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ShadowSense™

Palm Detection and Rejection

The proliferation of multi-touch technologies has created a challenge for application developers that have been comfortable with traditional single touch user interfaces. Drags, pinches and other dynamic touches now cause the traditional "single extended finger" to move and be oriented in unexpected ways as the entire hand moves across the screen. Depending on the touch technology, random touches may be recognized and reported to the host from sources as diverse as the side of the hand, the palm, jewelry, coat sleeves and other random personal articles.

The level of sensitivity to a random touch will vary based on the touch technology and implementation details. For example, projected capacitive touchscreens are more likely to report a touch from the side of the hand, palm, dragging knuckles or a little finger. See *Figure 1*. Depending on the sensitivity of the touch controller, contact with the screen may not have even occurred as the body part simply entered into the hover distance of the touchscreen. Optical systems with "Any Object" touch detection will register a touch from any solid object entering the touch plane, dramatically extending the likelihood of a random touch

to include inanimate objects a user may be wearing or have in close proximity.

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 elegant position detection algorithms, ShadowSense touchscreens report not just the position of the touch object, but the size of it as well.
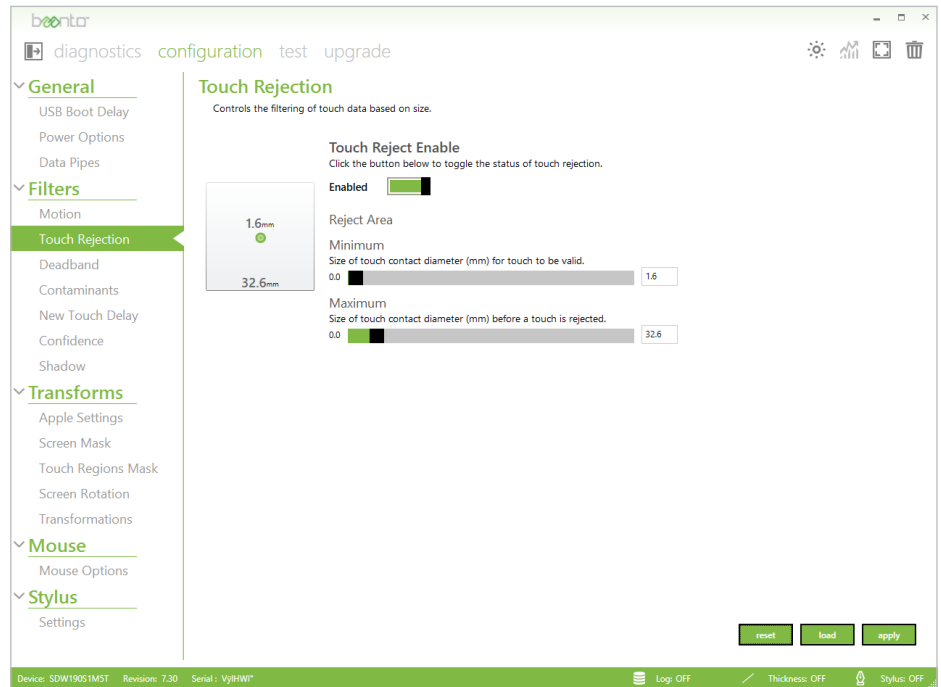

Figure 1: Screen without touch rejection

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The size information can be used to create a touch "gate" which can dramatically reduce the number of false touches by eliminating touch points with sizes smaller and larger than the target touch input object.

Baanto has coupled the touch size information with a configuration application called Dashboard, that allows customers to define the size limits associated with expected, desired, or required touch objects to reduce or even eliminate false touch reporting.

For example, adjusting the touch gate to a minimum touch area of 7 mm^2 (diameter of 1.6 mm) and a maximum touch area of 3,340 mm^2 (diameter of 52.6 mm) is designed to eliminate palm touches in a multi-touch system. *Figure 2* shows the configuration changes.

The result of the change is illustrated in *Figure 3*. The fist resting on the touchscreen is ignored while the finger trace is within the size "gate" and reported as a valid touch trace.

Figure 2: Using Dashboard to enable touch rejection
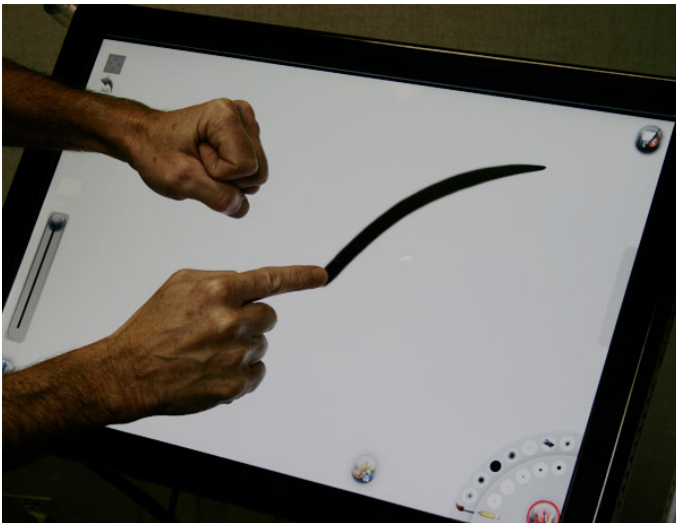

Figure 3: Screen with touch rejection enabled

An additional parameter to further enhance spurious touch rejection is the "dwell time" before a new touch is acknowledged and reported to the host PC. Also controlled by 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. This is shown in *Figure 4*. This setting further enhances the transient touches which are characteristic of jewelry or clothing accidently entering the touch plane when a user is in the act of touching or tracking a touch point on the screen.

The combination of Touch Area Detection and New Touch Delay provides users unprecedented control over the performance of a Baanto ShadowSense touchscreen. This creates an opportunity for application developers to exploit the advantages of optical touch systems with a much higher degree of reliability and control.

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

For more information about ShadowSense, please contact a member of our sales team at **sales@baanto.com**.
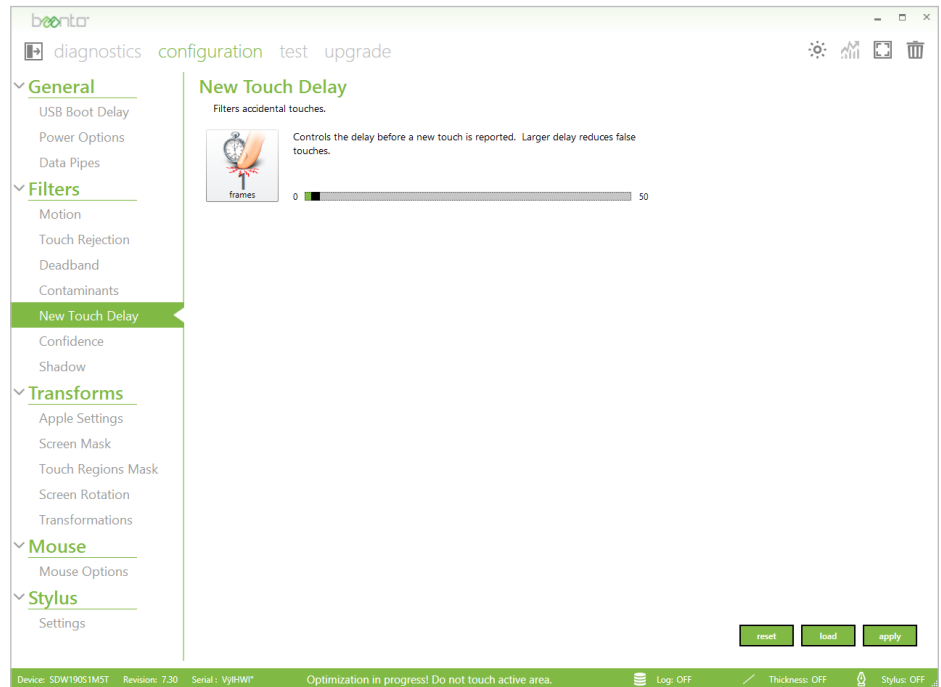
Figure 4: Using Dashboard to change new touch delay