

Image Control

Introduction

At Pix2o, from day one, our overarching strategy has been driven by two simple concepts:

- The more often a display is lit, the more revenue it can generate.
- The wider the range of application for a display, the more often the pixels will be lit.

In keeping with this philosophy, we designed our video system from inception to offer unprecedented control over the image, especially at this price point. As important as it is for us to provide great control, and though we clearly understand the capabilities of scalers and video servers, we have chosen not to needlessly implement many of those functions into our system. We have distilled the image management features we believe should be located on the display and have implemented our system incorporating those critical controls.

Color calibration is an excellent example. Other displays in the market, if calibrated at all, are calibrated at a single point and calibrated to a single intent. Our innovative distributed architecture allows us to fully calibrate to four different parameter sets to enable four unique intents. Further, these intents can be switched on the fly and can be adjusted to suit the user's needs and tastes. This enables Pix2o displays to produce outstanding visual results regardless of content and environment. From accurate skin tones with image magnification in a very dark setting through super-saturated video effects in direct sunlight -- the display excels everywhere. Combining these factors allows Pix2o's displays to faithfully reproduce the designers' intent in many applications and settings.

Image Controls

Color Calibration

Pix2o VideoBlades™ are fully tristimulus calibrated to four distinct points. These points are designed to match the designers' intent.

- To maintain increased bit depth when dim, the system is fully calibrated at both 1,800 and 6,500 nits.
- To provide the most accurate skin tones and a consistent color space throughout the entire video processing chain, the system is calibrated to standard 709/sRGB primaries and white point. This setting is intended for Imag and other true-to-life applications.
- For the most saturated possible primary colors the system is also calibrated to the WideRGB™ color space, this expands the display primaries to match the potential of the LEDs. This setting is intended to provide saturated colors and a wider gamut for video effects, or whenever absolute accuracy is less important.

Another important point about Pix2o's calibration methodology is that our calibration systems are themselves calibrated to known standards on a daily basis ensuring consistency batch after batch.

Display Luminance

Our Display Luminance command enables the user to reduce the intensity of the screen down from indoor/outdoor settings. This allows fine tuning of the screen intensity to better match the surroundings or intent. The instant adjustment can easily be used during a show as part of the designer's intent to adjust the lighting on the entire set. Because of our data architecture, this control is implemented in 16 bits at the VideoBlade and does not get re-compressed to 8bit. This affords improved shadow detail and smoothness.

Brightness

We have implemented a separate Brightness command into our system. This allows the user to adjust the brightness of the image without impacting the maximum intensity of the screen. Though brightness adjustments exist on other gear in the video processing chain, because of our data architecture, this control is implemented in 16 bits at the VideoBlade and does not get re-compressed to 8bit. This affords improved image smoothness on large screens.

Gamma & Contrast

By default, our system is set to a gamma of 1/2.2 resulting in an end-to-end gamma of 1.0. Based on lighting conditions, net gamma through the video system for best results can range from 0.9 through 1.5. Multiple gamma presets are available allowing the designer to fine tune the net gamma.

White Point

By definition, the 709 and sRGB color spaces define white point at 6,500°K (or D65). However most video cameras are set closer to 5,500°K, many stage lights are closer to 3,800°K and customers, accustomed to PC monitors are prepared for something approaching 8,800°K. Because of this, we have incorporated the ability for the designer to adjust the white point of the display to match ambient lighting, video camera or customer expectations.

Luminance/Color Balance

It's no secret that LED displays shift color with age. For this reason, we have incorporated the ability to adjust each blade, or group of blades, in a display for brightness and color cast. This feature is fully incorporated into BladeRunner™. Because our system is Ethernet based, BladeRunner actually generates the required test video and distributes it to the screen directly over Ethernet.

Field Calibration

Our advanced processing architecture has enabled Pix2o to design a system that allows for field calibration using nothing more than our software and a consumer digital camera. To conduct a field calibration, only a reasonable dim room is required. Calibration of the display on the set will be possible in many cases.