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SPECIFICATION

CVS-PC-2402-001

24.0" Projective Capacitive Touch Screen

(Rev. 1)

July 2, 2013

Clarus Vision, LLC

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1. Scope

This specification is applied to the CVS-PC-2402 24.0" Projective Capacitive Touch screen panel.

2. Electrical Characteristics

2.1. Touch Points

10-Point Multi-touch

2.2. Linear Accuracy

X, Y axis: $\pm 1.0\%$ or less

2.3. Touch Resolution

4096 x 4096

2.4. Touch Response Time

Standard: 16ms, Customized: 8ms

Scan Rate: 125 frames per second

2.5. Electrostatic Discharge (ESD)

30kV for 3mm Cover Glass

2.6. Operating Current

225mA with touch; 25mA without touch

2.7. Calibration

No calibration required.

2.8. Communication

USB HID (USB cable included)

3. Optical Characteristics

3.1. Light Transmittance

Total: More Than 80% (typical)

3.2. Haze

Clear $2.0 \pm 1.0\%$

Anti-Glare (Optional) $5.0 \pm 2.0\%$

4. Mechanical Characteristics

4.1. Type

Projective Capacitive Touch Screen

4.2. Input Method

Finger/ Gloved Finger/Passive Pen

4.3. Structure

Cover Glass - Film Sensor: 3.57mm \pm 10%

Cover Glass: 3mm \pm 10%, Chemical Strengthened Glass,
Optional: Clear, Anti-glare

Film Thickness: 0.57mm \pm 10%

4.4. Operating Force

No Touch activation force is required.

4.5. Cover Glass Options

Normal glass

Strengthened glass (optional)

4.6. Cover Glass Surface Hardness

Clear type: Mohs pick with hardness rating of 4 or higher

Anti-Glare (optional): More than 8H (Pencil hardness rating)

4.7. Dimensions

Touch AA (Active Area): 531.87 x 299.39 mm

Cover Glass VA (Viewing Area): 531.87 x 299.39 mm

Cover Glass OD (Outline Drawing): 609.6 x 381.11 x 3.0mm

Sensor OD (Outline Drawing): 564.08 x 323.21 x .57 mm

FPC Length (from edge): 147.24 mm

5. Environmental Characteristics

5.1. Operation Temperature

Temperature: from -25 °C to 70 °C

5.2. Storage Temperature

Temperature: from -30 °C to 80 °C

6. Durability

6.1. Drop Test

Steel Ball Weight: 535 grams

Steel Ball Size: 50 mm diameter

Drop Height: 100 cm

No breakage when 227g 38mm diameter steel ball is dropped on the touch panel supported with the display module from 100 cm height at 1 time.

6.2. Chemical Resistance

Test Method: ASTM-D-F-1598-95

Chemical	Concentration	Test Condition
Hydrochloric Acid	6%	10 min. 25 °C
Sulfuric Acid	40%	10 min. 25 °C
Toluene	99.5%	10 min. 25 °C
Ethanol	99.9%	10 min. 25 °C
Xylene	80%	10 min. 25 °C
Acetone	99.5%	10 min. 25 °C

6.3. Surface Writing

Number of Measurements: 100,000 times.

- 1) Testing Equipment: Pen Plotter
- 2) Testing load / force: 250 gf
- 3) Sliding Speed: 100 mm/sec
- 4) Tip Probe: R0.8 mm stylus pen

6.4. Surface Hitting

Number of Measurements: 1,000,000 times.

- 1) Testing load / force: 250 gf
- 2) Sliding Speed: 2 times/sec
- 3) Tip Probe: R0.8 mm Rubber

7. Reliability

7.1. Low Temperature

Put in a vessel at a condition of $-30\text{ }^{\circ}\text{C}$ for 120 hours, and then leave at room temperature for 4 hours. (Non-operation)

7.2. High Temperature

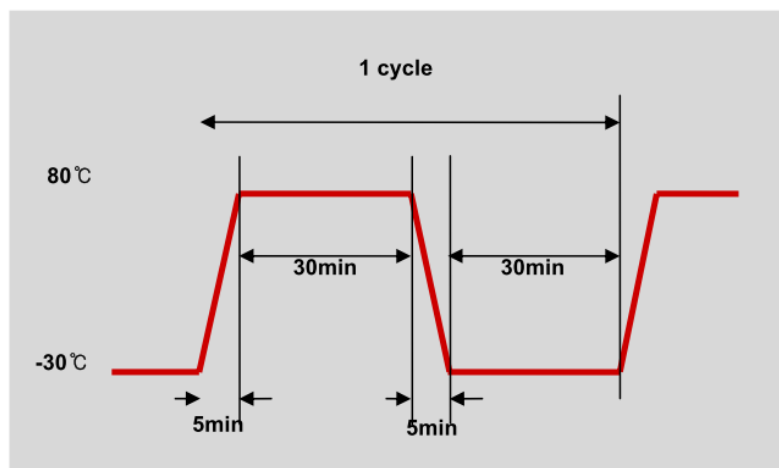
Put in a vessel at a condition of $80\text{ }^{\circ}\text{C}$ for 120 hours, and then leave at room temperature for 24 hours. (Non-operation)

7.3. High Temperature and High Humidity

Put in a vessel at a condition of $60\text{ }^{\circ}\text{C}$, 80% RH, for 120 hours, and then leave at room temperature for 4 hours. (Non-operation)

7.4. Thermal Shock

Put in a vessel at a condition of $-30\text{ }^{\circ}\text{C}$ for 30 minutes and then $80\text{ }^{\circ}\text{C}$ for 30 minutes, temperature ramp occurs within 5 minutes. Process is repeated 10 cycles. (Non-operation)



< Temperature Profile >

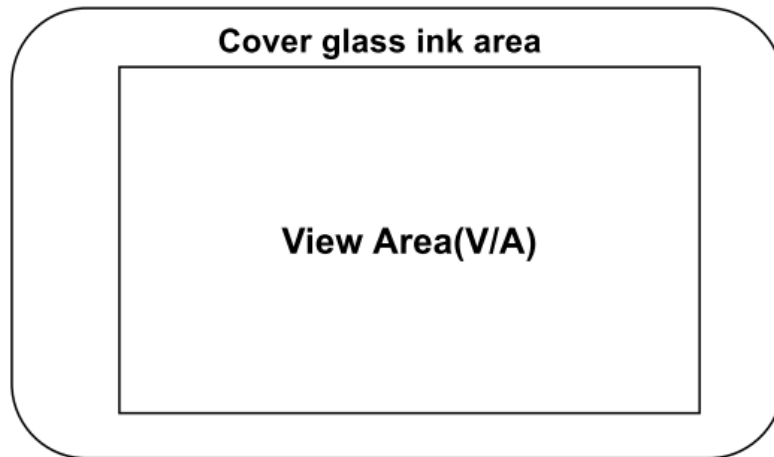
8. Appearance Inspection Criterion

The following are applied to the viewing area. Those in the non-viewing area are ignored as long as the electrical performance of the touch panel is normal.

Contamination that can be cleaned using a soft cloth with ethyl alcohol does not apply to these inspection criteria.

But if an object is in the viewing area after rubbed by the soft cloth to a direction 3 times longer, it is considered a linear foreign object.

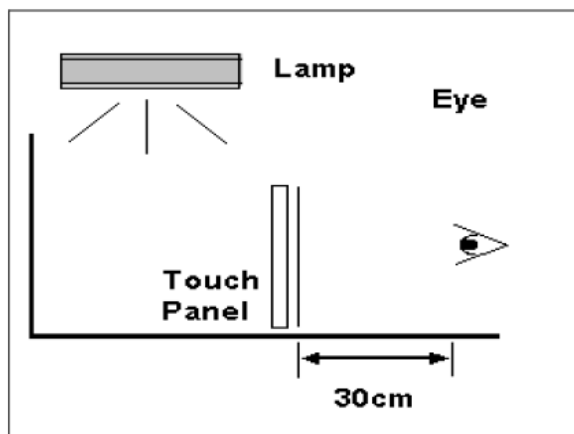
8.1. Inspection Area



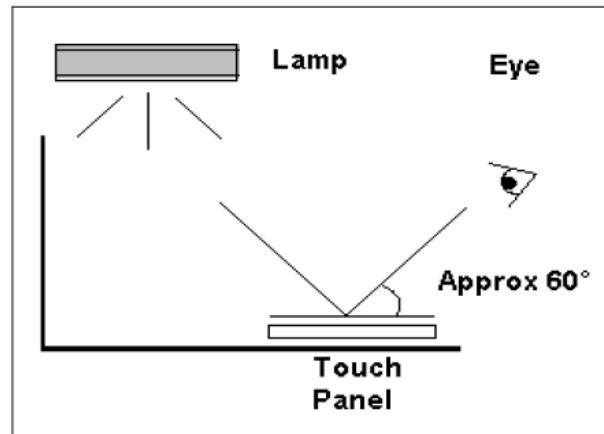
8.2. Inspection Condition

The inspection shall be performed by using 1000LUX fluorescent lamp.

The panel shall be placed at 30 cm away from eyes as shown below.

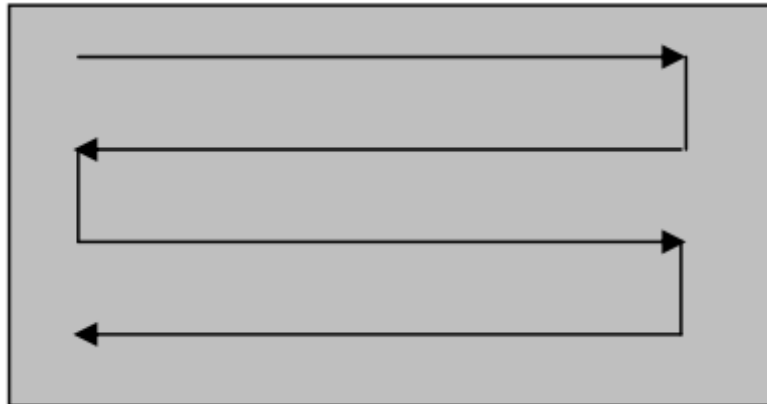


< Transmission light >



< Reflection light >

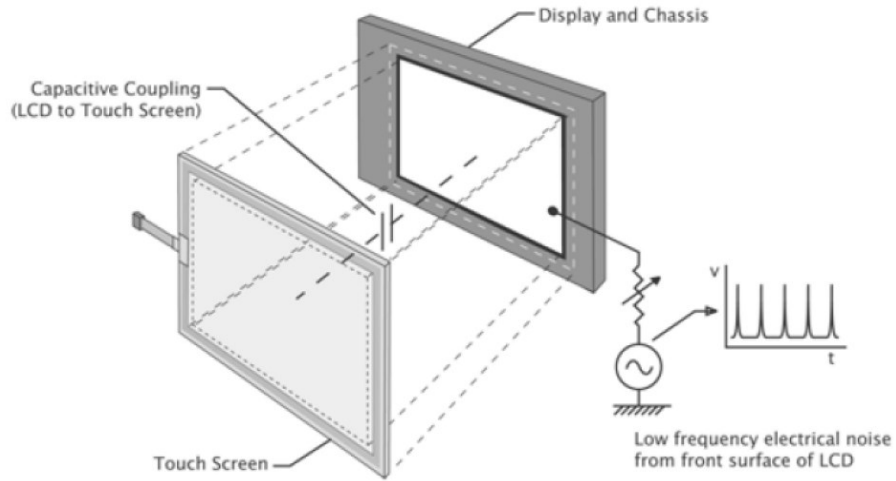
8.3. Inspection Flow



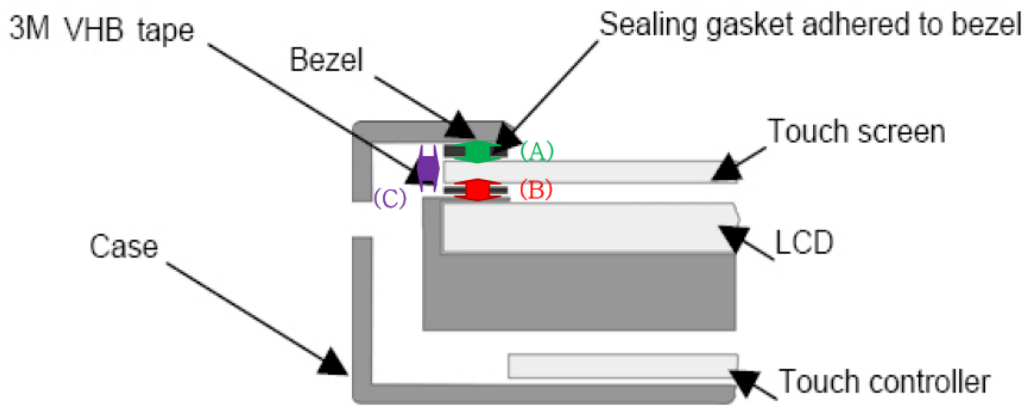
8.4. Visual Inspection

DEFECT TYPE		CRITERION		DECISION	
Granular foreign object (Spot, Stain, Dust)		$D \leq 0.3\text{mm}$		Acceptable	
		$0.3\text{mm} < D \leq 0.5\text{mm}$		Acceptable if less than 5 pieces	
		$D > 0.5\text{mm}$		Unacceptable	
Bubble Surface Defect		$D \leq 0.3\text{mm}$		Acceptable	
		$0.3\text{mm} < D \leq 0.5\text{mm}$		Acceptable if less than 5 pieces	
		$D > 0.5\text{mm}$		Unacceptable	
Linear Foreign Object (Light lint, Dark lint, Hair)		$W \leq 0.05\text{mm}$	$L \leq 5\text{mm}$	Acceptable	
		$0.05\text{mm} < W \leq 0.08\text{mm}$	$L \leq 5\text{mm}$	Acceptable if less than 5 pieces	
		$W > 0.08\text{mm}$	$L > 5\text{mm}$	Unacceptable	
Scratch		$W \leq 0.05\text{mm}$	$L \leq 10\text{mm}$	Acceptable	
		$0.05\text{mm} < W \leq 0.08\text{mm}$	$L \leq 10\text{mm}$	Acceptable if less than 5 pieces	
		$W > 0.08\text{mm}$	$L > 10\text{mm}$	Unacceptable	
Cover Glass	Dent	Front		$D \leq 0.3\text{mm}$	Acceptable
		Back		$D \leq 0.5\text{mm}$	Acceptable
	Breakage	Corner	Non-Printed	$X \leq 1\text{mm}$ $Y \leq 1\text{mm}$ $Z \leq t/2\text{mm}$	Acceptable
			Printed	-	Unacceptable
		Edge	Non-Printed	$X \leq 2\text{mm}$ $Y \leq 1\text{mm}$ $Z \leq t/2\text{mm}$	Acceptable
			Printed	-	Unacceptable
	Crack	Corner, Edge	Non-Printed	-	Unacceptable
			Printed	-	Unacceptable

9. Integration Guide



The touch screen should be kept away from LCD properly. Display signals from the LCD can be interpreted by the touch screen as electrical noise and cause touch malfunction. When the occurred capacitance between the touch screen and LCD is large, it makes touch controller issues with the capacitance on the top of the touch screen. Therefore, enough space should be between the touch screen and the LCD to prevent touch malfunction.



Location		Space
(A)	Between Top of Touch Screen and Bezel	>1.5mm
(B)	Between Touch Screen and LCD	>1.5mm
(C)	Edge of Touch Screen	>1.5mm

9.1. FPC Tail



Keep the FPC tail straight when assembling. If that is not possible, fold the tail naturally and do not crease the wires.

9.2. Touch Controller

Thread the screws into the holes that connect the Touch Controller to the chassis ground.

10. Handling remarks

10.1. Storage

Store panels within the range specified in this document.
Store panels in the same materials and state that they were delivered in.
Do not leave exposed to direct sunlight before installation.

10.2. Unpacking

No not hold FPC tail to remove from package.

10.3. Handling

Use gloves and finger coat to prevent stains on the touch panel and injury by the sharp edge of the touch panel.
Do not take hold of FPB tail when handling the touch panel.
Do not pile up touch panels.
Do not put anything on the touch panel.
Do not fold the FPC tail.
Clean off the touch panel with soft cloths when necessary.
Prevent alcohol from penetrating into the touch panel.
Prevent using organic solvents except for alcohol.

10.4. Assembly

Avoid excessive force on touch panel.
Do not give unnecessary strain to the FPC/ Copper tail while assembling.

10.5. Operation

Do not operate touch panel by applying excessive force.

Do not use sharp objects for input.

We recommend calibration after long time use.

11. Others

This specification shall guarantee the quality of the product.

When using the panel, be sure to check and evaluate after installation.

This is a fragile product, please put the box down gently and prevent dropping.

Any changes of the approved specification should be approved by both parties.

The specification shall not be modified without proper approval.

12. Warranty

Film, cover glass type, and sensor manufactured to this specification shall be capable of meeting all characteristics for a minimum period of one year from the shipping date of Clarus Vision when stored or used as specified under normal conditions within the context of these sheets. If the touch panel products are not stored or used as specified herein, this warranty is not valid. Unlimited warranty for touch operation.