

8mm Pixel Pitch with SMD LEDs

M8

Outdoor LED Display Users Manual



Operation Manual

19-Mar.-2015

Document version 1.0M



Attention

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT OPEN THE PANEL ACCESSIBLE DOORS WHEN POWER IS ON.

- ◆ Always ensure that the unit is properly earthed and power connections correctly made.
- ◆ This equipment must be supplied from a power system providing a PROTECTIVE EARTH connection and having a neutral connection, which can be reliably identified.
- ◆ The power outlet supplying power to the unit should be close to the unit and easily accessible.
- ◆ Always remember to close and lock the panel access doors after servicing and before resuming the power supply.
- ◆ Ensure whole system power off before connect or disconnect the net cable.
- ◆ This pluggable type A equipment is professional installable.
- ◆ For pluggable equipment, the socket-outlet shall be installed near the equipment and shall be easily accessible.
- ◆ Always remember to dry the panel fully before packing .
- ◆ Store in a dry and airy place .
- ◆ This is a class A product. In a domestic environment this product may interference in which case the user may be required to take adequate measure.

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1. General

Thank to use DESAY'S led display screen and the relative devices.

This manual mainly introduces basic parameters and operation method of M8. A Led display screen involves cabinet, Main controller, Branch controller, HUB, computer and other peripheral.

The M8 is easy to install and operate, with powerful functions, with low requirements on working environment and high protection rate. And it can realize intelligent power on/off & 24 hrs timing on/off. These above aspects perfect the display function.

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1.1 M8 LED Panel Specifications

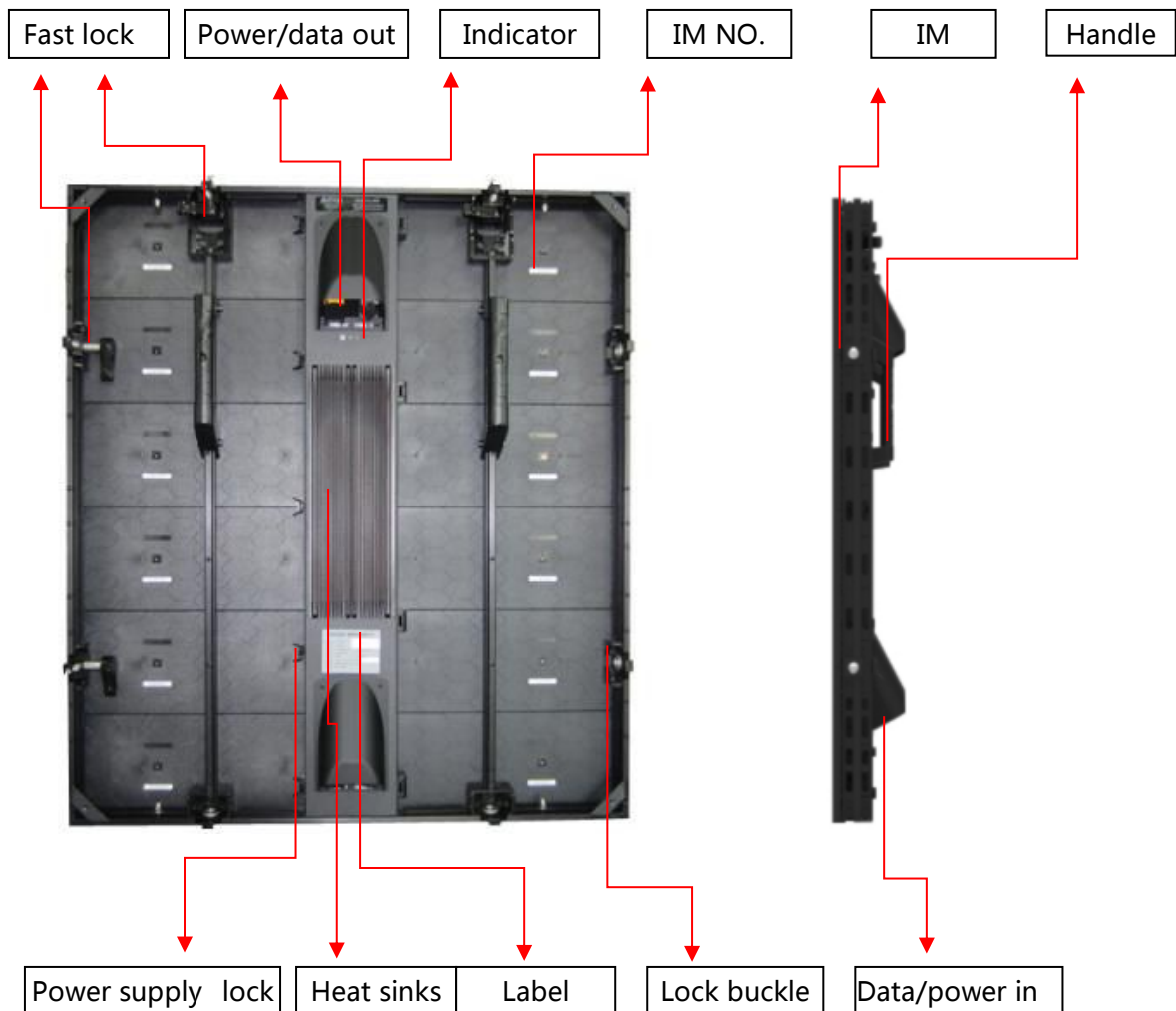
M8 Specification		
No	Specifications	Parameters
1	Model No.	M8
2	Pixel pitch	physical pitch: ≥8 mm
3	Brightness	≥6000 nit
4	Pixel configuration	SMD 3in1
5	Pixel density	25600 pixels/sqm
6	Viewing angle (min. 50% brightness)	Horizontal: 140 degree (+70/-70) Vertical: 120 degree (+60/-60)
7	Lifetime (full white – 50% brightness)	≥100,000 Hours
8	Power consumption / sqm	Max.: 450W Avg.: 160W
9	Refresh frequency	≥2000Hz
10	Colors	281trillion
11	Weight/panel	16.6Kg
12	Control system	Nova system
13	Certification	CE
14	Module size	400mm×150mm
15	Panel size	800mm(W)×900mm(H) = 0.72sq.m
16	Recommended viewing distance	≥8m
17	Operating environment	Temperature: 10°C ~ +40°C; Humidity: 10% ~ 95%
18	Input voltage	110~230V/AC(±10%)
19	Input power frequency	50/60Hz

2. Main Assemblies

2.1 Main Composition of display unit

Item	Description	Qty(PCS)
1	Intelligent Module (IM) including IM driver / LED PCBA	12 PCS
2	Reception board+ HUB	1
3	5V 300W Switched Mode Power Supply	2
4	Power connector	2
5	signal connector	2

2.1.1 Component Placement

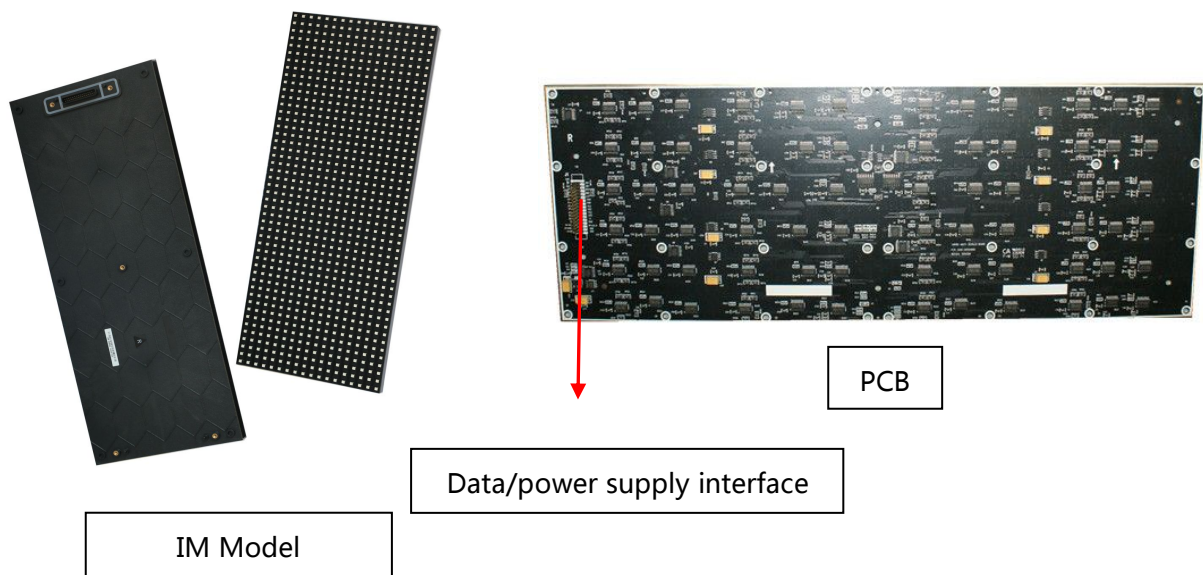


2.2 Intelligent module (IM)

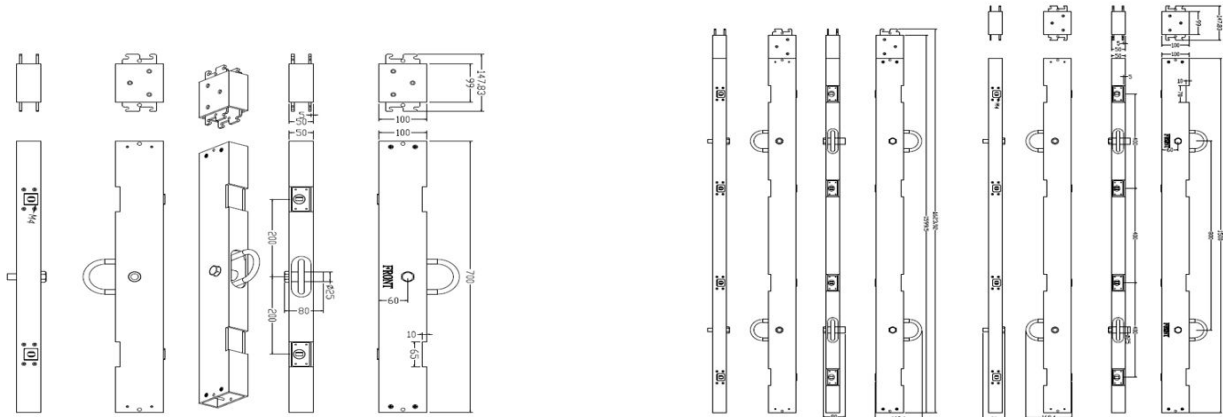
Module usage: module is a very important part of display unit, it can convert video signal into optoelectronic signal, finally return to video image.

Failure Analysis: When the display module does not work normally , they generally will show a black screen, full white, flashing, color cast, multi-line black LED lamp dots, etc., and may affects next module's working.

Note: Be sure to turn off the power before replacing the module, pay attention to the method and strength when pulling out and inserting the power cable and flat cable, dot not damage the power cable, when plugging the power cable, pay attention to insert to the corresponding place, cannot misplace or reverse insert, the flat cable insert should choose the right place, do not reverse insertion.



2.3 Hanging Bracket (HB)



(hanging bracket)

(double hanging bracket)

The hanging bracket (HB) is a lifting device specially designed to lift one or several panels that have been locked together, and thus form a column or a stack. When screens are rigged or flown from a truss, the HB will form the connection between the truss and the column of the screen. Subsequently the HB holds the complete weight of this column. It is important to keep the HB in good condition and check it before use.

Mechanism is basically made of the locking rod inside the centre door of the panel. To lock the panel to the HB, you need to insert the kingpin through the hole in the HB, and then turn the locking rod (inside the centre door of the panel), so that the kingpin can slide into the locking position on the HB.

When using the hanging brackets, the operator should make sure that the kingpin of the panel is locked onto the hanging bracket.

Specification of the SHB (size: W x H x D)

Dimensions (hanging bracket including connection piece): 799.5 x 100 x 50mm

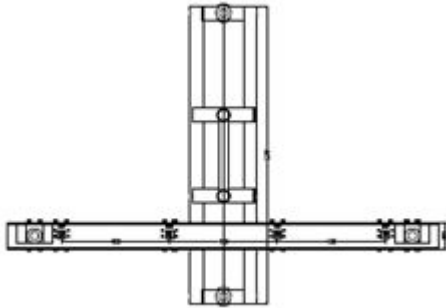
Weight (hanging bracket): 3.8 Kg

Specification of the DHB (size: W x H x D)

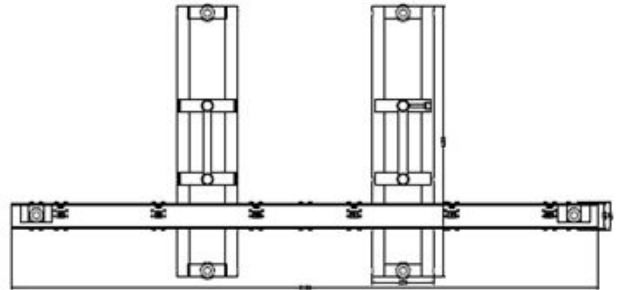
Dimensions (double hanging bracket including connection piece): 1599 x 100 x50mm

Weight (double hanging bracket): 8.5Kg

2.4 Stacker & Base

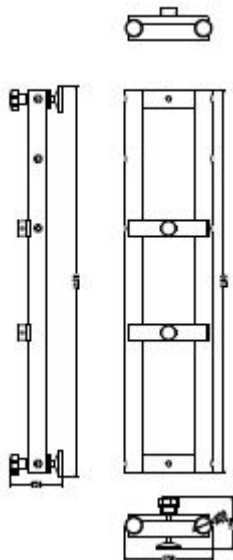


(Double stacking +base)



(Triple stacking +double base)

2.4.1 Base



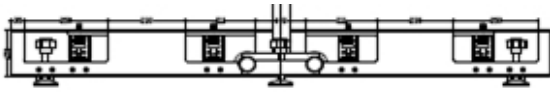
The base is used for stacking a screen. It uses the same locking system as panels, so the kingpin on the base is locked into the panel. The base has adjustable feet to level out the screen.

Specification of the Base (size: L x H x W)

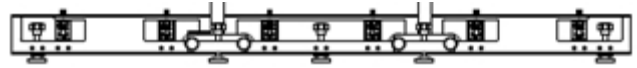
Dimensions (base): 1795 x 350x 50 mm

Weight (base): 8.0 Kg

2.4.2 Stacker



(double stacking)



(Triple stacking)

The stacker is an external buttress used when the screen is stacked. These stackers can be locked onto the back of the panel to give the stacked panels extra support. There are two types of stacker available: double stacker and triple stacker, which can lock respectively 2 or 3 panels on the stack. By combining these, a screen with uneven rows can be made. The stacker must be locked onto the ski or onto the stacker underneath using the locking rod and the extra security pin. The stackers are locked onto the panel using the connection screws. Stackers must be used at all times when screens are stacked. The stacker should be properly locked to the panel and ski/base.

Specification of the Stacker (size: L x H x W)

Dimensions (double stacker): 1600 x 150 x 100mm

Weight (double stacker): 22 Kg

Dimensions (triple stacker): 2400 x 150x 100mm

Weight (triple stacker): 32 Kg

2.5 Truss



The Truss is an external buttress used when the screen is stacked. These Truss can be locked onto the back of the panel to give the stacked panels extra support. The truss can lock respectively 2 or 3 panels on the stack. By combining these, a screen with uneven rows can be made. The Truss must be locked onto the ski. The Truss are locked onto the panel using the connection screws.

Truss must be used at all times when screens are stacked. The Truss should be properly locked to the panel and ski/base.

Specification of the Truss (size: H x W)

Dimensions (Short): 1795 x 350 mm

Weight: 7 Kg

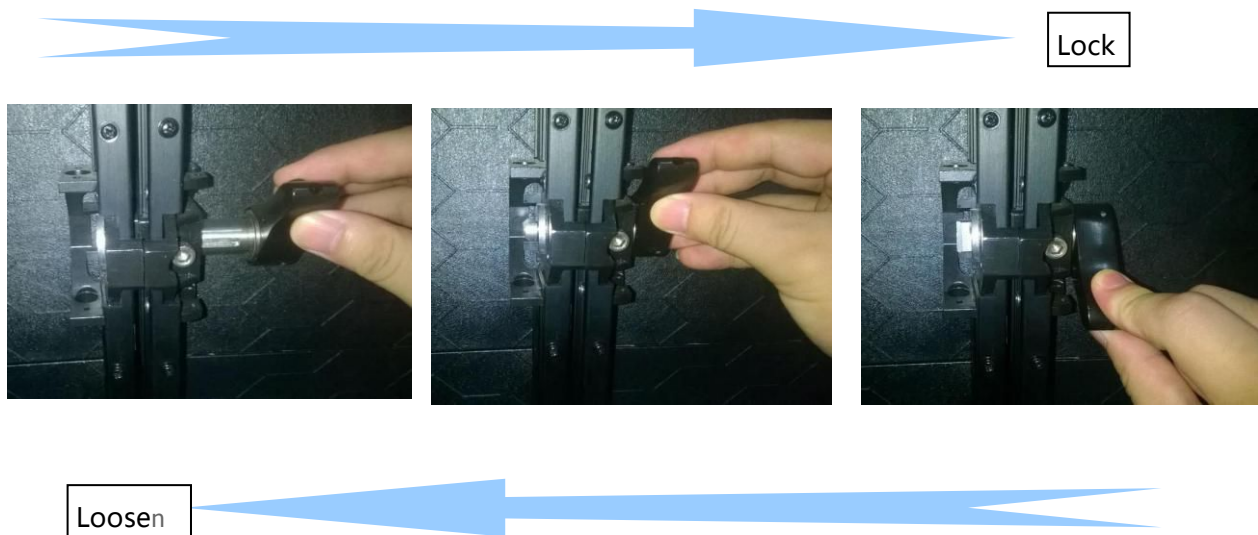
3. Installation Guidelines

Please read the following carefully before installing the panels

3.1 Mechanical

The M8 panels can be installed in two ways: rigging/hanging or stacking/ground support. In either case, it is important to ensure that the entire screen is correctly aligned both vertically and horizontally, to ensure there are no visible gaps.

The principle is to build several panels vertically on top of another and horizontally next to another. The panels are locked together both vertically and horizontally, so that they can form one surface of screen-configuration.



Locking mechanisms (4 lockers: Up & left) at the panel does the horizontal & vertical locking of the panels on to each other. Each panel has been tested with a weight of 2.5tons attached to the bottom locking mechanism. The Top locker is then attached to a hoist and the whole is lifted into suspension. As panels are locked to one another, each panel forms a critical element of the complete structure. Especially when screens are rigged or flown, the top panel of each column (or stack) supports its own weight plus that of the number of panels underneath in the same column. In the stacked screens, the bottom panel supports the weight of the whole column.

3.1.1 Rigging/Hanging Installation

When a screen must be rigged, a structure must be placed before the building of the actual screen can start. The screen engineer makes sure that the structure is correctly built and that it is intended for the correct weight and size of the screen. The screen engineer must make the same checks for the beam, beam trolleys, motors or any other devices that form a part of the structure or the lifting devices.

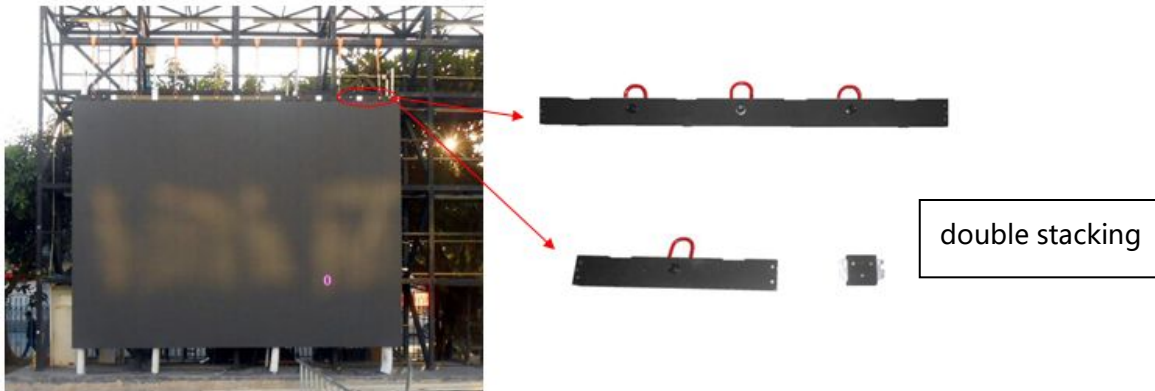
Consult for maximum height of screen in next section.

Notes:

- 1) A base can never be used without a truss.
- 2) The motor must always be secured with a steel cable or a strap.
- 3) Hanging structure verified with TUV strength test 1.8tons

3.1.1a To rig a single column of a screen

- 1 Attach the hanging bracket to the hanging motor (with turnbuckle) and hoist it up.
- 2 Lock and secure the panel onto the hanging bracket with the locking system.
- 3 Repeat for all the columns.
- 4 Place the columns next to each other and lock the panels horizontally.
- 5 Bring the next panel straight under the row that is already hanging on the motor.
- 6 Lock and secure the panel on the hanging panel. Repeat for other columns and lock horizontal. Finally hoist up the 2 rows of panels. Continue this process until the screen column is finished.



3.1.1b To rig the screen in row direction

The side lock is used to lock the columns of panels next together to form the rows.

Safety while in use:

When the installation is finished, **steel cables or straps can secure the columns**. Cables or straps must be attached to the screen so that it can rock back and forth, but cannot move too far to the front or to the back. Make sure everything is locked & secured.

3.1.2 Stacking Installation

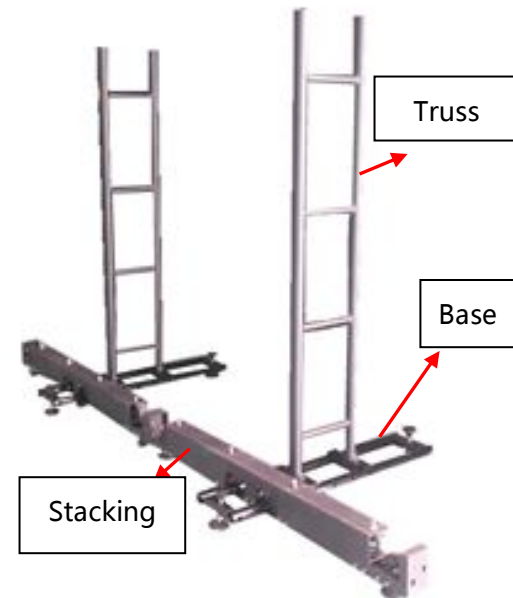
Before starting make sure that the surface, on which the screen is to be build, is strong enough to hold all the weight, including counterweights. **Consult for maximum height of screen in next section.**

Procedure for stacking installation:

- 1 Place the base with the one or two short skis. If necessary you can place an extension ski locked onto a short ski. Lock the connection screws of the skis onto the bases and level out with the adjustable feet. Do this for all bases and lock these together and level out.
- 2 Place the first row of panel onto the base and lock.
- 3 Lock the panels horizontally together.
- 4 Place and lock the next row(s) onto the panels and also lock horizontally.
- 5 Depending on the height of the total screen you now lock a double (two panels high) or triple stacker (three panels high) onto the panels.
- 6 Continue this procedure for all the rows. Make sure to lock firmly and the stackers must be lock onto each other.

Safety while in use:

When dismantling the screen care must be taken that the horizontal locking is undone before attempting to hoist the panels.



3.2 Electrical

The power distribution system used must provide adequate protection against excess line current and leakage currents to earth.

Electrical Characteristics for ONE M8

Electrical Characteristics for ONE M8							
At 110V AC Input				At 240V AC Input			
Parameter	Unit	Rating nom.	Max	Parameter	Unit	Rating nom.	Max
Input current	A	1.3	3.7	Input current	A	0.7	1.8
Input freq.	Hz	50~60	65	Input freq.	Hz	50~60	65
Power	W	140	400	Power	W	140	400

For large installations, a three-phase supply is recommended and the power from each phase should be distributed evenly to the single-phase appliance coupler on each panel. The screen may be conveniently split into sections (e.g. rows or columns), each powered from a single phase.

3.2.1 Circuit Protection

Each section of the screen should be protected by a Circuit Breaker to protect against high fault currents, and a Residual Current Device (RCD) to detect earth leakage currents.

3.2.2 Earth Leakage Considerations

To reliably operate a LED video screen, the leakage value figure per panel must be known, or if the leakage value is close to the breaker trip value, the breaker may trip at a very inopportune time. Ensure that the total leakage current value per earth leakage breaker is at least 10% (preferably 20%) below the value earth leakage breaker trip point to ensure that nuisance tripping does not occur. Earth leakage current is normally a constant value, but can increase in wet or humid weather, so this margin is suggested.

Each panel of the system has earth leakage current contributions from two switched-mode power supplies and one RFI filter. The total earth leakage current per panel can be up to 3mA at 240V. If a 24mA RCD is used, then the maximum number of panels per section should be safely limited to 8.

3.2.3 Inrush-current and over-current considerations

Video screen panels draw a very high in-rush or surge current at the moment of switch-on. This current can be twenty times the maximum operating current of the panel, but occurs only for a very short time – typically less than half an AC power cycle – less than 10 ms.

On each M8 panel the in-rush current is 180A at 230V. However, maximum current in the steady-state for a panel is considerably less: 2 A at 240 volts. This high in-rush current needs to be considered when selecting a suitable circuit breaker to feed the panels. In choosing the circuit breaker, both the maximum operating current and the in-rush (surge) current need to be considered.

3.2.4 Earthing

Each panel is separately connected to the ac power distribution system's earth through the appliance coupler's green/yellow wire connection. All exposed panel metalwork (main frame and doors) is also connected to this earth.

If the framework is earthed only through each panel (i.e. through the panel's mounting bolts), there is a possibility of electrical damage if a wiring fault occurs, or if an electrical discharge, such as lightning strike, hits the panels. Under these circumstances, the current discharge path will be through the panel to earth rather than through the framework to earth. When permanently installed on a metal framework, the framework itself should be directly connected to earth.

3.2.5 FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. (in order to realize this one product must be in conformity with the EMC standard screen, common case is not suitable)

*Note: Modifications not authorized by the manufacturer may void users authority to operate this device. The above Electrical data subject to Ming Wei power supply with CE certification

3.3 Power Cable Wiring

3.3.1 AC Power

An approved three-pole appliance coupler inside the center door connects to the AC supply. The AC power cable is then connected to the EMI filter and distributes to the power supply units on left and right doors. Each door has an earth point for grounding.

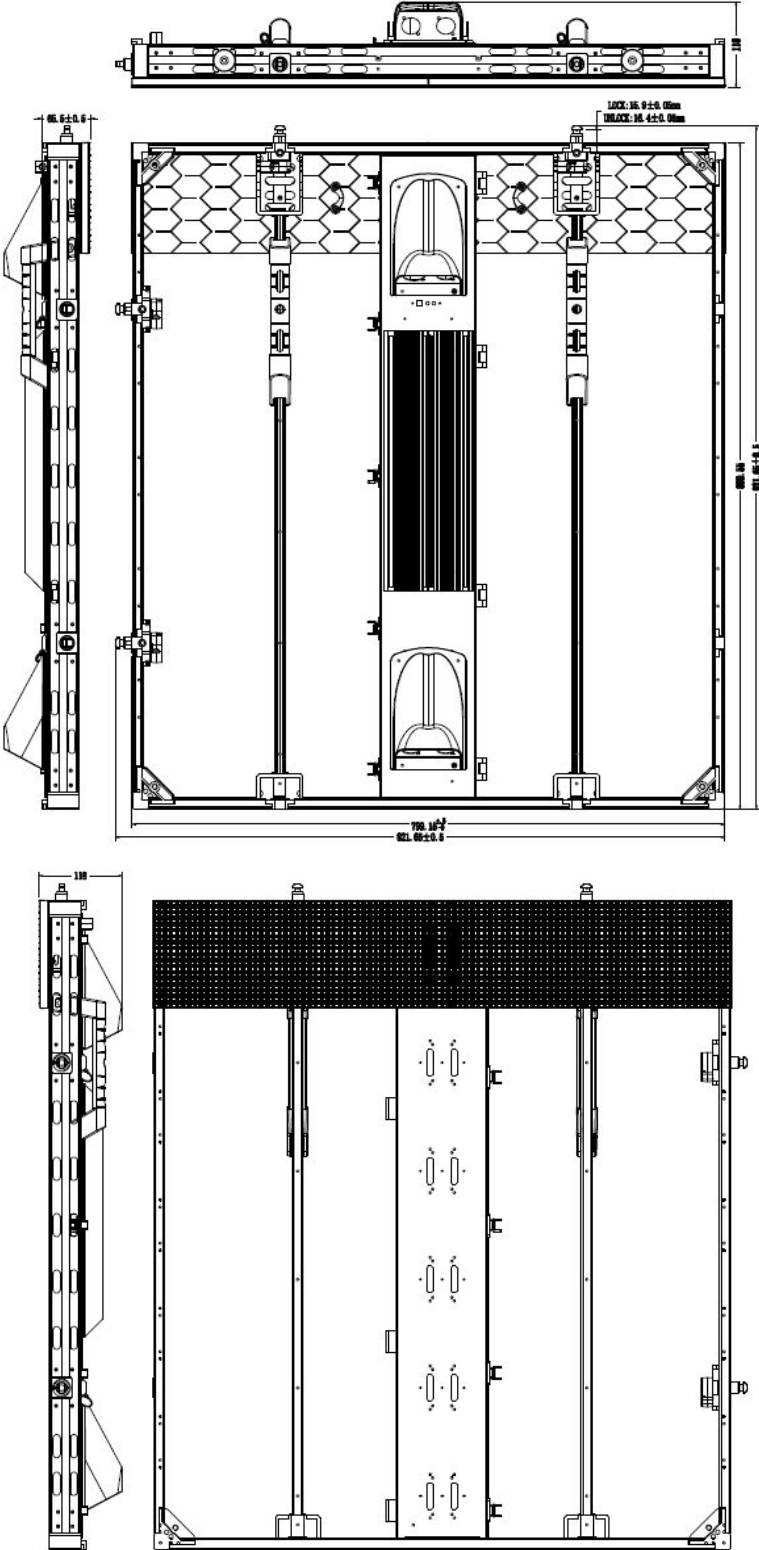
Colour of Wire	A.C. Supply connection (for single-phase)	A.C. Supply connection (for three-phase)
Brown	a.c. Live	a.c. Line 1
Blue	a.c. Neutral	a.c. Line 2
Green/Yellow	a.c. Protective earth	a.c. Protective earth

DC power from each power supply unit provides low voltage power to the assigned electronics components, for example, driver board, and fans, the responding color of the wire represents the relevant component's power connection, please note the list below for a clear cabling configuration.

Colour of wire	D.C. Supply connection
White	Red LED / Green LED / Blue LED / TTL (+5)
Black	GND (0V)

Appendix A: M8 Mechanical Assembly & Wiring Diagram

1. Mechanical Assembly



2. Wiring Diagram

- ① handle
- ② Receive card
- ③ PCB
- ④ Reticle
- ⑤ cable
- ⑥ power supply
- ⑦ The power supply box lock
- ⑧ Black MYLAR sheet



Appendix B : Procedure for IM Replacement, Power Supply, Receiving Card

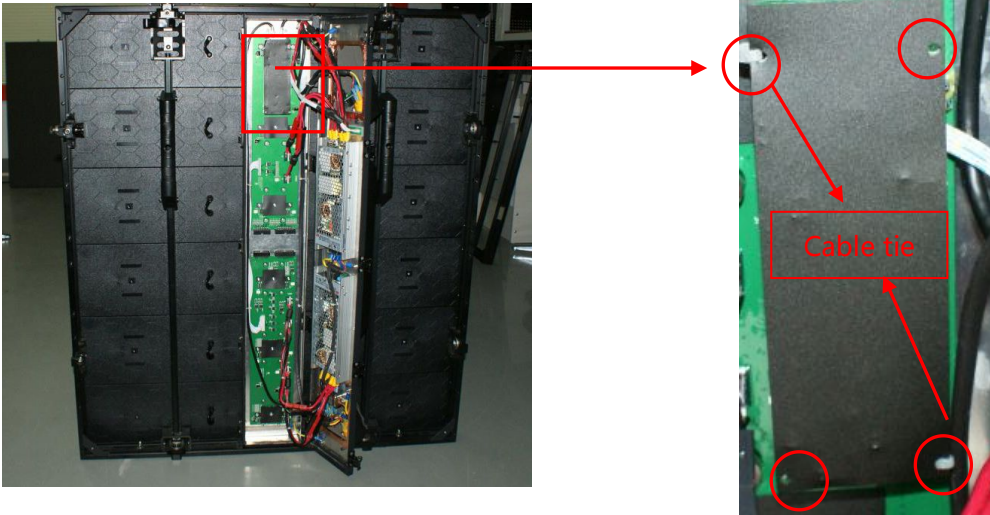
Procedure for IM Replacement :

1. Power off the panel.
2. Open the relevant panel door and locate the problem IM.
3. Remove all the cabling (from the power connector and data connector) of the problem IM and take the IM off from the panel; (totally 5 screws need to be remove, see the following pictures.)
4. Take out the replacement IM.



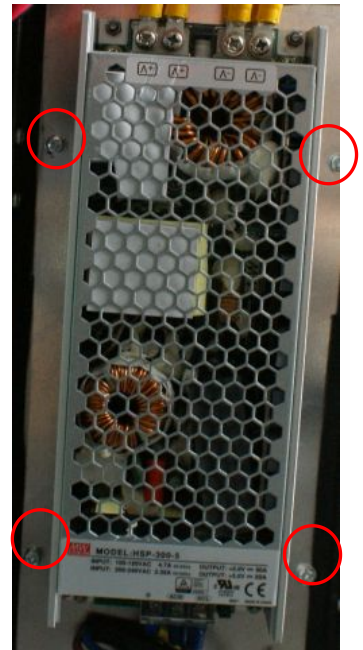
Procedure for Receiving Card replacement :

1. Power off the panel.
2. Find the receiving cards. (see the following picture)
3. Disconnect the four screws.
4. cut off the cable tie fixed the black MYLAR sheet.
5. Replace it with new receiving cards.



Procedure for Power Supply replacement :

1. Power off the panel;
2. Open the relevant panel door and locate the problem Power supply;
3. Disconnect the four screws by M3 sleeve;
4. Disconnect the power supply line of the input and output;
5. Replace it with new power supply.



Appendix C: Trouble shooting

Failure phenomena	Failure cause	Treatment
LED lamp in IM (intellectual LED module) dead, dark, and long lighting.	Dead and dark Lights 50 are generally the problem of LED lamp; LED long bright may be caused by IC empty soldering or internal short circuit.	Replace the IM
Four LEDs in a row are dark or long bright	IC short soldering or bad pin inserting	Replace the module
Entire IM and the IM next to it doesn't display or display white	1.The IM with bad circuit 2. Bad Flat signal cable 3. Bad power supply plug on the IM	1.Replace the bad module 2.Replaced the bad flat signal cable 3.Replace power supply plug
Many IMS don't display	1.No voltage output for the power supply 2.Bad branch controller	1.Replace the bad power supply 2.Replace the branch controller
The whole screen is blank	1.Main control card is damaged 2. The first branch card has been damaged. 3.IPC don't have DVI output 4Multifunction card has been damaged	1.Replace the main controller card 2.Replace the branch controller 3.Set the DVI output or replace the bad display card in the PC; 4.Replace bad multi-function card
picture is not consistent in multiple area of the screen	Wrong Panel address setting or wrong wire connecting in the Control software	Reset the Panel address and wire connecting in the software
exchanged displaying for multi -IMs	Exchang the connection of the first flat module of data line	Exchange date line
The screen can not automatically control the brightness	1.Multifunction card has been damaged; 2 Light sensors have been damaged; 3 Control software does not start the automatic brightness control;	1.Replace the multifunction board; 2.Replace the light sensors; 3. Reset to automatic brightness control in the software.