

21.3" 5-Wire

TOUCHSCREEN  
SPECIFICATION

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MODEL: AM-2135-F180

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DATE: 06-15-2010

Product that has been mounted and removed is not returnable for cosmetic defects; scratches, chips or cracks.

Approved

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Company

\_\_\_\_\_  
Date

**ATTENTION: REGARDING HIGH-RISK APPLICATIONS**

The Products have not been designed, manufactured, tested or qualified for use in any high-risk application (a "High-Risk Application"), including, but not limited to, the following: life support or life sustaining, "medical device" as defined by applicable law, nuclear, vehicle control (including airplane, automotive, train and other vehicle) or any other application in which failure of the Product, or the product into which it is incorporated, could foreseeably result in personal injury, death, or significant property damage.

To contact us, please call us toll-free at (425) 774-8151 or  
send email to [sales@hantouchUSA.com](mailto:sales@hantouchUSA.com)  
Visit us on the web at [www.hantouchUSA.com](http://www.hantouchUSA.com)

## INSPECTION AND WARRANTY

### Inspection

Within 30 days after delivery customer will inspect the products and give written notice of rejection to Hantouch USA detailing the manner in which anyproducts do not conform to specifications. Upon receiving authorization and shipping instructions from Hantouch USA, customer may return rejected products. If the customer retains the products after their delivery without giving Hantouch USA such notice within the designated period, customer will be deemed to have irrevocably accepted the products. Customer's inspection and acceptance tests shall not exceed the inspection and test procedures customary in the industry for the products and shall be at customer's expense. Hantouch USA may charge to the customer any costs resulting from the testing, handling, and disposition of any products returned by the customer which are not found by Hantouch USA to be non-conforming.

### Warranty

Hantouch USA warrants to the customer that the products will be free from defects in material and workmanship under normal use and service for a period of one year from the date of invoice. Customer's exclusive remedy for breach of this warranty is that Hantouch USA will either (i) repair or replace, at it's option, any product which fails during the warranty period because of such defect (if customer promptly reported the failure to Hantouch USA in writing) or (ii) if Hantouch USA is unable to repair or replace, Hantouch USA will refund the purchase price of the product upon it's return to Hantouch USA

This warranty does not apply to any product which has been subjected to misuse, abnormal service or handling, or which has been serviced or repaired by anyone other than Hantouch USA. The warranties set forth herein are in lieu of, and exclusive of, all other warranties, express or implied.

**ALL EXPRESS AND IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR USE AND FITNESS FOR A PARTICULAR PURPOSE ARE SPECIFICALLY EXCLUDED.**

Product that has been mounted and removed is not returnable for cosmetic defects; scratches, chips or cracks.

Hantouch USA reserves the right to make changes in the specifications, characteristics, data, materials, structures and other contents described herein at any time without notice in order to improve design or reliability. Contact Hantouch USA in order to obtain the latest specification sheets before using any Hantouch USA device. Manufacturing locations are also subject to change.

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## 1. Warranty

5-Wire Touch Panel products manufactured to this specification shall be capable of meeting all characteristics for a maximum period of 1 year from the date of shipping from HantouchUSA when stored or used as specified under normal conditions within the content of these sheets.

## 2. Features

Type: 5-Wire Analog Resistive Type Touch Panel

Input Mode: Pen or Finger

Structure: PET - Anti glare hard coating and anti Newton ring ITO film, 188 $\mu$ m

Glass - ITO Glass, 2.0mm

Spacer - .1m

Dot Pitch - 3.0mm x 3.0mm

Connector: FPC

## 3. General Specification

Item	Specification	Unit
Dimensional Outline	Length x Width x Thickness	mm
Viewing Area	Length x Width	mm
Active Area	Length x Width	mm
ITO Glass	2.0 $\pm$ 0.1	mm
PET (ITO Film)	188 $\pm$ 15	$\mu$ m
Connector	FPC, 5-Pin	

## 4. Rating

4.1 The Maximum Voltage: 5V(DC), 1mA

4.2 Usable Temperature Range: From -10°C to +60°C

4.3 Storage Temperature Range: From -20°C to +70°C

## 5. Electrical Specification

5.1 Resistance Between Leads: 30-800 $\Omega$

5.2 Linearity:  $\pm$ 5% or less

5.3 Insulation Resistance: 10M $\Omega$  or more @25V(DC)

5.4 Chattering Time: 30msec or less

## 6. Mechanical Specification

6.1 Input Method: Pen or Finger

6.2 Operating Force: 80g or less with  $\varnothing$ 2mm Manuscript Pen

6.3 Surface Hardness: 3H (pencil test) & Hard Coated PET

6.4 Light Transmission: 80 $\pm$ 3% at 550nm wavelength.

## 7. Durability

### 7.1 Durability Against Writing Characters

After writing 10,000 times in the same length (10-100mm) with R0.8 Polyacetal Test header, Force: 250g, Speed:60mm/sec, it must be satisfied with:

7.1.1 Resistance between leads: 30-800Ω

7.1.2 Linearity: ±5% or less

7.1.3 Insulation resistance: 10MΩ or more @25V(DC)

### 7.2 Punching Life

After Punching 20,000,000 Times with ø2mm Manuscript Pen, Force: 250g, Speed: 2 times/sec, it must be satisfied with:

7.2.1 Resistance between leads: 30-800Ω

7.2.2 Linearity: ±5% or less

7.2.3 Insulation resistance: 10MΩ or more @25V(DC)

### 7.3 Impact Resistance

No damage when ø9mm steel ball is dropped on the surface from 30cm height at 1 time.

### 7.4 ITO Connector Insert / Pull-Out Resistance: 5 times at least.

The requirements in 4.1 shall be satisfied

### 7.5 Package Drop: No damage to product

## 8. Reliability

### 8.1 High Temperature Test

After putting panels at 60°C for 120 hours, then leaving for 24 hours at room temperature, it must be satisfied with:

8.1.1 Resistance between leads: 30-800Ω

8.1.2 Linearity: ±5% or less

8.1.3 Insulation resistance: 10MΩ or more @25V(DC)

8.1.4 Operating Force: 80g or less with ø2mm Manuscript Pen

### 8.2 Low Temperature Test

After putting panels at -20°C for 120 hours, then leaving for 24 hours at room temperature, it must be satisfied with:

8.2.1 Resistance between leads: 30-800Ω

8.2.2 Linearity: ±5% or less

8.2.3 Insulation resistance: 10MΩ or more @25V(DC)

8.2.4 Operating Force: 80g or less with ø2mm Manuscript Pen

### 8.3 Temperature and Humidity Test

After putting panels at 40°C, 90%RH for 120 hours, then leaving for 24 hours at room temperature, it must be satisfied with:

8.3.1 Resistance between leads: 30-800Ω

8.3.2 Linearity: ±5% or less

8.3.3 Insulation resistance: 10MΩ or more @25V(DC)

8.3.4 Operating Force: 80g or less with ø2mm Manuscript Pen

## 9. Visual Inspection

The following are applied to viewing areas only. They are ignored in the non-viewing areas as long as the electrical performance of the TP is functional. W=Width L=Length D=Diameter. GT=Glass Thickness. Contamination that can be cleaned using a soft cloth with ethyl alcohol does not apply to these inspection criteria. If the object is 3 times larger in one direction than in a perpendicular direction, then it is considered a linear foreign object. Extra dielectric dots are treated as a granular foreign object. Extra silver or carbon is regarded as a defect.

### 9.1 Scratch

CRITERIA	DECISION
$W < 0.04\text{mm}$	In case of $L < 20\text{mm}$ , the scratch is ignored.
$0.04\text{mm} < W < 0.06\text{mm}$	In case of $L < 20\text{mm}$ where the scratch is $> 20\text{mm}$ in distance from any other scratch or foreign object, it is ignored. In case of $L < 20\text{mm}$ where the scratch is $< 20\text{mm}$ in distance from any other scratch or foreign object, the TP is defective. In case of $L > 20\text{mm}$ , the TP is regarded as a defect.
$W > 0.06\text{mm}$	The TP is regarded as a defect.

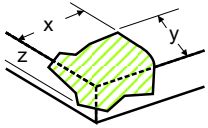
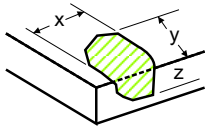
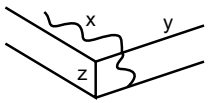
### 9.2 Granular Foreign Object

CRITERIA	DECISION
$D < 0.3\text{mm}$	Ignored
$0.04\text{mm} < W < 0.5\text{mm}$	In case of where the object is $> 20\text{mm}$ in distance from any other scratch or foreign object, it is ignored. In case where the object is $< 20\text{mm}$ in distance from any other scratch or foreign object, the TP is defective.
$D > 0.6\text{mm}$	The TP is defective.

### 9.3 Linear Foreign Object

CRITERIA	DECISION
$W < 0.04\text{mm}$	In case of $L < 4\text{mm}$ , the object is ignored.
$0.04\text{mm} < W < 0.09\text{mm}$	In case of $L < 4\text{mm}$ where the object is $> 20\text{mm}$ in distance from any other scratch or foreign object, it is ignored. In case of $L < 4\text{mm}$ where the scratch is $< 20\text{mm}$ in distance from any other scratch or foreign object, the TP is defective. In case of $L > 4\text{mm}$ , the TP is regarded as a defect.
$W > 0.09\text{mm}$	The TP is regarded as a defect.

### 9.4 Glass Fragment

Corner Fragment		$X < 3.0\text{mm}$ and $Y < 3.0\text{mm}$ and $Z < \text{GT}$ , it is ignored.
Side Fragment		$X < 6.0\text{mm}$ and $Y < 2.0\text{mm}$ and $Z < \text{GT}$ , it is ignored.
Progressive		TP is regarded as defective.

## 10. Test

- 10.1 Linearity: Direction +/- 5% or less.
- 10.2 Open and short circuit test.
- 10.3 Insulation resistance: 10megohms or more @ 25v (dc).
- 10.4 Finished product functional test.

## 11. Handling Remarks

### 11.1 Storage:

- 1.1.1 Store the products at the temperature and humidity range presented in the specification.
- 1.1.2 Store the products in the original package.
- 1.1.3 Do not expose the products directly to the sun

### 1.2 Unpack:

- 1.2.1 Do not hold FPC tail to take touch panels out of package.
- 1.2.2 Open box after checking the "Up/Down" indicator

### 1.3 Handling:

- 1.3.1 Use gloves and finger cot when handling touch panels.
- 1.3.2 Hold Touch Panels at the outside of view area and do not touch where tails are heat-sealed in order to avoid disconnection.
- 1.3.3 Please do not pile up touch panels in order to avoid the edge of the touch panel scratching the surface of other touch panels.
- 1.3.4 Do not put heavy objects on touch panels

### 1.4 Assembly:

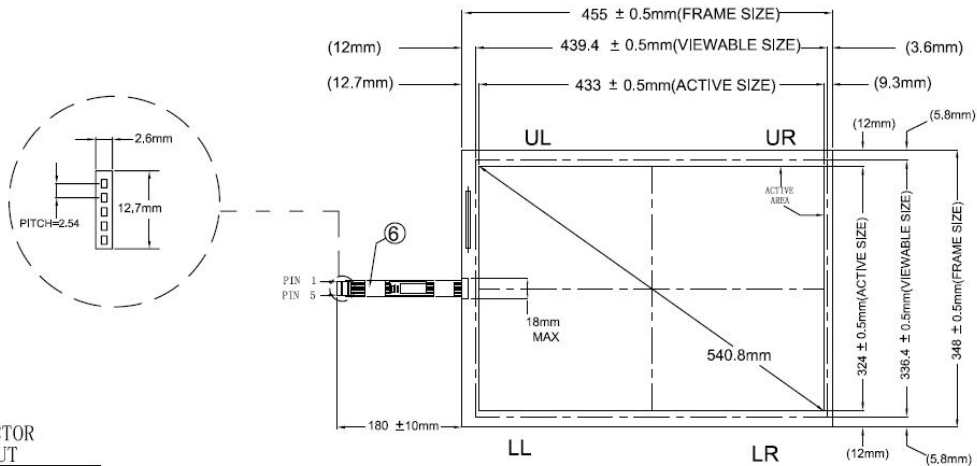
- 1.4.1 After protective film is released, and when protective film is laminated to TP again, please check to see that there is no dirt on it.
- 1.4.2 While designing the housing, try to minimize the stress of housing to the touch panels.
- 1.4.3 Please pay attention not to harm touch panels with your tools that may be used to assemble. (Plastic tools are recommended)
- 1.4.4 Please pay the best attention not to create any stress to the heat-sealed tails. Heavy stress may cause disconnection.
- 1.4.5 If Touch Panels have slender holes to make inner pressure and outer pressure evenly please design housing not to store any water or lubricants near this hole.

**NOTE:** The Hantouch USA Incoming Inspection Standard is part of this drawing. This quality and performance document can be viewed at: [www.hantouchUSA.com](http://www.hantouchUSA.com), under Incoming Inspection Standards.

REVNO.	REVISED	DATE	DRAWN	CHECKED	APPROVED
0	NEW DRAW				

**NOTES:**

1. ITO FILM TYPE: CLEAR FILM OR ANTI-GLARE FILM
2. GLASS THICKNESS TYPE: 1.1mm 1.8mm OR 2.8mm
3. FINISHED PART THICKNESS TYPE: 1.45mm 2.15mm OR 3.15mm
4. PANEL CABLE LENGHT TYPE: 100mm OR 180mm
5. CABLE IS ATTACHED TO THE LEFT SIDE OF TOUCHSCREEN AT CENTER POINT AS SHOWN
- ⑥. LABEL TO BE ATTACHED AT FRONT SIDE OF CABLE



**CONNECTOR PINOUT**

PIN NO.	DESIGNATION
1	UR
2	LR
3	Sense
4	UL
5	LL

**RoHS Compliant**

APPROVE	CHECKE	DESIGN	DRAW	UNIT	SCALE	PROJECTION	DRAWING NO.	REV.
				mm	NONE		AM-2135-F180	
				<b>HantouchUSA</b> Touch Screen Specialists			DESCRIPTION	SHEET
							21.3"	1/1