

Point of Sale / Point of Information

High Reliability Touch for Commercial Systems

Equipment failures are disruptive to the flow of business. In today's hyper-competitive marketplace, companies cannot afford to lose productivity. A POS terminal is a key component in completing the sales process: durability and high-reliability is a must.

Several different surface-based touch technologies have been utilized for POS & POI monitors. Technologies such as Resistive or Capacitive have a common component: a membrane or film that has been applied to the panel's surface. Surface-based technologies not only impact optical clarity, but also fail over time because the membrane / film is subjected to stress and wear every time it is touched. Keys, pens, credit cards, and other sharp objects are often used to input data, potentially compromising or tearing the membrane. It can also be affected by environmental / surface factors such as moisture, dust, temperature and sunlight.



zTouch™ enabled 15" Point-of-Sales Terminal.

To achieve improved optical clarity, durability, reliability, and design flexibility, as well as reduce the overall solution cost, F-Origin developed a touch-screen technology based on the application of force, called zTouch™.

With zTouch™, there is no surface membrane to wear out. Miniature touch sensors are positioned behind the screen's surface and never come in direct contact with the user's input. Designers can use whatever type of rigid and hard surface material they desire (glass, plastics, etc).

About F-Origin

F-Origin is the developer of zTouch™, an innovative force-based touch technology. zTouch™ delivers robust design advantages to OEMs and ODMs implementing touch screen, touch panel, and high durability touch user interface solutions. Founded in 2005, F-Origin is a privately held US company with headquarters in Research Triangle Park, North Carolina.

Since the sensors are located behind the touch surface, water seals and other environmental enhancements can also be utilized, further increasing the durability of the design. Bezel or bezel-less designs are also available.

By eliminating the surface membrane, light transference / panel emissivity is enhanced. This maximizes optical clarity while allowing reduced backlighting levels and power consumption.

Membrane based technologies negatively impact optical clarity, the capacitive based technologies also require the input from a human finger. If the user is wearing a glove, it must be removed in order to input data. These limitations do not exist for zTouch™ as it supports most any type of touch object.

Another issue for optical and wave-based technologies is that if there is a buildup of contamination on the surface or the sensors, a degradation of performance or "dead zones" can occur. To avoid this problem, the touch surface needs to be cleaned on a regular basis.



Since zTouch™ measures location and input force of the touch, the system can be programmed for touch sensitivity. A variety of parameters can be controlled, adding an additional dimension to the feature set. The system can therefore also differentiate between key touch, key press, key hold etc.

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zTouch™ Benefits

Because panel surface membranes / films are eliminated from the design, there are a number of user benefits available to zTouch™ product developers and end users.

Optical Performance and Durability

A touch-screen utilizing zTouch™ technology has an improved durability relative to resistive and capacitive systems because there is no surface-mounted film or membrane to wear out. The absence of a film also means no optical degradation of the display, so the screen is naturally brighter and clearer, enabling use in a broad range of indoor and outdoor environments. Additionally, the display is also more energy efficient, as less backlighting is required.

Any Object Touch

zTouch™ works with a finger, gloved finger, stylus or any other object. In contrast, capacitive touch-screens require the touch to be from a finger or special stylus. Other technologies, such as optical-based systems, are also limited by the touch surface area.

Design Flexibility

Since zTouch™ only requires that the touch surface be rigid, any surface material may be used (glass, plastic, metal, ceramic, etc). This provides a high level of design flexibility for touch-screen or panel-based products. The product designer can also select appropriate materials to meet enhanced durability requirements for their end product. zTouch™ is also well suited for applications that require dust and water seals.

Handwriting and Gestures

zTouch™ supports both finger and stylus touch. Along with a high touch resolution, frequency coordinate reporting and software-defined touch and click force levels, zTouch™ is an excellent technology for handwriting and gestures.

3DTouch™

The zTouch™ touch-screen system supports an alternative form of multi-touch. In addition to detecting the touch coordinates, the system also determines the force level of that touch. In other words, the force of the user's touch is measured and can be used as another application input.

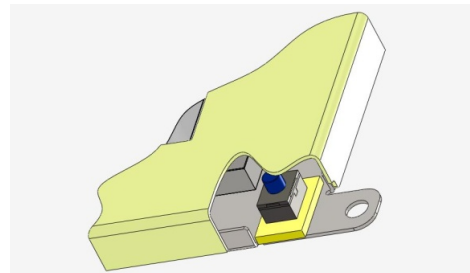
This three-dimensional touch input can be applied to fixed thresholds, where a soft touch represents mouse movement, and a force larger than the threshold represents a mouse click. The force input levels may also be used for smoothly variable input controls, such as the heat setting of a cook top or the volume setting of an audio control.

Cost

Since the sensors in a zTouch™ system do not cover the touch screen area, the product cost is not a function of surface area, resulting in a highly cost effective solution as the touch screens/panels grow in size.

zTouch™ Description

The core system components are; force sensors, signal amplification, and a micro controller unit. Not only can the overall system cost be kept very low, the manufacturing and assembly process is straightforward and scalable.



Close up illustration shows the placement of a force sensor in a corner behind the LCD front bezel.

The sensors are normally placed under each corner of the touch surface, where they record force changes lower than 1 mN. The zTouch™ software continuously records the sensor data and “quadrangulates” the touch coordinates. In order to ensure accuracy, a number of filtering, compensation and calibration functions are included in the coordinate calculation. The touch coordinates and touch forces are communicated at 200 points per second over USB or any other appropriate interface.