

LED SIGN TECHNICAL SPECIFICATIONS



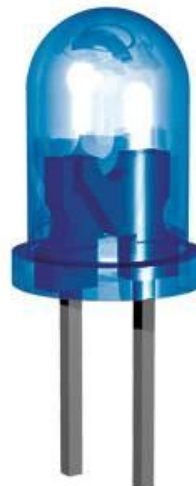
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What is an LED?

A light emitting diode (LED) is a tiny, electronic semiconductor that converts electric energy into visible light. The chemical compound used within an LED determines its color, brightness and power efficiency.

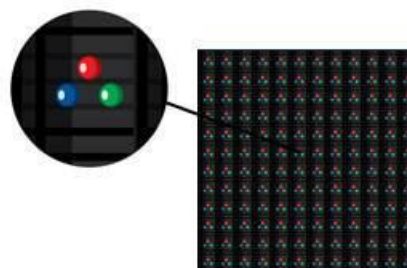
This is the most important element of an LED display with the quality of the LED directly impacting on the clarity, brightness and longevity of a display. Unlike incandescent lamps, LEDs have no filaments that can burn out or fail.



All programmable LED displays can be described as variable message signs (VMS). This means that regardless of the type – scrolling text sign, full colour graphic display or LED video screen – all displays use control software that turn the LEDs on and off in sequence creating a changeable or variable text, graphic or video sign.

What is a pixel?

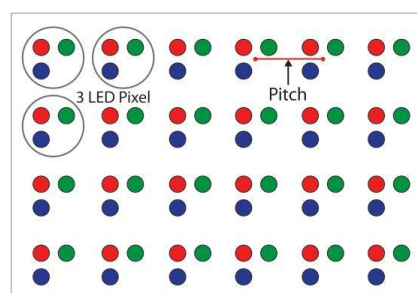
Pixel is short for picture element. Pixels are points of light that illuminate together to form letters, words, graphics, animation, and video images. Pixels are made up of one, or a cluster of, LEDs that create a single point of light or colour.



A pixel can be made up of a single LED, multiple LEDs of the same color or multiple LEDs of different colours. A pixel is the smallest element of the electronic display system that can be individually controlled. It can be turned off or on at various brightness levels.

What does pitch refer to?

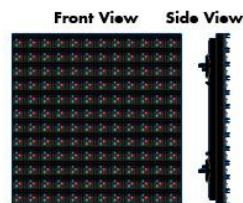
The pitch of the display is the distance between the centre of two pixels. The closer together the pixels the higher the resolution resulting in a more detailed, crisper image. That is, the display will be less pixelated especially when viewed from shorter distances.



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What is a module?

An LED module is a combination of parts that form the building blocks of LED video displays, message centres and dynamic message signs.



Cooling fans.

CSI's LED Changeable signs (Electra[®]) incorporate energy efficient internal cooling fans. These fans are a vital component that ensure your sign will function effectively throughout its lifespan in the harsh Australian environment. The cooling fans included in our screens are designed to control the operating temperature to ensure the LED node manufacturer's guarantees of 100,000 life hours are not voided.

LED Styles (DIP vs. SMD)?

There are two types of LED's available.

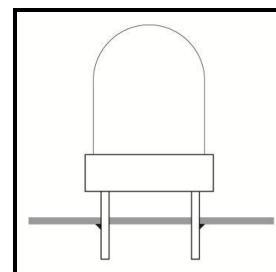
The majority of LED displays are made up of discrete diodes. For example a full colour **RGB** screen would be constructed using clusters of three individual LEDs – 1 red, 1 green, 1 blue – to create a single pixel. These screens are commonly referred to as **DIP (dual inline package)** displays because of the way the LEDs are attached to the circuit board with two parallel pins.



RGB Pixel

(1 red, 1 green, 1 blue)

However, advances in LED technology resulting in the ability to miniaturise the diode's electrical components has seen the introduction of **SMD (surface mounted diode)** displays (these are better suited for indoors / lower temperature areas). These significantly smaller LEDs can be mounted so that they are almost flush with the surface of the electronic board. This produces a flatter screen with improved visibility angles. The visibility angle is the angle at which the clarity of the display is equal to 50% of its frontal luminosity.



DIP (Dual inline package)

Another advantage of SMD displays is the ability to fit miniature LEDs (red, green, blue) into the one small case allowing full colour displays with a smaller pitch, a higher resolution and superior image quality. SMD technology is particularly suited to applications such as sports bars or beer gardens where up close and angled viewing is required.



SMD (surface mounted diode)

But with all new technologies buyers should use some caution when selecting an SMD screen. Some SMD suppliers have, over time, had issues with temperature failure, weather proofing and colour balance. It should be remembered that it took about 20 years to perfect quality, robust outdoor DIP screens.

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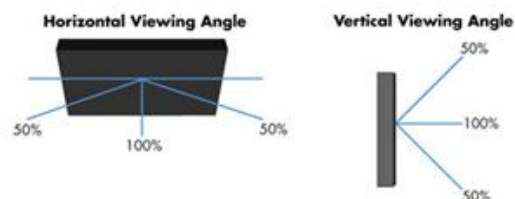
Available Colours.

Typically, LED text signs are either single or tri-colour displays with the most popular colour being **red**, possibly because early LEDs emitted only red light. Other commonly used colour options include **yellow, green** and **blue**.

Single colour **white** displays are also available and are produced by adding a phosphorous coating to a blue diode. But white displays, and indeed full colour white screens, can also be created using a combination of red, green and blue diodes. These displays are commonly referred to as **RGB** (red, green, blue) screens and are usually used in large video wall applications.

What are viewing angles?

LED displays are at their brightest when viewed "head on" and slowly decrease in brightness as the viewing angle increases. The viewing angles of an LED display – both horizontal and vertical – are the angles at which the intensity has dropped 50 percent from the direct "head on" brightness.



What are viewing distances?

Viewing distances are calculated based on the display type and the distance from the display. Each display will have a minimum and a maximum viewing distance that may vary based on application and intended use.

For example, a large character will have a longer viewing distance while a small character will have a shorter viewing distance. The general rule for viewing distance is that you take your letter height, halve it and convert it to metres. (i.e. 100mm letter height / 2 = 50mm; convert to metres = 50metre viewing distance)

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COMMUNICATION OPTIONS

WIRED

RS-232:

This communication is a standard inclusion (5M serial lead). This enables the creation of messages for the display via laptop computer, connected directly to the sign when a change is required.

LAN (Local area network)

This form of communication requires a wired connection to existing computer network. Depending on your computer network structure, this should allow the creation and editing of messages from anywhere on your network.

Fibre Optic:

This form of communication requires a wired fibre optic cable connection. It is relatively cheap, very common and the install cost is insignificant when you install it at the same time as the power.

WIRELESS

Important Note:

Our wireless communication options all communicate directly with your sign. You will not be dependent on any external internet portals to communicate with your sign. This ensures uninterrupted communication with your LED sign.

BLUETOOTH (300 metre **line of sight**):

This is a very common form of communication used by CSI and has been installed at hundreds of different sites Australian wide. This communication is highly encrypted to prevent interference from unwanted sources. A 300 metre direct line of sight view is required for communication to the sign. There are no ongoing costs for this style of communication.

GSM (2G) – Mobile network:

This communication uses the GSM mobile network to upload messages to your LED sign. This enables Australia wide remote communication from a desktop PC. Yearly or monthly fees (depending on plans chosen) are associated with this communication.

NEXTG (3G) – Internet based communication

This communication uses the NEXTG/3G internet network to send messages to your LED sign. This enables Australia wide remote communication from a desktop PC. It allows faster upload of files and upload of very large files. As an example, a 10 second animation would take nearly 10 minutes to load by GSM, over NextG it will be closer to 5 seconds. Yearly or monthly fees (depending on plans chosen) are associated with this communication.