

Interview with Ty Silberhorn from 3M Touch Systems

(Excerpted from Veritas et Visus Touch Panel, September issue)



Ty Silberhorn is General Manager of 3M Touch Systems (a wholly-owned subsidiary of 3M Company) and manages 3M's global touch business which includes sales, marketing, engineering, and manufacturing. Prior to 3M Touch Systems, Ty was the Six Sigma Director for the 3M Display & Graphics Business and previously, Business Unit Manager for 3M's IATD (industrial adhesives) Business. Ty holds BS and MBA degrees from Indian University and University of Minnesota.

1. Please give us some background information about 3M Touch Systems, starting with the historical information related to MicroTouch Systems.



3M Touch Systems was created in 2001 through the acquisitions of MicroTouch Systems (Massachusetts) and Dynapro Thin Films (Milwaukee and Vancouver, Canada). MicroTouch Systems was founded in the early-1980s and was the company that patented and commercialized surface capacitive technology, which became and continues to be the preferred touch technology for many heavy-use, public access applications, especially for video slot and card games. Dynapro was a leading supplier of 4- and 8-wire resistive and developed projected capacitive touch solutions for industrial applications. 3M Touch Systems is headquartered in Methuen, Massachusetts, with dedicated technical and sales teams in North America, Europe, Australia and throughout Asia. Within the 3M Company structure, 3M Touch Systems reports to the 3M Electro Communications Business (Austin, Texas), which is one of the five 3M business units.

2. Does 3M's long history in the touch industry give you an advantage in the market, or do you sometimes feel constrained by your long legacy of product innovations.

Being in the touch industry for more than 25 years provides 3M Touch Systems many benefits not always available to newer companies. In addition to the strong MicroTouch brand name and millions of surface capacitive systems in the field, 3M has developed a strong, experienced sales and technical team around the world capable of matching customer needs with solutions and providing local language support in key manufacturing and design centers. Over the years the R&D organization has developed an extensive expertise in surface capacitive and projected capacitive technologies, as well as working knowledge of all popular touch technologies, which enables us to develop next generation products and add complementary technologies to our technology portfolio, such as 3M Dispersive Signal Technology (DST).

3. The touch industry is currently comprised primarily of numerous relatively small companies that fill a specific technology niche. As a large and diversified company, 3M is an exception to this generalization. Do you consider 3M's size and broad-based technology profile to an advantage, or do you sometimes struggle with "big-company" inertial forces that make it slow to quickly adapt to market conditions?

3M Touch System enjoys the advantages of being both a large company and small organization. As a subsidiary of 3M, with headquarters, sales, marketing, engineering and manufacturing located in Methuen, Massachusetts, we're able to work as an innovative, self-contained entity, yet take advantage of many of the advantageous large company resources and programs, such as the process control, quality and Six Sigma organizations. We're also able to tap into 3M expertise in optical films, coating and adhesives technology, and materials management. We also benefit from the worldwide customer reach of 3M organizations in more than 60 countries around the world.

4. Can you provide us with a rough split of your business by technology (surface capacitive, projected capacitive, bending wave, and other)? How do you expect that split to change over the next 3 years?

As a matter of company policy we don't share this type of information, but we can say that 3M Surface Capacitive technology currently represents the largest share of our business. We expect our technology mix to continue to change with the continued growth of 3M Dispersive Signal Technology (DST) and the industry's positive response to 3M's 10-finger, "true" Multi-touch Projected Capacitive technology.

5. Is 3M Touch Systems now completely out of the analog resistive market?

While both MicroTouch Systems (5-wire) and Dynapro Films (4- and 8-wire) manufactured resistive touch screens prior to joining 3M Touch Systems, approximately 5 years ago 3M decided to stop manufacturing resistive sensors to focus on stronger performing technologies. Currently, 3M is not manufacturing any resistive-based touch sensors, but still offers 4-, 5-, and 8-wire controllers and chipsets.

6. How big of a deal is multi-touch?

Without a doubt, the multi-touch and multi-user interface is a rapidly expanding application due first to the runaway success of the Apple iPhone and then the anticipated release of the multi-touch API as part of Microsoft Windows 7. In the short time that the 3M Multi-touch Developer Kit has been available, the technology has been shipped to developers around the world who are working on "true" real-world multi-touch applications that take advantage of its unique 10-finger functionality.

7. Tell us about your new multi-touch, projected capacitive technology.



The newly-released 3M Multi-touch Technology is based on 3M Projected Capacitive touch technology. The touch sensor has a durable glass surface and premium optics. Currently available as a 19" wide screen developer's display, this technology independently resolves and tracks 10 independent finger inputs in less than 25ms. Since this touch technology is Windows 7 logo compliant and received Advanced Qualification status (with a 100% score),

developers can easily create "true" multi-touch applications without special API drivers or can write their own API's based on 3M communication protocol documentation for enhanced multi-touch capabilities.

8. You recently introduced a multi-touch developer kit. What's been the uptake? Any interesting trends that you've noticed based upon customer inquiries related to the developer kit?



The response to the 3M Multi-touch technology has been overwhelming and extremely positive. While there hasn't been any predominant trend among those interested in the technology, the appeal of "true" 10 finger multi-touch is crossing all market applications as kits have been sold to developers in the education, advertising, digital signage, entertainment and gaming markets. We're also hearing that developers are focusing on multi-user collaborative applications using the multi-touch technology. Since the operating system platform is not limited to Windows 7, we're seeing interest from the Apple OS and Linux communities as well.

9. Are there any limitations as to panel size with regard to projected capacitive multi-touch screens?

From a theoretical perspective there is no limit to the size this technology can scale to, though as you consider larger sizes you run into issues concerning relative price points and the logistics of transporting and handling oversized touch screens (which is not limited to projected capacitive).

10. With many companies working on multi-touch solutions, are you at all concerned about gesture confusion? Is 3M doing anything to help standardize gestures, or do you think that there are some proprietary advantages to multiple gesture protocols?

Without a doubt there is a great deal of confusion in the industry and among customers about what “multi-touch” really is. Since 3M is in the unique position of offering products that provide a broad range of touch functionality, we’re able to help standardize the touch nomenclature. 3M generally groups touch functionality into three categories: Single Touch (which includes gestures), Two Touch (may or may not resolve two simultaneous touch events) and True Multi-touch (able to resolve 3 or more simultaneous touch events). More detailed information on “What is Multi-touch?” is available at a newly-launched, industry reference site called “touchtopics.com.” 3M developed this site to help create an industry-standard nomenclature for common touch-related terms and concepts. And, in effort to help educate the industry, 3M is presenting at industry events, such as the recently-held DisplayBank FPD Conference and DisplaySearch Emerging Technologies Conference.

Touch Topics

Helping Define Technologies, Terms and Trends for the Touch Industry



Touch Technologies

An overview of popular touch technologies may help you choose the best solution for your application's requirements and user environment.



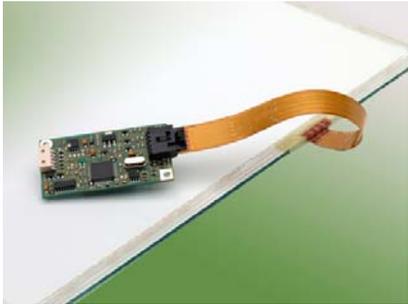
Touch Terminology

A comprehensive glossary of terms may enable you better understand the terminology used by touch manufacturers, display integrators and systems providers.

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11. Do you produce both the touch screen solution as well as the accompanying controller electronics? What if a customer wants to install their own touch controller?



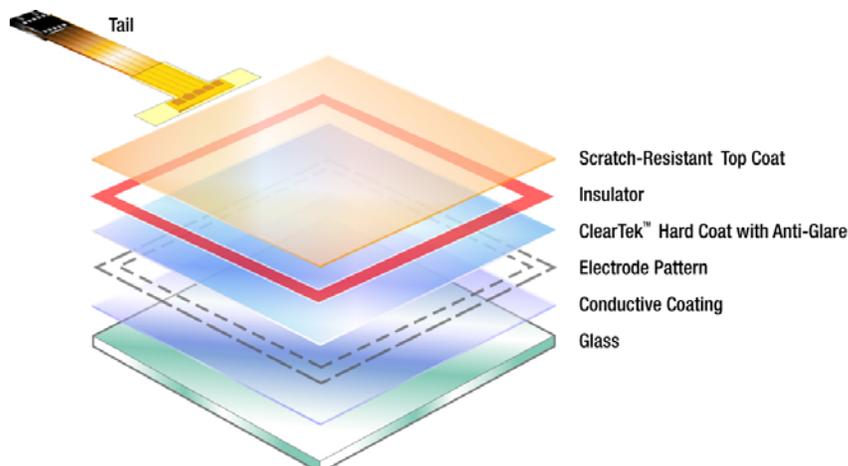
3M has long supported the idea that the customer is best served by a total system approach that includes a 3M MicroTouch touch sensor mated with a 3M MicroTouch touch controller and supported by 3M MicroTouch MT7 touch software/drivers. To that end for the past 15 years 3M has supplied a dedicated surface capacitive touch ASIC and chipset so customers are guaranteed system compatibility and maximum functionality. While some touch sensor customers may want to use an alternative controller solution, 3M is not able to guarantee the optimal performance of these hybrid systems.

12. Would you describe 3M's surface capacitive technology to be your flagship product?

MicroTouch Systems, and now 3M Touch Systems, have been manufacturing surface capacitive touch systems for more than 20 years and there are millions of systems in operation around the world. While the 3M Surface Capacitive product is traditionally our largest volume product, courtesy of our high volume manufacturing facility in Methuen, Massachusetts, 3M Dispersive Signal Technology (DST)(for large-screen LCD displays) and 3M Projected Capacitive Technology (for multi-touch applications) continue to achieve greater industry acceptance for their targeted applications. These two new technologies expand 3M's reach into market applications and segments that were unavailable to 3M Surface Capacitive products.

13. You boast a one-side ITO solution for your surface capacitive technology. What advantages does that enable?

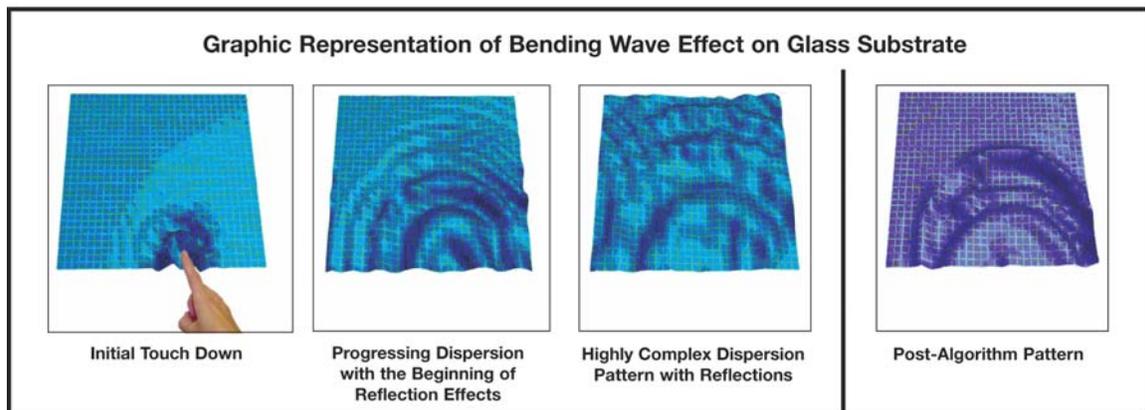
The primary customer advantages of a single-sided conductive coated surface capacitive sensor is improved optics (3-4% improvement over 2-sided coated sensors) and increased production flexibility (by reducing lead time processing steps) which allows for improved responsiveness to customer requests for varying sizes and aspect ratios.



14. There have been numerous panic stories related to availability and pricing of ITO. Are you concerned? Is 3M attracted to any particular ITO alternative technologies?

3M Touch Systems carefully manages its supply chain to minimize the impact of the fluctuating conductive coating industry and as a matter of course, evaluates alternative technologies for alternative production methods or improved materials functionality. And, since materials science is an area where 3M excels, we're able to tap into corporate resources for support and development.

15. Please give us some information about the technology behind 3M's Dispersive Signal Technology (DST).



3M DST is 3M's proprietary implementation of bending wave technology for applications ranging from 32 to 46 inches. It's a passive touch system that works when a finger, gloved hand or stylus touches the glass surface and creates a bending wave within the glass substrate. The bending wave radiates outward to the sensor corners where four piezoelectric transducers convert this mechanical energy into electrical energy and, through proprietary algorithms, the controller is able to quickly and accurately calculate the location of the touch event, all in less than 20 milliseconds. This real-time processing allows DST to be precisely accurate in varying environments and in larger display sizes. The speed of the controller enables DST to be fast and accurate and facilitates drawing and gesture capabilities. Also, since DST's piezos and printed conductive traces are on the back of the sensor, customers can implement virtual bezel and flat front surface designs.

16. Is there an opportunity to enable multi-touch using DST?

Due to DST's theory of operation, "true" multi-touch capabilities are difficult to develop and are not yet available. However, DST now supports gestures such as flick, scroll, expand and rotate, which should suffice for most application developer's requirements.

17. How does DST differ from Elo's APR technology?

The primary difference between DST and APR is that the DST controller performs real-time positioning calculations on each detected bending wave to accurately determine the location of each touch event, while APR compares each detected bending wave to a look-up table of pre-determined bending wave signals. We advise prospective customers to test each system to determine their preferred response characteristics.

18. 3M is well-known as a manufacturer of films. In your touch business, it seems that you are focused on glass-based technologies. Any plans to utilize film-based touch technologies?

3M Touch Systems is constantly looking to develop touch technologies to meet its customer's needs and within 3M there are many synergistic technologies that could help enhance our existing technologies or possibly lead to new ones. The 3M Vikuiti light control film is a great example of leveraging the big 3M to help meet our customers' requirements. We currently offer a privacy viewing touch sensor, the 3M MicroTouch System SCT7650EX, which combines our impact-resistant touch solution with 3M Vikuiti ALCF (light control film). We have also experimented with other Vikuiti film products at the request of various customers to meet their special optic needs.

19. Can you share information about 3M's segmentation between the POS, gaming, self-service, digital signage, and entertainment market segments?

Not more than saying that these represent many of our primary target markets and segments that we've serviced for many years.

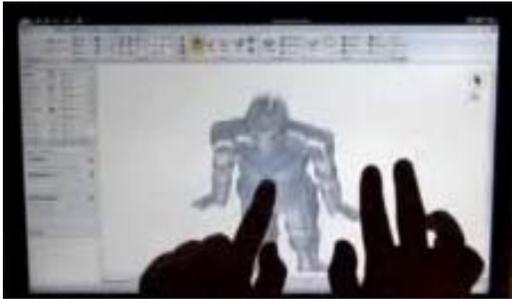
20. For the future, to what extent do you expect the PC space will utilize touchscreen inputs?

We call this the "touch attach rate" and it certainly varies for each vertical market. The applications that we target that are seeing the highest growth in attach rates are digital signage and consumer products.

21. What is the significance of Windows 7 regarding touch-based computing? How will this change the industry generally speaking -- for products, consumers, businesses, and vendors?

Without a doubt businesses are excited about the upcoming release of Windows 7. So, when the upgraded and new Windows 7 CPU's replace the millions of existing installations, the embedded multi-touch API will touch-enable these machines whether that feature is being used or not. This means that application developers and multi-touch hardware providers will have a pre-established user base for their touch or multi-touch applications as they become available. Since 3M's projected capacitive technology (multi-touch) has received Windows 7 AQ (with a 100% rating) certification and 3M surface capacitive touch technology (single touch, HID controller) has received Windows 7 logo compliance, we're expecting that our products will continue to win acceptance among this new group of business and consumer users.

22. What is the most compelling multi-touch application you've seen to date?



Now that "true" multi-touch hardware is becoming available, we're excited to see how the developer community uses the full capabilities of this new touch interface. New application examples appear on YouTube every day and one of the most public and intriguing is SpaceClaim's 3D Direct Modeling software (www.spaceclaim.com), which adds multi-finger interactions and on-screen radial menus for CAD design in place of traditional mouse clicks.

Additional application ideas include: classroom interactivity between students and teachers, telepresence communication systems, interactive story boarding, general conference room interactivity, video walls, and healthcare applications. The possibilities are endless. 3M is collecting best of breed examples and is posting them on www.3m.com/multitouch.

23. Tell us about 3M Touch Systems' manufacturing structure.

It's pretty simple. For 3M Surface Capacitive products, 3M Touch Systems is vertically integrated starting with mother-to-daughter size glass cutting, in-house printing and coating, on-site tail assembly, controller manufacturing, system testing, and product warehousing, all within 3M's control. It's an optimal arrangement to help meet customer lead times. And for worldwide logistics we're able to tap into the larger 3M to help facilitate product availability and logistical support for our global customers.

24. What are the biggest technical challenges that you think still need improvement in your various technologies?

The biggest technical challenge we face is adapting our products to meet customer needs for their evolving touch applications. Some of these emerging applications have unique requirements that differ significantly from the capabilities of traditional touch applications. As a result, our development teams continuously focus on product extensions and product enhancements to help meet their needs.

For more information about 3M Touch Systems and 3M MicroTouch products, visit www.3m.com/touch.

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