



LED displays and color calibration

Ensuring color consistency in your large scale visualization products

Introduction

LED Displays have come of age. As companies turn to digital signage for their messaging, competition in the industry has become more aggressive. Before making an investment decision there are several key questions buyers should ask: Are the LED displays available in any size, shape or curvature? This is important if space is limited or challenging. Is the color evenly distributed? It is normal for an LED to degrade in color over time, but the display color should remain constant across the screen. With the use of color calibration at NanoLumens, all displays are guaranteed to be the best quality.

Why expert color calibration is needed?

LED displays are organized in an array format. Some arrangements can be found in rows and columns, and others by blocks. This is because LED manufacturers create and produce LEDs by grouping them through a process called binning. When an LED manufacturer bins LEDs, they group them by their common qualities - usually by light intensity and color wavelength. However, when a display combines multiple "bins" of LEDs, each bin will have a different quality. Individual bins will be relatively consistent, but as a whole, the display will look blotchy.

"Many times, batches of LEDs can be faulty and show obvious signs of color variation." says Rick Morrison, Senior Electrical Engineer at NanoLumens. The result is an LED display that looks sloppy and unmatched. Displays that have not been calibrated can be quite noticeable even to the untrained eye, often resulting in a poorly color-distributed display.

LED displays - constantly changing and improving

To have color consistency throughout a display, color calibration should be done. Because all LEDs have different binning ranges, calibration is able to find the common value of brightness and intensity throughout the LEDs. Therefore, if one bin of LEDs has a luminance of 700 nits, and another bin of LEDs has 1000 nits; then we need to adjust the display to 700 nits, the base value, for evenness.

Think of it like a camera. Essentially, optical equipment like cameras use digital processing of images to gather data for each pixel on the display then generates some coefficient to apply to the LEDs to make the LEDs either brighter or dimmer. Many times, when an LED display is given a solid color, usually white, calibration can make an obvious change for the best. Therefore, in order to create the best LED display, calibration will always make it look better.

Nanolumens can ensure quality displays by its calibration process. After Nanolumens puts its displays together, we don't just rely on the LED manufacturers' binning process, we go the extra mile to establish color maintenance. Our process to calibrate displays is unparalleled in the large-scale visualization industry.

Nanolumens calibrates displays through a series of images taken from a highend digital camera that are then synced to software that analyzes the display pixels' brightness and color. The software breaks down the image into partitions and focuses in on color and intensity.

"Nanolumens' software creates a database in which we can adjust the brightness of all LEDs to the same level." Says Jammie Proctor, Electrical Engineer at NanoLumens. The way our software adjusts the LEDs is by calculating a coefficient that can then be applied to the display. This coefficient brings even level to the LEDs -eradicating any blotchiness found on the solid color background.

Calibration brings uniformity to displays. With calibration, customers need not worry how their display will look with different types of images. Any picture they choose, even if it is a solid color on the display, will look amazing. At times, manufacturers bin LEDs very well, rendering calibration unnecessary but calibration will always guarantee consistency.

Did you know? Digital LED vs printed signage

When properly serviced, LEDs can have a significant impact on your messaging, racking up countless impressions within days. Alternatives like posters and billboards may get the point across to a degree, but they're seldom given a second look and changing the content on the fly is time consuming and expensive. Printed signage fades quickly - and so does interest in them. In a study conducted by Intel, cameras monitored an LED display and a poster of similar size and shape. These cameras tracked how many people - kids, teenagers, and adults - stopped and stared at the advertisements. The results were conclusive. Comparatively, the poster's impressions weren't competitive. There was a 400-600% increase in viewers with the LED display. The LED display was engaging, and it gave potential customers what they wanted: an advertisement that popped. Not only did the LED display garner more views, it also had a substantially better return on investment than the printed signage.

About Nanolumens

Nanolumens is a US-Based LED design and manufacturer headquartered in Atlanta, Georgia. Nanolumens offers world-class displays across multiple market segments adding wonder to physical spaces. Nanolumens is a pioneer of the true curve technology and are committed to being better. With a bold and visionary team of experts Nanolumens will take your project, in all shapes and sizes, from concept to reality. Nanolumens brings your creative visions to life, leaving a first and lasting impression. We are LED! For more information, visit www.nanolumens.com