



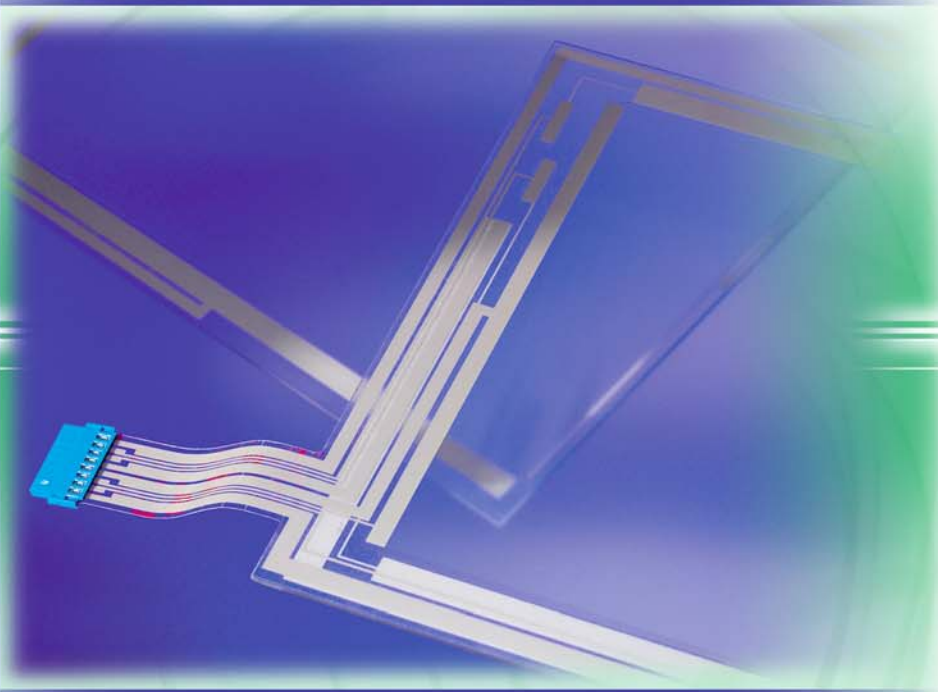
# PL Resistive Touch Screen

HIGH-VALUE

FAST

VERSATILE

EASILY INTEGRATED



## Product Highlights

- Chemically strengthened glass option for added break resistance
- Low power consumption for rugged portable products
- Input flexibility – finger, gloves, stylus
- Value touch solution

## Touch Solutions for Ruggedized Touch Products

MicroTouch™ Polyester Laminated (PL) resistive touch screen technology, manufactured by 3M Touch Systems, is the preferred solution for ease of integration into your rugged touch product. The field-proven PL design gives MicroTouch resistive touchscreens exceptional durability. PL screens use a full sheet of specially formulated optical-grade adhesive to bond the switch layers to strengthened glass, creating a shatter-resistant touch screen that has the ability to withstand temperature and humidity extremes found in harsh indoor and outdoor environments.

3M Touch Systems offers the PL construction in 4- and 8-wire designs, each capable of accepting input from any stylus, including fingers and gloved hands. The 4-wire resistive design is primarily used for rugged portable products under 8.4" in size. With its compact design, low power draw, and break resistance, the 4-wire PL resistive is ideal for portable test devices, automotive diagnostic equipment, warehousing, and other rugged mobile applications. The 8-wire design is offered in 8.4" and larger sizes for factory floor automation, attended kiosks, and other mid-sized touch applications. The 8-wire sensor uses a sophisticated sensing technology to maintain accuracy in a variety of environments over the life of the product.

## Making the Difference

3M Touch Systems has worked hard to perfect the science of building resistive touch screens. By taking a hands-on approach and coating, printing and processing its own conductive film, 3M is confident that it has built accuracy and reliability into every resistive product.

# MicroTouch™ PL Resistive Touch Screen

## Electrical

Operating Voltage	2.5V to 5 VDC
Linearity	1.5% error
Absolute Position	≤ 1.5% on ITO coated polyester layers
Isolation	≥ 15 M Ω Isolation is the minimum resistance between traces that are not connected in the design when the touch screen is not deliberately activated.

## Optical

	All values gained using BYK Garder hazegard plus.
Transmittance	76% ± 2                      Enhanced option: 79% ± 2
Haze and Clarity (Typical Values)	Hardcoat HCC01 – Haze 3%, Clarity 93% Hardcoat HCG12 – Haze 5%, Clarity 77% Hardcoat HCG10 – Haze 13%, Clarity 65%

## Environmental

Operating	<i>High Temperature and Humidity:</i> +50 degree C and 90% RH non-condensing. Touch screen meets the isolation specification after 2 weeks continuous at condition.
Storage	<i>Low and High Temperature:</i> -20 degrees C to +50 degree C, 20-50%RH, non-condensing >2 weeks, integrated or non-integrated, 15 degrees C to 30 degrees C ambient conditions. -40 degrees C to -21 degrees C and +51 degrees C to +70 degrees C 20-50% RH, non-condensing limited for ten days continuous.

## Mechanical

	Data is for .004" diameter separator dots on a 0.14" pitch. Testing using 3M Touch Systems SC4 controller.
Activation Force	Stylus: < 25g average with plastic stylus with 1mm radius, full hemispherical tip. Finger: < 50g average with 5/8" diameter silicone finger.
Option	Custom activation force and palm rejection available.

## Durability

	Data is for .004" diameter separator dots on a 0.14" pitch.
Point Activation	1,000,000 activations (typical) at a single point with a 5/8" diameter silicone finger with a 350g load at 2 touches per second, using a 3M Touch Systems SC4 controller.
Gouge Hardness	≥ 4H per ASTM D3363-92 for HCC01, HCG10 and HCG12 per ASTM D3363-92 for HCG01 and HCG13

## Chemical Resistance

The touch screen surface finish is unaffected by exposure to the following chemicals for a period of one hour at 22 degrees C, 45% relative humidity. ASTM-F-1598-95.

Tea, Coffee, Ketchup, Mustard, Vinegar, Beer, Coca-Cola, Red Wine, Cooking Oil Wisk Laundry Detergent, Fantastik All Purpose Cleaner, Joy Dishwashing Liquid, Windex, Formula 409 Cleaner, Clorox Bleach (5.25%), Hydrogen Peroxide (3%), Lysol, Ethyl Alcohol, Isopropyl Alcohol Acetone, Methyl Ethyl Ketone (MEK), Toluene, Concentrated Hydrochloric Acid, Naptha, Mineral Spirits, Gasoline, 10W30 Motor Oil, Diesel Fuel, Transmission Fluid, Brake Fluid, Antifreeze, Hydraulic Oil

## Warranty

5 years

*\* PL analog resistive touch screen construction is defined as a non-buffer layer, film on film construction with nominal 350 ohm/sq or higher ITO on polyester resistance, a glass backing panel and an Anti-Newton Ring, no vent design.*



### 3M Touch Systems 3M Optical Systems Division

300 Griffin Brook Park Drive  
Methuen, MA 01844  
U.S.A.  
1-866-407-6666  
www.3Mtouch.com

### Worldwide Manufacturing Plants

Methuen, Massachusetts  
Milwaukee, Wisconsin  
Vancouver, BC Canada

For more information  
on 3M touch products,  
visit [3Mtouch.com](http://3Mtouch.com) or  
call toll-free 1-866-407-6666

**NOTICE:** Given the variety of factors that can affect the use and performance of a 3M Touch Systems Product (the "Product"), including that solid state equipment has operation characteristics different from electro mechanical equipment, some of which factors are uniquely within User's knowledge and control, it is essential that User evaluate the 3M Touch Systems Product and software to determine whether it is suitable for User's particular purpose and suitable for User's method of application. 3M Touch Systems' statements, engineering/technical information, and recommendations are provided for User's convenience, but their accuracy or completeness is not warranted. 3M Touch Systems products and software are not specifically designed for use in medical devices as defined by United States federal law. 3M Touch Systems products and software should not be used in such applications without 3M Touch Systems' express written consent. User should contact its sales representative if User's opportunity involves a medical device application.

**IMPORTANT NOTICE TO PURCHASER:** Specifications are subject to change without notice. These 3M Touch Systems' Products and software are warranted to meet their published specifications from the date of shipment and for the period stated in the specification. **3M Touch Systems makes no additional warranties, express or implied, including but not limited to any implied warranties of merchantability or fitness for a particular purpose.** User is responsible for determining whether the 3M Touch Systems Products and software are fit for User's particular purpose and suitable for its method of production, including intellectual property liability for User's application. If the Product, software or software media is proven not to have met 3M Touch Systems' warranty, then 3M Touch Systems' sole obligation and User's and Purchaser's exclusive remedy, will be, at 3M Touch Systems' option, to repair or replace that Product quantity or software mediator to refund its purchase price. 3M Touch Systems has no obligation under 3M Touch Systems' warranty for any Product, software or software media that has been modified or damaged through misuse, accident, neglect, or subsequent manufacturing operations or assemblies by anyone other than 3M Touch Systems. **3M Touch Systems shall not be liable in any action against it in any way related to the Products or software for any loss or damages, whether non-specified direct, indirect, special, incidental or consequential (including downtime, loss of profits or goodwill) regardless of the legal theory asserted.** (7/02)