



**TEST REPORT CONCERNING THE COMPLIANCE OF A
8.2 MHz EAS SYSTEM WITH ANTENNAS PG27 AND
PG39 INCLUDING EXTERNAL TRANSCEIVER BOX,
BRAND NEDAP, MODEL FLEUR_{as}
WITH 47 CFR PART 15 (JULY 10, 2008).**

**10021803.fcc01_Rev02
APRIL 26, 2010**

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

N.V. Nederlandsche Apparatenfabriek "Nedap"
Model : FLEUreas

With antenna: PG27 and PG39 including external transceiver box

FCC ID: CGDFLEUREAS

April 26, 2010

This report concerns: Original grant/certification Class 2 change Verification			
Equipment type: Anti-Pilferage Device, operating on 8.2 MHz			
Deferred grant requested per 47 CFR 0.457(d)(1)(ii) ?	Yes	No	n.a.
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The data taken for this test and report herein was done in accordance with 47 CFR Part 15 (july 10, 2008) and the measurement procedures of ANSI C63.4-2003. 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: April 26, 2010

Signature:



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

Description of test item

Test item : Antennas PG27 and PG39 for the Anti-Pilferage Device FLEUreas including external transceiver box for detection of 8.2MHz EAS labels, hard tags or disposable paper tags.
Manufacturer : N.V. Nederlandsche Apparatenfabriek "Nedap"
Brand : Nedap
Model(s) : FLEUreas
Serial number(s) : A222 001 and A222 002 (EUT1), A202 001 and A202 002 (EUT2)
Revision : n.a.

Applicant information

Applicant's representative : Mr. J. Hulshof
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Test(s) performed

Location : Niekerk
Test(s) started : February 23, 2010
Test(s) completed : April 21, 2010
Purpose of test(s) : Class 2 change in Equipment Authorization
Test specification(s) : 47 CFR Part 15 (July 10, 2008)

Test engineer(s) : R. van der Meer



Report written by : R. van der Meer



Report date : April 26, 2010

This report is in conformity with NEN-EN-ISO/IEC 17025: 2005

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

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1 General information.

1.1 Product description.

1.1.1 Introduction.

The Nedap FLEUreas system is an EAS (Electronic Article Surveillance) system for detection of 8.2MHz EAS labels, hard tags or disposable paper tags, used at the entry of shops, libraries etc. Up to 4 antennas (ports) can be used, allowing for max 3 entries. Choice of the antenna width can be either the PG27(=27 cm wide) or PG39 (=39 cm wide). The system operates in the frequency range: 7.4 MHz up to 8.8 MHz with a sweep of 600Hz. This testreport concerns the addition of antenna PG27 and the PG39 to the system and replacing the transmitter/receiver boards in a separate transceiver box..

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 grant/certification in equipment authorization files under FCC ID: **CGDFLEUREAS**.

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.

EUT1	:	Antenna , 2 pcs
Manufacturer	:	N.V. Nederlandsche Apparatenfabriek "Nedap"
Brand	:	Nedap
Model (Type)	:	PG27
Part no.	:	9942505
Serial number	:	A222 001 and A222 002
Voltage input rating	:	n.a.
Voltage output rating	:	n.a.
Current input rating	:	n.a.
Remarks	:	connects to EUT3



Photograph of the EUT1



Photograph of the EUT2

EUT2	:	Antenna , 2 pcs
Manufacturer	:	N.V. Nederlandsche Apparatenfabriek "Nedap"
Brand	:	Nedap
Model (Type)	:	PG39
Part no.	:	9940596
Serial number	:	A202 001 and A202 002
Voltage input rating	:	n.a.
Voltage output rating	:	n.a.
Current input rating	:	n.a.
Remarks	:	connects to EUT3
ÈUT3	:	External Transceiver Box
Manufacturer	:	N.V. Nederlandsche Apparatenfabriek "Nedap"
Brand	:	Nedap
Model (Type)	:	Transceiver Box
Part no.	:	9945342
Serial number	:	A222 001
Voltage input rating	:	100 – 240Vac
Voltage output rating	:	n.a.
Current input rating	:	2A
Antenna	:	EUT1 or EUT2
Remarks	:	This External Transceiver Box consist of the following items:
ÈUT3.1	:	Mains Power Supply Adapter
Brand	:	Power-win Technology Corp.
Model (Type)	:	PWY-065A-1Y30F1(G) 10M
Serial number	:	3766905
Voltage input rating	:	100 – 240Vac~2A, 50/60Hz
Voltage output rating	:	30Vdc / 1.5A/45W
Remarks	:	FCC approved
ÈUT3.2	:	EC
Manufacturer	:	N.V. Nederlandsche Apparatenfabriek "Nedap"
Brand	:	Nedap
Model (Type)	:	FL-EU
Part no.	:	9922679
Serial number	:	A222 001
Voltage input rating	:	30Vdc
Voltage output rating	:	n.a.
Current input rating	:	1.5A
Remarks	:	--
EUT3.3a	:	LAN (option)
Brand	:	Lantronix
Model (Type)	:	XPORT-03 (9922644= nedap article number)
Nedap model no.	:	FL-CU-LAN
Serial number	:	X417A001
Remark	:	fitted option
EUT3.3b	:	GSM (option)
Brand	:	Multi-Tech Systems Inc.
Model (Type)	:	MTSMC-G-F4 (9922636= nedap article number)
Nedap model no.	:	FL-CU-LAN
Serial number	:	X417A001
FCC ID	:	AU79U07A31817
IC	:	125A-0027
Remark	:	fitted option

Note: Also possible under EUT3.3 is the following item but for the measurements the LAN and the GSM option has been chosen because this is the worst case situation

- EUT3.3c : Customer Counter and service RS-232 connection (option)
Brand : Nedap
Model (Type) : 9926402 (nedap article number)
Nedap model no. : FL-CU-LAN
Serial number : X417A001
Remark : --
- AUX1 : Switchbox
Manufacturer : N.V. Nederlandsche Apparatenfabriek "Nedap"
Brand : Nedap
Model (Type) : 92210212
Serial number : UN23 A 001
Remark : Switches alarm on/off, connects to EUT3

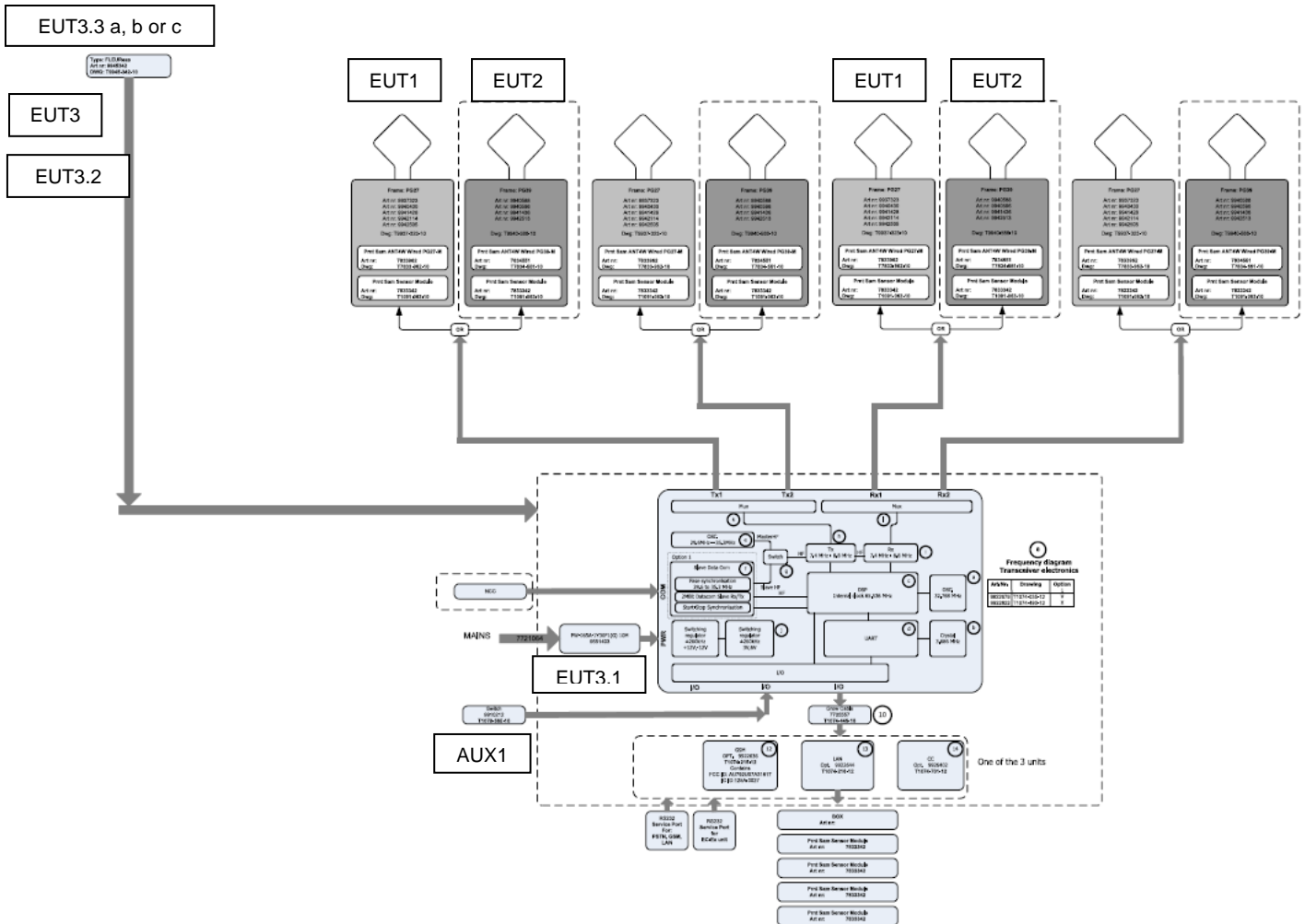


Figure 1: Block diagram of the system

1.3.1 Description of input and output ports.

Number	Terminal	From	To	Remarks
1	Mains	Mains	AUX1	--
2	T1	EUT3	EUT1 or EUT2	Shielded cable
3	R1	EUT3	EUT1 or EUT2	Shielded cable
4	--	EUT1/2 (Ant1)	EUT1 /2(Ant2)	Shielded cable
5	Switch	AUX1	EUT3	--
6	LAN	EUT3	LAN network testhouse	Shielded cable >3m

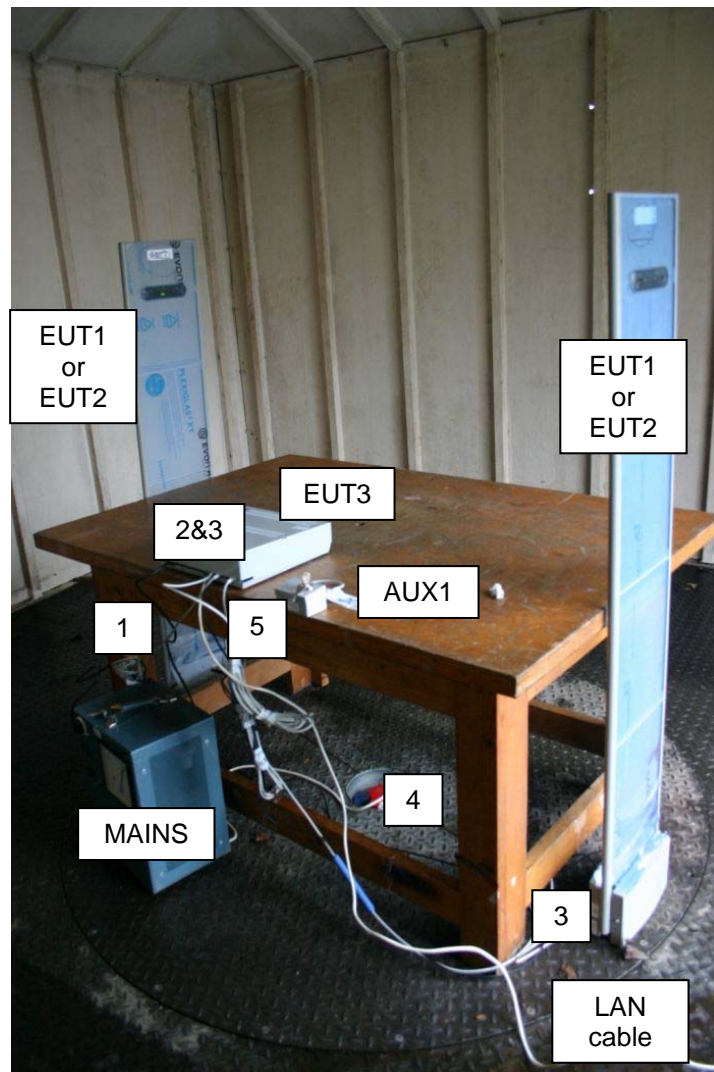


Photo 1: Basic testsetup and connections

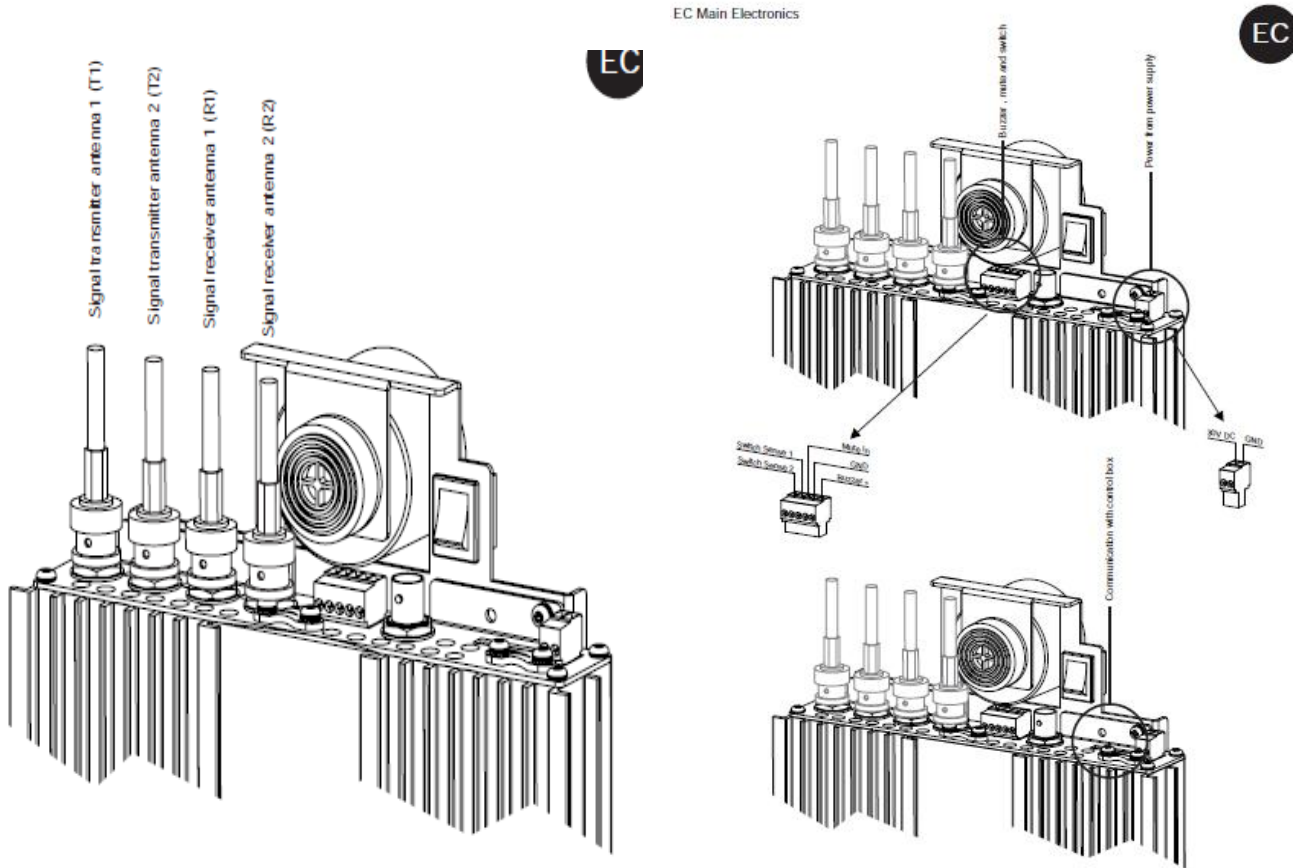


Figure 1. Connections of the EC unit (EUT3)

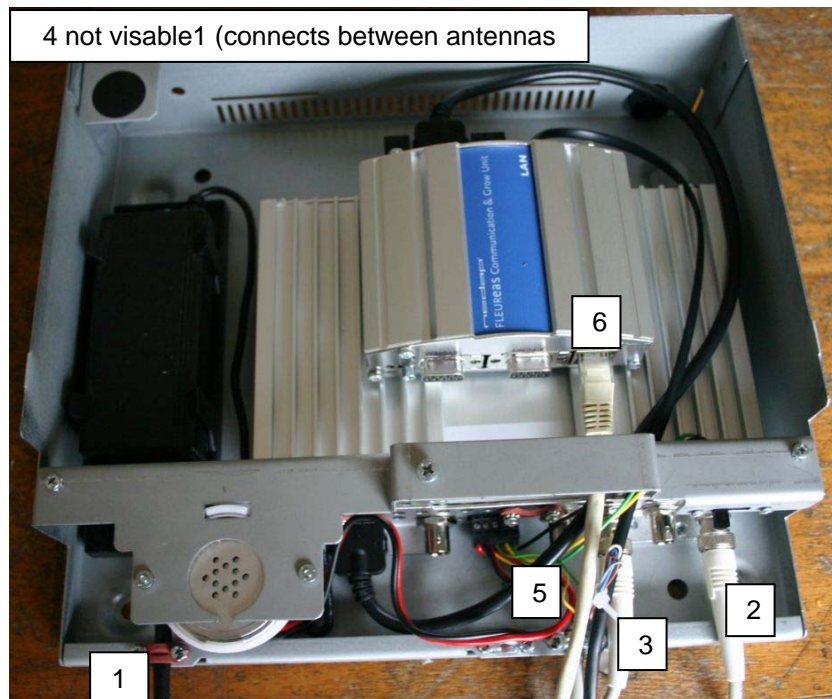


Photo 2: Input & Output ports connections

1.4 Test methodology.

Since the Anti-Pilferage Device, brand Nedap, model FLEUreas, is already a certified device the new additions to this system in the form of antennas, brand Nedap model PG27 and PG39 and an external transceiver box with integral Power supply with FCC ID: CGDFLEUREAS, will only require testing for radiated and conducted emissions to prove that with these additions the whole system still meets the requirements.

The test methodology used is based on the requirements of 47 CFR Part 15 (july 10, 2008), sections 15.31, 15.207, 15.209 and 15.223. The test methods, which have been used, are based on ANSI C63.4: 2003.

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.

1.5 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.

1.6 Test conditions.

Normal test conditions:

Temperature (*)	: +15°C to +35°C
Relative humidity(*)	: 20 % to 75 %
Supply voltage	: 115VAC/60Hz to the AC/DC Power Supply
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.

The system was configured for testing in a typical fashion as a customer would normally use it.

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: 2003.

2.2 EUT mode of operation.

The EUT has been tested in active mode, i.e. the EUT is ready to detect a tag. To assess the behavior of the EUT while reading the tag, the EUT is tested with a tag presented such that it continuously reads the tag. The intentional radiator tests (47 CFR Part 15 sections, 15.207, 15.209 and 15.223) have been performed with a complete functioning EUT and interconnections.

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 Labelling

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 – 1 GHz, E-field), with EUT1

Frequency (MHz)	Measurement results @3m Vertical (dBuV)	Measurement results @3m Horizontal (dBuV)	Correction factor (dB)	Results after correction Vertical (dBuV/m)	Results after correction Horizontal (dBuV/m)	Limits @3m (dBuV/m)	Pass/Fail
37	10	9	15	25	24	40	Pass
44	10	9	15	25	24	40	Pass
74	10	8	9.8	19.8	17.8	40	Pass
88	10	9	9.8	19.8	18.8	40	Pass
392.8	7	7	19.5	26.5	26.5	46	Pass
505	15	14	22.7	37.7	36.7	46	Pass
548	20	19	25.1	45.1	44.1	46	Pass
786	11	11	28.1	39.1	39.1	46	Pass
831	14	14	29.2	43.2	43.2	46	Pass


Table 1a Radiated emissions of the EUT in combination with EUT1

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.209 with the EUT operating in activated mode while detecting a tag are depicted in Table 1a. The system is tested as in whole, being the worst case situation. So with all equipment as shown in Figure1 in place and functioning and with the option LAN installed since this was the worst case situation for the original certification tests of the system.

Notes:

1. Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
2. Measurement uncertainty is ± 5.0 dB
3. 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).
4. A Quasi-peak detector was used with a resolution bandwidth of 120 kHz.

Test engineer

Signature : 

Name : Richard van der Meer

Date : February 24, 2010

3.2 Radiated field strength measurements (30 MHz – 1 GHz, E-field), with EUT2

Frequency (MHz)	Measurement results @3m Vertical (dBuV)	Measurement results @3m Horizontal (dBuV)	Correction factor (dB)	Results after correction Vertical (dBuV/m)	Results after correction Horizontal (dBuV/m)	Limits @3m (dBuV/m)	Pass/Fail
37	10	9	15	25	24	40	Pass
44	10	9	15	25	24	40	Pass
74	10	9	9.8	19.8	18.8	40	Pass
88	10	9	9.8	19.8	18.8	40	Pass
137	5	5	14.1	19.1	19.1	43.5	Pass
230	5	5	13.9	18.9	18.9	46	Pass
416	-1	-1	21.8	20.8	20.8	46	Pass
475	20	20	23.5	43.5	43.5	46	Pass
523	0	0	25.7	25.7	25.7	46	Pass
683	-2	-2	28.5	26.5	26.5	46	Pass
922	6	0	33.6	39.6	39.6	46	Pass

Table 2b Radiated emissions of the EUT in combination with EUT2

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.209 with the EUT operating in activated mode while detecting a tag are depicted in Table 1b. The system is tested as in whole, being the worst case situation. So with all equipment as shown in Figure1 in place and functioning and with the option GSM installed.

Notes:

1. Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
2. Measurement uncertainty is ± 5.0 dB
3. 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).
4. A Quasi-peak detector was used with a resolution bandwidth of 120 kHz.

Test engineer

Signature :



Name :

Richard van der Meer

Date :

April 21, 2010

3.3 Radiated field strength measurements (frequency range of 0.009-30 MHz, H-field) Average values, with EUT1

Frequency (MHz)	Measurement results (dB μ V)	Detector	Antenna factor (dB)	Cable loss (dB)	Measurement results (calculated) (dB(μ V)/m)	Limits (dB(μ V)/m)
	3 meters					
0.009 - 0.490	<0	Av	20.9	1	<-58.1	48.5 down to 13.8 @300m
0.490 - 1.705	<-10	Qp	20.2	1	<-28.8	33.8 down to 22.9 @30m
7.419	0.4	Av	19.5	1	-19.1	40 @30m
7.466	20	Av	19.5	1	0.5	40 @30m
7.478	20.3	Av	19.5	1	0.8	40 @30m
7.485	25.6	Av	19.5	1	6.1	40 @30m
7.505	28.5	Av	19.5	1	9.0	40 @30m
7.517	22	Av	19.5	1	2.5	40 @30m
7.620	26.2	Av	19.5	1	6.7	40 @30m
7.720	18	Av	19.5	1	-1.5	40 @30m
7.740	20.1	Av	19.5	1	0.6	40 @30m
7.760	26.2	Av	19.5	1	6.7	40 @30m
7.803	23.4	Av	19.5	1	3.9	40 @30m
7.824	28.1	Av	19.5	1	8.6	40 @30m
7.864	21.7	Av	19.5	1	2.2	40 @30m
7.885	27.9	Av	19.5	1	8.4	40 @30m
7.904	26.3	Av	19.5	1	6.8	40 @30m
7.922	24.2	Av	19.5	1	1.3	40 @30m
7.943	27.2	Av	19.5	1	4.7	40 @30m
7.962	23.7	Av	19.5	1	1.3	40 @30m
7.997	20.7	Av	19.5	1	1.2	40 @30m
8.109	22.1	Av	19.5	1	2.6	40 @30m
8.185	23.7	Av	19.5	1	4.2	40 @30m
8.300	25	Av	19.5	1	5.5	40 @30m
8.400	22	Av	19.5	1	2.5	40 @30m
8.500	24	Av	19.5	1	4.5	40 @30m
8.600	22.6	Av	19.5	1	3.1	40 @30m
8.700	23	Av	19.5	1	3.5	40 @30m
8.800	6.7	Av	19.5	1	-12.8	40 @30m
8.900	-15	Av	19.5	1	-34.5	40 @30m
14.8	-14	Qp	19.7	1	-33.3	29.5 @30m
15.0	-19	Qp	19.7	1	-38.3	29.5 @30m
15.2	-10	Qp	19.7	1	-29.3	29.5 @30m
16	-10	Qp	19.7	1	-29.3	29.5 @30m
22	-18	Qp	20.0	1	-37.0	29.5 @30m
30	-18	Qp	19.4	1	-37.0	29.5 @30m

Table 2a Radiated emissions of the EUT in combination with EUT1.

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.209 and 15.223 with the EUT operating in continuous transmit mode on 8.2 MHz, are depicted in Table 2a. See notes on the next page.

Notes:

1. Calculated measurement results are obtained by using the 40dB/decade factor (antenna factor and cable loss is included). i.e at 7.505 MHz: 28.5 dBuV + 19.5dB + 1dB - 40dB= 9.0 dBuV/m.
2. A resolution bandwidth of 9kHz was used during testing
3. Field strength values of radiated emissions at frequencies not listed in Table 2a are more than 20 dB below the applicable limit
4. The loop antenna was varied in horizontal and vertical orientations and also around it's axis. The reported value is the worst case found at the reported frequency.
5. The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity). Maximum values have been noted.
6. The EUT was tested with the LAN installed since this was the worst case situation from the original certification testing.
7. Measurement uncertainty is ± 5.0 dB

Test engineer

Signature

: 

Name

: R. van der Meer

Date

: February 24, 2010

3.4 Radiated field strength measurements (frequency range of 0.009-30 MHz, H-field) Average values, with EUT2

Frequency (MHz)	Measurement results (dB μ V)	Detector	Antenna factor (dB)	Cable loss (dB)	Measurement results (calculated) (dB(μ V)/m)	Limits (dB(μ V)/m)
	3 meters					
0.009 - 0.490	<0	Av	20.9	1	<-58.1	48.5 down to 13.8 @300m
0.490 - 1.705	<-10	Qp	20.2	1	<-28.8	33.8 down to 22.9 @30m
7.44	28.8	Av	19.5	1	9.3	40 @30m
7.46	36.8	Av	19.5	1	17.3	40 @30m
7.48	43.6	Av	19.5	1	24.1	40 @30m
7.50	42.4	Av	19.5	1	22.9	40 @30m
7.52	43.2	Av	19.5	1	23.7	40 @30m
7.54	43.2	Av	19.5	1	23.7	40 @30m
7.56	43.4	Av	19.5	1	23.9	40 @30m
7.58	43.5	Av	19.5	1	24.0	40 @30m
7.60 to 8.74	46.8	Av	19.5	1	27.3	40 @30m
8.76	43.0	Av	19.5	1	23.5	40 @30m
8.78	36.1	Av	19.5	1	16.6	40 @30m
8.80	29.8	Av	19.5	1	10.3	40 @30m
8.82	24.7	Av	19.5	1	5.2	40 @30m
8.84	20.2	Av	19.5	1	0.7	40 @30m
8.86	15.0	Av	19.5	1	-4.5	40 @30m
14.88-14.95	-1	Qp	19.7	1	-20.3	29.5 @30m
14.96	4	Qp	19.7	1	-15.3	29.5 @30m
15 - 18	-2	Qp	20.0	1	-21.3	29.5 @30m
18 - 30	0	Qp	19.4	1	-19.3	29.5 @30m

Table 2b Radiated emissions of the EUT in combination with EUT2.

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.209 and 15.223 with the EUT operating in continuous transmit mode on 8.2 MHz, are depicted in Table 2b.

Notes:

1. Calculated measurement results are obtained by using the 40dB/decade factor (antenna factor and cable loss is included), i.e at 8.74 MHz: 46.8 dB μ v + 19.5dB + 1dB - 40dB= 27.3 dB μ v/m.
2. A resolution bandwidth of 9kHz was used during testing
3. Field strength values of radiated emissions at frequencies not listed in Table 2b are more than 20 dB below the applicable limit
4. The loop antenna was varied in horizontal and vertical orientations and also around it's axis. The reported value is the worst case found at the reported frequency.
5. The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity). Maximum values have been noted.
6. The EUT was tested with the GSM installed.
7. Measurement uncertainty is \pm 5.0dB.



Test specification(s): FCC Part 15
Description of EUT: Antennas PG27 and PG39 including external
transceiver box for an Anti-Pilferage Device
FLEUreas
Manufacturer: N.V. Nederlandsche Apparatenfabriek "Nedap"
Brand mark: Nedap
Model: FLEUreas
FCC ID: CGDFLEUREAS

Test engineer

Signature :

Name : R. van der Meer

Date : April 21, 2010

3.5 Radiated field strength measurements (frequency range of 0.009-30 MHz, H-field) Peak values, with EUT1.

Frequency (MHz)	Measurement results (dB μ V)	Detector	Antenna factor (dB)	Cable loss (dB)	Measurement results (calculated)	Limits
	3 meters				dB(μ V)/m	dB(μ V)/m
7.419	6.2	Pk	19.5	1	-13.3	60 @30m
7.466	24.2	Pk	19.5	1	4.7	60 @30m
7.478	26.3	Pk	19.5	1	6.8	60 @30m
7.485	29.6	Pk	19.5	1	10.1	60 @30m
7.505	25.8	Pk	19.5	1	6.3	60 @30m
7.517	27.3	Pk	19.5	1	7.8	60 @30m
7.620	29.6	Pk	19.5	1	10.1	60 @30m
7.630	27.5	Pk	19.5	1	8.0	60 @30m
7.650	26.4	Pk	19.5	1	6.9	60 @30m
7.680	27.6	Pk	19.5	1	8.1	60 @30m
7.700	28.0	Pk	19.5	1	8.5	60 @30m
7.720	27.4	Pk	19.5	1	7.9	60 @30m
7.740	30.0	Pk	19.5	1	10.5	60 @30m
7.750	28.0	Pk	19.5	1	8.5	60 @30m
7.760	29.7	Pk	19.5	1	10.2	60 @30m
7.770	29.0	Pk	19.5	1	9.5	60 @30m
7.784	27.0	Pk	19.5	1	7.5	60 @30m
7.803	29.3	Pk	19.5	1	9.8	60 @30m
7.824	30.0	Pk	19.5	1	10.5	60 @30m
7.843	29.0	Pk	19.5	1	9.5	60 @30m
7.864	29.0	Pk	19.5	1	9.5	60 @30m
7.885	30.0	Pk	19.5	1	10.5	60 @30m
7.904	29.5	Pk	19.5	1	10	60 @30m
7.922	28.6	Pk	19.5	1	9.1	60 @30m
7.943	29.0	Pk	19.5	1	9.5	60 @30m
7.955	30.0	Pk	19.5	1	10.5	60 @30m
7.962	29.0	Pk	19.5	1	9.5	60 @30m
7.997	29.4	Pk	19.5	1	9.9	60 @30m
8.109	29.0	Pk	19.5	1	9.5	60 @30m
8.185	29.0	Pk	19.5	1	9.5	60 @30m
8.300	29.5	Pk	19.5	1	10.0	60 @30m
8.400	29.2	Pk	19.5	1	9.7	60 @30m
8.500	28.6	Pk	19.5	1	9.1	60 @30m
8.600	28.8	Pk	19.5	1	9.3	60 @30m
8.700	31.3	Pk	19.5	1	11.8	60 @30m
8.800	13.0	Pk	19.5	1	-6.5	60 @30m
8.900	-5.0	Pk	19.5	1	-24.5	60 @30m

Table 2c Radiated emissions of the EUT in combination with EUT1

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.223 with the EUT operating in continuous transmit mode on 8.2 MHz, are depicted in Table 2c. See notes on the next page.

Notes:

1. Calculated measurement results are obtained by using the 40dB/decade factor (antenna factor and cable loss is included). i.e at 8.7 MHz: $31.3 \text{ dBuV} + 19.5 \text{ dB} + 1 \text{ dB} - 40 \text{ dB} = 11.8 \text{ dBuV/m}$.
2. A Peak detector was used during testing.
3. A resolution bandwidth of 9kHz was used during testing
4. Field strength values of radiated emissions at frequencies not listed in Table 2c are more than 20 dB below the applicable limit
5. The loop antenna was varied in horizontal and vertical orientations and also around it's axis. The reported value is the worst case found at the reported frequency.
6. The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity). Maximum values have been noted.
7. The EUT was tested with the LAN installed since this was the worst case situation from the original certification testing.
8. Measurement uncertainty is $\pm 5.0 \text{ dB}$

Test engineer

Signature : 

Name : R. van der Meer

Date : February 24, 2010.

3.6 Radiated field strength measurements (frequency range of 0.009-30 MHz, H-field) Peak values, with EUT2.

Frequency (MHz)	Measurement results (dB μ V)	Detector	Antenna factor	Cable loss	Measurement results (calculated)	Limits
	3 meters					
7.44	49.0	Pk	19.5	1	29.5	60 @30m
7.46	57.1	Pk	19.5	1	37.6	60 @30m
7.48	64.0	Pk	19.5	1	44.5	60 @30m
7.50	63.0	Pk	19.5	1	43.5	60 @30m
7.52	63.5	Pk	19.5	1	44.0	60 @30m
7.54	63.5	Pk	19.5	1	44.0	60 @30m
7.56	63.6	Pk	19.5	1	44.1	60 @30m
7.58	63.7	Pk	19.5	1	44.2	60 @30m
7.60-8.74	67.2	Pk	19.5	1	47.7	60 @30m
8.76	63.4	Pk	19.5	1	43.9	60 @30m
8.78	56.4	Pk	19.5	1	36.9	60 @30m
8.80	50.1	Pk	19.5	1	30.6	60 @30m
8.82	44.8	Pk	19.5	1	25.3	60 @30m
8.84	39.7	Pk	19.5	1	20.2	60 @30m
8.86	34.0	Pk	19.5	1	14.5	60 @30m

Table 2d Radiated emissions of the EUT in combination with EUT2

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.223 with the EUT operating in continuous transmit mode on 8.2 MHz, are depicted in Table 2d.

Notes:

1. Calculated measurement results are obtained by using the 40dB/decade factor (antenna factor and cable loss is included). i.e at 8.74 MHz: 67.2 dBuV + 19.5dB + 1dB - 40dB= 47.7 dBuV/m.
2. A Peak detector was used during testing.
3. A resolution bandwidth of 9kHz was used during testing
4. Field strength values of radiated emissions at frequencies not listed in Table 2d are more than 20 dB below the applicable limit
5. The loop antenna was varied in horizontal and vertical orientations and also around it's axis. The reported value is the worst case found at the reported frequency.
6. The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity). Maximum values have been noted.
7. The EUT was tested with the GSM option installed.
8. Measurement uncertainty is ± 5.0 dB

Test engineer

Signature : 

Name : R. van der Meer

Date : April 21, 2010.

4 Conducted emission data.

4.1 Conducted emission data of the EUT in combination with EUT1

Frequency (MHz)	Measurement results dB(μV) Neutral		Measurement results dB(μV) Line 1		Limits dB(μV)		Result
	QP	AV	QP	AV	QP	AV	
0.200	43.5	31.7	42.7	32.4	63.6	53.6	PASS
0.270	39.3	27	37	29	61.1	51.1	PASS
3.650	23.4	16	27.4	22.7	56	46	PASS
3.920	24	18.3	28.9	23.8	56	46	PASS
4.190	25.4	20	25	21	56	46	PASS
4.460	26.4	22	26.8	22.7	56	46	PASS
7.600	24	10	17.8	6	60	50	PASS
7.700	28.4	23.7	25.2	20.5	60	50	PASS
7.834	28.5	23	25	19.2	60	50	PASS
7.902	27.4	23	26.2	21	60	50	PASS
7.972	27.4	22.7	26	19.3	60	50	PASS
8.039	28.6	23	28.2	21	60	50	PASS
8.103	29.5	24	29.5	22	60	50	PASS
8.173	29.8	24	30	22	60	50	PASS
8.239	30	24.7	30.8	22.3	60	50	PASS
8.308	30	24.7	31.4	22.4	60	50	PASS
8.375	30.4	25	32	22.7	60	50	PASS
8.443	30.8	25	32.7	22.9	60	50	PASS
8.514	29.8	22	32.9	20.3	60	50	PASS
8.580	31	23.3	33.7	22	60	50	PASS
8.642	31.7	24	34.4	22.9	60	50	PASS
8.716	32.5	24	35	21.7	60	50	PASS
8.780	30.3	25	28	22.3	60	50	PASS
8.848	30.1	24.5	32.4	14	60	50	PASS
8.914	30.1	24.7	26	21.6	60	50	PASS
8.898	30.2	24.3	25.7	21.4	60	50	PASS
9.048	29.8	24	25.6	21.9	60	50	PASS
9.117	30.1	25	31	26	60	50	PASS
12.000	30.1	25	31	26	60	50	PASS

Table 3a Conducted emission measurements.

The results of the conducted emission tests in the range of 150 kHz up to 30 MHz, carried out in accordance with 47 CFR Part 15 section 15.207, at the 120 Volts AC mains connection terminals of the AC/DC power supply which was connected to EUT3, are depicted in Table 3a. Maximum values recorded. The system is tested as in whole, so with all equipment as shown in Figure1 in place and functioning. Being the worst case situation.

Notes:

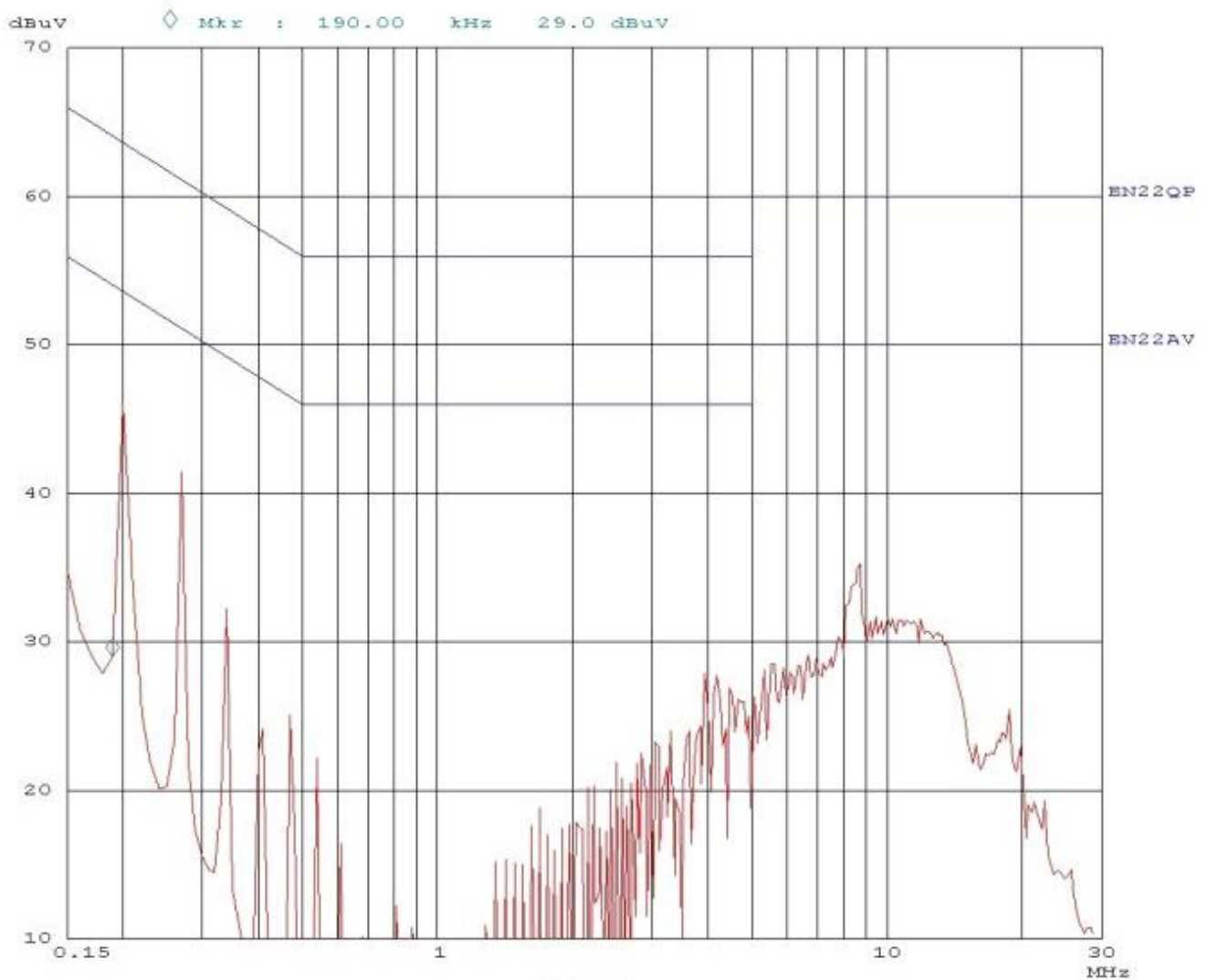
1. Measurement uncertainty is ± 3.5 dB
2. The resolution bandwidth used was 9 kHz.
3. Values of conducted emissions at frequencies not listed in Table 3a are more than 20 dB below the applicable limit.
4. The EUT was tested with the options LAN installed since this was the worst case situation from the original certification testing. Maximum values have been noted.
5. This test is performed to prove compliance of the already certified EUT3 with the new antenna EUT1 connected.
6. The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity).

Test engineer

Signature : 

Name : R. van der Meer

Date : March 09,2010



Plot 1: Graphical presentation of the conducted emissions in combination with EUT1

4.2 Conducted emission data of the EUT in combination with EUT2

Frequency (MHz)	Measurement results dB(μV) Neutral		Measurement results dB(μV) Line 1		Limits dB(μV)		Result
	QP	AV	QP	AV	QP	AV	
0.154	32.6	* note 4	34.3	* note 4	66	56	PASS
0.206	35.6		35.6		63.2	53.2	PASS
7.63	40.1		35.3		60	50	PASS
7.698	40.1		35.7		60	50	PASS
7.894	39.8		36.8		60	50	PASS
7.966	40.5		37.9		60	50	PASS
8.01	40.1		37.9		60	50	PASS
8.038	40.1		38.2		60	50	PASS
8.07	40.1		38.6		60	50	PASS
8.102	40.5		38.9		60	50	PASS
8.138	40.2		39.3		60	50	PASS
8.174	40.2		39.5		60	50	PASS
8.214	40.0		39.8		60	50	PASS
8.238	40.6		40.1		60	50	PASS
8.27	39.9		40.2		60	50	PASS
8.298	39.9		40.3		60	50	PASS
8.33	39.8		40.5		60	50	PASS
8.378	39.8		40.7		60	50	PASS
8.438	39.8		40.8		60	50	PASS
8.502	39.6		41.0		60	50	PASS
8.57	39.6		41.2		60	50	PASS

Table 3b Conducted emission measurements.

The results of the conducted emission tests in the range of 150 kHz up to 30 MHz, carried out in accordance with 47 CFR Part 15 section 15.207, at the 120 Volts AC mains connection terminals of the AC/DC power supply which was connected to EUT3, are depicted in Table 3b. Maximum values recorded. The system is tested as in whole, so with all equipment as shown in Figure1 in place and functioning. Being the worst case situation.

Notes:

1. Measurement uncertainty is ± 3.5 dB
2. The resolution bandwidth used was 9 kHz.
3. Values of conducted emissions at frequencies not listed in Table 3b are more than 20 dB below the applicable limit.
4. Measured values with Quasi-peak detector are already within limits for Average-detector and therefore not retested with average-detection.
5. The EUT was tested with the option GSM installed. Maximum values have been noted.
6. This test is performed to prove compliance of the already certified EUT3 with the new antenna EUT2 connected.
7. The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity).

Test engineer

Signature : 

Name : R. van der Meer

Date : April 21,2010



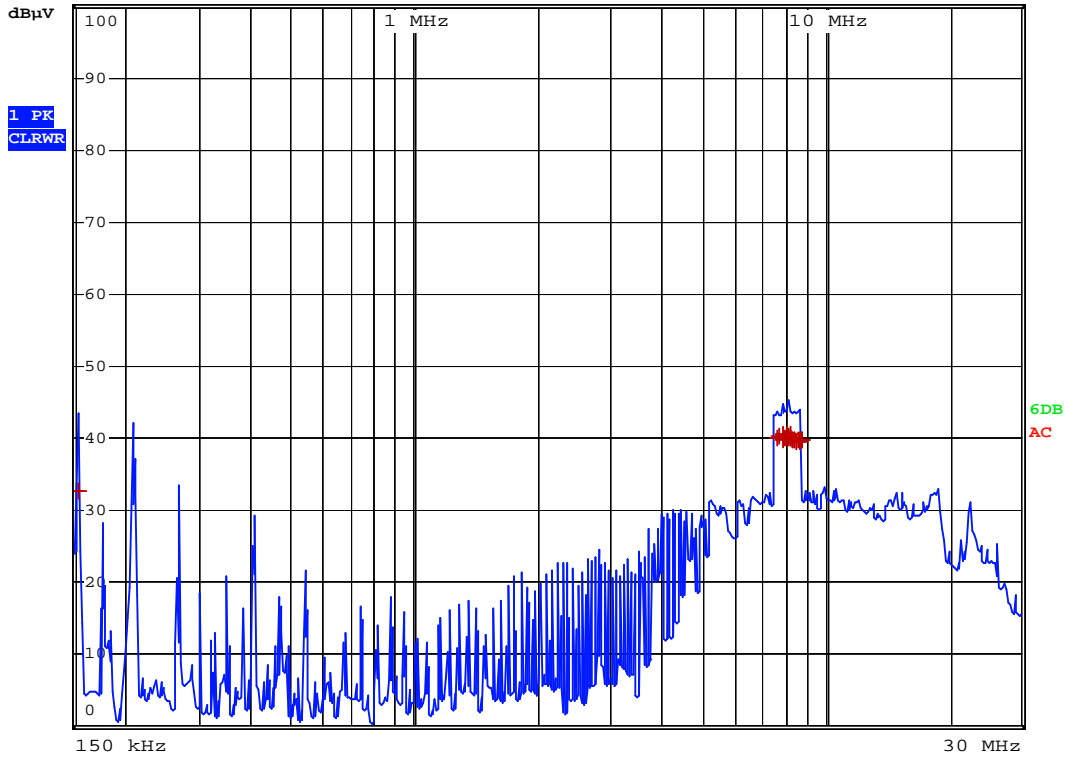
Demod AM

RBW 9 kHz

MT 1 s

Att 10 dB

PREAMP OFF



Date: 21.APR.2010 14:26:37

Plot 2: Graphical presentation of the conducted emissions in combination with EUT2

5 List of utilized test equipment.

Inventory number	Description	Brand	Model	Last cal.	Next cal.
12512	LISN	EMCO	3625/2	01/2010	01/2012
13313	Pulse Limiter	R&S	ESH3-Z2	02/2010	02/2011
15453	Active loopant. 60 cm	Chase	HLA6120	05/2009	05/2010
15633	Biconilog Testantenna	Chase	CBL 6111B	02/2010	02/2011
15667	Measuring receiver	R&S	ESCS30	04/2009	04/2010
99070	Coax 15m RG213 OATS	NMi Certin B.V.	KABEL 15M OATS	11/2009	11/2010
99071	Coax OATS ground	NMi Certin B.V.	KABEL GROND OATS	11/2009	11/2010
99107	Controller OATS	Heinrich Deisel	4630-100	NA	NA
99161	Variac 250V 6A	RFT	LTS006	NA	NA
99547	Temperature-Humiditymeter	Europe supplies	WS-7082	10/2009	10/2010
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
99613	Temperature-Humiditymeter	Europe supplies	WS-7082	10/2009	10/2010
99699	Measuring receiver	R&S	ESCI	12/2009	12/2010
99721	GSM Basestation emulator	Willtek	2201 ProLock	NA	NA

NA= Not Applicable