Elo TouchSystems IntelliTouch Plus Multi-touch & Windows 7 Communication Brief

Introduction
With the release of Microsoft Windows® 7, multi-touch has become the center of attention. The intent of this Q & A is to respond to the inquiries regarding the development of our products with multi-touch functionality and compatibility with Microsoft Windows 7.

Background
The Tyco Electronics’ Elo TouchSystems expertise in touch covers the entire spectrum of touch technology – from drivers and components, touchmonitors, touchcomputers to large interactive displays and small handheld mobile displays.

The Tyco Electronics’ Elo TouchSystems R&D and engineering groups have developed and currently support one of the largest touch technology portfolios on the market. These technologies are available in products produced at our high volume manufacturing plants around the world. As a result of this world-wide experience, the Elo TouchSystems touch technology portfolio offers a choice of high-performance, stable touch technologies.

Microsoft selected the Elo TouchSystems multi-touch driver at the early development stages of Windows 7 for its reliable and stable performance coupled with our depth of engineering and integration experience. At the 2008 Wall Street Journal’s “D6: All Things Digital” conference, the Elo TouchSystems 19-inch touchmonitor with CarrollTouch multi-touch technology was featured in a brief demonstration of the Windows 7 operating system by Julie Larson-Green, corporate vice president of program management for the Windows Experience at Microsoft Corp.

Q1: With all the touch technologies available, why did Tyco Electronics’ Elo TouchSystems IntelliTouch surface acoustic wave technology as your first multi-touch technology?
A: IntelliTouch surface acoustic wave is a proven technology that delivers reliable multi-touch functionality in desktop and open-frame monitors, All-in-One touchcomputers and components. In addition to providing high touch sensitivity, it can also be scaled to accommodate a variety of screen sizes.

Q2: What are your plans for Elo TouchSystems multi-touch products?
A: Elo has received the “Compatible with Windows 7” logo for IntelliTouch Plus surface acoustic wave multi-touch. This new technology allows device and equipment manufacturers to cost-effectively develop next-generation products to enhance applications with the multi-touch functionality inherent in Windows 7. It leverages the benefits of IntelliTouch surface acoustic wave touchscreens coupled with advanced software algorithms to enable two-finger touch with a variety of multi-media rich devices. It supports two-finger zoom, two-finger scrolling, anchor and rotate gestures, plus standard single-finger gestures including pan and flip. Consisting of an enhanced controller and firmware set, the technology can be quickly integrated into touchscreen systems.
We have always been committed to bring the latest technologies to market. That's why we have other technologies in development that will provide OEMs and software engineers with the right solutions and options that best address their unique segments.

**Q3: Is the functionality of Elo’s multi-touch products limited to just gestures?**

**A:** The software applications currently available on the market primarily utilize gestures, such as scrolling, zoom, pinch and rotate. Now that Windows 7 is released, software developers will quickly gain experience and we fully expect to see applications that utilize multi-touch functionality beyond gestures and simple paint applications.

However, Elo TouchSystems IntelliTouch Plus not only supports gestures, but on compatible hardware, multi-touch as well.

**Q4: How does IntelliTouch Plus multi-touch hardware work?**

**A:** Each multi-touch technology determines the location of multiple touch points in a different manner. For instance:

- Projected capacitive technology works by measuring touch using a 2-dimensional “map” of the touch activity and therefore has sufficient data to interpret the unique location of multiple touches.
- Camera-based optical touch systems work by scanning the touch surface from different angles to produce unique touch locations required for multi-touch. However, these systems can be subject to loss of touch recognition in high ambient light variances and to false touches.
- With standard surface acoustic wave where the waves cast shadows on the touch surface, touch is measured along each independent axis as a 1-dimension (X) + 1-dimension (Y) resulting in a paired value of X and Y coordinates within the touch active area. When multiple touches are applied to the screen, a third coordinate, arising from the diagonal axis “U,” is needed to provide the additional information necessary to distinguish each pair of X and Y coordinates into the correct touch locations; thus, resulting in a unique X-Y-U location identification. Since changes to the standard IntelliTouch surface acoustic wave hardware were needed to produce the additional touch coordinates, IntelliTouch Plus is not supported on current Elo monitors.

**Q5: How can customers obtain Elo TouchSystems multi-touch products?**

**A:** Elo TouchSystems multi-touch products will be sold through the existing channels.

**Q6: Will a complete touchmonitor be released, or components only, or both?**

**A:** The first planned releases are for component touchscreens with IntelliTouch Plus multi-touch technology to be commercially available in the first quarter of 2010, followed by the 2239L open-frame touchmonitor in the second quarter.
Q7: Will multi-touch only be available on 22”? Or will there be other sizes?
A: Initially, the 2239L 22-inch open-frame monitor is the first standard product to be available. Additional sizes from 17-inch to 32-inch are available as custom units. Contact Customer Service or your Elo sales manager for details on minimum quantities and delivery times.

Q8: What is Windows 7? What is the difference between Windows 7 and the previous Windows operating systems? Will it replace Vista or XP?
A: Windows 7 is an all new version of the Windows operating system (OS), intended to be an incremental upgrade to the Windows line, with the goal of being compatible with applications and hardware where Vista is already compatible. It integrates the best features of XP and Vista with a redesigned Windows shell, a new taskbar, a home networking system called HomeGroup, additional new features and improved performance. It is intended to provide users more precise control, more manageable system settings, new desktop and taskbar functionality and of course, multi-touch. Where XP and Vista recognize a touch input as a single mouse input, they are unable to recognize inputs from multiple touch points. Therefore, only single-touch is possible. Windows 7 however, has the ability to recognize and interpret inputs from multiple simultaneous touch points as coordinates to determine the location of multiple touches.

Q9: What is the Microsoft Windows 7 logo?
A: According to Microsoft, the Windows 7 logo program is intended to help customers identify products that have passed Microsoft-designed tests for compatibility and reliability with Windows 7. The Windows 7 logo is a system logo for a combination of hardware, firmware, driver and operating system. The Windows 7 logo requirements established by Microsoft come in two tiers: a software/driver set of tests, and additional manual touch tests called Additional Qualification (AQ).

Q10: Do new drivers need to be installed?
A: Existing Elo TouchSystems products and drivers are compatible with Windows 7 for single-touch and single touch gestures. However, multi-touch technologies are different than the standard IntelliTouch single-touch technologies. In order to use the multi-touch functionality in Windows 7, new drivers, compatible with new hardware and an OS that can interpret multiple touch inputs, are needed to enable Windows 7 multi-touch functionality.

Q11: Are Elo TouchSystems products Windows 7 compliant?
A: Many companies may claim Windows 7 "compliance" or “certification” when in fact these are not terms that Microsoft approves. Instead, Microsoft has issued specific terms and descriptions to be used when describing compatibility with Windows 7.

“Compatible with Windows® 7” is the approved description for software and devices that have passed Microsoft-designed tests for compatibility and reliability for the Windows 7 operating system. These performance tests are comprised of tests for hardware and software with a subset of tests for drivers.
and Additional Qualifications (AQ) for touchscreen hardware. The AQ test was added to meet additional performance criteria for usability of the touchscreen hardware. The combination of a driver and touchscreen hardware that pass both the WLK and AQ testing will qualify to receive the Windows 7 logo. Other multi-touch systems that pass the WLK driver qualification but not the AQ touchscreen hardware will not be "logo'd." However, these non-logo'd touch systems can still work well with Windows 7 and enable touch functionality.

IntelliTouch Plus surface acoustic wave touch technology is compatible with Windows 7 and enables multi-touch capability with the matched hardware. In addition, new Elo drivers are also available that are compatible with Windows 7 touch and can be used on current Elo hardware to enable single touch and single-touch gestures.

Q12: Will the legacy drivers you have today work with Windows 7?
A: Our legacy drivers are mouse HID and will continue as such in Windows 7. They are compatible with Windows 7 and support currently shipping single-touch products.

Q13: What drivers are used for gestures? What drivers are used for multi-touch?
A: We have today a new USB driver that is compatible with Windows 7 and it works with both new (multi-touch enabled) and legacy (single touch) hardware. It enables multi-touch when connected to new multi-touch devices and enables single-touch/gestures when connected to current devices. This allows us to have single-touch gestures using current monitors. It is important to understand that merely downloading the new driver does not give multi-touch; new hardware is needed too. But this driver will enable single-touch gestures for a system running the Windows 7 operating system.

Q14: Will Tyco Electronics’ Elo TouchSystems continue to provide support for older OS versions, like XP and Vista? Any plans for Linux?
A: We will continue to support our legacy drivers due to the large population of monitors, applications and customers that use these operating systems. A multi-touch driver for Linux is in the early evaluation stage.

Q15: Which Elo TouchSystems technologies will be available for Windows 7 use? Will there also be touch technologies on Windows 7 that are not with multi-touch?
A: All the current standard Elo touch technologies and drivers are compatible with the Windows 7 operating system, but as single-touch only. Not all touch technologies are capable of multi-touch functionality, as it is dependent on how the driver interprets the touch inputs. The location of a single-touch is determined by the X and Y coordinates on the screen at the point of the touch. In order to interpret multi-touch points, a third coordinate is required and only certain touch technologies have this capability: IR, SAW, projected capacitive and camera-based optical are the primary technologies that can enable multi-touch today. Both new hardware and new touch drivers are required.
Currently, IntelliTouch Plus is the first Elo touch technology compatible with Windows 7 for multi-touch.

Q16: In what way is the Windows 7 touch functionality support different from other OS? You still need drivers to enable the touch support.
A: It is required that a Windows 7 driver reports the multiple touch points to the OS as HID (not mouse). The Windows 7 Operating System has the ability to recognize inputs from multiple simultaneous touch points to determine the coordinates used by the software application package. XP and Vista recognize touch as mouse inputs and therefore cannot interpret multiple touch points.

Q17: I see that Windows 7 supports the following gestures:
- Tap and Double-tap: Touch and release to click. This is the most basic touch action. Can also double-tap to open files and folders. Tolerances are tuned to be larger than with a mouse. This works everywhere.
- Drag: Touch and slide your finger on screen. Like a dragging with a mouse, this moves icons around the desktop, moves windows, selects text (by dragging left or right), etc. This works everywhere.
- Scroll: Drag up or down on the content (not the scrollbar!) of scrollable window to scroll. This may sound basic, but it is the most used (and most useful – it’s a lot easier than targeting the scrollbar!) gesture in the beta according to our telemetry. You’ll notice details that make this a more natural interaction: the inertia if you toss the page and the little bounce when the end of the page is reached. Scrolling is one of the most common activities on the web and in email, and the ability to drag and toss the page is a perfect match for the strengths of touch (simple quick drags on screen). Scrolling is available with one or more fingers. This works in most applications that use standard scrollbars.
- Zoom: Pinch two fingers together or apart to zoom in or out on a document. This comes in handy when looking at photos or reading documents on a small laptop. This works in applications that support mouse wheel zooming.
- Two-Finger Tap: tapping with two fingers simultaneously zooms in about the center of the gesture or restores to the default zoom – great for zooming in on hyperlinks. Applications need to add code to support this.
- Rotate: Touch two spots on a digital photo and twist to rotate it just like a real photo. Applications need to add code to support this.
- Flicks: Flick left or right to navigate back and forward in a browser and other apps. This works in most applications that support back and forward.
- Press-and-hold: Hold your finger on screen for a moment and release after the animation to get a right-click. This works everywhere.

- Press-and-tap with a second finger: To get right-click, just like you would click the right button on a mouse or trackpad. This works everywhere.

**Can Elo TouchSystems multi-touch do all of those?**

**A:** In a short answer, yes. The driver reports the multiple touches and gestures to the operating system. These features are then a function of the operating system and the software package using them in the application. For example, the operating system determines what is a flick or a swipe based on touch stream data coming from the driver.