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Job Number:	986616
Project Number:	08CA35293
File Number:	MC15986
Date:	July 22, 2008
Model:	S-TAD
FCC ID:	JM7-IGWT-662008
IC ID	2683A-662008

Electromagnetic Compatibility Test Report

For

Innovative Control Systems, Inc.

Test Report Details

Tests Performed By:	**Underwriters Laboratories Inc. 333 Pfingsten Rd. Northbrook, IL 60062**
Tests Performed For:	**Innovative Control Systems, Inc. 10125 S52nd Street Franklin, WI 53132**
Applicant Contact:	**Mark Kieckhefer**
Phone:	**(414) 423-1088**
E-mail:	**MarkK@accutech-ics.com**
Test Report Date:	**July 22, 2008**
Product Type:	**Handheld, Battery Powered (9V), 128kHz Transmitter**
Product standards	**FCC Part 15, Subpart C, RSS-210, RSS-GEN**
Model Number:	**S-TAD**
Sample Serial Number:	**N/A**
EUT Category:	**Low Power Transmitter**
Testing Start Date:	**July 14, 2008**
Date Testing Complete:	**July 17, 2008**
Overall Results:	**Compliant**

Underwriters Laboratories Inc. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. Underwriters Laboratories Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Underwriters Laboratories Inc. issued reports. This report shall not be used to claim, constitute or imply product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the US government.

This report may contain test results that are not covered by the NVLAP or A2LA accreditation. The scope of accreditation is limited to the specific tests that are listed on the NVLAP and/or A2LA websites referenced at the end of this report.

Report Directory

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
None			

1.0 G E N E R A L – Product Description

1.1 Equipment Description

The Secured Tag Activator / Deactivator (S-TAD) is used as a diagnostic and activating tool in conjunction with a patient Tag within a patient abduction – egress prevention system. The S-TAD (Secure Tag Activator/Deactivator) is used to check the functionality of an Accutech Tag. Accutech Tags operate by internal battery but were not part of this investigation

1.2 Equipment Marking Plate

1.3 Device Configuration During Test

1.3.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	Secured Tag Activator / Deactivator	Innovative Control Systems, Inc.	S-TAD	None
AE	Laptop	IBM	T21	None
Note: **EUT** – Equipment Under Test, **AE** – Auxiliary/Associated Equipment, or **SIM** – Simulator (Not Subjected to Test)				

1.3.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	USB	I/O	N	N	None

Note:
AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

1.3.3 EUT Internal Operating Frequencies:

Frequency (MHz)	Description
3.58	Microcontroller
0.12786	Transmit Frequency
418	Receive Frequency
0.008	Pulse Generator
48	USB UART

1.3.4 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	9	-	-	DC	-	Battery Powered

1.4 EUT Configurations

Mode #	Description
1	EUT connected to PC via USB. PC running Hyper Terminal reading data from EUT. EUT tested in X, Y, Z axis

1.5 EUT Operation Modes

Mode #	Description
1	8kHz Pulses active, Transmit 127.86kHz
2	Transmit 127.86kHz only

2.0 Summary

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

2.1 Deviations from standard test methods

None

2.2 Device Modifications Necessary for Compliance

None

2.3 Reference Standards

Standard Number	Standard Name	Standard Date
47 CFR Part 15	Code of Federal Regulations, Part 15, Radio Frequency Devices	2007
RSS-210	Low-power License exempt Radiocommunication Devices (all Frequency Band): Category 1 Equipment	2007
RSS-Gen	General Requirements and Information for the Certification of Radiocommunication Equipment	2007

2.4 Results Summary

This product is considered Class B

Requirement – Test	Result (Compliant / Non-Compliant)*
Radiated Emissions	Compliant
99% Occupied Bandwidth	Compliant

Test Engineer:

Michael Ferrer (Ext.41312)
Project Engineer
International EMC Services
Conformity Assessment Services-

Reviewer:

Bartlomiej Mucha (Ext.41216)
Senior Project Engineer
International EMC Services
Conformity Assessment Services

Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

4.0 EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

---------- North America ----------

Code of Federal Regulations Title 47	Part 15, Radio Frequency Devices
Industry Canada	RSS-210, RSS-GEN

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

Ambient Temperature, °C	22.5 ± 2.5	Relative Humidity, %	45 ± 15	Barometric Pressure, mBar	950 ± 150

4.1 t Conditions and Results – 99% Occupied Bandwidth

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.
Basic Standard	RSS-210, RSS-GEN
99% Occupied Bandwidth	
2.37 kHz	

Table 1 Occupied Bandwidth Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	2
Supplementary information: None		

Table 2 Occupied Bandwidth Spectrum Analyzer Settings

Resolution Bandwidth	Occupied Bandwidth Requirements
	%
1kHz (1% of the Span)	99
Supplementary information: None	

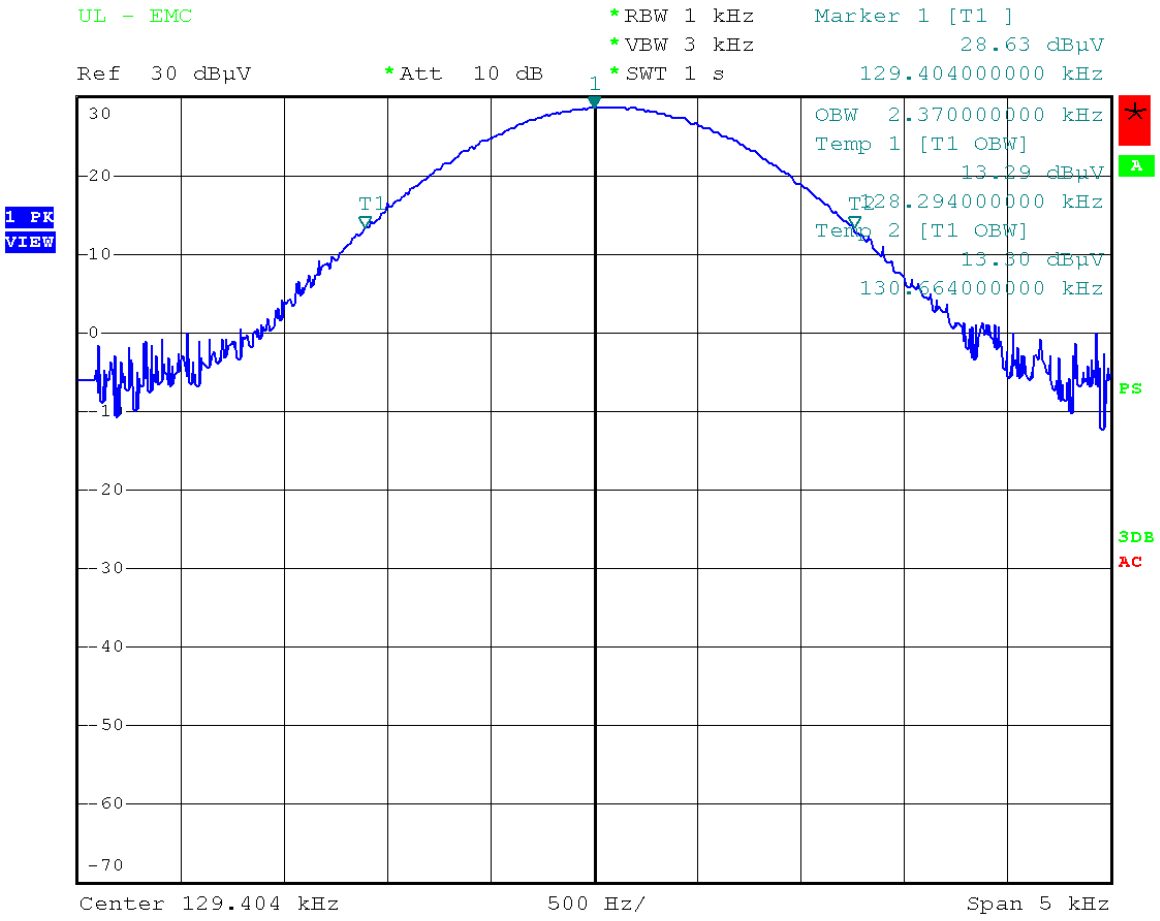
Table 3 Occupied Bandwidth Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
Receiver	Rhode & Schwartz	ESU	EMC 4323
Antenna	EMCO	901	SN 0110

Figure 1 Test Setup for Occupied Bandwidth

See Test Setup Photos Exhibit

Figure 2 Occupied Bandwidth Graph



Date: 17.JUL.2008 20:51:52

4.2 t Conditions and Results – RADIATED EMISSIONS

Test Description	Measurements were made in a 3 and 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 and 10-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.	
Basic Standard	FCC Part 15, Subpart C, 15.209, RSS-210 Sec. 2.6, RSS-GEN Sec. 6	
UL LPG	80-EM-S0029	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	9kHz – 30MHz	(3 meter measurement distance)
	30MHz – 1GHz	(10 meter measurement distance)
	1GHz – 2 GHz	(3 meter measurement distance)

Limits - Class B

Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Average
0.009-.090	N/A	128.5 – 108.3
0.090-0.110	108.3 – 106.8	N/A
0.110-0.490	N/A	106.8 - 93.8
0.490 – 1.705	73.8 – 63	NA
1.705 – 30	69.5	NA
30-88	29.6	NA
88-216	33.1	NA
216-960	35.6	NA
Above 960	NA	54

Supplementary information: None

*Fundamental Frequency 127.86kHz was not visible above the noise floor during testing.

Table 4 Radiated Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1,2
Supplementary information: None		

Table 5 Radiated Emissions Test Equipment

Description	Manufacturer	Model	Identifier
Spectrum Analyzer	HP	8566B	EMC4085
Quasi-Peak Detector	HP	85650A	EMC4016
Bicon Antenna	Chase	VBA6106A	EMC4078
Log-P Antenna	Chase	UPA6109	EMC4313
Loop Antenna	EMCO	6502/1	EMC4026
Spectrum Analyzer	Rhode & Schwartz	FSEK	EMC4182
Antenna Array	UL	BOMS	EMC4276

Figure 3 Test setup for Radiated Emissions

See Test Setup Photos Exhibit

Figure 4 Radiated Emissions Graph

Operation Mode #2

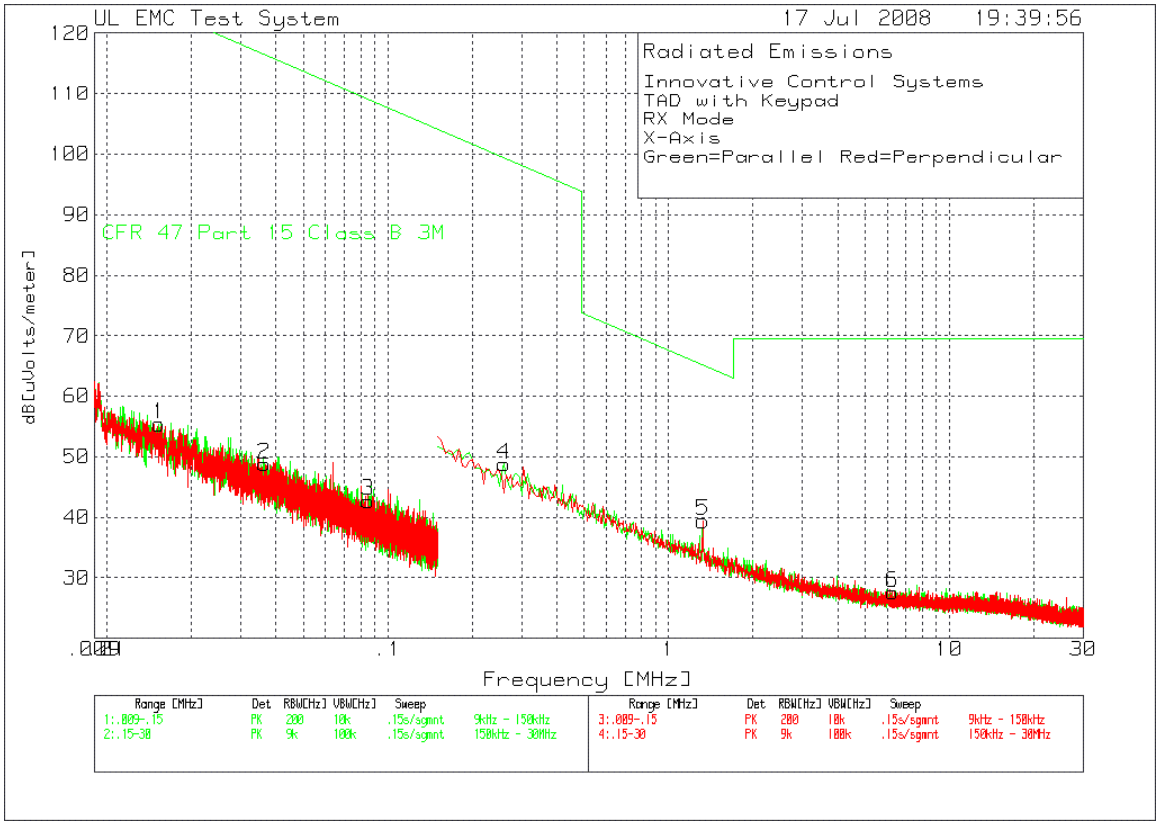


Table 6 Radiated Emissions Data Points

Innovative Control Systems
S-TAD
X-Axis
Green=Parallel Red=Perpendicular

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
9kHz - 150kHz .009 - .15MHz											
1	.01533	35.8 pk	0	19.6	55.4	123.9	-	-	-	-	-
	Azimuth:43			Margin [dB]		-68.5	-	-	-	-	-
2	.03632	33.8 pk	0	15	48.8	116.4	-	-	-	-	-
	Azimuth:341			Margin [dB]		-67.6	-	-	-	-	-
3	.08497	29.8 pk	0	12.9	42.7	109	-	-	-	-	-
	Azimuth:197			Margin [dB]		-66.3	-	-	-	-	-
150kHz - 30MHz .15 - 30MHz											
4	.25936	36.4 pk	.1	12.3	48.8	99.4	-	-	-	-	-
	Azimuth:342			Margin [dB]		-50.6	-	-	-	-	-
5	1.32312	27 pk	.2	12.2	39.4	65.2	-	-	-	-	-
	Azimuth:97			Margin [dB]		-25.8	-	-	-	-	-
6	6.2741	15.8 pk	.3	11.5	27.6	69.5	-	-	-	-	-
	Azimuth:77			Margin [dB]		-41.9	-	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 3M

pk - Peak detector

Figure 5 Radiated Emissions Graph

Operation Mode #1

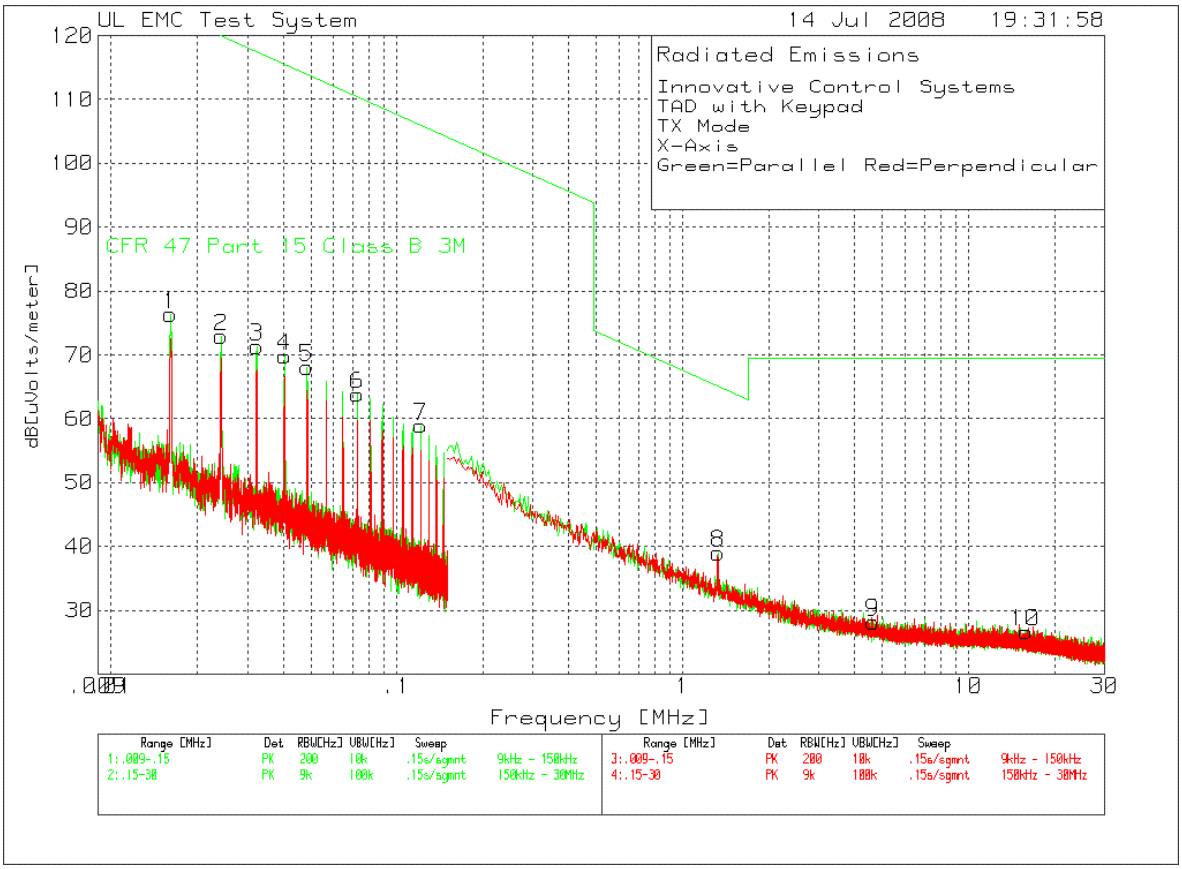


Table 7 Radiated Emissions Data Points

Innovative Control Systems
S-TAD
TX Mode
X-Axis
Green=Parallel Red=Perpendicular

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
9kHz - 150kHz .009 - .15MHz											
1	.01615	57.1 pk	0	19.3	76.4	123.4	-	-	-	-	-
	Azimuth:119			Margin [dB]		-47	-	-	-	-	-
2	.02426	56.3 pk	0	16.6	72.9	119.9	-	-	-	-	-
	Azimuth:3			Margin [dB]		-47	-	-	-	-	-
3	.03232	56 pk	0	15.3	71.3	117.4	-	-	-	-	-
	Azimuth:344			Margin [dB]		-46.1	-	-	-	-	-
4	.04042	55.1 pk	0	14.7	69.8	115.5	-	-	-	-	-
	Azimuth:10			Margin [dB]		-45.7	-	-	-	-	-
5	.04849	54.2 pk	0	13.9	68.1	113.9	-	-	-	-	-
	Azimuth:16			Margin [dB]		-45.8	-	-	-	-	-
6	.07277	50.7 pk	0	13.1	63.8	110.4	-	-	-	-	-
	Azimuth:10			Margin [dB]		-46.6	-	-	-	-	-
7	.12127	46.1 pk	0	12.8	58.9	106	-	-	-	-	-
	Azimuth:1			Margin [dB]		-47.1	-	-	-	-	-
150kHz - 30MHz .15 - 30MHz											
8	1.32802	26.6 pk	.2	12.2	39	65.2	-	-	-	-	-
	Azimuth:121			Margin [dB]		-26.2	-	-	-	-	-
9	4.63839	16.3 pk	.3	11.6	28.2	69.5	-	-	-	-	-
	Azimuth:239			Margin [dB]		-41.3	-	-	-	-	-
10	15.88172	15.2 pk	.5	10.9	26.6	69.5	-	-	-	-	-
	Azimuth:33			Margin [dB]		-42.9	-	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 3M

pk - Peak detector

Figure 6 Radiated Emissions Graph

Operation Mode #1

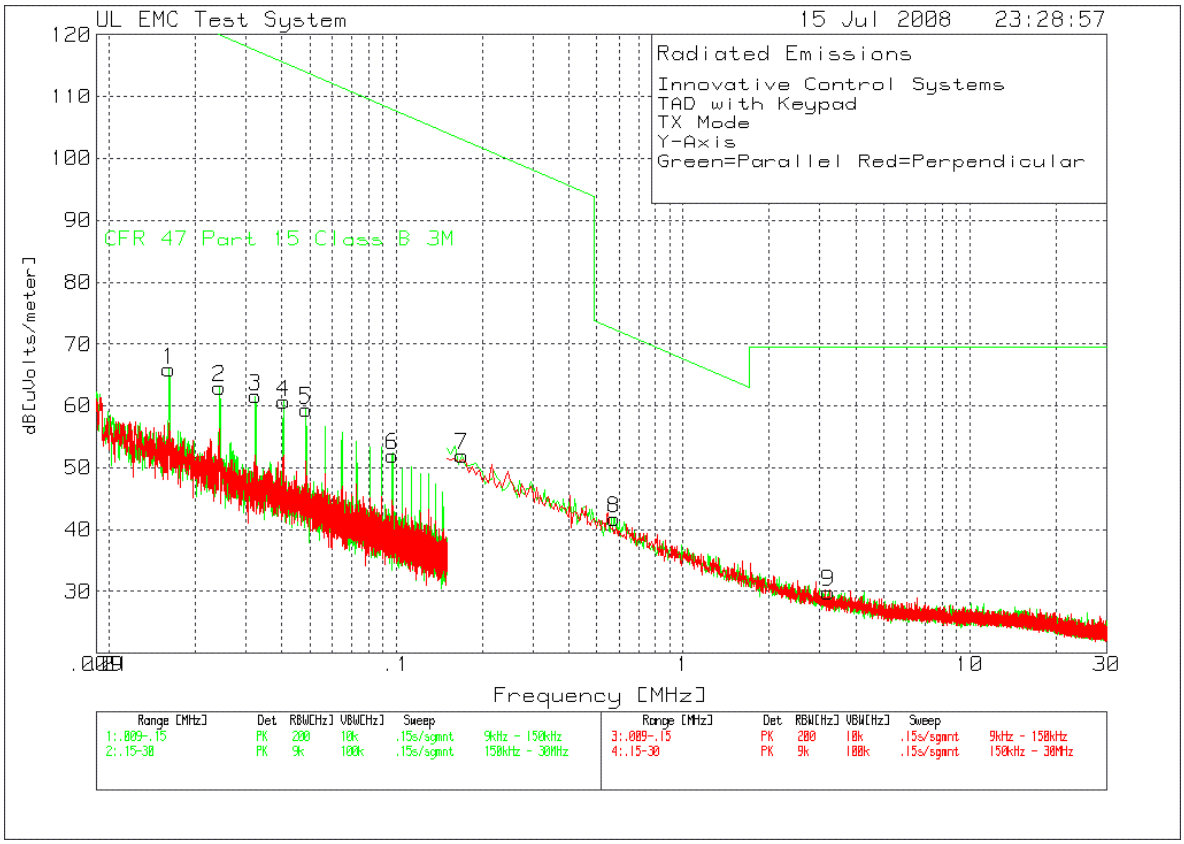


Table 8 Radiated Emissions Data Points

Innovative Control Systems
S-TAD
TX Mode
Y-Axis
Green=Parallel Red=Perpendicular

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
9kHz - 150kHz .009 - .15MHz											
1	.01616	46.7 pk	0	19.2	65.9	123.4	-	-	-	-	-
	Azimuth:281			Margin [dB]		-57.5	-	-	-	-	-
2	.02426	46.4 pk	0	16.6	63	119.9	-	-	-	-	-
	Azimuth:281			Margin [dB]		-56.9	-	-	-	-	-
3	.03233	46.3 pk	0	15.3	61.6	117.4	-	-	-	-	-
	Azimuth:281			Margin [dB]		-55.8	-	-	-	-	-
4	.04044	46 pk	0	14.7	60.7	115.5	-	-	-	-	-
	Azimuth:272			Margin [dB]		-54.8	-	-	-	-	-
5	.04851	45.5 pk	0	13.9	59.4	113.9	-	-	-	-	-
	Azimuth:196			Margin [dB]		-54.5	-	-	-	-	-
6	.09703	39.1 pk	0	12.9	52	107.9	-	-	-	-	-
	Azimuth:238			Margin [dB]		-55.9	-	-	-	-	-
150kHz - 30MHz .15 - 30MHz											
7	.16988	39.3 pk	.1	12.6	52	103	-	-	-	-	-
	Azimuth:281			Margin [dB]		-51	-	-	-	-	-
8	.57501	29.5 pk	.1	12.2	41.8	72.4	-	-	-	-	-
	Azimuth:131			Margin [dB]		-30.6	-	-	-	-	-
9	3.20708	17.8 pk	.2	11.9	29.9	69.5	-	-	-	-	-
	Azimuth:262			Margin [dB]		-39.6	-	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 3M

pk - Peak detector

Figure 7 Radiated Emissions Graph

Operation Mode #1

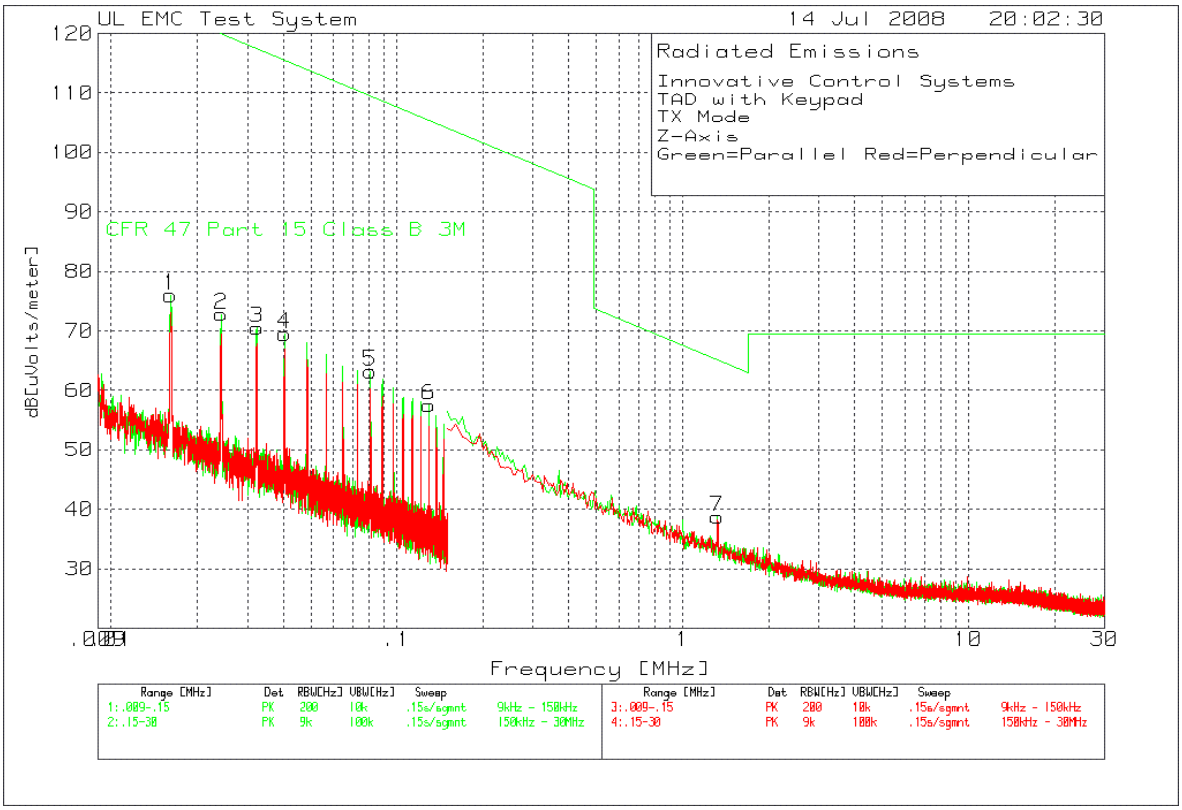


Table 9 Radiated Emissions Data Points

Innovative Control Systems
S-TAD
TX Mode
Z-Axis
Green=Parallel Red=Perpendicular

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
9kHz - 150kHz .009 - .15MHz											
1	.01615	56.7 pk	0	19.3	76	123.4	-	-	-	-	-
	Azimuth:158			Margin [dB]		-47.4	-	-	-	-	-
2	.02426	56.2 pk	0	16.6	72.8	119.9	-	-	-	-	-
	Azimuth:271			Margin [dB]		-47.1	-	-	-	-	-
3	.03232	55.2 pk	0	15.3	70.5	117.4	-	-	-	-	-
	Azimuth:271			Margin [dB]		-46.9	-	-	-	-	-
4	.04042	54.8 pk	0	14.7	69.5	115.5	-	-	-	-	-
	Azimuth:281			Margin [dB]		-46	-	-	-	-	-
5	.08086	50.3 pk	0	12.9	63.2	109.5	-	-	-	-	-
	Azimuth:272			Margin [dB]		-46.3	-	-	-	-	-
6	.12936	44.6 pk	.1	12.8	57.5	105.4	-	-	-	-	-
	Azimuth:320			Margin [dB]		-47.9	-	-	-	-	-
150kHz - 30MHz .15 - 30MHz											
7	1.32312	26.3 pk	.2	12.2	38.7	65.2	-	-	-	-	-
	Azimuth:347			Margin [dB]		-26.5	-	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 3M
pk - Peak detector

Figure 8 Radiated Emissions Graph

Operation Mode #1

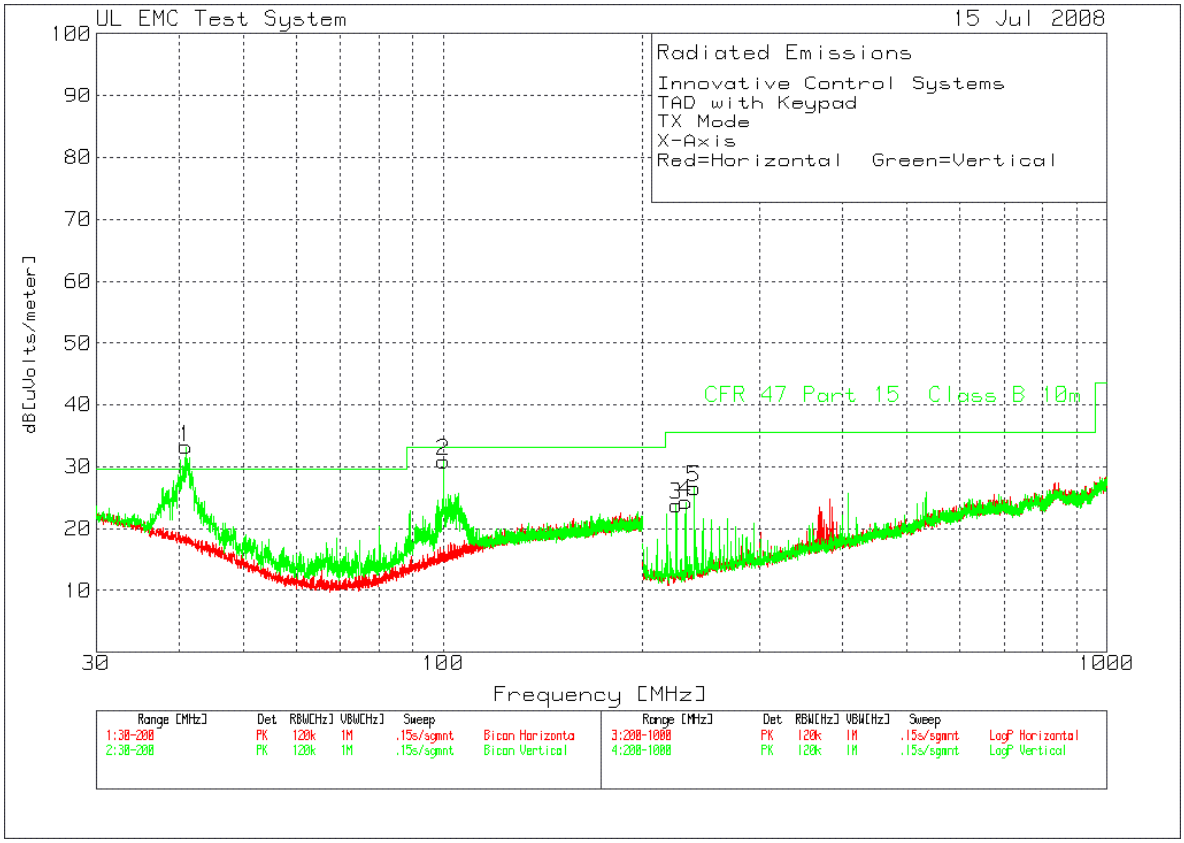


Table 10 Radiated Emissions Data Points

Innovative Control Systems
S-TAD
TX Mode
X-Axis
Red=Horizontal Green=Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Bicon Vertical 30 - 200MHz ----------											
1	40.9568	49.9 pk	-30.3	13.6	33.2	29.6	-	-	-	-	-
	Azimuth:3	Height:100 Vert		Margin [dB]		3.6	-	-	-	-	-
2	100.1574	50.2 pk	-30	10.7	30.9	33.1	-	-	-	-	-
	Azimuth:25	Height:200 Vert		Margin [dB]		-2.2	-	-	-	-	-
LogP Vertical 200 - 1000MHz ----------											
3	224.5816	46.4 pk	-33.3	10.7	23.8	35.6	-	-	-	-	-
	Azimuth:25	Height:100 Vert		Margin [dB]		-11.8	-	-	-	-	-
4	231.976	46.8 pk	-33.3	10.8	24.3	35.6	-	-	-	-	-
	Azimuth:339	Height:100 Vert		Margin [dB]		-11.3	-	-	-	-	-
5	239.1706	48.6 pk	-33.2	11.2	26.6	35.6	-	-	-	-	-
	Azimuth:351	Height:100 Vert		Margin [dB]		-9	-	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 10m
pk - Peak detector

Innovative Control Systems
S-TAD
TX Mode
X-Axis
Red=Horizontal Green=Vertical

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Bicon Vertical 30 - 200MHz										
99.9983	48.79 qp	-30	10.6	29.39	33.1	---	-	-	-	-
Azimuth: 355	Height:100	Vert		Margin [dB]:	-3.71	----	-	-	-	-
40.9035	42.08 qp	-30.3	13.6	25.38	29.6	---	-	-	-	-
Azimuth: 51	Height:100	Vert		Margin [dB]:	-4.22	-----	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 10m

qp - Quasi-Peak detector

Figure 9 Radiated Emissions Graph

Operation Mode #1

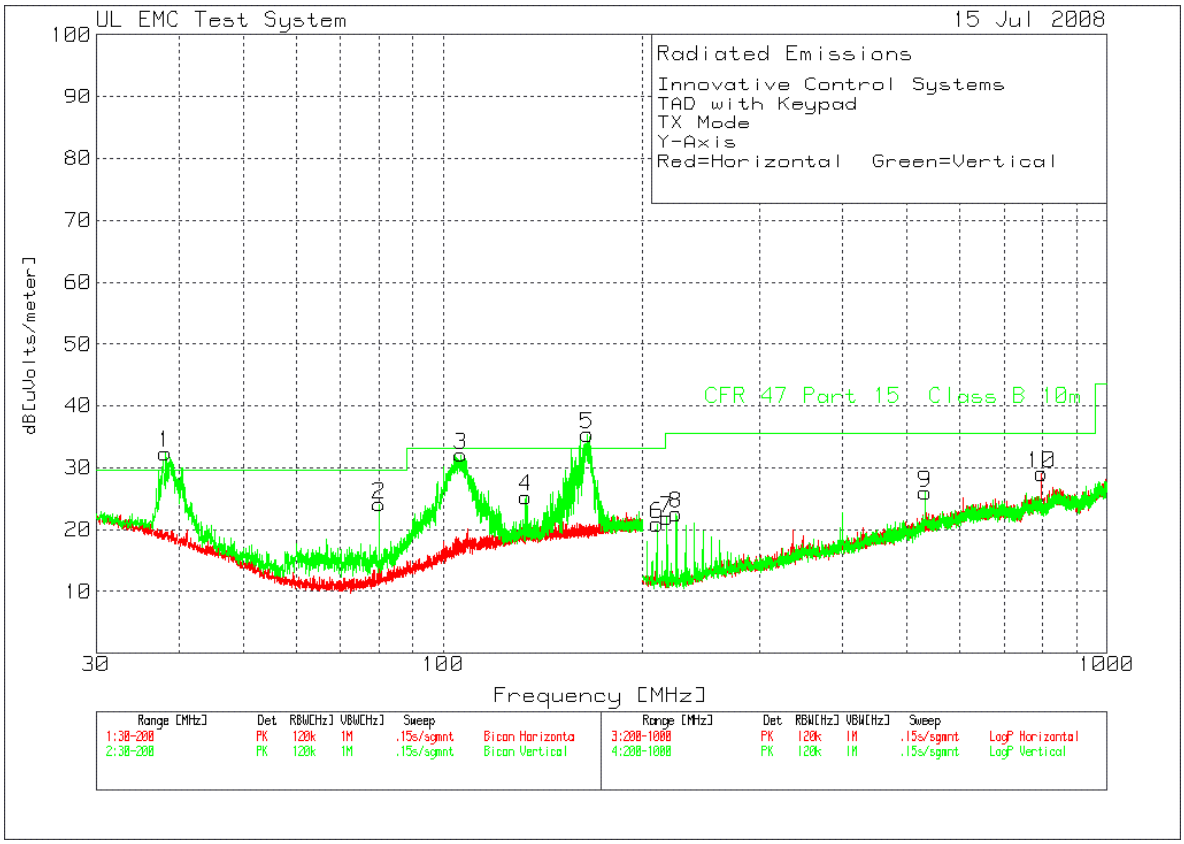


Table 11 Radiated Emissions Data Points

Innovative Control Systems
S-TAD
TX Mode
Y-Axis
Red=Horizontal Green=Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Bicon Vertical 30 - 200MHz											
1	38.1114	48 pk	-30.3	14.7	32.4	29.6	-	-	-	-	-
	Azimuth:95	Height:100 Vert		Margin [dB]		2.8	-	-	-	-	-
2	80.0699	47.1 pk	-30.1	7.1	24.1	29.6	-	-	-	-	-
	Azimuth:284	Height:400 Vert		Margin [dB]		-5.5	-	-	-	-	-
3	106.3153	50.6 pk	-30	11.5	32.1	33.1	-	-	-	-	-
	Azimuth:133	Height:100 Vert		Margin [dB]		-1	-	-	-	-	-
4	133.1976	41.3 pk	-30.1	14.1	25.3	33.1	-	-	-	-	-
	Azimuth:231	Height:100 Vert		Margin [dB]		-7.8	-	-	-	-	-
5	164.9638	50.4 pk	-30	15	35.4	33.1	-	-	-	-	-
	Azimuth:347	Height:100 Vert		Margin [dB]		2.3	-	-	-	-	-
LogP Horizontal 200 - 1000MHz											
10	798.1514	39.3 pk	-31.5	21.3	29.1	35.6	-	-	-	-	-
	Azimuth:234	Height:100 Horz		Margin [dB]		-6.5	-	-	-	-	-
LogP Vertical 200 - 1000MHz											
6	209.9925	43.4 pk	-33.4	10.9	20.9	33.1	-	-	-	-	-
	Azimuth:66	Height:99 Vert		Margin [dB]		-12.2	-	-	-	-	-
7	217.387	44.5 pk	-33.4	10.8	21.9	35.6	-	-	-	-	-
	Azimuth:16	Height:99 Vert		Margin [dB]		-13.7	-	-	-	-	-
8	224.5816	45.2 pk	-33.3	10.7	22.6	35.6	-	-	-	-	-
	Azimuth:11	Height:99 Vert		Margin [dB]		-13	-	-	-	-	-
9	532.9503	38.9 pk	-31.7	18.8	26	35.6	-	-	-	-	-
	Azimuth:344	Height:99 Vert		Margin [dB]		-9.6	-	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 10m
pk - Peak detector

Innovative Control Systems
S-TAD
TX Mode
Y-Axis
Red=Horizontal Green=Vertical

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Bicon Vertical 30 - 200MHz										
38.554	43.71 qp	-30.3	14.6	28.01	29.6	-	-	-	-	-
Azimuth: 70	Height:115 Vert		Margin [dB]:		-1.59	-	-	-	-	-
80.0105	45.24 qp	-30.1	7.1	22.24	29.6	-	-	-	-	-
Azimuth: 55	Height:396 Vert		Margin [dB]:		-7.36	-	-	-	-	-
105.984	46.55 qp	-30	11.5	28.05	33.1	-	-	-	-	-
Azimuth: 242	Height:101 Vert		Margin [dB]:		-5.05	-	-	-	-	-
133.242	36.5 qp	-30.1	14.1	20.5	33.1	-	-	-	-	-
Azimuth: 314	Height:108 Vert		Margin [dB]:		-12.6	-	-	-	-	-
162.762	44.48 qp	-29.9	15	29.58	33.1	-	-	-	-	-
Azimuth: 141	Height:100 Vert		Margin [dB]:		-3.52	-	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 10m
qp - Quasi-Peak detector

Figure 10 Radiated Emissions Graph

Operation Mode #1

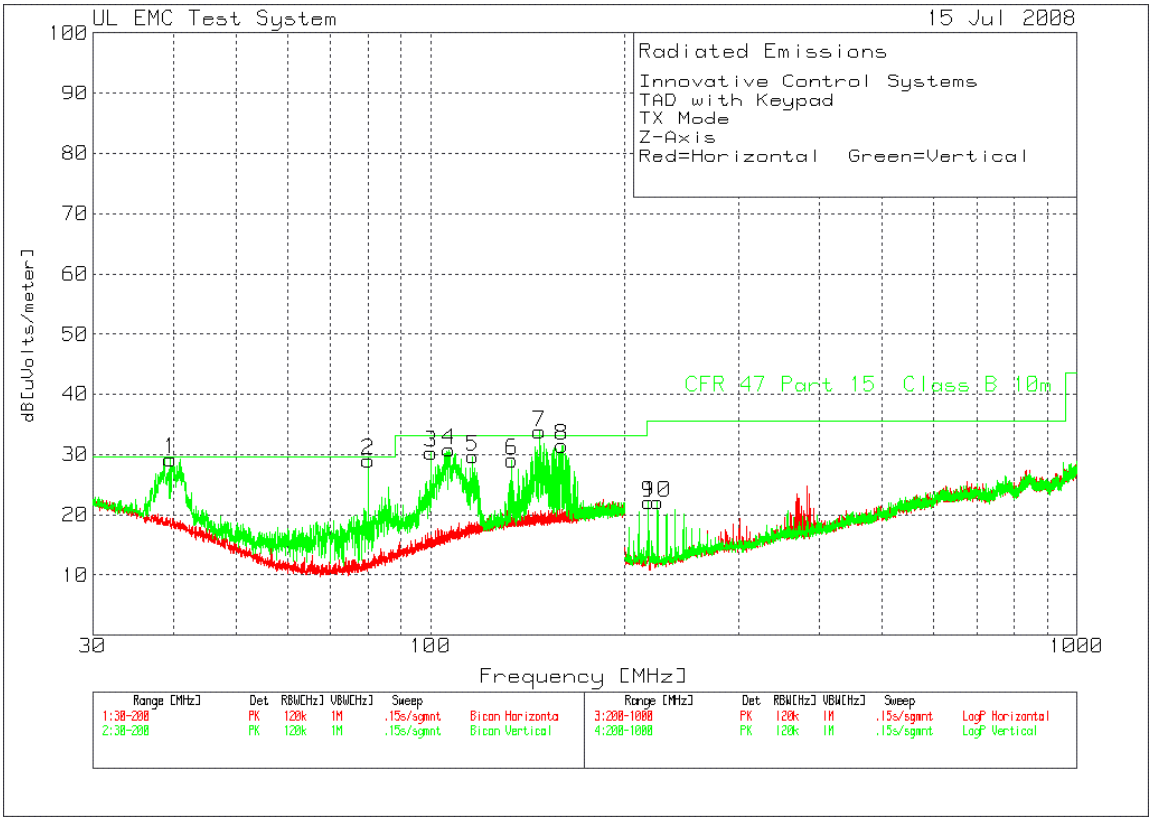


Table 12 Radiated Emissions Data Points

Innovative Control Systems
S-TAD
TX Mode
Z-Axis
Red=Horizontal Green=Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Bicon Vertical 30 - 200MHz											
1	39.5553	45.3 pk	-30.3	14.2	29.2	29.6	-	-	-	-	-
	Azimuth:294	Height:100 Vert		Margin [dB]		-.4	-	-	-	-	-
2	80.1124	52 pk	-30.1	7.1	29	29.6	-	-	-	-	-
	Azimuth:352	Height:400 Vert		Margin [dB]		-.6	-	-	-	-	-
3	100.1999	49.6 pk	-30	10.7	30.3	33.1	-	-	-	-	-
	Azimuth:11	Height:100 Vert		Margin [dB]		-2.8	-	-	-	-	-
4	106.8673	49.1 pk	-29.9	11.6	30.8	33.1	-	-	-	-	-
	Azimuth:68	Height:100 Vert		Margin [dB]		-2.3	-	-	-	-	-
5	116.2528	46.9 pk	-30	12.8	29.7	33.1	-	-	-	-	-
	Azimuth:267	Height:100 Vert		Margin [dB]		-3.4	-	-	-	-	-
6	133.6223	45 pk	-30.1	14.2	29.1	33.1	-	-	-	-	-
	Azimuth:166	Height:100 Vert		Margin [dB]		-4	-	-	-	-	-
7	147.3395	49.1 pk	-30	14.7	33.8	33.1	-	-	-	-	-
	Azimuth:154	Height:100 Vert		Margin [dB]		.7	-	-	-	-	-
8	159.6977	46.5 pk	-30	15	31.5	33.1	-	-	-	-	-
	Azimuth:332	Height:100 Vert		Margin [dB]		-1.6	-	-	-	-	-
LogP Vertical 200 - 1000MHz											
9	217.387	44.7 pk	-33.4	10.8	22.1	35.6	-	-	-	-	-
	Azimuth:332	Height:301 Vert		Margin [dB]		-13.5	-	-	-	-	-
10	224.5816	44.7 pk	-33.3	10.7	22.1	35.6	-	-	-	-	-
	Azimuth:130	Height:301 Vert		Margin [dB]		-13.5	-	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 10m
pk - Peak detector

Innovative Control Systems
S-TAD
TX Mode
Z-Axis
Red=Horizontal Green=Vertical

Frequency [MHz]	Test Reading [dB(uV)]	Meter Factor [dB]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Bicon Vertical 30 - 200MHz											
80.0011	50.5 qp	-30.1	7.1	27.5	29.6	-	-	-	-	-	
Azimuth: 6	Height:400 Vert		Margin [dB]:		-2.1	-	-	-	-	-	
106.5555	43.11 qp	-30	11.6	24.71	33.1	-	-	-	-	-	
Azimuth: 193	Height:100 Vert		Margin [dB]:		-8.39	-	-	-	-	-	
40.662	39.69 qp	-30.3	13.7	23.09	29.6	-	-	-	-	-	
Azimuth: 131	Height:104 Vert		Margin [dB]:		-6.51	-	-	-	-	-	
100.0045	45.82 qp	-30	10.6	26.42	33.1	-	-	-	-	-	
Azimuth: 82	Height:109 Vert		Margin [dB]:		-6.68	-	-	-	-	-	
147.6245	40.66 qp	-30	14.7	25.36	33.1	-	-	-	-	-	
Azimuth: 143	Height:104 Vert		Margin [dB]:		-7.74	-	-	-	-	-	
158.147	34.4 qp	-29.9	14.9	19.4	33.1	-	-	-	-	-	
Azimuth: 313	Height:102 Vert		Margin [dB]:		-13.7	-	-	-	-	-	
117.851	32.37 qp	-30	13	15.37	33.1	-	-	-	-	-	
Azimuth: 26	Height:100 Vert		Margin [dB]:		-17.73	-	-	-	-	-	
133.2563	42.8 qp	-30.1	14.1	26.8	33.1	-	-	-	-	-	
Azimuth: 224	Height:108 Vert		Margin [dB]:		-6.3	-	-	-	-	-	

LIMIT 1: CFR 47 Part 15 Class B 10m
qp - Quasi-Peak detector

Figure 11 Radiated Emissions Graph

Operation Mode #2

Table 13 Radiated Emissions Data Points

Innovatative Control Systems
S-TAD
X-Axis
Red=Horizontal Green=Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
1 - 2GHz 1000 - 2000MHz											
1	1130.261	58.43 pk	-56.1	24.5	26.83	54	-	-	-	-	-
		Height:100 Vert	Margin [dB]		-27.17		-	-	-	-	-
2	1390.782	59.53 pk	-55.44	25.1	29.19	54	-	-	-	-	-
		Height:100 Vert	Margin [dB]		-24.81		-	-	-	-	-
3	1565.13	56.89 pk	-54.6	25.7	27.99	54	-	-	-	-	-
		Height:200 Vert	Margin [dB]		-26.01		-	-	-	-	-
4	1731.463	56.16 pk	-53.86	26.4	28.7	54	-	-	-	-	-
		Height:100 Vert	Margin [dB]		-25.3		-	-	-	-	-
5	1855.711	59.19 pk	-53.67	26.9	32.42	54	-	-	-	-	-
		Height:150 Vert	Margin [dB]		-21.58		-	-	-	-	-
6	1979.96	59.27 pk	-53.11	27.4	33.56	54	-	-	-	-	-
		Height:150 Vert	Margin [dB]		-20.44		-	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 3m

pk - Peak detector

Figure 12 Radiated Emissions Graph

Operation Mode #2

Table 14 Radiated Emissions Data Points

Innovatative Control Systems
S-TAD
Y-Axis
Red=Horizontal Green=Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
1 - 2GHz 1000 - 2000MHz											
1	1142.285	59.77 pk	-56.12	24.5	28.15	54	-	-	-	-	-
		Height:100 Vert	Margin [dB]		-25.85		-	-	-	-	-
2	1396.794	59.88 pk	-55.39	25.2	29.69	54	-	-	-	-	-
		Height:151 Vert	Margin [dB]		-24.31		-	-	-	-	-
3	1589.178	57.12 pk	-54.38	25.8	28.54	54	-	-	-	-	-
		Height:100 Vert	Margin [dB]		-25.46		-	-	-	-	-
4	1757.515	56.42 pk	-53.78	26.5	29.14	54	-	-	-	-	-
		Height:200 Vert	Margin [dB]		-24.86		-	-	-	-	-
5	1941.884	56.76 pk	-53.27	27.3	30.79	54	-	-	-	-	-
		Height:100 Vert	Margin [dB]		-23.21		-	-	-	-	-
6	1979.96	57.44 pk	-53.11	27.4	31.73	54	-	-	-	-	-
		Height:100 Vert	Margin [dB]		-22.27		-	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 3m

pk - Peak detector

Figure 13 Radiated Emissions Graph

Operation Mode #2

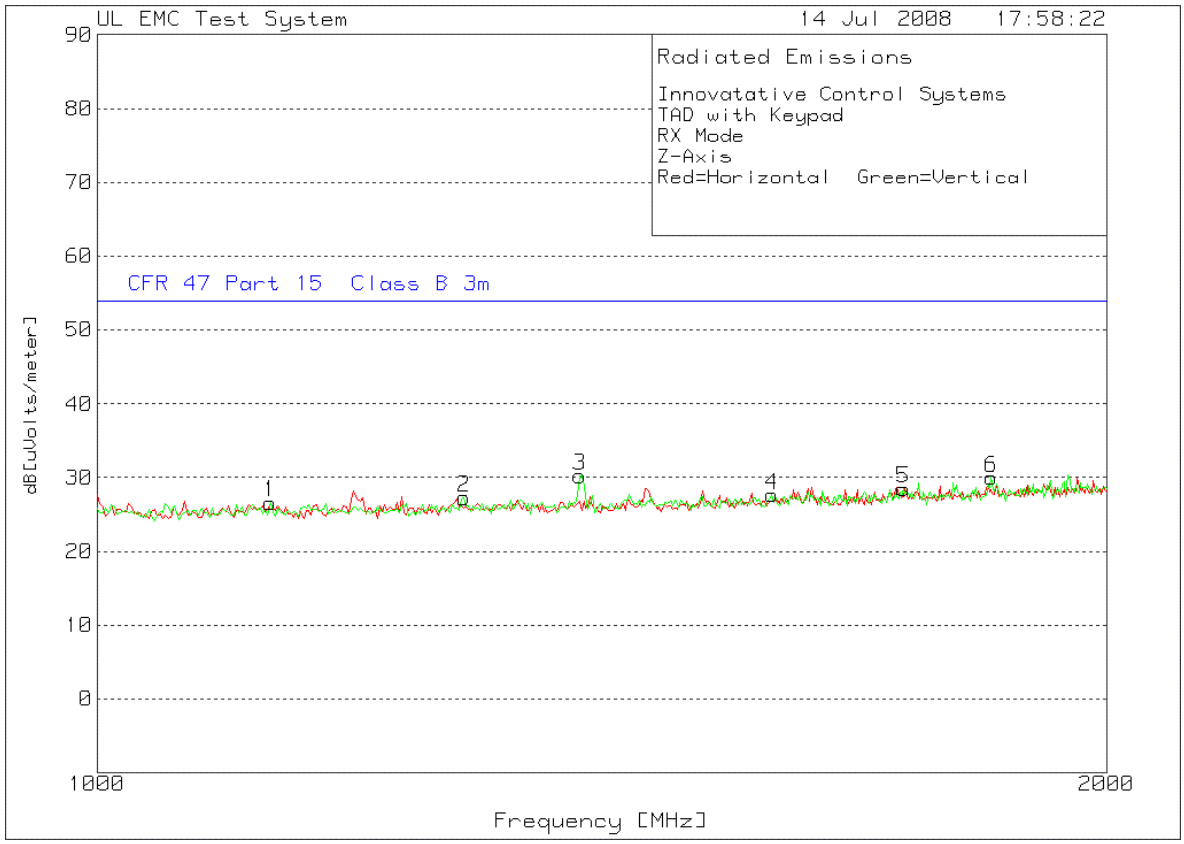


Table 15 Radiated Emissions Data Points

Innovatative Control Systems
S-TAD
Z-Axis
Red=Horizontal Green=Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
1 - 2GHz 1000 - 2000MHz											
1	1126.253	58.15 pk	-56.07	24.5	26.58	54	-	-	-	-	-
		Height:150 Vert		Margin [dB]		-27.42	-	-	-	-	-
2	1286.573	57.82 pk	-55.44	24.9	27.28	54	-	-	-	-	-
		Height:150 Vert		Margin [dB]		-26.72	-	-	-	-	-
3	1392.786	60.56 pk	-55.42	25.1	30.24	54	-	-	-	-	-
		Height:200 Vert		Margin [dB]		-23.76	-	-	-	-	-
4	1589.178	56.22 pk	-54.38	25.8	27.64	54	-	-	-	-	-
		Height:150 Vert		Margin [dB]		-26.36	-	-	-	-	-
5	1739.479	55.85 pk	-53.79	26.4	28.46	54	-	-	-	-	-
		Height:200 Vert		Margin [dB]		-25.54	-	-	-	-	-
6	1847.695	56.79 pk	-53.71	26.9	29.98	54	-	-	-	-	-
		Height:101 Vert		Margin [dB]		-24.02	-	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 3m
pk - Peak detector

5.0 IMMUNITY TEST RESULTS

Immunity is not required per standard.

Appendix A

Accreditations and Authorizations

NVLAP Lab code: 100414-0

NVLAP: The National Institute of Standards and Technology (NIST) administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP is comprised of laboratory accreditation programs (LAPs) which are established on the basis of requests and demonstrated need. Each LAP includes specific calibration and/or test standards and related methods and protocols assembled to satisfy the unique needs for accreditation in a field of testing or calibration. NVLAP accredits public and private laboratories based on evaluation of their technical qualifications and competence to carry out specific calibrations or tests. Accreditation criteria are established in accordance with the U.S. Code of Federal Regulations (CFR, Title 15, Part 285), NVLAP Procedures and General Requirements, and encompass the requirements of ISO/IEC 17025. For a full scope listing see http://ts.nist.gov/ts/htdocs/210/214/scopes/1004140.htm

FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91044).

Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2180

VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: Radiated Emissions R-621, Conducted Emissions C-642.

ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).

NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.
NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).
NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6