

# LED Displays

A short introduction to Modular LED Display Technology and its uses in advertising, education and other areas.

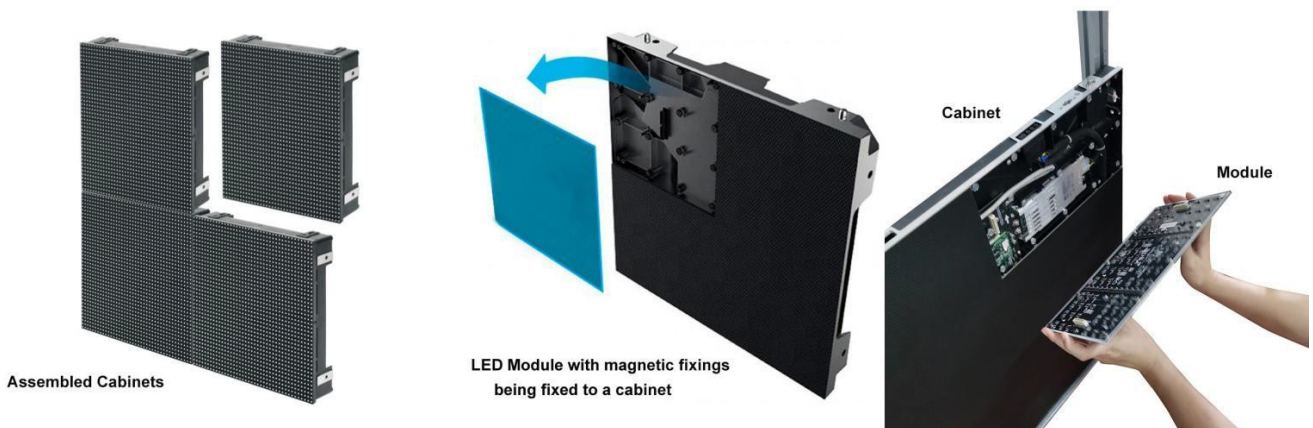
Many people worry when involved in the purchase of digital LED displays for the first time. They may not know how to choose the LED display with a suitable resolution (pixel pitch) and brightness to suit the location and environment? How much should you or they budget for the LED display? Choosing the right LED screen is not a trivial matter. Making the right choice is not only related to the success or failure of the advertising itself, but also to the company's own reputation and brand reputation.

We aim to reduce those concerns and provide information to help make informed decisions to create successful projects and ongoing brand success.



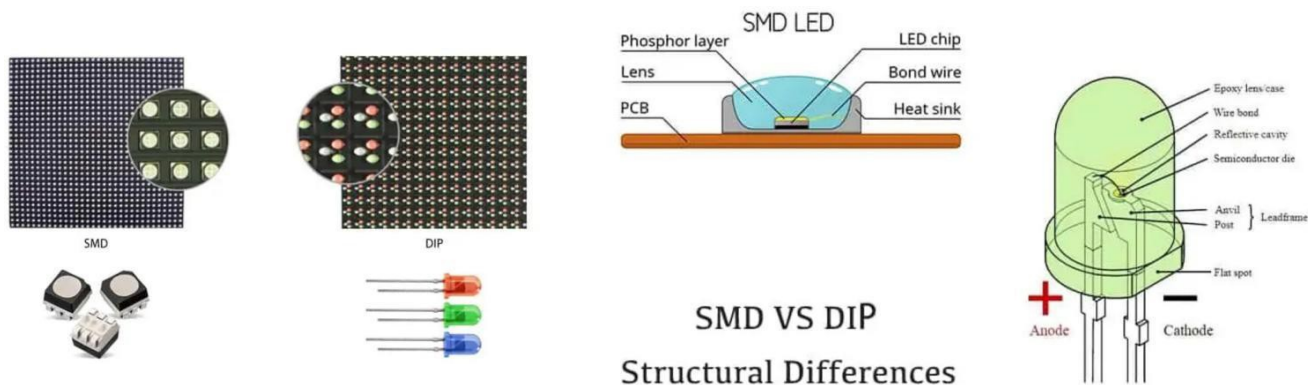
## What is a Modular Digital LED Display ?

"A modular LED display is a flat panel display that uses an array of light-emitting diodes (LEDs) as pixels. The LEDs are fitted into modules that quickly and easily connect together to form a large display of virtually any size and shape. The brightness of LEDs allows them to be used outdoors where they are easily visible in sunlight for a wide variety of uses such as store signs and billboards etc".



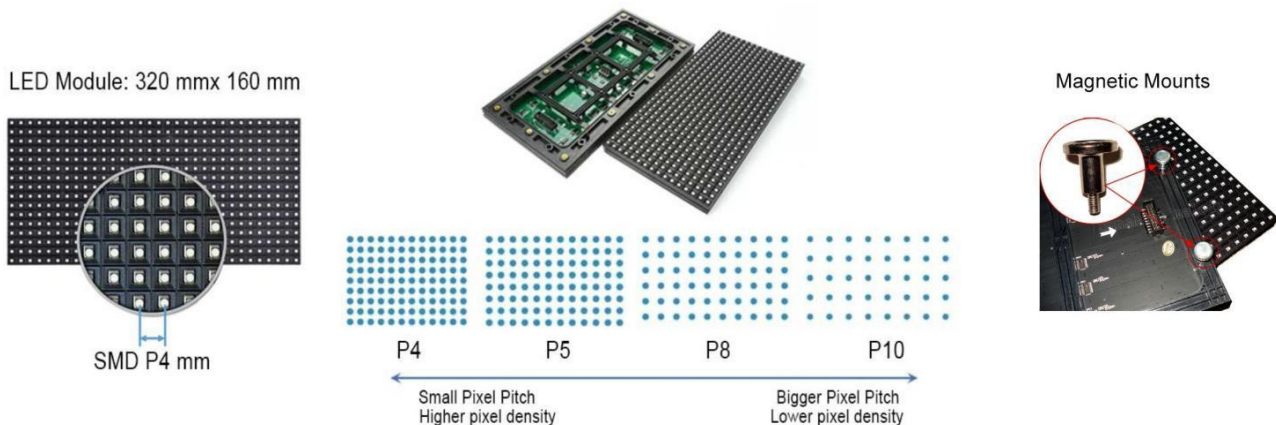
## What are the differences between SMD and DIP LEDs used in displays

An LED DIP chip will typically produce around 4 lumens per LED, much less than the newer chips. SMD stands for Surface mounted diode and are much smaller and efficient LEDs than the previous DIP chips. They have become popular due to their versatility and are typically mounted and soldered onto a circuit board.



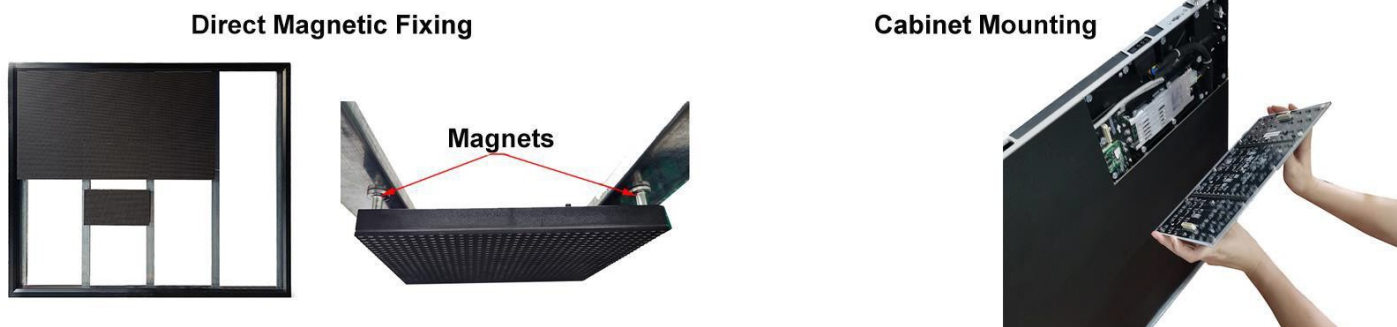
## What is an LED display module?

An LED module (or panel) is typically a 320x160mm array of LEDs in a plastic moulding that integrates the LEDs and electronics so that the LEDs reproduce images and videos.



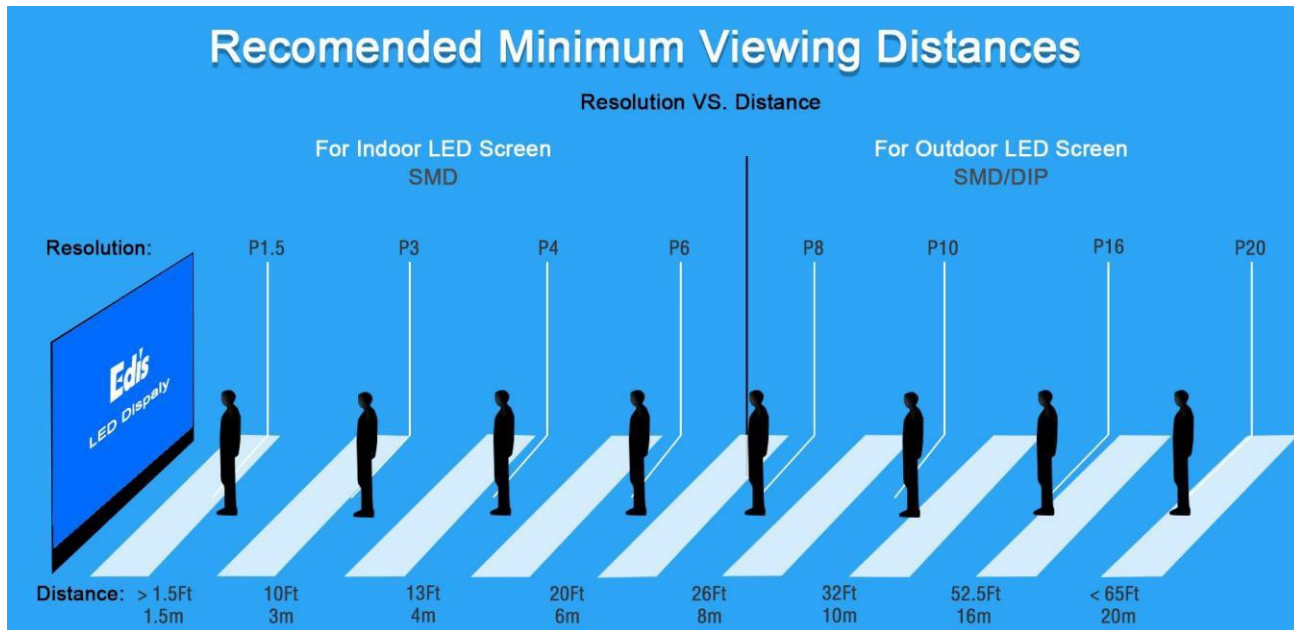
## How are LED modules used to make a display ?

LED Modules can be made from small flat, curved or bendable materials to suit their intended use. They can be loaded into cabinets, fixed directly to steell supports in a frame work or screwed to a wooden backboard etc



## What resolution is needed to see LED Displays clearly ?

The required resolution of a display depends on the distance the observer from the display. A simple rule of thumb is that the optimum viewing distance is the same as the pixel pitch but in metres so a P8 (8mm pixel pitch) is best viewed at 8 metres from the display.



## What screen brightness is needed for different locations ?

Screen brightness needs to be chosen to stand out from the ambient brightness of the display's location. A low brightness screen for indoors and a very much brighter screen for a display in full sunlight.



**Outdoor 5,000 Nits**

**Indoor 500 Nits**

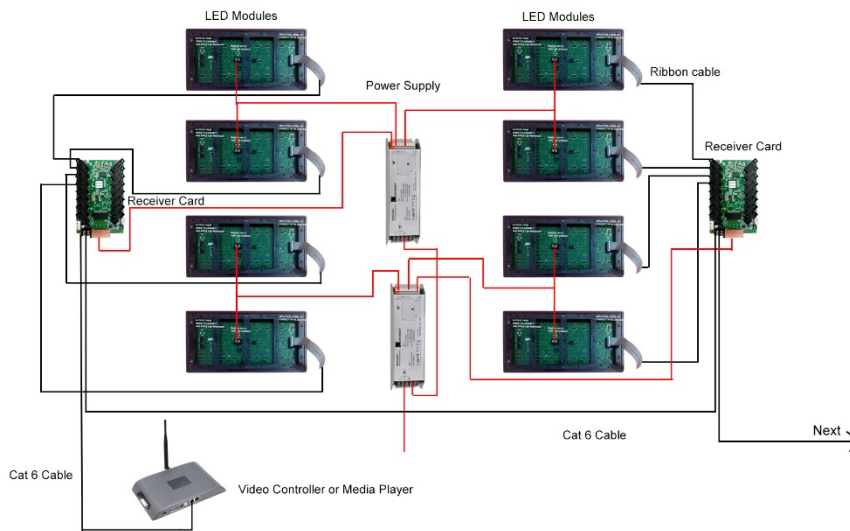
Automatic brightness control (ABC) is an optional feature that uses a built-in light sensor ("ABC sensor") to detect the ambient light level and then adjusts the brightness of the screen to provide a more appropriate and comfortable viewing condition. Manual brightness controls are built in to Media players and video controllers too.

The receiver cards are connected to the LED modules using ribbon cables, column by column, with the topmost module connected to the top left

receiver card input. One receiver card can be used with up to 16 modules in the same column.

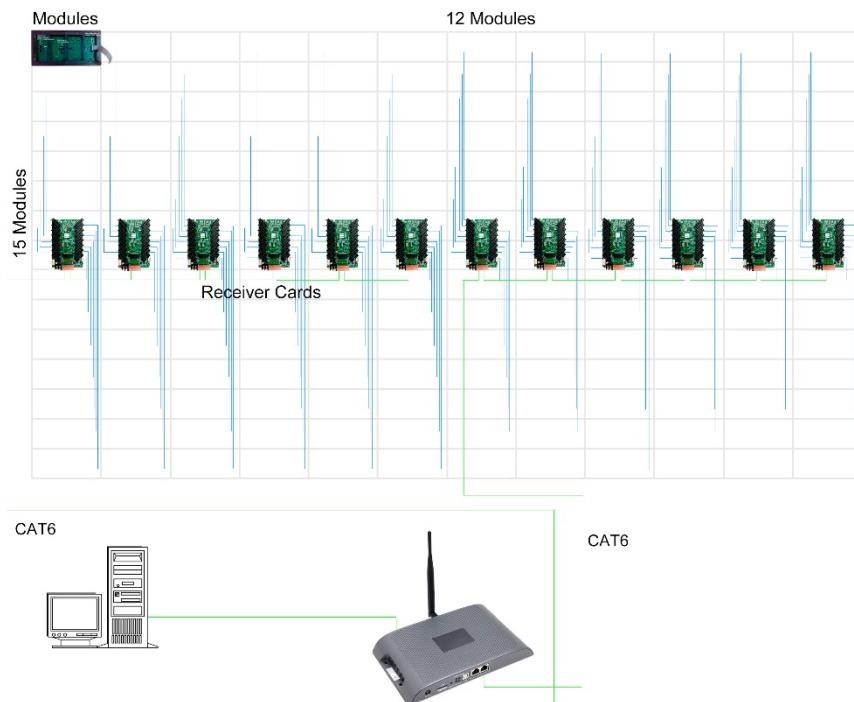
## How do you connect LED Modules on a steel frame ?

Power supplies connect to 4 modules and are linked together with a power cable



PSU's are connected in series with a maximum of 12 per run

Example frame installation:



Receiver cards are connected in series to each RJ45 output on the Media Player with a maximum of 65,000 pixels per RJ45 connection. Up to 16 Modules can be connected to each receiver card from top left to bottom left as shown

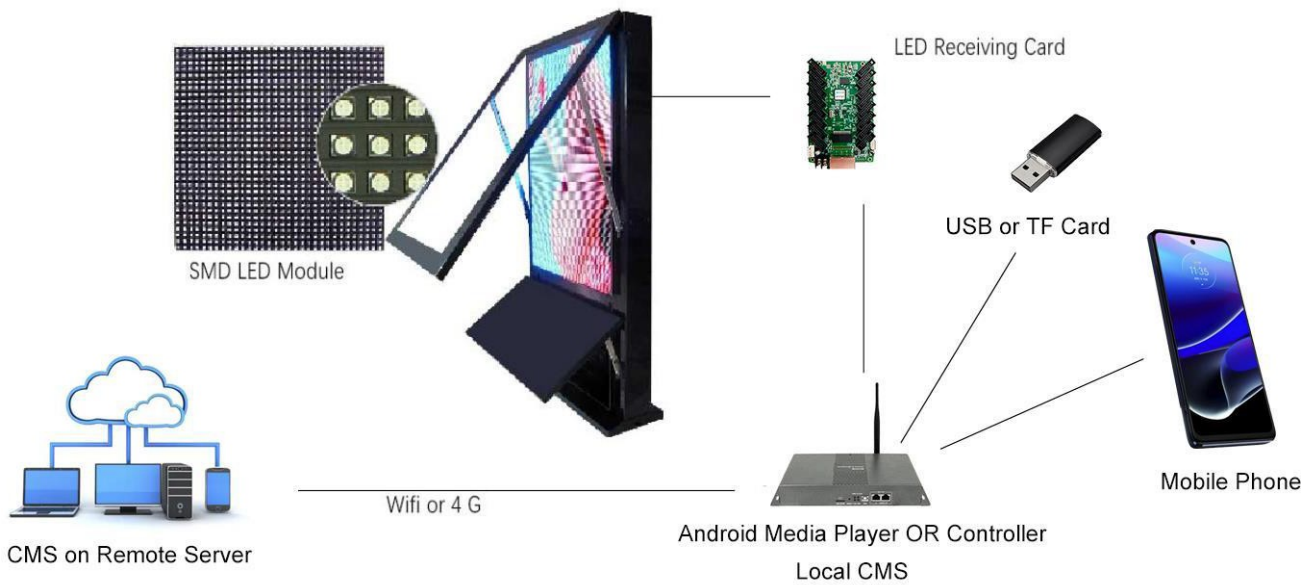
The first, top left, receiver card output is connected to the video controller or media player with a Cat 6 cable via RJ45 connectors and looped to adjacent receiver cards via their RJ45 connectors.

### Mains Power

LED displays draw significant power from the mains electricity supply. Power from the 5v power supply units (PSU) is connected to the receiver cards and up to 4 LED modules with 4 pin connector cables. The power rating of these PSUs is 5v and up to 40 amps ie 200 watts each so the electric mains supply needs cabling and an isolator switch to cope with the total number of modules being installed - which could be several kilowatt of power for a complete display (for example a 4mx3m display needs between 7kw and 9kw 240v supply with a minimum rating of 45amp mains isolator switch. As a rough rule of thumb indoor displays need 600 Watts/m<sup>2</sup> and outdoor about 1,000 Watts/m<sup>2</sup>

## How is media displayed on an LED screen ?

Media can be provided from a host of sources either locally by TF Card, mobile phone, WiFi, Bluetooth or remotely via ethernet cable, WiFi, 4G or 5G to a remote server. Images and sound are controlled by Content Media System (CMS) software installed locally on an Android or Windows CPU or from a server based CMS that controls many displays.



## How does CMS software control media on LED Displays

A content management system (CMS) is a software application that enables users to create, edit, collaborate, publish and store digital content.

### How Remote CMS Works



In practice CMS software is easy to use and a single designer can create, update and change media very quickly to one or many displays at the same time.

## How are LED Cabinets installed as Displays

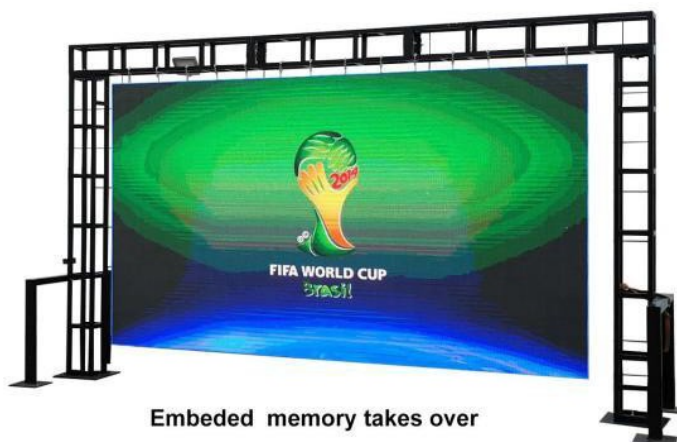
Large Video wall displays are generally built using 40x40mm 3mm thick steel tube fixed directly or with a wood panel base to an existing wall. Cabinets with front access modules are then fixed to the framework with simple mounting clamps and the whole assembly fixed with an out surround. The cabinets will normally have interlocking fixings and cable links joining them. There are many variations that can be adopted to suit site location and conditions.



Indoor cabinets can be mounted on a steel framework as above or directly wall mounted with screws

## What happens to Display Images if the Internet connection fails ?

Network Fail

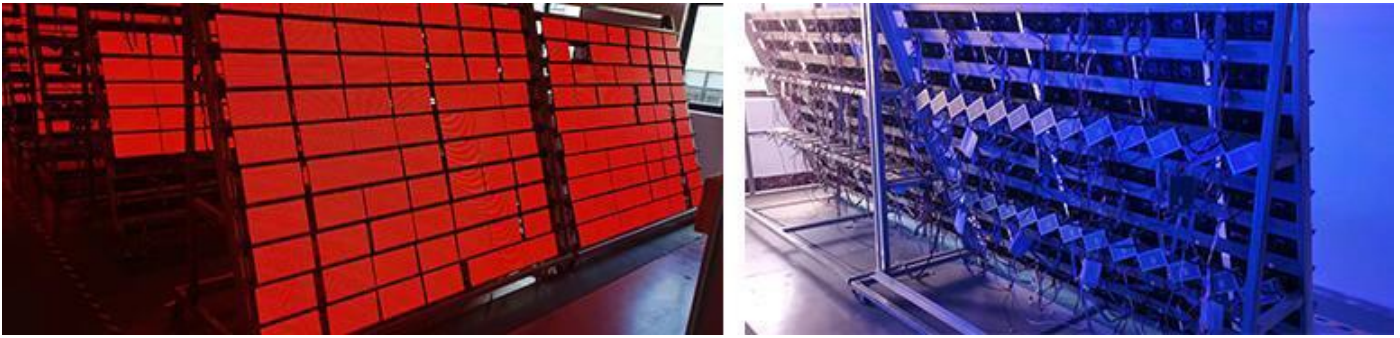


Embedded memory takes over

The CMS system, that controls the presentation of media on the LED display, will save content to local memory built into the media player inside the LED Display so media is safe and still plays despite internet failure. Albeit no updates can be uploaded remotely until the connection is restored.

## How is my display tested in your factory ?

All displays are configured, checked, assembled and tested for 24 hours prior to packing and shipment.



In addition spare modules are supplied with each display with a 3 year warranty

