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

Test Report Number:	**ETRA80804, Rev. D**
Reference Standard:	**CFR Title 47, FCC Part 15, Subpart C, Section 15.249**
Date of Test:	**23 January 2010**
Date of Report:	**1 February 2010**
Model Number:	**Propane Monitor**
Serial Number:	**15699**
Manufacturer's FRN:	**0018637629**
FCC ID#:	**NHITRAN2**
Manufacturer:	**Remote Sensing Systems**
Representative:	**Roger Steele**
Report Type:	**Formal Compliance**
Test Result:	**Compliant**

Approved By: Vincent W. Gut

NVLAP LAB CODE 200737-0

Nemko ELA No. 215

FCC	BSMI	VCCI	MIC
319793 & 610588	SL2-IN-E-1134R	C-2697 R-2462	US0168

Prepared for:

Remote Sensing Systems
15285 Rockview Drive
Colorado Springs, Colorado 80921
Phone: (719) 488-1528
Fax: (719) 488-0412

Customer Representative:

Roger Steele
President

Tested at:

EMC Integrity, Inc.
1736 Vista View Drive
Longmont, Colorado 80504

Tested by:

Kevin Johnson
EMC Test Engineer

Report Prepared by:

Mary Burback
Office Manager

Report Approved by:

Vincent Greb
Quality Manager

Revision	Description of Revision	Date:
Rev. -	Initial Release	29 June 2009
Rev. A	Revised, per Nemko comments	20 July 2009
Rev. B	Revised, per Nemko comments	22 September 2009
Rev. C	Revised with new FCC ID for product	30 September 2009
Rev. D	Complete retest with updated sample	1 February 2010

TABLE OF CONTENTS

Section #

Overview 1.0

Equipment Under Test 2.0

Test Conditions 3.0

Observations 4.0

Description of Test Methods 5.0

Representative Test Setup Photographs 6.0

Statement of Measurement Uncertainty 7.0

LIST OF APPENDICES

Radiated Emissions, Part 15.249(a) ..... APPENDIX A

Field Strength, Fundamental & Harmonics, Part 15.249(a) ..... APPENDIX B

20 dB Bandwidth, Part 15.215(c) ..... APPENDIX C

Band-Edge, Part 15.249(d) ..... APPENDIX D

Laboratory Accreditations ..... APPENDIX E

1.0 OVERVIEW

1.1 Purpose of Test

The purpose of this testing was to demonstrate that this product complies with the limits defined by FCC 15.249 for intentional radiators and can therefore, be sold as a product under the FCC ID# NHITRAN2.

1.2 Test Results

These tests were conducted on a sample of the equipment for the purpose of demonstrating continued compliance with Part 15; Subpart C. Radiated tests were conducted is accordance with FCC Part 2, FCC Part 15, and ANSI C63.4-2003. Radiated emissions are made in a 10-meter chamber which has been accredited by both NVLAP and Nemko.

The equipment under test complied with all testing performed, demonstrating continued compliance with FCC Part 15, Subpart C for intentional radiators. A summary of test results is shown in Table 1-1.

Table 1-1

Test	Description	FCC Part	Appendix	Result
Radiated Emissions	Electric field emissions, 30 MHz to 10 GHz, EUT in Tx mode (See Notes 1, 3, and 4)	15.249(a)	A	Compliant
Field Strength, Fundament & Harmonics	Fundamental field strength (Peak and QP) (See Note 1) and harmonic field strength (Peak and Ave) measured (See Notes 1 and 2)	15.249(a)	B	Compliant
20 dB Bandwidth	Radiated measurement on unit to confirm 20 dB bandwidth (See Notes 3 and 4)	15.215(c)	C	Compliant
Band-Edge	Radiated measurement on unit to verify transmitter does not violate band-edge requirement (See Notes 2 and 3)	15.249(d)	D	Compliant

Note 1. All radiated emissions were performed at a distance of 10 meters; therefore, the limits were corrected in accordance with FCC Part 15.31(f)(1). The limit correction from 3 to 10 meters is as follows: $20 \log_{10} (3/10) = -10.5$ dB. Thus, the limit at a 10 meter spacing is reduced 10.5 dB from the limit at a 3 meter spacing.

Note 2. As the unit only pulsed once every two seconds, with a pulse duration of less than 100 msec, the pulse width correction of FCC 15.35(c) was applied for average measurements. The measured pulse duration was 31.6 msec over a 100 msec window, which equates to a 31.6% duty cycle. The limit relaxation is calculated as follows: $20 \log_{10} (31.6/100) = -10$ dB.

Note 3. Unit operates as a transmitter only.

Note 4. Although measurements were performed for both low and high band-edge, it should be noted that the high band-edge measurement showed only noise floor due to the fact that this product only operates at a single frequency: 903.8 MHz.

2.0 EQUIPMENT UNDER TEST (EUT)

2.1 Product Identification

The product tested was the Propane Monitor. The details of the components which comprised the EUT are listed in Table 2-1.

Table 2-1

Component
Printed circuit board
Antenna
Plastic Housing

In addition, an external battery was used to simulate the solar cell which powers this device. It is important to note that in actual use, the product does not have a battery, but is powered directly from the solar cell. However, for the purposes of this testing, a ***new battery*** was used.

2.2 Samples Submitted for Assessment

A single sample was submitted for assessment. The components of this sample are shown in Table 2-1.

2.3 Sample Description

The unit under test consisted of a printed circuit board and solar cell that is house within a plastic injection molded enclosure. The enclosure is totally encapsulated with a potting compound. This unit is mounted to the side of a liquid propane tank. It senses the amount of liquid propane in the tank and transmits that information to a base station

2.4 Theory of Operation

The Propane Monitor is a solar-powered transmitter assembly designed for transmitting the amount of propane in the tank, to which it is affixed, to a base station. Under solar power, every five minutes the unit wakes from the sleep mode, takes a reading and transmits the fluid level data to a receiver unit. The unit operates at a single frequency (903.8 MHz) in the 902-928 MHz band.

The unit is housed in a waterproof enclosure and is powered from a solar array. The antenna used is a short stub antenna which is connector on the transmitter board.

2.5 Technical Specfications of EUT

Frequency:	903.8 MHz
FCC compliance:	Part 15.249 (unlicensed)
Temperature:	-40°F to 149°F (-40°C to +65°C)
Humidity:	0% to 100%
Power:	Solar Powered 3 Vdc @ 12 µA
Dimensions:	1.8” wide x 4.2” tall x .8” deep 45.7 x 106.7 x 20.3 mm
Weight:	0.125 lb (0.05 kg)

3.0 TEST CONDITIONS

3.1 Specifications

This apparatus was assessed against the following specifications:

CFR Title 47, FCC Part 15, Subpart C, Section 15.249 for operation of digitally modulated transmitters in the 902-928 MHz range.

3.2 Deviations from Laboratory Test Procedures

None.

3.3 Test Environment

Temperature:	21 degrees Celsius (=/- 2 degrees)
Relative Humidity:	29% (+/-3%)
Barometric Pressure:	837 mbars (+/-5%)
Voltage:	3 Vdc (from battery – to simulate solar array)

3.4 Test Equipment

The test equipment used for each test is given as the last page of the test data sheet. All test data is contained in the appropriate appendix of this report.

4.0 OBSERVATIONS

4.1 Modifications Performed During Assessment

None.

4.2 Record of Technical Judgments

No technical judgments were made during the assessment.

4.3 EUT Parameters Affective Compliance

The user of the apparatus could not alter parameters that would affect compliance.

4.4 Test Deleted

No tests were deleted from this assessment.

4.5 Comments

There were no additional observations made during this assessment.

5.0 DESCRIPTION OF TEST METHODS

5.1 Radiated E-field Emissions

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 ANSI C63.4: 2003. For measurements from 30 MHz to 2 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.

For emission measurements above 1 GHz, the antenna is changed to a double-ridged horn equipped with a preamplifier and run directly into the spectrum analyzer. The QP adapter and RF preselector are not used above 1 GHz. A notch filter was used on the fundamental transmit frequency to ensure that it did not send the preamplifier into compression.

Pre-scanning a product from 1-10 GHz is performed similarly, except that 16 radials (every 22.5 degrees) and three antenna heights (1 m, 1.5 m and 2 m) are used. A similar maximization process is used as for the lower frequency range with two major exceptions. First, average measurements are performed, rather than QP measurements and second, a boresight fixture is installed to ensure the EUT is within the beamwidth of the horn antenna.

5.2 20 dB Bandwidth

As direct connection to the antenna port was not possible, the measurement was made as a radiated measurement.

The analyzer settings are shown on each plot and the EUT is configured to transmit at 903.8 MHz, which is the only frequency at which the device operates. The peak of the signal is identified using the "peak search" function and this amplitude is noted. The "delta marker" function is then used as Marker 1 is tuned to the 20 dB down point on the low side of the waveform and Marker 2 is tuned to the 20 dB down point on the high side of the waveform. The 20 dB bandwidth is simply the distance between these two markers, and this number is then compared against the requirement to determine compliance.

5.3 Band-Edge Measurement

As direct connection to the antenna port was not possible, the measurement was made as a radiated measurement.

The analyzer settings are shown on each plot and the EUT is configured to transmit at 903.8 MHz, which is the only frequency at which the device operates to determine whether or not the emissions at the boundary of the specific frequency band is within acceptable limits.

Band-edge measurements were taken for both low and high edges. Since the unit only operates near the lower end of the 902-928 MHz band, the high band-edge measurement showed only noise floor.

5.4 Fundamental and Harmonic Field Strength

For this measurement, the *fundamental* transmit frequency of the UUT was maximized and averaged, and then compared to the field strength limit as defined in 15.249. While the limit is given in terms of mV/m, the measurement was made in terms of dBuV/m. The conversion from mV/m to dBuV/m is as shown as follows.

- Fundamental Field Strength, as defined in FCC 15.249(a): 50 mV/m
- Convert "mV/m" to "uV/m": 50 mV/m x 1000 uV/mV = 50,000 uV/m
- Convert "uV/m" to "dBuV/m": dBuV/m = 20 log10 (50,000 uV/m/1 uV/m) = 94 dBuV/m

It should be noted that this limit is specified for an antenna spacing of 3 meters. As the measurement was taken at a 10-meter spacing, the limit must be further corrected (i.e. reduced) to account for the greater separation, as follows:

- Distance conversion (dB) = 20 log (10 m/3 m) = 10.5 dB
- 94 dBuV/m - 10.5 dB = 83.5 dBuV/m

Thus, the limit for the fundamental emission at 10 meters is 83.5 dBuV/m.

A similar conversion was made for the *harmonic* field strength measurements, which are specified in terms of microvolts/meter at a distance of 3 meters. The conversion from µV/m to dBuV/m is as shown as follows:

- Harmonic Field Strength, as defined in FCC 15.249(a): 500 µV/m
- Convert "µV/m" to "dBµV/m": dBµV/m = 20 log10 (500 µV/m/1 µV/m) = 54 dBuV/m
- Distance conversion (dB) = 20 log (10 m/3 m) = 10.5 dB
- 54 dBµV/m - 10.5 dB = 43.5 dBµV/m

Finally, the limit was relaxed based on the duty cycle stipulation given in FCC 15.35(c), as follows:

- Duty Cycle Relaxation: $20 \log_{10}$ (Pulse Duration/100 msec)
- Measured pulse duration of 31.6 msec (see Appendix B for data)
- Duty Cycle Calculation: $20 \log_{10}$ (31 msec/100 msec) = -10 dB

Thus, the duty cycle correction may be added to final peak and average measurements above 1 GHz.

6.0 REPRESENTATIVE TEST SETUP PHOTOGRAPHS

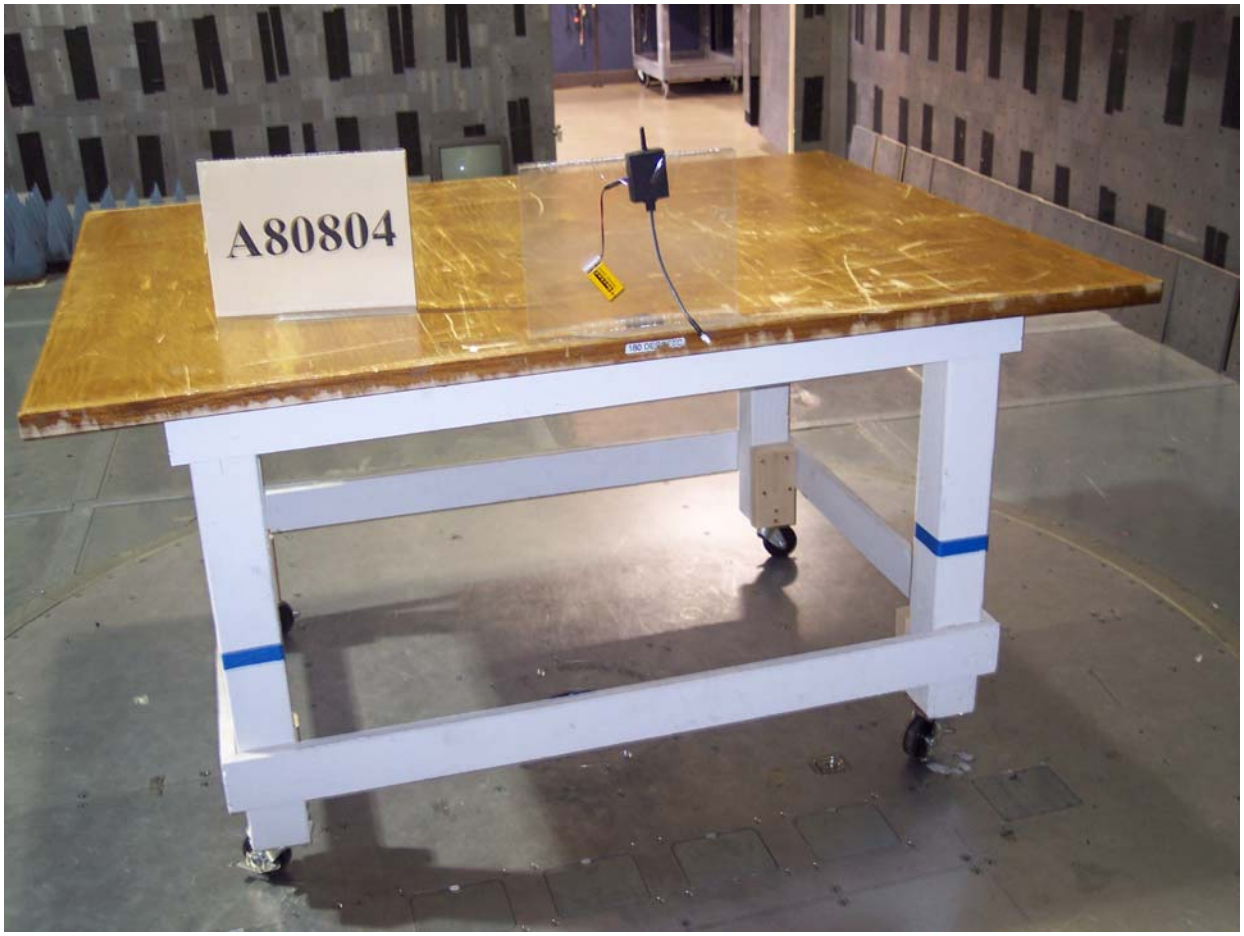

Figure 6-1. Representative Test Setup – All Measurements.

7.0 STATEMENT OF MEASUREMENT UNCERTAINTY

7.1 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 7-1

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

APPENDIX A

Radiated Emissions, Part 15.249(a)

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Radiated Emissions, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	15699
Standard Referenced:	FCC Part 15 Class B	Date:	Jan 23, 2010
Temperature:	21˚C Humidity: 29%	Pressure:	837mb
Input Voltage:	3 Vdc battery (simulating solar array)		
Configuration of Unit:	Transmit at 903.8 MHz		
Test Engineer:	Kevin Johnson		

A80432-22-RE.doc FR0100

Type	Frequency (MHz)	Level (dBuV)	Transducer (dB/m)	Gain / Loss (dB)	Final (dBuV/m)	Azm(deg)/Pol/Hgt(m)	FCC Part 15 Class B Limit (dBuV/m @ 10 m)	Margin to FCC Class B Limit
QP	30.845	26.1	20.6	-30.4	16.3	216/V-Pole/1.36	29.5	13.2
QP	72.333	34.5	8.2	-30.7	12.0	47/V-Pole/1.51	29.5	17.5
QP	114.449	26.6	13.5	-30.6	9.5	87/H-Pole/2.57	33	23.5
QP	126.989	26.4	14.0	-30.5	9.9	190/V-Pole/2.28	33	23.1
QP	178.895	25.5	11.4	-30.4	6.5	261/H-Pole/2.17	33	26.5
QP	200.242	33.0	13.0	-30.7	15.3	263/V-Pole/1.24	33	17.7
QP	289.322	28.5	13.3	-30.4	11.4	98/V-Pole/3.09	35.5	24.1
QP	523.912	26.6	18.2	-30.1	14.7	17/H-Pole/3.11	35.5	20.8

Note: The only measurable signals greater than 1 GHz were the harmonics of the fundamental transmit frequency. Peak and average measurements made on these signals may be foun in Appendix B of this report.

The highest emission measured was at **30.845,** which was **13.2 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
  - QP = Quasi-Peak Measurement
  - AV = Video Average Measurement
- The "Final" emissions level is attained by taking the "Level" and adding the "Transducer" factor and the "Gain/Loss" which includes both preamplifier and cables. **(Sample: 26.1 dBuV + 20.6 dB/m – 30.4 dB = 16.3 dBuV/m)**
- 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.
- 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.
- For making QP RE measurements, the bandwidth is 120 kHz and the QP detector is enabled.
- For making average RE measurements, the resolution bandwidth is 1 MHz and the video bandwidth is 10 Hz.

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Radiated Emissions, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	15699
Standard Referenced:	FCC Part 15 Class B	Date:	Jan 23, 2010

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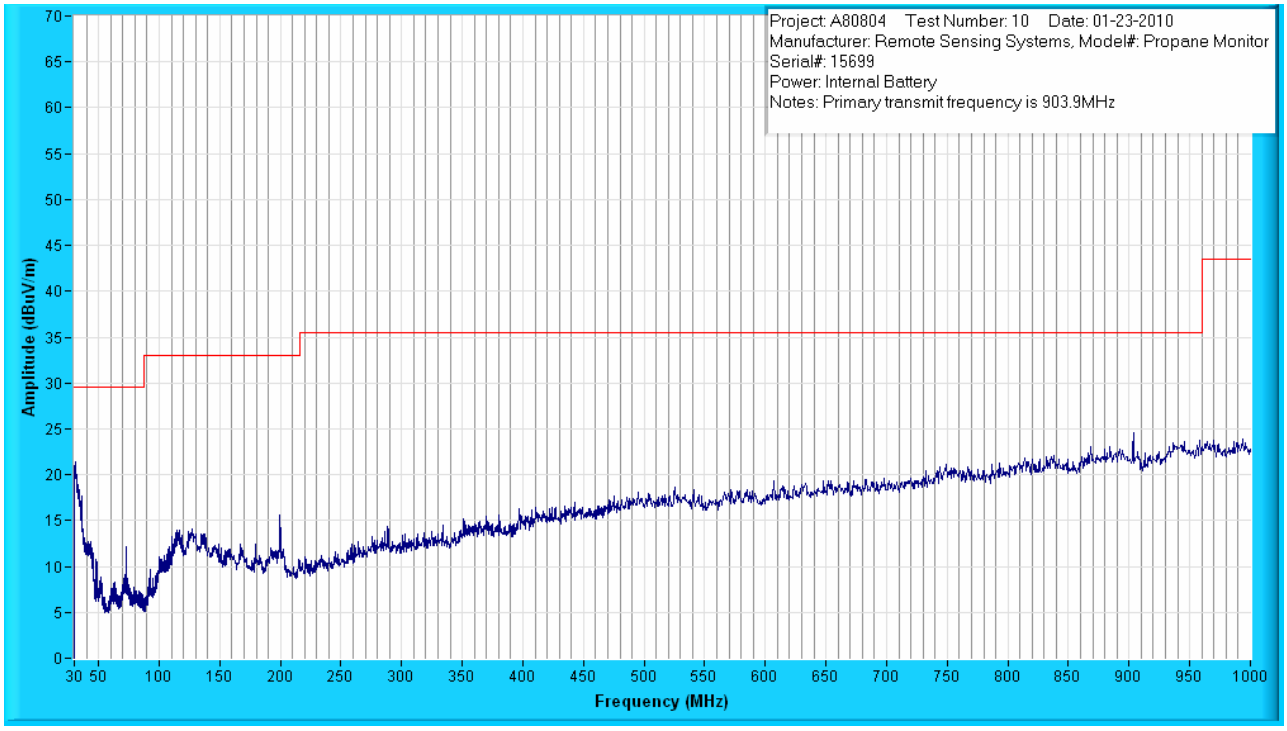

Figure A1: Radiated Emissions Prescan –30 MHz to 1 GHz @ 10 meter spacing Peak Measurement

(Note - all emissions "spikes" were examined. Those spikes which do not appear in the final table, with the exception of the 903.8 MHz transmitter, were spurious emissions which QPed or averaged down to the noise floor.)

Notes
For pre-scans from 30 MHz to 1 GHz, the settings are:
RBW is 120 kHz (set by the QP Adapter)
VBW is 3 MHz

For pre-scans >1 GHz, the settings are:
RBW is 1 MHz
VBW is 100 kHz

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Radiated Emissions, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	15699
Standard Referenced:	FCC Part 15 Class B	Date:	Jan 23, 2010

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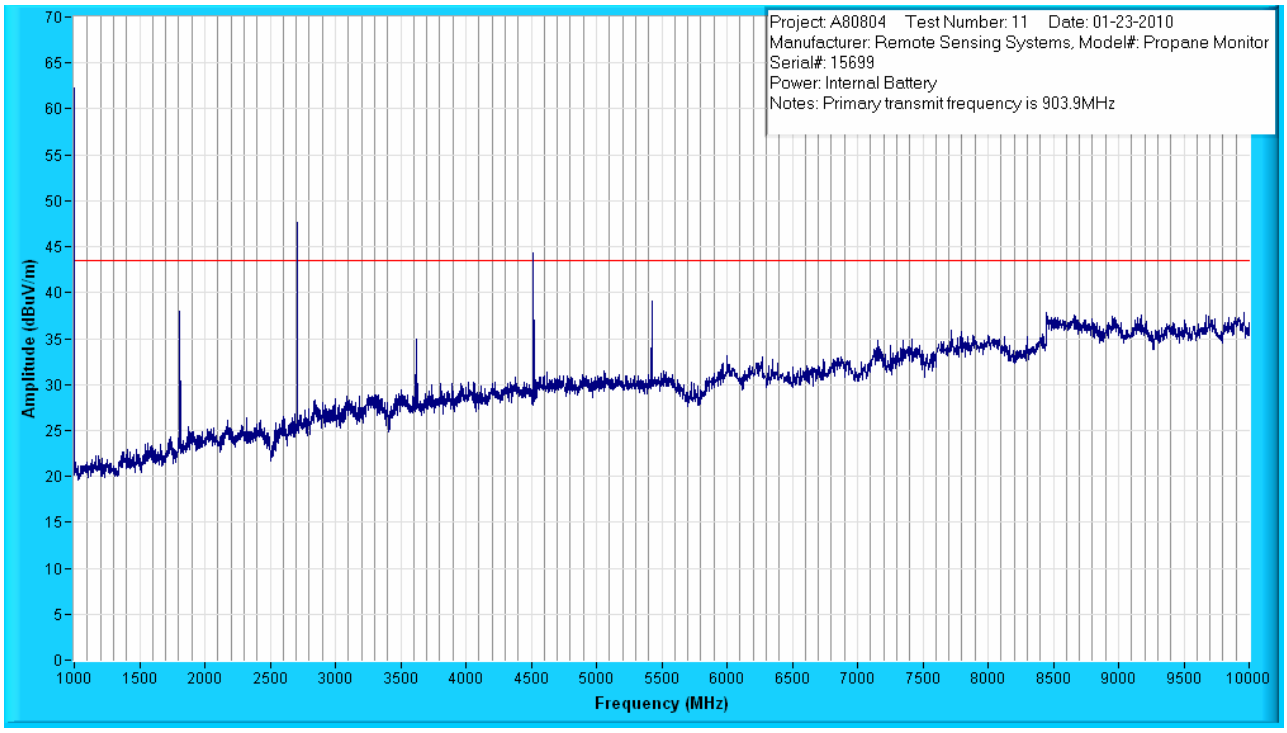

Figure A2: Radiated Emissions Prescan –1 – 10 GHz @ 10 meter spacing Peak Measurement

Notes
For pre-scans from 30 MHz to 1 GHz, the settings are:
RBW is 120 kHz (set by the QP Adapter)
VBW is 3 MHz

For pre-scans >1 GHz, the settings are:
RBW is 1 MHz
VBW is 100 kHz

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Radiated Emissions, CFR Title 47, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	15699
Standard Referenced:	FCC Part 15 Class B	Date:	Jan 23, 2010

A80432-22-RE.doc FR0100

Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1093	Hewlett Packard	85650A	2811A01231	Quasi-Peak Adapter	04/29/2009	04/29/2010
1046	Hewlett Packard	8566B	2430A00988	Spectrum Analyzer with 2403A08106	04/29/2009	04/29/2010
1045	Hewlett Packard	8566B	2403A08106	Spectrum Analyzer Display	04/29/2009	04/29/2010
1219	Mini-Circuits	ZKL-2	062905	Preamp, 10 - 2000 MHz, 30 dB	03/30/2009	03/30/2010
1229	Hewlett Packard	85685A	3010A01077	RF Preselector	06/11/2009	06/11/2010
1232	Sunol Sciences	JB1	A071605-2	Bilog Antenna, 30 MHz to 2.0 GHz	08/04/2009	08/04/2010
1196	EMCO	3115	00028256	DRG Horn 1-18 GHz	06/08/2009	06/08/2010
1276	Narda	DBL-0218N308	037-038	1GHz to 18GHz Preamplifier, 60dB gain nominal	04/24/2009	04/24/2010
1234	CIR Enterprises	10m Chamber	001	10m Radiated Emissions Semi-Anechoic Chamber	10/18/2009	10/18/2010

APPENDIX B

Field Strength, Fundamental & Harmonics, Part 15.249(a)

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Radiated Emissions, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	15699
Standard Referenced:	FCC Part 15 Class B	Date:	January 23, 2010
Temperature:	21˚C Humidity: 29%	Pressure:	837mb
Input Voltage:	3 Vdc battery (simulating solar array)		
Configuration of Unit:	Transmit at 903.8 MHz		
Test Engineer:	Kevin Johnson		

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Type	Frequency (MHz)	Level (dBuV)	Transducer (dB/m)	Gain / Loss (dB)	Final Value (dBuV/m)	Azm(deg)/ Pol/Hgt(m)	FCC Part 15.249 Limit in dBuV/m (Fundamental)	Margin to FCC 15.249 Limit
PK	903.862	87.9	22.5	-28.9	81.5	266/V-Pole/1.00	83.5	2.0
QP	903.862	79.7	22.5	-28.9	73.3	266/V-Pole/1.00	83.5	10.2

(Sample Calculation: 87.9 dBuV + 22.5 dB/m – 28.9 dB = 81.5 dBuV/m)
Peak measurement is 2.0 dB under QP limit.
QP measurement is 10.2 dB under QP limit.
Conclusion: Product complies with fundmental limits of 15.249(a).

Type	Frequency (MHz)	Level (dBuV)	Transducer (dB/m)	Gain / Loss (dB)	Duty Cycle Correction (dB)	Azm(deg)/Pol/Hgt(m)	FCC Part 15.249 Limit in dBuV/m (Fundamental)	Final Value (dBuV/m)
AV	1807.540	81.0	26.9	-67.2	-10	180/H-Pole/2.26	43.5	30.7
PK	1807.540	83.2	26.9	-67.2	-10	180/H-Pole/2.26	63.5	32.9
AV	2711.263	87.5	29.5	-67.8	-10	4/H-Pole/2.00	43.5	39.1
PK	2711.263	88.7	29.5	-67.8	-10	4/H-Pole/2.00	63.5	40.4
AV	3615.539	71.2	32.1	-64.9	-10	230/H-Pole/2.12	43.5	28.4
PK	3615.539	74.8	32.1	-64.9	-10	230/H-Pole/2.12	63.5	31.9
AV	4518.781	79.7	32.8	-64.5	-10	44/V-Pole/1.98	43.5	38.0
PK	4518.781	81.3	32.8	-64.5	-10	44/V-Pole/1.98	63.5	39.6
AV	5423.275	71.8	34.7	-63.1	-10	1/V-Pole/1.97	43.5	33.4
PK	5423.275	73.2	34.7	-63.1	-10	1/V-Pole/1.97	63.5	34.8

(Sample Calculation: 81.0 dBuV + 26.9 dB/m – 67.2 dB – 10 dB = 30.7 dBuV/m)
All PEAK measurements are under AVERAGE limit.
All AVERAGE measurements are under AVERAGE limit.
Conclusion: Product complies with harmonic limits of 15.249(a).

- "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
  - QP = Quasi-Peak Measurement
  - AV = Video Average Measurement
- The duty cycle correction factor (per FCC 15.35) was derived from information supplied by the client, stating that the pulse duration of their unit is no more than 34.5 msec over a 100 msec window. Thus, **$20 \log_{10} (31.6/100) = -10$ dB**.
- 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.
- The "Azm/Pol/Hgt" indicates the turn-table *azimuth*, the antenna *polarity*, and the antenna *height* where the maximum emissions level was measured.
- For making PEAK measurements, the RBW = 1 MHz and the VBW = 3 MHz.
- For making QP measurements, the bandwidth is 120 kHz and the QP detector is enabled.
- For making average measurements, the resolution bandwidth is 1 MHz and the video bandwidth is 10 Hz.

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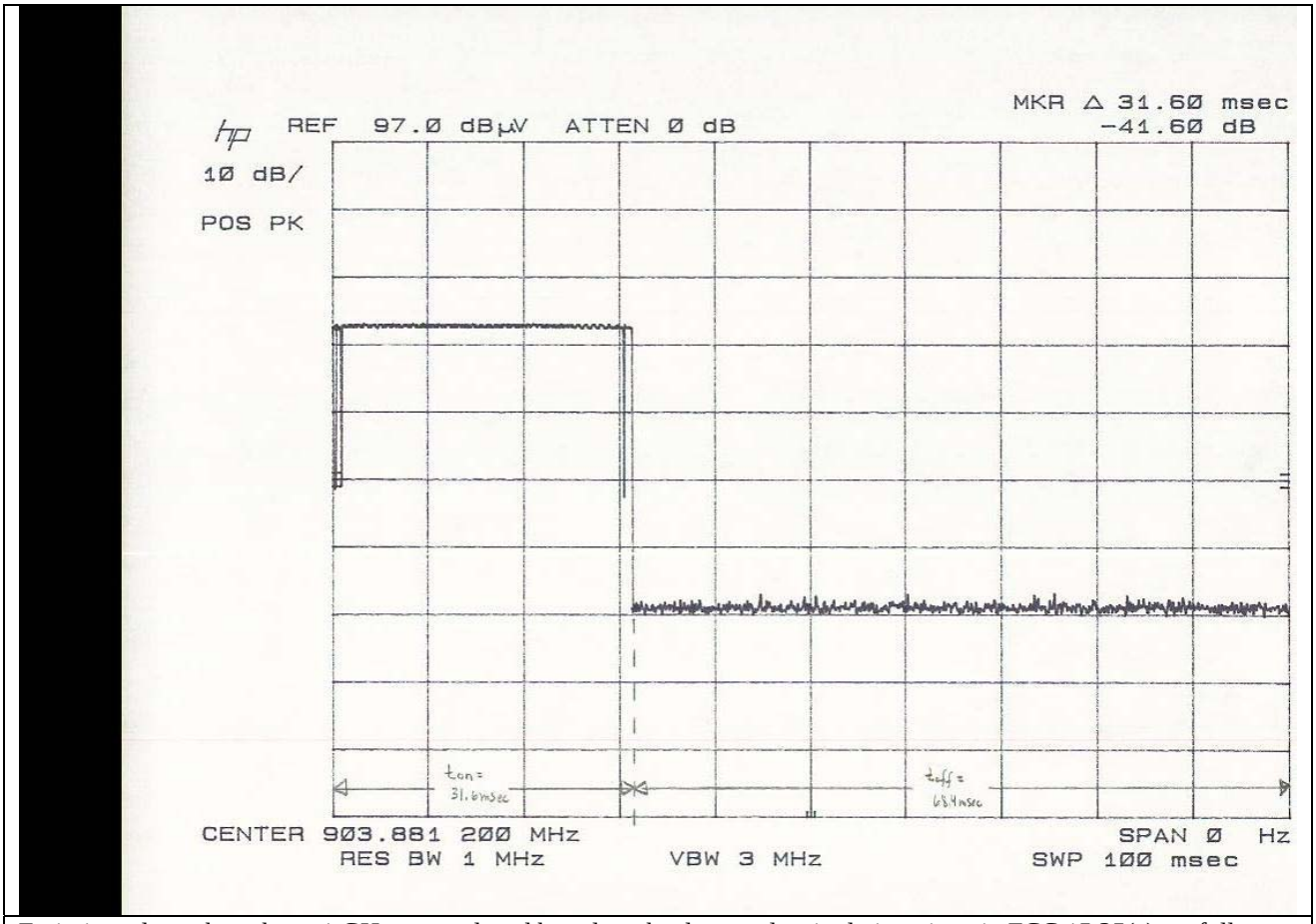
Radiated Emissions, CFR Title 47, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	15699
Standard Referenced:	FCC Part 15 Class B	Date:	January 23, 2010

A80432-22-RE.doc FR0100

Figure B1. Duty Cycle of Tranmitted Signal



Emissions data taken above 1 GHz was reduced based on the duty cycle stipulation given in FCC 15.35(c), as follows:

- Duty Cycle Relaxation: 20 $\log_{10}$ (Pulse Duration/100 msec)
- Measured pulse duration of 31.6 msec (see Appendix B for data)
- Duty Cycle Calculation: 20 $\log_{10}$ (31 msec/100 msec) = -10 dB

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Radiated Emissions, CFR Title 47, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	15699
Standard Referenced:	FCC Part 15 Class B	Date:	January 23, 2010

A80432-22-RE.doc FR0100

Test Equipment List

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1046	Hewlett Packard	8566B	2430A00988	Spectrum Analyzer with 2403A08106	04/29/2009	04/29/2010
1045	Hewlett Packard	8566B	2403A08106	Spectrum Analyzer Display	04/29/2009	04/29/2010
1219	Mini-Circuits	ZKL-2	062905	Preamp, 10 - 2000 MHz, 30 dB	03/30/2009	03/30/2010
1229	Hewlett Packard	85685A	3010A01077	RF Preselector	06/11/2009	06/11/2010
1232	Sunol Sciences	JB1	A071605-2	Bilog Antenna, 30 MHz to 2.0 GHz	08/04/2009	08/04/2010
1196	EMCO	3115	00028256	DRG Horn 1-18 GHz	06/08/2009	06/08/2010
1276	Narda	DBL-0218N308	037-038	1GHz to 18GHz Preamplifier, 60dB gain nominal	04/24/2009	04/24/2010
1234	CIR Enterprises	10m Chamber	001	10m Radiated Emissions Semi-Anechoic Chamber	10/18/2009	10/18/2010

APPENDIX C

20 dB Bandwidth

emc integrity incorporated

Radiated Emissions, CFR Title 47, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	Jan 23, 2010
Standard Referenced:	FCC Part 15 Class B	Date:	837mb
Temperature:	21˚C Humidity: 29%	Pressure:	837mb
Input Voltage:	3 Vdc battery (simulating solar array)		
Configuration of Unit:	Transmit at 903.8 MHz		
Test Engineer:	Kevin Johnson		

A80432-22-RE.doc FR0100

Frequency	20 dB Bandwidth Measurement
903.8 MHz	0.202 MHz

Conclusion: The maximum 20 dB bandwidth for this product is **0.202 MHz**.

emc integrity incorporated

Radiated Emissions, CFR Title 47, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	Jan 23, 2010
Standard Referenced:	FCC Part 15 Class B	Date:	837mb

A80432-22-RE.doc FR0100

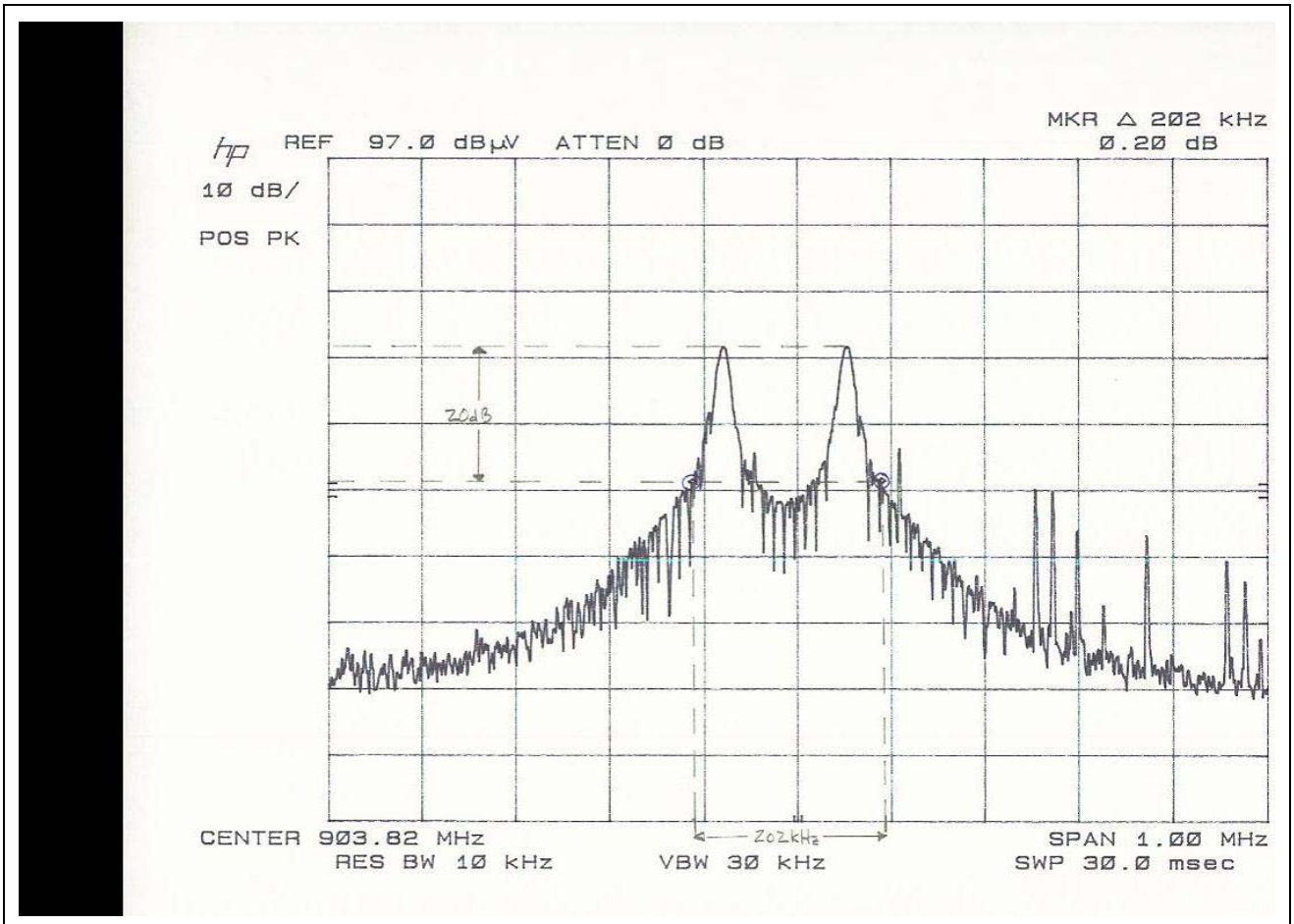

Figure C1. 20 dB Bandwidth Measurement.

emc integrity incorporated

Radiated Emissions, CFR Title 47, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	Jan 23, 2010
Standard Referenced:	FCC Part 15 Class B	Date:	837mb

A80432-22-RE.doc FR0100

Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1093	Hewlett Packard	85650A	2811A01231	Quasi-Peak Adapter	04/29/2009	04/29/2010
1046	Hewlett Packard	8566B	2430A00988	Spectrum Analyzer with 2403A08106	04/29/2009	04/29/2010
1045	Hewlett Packard	8566B	2403A08106	Spectrum Analyzer Display	04/29/2009	04/29/2010
1219	Mini-Circuits	ZKL-2	062905	Preamp, 10 - 2000 MHz, 30 dB	03/30/2009	03/30/2010
1229	Hewlett Packard	85685A	3010A01077	RF Preselector	06/11/2009	06/11/2010
1232	Sunol Sciences	JB1	A071605-2	Bilog Antenna, 30 MHz to 2.0 GHz	08/04/2009	08/04/2010
1196	EMCO	3115	00028256	DRG Horn 1-18 GHz	06/08/2009	06/08/2010
1276	Narda	DBL-0218N308	037-038	1GHz to 18GHz Preamplifier, 60dB gain nominal	04/24/2009	04/24/2010
1234	CIR Enterprises	10m Chamber	001	10m Radiated Emissions Semi-Anechoic Chamber	10/18/2009	10/18/2010

APPENDIX D

Band-edge

emc integrity incorporated

Radiated Emissions, CFR Title 47, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	Jan 23, 2010
Standard Referenced:	FCC Part 15 Class B	Date:	837mb
Temperature:	21˚C Humidity: 29%	Pressure:	837mb
Input Voltage:	3 Vdc battery (simulating solar array)		
Configuration of Unit:	Transmit at 903.8 MHz		
Test Engineer:	Kevin Johnson		

A80432-22-RE.doc FR0100

Frequency Range	Band-Edge Measurement
Low-band	**PEAK** amplitude at 902.0 MHz is **22.5 dBuV/m,** which is below the (adjusted) limit of 35.5 dBuV/m, as specified by FCC 15.209. Calculation of signal: 28.9 dBuV + 22.5 dB/m – 28.9 dB = 22.5 dBuV/m Calculation of Limit: Limit defined as 200 uV/m @ 3 meters by FCC 15.209 • **Convert "uV/m" to "dBuV/m": dBuV/m = 20 $\log_{10}$ (200 uV/m/1 uV/m) = 46 dBuV/m** • **Distance conversion (dB) = 20 log (10 m/3 m) = 10.5 dB** • **46 dBuV/m - 10.5 dB = 35.5 dBuV/m** For the peak measurement, RBW = 1 MHz and VBW = 3 MHz.
High-band	**PEAK** amplitude at 902.0 MHz is **21.5 dBuV/m,** which is below the (adjusted) limit of 35.5 dBuV/m, as specified by FCC 15.209. Calculation of signal: 28.2 dBuV + 21.9 dB/m – 28.6 dB = 21.5 dBuV/m Calculation of Limit: Limit defined as 200 uV/m @ 3 meters by FCC 15.209 • **Convert "uV/m" to "dBuV/m": dBuV/m = 20 $\log_{10}$ (200 uV/m/1 uV/m) = 46 dBuV/m** • **Distance conversion (dB) = 20 log (10 m/3 m) = 10.5 dB** • **46 dBuV/m - 10.5 dB = 35.5 dBuV/m** For the peak measurement, RBW = 1 MHz and VBW = 3 MHz.

Conclusion: Product complies with Band-Edge requirement of FCC Part 15.249(d), which states that **"Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated…to the general radiated emission limits in 15.209..."**

emc integrity incorporated

Radiated Emissions, CFR Title 47, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	Jan 23, 2010
Standard Referenced:	FCC Part 15 Class B	Date:	837mb

A80432-22-RE.doc FR0100

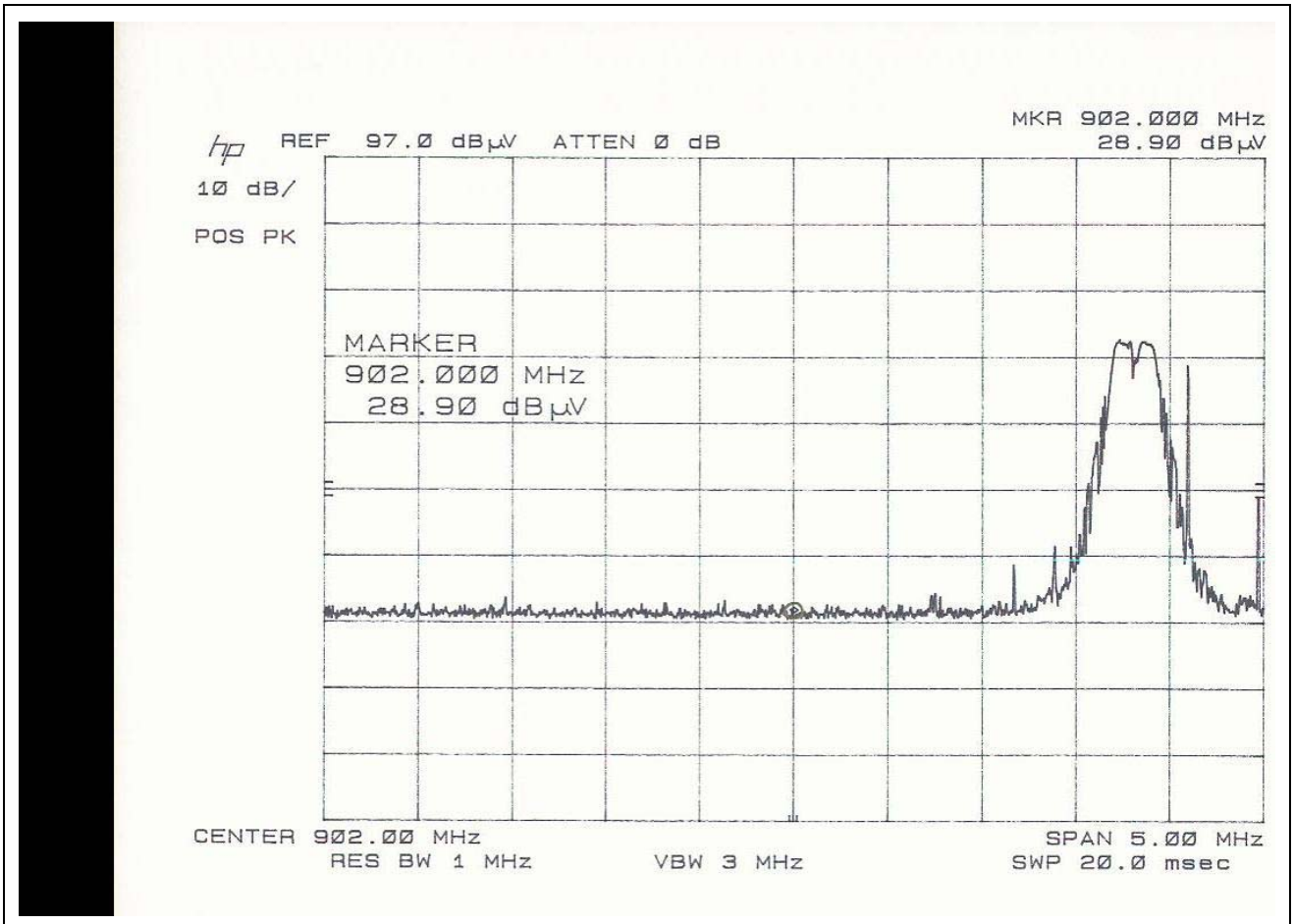

Figure D1. Band-Edge Measurement, Low-band.

emc integrity incorporated

Radiated Emissions, CFR Title 47, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	Jan 23, 2010
Standard Referenced:	FCC Part 15 Class B	Date:	837mb

A80432-22-RE.doc FR0100

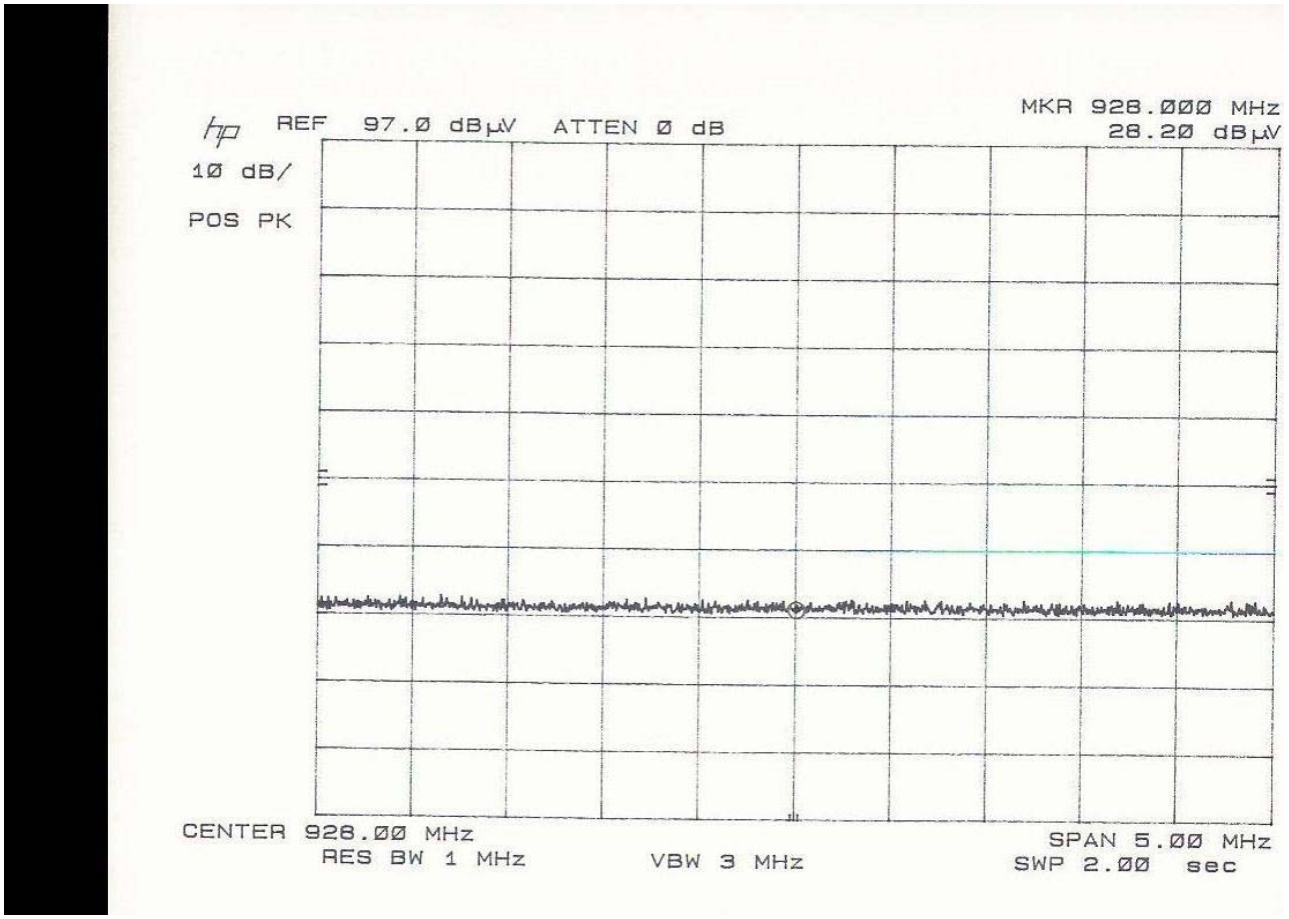

Figure D2. Band-Edge Measurement, High-band.

emc integrity incorporated

Radiated Emissions, CFR Title 47, FCC Part 15

Manufacturer:	Remote Sensing	Project Number:	A80804
Customer Representative:	Roger Steele	Test Area:	10m
Model:	Propane Monitor	S/N:	Jan 23, 2010
Standard Referenced:	FCC Part 15 Class B	Date:	837mb

A80432-22-RE.doc FR0100

Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1093	Hewlett Packard	85650A	2811A01231	Quasi-Peak Adapter	04/29/2009	04/29/2010
1046	Hewlett Packard	8566B	2430A00988	Spectrum Analyzer with 2403A08106	04/29/2009	04/29/2010
1045	Hewlett Packard	8566B	2403A08106	Spectrum Analyzer Display	04/29/2009	04/29/2010
1219	Mini-Circuits	ZKL-2	062905	Preamp, 10 - 2000 MHz, 30 dB	03/30/2009	03/30/2010
1229	Hewlett Packard	85685A	3010A01077	RF Preselector	06/11/2009	06/11/2010
1232	Sunol Sciences	JB1	A071605-2	Bilog Antenna, 30 MHz to 2.0 GHz	08/04/2009	08/04/2010
1196	EMCO	3115	00028256	DRG Horn 1-18 GHz	06/08/2009	06/08/2010
1276	Narda	DBL-0218N308	037-038	1GHz to 18GHz Preamplifier, 60dB gain nominal	04/24/2009	04/24/2010
1234	CIR Enterprises	10m Chamber	001	10m Radiated Emissions Semi-Anechoic Chamber	10/18/2009	10/18/2010

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 December 31, 2011.

Dallas, Texas, USA.

For and on behalf of Nemko AS:

T.B. Ketterling,

Nemko ELA Co-ordinator

Region: North America

Nemko

Nemko Laboratory Authorization

Authorization: ELA 215

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 CISPR 11:1997 (Modified) + A1:1999 + A2:2002 CISPR 11 Ed. 4.1	EN 55014-1:2006 EN 55014-1:2000 + A1:2001 + A2:2002 CISPR 14-1:2000 + A1:2001 + A2:2002 CISPR 14-1 Ed. 5.0	EN 55014-2:1997 + A1:2001 CISPR 14-2:1997 + A1:2001 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 EN 55022 +A1: 2007	EN 55024: 1998 +A1:2001, +A2:2003 CISPR 24: 1997 +A1:2001, +A2:2002 CISPR 24 Ed. 1.0	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 IEC 61326:2006	EN 60601-1-2:2001 + A1:2006 IEC 60601-1-2:2001 EN 60601-1-2:2006 IEC 60601-1-2 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	ETSI EN 301 489 V1.8.1	ETSI EN 300 339 Ed. 1
Basic Standards		
EN 61000-4-2:1995, +A1:1998, +A2:2000 IEC 61000-4-2:1995, +A1:1998, +A2:2000 IEC 61000-4-2 : 2009	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	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
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	EN 61000-4-8:1994,+A1:2001 IEC 61000-4-8:1994, +A1:2001 IEC 61000-4-8 Ed. 1.1
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

May 1, 2009

T.B. Ketterling, Nemko ELA Co-ordinator

2(2) NLA 3 ED3

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: 2010-01-15

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/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
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

2009-07-01 through 2010-06-30
Effective dates

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For the National Institute of Standards and Technology

Page 1 of 7

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

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ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200737-0
Scope Revised: 2010-01-15

NVLAP Code	*Designation / Description*
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/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
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

2009-07-01 through 2010-06-30
Effective dates

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Page 2 of 7

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

NVLAP® National Voluntary Laboratory Accreditation Program

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200737-0
Scope Revised: 2010-01-15

NVLAP Code	*Designation / Description*
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): LImits and Methods of Measurement of Radio Interference 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/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/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
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/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/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

2009-07-01 through 2010-06-30
Effective dates

Sally S. Bruce
For the National Institute of Standards and Technology

Page 3 of 7

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

NVLAP® National Voluntary Laboratory Accreditation Program

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

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Scope Revised: 2010-01-15

NVLAP Code	*Designation / Description*
12/T51	AS/NZS CISPR 22 (2002) and AS/NZS 3548 (1997): Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment
12/VCCIa	VCCI: Agreement of Voluntary Control Council for Interference by Information Technology Equipment - Technical Requirements: V-3/2005.04
12/VCCIb	Agreement of VCCI V-3 (2006.04): Agreement of Voluntary Control Council for Interference by Information Technology Equipment - Technical Requirements: V-3/2006.04
12/VCCIc	Agreement of VCCI V-3 (2007.04): Agreement of Voluntary Control Council for Interference by Information Technology Equipment - Technical Requirements: V-3/2007.04
12/VCCId	Agreement of VCCI V-3 (2008.04): Agreement of Voluntary Control Council for Interference by Information Technology Equipment - Technical Requirements: V-3/2008.04

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
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/I02b	IEC/EN 61000-4-3, Ed. 2.1 (2002), A1 (2002); EN 61000-4-3: Radiated, radio-frequency, electromagnetic field immunity test
12/I02e	EN 61000-4-3 (2002) + A1(2002) + IS1(2004): Radiated, radio-frequency, electromagnetic field immunity test
12/I02f	EN 61000-4-3 (2002) + A1(2002): Radiated, radio-frequency, electromagnetic field immunity test

2009-07-01 through 2010-06-30
Effective dates

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For the National Institute of Standards and Technology

Page 4 of 7

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

NVLAP® National Voluntary Laboratory Accreditation Program

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

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Scope Revised: 2010-01-15

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/I04b	IEC 61000-4-5 (2001), A1(2000); EN 61000-4-5(2001), A1(2000): 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/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/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/KN24	KN24 (December 2005) with RRL Notice No. 2005-83: Information Technology Equipment - immunity charateristics - limits and methods of measurements

2009-07-01 through 2010-06-30
Effective dates

Sally S. Bruce
For the National Institute of Standards and Technology

Page 5 of 7

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

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ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200737-0
Scope Revised: 2010-01-15

NVLAP Code	*Designation / Description*
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/KN2a	KN 61000-4-2 with RRL Notice No. 2005-130 (Dec. 27, 2005): Electrostatic Discharge Immunity Test
12/KN2c	KN 61000-4-2 (2008-5); RRL Notice No. 2008-4 (May 20, 2008): 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/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/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/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,
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

2009-07-01 through 2010-06-30
Effective dates

Sally S. Bruce
For the National Institute of Standards and Technology

Page 6 of 7

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

NVLAP® National Voluntary Laboratory Accreditation Program

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200737-0
Scope Revised: 2010-01-15

NVLAP Code	*Designation / Description*
12/KN8a	KN 61000-4-8 with RRL Notice No. 2005-130 (Dec. 27, 2005): Power Frequency Magnetic Field Immunity Test

2009-07-01 through 2010-06-30
Effective dates

Sally S. Bruce
For the National Institute of Standards and Technology

Page 7 of 7

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

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).

2009-07-01 through 2010-06-30
Effective dates

Sally S. Bruce
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NVLAP-01C (REV. 2009-01-28)

END OF REPORT