



Color-Space (Beijing) Technology Inc., a Beijing based enterprise focusing on screen calibration, after years of R&D, debuts its first in the world light in weight and handy to use Color & Brightness calibration system. The system has been steadily launched in North America, Europe besides domestic China, and is well received by incumbent screen operators whom with a day to day calibration need on their multitude of control systems stockpile either warehoused or running in the field.

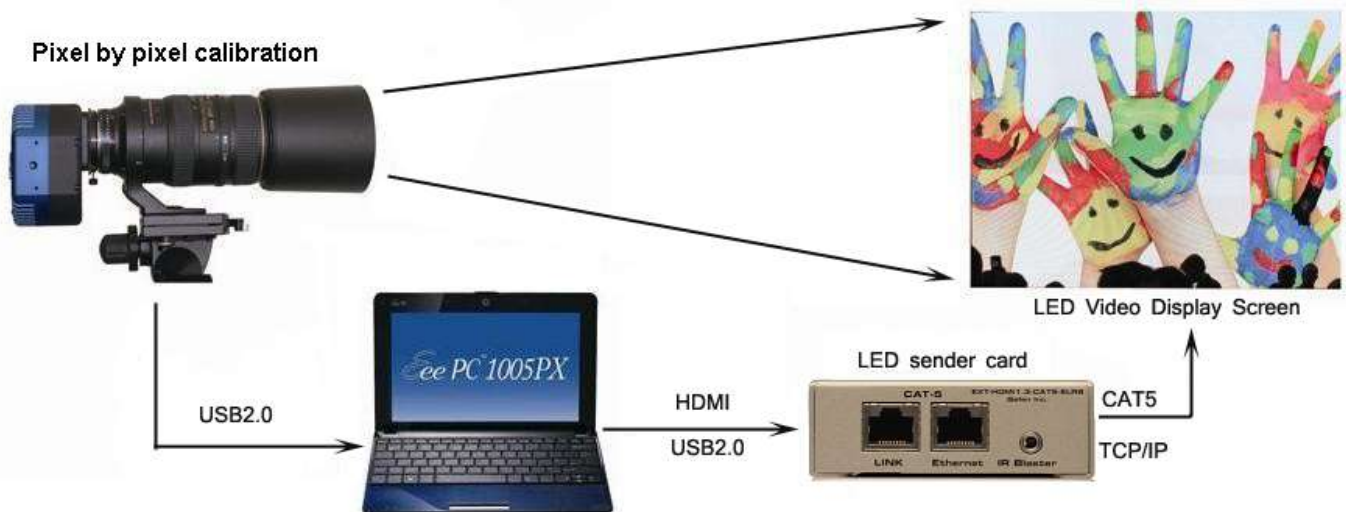
1. For small pixel pitch LED display, the color calibration system can eliminate bright and dark line on the edge of each module.
2. For the rental LED display, the color calibration system can adjust the wave length of each LED and let different batches of LED cabinet can be mix used together.
3. For the outdoor big LED signage, the entire LED display can be color calibrated automatically. One shot is enough, no need of separate the screen into several blocks.

PM-30 has 4 times faster calibration ability than PM-20 . For 1920x1080 resolution LED display, the calibration period is 20 minutes. For rental display, 20 cabinets can be calibrated in one hours.

PM-50 has higher resolution and automatic aperture/focus function and easy to use for fresh operator.

Color-Space Inc. has been focusing on photometric computation and its implementation. Our calibration system support many LED control system like Linsn, Nova, Brompton, Colorlight, Dbstar, Moncell , Zedec, etc.

Calibration system structure



Improvement of LED Screen Brightness & Color Uniformity



Features

- De-seaming function especially for small pixel pitch application. Bright and dark gaps caused by mechanical tolerance can be deleted visually.
- Cabinet based calibration function mode especially for Rental application. Cabinet can be arranged randomly during installation. (Rental cabinet mode)
- Capture and measure fast field calibration mode function. Just zoom and capture the entire screen focus and capture automatically. No need of manually measuring big screen block by block.
- Special exterior screen capture and calibration. The system can calibrate screen of any exterior size (Round, 1/4 Garden, Saw tooth, step size, etc.)
- Individual pixel based LED wave length uniformity calibration to guarantee different batches of Tiles can be mix used together.
- Automatic NTSC, PAL, sRGB and Best saturate color gamut adjustment. True color optimization to make the screen color same as nature color.
- Servo based automatic XYZ coordinate capture function and integrated brightness and color measurements both with raw and calibration data capability.
- A customer acclaimed easy and fast setup process. Simple to follow software steps and operation.
- Support multitude of LED screen control systems prevalent in the marketplace. (Linsn, Nova Star, Color Light, DB Star, Moon Cell, ZDEC, etc.).
- A 4250x2838 pixel resolution per single shot that's best adapted for screens with < Pitch2 and 4K resolution and higher.

Different batches of LED screen can be mix used together



Before Calibration (pictures are taken in Elation warehouse)



After calibration (pictures are taken in Elation ware house)

True color function renders nature Green trees on the top-left 1/4 of screen:



(Picture is taken in Silicon-Core warehouse)



Picture1 Display with visible gaps before calibration

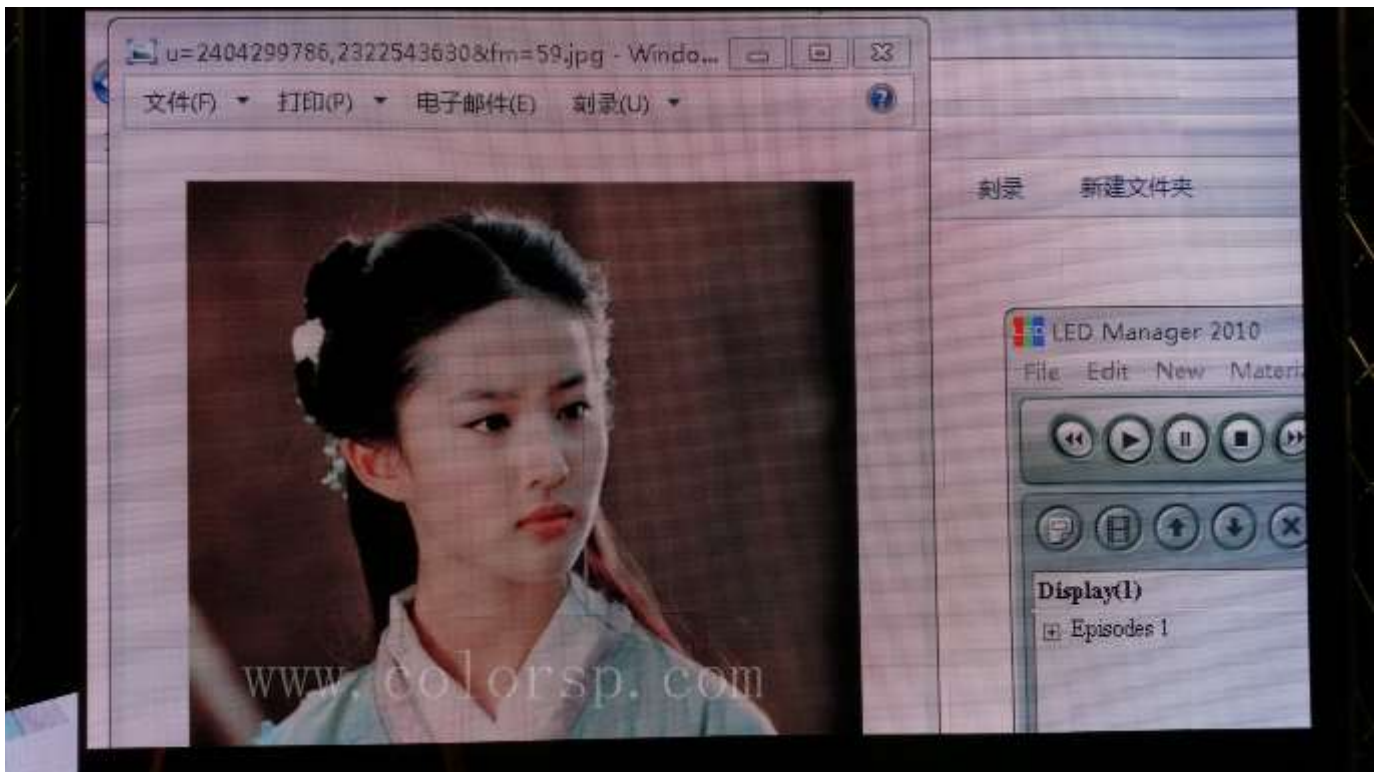


Picture2 Display after calibration

True Color renders healthy human face:

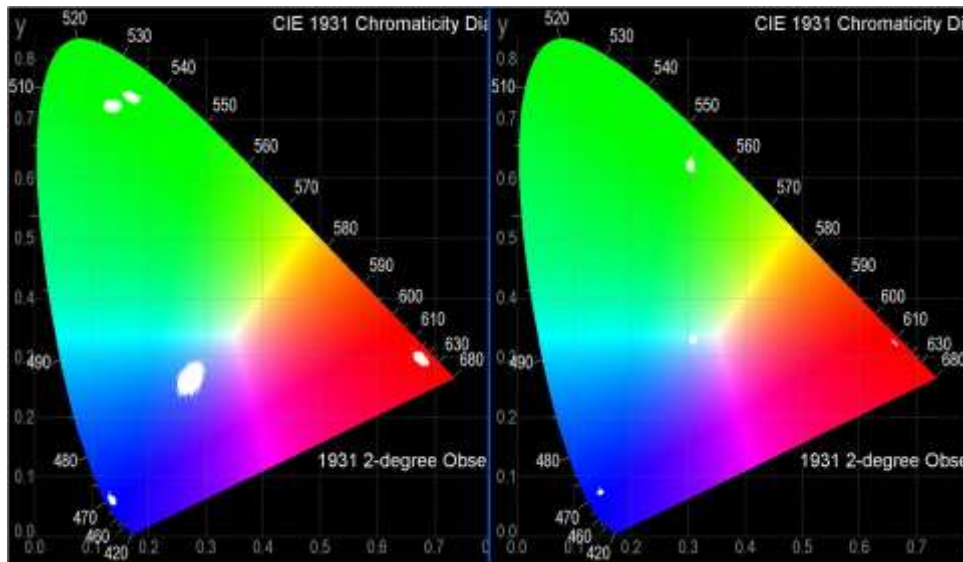


Before calibration (Pictures are taken in Elation warehouse)

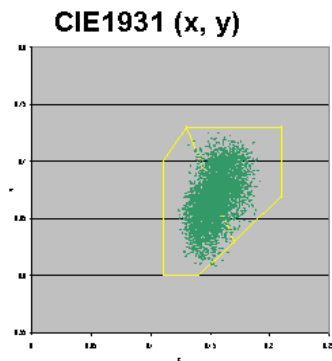


After calibration (Pictures are taken in Elation warehouse)

- CIE1931 standard 2° brightness and color criterion
- Maximum saturation, PAL-NTSC True color realization
- Color repeatability accuracy ± 0.0006



Color Uniformity Calibration and True Color adjustment

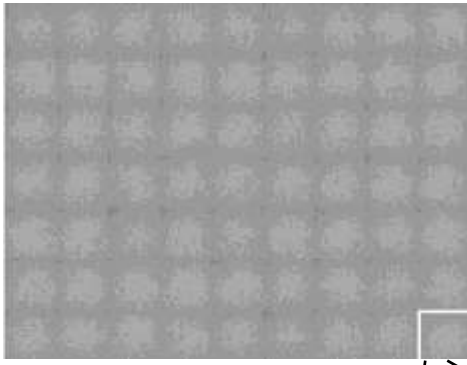


Chroma distribution Criteria

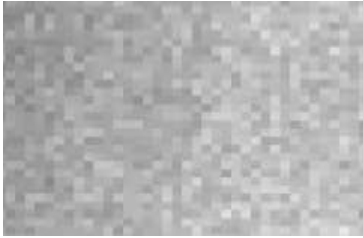
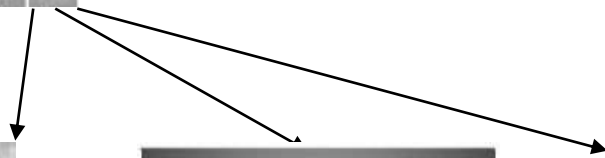
- True color calibration target gamut can be automatically generated by the system software - auto Targeting feature, or with an manual option of setting the target range within the CIE 1931 (x, y) color coordinates, if required.
- After calibration, the respective Red, Green, Blue and white coordinates of the subject screen will be converged within the target tri-stimulus color gamut. The screen thus shown reflects the target or ideal true color gamut, and the previously distributed LED color dots may now be found converging onto a much smaller dotting spot with improved screen uniformity and saturation seen.

Friendly Rental Cabinets calibration Application

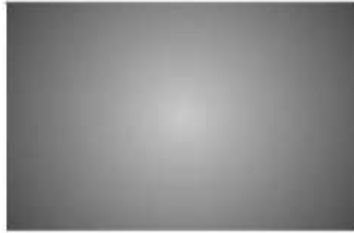
- Fully automatic segment by segment shooting with turns of 9 shots/segment over the whole subject screen, together with the auto targeting feature, the screen can be started running anew upon calibration done.
- Rental tiles of different batches can be assembled upon calibration without any visible criss cross color or brightness pattern seen.
- Individual pixel & column/row brightness calibration, a need as a result of module imperfection or screen assembly issue.
- Auto angle compensation due to imperfect on site camera location resulted.
- Assured equipment precision consistency and measurement results over multiple usages with negligible parametric drifts over time.
- A finely granulated precision system ensuring the detection of any minute difference on measurements, lives well to the prevailing industrial standard.



Now rental tiles can be mix-mounted without any visual degradation seen, thanks to the automatic angle compensation feature.



Non-uniform pixel response



LED view angle cosine fall off



Lens vignetting



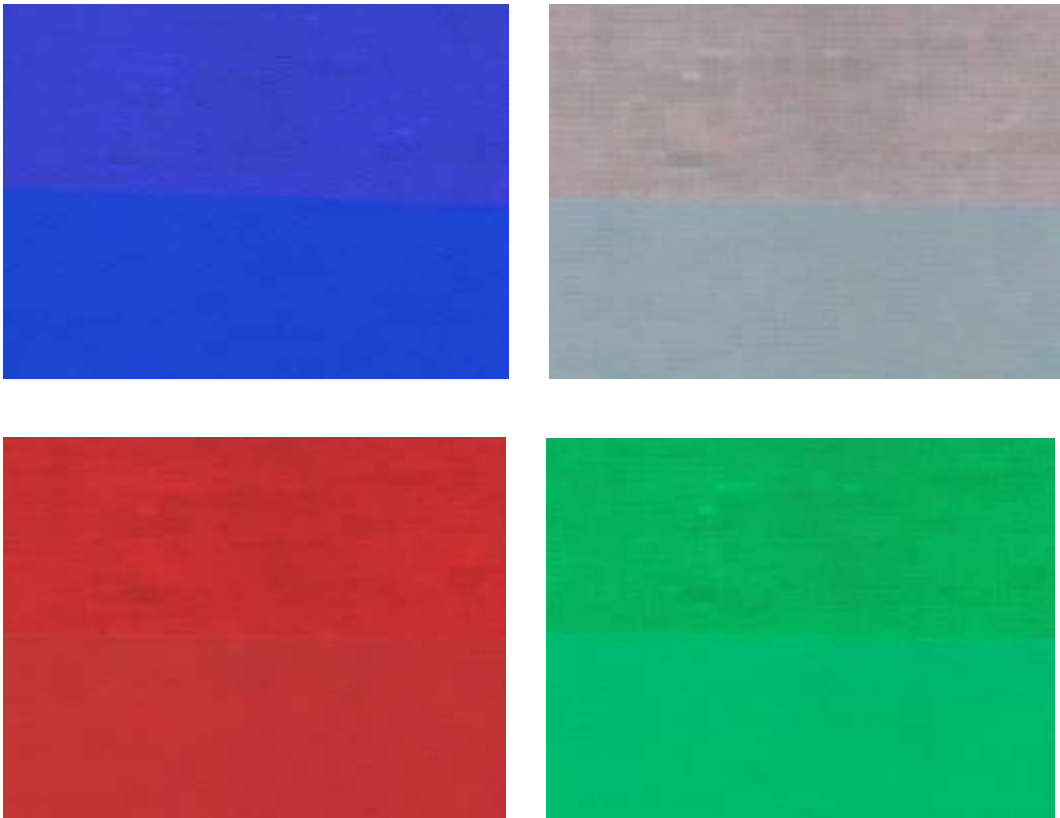
Lens vignetting measurement and compensation

Easy and fast field color calibration application, in short:

- Low power consumption – rechargeable battery – no lengthy field wiring required during setup
- Compact, light and small – hand carry size, no customs clearance issue unless really bad luck
- Likewise, no positional and directional data adjustment required upon restricted camera location availability on site
- Easy and fast set up process
- Repeated automatic segment start/stop positioning and panning.
- Automatic LED pixel location and calibration data generation
- Wireless TCP/IP communication with automatic data transport and download process



Uniformity comparison before and after color calibration



Specifications

Feature	PM-20	PM-30
Pixel Array (W x H):	3326x2504 active (visible)	4250x2838(visible)

Dynamic Range	70 dB	73dB
Shutter	Mechanical exposure, 0.03 s to 240 min	Electronica exposure
Digital Resolution	16 bits, Max 65536	16 bits, Max 65536
Capability	CIE1931 XYZ; Brightness (Y) ; CIE1931 Color Position (x, y) ;	CIE1931 XYZ; Brightness (Y) ; CIE1931 Color Position (x, y) ;
Brightness Accuracy	CIE (Y) +/- 3%	CIE (Y) +/- 3%
Color Accuracy	CIE (x, y) +/- 0.003	CIE (x, y) +/- 0.003
Repeat Brightness Accuracy	CIE (x, y) +/- 0.003	CIE (x, y) +/- 0.003
Repeat Color Accuracy	CIE (x, y) +/- 0.0006	CIE (x, y) +/- 0.0006
Spatial Uniformity	<2%	<2%
Computer Connectivity	USB 2.0 (USB 1.1 compatible)	USB 2.0 (USB 1.1 compatible)
Full Image Download	<12 seconds (host computer dependent)	<2 seconds
Thermoelectric CCD Cooling	Temperature regulation +/- 0.1°C, @ 0°C to -40°C CCD temperature	Temperature regulation +/- 0.1°C, @ 0°C to -40°C CCD temperature
Status and Notification	Multi-color LED status indicator and audible beeper. Over-temperature and high/low voltage alarms.	Multi-color LED status indicator and audible beeper. Over-temperature and high/low voltage alarms.
Lens Adaptor	Nikon F	Nikon F
Dimensions	W4.45" x H4.45" x D2.50"	W4.45" x H4.45" x D2.50"
Weight, without Lens	40 oz. / 1120g	40 oz. / 1120g
Power Consumption	12v, 1.7A (20.4 watts) at max (25 AC watts 90-240V AC power supply)	12v, 1.7A (20.4 watts) at max (25 AC watts 90-240V AC power supply)
Operating Environment	Temperature: -20°C to 30°C, Humidity: 10% to 90% non-condensing	Temperature: -20°C to 30°C, Humidity: 10% to 90% non-condensing

Color-Space (Beijing) Technology Inc. is aiming to provide you an easy practical to use yet high precision calibration system which will improve your product quality, save your running cost, shorten your delivery time and ensure peace of mind of your advertising business with probable stable revenue over the course of the respective screen in operation.

Color Space (Beijing) Technology Inc.

Phone Number: +86-10-89146501

Mobile Phone: +86-13701011831

E-mail: vip@colorsp.com

Web: <http://www.colorsp.com/>

Head Office: Room 5-1-608, Zhu Jiang Moore International Center, No.1 Bei Qing Road, Chang Ping District, Beijing, China

Post code: 102200