Touch Screen Systems

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A touch screen is an input device that allows users to operate a PC by simply touching the display screen. Touch input is suitable for a wide variety of computing applications. A touch screen can be used with most PC systems as easily as other input devices such as track balls or touch pads. Browse the links below to learn more about touch input technology and how it can work for you.

How Does a Touch screen Work?

A basic touch screen has three main components: a touch sensor, a controller, and a software driver. The touch screen is an input device, so it needs to be combined with a display and a PC or other device to make a complete touch input system.

A Touch Screen looks like :

1. Touch Sensor

A touch screen sensor is a clear glass panel with a touch responsive surface. The touch sensor/panel is placed over a display screen so that the responsive area of the panel covers the viewable area of the video screen. There are several different touch sensor technologies on the market today, each using a different method to detect touch input. The sensor generally has an electrical current or signal going through it and touching the screen causes a voltage or signal change. This voltage change is used to determine the location of the touch to the screen.

2. Controller

The controller is a small PC card that connects between the touch sensor and the PC. It takes information from the touch sensor and translates it into information that PC can understand. The controller is usually installed inside the monitor for integrated monitors or it is housed in a plastic case for external touch add-ons/overlays. The controller determines what type of interface/connection you will need on the PC. Integrated touch monitors will have an extra cable connection on the back for the touch screen. Controllers are available that can connect to a Serial/COM port (PC) or to a USB port (PC or Macintosh). Specialized controllers are also available that work with DVD players and other devices.

3. Software Driver

The driver is a software update for the PC system that allows the touch screen and computer

to work together. It tells the computer's operating system how to interpret the touch event information that is sent from the controller. Most touch screen drivers today are a mouse-emulation type driver. This makes touching the screen the same as clicking your mouse at the same location on the screen. This allows the touch screen to work with existing software and allows new applications to be developed without the need for touch screen specific programming. Some equipment such as thin client terminals, DVD players, and specialized computer systems either do not use software drivers or they have their own built-in touch screen driver.

What Are Touch screens Used For ?

The touch screen is one of the easiest PC interfaces to use, making it the interface of choice for a wide variety of applications. Here are a few examples of how touch input systems are being used today:

Public Information Displays

Information kiosks, tourism displays, trade show displays, and other electronic displays are used by many people that have little or no computing experience. The user-friendly touch screen interface can be less intimidating and easier to use than other input devices, especially for novice users. A touch screen can help make your information more easily accessible by allowing users to navigate your presentation by simply touching the display screen.

Retail and Restaurant Systems

Time is money, especially in a fast paced retail or restaurant environment. Touch screen systems are easy to use so employees can get work done faster, and training time can be reduced for new employees. And because input is done right on the screen, valuable counter space can be saved. Touch screens can be used in cash registers, order entry stations, seating and reservation systems, and more.

Customer Self-Service

In today's fast pace world, waiting in line is one of the things that has yet to speed up. Self-service touch screen terminals can be used to improve customer service at busy stores, fast service restaurants, transportation hubs, and more. Customers can quickly place their own orders or check themselves in or out, saving them time, and decreasing wait times for other customers. Automated bank teller (ATM) and airline e-ticket terminals are examples of self-service stations that can benefit from touch screen input.

Control and Automation Systems

The touch screen interface is useful in systems ranging from industrial process control to home automation. By integrating the input device with the display, valuable workspace can be saved. And with a graphical interface, operators can monitor and control complex operations in real-time by simply touching the screen.

Computer Based Training

Because the touch screen interface is more user-friendly than other input devices, overall training time for computer novices, and therefore training expense, can be reduced. It can also help to make learning more fun and interactive, which can lead to a more beneficial training experience for both students and educators.

Assistive Technology

The touch screen interface can be beneficial to those that have difficulty using other input devices such as a mouse or keyboard. When used in conjunction with software such as on-screen keyboards, or other assistive technology, they can

help make computing resources more available to people that have difficulty using computers.

And many more uses

The touch screen interface is being used in a wide variety of applications to improve human-computer interaction. Other applications include digital jukeboxes, computerized gaming, student registration systems, multimedia software, financial and scientific applications, and more.

Comparing Touch screen and Display Technologies

There are two types of touch screen and display technologies :

· Comparing Touch Technologies

· Comparing Conventional CRT and Flat Panel LCD Monitors

Comparing Touch Technologies

4-Wire Resistive Touch screens

4-Wire Resistive touch technology consists of a glass or acrylic panel that is coated with electrically condictive and resistive layers. The thin layers are separated by invisible separator dots. When operating, an electrical current moves through the screen. When pressure is applied to the screen the layers are pressed together, causing a change in the electrical current and a touch event to be registered.

4-Wire Resistive type touch screens are generally the most affordable. Although clarity is less than with other touch screen types, resistive screens are very durable and can be used in a variety of environments. This type of screen is recommended for individual, home, school, or office use, or less demanding point-of-sale systems, restaurant systems, etc.
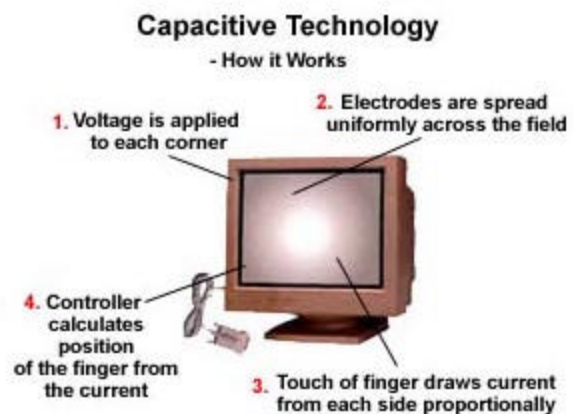
5-Wire Resistive Touch screens

5-Wire Resistive touch technology consists of a glass or acrylic panel that is coated with electrically condictive and resistive layers. The thin layers are separated by invisible separator dots. When operating, an electrical current moves through the screen. When pressure is applied to the screen the layers are pressed together, causing a change in the electrical current and a touch event to be registered.

5-Wire Resistive type touch screens are generally more durable than the similiar 4-Wire Resistive type. Although clarity is less than with other touch screen types, resistive screens are very durable and can be used in a variety of environments. This type of screen is recommended for demanding point-of-sale systems, restaurant systems, industrial controls, and other workplace applications.

Capacitive Touch screens

A capacitive touch screen consists of a glass panel with a capacitive (charge storing) material coating its surface. Circuits located at corners of the screen measure the capacitance of a person touching the overlay. Frequency changes are measured to determine the X and Y coordinates of the touch event.

Capacitive Technology
- How it Works

1. Voltage is applied to each corner
2. Electrodes are spread uniformly across the field
3. Touch of finger draws current from each side proportionally
4. Controller calculates position of the finger from the current

Capacitive type touch screens are very durable, and have a high clarity. They are used in a wide range of applications, from restaurant and POS use to industrial controls and information KIOSKS.

Pen Touch Capacitive Touch screens

The Pen Touch Capacitive screen is a durable Capacitive type touch screen with an attached pen stylus. The Pen Touch screen can be set to respond to finger input only, pen input only, or both. A capacitive touch screen consists of a glass panel with a capacitive (charge storing) material coating its surface. Circuits located at corners of the screen measure the capacitance of a person touching the overlay. Frequency changes are measured to determine the X and Y coordinates of the touch event.

Capacitive type touch screens are very durable, and have a high clarity. They are used in a wide range of applications, from restaurant and POS use to industrial controls and information kiosks.

Surface Acoustic Wave Touch screens

Surface Acoustic Wave technology is one of the most advanced touch screen types. It is based on sending acoustic waves across a clear glass panel with a series of transducers and reflectors. When a finger touches the screen, the waves are absorbed, causing a touch event to be detected at that point.

Because the panel is all glass there are no layers that can be worn, giving this technology the highest durability factor and also the highest clarity. This technology is recommended for public information kiosks, computer based training, or other high traffic indoor environments.

Near Field Imaging Touch screens

We offer Near Field Imaging touch screen technology as one of the custom LCD touch monitor solutions that we can provide. It is an extremely durable screen that is suited for use in industrial control systems and other harsh environments. The NFI type screen is not affected by most surface contaminants or scratches. Responds to finger or gloved hand. Follow this link for more information.

Comparing Conventional CRT and Flat Panel LCD Monitors

Physical Size

One of the biggest advantages of LCD monitors is that they are compact and lightweight. An LCD monitor is based upon a very thin screen as opposed to the bulky tube of a CRT monitor. This means that not only do they take up less of your desktop space, they can also be used in many places where a larger CRT monitor can not fit. Shown here, a 12.1" LCD monitor with a stand takes up only about one-third of the desk space of a typical 14" CRT monitor.

Display Size

Thanks to advances in LCD technology, color flat panel LCD monitors are now available that are comparable in screen size to traditional CRT monitors. Shown here, a 12.1" LCD display (left) has only a slightly smaller viewing area than a typical 14" CRT monitor. Newer, larger LCD monitors are also appearing that have 15", 17", and even larger screen sizes that are comparable to the largest CRT monitors. One thing to note is that LCD monitors are typically sized by their actual viewable diagonal measurement, but CRTs typically are not. For example, the viewable area on a 17" LCD monitor will typically measure 17" diagonally, but the viewable area on a CRT monitor will typically only measure 16" diagonally.

Colors

Most CRT monitors are capable of displaying unlimited colors. Some LCD monitors

are only capable of hundreds or thousands of colors, but many of the newer LCD's are capable of unlimited colors.

Resolution

An important issue with LCD monitors is resolution. CRT monitors are usually capable of displaying multiple video resolutions, each with the same quality. LCD monitors, however, usually has what is called a Native resolution, or the resolution that it displays best. The native resolution is generally the highest resolution that the LCD can display and this is the display resolution that will appear the crispest/sharpest.

Brightness

Typically, brightness is not a concern with CRT monitors. LCD monitors are backlit and have different levels of brightness. The brightness rating for an LCD monitor is commonly referred to as 'nits', and commonly range from 70 to 250 nits. The higher the nits, the brighter the display.

Viewing Angle

Another issue with the LCD monitor is the viewing angle. A CRT screen can be looked at from a very wide angle, practically from the side, but an LCD monitor typically has a smaller viewing angle, needing to be viewed more directly from the front. From the side, the image on an LCD screen can seem to disappear, or invert colors. Newer displays that are coming out have wider viewing angles so this is not as much of an issue as it has been in the past.

Power Consumption and Radiation Emission

Besides being compact and space saving, LCD displays offer several other benefits. For one, LCD monitors consume much less energy than CRT monitors. This makes the LCD great for laptop and portable computers. Secondly, CRT monitors are known to emit harmful radiation, whereas LCD monitors do not.

Price

CRT monitors are generally more affordable than LCD monitors. In the past LCD monitors have been very expensive but their costs have come down quite a bit in the last 1-2 years. One thing to consider is the up-front cost versus the long-term cost. A CRT monitor will cost less up front but will use more energy than a flat panel monitor. An LCD monitor will cost more up front but will conserve energy in the long run. The energy savings may not be much for an individual user, but if you are looking at a corporate office where 50 displays are in use, the energy savings might be more of an issue.

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