

3M Surface Capacitive Solution Enables More Intuitive User Interface in Marine Navigation Application

The Application

Electronic devices used in the marine environment are increasing in popularity. These devices consist of chart plotters, fish finders, global positioning systems (GPS), radar and live video feed equipment. Traditionally these devices used buttons, a joystick or a combination of both for the user interface. Now, these multiple electronic devices are converging into a single large display with multi-function capability. This convergence increases the amount of information being displayed on the LCD screen and is driving the development of a more complex, yet intuitive, interface so the user can interact easily with the increased data. Marine electronic devices range in size from 7 inches to 19 inches and can be found on premium pleasure boats and larger commercial shipping vessels.



The Problem

A major European-based navigation device manufacturer was looking to differentiate their existing product by introducing a large marine display device that was capable of navigation, radar, and chart plotting. The OEM was interested in using touch to simplify the complex interface, but needed to maintain the optical clarity of the high-end LCD used in its product.

LCD displays used in marine devices are high-performing with excellent optical characteristics including wide viewing angle, high brightness and high contrast ratios. Users may not have direct line of sight to the display so wide viewing angle is important. The LCD display can be used in an open area or in the cockpit so light exposure is variable. The device must be easily readable in direct sun, high ambient and low light conditions and be able to withstand exposure to ultra-violet (UV) light without affecting image clarity. Exposure to salt water or water from wash downs requires the device be sealed against water ingress. The touchscreen choice in this application could not adversely affect the above mentioned optical characteristics of the LCD display and must be capable of being effectively sealed against water ingress.

The Solution

The 3M™ MicroTouch™ Sensor SCT3250 (see Figure 1) was the optimal solution for this application. It is an all glass solution with 3M proprietary optical and anti-glare coatings. The optical coatings help reduce light refraction that occurs between the front of the LCD display and the back of the touchscreen glass. Less light refraction

enables more light to pass through to the user's eye. When combined with an anti-glare coating on the front of the touchscreen that scatters ambient light the touchscreen provides a maximum of 91.5% light transmission. The display's high brightness and contrast is maintained by passing through the maximum amount of light. Through a proprietary formulation 3M's anti-glare coating minimizes the viewing angle loss.

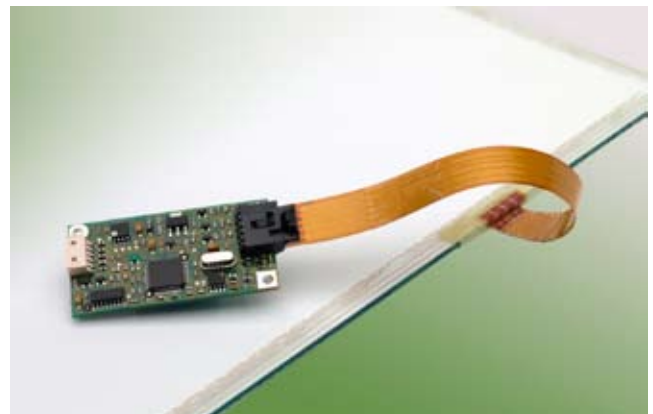


Figure 1: 3M MicroTouch Sensor SCT3250 and 3M MicroTouch Controller EX

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3M's SCT3250 sensor is an all glass solution which is unaffected by UV exposure regardless of the exposure time length. When compared to a traditional 5-wire resistive construction consisting of a polyethylene (PET) layer, the SCT3250 sensor is a more robust solution. When PET is exposed to UV it tends to yellow and discolor over time. The amount of time for yellowing to occur is directly related to the amount and type of exposure. A high UV light environment will cause the PET to yellow faster than a low UV light environment. Since UV exposure may not be easily controlled or managed, 3M's all glass touch solution is the answer when optical clarity is required and UV exposure is possible.

The all glass structure is capable of withstanding the torque force required to achieve a water tight seal, commonly known as either an IP (Ingress Protection) or NEMA (National Electronics Manufacturers Association) rating.

The Result

After reviewing the available touch technologies, the customer specified 3M's SCT3250 touch sensor for their product. The integrated marine navigation product has been proven to provide excellent optical characteristics and water ingress properties, and has set a new industry benchmark for devices of this type.

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