TOUCH SCREEN TECHNOLOGY

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Contents

- Introduction to the Technology
- How it works?
- Touch Screen Diversity
- Controllers Used
- Applications
Introducing The Technology

- A touch screen is an input device that allows users to operate a PC by simply touching the display screen.

- The display screen has a sensitive glass overlay placed on it and we could give the desired input by touching it.

- A touch screen is based on CRT (Cathode Ray Tube) technology, that accepts direct onscreen input.

- The ability for direct onscreen input is facilitated by an external (light pen) or an internal device (touch overlay and controller).
How does a Touch Screen work?

Main Touch Screen Components:

- Touch sensor
- Controller
- Software driver
Touch Sensor

- A touch screen sensor is a clear glass panel with a touch responsive surface which is placed over a display screen so that the responsive area of the panel covers the viewable area of the display screen.

- 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.
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.
Software Driver

- The driver is a software that allows the touch screen and computer to work together. It tells the 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.
Touch Screen Diversity

- Resistive Touch screen
- Surface wave Touch screen
- Capacitive Touch screen
  - Surface capacitive
  - Projected capacitive
- Near Field Imaging Touch screen
- Infrared Touch screen
Resistive Touch Screen

It consists of the following components:

- Polyester Film
- Top Resistive Layer
- Conductive Transparent Metal Coating
- Bottom Resistive Layer
- Insulating Dots
- Glass Substrate
Resistive Touch Screen (Contd.)

- Resistive touch screen monitor is composed of a flexible top layer and a rigid bottom layer separated by insulating dots, attached to a touch screen controller.

- The inside surface of each of the two layers is coated with a transparent metal oxide coating.

- Pressing the flexible top sheet creates electrical contact between the resistive layers, producing a switch closing in the circuit.

- The controller gets the alternating voltages between the two layers and converts them into the digital X and Y coordinates of the activated area.
VS20UA Controller

- **Supply Voltage**
  5.0 V DC
- **Maximum Current**
  20 mA (Pick)
- **Resolution**
  12-bit
Surface Wave Technology

- It has transmitting and receiving transducers for both the X and Y axes.

- The touch screen controller sends a 5 MHz electrical signal to the transmitting transducer, which converts the signal into ultrasonic waves within the glass.

- These waves are directed across the front surface of the touch screen by an array of reflectors.

- Reflectors on the opposite side gather and direct the waves to the receiving transducer, which reconverts them into an electrical signal—a digital map of the touch screen.
Surface Wave Technology (Contd.)

When you touch the screen, you absorb a portion of the wave travelling across it. The received signal is then compared to the stored digital map, the change recognized, and a coordinate calculated. The digitized coordinates are transmitted to the computer for processing.
2701 RSU Controller

- **Voltage**
  +5 V DC

- **Baud Rate**
  9600 (default) and 19200

- **Touch Resolution**
  12-bit, size independent

- **Conversion Time**
  10 ms per coordinate set
Capacitive Touch Screen

- It has a uniform conductive coating on a glass panel

- During operation, electrodes around the panel's edge evenly distribute a low voltage across the conductive layer & creates an uniform electric field

- A finger touch draws current from each corner

- Then the controller measures the ratio of the current flow from the corners and calculates the touch location
5000 RSU Serial Controller

- **Supply Voltage**: +5 V DC or +12 V DC

- **Baud Rate**
  9600 (default) and 19200

- **Touch Resolution**
  12-bit, size independent

- **Conversion Time**
  Approximately 15 ms per coordinate set
Projected Capacitive Touch Screen

3 layers:- front and back protective glass provides optical and strength enhancement options & middle layer consists of a laminated sensor grid of micro-fine wires
Projected Capacitive Touch Screen (Contd.)

- During a touch, capacitance forms between the finger and the sensor grid
- The embedded serial controller in the touch screen calculates touch location coordinates and transmits them to the computer for processing
Applications

- **Public Information Displays**
  Tourism displays, Trade show display

- **Customer Self-Services**
  Stores, Restaurants, ATMs, Airline ticket terminals and Transportation hubs

- **More Uses**
  Digital jukeboxes, Computerized gaming, Student Registration systems, Multimedia softwares, Scientific applications etc
<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<tbody>
<tr>
<td>➢ Direct pointing to the objects.</td>
<td>➢ Low precision by using finger</td>
</tr>
<tr>
<td>➢ Fast</td>
<td>➢ The screen may be covered more by using hand</td>
</tr>
<tr>
<td>➢ No keyboard necessary</td>
<td>➢ No direct activation to the selected function</td>
</tr>
<tr>
<td>➢ Suited to: novices, application for information retrieval etc</td>
<td></td>
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References

- Wikipedia
- www.computer.howstuffworks.com
- www.scribd.com
THANK YOU
QUESTIONS