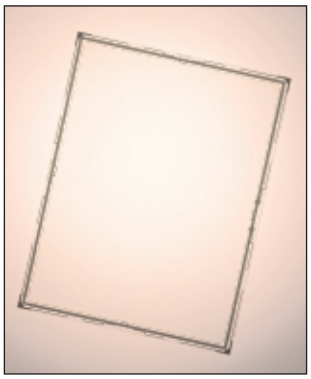
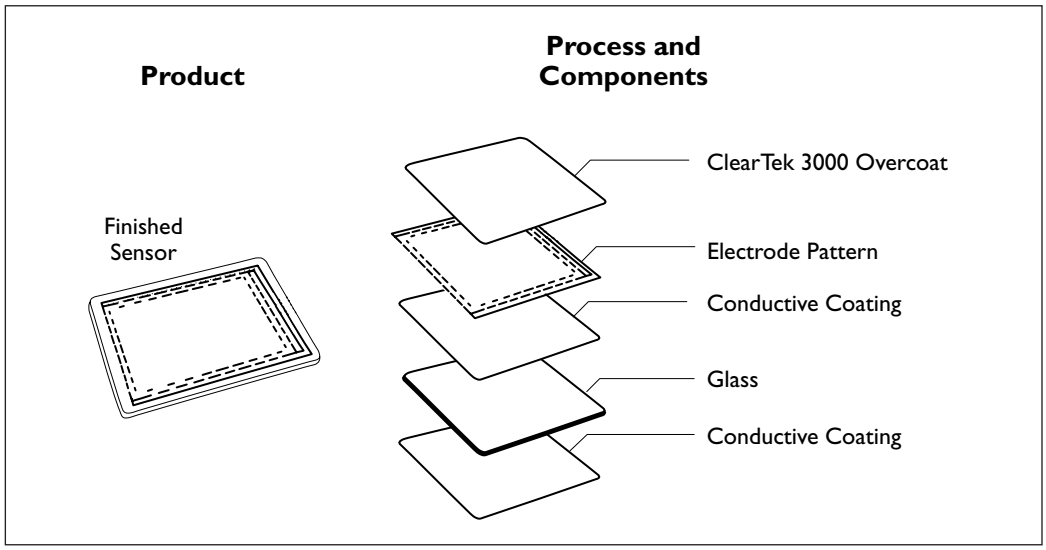
ClearTek 3000

CAPACITIVE TOUCHSCREENS

ClearTek® 3000, MicroTouch Systems' capacitive touchscreen, offers unmatched durability, reliability, and optical clarity for public-access and your business applications. Popular applications are gaming machines, ATM installations, kiosks, industrial equipment, and point-of-sale. ClearTek 3000's ultra-smooth overcoat drastically increases physical durability by resisting scratches and abrasions to the touchscreen surface — providing 210 times improved scratch-resistance. ClearTek 3000's performance is unaffected by everyday contaminants and its ultra-smooth overcoat sets new standards for environmental robustness by causing liquids to more readily bead up and slide off the touchscreen.



ClearTek 3000 Touchscreen



ClearTek 3000 Sensor Construction

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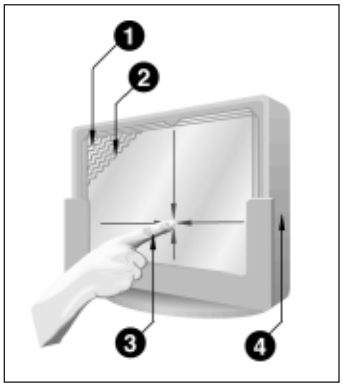
ClearTek 3000 touchscreens are constructed of an all-glass sensor with a transparent, thin-film conductive coating applied to its surface. An electrode pattern is precisely printed along the edge on the conductive layer. A transparent glass overcoat (ClearTek 3000) is fused over the conductive coating to protect and seal the sensor. The glass sensor is often etched to provide the suitable clarity and anti-reflective properties for the touchscreen application.



How ClearTek 3000 Works

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Voltage is applied to the screen **(1)** and the electrode pattern uniformly distributes a low-voltage field **(2)** over the conductive layer. When a finger touches the screen **(3)**, it "capacitively couples" with the voltage field, drawing a minute amount of current to the point of contact. The current flow from each corner is proportional to the distance from the corner to the finger.The controller simply calculates the flow proportions to locate the touch **(4)**.

MicroTouch®
The Global Standard in Touch

ClearTek 3000 Technical Specifications

ELECTRICAL

Technology	Capacitive.
Accuracy	Less than ±1% error within the active area.

OPTICAL

Touchscreen Resolution	1024 touch points per axis within the calibrated area.
Optical Clarity	Up to 85% light transmission at 550 nm when bonded.
Surface Finishes	True (NL) etch; Industrial (C) etch; Polished finish.
Optical Coating	ClearTek® 3000, a protective glass overcoat that protects the sensor by resisting scratches and increasing durability.
Optional Optical Bonding	MicroTouch bonds touchscreen to CRT with a transparent bonding compound to improve optics, add structural support, and eliminate condensation.

MECHANICAL

Initial Touch Down Speed	8-15ms.
Touch Contact Requirement	As low as 3ms.
Conversion Speed	Up to 200 touch points per second at 19.2K baud.
Dynamic Range	Positional variation of ±2% (anywhere on screen) when capacitive load varies.
Linearization	Factory linearization values are stored in the touchscreen NOVRAM.
Construction	Glass sheet with transparent conductive coating beneath glass overcoat. Electrodes printed on perimeter.
Thickness	0.125" (±0.01") / 3.18mm (±.25mm) standard.
Size and Shape	More than 43 curved (spherical and cylindrical) sizes and 27 flat sizes offered. Custom sizes also available. Aspect ratios available up to 2:1.
Perimeter Electrode Width	Proportional to sensor size.
Harness	Screen supplied with 12", 24", or 36" (3.66, 7.32, or 10.97 meters) shielded cable to connect to controller.
Surface Durability	Cannot be scratched using any stylus with Mohs' rating of less than 6. Exceeds severe abrasion test per MIL-C-675C. Withstands 10,500 grams of force per Balance Beam Scrape Adhesion Mar Tester, Paul N. Gardner Co. model PA-2197 using a loop stylus (0.128 in. O.D. Rockwell Hardness 55-61). MicroScratch tester with 10 micron radius tungsten carbide indenter takes a force of 1.8 Newtons.

RELIABILITY

Touch Life	Coating shows no surface degradation in any touch location at 150 million touches as of February 2000 and the test continues.
Antibacterial Protection	CleanScreen safely and effectively controls bacteria and other microorganisms that come in contact with the touchscreen.
Electrode Durability	Fused into glass. Will not be damaged during installation.
Surface Obstructions	Touchscreen's operation unaffected by almost any surface obstructions such as dirt, dust, grease, smoke, peanut butter, etc.
Chemical Resistance	ClearTek 3000 is highly resistant to corrosives, in accordance with ASTM-D-1308-87 (1993) and ASTMD-F-1598-95. *Details on next page.*
Liquid Resistance	Liquids on screen do not impede touchscreen performance.
Liquid Repellence	Contact angle of 94° and greater using Sessile Drop Contact Angle Method rendered screen extremely water repellent.
Operating Temperature	-15°C to 70°C for touchscreen.
Storage Temperature	-50°C to 85°C for touchscreen.
NEMA Rating	NEMA sealable.
Gasketing	Complete water-resistant seal obtainable with polyethylene gasket. Standard with MicroTouch retrofit.
Cleaning	Water, isopropyl alcohol, and similar non-abrasive cleaners.

ClearTek 3000 Technical Specifications

CONTROLLER

Controller Options *See ClearTek Controller Specification Sheet*

SUPPLEMENTAL DOCUMENTATION

ClearTek Controller Specification Sheet, CleanScreen Technology Brief

The Hygienic Touchscreen

In public access environments — such as ATMs, kiosks, and gaming machines — where technology is shared on an daily basis or industries where cleanliness is critical such as medical and foodservice, ClearTek 3000 features ***CleanScreen***™, *Antibacterial Protection for Touchscreens.* ***CleanScreen*** safely and effectively controls the transmission of bacteria and other microorganisms by bonding the EPA-registered *AEGIS Microbe Shield* to the surface of the touchscreen. AEGIS' Microbe Shield provides long-term, effective control of microorganisms which are commonly associated with human health problems.

Chemical Resistance Tests

Touchscreens are exposed to various environments where chemicals, household cleaners, or industrial cleaners come in contact with the screen. ClearTek 3000 is constructed of a glass layer and a glass overcoat. The glass overcoat resists scratches and can be configured with a polished or anti-glare finish. The following tests measure the resistance of ClearTek 3000 to a variety of chemicals.

Test Objective. The glass overcoat has been tested to resist the following chemicals.

Test Goal. To document which chemicals are compatible with the glass overcoat.

Test Methods. ASTMD-F-1598-95 and ASTMD1308-87 (1993)

Test 1

ASTMD-F-1598-95 tests for chemical resistance effects of solvents and reagents. After a 10-minute spot test, no evidence of physical damage and all samples met the requirements of post chemical functional tests.

6% Hydrochloric Acid	Acetone	Toluene	Gasoline
70% Nitric Acid	Brake Fluid	Xylene	
40% Sulfuric Acid	10% Sodium Hydroxide	Windex	

Test 2

ASTMD-F-1598-95 tests for chemical resistance effects of volatile liquids. After a 10-minute spot test, no evidence of physical damage and all samples met the requirements of post chemical functional tests.

5% Ammonia	Ethanol	Trichloroethyene
Methyl ethyl ketone (MEK)	Gasoline	10% Caustic Soda
70% Nitric Acid	Acetone	Xylene
Windex		

Test 3

ASTM-D-1308-87 (1993) tests for household chemicals. After 24-hour spot test no evidence of physical damage after chemical testing and all samples met requirements of post chemical functional tests.

Beer	Tea	Coffee	Coca-Cola	Lipstick
White Vinegar	Caustic Soda	Grease Pencil	Stamping Ink	Ball Point Ink
Naptha	Lysol	Rubber Cement		

ClearTek 3000 Capacitive Touchscreens

CORPORATE PROFILE

Global company committed to the innovation and application of touchscreen technology

Founded in 1982

Public company (NASDAQ: MTSI)

1999 sales of $157.5 million

The MicroTouch Difference

When you partner with MicroTouch for your touchscreen needs, you benefit from the industry's best combination of service, warranties, and support.

Five-Year Warranty

MicroTouch products come with a five-year warranty on all touchscreen components.

Around-the-World Service and Support

When you need product information quickly or new software drivers, you can reach us through our Technical Assistance telephone support line, Web site, or e-mail. We're never out of touch.

A Commitment to Quality

MicroTouch's headquarters manufacturing facility is ISO 9001-certified. Our numerous quality groups, inspections, and executive involvement are just some of the MicroTouch quality initiatives that ensure the product you receive is the most reliable in the industry.

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