

Touch Screen LCD

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ABSTRACT: Touch screen technology which allows user to interact directly with what is being displayed, rather indirectly using mouse or keyboard. It can be used without any intermediate devices. Touch screen is usually found in smart phones, video games, kiosks, navigation system etc.

Keywords: Touch Screen, Sensors, Screen, Layers, Fingers and Stylus.

1. INTRODUCTION: An input/output device that accept input directly from the monitor, the user touches words, graphical icons or symbols displayed on screen to activate commands. A touch screen[1] is an electronic visual display that can detect the presence and location of a touch within the display area. A touch screen is a computer display screen that is sensitive to human touch, allowing a user to interact with the computer by touching pictures or words on the screen. Touch screens can sense finger and other passive objects, such as a stylus. However if the object sensed is active, as with a light pen.

2. WORKING:

A basic Touch Screen has three main components:

- Touch sensor
- Controller
- Software driver.

A. Touch Sensor: A touch screen sensor[2] 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 videos screen[3]. There is several type of touch sensor technology available in market today, each using 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 changes. This voltage change is used to determine the location of the touch to the screen.

B. Controller: A controller is a small PC card that connects between the touch sensor and PC. It takes information's from the touch sensor and translates it into information the PC can understand. The controller is usually installed International Journal of Trend in Research and Development, Volume 3(1), ISSN: 2394-9333 www.ijtrd.com IJTRD | Jan - Feb 2016 Available Online@www.ijtrd.com 75 inside the monitor for integrated monitors or it is housed in the plastic case for external touch add-ons/overlays. The controller determines what type of interface/connection you will need on the PC. Specialized controllers are also available that works with DVD players and other devices.

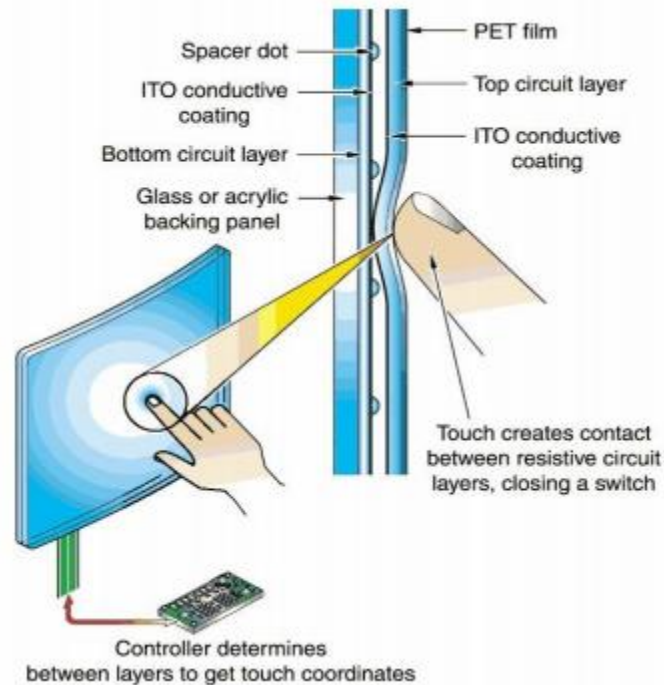
C. Software Driver: The driver is a software update for the PC system that allows the touch screen and computers to work together. It tells the computers operating system how to interpret the touch event information that is sent from the controller. Most touch screen drivers today are mouse-eliminated type driver. This makes touching the screen the same as clicking your mouse at the same location on the screen.

Four main technology are used to make touch screen.

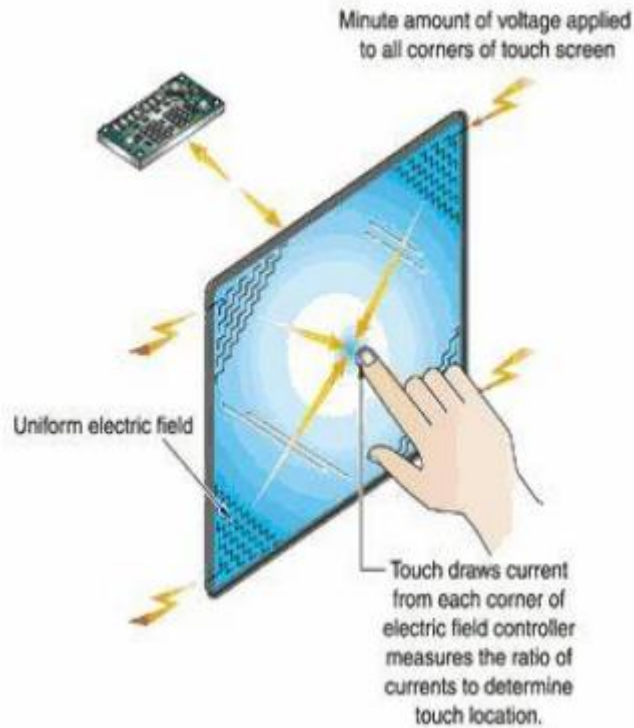
1. Resistive
2. Capacitive
3. Surface Acoustic Wave (SAW)
4. Infrared LED or Optical

A. Resistive Touch Screens: It contains two layers of conductive material, which is separated by thin spaces. Touch creates contact between resistive layers completing circuit. It consists of Indium Tin Oxide (ITO) layers. The Touch Screen is also of different types as 4-wire design and 5-wire design and 8-wire.

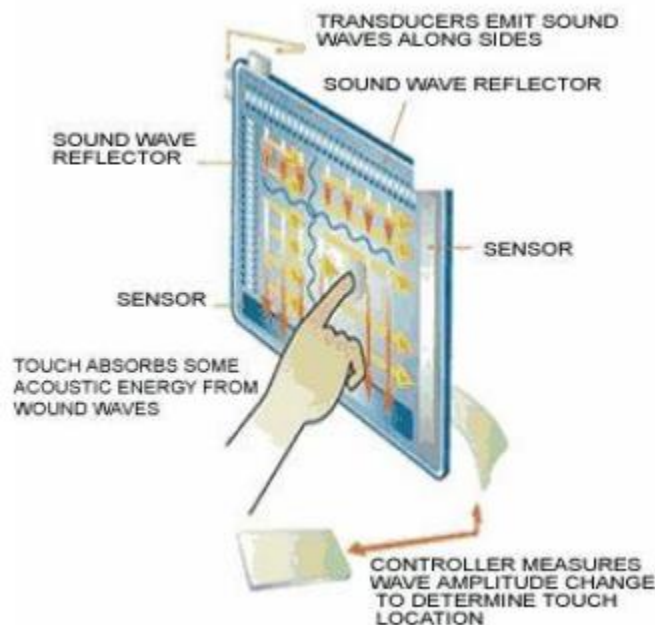
Step1: Initially user presses down. Step2: Contact is made. Step3: uniform voltage is given to the first layer. Step4: And same force touches on to the second layer, which is happened instantaneously.



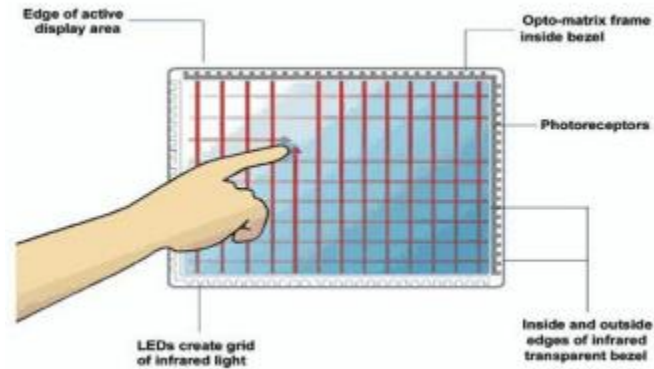
B. Capacitive Touch Screens: It consists of Insulators (Glass or Air), Glass panel with conductive Indium Tin Oxide (ITO) layer. It is also of two types as Surface and Projected. Small amount of voltage is applied to four corners of the Touch Screen.



C. **Surface Acoustic Wave (Saw):** Screens Surface[4] consists of glassy overlay with transmitting and receiving transducers. Electrical signals sent to the transmitting transducers converts to ultrasonic waves. Waves are directed across screen by reflectors then directed to receiving transducers.



D. **Infrared Led or Optical Touch Screens:** Optical touch screen use infrared LED's and matching photo detectors. Touching screen interrupts LED's. Cameras detect reflected LED caused by touch. Controller able to calculate coordinates from camera data.



Advantages Touch Screens: • A touch screen is easy to use as the user can touch what he/she want to display on the screen.

- Save spaces as no buttons are required.
- Touch screens are faster pointing devices.
- Touch screen have easier hand eye coordination than buttons.
- Touch screens are durable.

3. **CONCLUSION:** Thought of touch screen technology contains some of the limitations. It is very user friendly, fast, accurate and more fun to operate. It has been widely accepted. And now by just modifying the mouse and key boards completely in near future.

4. References:

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