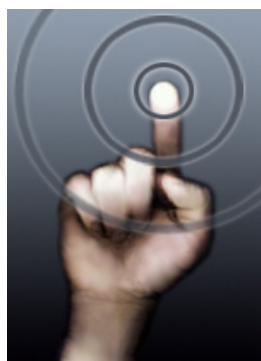


Touchscreen Technologies Explained

Introduction

Touchscreens, **touch screens**, **touch panels** or **touchscreen panels** are display overlays, which are typically either pressure-sensitive (Resistive), electrically sensitive (Capacitive) or acoustically-sensitive (SAW - Surface Acoustic Wave). The effect of such overlays allows a display to be used as an input device, removing the keyboard and/or the mouse as the primary input device for interacting with the display's content. Such displays can be attached to computers or, as terminals, to networks. Touch screens are very resistant to harsh environments where



keyboards might eventually fail. They are used in a wide range of applications and typical software will use on-screen buttons large enough to be pressed with the finger.

Technologies Explained.

Resistive: A Resistive touch screen panel is coated with a thin metallic electrically conductive and resistive layer that causes a change in the electrical current which is registered as a touch event and sent to the controller for processing. Resistive touch screen panels are generally more affordable but can offer lower optical clarity, also sharp objects can damage the layer. Resistive touch screen panels are not affected by outside elements such as dust or water. **Resistive sensors can be operated with a finger, gloved hand or stylus.**

Capacitive: A capacitive touch screen panel is coated with a material, typically indium tin oxide, which conducts a continuous electrical current across the sensor. The sensor therefore exhibits a precisely controlled field of stored electrons in both the horizontal and vertical axes - it achieves capacitance. The human body is also an electrical device that has stored electrons and therefore also exhibits capacitance. When the sensor's 'normal' capacitance field (its reference state) is altered by another capacitance field, i.e., someone's finger, electronic circuits located at each corner of the panel measure the resultant 'distortion' in the sine wave characteristics of the reference field and send the information about the event to the controller for processing. Capacitive touch screens are not affected by outside elements and have high clarity.

Capacitive sensors must be touched with a finger or a conductive device being held by a bare hand.

Surface Acoustic Wave: Surface wave technology uses ultrasonic waves that pass over the touch screen panel. When the panel is touched, a portion of the wave is absorbed. This change in the ultrasonic waves registers the position of the touch event and sends this information to the controller for processing. Surface wave touch screen panels are the most advanced of the three types, but they can be damaged by outside elements. Contaminants on the surface can also interfere with the functionality of the touchscreen. **SAW sensors can be operated with a Finger, Most Gloved Hand's and soft stylus activation.**