Test Report:	6W77120
Applicant:	Nordic ID Myllyojankatu 2A Salo, Finland 24100
Apparatus:	PL3000 HF RFID
FCC ID:	SCCPL3000H
In Accordance With:	FCC Part 15 Subpart C, 15.225 Operation within the band 13.110-14.010 MHz
Tested By:	Nemko Canada Inc. 303 River Road Ottawa, Ontario K1V 1H2
Authorized By:	Roman Kuleba, Wireless Specialist
Date:	December 13, 2006
Total Number of Pages:	19

Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

The assessment summary is as follows:

Apparatus Assessed:	PL3000 HF RFID
Specification:	FCC Part 15 Subpart C, 15.225
Compliance Status:	Complies
Exclusions:	This report only assessed the RFID portion of this equipment.
Non-compliances:	None
Report Release History:	Original Release

Author: Jason Nixon, Telecom Specialist

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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Section 1 : Equipment Under Test

1.1 Product Identification

The Equipment Under Test was identified as follows:

PL3000 HF RFID Reader

1.2 Samples Submitted for Assessment

The following samples of the apparatus have been submitted for type assessment:

Sample No.	Description	Serial No.
1	PL3000	None
3	PL3000 Charger (Type: ACN00017)	L063800650
4	Nordic Power AB Power supply (M/N: SA30-24U)	None

The first samples were received on: November 24, 2006

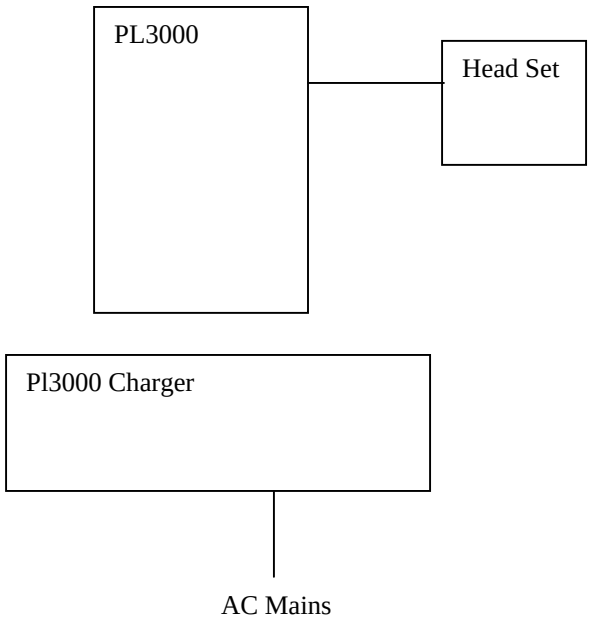
1.3 Theory of Operation

The EUT is a handheld barcode scanner that incorporates RFID, WLAN and Bluetooth.

1.4 Technical Specifications of the EUT

Manufacturer:	Nordic ID
Operating Frequency:	13.56MHz
Emission Designator	F0N
Modulation:	FSK
Antenna Data:	Integral
Power Supply:	7.4VDC Battery

1.5 Block Diagram of the EUT



Section 2 : Test Conditions

2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.225

Operation within the band 13.110-14.010 MHz

2.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

2.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15 – 30 ^{o}C
Humidity range	:	20 - 75 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 5% of rated voltages

2.4 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Next Cal.
LISN	Rohde & Schwarz	ENV216	FA002023	Aug. 28/07
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU	FA002043	Oct. 24/07
International Power Supply	California Inst.	3001i	FA001021	Jan. 11/07
50 Coax cable	HUBER + SUHNER	None	FA002021	Sept. 08/07
50 Coax cable	WFU	None	FA002028	Oct. 02/07
Spectrum Analyzer	Rohde & Schwarz	FSP	FA001920	March 17/07
Receiver	Rohde & Schwarz	ESHS 10	FA001918	Feb. 17/07
Active Loop Antenna	Rohde & Schwarz	HFH2-Z2	FA000631	June 12/07
Biconical (1) Antenna	EMCO	3109	FA000805	May 03/07
Log Periodic Antenna #1	EMCO	LPA-25	FA000477	Sept. 12/07
50 Coax cable	WFU	None	FA002026	Oct. 02/07
50 Coax cable	WFU	None	FA002027	Oct. 02/07
Temperature Chamber	Thermotron	SM-16C	FA001030	COU
K/J Thermometer	Fluke	52	FA001247	Jan 10/07

COU – Calibrate on Use

Section 3 : Observations

3.1 Modifications Performed During Assessment

No modifications were performed during assessment.

3.2 Record Of Technical Judgements

No technical judgements were made during the assessment.

3.3 EUT Parameters Affecting Compliance

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

3.4 Test Deleted

No Tests were deleted from this assessment.

3.5 Additional Observations

There were no additional observations made during this assessment.

Section 4 : Results Summary

This section contains the following:

FCC Part 15 Subpart C : Test Results

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N	No : not applicable / not relevant.
Y	Yes : Mandatory i.e. the apparatus shall conform to these tests.
N/T	Not Tested, mandatory but not assessed. (See section 3.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

4.1 FCC Part 15 Subpart C : Test Results

Part 15	Test Description	Required	Result
15.31(e)	Variation of power supply	N	
15.207(a)	Powerline Conducted Emissions	Y	PASS
15.215(c)	20dB Bandwidth	Y	PASS
15.225(a)	Field Strength in the 13.553-13.567 MHz band	Y	PASS
15.225(b)	Field Strength in the 13.410-13.553 MHz and 13.567-13.710 MHz MHz bands	N	
15.225(c)	Field Strength in the 13.110-13.410 MHz and 13.710-14.010 MHz bands	N	
15.225(d)	Field Strength of any emissions appearing outside of the 13.110-14.010 MHz band	Y	PASS
15.225(e)	Frequency tolerance of the carrier signal	Y	PASS
15.225(f)	Radio frequency powered tags	N	

Notes:

Appendix A : Test Results

Clause 15.215(c) 20dB Bandwidth

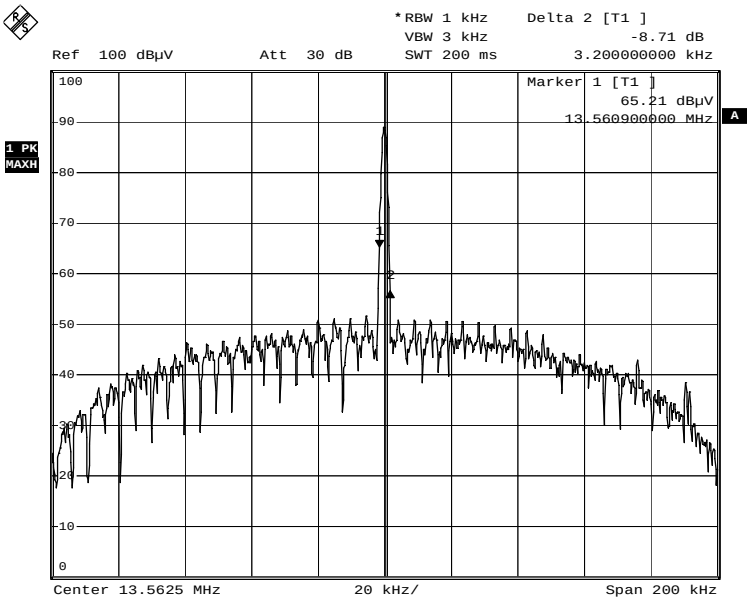
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Test Conditions:

Sample Number:	1	**Temperature (°C):**	24
Date:	November 27, 2006	**Humidity (%):**	28
Modification State:	0	**Tester:**	Jason Nixon
		Laboratory:	Wireless

Test Results: See Attached Plots.

20dB Bandwidth:



20dB Bandwidth

Date: 27.NOV.2006 23:09:40

Clause 15.207(a) Powerline Conducted Emissions

Frequency of Conducted limit (dBmV)

Emission (MHz)	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test Conditions:

Sample Number:	1	**Temperature (°C):**	23
Date:	November 29, 2006	**Humidity (%):**	24
Modification State:	0	**Tester:**	Jason Nixon
		Laboratory:	Shielded Room

Test Results: See attached tables and plots.

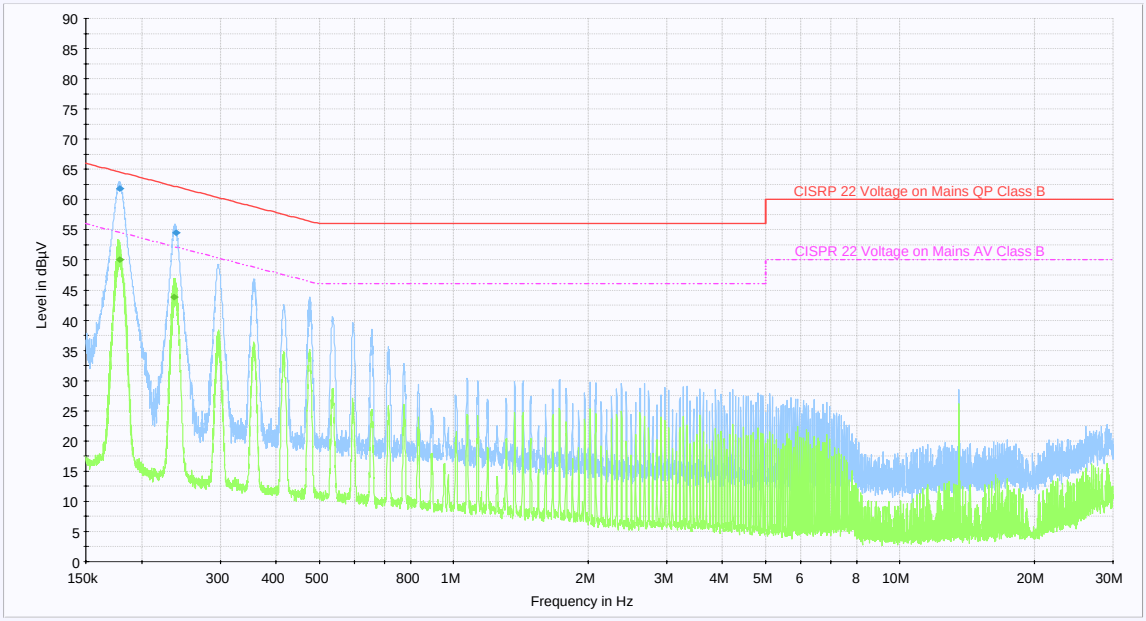
Additional Observations:

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	0.1s	Receiver

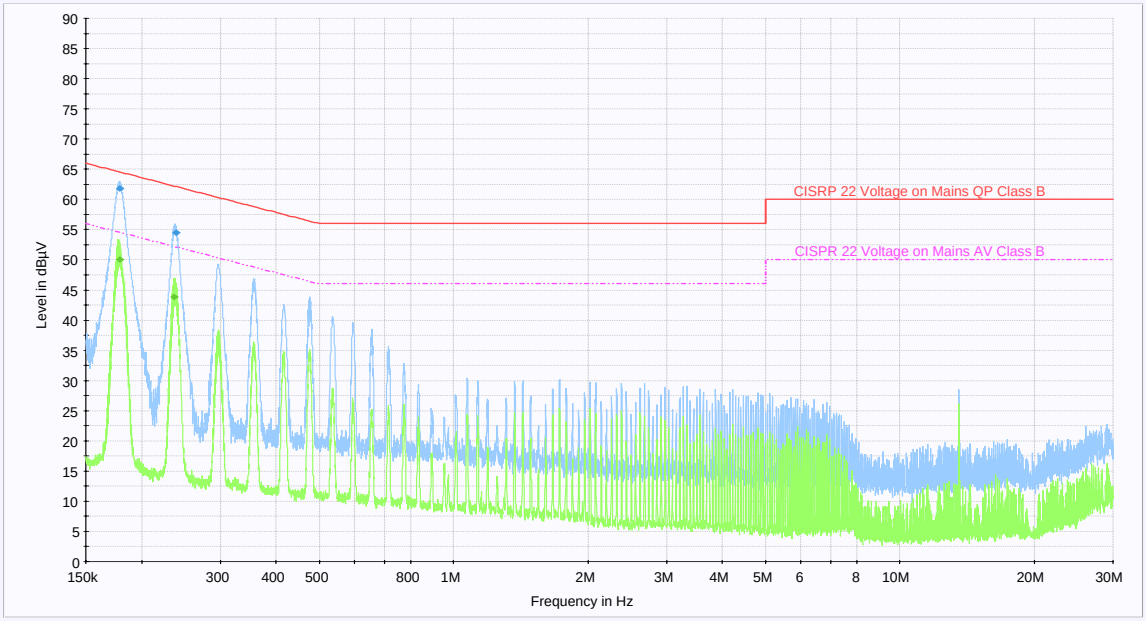
Frequency (MHz)	QuasiPeak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.178395	63.2	L1	9.6	1.4	64.6
0.237050	55.6	L1	9.6	6.6	62.2
0.297375	49.2	L1	9.6	11.1	60.3
0.178493	61.8	N	9.6	2.8	64.6
0.238352	54.5	N	9.6	7.7	62.2

Frequency (MHz)	Average (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177706	50.9	L1	9.6	3.7	54.6
0.239445	43.8	L1	9.6	8.3	52.1
0.178315	50.0	N	9.6	4.6	54.6
0.236579	43.9	N	9.6	8.3	52.2

Phase



Neutral



Clause 15.225(a) Field Strength in the 13.553-13.567 MHz band

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

Test Conditions:

Sample Number:	1	**Temperature (°C):**	10
Date:	November 28, 2006	**Humidity (%):**	82
Modification State:	0	**Tester:**	Jason Nixon
		Laboratory:	OATS

Test Results: See Attached table.

13.5623MHz	Measured level	Distance correction	Level @ 30m	Limit @ 30m
x-axis	45.6dBuV/m	40dB	5.6dBuV/m	84dBuV/m
y-axis	34.6dBuV/m	40dB	-5.4dBuV/m	84dBuV/m
z-axis	46.3dBuV/m	40dB	6.3dBuV/m	84dBuV/m

Additional Observations:

All measurements were performed at 3m using a Peak detector with 10kHz RBW/VBW.

The loop antenna was rotated 360° about its axis.

Clause 15.225(d) Field Strength of any emissions appearing outside of the 13.110-14.010 MHz band

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in §15.209

15.209(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Conditions:

Sample Number:	1	**Temperature (°C):**	10
Date:	November 29, 2006	**Humidity (%):**	75
Modification State:	0	**Tester:**	Jason Nixon
		Laboratory:	OATS

Test Results: No emissions were detected within 20dB below the limit.

Additional Observations:

The Spectrum was searched from 30MHz to 1GHz.

The EUT was measured on three orthogonal axis.

All measurements were performed at 3m.

Clause 15.225(e) Frequency tolerance of the carrier signal

The frequency tolerance of the carrier signal shall be maintained within +/-0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a 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.

Test Conditions:

Sample Number:	1	**Temperature (°C):**	23
Date:	November 27, 2006	**Humidity (%):**	25
Modification State:	0	**Tester:**	Jason Nixon
		Laboratory:	Wireless

Test Results:

Conditions	Frequency (Hz)	Offset (ppm)
+50°C, Nominal power	13562375	-1.84
+40°C, Nominal power	13562385	-1.11
+30°C, Nominal power	13562405	0.37
+20°C, Nominal power	13562400	——
+10°C, Nominal power	13562415	1.11
0°C, Nominal power	13562420	1.47
-10°C, Nominal power	13562420	1.47
-20°C, Nominal power	13562420	1.47

Additional Observations:

The EUT is battery powered and was tested with fully charged batteries.

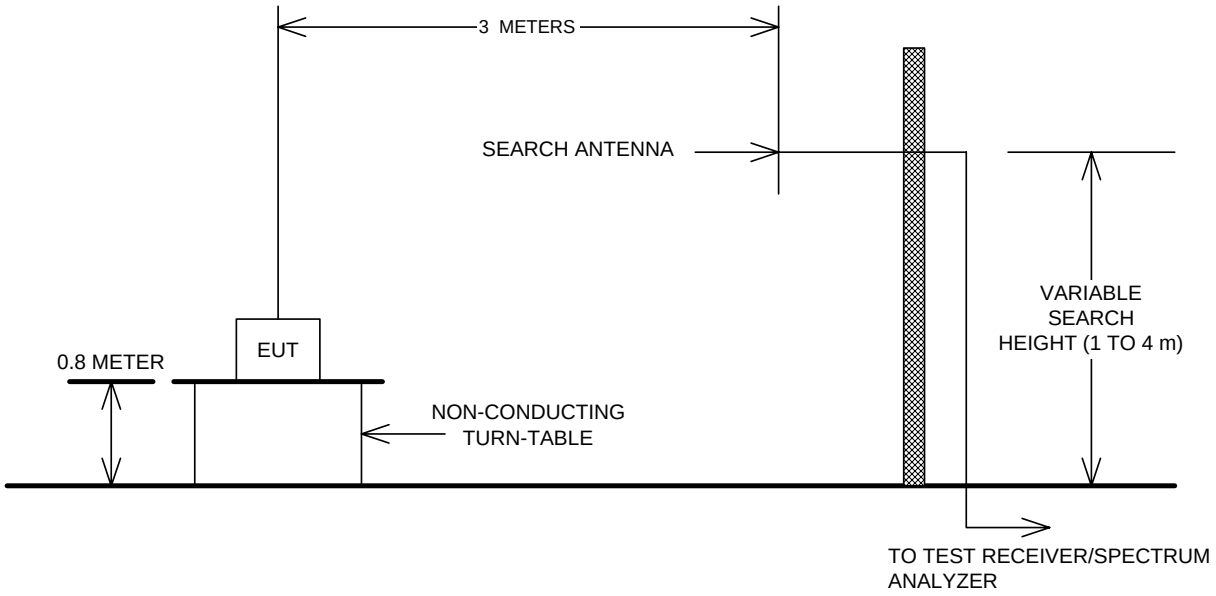
Appendix B : Setup Photographs

Conducted Emissions Setup:

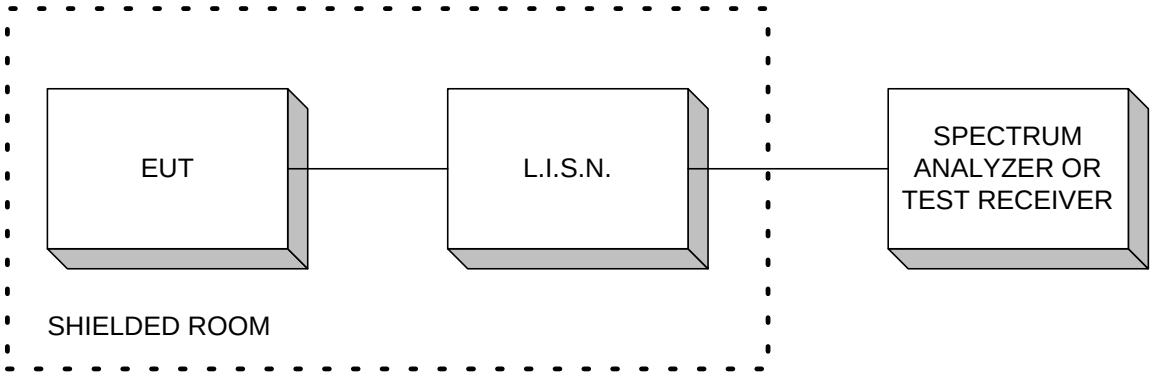
Spurious Emissions Setup:

Appendix C : Block Diagram of Test Setups

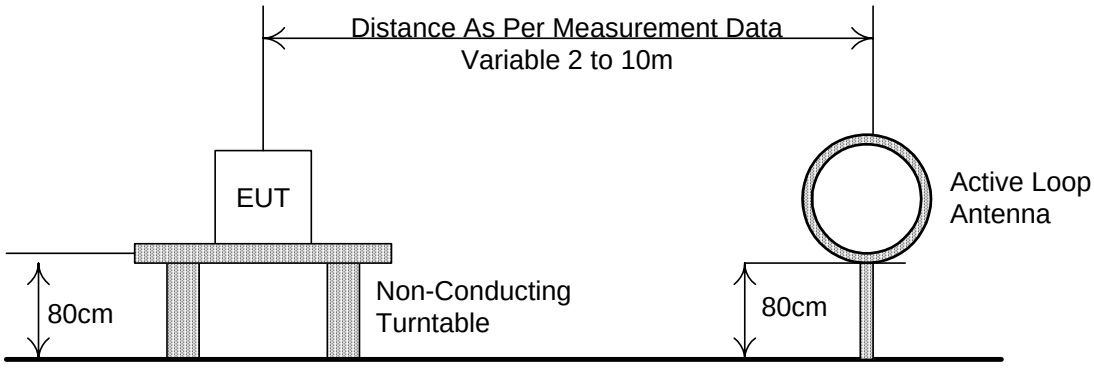
Test Site For Radiated Emissions above 30MHz



Conducted Emissions



Emissions below 30MHz



Open Area Test Site – Flat Level Area – Asphalt Surface – Clear Of Obstacles

Frequency Stability