



# Nemko

**Test Report:** 2W06678


**Applicant:** Instantel Inc.  
309 Legget Drive  
Kanata, Ontario K2K 3A3

**Equipment Under Test:  
(EUT)** 806A2201, Mother Tag  
125KHz Low Power Transmitter

**In Accordance With:** **FCC Part 15, Subpart C, 15.209**

**FCC I.D. :** **ISEKTG**

**Tested By:** Nemko Canada Inc.  
303 River Road, R.R. 5  
Ottawa, Ontario K1V 1H2

**Authorized By:**   
Kevin Carr, EMC Specialist

**Date:** 12 November 2002

**Total Number of Pages:** 11

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*EQUIPMENT: 806A2201 Mother Tag*

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## **Section 1. Summary Of Test Results**

### **General**

**All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15, Subpart C for low power devices. All tests were conducted using measurement procedure ANSI C63.4-1992. Radiated Emissions were made on an open area test site. A description of the test facility is on file with the FCC.

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE  
TEST SPECIFICATIONS HAVE BEEN MADE.

See " Summary of Test Data".



TESTED BY: \_\_\_\_\_  
Glen Westwell, Wireless Technologist

DATE: 11 November 2002

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This report applies only to the items tested.

*EQUIPMENT: 806A2201 Mother Tag*

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**Summary Of Test Data**

<b>Name Of Test</b>	<b>Para. No.</b>	<b>Result</b>
Powerline Conducted Emissions	15.207	N/A
Radiated Emissions	15.209	Complies

**Footnotes For N/A's:**

- This device is powered by a 3 Vdc Lithium cell.
- This device has been previously certified under FCC ID ISEMTG (Ref. Nemko test report 2W04940) The original test data has been included for completeness.
- This application for a new FCC ID is based on original test results. No performance changes have been incorporated from the original application. The frequency of operation has been changed from a fixed frequency of 125KHz to a range from 117-129KHz. See Customer statement of change below.
- The power consumption from the battery is optimised for battery longevity by operating the three separate antenna windings slightly off each of their resonant points. The tag firmware has been designed with the capability of transmitting on slightly different frequencies, determined during the production testing of the tag. Each optimised frequency is stored in non-volatile memory. This means that the tag transmits on up to three distinct frequencies as the firmware sequences through the three antennas in time. The frequency range will be 117 kHz to 129 kHz. There is also an LED (for low-battery indication) and a phototransistor (to keep the product inactive during shipping).

**Test Conditions:**

**Indoor**                      Temperature: 24 °C  
                                    Humidity: 38 %

**Outdoor**                    Temperature: 15 °C  
                                    Humidity: 44 %

*EQUIPMENT: 806A2201 Mother Tag*

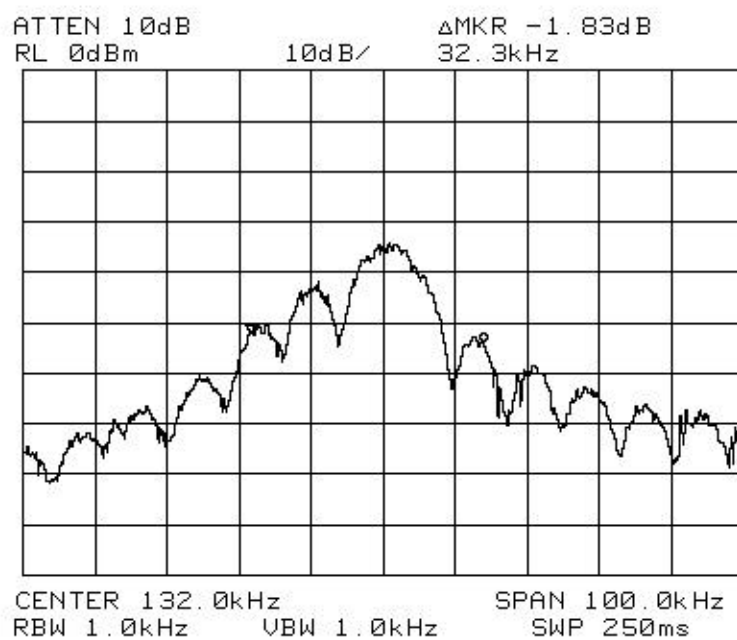
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## **Section 2.           General Equipment Specification**

<b>Manufacturer:</b>	Instantel Inc.
<b>Model No.:</b>	806A2201
<b>Serial No.:</b>	None
<b>Date Received In Laboratory:</b>	7 May 2002
<b>Nemko Identification No.:</b>	#1
<b>Frequency:</b>	117-129 kHz
<b>Modulation:</b>	Pulse Modulated (on/off keying)
<b>Emission Designator:</b>	32K3POD

EQUIPMENT: 806A2201 Mother Tag

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*EQUIPMENT: 806A2201 Mother Tag*

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**Section 3. Radiated Emissions****Para. No.: 15.209****Test Performed By:** Glen Westwell**Date of Test:** 13 May 2002**Minimum Standard:**

<b>Fundamental (MHz)</b>	<b>Field Strength (<math>\mu</math>V/m)</b>	<b>Field Strength (dB<math>\mu</math>V)</b>
0.009 - 0.490	2400/F(kHz) @ 300m	—
0.490 - 1.705	24000/F(kHz) @ 30m	—
1.705 - 30	30 @ 30m	—
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

**Test Results:** Complies.**Measurement Data:** See attached table.

*EQUIPMENT: 806A2201 Mother Tag***Test Data - Radiated Emissions**

Frequency of Emission (MHz)	Received Signal (dBuV/m@0.1m)	Received Signal (dBuV/m@1m)	Extrapolated Signal (dBuV/m@300m)	Limit (dBuV/m@300m)	Margin (dB)
0.125	--	45.3	-53.7	25.6	79.4
0.250	35.0	N.D.	-104.1	19.6	123.7
0.375	29.0	N.D.	-110.1	16.1	126.2
0.500	28.7	N.D.	-110.4	33.6	143.9
0.625	30.0	N.D.	-109.1	31.7	140.4

**Notes:**

Field strength emissions were measured at 0.1m and 1m due to the very low power of the device.

All emissions measured were extrapolated using 40 dB/decade extrapolation factor.

N.D. = Not Detected.

*All harmonic and spurious emissions were searched up to the 10<sup>th</sup> harmonic.*



*EQUIPMENT: 806A2201 Mother Tag*

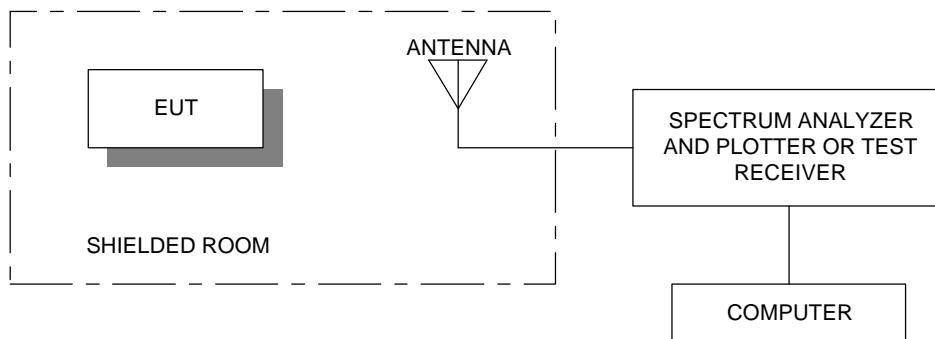
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**Radiated Emissions- Photographs**



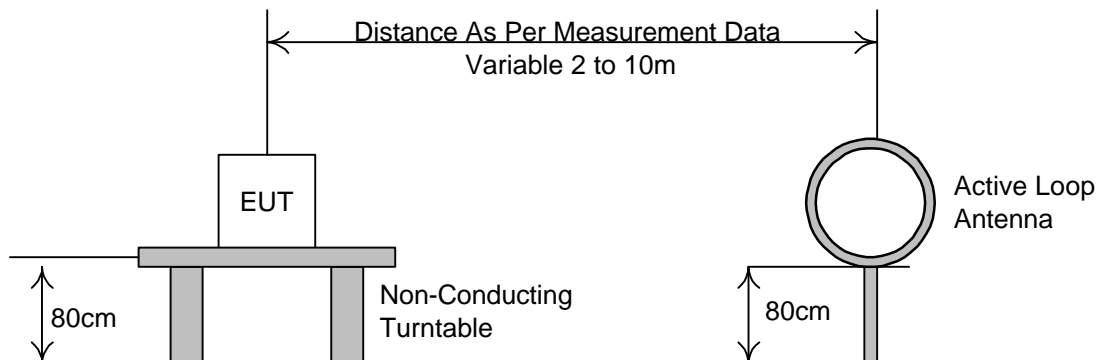
## Section 4. Block Diagrams

### Radiated Prescan



### Test Site For Radiated Emissions

Measurement distance at 1m, fundamental and 0.1m harmonics, due to the very low power of this device.



*EQUIPMENT: 806A2201 Mother Tag*

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**Section 5.          Test Equipment List**

<b>CAL CYCLE</b>	<b>EQUIPMENT</b>	<b>MANUFACTURER</b>	<b>MODEL</b>	<b>SERIAL</b>	<b>LAST CAL.</b>	<b>NEXT CAL.</b>
1 Year	Spectrum Analyzer	Hewlett Packard	8564E	FA001367	Mar 6/02	Mar 6/03
1 Year	Receiver	Rohde & Schwarz	ESH3	892473/002	Oct 18/01	Oct 18/02
1 Year	Active Loop Antenna	Rohde & Schwarz	HFH2-Z2	FA000631	May 12/02	May 12/03

NA: Not Applicable

NCR: No Cal Required

COU: CAL On Use