**4.17.4 Touch Panel Panel**

**4.17.4.1 Hardware Requirements**

**4.17.4.1.2 Palm Rejection**

Quasar-5139 - Palm Rejection  
The Touch Panel Panel shall support palm rejection for both right and left hand users at all times.  
  
  
Shall Have, Req't Team Approved, System Requirement

**4.17.4.1.3 Light Transmission**

Quasar-5141 - Light Transmission.  
The Touch Panel Panel shall have minimum 85% light transmission.Shall Have, Req't Team Approved, System Requirement

**4.17.4.1.4 Finger Detection**

Quasar-5143 - Device shall be able to detect the presence of a human finger at no more than 1...  
Device shall be able to detect the presence of a human finger at no more than 1.0 mm above the surface of the Touch Panel Panel.  Any activation's occurring outside 1.0 mm distance from the Touch Panel Panel shall be considered a false activation.  
Shall Have, Req't Team Approved, System Requirement

Quasar-5144 - Touch Panel Panel Performance Accuracy  
Base SKU: Touch Panel Panel Shall Support accuracy to meet Center +/-1.5mm , border +/-2mm  
  
Premium SKU: Touch Panel Panel Shall Support accuracy to meet non-border area +/-1mm , border area +/-2mm  (border area to be defined, is there a test plan for this?)Shall Have, Req't Team Approved, System Requirement

Quasar-5145 - Touch Panel Panel Performance Linearity  
Touch Panel Panel shall Support linearity to meet Non-border +/-1.5mm , border +/-1.5mmShall Have, Req't Team Approved, System Requirement

Quasar-5146 - Touch Panel Panel Performance Jitter  
Base SKU: Touch Panel Panel Shall support Jitter to meet +/- 1.5mm  
  
Premium SKU: Touch Panel Panel Shall support Jitter, the distance between any two reported positions shall not exceed 1.0 mm  
Shall Have, Req't Team Approved, System Requirement

Quasar-5147 - Touch Panel Panel Performance two Finger Separation  
Base SKU: Touch Panel Panel Shall support two finger separation < 20mm  
  
Premium SKU: Touch Panel Panel Shall support nearest two finger separation <12mm  
Shall Have, Req't Team Approved, System Requirement

**4.17.4.1.5 False Activation's**

Quasar-5149 - False activation  
Device shall have no false activation across the working environmental conditions listed in the  PRD “Environmental” section 4.5  
  
Shall Have, Req't Team Approved, System Requirement

**4.17.4.1.6 Newton Rings**

Quasar-5151 - Newton Rings  
No Newton Rings shall appear under the following test condition:  
  
The terminal shall be operating within 20-25 deg C, then view the Touch Panel Panel at 45deg angle using a 300 ~ 500 lx light source (white fluorescent light, 3 wavelength fluorescent light or sunlight), which is positioned perpendicular to the Touch Panel Panel.  
Shall Have, Req't Team Approved, System Requirement

**4.17.4.1.7 ITO Lines**

Quasar-5153 - ITO Lines  
The Touch Panel Panel's ITO lines shall not be visible at normal viewing angles.  
  
Note: the intent of this requirement is to not obstruct the user from viewing the Touch Panel Panel.Shall Have, Req't Team Approved, System Requirement

**4.17.4.1.8 Gorilla Glass**

Quasar-5155 - Gorilla Glass  
Base SKU: The Touch Panel Panel Touch Panel shall use Gorilla Glass 5 (or equivalent or better) for rugged construction.  
  
Premium SKU: The Touch Panel Panel Touch Panel shall use Gorilla Glass 5 (or equivalent or better) for rugged construction.Shall Have, Req't Team Approved, System Requirement

**4.17.4.1.10 Wake Up Time**

Quasar-5162 - Touch Panel Panel Wake up time  
The Touch Panel Panel shall be able to transition from an off state to full function in less than 100 ms at room temperature.Shall Have, Req't Team Approved, System Requirement

**4.17.4.1.11 Cursor Reporting**

4.17.4.1.11.1 Latency to First Cursor Report

Quasar-5165 - Touch Panel Panel cursor report time  
The Touch Panel Panel shall have a report time from Touch Paneldown <= 25mS at room temperature ( applied to panel to first position report).Shall Have, Req't Team Approved, System Requirement

4.17.4.1.11.2 Update Latency

Quasar-5167 - Touch Panel Panel Latency  
The Touch Panel Panel shall have an update of position after Touch Paneldown <=15mS at room temperature.Shall Have, Req't Team Approved, System Requirement

4.17.4.1.11.3 Update Rate

Quasar-5169 - Touch Panel Panel Update Rate  
Base SKU: The Touch Panel Panel in-cell panel shall have a continuous sample reporting rate same as refresh rate.  
  
Premium SKU: The Touch Panel Panel shall have a continuous sample reporting rate of 100Hz to support, signature captureShall Have, Req't Team Approved, System Requirement

**4.17.4.1.12 Resolution**

Quasar-5171 - Touch Panel Panel Touch Panel Density/Resolution  
The Touch Panel Panel Touch Panel shall have a reporting Density/Resolution same as display resolution, as a minimum.Shall Have, Req't Team Approved, System Requirement

Quasar-5174 - Touch Panel Panel Desense -No Impact  
The Touch Panel Panel shall not experience any drop Touch Paneles (gestures), missed Touch Paneles, or ghost/false Touch Paneles during the following interference conditions:  
1) Conducted Susceptability: 3V rms (150K - 80MHz) AM Modulated 80% 1KHz.  
2) EFT  
Shall Have, Req't Team Approved, System Requirement

Quasar-5175 - Touch Panel Panel Desense - Low Impact  
The Touch Panel Panel shall not experience significant degradation and no ghost/false at 10Vrms (150K - 80MHz) AM Modulated 80% 1KHz conducted susceptibility.  
Shall Have, Req't Team Approved, System Requirement

**4.17.4.1.14 Touch Panel Panel - Fingerprint Resistance**

Quasar-5177 - Oleophobic coating  
The top outside or exposed surface of the Touch Panel Panel on the Device shall have an oleophobic coating to resist the buildup of oil (from fingers) on the panel.  The oleophobic coating will also make it possible to clean the Touch Panel of any oil deposits by gently wiping a clean dry non-abrasive cloth across the panel surface.Shall Have, Req't Team Approved, System Requirement

**4.17.4.1.15 Glove Types**

Quasar-5179 - Gloves Type  
Base SKU:  
  
Device shall support the following gloves

|  |  |  |  |
| --- | --- | --- | --- |
| **Index** | **Description** | **Image** | **Material** |
| 1 | Light weight nylon gloves    Example: MaxiFlex Ultimate  Palm coating, 1mm thickness, stretch-nylon 34-874 |  | Nylon Liner with Lycra, Black Micro-Foam Coated Palm and Finger Tips |
| 2 | NOT SUPPORTED   Leather work gloves  Example: PIP® Economy Grade Shoulder Split Cowhide Leather Reinforced Palm Glove 85-7500P |  | Cowhide Leather |
| 3 | Latex and Nitrile Gloves up to 5mils thick  Example: Ambi-dex® Food Grade Disposable Nitrile Glove, Powder Free with Textured Grip - 4 Mil 63-532PF |  | Latex and Nitrile |
| 4 | Knit Nylon Glove with Nitrile coating  Example: MaxiFlex® Elite™ Ultra Light Weight Seamless Knit Nylon Glove with Nitrile Coated MicroFoam Grip on Palm & Fingers 34-274 |  | Knit Nylon Glove with Nitrile Coated Micro-Foam Grip on Palm & Fingers |
| 5 | NOT SUPPORTED   Knit Nylon Glove with Polyurethane coating  Example: G-Tek® NPG Seamless Knit Nylon Glove with Polyurethane Coated Smooth Grip on Palm & Fingers 33-G125 |  | Knit Nylon Glove with Polyurethane Coated Smooth Grip on Palm & Fingers |
| 6 | NOT SUPPORTED   Cotton/Polyester Gloves  Example: Sure Knit Economy 7-gauge Cotton/Polyester Gloves SQ |  | Cotton/Polyester blend |
| 7 | NOT SUPPORTED    Cowgrain Leather Fitters Work Glove (Freezer)  Example: Endura Fully Fleece-Lined Cowgrain Gloves - 76YBDFL |  | Leather. Full cotton-fleece lining for warmth. |

 (all can be ordered at <http://www.gloves-online.com/>)  
  
Premium SKU:  
Device shall support the following gloves

|  |  |  |  |
| --- | --- | --- | --- |
| **Index** | **Description** | **Image** | **Material** |
| 1 | Light weight nylon gloves    Example: MaxiFlex Ultimate  Palm coating, 1mm thickness, stretch-nylon 34-874 |  | Nylon Liner with Lycra, Black Micro-Foam Coated Palm and Finger Tips |
| 2 | Leather work gloves  Example: PIP® Economy Grade Shoulder Split Cowhide Leather Reinforced Palm Glove 85-7500P |  | Cowhide Leather |
| 3 | Latex and Nitrile Gloves up to 5mils thick  Example: Ambi-dex® Food Grade Disposable Nitrile Glove, Powder Free with Textured Grip - 4 Mil 63-532PF |  | Latex and Nitrile |
| 4 | Knit Nylon Glove with Nitrile coating  Example: MaxiFlex® Elite™ Ultra Light Weight Seamless Knit Nylon Glove with Nitrile Coated MicroFoam Grip on Palm & Fingers 34-274 |  | Knit Nylon Glove with Nitrile Coated Micro-Foam Grip on Palm & Fingers |
| 5 | Knit Nylon Glove with Polyurethane coating  Example: G-Tek® NPG Seamless Knit Nylon Glove with Polyurethane Coated Smooth Grip on Palm & Fingers 33-G125 |  | Knit Nylon Glove with Polyurethane Coated Smooth Grip on Palm & Fingers |
| 6 | Cotton/Polyester Gloves  Example: Sure Knit Economy 7-gauge Cotton/Polyester Gloves SQ |  | Cotton/Polyester blend |
| 7 | Cowgrain Leather Fitters Work Glove (Freezer)  Example: Endura Fully Fleece-Lined Cowgrain Gloves - 76YBDFL |  | Leather. Full cotton-fleece lining for warmth. |

 (all can be ordered at <http://www.gloves-online.com/)Shall> Have, Req't Team Approved, System Requirement

**4.17.4.1.16 Touch Panel Panel Touch Panel - Water Rejection & Immunity**

Quasar-5181 - Water Rejection  
Touch Panel Panel  shall provide no false activations of the Touch PanelTouch Panel or rejection of valid inputs after removal from an IPX5 water test enclosure.  Once removed from the test enclosure, there will be no water traveling across the Touch Panel.  
  
Note :"Moisture support tested according to below spec  
1. Water drop test (4x10mm):   
4x10mm water drops placed on Touch Panel. Must be able to draw around the water drops with no broken lines  
2. Water drop test (1x10mm):  
1x10mm water drop placed on Touch Panel. Must have no ghosting when move finger through the water. After wiping must operate correctly  
3. Spray test (3mm):  
Spray on Touch Panel, and check that normal Touch Panel Panel operation is possible for 60 seconds. After wiping must have normal Touch Panel Panel operation  
4. Rain drops  
Pour water drops to Touch Panel from a container having a hole of dia. approx. 2.5mm. Check that the drops are not causing Touch Paneles   
  
Tested but operation not quaranteed:  
5. Touch Panel Panel in large area of water  
Apply>30mm pool of moisutre on Touch Panel. Place Touch Panel Panel directly in moisture. Touch Panel Panel should be reported with no ghosts. After wiping must have normal Touch Panel Panel operationShall Have, Req't Team Approved, System Requirement

**4.17.4.1.17 Touch Panel Panel - Touch Panel Protector**

Quasar-5183 - Touch Panel Protector Compatibility  
The Touch Panel Panel shall be compatible with a glass Touch Panel protector without degradation in finger performance.    
  
Note: impact on glove performance shall be evaluated and possibly a Touch Panel protector mode for glove/finger mode made be needed.Shall Have, Req't Team Approved, System Requirement