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Test Report Number:	**ETRB40441**
Reference Standard:	**EN 55011: 2009 + A1: 2010, Class A, Group 1** **CISPR 11, Ed. 5.1, 2010-05, Class A, Group 1**
Date of Test:	**7 April 2014**
Date of Report:	**30 July 2014**
Product Name:	**ACX-250-1**
Model Number:	**ACX-250-1**
Serial Number:	**443-DX**
Manufacturer:	**Tensitron**
Representative:	**Chris Crosby**
Report Type:	**Radiated and Conducted Emissions**
Test Result:	**Compliant**
Approved By:	Vincent W. Bruti

Prepared for:

Tensitron
733 South Bowen Street
Longmont, Colorado 80501
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Customer Representative:

Chris Crosby
President

Tested at:

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Tested by:

Kevin Johnson
Test Engineer

Report Prepared by:

Mary Burback
Office Manager

Report Approved by:

Vincent Greb
Laboratory Manager

Revision	Description of Revision	Date:
Rev. -	Initial Release	30 July 2014

TABLE OF CONTENTS

LIST OF APPENDICES

1.0 TEST SUMMARY

1.1 Product Description

The unit under test (UUT) was the ACX-250-1. The Serial Number tested was 443-DX. This product is manufactured by Tensitron located in Longmont, Colorado. It is an electronic tension gauge designed for use in industrial locations. A more complete description of this product may be found in the Product Data Sheet, located in Appendix C of this report.

1.2 Purpose

This report documents the test efforts performed on the ACX-250-1 to verify compliance to the Class A, Group 1 limits of EN 55011. This was a formal qualification test and was conducted on 7 April 2014.

1.3 Test Standards Used

The emission limits applied to the product tested are defined in EN 55011, which is the product family standard for Industrial, Scientific and Medical (ISM) equipment. The UUT was set up as specified in CISPR 16.

The normative references of this standard define the test methods used for the emissions testing. These standards are contained in Table 1-1.

Table 1-1

EN 55011: 2009 + A1: 2010	CISPR 11, Ed. 5.1, 2010-05
CISPR 16-1, Ed. 2.1 (2002-10)	CISPR 16-2, Ed. 2.0 (2003-07)
CISPR 16-3, Ed. 1.1 (2002-08)	CISPR 16-4, Ed. 1.0 (2002-05)

1.4 Test Results

The UUT **complied** with the Class A, Group 1 emission requirements defined by EN 55011. Test data is contained in the appropriate appendices of this report.

1.5 Modifications Required for Compliance

No modifications were required for compliance with emissions.

2.0 TEST ENVIRONMENT

2.1 Radiated Emissions Test Site

Radiated emissions testing was performed at a distance of 10-meters in a semi-anechoic 10-meter chamber. This chamber is calibrated annually and meets the volumetric site attenuation requirements of CISPR 16 at a distance of 10 meters. For measurements from 30 MHz to 1 GHz, a biconilog antenna is used in conjunction with a high-gain, low-noise preamplifier. This is connected to an HP 8566B spectrum analyzer with an HP 85650A Quasi-Peak (QP) Adapter, via an HP 85685 RF Preselector.

Radiated emissions testing is broken into two parts: pre-scan and QP/maximization. Pre-scanning a product from 30 MHz to 1 GHz consists of measuring peak emissions from eight radials (every 45 degrees), at four antenna heights (1 m, 2 m, 3 m and 4 m) for both antenna polarities. Data is recorded in a graph showing amplitude vs. frequency of the emissions, and frequencies for QP/maximization are chosen based on this graph. The procedure for maximizing emissions is as follows:

1. The analyzer is tuned to the frequency associated with the emissions having the least margin.
2. The turntable and antenna mast are moved to the location where the maximum emission was measured during the pre-scan.
3. Both are then oriented such that the maximum emission is obtained.
4. Cables on the UUT are manually manipulated to achieve the maximum emission.
5. The turntable and antenna mast are then re-adjusted to ensure a maximum reading.
6. If the signal in question is less than 1 GHz, quasi-peak detection is performed on the signal for a minimum of 10 seconds. For signals greater than 1 GHz, video averaging is performed.
7. Turntable/antenna mast maximization and QP detection are performed on all other signals within 6 dB of the limit. In the event that there are not six signals within 6 dB of the limit, the highest six signals are maximized. This ensures that a minimum of six signals are maximized and appear in the final data table.

2.2 Conducted Emissions Test Site

Conducted emissions testing was performed on a 10’ by 10’ ground plane, which is bonded to the wall of the 10-meter chamber, using its wall as the vertical coupling plane. Line impedance stabilization networks (LISNs) was inserted in series with both the UUT and the support equipment. The LISNs used were standard 50 Ω/50 uH LISNs which complied with the requirements of CISPR 16. These LISNs are calibrated annually for both complex impedance and insertion loss. Measurement equipment used was an HP 8566B spectrum analyzer with an HP 85650A QP adapter. In addition, a transient limiter and a high-pass filter are used to protect the front-end of the receiver from transients and low-frequency noise, respectively.

2.3 Measurement Uncertainty

The measurement uncertainty for EMC Integrity's emissions test facility complies with the requirements defined in CISPR 16. The complete calculations of EMC Integrity's measurement uncertainty is contained in an EMCI memo, which is available upon request. However, a summary of EMCI's measurement uncertainty is given in Table 2-1.

Table 2-1

Test	Requirement	Actual
Conducted Emissions	3.60 dB	3.04 dB
Radiated Emissions – Horizontal Polarity	5.20 dB	4.67 dB
Radiated Emissions – Vertical Polarity	5.20 dB	5.01 dB

3.0 Radiated Emissions

3.1 Summary of Test Results

Radiated electric field emissions were measured on the UUT over the frequency range from 30 MHz to 1 GHz. The UUT was powered from 230 Vac/50 Hz, configured in its normal operating mode, and exercised continually during testing. Cables were oriented such that the maximum emission was achieved and quasi-peak detection was performed all signals (minimum of six) used in the final data table.

Test result: Compliant
Margin: 19.41 dB @ 862.526 MHz

3.2 Test Setup

The UUT was set up in accordance with CISPR 16 and tested to the Class A, Group 1 limits specified in EN 55011.

3.3 Special Configurations

Not applicable.

3.4 Deviations from Test Procedures

Not applicable.

3.5 Test Data

See APPENDIX A for all test data sheets, test setup pictures and test equipment used.

4.0 Conducted Emissions

4.1 Summary of Test Results

Conducted emissions were measured on the AC power input of the UUT over the frequency range from 150 kHz to 30 MHz. With the UUT configured in its normal operating mode, testing was performed with UUT powered from 230 Vac/50 Hz. The input power to the UUT was run through a standard 50 Ω/50 uH line impedance stabilization network (LISN) which complied with the requirements of CISPR 16. Emissions were compared to both quasi-peak (QP) and average limits, with QP detection and averaging performed on the six highest signals.

Test result: Compliant
Margin: 32.00 dB @ 3.840 MHz

4.2 Test Setup

The UUT was set up in accordance with CISPR 16 and tested to the Class A limits specified in EN 55011.

4.3 Special Configurations

Not applicable.

4.4 Deviations from Test Procedures

Not applicable.

4.5 Test Data

See APPENDIX B for all test data sheets, test setup pictures and test equipment used.

APPENDIX A

Radiated Emissions Test Data

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Radiated Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014
Temperature:	20˚C Humidity: 24%	Pressure:	838mb
Input Voltage:	230Vac/50Hz		
Configuration of Unit:	Pre-set load reading		
Test Engineer:	Kevin Johnson		

B40441-11-RE.doc FR0100

Type	Frequency (MHz)	Level (dBuV)	Transducer (dB/m)	Gain / Loss (dB)	Final (dBuV/m)	Azm(deg)/Pol/Hgt(m)	Margin: EN55011 Class A Group 1 QP (dB)
QP	31.896	25.0	19.8	-31.3	13.5	235/V-Pole/1.53	26.51
QP	87.515	40.9	7.5	-30.9	17.6	110/V-Pole/3.68	22.44
QP	111.959	29.3	13.2	-30.5	12.0	117/V-Pole/1.00	28.02
QP	174.310	31.3	11.6	-30.2	12.7	245/H-Pole/1.00	27.30
QP	614.309	31.3	18.9	-26.9	23.3	277/H-Pole/3.96	23.71
QP	647.529	29.0	19.5	-26.5	21.9	70/H-Pole/1.22	25.05
QP	862.526	31.0	21.9	-25.4	27.6	272/V-Pole/2.60	19.41
QP	929.943	29.4	22.3	-25.2	26.5	266/V-Pole/2.16	20.48

The highest emission measured was at **862.526 MHz,** which was **19.41 dB** below the limit.

- "Type" refers to the type of measurement performed. The type of measurement made is based on the requirements of the particular standard:
  - PK = Peak Measurement: RBW is 120kHz, VBW is 3 MHz
  - QP = Quasi-Peak Measurement: RBW is 120kHz, VBW is 3 MHz, and QP Detection is ENABLED
  - AV = Video Average Measurement: RBW is 1 MHz, VBW is 10 Hz
- The "Final" emissions level is attained by taking the "Level" and adding the "Transducer" factor and the "Gain/Loss" factor. Final measurements are made with the Azimuth, Polarity, Height, and EUT Cables positioned for maximum radiation. If applicable, cables positions are noted in the test log. (Sample Calculation: 49.6 dBuV + 11.4 dB/m – 28.8 dB = 32.2 dBuV/m. **Important Note**: This is a sample calculation only for the purpose of demonstration, and does not reflect data in this report.)
- The "Azm/Pol/Hgt" indicates the turn-table *azimuth*, the antenna *polarity*, and the antenna *height* where the maximum emissions level was measured.
- The "Margin" is with reference to the emissions limit. A positive number indicates that the emission measurement is below the limit. A negative number indicates that the emission measurement exceeds the limit.
- The PRESCAN is a peak measurement and is performed with the RBW set to 120 kHz, VBW set to 3 MHz (30 MHz to 1 GHz), and the RBW set to 1 MHz, VBW set to 100 kHz (> 1 GHz)

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Radiated Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014

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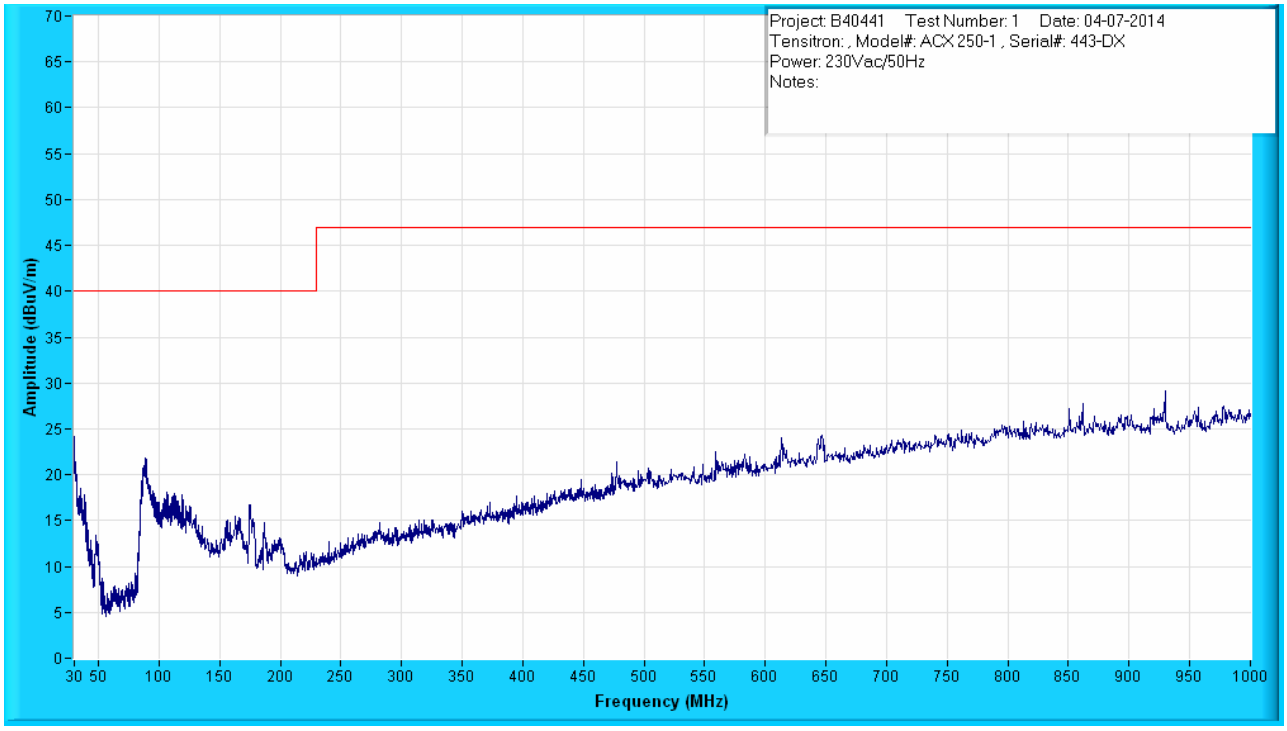

Figure A1: Radiated Emissions Prescan, 30MHz to 1000MHz, Peak Measurements at 10m Distance

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Radiated Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014

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Figure A2: Radiated Emissions Test Setup - Front

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Radiated Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014

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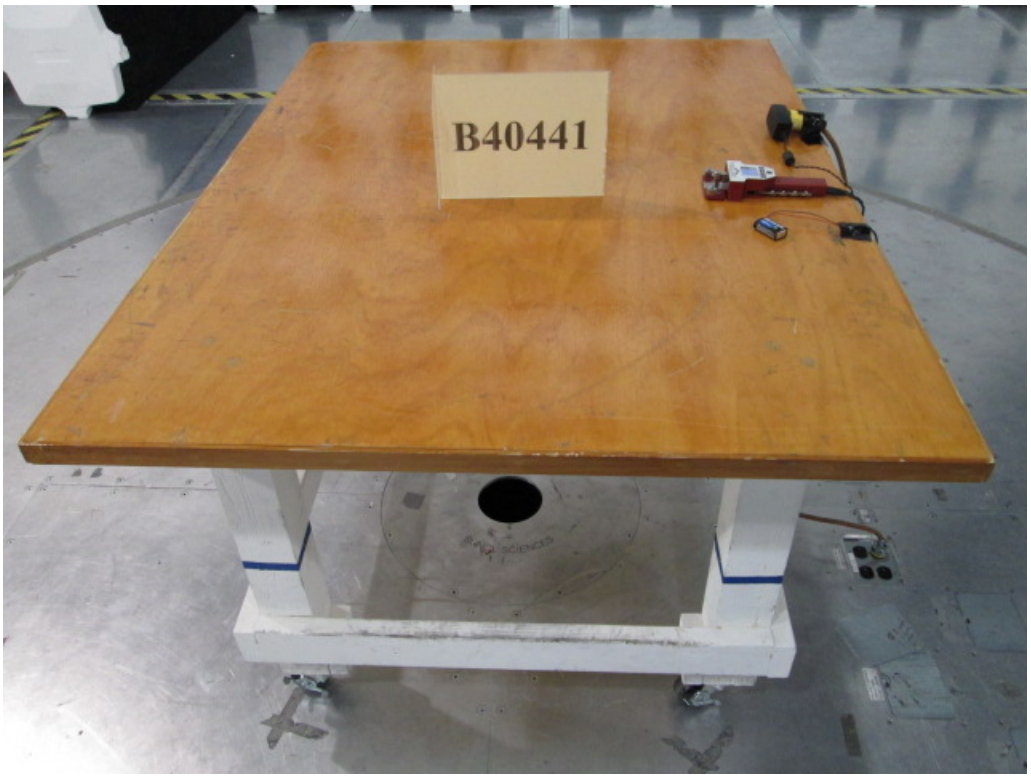

Figure A3: Radiated Emissions Test setup - Right

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Radiated Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014

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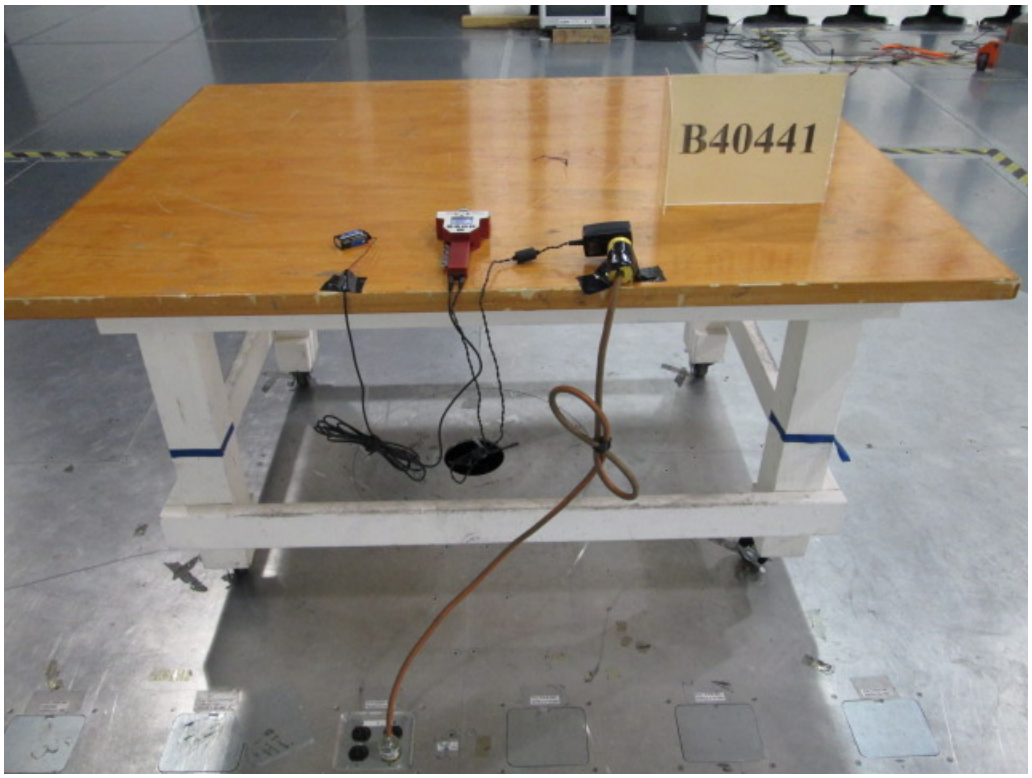

Figure A4: Radiated Emissions Test Setup - Back

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Radiated Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014

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Figure A5: Radiated Emissions Test Setup - Left

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Radiated Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014

B40441-11-RE.doc FR0100

Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1220	Mini-Circuits	ZKL-2	NA	Preamp, 10 - 2000 MHz, 30 dB	02/17/2014	02/17/2015
1229	Hewlett Packard	85685A	3010A01077	RF Preselector	01/07/2014	01/07/2015
1232	Sunol Sciences	JB1	A071605-2	Bilog Antenna, 30 MHz to 2.0 GHz	08/30/2013	08/30/2014
1263	Hewlett Packard	8566B	3014A06873	Spectrum Analyzer, 100 Hz to 22 GHz	01/07/2014	01/07/2015
1264	Hewlett Packard	85662A	2848A18247	Spectrum Analyzer Display	01/07/2014	01/07/2015
1265	Hewlett Packard	85650A	2521A00641	Quasi-Peak Adapter	01/07/2014	01/07/2015
1396	CIR Enterprises	10m Chamber #2	002	10m Chamber with 4m turntable	07/03/2013	07/03/2014
1410	Sunol Sciences	SC110V	021611-1	System Controller 10meter #2	NA	NA
1500	Pacific Power Source	3060-MS/M93235	0871_08097	62KVA-175 AMP, Frequency 47-500Hz, Power Supply	NA	NA
1538	Extech Instruments	445715	Z315812	Hygro-Thermometer	03/21/2014	03/21/2015

APPENDIX B

Conducted Emissions Test Data

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Conducted Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014
Temperature:	20˚C Humidity: 24%	Pressure:	838mb
Input Voltage:	230Vac/50Hz		
Configuration of Unit:	Pre-set load reading		
Test Engineer:	Kevin Johnson		

B40441-11-CE.doc FR0100

Type	Frequency (MHz)	Level (dBuV)	Transducer (dB)	Gain / Loss (dB)	Final (dBuV)	Test Point	Margin: EN55011 Class A Group 1 AV (dB)	Margin: EN55011 Class A Group 1 QP (dB)
AV	1.800	8.8	-0.3	16.2	24.7	Line 1	35.33	-
QP	1.800	13.2	-0.3	16.2	29.1	Line 1	-	43.88
AV	2.307	7.8	-0.3	16.2	23.7	Line 1	36.32	-
QP	2.307	12.2	-0.3	16.2	28.2	Line 1	-	44.82
AV	2.825	9.6	-0.3	16.3	25.6	Line 1	34.42	-
QP	2.825	14.2	-0.3	16.3	30.1	Line 1	-	42.86
AV	3.840	12.0	-0.2	16.2	28.0	Line 1	32.00	-
QP	3.840	13.0	-0.2	16.2	29.0	Line 1	-	44.01
AV	4.361	5.5	-0.2	16.2	21.5	Line 1	38.45	-
QP	4.361	9.8	-0.2	16.2	25.8	Line 1	-	47.25
AV	5.390	5.4	-0.2	16.2	21.4	Line 1	38.56	-
QP	5.390	9.8	-0.2	16.2	25.8	Line 1	-	47.18
AV	1.796	6.3	-0.3	16.2	22.2	Neutral	37.78	-
QP	1.796	11.0	-0.3	16.2	26.9	Neutral	-	46.07
AV	2.829	5.7	-0.3	16.3	21.7	Neutral	38.32	-
QP	2.829	10.3	-0.3	16.3	26.3	Neutral	-	46.73
AV	3.341	4.0	-0.3	16.3	20.0	Neutral	40.00	-
QP	3.341	8.6	-0.3	16.3	24.6	Neutral	-	48.40
AV	3.855	6.4	-0.2	16.2	22.4	Neutral	37.60	-
QP	3.855	10.3	-0.2	16.2	26.3	Neutral	-	46.74
AV	4.366	5.2	-0.2	16.2	21.2	Neutral	38.80	-
QP	4.366	9.0	-0.2	16.2	25.0	Neutral	-	48.04
AV	5.385	6.5	-0.2	16.2	22.5	Neutral	37.46	-
QP	5.385	11.2	-0.2	16.2	27.3	Neutral	-	45.74

The highest emission measured was at **3.840 MHz,** which was **32.00 dB** below the limit.

- "Type" refers to the type of measurement performed. The type of measurement made is based on the requirements of the particular standard:
  - PK = Peak Measurement: RBW is 9 kHz, VBW is 3 MHz
  - QP = Quasi-Peak Measurement: RBW is 9 kHz, VBW is 3 MHz, and QP Detection is ENABLED
  - AV = Video Average Measurement: RBW is 9 kHz, VBW is 10 Hz
- The "Final" emissions level is attained by taking the "Level" and adding the "Transducer" factor and the "Gain/Loss" factor. (Sample Calculation: 40.2 dBuV + 1.6 dB + 16.3 dB = 58.1 dBuV. **Important Note**: This is a sample calculation only for the purpose of demonstration, and does not reflect data in this report.)
- The "TestPoint" indicates which AC or DC input power line or which I/O cable the measurement was made on.
- The "Margin" is with reference to the emissions limit. A positive number indicates that the emission measurement is below the limit. A negative number indicates that the emission measurement exceeds the limit.
- The PRESCAN is a peak measurement and is performed with the RBW set to 9 kHz, and the VBW set to 3 MHz

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Conducted Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014

B40441-11-CE.doc FR0100

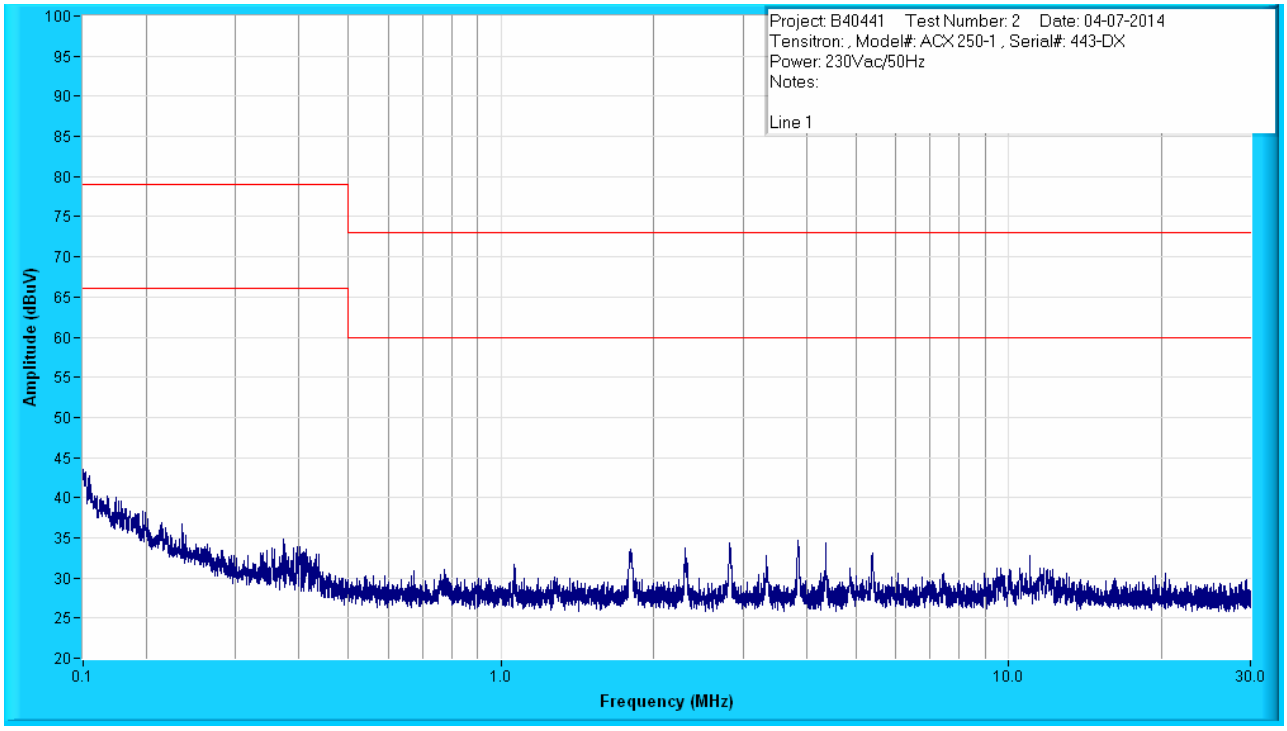

Figure B1: Conducted Emissions Prescan, Line 1, 0.150MHz to 30MHz, Peak Measurements

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Conducted Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014

B40441-11-CE.doc FR0100

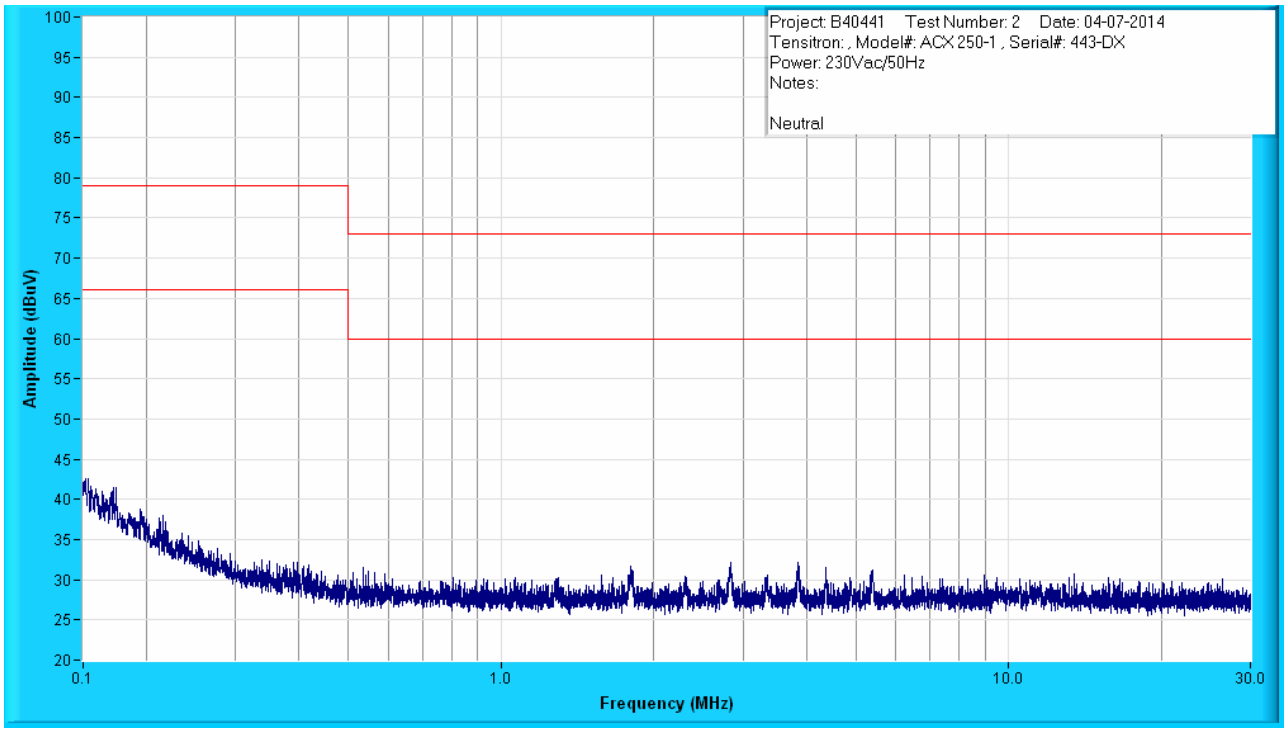

Figure B2: Conducted Emissions Prescan, Neutral, 0.150MHz to 30MHz, Peak Measurements

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Conducted Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014

B40441-11-CE.doc FR0100

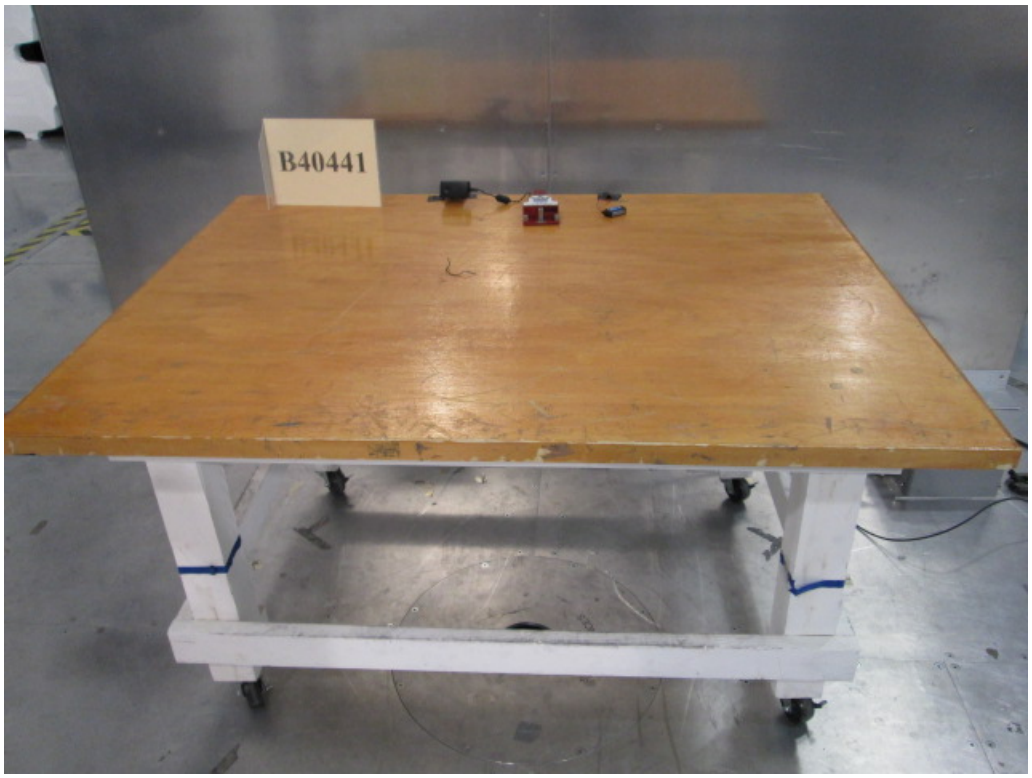

Figure B3: Conducted Emissions Test Setup - Front

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Conducted Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014

B40441-11-CE.doc FR0100

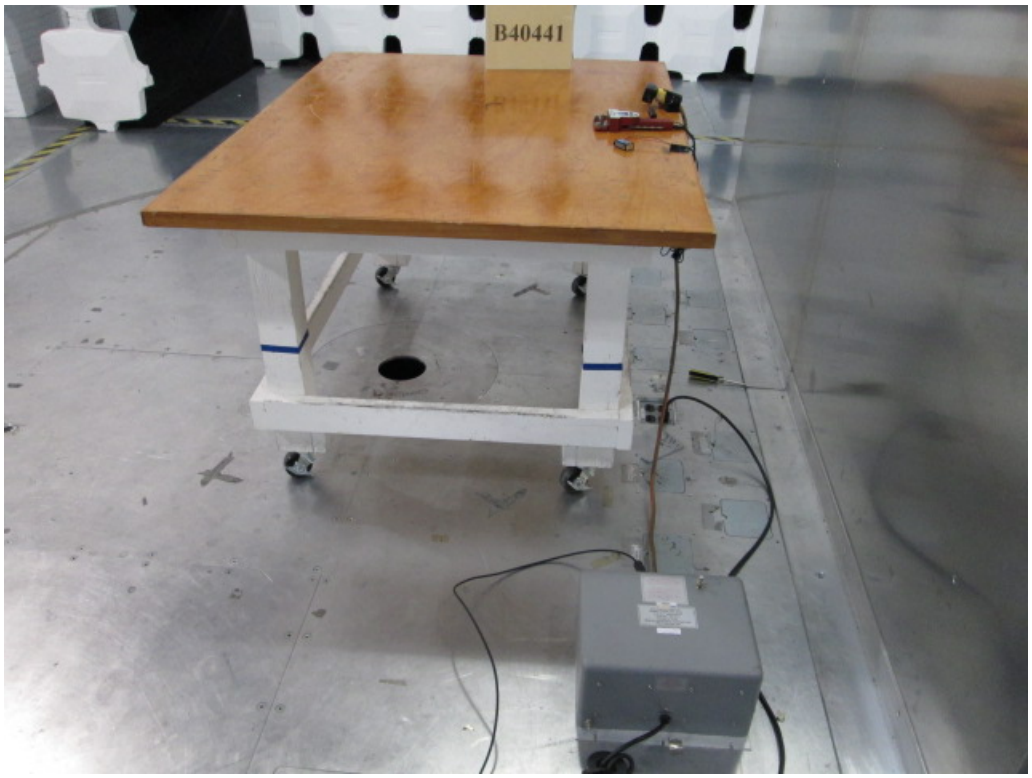

Figure B4: Conducted Emissions Test Setup - Right

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Conducted Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014

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Figure B5: Conducted Emissions Test Setup - BAck

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Conducted Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014

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Figure B6: Conducted Emissions Test Setup - Left

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Conducted Emissions, CISPR / EN 55011

Manufacturer:	Tensitron	Project Number:	B40441
Customer Representative:	Chris Crosby	Test Area:	10m2
Model:	ACX250-1	S/N:	443-DX
Standard Referenced:	EN55011	Date:	April 7, 2014

B40441-11-CE.doc FR0100

Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1195	Solar	9252-50-R-24-BNC	042013	LISN	03/18/2014	03/18/2015
1201	Agilent Technology	11947A	3107A03805	Transient Limiter, 9 kHz to 200 MHz	01/28/2014	01/28/2015
1229	Hewlett Packard	85685A	3010A01077	RF Preselector	01/07/2014	01/07/2015
1263	Hewlett Packard	8566B	3014A06873	Spectrum Analyzer, 100 Hz to 22 GHz	01/07/2014	01/07/2015
1264	Hewlett Packard	85662A	2848A18247	Spectrum Analyzer Display	01/07/2014	01/07/2015
1265	Hewlett Packard	85650A	2521A00641	Quasi-Peak Adapter	01/07/2014	01/07/2015
1396	CIR Enterprises	10m Chamber #2	002	10m Chamber with 4m turntable	07/03/2013	07/03/2014
1500	Pacific Power Source	3060-MS/M93235	0871_08097	62KVA-175 AMP, Frequency 47-500Hz, Power Supply	NA	NA
1538	Extech Instruments	445715	Z315812	Hygro-Thermometer	03/21/2014	03/21/2015

APPENDIX C

Product Data Sheet

emc integrity incorporated
www.emcintegrity.com
1736 Vista View Drive | Longmont, CO 80504 | tel: 303.776.7249 | fax: 303.776.7314 | info@emcintegrity.com

1.0 Client Information

Client Information	
Manufacturer Name	Tensitron
Address	733 South Bowen Street
City	Longmont
State	CO
Zip Code	80501
Client Representative	Chris Crosby (CEPD)
Title	President
Phone	(303) 415-1112 Ext 13
Fax	(720) 306-4445
Email	ccrosby@cepd.com

2.0 Product Information - General

Product Information	
Product Name (**as it should appear on test report**)	ACX-250-1
Model Number (of UUT to be tested)	ACX250-1
Functional description of product (what is it, what does it do, etc.)	Electronic Tension Gauge
List all modes of operation	BATTERY POWER AND/OR POWER SUPPLY
Can modes be operated simultaneously? If so, explain.	YES
What mode(s) will be used for testing?	POWER SUPPLY
Product type (IT, Medical, Scientific, Industrial, etc.)	Industrial
Is the product an intentional radiator	No
Product Dimensions	7" X 9.8" X 2.23"
Product Weight	2-3/4 LBS
Will fork lift be required	No
Applicable Standards, if known	EN 61326-1: 2006 (Industrial)
Describe all environment(s) where product will be used (residential, commercial, industrial, etc.)	INDUSTRIAL
Does product consist of multiple components? (If yes, please describe each system component)	NO
Cycle time > 3 seconds? (If yes, how long?)	No
Highest internally generated frequency	6 MHz
Product Set-up Time	30 minutes
Boot up time in the event of an unintentional power down	< 10 seconds

Identify **ALL** I/O connections on the unit(s) under test, as well as **MAXIMUM** associated cable lengths below

Model No.	Description	I/O Type		Length (m)	Patient Connect? (See Note)	QTY
		UUT-UUT	UUT - SE			
EMSA090170-P7P-SZ-C	Power supply			1.5		
n/a	4-20mA cable			3		

Note: "Patient Connect" column applies only to medical devices.

emc integrity incorporated
www.emcintegrity.com
1736 Vista View Drive | Longmont, CO 80504 | tel: 303.776.7249 | fax: 303.776.7314 | info@emcintegrity.com

3.0 Power

Power Requirements	
Does/can product connect to AC mains? (If so, can the UUT function when connected to AC?)	Yes
Input Voltage Rating as it appears on unit, power supply, or power brick	100-240, 50/60 Hz
Input Current (specify @ 230 Vac/50 Hz)	Less than 0.3A
Single or Multi-Phase (If multi-phase, specify delta or wye)	Single
Is input power connector two-prong (Hot & Neutral) or 3-prong (H, N, Ground)	Two-prong
Does UUT have more than 1 power cord? (If yes, explain.)	No

4.0 Unit Under Test (UUT) – Detailed Information

UUT Hardware	
Condition	New
Configuration During Test	Charger connected
Input Power	Battery powered and with changer connected

UUT Components			
Name	**Model No.**	**Serial No.**	**Description**
STX250-1	STX250-1	443-DX	Aircraft Tension Meter

I/O Cabling
See Section 2.0 for details

UUT Software/Firmware		
Name	**Version/Revision**	**Functionality**
Tensitron_LCD	2.01.109	Full function, production firmware

UUT Operating Conditions	
List all frequencies generated/used by the product.	6MHz, 500KHz, both internal to the unit.
How will product be exercised during test?	Pre-set load reading, no user intervention required.
How will product be monitored during test?	Visual monitoring of display
What are the product's critical parameters?	Display reading to stay within +/-2% during testing
Specify tolerance of all critical parameters.	Tension reading, +/- 2%

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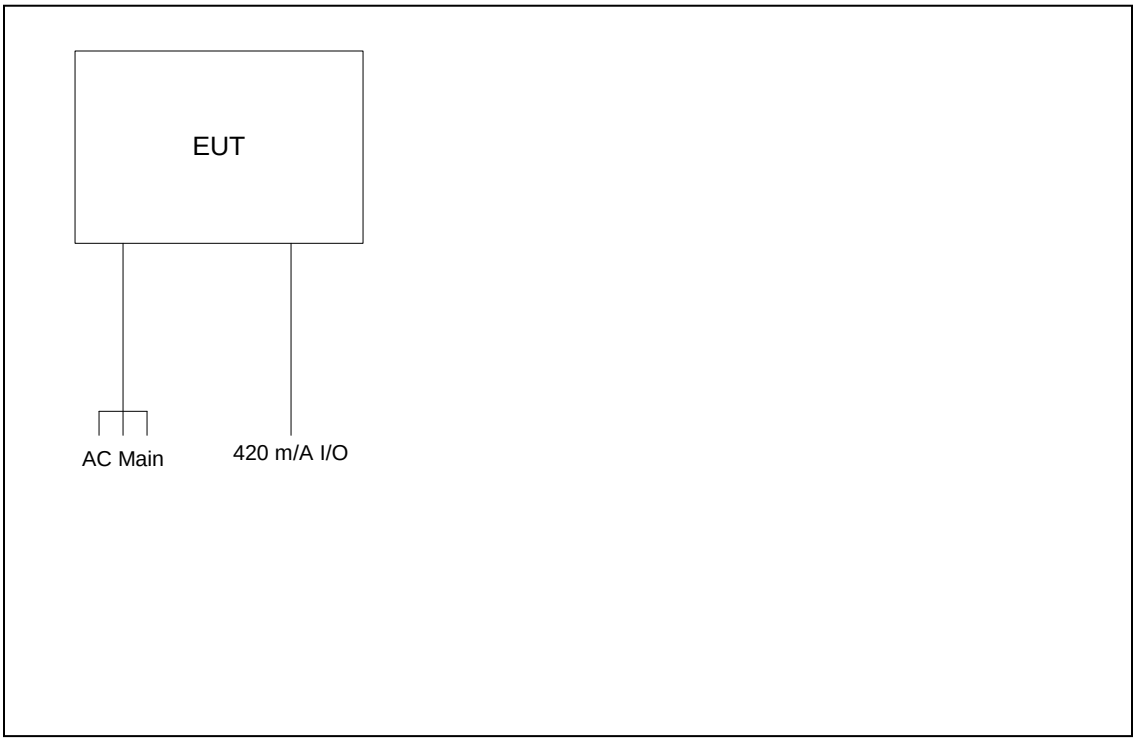
5.0 Support Equipment (SE) – Detailed Information

Support Equipment (SE)			
Name	**Model No.**	**Serial No.**	**Description**
None			

SE I/O Cabling				
Model No.	**Description**	**Shielded?**	**Length**	**Quantity**
None				

SE Software/Firmware		
Name	**Version/Revision**	**Functionality**
None		

6.0 Block Diagram



APPENDIX D

EMI Test Log

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EMI Test Log

Manufacturer:	Tensitron	Project Number:	B40441
Model:	STX250-1	S/N:	443-DX
Customer Representative:	Chris Crosby		
Standard Referenced:			

FR0105

10m Emissions

Test	Test Code	Date	Event	OT	Time (hrs)	Result	Initials
RE	1122	April 7, 2014 0800-1000	Test#1: 30MHz – 1GHz, 8 rads, 4 heights, 3 second dwell, ref level = 80dB, test distance= 10 meters 230Vac/50Hz Pretest validation complete		2.0	Pass	KJ
CE	2121	1000-1100	Test#2: 150kHz – 30MHz 230Vac/50Hz		1.0	Pass	KJ

Regular hours:	3.0
Overtime/Prem hours:	
Total hours:	3.0

Ground Planes / CALC

Test	Test Code	Date	Event	OT	Time (hrs)	Result	Initials
4-3	4388	April 7, 2014 1100-1200	Setup, removing CE back plane and setting tiles for RI		1.0	Complete	KJ
		1230-1630	Radiated RF Immunity 10V/m, 80MHz-1GHz, 3V/m, 1.4-2GHz, 1V/m, 2-2.7GHz, 1% Step, 80% AM, 1kHz sine, 3s dwell (6 sides) 230 VAC / 50 Hz Performed in 10m2 Baseline reading is 17.5		4.0	Fail	KJ
			Unit read to 28 at 355MHz, right side, H-pole. Unit read to 35.5 at 381MHz, back side, H-pole Unit read to 47 at 397MHz, left side, H-pole Re-running left side, H-pole with fresh 9 volt battery-no change Unit went to 73 at 370MHz on top side, H-pole Finished front, right, back and top sides -80MHz – 1GHz. Still need the bottom side 80MHz-1GHz and all sides 1.4 to 2.7GHz				KJ

Ground Planes / CALC

Test	Test Code	Date	Event	OT	Time (hrs)	Result	Initials
4-3		April 8, 2014 0800-1100	Baseline reading is 22.5 Re-running top side, H-pole: Unit read 52 at 394MHz Re-running top side without analog cable, H-pole: unit read 23 at 394. Re-running top with ferrite on analog out cable, H-pole: unit read 32.5 at 398MHz Re-running top with ferrite with 2 turns on analog cable, H-pole: unit read 29.5 at 398MHz Re-running top with 2 turns on a A6 WE ferrite, H-pole: unit read 38.5 at 400MHz Re-running top with 2 turns on a B2 We ferrite ,H-pole: unit read 27.5 at 400MHz		3.0	Complete	KJ
			Running bottom side		--	--	KJ
			Running top side 1.4 to 2.7 GHz-OK Running left side 1.4 to 2.7 GHz-OK Running back side 1.4 to 2.7 GHz-OK Running right side 1.4 to 2.7 GHz-OK Running front side 1.4 to 2.7 GHz-OK Running back side 1.4 to 2.7 GHz-OK		--	--	KJ
4-6	4613	1100-1200	Conducted RF Immunity 3Vrms, 0.15 - 80 MHz, 1% Step, 80% AM, 1kHz sine, 3s dwell (AC main & one I/O) 230 VAC / 50 Hz		---	---	DW
		1200-1230	Lunch		---	---	DW
		1230-1400	Continued CI testing to completion.		2.5	Pass	DW
4-4	4411	1400-1430	Electrical Fast Transient / Burst Mains: +/- 2kV, I/O: +/- 1kV (AC main & one I/O) 230 VAC / 50 Hz		0.5	Pass	DW
4-11	4171	1430-1530	Voltage Dips and Interruptions 0% nom, 1 cycle / 40% nom, 10/12 cycles / 70% nom, 25 cycles / 0% nom, 250 cycles 230 VAC / 50 Hz		1.0	Pass	DW
4-8	4831	1530-1630	Power Frequency H-Field Immunity 30A/m, 50 / 60 Hz, 3 axes 230 VAC / 50 Hz		1.0	Pass	DW
4-5	4515	April 9, 2014 0800-1300	Surge Immunity Mains: +/- 2kV CM, +/- 1kV DM, (0, 90, 180, 270) 230 VAC / 50 Hz		5.0	Pass	DW
4-2	4223	1300-	Electrostatic Discharge +/- 2, 4kV Contact, +/-2, 4, 8kV Air 230 VAC / 50 Hz		---	---	DW
		1430	At +8kV to lower corner of display caused display to blank. Reset EUT and it will no longer read tension.		1.5	---	DW
		April 10, 2014 1330-1430	Client returned for Repeat ESD Testing. Previous failure was a calibration problem with the EUT. Could not repeat failure. Retested all of ESD and it passed.		1.0	Pass	DW

Ground Planes / CALC

Test	Test Code	Date	Event	OT	Time (hrs)	Result	Initials
4-3	4388	July 23, 2014 0800 - 1200	Radiated RF Immunity (Re-test) 10V/m, 80MHz-1GHz, 3V/m, 1.4-2GHz, 1V/m, 2-2.7GHz, 1% Step, 80% AM, 1kHz sine, 3s dwell (6 sides) 230 VAC / 50 Hz Note: Failures w/ 4-20 ma cable, cable removed and port to be labeled "service only".		4.0	---	CL
---	---	1200 - 1230	Lunch		---	---	CL
Client removed 4-20 ma cable, port will be marked "Do not use".							
---	---	1230 - 1630	Radiated RF Immunity (Re-test) 10V/m, 80MHz-1GHz, 3V/m, 1.4-2GHz, 1V/m, 2-2.7GHz, 1% Step, 80% AM, 1kHz sine, 3s dwell (6 sides) 230 VAC / 50 Hz		4.0	---	CL
---	---	July 24, 2014 0800 - 0900	Radiated RF Immunity (Re-test) 10V/m, 80MHz-1GHz, 3V/m, 1.4-2GHz, 1V/m, 2-2.7GHz, 1% Step, 80% AM, 1kHz sine, 3s dwell (6 sides) 230 VAC / 50 Hz. **NOTE: No unquoted work for the extra hour per Pat S.**		1.0	Pass	CL

Regular hours:	8.0
Overtime/Prem hours:	
Total hours:	

APPENDIX E

Laboratory Accreditations

Nemko Laboratory Authorization

Authorization: ELA 215

EMC Laboratory: **EMC Integrity, Inc.**
1736 Vista View Drive
Longmont, Colorado 80504
USA

Scope of Authorization: **All CENELEC standards [ENs] for EMC that are listed on the accompanying page, and all of the corresponding CISPR, IEC and ISO EMC standards that are listed on the accompanying page.**

Nemko has assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA -10. During the visit by the Nemko representative it was found that the Laboratory is capable of performing tests within the Scope of the Authorisation.

Accordingly, Nemko will normally accept test results from the laboratory on a partial or complete basis for certification of the products.

In order to maintain the Authorisation, the information given in the pertinent NLA-10 must be carefully followed. Nemko is to be promptly notified about any changes in the situation at the Laboratory, which may affect the basis for this Authorisation. The Authorisation may be withdrawn at any time if the conditions are no longer considered to be fulfilled.

The Authorisation is valid through June 30, 2015.

Dallas, Texas, USA.

For and on behalf of Nemko AS:

T.B. Ketterling,
Nemko ELA Co-ordinator
Region: North America

SCOPE OF AUTHORIZATION

Capability to perform a basic test implies also that any product (family) standard calling up this basic test is also within the scope if mentioned below or not.

Generic & Product –Family Standards		
EN 55011 :1998+A1 :1999 +A2 :2002 EN 55011:2007 +A2:2007 EN 55011:2009 +A1:2010 CISPR 11:1997 (Modified) + A1:1999 + A2:2002 CISPR 11 Ed. 4.1 CISPR 11 Ed 5.1 (2010-7)	EN55014:1997 +A1:2008 EN 55014-1:2006 +A1:2009 EN 55014-1:2000 + A1:2001 + A2:2002 CISPR 14-1:2000 + A1:2001 + A2:2002 CISPR 14-1:2005 +A1:2008 CISPR 14-1 Ed. 5.0	EN 55014-2:1997 + A1:2001 CISPR 14-2:1997 + A1:2001 +A2:2008 CISPR 14-2 Ed. 1.2
EN 55022: 1998+ A1:2000, +A2:2003 CISPR 22: 2003+ A1:2004 CISPR 22:2005 (Modified) EN55022:2006 CISPR 22 Ed. 5.2 CISPR 22 Ed. 6.0 (2008-09) EN 55022 +A1: 2007 EN 55022:2010	EN 55024: 1998 +A1:2001, +A2:2003 CISPR 24: 1997 +A1:2001, +A2:2002 CISPR 24 Ed. 1.0 EN 55024:2010	EN 61000-6-1 :2007 IEC 61000-6-1 Ed. 2.0 EN 61000-6-1: 2001
EN 61000-6-2:2005 IEC 61000-6-2 Ed. 2.0	EN 61000-6-3 :2007 IEC 61000-6-3 Ed. 2.0 EN 61000-6-3: 2001 + A1 :2004	IEC 61000-6-2 Ed. 2.0 EN 61000-6-2: 2005 IEC 61000-6-2: 2005 EN 61000-6-2: 2001
EN 61326:1997 +A1:1998 + A2:2001 +A3:2003 IEC 61326:1997 + A1:1998 + A2:2000 EN 61326-1 Ed. 1.0 EN 61326-1 :2013 IEC 61326-1 Ed. 2.0 (2012-07) IEC 61326:2006	EN 60601-1-2:2001 + A1:2006 IEC 60601-1-2:2001 EN 60601-1-2:2007 IEC 60601-1-2:2007 (Ed. 3.0)	EN 55103-1:1996 EN 55103-2 :1996 EN 55103-1:2005 EN 55103-2:2005
EN 300 386 V.1.3.1 EN 300 386 V.1.3.3 EN 300 386 V.1.4.1	EN 61000-3-3: 1995, +A1:2001 +A2:2005 IEC 61000-3-3: 1994, +A1:2001 +A2:2005 EN 61000-3-3:2008	EN 61000-3-2: 2000 +A2 :2005 IEC 61000-3-2: 2000 (Modified) +A1:2001 +A2:2004 EN 61000-3-2:2006
EN 50130-4: 1995 + A1:1998 + A2:2002 EN 50130-4:2011	ETSI EN 301 489-x ETSI EN 300 220-x	ETSI EN 300 339 Ed. 1

T.B. Ketterling, Nemko ELA Co-ordinator

2(3) NLA 3 ED3

Basic Standards		
EN 61000-4-2:1995, +A1:1998, +A2:2000 IEC 61000-4-2:1995, +A1:1998, +A2:2000 EN 61000-4-2 : 2009 EN 61000-4-2 :2008 (ed. 2) IEC 61000-4-2:2001 (ed. 1.2)	EN 61000-4-3:2002, +A1:2002 IEC 61000-4-3:2002, +A1:2002 EN 61000-4-3 :2006 +A1 :2006 +A2 :2006 IEC 61000-4-3 (Ed. 3.0) +A1 :2007 +A2 :2010	EN 61000-4-4:1995, +A1:2002, +A2:2002 IEC 61000-4-4:1995, +A1:2000, +A2:2001 EN 61000-4-4:2004 IEC 61000-4-4 Ed. 2.0 IEC 61000-4-4:2012
EN 61000-4-5:1995, +A1:2001 IEC 61000-4-5:1995, +A1:2000 EN 61000-4-5 :2006 IEC 61000-4-5 Ed. 2.0	EN 61000-4-6:1996, +A1:2001 IEC 61000-4-6:1996, +A1:2000 EN 61000-4-6 : 2009 IEC 61000-4-6 Ed. 2.2 IEC 61000-4-6 :2008	EN 61000-4-8:1994,+A1:2001 IEC 61000-4-8:1994, +A1:2001 IEC 61000-4-8 Ed. 1.1 IEC 61000-4-8 :2001 IEC 61000-4-8 :2009 EN 61000-4-8 :2010
EN 61000-4-11:2004 IEC 61000-4-11 Ed. 2.0 EN 61000-4-11:1994, +A1:2000 IEC 61000-4-11:1994, +A1:2000	BLANK	BLANK

TBKetterling T.B. Ketterling, Nemko ELA Co-ordinator

3(3) NLA 3 ED3

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200737-0

EMC Integrity, Inc.
Longmont, CO

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2014-07-01 through 2015-06-30
Effective dates

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2009-01-28)

NVLAP® National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

EMC Integrity, Inc.
1736 Vista View Drive
Longmont, CO 80504
Mr. Vincent W. Greb
Phone: 303-776-7249 Fax: 303-776-7314
E-Mail: vinceg@emcintegrity.com
URL: http://www.emcintegrity.com

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200737-0
Scope Revised: 2014-07-17

NVLAP Code	*Designation / Description*
Emissions Test Methods	
12/100063c	IEC 61000-6-3 (1996), EN 61000-6-3 (2001), A1 (2004): Electromagnetic Compatibility (EMC) - Part 6: Generic standards - Section 3: Emission standard for residential, commercial, and light-industrial environments.
12/610006m	EN 61000-6-4 (2007): Electromagnetic Compatibility (EMC) - Part 6-4: Generic Standards - Emission Standard for Industrial Environments
12/61326da	IEC 61326-1 Ed. 2.0 (2012): Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
12/CIS11f	AS/NZS CISPR 11 (2002): Industrial, scientific and medical (ISM) radio frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement
12/CIS11g	IEC/CISPR 11, Ed. 4.1 (2004-06): Industrial, scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurements
12/CIS11h	AS/NZS CISPR 11 (2004): Industrial, scientific and medical (ISM) radio frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement
12/CIS11i	IEC/CISPR 11, Ed. 4.1 (2004-06) + A1(2004): Industrial, scientific and medical (ISM) radio frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement

2014-07-01 through 2015-06-30
Effective dates

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NVLAP LAB CODE 200737-0
Scope Revised: 2014-07-17

NVLAP Code	*Designation / Description*
12/CIS11j	EN 55011 (1998) + A1(1999), A2(2002): Industrial, scientific and medical (ISM) radio frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement
12/CIS11k	IEC/CISPR 11 (2003), EN 55011 (1998), A2(2002): Limits and Methods of Measurement of Electromagnetic Disturbance Characteristics of Industrial, Scientific, and Medical Radio-Frequency Equipment
12/CIS11m2	EN 55011 (2009) + A1 (2010): Industrial, scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement
12/CIS11p	IEC/CISPR 11 Ed. 5 (2009-05): Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
12/CIS14b1	AS/NZS CISPR 14-1 (2003): Electromagnetic Compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission
12/CIS14x	IEC/CISPR 14-1, Ed. 4 (2003): Electromagnetic Compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission
12/CIS22	IEC/CISPR 22 (1997) & EN 55022 (1998) + A1(2000): Limits and methods of measurement of radio disturbance characteristics of information technology equipment
12/CIS22a	IEC/CISPR 22 (1993) and EN 55022 (1994): Limits and methods of measurement of radio disturbance characteristics of information technology equipment, Amendment 1 (1995) and Amendment 2 (1996)
12/CIS22a4	IEC/CISPR 22 (1993) & EN 55022 (1994)+A1(1995), A2(1997): Limits and methods of measurement of radio disturbance characteristics of information technology equipment
12/CIS22b	CNS 13438 (1997): Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment
12/CIS22c	IEC/CISPR 22, Fourth Edition (2003-04) & EN 55022 (1998): Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement

2014-07-01 through 2015-06-30
Effective dates

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NVLAP Code	*Designation / Description*
12/CIS22c1	IEC/CISPR 22, Edition 5 (2005) and EN 55022 (1998): Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
12/CIS22c3	IEC/CISPR 22, Edition 5 (2005) + A1(2005): Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
12/CIS22c4	EN 55022 (1998) + A1(2000) + A2(2003): Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
12/CIS22f	CNS 13438 (2006) (up to 6GHz): LImits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment
12/CIS22i	IEC/CISPR 22, Edition 5.2 (2006-03): Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment
12/CIS22j	EN 55022 (2006): Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
12/CIS22j1	EN 55022 (2006) + A1 (2007): Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
12/CIS22j2	EN 55022:2010: Information technology equipment. Radio disturbance characteristics. Limits and methods of measurement
12/CIS22k	IEC/CISPR 22 (2008-09): Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment
12/EM02d	IEC 61000-3-2, Edition 2.2 (2004-11): Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current <= 16 A per phase)
12/EM02k	GB 17625.1 (2003): Electromagnetic compatibility (EMC) - Part 3: Limits - Section 2. Limits for harmonic current emissions (equipment input current <= 16A per phase)
12/EM03b	IEC 61000-3-3, Edition 1.1(2002-03) & EN 61000-3-3, A1(2001): EMC - Part 3-3: Limits - Limitations of voltage changes, voltage flucuations and flicker, in public low-voltage supply-systems, for equipment with rated current <=16 A per phase and not subject to conditional connections

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NVLAP LAB CODE 200737-0
Scope Revised: 2014-07-17

NVLAP Code	*Designation / Description*
12/EM03g	IEC 61000-3-3, Edition 1.1 (2003) +A2 (2005): EMC Part 3-3: Limits - Limitations of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connections
12/EM12c	IEC 61000-3-12 Ed. 2.0 (2011): Electromagnetic compatibility (EMC) - Part 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and = 75 A per phase
12/EM12d	EN 61000-3-12 (2011): Electromagnetic Compatibility (EMC) - PART 3-12: Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current greater than 16A and less than or equal to 75A
12/F18	FCC OST/MP-5 (1986): FCC Methods of Measurement of Radio Noise Emissions for ISM Equipment (cited in FCC Method 47 CFR Part 18 - Industrial, Scientific, and Medical Equipment)
12/FCC15b	ANSI C63.4 (2003) with FCC Method 47 CFR Part 15, Subpart B: Unintentional Radiators
12/FCC15bb	ANSI C63.4 (2009) with FCC Method 47 CFR Part 15, Subpart B: Unintentional Radiators
12/KN11d1	KN11 (Annex 3) with RRA Announce 2008-11 (Dec. 16, 2008): Conformity Assessment Procedure for Electromagnetic Interference; With KN 11 (Annex 3)
12/KN16	Korea RRA Notice No. 2008-11 (Dec. 16, 2008): Conformity Assessment Procedures for Electromagnetic Interference using KN 16-1-1, KN 16-1-2, KN 16-1-3, KN 16-1-4, KN 16-1-5, KN 16-2-1, KN 16-2-2, KN 16-2-3, KN 16-2-4 (2008-05)
12/KN22	KN22 with RRL Notice No. 2005-82 (Sept. 29, 2005): RRL Notice No. 2005-82: Technical Requirements for Electromagnetic Interference Annex 8 (KN-22), RRL Notice No. 2005-131: Conformity Assessment Procedures for Electromagnetic Interference
12/KN22e	KN22 (2008-5) with RRL Notice No. 2008-3 (May 20, 2008): Conformity Assessment Procedure for Electromagnetic Interference; With KN 22
12/KN22f	KN22 (Annex 5) with RRA Announce 2010-5 (Dec 24, 2010): Conformity Assessment Procedure for Electromagnetic Interference; With KN 22 (Annex 5)

2014-07-01 through 2015-06-30
Effective dates

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ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200737-0
Scope Revised: 2014-07-17

NVLAP Code	*Designation / Description*
12/RRA04a	RRA 2014-8 and RRA 2014-37 (June 23, 2014): Technical Requirements and Test Methods for Electromagnetic Interference; K only (See specific Annexes listed on scope)
12/RRA105	RRA Announce 2010-5, K only (December 24, 2010): Conformity Assessment Procedure for Electromagnetic Interference (K only)
12/RRA1118	RRA Public Notification 2011-18, K only (July 5, 2011): Technical Requirements for Electromagnetic Interference (K only)
12/T51	AS/NZS CISPR 22 (2002) and AS/NZS 3548 (1997): Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment
12/T51b1	AS/NZS CISPR 22 (2009): Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
12/TCVNa	TCVN 7189:2009 (CISPR 22:2006): Information Technology Equipment-Radio disturbance characteristics - Limits and methods of measurement
12/VCCIe	Agreement of VCCI V-3 (2009.04): Agreement of Voluntary Control Council for Interference by Information Technology Equipment - Technical Requirements: V-3/2009.04 (radiated disturbance above 1 GHz)
12/VCCIg	Agreement of VCCI V-3 (2011.04): Agreement of VCCI Council - Technical Requirements: V-3/2011.04 (including radiated disturbance above 1 GHz)
12/VCCIi	Agreement of VCCI V-3 (2013.04): Agreement of VCCI Council - Technical Requirements: V-3/2013.04 (including radiated disturbance above 1 GHz)

Immunity Test Methods

12/610006h	IEC 61000-6-1, 2nd edition (2005-03): Electromagnetic compatibility (EMC) - Part 6: Generic standards - Section 1: Immunity for residential, commercial and light-industrial environments
12/610006i	IEC 61000-6-2, Edition 2.0 (2005-01): Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

2014-07-01 through 2015-06-30
Effective dates

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ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200737-0
Scope Revised: 2014-07-17

NVLAP Code	*Designation / Description*
12/61326aa	EN 61326-1:2013: Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
12/CIS24g	CISPR 24 ed2.0 (2010-08): Information technology equipment - Immunity characteristics - Limits and methods of measurement
12/CIS24h	EN 55024 (2010): Information technology equipment. Immunity characteristics. Limits and methods of measurement
12/I01b	IEC 61000-4-2 (2001); EN 61000-4-2 (2001), A2 (2001): Electrostatic Discharge Immunity Test
12/I01c	EN 61000-4-2 +A1(1998) +A2(2001): Electrostatic Discharge Immunity Test
12/I01d	IEC 61000-4-2, Ed. 2.0 (2008-12): Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test
12/I01f	EN 61000-4-2 (2009-05): Electromagnetic compatibility (EMC) - Part 4-2 : Testing and measurement techniques - Electrostatic discharge immunity test
12/I02b	IEC/EN 61000-4-3, Ed. 2.1 (2002), A1 (2002); EN 61000-4-3: Radiated, radio-frequency, electromagnetic field immunity test
12/I02c	IEC 61000-4-3 (1995), A1(1998), A2(2000): Radiated, radio-frequency, electromagnetic field immunity test
12/I02f	EN 61000-4-3 (2002) + A1(2002): Radiated, radio-frequency, electromagnetic field immunity test
12/I02ggg	IEC 61000-4-3, Ed. 3.0 (2006-02) + A1 (2007) + A2 (2010): Electromagnetic compatibility (EMC) - Part 4-3: Testing measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test
12/I02hhh	EN 61000-4-3 (2006) +A1 (2008) + A2 (2010): Electromagnetic compatibility (EMC). Testing and measurement techniques. Radiated, radio- Frequency, electromagnetic field immunity test

2014-07-01 through 2015-06-30
Effective dates

For the National Institute of Standards and Technology

NVLAP® National Voluntary Laboratory Accreditation Program

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200737-0
Scope Revised: 2014-07-17

NVLAP Code	*Designation / Description*
12/I03c	IEC 61000-4-4, Ed. 2.0 (2004-07): Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test
12/I03e	EN 61000-4-4 (2004): Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test
12/I04aa	IEC 61000-4-5, Ed. 2.0 (2005-11); EN 61000-4-5: Electromagnetic Compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test
12/I04b	IEC 61000-4-5 (2001), A1(2000); EN 61000-4-5(2001), A1(2000): Surge Immunity Test
12/I04d	BS EN 61000-4-5 (2006): Electromagnetic compatibility (EMC). Testing and measurement techniques. Surge immunity test
12/I05d	IEC 61000-4-6, Ed. 2.1 (2004); EN 61000-4-6: Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
12/I05e	EN 61000-4-6 (1996) + A1 (2001): Immunity to Conducted Disturbances, Induced by Radio Frequency Fields
12/I05f1	IEC 61000-4-6 Ed. 3.0 (2008): Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
12/I05j	EN 61000-4-6 (2009): Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
12/I06b	IEC 61000-4-8 (2001), A1(2000); EN 61000-4-8 (2001),A1(2000): Power Frequency Magnetic Field Immunity Test
12/I06c	EN 61000-4-8 (1993) + A1 (2001): Power Frequency Magnetic Field Immunity Test
12/I06e	IEC 61000-4-8 (2009): Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test

2014-07-01 through 2015-06-30
Effective dates

For the National Institute of Standards and Technology

NVLAP® National Voluntary Laboratory Accreditation Program

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200737-0
Scope Revised: 2014-07-17

NVLAP Code	*Designation / Description*
12/I06f	EN 61000-4-8:2010: Electromagnetic compatibility (EMC). Testing and measurement techniques. Power frequency magnetic field immunity test
12/I07c	IEC 61000-4-11, Ed. 2 (2004-03) & EN 61000-4-11: Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests
12/I07e	EN 61000-4-11 (1994), A1 (2001): Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests
12/I07f	EN 61000-4-11 (2004): Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests
12/KN11a	KN 61000-4-11 with RRL Notice No. 2005-130 (Dec 27, 2005): Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests
12/KN11f	KN 61000-4-11 (2008-5); RRL Notice No. 2008-4 (May 20, 2008): Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests
12/KN11h	KN 61000-4-11 (Annex 1-7) RRA Announce 2010-6 (Dec.24, 2010): Conformity Assessment Procedure for EMS (Voltage Dips, Short Interruptions and Voltage Variations Immunity tests)
12/KN24	KN24 (December 2005) with RRL Notice No. 2005-83: Information Technology Equipment - immunity charateristics - limits and methods of measurements
12/KN24d	KN 24 (2008-5) with RRL Notice No. 2008-4 (May 20, 2008): Information Technology Equipment - immunity charateristics - limits and methods of measurements
12/KN24e	KN 24 (Annex 5) with RRA Announce 2010-6 (Dec. 24, 2010): Conformity Assessment Procedure for EMS (Information technology equipment - Immunity characteristics - Limits and methods of measurement)
12/KN2a	KN 61000-4-2 with RRL Notice No. 2005-130 (Dec. 27, 2005): Electrostatic Discharge Immunity Test

2014-07-01 through 2015-06-30
Effective dates

For the National Institute of Standards and Technology

Page 8 of 11

NVLAP-01S (REV. 2005-05-19)

NVLAP® National Voluntary Laboratory Accreditation Program

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200737-0
Scope Revised: 2014-07-17

NVLAP Code	*Designation / Description*
12/KN2c	KN 61000-4-2 (2008-5); RRL Notice No. 2008-4 (May 20, 2008): Electrostatic Discharge Immunity Test
12/KN2e	KN 61000-4-2 (Annex 1-1) RRA Announce 2010-6 (Dec. 24, 2010): Conformity Assessment Procedure for EMS (Electrostatic Discharge Immunity Test)
12/KN3a	KN 61000-4-3 with RRL Notice No. 2005-130 (Dec. 27, 2005): Radiated, radio-frequency, electromagnetic field immunity test
12/KN3c	KN 61000-4-3 (2008-5); RRL Notice No. 2008-4 (May 20, 2008): Radiated, radio-frequency, electromagnetic field immunity test
12/KN3e	KN 61000-4-3 (Annex 1-2) RRA Announce 2010-6 (Dec. 24, 2010): Radiated, radio-frequency, electromagnetic field immunity test
12/KN4a	KN 61000-4-4 with RRL Notice No. 2005-130 (Dec. 27, 2005): Electromagnetic compatibility (EMC): Testing and measurement techniques - Electrical Fast Transient/Burst Immun
12/KN4c	KN 61000-4-4 (2008-5); RRL Notice No. 2008-5 (May 20, 2008): Electromagnetic compatibility (EMC): Testing and measurement techniques - Electrical Fast Transient/Burst Immunity Test
12/KN4e	KN 61000-4-4 (Annex 1-3) RRA Announce 2010-6 (Dec. 24, 2010): Electromagnetic compatibility (EMC): Testing and measurement techniques - Electrical Fast Transient/Burst Immunity Test
12/KN5a	KN 61000-4-5 with RRL Notice No. 2005-130 (Dec. 27, 2005): Surge Immunity Test
12/KN5c	KN 61000-4-5 (2008-5); RRL Notice No. 2008-4 (May 20, 2008): Surge Immunity Test
12/KN5e	KN 61000-4-5 (Annex 1-4) RRA Announce 2010-6 (Dec. 24, 2010): Conformity Assessment Procedure for EMS (Surge Immunity Test)
12/KN6a	KN 61000-4-6 with RRL Notice No. 2005-130 (Dec. 27, 2005): Electromagnetic compatibility (EMC): Testing and measurement techniques - Immunity to conducted disturbances,

2014-07-01 through 2015-06-30
Effective dates

For the National Institute of Standards and Technology

NVLAP® National Voluntary Laboratory Accreditation Program

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200737-0
Scope Revised: 2014-07-17

NVLAP Code	*Designation / Description*
12/KN6c	KN 61000-4-6 (2008-5); RRL Notice No. 2008-4 (May 20, 2008): Electromagnetic compatibility (EMC): Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
12/KN6e	KN 61000-4-6 (Annex 1-5) RRA Announce 2010-6 (Dec. 24, 2010): Electromagnetic compatibility (EMC): Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
12/KN8a	KN 61000-4-8 with RRL Notice No. 2005-130 (Dec. 27, 2005): Power Frequency Magnetic Field Immunity Test
12/KN8c	KN 61000-4-8 (2008-5); RRL Notice No. 2008-4 (May 20, 2008): Power Frequency Magnetic Field Immunity Test
12/KN8e	KN 61000-4-8 (Annex 1-6) RRA Announce 2010-6 (Dec. 24, 2010): Conformity Assessment Procedure for EMS (Power Frequency Magnetic Field Immunity Test)
12/RRA04b	RRA 2014-09 and RRA 2014-38 (June 23, 2014) K only: Technical Requirements and Test Methods for Electromagnetic Susceptibility; Korean only (See specific annexes listed on scope)
12/RRA106	RRA Public Notification 2010-6, December 24, 2010 (K only): Conformity Assessment Procdure for Electromagneitc Susceptibility (K only)
12/RRA1117	RRA Public Notification 2011-17, K only (July 5, 2011): Technical Requirements for Electromagnetic Susceptibility, K only

Product Safety Test Methods

12/60601ab	IEC 60601-1-2, Ed. 3.0 (2007): Medical electrical equipment - Part 1-2: General requirements for safety - Collateral standard: Electromagnetic compatibility - Requirements and tests
12/60601ac	KN 60601-1-2 (2008-5); RRL Notice No. 2008-4 (May 20, 2008): Medical electrical equipment - Part 1-2: general requirements for safety - collateral standard: electromagnetic compatibility - requirements and tests

2014-07-01 through 2015-06-30
Effective dates

For the National Institute of Standards and Technology

NVLAP® National Voluntary Laboratory Accreditation Program

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200737-0
Scope Revised: 2014-07-17

NVLAP Code	*Designation / Description*
12/60601h1	EN 60601-1-2 (2007): Medical electrical equipment - Part 1-2: General requirements for safety - Collateral standard: EMC - Requirements and tests
MIL-STD-462 : Conducted Emissions	
12/A20	MIL-STD-461 Version F Method CE102
12/A21	MIL-STD-461 Version F Method CE106
MIL-STD-462 : Radiated Emissions	
12/D11	MIL-STD-461 Version F Method RE102
12/D12	MIL-STD-461 Version F Method RE103
MIL-STD-462 : Radiated Susceptibility	
12/E16	MIL-STD-461 Version F Method RS103

2014-07-01 through 2015-06-30
Effective dates

For the National Institute of Standards and Technology

Page 11 of 11

NVLAP-01S (REV. 2005-05-19)

End of Report