

## **NEC Electronics Europe Announces Three New LCDs for Medical Display Applications**

### ***High-Resolution, Wide-Viewing-Angle LCD Modules to Drive Radiological and Medical Record Imaging Applications***

**DUESSELDORF, Germany, December 9, 2004** — In its latest move to support the growing medical imaging market, NEC Electronics (Europe) GmbH today announced three new 21.3-inch thin-film-transistor (TFT) liquid-crystal display (LCD) modules targeting medical display applications. The medical market has begun to replace its film and paper-based X-ray and medical record systems with digital platforms that must display high-quality, high-resolution images that can be clearly viewed at many different angles. To address these digital platforms, the new LCDs feature large viewing surfaces, frame widths of 12 millimeters (mm) and NEC LCD Technologies' SA-SFT (super-advanced, super-fine technology). SA-SFT, NEC LCD Technologies' proprietary version of ultra-wide viewing angle in-plane switching (IPS) technology, delivers improved panel transmissivity, higher brightness, wider color gamut, faster response times and an oblique viewing angle of up to 170 degrees with reduced color shift. The three versions of the 21.3-inch modules are:

- 2-megapixel monochrome TFT LCD module with a three-color LED backlight system
- 3-megapixel monochrome TFT LCD module with 10-bit input/output
- 3-megapixel high-luminance color TFT LCD module

“Customers are realizing the advantages of using digital images instead of film or paper in medical applications. A digital image is easily shared with other doctors via a network, which reduces the time between taking an X-ray and viewing a diagnostic image, and facilitates image processing and analysis by computer for a more accurate diagnosis,” said Hideoto Tachimoto, Manager Display Management Unit, NEC Electronics Europe. “NEC LCD Technologies and NEC Electronics Europe are supporting medical applications like these by delivering display modules that meet the specific demands of this growing market, particularly with regard to high-resolution monochrome displays.”

The 21.3-inch, 2-megapixel monochrome TFT LCD module with a three-color LED backlight system allows for customization of the display's white point levels by controlling the luminance of each individual LED color. The display module also has a built-in luminance and color sensor

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capable of supporting external communication functions. With this module, users can choose the base screen color (P45 blue base or P104 clear base) best suited for their applications.

The 21.3-inch, 3-megapixel monochrome TFT LCD module (part number NL204153BM21-xx) uses a 10-bit TFT LCD source driver to enable individual sub-pixel control of 1024 greyscales from input to output, achieving simultaneous display of 3070 greyscales (equivalent to 11.5 bits). Furthermore, the NL204153BM21-xx module's 12-bit internal look-up table (LUT) enables the selection of the most suitable greyscales through the use of the greyscale standard display function (GSDF) as defined by part 14 of the DICOM standard. The module's advanced greyscale features provide the extremely high-quality monochrome images needed for radiographic image displays, particularly those used in mammography.

In addition to the SA-SFT technology used on all three products, the 3-megapixel color LCD module (part number NL204153AC21-03) offers a high-intensity direct backlight system that provides 450 cd/m<sup>2</sup> luminance to further enhance viewability. This display module's brightness and ability to display both monochrome and full-color images make it ideal for radiogram and medical information display applications.

### **Pricing and Availability**

For sample pricing and availability of the three new LCD modules, contact NEC Electronics Europe or visit the NEC Electronics Europe website at <http://www.ee.nec.de>.

### **About NEC Electronics (Europe) GmbH**

NEC Electronics (Europe) GmbH, headquartered in Duesseldorf, Germany, is a leading developer, manufacturer and supplier of semiconductor products in Europe. Committed to meeting customers' cost, performance and time-to-market requirements, the company offers solutions ranging from standard products to system-on-a-chip (SoC) solutions, as well as customized products for next-generation designs. NEC Electronics also offers customers the benefit of state-of-the-art manufacturing locally in Europe, besides the global production of its parent company, NEC Electronics Corporation. Additionally, NEC Electronics (Europe) GmbH is the exclusive European sales and marketing channel of LCD modules from NEC LCD Technologies Ltd.. For more information visit <http://www.ee.nec.de>.

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**LCD Display Specifications:**

**1) 2-megapixel monochrome TFT LCD module with a three-color LED backlight system**

Display mode	Amorphous silicon TFT active-matrix
Display size	Diagonal screen size of 21.3 inches (54 cm)
Pixel	Horizontal 1,600 x vertical 1,200 (1,920,000 pixels)
Dot	5,760,000 (dot)
Pixel arrangement	LCR vertical stripe
Pixel pitch	Horizontal 0.27 mm x vertical 0.27 mm
Display greyscale	256 greyscale per 1 subpixel
White chromaticity	P104 and P45-like
Luminance	White chromaticity P104: 930 cd/m <sup>2</sup> TYP. White chromaticity P45-like: 1,000 cd/m <sup>2</sup> typ.
Contrast ratio	TBD
Interface	LVDS 2-port
Viewing angle range	Horizontal: 170 degrees; vertical: 170 degrees typ. (contrast ratio at over 10:1)
Backlight	LED array type

**2) 3-megapixel monochrome TFT LCD module with 10-bit input/output**  
**(part number NL204153BM21-xx)**

Display mode	Amorphous-silicon TFT active-matrix
Display size	Diagonal screen size of 21.3 inches (54 cm)
Pixel	Horizontal 2,048 x vertical 1,536 (3,145,728 pixels)
Dot	9,437,184 (dot)
Pixel arrangement	LCR vertical stripe
Pixel pitch	Horizontal 0.211 mm x vertical 0.2115 mm
Display grayscale	256 greyscale per 1 subpixel
White chromaticity	P104 and P45-like
Luminance	800 cd/m <sup>2</sup> typ.
Contrast ratio	700:1 typ.
Interface	LVDS 4-port
Viewing angle range	Horizontal: 170 degrees; vertical: 170 degrees typ. (contrast ratio at over 10:1)
Backlight	CCFL type (edge light)

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**3). 3-megapixel high-luminance color TFT LCD module**  
**(part number NL204153AC21-03)**

Display mode	Amorphous-silicon TFT active-matrix
Display size	Diagonal screen size of 21.3 inches (54 cm)
Pixel	Horizontal 2,048 × vertical 1,536 (3,145,728 pixels)
Dot	9,437,184 (dot)
Pixel arrangement	RGB vertical stripe
Pixel pitch	Horizontal 0.2115 mm × vertical 0.2115 mm
Display color	16,777,216 colors
Color gamut	72% typ. (against NTSC color space)
Luminance	450 cd/m <sup>2</sup> typ.
Contrast ratio	400:1 typ.
Interface	LVDS 4-port
Viewing angle range	Horizontal: 170 degrees; vertical: 170 degrees typ. (contrast ratio at over 10:1)
Backlight	CCFL type (direct)