Nemko Test Report:	129836-1TRFWL
Applicant:	Nordic ID Myllyojankatu 2 A 24100 Salo Finland
Apparatus:	PL3000HF
FCC ID:	SCCPL3000L
In Accordance With:	FCC Part 15 Subpart C, 15.225 Operation within the band 13.110–14.010 MHz
Authorized By:	Kevin Ma Kevin Ma, Wireless/EMC Specialist
Date:	November 23, 2009
Total Number of Pages:	14

Nemko Canada Inc.
303 River Road,
Ottawa, Ontario
K1V 1H2
T 1 613 737 9680 **F** 1 613 737 9691**TF** 1 800 563 6336
Email Canada@nemko.com
Web www.nemko.com

TABLE OF CONTENTS

Section 1 : 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.

The assessment summary is as follows:

Apparatus Assessed:	PL3000HF
Specification:	FCC Part 15 Subpart C, 15.225
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release
Test Location:	Nemko Canada Inc. 303 River Road Ottawa, Ontario K1V 1H2
Registration Number:	176392 (3 m Semi-Anechoic Chamber)
Tests Performed By:	Andrey Adelberg, Senior Wireless/EMC Specialist
Test Dates:	June 22, 2009

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. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Section 2 : Equipment Under Test

2.1 Identification of Equipment Under Test (EUT)

The following information identifies the EUT under test:

Type of Equipment:	Handheld RFID computer
Brand Name:	NordicID
Model Name or Number:	PL3000HF
Serial Number:	L092017537
Nemko Sample Number:	1
FCC ID:	SCCPL3000L
Date of Receipt:	June 8, 2009

2.2 Accessories

No additional equipment was used to exercise the EUT during testing.

2.3 EUT Description

The NordicID PL3000 is a portable data terminal running Windows CE 6.0 or later. It is intended to provide a platform for a 3rd party to create their custom software solution. The unit is internally divided into two PCBs, the CPU board and the MOD board, plus additional modules like RFID (13.56 MHz) reader.

2.4 Technical Specifications of the EUT

Operating Band: 13.553–13.567 MHz

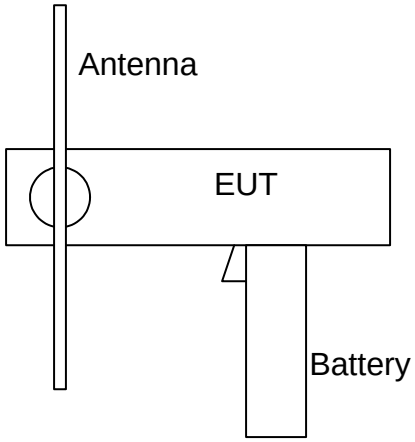
Operating Frequency: 13.56 MHz

Modulation: On/Off Keying

Antenna Data: Integral

Power Supply Requirements: Li-Ion Battery, 7.4 V

2.5 EUT Setup diagram



2.6 Operation of the EUT during testing

The EUT was turned on and RFID function turned on.

2.7 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

Section 3 : Test Conditions

3.1 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

3.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

3.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15–30 °C
Humidity range	:	20–75 %
Pressure range	:	86–106 kPa
Power supply range	:	±5% of rated voltages

3.4 Measurement Uncertainty

Nemko Canada measurement uncertainty has been calculated using guidance of UKAS LAB 34:2003 and TIA-603-B Nov 7, 2002. All calculations have been performed to provide a confidence level of 95 % and can be found in Nemko Canada document MU-003.

3.5 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Cal. Date	Next Cal.
3 m EMI Test Chamber	TDK	SAC-3	FA002047	May 06/09	May 06/10
Bilog	Sunol	JB3	FA002108	Jan. 27/09	Jan. 27/10
Flush Mount Turntable	Sunol	FM2022	FA002082	NCR	NCR
Controller	Sunol	SC104V	FA002060	NCR	NCR
Mast	Sunol	TLT2	FA002061	NCR	NCR
International Power Supply	California Inst.	3001i	FA001021	Jan. 13/09	Jan. 13/10
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU 26	FA002043	Dec. 16/08	Dec. 16/09
Active Loop Antenna	EMCO	6502	FA001686	July 22/09	July 22/10

NCR – No Calibration Required

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 Report Summary)

4.1 FCC Part 15 Subpart C : Test Results

Part 15	Test Description	Required	Result
15.31(e)	Variation of power supply	Y	PASS
15.207(a)	Powerline Conducted Emissions	N*	
15.215(c)	20 dB 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 bands	Y	PASS
15.225(c)	Field Strength in the 13.110–13.410 MHz and 13.710–14.010 MHz bands	Y	PASS
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	

Note: The EUT does not operate from the AC power lines.

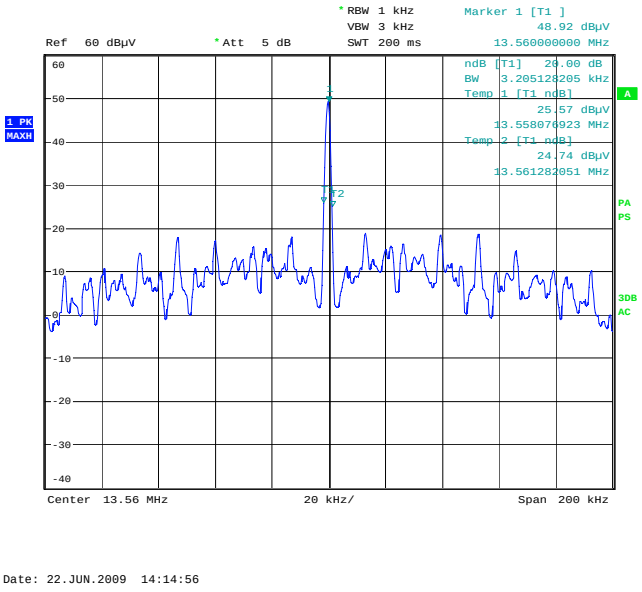
Appendix A : Test Results

Clause 15.215(c) 20 dB 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 Results: Pass

20 dB Bandwidth:



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.

Clause 15.225(b) Field Strength in the 13.410–13.553 MHz and 13.567–13.710 MHz bands

Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

Clause 15.225(c) Field Strength in the 13.110–13.410 MHz and 13.710–14.010 MHz bands

Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

Test Results: Pass

Additional Observations:

Measurements were made using a 10 kHz Peak detector @ 3 m.
Conversion factor of 40 dB was used to calculate Field strength at 30 m according to following equation: $40Log_{10}(3/30) = -40$ dB

The EUT was measured on three orthogonal axis and the EUT was rotated 360°
The test was performed using fully charged battery.

Frequency MHz	Emission @ 3 m dBµV/m	EUT Position	Total Loss dB	Emission @ 30 m dBµV/m	Limit @ 30 m dBµV/m	Margin dB
13.560	100.2	Flat	11.9	60.2	84.00	23.8
13.560	100.2	Side	11.9	60.2	84.00	23.8
13.560	90.3	Stand	11.9	50.3	84.00	33.7

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 Results: Pass

Additional Observations:

The Spectrum was searched from 30 MHz to the 10th Harmonic using a quasi-peak detector with 120 kHz RBW and 300 kHz VBW below 1 GHz and 1 MHz/3 MHz peak detector above 1 GHz.

The EUT was measured on three orthogonal axis.

All measurements were performed at 3m.

Frequency MHz	Emission* @ 3 m dBµV/m	EUT Position	Total Loss dB	Emission @ 30 m dBµV/m	Limit @ 30 m dBµV/m	Margin dB
27.120	69.2	Flat	9.8	29.2	29.54	0.34

* - Measured with peak detector and 10 kHz RBW

Frequency MHz	Quasi-Peak dBµV/m	Polarization	Total Loss dB	Margin dB	Limit dBµV/m
40.6800	24.7	H	14.7	15.3	40.0
40.6800	35.2	V	13.5	4.8	40.0
67.8000	27.2	V	8.2	12.8	40.0
67.8000	19.1	H	9.1	20.9	40.0
122.040	41.8	H	14.9	1.7	43.5
122.040	31.4	V	15.3	12.1	43.5
135.600	36.7	H	14.6	6.8	43.5
135.600	28.0	V	14.9	15.5	43.5

Note: Total Loss includes antenna factor, cable loss and amplifier gain where applicable.

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.

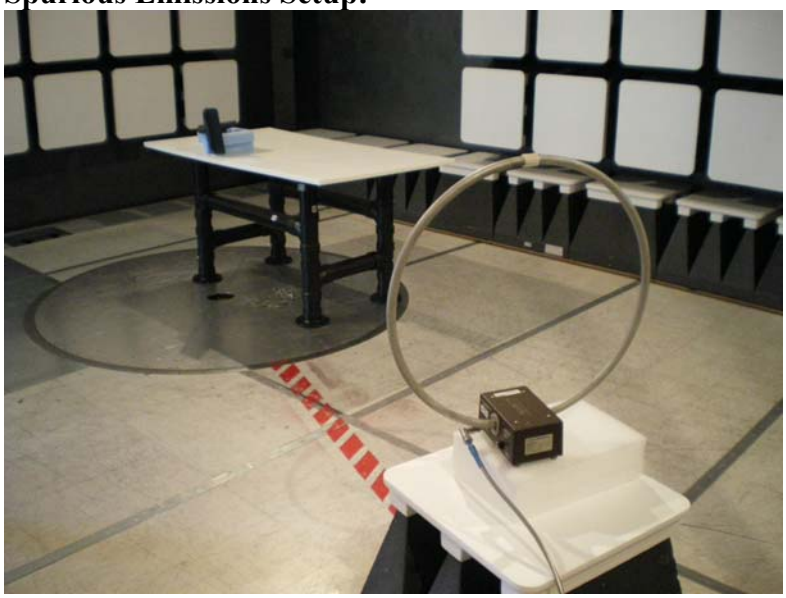
Test Results: Pass

The test was performed using fully charged battery.

Conditions	Frequency (Hz)	Offset (ppm)
+50 °C, Nominal power	13559988	0.88
+40 °C, Nominal power	13559967	2.43
+30 °C, Nominal power	13559902	7.23
+20 °C, +10 % power	13560009	−0.66
+20 °C, Nominal power	13560000	——
+20 °C, −10 % power	13559999	0.07
+10 °C, Nominal power	13560012	−0.88
0 °C, Nominal power	13560144	−10.62
−10 °C, Nominal power	13560192	−14.16
−20 °C, Nominal power	13560218	−16.08

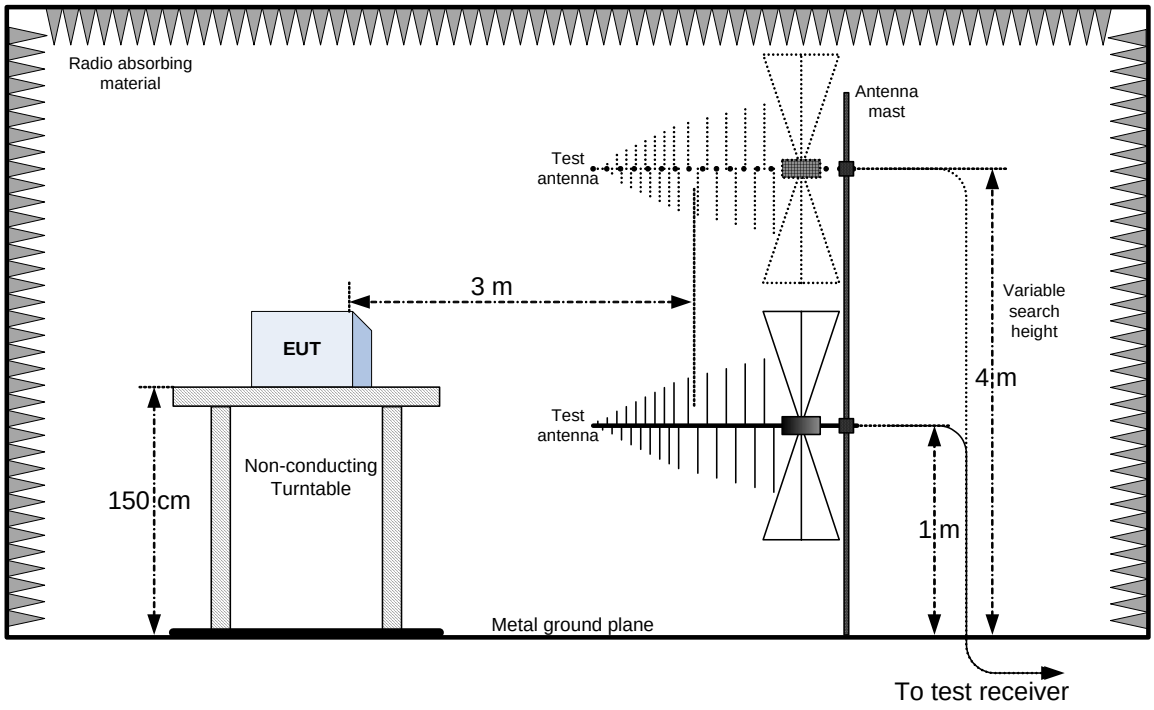
Appendix B : Setup Photographs

Spurious Emissions Setup:

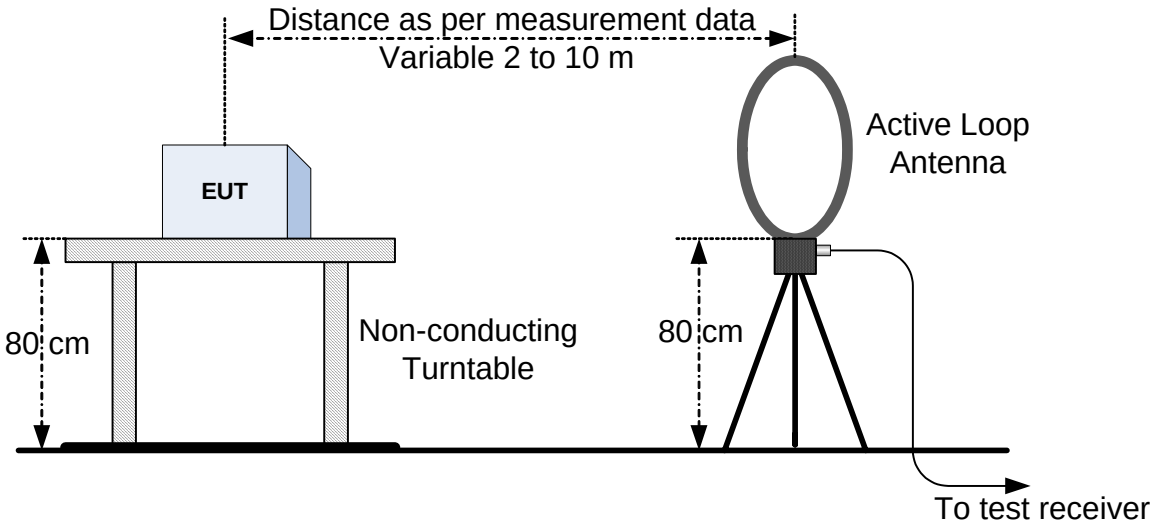


Appendix C : Block Diagram of Test Setups

Radiated Emissions above 30 MHz test setup



Radiated Emissions below 30 MHz test setup



Frequency Stability test setup