

SpectraView_{II}™ LCD Series

Color calibration solution for 19" - 26" professional LCDs ideal for color-critical applications

Unparalleled display performance for color-critical applications. Designed for professionals with color critical applications, the SpectraView_{II} Color Calibration Solution combines award-winning NEC Display Solutions LCD monitor technology with a color measurement sensor and sophisticated software. The result is a highly accurate, reliable, repeatable and feature-rich display calibration and profiling solution.

Quick and easy measurements. The SpectraView_{II} system, available for Mac OS and Windows, uses a custom-calibrated, co-branded colorimeter based on the iOne Display 2 from GretagMacleb, to take color measurements of the display screen during calibration. The software analyzes these measurements and sends color adjustment commands directly to the display monitor. This means that color adjustments are made in the

monitor rather than in the video graphics adapter, resulting in full use of the number of colors available on the graphics adapter and a much brighter image with the maximum possible color gamut. With SpectraView_{II}, the video graphics adapter is not used at all to make any gamma or tone response curve corrections to the display, so the full color resolution and fidelity of the system is maintained.



SpectraView_{II} Color Calibration Solution Features and Benefits

10-/12-bit Internal Look Up Tables (LUTs) - Each LCD monitor supported by SpectraView_{II} features three internal 12-bit LUTs (10 bits on LCD2180WGLED model). These tables allow precise adjustments to be made to the display's tone response curve with minimal reduction to the number of displayable colors. Since the tone response curve correction is stored within the display and not on the host system's video graphics card LUT, the display can be calibrated on one machine and then used on another and still maintain calibration as long as a digital video signal is used.

Display Data Channel Command Interface (DDC/CI) - SpectraView_{II} communicates with the monitor using DDC/CI, which is a two-way communications link between the video graphics adapter and display monitor using the standard video signal cable. No extra cables are necessary. All adjustments to the monitor settings are done automatically using this communications link.

Multiple calibration sets - Different monitor calibrations can be instantly loaded, allowing quick and easy switching between different calibration settings without the need to re-calibrate the display. Each time a calibration set is loaded, the necessary monitor settings and ICC/ColorSync profiles are automatically updated.

Calibrated display information - At the end of each monitor calibration, an information window is displayed, which shows the results of the calibration and includes a wealth of information about the display such as the measured color gamut, grayscale color tracking, Delta-E and luminance values. Additional information about the display monitor such as the model name, serial number and the total number of hours that it has been in use are also displayed.

Calibration status validation - SpectraView_{II} will query each calibrated monitor to see if any controls have changed since the last

calibration. If anything has changed, the previous calibrated state can be restored automatically.

Application flexibility - SpectraView_{II} provides many features and options that make it flexible enough to be used in a large variety of applications, including full DICOM support for medical imaging. The display luminance can be adjusted to either a specific user-defined value or set to the maximum the display can achieve. In addition, custom target response curves can be created in addition to presets such as L* and SMPTE.

Network support (Windows only) - SpectraView_{II} integrates with the NEC NaViSet™ Administrator network software (available separately from your NEC representative) to provide remote network access and monitoring of display monitors. NaViSet Administrator is able to read, display and log the current calibration settings and status of displays on an existing network (LAN). This feature is particularly useful for large installations where central monitoring and asset management is needed.

Monitor locking - Once calibrated, the On Screen Display (OSD®) controls for the display monitors can be locked to prevent accidental or unauthorized adjustment, which may invalidate the calibrated state of the monitor.

Monitor profiling - After calibration, the display is automatically profiled and highly accurate ICC/ColorSync color profiles are generated and automatically registered with the color management system. These profiles use the Bradford Chromaticity Adaptation matrix.

Colorimeter function - The software features a colorimeter function, which allows direct measurements to be taken by the color sensor and the results displayed in a variety of different formats.

The **21.3" NEC MultiSync® LCD2180WG LED**, the world's first LED-backlit LCD desktop display, delivers new levels of image detail and color scale to professional-level users in the areas of computer graphics, digital animation, medical imaging, pre-press production and film, video and photo editing. Chosen from only the top 5% of the manufacturer's production, the LEDs used for this display meet stringent purity and light output vs. power requirements.

Using LEDs as the backlight source in lieu of normal fluorescent tubes, the LCD2180WG LED reveals an amazingly broad color gamut without loss of luminance. This state-of-the-art technology is able to produce more detail and greater nuances on digital images than any other LCD or CRT on the market today.

MultiSync LCD2180WG LED features include:

Wide color gamut achieves 107% size/100% coverage of Adobe RGB

Variable whitepoint system backlight is achieved by varying the relative intensity of the red, green and blue LEDs and results in no loss of luminance or available LUT levels when the whitepoint is adjusted between 5000-9300K)

Built-in color feedback system stabilizes target color in one minute after power is turned on vs. up to 30 minutes for standard desktop LCDs. The system also maintains the stability of color over time

ColorComp™ compensates for the differences with the screen's white uniformity and improves the color and luminance uniformity of the display

10-bit internal look-up tables (LUTs) allow the monitor to display from a color palette of more than 1 billion colors as well as precise adjustments to be made to the display's tone response curve without reducing the number of displayable colors

Built-in feedback maintains color stability and better color tracking compared to CCFL

True 10-bit digital video input designed for compatibility with future 10-bit video cards and operating systems

XtraView+™ technology allows for 176° viewing angle from all directions

Environmentally friendly and RoHS compliant due to omission of CCFL lighting source

Passive cooling system results in no fan noise or moving mechanical parts

Dual DVI connectivity allows for multi-computer configurations through a single monitor, significantly improving productivity



When combined with the SpectraView_{II} Color Calibration Solution, select 19" - 26" NEC LCDs deliver the utmost in desktop color performance. The 19" NEC MultiSync LCD1990SX_i, 20" LCD2090UX_i and 21" LCD2190UX_i, along with the widescreen 24" LCD2490WUX_i and 26" (25.5" VIS) LCD2690WUX_i, have not only revolutionized the way flat-panel monitors are engineered and designed, but how they can be used. With their multitude of leading-edge capabilities, combined with groundbreaking minimalist design, these monitors could easily be considered the most intelligent visual display solutions to date. Not only are these monitors smart investments for you and your company, their advanced functionality and productivity-enhancing technologies illustrate their unique brilliance.

Features and benefits of these displays include:

X-Light Pro™ technology maintains a consistent light output for the useful life of the display as well as correcting for short-term fluctuations. By using an internal luminance and color sensor that constantly monitors and corrects the light output of the LCD backlight, the display can be used for color-critical applications within minutes of powering on (LCD2490WUX_i and LCD2690WUX_i)

ColorComp reduces uniformity imperfections by compensating for differences in color and luminance across the screen area. Each display is individually characterized during production by measuring hundreds of points across the screen at different gray levels in order to build an internal three-dimensional correction matrix. This is then used to compensate for the screen uniformity, not only as a function of position on the display screen, but also as a function of gray level.

Internal 12-bit Look Up Tables (LUTs) allows the display of 16.7 million colors out of a palette of 69 billion, thus providing for more points of shading between white and black and virtual elimination of color banding and posterization effects

In-plane switching (IPS) type LCD module boasts the best possible color and grayscale accuracy and minimal gamma (brightness tone) shift at off angles, making these LCDs more suitable for demanding, color-critical applications

Ambix³™ technology provides the widest range of computer video compatibility between analog and digital systems, and enables you to switch between three inputs

AmbiBright™ automatically adjusts the screen brightness depending on the ambient lighting conditions

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



The NEC MultiSync 90 Series' widescreen models provide roughly the same work area as two smaller-sized LCDs, increasing your productivity.

OSD lockout gives users the ability to lock out all functions, including power, thereby limiting non-users from adjusting preset adjustments

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

Advanced No Touch Auto Adjust™ provides optimal image settings upon initial power-on and closed signal changes (includes a user-selectable mode in the Advanced OSD™)

TileMatrix™ and TileComp™ allow you to build virtually seamless video walls of various configurations (horizontal or vertical) through the Advanced OSD

Rapid Response™ technology with Rapid Motion™ and overdrive provides smooth, undistorted rendering of fast-moving video

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

Four-way ergonomic stand boasts pivot, swivel, tilt and height-adjustment up to 150mm to maximize your viewing comfort

Ultra-thin black bezel provides a neutral color surround to minimize unwanted peripheral influence when used for color-critical viewing. The power indicator LED also can be dimmed and even disabled to further enhance viewing.

Model	LCD2180WGLEDKBSV	LCD19905Xi-BK-SV	LCD2090UXi-BK-SV	LCD2190UXi-BK-SV	LCD2490WUXiBKSV	LCD2690WUXiBKSV	
Display	Viewable Size Image	21.3"	19"	20.1"	21.3"	24.1"	25.5"
	Pixel Pitch	0.270mm	0.294mm	0.255mm	0.270mm	0.27mm	0.287mm
	Brightness (typical)	94 @ native resolution	86 @ native resolution	100 @ native resolution	94 @ native resolution	94 @ native resolution	89 @ native resolution
	Viewing Angle (typical)	200 cd/m ² (with ColorComp off)	270 cd/m ² (with ColorComp off)	280 cd/m ² (with ColorComp off)	250 cd/m ² (with ColorComp off)	400 cd/m ²	400 cd/m ²
Response Time (typical)	430:1	600:1	700:1	500:1	800:1 (with ColorComp off)	800:1 (with Color Comp off)	800:1 (with Color Comp off)
	176° Vert., 176° Hor. (88U/88D/88L/88R) @ CR > 10 Rapid Response (20ms)	178° Vert., 178° Hor. (89U/89D/89L/89R) @ CR > 10 Rapid Response (18ms)	178° Vert., 178° Hor. (89U/89D/89L/89R) @ CR > 10 Rapid Response (16ms)	178° Vert., 178° Hor. (89U/89D/89L/89R) @ CR > 10 Rapid Response (16ms)	178° Vert., 178° Hor. (89U/89D/89L/89R) @ CR > 10 Rapid Response (16ms)	178° Vert., 178° Hor. (89U/89D/89L/89R) @ CR > 10 Rapid Response (16ms)	178° Vert., 178° Hor. (89U/89D/89L/89R) @ CR > 10 Rapid Response (16ms)
Display Colors	More than 16 million with 8-bit video card/More than 1 billion with 10-bit video card	16.7 million out of 68.5 billion	16.7 million out of 68.5 billion	16.7 million out of 68.5 billion			
Color Gamut (Size/Coverage)*	107% / 100% Adobe RGB NTSC	76% / 75% 72% / 71%	76% / 74% 72% / 71%	77% / 76% 74% / 74%	76% / 75% 72% / 71%	95% / 93% 91% / 88%	
Synchronization Range	Horizontal	75 kHz	31.5-81.1 KHz (Analog/Digital)	31.5-91.1 KHz (Analog/Digital)	31.5-91.1 KHz (Analog/Digital)	31.5-93.8/119.2KHz (Analog/Digital)	31.5-93.8/119.2 KHz (Analog/Digital)
	Vertical	60 Hz	50-85 Hz	50-85 Hz	50-85 Hz	50-85 Hz	51-85 Hz
Input Signal	Video Sync	NA NA	ANALOG RGB 0.7 Vp-p/75 Ohms Separate sync: TTL Level (Positive/Negative) Composite sync: TTL Level (Positive/Negative) Composite sync on green: (0.3Vp-p negative 0.7Vp-p positive)	ANALOG RGB 0.7 Vp-p/75 Ohms Separate sync: TTL Level (Positive/Negative) Composite sync: TTL Level (Positive/Negative) Composite sync on green: (0.3Vp-p negative 0.7Vp-p positive)	ANALOG RGB 0.7 Vp-p/75 Ohms Separate sync: TTL Level (Positive/Negative) Composite sync: TTL Level (Positive/Negative) Composite sync on green: (0.3Vp-p negative 0.7Vp-p positive)	ANALOG RGB 0.7 Vp-p/75 Ohms Separate sync: TTL Level (Positive/Negative) Composite sync: TTL Level (Positive/Negative) Composite sync on green: (0.3Vp-p negative 0.7Vp-p positive)	ANALOG RGB 0.7 Vp-p/75 Ohms Separate sync: TTL Level (Positive/Negative) Composite sync: TTL Level (Positive/Negative) Composite sync on green: (0.3Vp-p negative 0.7Vp-p positive)
	Input	2X DVI-D (10-bit video support on Input 2)	DVI-D, DVI-I & VGA 15 pin D-sub	DVI-D, DVI-I & VGA 15 pin D-sub	DVI-D, DVI-I & VGA 15 pin D-sub	DVI-D, DVI-I & VGA 15 pin D-sub	DVI-D, DVI-I & VGA 15 pin D-sub
Resolutions Supported	DIGITAL 1600 x 1200 @ 60 Hz	ANALOG/DIGITAL 640 x 400 @ 70-85 Hz 720 x 400 @ 70-85 Hz 640 x 480 @ 60-85 Hz 800 x 600 @ 56-85 Hz 832 x 624 @ 75 Hz 1024 x 768 @ 60-85 Hz 1152 x 864 @ 70-85 Hz 1152 x 870 @ 75 Hz 1280 x 960 @ 60 Hz 1280 x 1024 @ 60-75 Hz	ANALOG/DIGITAL 640 x 400 @ 70-85 Hz 720 x 400 @ 70-85 Hz 640 x 480 @ 60-85 Hz 800 x 600 @ 56-85 Hz 832 x 624 @ 75 Hz 1024 x 768 @ 60-85 Hz 1152 x 864 @ 70-85 Hz 1152 x 870 @ 75 Hz 1280 x 960 @ 60 Hz 1280 x 1024 @ 60-85 Hz 1600 x 1200 @ 60 Hz	ANALOG/DIGITAL 640 x 400 @ 70-85 Hz 720 x 400 @ 70-85 Hz 640 x 480 @ 60-85 Hz 800 x 600 @ 56-85 Hz 832 x 624 @ 75 Hz 1024 x 768 @ 60-85 Hz 1152 x 864 @ 70-85 Hz 1152 x 870 @ 75 Hz 1280 x 960 @ 60 Hz 1280 x 1024 @ 60-85 Hz 1600 x 1200 @ 60 Hz	ANALOG/DIGITAL 640 x 400 @ 70-85 Hz 720 x 400 @ 70-85 Hz 640 x 480 @ 60-85 Hz 800 x 600 @ 56-85 Hz 832 x 624 @ 75 Hz 1024 x 768 @ 60-85 Hz 1152 x 864 @ 70-85 Hz 1152 x 870 @ 75 Hz 1280 x 960 @ 60 Hz 1280 x 1024 @ 60-75 Hz 1600 x 1200 @ 60 Hz 1920 x 1200 @ 60 Hz	ANALOG/DIGITAL 640 x 400 @ 70-85 Hz 720 x 400 @ 70-85 Hz 640 x 480 @ 60-85 Hz 800 x 600 @ 56-85 Hz 832 x 624 @ 75 Hz 1024 x 768 @ 60-85 Hz 1152 x 864 @ 70-85 Hz 1152 x 870 @ 75 Hz 1280 x 960 @ 60 Hz 1280 x 1024 @ 60-75 Hz 1600 x 1200 @ 60 Hz 1920 x 1200 @ 60 Hz	ANALOG/DIGITAL 640 x 400 @ 70-85 Hz 720 x 400 @ 70-85 Hz 640 x 480 @ 60-85 Hz 800 x 600 @ 56-85 Hz 832 x 624 @ 75 Hz 1024 x 768 @ 60-85 Hz 1152 x 864 @ 70-85 Hz 1152 x 870 @ 75 Hz 1280 x 960 @ 60 Hz 1280 x 1024 @ 60-75 Hz 1600 x 1200 @ 60 Hz 1920 x 1200 @ 60 Hz
Recommended Resolution	1600 x 1200	1280 x 1024 @ 60 Hz	1600 x 1200 @ 60 Hz	1600 x 1200 @ 60 Hz	1920 x 1200 @ 60 Hz	1920 x 1200 @ 60 Hz	
Additional Features	Ultra-thin frame (bezel), tilt base, XtraView+ wide-angle viewing technology, cable management, ColorComp screen uniformity correction, OmniColor 6-axis color control, 10-bit video input (using DualLink DVI), sRGB and Adobe RGB color space emulation, digital controls, vacation switch, power-off timer, color temperature mode, serial number display, Rapid Response, ISO 13406-2	Ultra-thin-frame (bezel), No Touch Auto Adjust, NaViSet software, tilt, VESA mount, sRGB, cable management, touch-enabled, swivel, vacation switch, height-adjustable stand, 12-bit gamma, AmbiBright, pivot, ColorComp, overdrive, eco-mode, real-time clock, quick release stand, Ambix ³	Ultra-thin-frame (bezel), No Touch Auto Adjust, NaViSet software, tilt, VESA mount, sRGB, cable management, touch-enabled, swivel, vacation switch, height-adjustable stand, 12-bit gamma, AmbiBright, pivot, ColorComp, overdrive, eco-mode, real-time clock, quick release stand, Ambix ³	Ultra-thin-frame (bezel), No Touch Auto Adjust, NaViSet software, tilt, VESA mount, sRGB, cable management, touch-enabled, swivel, vacation switch, height-adjustable stand, 12-bit gamma, AmbiBright, pivot, ColorComp, overdrive, eco-mode, real-time clock, quick release stand, Ambix ³	Ultra Thin-frame (bezel), No Touch Auto Adjust, NaViSet software, tilt, VESA mount, sRGB, cable management, touch-enabled, swivel, vacation switch, height-adjustable stand, 12-bit gamma, AmbiBright, pivot, ColorComp, overdrive, Eco-Mode, real-time clock, quick-release stand, Ambix ³ , X-Light Pro	Ultra Thin-frame (bezel), No Touch Auto Adjust, NaViSet software, tilt, VESA mount, sRGB, cable management, touch-enabled, swivel, vacation switch, height-adjustable stand, 12-bit gamma, AmbiBright, pivot, ColorComp, overdrive, Eco-Mode, real-time clock, quick-release stand, Ambix ³ , X-Light Pro	Ultra Thin-frame (bezel), No Touch Auto Adjust, NaViSet software, tilt, VESA mount, sRGB, cable management, touch-enabled, swivel, vacation switch, height-adjustable stand, 12-bit gamma, AmbiBright, pivot, ColorComp, overdrive, Eco-Mode, real-time clock, quick-release stand, Ambix ³ , X-Light Pro
Touch-Capable	No	Designed for integration	Designed for integration	Designed for integration	Designed for integration	Designed for integration	
Voltage Rating	100-240V @ 50-60 Hz	AC 100-120V / AC 220-240V	AC 100-120V / AC 220-240V				
Power Consumption (typical)	On Power Savings Mode	100W 7W	46W < 1W	50W < 1W	50W < 1W	83W 1W	111W 1W
Dimensions (WxHxD)	Net (with stand)	18.6 x 18.2 x 8.3 in./ 473 x 461.7 x 211.9mm	15.8 x 14.4-19.5 x 9.7 in./ 402.3 x 410.7-560.7 x 247.3mm	17.3 x 16.4-22.3 x 9.7 in./ 439.2 x 415.5-565.5 x 247.3mm	18.3 x 16.7-22.6 x 9.7 in./ 464.8 x 424.8-574.8 x 247.3mm	21.8 x 17 x 12 in./ 554.2 x 432.4 x 306mm	23.2 x 17.5 x 12 in./ 589.8 x 444.2 x 306mm
	Net (without stand)	18.6 x 14.6 x 4.9 in./ 473 x 370.4 x 124.5mm	15.8 x 13 x 3.1 in./ 402.3 x 330.3 x 80mm	17.3 x 13.4 x 3.3 in./ 439.2 x 340 x 85mm	18.3 x 14.1 x 3.3 in./ 464.8 x 358.6 x 85mm	21.8 x 14.2 x 4.1 in./ 554.2 x 359.8 x 104mm	23.2 x 15.1 x 4.1 in./ 589.8 x 383.4 x 104mm
Net Weight	(with stand)	40.3 lbs./18.3 kg	19.8 lbs./9 kg	21.4 lbs./9.7 kg	24 lbs./10.9 kg	26 lbs./11.8 kg	27.7 lbs./12.6 kg
	(without stand)	31.1 lbs./14.1 kg	13.8 lbs./6.3 kg	15.4 lbs./7 kg	18.1 lbs./8.2 kg	18.5 lbs./8.4 kg	20.2 lbs./9.2 kg
VESA Hole Configuration Specifications	100 x 100mm	100 x 100mm	100 x 100mm	100 x 100mm	100 x 100mm	100 x 100mm	
Environmental Conditions	Operating Temperature	5-35° C/41-95° F	5-35° C/41-95° F	5-35° C/41-95° F	5-35° C/41-95° F	5-35° C/41-95° F	5-35° C/41-95° F
	Operating Humidity	30-80%	30-80%	30-80%	30-80%	30-80%	30-80%
	Operating Altitude	3658m/12,001 ft.	3048m/10,000 ft.	3048m/10,000 ft.	3048m/10,000 ft.	3048m/10,000 ft.	3048m/10,000 ft.
	Storage Temperature	-10-60° C/14-140° F	-10-60° C/14-140° F	-10-60° C/14-140° F	-10-60° C/14-140° F	-10-60° C/14-140° F	-10-60° C/14-140° F
	Storage Humidity	10-85%	10-85%	10-85%	10-85%	10-85%	10-85%
Storage Altitude	12,192m/40,000 ft.	12,192m/40,000 ft.	12,192m/40,000 ft.	12,192m/40,000 ft.	12,192m/40,000 ft.	12,192m/40,000 ft.	
Regulatory Approvals	UL/C-UL or CSA, FCC Class B/Canadian DOC, TUV GS, TUV Ergonomie, CE	UL/C-UL or CSA, FCC Class B/Canadian DOC, TUV GS, TUV Ergonomie, CE	UL/C-UL or CSA, FCC Class B/Canadian DOC, TUV GS, TUV Ergonomie, CE	UL/C-UL or CSA, FCC Class B/Canadian DOC, TUV GS, TUV Ergonomie, CE	UL/C-UL or CSA, FCC Class B/Canadian DOC, TUV GS, TUV Ergonomie, CE	UL/C-UL or CSA, FCC Class B/Canadian DOC, TUV GS, TUV Ergonomie, CE	
RoHS Compliant	Yes	Yes	Yes	Yes	Yes	Yes	
Limited Warranty	3 years parts and labor, including backlight	4 years parts and labor, including backlight	4 years parts and labor, including backlight	4 years parts and labor, including backlight	4 years parts and labor, including backlight	4 years parts and labor, including backlight	
Technical Support	M - F (7am - 7pm CST)	M - F (7am - 7pm CST)	M - F (7am - 7pm CST)	M - F (7am - 7pm CST)	M - F (7am - 7pm CST)	M - F (7am - 7pm CST)	

SpectraView_{ii} Software Requirements

Apple Mac OS X 10.2.8 or higher/Microsoft Windows 2000, XP, XP x64, Server 2003 or Vista 32 bit.
At least one available USB port for GretagMacbeth color sensor.

Visit www.necdisplay.com for the latest requirements.

* **Color Gamut Size and Coverage** calculated as 2D gamut area in CIE 1931 xy colorspace. **Size** is the total relative display gamut area and includes any colors outside the reference gamut. **Coverage** is the relative display gamut area contained inside the reference gamut. NTSC values provided for comparison purposes – modern broadcast video uses SMPTE-C, ITU-R BT. 709-5/sRGB or EBU primaries.



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