BIOSYN Systems

FAB

Report of Measurements

per

Industry Canada RSS-210 Issue 6 Annex 2.9

and

FCC CFR47 Part 15/B; FCC CFR47 Part 15/C – 15.249

and

IEC60601-1-2:2001 Medical Electrical Equipment

Revision 2.0

April 5, 2007

Approved by		
Checked by	Dan Petrulian, EMC Eng.	April 05th, 2007 Date

Protocol Data Systems EMC Lab, Abbotsford BC, Canada
FCC O.A.T.S. Registration Number 96437
Industry Canada O.A.T.S. Registration Number IC3384

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Section I: Information for Test Report of Measurements

Testing Details

TESTED BY: Emission Testing: David Johanson
Immunity Testing: Parminder Singh

TEST CONDITIONS: Temperature and Humidity:

TEST VOLTAGE: 120Vac 60Hz/240Vac 50Hz and Battery Pack

Test Facilities

Protocol Data Systems Inc., EMC Lab
28945 McTavish Rd.
Abbotsford BC, Canada, V4X 2E7

FCC O.A.T.S. Registration Number 96437
Industry Canada O.A.T.S. Registration Number IC3384

Test Equipment List

EMISSIONS:

Manufacturer	Model	Equipment Description	Serial No.	Last Cal	Next Cal
HP	85650A	CDN Quasi-Peak Adapter	2043A00240	22/03/05	22/03/06
HP	85662A	Spectrum Analyzer Display	2318A05184	22/03/05	22/03/06
HP	8566B	Spectrum Analyzer RF Section	2241A02102	22/03/05	22/03/06
HP	85685A	RF-Preselector	3107A01222	22/03/05	22/03/06
A.H. Systems	SAS-200/510	Antenna Log Periodic	761	04/03/05	04/03/06
EMCO	3105	Antenna DRG Horn (Med)	2024	25/02/05	25/02/06
LaPlace Instruments	AC1000	Low Distortion Power Source	138041	12/12/05	12/12/06
Thurlby Thandar	HA1600	Power and Harmonics Analyzer	140108	13/12/05	13/12/06
EMCO	3825 2	LISN(25A 50ohm 50/250uH 10k-100M)	9509-2470	20/07/05	20/07/06
EMCO	3110B	Antenna Biconical (Type 3)	9401-1850	01/03/05	01/03/06
Rhientech	Custom	Antenna Mast	N/A	N/A	N/A
Protocol EMC	Custom	Turntable	N/A	N/A	N/A

IMMUNITY:

Manufacturer	Model	Equipment Description	Serial No.	Last Cal	Next Cal
EIN	3100L	RF Amplifier	309	N/A	N/A
Amplifier Research	30W1000M7	RF Amplifier	22606	N/A	N/A
Amplifier Research	FP4000	Field Probe	21776	14/05/05	14/05/06
Amplifier Research	TC2000	Test Cell	22666	14/05/05	14/05/06
HP	8657A	Signal Generator	2913A00373	09/05/05	09/05/06
Schaffner	NSG432	ESD Simulator:	1243	16/12/05	16/12/06
Keytek	CM-BASE	CE Combination Tester *	9611222	08/10/05	08/10/06
Schaffner	CDN 125	Coupling Network	310	09/05/05	09/05/06
EMCO	95236-1	Bulk Injection Clamp	50958	27/02/05	27/02/06

The CE-Master CM-BASE will perform the Electrical Fast Transient test, the Surge Transient Test, the Power Frequency Magnetic Field Test, the pulsed Magnetic Field test and the Voltage Dips and Interruptions test all according

Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	±1 x 10-5
Total RF power, conducted	±1,5 dB
RF power density, conducted	±3 dB
Spurious emissions, conducted	±3 dB
All emissions, radiated	±6 dB
Temperature	±1°C
Humidity	±5 %
DC and low frequency voltages	±3 %

Company Tested:

NAME: BIOSYN Systems

ADDRESS: 15649 107A Avenue
Surrey, BC V4N 3H9

CONTACT: Mr. Russell McNeil

EMAIL: office@biosyn.ca

NUMBER: 604-375-2697

Equipment Under Test

THE TEST SYSTEM: EUT: FAB System

Manufacturer: Biosyn Systems

Part Number:
Serial Number:

TEST VOLTAGE: Internal Battery Pack (DC rechargeable internal pack)

CABLING:

Cable	Pins	Connector	Load/Termination	Shielded	Ferrites
Power	2	Mini-DC	No	No	No

TEST SET-UP: The FAB System is comprised of 10 x 3 Dimension Sensors, 2 Foot Pressure Sensors and 1 x Belt clip module. The 3 Dimension sensors are placed on various parts of the body and are used to record the 3 Dimension location of the body part, such as arm movements, in relation to each other. The Foot Pressure Sensor is used to record the foot pressure. All sensors send their data to the Belt Clip module for recording using a wireless transmitter.

All devices have a transceiver system operating on a fixed frequency of 916.5MHz.

In normal mode of operation, the Sensors are in Receive Mode and collect data. The data for each sensor is transmitted during its time slot on request by the Belt Clip Module.

All Sensor modules and the Belt Clip Module use the same identical circuit board layout, components and antenna. Although the Lower Back sensor looks different, it is only the plastic housing that is changed.

All device Transmitters were tested and only the worst case emissions are reported.

All Receivers were verified at the same time to ensure compliance with Class B emission levels and the results are the composite of the worst case.

CONCLUSION: The FAB complies with the requirements of FCC CFR47 Part 15/B Class B, FCC CFR47 Part 15/C Class B, 15.249, Industry Canada ICES-003 Class B and Industry Canada RSS-210 Issue 6 Annex 2.9 - Devices Operating in Non-Service Specific License-exempt Bands. These test results are representive of the provided sample given to us for testing as documented above in the EUT section.

Section II: Report of Measurements to IC RSS-210 Iss.6 & FCC CFR47 Part 15/B

This product is License Exempt for both FCC and IC. There is a requirement for this product to be submitted for certification and requires both an FCC ID and an IC ID number to be added to the labels in accordance with FCC CFR47 Part 2 subpart J (2.901 to 2.956) as well as IC Self-Marking and RSS-Gen standards.

Markings

According to FCC Section 15.19, and ICES 003, a statement similar to the following must be included on an identification label, which also uniquely identifies the manufactured date, either explicitly or through a serial number etc.:

> "This equipment complies with FCC Rules, Part 15 and Industry Canada's ICES 003 for a Class A Digital Device. Operation is subject to two conditions:
>
> 1) This device may not cause harmful interference, and
>
> 2) This device must accept any interference that may cause any undesired operation"

Additionally, If the manufacturer markets product to Quebec, the following supplemental information should be added to the label:

> "Cet Apparreil numerique de la Classe A respecte toutes les exigences du Reglement sur le material broilleur du Canada."

User Manual Statements

According to FCC Section 15.105, the following statement must be included in a prominent location your User's Manual:

> NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

It is also required according to FCC Section 15.21 that a caution is included such as:

> Caution: Changes or modifications to this equipment, not expressly approved by the manufacturer could void the user's authority to operate the equipment.

According to IC RSS-Gen, the following statements must be included in a prominent location your User's Manual:

> The user manual of transmitter devices equipped with detachable antennas shall contain the following information in a conspicuous location:
>
> > “This device has been designed to operate with the antennas listed below, and having a maximum gain of [x] dB. Antennas not included in this list or having a gain greater than [x] dB are strictly prohibited for use with this device. The required antenna impedance is [y] ohms.”
>
> Equipment manufacturers shall provide proper values of x and y to comply with the applicable RSS. Immediately following the above statement, the manufacturer shall provide a list of all antennas acceptable for use with the transmitter.
>
> User manuals for license-exempt Low-Power radio communication Devices (LPDs) shall contain the following or equivalent statements in a conspicuous position:
>
> > “Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.”
>
> If the antenna is detachable (i.e. selectable by the user), see the user manual requirement in RSS-Gen Section 7.1.4. the following instructions in the user manual are also required:
>
> > “To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropic ally radiated power (e.i.r.p.) is not more than that permitted for successful communication.”
>
> The above statements may be placed on the device instead of in the manual.

Section III: Report of Measurements to IC RSS-210 Iss. 6 Annex 2.9 - Emissions Testing

Test Results - Summary

Testing was performed pursuant to Industry Canada RSS-Gen and RSS-210 Issue 6 Annex 2.

Test	Standard	Description	Result
A.C. Mains Conducted Emissions Idle/Receive Mode	RSS-Gen (7.2.2)	The Conducted Emissions are measured on the phase and Neutral Power lines in the 0.15 - 30.0 MHz range.	Complies
Radiated Emissions Idle/Receive Mode	RSS-Gen (6)(a)	The radiated emissions are measured in the 30-1000 MHz range	Complies
Radiated Emissions Transmit Mode	RSS-210 (A2.9)	The radiated emissions are measured in the 30-10000 MHz range	Complies
Output Power and EIRP Emissions	RSS-Gen (4.6) and RSS-210 (A2.9))	Output power shall not exceed 1.0 Watt	Complies

Part 1 - A.C. Mains Conducted Emission Testing

DATE: April 10, 2006

TEST STANDARD: RSS-Gen (7.2.2)

TEST VOLTAGE: 120Vac, 60Hz / 240Vac, 50Hz

MINIMUM STANDARD: Class A Limit:

Frequency (MHz)	Limits dB (μV)	
	Quasi –Peak	Average
0.15 to 0.50	66 to 56 (Note)	56 to 46 (Note)
0.50 -5	56	46
5 - 30	60	50
Note: Decreases with the logarithm of the frequency		

METHOD OF MEASUREMENT: Measurements were made using a spectrum analyzer with 10kHz RBW, Peak detector. Any emissions that are close to the limit are measured using a test receiver with 10kHz bandwidth, CISPR Quasi-Peak detector. Bandwidths used on the test receiver are those specified in RSS-Gen (7.2.2).

All Sensors and Belt Clip Modules use the same circuitry and the AC power adapter is only used to recharge the internal battery when the system is not active. Only one of the Foot Sensor modules data has been recorded since it had the worst results when compared to the other sensors.

MODIFICATIONS: No modifications were required for the EUT to pass the tests.

MEASUREMENT DATA: See Appendix C for Plots and Tables.

EMISSIONS DATA: See Tables 1 and 2 in Appendix C for corresponding frequencies.

PERFORMANCE: Complies with standard.

Part 2 - Radiated Emission Testing in Idle/ Receive Mode

DATE: April 10, 2006

TEST STANDARD: RSS-Gen (6)(a)

TEST VOLTAGE: 120Vac, 60Hz and Internal Battery Pack

MINIMUM STANDARD: (Same as FCC Class B Limit):

Frequency (MHz)	Maximum Field Strength µV/m at 3 m	Maximum Field Strength dBµV/m at 3 m
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0
Note 1. The lower limit shall apply at the transition frequency		

METHOD OF MEASUREMENT: The equipment was set up in a 10-meter open field test site; Tests were performed at 3 meters. Testing was performed using the manufacturer's specified normal cabling configuration, with all cables over 1 meter in length bundled at 1 meter and retained from the floor. A typical application was tested.

Emissions in both horizontal and vertical polarization's were measured while rotating the EUT on a turntable to maximize the emissions signal strength.

In cases where the presence of high ambient noise makes it impossible to measure an emission at the required distance, the measurement is performed at a closer distance and the limit is adjusted per EN61000-6-3: 2001

All frequencies 30-1000GHz were tested at 3m and all frequencies 1GHz and up were tested at 1meter in accordance with ANSI c63.4. Those measurements made a 1 meter, were adjusted to 3 Meter equivalent using the following formula:

20 Log (D1/D2)
Where D1 = New Distance D2 = Required Distance The result is added or subtracted, as required, to the required emission level to ensure compliance at the new distance.

This product was tested, as per RSS-Gen (4.8) procedures, up to the 5th Harmonic of the highest Transmit/Receive Frequency of 916.5 MHz, through the range of 30MHz to 5 GHz.

EMISSIONS DATA: See Appendix C for corresponding frequencies.

PERFORMANCE: Complies.

Part 3 - Radiated Emissions – Transmit Mode

DATE: April 10, 2006

TEST STANDARD: RSS-Gen (4.7) and RSS-210 Iss.6 Annex 2 (A2.9)
Devices Operating in Non-Service Specific License-exempt Bands 902-928MHz

TEST SETUP: Refer to setup in Part 1 above.

MINIMUM STANDARD: A2.5 Low -power devices that can be used for any application provided the following conditions are met

(1) The field strengths measured at 3 meters shall not exceed the following:

Fundamental Frequencies	Maximum Field Strength Fundamental		Maximum Field Strength Harmonics	
(MHz)	mV/m	dBµV/m	MV/m	dBµV/m
902-928	50 (Note 1)	94	0.5	54
2400-2483.5	50 (Note 1)	94	0.5	54
5725-5875	50 (Note 1)	94	0.5	54
Note 1. Equivalent to 0.75 mW e.i.r.p.				

(2) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to Table 2 limits (Note1), whichever is the less stringent.

(3) The measurement method shall be described in the report. The same parameter, peak power or average power, used for the transmitter output power measurement shall be used for unwanted emission measurement.

(4) The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate or carrier frequency), or from 30 MHz, whichever is the lowest frequency, to the 5^{TH} harmonic of the highest frequency generated without exceeding 40GHz.

Note1: Table 2: see Part 1- above (RSS-Gen (6)(a))

METHOD OF MEASUREMENT: Measurements were made using a spectrum analyzer with 100kHz RBW, Peak detector. Any emissions that are close to the limit are measured using a test receiver with 120kHz bandwidth, CISPR Quasi-Peak detector as well as an averaging meter.

DEVICE DESCRIPTIONS: As described in the Equipment under Test Section, above.

EMISSIONS DATA: See Plots and Tables in Appendix B for data.

PERFORMANCE: Complies.

Part 4 - Output Power and EIRP Emissions

DATE: April 13, 2006

TEST STANDARD: RSS-Gen (4.6) and RSS-210 Iss.6 A2.9 – Transmitter Output Power

TEST SETUP: Refer to setup in Part 1 above.

MINIMUM STANDARD: RSS-Gen (4.6) and RSS-210 (A2.9)

For frequency systems operating in the 902-928 MHz band, the maximum peak e.i.r.p power is not to exceed 0.75 mW.

RSS-Gen (4.6) Transmitter output power measurements shall be carried out before the unwanted emissions test. The transmitter output power value, obtained from this test, serves as the reference level used to determine the unwanted emissions. For comparative purposes, the measurements of emission power and unwanted emissions can be in peak or average provided the same parameter is used when measuring both.

If the antenna is not detachable, field strength measurements shall be made using a calibrated open area test site.

The following formula may be used to convert field strength (FS) in volts/meter to transmitter output power (TP) in watts:

$TP = (FS \times D)^2 / (30 \times G)$

where,

TP - Transmitter power
FS - Field strength
D - Distance between EUT and Rx antennas
G - Antenna gain

METHOD OF MEASUREMENT: Measurements were made using a spectrum analyzer with 100kHz RBW, Peak detector. Any emissions that are close to the limit are measured using a test receiver with 120kHz bandwidth, CISPR Quasi-Peak detector as well as an averaging meter. Since the antenna is detachable, a conducted measurement was performed at the antenna terminal.

DEVICE DESCRIPTIONS: As described in the Equipment under Test Section, above.

MEASUREMENT DATA:

Frequency	Measured Signal Peak at 3m	Equipment correction	Corrected Signal Peak at 3m	Corrected Signal Peak at 3m	Signal Power Level per RSS-212 (3.2)	Limit Line
(MHz)	(dBµV)	(dB)	(dBµV)	V/m	(mW)	(mW)
916.5	50.9	30.2	81.1	0.011	0.055 (Note)	0.75

Note: Formula shown above was used to calculate Signal Power Level

PERFORMANCE: Complies.

Section IV: Report of Measurements to FCC CFR47 Part 15/B & 15/C

General

Tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15 – Subpart B – Unintentional Radiators Class A; Part 15 – Subpart C - Intentional Radiators.

Additionally, the specific section used for Intentional Radiator compliance is 15.249 – Operation within the band 902-928MHz, 2400-2483.5MHz, 5725-5875 MHz and 24.0-24.25 GHz – limited to intentional radiator.

Requirements for Intentional Radiators

This product is License Exempt for FCC. There is a requirement for this product to be submitted for certification under the rules and regulations of FCC Part 15 Subpart C and FCC Part 2 Subpart J. An FCC ID must be applied for and added to the labels in accordance with FCC Part 2 subpart J.

Labeling and Markings

You should refer to the clauses of FCC part 2 Section 2.925 and FCC part 15 Section 15.19 for information to be contained on the label as well as information about the label. Any other statements or labeling requirements may appear on a separate label at the option of the applicant/grantee.

According to FCC Part 2 Section 2.925(a) ." Each equipment covered in an application for equipment authorization shall bear a nameplate or label listing the following: (1) FCC Identifier consisting of the two elements in the exact order specified in § 2.926. The FCC Identifier shall be preceded by the term FCC ID in capital letters on a single line, and shall be of a type size large enough to be legible without the aid of magnification. Example: FCC ID XXX123. XXX—Grantee Code and 123—Equipment Product Code "

According to FCC Section 15.19(a)(3), the following statement must be included on the identification label:

> "This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference that may cause undesired operation"

According to FCC Section 15.19(b) the FCC logo is not required for this product since it does not fall under the rules for a Product subject to authorization under a Declaration of Conformity.

User Manual Statements

According to FCC Section 15.105, the following statement must be included in a prominent location in your User's Manual:

> "NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense."

It is also required according to FCC Section 15.21, that the user manual or instruction manual for an intentional or unintentional radiator shall caution as follows:

> "Caution: Changes or modifications to this equipment, not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. "

Test Results – Summary

Test	Standard	Description	Result
AC Mains Conducted Emissions - Idle Mode	FCC PART 15 Subpart B Class A Limits	The Conducted Emissions are measured on the phase and Neutral Power lines in the 0.15 - 30.0 MHz range.	Complies
Unintentional Radiated Emissions - Idle Mode	FCC PART 15 Subpart B Class A Limits	The radiated emissions are measured in the 30-1000Mhz range	Complies
Antenna Requirement	FCC Part 15 Subpart C 15.203	Proper Antenna is specified and used.	Complies
Intentional Radiated Emissions - Transmit Mode	FCC Part 15 Subpart C 15.249	Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz and 24.0-24.25 GHz	Complies

Part 1 - AC Mains Conducted Emissions

DATE: April 10, 2006

TEST STANDARD: FCC PART 15 Subpart B Class A

TEST VOLTAGE: 120Vac, 60Hz, 240Vac, 50Hz

MINIMUM STANDARD: Class A Limit:

Frequency (MHz)	Limits dB (μV)	
	Quasi –Peak	Average
0.15 to 0.50	66 to 56 (Note)	56 to 46 (Note)
0.50 -5	56	46
5 - 30	60	50
Note: Decreases with the logarithm of the frequency		

METHOD OF MEASUREMENT: Measurements were made using a spectrum analyzer with 10kHz RBW, Peak detector. Any emissions that are close to the limit are measured using a test receiver with 10kHz bandwidth, CISPR Quasi-Peak detector. Bandwidths used on the test receiver are those specified in FCC Part 15.107

All Sensors and Belt Clip Modules use the same circuitry and the AC power adapter is only used to recharge the internal battery when the system is not active. Only one of the Foot Sensor modules data has been recorded since it had the worst results when compared to the other sensors.

MODIFICATIONS: No modifications were required for the EUT to pass the tests.

MEASUREMENT DATA: See Appendix C for Plots.

EMISSIONS DATA: See Tables 3 and 4 in Appendix C for corresponding frequencies.

PERFORMANCE: Complies with standard.

Part 2 - Radiated Emission - Unintentional Testing

DATE: April 10, 2006

TEST STANDARD: FCC CFR47, Part 15, Subpart B – Class A

TEST VOLTAGE: Battery Pack and 120Vac

TEST SETUP: Although this test calls for measurements to be performed at 10-meters, this EUT radiates so few frequencies and at such low levels that the equipment was set up in a 3-meter open field test site. Emissions in both horizontal and vertical polarizations were measured while rotating the EUT on a turntable to maximize the emissions signal strength and compensated to indicate the equivalent level if the signals were measured at 10-meters.

The EUT was tested with the power "ON" and in Receive Mode with all sensors in continuous operation.

MINIMUM STANDARD: Class A Limits:

Frequency	Field Strength - 10m		Equivalent Field Strength - 3m	
MHz	μV/m	dBμV/m	μV/m	dBμV/m
30 - 88	90	39.0	300	49.5
88 - 216	150	43.5	500	54.0
216 - 960	210	46.4	700	56.9
960 - above	300	49.5	1000	60.0

METHOD OF MEASUREMENT: The equipment was set up in a 10-meter open field test site; Tests were performed at 3 meters. Limit lines were modified to compensate as per procedures for short range, as below, using the manufacturer's specified normal cabling configuration, with all cables over 1 meter in length bundled at 1 meter and retained from the floor. A typical application was tested.

Emissions in both horizontal and vertical polarization's were measured while rotating the EUT on a turntable to maximize the emissions signal strength.

Per ANSI C63.4-2003 5.1.2 in cases where the presence of high ambient noise makes it difficult to measure an emission at the required distance, the measurement is performed at a closer distance and the limit is adjusted in accordance with the formula as outlined in CISPR 22.

For limits specified in dBμV/m - 20 Log (D1/D2)
Where D1 = New Distance D2 = Required Distance The result is added to the required emission level to ensure compliance at the new distance.

DEVICE DESCRIPTIONS: Refer to the Equipment Under Test Section.

CABLING DESCRIPTIONS: Please refer to Equipment Under Test Section

EMISSIONS DATA: No detectable frequencies 30 to 2000MHz

PERFORMANCE: Complies.

Part 3 - Antenna Requirement - 15.203

DATE: April 10, 2006

TEST STANDARD: FCC CFR47, Part 15, Subpart C 15.203

MINIMUM STANDARD: 15.203 - An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

PERFORMANCE: Complies.

This unit meets 15.203 requirement. The antenna is a 916.5 MHz printed circuit board inverted-F Antenna design that is permanently connected to the transceiver. It is the essentially the same in all units except same for some slight tuning changes per antenna. The antenna can only be replaced with appropriate printed inverted-F design as specified by the manufacturer and is only installed or replaced by authorized, factory trained personnel.

Part 4 - Radiated Emission - Intentional /Operation within the required bands - 15.249

TEST STANDARD: FCC CFR47, Part 15, Subpart C 15.249

TEST SETUP:

Freq. Range Measured	30Mhz – 10000MHz
Test Distance	1 to 3m
Test Instrumentation resolution	120KHz Quasi-Peak (30MHz to 1000MHz) 1MHz Average (1000MHz to 10000MHz)
Receive Ant. Scan Height	1m – 4m
Receive Ant. Polarization	Vertical and Horizontal.

The equipment was set up in a 3-meter open field test site. Emissions in both horizontal and vertical polarizations were measured while rotating the EUT on a turntable to maximize the emissions signal strength and the results recorded on the attached plots. The emissions were tested using radiated test procedures instead of conducted measurement procedures.

The emissions were measured while the unit was in a standby mode and not communicating with any device (hereafter referred to as Quiescent Mode). This unit was also measured while it was transmitting data (hereafter refereed to as Transmit Mode). To perform the Transmit Mode measurements, the unit was set-up in a continuous transmit mode, at the designated power level and frequency.

This unit was designed to communicate on one transmitting frequency within the 902-928MHz band. The unit is designed to automatically transmit/receive data on the specified frequency that was programmed into the Unit. These units are only designed to communicate with multiple devices within its network. Measurements were performed at the fundamental which is 916.5 MHz, 1ST

MINIMUM STANDARD: 15.249(a) - The provisions of this section is limited to frequency operation within the following bands; 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz and 24.0-24.25 GHz

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental	Field strength of Harmonics
(MHz)	(millivolts/meter)	(microvolts/meter)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

(b) Fixed, point-to-point operation as referred to in this paragraph shall be limited to systems employing a fixed transmitter transmitting to a fixed remote location. Point-to-multipoint systems, omni directional applications, and multiple co-located intentional radiators transmitting the same information are not allowed. Fixed, point-to-point operation is permitted in the 24.05-24.25 GHz band subject to the following conditions:

(1) The field strength of emissions in this band shall not exceed 2500 millivolts/meter.

(2) The frequency tolerance of the carrier signal shall be maintained within ±0.001% of the operation frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage and for variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For Battery operated equipment, the equipment tests shall be performed using a new battery.

(3) Antenna gain must be at least 33 dBi. Alternatively, the main lobe beam width must not exceed 3.5 degrees. The beam width limit shall apply to both the azimuth and elevation planes. At antenna gains over 33 dBi or beam widths narrower than 3.5 degrees, power must be reduced to ensure that the field strength does not exceed 2500 millivolts/meter.

(c) Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonic, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation.

(e) As shown in 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

(f) Parties considering the manufacture, importation, marketing or operation of equipment under this section should also note the requirement in 15.37(d)

DEVICE DESCRIPTIONS: Refer to the Equipment Under Test Section, above, for EUT Descriptions. to 10th harmonics (916.5MHz, 1833.0MHz, 2749.5MHz and up to 9160.5MHz).

MODIFICATIONS: No modifications have been made to the EUT in order to achieve compliance.

CABLING DETAILS: No cabling is part of the test.

RESULTS: To verify compliance, the radiated emission tests were carried out in accordance with part 15.109, 15.205, 15.209 and 15.249. The spectrum was scanned from 0.4MHz to 10000 MHz looking for all Spurious and Harmonic emissions in Quiescent, and Transmit modes. The Quiescent Mode and Transmit mode measurements with plots for Un-intentional emissions 30-1000 MH are contained in Appendix B. The results of the harmonics and spurious frequencies 1000-10000 MHz are contained in Appendix B.

PERFORMANCE: Complies.

Section V: Report of Measurement for 60601-1-2 Summary

Testing was performed per the following standards, pursuant to IEC60601-1-2:2001-09.

Performance Criterion determines the Pass/Fail result of the test as per 36.202.1-(J) Compliance Criteria. Additional factors of operation where taken into consideration when testing based on manufacturer's requirements, Extraordinary Environmental Factors (EEF) has been determined as a pass due to the nature of the unit's function.

The test conditions specified in 36.202, requires the EQUIPMENT or SYSTEM to provide ESSENTIAL PERFORMANCE and remain safe.

Voltage Fluctuations and Flicker

Applicable Standard	Description	Test or Measurement	Required by EN60601-1-2:2001	Performance Criterion
Power Line Harmonics	EN 61000-3-2 Class A Limits	Maximum 1.08, 2.3, 0.43, 1.14, 0.3, 0.77, 0.23 A.... for 2nd to nth Harmonic	Class A Limits	Complies
Power line Fluctuations (Flicker)	EN 61000-3-3 P_{st} <1, P_{lt} < 0.65	The value of d(t) during a voltage change shall not exceed 3% for more than 200 ms	P_{st} <1, P_{lt} < 0.65	Complies
Electrostatic Discharge EN 61000-4-2: 2001-09 (36.202.2)	Direct and Indirect Air Discharge ESD and Contact Discharge at several points with 10 positive and 10 negative 'hits' per location.	Air Discharge Contact Discharge (Direct - Coupling Plane)	+/-8kV +/-6kV	Complies Complies
Radiated Immunity EN 61000-4-3: 2001-09 (36.202.3)	Subject to electromagnetic field from 80 MHz to 2.5 GHz	Frequency Field Modulation Non-Life Supporting Equipment Outside ISM Band	3V/m	Complies
Electrical Fast Transient/Burst EN 61000-4-3: 2001-09 (36.202.4)	EFT/Burst coupled to the all I/O and control signals respectively is injected on the Power Line.	AC Line - for power supply lines (Direct injection)	2.0kV	Complies
Surge Transient EN 61000-4-5: 2001-09 (36.202.5)	5 Hits each of Surge Transients at positive and negative polarization are injected on the Power Line. For AC - L1-L2, L1-PE, L2-PE, and at 0, 90 and 270 phase degree	AC Line to Earth AC Line to Line	2.0kV 1.0kV	Complies Complies
Voltage Dips EN 61000-4-11: 2001-09 (36.202.7)	Voltage on the power line is reduced	Voltage Dip	60% for 5 cycles 30% for 25 cycles >95% for 0.5 cycles	Complies
Voltage Dips EN 61000-4-11: 2001-09 (36.202.7)	Voltage on the power lines is interrupted	Voltage Interruption	>95% for 5 sec	Complies

Part 1 - Limits for Harmonic Current Emissions

DATE:	April 20, 2006
TEST STANDARD:	EN61000-3-2:2000-08
TEST VOLTAGE:	240Vac, 50Hz and Battery Pack
MINIMUM STANDARD:	Class A Limits
CLASS A DEFINED:	EN61000-3-2:IEC:2000 (7.1) Limits for Class A equipment
	For Class A equipment, the harmonics of the input current shall not exceed the absolute values given in Table One.
METHOD OF MEASUREMENT:	The equipment was setup using a power analyzer, and a filtered power source, and the harmonic contents were measured.
	Class A Balanced 3Ph and all others not listed below
	Class B Portable electric tools
	Class C Lighting equipment
	Class D Equipment with an active input power > 75W
MODIFICATIONS:	The Harmonic Emissions did not require any modifications.
EMISSIONS DATA:	See Table 5 in Appendix C for corresponding data.
PERFORMANCE:	Complies with Class A.

Harmonic Limits:

Table 1 – Harmonic Limits for Class A equipment

Harmonic order n	**Maximum permissible harmonic current** A
Odd Harmonics	
3 5 7 9 11 13 $15 \leq n \leq 39$	2.30 1.14 0.77 0.40 0.33 0.21 $0.15 \frac{15}{n}$
Even harmonics	
2 4 6 $8 \leq n \leq 40$	1.08 0.43 0.30 $0.23 \frac{8}{n}$

Table 2 – Harmonic Limits for Class C equipment

Harmonic order n	**Maximum permissible harmonic current expressed as a percentage of the input current at the fundamental frequency** %
2 3 5 7 9 $11 \leq n \leq 39$ (odd harmonics only)	2 $30 \cdot \aleph$ (1) 10 7 5 3
(1) $\aleph$ is the circuit power factor	

Table 3 – Harmonic Limits for Class D equipment

Harmonic order n	**Maximum permissible harmonic current per watt** mA/W	**Maximum permissible harmonic current** A
3 5 7 9 11 $13 \leq n \leq 39$ (odd harmonics only)	3.4 1.9 1.0 0.5 0.35 $\frac{3.85}{n}$	2.30 1.14 0.77 0.40 0.33 See table 1

Part 2 - Limitation of Voltage Fluctuations and Flicker

DATE: April 20, 2006

TEST STANDARD: EN61000-3-3:1994+A1:2001-01

TEST VOLTAGE: 240Vac, 50Hz and Battery Pack

MINIMUM STANDARD: P_{st} <1.0, P_{lt} < 0.65

METHOD OF MEASUREMENT: The equipment was setup using a power analyzer, and a filtered power source, and short-term (P_{st}) and the long (P_{lt}) flicker was measured.

P_{st} : The flicker severity evaluated over a short period (in minutes)
P_{lt} : The flicker severity evaluated over a long period (in few hours)

MODIFICATIONS: The Harmonic Emissions did not require any modifications.

MEASUREMENT DATA: P_{st} = 0,
P_{lt} =0 *P_{st} = 0

Note: The EUT drew very little current, therefore P_{lt} and P_{st} remained zero.

PERFORMANCE: Complies with standard and manufacturing requirements.

Part 3 - Electrostatic Discharge

DATE: April 21, 2006

TEST STANDARD: EN 61000-4-2: 2001-09 (36.202.2)

TEST CONDITIONS: Temperature and Humidity: 7.5 C°, 51% RH

TEST VOLTAGE: 240Vac, 50Hz and Battery Pack

REQUIRED STANDARD: 36.202.2 (a) Requirements - EQUIPMENT and SYSTEMS shall comply with the requirements of 36.202.1 j) at IMMUNITY TEST LEVELS of +/-2 kV, +/-4 kV, +/-8 kV for air discharge and +/-2 kV, +/-4 kV, +/-6kV for contact discharge.
Compliance is checked by the following tests and determined during and after the tests in accordance with 36.202.1 j) based upon the response of the EQUIPMENT or SYSTEM, considering each discharge individually.

METHOD OF MEASUREMENT: When the equipment is subjected to air discharge or contact discharge of the selected severity level, the equipment must meet the minimum performance criteria described above. Each operator accessible connector and control is discharged 10 times without a system failure. Longer time between discharges may be required in order to be able to distinguish between a response caused by a single discharge and a response caused by a number of discharges.
Indirect application of the discharge. Discharges to objects placed or installed near the EUT is simulated by applying the discharges of the ESD generator to a coupling plane, in the contact discharge mode.
Horizontal coupling plane - at least 10 single discharges (in the most sensitive polarity) is applied to the horizontal coupling plane, at points on each side of the EUT. The ESD generator is positioned vertically at a distance of 0.1 m from the EUT, with the discharge electrode touching the coupling plane.
Vertical coupling plane - at least 10 single discharges (in the most sensitive polarity) is applied to the centre of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5 m x 0.5m, is placed parallel to, and positioned at a distance of 0.1 m from, the EUT. Discharges shall be applied to the coupling plane, with sufficient different positions such that the four faces of the EUT are completely illuminated.

MODIFICATIONS: No modifications are required

TEST DEFINITIONS: Pass Denotes successful discharge with no effect.
Fail Denotes failure to pass Standard.

MEASUREMENT DATA: See Test Data below and next page

DISCHARGE POINTS:

Contact Discharge	Air Discharge
Upper Left of the Belt Clip	Upper Left of the Belt Clip
Lower Left of the Belt Clip	Lower Left of the Belt Clip
Lower Right of the Belt Clip	Upper Right of the EUTs
Middle of the Display	Middle of the Display
AC power connector for the Back Sensor	AC power connector for the Back Sensor
Left of the sensors	Left of the sensors
Top[of the sensors	Top of the sensors
Front of the sensors	Front of the sensors
Bottom of the sensor	Bottom of the sensor

INDIRECT ESD: Vertical and Horizontal Coupling Plane:

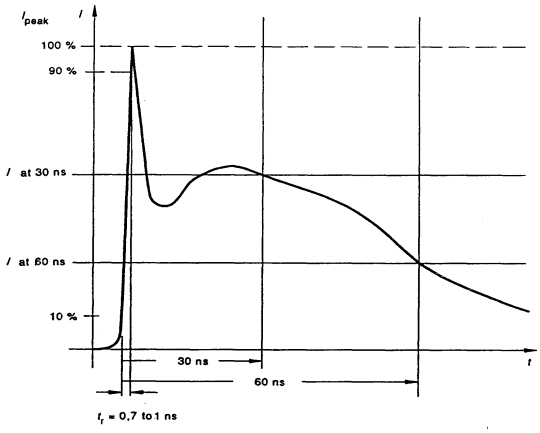
Four Faces of EUT	Horizontal Plane		Vertical Plane	
Variables	+/-4kV	+/-6kV	+/-4kV	+/-6kV
Front of EUT	Pass	Pass	Pass	Pass
Left Side of EUT	Pass	Pass	Pass	Pass
Back of EUT	Pass	Pass	Pass	Pass
Right Side of EUT	Pass	Pass	Pass	Pass

CONTACT DISCHARGE:
+/-2kV, +/-4kV, +/-6kV

	Hit 1	Hit 2	Hit 3	Hit 4	Hit 5	Hit 6	Hit 7	Hit 8	Hit 9	Hit 10
Point 1	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 2	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 3	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 4	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 5	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 6	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 7	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 8	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 9	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 10	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

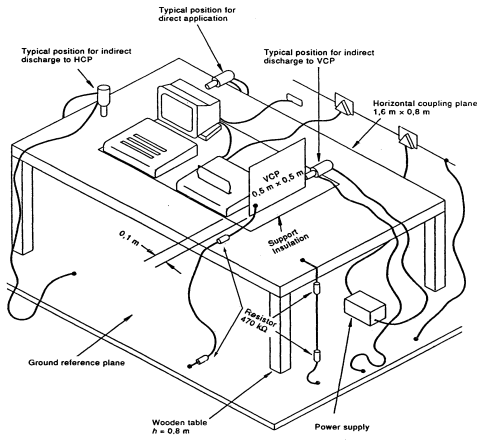
AIR DISCHARGE:
+/-2kV, +/-4kV, +/-8kV

	Hit 1	Hit 2	Hit 3	Hit 4	Hit 5	Hit 6	Hit 7	Hit 8	Hit 9	Hit 10
Point 1	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 2	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 3	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 4	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 5	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 6	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 7	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 8	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 9	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Point 10	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass



Typical waveform of the output current of the ESD generator

EN61000-4-2 ESD Waveform



Example of test set-up for table-top equipment, laboratory tests

EN61000-4-2 ESD Test Setup

Part 4 - Radiated Immunity Testing (A.M.)

DATE: April 19, 2006

TEST STANDARD: EN61000-4-3: 2001-09 (36.202.3)

TEST CONDITIONS: Temperature and Humidity: 8.9 C°, 49% RH

TEST VOLTAGE: 240Vac, 50Hz and Battery Pack

REQUIRED STANDARD: Demonstrating compliance with Summary of EN61000 and Medical Directive 60601-1-2 © IEC: 2001 (E) 36.202.1-(J) Compliance Criteria. Under the test conditions specified in 36.202, the EQUIPMENT or SYSTEM shall be able to provide the ESSENTIAL PERFORMANCE and remain safe.

METHOD OF TEST: Requirements (General) - EQUIPMENT and SYSTEMS that are not LIFE-SUPPORTING EQUIPMENT and other SYSTEMS must comply with the requirements of 36.202.3, at an IMMUNITY TEST LEVEL of 3 V/m ***or*** the size and the location of the EUT disqualifies the use of a semi-anechoic chamber for testing. Then the bulk current injection clamp method is utilized to simulate the radiated immunity test on the I/O and power cables, with acceptance of all parties involved. This method has shown similar if not the same results as the standard test method. The test is then executed at 80MHz to 2.5MHz and the test level is 3 V/m. This method uses the same sweep time, dwell time, and modulation technique as the standard method.

Frequency Range: 80MHz - 2.5 GHz

RF Power: 3 V/m

Modulation: 80% AM (1kHz tone)

Sweep Rate: Less than 1.5 x 10-3 decades/s

Step Size: 1% of previous Frequency (i.e. Previous Frequency X 1.01)

Dwell Time: 3000 ms

Side	Orientation Antenna	80MHz - 1GHz	1 GHz –2GHz	2 GHz –2.5GHz
1	Horizontal	√	√	√
1	Vertical	√	√	√
2	Horizontal	√	√	√
2	Vertical	√	√	√
3	Horizontal	√	√	√
3	Vertical	√	√	√
4	Horizontal	√	√	√
4	Vertical	√	√	√

PERFORMANCE: Complies with standard and manufacturers requirements.

Part 5 - EFT/Burst Testing (Fast Transient - AC Power Supply)

DATE: April 20, 2006

TEST STANDARD: EN 61000-4-4: 2001-09 (36.202.2)

TEST CONDITIONS: Temperature and Humidity: 9 C°, 76% RH

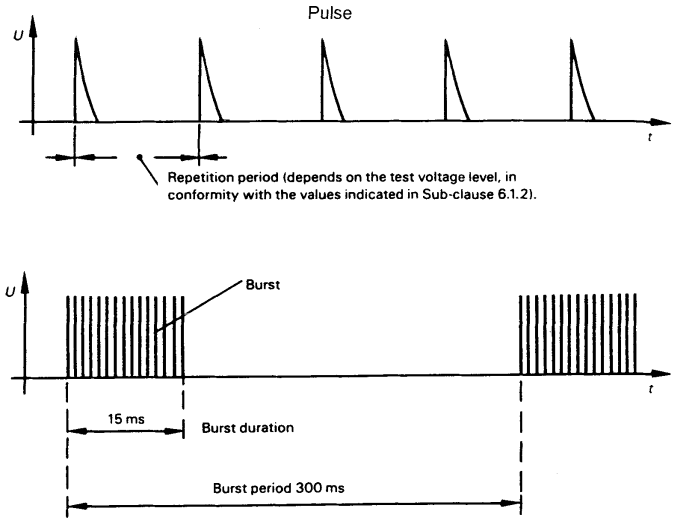
TEST VOLTAGE: 240Vac, 50Hz and Battery Pack

REQUIRED STANDARD: 36.202.4 a) Requirements - EQUIPMENT and SYSTEMS shall comply with the requirements of 36.202.1 j) at an IMMUNITY TEST LEVEL of +/- 2 kV for AC and DC power lines and +/- 1 kV for signal and interconnecting cables. Signal and interconnecting cables are specified to be(restricted to) less than 3 m in length by the manufacturer of the EQUIPMENT of SYSTEM and all PATIENT-coupled cables are not tested directly. However, the effects of any coupling between cables that are tested directly and cables that are not tested directly shall be taken into account. Compliance is checked by the following tests and determined during and after the tests in accordance with 36.202.1 j). Compliance Criteria.

METHOD OF MEASUREMENT: Only AC power lines to AC-to-DC converters and battery charges are tested This test was performed by injecting EFT bursts directly on to the AC mains.
The EUT is configured as shown and subjected to Fast Transient Bursts at the severity level defined below. The equipment is monitored to establish compliance with the Minimum Standard requirement, as above.

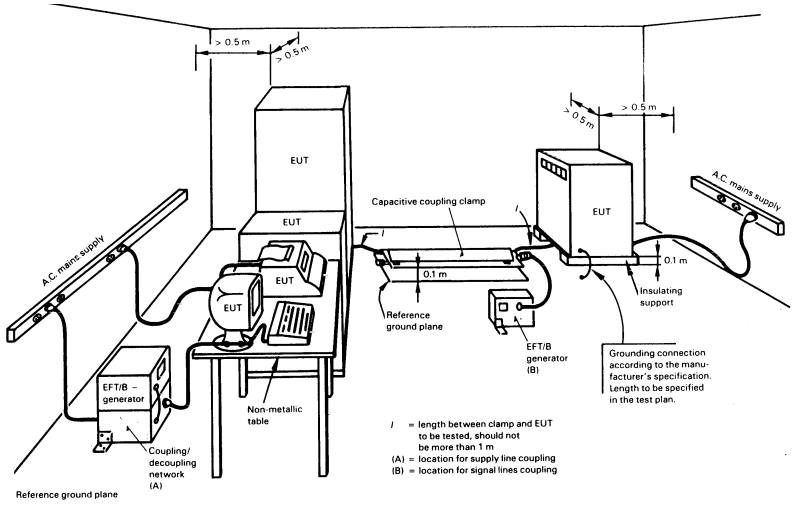
+/- 2.0kV for AC power line (Direct Injection)

PERFORMANCE: Complies with Standard.



General graph of a fast transient/burst.

IEC 801-4, EN61000-4-4 EFT Waveforms



General test set-up for laboratory type tests.

IEC 801-4, EN61000-4-4 EFT Test Setup

Part 6 - Surge Transient Immunity

DATE:	April 20, 2006
TEST STANDARD:	EN61000-4-5: 2001-09 (36.202.5)
TEST CONDITIONS:	Temperature and Humidity: 9 C°, 76% RH
TEST VOLTAGE:	240Vac @ 50Hz and Battery Pack
REQUIRED STANDARD:	36.202.5 (a) The EQUIPMENT and SYSTEM shall comply with the requirements of 36.202.1 j) at IMMUNITY TEST LEVELS of +/- 0.5 kV, +/- 1 kV, +/- 2 kV, for AC power line (s) to ground and +/- 0.5 kV and +/- 1 kV for AC power line(s) to line(s). All other EQUIPMENT and SYSTEM cables are not tested directly. The determination of compliance with this requirement shall be based on the response of the EQUIPMENT or SYSTEM, considering each surge individually, taking into account the effects of any coupling between cables that are tested directly and cables that are not tested directly. Compliance is checked by the following tests and determined during and after the tests in accordance with 36.202.1 j) Compliance Criteria.
METHOD OF TEST:	Only AC power lines to AC-to-DC converters and battery charges are tested; however, all EQUIPMENT and SYSTEM cables are attached and operating during the test. Five surges at each voltage level and polarity are applied to each power line at each of the following AC voltage waveform angles: 0º or 90º, 180º, and 270º. NOTE: While testing at both 0º and 180º is allowed, testing at only one of these two-phase angles, in addition to 90º and 270º is required.
PERFORMANCE:	Complies with Standard.

Part 7 - Voltage Dips and Interruptions Testing

DATE: April 20, 2006

TEST STANDARD: EN61000-4-1: 2001-09 (36.202.5)

TEST CONDITIONS: Temperature and Humidity: 9 C°, 76% RH

TEST VOLTAGE: 240Vac, 50Hz

REQUIRED STANDARD: Compliance is checked by the following tests and determined during and after the tests in accordance with 36.202.7

PERFORMANCE: Complies with Standard.

METHOD OF TEST: For EQUIPMENT and SYSTEMS that are not LIFE-SUPPORTING and for which the RATED input power is greater than 1kV A and the RATED input current is less than or equal to 16 A per phase, deviation from the requirements or 36.202.1 j) is allowed at the IMMUNITY TEST LEVELS specified in the following tables, provided the EQUIPMENT and SYSTEM remains safe, experiences no component failures and is restorable to the pre-test state with OPERATOR intervention.

Immunity Test Levels for Voltage Dips

Voltage test level (% U_T)	**Voltage dip**(% U_T)	**Duration Period**
<5	>95	0.5
40	60	5
70	30	25
NOTE U_T is the AC mains voltage prior to application of the test level		

Immunity Test Level for Voltage Interruptions

Voltage test level (% U_T)	**Voltage dip** (% U_T)	**Duration** (s)
<5	>95	5
NOTE U_T is the AC mains voltage prior to application of the test level		

TEST DATA:

Voltage Dips & Interruptions	**Required Standard**
30% for 25 cycles	Pass
60% for 5 cycles	Pass
>95% for 5 sec	Pass

PERFORMANCE: Complies with Standard.

Appendix A: EUT Photos

Emissions Test Setup of FAB Front View

Emissions Test Setup of Main Unit Up Close

Emission Setup of Back Unit

Emissions Test Setup of Foot Pads

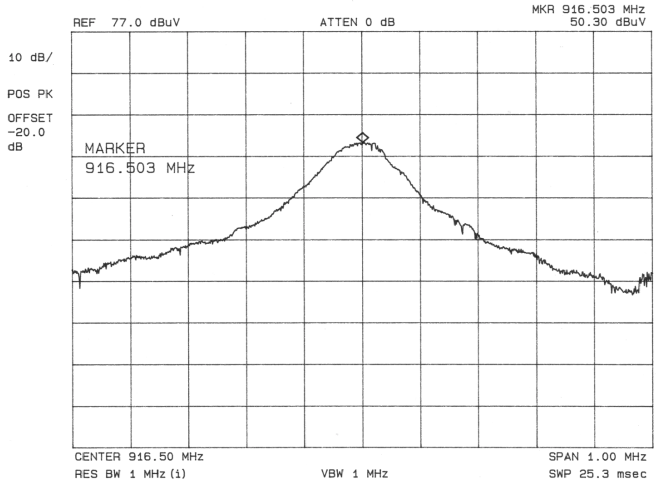
Emission Set up of FAB Sensors

Appendix B: Intentional Emission Data and Plots

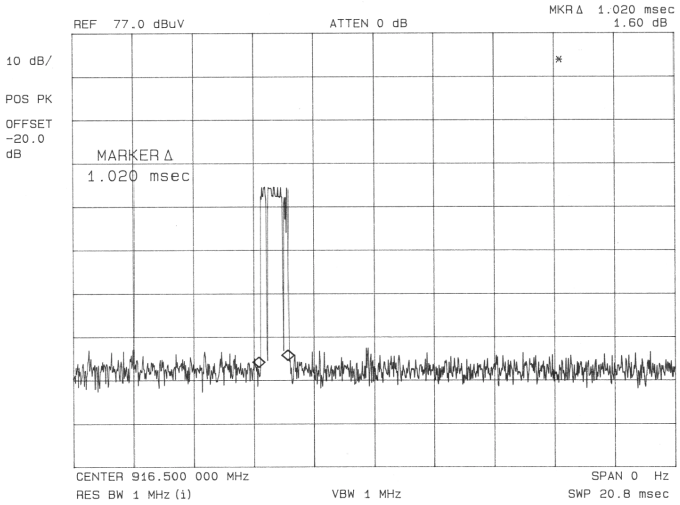
Table 1: 15.249(b,d) / IC RSS-210 Appendix 8, 916.5 MHz, Radiated Spurious Emissions

Freq.	Harmonic	Restricted Bands	Measured Signal Average (RBW=1MHz / VBW=1MHz)	Equipment Attenuation (cable)	Antenna Factor (dB/m)	Corrected Signal	Measured Distance	Corrected Signal for 3m (-9.5dB)	Calculated Averaged Signal with Duty Cycle Correction (-11.46 dB)	Limit - FCC 15.249	Delta Limit - FCC 15.249	Delta from Peak Carrier	Limit - IC RSS-210 A2.9	Delta Limit - IC RSS-210
(MHz)			(dBµV)	(dB)	(dB/m)	(dBµV)	(m)	(dBµV)	(dBµV)	(dBµV)	(dB)	(dBc)	(dBµV)	(dB)
916.5	1ST	N/A	50.20	7.0	22.40	79.60	3	79.6		94	25.86		94	
1833	2ND	N/A	9.54	3.1	28.69	41.33	1	31.83	20.37	54	33.63	47.77	54	33.63
2749.5	3RD	2655-2900	-0.40	2.8	31.35	33.75	1	24.25	12.79	54	41.21	55.35	54	41.21
3666.0	4TH	3600-4400	-0.30	3.5	33.63	36.83	1	27.33	15.87	54	38.13	52.27	54	38.13
4582.5	5TH	4500-5150	-0.70	5.0	34.80	39.10	1	29.60	18.14	54	35.86	50.00	54	35.86
5499.0	6TH	N/A	-0.70	5.3	36.70	41.30	1	31.80	20.34	54	33.66	47.80	54	33.66
6415.5	7TH	N/A	-0.90	7.3	37.10	43.50	1	34.00	22.54	54	31.46	45.60	54	31.46
7332.0	8TH	7250-7750	-0.70	7.5	38.73	45.53	1	36.03	24.57	54	29.43	43.57	54	29.43
8248.5	9Th	8025-8500	-0.70	9.6	39.30	48.20	1	38.70	27.24	54	26.76	40.90	54	26.76
9165.0	10TH	9000-9200	-0.70	10.3	40.11	49.71	1	40.21	28.75	54	25.25	39.39	54	25.25

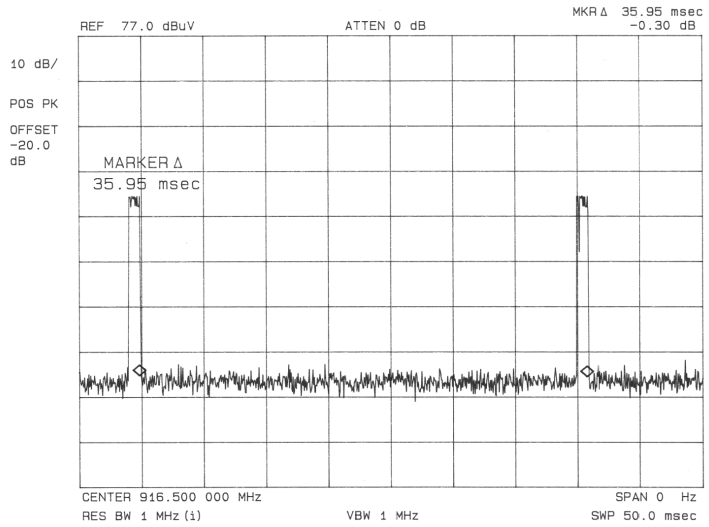
Intentional Plots15.247(a)(2) – 6dB Bandwidth



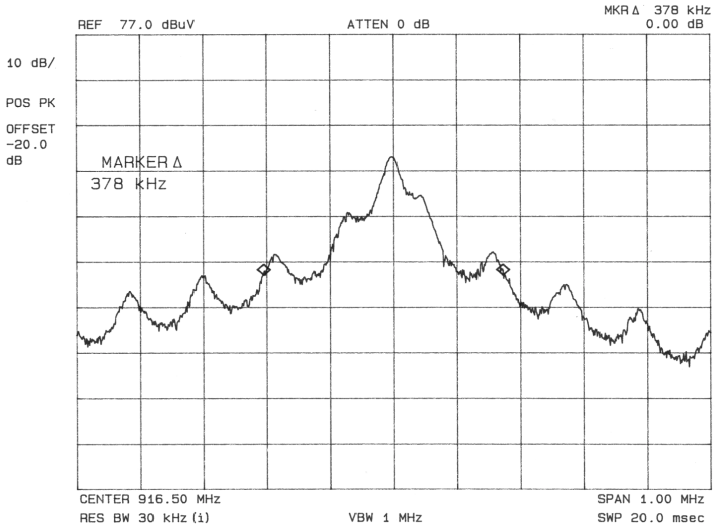
Plot 1: Peak Power Radiated Belt Clip



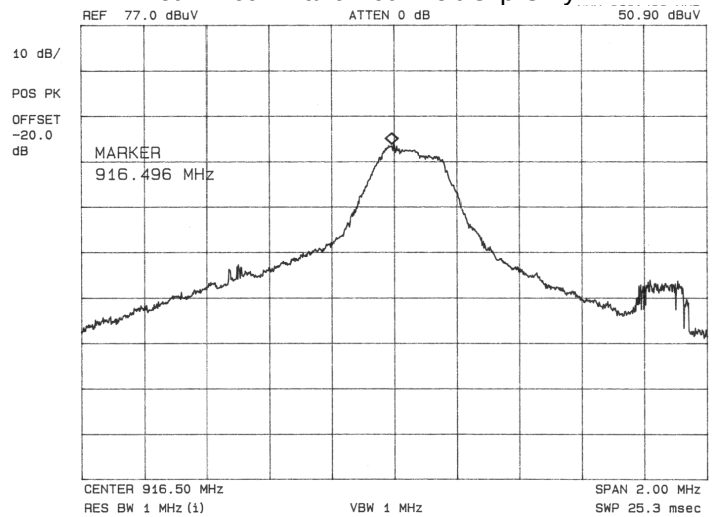
Plot 2: Pulse Width Belt Clip Only



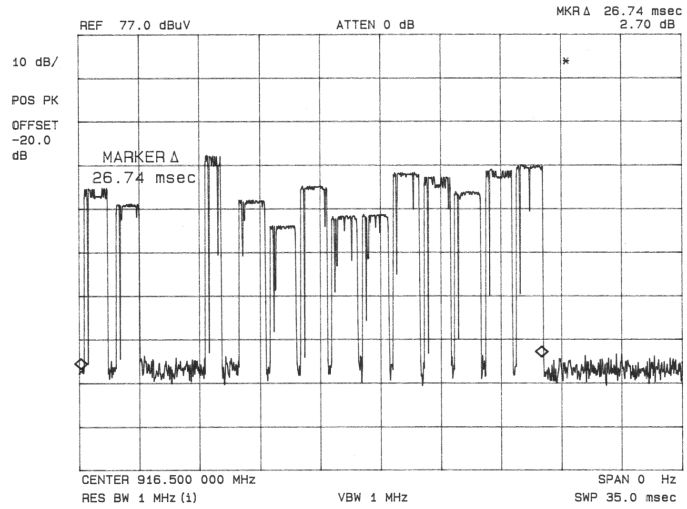
Plot 3: Pulse Cycle Belt Clip Only



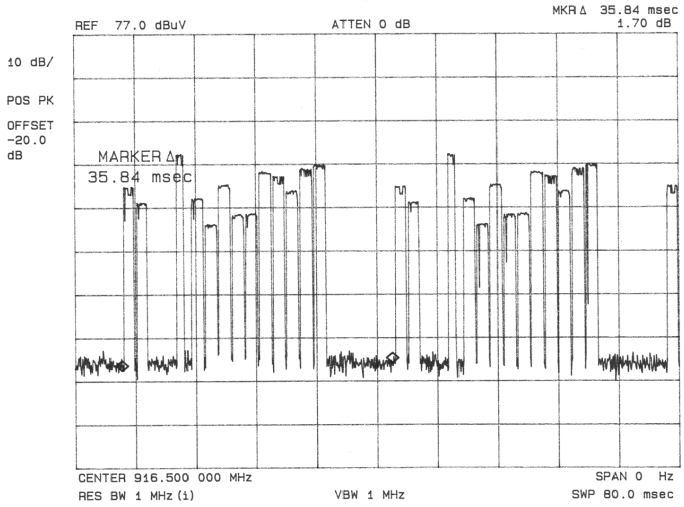
Plot 4: 26dB Bandwidth Belt Clip Only



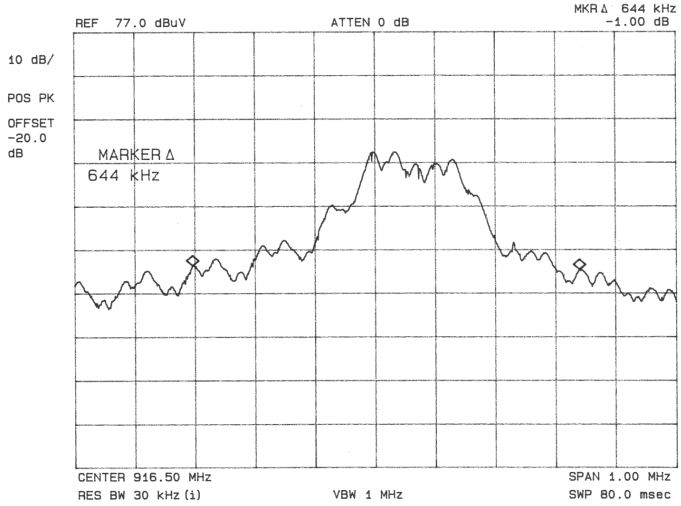
Plot 5: Peak Power Belt Clip and all Sensors



Plot 6: Pulse Width Belt Clip with 12 Sensors



Plot 7: Pulse Cycle Belt Clip with 12 Sensors



Plot 8: 26db Bandwidth Belt Clip with 12 Sensors

Appendix C: Unintentional Emission Data and Plots

Conducted Emissions - AC Mains Sensor Battery Charger with Foot Pas Sensor

Table 1: Line 1 – 120Vac, 60Hz`

Frequency (MHz)	Limit (dBµV)	DelLim-Pk (dB)
0.2094	50.8	-2.4
0.2061	49.3	-4.0
0.348	43.9	-5.1
0.2757	45.5	-5.4
0.2801	44.0	-6.8
0.6889	38.2	-7.8

Table 2: Line 2 – 120Vac, 60Hz

Frequency (MHz)	Limit (dBµV)	DelLim-Pk (dB)
0.2061	50.0	-3.3
0.2083	49.7	-3.5
0.2105	48.2	-4.9
0.2757	45.4	-5.5
0.348	43.4	-5.6
0.6962	38.4	-7.6

Table 3: Line 1 - 240Vac, 50Hz

Frequency (MHz)	Limit (dBµV)	DelLim-Pk (dB)
0.2083	48.7	-4.5
0.4166	42.7	-4.8
0.5515	41.0	-5.0
0.2772	45.8	-5.1
0.6889	40.7	-5.3
0.4857	40.3	-5.9

Table 4: Line 2 – 240Vac, 50Hz

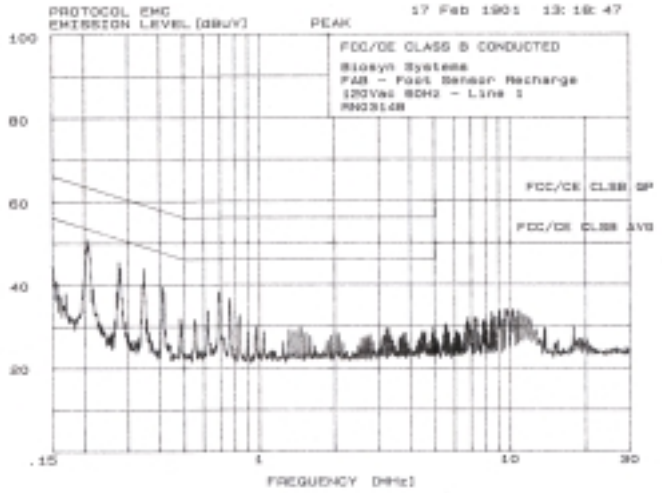
Frequency (MHz)	Limit (dBµV)	DelLim-Pk (dB)
0.3462	45.2	-3.8
0.5545	41.8	-4.2
0.6925	41.6	-4.4
0.2094	48.6	-4.6
0.2072	48.4	-4.9
0.2772	45.7	-5.2

Radiated Emissions –FCC Part15/B Class B Limits Battery Mode Operation
No detectable frequencies were found between 30 to 2000 MHz.

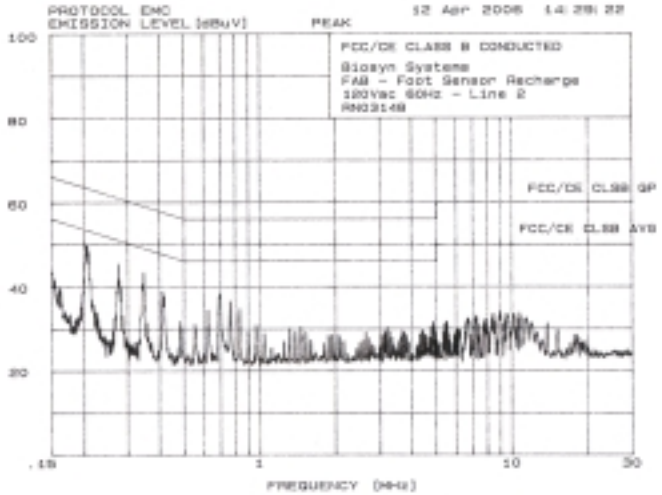
Table 5: Harmonic Data

Harmonic Number N	Limit Current mA Filtered	Limit	Average	% Limit	Max value filtered mA	% Limit	Assessment
1.	5.78	-	5.8	-	5.82	-	Pass
2:	0.35	-	0.4	-	0.37	-	Pass
3:	5.30	-	5.3	-	5.33	-	Pass
4:	0.34	-	0.4	-	0.36	-	Pass
5:	5.20	-	5.2	-	5.23	-	Pass
6:	0.33	-	0.3	-	0.35	-	Pass
7:	5.04	-	5.1	-	5.07	-	Pass
8:	0.32	-	0.3	-	0.33	-	Pass
9:	4.84	-	4.9	-	4.86	-	Pass
10:	0.30	-	0.3	-	0.32	-	Pass
11:	4.59	-	4.6	-	4.61	-	Pass
12:	0.28	-	0.3	-	0.23	-	Pass
13:	4.31	-	4.3	-	4.33	-	Pass
14:	0.26	-	0.3	-	0.27	-	Pass
15:	3.99	-	4.0	-	4.01	-	Pass
16:	0.23	-	0.2	-	0.25	-	Pass
17:	3.66	-	3.7	-	3.68	-	Pass
18:	0.21	-	0.2	-	0.22	-	Pass
19:	3.31	-	3.3	-	3.32	-	Pass
20:	0.18	-	0.2	-	0.19	-	Pass
21:	2.95	-	3.0	-	2.96	-	Pass
22:	0.16	-	0.2	-	0.16	-	Pass
23:	2.59	-	2.6	-	2.60	-	Pass
24:	0.14	-	0.1	-	0.14	-	Pass
25:	2.23	-	2.2	-	2.24	-	Pass
26:	0.11	-	0.1	-	0.11	-	Pass
27:	1.89	-	1.9	-	1.90	-	Pass
28:	0.08	-	0.1	-	0.09	-	Pass
29:	1.57	-	1.6	-	1.59	-	Pass
30:	0.06	-	0.1	-	0.07	-	Pass
31:	1.18	-	1.2	-	1.18	-	Pass
32:	0.05	-	0.1	-	0.06	-	Pass
33:	1.07	-	1.1	-	1.08	-	Pass
34:	0.03	-	0.0	-	0.03	-	Pass
35:	0.77	-	0.8	-	0.77	-	Pass
36:	0.02	-	0.0	-	0.03	-	Pass
37:	0.60	-	0.6	-	0.60	-	Pass
38:	0.02	-	0.0	-	0.02	-	Pass
39:	0.47	-	0.5	-	0.48	-	Pass
40:	0.02	-	0.0	-	0.04	-	Pass

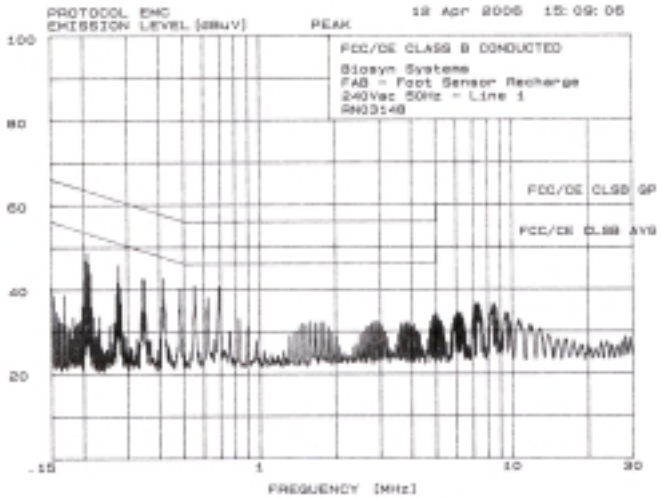
Conducted Emission Plots



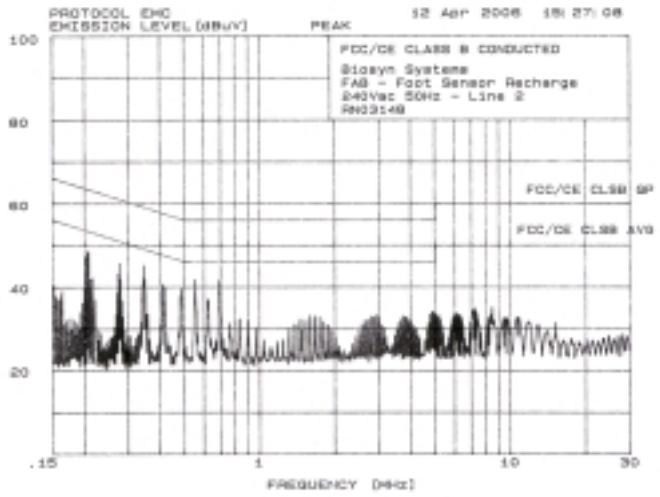
Plot 9: Line 1 - 120Vc, 60Hz



Plot 10: Line 2 – 120Vac, 60Hz



Plot 11: Line 1 – 240Vac, 50Hz



Plot 12: Line 2 – 240Vac, 50Hz