Glossary of Terms

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A

Acoustic Touch Screen

See Surface Acoustic Wave (SAW) Touch Screen.

Active Area

The area of the display or touch panel that is useful for touch or viewing.

Active Matrix = AMLCD (See also TFT)

Active matrix liquid crystal display (LCD). A Liquid crystal based display technology in which switching transistors or diodes are attached to each pixel to control the on/off voltage and to create high resolution and fast response times. It produces a brighter and sharper display with a broader viewing angle than a passive matrix display. One type of LCD is known as thin film transistor (TFT) LCD, in which the switch used is a thin film transistor. Displays based on this technology range from as small as 1" diagonal up to 100" diagonal.

Analog to Digital Controller

A controller which converts an analog signal to a digital signal thus providing the input to the display in a digital format.

Analog Resistive Touch Panel

A touch screen made from a rigid layer of glass or clear plastic, with a flexible layer of plastic on top (usually polyester). The facing sides are both coated with a semiconductive, transparent material. Very small raised dots on the flexible layer keep them separated. Touching the screen causes the two layers to come in contact and form a switch closure. By measuring the voltage gradient in the horizontal and vertical axis, position can be determined.

Analog Signal

A signal that travels continuously. An analog signal may be either direct or alternating current.

Aspect Ratio

The width-to-height ratio of the active area of a display. Two common videographic aspect ratios are 4:3 (1.33:1) and 16:9 (1.78:1). Other video aspect ratios exist but are used infrequently. Standard U.S. video has an aspect ratio of 4:3.

TOP

B

Backlight

The light source for an active matrix liquid crystal display (LCD), located behind the panel. It is usually made up of several fluorescent lamps, a light guide, reflectors, and brightness enhancing films.

Bezel

Secures the LCD to the printed circuit board. Can be plastic or metal.

Bluetooth

This is a wireless protocol for exchanging data over short distances of generally 33 feet (10 meters) or less from fixed and mobile devices. Bluetooth transfers data at the rate of 1 Mbps, which is from three to eight times the average speed of parallel and serial ports, respectively. By embedding a Bluetooth chip and receiver into products, cables that would normally carry the signal can be eliminated.

Brightness

This is the measure of the luminosity in a display, ranging from black to white, expressed in nits or candelas/meter.

C

Calibration

A test routine that calibrates the displayed video to certain points on the touchscreen. Calibration routine is included within the driver software.

Capacitive Touch Screen

A touch screen consisting of an array of transparent conductors on top or embedded near the top of a piece of plastic or glass, along with electronics to sense the capacitance between adjacent conductors. Touching the array changes this capacitance, allowing location to be detected.

Character Display

A display that is used to display letters, numbers, and symbols only. Typically described as Number of lines by number of characters.

COB (Chip-On-Board)

A popular IC mounting method that provides wire bonding as the direct attachment of bare die to laminated printed circuit boards. The LCD driver is formatted into an area on the back of a PCB. Electrical connections are made by micro diameter gold wires. The entire area is then covered with epoxy. The PCB is affixed to the LCD glass and allows for compact and easy assembly of the display to any design application.

TOP

COF (Chip-On-Flex)

A method of bonding driver integrated circuits (ICs) in their bare die form as well as other discrete components to a flex. One end of it is bonded to the LCD glass, and the other is either inserted into a suitable ZIF connector or bonded to a PCB. This mounting method provides very compact solution and variable distance from LCD to customer's hardware.

COG (Chip-On-Glass)

A method of bonding driver integrated circuits (ICs) directly to the edges of active matrix liquid crystal displays (LCDs) for smaller packages, higher quality, and improved ruggedness. The driver IC is mounted upside down (flip chip) eliminating bond wires and interconnects. Reliability is improved due to reduction in interconnects.

Contrast

The ratio between the maximum and the minimum brightness of the display.

Controller

A communication device that provides communication (RS232 or USB) between the touchscreen and computer.

CRT

Cathode ray tube (CRT), a technology used in many traditional television sets and desktop computers. A CRT uses a vacuum tube that produces images when an electron beam strikes a phosphorescent surface. CRT devices are bulkier and require more space than active matrix liquid crystal display (LCD) devices.

Color Super-Twisted Nematic (CSTN)

A type of passive matrix display used by many early color capable mobile devices, and is still used on some current and cheaper devices. CSTN displays are prone to ghosting or streaking when images on the display change quickly, and offer relatively poor contrast and color saturation.

D

Digital

A digital signal is one that varies in discrete steps. The signal does not vary smoothly but instead jumps from one level to the next with a sharp discontinuity.

Dot Matrix

A display made up of an array of pixel elements in a matrix. Also called "graphic display". Can be used to display graphics, pictures and text.

Dot Pitch

The distance between one phosphor dot (i.e. red, green, or blue) and the nearest phosphor dot of the same color in the line above or below. The dot pitch is measured in millimeters (mm) and a smaller number means a sharper image.

TOP

Driver

Voltage IC mounted on the display, which provides the voltage to each row and column (do not confuse with the controller IC).

F

Flex Tail

A flexible ribbon cable that provides connectivity between the glass touchscreen and the controller.

FPD

Flat panel display (FPD). FPD can be used to refer to any of a number of "flat" display technologies including LCD, plasma, FED, or others.

FSTN

Film Super-Twisted Nematic display. STN display with a film layer to improve contrast and viewing angle. This film also changes the display “on” color from blue to black.

G

Graphic Display

A display made up of an array of pixel elements in a matrix. Also called “dot matrix”. Can be used to display graphics, pictures and text.

Grayscale Display

Generally the same as a monochrome display.

I

Infrared (IR) Touch Panel

Infrared light emitting diodes and detectors are positioned along the screen edges to create a grid of light. A finger or stylus, pressing against the display interrupts the light beams allowing detection of the touch location.

K

Kiosk

A computer housed in a box.

TOP

L

LCD (See also AMLCD)

Active matrix liquid crystal display (LCD). A display technology that uses a switch at each pixel to create high resolution and fast response times. One type of LCD in which the switch used is a thin film transistor (TFT), is known as a TFT-LCD. Displays based on this technology range from as small as 1" diagonal up to 40" diagonal.

LCD Module

A thin film transistor-passive or active matrix liquid crystal display (TFT-LCD) that contains all components, including backlight and driver integrated circuits (ICs), and is ready to be integrated into an end product such as a TV, monitor, notebook PC, or other device. This term is often used interchangeably with LCD panel.

LCD Panel

A thin film transistor-passive or active matrix liquid crystal display (TFT-LCD) that includes the array, color filter, and liquid crystal. May also include a backlight and driver integrated circuits (ICs), but sometimes is used to refer to just the glass-liquid crystal composite. Often used interchangeably with LCD module.

LED Backlights

Light Emitting Diodes are becoming the most popular type of backlight because they do not require an inverter, and they have a longer lifetime than EL or CCFL. Character modules and small graphic modules use yellow-green LEDs because they are lowest in cost and have the longest life. Monochrome FSTN and color modules require white LEDs, which are becoming lower in cost and longer in lifetime.

Linearity

The degree to which the actual location of a pixel on the screen corresponds with its intended location. Nonlinearity causes screen images to be more distorted in one area of the screen than in another. This is sometimes caused by poor voltage regulation in the monitor's electronics.

M

Monochrome Display

A display only showing two colors (e.g., black and white), or sometimes a few different levels of "grey." Sometimes called a grayscale display.

TOP

O

Organic Light Emitting Diode/Device (OLED)

A display technology that offers bright, colorful images with a wide viewing angle, low power, high contrast ratio and fast response time for sports and action movies. Because OLEDs do not require backlights, the screens can be ultra-thin.

P

Passive

A technique by which each row and column of the display are multiplexed or addressed in turn (also can be referred to as Duty Type).

Passive matrix LCDs

These are the predecessors to active matrix liquid crystal displays (LCDs); these displays do not incorporate a thin film transistor (TFT) or switch at each pixel. As a result, they tend to have lower resolution, slower refresh rates, and poorer viewing angles than active matrix LCDs.

Pixel

An individual dot on the display. Short for "picture element," a pixel is the basic unit of information on a display. It can be made up of different colored sub-pixels.

Polarizer

This is a material that selectively transmits light with a given polarization. Polarizers are critical in the operation of most active matrix liquid crystal displays (LCDs), as the liquid crystal manipulates polarized light. A twisted-nematic (TN) LCD typically has polarizers on both sides of the LCD cell.

PS/2

A port type developed by IBM for the purpose of connecting a keyboard or mouse to a PC. The PS/2 port has a mini DIN plug containing 6 pins. Often called the mouse port.

Q

QXGA Resolution

2048x1536 pixel count.

TOP

R

Reflective

A display without a backlight. Reflective displays rely on ambient light to provide the image. Excellent for outdoors or bright light conditions. Most digital watches and calculators use reflective LCDs, although some color versions have been developed for mobile phones and PDAs.

Resistive Touch Screen

See Analog Resistive Touch Screen.

Resolution

The number of individual dots (pixels) that can be displayed on a screen, specified as the number of pixels in a horizontal line multiplied by the number of horizontal lines. For example, a resolution of 800 x 600 is 800 pixels running horizontally and 600 pixels running vertically-a total of 480,000 pixels. More pixels (higher resolution) enables finer details to be displayed and generally results in a better image quality.

RS-232 Port

A standardized serial port for connecting a computer to peripheral equipment, such as printer, mouse, scanner, modem, or touchscreen.

S

Super-Twisted Nematic (STN)

A type of high-performance passive matrix display used to improve optical properties at high multiplex rates. Method is to increase the twist angle in the LCD construction from the 90 degrees used in TN to a much higher twist (270 degrees or more). Hence the nickname “super twist”. Used exclusively in character modules and graphic modules, including Color STN.

Sub-Pixel

A sub portion of a pixel showing only one of the primary colors: green, red or blue. Three or more sub-pixels make up a single pixel.

Sunlight Readable

A display that is reasonably easy-to-read in direct, bright sunlight. Very difficult to achieve for full-color transmissive displays; can be easily achieved with monochrome reflective displays. Sunlight readability is affected by the brightness of the backlight, the contrast ratio of the display, reflections and dispersions from the numerous layers constituting the display, and reflections and dispersions from any window or touch screen over the display.

TOP

Surface Acoustic Wave (SAW) Touch Screen

There are several varieties of touch screens using sound to detect where a finger is pressed. In general, sound is passed along the surface or through the body of the touch screen, and touching it causes disturbances or reflections detected by appropriate sensors and electronics.

SVGA Resolution

800x600pixel count.

SXGA Resolution

1280x1024 pixel count.

T

TAB (Tape Automated Bonding)

A mounting method that requires LCD driver integrated circuits (ICs) to be encapsulated in a thin, hard bubble package on a flex circuit. This package is then affixed to the tape which is connected to the LCD glass and/or PCB by adhesive that is located along the edges of the tape. This mounting method offers compactness (IC and its interfacing circuitry can be bent behind the LCD glass panel) and can provide interfacing at very fine pitches.

Thin Film Transistor (TFT)

Usually made from amorphous silicon (a-Si) and used as a switch to a charge storage device located below each sub-pixel on an active matrix LCD.

Touch Panel Controller

The hardware element that translates the information between the touch panel and the host system.

Touchscreen

A transparent glass or hard plastic sheet that mounts over the display viewing area and responds to the touch of the finger on a screen rather than use of keyboard or mouse. There are numerous technologies used to make touch screens. By far the most common is the resistive touch screen. Others include capacitive touch screens, acoustic touch screens, and infrared (IR) touch screens.

Touchscreen Driver

A program that is required to allow interface between a touchscreen, controller and a computer.

TOP

Transflective

A display that combines reflective and transmissive qualities. In dark ambient light environments, the backlight can be used to provide light for the display and can be switched off to save battery life. Most often used in PDAs and mobile phones. Good in bright sunlight and outdoor applications, due to its reflective nature, or in total darkness, due to its backlight. Contrast ratio and brightness are decreased compared to transmissive type.

Transmissive

A display that uses a backlight shining through the LCD to produce the image. Good in regular or dim lighting. Not for use in bright sunlight. Ambient light interferes with the backlight, and "washes out" the display image. The light is created by a CCFL or light emitting diode (LED) backlight, the switching is provided by the thin film transistor (TFT) array, and the color is provided by the color filter.

Transparent

The characteristic of allowing light and objects to be seen clearly through it.

Twisted Nematic (TN)

A type of passive matrix display, most widely used in the manufacture of LCD monitors. TN displays are cheap and offer excellent response times, making them perfect for fast paced gaming. Unfortunately the color reproduction, viewing angles and contrast ratios of TN displays are the worst of any current LCD panel technology.

U

Universal Serial Bus (USB)

An external bus standard that supports data transfer rates of 12 Mbps (12 million bits per second). A single USB port can be used to connect up to 127 peripheral devices, such as mice, modems, and keyboards. USB also supports Plug-and-Play installation.

UXGA Resolution

1600x1200 pixel count.

V

VGA Resolution

640x480 pixel count.

TOP

Viewing Angle

The angle at which the viewer must be in comparison to the screen, in order to see the image on a display. For example, a 0° horizontal viewing angle is directly in front of the display and a 90° horizontal viewing angle is directly to the side. Emissive displays show the same brightness and color regardless of viewing angle, however, rear projection displays and transmissive displays can show some differences in color, brightness, and gray scale, with the most difference being noticed at the steepest viewing angles.

Viewing Area

The part of the display that can be seen inside the bezel.

W

Wide Screen

Refers to a display with a wider and shorter aspect ratio than the standard 4:3 display.

WSXGA Resolution

1920x1600 pixel count.

WXGA Resolution

1366x1280 pixel count.

X

XGA Resolution

1024x768 pixel count.

TOP