

Prüfbericht-Nr.: Test Report No.:	10047020 001	Auftrags-Nr.: Order No.:	114020736	Seite 1 von 26 Page 1 of 26
Kunden-Referenz-Nr.: Client Reference No.:	N/A	Auftragsdatum: Order date:	April 3, 2014	
Auftraggeber: Client:	N.V. Nederlandsche Apparatenfabriek "Nedap" , Parallelweg 2, NL-7141 DC, Groenlo, The Netherlands			
Prüfgegenstand: Test item:	EAS system			
Bezeichnung / Typ-Nr.: Identification / Type No.:	Dynamic line			
Auftrags-Inhalt: Order content:	FCC and IC Test report for the 8 MHz portion			
Prüfgrundlage: Test specification:	FCC 47CFR Part 15: Subpart C Section 15.223 RSS-210 (12-2010) A2.3			
Wareneingangsdatum: Date of receipt:	4/8/2014			
Prüfmuster-Nr.: Test sample No.:	A000079948-001			
Prüfzeitraum: Testing period:	19-Jun-2014 - 24-Jun-2014			
Ort der Prüfung: Place of testing:	EMC/RF Laboratory Taipei			
Prüflaboratorium: Testing laboratory:	TUV Rheinland Taiwan Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von / tested by: 		kontrolliert von / reviewed by: 		
2014-07-23 Datum Date	Ryan W. T. Chen / Project Engineer Name / Stellung Name / Position	2014-07-23 Datum Date	Rene Charton / Senior Project Manager Name / Stellung Name / Position	
	Unterschrift Signature		Unterschrift Signature	
Sonstiges / Other:				
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:		Prüfmuster vollständig und unbeschädigt Test item complete and undamaged		
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet
Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.				

VD4

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: Passed

5.1.2 FIELD STRENGTH OF FUNDAMENTAL

RESULT: Passed

5.1.3 6dB AND 20dB BANDWIDTH

RESULT: Passed

5.1.4 SPURIOUS EMISSION

RESULT: Passed

5.2.1 CONDUCTED EMISSIONS LINE AND NEUTRAL

RESULT: Passed

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1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix P: Photo Documentation

(File Name: 10047020APPENDIX P)

Appendix D: Test Result of Radiated Emissions

(File Name: 10047020APPENDIX D)

Test Specifications

The following standards were applied (in bold: product standards, otherwise: basic standards).

Table 1: Applied Standard and Test Levels

Radio
FCC CFR47 Part 15: Subpart C Section 15.223 ANSI C63.4 LP0002(2011)(100年6月28日)

2. Test Sites

2.1 Test Facilities

TUV Rheinland Taiwan Ltd.

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

FCC Registration No.: 365730
TAF Accredited NCC Test Lab. No.:0759
TAF ISO17025 Certification effective periods: 2013-Jul-1st to 2016-Jun-30th



Testing Laboratory
0759

2.2 List of Test and Measurement Instruments

Table 2: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
EMI Test Receiver	R&S	ESCI 7	101062	1-Sep-14
Bilog Antenna	TESEQ	CBL6111D	29802	29-Jun-14
Spectrum Analyzer	R&S	FSV 40	100921	10-Dec-14
Horn Antenna	ETS-Lindgren	3117	138160	10-Jan-15
Horn Antenna (18GHz~40GHz)	COM-POWER	AH840	101031	29-Oct-15
Preamplifier (30MHz -1GHz)	HP	8447F	2805A03335	2-Sep-14
Preamplifier (18 GHz -40 GHz)	COM-POWER	PAM-840	461257	2-Sep-14
Pre-Amplifier (1GHz~18GHz)	EM Electronics	EM30180	60558	23-Oct-14
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	28-Sep-14
EMI Test Receiver	R&S	ESCI	101094	29-Aug-14
LISN (1 phase)	R&S	ENV216	101243	30-May-15
LISN	Rolf Heine	NNB-2/16Z	99080	30-Aug-14

2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements are $\pm 3\text{dB}$.

Table 3: Emission Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-7}$
RF power, conducted	$\pm 1.5 \text{ dB}$
Adjacent channel power	$\pm 3 \text{ dB}$
Radiated emission of transmitter, valid up to 26 GHz	$\pm 6 \text{ dB}$
Radiated emission of receiver, valid up to 26 GHz	$\pm 6 \text{ dB}$
Temperature	$\pm 2 \text{ }^{\circ}\text{C}$
Humidity	$\pm 10 \%$

3. General Product Information

3.1 Product Function and Intended Use

The EUT is an Electronic Article Surveillance System working in the 8 MHz Band. Additionally there is a metal detector that works at 125 kHz. In the Basic Configuration there is one TX Antenna with the TX module, and one RX Antenna with a Rx module. The system is powered by the NCC and the Power Inserter. This report relates to the 8 MHz portion of the device. For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 Ratings and System Details

Table 4: Basic Information of EUT

Item	EUT information
Kind of Equipment	EAS system
Type Designation	Dynamic line
Brand Name	NEDAP
FCC ID	CGDXQMK2UL IC Can ID: 1444A-XQMK2UL

Table 5: Technical Specification of EUT

Technical Specification	Value
Operating Frequency	7.4~8.8MHz
Channel number	Continuous Sweep
Operation Voltage	120V
Modulation	Continuous Sweep

3.3 Independent Operation Modes

Basic operation modes are:

- A. Transmitting
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum emission level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Setup for testing: Test samples are provided with a Data interface which makes it possible to control them through a test software installed on a notebook computer.

4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

Kind of Equipment	Manufacturer	Model Name	S/N
--	--	--	--

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

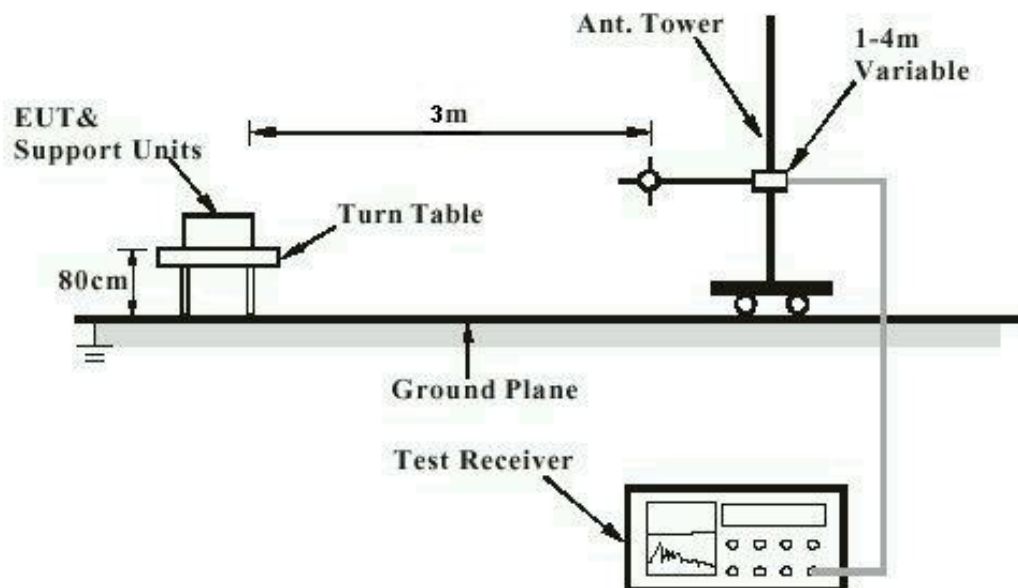
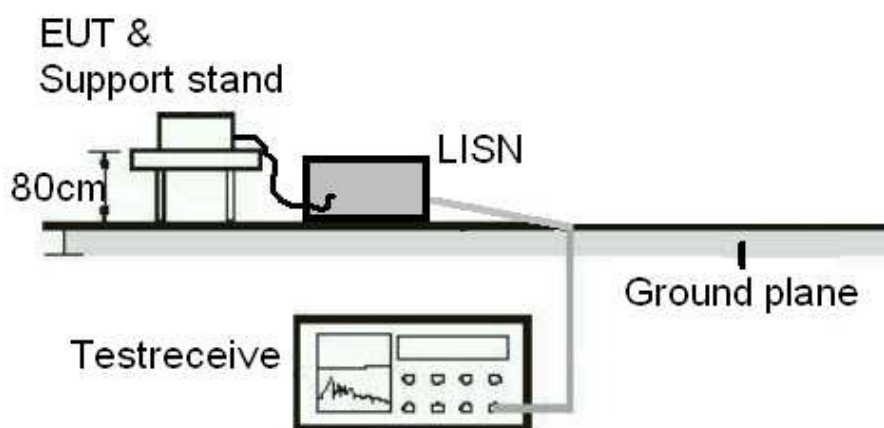


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)

5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:**Passed**

Standard : LP0002(2011): 2.2
Part 15.203 and RSS-Gen 7.1.4
Requirement : use of approved antennas only

The antenna and the transmitter are one assembly with no possibility of replacement with a non-approved antenna by a normal the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

5.1.2 Field strength of fundamental

RESULT:

Passed

Test standard : LP0002(2011) 3.1
 FCC Part 15.223
 RSS-210 A2.3

Basic standard : ANSI C63.10:2009

Test setup

Test Frequency : Low. High
 Operation Mode : A

Atmospheric pressure : 100-103 kPa

Applicable Limit:

Frequency (MHz)	Field strength AV (μV/m)	Field strength AV (dBμV/m)	Field strength Pk (dBμV/m)	Measurement Distance (m)
1.705 - 10	100	40	60	30
1.705 - 10	10000	80	100	3

The center frequency is 8100 kHz.

The 6 dB BW is more than 810 kHz

Table 6: Field strength of fundamental, maximal level found

Frequency (MHz)	Level(3m) (dBuV/m)	Detector	Limit(3m) (dBuV/m)	Level(30m) (dBuV/m)	Limit(30m) (dBuV/m)	Remark	Result
7.4539	88.98	PK	100	50.20	60	Antenna model:PG39U	Pass
7.4539	70.20	AV	80	30.20	40	Antenna model:PG39U	Pass

Remark: For details refer to Appendix D

5.1.3 6dB and 20dB Bandwidth

RESULT:
Passed

Test standard : LP0002(2011) 3.1
 RSS-210 A2.3
 Basic standard : ANSI C63.10:2009, KDB558074
 Kind of test site : Shielded room

Test setup

Test Channel : Low/ Middle/ High
 Operation Mode : A

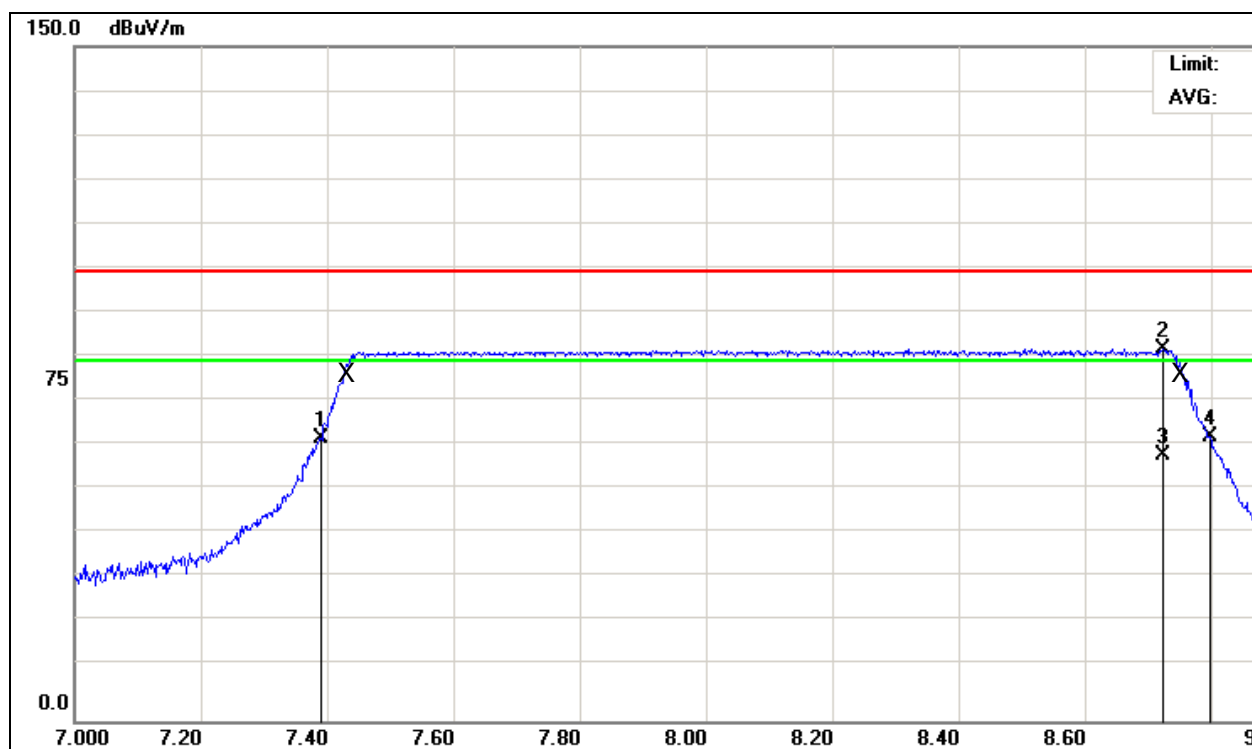
Ambient temperature : 22-26 °C
 Relative humidity : 50-65 %
 Atmospheric pressure : 100-103 kPa

Table 7: Test result of 6dB Bandwidth

Antenna type	Channel Frequency left(MHz)	Channel Frequency right(MHz)	6dB Bandwidth (kHz)
PG27U	7.450	8.750	1300
PG39U	7.410	8.740	1330
FL30NU	7.430	8.740	1310
FL45NU	7.430	8.740	1310

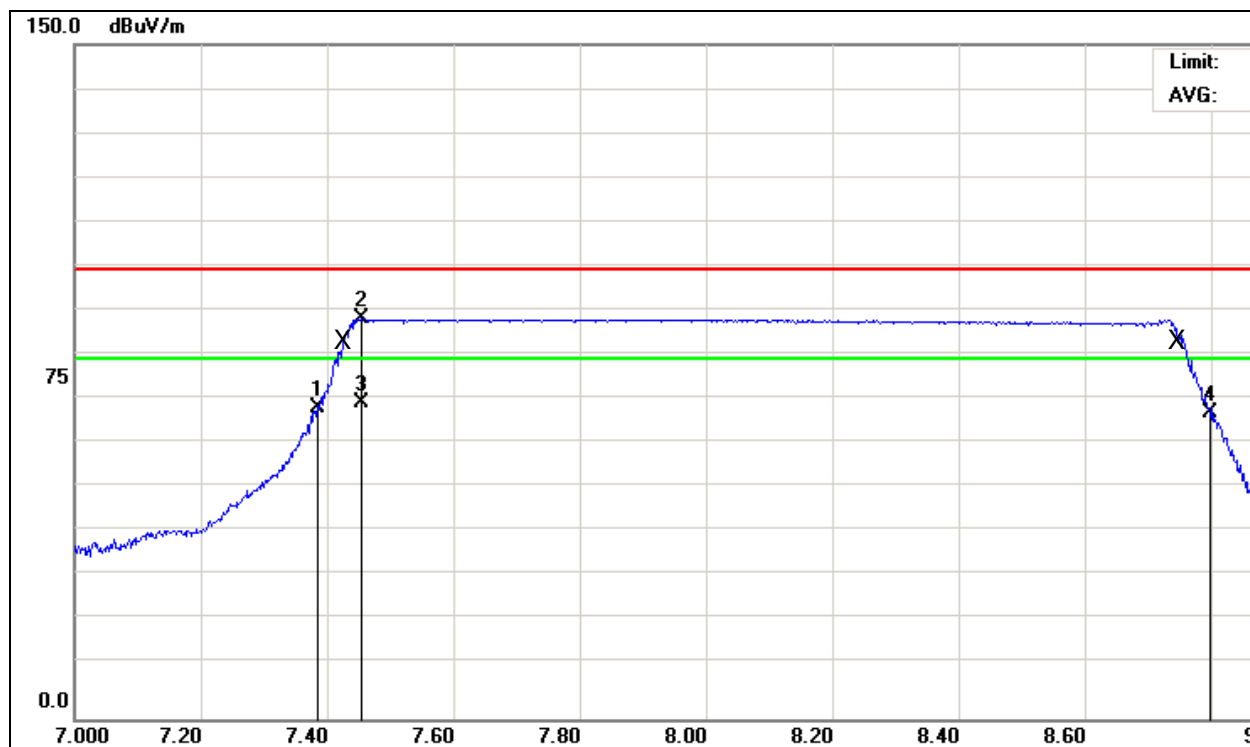
Table 8: Test result of 20dB Bandwidth

Antenna type	Channel Frequency left(MHz)	Channel Frequency right(MHz)	26dB Bandwidth (kHz)
PG27U	7.3898	8.7980	1408.2
PG39U	7.3860	8.7980	1412
FL30NU	7.3900	8.7960	1406
FL45NU	7.3898	8.7980	1408.2

Test Plot of 6dB and 20dB Bandwidth, Antenna PG27U


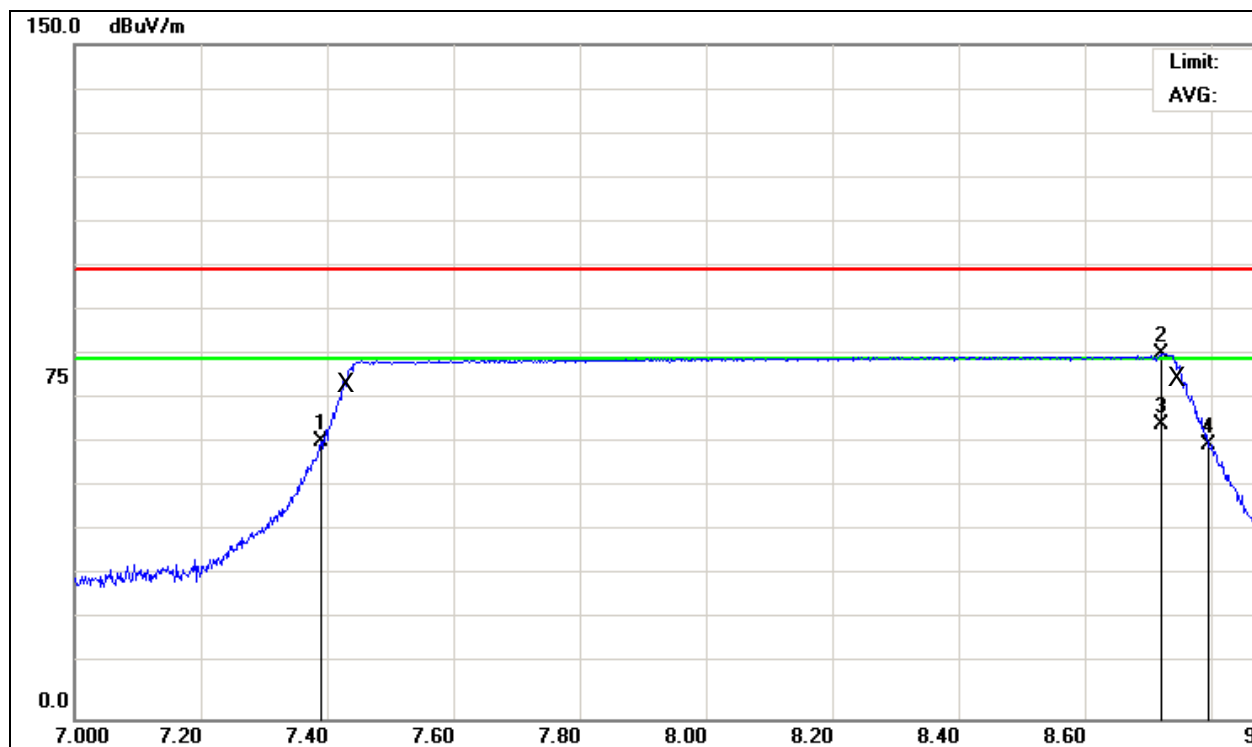
Service No.:	114020736	Test Distance:	3m
Test Standard:	FCC 15.223_主波_PK_3m(dBuV/m)	Ant. Polarization:	
Test item:	Radiation Emission	Test Time:	2014/6/5 11:48:08
Applicant:	NEDAP	Test Rating:	AC 120V/60Hz
Product:	Dynamic Line	Temp.(°C)/Hum.(%):	25.5(°C)/53%
Model No.:	XQMK2UL	Test Engineer:	Freeman Wang
Test Mode:	TX		
Remark:	Antenna model:PG27U		

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	7.3898	20.33	42.45	62.78	100.00	-37.22	peak			
2	8.7240	20.51	62.28	82.79	100.00	-17.21	peak	100	244	
3	8.7240	20.51	38.69	59.20	80.00	-20.80	AVG	100	244	
4	8.7980	20.52	42.85	63.37	100.00	-36.63	peak			

Test Plot of 6dB and 20dB Bandwidth, Antenna PG39U


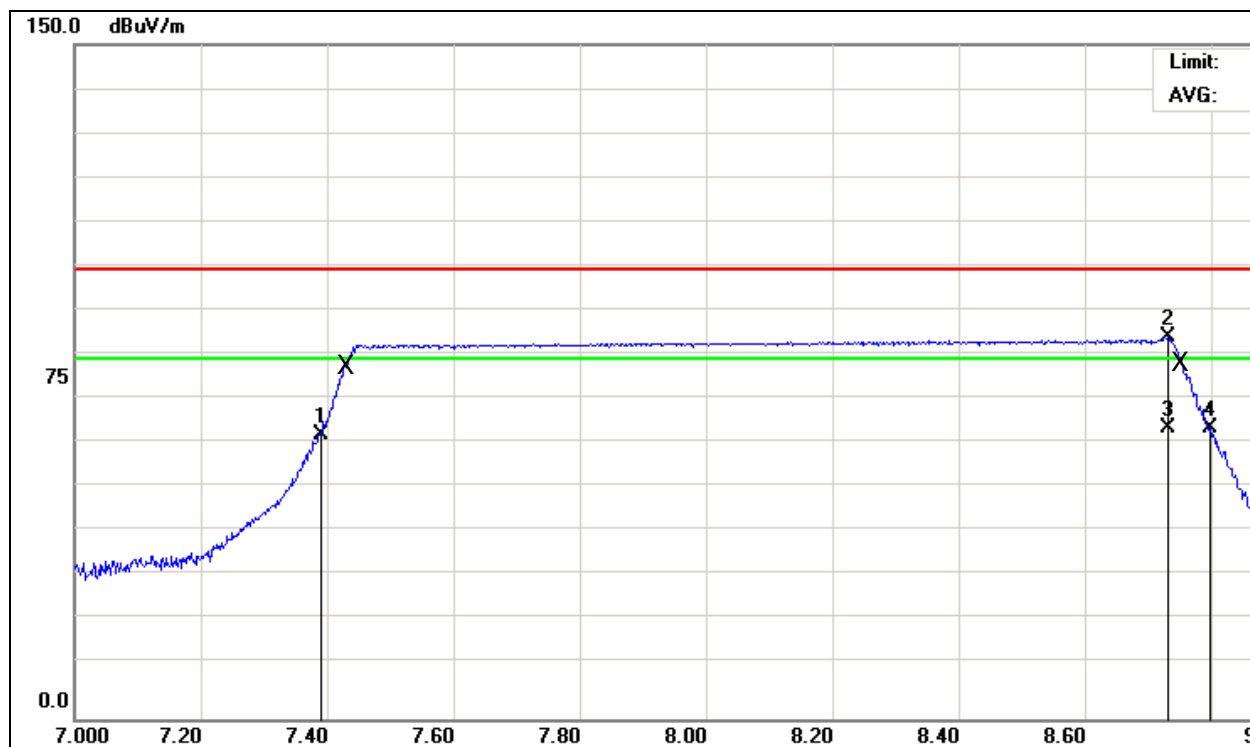
Service No.:	114020736	Test Distance:	3m
Test Standard:	FCC 15.223_主波_PK_3m(dBuV/m)	Ant. Polarization:	
Test item:	Radiation Emission	Test Time:	2014/6/4 15:30:31
Applicant:	NEDAP	Test Rating:	AC 120V/60Hz
Product:	Dynamic Line	Temp.(°C)/Hum.(%):	24.7(°C)/55%
Model No.:	XQMK2UL	Test Engineer:	Freeman Wang
Test Mode:	TX		
Remark:	Antenna model:PG39U		

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	7.3860	20.33	48.74	69.07	100.00	-30.93	peak			
2	7.4539	20.34	68.64	88.98	100.00	-11.02	peak	100	260	
3	7.4539	20.34	49.86	70.20	80.00	-9.80	AVG	100	260	
4	8.7980	20.52	47.68	68.20	100.00	-31.80	peak			

Test Plot of 6dB and 20dB Bandwidth, Antenna FL30NU


Service No.:	114020736	Test Distance:	3m
Test Standard:	FCC 15.223_主波_PK_3m(dBuV/m)	Ant. Polarization:	
Test item:	Radiation Emission	Test Time:	2014/6/4 13:37:18
Applicant:	NEDAP	Test Rating:	AC 120V/60Hz
Product:	Dynamic Line	Temp.(°C)/Hum.(%):	24.7(°C)/55%
Model No.:	XQMK2UL	Test Engineer:	Freeman Wang
Test Mode:	TX		
Remark:	Antenna model:FL30NU		

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	7.3900	20.33	41.33	61.66	100.00	-38.34	peak			
2	8.7220	20.51	60.75	81.26	100.00	-18.74	peak	100	256	
3	8.7220	20.51	44.91	65.42	80.00	-14.58	AVG	100	256	
4	8.7960	20.52	40.39	60.91	100.00	-39.09	peak			

Test Plot of 6dB and 20dB Bandwidth, Antenna FL45NU


Service No.:	114020736	Test Distance:	3m
Test Standard:	FCC 15.223_主波_PK_3m(dBuV/m)	Ant. Polarization:	
Test item:	Radiation Emission	Test Time:	2014/6/4 17:42:41
Applicant:	NEDAP	Test Rating:	AC 120V/60Hz
Product:	Dynamic Line	Temp.(°C)/Hum.(%):	24.7(°C)/55%
Model No.:	XQMK2UL	Test Engineer:	Freeman Wang
Test Mode:	TX		
Remark:	Antenna model:FL45NU		

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (°)	Remark
1	7.3898	20.33	43.01	63.34	100.00	-36.66	peak			
2	8.7319	20.51	64.45	84.96	100.00	-15.04	peak	100	248	
3	8.7319	20.51	44.29	64.80	80.00	-15.20	AVG	100	248	
4	8.7980	20.52	44.14	64.66	100.00	-35.34	peak			

5.1.4 Spurious Emission

RESULT:**Passed**

Test standard	:	LP0002(2011) 3.1 FCC Part 15.223 RSS-210 A2.3 AND RSS-Gen
Basic standard	:	ANSI C63.10: 2009
Limits	:	Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a), must comply with the radiated emission limits specified in FCC 15.209(a). Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in FCC 15.209(a) or FCC 15. 231(e).
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	A

Remark: Testing was carried out within frequency range 9 kHz to 1 GHz.

For details refer to Appendix D.

5.2 Mains Conducted Emissions

5.2.1 Conducted Emissions Line and Neutral

RESULT:**Passed**

Test standard	:	LP0002: 2.3 FCC Part 15.207 FCC Part 15.107 RSS-Gen
Limits	:	Mains Conducted emissions as defined in LP0002: 2.3 , must comply with the mains conducted emission limits specified in LP0002: 2.3
Kind of test site	:	Shielded Room

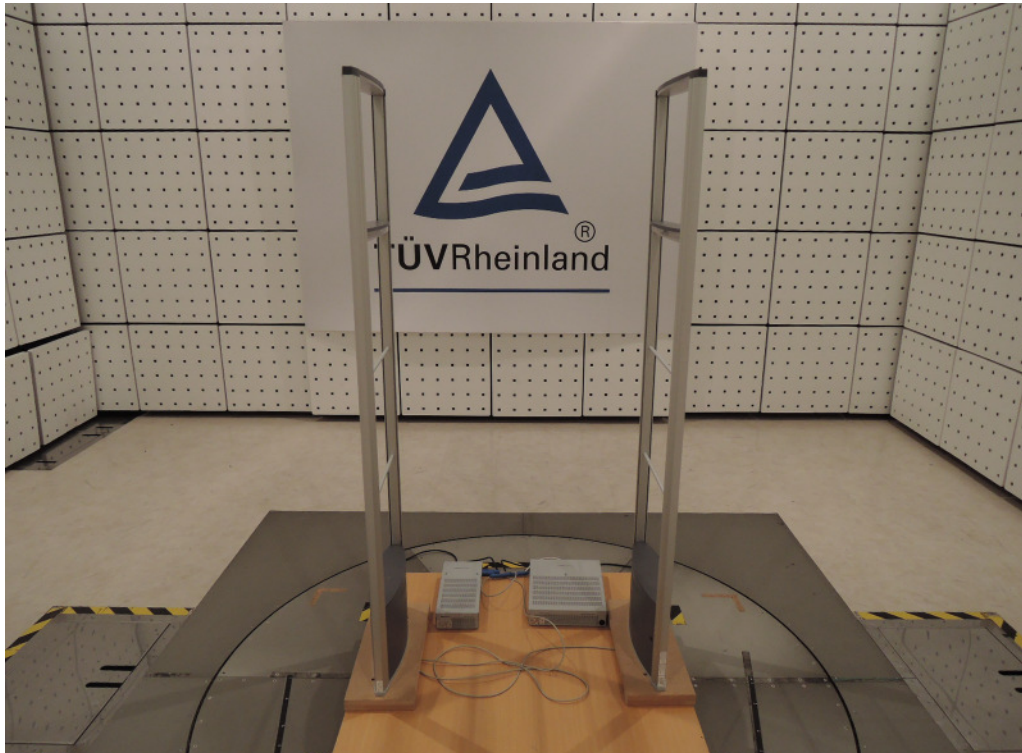
Test setup

Test Channel	:	Middle
Operation mode	:	Normal

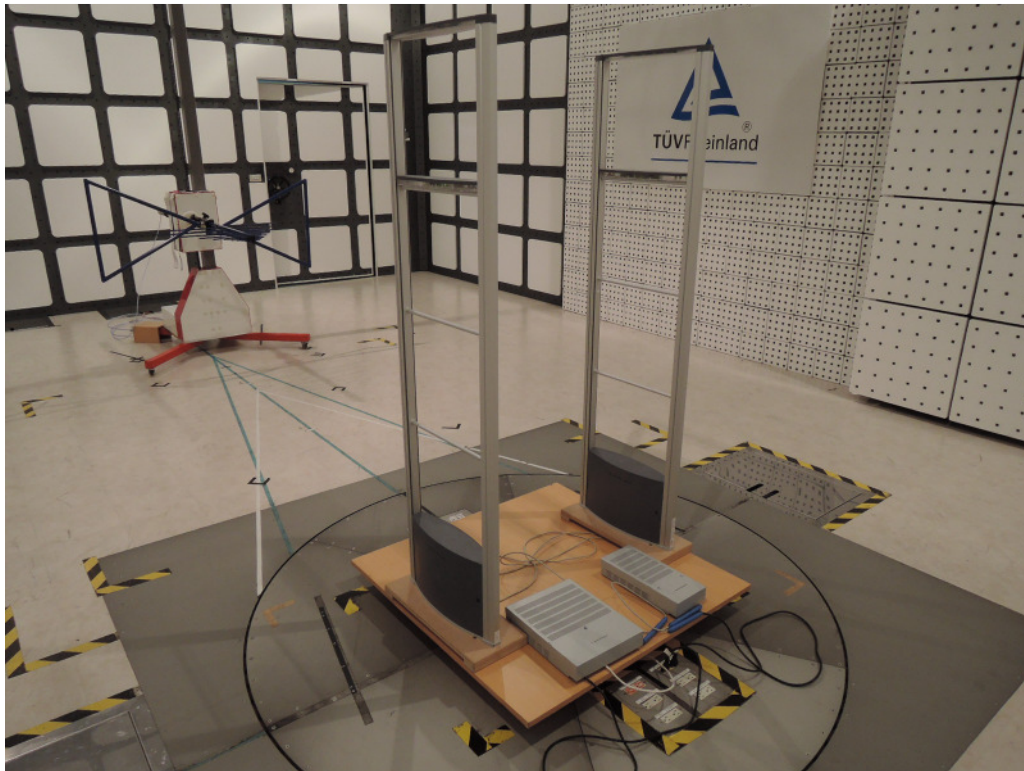
Remark: For details refer to Appendix D.

6. Photographs of the Test Set-Up

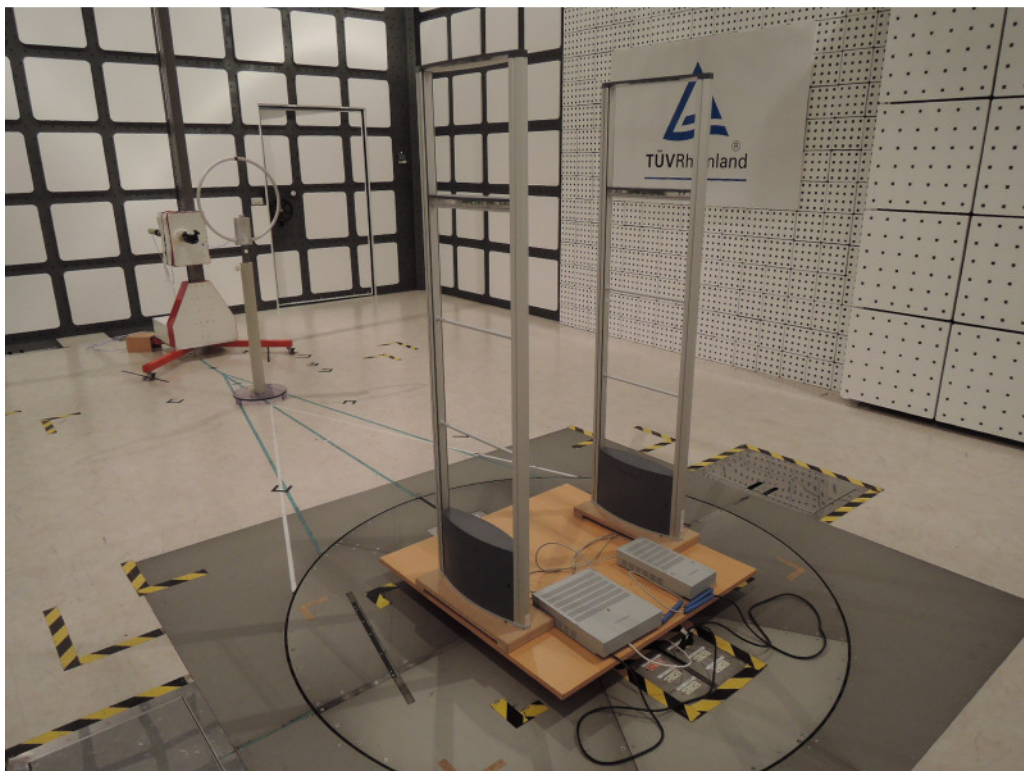
Photograph 1: Set-up for Spurious Emissions TX (Front View)



Photograph 2: Set-up for Spurious Emissions (Back View 1)



Photograph 3: Set-up for Spurious Emissions (Back View 2)



Photograph 4: Set-up for for Mains Conducted testing Back



Photograph 5: Set-up for for Mains Conducted testing Front



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