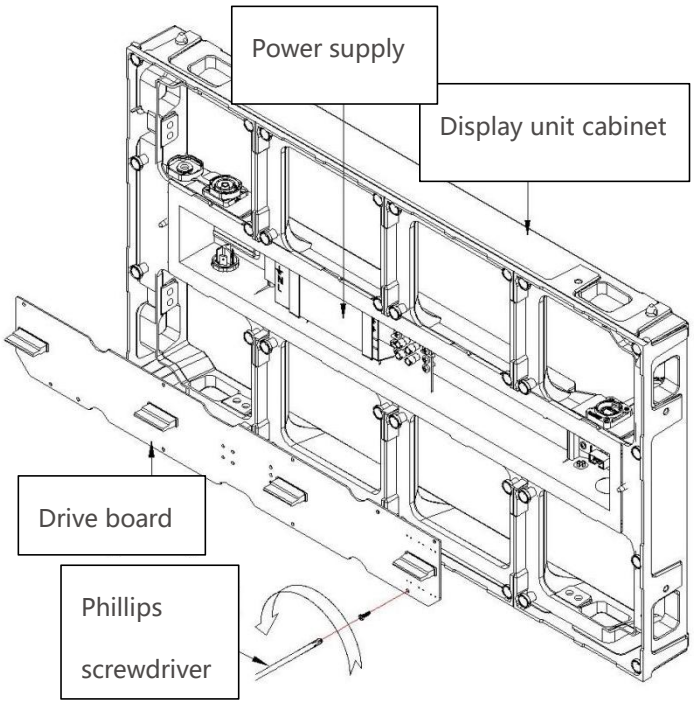
① Flatness adjustment of LED module in the unit cabinet. If the LED modules in the unit cabinet are unflat, the MGS magnet adjusting tool can be used to adjust the magnetic column height in the unit cabinet . The adjustable range of magnetic column is 0-1mm, see below:



② Repeat the first step. After removing all the LED modules, remove the front cover of the power cabinet. After removing the front cover, you can see the drive board of this product.After removing the fixing screw on the drive board, take out the drive board, check and repair the drive board. See below for details:



③ After removing the drive board, you can see the power supply of this display unit, now you can repair or replace the power supply, see the following figure:



④ After completing all or any of the above steps. If the product returns to normal, install the product in an orderly manner, carefully check whether the disassembled area is still water proofing . If there is an exception, you need to handle the exception, and then install and use the product.

（Special note: non-professional personnel are prohibited to remove the LED display unit for overhaul or change the internal wiring, which may cause product damage and safety hazards and other serious consequences!）

2.0、 Control system

2.11 Receiving card

The physical appearance of the receiving card is shown in the following figure:

Product model: X300-II / LEADSHOW 5G receiving card LSR8C-1

2.12 Interface description

Indication light	Color	Status	Description
Signal indication light	Green	Flashes once at intervals of 1 s	The receiving card works normally, the network cable is connected normally, and the video source input is available
		Flashes once at intervals of 3 s	Abnormal connection of network cable
		Flashes 3 times at intervals of 0.5s	Network Cable connection is normal, no video input source
		Flashes once at intervals of 0.2s	The application area program fails to load and enters the working state of the backup program
		Flashes 8 times at intervals of 0.5s	Network port switches to redundancy , loop backup is effective
Power indication	Red	Always on	Power Input Normal

light			

2.13 Sending box

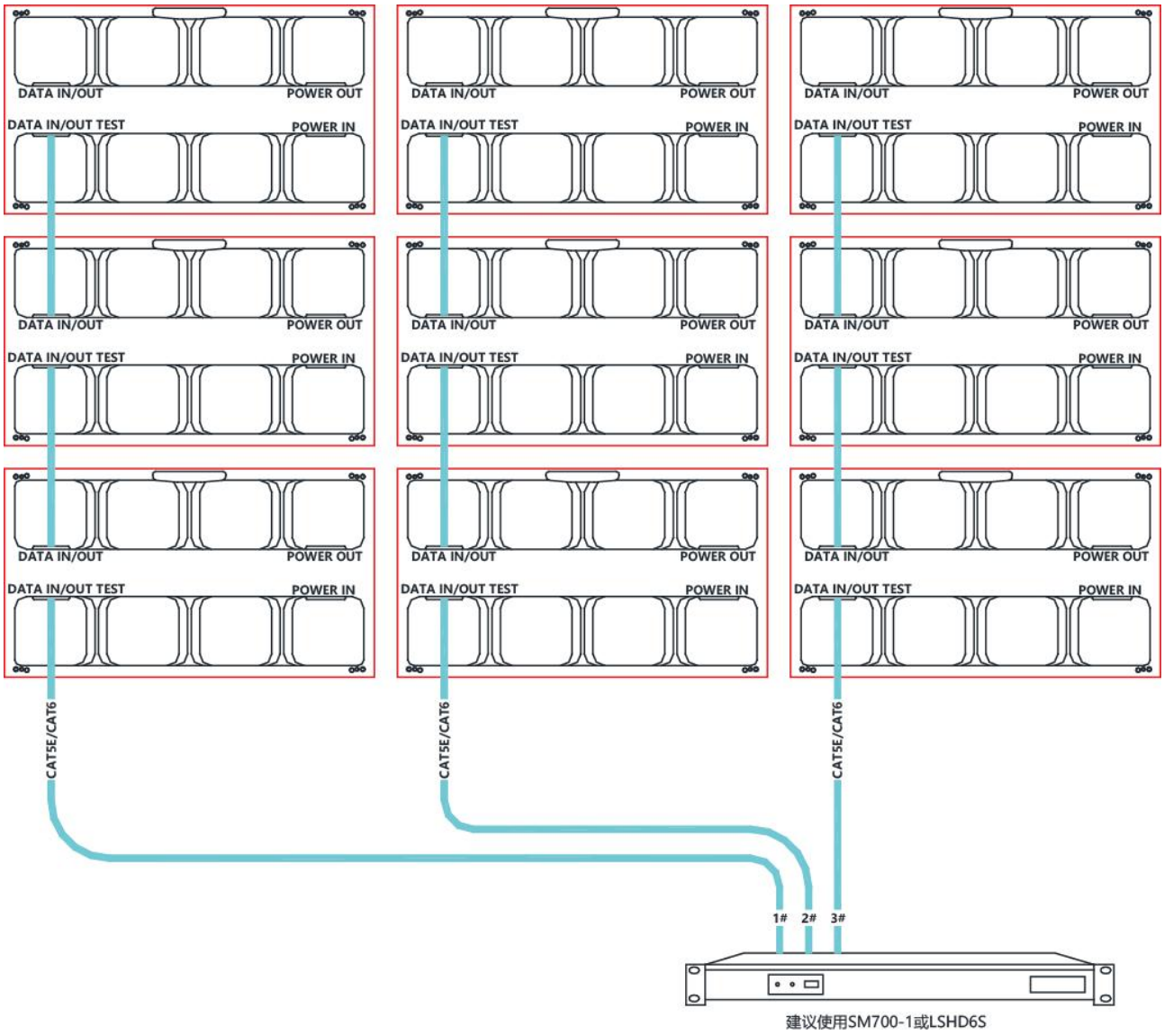
Indication light	
RUN	Equipment running indicator, slow flashing when there is no video source(frequency is on for 2 seconds, off 2 for seconds)
	Normal flashing when there is video source input (approx. 1 second flashes twice)
	The receiver card flashes quickly when the initial image is displayed
	The indicator will be breath flash status when switch to redundancy signal.
STATUS	The indicator 2 of device is always on during normal operation and flashes during authorization.

Interface Panel	
Input source	AUDIO Audio input port
	DVI IN DVI Input port
	HDMI IN HDMI Input interface

Indication light	Same as the front panel
Output interface	OUT1-44 network port output
Control interface	USB connection to computer, USB control interface
	UART IN, OUT cascade input and output
Functional interface	LIGHT SENSOR interface
Power supply	AC-100-240V-50/60HZ AC power interface

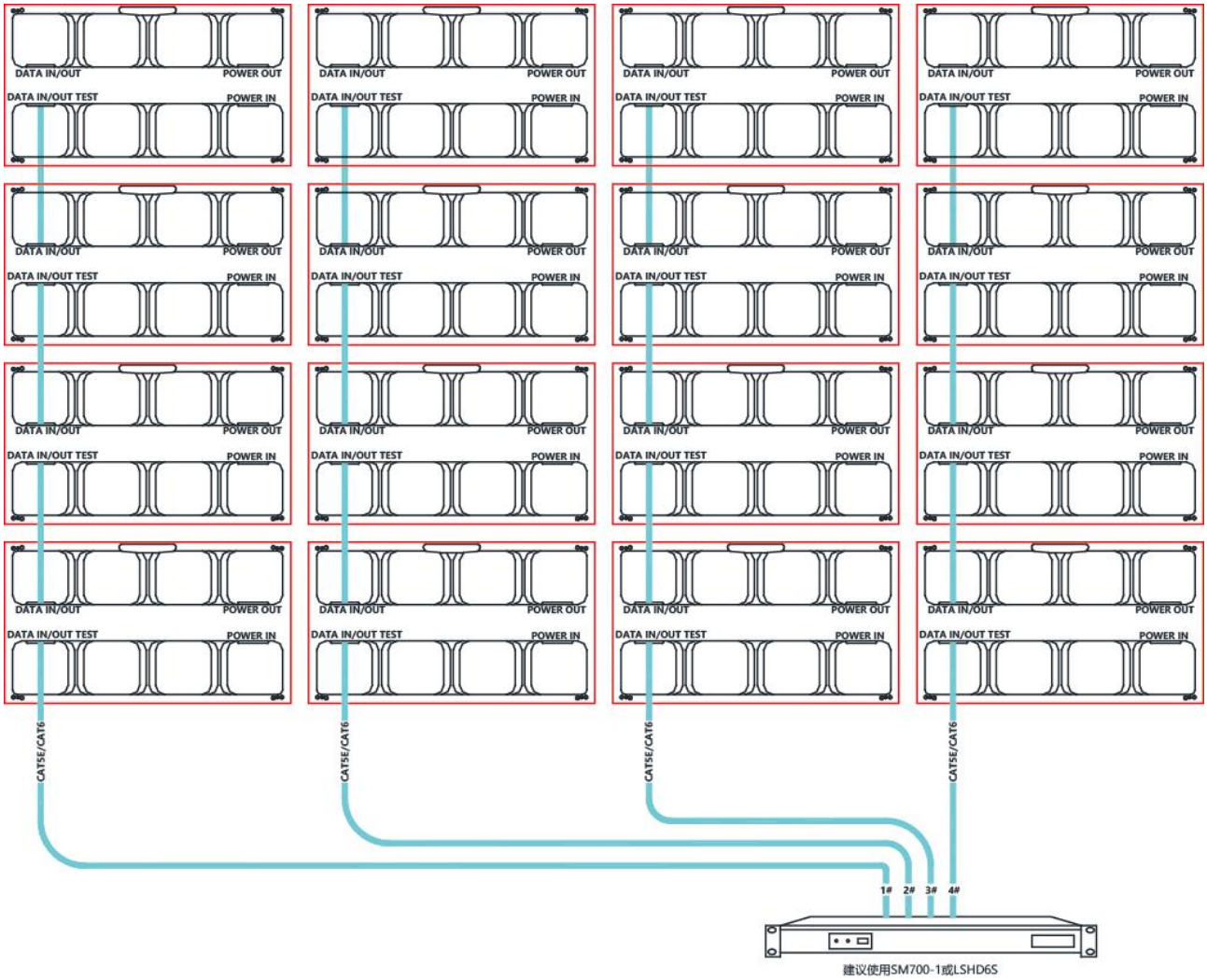
2.14 Schematic diagram of single signal routing

Example 1: MGS1.2 the resolution of a single unit cabinet is 512x288. A single network cable can load up to four cabinets (rectangles). Support left and right, up and down connection, take 2K sending card as an example, the 2K area is arranged as 3x3, and the total resolution is 1536*864, see the figure below:



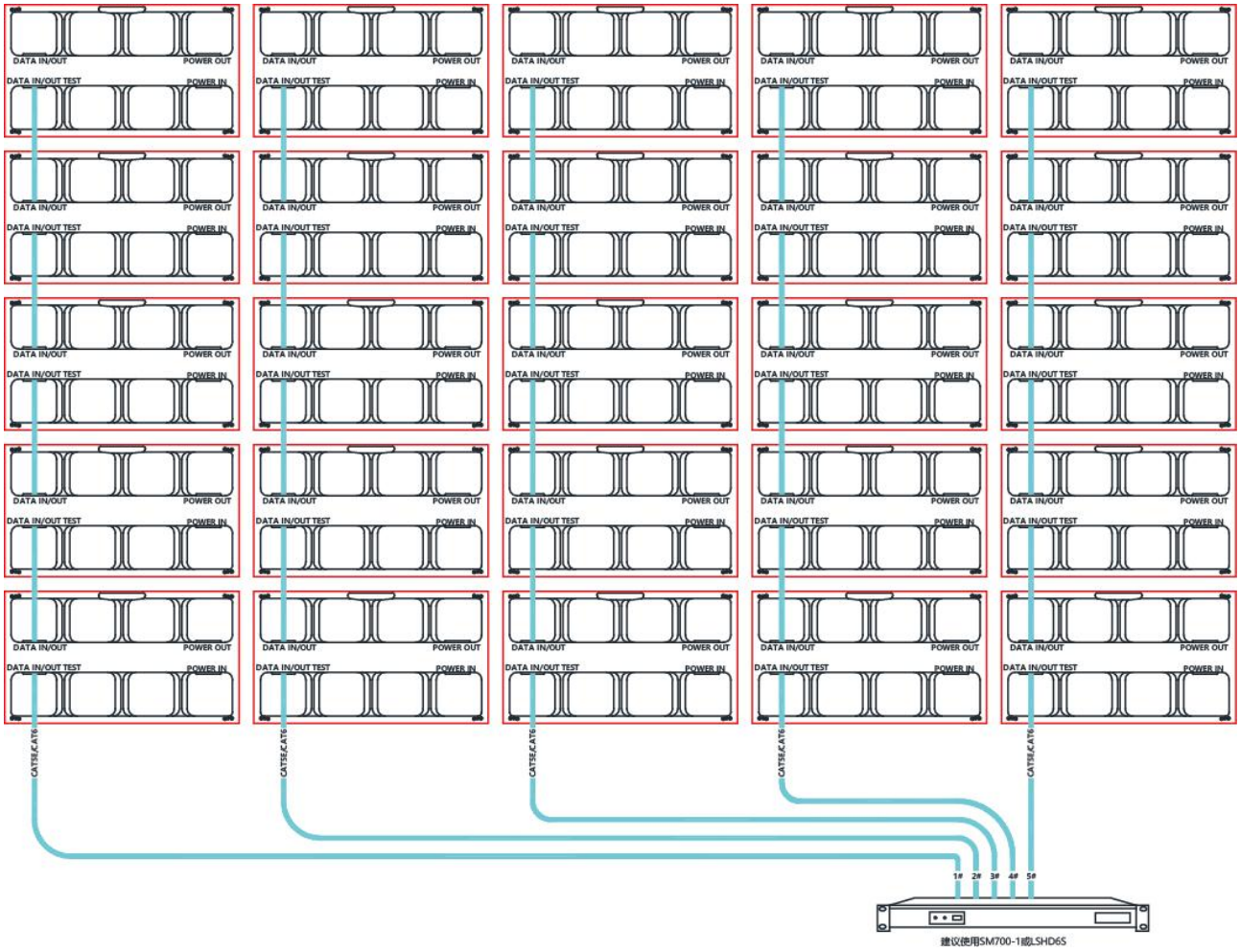
MGS1.2 Schematic diagram of single signal routing

Example 2: MGS1.5 single cabinet unit resolution is 416x232, a network cable can load up to six cabinets (rectangular) , support left and right, up and down connection, take 2K send card as an example, 2k area arrangement is 4x4, the total resolution is 1664x928, see below:



MGS1.5 Schematic diagram of single signal routing

Example 3: MGS1.8 single cabinet unit resolution is 344x192, a net cable can load up to 9 cabinets (rectangle) , support left and right, up and down connection, take 2K send card as an example, 2k area arrangement is 5x5, the total resolution is 1720x960, see below:

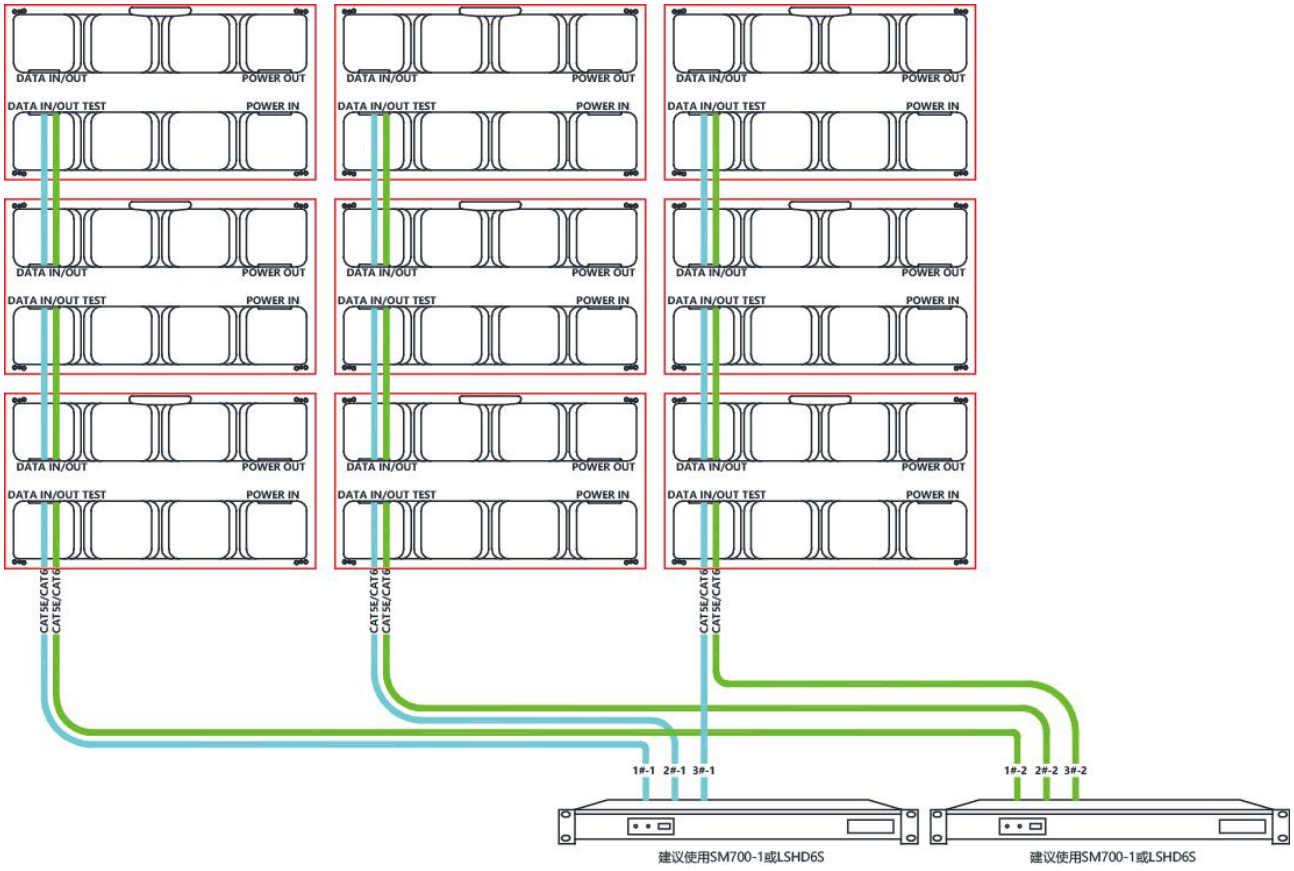


MGS1.8 Schematic diagram of single signal routing

2.15 Schematic diagram of dual signal routing

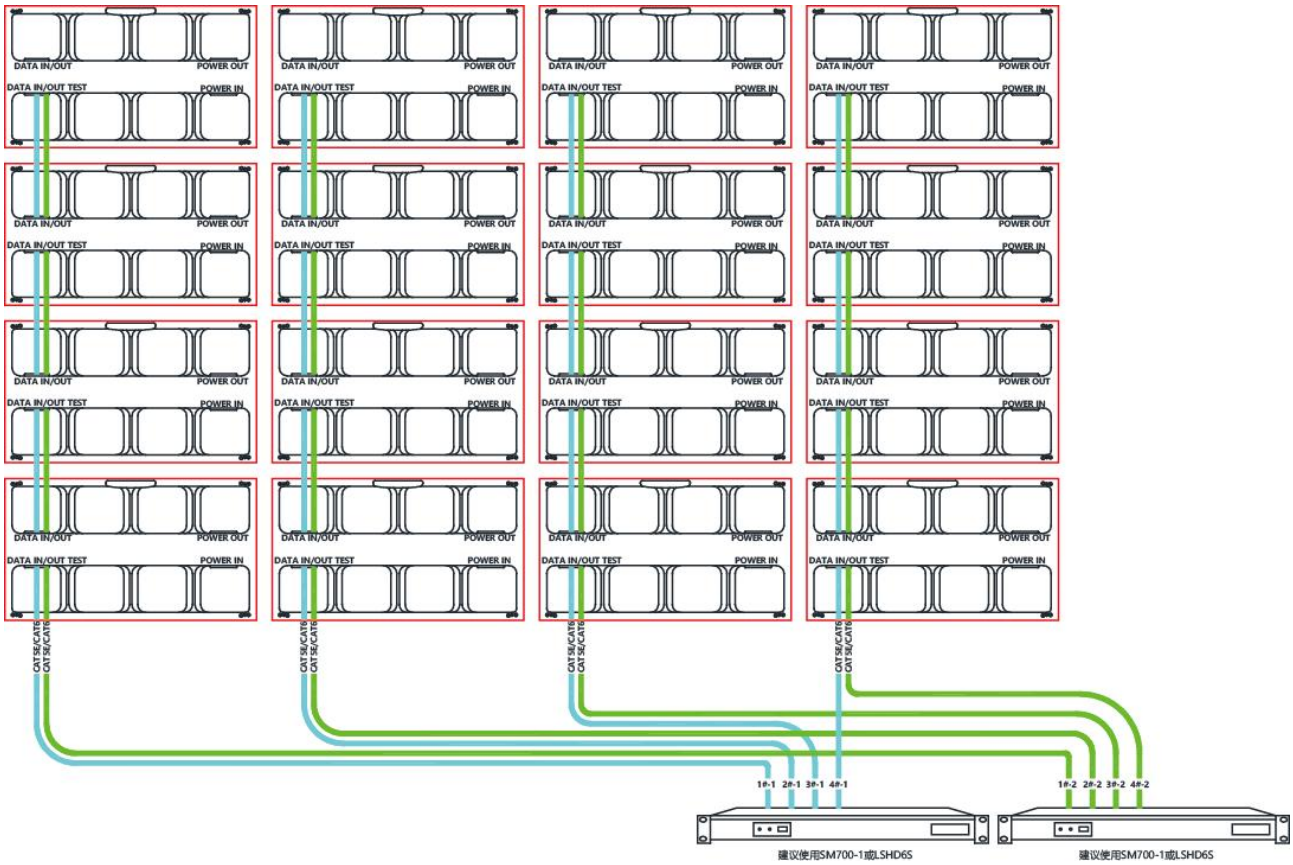
Example 1: MGS1.2 single cabinet unit resolution is 512x288, a network cable loads up to 4 cabinets (rectangle) , support left and right, up and down connection, take 2K send card

as an example, 2k area arrangement is 3x3, the total resolution is 1536 * 864, see below:



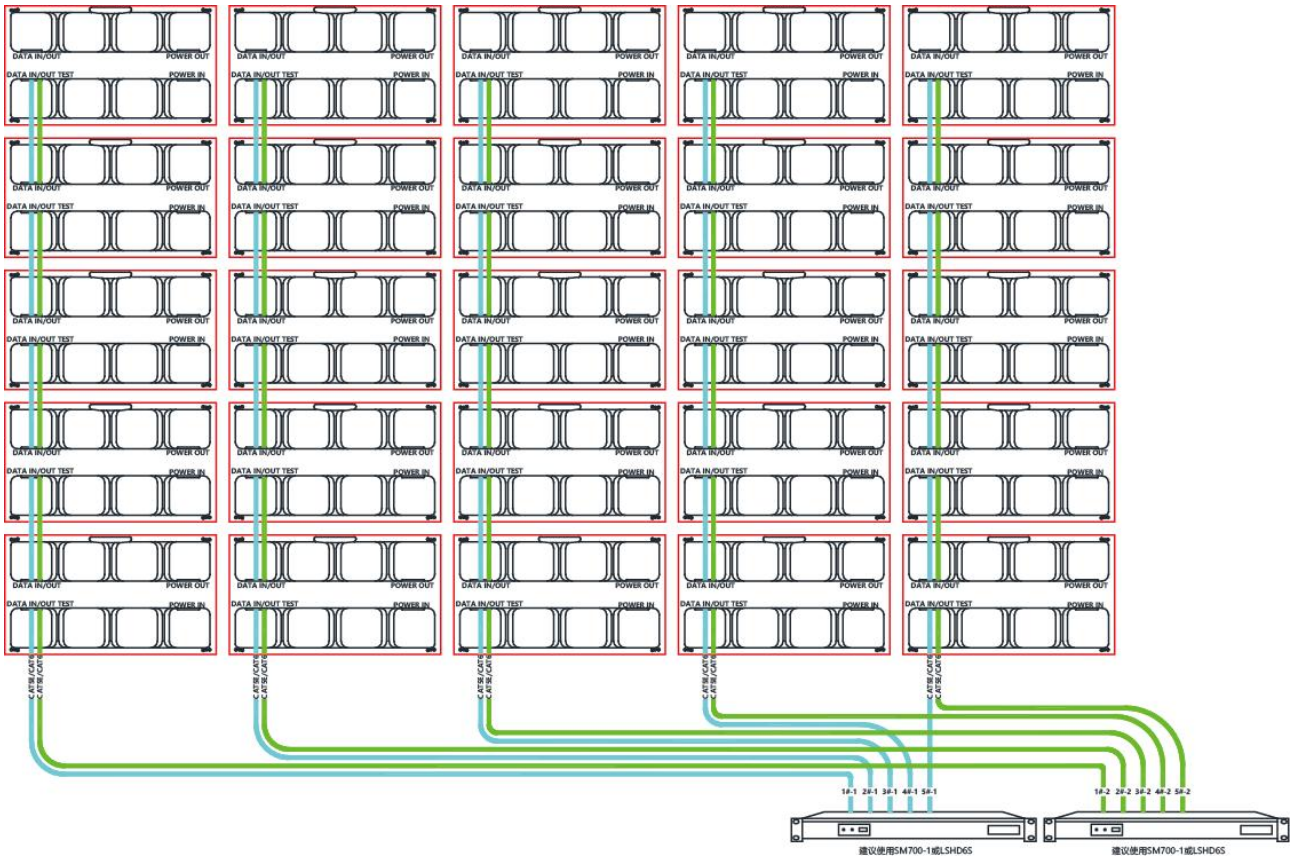
MGS1.2 Schematic diagram of dual signal routing

Example 2: MGS1.5 single cabinet unit resolution is 416x232, a network cable loads up to six cabinets (rectangular) , support left and right, up and down connection, using 2K send card as an example, 2k area arrangement is 4x4, the total resolution is 1664x928, see below:



MGS1.5 Schematic diagram of dual signal routing

Example 3: MGS1.8 single cabinet unit resolution is 344x192, a net cable loads up to 9 cabinets(rectangle) , support left and right, up and down connection, using 2K send card as an example, 2k area arrangement is 5x5, the total resolution is 1720x960, see below:



MGS1.8 Schematic diagram of dual signal routing

3.0、 Description of power distribution loading

3.11 Calculation of total power consumption of display screen

Total display power = total screen power + total power of peripheral device + total power of heat dissipation device

① Power of switching power supply: output voltage (V) × output current (A) = power of single power supply (W)

② Total screen power:

Method(1): number of cabinets × the power of cabinets

Method(2): Screen area × 120% of maximum power per square (20% reserved for switching power supply)

(Note: As for the maximum power of per square of the screen, please refer to the corresponding product model specification)

③ Peripheral device: processor, lighting behind the screen about 2KW

④ Heat dissipation device: air conditioning power ≈ 10m²/P≈800w (for example, 30m² screen needs heat dissipation air conditioner 3P, then the total power is 800w×3=2.4kw)

3.12 Power distribution cabinet cable model selection

Power distribution model (KW)	Inlet cable model(MM²)	Maximum current (A)	Minimum conduit (mm)
10KW Power distribution cabinet	YJV5×6	25	25
20KW Power distribution cabinet	YJV5×10	50	50
30KW Power distribution cabinet	YJV5×16	65	50
40KW Power distribution cabinet	YJV4×25+1×16	85	50
50KW Power distribution cabinet	YJV4×35+1×16	105	65

60KW Power distribution cabinet	YJV4×35+1×16	125	80
80KW Power distribution cabinet	YJV4×50+1×16	150	80
100KW Power distribution cabinet	YJV4×70+1×16	190	100
120KW Power distribution cabinet	YJV4×120+1×70	235	120
150KW Power distribution cabinet	YJV4×185+1×95	300	150
200KW Power distribution cabinet	YJV4×240+1×120	412	150

Note: It is generally stipulated that in important fireproof places, such as airports, railway stations, the Great Hall of the People and other densely populated areas, the cable leading from the customer's power distribution room to the display power distribution cabinet requires the use of low-smoke halogen-free flame retardant cable, number: WDZB(C)-YJY-. Cross-linked power cables can be used in other general conventional places, numbered: YJV or YJY, which has strong tensile resistance. Outdoor places may encounter the requirements of cable buried directly in the ground, the cable requirements for armored (sheath layer with a layer of metal skin) , commonly used number: YJV22-or YJV23-, etc. , this cable bending radius is large, inconvenient laying.

3.13 Leyard engineering power distribution cabinet model description

Power distribution cabinet model	10KW Power distribution cabinet	20KW Power distribution cabinet	30KW Power distribution cabinet	40KW Power distribution cabinet	50KW Power distribution cabinet	60KW Power distribution cabinet
Power	400×600×200	500×700×	600×800×	600×1000×	600×1000×	600×1200×

distribution cabinet dimension MM (W) × (H) × (D)		200	200	200	200	200
Power distribution cabinet weight (KG)	10	15	20	25	30	40
Installation method	Hanging					
供电方式 Power supply mode	AC380V three-phase five-wire system					
配电柜进线 Inlet cable of power distribution cabinet (MM²)	YJV5×6	YJV5×10	YJV5×16	YJV4×25+1×16	YJV4×35+1×16	YJV4×35+1×16
Output voltage and number of outputs	AC220 6 outputs	AC220 9 outputs	AC220 12 outputs	AC220 15 outputs	AC220 18 outputs	AC220 24 outputs
Main circuit breaker of power distribution cabinets	25A/3P	25A/3P	25A/3P	25A/3P	25A/3P	25A/3P
Communication interface	RJ45,RS232.RS485					
Main functions	Short Circuit, over current, over voltage protection, PLC remote switch, timing display screen function					

The above is the standard distribution cabinet parameter selection commonly used for indoor cabinets. The explanation is as follows::

(1) When the display peak power does not exceed 10KW, select the above 10KW standard distribution cabinet, the input voltage is three-phase AC380V. At the same time, the distribution cabinet above 60KW needs to be used with the sub-distribution cabinet.

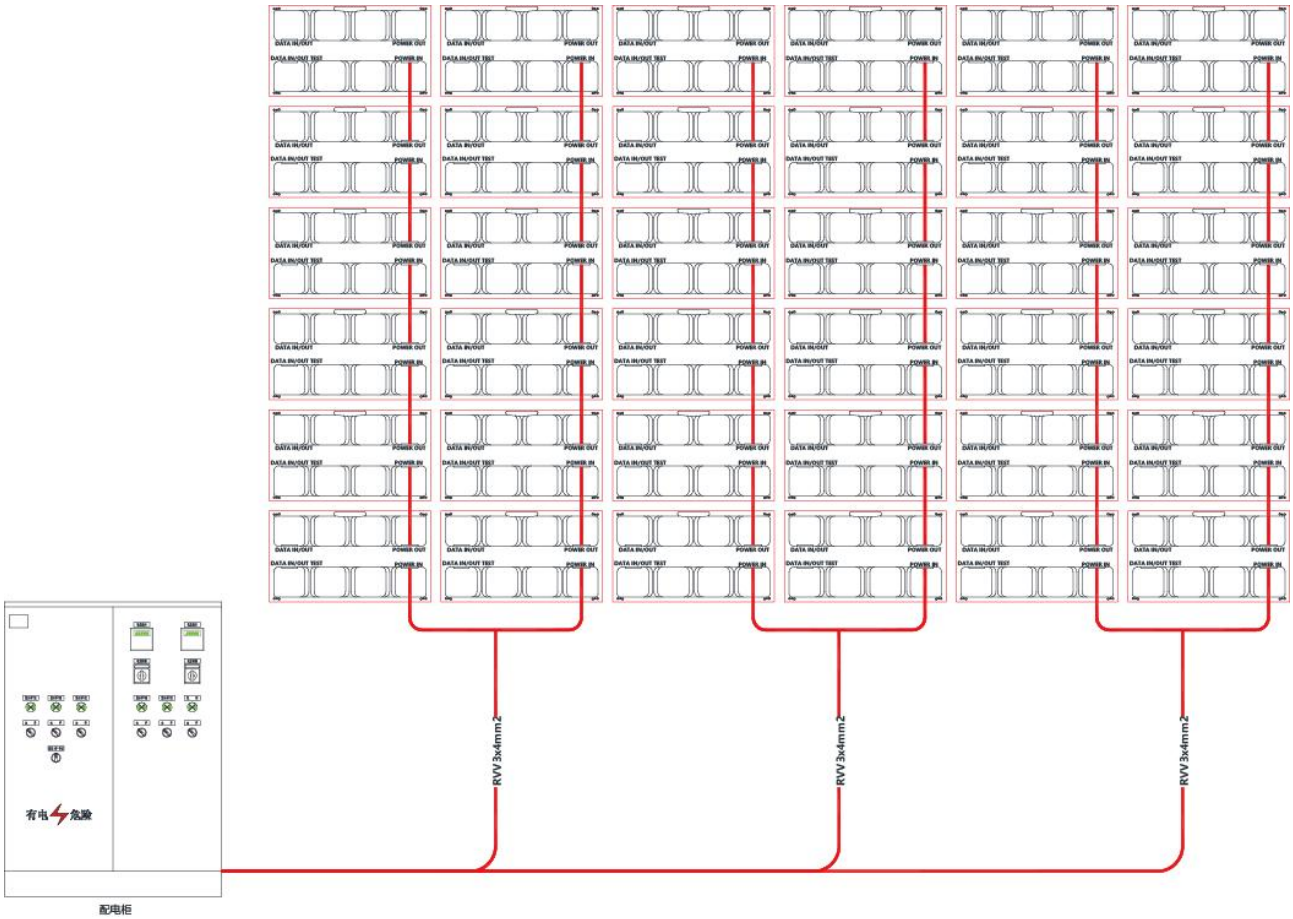
(2) The output of the 10KW-60KW power distribution cabinet adopts AC220V, which directly

supplies power to the display. The output of 80KW-200KW power distribution cabinet adopts AC380V, and the 20KW or 30KW sub-distribution cabinet is used together with 80KW-200KW power distribution cabinet to supply power to the display.

(3) The distribution cabinet (distribution box) adopts step-by-step start to reduce the impact of the distribution cabinet to the power grid. The power per step is more than 8KW. The cable from the distribution cabinet to the display screen generally adopts RVV3*4MM ² cable (branch line). For MGS Series products, a single RVV3 * 4MM²(branch line) loads no more than 18 PCS of MGS cabinets.

3.14 Example distribution connection schematic

MGS cabinet arrangement (W) 6× (H) 6 distribution connection diagram:



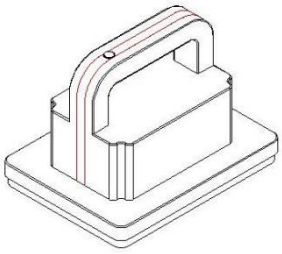
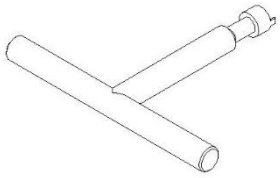
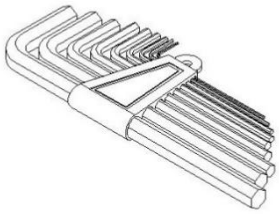
MGS distribution connection diagram

4.0、 Product installation solution

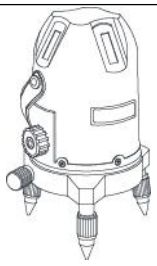
4.11 Preparation before installation

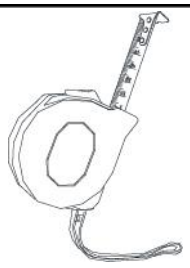
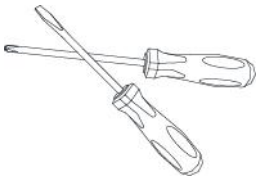
Before installation, the necessary tools, general installation tools, installation accessories and work protective equipment should be prepared. The necessary tools and installation accessories should be provided by the project, general installation tools and work protective equipment should be equipped by the construction personnel themselves.

① **Necessary tools:**

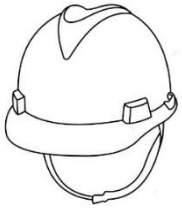
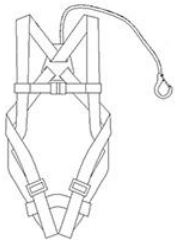
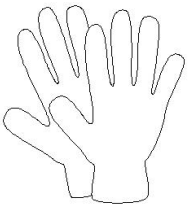
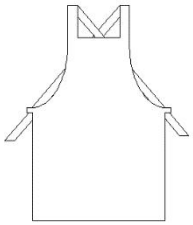
Tool			
Tool name	MGS Electric front maintenance tool	MG magnet adjusting tool	Allen key

② **General installation tools**

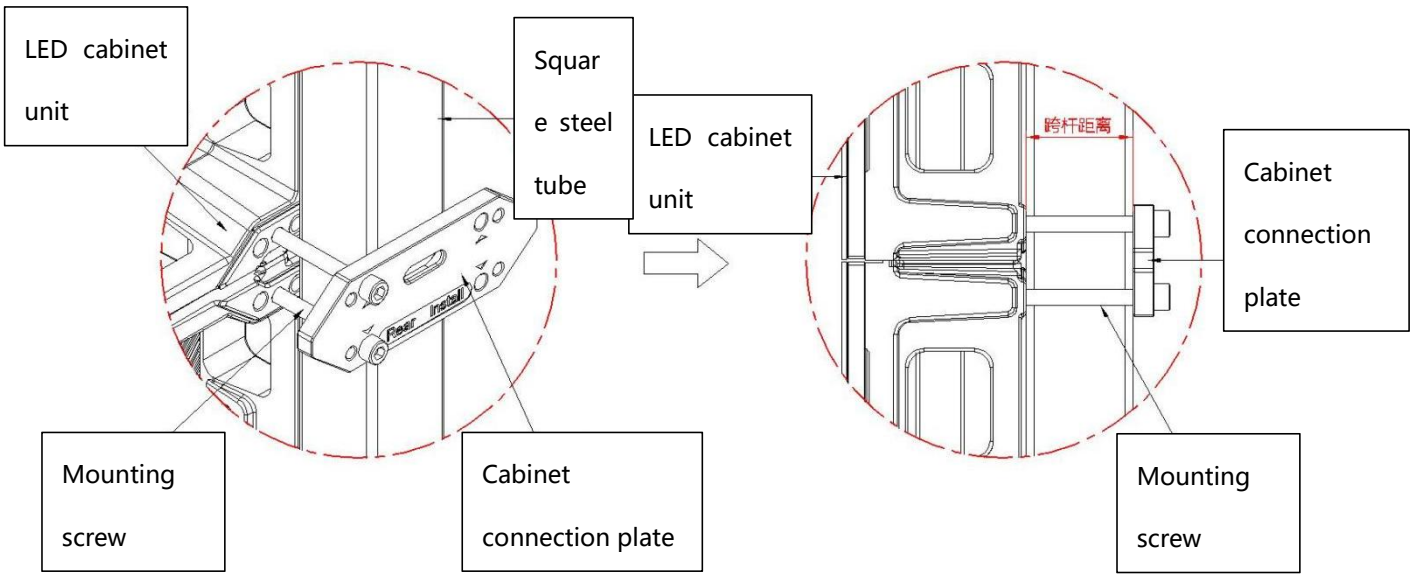
Tool				
Tool name	Laser level	Hand drill	Multimeter	Cutters

Tool				
Tool name	Rubber hammer	Active wrench	Tape measure	Screwdriver

③ **Protective equipment:**

Protective equipment				
Name	Safety helmets	Seat belt buckle	Protective Gloves	Protective apron

Note: as for rear installation with connection plate mounted across the square tube, the project leader needs to choose the length of the installation screw according to the actual needs of the on-site steel structure. The length of the screw is calculated as: 16mm + the depth of the square tube = equal to the actual required length of the screw, as shown in the figure below:

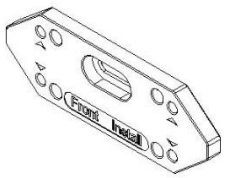
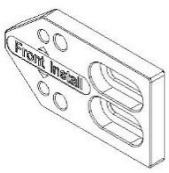
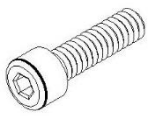


4.12 Introduction of installation solution

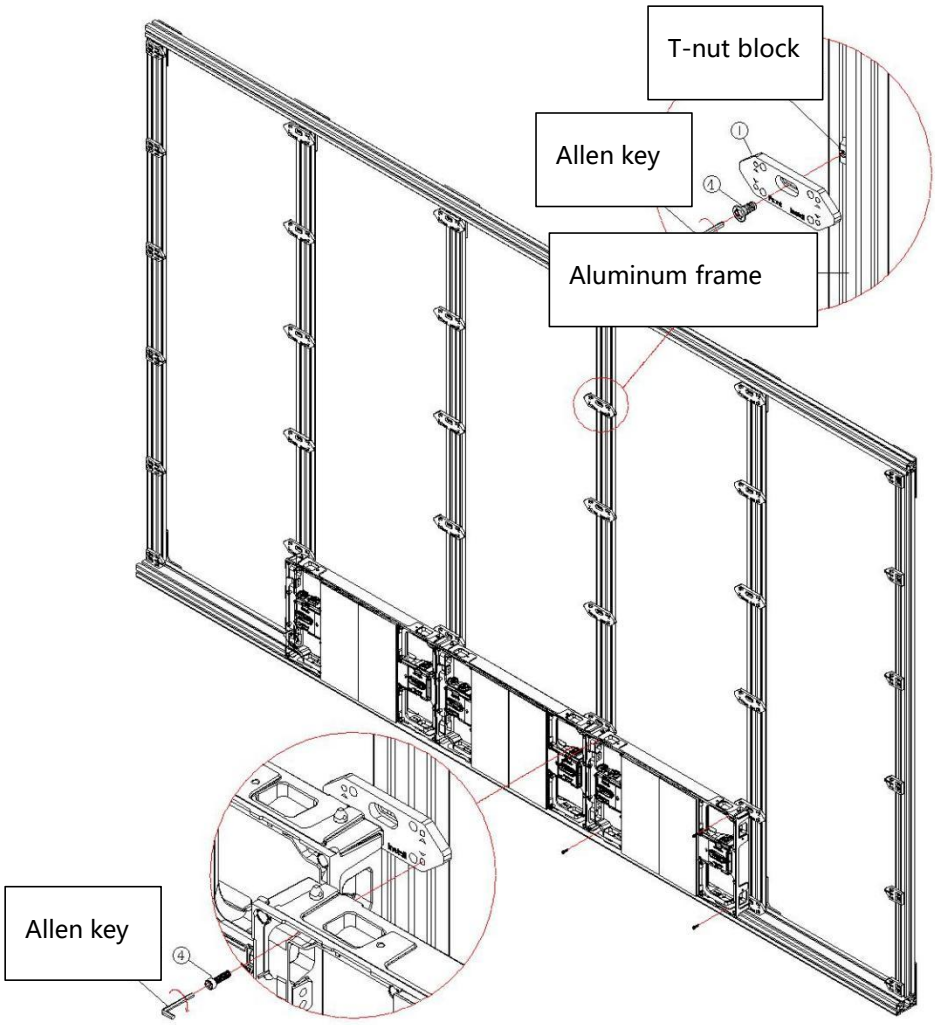
① Conventional aluminum profile structure front installation solution:

This installation solution is suitable for small area LED screen projects, the screen had better be hanged onto the building wall. After the LED screen is installed, it is necessary to package and seal the whole aluminum profile structure, in order to prevent direct contact with natural weather, which may cause oxidation and affect the strength of the structure; The following are the installation steps of aluminum profile structure:

1. Common front-installation accessories. The accessories will provided by the factory. Please count the number of accessories before installation, as shown in the table below:

Accessory				
Accessory name	Cabinet connection plate A	Cabinet connection plate B	M6*16 cylindrical head hexagonal screw	M6 * 16 countersunk head hex screw

2. Arrange the pre-embedding in advance according to the project design drawings and the conditions on site, ; For the layout of embedding, you need to consider the self-weight load of the LED screen and the installation structure, determine the safety and reliability of the embedded point by combining with the local natural load standard value and anti - seismic standard value.
3. Assemble the aluminum profile structure according to the project design drawings and fix it on the pre-embedded points.
4. After fixing the installation structure, lock the cabinet connecting plate A/B on the corresponding aluminum frame back bar with M6 * 16mm countersunk hex screw. measure and adjust the position of cabinet connecting plate with ruler, adjust the horizontal bottom cabinet connecting plate on the same horizontal line with laser level meter. After locking the screws, the first row of cabinet units can be installed. Remove the left and right module of the display cabinet unit with the MGS electric front maintenance tool, and remove the inner side of the module from the front of the cabinet, fix the cabinet on the already installed cabinet connecting plate with M16 * 16 cylinder head inner hexagonal screw. See below for details:



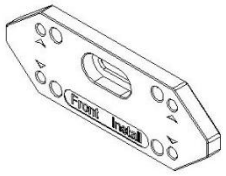
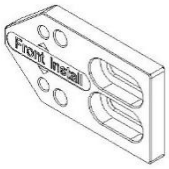
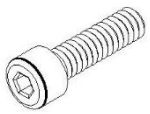
5. Install all the cabinet unit in sequence according to the figure above.
6. Connect the relevant cables according to the project power distribution system diagram and system connection diagram.
7. After the electrical test with the multi-meter is finished, assemble the module back to the cabinet unit, adjust the flatness, and carry out power adjustment.

② **Steel frame rear installation solution:**

The installation scheme is suitable for large-area LED screen projects, suitable for various installation environments, for different environment, need to choose different steel material and different structural solution according to the designer’ s opinion; the following are the

installation steps for the aluminum profile structure:

1. Common front-installation accessories. The accessories will provided by the factory. Please count the number of accessories before installation, as shown in the table below:

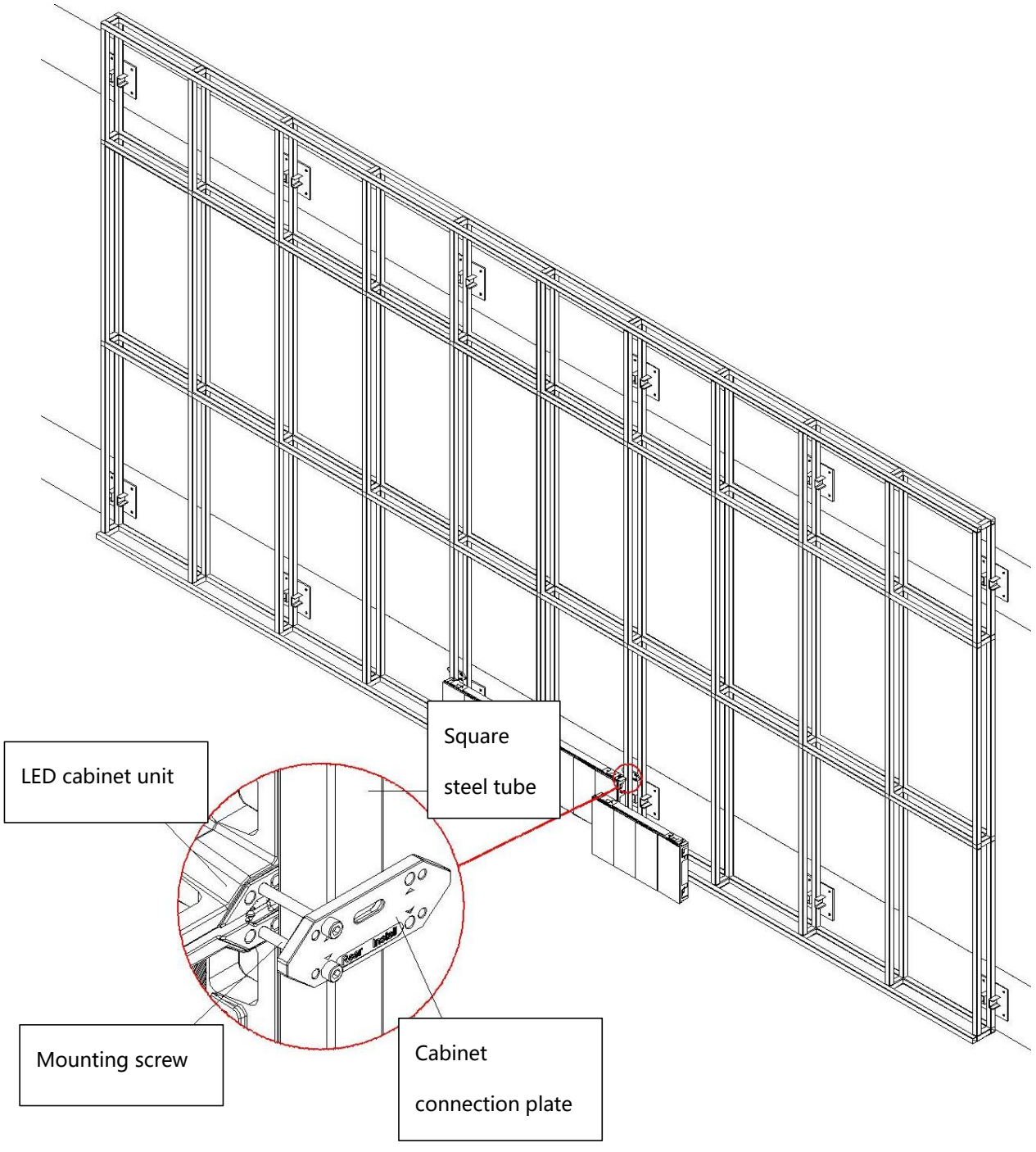
Accessory			
Accessory name	Cabinet connection plate A	Cabinet connection plate B	M6*60 cylindrical head hexagonal screw

2. Arrange the pre-embedding or basis in advance, according to the project design drawings and the conditions on site; For the layout of embedding or basis, you need to consider the self-weight load of the LED screen and the installation structure, determine the safety and reliability of the embedded point by combining with the local natural load standard value and anti - seismic standard value.

3. Assemble the steel frame according to the project design drawings and fix it on the pre-embedded points or basis.

4. After fixing the installation structure, adjust the horizontal bar of the steel structure to the level with the laser level meter. Place the display cabinet unit on the middle of the horizontal bar and start installing the first row of cabinet units. Start from the middle to the two sides

gradually. For rear installation, the module of display unit need not be removed, and the square steel tube can be crossed directly from the rear of the cabinet. The cabinet can be locked with the corresponding screws of the project. If there is no extra space behind the structure, when fixing the box, the signal cable and the power cable of the cabinets can be connected layer by layer, so as to avoid the difficulty of the cable connection caused by cabinet height. If this issue already happens, remove the module of the display unit with the MGS electric front-maintenance tool, and then connect the cables, as shown below:



5. Connect the relevant cables according to the project power distribution system diagram and system connection diagram.

6. After the electrical test with the multi-meter is finished, assemble the module back to the cabinet unit, adjust the flatness, and carry out power adjustment.

5.0 Common faults and solutions

Fault description	Solution
1.The whole LED screen does not display image	1.Whether the display is powered on.
	2.Whether the display has HDMI signal input, connect the LCD monitor to check whether it is caused by a signal transmission link failure.
	3.Whether the brightness setting of the display control software is normal.
2.Part of the LED screen does not display image	1.Check the display screen area that does not display an image and make sure the power is normal, including input power and switch power.
	2. If no abnormality is found in the first step, restart the power switch in the relative area, after the power is off, wait for more than 1 minute before powering it on again, and when the power is on again, the re-initialization of the display unit may solve the

	problem.
	3.Display unit cascade cable transmission issues.
	4. If the control board is replaced, the display unit image still can not be connected with the surrounding, you need to use the software to set the corresponding address coordinates and brightness color values.
3.Part of the LED screen images flash	1.Display unit cascade signal transmission problem. Try replacing the cascaded signal cable or control panel. If the control board is replaced, the display unit image still can not be connected with the surrounding, you need to use the software to set the corresponding address coordinates and brightness color values.
	2.Input signal problem, connect the LCD monitor to check.
	3.The processor resolution exceeds the maximum resolution of the sending card.
	4.Power supply problems in the screen.
4.LED display module display is not normal, the whole module or part of the module lack of color, long light, out of control or semi-out of control	1.If the display unit is not initialized properly, restart the power of the area at intervals of not less than 1 minute, and sometimes it may take 2-3 times to solve the problem.
	2.If step 1 does not solve the problem, preliminary judgment may be because of poor contact between LED modules and control board, which can be re-inserted in order to solve the physical contact problem.

state	3.If the problem still exists after the above two-step settings, the judgment may be because of LED module or control board circuit issues, you can replace the LED module or control board, adjust the coordinate, color, brightness , so that it is consistent with the the image color of the whole screen.
	4.The cabinet set resolution is inconsistent with the actual resolution
5.The video window image is incomplete	1.Connect the LCD monitor to check whether the signal input or output of the video processor is normal
	2.Check whether the input signal resolution is consistent with the saved resolution set.
	3.Check if the video processor is set up correctly
6.The sending card is not detected	1. The power supply of the equipment is not normal
	2. The serial cable or computer USB port is damaged
	3. The serial port is occupied by other software
	4. The serial driver computer is not installed

When the LED display is abnormal, it is necessary to comprehensively analyze which part of the display screen has a problem based on experience and combined with different situations. If the final judgement is a problem of a component in the display unit, it is recommended to replace it on site directly. For example, LED module, power or LED control board, after the replacement the LED module, the software needs to read back the data to the LED control board, after the replacement of the LED control board, software settings need to be done. See the software operations guide section for details.

6.0 Product usage notes

6.11 Notes

① As LED and CMOS integrated circuits are electrostatic sensitive devices, it is necessary to prevent static electricity when using LED modules. Static electricity can be effectively prevented by:

- Personnel in contact with the product must wear a grounding electrostatic bracelet or electrostatic gloves
- The switching power supply shell, cabinet, screen body, etc. should be strictly grounded, and the grounding resistance is required to be ≤ 10 Ω, and the spot check needs to be carried out every six months;
- All tools must be strictly grounded during installation.

② When cleaning LED module surface, do not use unknown chemical liquid，so as to avoid damage or corrosion to LED:

- When cleaning the LED tube, wipe it gently with a clean soft rag dipped in alcohol, and let it dry before use
- When cleaning the kit, wipe it gently with a clean soft rag dipped in clean water, no water mark is allowed after wiping, and it needs to be dried before use;

③ When repairing the LED module, it is recommended to use thermostatic soldering iron and adjust the temperature of the soldering iron according to the composition of the tin wire;

- When repairing the welding LED, the temperature of the electric soldering iron is generally set at about 315 °C, the welding time does not exceed 5s (preferably 3s), and the number of welding times does not exceed three times

- When repairing and soldering CMOS devices, the temperature of the electric soldering iron must be kept below 315 °C, the soldering time should not exceed 3s, and the number of welding times should not exceed three times;

④ In order to ensure the stability and service life of LED, the storage temperature can not exceed 60 ° C, otherwise necessary cooling measures must be taken;

⑤ In order to prevent the improper use of the power supply, which reduces the service life of the module or burns the module, the access of the LED module power supply should strictly follow the following precautions;

- Using the special switching power supply for LED display, the module adopts DC 4.2V input, and must not be directly connected to 220V, otherwise the whole screen module will be burned;
- When installing the LED module, please pay attention to the correct wiring of the power port, which must correspond to the positive and negative poles; If the positive and negative poles are reversed, the power must be turned off in time to avoid damage to the components
- The working voltage of the module should not exceed its maximum allowable working voltage of 5.5V

⑥ When the module is in the area of -10 ° C or below temperature, magnetic installation is not recommended, which may cause the module deformation and affect the flatness of the display screen. Need to lock with screw.

⑦ Require power distribution cabinet with surge protector and other lightning protection facilities;

。

⑧ During use and transportation, do not drop, push, squeeze or press the module to avoid

damage to the module;

⑨ Any product, under certain conditions, may fail. Users are responsible for complying with safety standards and taking safety measures to avoid potential risks of failure, personal injury or property damage.

6.12 Standard and method of full screen acceptance

- Screen brightness: adjust the screen to a fully bright state, adjust the brightness in the test software to 80% on the computer, and measure the brightness of the screen with a light gun within 10 minutes. When measuring brightness, the light gun is required to be aimed at the screen, and it is best to keep the gun at the same level with the screen when measuring brightness. Make sure that the black position of the viewing window covers more than 16 pixels, adjust the focus, and make measurements and readings after allowing yourself to clearly see the glowing points.
- Viewing Angle: when measuring, a person stand at the position of 160 ° on the left and right of the screen , and watch at the position of 70 ° on the bottom of the screen body (that is, the vertical viewing angle of the screen is 140 °). Require screen has no obvious dark spots, no obvious dark block problem.
- Grounding: the switching power supply shell, cabinet and screen is correctly grounded, the grounding point is correctly marked, the grounding resistance is required to be ≤ 10 ohms, and the spot check is carried out every six months;

- Lightning protection treatment: the building is required to have lightning rod or lightning

protection belt facilities and effectively grounded, the power distribution cabinet is required to be equipped with surge protector, and the lightning protection facilities are inspected every six months.