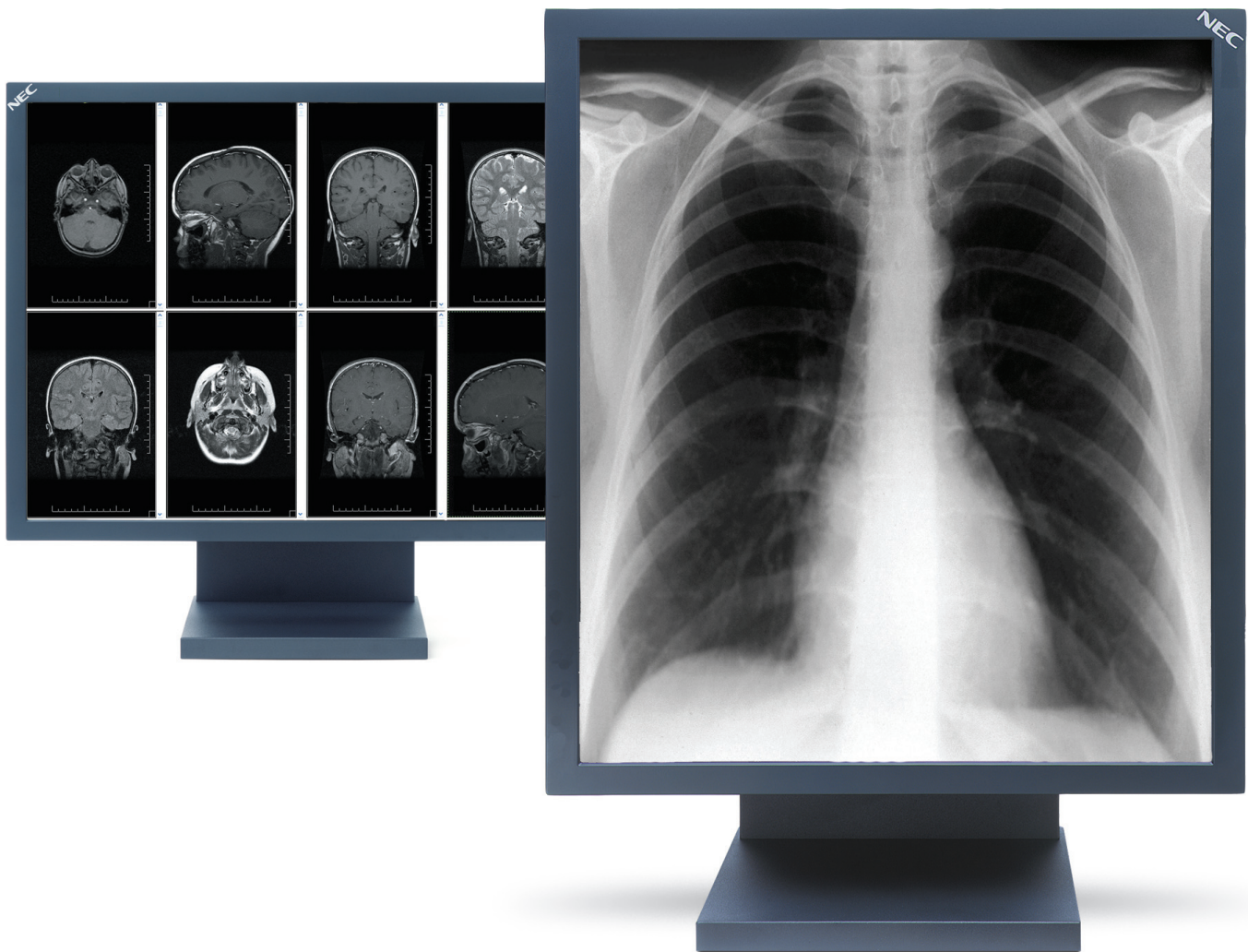


# NEC MultiSync® MD Series

21.3" grayscale medical-grade LCD displays ideal for diagnostic imaging



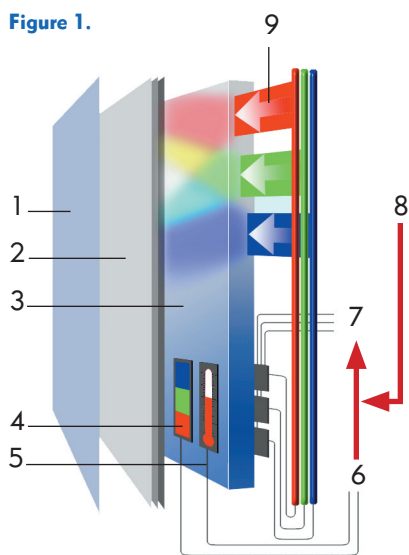
NEC MULTISYNC  SERIES The clear choice in diagnostic viewing.

Modern medical technology enables complex examinations. But in the end, it is the radiologist who is responsible for fast and accurate diagnostic findings. To support these findings in a soft copy reading environment, flat-panel displays need to comply with the highest visual requirements. Their image quality has a decisive influence on diagnostic accuracy.

MultiSync MD Series grayscale displays – in combination with the appropriate graphics controller – are designed for diagnostic imaging and for use in Picture Archiving and Communication System (PACS) applications. Furthermore, diagnostic imaging displays from NEC Display Solutions are based on technologies and functions which actively contribute to a reduction of cost of ownership.



Figure 1.



### X-Light technology - a view behind the screen

- 1 LCD panel
- 2 Polariser diffusing plate, etc.
- 3 Light guide plate
- 4 Color sensor
- 5 Temperature sensor
- 6 Current data of color sensor and temperature sensor
- 7 Control of 3 inverters
- 8 Calibration of whitepoint via pre-calibration in factory, software (GammaComp MD) or reference value of external sensor
- 9 Light sources, white light using a mixture of different phosphor colors

**Factory calibration and consistency.** Using state-of-the-art equipment during production, each NEC MultiSync MD Series monitor is calibrated to the DICOM display function for luminance and to a desired whitepoint (color of the white). NEC Display Solutions' patent-pending X-Light™ technology (Fig. 1) has the unique ability to control and adjust the luminance and whitepoint via an integrated fast-feed-back internal backlight sensor, which continuously monitors and realigns these settings to maintain the factory calibration throughout the life of the monitor. X-Light technology also alleviates the color shift of the backlight to the yellow spectrum.

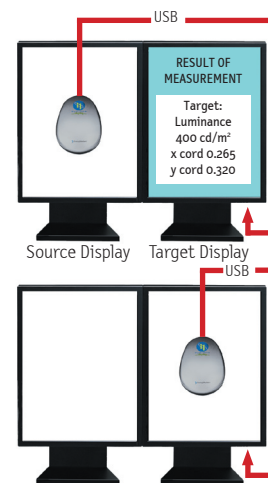
**Monitor matching and reduced downtime.** X-Light helps reduce service costs

as it enables a more flexible use of display equipment. Since all X-Light-equipped monitors are set for the same whitepoint during production, they can be exchanged at any time within one location and swapped in existing dual- or multi-screen configurations without calibration.

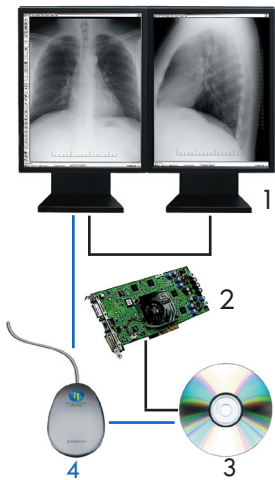
**Standalone calibration and monitor matching.** NEC MultiSync MD Series monitors have been designed to maintain their factory calibration. However, if calibration or matching (Fig. 2) to a replacement is required, the monitors can be configured using the built-in, standalone algorithm programmed into the monitor's firmware. This feature is useful for monitors that are not used in a setup where calibration can easily be performed with a PC and external software or non-supported operating systems.

**GammaComp™ MD calibration and conformance software.** Quality control and calibration/matching can also be accomplished using GammaComp MD (shipped with display), ensuring consistent image quality on a single display system. The software maintains the monitor's conformance to the DICOM standard, while providing an easy-to-use QA environment for medical imaging. Optionally, GammaComp MD Administrator provides centralized control and management of multiple display systems.

Figure 2.



Display matching in the field



**A typical NEC MultiSync MD Series display system configuration**

- 1 Single or dual head displays
- 2 Display controller board
- 3 GammaComp MD quality control software
- 4 Calibrator (optional)

Therefore, it provides the best conditions for several doctors doing consultation in front of the display.

**Multiple video card support.** NEC MultiSync MD Series monitors work with 10-bit or 8-bit cards, however, 10-bit is recommended for optimum performance. 10-bit provides 1024 out of 3061 shades, while 8-bit provides only 256 out of 3061.

**Internal power supply.** The NEC MultiSync MD Series features an internal power supply. There is no brick to kick, therefore, clutter from a clunky power supply is eliminated.

**Optional accessories.** To add further performance and convenience, these accessories are available for the NEC MultiSync MD Series.

**Protective shield.** As these displays are often used by diagnostic professionals for illustration purposes, it is common for them



**Figure 3.** Attachable protective shield

**3061 shades of gray.** 1024 shades of gray out of a palette of 3061 can be depicted when used with a 10-bit video card.

**Onboard selectable look-up tables (LUTs).** The LUT for adjustment is built into the monitor, making it independent of the video card. The monitor's gamma is factory set to the DICOM GSDF standard, but custom gamma settings can be selected using the built-in LUTs.

**SA Superfine TFT displays with anti-glare and low reflection.** The innovative SA Superfine TFT glass with 2- or 3-Megapixel resolution delivers a brilliant picture with a wide viewing angle of up to 176° and minimal off-angle color shift.

to encounter frequent contact from fingers, pointers and pens. To help protect against LCD screen damage while maintaining the display's optimal image quality, an optional protective shield (Fig. 3) is available. This lightweight accessory, which is quickly and easily attached and removed,

lengthens the life of the screen by fending off scratches caused by surface contact. The 98.5% transparent shield features anti-reflective coating on both sides, anti-fingerprint coating on the outside layer, a hard coat for ruggedness and excellent permanent marker resistance.

**Sentry<sup>DX</sup> remote network sensor.** For non-assisted conformance, calibration and reporting functions, an optional, retractable remote sensor (Fig. 4) is available for NEC MultiSync MD Series displays. This component, which also can be used with non-MD Series monitors, is capable of measuring monitor brightness, whitepoint and ambient lighting, while performing a quality check for DICOM conformance and contrast response.

**GammaComp MD colorimeter.** Featuring perfectly matched coding for NEC MultiSync MD Series displays, this allows for improved accuracy and communication to the display and provides an ideal solution for radiology technicians. Working in conjunction with X-Light, the sensor (Fig. 5) also supports standalone calibration and exact monitor matching, while enhancing calibration and whitepoint matching for better DICOM GSDF conformance.

\* Each end-user environment is unique, therefore NEC Display Solutions recommends that the user follows the quality control and calibration



**Figure 4.** Sentry<sup>DX</sup> attachable remote network sensor



**Figure 5.** GammaComp MD colorimeter



When combined with an NEC MultiSync 90 Series display (left), NEC MultiSync MD Series monitors can help provide an ideal PACS configuration for your facility.

Model	<b>MultiSync MD21GS-2MP</b>	<b>MultiSync MD21GS-3MP</b>
LCD Viewable Image Size	21.3"	21.3"
LCD Module Technology	SA-Superfine Grayscale TFT Glass	SA-Superfine Grayscale TFT Glass
Active Screen Area	43.2 x 32.4 cm	43.3 x 32.5 cm
Native Resolution	1600 x 1200 Landscape/1200 x 1600 Portrait	2048 x 1536 Landscape/1536 x 2048 Portrait
Pixel Pitch	0.27mm	0.21mm
Brightness at Native (typical)	900 cd/m <sup>2</sup> (263 fl) max, 400 cd/m <sup>2</sup> (117 fl) calibrated	700 cd/m <sup>2</sup> (204 fl) max, 400 cd/m <sup>2</sup> (117 fl) calibrated
Contrast Ratio (typical)	700:1	700:1
Response Time (typical)	35ms	35ms
Viewing Angle (typical) (up/down/left/right)	88°/88°/88°/88°	88°/88°/88°/88°
Grayscale Tone	10-bit: 1024 shades of gray from a pallet of 3061	10-bit: 1024 shades of gray from a pallet of 3061
Input Connectors	DVI-D and VGA	DVI-D
Selectable Gamma	DICOM, log-linear, 2.2, 1.8 and programmable	DICOM, log-linear, 2.2, 1.8 and programmable
White Point (color temperature)	Clear base x = .292, y = .321, Approx. 8000 K	Clear base x = .292, y = .321, Approx. 8000 K
Sensor Calibration Brightness/White Point/External	Yes / Yes / Yes	Yes / Yes / Yes
Power Supply (internal)	Yes	Yes
Power Consumption (typical)(120V)	65W	65W
Power Savings	< 3W	< 3W
Tilt, Swivel Stand	25° up/5° down, 340°	25° up/5° down, 340°
Height Adjustable Stand	46mm	46mm
Pivot Enabled Stand	Yes	Yes
VESA Mounting	100 x 100mm	100 x 100mm
USB Input (for external colorimeter)	GammaComp MD sensor (calibration mode)	GammaComp MD sensor (calibration mode)
Dimensions (WxHxD)	18.4 x 18.1 x 7.9 in. (Landscape) 14.1 x 20.2 x 7.9 in. (Portrait)	18.4 x 18.1 x 7.9 in. (Landscape) 14.1 x 20.2 x 7.9 in. (Portrait)
Bezel Width	16mm	16mm
Net Weight	25.8 lbs.	25.8 lbs.
Regulatory Standards	UL2601/EN60601-1/EC601, FCC part 15 class B, CE/MDD, PCT, C-tick, PCBC/B Mark, PSB, EnergyStar, GEEA Energy Label, DIN 6868-57, FDA-510K	UL2601/EN60601-1/EC601, FCC part 15 class B, CE/MDD, PCT, C-tick, PCBC/B Mark, PSB, EnergyStar, GEEA Energy Label, DIN 6868-57, FDA-510K
Protection Glass (optional)	MD21PS-BK	MD21PS-BK
Display Video Cards (preferred)	MDM10B-2MP	MDM10B-3MP
Remote Network Sensor (optional)	Sentry <sup>DX</sup> (MD-N2M5B)	Sentry <sup>DX</sup> (MD-N2M5B)
Colorimeter	GammaComp MD Sensor (MDSVSENSOR)	GammaComp MD Sensor (MDSVSENSOR)
Limited Warranty	3 years, parts and labor (includes Advanced Overnight Exchange)*	3 years, parts and labor (includes Advanced Overnight Exchange)*
Extended Warranty (addtl. 1 yr./addtl. 2 yr.)	EW1-MD2MP21 / EW2-MD2MP21	EW1-MD3MP21 / EW2-MD3MP21

\* Limited to a luminance setting up to 450 cd/m<sup>2</sup> with guaranteed chromaticity match (whitepoint) +/- .01 of CIE x,y, of original factory setting via X-Light technology

NOTE 1: American College of Radiology (ACR) recommends minimum of 171 cd/m<sup>2</sup>

Display video card	<b>MDM10B-2MP</b>	<b>MDM10B-3MP</b>	<b>MDM10B-AVX3MP</b>
Graphics Chip	Matrox 512-bit GPU	Matrox 512-bit GPU	Matrox 256-bit GPU
Memory Type	DDR (Double Data Rate) SDRAM	DDR (Double Data Rate) SDRAM	DDR (Double Data Rate) SDRAM
Memory Size	256 MB	256 MB	128 MB
Main RAMDAC	400 MHz	400 MHz	400 MHz
Secondary RAMDAC	400 MHz	400 MHz	165 MHz
Card Type	PCI 64-bit, 66 MHz	PCI 64-bit, 66 MHz	PCIe x16, low profile
Form Factor	ATX	ATX	Low profile
Maximum Resolution	1920 x 1200 (digital / analog)	2048 x 1536 (digital)	1600 x 1200 (analog); 2048 x 1536 (digital)
Connectors	2 x DVI-I	2 x DVI-I	3 x DVI-I (1 analog, 2 digital)
Certifications	Class A: FCC, CE, CSA, VCCI	Class A: FCC, CE, CSA, VCCI	Class A: FCC, CE, CSA, VCCI
Limited Warranty	1 year	1 Year	1 Year



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