



WHITE PAPER

THE RISE OF LED DISPLAYS AND ITS ROLE IN TRANSFORMING MODERN BROADCASTING

The broadcast industry has always been at the forefront of visual storytelling, constantly evolving to enhance the viewer's experience. Over the past decade, LED displays have become the go-to technology for studios worldwide. With the increasing demand for high-quality visuals across television, streaming platforms and digital news channels, LED displays have revolutionized how broadcast environments are designed and executed.



Why Have LED Displays Become Common in the Broadcast Industry?

Two main factors have driven the widespread adoption of LED displays in the broadcast industry, specifically versatility and affordability. Unlike traditional studio backdrops, which rely on static imagery or green screens, LED displays provide real-time, high-resolution visuals that can be changed instantaneously. This capability has transformed studios into spaces where virtual backgrounds, interactive graphics and augmented reality elements enhance storytelling.

Additionally, LED technology has become much more affordable. While early adoption was limited to major networks due to high costs, advancements in manufacturing and increasing competition have driven prices down, making LED solutions accessible to mid-sized and local broadcasters. This cost reduction and superior visual performance have made LED displays a staple in modern studios.

LED displays have diversified the way content is presented in broadcasting. Some of the most common applications include:

- **Studio Backdrops:** High-resolution LED video walls replace traditional set pieces, allowing for dynamic background changes that enhance visual appeal.
- **Augmented Reality (AR) and Virtual Reality (VR) Integration:** Broadcasters increasingly use AR and VR to create immersive content, with LED walls as the perfect medium for rendering real-time graphics.
- **Live Event Coverage:** From sports broadcasts to award shows, LED displays aid in live broadcasts by providing real-time data, graphics and branding elements.
- **News Studios:** LED displays allow newsrooms to integrate infographics, video clips and live feeds seamlessly, creating a more engaging experience for the audience.
- **Esports and Gaming:** The rapid rise of esports broadcasting has been fueled by LED displays, which provide stunning visuals that enhance live-streaming experiences.

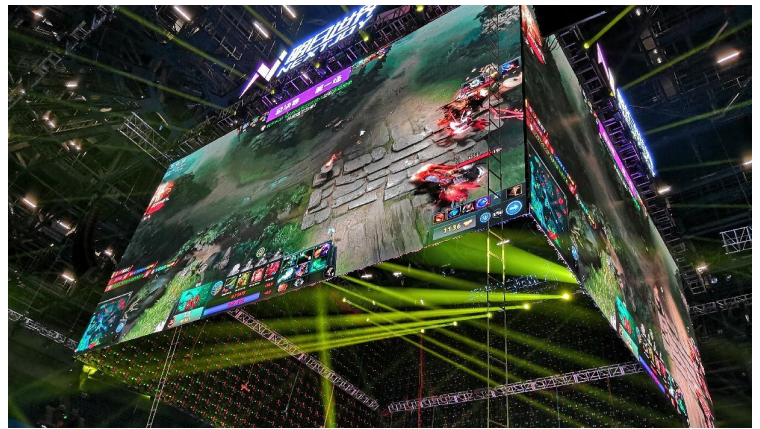
A Paradigm Shift with LEDs, Projection and Green Screens

For decades, green screens were the go-to solution for creating virtual environments. However, LED displays have gradually replaced them due to several advantages. Unlike green screens, which require extensive post-production work to match lighting, LED displays emit real light that interacts naturally with the set and the talent. Since LED walls display actual environments rather than backgrounds, there is less need for post-production adjustments. LED displays provide high-resolution, real-time imagery with minimal motion blur, making them superior to green screens. Additionally, with LED backgrounds, presenters, actors and talent can see and react to the environment in real-time, improving performance authenticity.

While projection technology has been widely used in broadcast settings, it has limitations that LED displays overcome. LED walls deliver higher brightness and deeper contrast, ensuring content remains vivid even under studio lighting conditions. LED panels can be arranged in various configurations and sizes, whereas projection is limited by throw distance and screen surfaces. LEDs have a significantly longer lifespan than projector bulbs and require less frequent maintenance. Additionally, LED technology consumes less power compared to traditional projectors, making them a more sustainable choice for broadcasters.

Virtual and Studio Capabilities of LED Displays

With the rise of virtual production, LED displays have become integral to next-generation studio designs. The combination of real-time game engine rendering with LED walls enables studios to create expansive virtual environments without leaving a soundstage. This is particularly beneficial for weather reporting, where virtual sets can depict real-time weather conditions, providing a more engaging and informative experience. For sporting events, analysis is enhanced as analysts can interact with 3D visualizations and replays in real-time. Entertainment shows like talk shows and reality TV can feature dynamic sets that change according to different segments or guest appearances. Finally, corporate and educational broadcasting also benefit from LED-equipped studios for professional presentations, webinars and online courses. There are several factors that must be considered when incorporating LED displays into a broadcast setting to



Esports in Action



Broadcast in Action



Live Events in Action



Virtual Production in Action



optimize performance. The finer the pixel pitch, the higher the resolution. For studio environments, a pixel pitch of 1.5mm to 2.5mm is recommended to ensure crisp visuals. A high refresh rate prevents motion artifacts and ensures smooth video playback. LED walls should be color-calibrated to match camera settings for accurate skin tones and seamless visual integration. A wide viewing angle is necessary to ensure the display remains clear and uniform from different camera perspectives. Notably, production studios often have prolonged operational hours, so LED panels must be designed to handle heat dissipation efficiently.

It's important to consider lighting, which is critical in broadcast production and, as a result, LED lighting systems must be selected carefully. The studio lighting should support a wide range of color temperatures to match different shooting environments. The lights should be dimmable without causing flicker, as studio cameras are highly sensitive to variations in light intensity. A remote-controllable lighting system offers greater flexibility and efficiency in managing studio conditions. It would be good to mention that LED displays are also used for ceilings and lighting. i.e. Trilogy Studios.

Notably, LED technology enhances visual appeal and contributes to cost savings. LED displays and lighting consume significantly less power than traditional studio setups and, as a result, LED displays generate less heat than conventional lighting and projection, reducing the need for extensive air conditioning. LED solutions have a longer operational lifespan, reducing the frequency of

replacements and repairs. Modular LED panels can be reconfigured for different productions, offering more value for investment.

What's Next for The Future of LED in Broadcasting?

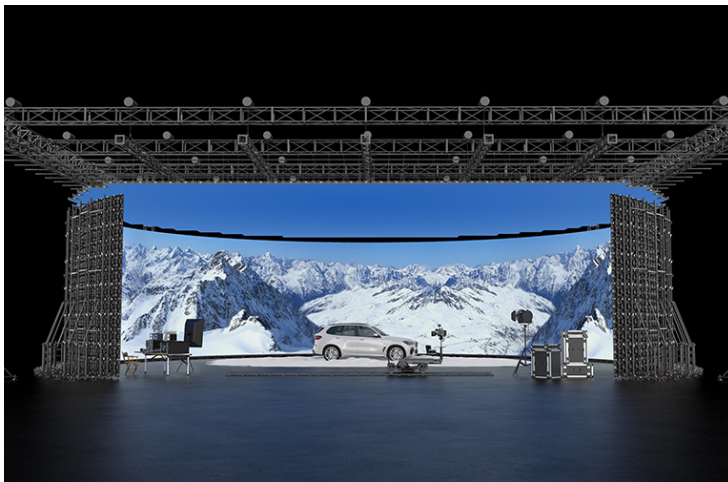


The next five years will bring even more advancements in LED technology, further transforming the broadcast industry. MicroLED will become the new standard for broadcast applications by offering even higher resolutions and better color performance. Advancements in artificial intelligence will play a role in real-time content adaptation, dynamically adjusting backgrounds based on audience engagement metrics. The combination of 5G and LED technology will enable ultra-low latency live streaming with high-resolution visuals. The industry will continue to see innovations in flexible and transparent LED panels, allowing for more creative set designs and interactive content presentation.

The Award-Winning AbsenLive Lineup

Absen is a leader in developing cutting-edge LED displays, with a strong commitment to delivering high-quality, innovative solutions for the broadcast industry. The AbsenLive solutions, including Saturn Series, Polaris V2 Series, and Pixel Reality Series, are specifically designed for broadcast environments, offering superior in-camera performance and exceptional image clarity. These displays are engineered to meet the demanding requirements of live broadcasts, providing high brightness, wide color gamut and ultra-smooth refresh rates. AbsenLive's product lineup is ideal for creating immersive, high-resolution visuals that enhance storytelling, whether in newsrooms, sports studios, or virtual production setups.

Pixel Reality Series



AbsenLive's Pixel Reality (PR) Series is a cutting-edge LED display solution designed specifically for virtual production and broadcast environments. With pixel pitches ranging from 1.5mm to 5.2mm and panel sizes of 500x500mm and 500x1000mm, the PR Series provides unmatched flexibility for LED backdrops, ceilings and immersive production spaces. The PR Series is engineered to deliver stunning in-camera visuals, making the filming process smoother and enabling the production of cinematic-quality content. It supports HDR for extreme dynamic range, while its 7680Hz refresh rate and 16-bit grayscale ensure a seamless, flicker-free image with no visible scan lines or color banding, which is critical for film, TV and live broadcast applications.

For LED backdrops, the PR1.5, PR1.9, and PR2.5 models offer narrow pixel pitches, allowing photographers and cinematographers to capture sharp, detailed images even at close range. Meanwhile, the PR3.9 and PR5.2 models are

ideal for LED ceilings, providing high brightness for optimal lighting effects in XR stages and virtual studios. With 99.9% DCI-P3 color gamut coverage, the PR2.5 ensures lifelike, vibrant visuals, crucial for accurate color reproduction in film and broadcast. It also supports high-frame-rate video playback up to 251Hz, minimizing motion blur and off-axis color shift, making it an ideal solution for high-speed cinematography.

Saturn Series



The AbsenLive Saturn (SA) Series is designed to meet the high standards of broadcast environments, delivering exceptional image quality and effortless installation. With brightness up to 1500 nits, 16-bit grayscale and an ultra-smooth 7680Hz refresh rate, it ensures vivid visuals that look stunning on camera. Built with lightweight yet durable materials, each panel weighs only 19 kg/m², making setup and adjustments quick and easy. The fast-locking system and magnetic module design allow for seamless connections, reducing setup time and ensuring perfect screen alignment.

The SA Series is incredibly versatile, supporting flat, curved (-2.5° to +2.5°) and ceiling-mounted configurations. This flexibility makes it ideal for newsrooms, virtual production, sports studios and event broadcasting, where dynamic, immersive displays are essential. Panels of different sizes can also be combined, offering creative display solutions for any studio layout. For installation, the SA Series provides multiple mounting options. It can be hung up to 10 meters high, stacked up to 5 meters or supported with 500mm and 1000mm lifting beams and floor racks, making it adaptable to any broadcast setup.

Polaris V2 Series



Surface of
PL2.5 Pro V2 and
PL2.5 XR V2



Surface of
conventional
panels

The AbsenLive Polaris V2 (PL V2) Series is ideal for broadcast and virtual production, offering exceptional image quality, effortless scalability and superior in-camera performance. Designed with harmonized 500mm panel increments, the PL V2 Series makes screen size calculations simple, ensuring smooth integration into any studio, newsroom, or event production setup. With pixel pitches ranging from 1.9mm to 4.8mm, the PL V2 Series caters to both indoor and outdoor environments, providing crisp, high-resolution visuals for live broadcasts, XR stages and virtual studios. The lightweight, ultra-thin panels are easy to handle and install, making them a practical choice for dynamic studio setups that require frequent adjustments.

The PL V2 Series supports HDR (High Dynamic Range), delivering vibrant colors and lifelike images that captivate viewers. With 16-bit grayscale, it ensures fine details and smooth gradients, while a refresh rate exceeding 7680Hz eliminates flicker and scanlines, providing a seamless on-camera experience for live streaming and television production. AbsenLive's Ultrablack Technology enhances contrast and reduces reflections, making the PL2.5 Pro V2 and PL2.5 XR V2 the ideal choice for XR stages, extended reality (XR) productions and virtual studios. By minimizing unwanted light reflections, these panels create deep, rich visuals that translate flawlessly on-screen, ensuring realistic, high-quality imaging for digital sets.

In Conclusion

LED displays have undeniably transformed the broadcast

industry, offering unparalleled versatility, affordability and performance. From replacing traditional green screens to enhancing live event coverage, LED technology is at the heart of modern broadcasting, enabling dynamic visual storytelling in real-time. As the demand for high-quality, immersive content continues to rise, LED displays are poised to evolve further, with innovations like MicroLED and AI-driven content adaptation paving the way for more advanced and engaging experiences. With industry leaders like Absen paving the way, LED displays will continue to reshape the broadcast industry. As technology continues to advance, LED solutions will become even more integral to broadcasting. Whether in newsrooms, sports studios, or entertainment productions, the LED revolution is here to stay.

For more information on Absen Inc., please visit www.usabsen.com/. Keep up with the latest news from Absen on [Facebook](#), [X \(formerly Twitter\)](#), [LinkedIn](#) and [YouTube](#).

