NEC

NEC Colour Management LCD Display Solutions

When Colour is Critical
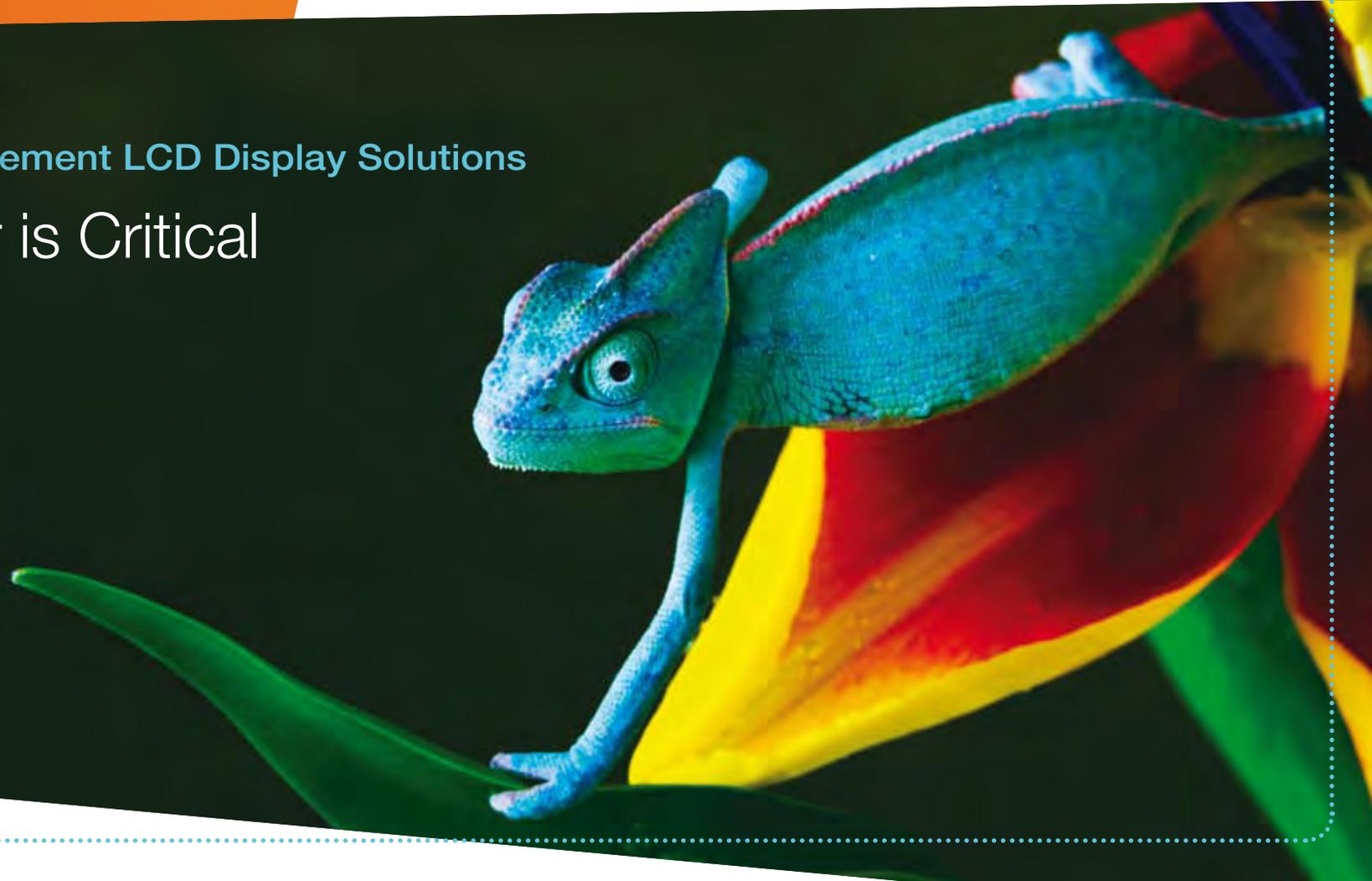
Keep it Green with NEC

NEC Colour Management LCD Displays A Partner for Your Creativity

NEC's commitment to the environment is carried through in many facets of our business—from the components used in our products and partnerships we form to the programs we offer and standards we help develop.

NEC plays a pivotal role in the spearheading, development and education of environmental initiatives in the display industry. For over 30 years NEC has been at the forefront of modern display technology. For the last 15 years, NEC has worked with the Environmental Protection Agency on the development and implementation of the ENERGY STAR standard. Since the early 90s we have been a leader in designing desktop monitors that meet or exceed ENERGY STAR standards. By following these standards and by educating our customers about the benefits of using energy-efficient equipment, NEC Display Solutions helps to lower the monitor's overall operating cost while increasing the lifespan of the product. In addition to offering cost-saving alternatives, NEC is leading the way by providing our customers with the most environmentally friendly display products available today.

NEC are the only company which use totally fire retardant housings on all our LCD Monitors and comply with strict RoHS (Restriction of Hazardous substances) requirements.

NEC are, now, endeavouring to cancel out our carbon dioxide (Co2) emissions within 3 years, with the creation of the NEC forest on Kangaroo Island. Recently, we planted our 700,000th tree.

Whether you're creating stunning images, designing functional 3-D representations, laying out eye-pleasing publications, developing true-to-life animations or any other professional project that requires the ultimate in display quality, NEC Commercial Display Solutions and its partners can deliver the total display solution to help you get the job done.

The fascination of colour: in recent years innovative technologies have revolutionised the field of digital image creation and image editing. Apart from higher resolutions, the most important developments have been in the reproduction of the colour gamut and depth. In digital colour workflows (consistent colour reproduction across all platforms and devices) the monitor plays a role that is both fundamental and highly complex.

NEC sets new standards in all fields of colour editing and visualisation. NEC LCD display solutions deliver uncompromising contour sharpness, colour reproduction and luminance, as well as featuring unparalleled coverage of the Adobe® RGB colour space. We have analysed the exacting requirements prevailing in the colour management sector and developed our innovative LCD display technology in close cooperation with leading colour editing industry professionals.

NEC MultiSync 90 Series LCD Monitors

NEC MultiSync 90 Series LCD monitors for colour-critical applications offer a wide range of application-oriented features, making these models one of the most intelligent, versatile LCD's to date.

Apart from functions for optimal colour reproduction, handy ergonomic details, future-proof connectivity and intelligent power-saving functions are a hallmark of the MultiSync brand.

Models ranging from 19-inch up to 30-inch in screen size deliver crisp, vivid viewing in an ultra-thin-frame design while producing unparalleled colour and unrivaled screen performance. Not only are these monitors smart investments for you and your company, their advanced functionality and productivity-enhancing technologies illustrate their unique brilliance.

DESIGN FEATURES FOR ASTHETICS AND EASE OF USE

Ultra-thin-frame design lets you to view more of your ideas and less of the monitor bezel, while freeing up more horizontal and vertical desktop space for multiple-monitor applications.

Redesigned bezel controls increase simplicity and ease of use, displaying on-screen functions alongside the appropriate buttons.

Height-adjustable stand boasts a range of up to 150mm to maximize your viewing comfort.

Recessed portability handle on the back of the display provides easier transport.

Quick-release stand allows you to detach the display from its base with the simple pull of a lever.

Improved cable management helps prevent unattractive cable and cord clutters no matter the height adjustment or orientation of your display.

Rear alignment clip slots allow for easier, more seamless multi-display setups.

Pivot capability adds flexibility enables you to rotate the display through 90° to your viewing preferences.

NEC MultiSync 90 Series LCD Monitors

ELECTRONICS FOR ENHANCED SCREEN PERFORMANCE AND DISPLAY MANAGEMENT

Colorcomp – Uniformity Compensation System

A homogenous distribution of light and colour over the entire surface of the image is crucial for colour-critical applications. ColorComp is a uniformity compensation and correction system designed to reduce any screen uniformity errors to almost unnoticeable levels.

The brightness, colour and gamma values of every display are individually measured and characterized during production, using a fully automated system which measures hundreds of points across the screen at different grey levels. These measurements are used to build a three-dimensional correction matrix which is then stored inside the display. ColorComp uses this matrix to applying a digital correction to each pixel on the screen to compensate for differences in color and luminance and create a uniform image and colour reproduction. The degree of compensation can be adjusted to suit individual requirements. ColorComp is based on an optimisation of a mixture of the colours red, green and blue.

Internal 12-bit lookup table (LUT) - which allows the MultiSync 90 Series monitors to display 16.7 million colours out of a palette of 68.5 billion, provides for more finely detailed points of shading, high-definition rendering of colour images and crisper display of even the most delicate shadings and colour differences.

XtraView+ technology provides for the widest viewing angles available (up to 178° horizontal and vertical) with minimal off-angle color shift.

Rapid Response™ technology with overdrive and Rapid Motion™ - delivers uninterrupted, undistorted viewing of high speed, full-motion video. The overdrive function improves the critical grey-to-grey response time, reducing pixel lag and enhancing the video experience. This feature has been developed specifically for 50 Hz broadcast video sources as it guarantees smooth representation of moving images.

Rapid Motion, a technology strictly for viewing moving video, DVD movies or MPEG files, bypasses frame memory altogether for smooth-flowing video reproduction without ghosting or digital artifacts.

LCD1990SX   LCD2090XUi   LCD2190UXp   LCD2190XUi   LCD2490WUXi   LCD2690WUXi

Gamma Selection – lets you adjust the Gamma by using preset values (including 2.2, DICOM GSDF, S-Curve or native) or create a custom setting from 0.5 to 4.0 in increments of 0.1, providing an ideal setting for video or other applications.

Ambix3™ technology - provides the widest range of computer video compatibility between analog and digital systems. Ambix3 provides the ability to toggle between all three inputs, reducing the expense of external monitor switches. This triple-interface architecture provides a number of single-, dual- or triple-input configurations.

AmbiBright™ - This feature automatically adjusts the backlight depending on the brightness of ambient lighting conditions. For example, if the sensor detects the ambient lighting becoming darker, it reduces the backlight appropriately, which helps provide optimal readability and reduce eyestrain. Further, if desired, you can set the display to automatically enter a power-saving mode when the ambient lighting falls below a predetermined value (i.e. when office lights are shut off at the end of the day), which can significantly reduce energy expenses.

LCD3090WQXi

ECO Mode - helps extend the life of the display by allowing the user to dim the backlight, thereby reducing heat generation and conserving energy.

Real-time clock - allows for 24/7 power management scheduling and monitor sleep/wake management, improving energy savings and extending display life.

Advanced OSD - enables display management customization to meet your preferred settings and features.

Automatic black level adjustment - regulates grayscale images for optimal picture quality.

Zoom mode - enables you to customize the screen size in three directions.

Screen saver function - including gamma adjustment, unnoticeably reduces the risk of image persistence for extended display life.

Self-diagnostic capabilities - alert you of failure points and other abnormalities with a flashing LED on the display's bezel.

6-axis color control engine - This feature allows for precise and simplified colour and colour temperature (2600-10,000K) adjustment. The controls also allow the hue and saturation of red, yellow, green, cyan, blue and magenta areas of the colour gamut to be manipulated independently in order to preview images within the Adobe RGB color space.

NEC SpectraView® Series LCD Display Solutions
High Level Colour Fidelity

Enjoy uparalelled display performance in your colour critical applications with the NEC SpectraView Series LCD Displays. These ultra-thin frame models feature the SpectraView Colour Calibration Solution, which combines the high performance and multitude of features, of selected 90 Series models with sophisticated colour profiling software with a light shielding hood*. The result is a highly accurate, reliable, repeatable and feature-rich display calibration and profiling solution. These displays are available in 20-inch, 26-inch and 30-inch screen sizes. *(except LCD3090WQXi)

OPTIMUM COLOUR MANAGEMENT FOR PROFESSIONAL APPLICATIONS

On the journey from creative concept to production, colours pass through numerous different applications, and discrepancies in colour reproduction can lead to unforeseen results, misinterpretations and the waste of a lot of time and money. NEC SpectraView® monitors guarantee optimum colour management, making them a valuable partner for your creativity whatever media you are using:

- **Digital image creation and editing**
- **Digital photography**
- **DTP and Graphic design**
- **Video animations**
- **4-colour printing processes**
- **Colour workflow solutions**
- **Soft proofing and Pre-press**
- **Textile design**
- **Industrial design**

INCREASED EFFICIENCY

Agencies and industry benefit from increased efficiency. Fewer proofs and exposures thanks to the possibility of checking colour fidelity directly at the monitor. Fewer working hours, reduced production time and lower costs. Increased flexibility allowing you to make changes at short notice. Benefits which will help you stay a step ahead day in day out.

Professional digital photographers also need to check their photos in real time, and colour fidelity is indispensable for the direct selection of photos, optimum image editing, retouching and simulation of printing results. All advantages which facilitate maximum creativity while saving on both production time and costs.

A BRILLIANT QUARTET SHINING BRIGHTLY IN THE RGB COLOUR SPACE

Uncompromising technology and outstanding screen features characterise the NEC SpectraView® 2090, 2690 and 3090 monitors, coupled with a comprehensive colour calibration solution. In addition to an easy-to-detach antiglare hood*, they incorporate the SpectraView® Profiler software for hardware calibration of brightness, white point and Gamma and for the creation of ICC profiles, which works seamlessly with ColorComp, GammaComp and the 12-bit look-up tables (LUTs)

– which are all built-in features of the 90 Series monitor. *(except LCD3090WQXi)

These are just a few of the stand-out details which make the NEC SpectraView® solution a class apart as a graphics partner. All NEC SpectraView® models come with the SpectraView® Certifier documentation which attests to the satisfactory performance of every single device during final testing.

10/12-BIT COLOUR PALETTE – PRINT RESULTS WITHOUT NASTY SURPISES

A programmable 10-/12-bit gamma correction – one each for red, green and blue – is the secret to optimum hardware calibration with the NEC SpectraView® models. 1,021/4,081 tonal values per colour mean that gradation adjustment is so much more precise. So even the most subtle tonal value gradations and greyscales are displayed with amazing smoothness. GammaComp ensures that the exact colours shown on the monitor are also produced in printed form. All this guarantees the highest levels of colour fidelity. Conventional 8-bit software calibration and graphics cards literally pale in comparison.

PERFECT COLOUR FIDELITY – NEW DIMENSIONS IN DIGITAL COLOUR WORKFLOW

Using digital workflows opens up huge potential savings. For enterprises, agencies, publishers, photographers, reproduction service providers and printers. Conventional workflows require three to five cycles of image editing, creation of colour separations, making of any necessary adjustments and final printing. The use of colour workflows allows the colour separation and proof cycles, for instance, to be speeded up by a factor of three, and global campaigns can be digitally coordinated and proofed before the printing stage.

However, a vital prerequisite here is accurate colour reproduction and perfect colour management. Any colour reproduction discrepancies are not just a visual problem, they can also lead to serious financial loss. 30% of all returns in the mail-order trade are due to differences between the colour in the catalogue image and the actual product.

SpectraView® Profiler
Hardware Calibration without Compromise

Colour-critical applications will only be successful if coupled with comprehensive hardware calibration. SpectraView® Profiler calibration and profiling software enables you to correct the colour reproduction directly in the monitor´s hardware.
SpectraView® Profiler calibration and profiling software allows you to calibrate the brightness, white point and luminance curve directly in your monitor, and to create ICC colour profiles for Apple and Windows. The result: colour reproduction that truly represents the quality of the subsequent processing and print versions.

QUALITY
The SpectraView® Profiler software has a brand new profiling engine built in. That´s how we achieved the virtually impossible: it outperforms all previous versions. Flexible and user-friendly, the new profile validation with colour gamut visualisation proves and documents the superior qualiy.

ERGONOMICS
The new user interface is clean and easy to use. Predefined calibration and profiling settings allow for a one-click-operation (express-calibration) without restricting the user in his abilities to use advanced individual settings. The professional user may select the parameters he wants and save them as additional settings. The wizard-like UI assists in doing so.

FUNCTIONALITY
SpectraView® Profiler (version 4.0 and higher) holds an abundance of features unknown in any other monitor calibration software until now. Besides the usual gamma settings, SpectraView® Profiler allows for the loading of any calibration curve. For video editing or working with office applications, you can calibrate your monitor to the gradation of sRGB and thus use the same characteristics as your data posesses.

Of course you can use the legendary L* calibration.
You can set any monitor white point, you can even import it from other ICC-profiles. This allows you to calibrate multiple monitors to the same standards. In addition to the white luminance you can set black luminance or alternatively the contrast ratio in order to optimally adapt your monitor to the viewing conditions of your working environment. The brand new ambient light measurement allows for compliance with viewing standards like ISO-3664 and 12646.
SpectraView® Profiler enables the creation of table and matrix profiles, the support of many standard measurement devices and the quick and easy calibration check with the validation function.

OVERVIEW
An overview of the most important features (SpectraView® Profiler Software, version 4.0 and higher):

- L* calibration (CIELAB L* colour gamut), alternative calibration with Gamma 1.8 or 2.2 or individual Gamma values or sRGB calibration
- Creation of LUT-based 16-bit ICC profiles and matrix profiles
- Iterative calibration process
- Manual white point and calibration curve editing
- White and black luminance adjustment (or contrast ratio)
- Support of many colorimeter and spectro-photometer sensors
- Profile validation for quick check at any time
- Check of ambient light conditions and viewing booth in relation to ISO 3664 & 12646
- Chromatic adaptation

Colours set the mood for life, inspire emotion and are unique in their nuances. Exploit this equally unique technology and the superb properties of the NEC colour critical LCD display solutions – a partner for your creativity.
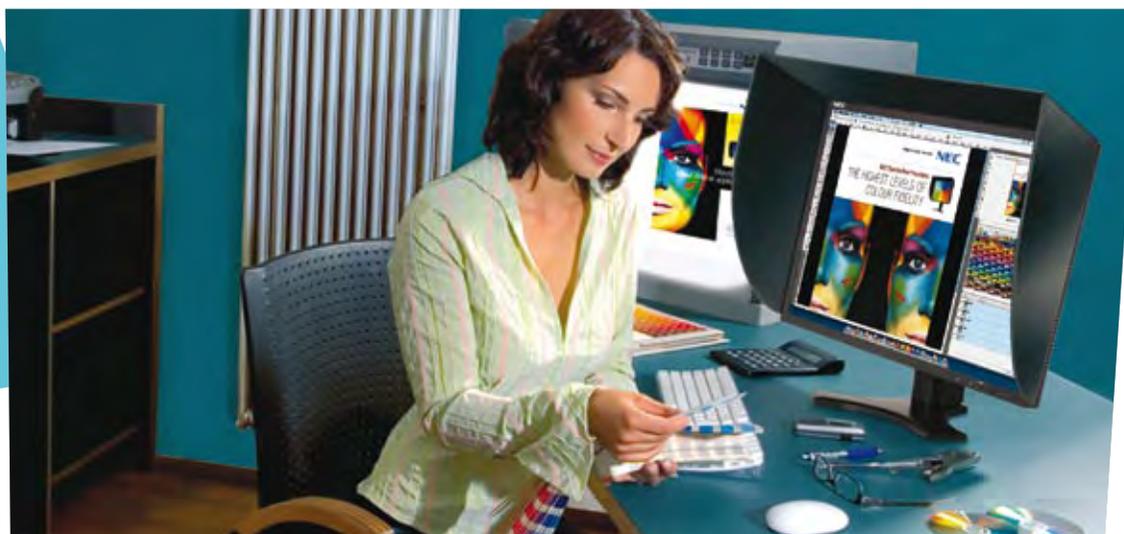
Empowered by Innovation

NEC

NEC 90 Series Colour Displays

Model Number	LCD1990SX	LCD2090XUi	LCD2190UXp	LCD2190UXi	LCD2490WUXi	LCD2690WUXi	LCD3090WQXi
Glass technology	S-IPS TFT	S-IPS TFT	S-PVA	SA-SFT	H-IPS TFT	H-IPS TFT	H-IPS TFT
Screen diagonal	48.2 cm (19 inch)	51 cm (20.1 inch)	54 cm (21.3 inch)	54 cm (21.3 inch)	60.9 cm (24 inch)	64.8 cm (25.5 inch)	73.4 cm (28.9 inch)
Native resolution	1280 x 1024	1600 x 1200	1600 x 1200	1600 x 1200	1920 x 1200	1920 x 1200	2560 x 1600
Pixel pitch	0.294 mm	0.255 mm	0.270 mm	0.270 mm	0.270 mm	0.287 mm	0.251 mm
Contrast ratio	1500:1 (typ.)	700:1 (typ.)	1000:1 (typ.)	500:1 (typ.)	800:1 (typ.)	800:1 (ty.)	1000:1 (typ.)
Peak luminance	250 cd/m2, (typ. Native)	280 cd/m2, (typ. Native)	300 cd/m2	250 cd/m2, (typ. Native)	400 cd/m2, (typ. Native)	400 cd/m2, (typ. Native)	350 cd/m2, (typ. Native)
Calibrated luminance	140-180 cd/m2, recommended	140-180 cd/m2, recommended	140-180 cd/m2	140-180 cd/m2, recommended	180-220 cd/m2, recommended	180-220 cd/m2, recommended	
Viewing angle	178° h/v (at CR > 10:1)	178° h/v (at CR > 10:1)	178° h/v (at CR > 10:1)	176° h/v (at CR > 10:1)	178° h/v (at CR > 10:1)	178o h/v (at CR > 10:1)	178o h/v (at CR > 10:1)
Reponse Time	8ms	8ms	8ms	10ms	8ms	8ms	6ms
Greyscale reproduction	8-bit (256 grey tones)	8-bit (256 grey tones)	8-bit (256 grey tones)	8-bit (256 grey tones)	8-bit (256 grey tones)	8-bit (256 grey tones)	8-bit (256 grey tones)
Displayable colours	16.77 million	16.77 million	16.77 million	16.77 million	16.77 million	16.77 million	16.77 million
Programmable gamma correction	12-bit Look-up table per channel (4096 grey tones)						
Factory calibration	Pre-Set DICOM gamma correction, Digital Uniformity Control				plus: backlight stabilisation		
Signal Inputs	Digital-1: DVI-D; Digital-2: DVI-I; Analogue: Mini D-sub 15 pin						

Further detailed specifications can be found at www.nec.com.au

For further information contact:

NEC Australia Pty Ltd

Call 131 632 from anywhere in Australia, visit www.nec.com.au or email displays@nec.com.au

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Specifications are subject to change at any time, without notice.