

# Latitude E6400 XFR

## Summary Of Independent Environmental Testing



### General Information

<b>Project Numbers</b>	<b>10325-30</b> MIL-STD Testing <b>19049</b> IEC Ingress Testing <b>08CA46457</b> UL1604 Hazardous Location Testing <b>15529</b> UL and CE Safety Testing / ESD, Emissions, Immunity Testing <b>10194-10</b> MIL-STD-461E Testing <b>10236-10</b> MIL-STD-461E Testing <b>10280-10</b> MIL-STD-461E Testing with Power Supply
<b>Equipment Tested</b>	Dell™ Latitude™ E6400 XFR
<b>Environmental Test Dates</b>	December 2008 August-November 2009
<b>Independent Test Companies And Contacts</b>	<b>Professional Testing (EMI), Inc.</b> 1601 FM 1460, B Round Rock, TX 78664 Jeffery A. Lenk, President  <b>NEMKO</b> 802 N Kealy St Lewisville, TX 75057 Randy Friedberg, Account Manager  <b>Underwriters Laboratories, Inc.</b> 333 Plingsten Road Northbrook, IL 60062-2096 Saad Lambaz, Associate Project Engineer, Department: Hazardous Locations

### Notes

All environmental testing listed in the accompanying tables was performed and reported independently by the accredited testing companies listed above.

Documented MIL-STD-810, IEC, UL, emissions, immunity and ESD testing guidelines were followed. All tests were performed with I/O and expansion doors closed. A summary listing of tests appear in the following tables.



# Latitude E6400 XFR

## Summary Of Independent Environmental Testing



### MIL-STD Testing

Test Listing	Test Method	Description	Result
Transit Drop	MIL-STD-810G Method 516.6 Procedure IV	48"(4', 1.22m) drop to 2"of plywood over concrete, 26 total drops on a single test unit. One drop to each face, edge and corner. Unit is closed and not operating.	PASS <sup>1</sup>
Operating Drop	MIL-STD-810G Method 516.6 Procedure IV	36"(3', 0.914m) drop to 2"of plywood over concrete, 26 total drops on a single test unit. One drop to each face, edge and corner. Unit is open, operating and configured with SSD.	PASS <sup>1</sup>
Blowing Rain Aggravated	MIL-STD-810G Method 506.5 Procedure I	5.8" (147mm) per hour of blowing rain with a 70 mph wind source for 30 minutes on each surface. Unit is operating.	PASS <sup>1</sup>
Blowing Dust	MIL-STD-810G Method 510.5 Procedure I	Particle Density: 10 ± 7 g/m <sup>3</sup> . Air Velocity: 300 to 1,750 ft/min (8.9 m/s or 19.5 mph). Operating temperature of 140°F (60°C). Unit is not operating.	PASS <sup>1</sup>
Blowing Sand	MIL-STD-810G Method 510.5 Procedure II	Sand Density: 1.2 g/m <sup>3</sup> . Air Velocity: 28 m/s (8.9 m/s or 19.5 mph). Operating temperature of 140°F (60°C). Unit is operating.	PASS <sup>1</sup>
Temperature Operating	MIL-STD-810G Methods 501.5, 502.5 Procedure II	<b>-20°F (-29°C) to 145°F (63°C)</b> High temperature: 5 day exposure (5x 24hr cycles). Low temperature: 24hr exposure. Unit is operating.	PASS <sup>1</sup>
Temperature Non-Operating/Storage	MIL-STD-810G Methods 501.5, 502.5 Procedure I	<b>-58°F (-50°C) to 160°F (71°C)</b> High temperature: 7 day exposure (7x 24hr cycles). Low temperature: 24 hour exposure. Unit is not operating.	PASS <sup>1</sup>
High Temperature Tactical Standby To Operational	MIL-STD-810G Methods 501.5 Procedure III	<b>158°F (70°C) to 140°F (60°C)</b> Unit is presoaked at 158°F (70°C) for 2 hours after temperature stabilization. Temperature is ramped to 140°F (60°C) and operational test is performed.	PASS <sup>1</sup>
Freeze/Thaw Rapid Temperature Change	MIL-STD-810G Methods 524 Procedure III	Unit stabilized at 77°F (25°C) and relative humidity of 97% for 1 hour, then transferred rapidly to a freezing chamber at 14°F (-10°C). Unit is allowed to stabilize plus one additional hour. Unit is brought back to above-freezing test. Unit is not operating during the test. Operational test is performed at the end of cycles.	PASS <sup>1</sup>
Thermal Shock	MIL-STD-810G Method 503.5 Procedure I	<b>-60°F (-51°C) to 160°F (71°C)</b> Cyclic temperature exposure. Three shocks. Unit is not operating. Functional test between cycles.	PASS <sup>1</sup>
Humidity Aggravated	MIL-STD-810G Method 507.5 Procedure II	<b>0% to 95% - non-condensing humidity</b> Temperature cycled between 86°F (30°C) and 140°F (60°C). Ten 24-hour cycles. Relative humidity maintained at 95%. Unit is not operating.	PASS <sup>1</sup>
Vibration Composite Wheeled Vehicle	MIL-STD-810G Method 514.6 Procedure I Category 4	Figure 514.6C-3. Unit is not operating.	PASS <sup>1</sup>
Vibration Ground Vehicle (Common Carrier / US Highway Truck)	MIL-STD-810G Method 514.6 Procedure I Category 4	Figure 514.6C-1. Unit is operating.	PASS <sup>1</sup>
Vibration Minimum Integrity Test	MIL-STD-810G Method 514.6 Procedure I Category 24	Figure 514.6E-1. Power Spectral Density = 0.04g <sup>2</sup> /Hz at 20Hz – 1000Hz, -6dB/Octave at 1000Hz – 2000Hz. 60 minutes x 3 axes. Unit is not operating during tests. Functional test after each axis.	PASS <sup>1</sup>
Vibration Loose Cargo	MIL-STD-810G Method 514.6, Procedure II	Figure 514.6C-4. 300 rpm for 60 minutes total. Unit is not operating during tests. Functional test after each axis.	PASS <sup>1</sup>

# Latitude E6400 XFR

## Summary Of Independent Environmental Testing



Test Listing	Test Method	Description	Result
<b>Salt Fog</b>	MIL-STD-810G Method 509.5 Procedure I	5% saline exposure for 2 cycles x 48hrs. (24 hours wet / 24 hours dry). Unit is not operating.	PASS <sup>1</sup>
<b>Altitude</b> Storage / Air Transport	MIL-STD-810G Method 500.5 Procedures I	Chamber at 30,000ft for 1 hour. Unit is not operating.	PASS <sup>1</sup>
<b>Altitude</b> Operation / Air Carriage	MIL-STD-810G Method 500.5 Procedures II	Chamber at 15,000ft for 1 hour. Unit is operational.	PASS <sup>1</sup>
<b>Functional Shock</b>	MIL-STD-810G Method 516.6 Procedure I	40g, 11ms, saw-tooth, 3 shocks, +/- per axis, 3 axes. Unit is operating.	PASS <sup>1</sup>
<b>Explosive Atmosphere</b>	MIL-STD-810G Method 511.5 Procedure I	Unit must be operating and perform various functions in an explosive environment without igniting the atmosphere.	PASS <sup>1</sup>

### IEC Ingress Protection Certifications

Test Listing	Test Method	Description	Result
<b>IP-6x</b> Dust Ingress Protection	IEC 60529	No ingress of dust. Complete protection against contact. Unit is not operating. Operational test performed at end of test cycle.	PASS <sup>1</sup>
<b>IP-x5</b> Water Ingress Protection	IEC 60529	<b>Jetting Water:</b> Water is projected in jets against the enclosure from any direction with no harmful effects. Unit is not operating. Operational test performed at end of test cycle.	PASS <sup>1</sup>

### Additional Testing Procedures

Test Listing	Test Method	Description	Result
<b>ASTM Vehicle Vibration</b> Truck Highway Assurance Level II	ASTM D4169-04(99) Schedule E	1-200Hz, 0.52 Grms in all three axis. 90 minutes per axis. Unit is operating.	PASS <sup>1</sup>
<b>LCD Impact Test</b>	Customized Test Based on Field Conditions	1" (2.54 cm) steel ball bearing, dropped repeatedly (20X) from 36" (91.44cm) height onto the LCD face. All quadrants on LCD surface. Unit is not operating during tests. No cosmetic or functional damage from impact.	PASS <sup>1</sup>

# Latitude E6400 XFR

## Summary Of Independent Environmental Testing



### Environmental Certifications

Test Listing	Test Method	Description	Result
Electromagnetic Interference	MIL-STD-461F	CE101, CE102 <sup>2</sup> , CS101, CS114, CS115, CS116, RE101, RE102 <sup>2</sup> , RS101, and RS103 <sup>2</sup> profiles.	PASS <sup>1</sup>
Hazardous Locations	UL1604 Class 1, Division II, Zones A,B,C,D	Certified Safe operation of system in potentially hazardous environments as defined. Tested by UL Labs, Department of Hazardous Locations.	PASS <sup>1</sup>
Safety	UL/IEC 60950	Standard Safety Certification. Tested by UL Labs.	PASS <sup>1</sup>
Conducted and Radiated Emissions	EN55022:2006 ANSI C63.4-2003	FCC 47 CFR Part 15, Class B. Tested by NEMKO.	PASS <sup>1</sup>
Electrostatic Discharge /Conducted And Radiated Susceptibility / Immunity	EN 61000-3-2 EN 61000-3-3 EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8 EN 61000-4-11	EN55024: 1998+A1:00+A2:03 ANSI C63.4-2003  8Kv/4Kv 3Vrms 3 V/M >95%-0.5p, 30%-25[, >95%-250p  Tested by NEMKO.	PASS <sup>1</sup>

### Notes

1. PASS indicates that the unit remained operational during the entirety of the test for operational tests and indicates that the unit powered on and booted to Microsoft® Windows® following each test non-operational tests.
2. Test passed with a 461F approved AC power supply.