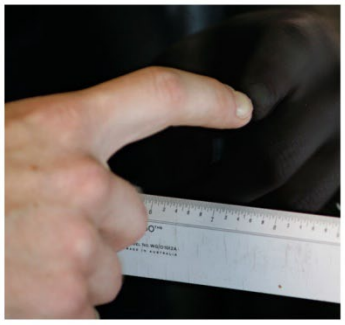
Touch Pressure in an Optical Touch System

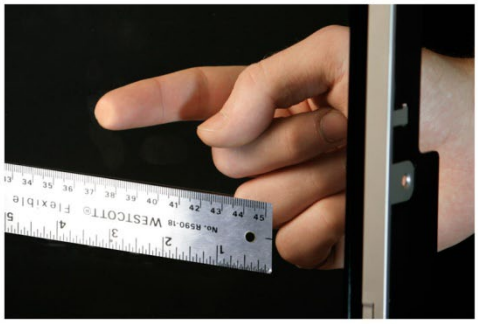
The selection of a touchscreen technology is often reduced to selecting the product that has the primary characteristic you need for your application and then working around the undesirable baggage that came along with your choice. Until the arrival of ShadowSense, if you needed pressure activation, then you had to deal with a fragile resistive screen that significantly reduced your display brightness and scratched within minutes of being used. If you wanted bare finger activation, then capacitive was your selection and you had to deal with the fallout from casual scratches and incidental EMI. If you didn't want users to take off their gloves, then SAW might have been your choice, until a piece of gum or bird debris stuck to the screen and rendered the touchscreen useless. Optical systems feature "Any Object" and "Zero Force" touch detection, but hovering and incidental touches plagued your applications.

Baanto ShadowSense™ touch technology is an innovative and patented optical position sensing technology using high performance sensors operating in the analog domain to provide innovative features and unprecedented performance, stability, and accuracy. Featuring an efficient sensor architecture coupled with an elegant position detection algorithms, ShadowSense touchscreens report not just the position of a touch object, but also the size of the touch object.

Baanto has coupled the touch size information with a dashboard application that allows customers to capture the outstanding user experience and reliability that optical systems offer with a methodology to enforce a positive finger style touch requirement.

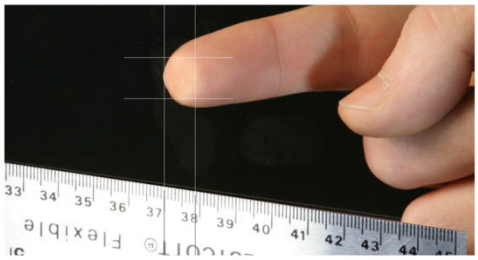
Consider the biomechanics of a finger touching the protective glass of a touchscreen. When a fingertip is barely in contact with the glass, there is modest deformation of the finger tip with a resulting touch area of ~ 6 mm to 9 mm. With a "Zero Force" optical touchscreen, this touch is reported as a valid touch.





Light press

Touch Area: 8.6 mm^2



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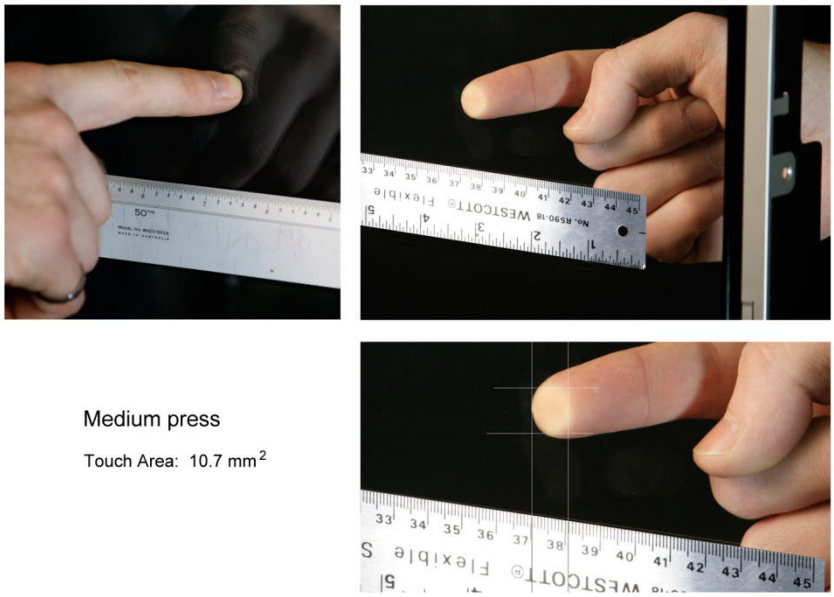
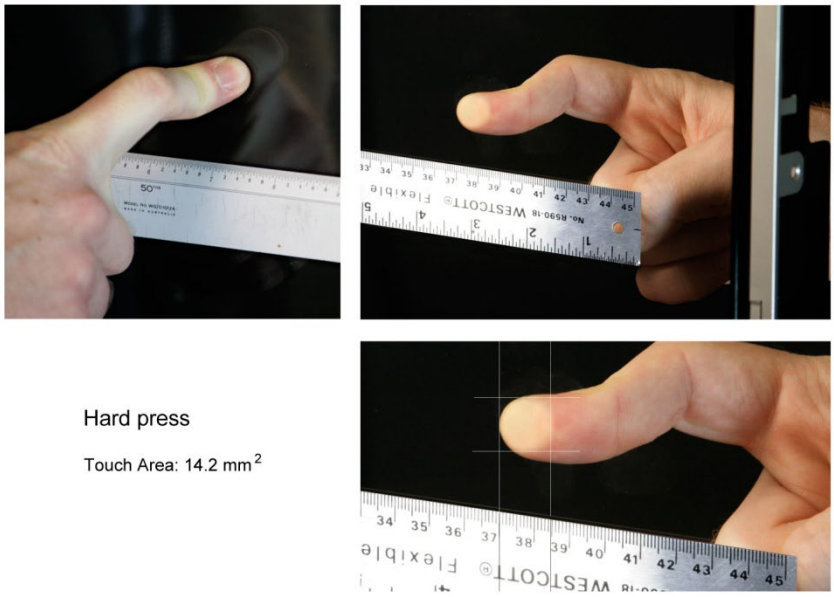
Now consider the natural user reaction if a light touch doesn't result in a response. Due to the long history of resistive and SAW touch in these applications, the user will typically and instinctively push harder, causing a more significant flattening of the fingertip with a resulting increase in touch area between ~9 mm to 11 mm.



Medium press

Touch Area: 10.7 mm^2

Continuing to ignore the touch, the user then pushes even harder and the finger will not only continue to flatten, but it will also start to bend at the first joint which dramatically increases the touch area to a range of ~12 mm to 15 mm.



Hard press

Touch Area: 14.2 mm^2

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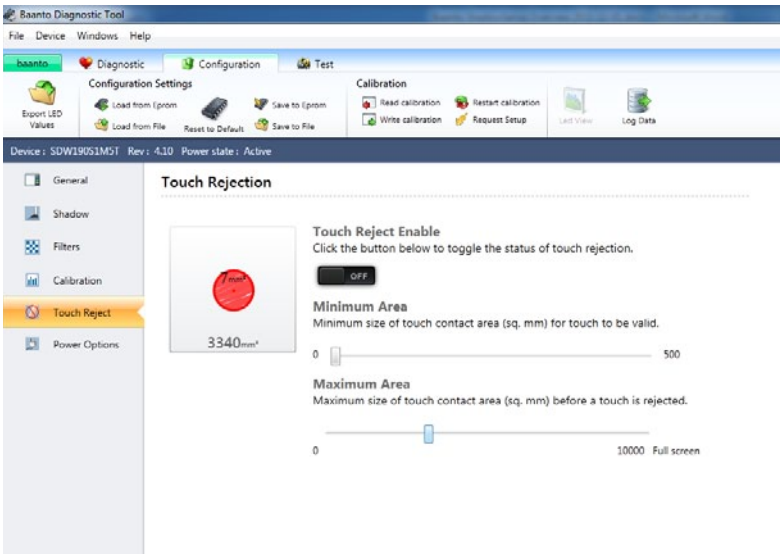
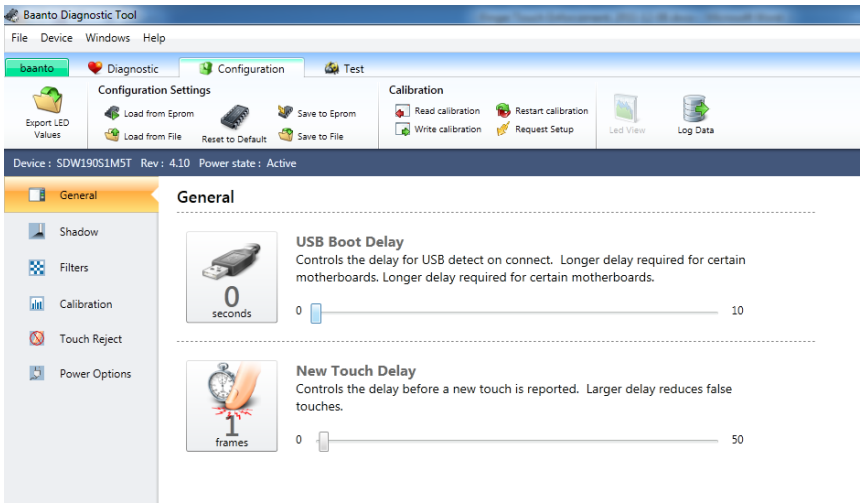
Baanto simplifies a user's ability to simulate finger pressure through a dashboard application that exploits the relationship of touch area to finger pressure. By simply adjusting the minimum touch area to a desired point the finger pressure required to activate a touch can be easily and simply emulated.



An additional parameter to further enhance finger enforcement is the dwell time before a new touch is acknowledged and reported to the host PC. Also controlled by the dashboard, the "New Touch Delay" feature allows an application developer to control the number of frames a touch object must be present before reporting a valid touch event.



The combination of Touch Area Detection and New Touch Delay provides users unprecedented control over the performance of a Baanto ShadowSense touchscreen

The results of this innovation are products featuring some of the highest performance, most robust, multi-touch capabilities available in the market today. Baanto touchscreens feature:

- True Multi-touch performance with 2 and 5 touch point options available
- Touch object size determination and reporting
- Solid touch activation
    - Senses solid objects 4 millimeters or greater in diameter
    - 6 to 8 millisecond response time
- Sub-2 millimeter touch point accuracy
    - No ghosting or dead zones
- Static object detection and rejection
    - Continues to function with debris on the screen
- 3mm tempered glass with 91% optical clarity
    - 93% and 95% transmissivity options available
    - IP65 rated front seal (bezel to glass)
- USB HID interface to host
    - Windows® 7 compliant
    - No drivers or CPU based algorithms
    - Calibration free
    - Mechanically and thermally stable

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