



**TEST REPORT CONCERNING THE COMPLIANCE OF A
TRANSMITTER FOR A COW PEDOMETER,
BRAND Nedap , MODEL LACTIVATOR REALTIME NEDAP**

**WITH 47 CFR PART 15 (10-1-09) AND THE
REQUIREMENTS OF INDUSTRY CANADA:
RSS-GEN AND RSS-210 (ISSUE 8, DECEMBER 2010)**

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November 28, 2011**

FCC listed : 90828
Industry Canada : 2932G-1
VCCI Registered : R-1518, C-1598
R&TTE, LVD, EMC Notified Body : 1856

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MEASUREMENT/TECHNICAL REPORT

Brand: Nedap
Model: LACTIVATOR REALTIME NEDAP

FCC ID: CGDRTLACT
IC: 1444A-RTLACT

This report concerns: Original grant/certification Class 2 Permissive Change Verification		
Equipment type: DSC Remote Control Transmitter		
Report prepared by:	Name	: Richard van der Meer
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The data taken for this test and report herein was done in accordance with 47 CFR Part 15 (10-1-09 edition) RSS-GEN (ISSUE 3, DECEMBER 2010), RSS-210 (ISSUE 8, DECEMBER 2010) and the measurement procedures of ANSI C63.4-2009. TÜV Rheinland EPS B.V. at Niekerk, The Netherlands, certifies that the data is accurate and contains a true representation of the emission profile of the Equipment Under Test (EUT) on the date of the test as noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: November 28, 2011

Signature:



O. Hoekstra
Senior Engineer Telecom TÜV Rheinland EPS B.V.

Summary

The device under test does:

- fulfill the general approval requirements as identified in this test report
- not fulfill the general approval requirements as identified in this test report

Description of test item

Test item (EUT) : Transmitter for a Cow pedometer
Manufacturer : N.V. Nederlandsche Apparatenfabriek "Nedap"
Brand : Nedap
Model(s) : LACTIVATOR REALTIME NEDAP
Serial number(s) : --
Receipt date : June 15, 2011


Applicant information


Applicant's representative : Mr. J. Hulshof
Company : N.V. Nederlandsche Apparatenfabriek "Nedap"
Address : Parallelweg 2
Postal code : 7141 DC
City : Groenlo
Country : The Netherlands
Telephone number : +31 544 471 162
Telefax number : +31 544 463 475

Test(s) performed

Location : Niekerk
Test(s) started : June 15, 2011
Test(s) completed : August 31, 2011
Purpose of test(s) : Equipment Authorization (Original grant/certification)

Test specification(s) : 47 CFR Part 15 (10-1-09 edition) and
RSS-GEN (ISSUE 3, DECEMBER 2010) AND RSS-210
(ISSUE 8, DECEMBER 2010)

Test engineer(s) : R. van der Meer 

Report written by : R. van der Meer 

Report date : November 28, 2011

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The test results relate only to the item(s) tested.

Table of contents

1	General information.....	5
1.1	Product description.....	5
1.1.1	Introduction.....	5
1.2	Related submittal(s) and/or Grant(s).....	5
1.2.1	General.....	5
1.3	Tested system details.....	5
1.3.1	Description of input and output ports.....	6
1.4	Test summary.....	6
1.5	Test methodology.....	6
1.6	Test facility.....	6
1.7	Test conditions.....	7
2	System test configuration.....	8
2.1	Justification.....	8
2.2	EUT mode of operation.....	8
2.3	Special accessories.....	8
2.4	Equipment modifications.....	8
2.5	Product Labeling.....	8
2.6	Block diagram of the EUT.....	8
2.7	Schematics of the EUT.....	8
2.8	Part list of the EUT.....	8
3	Radiated emission data.....	9
3.1	Radiated field strength measurements (30 MHz – 4.35 GHz, E-field), Average and Quasi Peak values.....	9
3.2	Radiated field strength measurements (30 MHz – 4.35 GHz, E-field), Peak values.....	11
4	Conducted emission data.....	12
4.1	Conducted emission data of the EUT (full configuration).....	12
5	Carrier stability under special conditions.....	12
5.1.1	At 85% and 115% of rated voltage supply level.....	12
6	Plots of measurement data.....	13
6.1	Bandwidth of the emission.....	13
6.2	RF On time.....	15
7	List of utilized test equipment.....	17

Appendix-A E-mail messages from Mr. Dan Sigouin

1 General information.

1.1 Product description.

1.1.1 Introduction.

The Cow pedometer tag, brand Nedap, model LACTIVATOR REALTIME NEDAP, operates in the frequencyband 433.6 MHz – 434.20 MHz.

The content of this report and measurement results have not been changed other than the way of presenting the data.

1.2 Related submittal(s) and/or Grant(s).

1.2.1 General.

This test report supports the original certification in equipment authorization files under registration number. **FCC ID: CGDRTLACT and IC: 1444A-RTLACT.**

1.3 Tested system details.

Details and an overview of the system and all of its components, as it has been tested, may be found below.

EUT	:	Transmitter for a Cow pedometer
Manufacturer	:	N.V. Nederlandsche Apparatenfabriek "Nedap"
Brand	:	Nedap
Model	:	LACTIVATOR REALTIME NEDAP
Serial number	:	--
Voltage input rating	:	3.6 V _{DC} battery powered
Voltage output rating	:	n.a.
Current input rating	:	--
Antenna	:	Internal
Operating frequency	:	433.60 – 434.20 MHz Channel 1: 433.6 MHz Channel 2: 433.8 MHz Channel 3: 434.0 MHz Channel 4: 434.2 MHz
Modulation	:	FSK
Remarks	:	n.a.



Photo 1. Photograph of the tested sample

1.3.1 Description of input and output ports.

The EUT is battery operated only and there are no actual input and output ports present.

1.4 Test summary

The EUT was tested in accordance with the specifications given in the table below.

Test Standard		Description	Page	Pass / Fail / Not Applicable
47 CFR Part 15 (10-1-09 Edition)	RSS-210 Issue 8, December 2010			
15.207(a)	RSS-Gen(7.2.4)	Conducted emissions	Not Applicable	Not Applicable
15.209, 15.231(e)*	RSS-Gen(4.9 and 7.2.5) and RSS-210(2.5)	Radiated emissions	9 - 11	Pass
15.215(c)	RSS-Gen(4.6.1)	Occupied bandwidth	13 - 14	Pass

Table: Test specifications

Testmethods: ANSI C63:2009, RSS-Gen Issue 3, December 2010 and RSS-210 annex A section A1.1.5 and table B limits.

* See FCC tracking number 574220 and e-mail from Dan Sigouin from 22-7-2011. See Appendix 1.

1.5 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15 (july 10, 2008), sections 15.31, 15.35, 15.205, 15.209, 15.231 and RSS-GEN (ISSUE 3, DECEMBER 2010) RSS-210 (ISSUE 8, DECEMBER 2010).

The test methods, which have been used, are based on ANSI C63.4: 2009.

Radiated emission tests above 30 MHz were performed at a measurement distance of 3 meters.

Radiated emission tests below 30 MHz were performed at a measurement distance of 3 meters.

To calculate the field strength level from these results to the appropriate distance at which the limit is specified, the appropriate extrapolation factor is used.

The receivers are switching automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. The antenna factors are programmed in the test receiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate antenna factor for the cable loss. The total correction is automatically added to the measured value.

1.6 Test facility.

The Federal Communications Commission and Industry Canada has reviewed the technical characteristics of the test facilities at TÜV Rheinland EPS B.V., located in Niekerk, 9822 TL Smidshornerweg 18, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948(10-1-06 edition).

The description of the test facilities has been filed at the Office of the Federal Communications Commission under registration number 90828. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The description of the test facilities has been filed to Industry Canada under registration number 2932G-1. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

1.7 Test conditions.

Normal test conditions:

Temperature (*) : +15°C to +35°C
Relative humidity(*) : 20 % to 75 %
Supply voltage : 3.6 V_{DC} battery powered
Air pressure : 950 – 1050 hPa

When it was impracticable to carry out the tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests are stated separately.

2 System test configuration.

2.1 Justification.

An EUT was supplied with modifications which enabled a constant transmit mode for testing purposes. All tests were done with a new fully loaded battery.

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.4: 2009.

2.2 EUT mode of operation.

The EUT has been tested in modulated transmit mode, i.e. the EUT is transmitting while continuously transmitting data. All test set ups have been documented in pictures in the documentation package which will be submitted to the Commission.

2.3 Special accessories.

No special accessories are used and/or needed to achieve compliance.

2.4 Equipment modifications.

No modifications have been made to the equipment in order to achieve compliance.

2.5 Product Labeling

The product labeling information is available in the technical documentation package.

2.6 Block diagram of the EUT.

The block diagram is available in the technical documentation package.

2.7 Schematics of the EUT.

The schematics are available in the technical documentation package.

2.8 Part list of the EUT.

The part list is available in the technical documentation package.

3 Radiated emission data.

3.1 Radiated field strength measurements (30 MHz – 4.35 GHz, E-field), Average and Quasi Peak values

Frequency (MHz)	Measurement results @3m Vertical (dB μ V)	Measurement results @3m Horizontal (dB μ V)	Detector	Correction factor (dB)	Results after correction Vertical (dB μ V/m)	Results after correction Horizontal (dB μ V/m)	Limits @3m (dB μ V/m)	Pass/ Fail
52.000	8.3	6.4	Qp	8.9	17.2	15.3	40	Pass
60.000	12.0	7.9	Qp	6.7	18.7	14.6	40	Pass
66.275	13.6	6.7	Qp	7.2	20.8	13.9	40	Pass
250.000	5.8	5.9	Qp	16.5	22.3	22.4	46	Pass
288.035	6.1	6.1	Qp	17.4	23.5	23.5	46	Pass
300.000	6.0	6.0	Qp	17.7	23.7	23.7	46	Pass
334.320	5.4	5.4	Qp	18.9	24.3	24.3	46	Pass
Fundamentals:								
433.60	84.8	79.9	Av	-19.66	65.14	60.24	72.86	Pass
433.80	84.9	80.0	Av	-19.66	65.24	60.34	72.86	Pass
434.00	84.9	80.1	Av	-19.66	65.24	60.44	72.87	Pass
434.20	85.0	80.2	Av	-19.66	65.34	60.54	72.88	Pass
Harmonics:								
867.20	7.7	7.4	Qp	32.7	40.4	40.1	46	Pass
867.60	7.9	7.3	Qp	32.7	40.6	40.0	46	Pass
868.00	7.8	7.3	Qp	32.7	40.5	40.0	46	Pass
868.40	7.8	7.4	Qp	32.7	40.5	40.1	46	Pass
1300.8	5.1	5.0	Qp	24.6	29.7	29.6	46	Pass
1301.4	5.1	4.9	Qp	24.6	29.7	29.5	46	Pass
1302.0	5.3	4.9	Qp	24.6	29.9	29.5	46	Pass
1302.6	5.2	5.1	Qp	24.6	29.8	29.7	46	Pass
1734.4	5.0	4.8	Qp	25.5	30.5	30.3	46	Pass
1735.2	4.9	4.8	Qp	25.5	30.4	30.3	46	Pass
1736.0	5.1	4.9	Qp	25.5	30.6	30.4	46	Pass
1736.8	5.1	4.9	Qp	25.5	30.6	30.4	46	Pass

Table 1 Radiated emissions of the EUT, average and Qp values

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.205, 15.209, 15.231(e), RSS-210 and RSS-Gen are depicted in Table 1.


Notes:

1. Table 1 show calculated average values from the pulsed emissions measurement data from section 3.2 Peak values, corrected with the worst case duty cycle factor over 100 msec (see Note 3 on this page).
2. Field strength values of radiated emissions at frequencies not listed in the Table 1 above are more than 20 dB below the applicable limit.
3. The values noted in Table 1 are after application of a duty cycle correction, according to part 15.35c of - 19.66 dB. Duty cycle calculated from: Duty cycle correction (dB) = $20 \log(10.4 \text{ msec} / 100 \text{ msec}) = -19.66 \text{ dB}$. See page 15 of this document for the RF On-time of 10.4 msec.
4. The frequencies of 1300.8 MHz to 1302.0 MHz fall within a restricted band as specified in section 15.205. Therefore the limit specified in section 15.209 has been applied.
5. Measurements were performed up to the 10th harmonic of the transmit frequency of 434.2 MHz.
6. A resolution bandwidth of 120 kHz was used below 1000 MHz.
7. Above 1000 MHz a Peak detector was used with a bandwidth of 1 MHz

Used test equipment and ancillaries:

99580	99070	99071	99107	99608	99609	99699	99547	15453
12483								

Test engineer

Signature : 

Name : Richard van der Meer
 Date : July 05, 2011

3.2 Radiated field strength measurements (30 MHz – 4.35 GHz, E-field), Peak values

Frequency (MHz)	Measurement results @3m Vertical (dBµV)	Measurement results @3m Horizontal (dBµV)	Detector	Correction factor (dB)	Results after correction Vertical (dBµV/m)	Results after correction Horizontal (dBµV/m)	Limits @3m (dBµV/m)	Pass/ Fail
Fundamentals:								
433.60	62.5	57.6	Pk	22.3	84.8	79.9	92.86	Pass
433.80	62.6	57.7	Pk	22.3	84.9	80.0	92.86	Pass
434.00	62.6	57.8	Pk	22.3	84.9	80.1	92.87	Pass
434.20	62.7	57.9	Pk	22.3	85.0	80.2	92.88	Pass

Table 2 Radiated emissions of the EUT

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.35, 15.205, 15.209, 15.231, RSS-210 and RSS-Gen are depicted in Table 2.

Notes:

- Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
- Measurement uncertainty is ± 5.0 dB
- The reported field strength values are the worst case values at the indicated frequency. The receiving antenna was varied in horizontal and vertical orientations and also in height (between 1m and 4m).
- The EUT was tested in horizontal and vertical orientations. Worst case values noted. Refer to the Testsetup photographs report for test positions.
- A Peak detector was used with a resolution bandwidth of 120 kHz.
- Above 1000 MHz a Peak detector was used with a bandwidth of 1 MHz.
- Measurements were performed up to the 10th harmonic of the transmit frequency of 434.2 MHz.

Used test equipment and ancillaries:

99580	99070	99071	99107	99608	99609	99699	99547	15453
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Test engineer

Signature :



Name : Richard van der Meer

Date : June 08, 2010

4 Conducted emission data.

4.1 Conducted emission data of the EUT (full configuration).

Not applicable, the EUT is battery operated only.

5 Carrier stability under special conditions.

5.1.1 At 85% and 115% of rated voltage supply level

Not applicable, battery operated.

6 Plots of measurement data

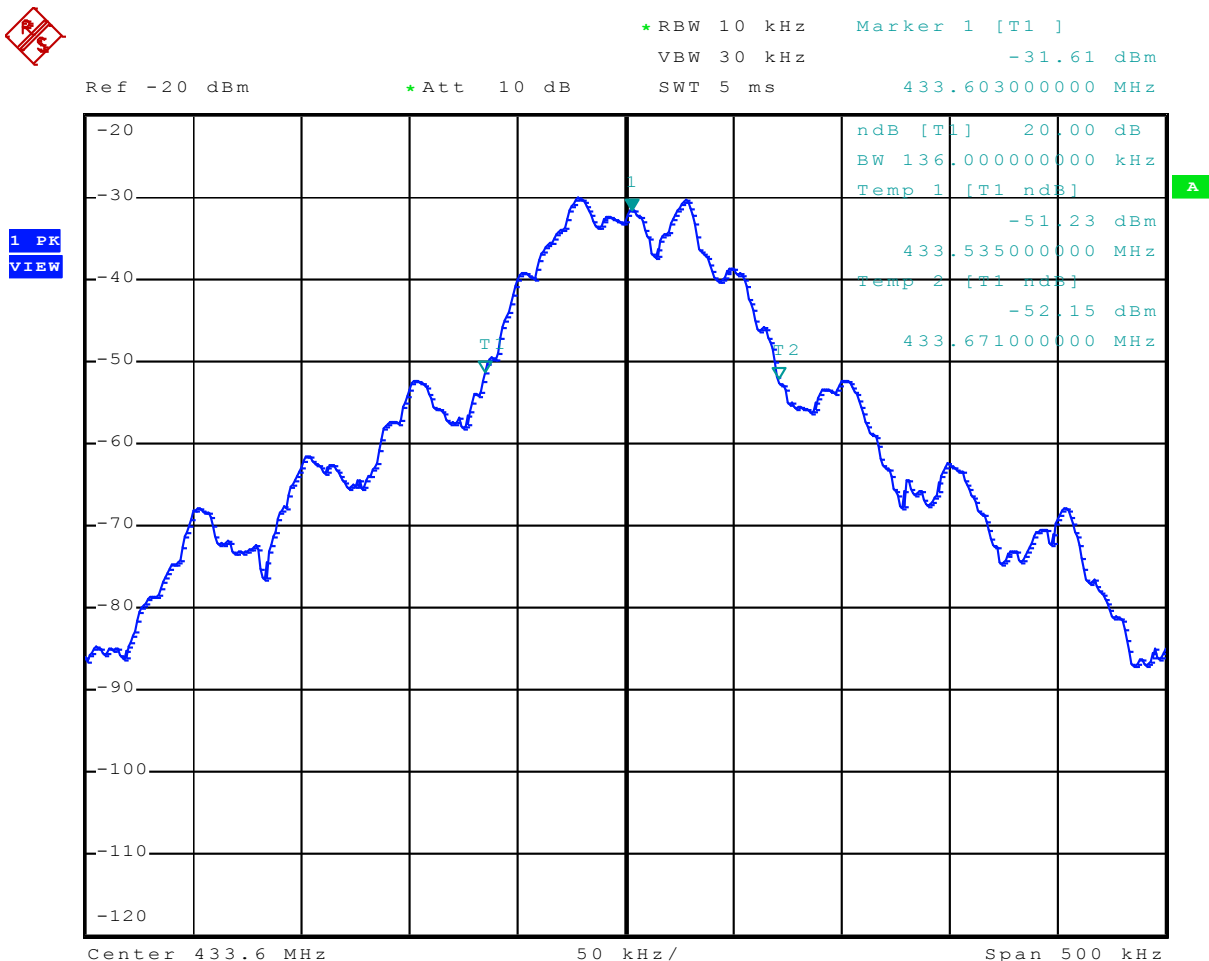
6.1 Bandwidth of the emission

The bandwidth of emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

For this EUT operating at the lowest operating frequency of 433.60 MHz (Channel 1) the allowable bandwidth of emissions would be:

$$0.25\% * 433.60 \text{ MHz} = 1084.0 \text{ kHz.}$$

The measured bandwidth of the emissions as measured with a spectrum analyzer was: **136.00 kHz** (see Plot1). The test was performed on a modified EUT, where constant transmission was enabled.



Date: 5.AUG.2011 10:54:29

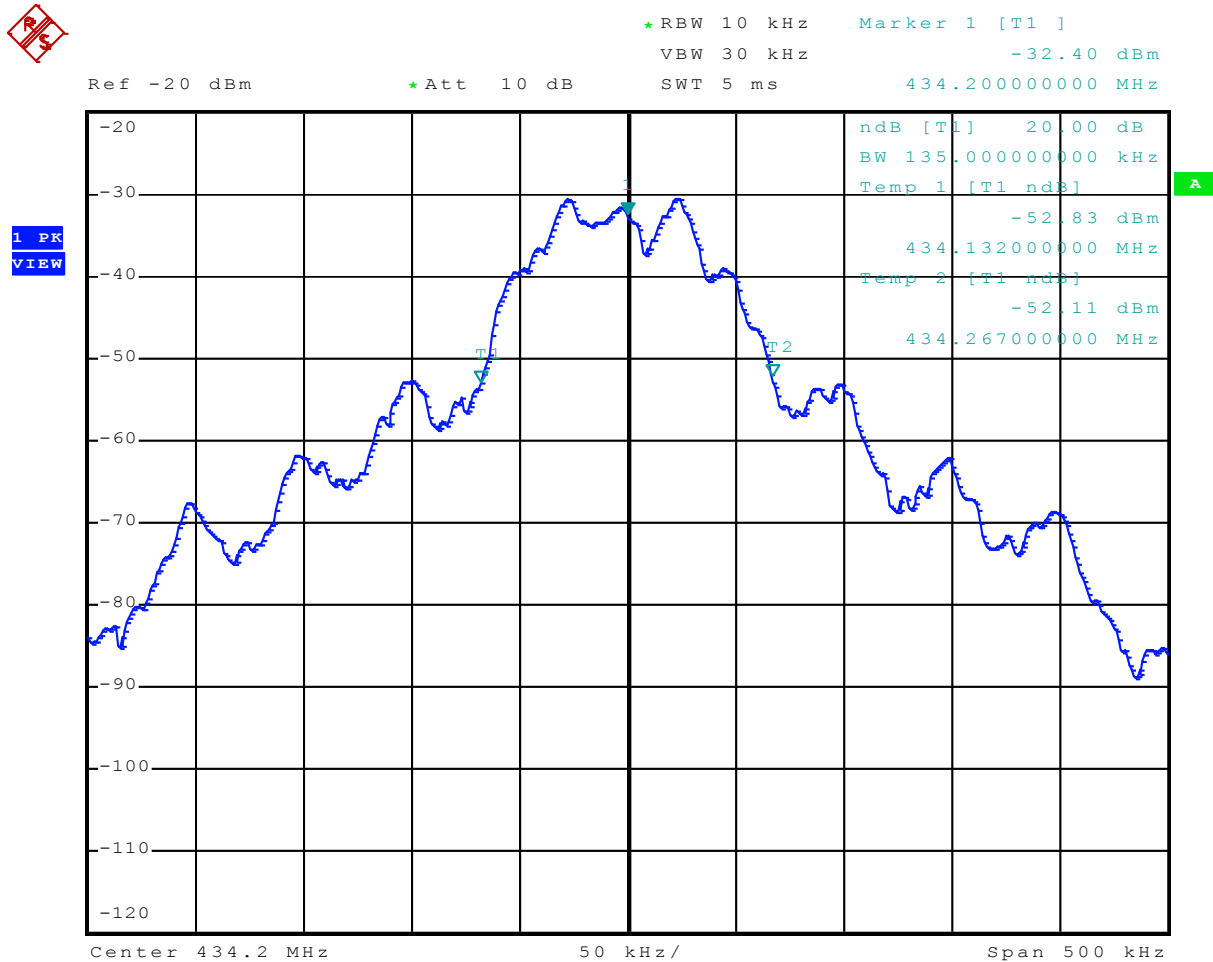
Plot1: plot of the emission at Channel 1. Measured on a spectrum analyzer

For this EUT operating at the highest operating frequency of 434.20 MHz (Channel 4) the allowable bandwidth of emissions would be:

$$0.25\% * 434.20 \text{ MHz} = 1085.5 \text{ kHz.}$$

The measured bandwidth of the emissions as measured with a spectrum analyzer was: **135.00 kHz** (see Plot2).

The test was performed on a modified EUT, where constant transmission was enabled.



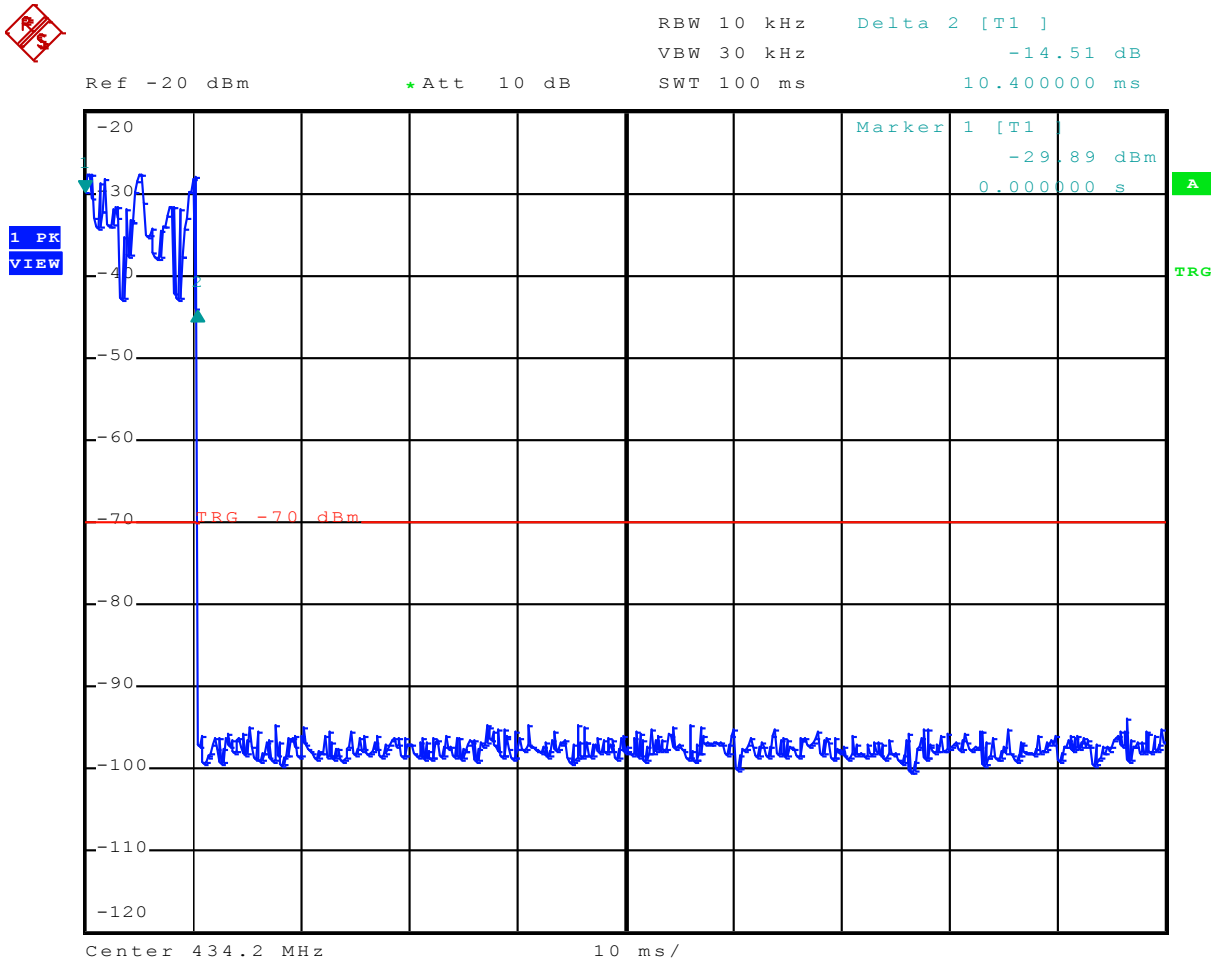
Date: 5.AUG.2011 10:58:47

Plot2: plot of the emission at Channel 4. Measured on a spectrum analyzer

6.2 RF On time

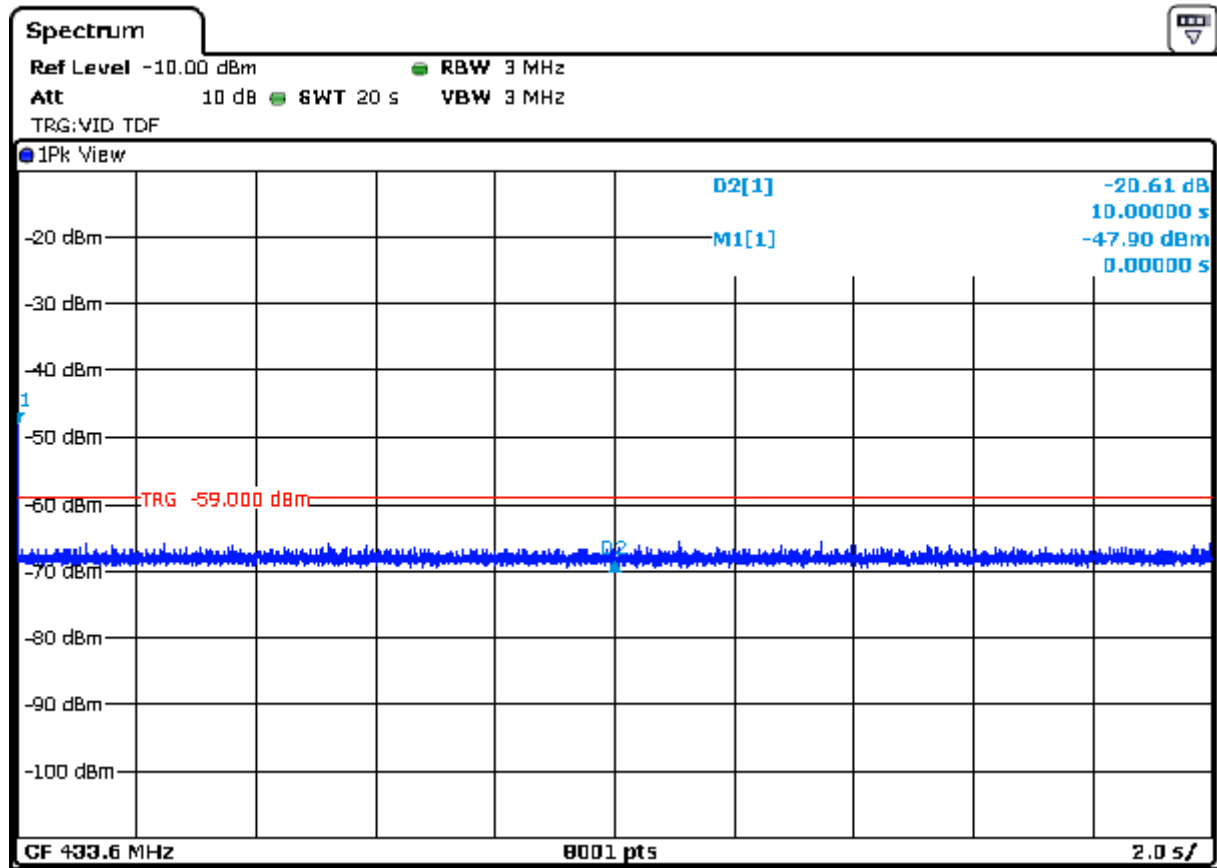
The RF On time in 100 ms is: 10.4 ms.

The duration of each transmission is confined within 1 second, and the required silent period is at least 10 seconds or 30 times the duration of transmissions according to 15.231(e). Plot 3 below shows the EUT's RF On Time. Plot 4 on page 16 shows that the time between transmissions is more than 30 times the RF On time.



Date: 5.AUG.2011 11:11:50

Plot 3: RF On Time of the transmitter as measured on a spectrum analyzer.



Plot 4: RF Off Time as measured on a spectrum analyzer.

The RF Off time is more than 10 seconds as required by section 15.231(e) as shown in plot 4 above where the RF On is indicated with marker 1. Marker 2 indicates the 10 seconds period, while the whole plot covers 20 seconds.

7 List of utilized test equipment.

Inventory number	Description	Brand	Model	Last cal.	Next cal.
12483	Guide horn antenna	Emco	3115	04/2011	04/2012
15453	Active loopant. 60 cm	Chase	HLA6120	05/2011	05/2012
15633	Biconilog Testantenna	Chase	CBL 6111B	02/2011	02/2012
99070	Coax 15m RG213 OATS	NMi Certin B.V.	CABLE 15M OATS	11/2010	11/2011
99071	Coax OATS ground	NMi Certin B.V.	CABLE OATS	11/2010	11/2011
99107	Controller OATS	Heinrich Deisel	4630-100	NA	NA
99547	Temperature-Humiditymeter	Europe supplies	WS-7082	10/2011	10/2012
99580	OATS	Comtest	FCC listed: 90828	08/2008	08/2011
99608	Controller (OATS)	EMCS	DOC202	NA	NA
99609	Antenna mast	EMCS	AP-4702C	NA	NA
99699	Measuring receiver	R&S	ESCI	02/2011	02/2012

NA= Not Applicable

----- Message from "oetech@fccsun27w.fcc.gov" <oetech@fccsun27w.fcc.gov> on Thu, 26 May 2011 19:31:29 +0200 -----

To: Jacques Hulshof <jacques.hulshof@nedap.com>

Subject: Response to Inquiry to FCC (Tracking Number 574220)

Link to Federal Communications Commission Home Page

<<http://apps.fcc.gov/oetcf/images/fcclogowords.gif>> Skip FCC Navigation Links
<<http://apps.fcc.gov/oetcf/images/spacer.gif>> FCC Home <<http://www.fcc.gov/>> |
Search <<http://www.fcc.gov/searchtools.html>> | RSS <<http://www.fcc.gov/rss/>> |
Updates <<http://www.fcc.gov/releases.html>> | E-Filing <<http://www.fcc.gov/e-file/>> |
Initiatives <<http://www.fcc.gov/major.html>> | Consumers
<<http://www.fcc.gov/consumers.html>> | Find People <<http://www.fcc.gov/fcc-bin/findpeople.pl>> <<http://apps.fcc.gov/oetcf/images/spacer.gif>> Office of
Engineering and Technology <<http://apps.fcc.gov/oetcf/images/oet-honor-montage.gif>>
<<http://apps.fcc.gov/oetcf/images/montage-right-cap.gif>> Office of Engineering
and Technology <<http://apps.fcc.gov/oetcf/images/spacer.gif>>
<<http://apps.fcc.gov/oetcf/images/spacer.gif>> Inquiry: Dear Madam or Sir, N.V.
Nederlandsche Apparatenfabriek "Nedap" (FCC ID: CGD) is developing an

----- Message from "Dan.Sigouin@ic.gc.ca" <Dan.Sigouin@ic.gc.ca> on Fri, 22 Jul 2011 20:50:04 +0200 -----

To: Jacques Hulshof <jacques.hulshof@nedap.com>

cc: "Hughes.Nappert@ic.gc.ca" <Hughes.Nappert@ic.gc.ca>, "Justine.Sider@ic.gc.ca" <Justine.Sider@ic.gc.ca>

Subject: RE: Cow identification systems in the 433 MHz band - RSS-210.

Hello,

Based on the description below you may test the device to demonstrate compliance with RSS-210 annex A section A1.1.5 and table B limits.

If you have any additional enquires regarding regulatory standards you may direct them to me directly or to the following e-mail address: res.nmr@ic.gc.ca

Regards,

Dan Sigouin

Regulatory Standards Specialist | Spécialiste des normes de réglementation

Engineering, Planning and Standards Branch | Direction générale du génie, de la planification et des normes

Industry Canada | Industrie Canada

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From: Jacques Hulshof [<mailto:jacques.hulshof@nedap.com>]
Sent: Fri 22/07/2011 8:35 AM
To: Sigouin, Dan: DGEPS-DGGPN
Cc: Nappert, Hughes: DGEPS-DGGPN; Sider, Justine: DGEPS-DGGPN
Subject: RE: Cow identification systems in the 433 MHz band - RSS-210.

Dear Mr. Sigouin,

Sorry not to have responded earlier but since you asked me the question about the FCC grant (which we do not have yet) I had to resolve this problem with the FCC first.

Your questions:

Frequency band of operation : 433.05-433.5 MHz
RF (power field strength) : < 4300 μ V/m @ 3m
Modulation technique : FSK
Bandwidth of operation : 160 kHz
Type of antenna : Ceramic Chip antenna
Including the name of the manufacturer of the device : N. V. Nederlandsche Apparatenfabriek
"Nedap"

A brief explanation of the application and usage.

This system checks the health /condition and state of a cow at the farm, meaning, that the transmitter only sends out a signal when the cow is active. The transmitter does not send periodic transmissions at regular times. When the health condition of the cow changes or a lot of change in activity of is detected, an alarm/condition message will be send. This message is lasting max. 25ms, with an interval of min. 5 minutes and so it is not a continuous or periodic repeated message with fixed interval time. When an alarm/condition message is send, the total duration of transmissions does not exceed 0.3sec / hour.

The following information is send to and received from FCC (Tracking Number 574220 and 698513):

Office of Engineering and Technology

Inquiry:

Dear Madam or Sir,

N.V. Nederlandsche Apparatenfabriek "Nedap" (FCC ID: CGD) is developping and producing cow identification systems. These devices only operate at farm houses. Now one of our systems operates on the 433.5-434.5 MHz. Are we allowed to operate under the Section 15.231 Periodic operation in the band 40.66-40.70 and above 70 MHz and apply the limits as mentioned in the table 15.231b?

Response:

Your system would most likely go under Section 15.231(e). Section 15.231(a) and its field strength limits which are found in the table in 15.231(b) are typically for remote control devices. Devices which transmit data are usually filed under Section 15.231(e). In cases where data is sent with a control signal Section 15.231(a) may apply.