

**TEST REPORT CONCERNING THE COMPLIANCE OF
DECODER, UNINTENTIONAL RADIATOR
Brand MYLAPS Model X2 Decoder
WITH 47 CFR PART 15, Subpart B (10-1-12 EDITION)**

**13072505.fcc03
October 15, 2013**

FCC listed	:	90828
Industry Canada	:	2932G-2
R&TTE, LVD, EMC Notified Body	:	1856

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MEASUREMENT/TECHNICAL REPORT

Unintentional radiator

Brand: MYLAPS
Model: X2 Decoder
FCC ID: NXYX2DECODER

This report concerns: ~~Original grant/certification~~ ~~Class 2 change~~ Verification

Equipment type: JBP Class B Computing Device Peripheral

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The data taken for this test and report herein was done in accordance with 47 CFR Part 15 (10-1-12 Edition) and the measurement procedures of ANSI C63.4-2009. TÜV Rheinland EPS at Leek, 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: October 15, 2013

Signature:



O. Hoekstra
Senior Engineer Telecom TÜV Rheinland EPS

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)	: Decoder, Unintentional radiator
Manufacturer	: MYLAPS B.V.
Brand	: MYLAPS
Model	: X2 Decoder
Serial number	: --
FCC ID	: NXYX2DECODER
IC	: Not applicable
Receipt date	: September 27, 2013

Applicant information

Applicant's representative	: Mr. B. van Rens and Mr. R. Stokman
Company	: MYLAPS BV
Address	: Zuiderhoutlaan 4
Postal code	: 2012PJ
City	: Haarlem
Country	: The Netherlands
Telephone number	: +31 23 5291893
e-mail address	: Ron.Stokman@mylaps.com

Test(s) performed

Location	: Leek
Test(s) started	: September 27, 2013
Test(s) completed	: October 14, 2013
Purpose of test(s)	: Equipment Authorization (Original grant/certification)
Test specification(s)	: 47 CFR Part 15, Subpart B (10-1-12 Edition) AND ANSI C63.4-2009
Compliance statement	: The test has demonstrated that this unit complies with stipulated standards.
Test engineer(s)	: R. van der Meer 
Report written by	: R. van der Meer 
Report date	: October 15, 2013

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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 brand MYLAPS, model X2 Decoder (hereafter referred to as EUT), is used in sports timing systems. It does contain a transceiver. This report covers the Unintentional/ Digital device part.

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 verification in equipment authorization.

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.
The EUT is not tested in combination with a POE (Power Over Ethernet) device.

EUT	:	Decoder
Manufacturer	:	MYLAPS B.V.
Brand	:	MYLAPS
Model	:	X2 Decoder
Serial number	:	--
Voltage input rating	:	12Vdc
Voltage output rating	:	--
Current input rating	:	--
Antenna	:	--
Remarks	:	See photos of the EUT on the next page

Auxiliary equipment (AUX1)	:	Power supply
Manufacturer	:	DVE
Brand	:	DVE
Model	:	DSA-0421S-12 1
Serial number	:	--
Voltage input rating	:	100-240Vac
Voltage output rating	:	+12Vdc 2.7A
Remark	:	power supply for EUT

Auxiliary equipment (AUX2)	:	GPS receive antenna
Manufacturer	:	Trimble
Brand	:	Trimble
Model	:	66800-52
Serial number	:	081120899
Voltage input rating	:	--
Voltage output rating	:	--.
Remark	:	--

Auxiliary equipment (AUX3)	:	Notebook computer with power supply adapter
Brand	:	Lenovo
Model	:	R60 (9456-HTG)
Serial number	:	L3-BF847 07/02
Voltage input rating	:	12 Vdc
Current input rating	:	--
Remark	:	Inventory TR EPS NR 99615

Auxiliary equipment (AUX4)	:	Printer
Brand	:	
Model	:	--
Serial number	:	--
Voltage input rating	:	--
Current input rating	:	--
Remark	:	connects to AUX3

Auxiliary equipment (AUX5)	:	Photocell
Brand	:	MYLAPS
Model	:	--
Serial number	:	--
Voltage input rating	:	--
Current input rating	:	--
Remark	:	connects to AUX port of the EUT

Auxiliary equipment (AUX6)	:	Optical Scroll Mouse
Brand	:	X Tensions
Model	:	XM-151 USB
Serial number	:	--
Voltage input rating	:	--
Current input rating	:	--
Remark	:	connects to AUX3

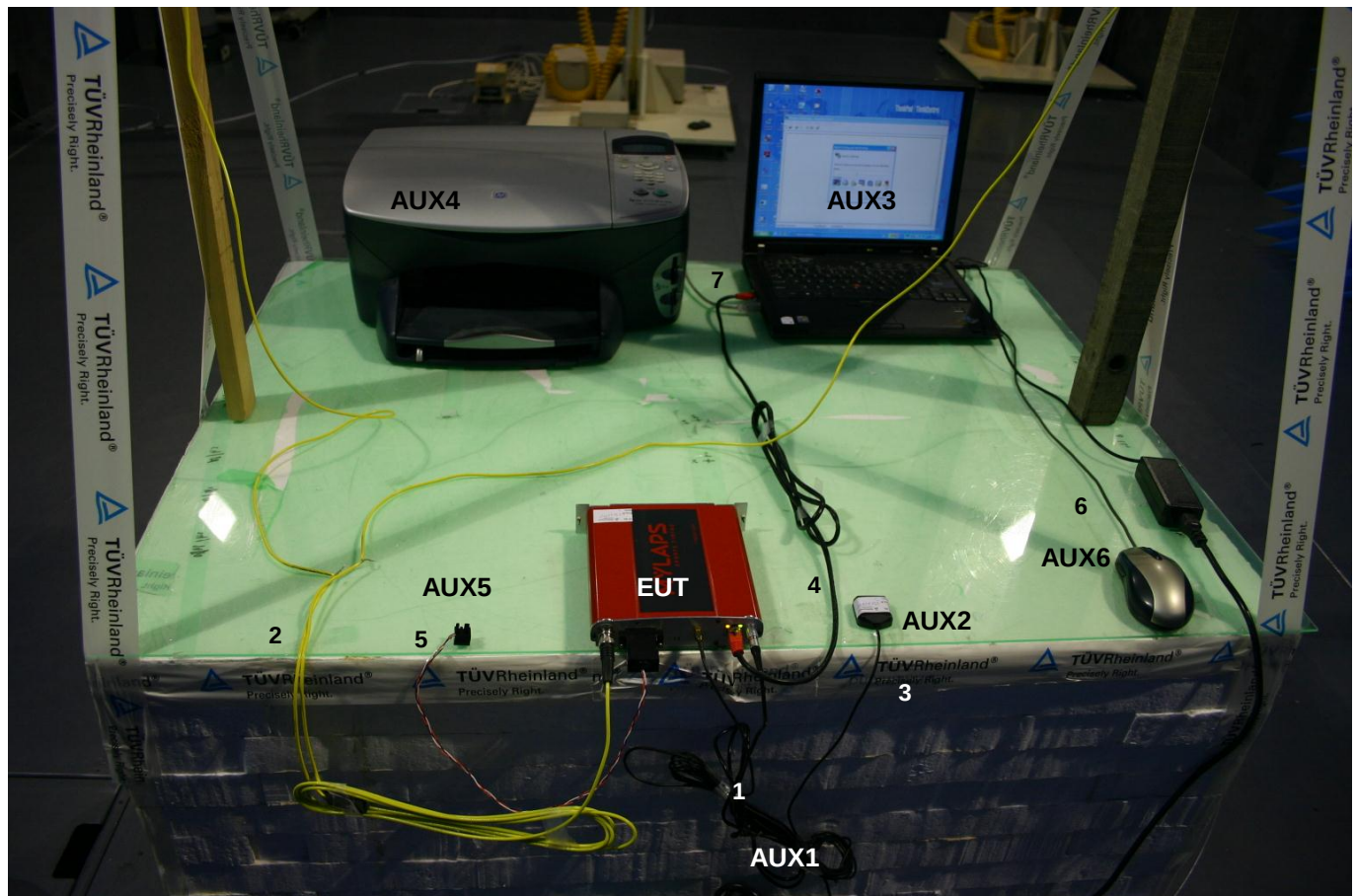


Photo 1: basic setup

1.3.1 Description of input and output ports.

The information as provided by the applicant regarding the input/output ports is stated as ports not being used and will be terminated with a protective shield. This is however beyond control of **TÜV Rheinland EPS**. A POE can be used to power the EUT but none is supplied with the EUT, the EUT is therefor not tested in combination with an POE.

Number	Terminal	From	To	Remarks
1	Mains	AUX1	EUT	Unshielded cable <3m length
2	Antenna	EUT Antenna port	Loop antenna	shielded cable >3m length
3	GPS	EUT GPS port	AUX2	Unshielded cable <3m length
4	Comms	EUT Comm port	AUX3	Unshielded UTP cable <3m length
5	Photocell	EUT Auxiliary port	AUX5	Shielded cable <3m length
6	USB	AUX3	AUX6	Unshielded cable <3m length
7	Comms	AUX3	AUX4	Shielded cable <3m length

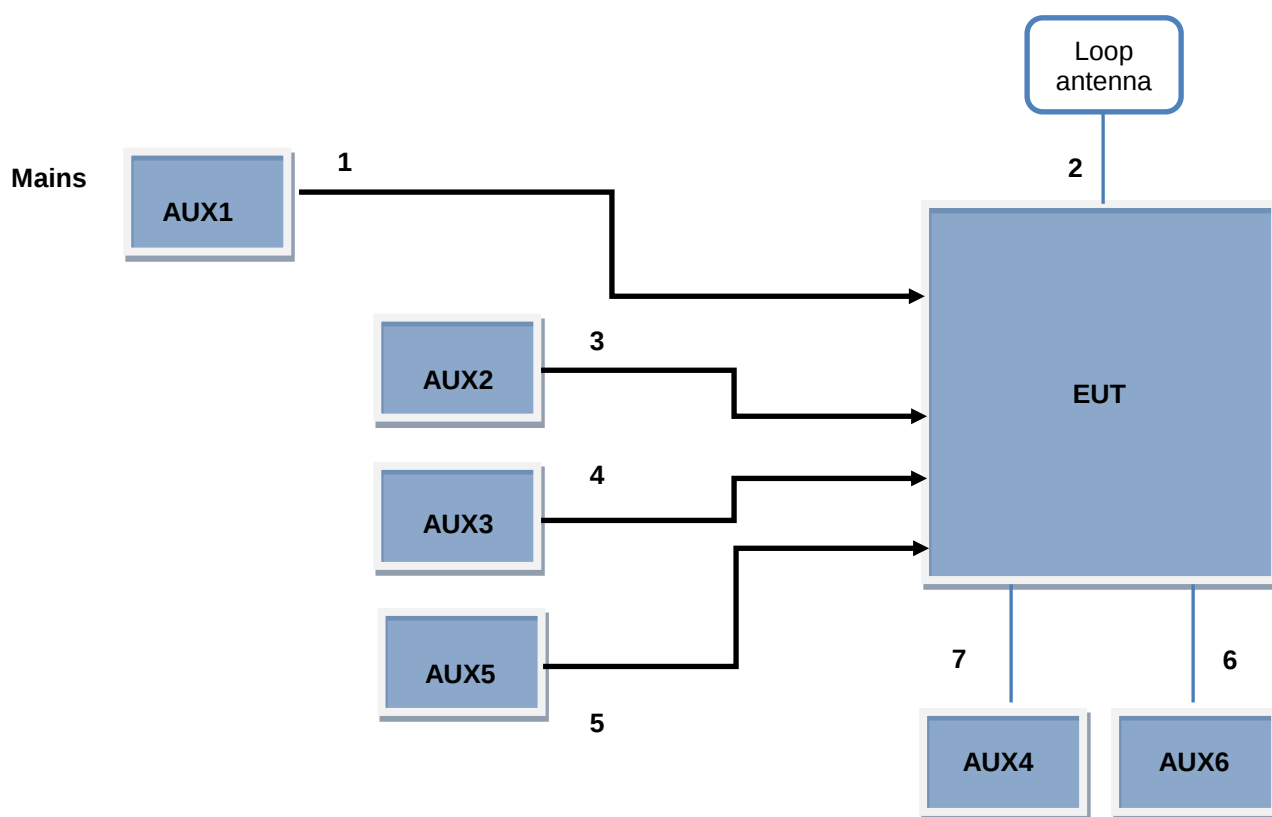


Figure 1. Basic set-up

1.4 Test Summary

The EUT was tested in accordance with the specifications given in Table 1 below.

Test Standard		Description		Pass / Fail
47 CFR Part 15 (10-1-12 Edition)			Page	
15.107(a) Class B		Conducted emissions	15 - 20	Pass
15.109(a) Class B		Radiated emissions	12 - 14	Pass

Table 1: Test specifications

Testmethods: ANSI C63.4:2009

1.5 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15 (10-1-12 Edition), sections 15.31, 15.35, 15.205, 15.107, 15.109.

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.

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, located at Eiberkamp 10, 9351 VT Leek, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948.

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-2. 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	: 120Vac / 60Hz
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 situation as a customer would normally use it. The sample as supplied by the applicant was configured with a standard BNC connector as Antenna connector.
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 normal use configuration, there is no special mode of operation available.

2.3 Test Software

No special testsoftware was required to perform the tests.

2.4 Special accessories.

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

2.5 Equipment modifications.

No modifications have been made to the equipment.

2.6 Product Labeling

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

2.7 Block diagram of the EUT.

Not applicable.

2.8 Schematics of the EUT.

Not applicable.

2.9 Part list of the EUT.

Not applicable.

3 Radiated emission data.

3.1 Requirements:

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Freq. [MHz]	Limit [μV/m]	Limit [dBμV/m]
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

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

Freq. [MHz]	Antenna Orientation	Level QP [dBμV/m]	Limit [dBμV/m]	Margin [dB]
30.00	Horizontal	25.1	40.0	Pass
31.94	Vertical	23.9	40.0	Pass
51.34	Horizontal	22.7	40.0	Pass
121.18	Horizontal	18.5	43.5	Pass
132.82	Vertical	21.3	43.5	Pass
557.68	Horizontal	29.0	46.0	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 15.205, 15.109(a) are depicted in Table 2. See notes on the following page.

Notes:

1. Field strength values of radiated emissions at frequencies not listed in Table 2 above are more than 20 dB below the applicable limit.
2. Measurement uncertainty is ± 5.0 dB.
3. The EUT was varied in three positions, the measuring antenna was varied in horizontal and vertical orientations and also around its axis and height. The reported value is the worst case found at the reported frequency.
4. Tested with EUT in operation modes as described in section 2.2, worst case values noted.
5. A Quasi-peak detector was used with a bandwidth of 120 kHz.

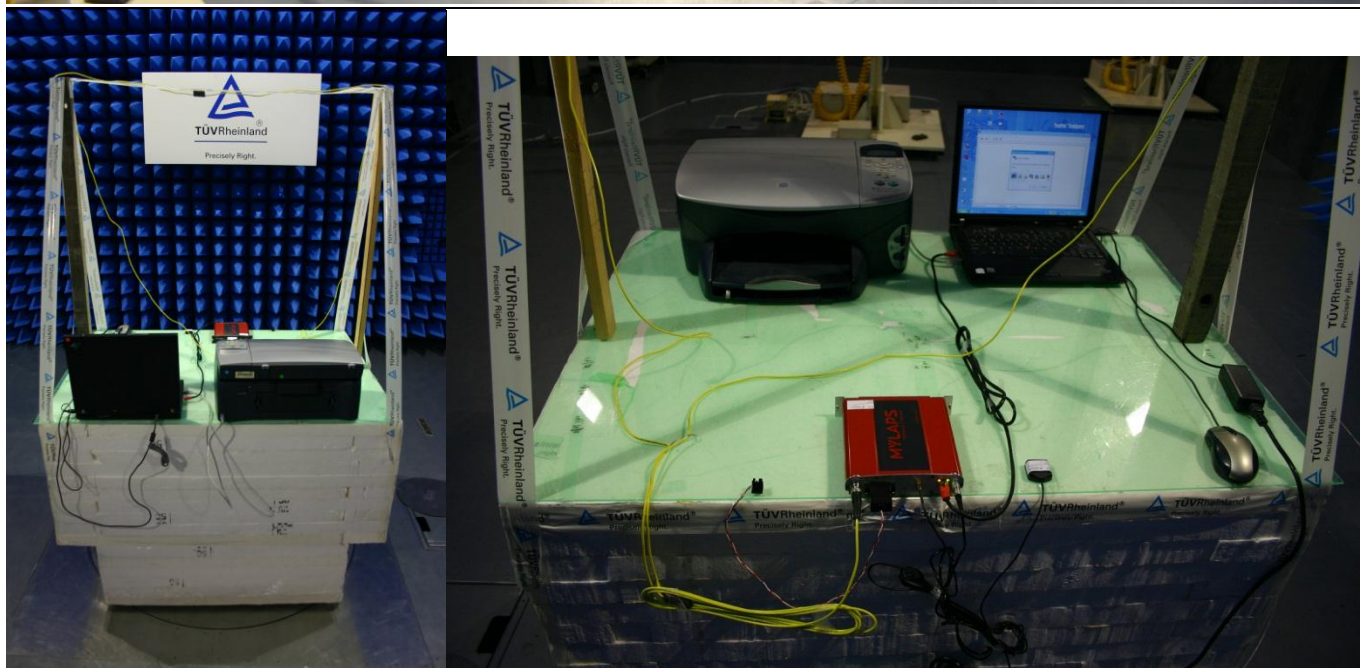
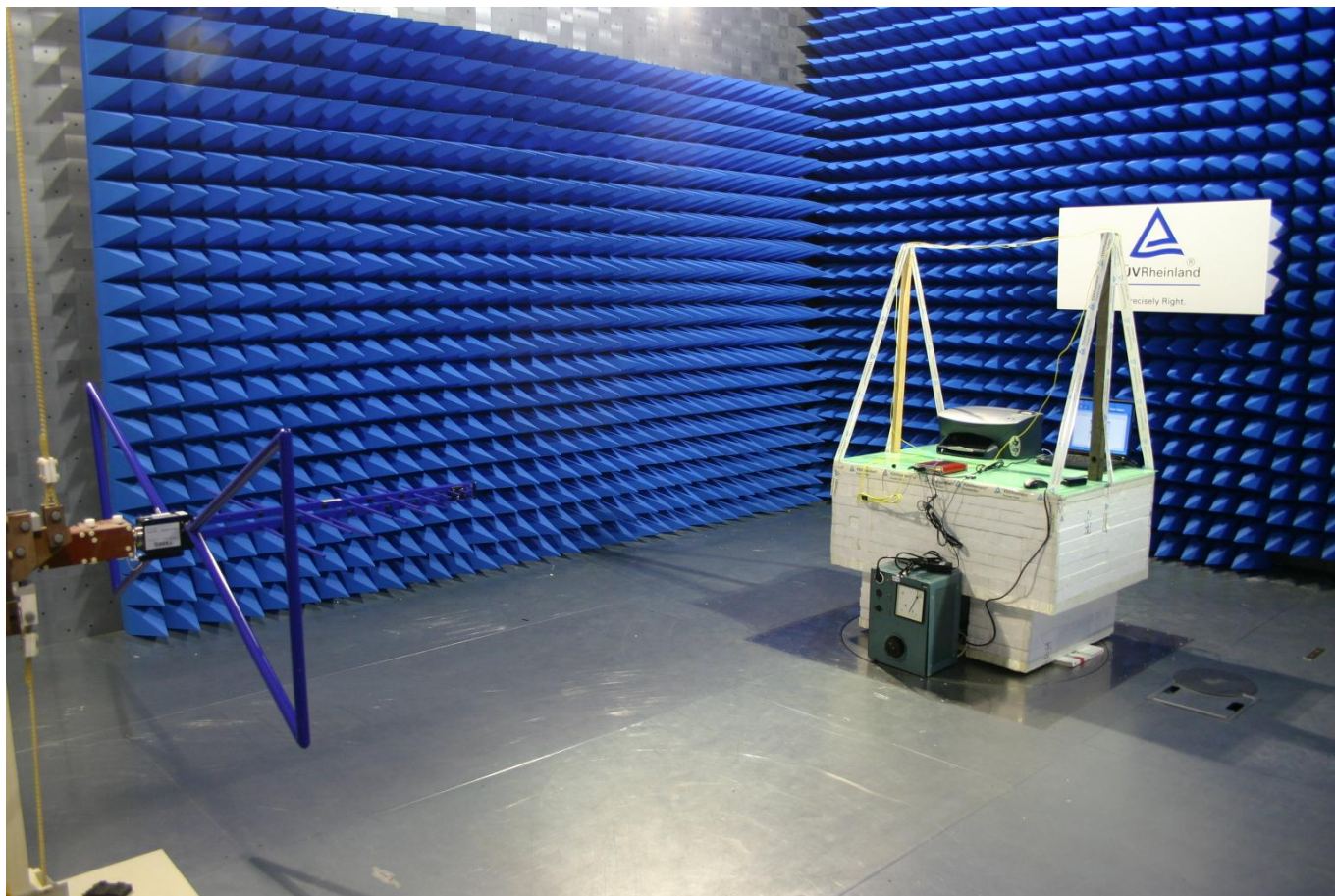
3.2.1 Test equipment used (for reference see test equipment listing).

99608	99699	99609	99861	99858	99580/99847	99877		

Test engineer



Signature :
Name : R. van der Meer
Date : September 27, 2013



Testsetup photographs

4 Conducted emission data.

4.1 Requirements

Except for Class A digital devices, for equipment that is designed to be connected the public utility AC power line, either directly or indirectly, the radio frequency voltage that is conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the following table. The tighter limit applies at the frequency range boundaries.

Frequency of Emission (MHz)	Conducted Limit (dBμV) Quasi-Peak	Conducted Limit (dBμV) Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 - 30	46	50

*Decreases with the logarithm of the frequency.

4.2 Testresults, Conducted emission data of the EUT

Frequency (MHz)	Measurement results (dBμV) Neutral/L2		Measurement results (dBμV) Line 1		Limits (dBμV)		Result
	QP	AV	QP	AV	QP	AV	
0.150	35.5	*5	35.5	*5	66.0	56.0	PASS
0.205	37.6	*5	34.0	*5	65.5	55.5	PASS
0.560	27.5	*5	28.5	*5	65.0	55.0	PASS
0.965	31.1	*5	29.5	*5	62.8	52.8	PASS
16.225	38.2	*5	37.9	*5	56.9	46.9	PASS
19.710	33.1	*5	33.7	*5	60.0	50.0	PASS

Table 3

The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15 section 15.207(a) section 7.2.4, at the 120 Volts/ 60 Hz AC mains connection terminals of AUX1 tah connect to the EUT, are depicted in Table 3 above. The system is tested as in whole, so with all equipment as shown in Figure 1 in place and functioning. Being the worst case situation. See note on the next page.

See notes on the next page and plots on pages 18 and 19.

Notes:

1. Measurement uncertainty is ± 3.5 dB
2. The resolution bandwidth used was 9 kHz
3. The EUT was tested with all auxiliary equipment connected as shown in figure 1. Worst case values noted.
4. The loop antenna was replaced by a 50 Ohm load (Inv Nr. 99082) as per KDB 174176.
5. Qp values were already within Av limits, Av therefor not tested.
6. Values of conducted emissions at frequencies not listed in Table 3 are more than 20 dB below the applicable limit.

Used test equipment and ancillaries:

15667	99161	12512	99848	99852	99855	99082
13313						

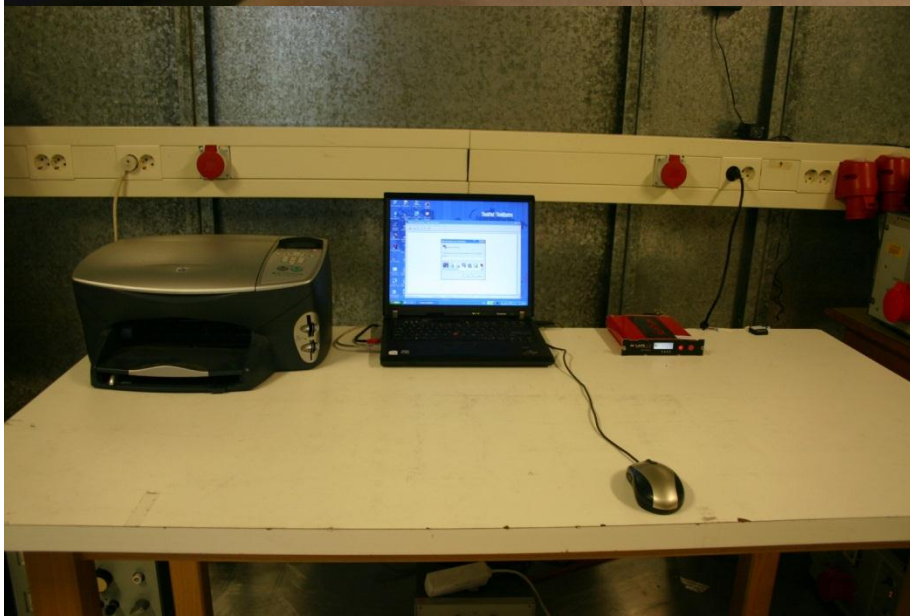
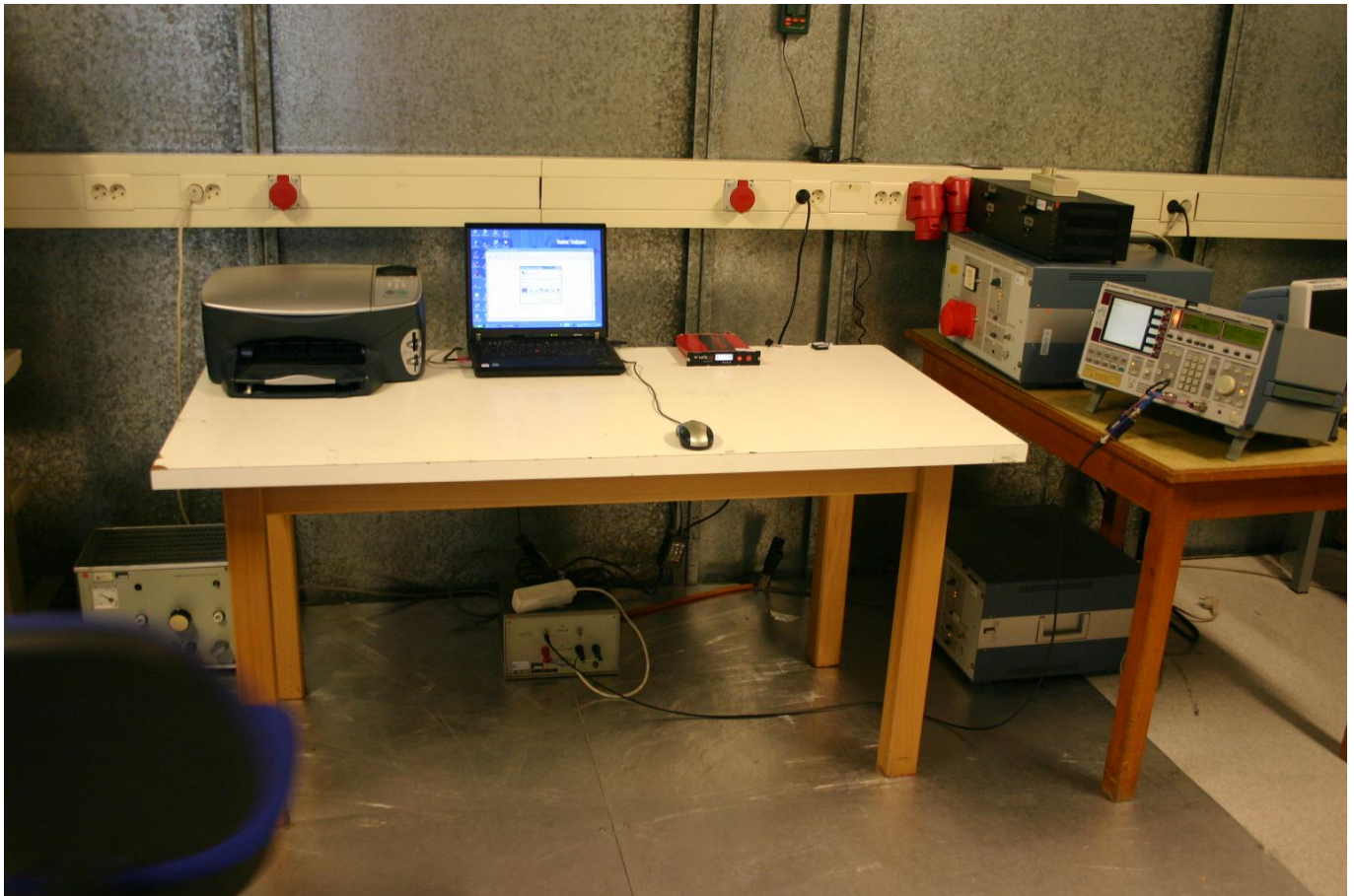
Test engineer

Signature :



Name : R. van der Meer

Date : October 14, 2013



Testsetup photographs

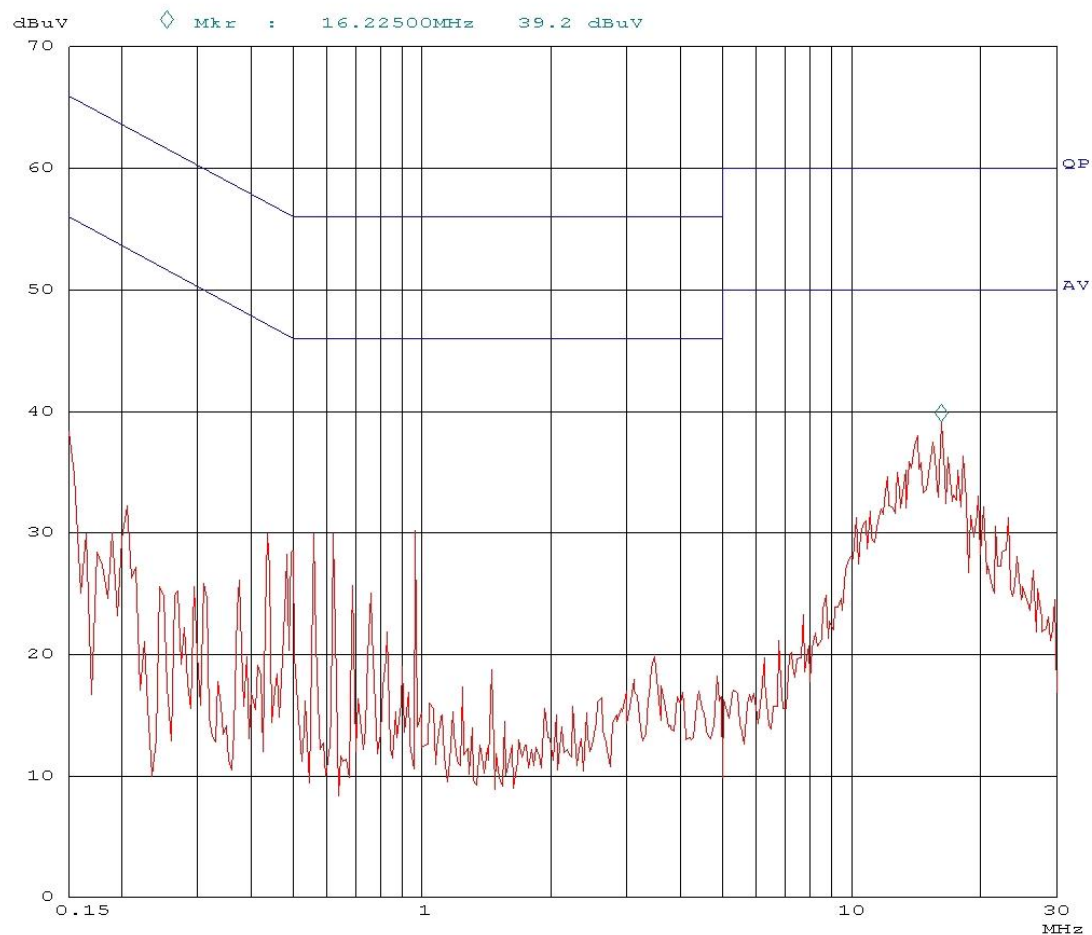


Testsetup photograph



14. Oct 13 10:34

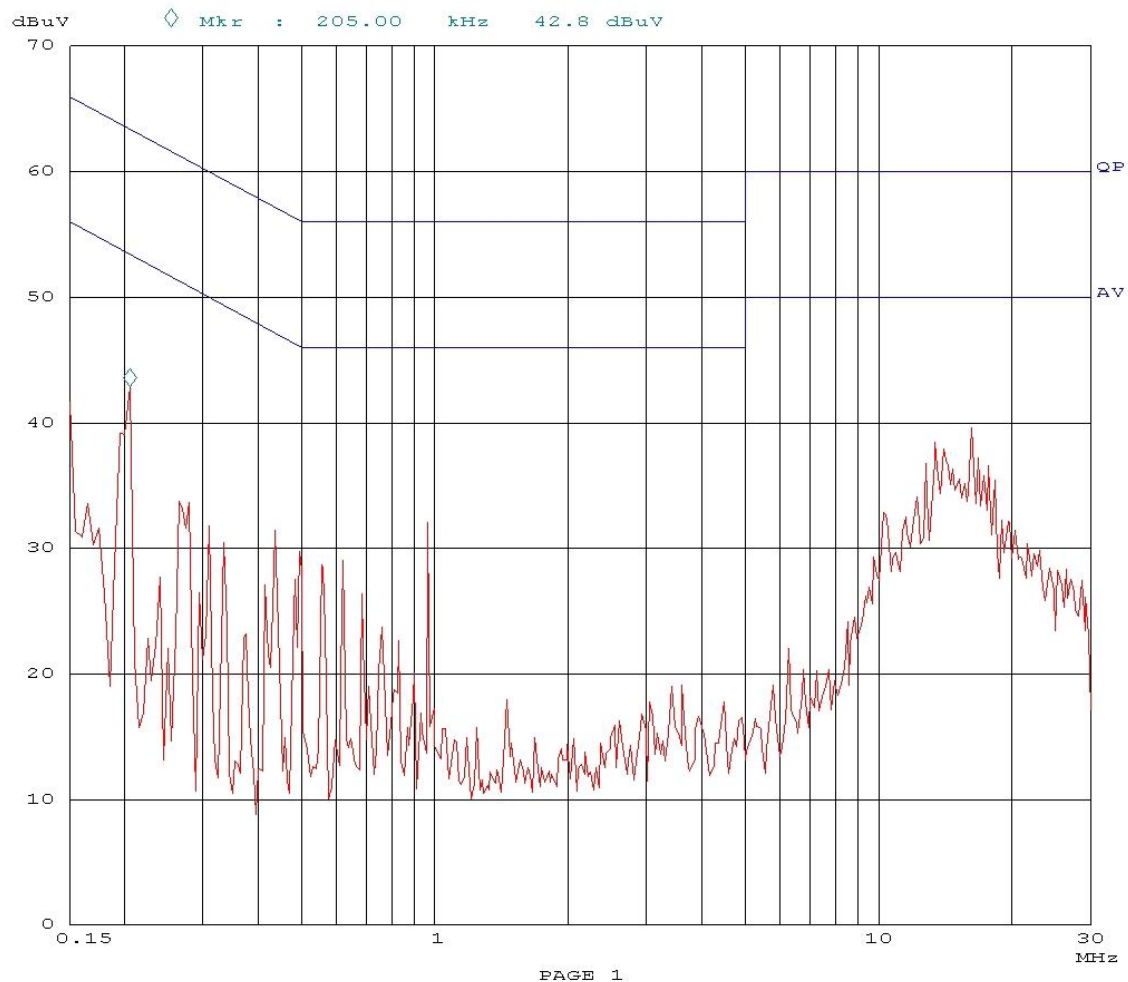
Scan Settings (1 Range)
|----- Frequencies -----| |----- Receiver Settings -----|
Start Stop Step IF BW Detector M-Time Atten Preamp
150k 30M 5k 9k PK 1ms AUTO LN OFF
Final Measurement: x QP
Meas Time: 1 s



Plot of the conducted emissions on L1

14. Oct 13 12:02

Scan Settings (1 Range)
|----- Frequencies -----|----- Receiver Settings -----|
Start Stop Step IF BW Detector M-Time Atten Preamp
150k 30M 5k 9k PK 1ms AUTO LN OFF
Final Measurement: x QP
Meas Time: 1 s



Plot of the conducted emissions on L2

5 List of utilized test equipment.

Inventory number	Description	Brand	Model	Last cal.	Next cal.
12512	LISN	EMCO	3625/2	01/2012	01/2014
13313	Pulse limiter	R&S	ESH3-Z2	01/2013	01/2014
15667	Measuring receiver	R&S	ESCS30	09/2013	09/2014
99082	50 Ohm load resistor	R&S	R404051000 50 9141	10-15/2012	10-15/2013
99877	Biconilog Test antenna	Teseq	CBL 6111D	06-2013	06-2014
99161	Variac 250V 6A	RFT	LTS006	NA	NA
99580/99847	Semi Anechoic Room	Siepel	FCC listed: 90828 IC: 2935G-2	12-2011	12-2014
99848	Shielded room for Conducted emissions	Euroshield	RFD-100 359	NA	NA
99609	Antenna mast	EMCS	AP-4702C	NA	NA
99608	Antenna mast controller	EMCS	DOC202	NA	NA
99852/ 99855	Temperature-Humiditymeter	Extech	SD500	02-2012	02-2014
99861	Controller turntable	Maturo	SCU/088/8090811	NA	NA
99877	Biconilog Test antenna	Teseq	CBL 6111B	06-2013	06-2014
99699	Measuring receiver	R&S	ESCI	03-2013	03-2014

NA= Not Applicable