

Profile™ Sensor Planning Guide

October 2001

The Profile sensor, 3M Touch System's innovative design for flat capacitive touch screens, incorporates advanced design and production techniques that result in high quality capacitive touch screens. The Profile sensor's sleek design provides ease-of-installation for LCD panels and flat CRT displays. The narrow border and wide viewing area, combined with durability, reliability, and optical clarity, make the Profile sensor the ideal choice for public access and business applications.

Profile sensors incorporate ClearTek 3000's ultra-smooth overcoat that dramatically increases physical durability by resisting scratches and abrasions to the touch screen surface.

This guide is intended to provide an overview of basic Profile sensor integration recommendations. For a more in-depth discussion of sensor integration, refer to the *Flat Panel Display Integration Reference Guide* (19-250 V2.2).

Components

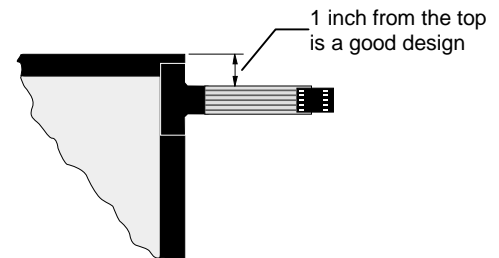
Profile touch screens are constructed of an all-glass flat sensor with a transparent, thin-film conductive coating applied to its top and bottom surfaces. A narrow electrode pattern is printed along the edge on the conductive layer to linearize the coating. A flat flex tail is attached to connect your touch screen controller.

A transparent glass overcoat (ClearTek 3000) is fused over the conductive coating to protect the sensor. The glass sensors have different etches to support the clarity and anti-reflective properties suitable to your specific touch screen applications.

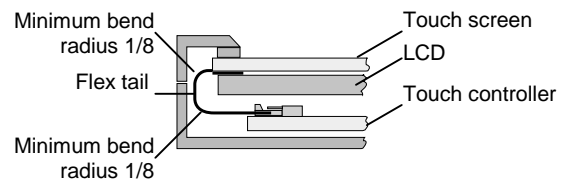
Putting It All Together

Proper integration of your Profile sensor into an LCD or flat CRT display will help prevent contamination from outside sources that could eventually cause problems.

- Always design your Profile sensor integration with the flex tail exiting from the top or sides. Never design tail exits from the bottom as spills could accumulate in this area and cause electrical shorting.

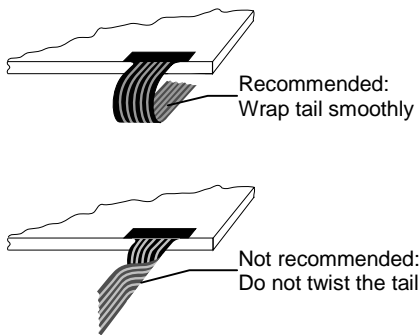


- The Profile sensor tail is designed to be flexible, although it should never be creased. The bend radius should be greater than 1/8 of an inch.



- To minimize the risk of EMI interference, never run the Profile touch screen connector near or over the LCD backlight inverter.
- The sensor tail is not a handle. Never pick your Profile sensor up by the tail. It is an electrical connection and is not designed for high stress.

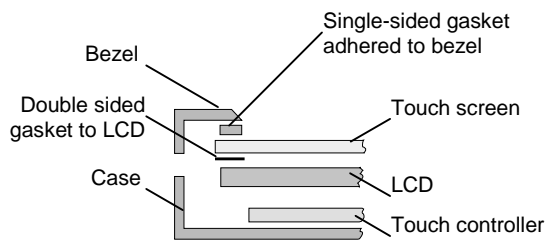
- ❑ Ensure that the tail and controller are aligned such that the tail remains straight (90°), not pulled or twisted in an odd angle from the sensor. Good engineering design avoids awkward electrical connections.



- ❑ The sensor tail should be secured in place with a light adhesive and not move freely after assembly.

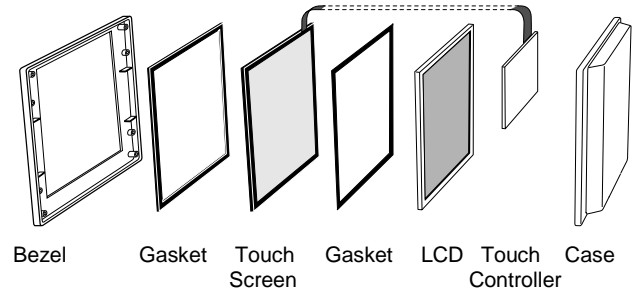
Gasketing

Proper gasketing is critical to any successful touch screen integration. We recommend using nonacidic, neutral pH 3M™ tapes to bond and seal your bezel and touch screen. These tapes not only provide high bond strength to various materials but also offer excellent sealing properties. 3M foam tapes are 100% closed cell and provide superior resistance to moisture and chemicals over other traditional cellular foam tapes.



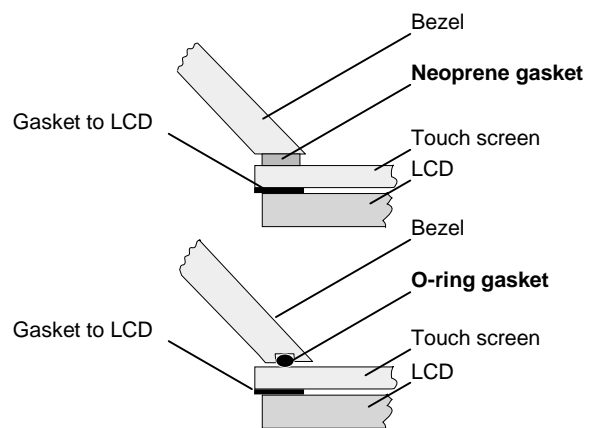
- ❑ Single-sided tapes, adhered to the bezel, make for easy alignment of the touch screen. Simply align and adhere the tape to the bezel edge. Gaskets should contact the sensor viewing area to ensure a good seal.

- ❑ Never adhere anything to the front surface of the touch screen. Using adhesives directly on the front surface of the touch screen may adversely affect the surface coating as well as your ability to service the unit.

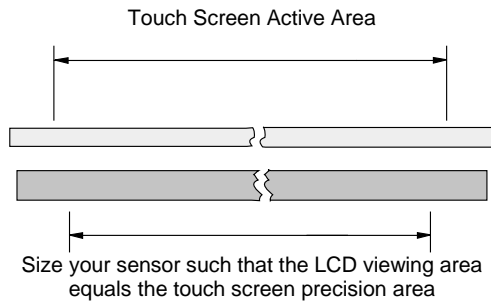


- ❑ A die cut or full perimeter of double-sided, thin, open cell foam gasket should be used as a dust barrier and insulator between the Profile sensor and the LCD metal frame. 3M Touch Systems has used 3M 4962 tape for this purpose.

- ❑ A neoprene flat gasket or O-ring seal between the bezel and the touch sensor is also a good choice. The compression should be evenly distributed to the glass surface. Be aware of and follow material manufacturer's recommended compression specifications.



- ❑ Ensure that gaskets do not interfere with the active viewing area of the Profile touch screen. 3M Touch Systems defines precision area to be 94% of the touch screen active area. Within the precision area the Profile touch screen meets or exceeds $\pm 1\%$ accuracy levels.



Keep Metal Away!

Because metal can interfere with and reduce the sensitivity of a capacitive touch screen, you must be careful when positioning the touch screen near metallic objects or materials.

- Do not let any metal — such as metal mounting brackets or screws — *physically* contact any part of the touch screen. This could be recognized as a touch.
- In the design phase, avoid metal bezels whenever possible. If your current design has a metal bezel, ensure that it doesn't contact the touch screen and is appropriately grounded and very secure (rigid). Use insulating tape or gasketing as a spacer.
- Be aware that some plastic bezels have conductive paint that could act as a metal bezel.
- Do not use artwork that has metallic pigments, metallic inks, or foil backings in front of or on the Profile touch screen.

Location, Location, Location

Remember that lighting changes over the course of a day and depends on weather. Consider the brightness of an area and how it will affect readability of the computer display.

- Daylight, particularly direct sun, can affect the paper, inks, and adhesives in any artwork your installation may contain. Make sure that these materials are UV stable.

- Consider using high brightness displays for better readability in bright ambients. Remember that sunlight comes in at different angles throughout the year. What might not be a problem in the summer could be an issue in winter.
- Electromagnetic interference can cause problems with any electrical device. Be aware of devices that generate electrical fields, such as radio transmitters, pager transmitters, and security tag deactivators, and plan your installation accordingly.
- Be aware of basic electrostatic discharge (ESD) considerations.
- Keep in mind the optics of the touch screen. Remember that different sources of light such as outdoor (natural sunlight) and indoor (incandescent versus fluorescent) can cause different effects on the touch screen. The Profile sensor data sheet can provide more detail on optical specifications.

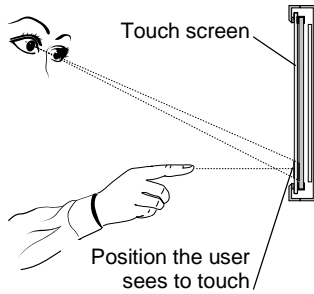
Designing Applications

With any touch application, the design can be crucial to the usability of the final product. Clear icons, bright contrasting colors, large buttons, and simple layouts will go a long way towards the success of your installation.

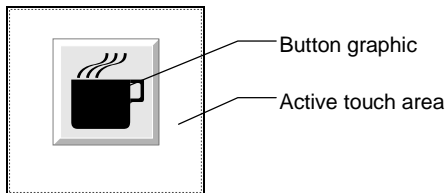
Parallax, the effect of a target object appearing in different positions when looked at from different angles, is a common problem in touch applications.

The combination of the touch screen in front of the display and differing heights of users can cause parallax.

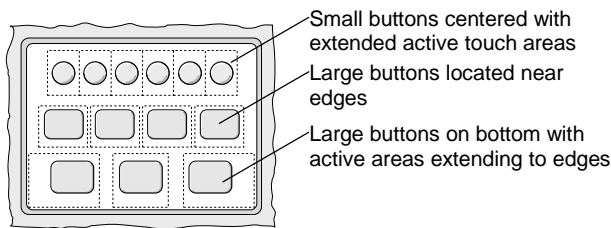
When designing your touch system software application, use the following guidelines to help reduce the effects of parallax.



- ❑ Design large buttons to facilitate touch. Remember that a fingertip is much larger than a cursor.



- ❑ Design larger active border areas for buttons. For example, if the button graphic is 1" X 1" the active touch area behind it could be 2" X 2".
- ❑ Keep buttons away from the edges and corners of the screen. If this is impossible, make sure the active touch areas extend to the outer edges of the viewing area.



- ❑ Place buttons horizontally whenever possible. One size does not fit all! Consider the varying heights of users when designing the application.

Care and Cleaning of Your Profile Sensor

Typically, isopropyl alcohol and water solution ratio of 50:50 is the best cleaning agent for your touch screen. You can also use straight isopropyl alcohol.

- ❑ As with any electronics, be sure to spray the cleaner onto a soft cloth not directly onto the touch screen.
- ❑ It is important to avoid using any caustic chemicals on the touch screen.
- ❑ Be sure to follow solvent manufacturer's precautions and directions for use when using solvents.

Notice: Given the variety of factors that can affect the use and performance of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is suitable for a particular purpose and suitable for the user's method of application.

3M Touch Systems products are not specifically designed for use in medical devices as defined by United States Federal Law. 3M Touch Systems products should not be used in such applications without 3M's expressed written consent. Contact your sales representative if the opportunity involves a medical device application.

Specifications subject to change without notice. This Product is warranted to meet its published specification for the period set forth in the specification. **3M makes no additional warranties, express or implied, including but not limited to any implied warranties of merchantability or fitness for a particular purpose.** In particular, but without limitation, 3M makes no representations or warranties concerning the effective life of the products or their ability to survive user's environmental testing. Purchaser is responsible for determining whether the 3M products are fit for the purchaser's particular purpose and suitable for the purchaser's method of production. **3M shall not be liable in any action against 3M in any way related to the products for any loss or damages, whether non-specified direct, indirect, special, incidental or consequential (including downtime, loss or profits or goodwill) regardless of the legal theory asserted.**



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