Medical Displays Respond to the Touch

Ralph Polshak, Optrex America, Inc., www.optrex.com

Medical devices present a special and challenging set of requirements for LCD displays. They need to provide high quality images with high contrast, high resolution images and data, as well as resistance to glare in high-ambient-light environments such as ambulatory surgical units, emergency rooms, operating rooms, and intensive care units. Portable medical devices must provide a rugged and bright display with lower power when powered by batteries. Displays incorporated into medical devices used in emergency vehicles must be able to withstand extreme conditions; temperature, shock, and vibration.

TFT LCDs have become the defacto standard for medical device displays, displacing the large, bulky, heat-generating CRT (cathode ray tube) monitors that were used for many years. Most medical diagnostic devices utilize TFT LCDs in the 6.5? to 19? diagonal range, and these displays have been incorporating a number of technological advancements that enable them to display more information and make it easier for medical professionals to read and interpret the critical data presented.

Fig. 1: Resistive touch screens offer High reliability and durability, high accuracy, multiple input modes such as finger or stylus, high transmittance (>80%), and wide operating temperature range.

Incorporating Touch Screens

The human/machine interface for most medical imaging systems has traditionally depended upon a keyboard and a mouse or roller ball device. Incorporating a touch interface not only makes the operator more efficient and effective, but it also enriches the visual experience for the operator and patient, enhancing understanding of the images on the screen. LCDs with touch screens are becoming more and more popular in medical displays. A touch screen display provides the ability for the user to make choices by simply touching icons or graphical buttons on the screen. This provides for more efficient interfaces and smaller overall product sizes. There are several touch technologies available, including 4-, 5- and 8-wire resistive, surface capacitive, projected capacitive, and surface acoustic wave (SAW). Resistive touch screens offer a number of features, including high reliability, durability, high accuracy, multiple input modes such as finger or stylus, high transmittance (>80%), wide operating temperature range, and decontamination cleaning capability.

Optrex has also developed a new surface capacitive touch switch based on technology experience gained in the smart phone market that detects variations in position and responds to fingertip input without requiring the application of significant pressure. This touch technology offers reduced reflectivity and higher transparency, resulting in improved visibility of the displayed image through the touch panel. It also offers a thinner touch screen in front of the LCD (as thin as 0.5 mm - 0.7 mm thick in the viewing area). These capacitive touch screens provide superior optical performance, excellent endurance, and high reliability over long periods of extensive use. With this superior performance and medical / surgical glove operation capability, they are fast becoming the preferred choice for highly demanding applications such as medical displays. This new technology is being integrated into smaller displays at

Fig 2: Touch screens are being integrated into more and more displays, such as this 3.5-inch diagonal room temperature control display.

present (3.0”, 3.5” diagonal), with larger displays (5.7” and 6.5”) under development. Ultimately, in the next generation of medical equipment, touch screen technology will be increasingly integrated into everything from bedside patient monitors to the thermostats controlling the temperature in hospital rooms (as shown in Fig. 2).

Medical Displays present a special challenge for LCD manufacturers. A vertically integrated display OEM needs to meet the demand for higher functionality, improved high-ambient-light readability, extreme durability, long-term support for the medical equipment life cycles, critical cleaning requirements, and the integration of new technologies such as touch screens into the next generation of medical device displays.

Source URL (retrieved on *12/17/2014 - 4:31pm*):
http://www.ecnmag.com/articles/2010/12/medical-displays-respond-touch