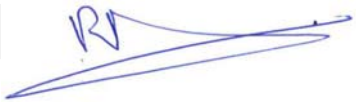
Nemko Test Report:	162227-1TRFWL
red **Applicant:**	Cattron Theimeg Inc 58 West Shenango St Sharpsville, PA 16150, USA
Apparatus:	Tag Reader System
FCC ID:	CN29116
In Accordance With:	FCC Part 15 Subpart C, 15.207 and 15.209 Intentional Radiators
Authorized By:	 Richard Brazeau, Laboratory Manager
Date:	January 4, 2011
Total Number of Pages:	15

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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:	Tag Reader System
Specification:	FCC Part 15 Subpart C, 15.207 and 15.209
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 (3m Semi-Anechoic Chamber)
Tests Performed By:	Kevin Ma, Technical Assessor
Test Dates:	December 6, 2010

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:	200 kHz Tag Reader
Brand Name:	Cattron
Model Number:	2OPT-9116-A900
Serial Number:	001
Nemko Sample Number:	1
FCC ID:	CN29116
Date of Receipt:	November 25, 2010

2.2 Accessories

The following information identifies accessories used to exercise the EUT during testing:

Description:	Regulated Power Supply
Brand Name:	ACOPIAN
Model Name or Number:	A75HT400
Serial Number:	N/A
Nemko Sample Number:	2
Connection Port:	DC port
Cable Length and Type:	3m

2.3 EUT Description

EUT is a 200 kHz Tag Reader System.

2.4 Technical Specifications of the EUT

Operating Band: 200 kHz

Operating Frequency: 200 kHz

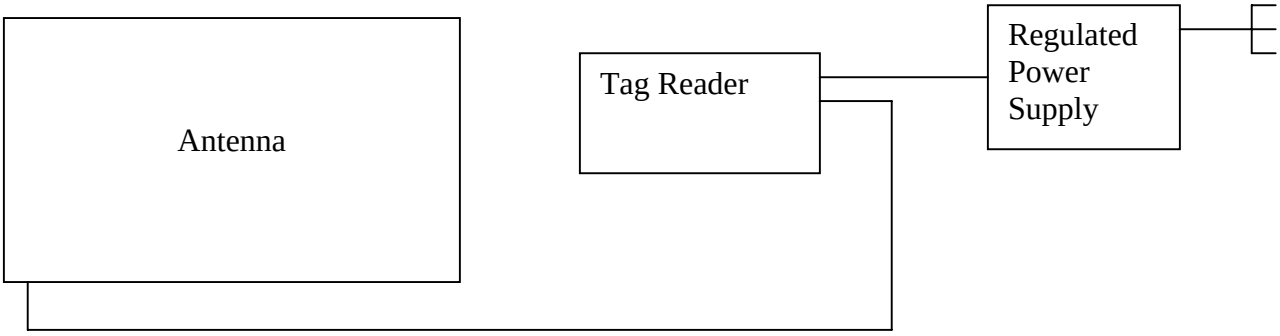
Modulation: CW

Occupied Bandwidth: 2.64 kHz

Antenna Data: 0 dBi

Power Supply Requirements: 72 VDC

2.5 EUT Setup diagram



2.6 Operation of the EUT during testing

EUT was set to constant transmission during the test.

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, 15.207 and 15.209
Intentional Radiators

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 ^{o}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	Mar. 09/10	Mar. 09/11
Flush Mount Turntable	Sunol	FM2022	FA002082	NCR	NCR
Controller	Sunol	SC104V	FA002060	NCR	NCR
Antenna Mast	Sunol	TLT2	FA002061	NCR	NCR
International Power Supply	California Inst.	3001i	FA001021	COU	COU
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU 26	FA002043	Jan. 14/10	Jan. 14/11
Spectrum Analyzer	Rohde & Schwarz	FSP 40	FA001920	May 17/11	May 17/11
Bilog Antenna	Sunol	JB3	FA002108	Jan. 18/10	Jan. 18/11
LISN	Rohde & Schwarz	ENV216	FA002023	1 year	Nov. 09/11
Active loop antenna	Emco	6502	FA001686	1 year	July 27/11

COU – Calibrate on Use
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
15.207(a) 15.209(a)	Conducted Emissions Radiated Emissions, general requirements	Y Y	PASS PASS

Notes: None

Appendix A : Test Results

Clause 15.207(a) Conducted Emissions

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 mH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of	Conducted limit (dBµV)	
emission (MHz)	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

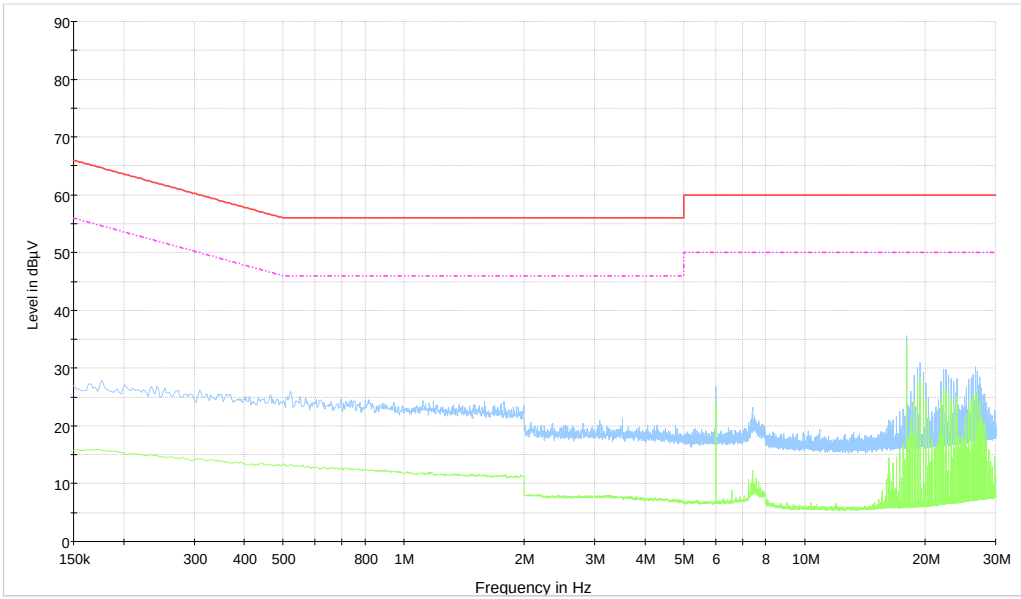
* Decreases with the logarithm of the frequency.

Test Results: Pass

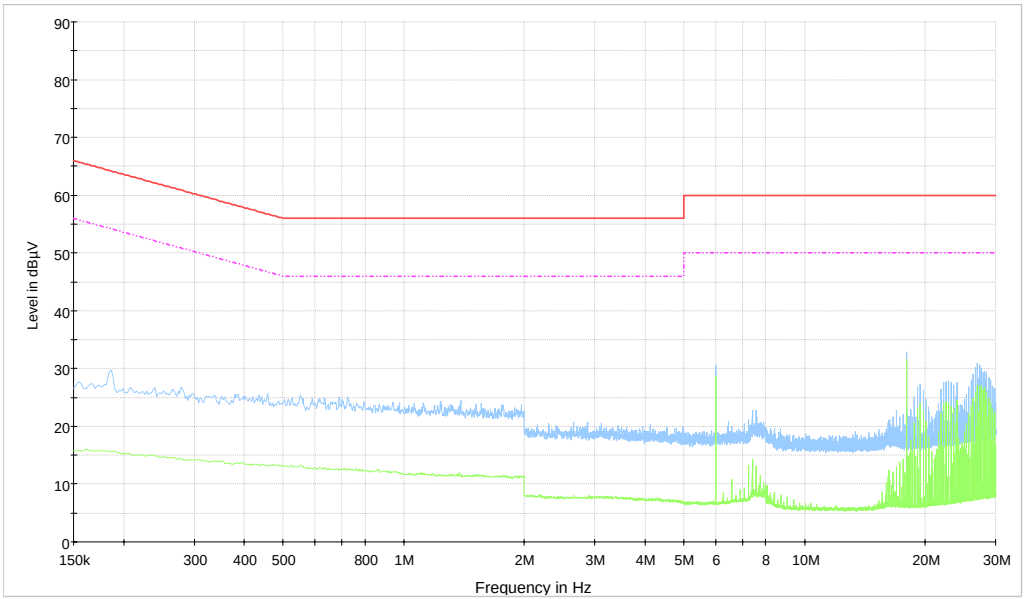
Additional Observations:

All plots were obtained using a sweeping receiver with an IF of 9kHz using a Peak and Average detector. The plots have been corrected with the cable loss and LISN loss to show compliance.

Phase



Neutral



Clause 15.209(a) Radiated Emissions, General Limits

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 (microvoltsmeter)	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 9 kHz to 1000 MHz.

The EUT was measured on two positions, perpendicular to ground and parallel to ground.

All measurements were performed by using peak detector with 9 kHz/30 kHz RBW/VBW for below 30 MHz, and quasi-peak detector with 120 kHz/300 kHz RBW/VBW for 30-1000MHz range.

Above 30 MHz, all measurements were performed at 3 meters.

Fundamental:

Fundamental field strengths were measured at two distances.

Point A:	132.58 dBµV/m at 4.3 meters
Point B:	125.25 dBµV/m at 5.6 meters

Difference in test distance in decade = log (test distance B / test distance A)
With test distance B > test distance A

Extrapolating factor (EF) is delta in dB of two field strengths measured at test distance B and test distance A divided by the difference in test distance in decades:

Point A to Point B: EF = (132.58- 125.25) / log (5.6 /4.3) = 63.89 dB/decade

Since the fundamental maximum measurement was done at 5.6 meters, EF needs to adapt to the number of decades between 5.6 and 300 meters:

EF at 300 meters = 63.89 × log (300 / 5.6) = 110.46 dB

Maximum field strength at 300 meters = Field strength at 5.6 meters - EF at 300 meters
= 125.25 dBµV/m - 110.46 dB = 14.79 dBµV/m

Fundamental field strength =14.79 dBµV/m at 300 meters

The limit is 21.58 dBµV/m @ 200 kHz at 300 meters

Margin is 6.79dB

Spurious:

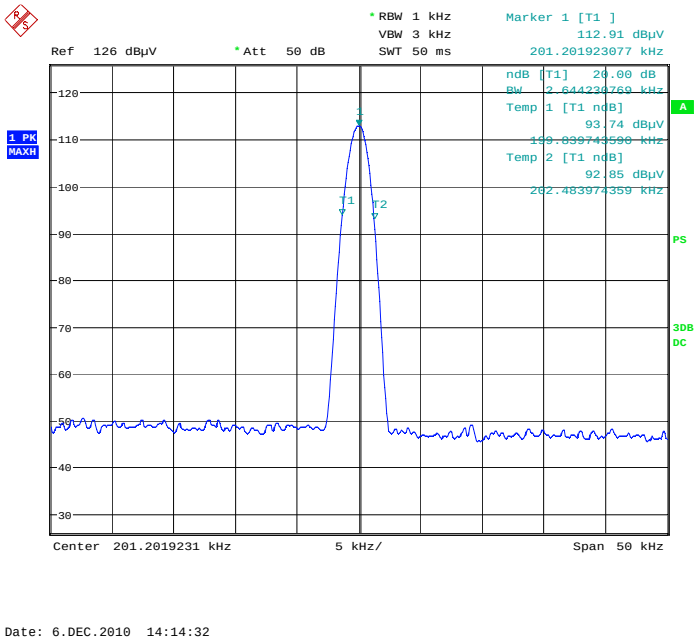
All spurious emissions below 30 MHz were measured at 5.6 m, and EF = 40dB/decade was used for 300 meters field strengths calculation.

EF at 300 meters = 40 × log (300 / 5.6) = 69.15 dB
EF at 30 meters = 40 × log (30 / 5.6) = 29.15 dB

Frequency kHz	Filed Strength @ 5.6 m dBµV/m	EF dB	Filed Strength @ specified distance in 15.209 dBµV/m	Limits dBµV/m	Margin dB
401.28	65.05	69.15	-4.1	5.98	10.08
603.36	57.62	29.15	28.47	39.78	11.31
1004.80	43.23	29.15	14.08	23.88	9.80

Above 30 MHz, all emissions were more than 20 dB below the limits.

20 dB Bandwidth:

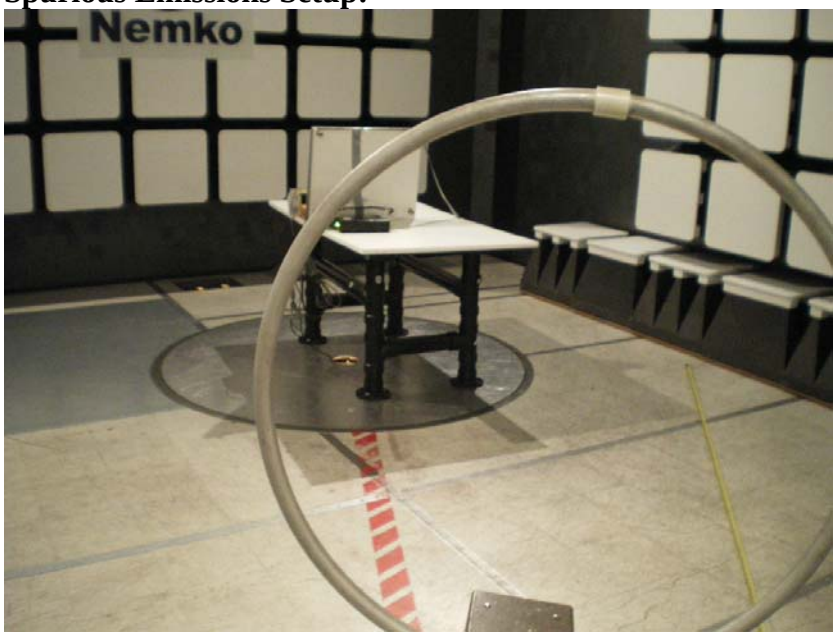


20 dB BW = 2.64 kHz

Appendix B : Setup Photographs

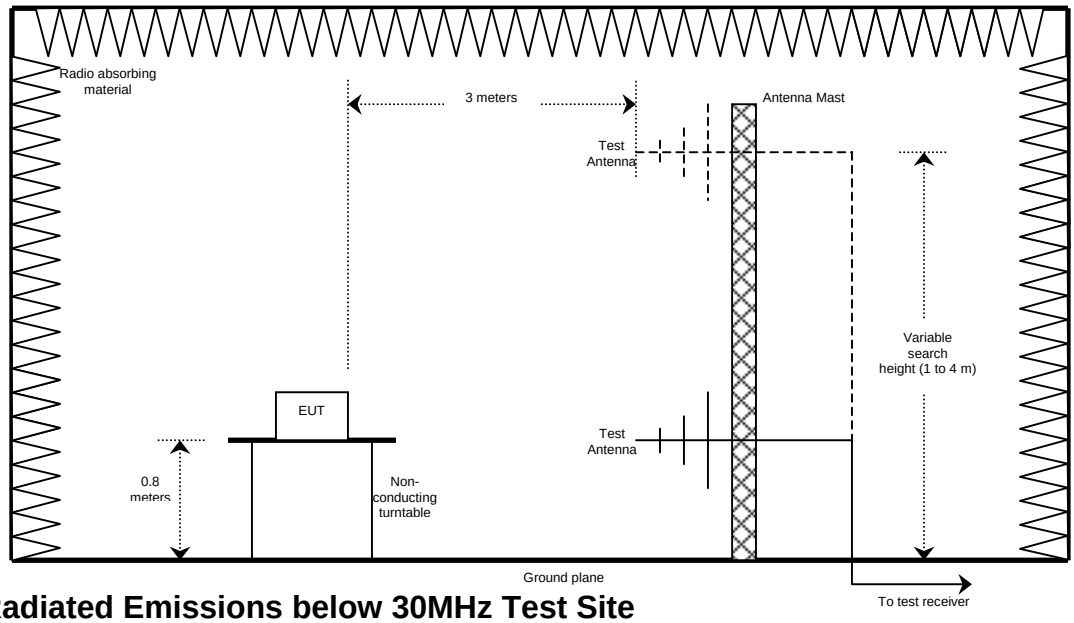
Conducted Emissions Setup:

Spurious Emissions Setup:

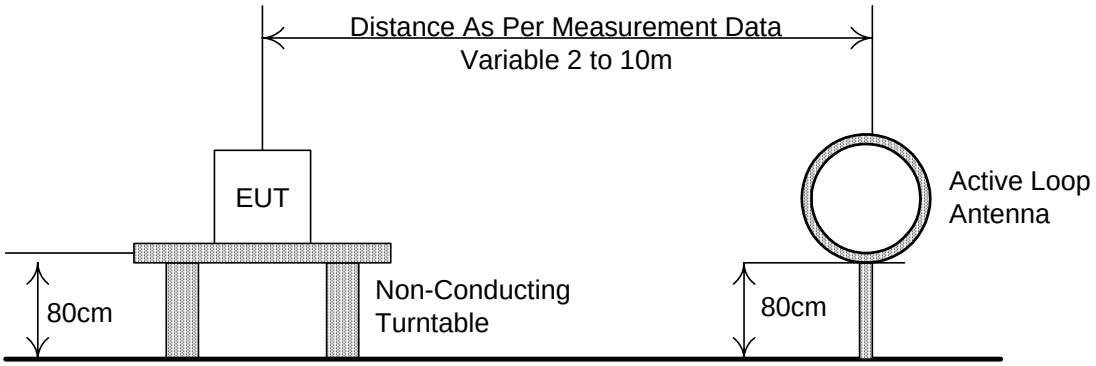


Appendix C : Block Diagram of Test Setups

Radiated Emissions above 30MHz Test Site



Radiated Emissions below 30MHz Test Site



Conducted Emissions Test Site