

Terminology

Active / Passive Matrix

These terms describe how an LCD handles its pixels to display an image on the screen. Passive matrix uses a grid of wires where each intersection is one pixel, while Active matrix uses an individual capacitor for each pixel. Active matrix is better at displaying fast-motion images, while passive is simpler and more inexpensive to produce.

Arduino

Arduino is an open-source hardware and software company that designs and manufactures kits, allowing users to develop digital devices and interactive objects.

BeagleBone

BeagleBone is a development platform. Other development platform examples are Arduino and Raspberry Pi. BeagleBone has many products for developing all kinds of electrical applications.

Breadboard

Also referred to as “plugboard” is a construction base used to prototype electronic components. It is a simple way to connect electronics together using wires to create a temporary circuit design since soldering is not required.

Capacitive

This is a type of touch panel that utilizes the conductive nature of the user’s finger(s) to register inputs. This allows them to respond to multi-touch gestures like pinching and zooming to offer more touch functionality.

Cape

Similar to how our Arduino Shields are designed, a cape is a mediator between a device and a BeagleBone product. They’re designed specifically to fit with BeagleBone products so that connections are quick and seamless.

Cathode

In VFDs, the Cathode (Filament) is the barium oxide coated tungsten wire which is heated by the external power source to approximately 600°C and emits free thermal electrons.

COG

(Chip-On-Glass) These displays are monochromatic passive matrix LCDs. They can be a character or graphic display type, and designed without a PCB. Instead, the LCD’s driver/controller is directly bonded to the glass of the display, allowing a more compact size.

Electrons

This word is used frequently with VFDs. In the case of non-light emission, electrons from the cathode are either blocked by the grid with a negative potential, or passed through the grid and repelled by the negative potential anode. In the case of light emission, electrons from the cathode are accelerated by the positively charged grid toward the positively charged anode. The phosphor on the anode emits luminous radiation when excited by electrons.

EVE

(Embedded Video Engine) The graphics engines on the EVE2 TFT boards are the 2nd generation of Embedded Video Engines manufactured by FTDI/Bridgetek (embedded video engine shortened as “EVE”, and 2nd generation noted as “EVE2”). These chips have very high processing power, allowing them to process any and all graphics information sent to the display very efficiently.

Embedded System

A computer system with a dedicated function within a larger mechanical system. It is embedded as part of a complete device often including hardware and mechanical parts. Embedded Systems often have a lot of constraints on aspects like computational resources, power consumption, bandwidth, physical size, and cost. An example of an embedded system might be a microcontroller built into a microwave, air-conditioner, TV, etc.

Filament

The filament is the cathode in VFDs. It consists of a very thin tungsten wire coated with barium, strontium and calcium oxides. Application of a specified voltage raises the temperature of the filament which causes thermionic emission.

Front Glass

In a VFD, the Front Glass is used together with a glass substrate to form a vacuum sealed package.

Grid

In a VFD, the grid is a metal mesh over the phosphor coated anodes and controls the electrons emitted from the cathode.

HDMI

(High Definition Multimedia Interface) Allows for information to be sent in a standardized digital format. This interface is quickly becoming the replacement for analog video and is growing in demand. You may be familiar with this term in relation to your TV or monitor – and the HDMI TFT Modules are equally as easy to connect to, you just need a standard HDMI cable.

HMI

This is any device or software that allows you (a human) to interact with the workings of a machine. This could be as simple as a push button or a single-touch display, or a remote connection operated by a smartphone.

IC

(Integrated Circuit) Also referred to as a “chip” or “controller.” This is a small piece of hardware that is responsible for the functionality of a display. Simply put, it is the brain of the display.

I²C Interface

(Pronounced I-squared-C) This interface is appropriate for peripherals where simplicity and low manufacturing costs are important, more than speed. You’ll save development time and I/O lines because of the capability of a microcontroller controlling the device chips with only two I/O pins and software. There are no extra boards or logic required for standard LCDs

Interface

The communication between two separate electronic components that allows for exchange of information. There are various types, we use Parallel, Serial, and I2C interface to communicate information to our displays.

ITO Contact Lead

The ITO Contact Lead in a VFD, lets the inside transparent conductive layer of the Front Glass connect to filament voltage to prevent ESP effects.

LCD

(Liquid Crystal Display) These are either active or passive matrix displays that can display information as text or pixel-by-pixel. Types we offer are: TFTs, COG, Graphic and Character LCDs.

LED

(Light Emitting Diode) LEDs are semiconductor light sources that emit light when current flows through it.

MCU

(Microcontroller Unit) The MCU of an application is essentially the main computer that sends out all the commands to the various electronic components so the device can perform whatever its functions are.

MVA

(Multi-domain Vertical Alignment) MVA could also be helpfully remembered as “Multiple Viewing Angles.” This technology in TFTs changes how the sub-pixels in the display are divided and directed when shining through the screen and allow for an easy to read image from nearly any angle of viewing. This is secondary in best viewing angles after IPS technology.

OLED

(Organic Light Emitting Diode) OLED displays are self-illuminating due to their organic material and require no backlight for maximum visibility in all environments.

Parallel Interface

This interface requires many more pins because each transmitted bit goes to one paired receiving bit. It's simple and fast in terms of communication, but at the cost of more occupied pins.

PCB

(Printed Circuit Board) A printed board that supports and electrically connects electronic components.

Phosphors

In a VFD, when electrons emitted by the filament collide, the phosphor is excited and emits light.

PWM

(Pulse Width Modulation) A type of digital signal used to control the dimming of backlight LEDs.

Reflective

This light mode uses reflective polarizers to benefit from ambient light environments without the need to power a backlight. However, without a backlight these displays suffer in low-light conditions with visibility.

Resistive

This is a type of touch panel that relies on the top layer of the panel to be pressed in and come in contact with the lower layers. The nature of this touch type allows for touch interaction even with thick gloves or objects.

RJ45

This is the technical name for the size and shape of the port that Ethernet cables are plugged into. An RJ45 port can connect with any cable with an RJ45 compatible head, this is not limited to only Ethernet cables.

SBC

(Single Board Computer) A complete computer built on a single circuit board. Has microprocessor(s), memory, input/output and other features of a functional computer. Popular examples are Raspberry Pi or BeagleBone.

Shield

An expansion board or an interface board for Arduino's development boards.

SPI / QSPI

SPI is a serial interface. Its information is sent in series instead of all at once which allows for fewer pins to connect to. QSPI, or "Quad SPI," is a more powerful SPI serial interface.

TFT

(Thin-Film Transistor) These are active matrix LCD displays with full RGB color. They exhibit bright color and have the ability to show fast animations and complex graphics.

Through Hole

This is a type of connector that is made up of rows of tiny open holes. The design of this connection is intended to make it much easier to develop and prototype with the display because of how easy it is to connect with a breadboard or Arduino board since it mimics their pin layout. In a VFD, the Through Hole is formed on the insulating layer connecting the anode electrode to the wiring pattern.

Transflective

This light mode uses both reflecting and transmitting properties, making it the most versatile. These displays perform adequately both in direct sunlight and low-light conditions.

Transmissive

This light mode depends on the power of a high brightness backlight. These displays are good for low-lighting viewing, but not for direct light conditions.

Transparent Conductive Layer

In a VFD, the transparent conductive layer is formed on the inside of the front glass. It protects the display from external electrostatic effects.

USB-HID (*USB Human Interface Device Class*)

USB-HID put simply means that when connected via USB, the device will automatically install the proper drivers and prepare itself for use, making them “plug-and-play.”

VFD

(Vacuum Fluorescent Display) These displays use a more complex infrastructure and makes them a bit bulky and expensive compared to more efficient LCD options. VFD technology works by heating tungsten wires that then cause electrons to come in contact with phosphor coated plates, producing light.

Widgets

Premade tools the EVE2 controller can draw/output. Similar to how Office programs have premade graphs/charts/images you can use, the EVE2 can generate stock buttons, clock, keys, gauges, text displays, progress bars, sliders, toggle switches, dials, gradients, etc.