

5-Wire Analog Resistive Touch Technology
Specifications Guide

The information provided in this document is intended as a guide only and is subject to change without notice. The topics and suggestions contained within this document are taken

from experience of years working with touch screens. Remember: each situation is different and you may need to adjust some of the following suggestions to best fit your particular application and environment.

This document does not cover all of the possible methods of touch screen integration, but the general practices apply. Clearances and tolerances are typical with all Touch International's touch screens; see individual spec sheets for variances.

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Document Revision History

Revision	Page	Content	Revised By	Date
1.1	All	Format Change	Kelly Leff	5/10/2010

5-Wire Specification Guide

1.0 Scope (Range of Application)	
This specification document applies to 5-wire analog resistive touch sensors designed for finger, gloved hand or pen input. This specification applies to a film glass construction.	
2.0 Mechanical/Electrical Characteristics	
This document applies to 5-wire resistive sensors. Standard sensor drawings are available on the Touch International website. For custom designs, contact Touch International at 877.832.8292 for a specific sensor dimensioned drawing to meet your needs. The specification data below applies to touch screens with the following properties:	
<ul style="list-style-type: none"> ▪ Single top polyester conductive layer ▪ Single bottom glass conductive layer 	
2.1 Optical Characteristics	
Total Visible Light Transmittance	
Standard Top Sheet Layer	Standard top sheet layer
Enhanced Anti-Reflective Top Sheet Layer	Enhanced anti-reflective top sheet layer
<i>Note: Other anti-reflective configurations are available. Please consult your Touch International sales person to determine the optimum configuration to meet your needs.</i>	
2.2 Durability Characteristics	
Touch Durability	35 million touches at a single point with 350 grams force.
Pen Hitting Durability	10 million touches at a single point with 350 gram force weight.
Pen Sliding Durability	1 million strokes repeated along the sample location at 350 gram force weight. <i>Note: a stroke is defined as a 10mm slide from one point to another point.</i>
Surface Hardness	4H ASTM D3363-92 and 3H or higher with JIS-K5400 standard
2.3 Electrical Characteristics	
Insulation Resistance	Exceeds 20M ohm or more @DC 25V
Operation Voltage	2.5V to 5V DC
Chattering Time	10 msec or less Linearity: $\pm 1.5\%$; 3% maximum @90% active area
Sheet Resistance of ITO Topsheet -within One Screen	All values in any 12"x12" square must be within 10% of the average value in that square.
Sheet Resistance of ITO Topsheet Variation-Sensor to Sensor	325~ 500 ohms/sq.
Sheet Resistance of ITO Topsheet Variation-within One Screen	All values in any 12"x12" square must be within 10% of the average value in that square.
Sheet Resistance of ITO Glass Variation	Sensor to sensor: 200~600 ohms/sq.
Touch Activation Force	Typical 80 grams; refer to the "Touch Screen Illustrations" section.

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2.0 Mechanical / Electrical Characteristics (Continued)		
2.4 Environmental Characteristics		
Operating Conditions	High Temperature and Relative Humidity (RH)	Tested at +50° C at 90% RH non-condensing for 240 hours
	Low and High Temperature	-20° C ~50° C, 50% relative humidity, non-condensing
Storage Conditions	40° C~ 75° C, tested at 50% relative humidity, non-condensing for 10 continuous days.	
2.5 Activation Characteristics		
In addition to the previously noted parameters, the specification data below applies to touch screens with spacer dot array: .003" and typical X: .14"		
Touch Activation		
Finger simulated stylus	Finger simulated stylus	
Pen stylus (.8mm diameter tip)	Pen stylus (.8mm diameter tip)	
2.6 Chemical Resistance		
Chemical Compounds: 6% HCl, 40% H2SO4, 10% NaOH and 70% HNO3		
Per ASTM F 1598-95 Industrial Chemicals	Per ASTM F 1598-95 Industrial Chemicals	
Per ASTM D 1308-87	Per ASTM D 1308-87	
Cleaning Instructions	Lightly wipe the surface of the touch panel with methyl alcohol, perspiration of your hand or household neutral cleanser	

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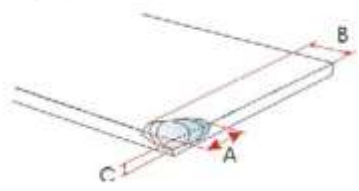
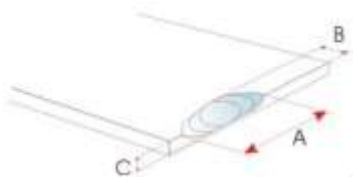
3.0 Cosmetic / Visual Specifications

3.1 Inspection Condition		
For Sensors under 12"		
Light Source	1000-1400 LUX fluorescent lamps.	
Method	Position the sensor 30(±5) cm far from human eyes with an angle between 15-45 degrees.	
Viewing Time	15(±3) seconds	
For Sensors above 12"		
Light Source	1000-1400 LUX fluorescent lamps.	
Method	White light 300±50 LUX	
Viewing Time	15(±3) seconds	
Inspection Condition	Use either one of the following three patterns to aid your eye.	
3.2 Inspection Criteria		
The following apply to viewing area. Any defects not visible shall be ignored, unless they affect electrical performance. This section applies only to inspection of the VA (viewable area). If a defect is found outside of the VA, the screen is still considered acceptable.		

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3.0 Cosmetic / Visual Specifications

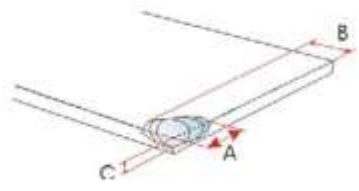
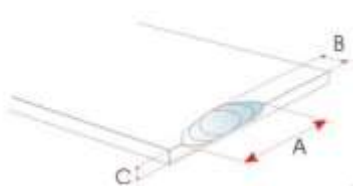
3.2 Inspection Criteria (Continued)

The table below shows the visual inspection for sensors below 12"		
Items/Type	Specifications/Explain	
Scratch	Width/Length	Judgment
	<0.05mm / < 3mm	Allow 2 and min distance above 20mm is Qualified (PASS)
]0.05mm /]3mm	Unqualified (NG)
Foreign Objective	(Width + Length)/2	Judgment
	*0.2 mm	Qualified (PASS)
	Polish film 0.2mm ~ 0.3mm Anti-grate film .2mm~0.4mm	Qualified (PASS) & allow 4 points interval distance above 20mm
	Polish film > 0.3 mm Anti-grate film > 0.4 mm	Unqualified (NG)
Linear Foreign Objective	Width / Length	Judgment
	*0.05mm / *3mm	Allow 2 and min distance above 20mm is Qualified (PASS)
	> 0.05mm / >3 mm	Unqualified (NG)
Puffiness	Height under 0.4 mm:	Qualified (PASS)
Film Surface Flat	Film from reflect light the shape like C	Qualified (PASS)
	Film from reflect light the shape like S	Unqualified (NG)
Glass Fragment	Corner Fragment 	a * 2.0mm, b * 2.0mm and c * t mm, (t: Glass Thickness) No more than 2 is qualified (PASS)
	Side Fragment 	a * 3mm , b * 2.0mm and c * 1/2 t mm, (t: Glass Thickness) Allow 3 fragments interval distance above 20mm every side is qualified (PASS)
Newton Ring	No Newton rings are allowed in sensors that specify "anti-Newton ring" materials. Otherwise, Newton rings are acceptable.	

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3.0 Cosmetic / Visual Specifications

3.2 Inspection Criteria (Continued)

The table below shows the visual inspection for sensors Above 12"		
Items/Type	Specifications/Explain	
Scratch	Width/Length	Judgment
	<0.1mm / < 30mm	Allow 2 and min distance above 20mm is Qualified (PASS)
] 0.1mm /] 30mm	Unqualified (NG)
Foreign Objective	(Width + Length)/2	Judgment
	*0.2 mm	Qualified (PASS)
	0.2 mm~0.5 mm	Qualified (PASS) & allow 4 points interval distance above 20mm
	> 0.5 mm	Unqualified (NG)
Linear Foreign Objective	Width / Length	Judgment
	*0.05mm / *3mm	Allow 2 and min distance above 20mm is Qualified (PASS)
	> 0.05mm / >3 mm	Unqualified (NG)
Puffiness	Height under 0.4 mm:	Qualified (PASS)
Film Surface Flat	Film from reflect light the shape like C	Qualified (PASS)
	Film from reflect light the shape like S	Unqualified (NG)
Glass Fragment	Corner Fragment 	a * 2.0mm, b * 2.0mm and c * t mm, (t: Glass Thickness) No more than 2 is qualified (PASS)
	Side Fragment 	a * 3mm , b * 2.0mm and c * 1/2 t mm, (t: Glass Thickness) Allow 3 fragments interval distance above 20mm every side is qualified (PASS)
Newton Ring	No Newton rings are allowed in sensors that specify "anti-Newton ring" materials. Otherwise, Newton rings are acceptable.	

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4.0 Materials Handling and Usage Instructions

In order to prevent accidental use and be guaranteed the performance of product, you are

requested to keep the following:

4.1 Storing your Touch Screen

- Store the products at specified temperature and humidity range, per the Environmental Conditions section of this document.
- Store the products in the original packing materials.
- Avoid exposing the touch screen to direct sunlight.

4.2 Unpacking your Touch Screen

- Do not hold or pull the FPC/Copper tail to facilitate the removal of the touch screen component from the package.
- Check and heed the "UP/DOWN" mark prior to opening the package.
- Do not subdue the touch screen to heavy duty shock or pressure.

4.3 Handling your Touch Screen

- Wear gloves when handling the touch screen in order to prevent finger prints or stains and to avoid injury due to sharp edges.
- Never hold the touch screen by the FPC/Copper tail.
- Never add stress on touch film.
- Never place heavy objects or material on top of the touch screen.
- Never stack touch screens on top of each other.

4.4 Cleaning your Touch Screen

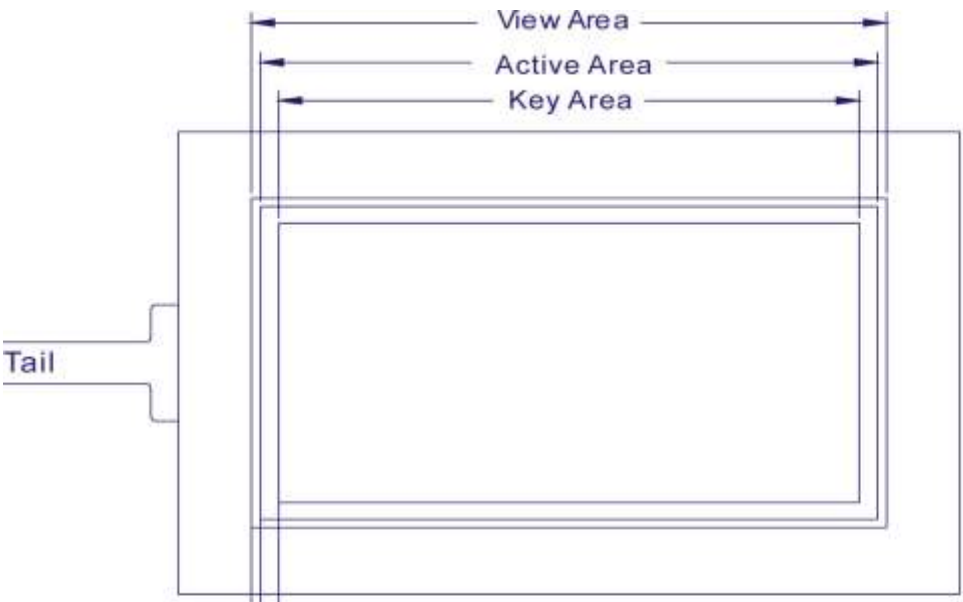
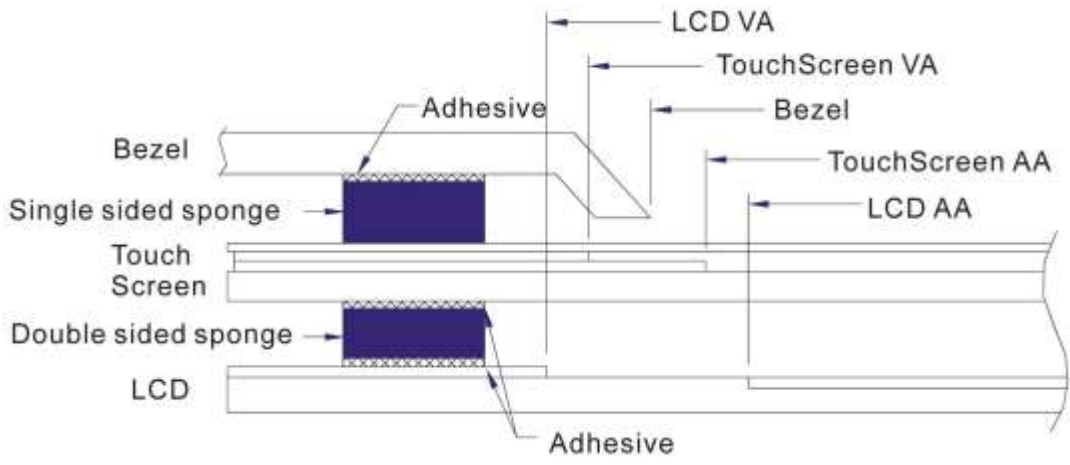
- Never use organic solvents on the touch screen, except alcohol.
- Use dry cloth or soft cloth with alcohol, neutral detergent or ethanol for clearing the touch panel in case of dirt or residue.

4.5 Assembling your Touch Screen

- The bezel or enclosure must not overlap with the viewing area.
- Avoid applying excessive pressure, weight or force on the touch screen.
- Avoid unnecessary strain to the FPC/Copper tail on assembling.
- Do not submerge the touch screen in water.
- The edge of the enclosure must be located between the viewing area and the active area.

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5.0 Touch Screen Illustrations



	Durability of pen sliding test		Typical to do Auctuation force by pen	
	Weight: 250 g	Weight: 1 kg	Dot space Pitch 4.0	Dot space Pitch 2.0
A-zone	A 100,000	5000	30~100(g)	30~100(g)
	B 500,000			
B-zone	A 10,000	500	80~130(g)	80~130(g)
	B 50,000			
C-zone		1		

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6.0 Warranty Policy

This warranty policy applies to Touch International's 5-wire resistive touch screen components. Touch International warrants all products to be free of workmanship or materials defects as specified under the terms of the limited warranty policy per the guaranty period stated below.

6.1 Warranty Period

Touch International guarantees this product for five year from the date of purchase.

6.2 Warranty Exclusions

- Failure to adhere to the handling, storage, operating, assembly or other procedures and parameters outlined in this delivery specification.
- Accidental or purposefully abuse, neglect, or acts of nature.
- Breakage or physical scratches to the touch screen.
- Other factors beyond the control of Touch International.