

Electronic Message Center Vocabulary Terms

LED (Light Emitting Diode)	LEDs are essentially solid-state semiconductors that contain a chemical compound that gives off light when an electric current passes through it. They operate without the glass and filament of incandescents and are noted for their lighting efficiency and long life.
LED and Display Colors	Bi-color LEDs are made using red and green LEDs in the same package. Most indoor programmable LED displays today use either all red LEDs or they use red and green LEDs. To a lesser extent all amber is sometime selected. It is possible to create 256 or more shades of color from red to green using only red and green bi-color LEDs. Blue LEDs are the most expensive and have the highest brightness. Adding blue LEDs to the red and green can give you over 1.7 million shades of color.
Monochrome LED Display	A display that is populated entirely in single color LEDs (e.g.: amber or red), which is less expensive than multicolor LED displays of the same type.
Full Color LED Displays (RGB)	A display that is fully populated with LEDs capable of presenting millions of colors per pixel. Recommended technology for video content. Colors may be set by software.
RG LED Displays (Red/Green)	A display that is populated with LEDs capable of two colors per pixel (red or green). Color in use is set by software.
Sunbrite LED	The brand name for 4U2SEE Indoor LED with a brightness of 1000 NITs used in environments with direct sunlight.
Full Matrix LED Display	A display that is fully populated with LEDs that allows the entire face of the display to be used to present text in variable fonts, sizes and foreign character sets, simple charts, graphics and video.
Types of Pixels	The pixel can be one or more LEDs. A discrete LED is one individual diode. LED blocks and clusters are multiple LEDs installed as a single unit.
Discrete LEDs	Individual LEDs are inserted one at a time into a circuit board. The anode and cathode lead wires are then individually soldered to the circuit board. A pixel may be composed of either one LED or several LEDs installed close together. LEDs grouped together appear as a single pixel when all LEDs in the group are lighted at the same time. A group of LEDs in a single pixel may contain more than one color LED. The various colors are produced by turning on the appropriate combination of LEDs in the pixel.
Clusters	When a brighter pixel is needed, multiple LEDs are assembled in "clusters" of LEDs that together form one pixel point when they are lighted. Multiple LEDs are connected to a molded cup which is then filled with clear epoxy to hold the LEDs in place. Clusters may contain one color LED or in a multi-color application the cluster may contain a combination of different LEDs.
Dot	Shorthand for an LED pixel.
Column	A single vertical row of LED dots (pixels) or blocks.
Row	A single contiguous horizontal line of LED dots (pixels) or blocks.
Number of Pixels	LED (light emitting diodes) displays are described by the number of rows and by the number of columns. Example a 7x40 display has 280 pixels.
Display Array or Matrix	The display area of a programmable sign is composed of rows and columns of "pixels". The term pixel is short for "Picture Element". The characters and graphics of a message are formed by turning on or activating specific patterns of pixels within the display array.
Pixel Diameter	The size of a pixel is stated by the diameter of the pixel. A pixel can be as small as a single. 1" diameter LED.
Center to Center Spacing (pitch)	The distance from the center of one pixel to the center of the next adjacent pixel is called "Center to Center Spacing" or "Pitch".

Resolution or Density	Pixel diameter and center to center spacing define the resolution or density of the character being displayed. The closer the pixels are to each other, the higher the resolution or density of the character. Low resolution characters are designed for distance viewing.
Pixel Light Sources	LEDs are significantly less expensive than incandescent lamps. LEDs are also less expensive than monitors over a life of 10 years. <ul style="list-style-type: none"> • LEDs have an expected life of more than 100,000 hours or from 11 to more than 20 years. The longer life dramatically lowers maintenance expense compared to monitors or lamps. • LEDs need very little power and generate less heat than other light sources. Less power and heat mean less operating and maintenance costs. • LEDs are small and lightweight. This lowers the cost of the enclosure and installation.
Character	A single letter, number or symbol. Standard single-stroke ASCII characters are formed within a 5x7 dot pattern.
Brightness	The output intensity or brightness of an LED is measured in millicandela. The most common technique used in indoor displays to get the greatest range of brightness is called "multiplexing". The LEDs are strobed rapidly, faster than the eye can detect, one at a time. This method limits the brightness of each pixel since the pixel is only turned on for a sequence of brief instances. When an LED is latched on, it is lighted continuously until it is turned off again. This produces brighter pixels. Data block modules can only be multiplexed; discrete clusters are usually latched.
Candela	A unit of measurement of the intensity of light. Part of the SI system of measurement, one candela (cd) is the monochromatic radiation of 540THz with a radiant intensity of 1/683 watt per steradian in the same direction. Another way of putting it is that an ordinary wax candle generates approximately one candela. See SI, lumen and nit.
cd/m ²	cd/m ² (candelas per meters squared) - unit of measure for the brightness of light emitted from the surface of one square meter as it appears to the human eye. For example, the brightness of the average TV is approximately 150 cd/m ² ; a Hi-Brite LED indoor display is approximately 1000 cd/m ² ; and a full color outdoor RainbowWall LED display is approximately 5000 cd/m ² .
Nit(s)	Shorthand notation for cd/m ² (1 cd/m ² = 1 Nit). See cd/m ² , above.
Viewing Distance and Speed	The size of the sign and the size of the characters are defined by the applications usage. A rule of thumb for determining how large characters must be to be easily read is to allow 50 feet of distance per readable inch or to allow 600 feet of distance per foot of readable text. Example in order to read a message on a sign 600 feet away, the characters and graphics in the message must be at least 12 inches high. The rule of thumb for messages viewed from an automobile is that an 18" character is required if traffic is moving 35 miles per hour, and a 12" character is required if traffic is stopped.
Programming	Programming sets the characteristics of the characters used in the message: font, size, color, and position as well as any special effects.
Special Effects	<ul style="list-style-type: none"> • Scroll Up or Down; Wipe Up, Down, Right, Left, In and Out. • Twinkle sparkle, Glitter, Starburst and Explode. • Roll, March or Job; Snow, Spray On and Slide Across. • Switch and Interlock; Paint On and Scan On. • Split Color, Rainbow and Reverse Video; Flash and Hold • Start and Stop Time. • Date, Time of Day, Temperature and Battery Backup. • Animation, Graphics and Dot Programming.
Baudot	Ticker code used in the U.S.
Tile	A block of LEDs, typically arranged in a rectangle or square, which is used as a component of a larger display. Tile size varies by display type.
Conformal Coating	Coating applied to electronic components that resists corrosion and protects against harsh weather conditions to extend the life of an outdoor display.
Fascia	Protective material that covers the surface of the display. Typically Lexan or wire mesh.
Firmware	A program stored on an internal chip inside the display that defines the specific functionality of the sign. It controls and formats data and operates the display hardware.

LCD (Liquid Crystal Display)	A high-resolution flat screen display technology that contains a liquid crystal solution between two sheets of polarizing material. Electric current passes through the liquid causing the crystals to align with the field, forming a crystalline arrangement that forms an image as light passes through. Recommended technology for video and close up text viewing.
Third-party Software	Customizable PC software, developed by a software vendor that interprets, filters and formats data.
Ticker Data	A stream of alpha and numeric data showing financial trading information. Traditionally, alpha characters (stock symbol) appear on the top line and numerals (prices) appear on the bottom line of the display.
RF	An acronym for Radio Frequency. RF is frequently used for wireless communication.