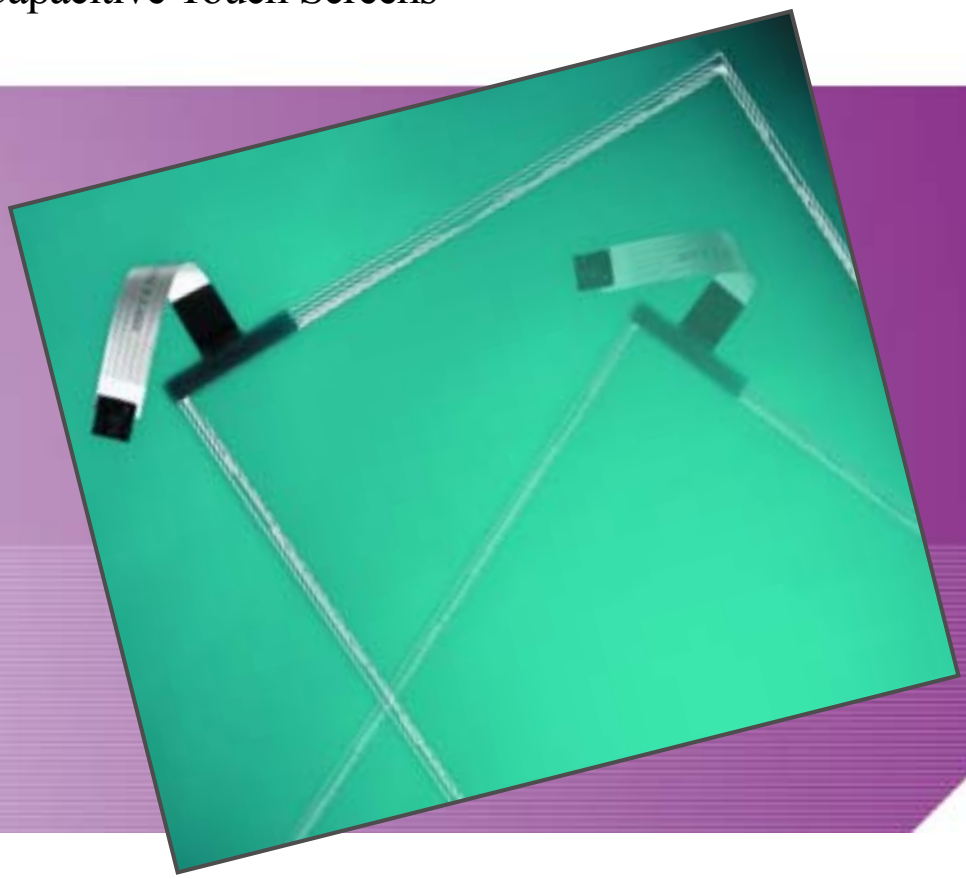
MicroTouch™ 3M

# ClearTek™ Capacitive Touch Screens

CAPACITIVE TOUCH SCREENS



## *Product Highlights*

- Transparent coating significantly increases durability by resisting scratches and abrasions
- Performance unaffected by everyday contaminants in the environment
- Accurate, fast, reliable touch response
- Narrow border for easy integration
- Connects to the new EX II electronics platform
- ClearTek capacitive touch screens available in both flat and curved

## Extended Durability for High-use Applications

MicroTouch ClearTek capacitive touch screens, manufactured by 3M Touch Systems, are the preferred touch solution for applications that require fast, reliable and accurate touch performance. The flat capacitive Profile sensor incorporates advanced construction and production techniques that result in a thin, sleek design which provides easy installation into flat panel displays and flat CRTs. The robust touch characteristics of ClearTek are attributed to its transparent overcoat, which significantly increases the physical durability of the surface by allowing it to resist scratches and abrasions. Popular applications include kiosks, ATM installations, point-of-sale, industrial equipment, gaming machines, and vending.

## Making the Difference

ClearTek capacitive touch technology provides accurate and sensitive response to the user's touch while offering outstanding durability. A ClearTek capacitive touch screen provides scratch-resistance and contaminant-resistance to dirt, liquids, and harsh chemicals. A ClearTek sensor with Industrial Etch has been tested in a laboratory environment to withstand over 225 million mechanical touches without noticeable degradation to the surface.*

* Mechanical touch activation in a single x,y location using a finger-like stylus of 45 durometer , shore "A" hardness, 0.5 inch diameter with a load of 0.46 pounds, +/- .01 pounds of force.

# ClearTek Options

## TouchPen

TouchPen supports both finger touch and pen input on a ClearTek sensor. The tethered stylus supports handwriting recognition, signature and data capture, annotation, and gloved-hand use. With TouchPen you can select from dense menus or work with detailed images too small to touch with a finger. A hand resting on the screen while writing is ignored through capacitive digitizer technology, which intelligently distinguishes between pen and finger touch.

### Features Unique to TouchPen Tethered Stylus

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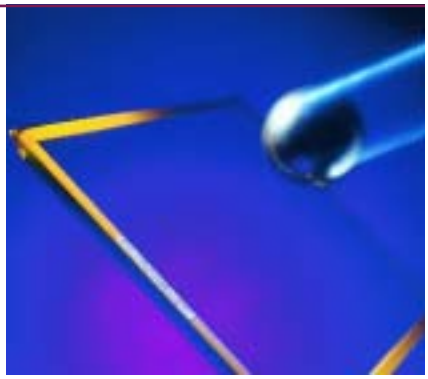
| **Pen Construction** | Plastic, lightly textured surface. Black |
| **Pen Dimensions** | 6” (152.4mm) length without strain relief, 0.42” (10.67mm) diameter. |
| **Pen Cabling** | 3.5’ or 5.5’ (1.07 or 1.68 meters) tether, strain relief to 17 lbs. (7.71 kg). Force 50 lbs. (22.68 kg) tensile strength. |
| **Pen Tip** | Non-metallic, non-marking, black, 0.12” (3.05mm) diameter, 0.08” (2.03mm) protrusion from barrel. |
| **Pen Tilt** | Up to 45 degrees from perpendicular |
| **Pen Connector** | 8-pin Rj 45 phone jack |
| **Resolution*** | 16k x 16k |

## ToughTouch



ToughTouch is a ClearTek sensor with a layer of strenghtened glass laminated to the back. ToughTouch provides increased impact-resistance for flat sensors in industrial, unattended, or vandal-prone environments. ToughTouch offers the same level of performance and contaminant-resistance as a ClearTek capacitive sensor with added impact resistance.

### Features Unique to ToughTouch

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| **Impact Test UL 1950 Clause 4.2.4** | ToughTouch capacitive sensors exceed the requirements of UL 1950 for impact resistance. |
| **Glass Thickness** | 0.34” (+/- 0.01”) / 8.64mm (+/-.25mm) typical (This does not include potential thickness of all tolerances.) |

## PrivacyTouch


PrivacyTouch is a ClearTek sensor with a 3M Light Control Film Polycarbonate (LCF-P) laminated to the back. The LCF-P is a thin plastic film containing closely-spaced black microlouvers. This film allows for privacy viewing. Only those viewers directly in front of the screen can view its contents. Viewers at other angles see only a dark screen. PrivacyTouch is ideal for confidential viewing on banking and security terminals or anywhere privacy viewing is desired.

### Features Unique to PrivacyTouch

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| **Louver Angle** | 0 degrees +/- 6 degrees (nominal tolerance) |
| **Viewing Angle** | 60 degrees +/- 8 degrees (nominal tolerance) |

# Technical Data

## ClearTek Capacitive Touch Screens

### ELECTRICAL

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| **Input Method** | Finger. TouchPen available with qualified sensor, attachments and electronics |
| **Accuracy and Precision Area** | Reported touch coordinates are within 1.0% of true position (based on viewing area dimensions) when linearized and used in conjunction with 3M Touch Systems electronics. |
| **Touch Screen Resolution*** | 16k x 16k |

### OPTICAL

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| **Optical Clarity** | Up to 88% light transmission at 550 nm; dependent on specific surface finish chosen.<br>Equipment used: BYK Gardner Haze Gard Plus |
| **Surface Finishes** | Industrial and Polished etch for flat or curved. True etch for curved only. True AR etch for flat only. |
| **Coating** | ClearTek is a protective glass overcoat that protects the sensor by resisting scratches and increasing durability. |

### MECHANICAL

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| **Linearization** | Factory linearization values are stored in the touchscreen NOVRAM, attached controller or 2D bar-code |
| **Touch Contact Requirement** | 3 ms for finger input. |
| **Glass Thickness** | 0.125" (±0.01") / 3.18mm (±.25mm) typical. (Glass only, not including tape, wires and solder if used) |
| **Size and Shape** | Hundreds of standard curved (spherical and cylindrical) and flat sizes offered. Custom sizes also available. |
| **Surface Scratch Hardness** [1] | Can not be scratched using any stylus with Mohs' rating of less than 6.5. Exceeds severe abrasion test per MIL-C-675C. Withstands 10,500 grams of force per Balance Beam Scrape Adhesion Mar Tester. MicroScratch tester with 10 micron radius tungsten carbide indenter takes a force of 1.8 Newtons. |
| **NEMA Rating** | NEMA sealable. |
| **Gasketing** | Complete water-resistant seal obtainable with polyethylene gasket.<br>Consult Sensor Integration guide for additional information. |
| **Cleaning** | Water, isopropyl alcohol, and similar non-abrasive cleaners. |

### RELIABILITY

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| **Endurance Test** [2] | A ClearTek sensor with Industrial etch has been tested in a laboratory environment to withstand over 225 million mechancial touches without noticable degradation to the surface. |
| **Surface Obstructions** | Touch screen's operation unaffected by surface obstructions such as dirt, dust, grease, smoke, peanut butter, etc. |
| **Chemical Resistance** | ClearTek is highly resistant to corrosives, in accordance with ASTM-D-1308-87 (1993) and ASTM-D-F-1598-95. |
| **Liquid Resistance** | Liquids on screen do not impede touchscreen performance. |
| **Liquid Repellence** | Contact angle of 94° and greater measured using Sessile Drop Contact Angle Method. This renders the screen extremely water repellent. |
| **Operating Temperature Range** | -15°C to 70°C for touch screen. |
| **Storage Temperature** | Always store the touch screen sensor in its original shipping container between -50° C and 85° C (MIL-STD-810E). Never store the touch sensors in an environment where condensation may form. |

* The maximum number addressable coordinates generated by the controller

1 Paul N. Gardner Co. model PA-2197 using a loop stylus (0.128 in. O.D. Rockwell Hardness 55-61)

2 Mechanical touch activation in a single x,y location using a finger-like stylus of 45 durometer , shore "A" hardness, 0.5 inch diameter with a load of 0.46 pounds, +/- .01 pounds of force.

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 electromechanical equipment, some of which factors are uniquely within User's knowledge and control, it is essential that User evaluate the 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.

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