NVLAP Lab Code 200087-0

Class 2 Permissive Change

Test Report

For Certified Equipment

Models: 1100dH and 1100xH

FCC ID: CCKPC0114

IC: 5251A-PC0114

FOR

Digital Monitoring Products, Inc.

2500 North Partnership Boulevard

Springfield, MO 65802-6310

Test Report Number: 130206d

NVLAP Lab Code 200087-0

ROGERS LABS, INC.

4405 West 259th Terrace
Louisburg, KS 66053
Phone / Fax (913) 837-3214

Class 2 Permissive Change

Test Report

For

Digital Monitoring Products, Inc.

2500 North Partnership Boulevard
Springfield, MO 65802-6310

Model: 1100dH and 1100xH

902 - 928 MHz Spread Spectrum/Digital Device

Frequency Range
903.3 – 927.2 MHz

FCC ID: CCKPC0114
IC: 5251A-PC0114

Test Date: February 6, 2013

Certifying Engineer: Scot D Rogers

Scot D. Rogers
Rogers Labs, Inc.
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Revisions

Revision 1 Issued March 1, 2013

Executive Summary

In accordance with the Federal Communications Commission, Code of Federal Regulations CFR 47, dated October 1, 2012, Parts 2 and 15, KDB 178919, and RSS-210 the following information is submitted in support of Class 2 permissive change of certified equipment. This report addresses addition of alternate antenna system from the original design.

Opinion / Interpretation of Results

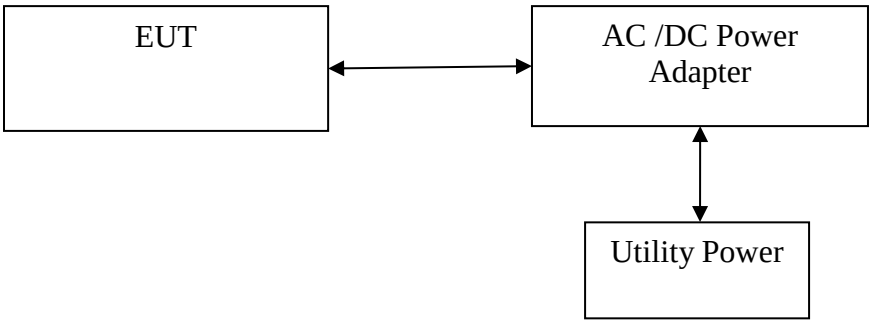
Test Performed	Margin (dB)	Results
Radiated Emissions in Restricted Bands	-12.9	Complies
AC Line Conducted Emissions	-8.8	Complies
General Radiated Emissions	-8.9	Complies
Transmitter Harmonic Emissions	-12.9	Complies

Equipment Tested

Equipment	Model	FCC ID	Serial Number
EUT	1100dH	CCKPC0114	EUT1
EUT	1100xH	CCKPC0114	N/A
AC Adapter	MGT-12500-SPS	N/A	N/A

The EUT is a 902-928 MHz radio transmitter used to transmit alarm conditions for use in an alarm panel installation. The device signals the alarm panel or initiates a contact point based on operational conditions. Test software was installed in the test sample allowing for testing. The modified software allowed the transmitter to be set to transmit on channels depending on activation of contact switches attached. The unit operates from external DC battery power only and has no other power options available. For testing purposes an AC/DC adapter was supplied by the manufacturer and used to power the EUT during testing.

Equipment Configuration



Change to Equipment

The design modification provides an alternate antenna system. This modification offers a reduction in physical dimensions of enclosure. Original design utilized two antennas which extended approximately 10 inches beyond the rectangular enclosure. The alternate antenna design utilizes antenna placement inside the rectangular enclosure. This modification reduces physical dimensions of design providing greater flexibility in placement and location requirements. Testing was performed to verify the design and modification continue to comply with all applicable rules and requirements of the CFR 47 and Industry Canada RSS-210. Testing confirmed the modifications do not degrade the characteristics allowable and acceptable by the regulations. The transmitter is electrically identical to the original design and application. The modification provided no change to the certified operating power or frequency band.

Environmental Conditions

Ambient Temperature	22.8° C
Relative Humidity	29%
Atmospheric Pressure	1013.4 mb

Test Site Locations

Conducted EMI — The AC power line conducted emissions tests were performed in a shielded screen room located at Rogers Labs, Inc., 4405 W. 259th Terrace, Louisburg, KS.

Radiated EMI — The radiated emissions tests were performed at the 3 meters, Open Area Test Site (OATS) located at Rogers Labs, Inc., 4405 W. 259th Terrace, Louisburg, KS.

Site Registration — Refer to Annex for FCC Site registration Letter, Reference # 90910, and Industry Canada registration IC3041A-1

Units of Measurement

Conducted EMI: Data is in dBµV; dB referenced to one microvolt.

Radiated EMI: Data is in dBµV/m; dB referenced to one microvolt per meter.

Radiated Emissions Calculations:

Note: The limit is expressed for a measurement in dBµV/m when the measurement is taken at a distance of 10 meters. Data taken for this report was taken at a distance of 10 meters. Sample calculation demonstrates corrected field strength reading for Open Area Test Site using the measurement reading and correcting for receive antenna factor, cable losses, and amplifier gains.

Field Strength (dBµV/m @ 10m) = FSM (dBµV) + A.F. (dB) + cable loss - Amp Gain (dB)

List of Test Equipment

A Rohde and Schwarz ESU40 and/or Hewlett Packard 8591EM Spectrum Analyzer was used as the measuring device for the emissions testing of frequencies below 1 GHz. A Rohde and Schwarz ESU40 and/or Hewlett Packard 8562A Spectrum Analyzer was used as the measuring device for testing the emissions at frequencies above 1 GHz. The analyzer settings used are described in the following table. Refer to the annex for a complete list of test equipment.

Analyzer Settings		
AC Line Conducted Emissions:		
RBW	Video BW	Detector Function
9 kHz	30 kHz	Peak/Quasi Peak
Radiated Emissions 30-1000 MHz		
RBW	Video BW	Detector Function
100 kHz	100 kHz	Peak
120 kHz	300 kHz	Peak/Quasi Peak
Radiated Emissions Above 1000 MHz		
RBW	Video BW	Detector Function
1 MHz	1 MHz	Peak / Average

Equipment	Manufacturer	Model	Band	Cal Date	Due
☒ LISN	Comp. Design	FCC-LISN-2-MOD.CD	.15-30MHz	10/12	10/13
☐ Antenna	ARA	BCD-235-B	20-350MHz	10/12	10/13
☐ Antenna	EMCO	3147	200-1000MHz	10/12	10/13
☒ Antenna	Com Power	AH-118	1-18 GHz	10/12	10/13
☒ Antenna	Com Power	AH-840	18-40 GHz	10/12	10/13
☒ Antenna	Standard	FXRY638A	10-18 GHz	3/12	5/13
☒ Antenna	EMCO	6509	.001-30 MHz	10/12	10/13
☐ Antenna	EMCO	3143	20-1200 MHz	5/12	5/13
☒ Antenna	Sunol	JB-6	30-1000 MHz	5/12	5/13
☐ Analyzer	HP	8591EM	9kHz-1.8GHz	5/12	5/13
☐ Analyzer	HP	8562A	9kHz-110GHz	5/12	5/13
☒ Analyzer	Rohde & Schwarz	ESU40	20Hz-40GHz	5/12	5/13
☒ Amplifier	Com-Power	PA-010	100Hz-30MHz	10/12	10/13
☒ Amplifier	Com-Power	CPPA-102	1-1000 MHz	10/12	10/13
☒ Amplifier	Com-Power	PA-22	0.5-22 GHz	10/12	10/13

Applicable Standards & Test Procedures

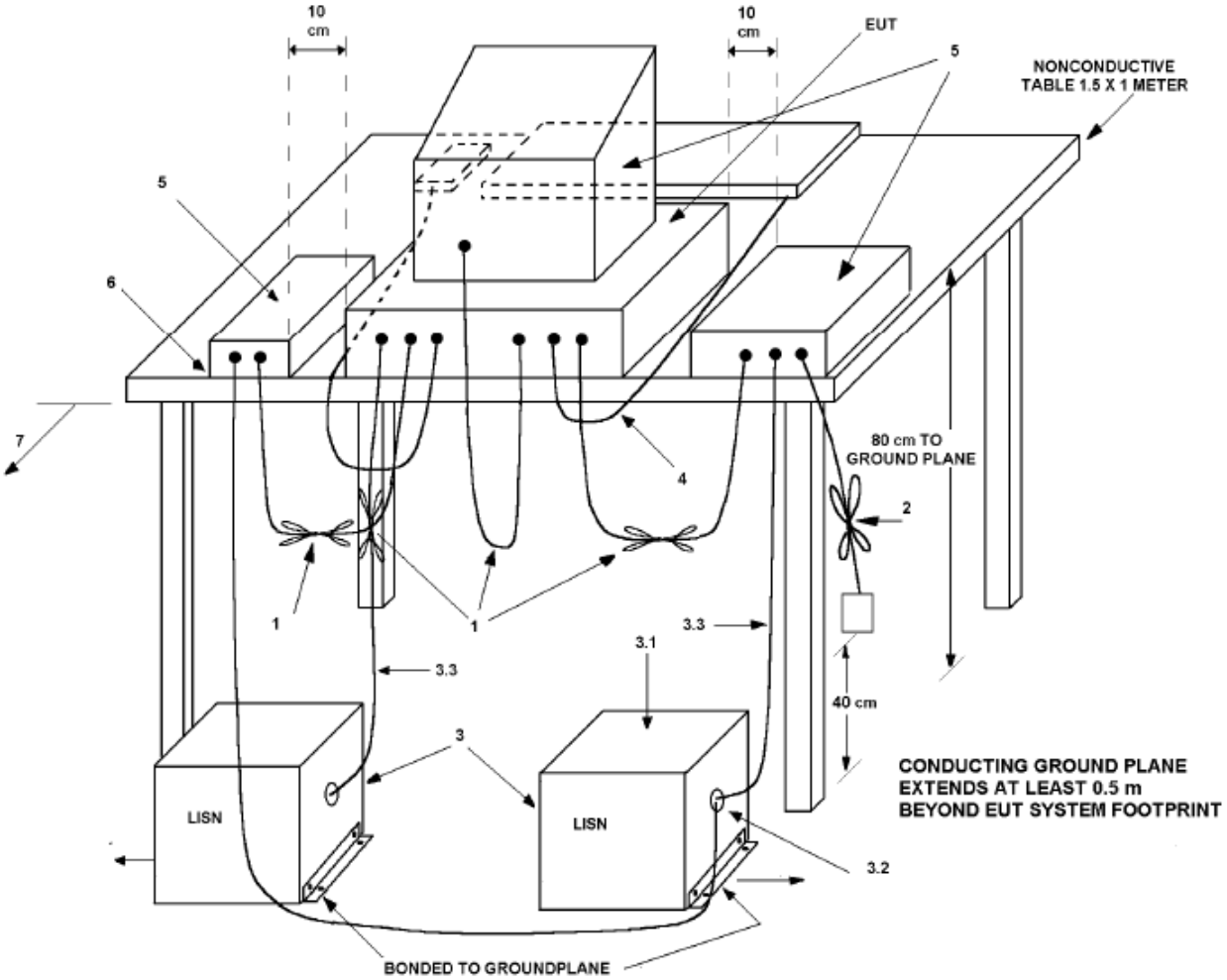
In accordance with the Federal Communications Code of Federal Regulations Title 47, dated October 1, 2012, Parts 2 and 15C, KDB 178919, and RSS-210 the following information is submitted. Test procedures used are the established Methods of Measurement of Radio-Noise Emissions as described in ANSI C63.4-2009, ANSI C63.10-2009, FCC KDB documents KDB 558074 D01 v02 and KDB 913591. Testing for the AC line-conducted emissions were performed as defined in sections 7 and 13.1.3, testing of the radiated emissions was performed as defined in sections 8 and 13.1.4 of ANSI C63.4-2009. Testing of the radiated emissions was performed as required including procedures in section 13 of ANSI C63.4-2.

Equipment Testing Procedures

AC Line Conducted Emission Test Procedure

For testing purposes, the manufacturer supplied AC/DC power adapter was used to power the EUT. Testing for the AC line-conducted emissions testing was performed as defined in sections 7 and 13.1.3 of ANSI C63.4-2009. The test setup including the EUT was arranged in typical equipment configurations and placed on a 1 x 1.5-meter wooden bench, 0.8 meters high located in a screen room. The power lines of the system were isolated from the power source using a standard LISN with a 50-µHy choke. EMI was coupled to the spectrum analyzer through a 0.1 µF capacitor internal to the LISN. The LISN was positioned on the floor beneath the wooden bench supporting the EUT. The power lines and cables were draped over the back edge of the table. Refer to diagram 1 showing typical test arrangement and photographs in the test setup exhibits for specific EUT placement during testing. Refer to photographs in the test setup exhibits for EUT placement during testing.

Diagram 1 Test arrangement for Conducted emissions



1. Interconnecting cables that hang closer than 40 cm to the ground plane were folded back and forth in the center forming a bundle 30 cm to 40 cm long.
2. Input/output (I/O) cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3. EUT connected to one LISN. Unused LISN measuring port connectors are terminated into 50 Ω loads. LISN is placed on top of and bonded to reference ground plane.

3.1 All other equipment powered from additional LISN(s).

3.2 Multiple outlet strips can be used for multiple power cords of non-EUT equipment.

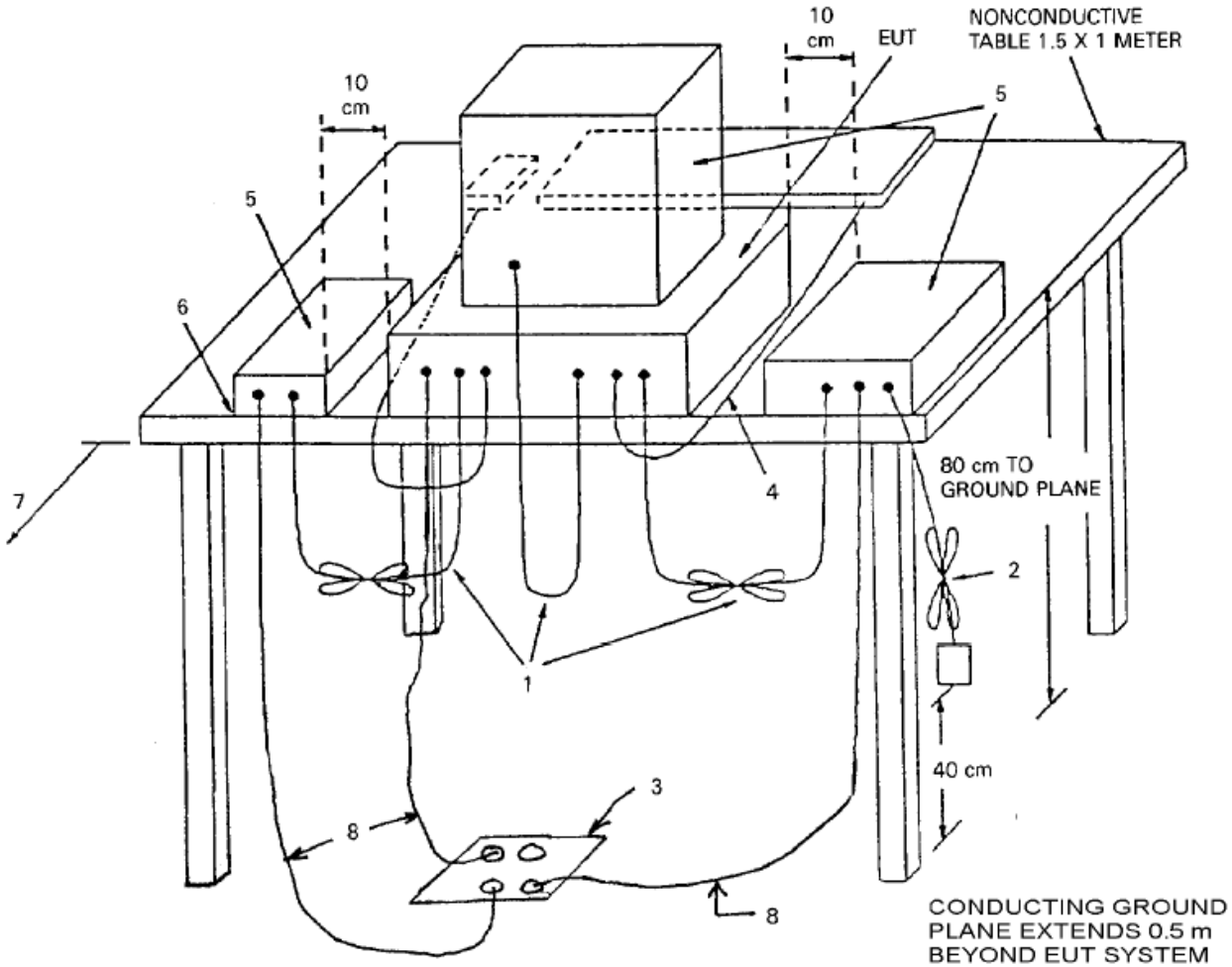
3.3 LISN is positioned at least 80 cm from nearest part of EUT chassis.

4. Cables of hand-operated devices, such as keyboards, mice, and so on, shall be placed as for normal use.
5. Non-EUT components of EUT system being tested.
6. Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
7. Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane (see 5.2.2 for options).

Radiated Emission Test Procedure

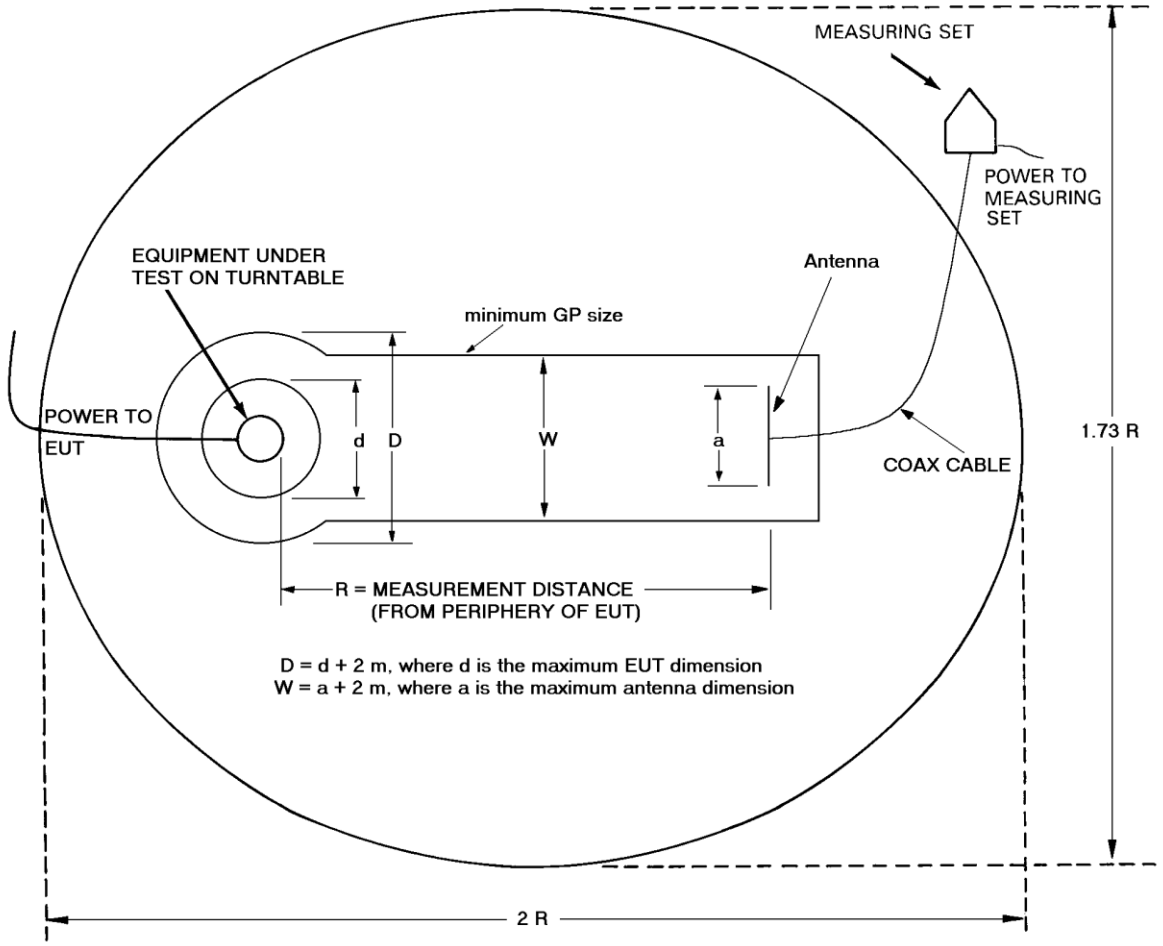
The EUT was placed on a rotating 1 x 1.5-meter wooden platform, 0.8 meters above the ground plane at a distance of 3 meters from the FSM antenna. Radiated emissions testing was performed as required in CFR47 15, RSS-210 and specified in sections 8 and 13.1.4 of ANSI C63.4-2009. EMI energy was maximized by equipment placement, raising and lowering the FSM antenna, changing the antenna polarization, and by rotating the turntable. Each emission was maximized before data was taken using a spectrum analyzer. The frequency spectrum from 9 kHz to 25,000 MHz was searched for during preliminary investigation. Refer to diagrams 2 and 3 showing typical test arrangement and photographs in the test setup exhibits for specific EUT placement during testing.

Diagram 2 Test arrangement for radiated emissions of tabletop equipment



1. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center, forming a bundle 30 cm to 40 cm long.
2. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated if required using the correct terminating impedance. The total length shall not exceed 1 m.
3. If LISNs are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground plane with the receptacle flush with the ground plane.
4. Cables of hand-operated devices, such as keyboards, mice, and so on, shall be placed as for normal use.
5. Non-EUT components of EUT system being tested.
6. Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop (possibly center of table for transmitter equipment).
7. No vertical conducting plane used.
8. Power cords drape to the floor and are routed over to receptacle.

Diagram 3 Test arrangement for radiated emissions tested on Open Area Test Site (OATS)



AREA DIMENSIONS =	R = 3m	R = 10 m	R = 30 m
	6 m x 5.2 m	20 m x 17.3 m	60 m x 52 m

Intentional Radiators

As per CFR47, Subpart C, paragraph 15.247 and RSS-210 the following information is submitted.

Antenna Requirements

The EUT incorporates integral antenna system and offers no provision for connection to alternate antenna systems. The antenna connection point complies with the unique antenna connection requirements.

Restricted Bands of Operation

Spurious emissions falling in the restricted frequency bands of operation were measured at the OATS. The EUT utilizes frequency, determining circuitry, which generates harmonics falling in the restricted bands. Emissions were investigated at the OATS, using appropriate antennas or pyramidal horns, amplification stages, and a spectrum analyzer. Peak and average amplitudes of frequencies above 1000 MHz were compared to the required limits with worst-case data presented below. Test procedures of ANSI C63.4-2009 paragraphs 13.1 and 8.3.1.2 and KDB 558074 paragraph 10.2 were used during testing. No other significant emission was observed which fell into the restricted bands of operation. Computed emission values take into account the received radiated field strength, receive antenna correction factor, amplifier gain stage, and test system cable losses.

Table 1 Radiated Emissions in Restricted Bands Data

Frequency in MHz	Horizontal Peak (dBµV/m)	Horizontal Quasi-Peak (dBµV/m)	Horizontal Average (dBµV/m)	Vertical Peak (dBµV/m)	Vertical Quasi-Peak (dBµV/m)	Vertical Average (dBµV/m)	Limit @ 3m (dBµV/m)
166.5	34.1	29.1	N/A	33.5	19.7	N/A	43.5
2709.9	70.0	N/A	34.6	70.6	N/A	37.9	54.0
2745.0	64.4	N/A	30.6	73.0	N/A	40.0	54.0
2779.9	63.1	N/A	34.5	73.1	N/A	41.1	54.0
3613.2	57.3	N/A	32.7	46.1	N/A	32.7	54.0
3660.0	67.2	N/A	37.0	54.4	N/A	33.0	54.0
3706.6	54.6	N/A	32.7	50.1	N/A	32.7	54.0
4516.5	65.9	N/A	37.9	47.0	N/A	34.1	54.0
4575.0	67.1	N/A	37.8	64.9	N/A	36.7	54.0
4633.3	63.0	N/A	35.8	56.3	N/A	34.5	54.0
5419.8	56.2	N/A	37.5	58.4	N/A	36.5	54.0
5490.0	63.6	N/A	38.6	66.6	N/A	39.6	54.0
5559.9	60.3	N/A	37.0	61.7	N/A	36.5	54.0
6323.1	50.3	N/A	32.9	45.0	N/A	32.5	54.0
6405.0	52.5	N/A	34.7	47.8	N/A	34.4	54.0
6486.6	45.7	N/A	32.4	45.3	N/A	32.5	54.0
7226.4	56.8	N/A	33.6	52.0	N/A	33.4	54.0
7320.0	49.6	N/A	31.5	46.4	N/A	31.2	54.0
7143.2	57.5	N/A	34.1	46.7	N/A	33.5	54.0
8129.7	47.6	N/A	34.3	47.4	N/A	34.3	54.0
8235.0	48.4	N/A	35.5	47.6	N/A	34.7	54.0
8339.9	50.6	N/A	33.2	53.5	N/A	34.2	54.0
9033.0	50.4	N/A	37.4	50.5	N/A	37.4	54.0
9150.0	49.9	N/A	36.2	53.3	N/A	36.1	54.0
9266.5	51.5	N/A	38.6	51.3	N/A	38.6	54.0

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range of 30-1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Summary of Results for Radiated Emissions in Restricted Bands

The EUT demonstrated compliance with radiated emissions requirements of FCC Part 15C and RSS-210 Intentional Radiators. The EUT presented with minimum margin of-12.9 dB below the average limit. Both average and peak amplitudes above 1000 MHz were investigated for compliance with the regulations. No other emissions where found in the restricted frequency bands. Other emissions were present with amplitudes at least 20 dB below the Limits.

AC Line Conducted Emissions Testing

The EUT was arranged in a typical equipment configuration and placed on a 1 x 1.5-meter wooden bench 80 cm above the conducting ground plane, floor of a screen room. The bench was positioned 40 cm away from the wall of the screen room. The LISN was positioned on the floor of the screen room 80-cm from the rear of the EUT. The manufacturer supplied AC power adapter for the EUT was connected to the LISN. A second LISN was positioned on the floor of the screen room 80-cm from the rear of the supporting equipment of the EUT. All power cords except the EUT were then powered from the second LISN. EMI was coupled to the spectrum analyzer through a 0.1 μF capacitor, internal to the LISN. Power line conducted emissions testing were carried out individually for each current carrying conductor of the EUT. The excess length of lead between the system and the LISN receptacle was folded back and forth to form a bundle not exceeding 40 cm in length. The screen room, conducting ground plane, analyzer, and LISN were bonded together to the protective earth ground. Preliminary testing was performed to identify the frequency of each radio frequency emission displaying the highest amplitude. The cables were repositioned to obtain maximum amplitude of measured EMI level. Once the worst-case configuration was identified, plots were made of the EMI from 0.15 MHz to 30 MHz then the data was recorded with maximum conducted emissions levels. Refer to figures one and two for plots of the EUT powered by manufacturer supplied AC/DC adapter.

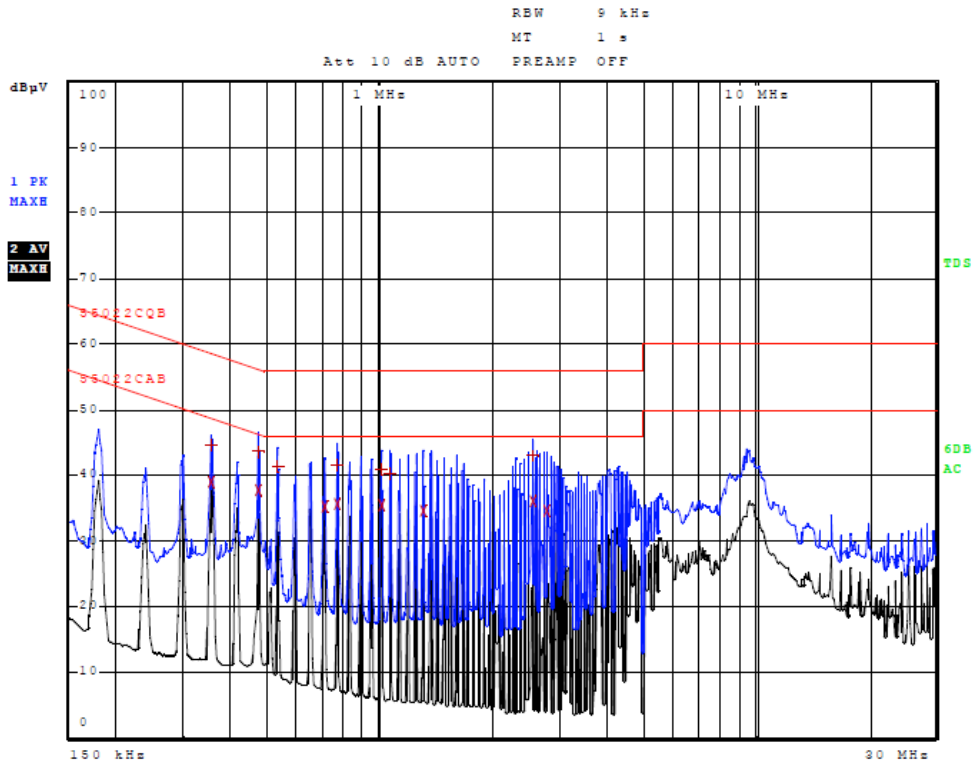


Figure One AC Line Conducted Emissions Line 1

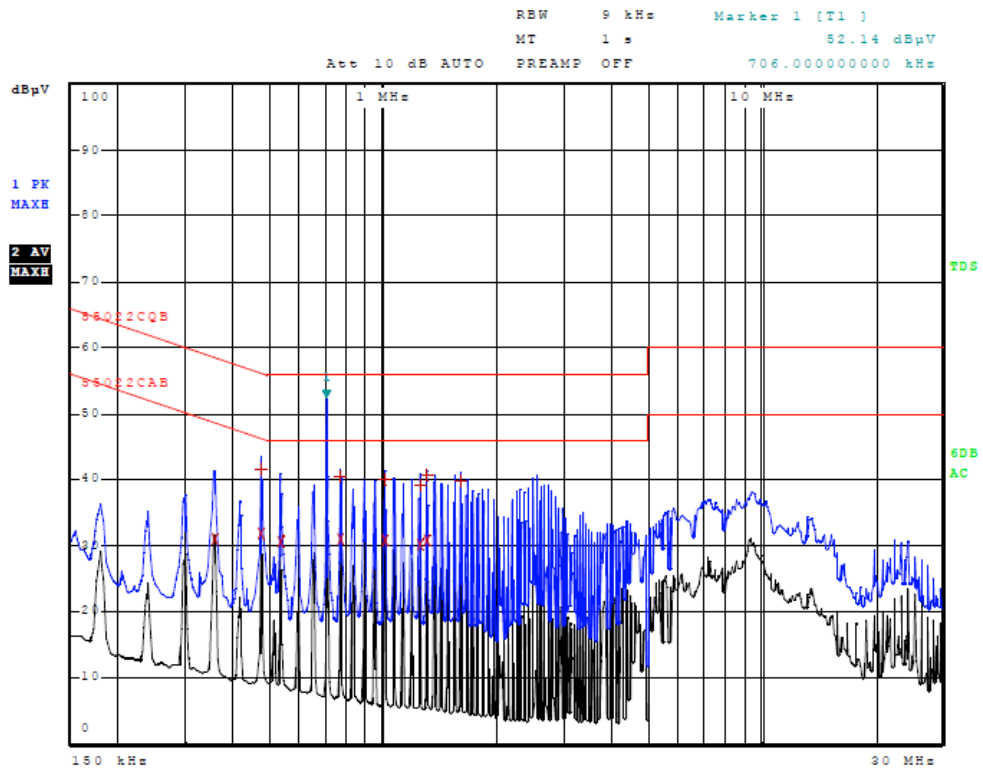


Figure Two AC Line Conducted Emissions Line 2

Table 2 AC Line Conducted Emissions Data (Line 1 Emissions)

Trace	Frequency	Level (dBµV)	Detector	Delta Limit/dB
2	354.000000000 kHz	39.05	Average	-9.82
1	354.000000000 kHz	44.74	Quasi Peak	-14.13
1	474.000000000 kHz	43.54	Quasi Peak	-12.91
2	474.000000000 kHz	37.61	Average	-8.83
1	534.000000000 kHz	41.24	Quasi Peak	-14.76
2	710.000000000 kHz	35.17	Average	-10.83
1	770.000000000 kHz	41.52	Quasi Peak	-14.48
2	770.000000000 kHz	35.59	Average	-10.41
1	1.010000000 MHz	40.82	Quasi Peak	-15.18
2	1.010000000 MHz	35.36	Average	-10.64
1	1.066000000 MHz	40.30	Quasi Peak	-15.70
2	1.306000000 MHz	34.51	Average	-11.49
1	2.550000000 MHz	43.06	Quasi Peak	-12.94
2	2.550000000 MHz	36.10	Average	-9.90
2	2.786000000 MHz	34.47	Average	-11.53

Other emissions present had amplitudes at least 20 dB below the limit.

Table 3 AC Line Conducted Emissions Data (Line 2 Emissions)

Trace	Frequency	Level (dBµV)	Detector	Delta Limit/dB
2	358.000000000 kHz	31.06	Average	-17.72
2	474.000000000 kHz	31.77	Average	-14.68
1	474.000000000 kHz	41.58	Quasi Peak	-14.86
2	534.000000000 kHz	30.58	Average	-15.42
2	770.000000000 kHz	30.92	Average	-15.08
1	770.000000000 kHz	40.47	Quasi Peak	-15.53
2	1.010000000 MHz	30.88	Average	-15.12
1	1.010000000 MHz	40.09	Quasi Peak	-15.91
2	1.246000000 MHz	30.23	Average	-15.77
1	1.246000000 MHz	39.08	Quasi Peak	-16.92
2	1.306000000 MHz	30.86	Average	-15.14
1	1.306000000 MHz	40.60	Quasi Peak	-15.40
1	1.602000000 MHz	39.77	Quasi Peak	-16.23

Other emissions present had amplitudes at least 20 dB below the limit.

Summary of Results for AC Line Conducted Emissions

The EUT demonstrated compliance with the conducted emissions requirements of CFR 47 Part 15C, RSS-210 and other applicable standards for Intentional Radiators. The EUT worst-case configuration demonstrated minimum margin of -11.5 dB below the CFR 47 limits. Other emissions were present with recorded data representing the worst-case amplitudes.

General Radiated Emissions Procedure

The EUT was arranged in a typical equipment configuration and operated through all available modes with worst-case data recorded. Preliminary testing was performed in a screen room with the EUT positioned 1 meter from the FSM. Radiated emissions measurements were performed to identify the frequencies, which produced the highest emissions. Each radiated emission was then maximized at the OATS location before final radiated emissions measurements were performed. Final data was taken with the EUT located at the OATS at a distance of 3 meters between the EUT and the receiving antenna. The frequency spectrum from 9 kHz to 25,000 MHz was searched for general radiated emissions. Measured emission levels were maximized by EUT placement on the table, rotating the turntable through 360 degrees, varying the antenna height between 1 and 4 meters above the ground plane and changing antenna position between horizontal and vertical polarization. Antennas used were Loop from 9 kHz to 30 MHz, Broadband Biconical from 30 to 200 MHz, Biconilog from 30 to 1000 MHz, Log Periodic from 200 MHz to 1 GHz and or double Ridge or pyramidal horns and mixers from 1 GHz to 40 GHz, notch filters and appropriate amplifiers and external mixers were utilized.

Table 4 General Radiated Emissions from EUT Data (Highest Emissions)

Frequency in MHz	Horizontal Peak (dBµV/m)	Horizontal Quasi-Peak (dBµV/m)	Horizontal Average (dBµV/m)	Vertical Peak (dBµV/m)	Vertical Quasi-Peak (dBµV/m)	Vertical Average (dBµV/m)	Limit @ 3m (dBµV/m)
49.7	32.6	17.9	N/A	35.0	24.7	N/A	40.0
103.6	38.9	30.2	N/A	34.9	29.8	N/A	43.5
166.5	34.1	29.1	N/A	33.5	19.7	N/A	43.5
175.4	36.9	30.9	N/A	33.4	19.8	N/A	43.5
175.9	32.9	31.3	N/A	32.8	21.6	N/A	43.5
176.4	37.0	30.9	N/A	31.2	19.5	N/A	43.5
191.4	26.5	20.0	N/A	25.3	16.2	N/A	43.5
284.8	44.8	37.9	N/A	41.6	29.3	N/A	46.0
890.3	44.5	34.1	N/A	56.6	35.6	N/A	46.0
1007.3	53.6	34.5	N/A	50.6	31.2	N/A	54.0

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range of 30-1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Summary of Results for General Radiated Emissions

The EUT demonstrated compliance with radiated emissions requirements for CFR 47 Part 15C, and Industry Canada RSS-210 requirements. The EUT presented with -8.1 dB minimum margin below the limit. Other emissions were present with amplitudes at least 20 dB below the limit.

Operation in the Band 902-928 MHz

The power output was measured at the open area test site at a three-meter distance. The EUT was placed on a wooden turntable 0.8 meters above the ground plane at a distance of 3 meters from the FSM antenna. The peak and quasi-peak amplitude of the frequencies below 1000 MHz were measured using a spectrum analyzer. The peak and average amplitude of emissions above 1000 MHz including were measured using a spectrum analyzer. Emissions data was recorded from the measurement results. Preliminary investigations were performed on the transmitter performance.

This product utilizes permanently attached antenna system and offers no provision for conducted antenna port measurements. Test procedures as defined in publications KDB 558074 and ANSI C63.10-2009 were utilized for compliance testing. These procedures utilize measurement of maximum field strength and conversion calculation for comparison with requirements.

1. Calculate the transmitter's peak power using the following equation:
   $P = (E * d)^2 / (30 * G)$

   Where: E = the measured maximum field strength in V/m.

   G = the numeric gain of the transmitting antenna over an isotropic radiator.

   d = the distance in meters from which the field strength was measured.

   P = the power in watts

   Setting the RBW > 6dB bandwidth of the emission or using a peak power meter

   Power measurements were conducted utilizing the channel power measurement function of the ESU40 receiver.

2. Emission Bandwidth was measured in compliance with KDB 558074 paragraph 7.
3. Maximum Peak Output Power was measured in compliance with KDB 558074 paragraph 8.
4. Maximum Power Spectral Density was measured in compliance with KDB 558074 paragraph 9.
5. Maximum Unwanted Emissions Levels were measured in compliance with KDB 558074 and CFR47 paragraph 15C at 3-meters distance located on the OATS.
6. Band Edge compliance was performed in compliance with KDB 913591.

Transmitter Emissions Data

Table 5 Calculated Transmitter Antenna Port Power

Frequency MHz	Calculated Antenna Port Conducted Output Power (Watts)
903.3	0.72
915.0	0.72
927.2	0.72

Table 6 Transmitter Radiated Emission

Frequency in MHz	Horizontal Peak (dBµV/m)	Horizontal Quasi-Peak (dBµV/m)	Horizontal Average (dBµV/m)	Vertical Peak (dBµV/m)	Vertical Quasi-Peak (dBµV/m)	Vertical Average (dBµV/m)	Limit @ 3m (dBµV/m)
1806.7	67.5	N/A	31.7	70.0	N/A	32.8	54.0
2709.9	70.0	N/A	34.6	70.6	N/A	37.9	54.0
3613.2	57.3	N/A	32.7	46.1	N/A	32.7	54.0
4516.5	65.9	N/A	37.9	47.0	N/A	34.1	54.0
5419.8	56.2	N/A	37.5	58.4	N/A	36.5	54.0
1830.0	62.3	N/A	32.8	65.4	N/A	33.8	54.0
2745.0	64.4	N/A	30.6	73.0	N/A	40.0	54.0
3660.0	67.2	N/A	37.0	54.4	N/A	33.0	54.0
4575.0	67.1	N/A	37.8	64.9	N/A	36.7	54.0
5490.0	63.6	N/A	38.6	66.6	N/A	39.6	54.0
1853.3	65.1	N/A	34.3	66.3	N/A	35.0	54.0
2779.9	63.1	N/A	34.5	73.1	N/A	41.1	54.0
3706.6	54.6	N/A	32.7	50.1	N/A	32.7	54.0
4633.3	63.0	N/A	35.8	56.3	N/A	34.5	54.0
5559.9	60.3	N/A	37.0	61.7	N/A	36.5	54.0

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded above for frequency range of 30-1000 MHz. Peak and Average amplitude emissions are recorded above for frequency range above 1000 MHz.

Summary of Results for Transmitter Radiated Emissions

The EUT demonstrated compliance with the radiated emissions requirements of CFR 47 Part 15.247, RSS-210 and other applicable standards for Intentional Radiators. The EUT worst-case configuration demonstrated minimum radiated harmonic emission margin of -12.9 dB below the limits. No other radiated emissions were found in the restricted bands less than 20 dB below limits than those recorded in this report. Other emissions were present with amplitudes at least 20 dB below the Limits.

Statement of Modifications and Deviations

No modifications to the EUT were required for the unit to demonstrate compliance with the CFR47 Part 15C or RSS-210 requirements. There were no deviations or exceptions to the specifications.

Annex

- Annex A Measurement Uncertainty Calculations
- Annex B Rogers Labs Test Equipment List
- Annex C Rogers Qualifications
- Annex D FCC Site Registration Letter
- Annex E Industry Canada Site Registration Letter
- Annex F Photographs of Test Setup
- Annex G Photographs of Equipment Under Test

Annex A Measurement Uncertainty Calculations

Measurement uncertainty calculations were made for the laboratory. Result of measurement uncertainty calculations are recorded below for AC line conducted and radiated emission measurements.

Measurement Uncertainty	$U_{(E)}$	$U_{(lab)}$
3 Meter Horizontal 30-200 MHz Measurements	2.08	4.16
3 Meter Vertical 30-200 MHz Measurements	2.16	4.33
3 Meter Vertical Measurements 200-1000 MHz	2.99	5.97
10 Meter Horizontal Measurements 30-200 MHz	2.07	4.15
10 Meter Vertical Measurements 30-200 MHz	2.06	4.13
10 Meter Horizontal Measurements 200-1000 MHz	2.32	4.64
10 Meter Vertical Measurements 200-1000 MHz	2.33	4.66
3 Meter Measurements 1-6 GHz	2.57	5.14
3 Meter Measurements 6-18 GHz	2.58	5.16
AC Line Conducted	1.72	3.43

Annex B Rogers Labs Test Equipment List

The test equipment is maintained in calibration and good operating condition. Use of this calibrated equipment ensures measurements are traceable to national standards.

Equipment	Calibration Date
Spectrum Analyzer: Rohde & Schwarz ESU40	5/12
Spectrum Analyzer: HP 8562A, HP Adapters: 11518, 11519, and 11520 Mixers: 11517A, 11970A, 11970K, 11970U, 11970V, 11970W	5/12
Spectrum Analyzer: HP 8591EM	5/12
Antenna: EMCO Biconilog Model: 3143	5/12
Antenna: Sunol Biconilog Model: JB6	10/12
Antenna: EMCO Log Periodic Model: 3147	10/12
Antenna: Antenna Research Biconical Model: BCD 235	10/12
Antenna: EMCO 6509	10/12
LISN: Compliance Design Model: FCC-LISN-2.Mod.cd, 50 µHy/50 ohm/0.1 µf	10/12
R.F. Preamp PA-010	10/12
R.F. Preamp CPPA-102	10/12
R.F. Preamp PA-122	10/12
Cable assembly: (L1) consisting of Belden RG-58, HP11509A, CAT-3	10/12
Cable assembly: (L2) consisting of Belden RG-58, HP11509A, CAT-3	10/12
Cable: (L3) Belden 8268	10/12
Cable: Time Microwave: 4M-750HF290-750	10/12
Cable: Time Microwave: 10M-750HF290-750	10/12
Frequency Counter: Leader LDC825	2/13
Oscilloscope Scope: Tektronix 2230	2/13
Wattmeter: Bird 43 with 50 Ohm Load 8085	2/13
Power Supplies: Sorensen SRL 20-25, SRL 40-25, DCR 150, DCR 140	2/13
R.F. Generators: HP 606A, HP 8614A, HP 8640B	2/13
R.F. Power Amp 65W Model: 470-A-1010	2/13
R.F. Power Amp 50W M185- 10-501	2/13
R.F. Power Amp A.R. Model: 10W 1010M7	2/13
R.F. Power Amp EIN Model: A301	2/13
LISN: Compliance Eng. Model 240/20	2/13
LISN: Fischer Custom Communications Model: FCC-LISN-50-16-2-08	2/13
Antenna: EMCO Dipole Set 3121C	2/13
Antenna: Compliance Design B-101	2/13
Antenna: Solar 9229-1 & 9230-1	2/13
Audio Oscillator: HP 201CD	2/13
Peavey Power Amp Model: IPS 801	2/13
ELGAR Model: 1751	2/13
ELGAR Model: TG 704A-3D	2/13
ESD Test Set 2010i	2/13
Fast Transient Burst Generator Model: EFT/B-101	2/13
Field Intensity Meter: EFM-018	2/13
KEYTEK Ecat Surge Generator	2/13
Shielded Room 5 M x 3 M x 3.0 M	

Annex C Rogers Qualifications

Scot D. Rogers, Engineer

Rogers Labs, Inc.

Mr. Rogers has approximately 17 years' experience in the field of electronics. Work experience includes six years working in the automated controls industry and remaining years working with the design, development and testing of radio communications and electronic equipment.

Positions Held:

Systems Engineer: A/C Controls Mfg. Co., Inc. 6 Years

Electrical Engineer: Rogers Consulting Labs, Inc. 5 Years

Electrical Engineer: Rogers Labs, Inc. Current

Educational Background:

1) Bachelor of Science Degree in Electrical Engineering from Kansas State University

2) Bachelor of Science Degree in Business Administration Kansas State University

3) Several Specialized Training courses and seminars pertaining to Microprocessors and Software programming.

NVLAP Lab Code 200087-0

Annex D FCC Test Site Registration Letter

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

November 01, 2011

Registration Number: 90910

Rogers Labs, Inc.
4405 West 259th Terrace,
Louisburg, KS 66053

Attention: Scot Rogers,

Re: Measurement facility located at Louisburg
3 & 10 meter site
Date of Renewal: November 01, 2011

Dear Sir or Madam:

Your request for renewal of the registration of the subject measurement facility has been received. The information submitted has been placed in your file and the registration has been renewed. The name of your organization will remain on the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website www.fcc.gov under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

Phyllis Parrish
Industry Analyst

NVLAP Lab Code 200087-0

Annex E Industry Canada Test Site Registration Letter

Industry Canada Industrie Canada

December 28, 2011

OUR FILE: 46405-3041
Submission No: 152685

Rogers Labs Inc.
4405 West 259th Terrance
Louisburg, KS, 66053
USA

Attention: Mr. Scot D. Rogers

Dear Sir/Madame:

The Bureau has received your application for the renewal of 3/10m OATS. Be advised that the information received was satisfactory to Industry Canada. The following number(s) is now associated to the site(s) for which registration / renewal was sought **(Site# 3041A-1).** Please reference the appropriate site number in the body of test reports containing measurements performed on the site. In addition, please keep for your records the following information;

- The company address code associated to the site(s) located at the above address is: **3041A**

Furthermore, to obtain or renew a unique site number, the applicant shall demonstrate that the site has been accredited to ANSI C63.4-2003 or later. A scope of accreditation indicating the accreditation by a recognized accreditation body to ANSI C63.4-2003 or later shall be accepted. Please indicate in a letter the previous assigned site number if applicable and the type of site (example: 3 metre OATS or 3 metre chamber). If the test facility is not accredited to ANSI C63.4-2003 or later, the test facility shall submit test data demonstrating full compliance with the ANSI standard. The Bureau will evaluate the filing to determine if recognition shall be granted.

The frequency for re-validation of the test site and the information that is required to be filed or retained by the testing party shall comply with the requirements established by the accrediting organization. However, in all cases, test site re-validation shall occur on an interval not to **exceed three years**. There is no fee or form associated with an OATS filing. OATS submissions are encouraged to be submitted electronically to the Bureau using the following URL;
http://strategis.ic.gc.ca/epic/internet/inceb-bhst.nsf/en/h_tt00052e.html.

If you have any questions, you may contact the Bureau by e-mail at certification.bureau@ic.gc.ca Please reference our file and submission number above for all correspondence.

Yours sincerely,

Dalwinder Gill

Dalwinder Gill
For: Wireless Laboratory Manager
Certification and Engineering Bureau
3701 Carling Ave., Building 94
P.O. Box 11490, Station "H"
Ottawa, Ontario K2H 8S2
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