



EMC EMISSIONS - TEST REPORT (Full)

Test Report No. **3137612DEN-002** Issue Date: **Mon 19/November/2007**

Model / Serial No. **MN: SM02/SN: 30212**

Product Type **Wireless alcohol monitoring bracelet/SCRAM II Bracelet**

Client **Alcohol Monitoring Systems**

Manufacturer **Alcohol Monitoring Systems**

License holder **Alcohol Monitoring Systems**

Address **1241 West Mineral Ave.**

Littleton, CO 80120

Test Criteria Applied
Test Result

FCC CFR47 Part 15.249

PASS

Title 47 CFR 15: RADIO FREQUENCY DEVICES

Test Project Number
References
Total Pages
Including
Appendices:

3137612

29

Michael Spataro

Robert Cresswell

Tested By : Michael Spataro

Reviewed By : Robert Cresswell

REVISION SUMMARY - The following changes have been made to this Report:

Rev.	Revision Statement	Author	Revision Date
	Initial Release of Document	See above	See above

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.



Lab Code:200264-0

The entity logos above are for reference only and may not apply to this test report.

DIRECTORY

Documentation	Page(s)
Test report	<u>1 - 29</u>
Directory	<u>2</u>
Test Regulations	<u>3</u>
General Remarks	<u>4</u>
Test-setup Photographs	<u>5 - 8</u>
Appendix A	
Test Data Sheets and Test Equipment Used	<u>9 - 17</u>
Appendix B	
Test Plan/Constructional Data Form	<u>18 - 24</u>
Appendix C	
Measurement Protocol/Test Procedures	<u>25 - 29</u>

STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The measurement uncertainty for Conducted Emissions in the frequency range of 150kHz – 30MHz is calculated to be $\pm 2.30\text{dB}$ and for Radiated Emissions is calculated to be $\pm 3.60\text{dB}$ in the frequency range of 30MHz – 200MHz and $\pm 3.38\text{dB}$ in the frequency range of 200MHz – 1000MHz.

EUT Received Date: 13-Nov-2007

Testing Start Date: 13-Nov-2007

Testing End Date: 13-Nov-2007

The tests were performed according to following regulations :

1. FCC CFR47 Part 15 subpart C
2. FCC CFR47 Part 15 subpart B

Emission Test Results:

Conducted Emissions, Powerline 15.207 - NA

Test Result

Minimum limit margin 0.0 dB at 0.0 MHz

Remarks: EUT is battery powered.

Radiated Emissions 15.209/15.109 - PASS

Test Result

Minimum limit margin -19.4 dB at 43.66 MHz

Remarks: _____

Radiated Emissions 15.249 (a) Fundamental - PASS

Test Result

Minimum limit margin -1.0 dB at 916.47 MHz

Remarks: _____

Radiated Emissions 15.249 (a) Harmonics of the Fundamental - PASS

Test Result

Minimum limit margin -0.2 dB at 6415.31 MHz

Remarks: _____

GENERAL REMARKS:

The following remarks are to be considered as “where applicable” and are taken into account while completing any FCC/IC/ETSI radio tests at Intertek.

Testing was performed in 3 different orthogonal axis to determine the worst case emissions from the device. The worst case emissions measurements are shown in this report.

FCC CFR47 Part 15.31: Measurement Standards: In any case where the device is powered off a battery, a fresh battery was used during test. In cases where the device is powered off an AC supply, voltage was varied per Part 15.31 to find worst case emissions.

FCC CFR47 Part 15.35: Measurement Detector Functions and Bandwidths: FCC Part 15.35 was utilized when performing the measurements within this report.

Sample:

Production Prototype See RFQ

Modifications required to pass: None

Test Specification Deviations: Additions to or Exclusions from: None

Test-setup photo(s):
Conducted Emissions

Not Applicable

Test-setup photo(s):
Radiated Emissions: Intentional and Unintentional Emissions



Test-setup photo(s):
Radiated Emissions: Intentional and Unintentional Emissions



Test-setup photo(s):
Radiated Emissions: Intentional and Unintentional Emissions



Appendix A

Test Data Sheets
and
Test Equipment Used

**Radiated Unintentional Emission
15.109**

And

**Spurious Emission
15.249 (d)
15.209**

Radiated Electromagnetic Emissions

Test Report #: 3137612 Run 02	Test Area: Pinewood Site 1 (3m)	Temperature: 23.5 °C
Test Method: FCC Part 15.209	Test Date: 13-Nov-2007	Relative Humidity: 24.8 %
EUT Model #: SM02	EUT Power: 3VDC	Air Pressure: 101 kPa
EUT Serial #: 30212		
Manufacturer: AMS		
EUT Description: Wireless alcohol monitoring bracelet/SCRAM II Bracelet		
Notes: _____		

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz	N/A
No emissions seen 200 to 1000 MHz Horizontal.						
Noise floor.						
205.59	22.8 Qp	1.5 / 11.2 / 27.3	8.2	H / 1.0 / 0.0	-35.3	N/A
500.00	19.6 Qp	2.6 / 18.1 / 28.2	12.1	H / 1.0 / 0.0	-33.9	N/A
995.00	18.3 Qp	3.7 / 23.8 / 27.2	18.6	H / 1.0 / 0.0	-35.4	N/A
No emissions seen 200 to 1000 MHz Vertical.						
Noise floor.						
250.00	27.6 Qp	1.7 / 12.5 / 27.1	14.7	V / 1.0 / 0.0	-31.3	N/A
550.00	19.1 Qp	2.6 / 18.0 / 28.2	11.6	V / 1.0 / 0.0	-34.4	N/A
990.00	18.2 Qp	3.7 / 23.6 / 27.2	18.3	V / 1.0 / 0.0	-35.7	N/A
43.66	36.5 Qp	0.7 / 10.8 / 28.0	19.9	V / 1.0 / 180.0	-20.1	N/A
43.66	36.2 Qp	0.7 / 10.8 / 28.0	19.6	V / 1.0 / 0.0	-20.4	N/A
43.66	36.2 Qp	0.7 / 10.8 / 28.0	19.7	V / 1.0 / 90.0	-20.3	N/A
43.66	36.1 Qp	0.7 / 10.8 / 28.0	19.6	V / 1.0 / 270.0	-20.4	N/A
No higher emissions seen 30 to 200 MHz Vertical.						
Noise floor.						
80.00	31.1 Qp	0.9 / 6.8 / 27.9	10.9	V / 1.0 / 270.0	-29.1	N/A
195.00	22.4 Qp	1.5 / 13.1 / 27.3	9.6	V / 1.0 / 270.0	-33.9	N/A
The following was maximized between 30 and 200 MHz Vertical.						
43.66	37.1 Qp	0.7 / 10.8 / 28.0	20.6	V / 1.0 / 10.0	-19.4	N/A
No emissions seen 30 to 200 MHz Horizontal.						
Noise floor.						

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz	N/A
30.00	22.0 Qp	0.5 / 12.8 / 28.1	7.2	H / 2.0 / 270.0	-32.8	N/A
85.00	29.9 Qp	0.9 / 6.9 / 27.8	9.9	H / 2.0 / 270.0	-30.1	N/A
190.00	24.9 Qp	1.4 / 12.7 / 27.4	11.7	H / 2.0 / 270.0	-31.8	N/A
No emissions found 8 to 30 MHz with the loop antenna Parallel to the EUT.						
Noise floor.						
8.00	7.0 Qp	0.2 / 10.8 / 0.0	17.9	V / 1.0 / 0.0	-51.6	N/A
25.00	6.2 Qp	0.5 / 9.1 / 0.0	15.8	V / 1.0 / 0.0	-53.7	N/A
No emissions found 8 to 30 MHz with the loop antenna Perpendicular to the EUT.						
Noise floor.						
10.00	7.5 Qp	0.2 / 10.7 / 0.0	18.4	H / 1.0 / 0.0	-51.3	N/A
20.00	5.5 Qp	0.4 / 10.3 / 0.0	16.2	H / 1.0 / 0.0	-53.3	N/A

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB\m) (dB)	(dBuV)	(m) (DEG)	15.209 <1GHz	N/A
***** Measurement Summary *****						
43.66	37.1 Qp	0.7 / 10.8 / 28.0	20.6	V / 1.0 / 10.0	-19.4	N/A
80.00	31.1 Qp	0.9 / 6.8 / 27.9	10.9	V / 1.0 / 270.0	-29.1	N/A
85.00	29.9 Qp	0.9 / 6.9 / 27.8	9.9	H / 2.0 / 270.0	-30.1	N/A
250.00	27.6 Qp	1.7 / 12.5 / 27.1	14.7	V / 1.0 / 0.0	-31.3	N/A
190.00	24.9 Qp	1.4 / 12.7 / 27.4	11.7	H / 2.0 / 270.0	-31.8	N/A
30.00	22.0 Qp	0.5 / 12.8 / 28.1	7.2	H / 2.0 / 270.0	-32.8	N/A
195.00	22.4 Qp	1.5 / 13.1 / 27.3	9.6	V / 1.0 / 270.0	-33.9	N/A
500.00	19.6 Qp	2.6 / 18.1 / 28.2	12.1	H / 1.0 / 0.0	-33.9	N/A
550.00	19.1 Qp	2.6 / 18.0 / 28.2	11.6	V / 1.0 / 0.0	-34.4	N/A
205.59	22.8 Qp	1.5 / 11.2 / 27.3	8.2	H / 1.0 / 0.0	-35.3	N/A
995.00	18.3 Qp	3.7 / 23.8 / 27.2	18.6	H / 1.0 / 0.0	-35.4	N/A
990.00	18.2 Qp	3.7 / 23.6 / 27.2	18.3	V / 1.0 / 0.0	-35.7	N/A
10.00	7.5 Qp	0.2 / 10.7 / 0.0	18.4	H / 1.0 / 0.0	-51.3	N/A
8.00	7.0 Qp	0.2 / 10.8 / 0.0	17.9	V / 1.0 / 0.0	-51.6	N/A
20.00	5.5 Qp	0.4 / 10.3 / 0.0	16.2	H / 1.0 / 0.0	-53.3	N/A
25.00	6.2 Qp	0.5 / 9.1 / 0.0	15.8	V / 1.0 / 0.0	-53.7	N/A

**Radiated Intentional Emission
15.249**

Field Strength Measurements Fundamental and Spurious of the Transmitter

Test Report #: 3137612 Test Area: Pinewood Site 1 (3m)
 Test Method: FCC CFR 47 part 15.249 Test Date: 13-Nov-2007
 EUT Model #: SM02 EUT Power: 9.6VDC
 EUT Serial #: 30212
 Manufacturer: Alcohol Monitoring Systems
 EUT Description: Wireless alcohol monitoring bracelet/SCRAM II Bracelet
 Notes: _____

Temperature: 23.5 °C
 Relative Humidity: 24.8 %
 Air Pressure: 101 kPa
 Page: _____

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	Duty Cycle Correction	Final Corrected	Limit	DELTA
(MHz)	(dBuV)	(dB) (dBm) (dB)	(dBuV)	(m) (DEG)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
Axis 1 EUT is Vertical on the table.								
916.47	63.9 Pk	3.6 / 22.8 / 0.0	90.3	V / 1.0 / 264.0	0.0	90.3	94	-3.7
916.47	66.6 Pk	3.6 / 22.8 / 0.0	92.9	H / 1.0 / 340.0	0.0	92.9	94	-1.1
Axis 2 EUT is flat on the table.								
916.47	66.0 Pk	3.6 / 22.8 / 0.0	92.3	H / 1.0 / 143.0	0.0	92.3	94	-1.7
916.47	60.8 Pk	3.6 / 22.8 / 0.0	87.1	V / 1.5 / 35.0	0.0	87.1	94	-6.9
Axis 3 EUT is vertical on the table rotated 90 deg.								
916.47	66.7 Pk	3.6 / 22.8 / 0.0	93.0	V / 1.2 / 63.5	0.0	93.0	94	-1.0
916.47	61.5 Pk	3.6 / 22.8 / 0.0	87.8	H / 1.2 / 33.0	0.0	87.8	94	-6.2
Axis 3 is worst case. All harmonics measured in this axis.								
1832.94	57.0 Pk	3.1 / 26.5 / 37.4	49.2	V / 1.0 / 278.0	-12	37.2	54	-16.8
1832.99	56.4 Pk	3.1 / 26.5 / 37.4	48.6	H / 1.0 / 167.0	-12	36.6	54	-17.4
2749.47	47.5 Pk	4.3 / 29.8 / 37.9	43.7	V / 1.0 / 0.0	-12	31.7	54	-22.3
2749.47	46.8 Pk	4.3 / 29.8 / 37.9	43	H / 1.0 / 0.0	-12	31	54	-23
3665.94	46.4 Pk	5.1 / 31.8 / 38.5	44.8	V / 1.0 / 0.0	-12	32.8	54	-21.2
3665.94	46.5 Pk	5.1 / 31.8 / 38.5	45	H / 1.0 / 0.0	-12	33	54	-21
4582.36	52.2 Pk	6.8 / 32.5 / 40.3	51.1	V / 1.6 / 0.0	-12	39.1	54	-14.9
4582.36	54.2 Pk	6.8 / 32.5 / 40.3	53.1	H / 1.4 / 291.0	-12	41.1	54	-12.9
5498.84	57.4 Pk	6.7 / 34.5 / 39.8	58.7	V / 1.1 / 335.0	-12	46.7	54	-7.3
5498.84	61.5 Pk	6.7 / 34.5 / 39.8	62.8	H / 1.4 / 350.0	-12	50.8	54	-3.2
6415.31	62.6 Pk	8.4 / 35.2 / 40.4	65.8	H / 1.3 / 40.0	-12	53.8	54	-0.2
6415.31	61.3 Pk	8.4 / 35.2 / 40.4	64.6	V / 1.3 / 15.0	-12	52.6	54	-1.4
7331.78	45.8 Pk	8.2 / 36.4 / 40.5	49.9	V / 1.0 / 355.0	-12	37.9	54	-16.1
7331.78	51.3 Pk	8.2 / 36.4 / 40.5	55.4	H / 1.5 / 350.0	-12	43.4	54	-10.6
No higher emissions found above the 8th harmonic.								

List of Equipment Utilized for Final Test

Project Report

Begin Date: 11/13/2007 End Date: 11/13/2007

Technician Mike Spataro

Project 3137612

Capital Asset ID	Manufacturer	Model #	Serial #	Description	Test Performed	Service Type	Service Date	Service Due
18808	EMCO	3146	9203-3376	Log Periodic Antenna	R Radiated Emissions	For Cal	10/12/2007	10/12/2008
18887	EMCO	3115	9205-3886	Horn Antenna 1-18GHz	R Radiated Emissions	For Cal	3/6/2007	3/6/2008
18889	EMC TEST SYSTEMS	3109	3142	Biconical Antenna 30-300MHz	R Radiated Emissions	For Cal	10/11/2007	10/11/2008
18897	EMCO	6502	9205-2738	Magnetic loop	R Radiated Emissions	For Cal	8/27/2007	8/27/2008
18900	Avantek	AFT97-8434-10F	1007	RF Pre-Amplifier (4-8 GHz)	R Radiated Emissions	For Ver	5/1/2007	5/1/2008
18901	Avantek	AWT-18037	1002	RF Pre-Amplifier (8-18 GHz)	R Radiated Emissions	For Ver	5/1/2007	5/1/2008
18906	Mini-Circuits Lab	ZHL-42	N052792-2	Amplifier	R Radiated Emissions	For Ver	5/1/2007	5/1/2008
18912	Hewlett-Packard	8447F	3113A05545	9 kHz- 1.3GHz Pre Amp	R Radiated Emissions	For Ver	5/1/2007	5/1/2008
18913	Hewlett-Packard	E7405A	My44211889	Spectrum Analyzer	R Radiated Emissions	For Cal	2/23/2007	2/23/2008
18919	Hewlett-Packard	8594E	3223A00145	Spectrum Analyzer	R Radiated Emissions	For Cal	5/18/2007	5/18/2008

Appendix B

Test Plan
and
Constructional Data Form

Request for Estimate & Test Plan

Please contact with any questions:

Contact:	Steve McGee
Title:	Engineer
Phone Number:	303-785-7793
Email Address:	smcgee@alcoholmonitoring.com

Client Information:

License Holder:	Alcohol Monitoring Systems
Address:	1241 West Mineral Ave.
Contact:	Mark Wojcik
Title:	V.P. Engineering
Phone Number:	303-785-7807
Fax Number:	
Email Address:	mwojcik@alcoholmonitoring.com

Please fill out the pertinent pages within this document and email this Form to Bryant and Amy at Bryant.Hart@Intertek.com and Amy.Baumberger@Intertek.com for a quotation. Other pages that do not pertain to your device can be left blank.

I.E. EMC Quote – Pages 1,2 & 3. Add Safety – add Page 4. If a radio is part of the device add page 5 etc.

This document is compiled as a WORD FORM. To enable the FORM tool, right click on the tool bar and select FORMS. You will then be able to add attachments, drawings etc by clicking on the “Lock” Graphic to unlock the FORM document. To make all the check boxes work within the FORM, the “Lock” graphic must be selected. Thank you for all your time and effort on this matter.

Estimates Requested: (Required for all devices)

EMC Testing/Services	
<input type="checkbox"/> Yes Requesting Estimate	<input type="checkbox"/> On-site/In-Situ Testing
<input type="checkbox"/> Pre-Compliance Scans / Engineering test	<input type="checkbox"/> TCF Compilation/Review Service

Radio Device Testing and Certification	
<input checked="" type="checkbox"/> FCC Certification	<input type="checkbox"/> Industry Canada Certification (Receivers required)
<input type="checkbox"/> Class 2 Notification Under the R&TTED	<input type="checkbox"/> TCF Compilation/Review Service

Safety Testing and Certification	
<input type="checkbox"/> NRTL Listing	<input type="checkbox"/> 1 Day Pre-Assessment (conducted at your facility)
<input type="checkbox"/> Letter of Findings	<input type="checkbox"/> CB Report Covering all country Deviations
<input type="checkbox"/> CE Report to Cover the LVD/MDD	<input type="checkbox"/> CB Report Covering - Specify Countries:

Any Additional Interest(s)	
<input type="checkbox"/> ISO Certification (Another RFQ is required)	<input type="checkbox"/> Energy Star Compliance
<input type="checkbox"/> FDA 510K Services (Another RFQ is required)	<input type="checkbox"/> NEBS
<input type="checkbox"/> International Approvals Management	<input type="checkbox"/> Wire and Cable
<input type="checkbox"/> Product Verification and Integrity Testing	<input type="checkbox"/> Other:

General Product Information: (Required for all Devices)

Product/Model Number(s):		SCRAM II		
Description of product(s):		Secured Remote Alcohol Monitoring Bracelet		
Intended Use:		<input type="checkbox"/> Household/Office <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Hospital <input type="checkbox"/> Life Supporting		
Intended Location:		<input checked="" type="checkbox"/> Dry <input type="checkbox"/> Damp <input type="checkbox"/> Wet <input type="checkbox"/> Hazardous Location		
Product Type:		<input type="checkbox"/> Prototype <input checked="" type="checkbox"/> Production Sample <input type="checkbox"/> Manufacturing Design Change: Please Describe		
Is it a stand-alone device or part of a system?		<input type="checkbox"/> Stand Alone Device <input checked="" type="checkbox"/> Component of a System		
If part of a system, please describe system parts and accessories: SCRAM II bracelet: measures transdermal alcohol emissions from a persons skin every 30 minutes, saves the data for a once daily upload to a modem. Modem: Used for daily upload of data from the bracelet via RF link, then sends that data via phone line to our internet site.				
If there is more than one product/model what are the differences?				
Is the Product Enclosure:		<input type="checkbox"/> Metal <input checked="" type="checkbox"/> Plastic <input type="checkbox"/> Both		
Size:	Length: 2 ¾ inches	Width: 3 inches	Height: 1 ¼ inches	Weight: 5 ounces
What Voltages/Current does the EUT run at? (AC/DC etc.) – if the unit runs off of DC though it is supplied with an AC/DC converter, please state the operating parameters of the converter.		Rated Voltage: Battery operated, 3 VDC battery, CR2 cell Rated Current: Average 3 ma DC # of Phases/Conductors: # of Power Cords:		
Are their multiple suppliers of power supplies?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes Please Describe:		
Are there Multiple Modes of Operation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes Please Describe: Sleep mode – all components are in low power operating mode; normal operating mode – the device records alcohol measurements and, once daily, communicates data via RF to the modem.				
Is there programmable software? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Can all modes of operation be operated simultaneously? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Explain: No, you're either in sleep mode or normal operating mode				
In which countries will you be selling the product? USA				
When can you supply samples of the device and all pertinent documentation (where applicable) to Intertek for testing? October 29, 2007				

EMC Information: (Required only if EMC work is requested)

What EMC certifications are desired?	
<input checked="" type="checkbox"/> FCC/ICES (US & Canada)	<input type="checkbox"/> SII (Israel)
<input type="checkbox"/> CE / EMC / MDD	<input type="checkbox"/> AS/NZS (Australia/New Zealand)
<input type="checkbox"/> BSMI (Taiwan)	<input type="checkbox"/> Korea MIC Certification / RRL
<input type="checkbox"/> VCCI (Japan)	<input type="checkbox"/> Other: Please Specify

Highest frequency utilized for device operation: 916.5 MHz

List of Clock Frequencies: 32K watch crystal for microprocessor, 26.0 MHz crystal for RF transceiver

What is the time that it takes for the device to complete a full cycle of operation? (time required to identify any degradation in performance) (please list per mode of operation) One normal alcohol reading takes approximately 30 to 45 seconds. These readings occur 48 times per day. Typical RF communications with the modem are once per day (but can be up to 6 times per day), and RF communications for 1 day's data typically lasts 50 to 60 seconds.
--

Total Number of I/O Cables: # Greater than 3m (9.75 feet) in Length # Greater than 30m (97.5 feet) in Length # of cables at a longer length (specify)	None
--	------

Number of Dedicated Earth Equalization Ports 0

Number of Ethernet and/or Telecommunications Ports 0 (One IRDA port for manufacturing diagnostics)

When the device is a compilation of subsystems (in separate chassis) how many interconnecting I/O's are greater than 1 meter in length between the Subsystem chassis? None
--

CISPR11/EN 55011 Specific Devices: 1. Does the EUT use RF Energy to affect a material? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, state frequency of energy:

General Safety Information: (Required only if Safety Listing/Certification/Testing is requested)

What Safety certifications are desired?	
<input type="checkbox"/> NRTL Listing US/Canada	<input type="checkbox"/> Limited Production Certification/Listing
<input type="checkbox"/> CB Certification (Worldwide – Outside US/Can)	<input type="checkbox"/> S Mark
<input type="checkbox"/> EU Investigation (EU – LVD/MDD)	<input type="checkbox"/> GS Mark
<input type="checkbox"/> Field Label (Onsite Inspection)	<input type="checkbox"/> Other: Please Specify

Please list all applicable safety standards that you would like your device certified under:
None

Has the device been tested and certified for product safety before?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
A. If it has been previously tested, to which standard and by which organization?	Standard tested to:
B. Can you provide the test report?	Organization tested by:
	<input type="checkbox"/> Yes <input type="checkbox"/> No

Do manuals and installation instructions exist? (Not always a necessity for quoting but most useful for complex products)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
---	---

Power Supply Safety Information:	<input type="checkbox"/> Yes <input type="checkbox"/> No
A. Is the power supply an approved “off-the-shelf” supply? Runs off a single CR2 battery	Standard tested to:
B. Can you provide the test report/CB Report?	Organization tested by:
	<input type="checkbox"/> Yes <input type="checkbox"/> No

Does the device contain batteries?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	What Type? 3.0 VDC lithium CR2 cell, commercially available
	How Many? 1

What technology is used? (i.e., lasers, X Ray, etc.)	
--	--

If Laser:	Class:	Output Power:	Beam Divergence Angle:	Wavelength:
-----------	--------	---------------	------------------------	-------------

Preferred testing location:	<input type="checkbox"/> Intertek Lab <input type="checkbox"/> Customer site
	<input checked="" type="checkbox"/> Intertek Local Lab (May increase turn around time and expense)

Radio Information: (Required only if the device contains an intentional transmitter)

What Radio certifications are desired?

<input checked="" type="checkbox"/> FCC (USA)	<input type="checkbox"/> Notified or Competent Body TCF Review
<input type="checkbox"/> Industry Canada	<input type="checkbox"/> Other: Please Specify
<input type="checkbox"/> ETSI (R&TTE)	

Please list the particular radio standards that apply.
FCC Part 15

Operating Frequency: 916.5 MHz

RF Output Power: 10 dBm maximum, typically 8dBm

Is there an RF Conducted Port? Yes No Description:

Number of Antennas & Description:
(Internal, External, Known Gain, etc.) 1, Fractus chip antenna, P/N FR05-S1-R-0-105

Modulation Technique: ASK

Number of Channels/Number of Discrete frequencies per Channel: 1 /1

Can the device be operated in CW Mode? Yes No

What is the lowest utilized frequency within the device? 916.5 MHz

Notes: Please ensure to bring a notch filter covering your fundamental operating frequency.

Additional Information:

This information is required to be filled in to act as a test plan and constructional data form required to be supplied as part of the test report in accordance to the required standards. This information is not required to obtain a quote but should be filled out to show a completed report under the applicable standards for EMC etc. Thank you for your time in effort in completing this section of the RFQ/Test Plan.

Support Equipment:

Intertek requires our customers provide all support equipment necessary to fully operate the device undergoing testing. This includes any filters required for testing radio devices, computer equipment, etc.

Item: Modem

Description: Modem with which the SCRAM II communicates. The modem is the "master", always RF polling for responses from the SCRAM II.

Manufacturer: Alcohol Monitoring Systems

Model No.: AMS-SM01

Cabling Information:

Cable
Function*
Type of Shield
Length
Connectors
Connection**

* Function examples (Ethernet, RS232, USB, Analog, physiological parameter, etc.)

** Connection examples (Outside Plant, Patient Coupled, Ring Voltage, etc.)

Monitoring the EUT:

Please provide instructions below on how to observe the EUT to verify proper operation in all modes. (including software revision): The modem unit will continually "poll" the SCRAM II. The SCRAM II can be woken with a magnet via it's internal reed switch. The SCRAM II will wake, perform it's normal measurement, then communicate via RF with the modem. Once communication is complete, the SCRAM II will go back into "sleep" mode.

Any other information required: (Notes, Photos, Block Diagrams, Drawings, etc.)

A minimum of a block diagram showing the equipment under test and its support equipment.

Information is included along with this submittal.

Appendix C

Measurement Protocol

And

Test Procedures

MEASUREMENT PROTOCOL

GENERAL INFORMATION

Test Methodology

Conducted and radiated emission testing is performed according to the procedures in ANSI C63.4 & CNS13438.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

CONDUCTED EMISSIONS

The final level, expressed in dB μ V, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the applicable limit.

To convert between dB μ V and μ V, the following conversions apply:

- $\text{dB}\mu\text{V} = 20(\log \mu\text{V})$
- $\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$

RADIATED EMISSIONS

The final level, expressed in dB μ V/m, is arrived at by taking the reading from the spectrum analyzer (Level dB μ V) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has the applicable limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets in Attachment B. The amplifier gain is automatically accounted for by using an analyzer offset.

Example: At a Test Frequency of 30 MHz, with a peak reading on the spectrum analyzer or measuring receiver of 14 dB μ V:

Measured Level		Transducer & Cable Loss factor		Corrected Reading	Specification Limit		Corrected Reading		Delta Specification
(dB μ V)	+	(dB)	=	(dB μ V/m)	(dB μ V/m)	-	(dB μ V/m)	=	
14.0		14.9		28.9	40.0		28.9		-11.1

DETAILS OF TEST PROCEDURES

General Standard Information

The test methods used comply with ANSI C63.4-2003 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

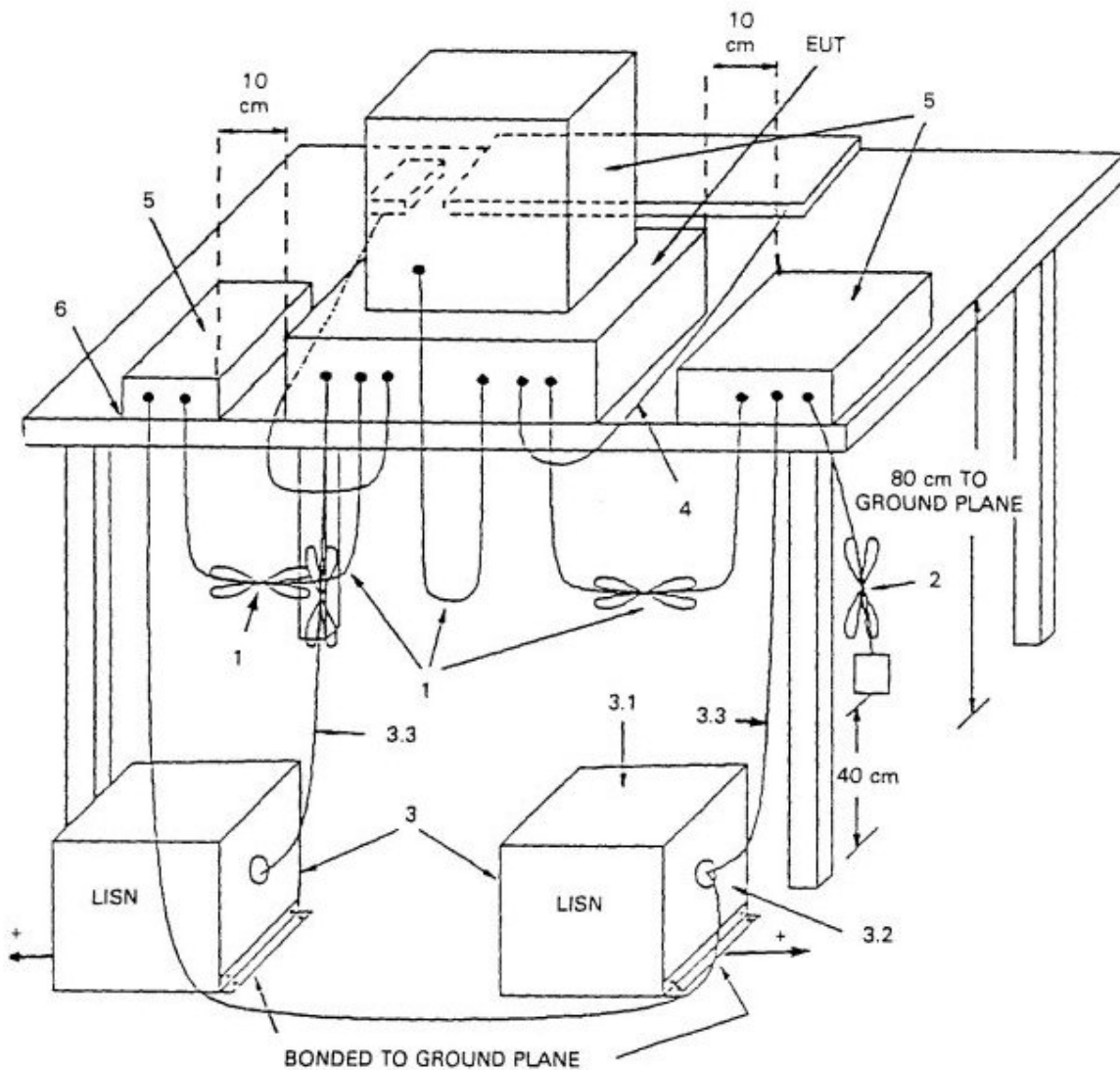
Conducted Emissions

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω /50 μ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. In some cases, a pre-scan using a spectrum analyzer is initially performed on the units comprising the system under test to locate the highest emissions. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are re-measured using a tuned receiver or spectrum analyzer with quasi-peak and average detection and recorded on the data sheets.

Radiated Emissions

Radiated emissions from the EUT are measured in the frequency range of 30 to 22GHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3, 10 or 30 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees.

Conducted Emissions Diagram:



Radiated Emissions Diagram:

