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DELTA Test Report

TEST REPORT issued by an Accredited Testing Laboratory



1688
ISO/IEC 17025

EMC emission test of Sense MC-S

Performed for Precise Biometrics AB

REC-E703141_1F

Project no.: E703141

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19 Feb.2012

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Title EMC emission test of Sense MC-S

Test object Sense MC-S

Report no. REC-E703141_1F

Project no. E703141

Test period 15 Feb. 2012

Client Precise Biometrics AB
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Sweden
Tel.: 046-311100

Contact person Lena Strutz
E-mail: Lena.strutz@precisebiometrics.com

Manufacturer Precise Biometrics AB

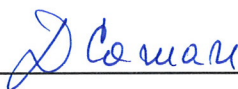
Specifications FCC Part 15 Subpart B

Results The test object was found to be in compliance with the specifications, as listed in Section 1

Test personnel Daniela Coman

Date 19 Feb. 2012

Project Manager



Daniela Coman
DELTA

Responsible



Ulf Bjerke Technical Manager
DELTA



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1. Summary of tests

Tests	Test methods	Results
Measurement of radio frequency voltage on mains	ANSI C63.4:2009	Passed
Measurement of radio frequency electromagnetic field	ANSI C63.4:2009	Passed

Conclusion

The test object(s) mentioned in this report meet(s) the requirements of the standard(s) stated below.

- 47 CFR – Telecommunication, Chapter I – FCC Part 15 – Radio Frequency Devices - Subpart B: Unintentional radiators

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



2. Test object(s) and auxiliary equipment

2.1 Test object(s)

Test object 2.1.1

Name of test object	Sense MC-S
Model / type	Precise Sense MC-S
Part no.	SAA 103 1002
Serial no.	0-1
Manufacturer	Precise Biometrics AB
Supply voltage	5V
Software version	N/A
Hardware version	R2A
Highest frequency generated or used	12 MHz
Comment	



Photo 2.1.1 Precise Sense MC-S

2.2 Auxiliary equipment

Auxiliary equipment 2.2.1

Name of auxiliary equipment	Computer
Model / type	Thinkpad 600E
Part no.	2645-8BG
Serial no.	5537CNN 02/99
Software version	SPA 123 1004 R2A
Manufacturer	IBM
Supply voltage	230V

Auxiliary equipment supplied by the client, who also has the responsibility for its correct function and set up.

Auxiliary equipment 2.2.2

Name of auxiliary equipment	Desktop Printer
Model / type	Deskjet895Cxi
Part no.	C6410A
Serial no.	HU0151N087
Manufacturer	Hewlett Packard
Supply voltage	230V

Auxiliary equipment supplied by the client, who also has the responsibility for its correct function and set up.

Auxiliary equipment 2.2.3

Name of auxiliary equipment	Computer Mouse
Model / type	Wheel Mouse
Part no.	83351-576
Serial no.	0304842
Manufacturer	Microsoft
Supply voltage	5V

Auxiliary equipment supplied by the client, who also has the responsibility for its correct function and set up.



3. General test conditions

3.1 Test setup during test

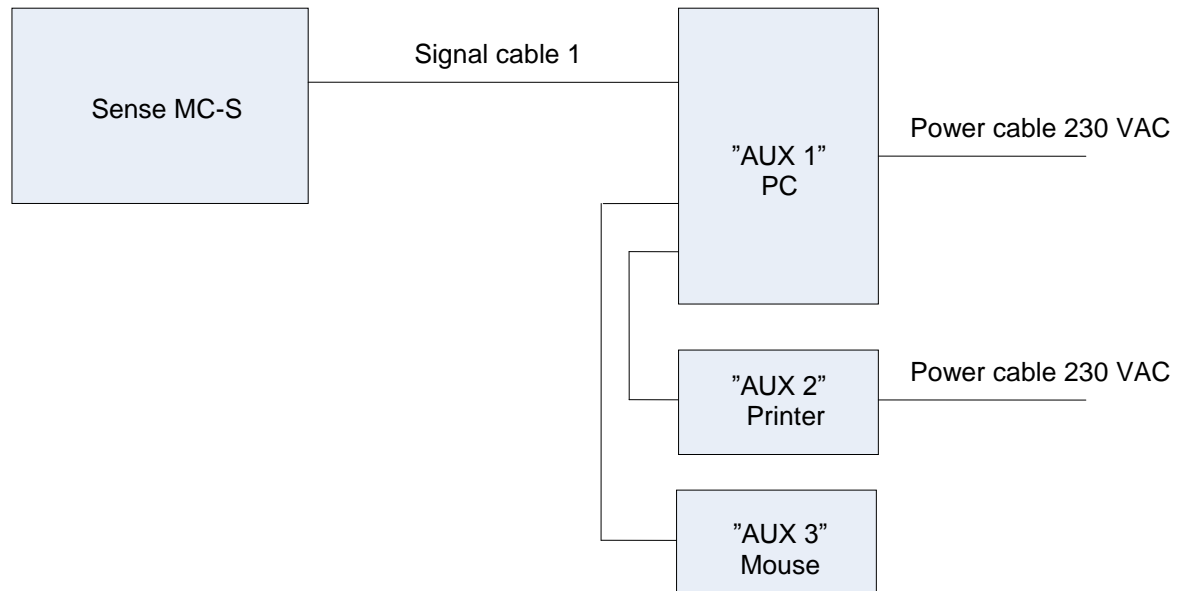


Figure 3.1.1 Block diagram of test object(s) with cables and auxiliary equipment.

Name	Cat.	Type	Max. Length
Signal Cable 1	Shielded	USB Cable with ferrite	1.5 m
Power cable	Unshielded	3 x 1.5 mm ²	1.8 m
Power cable	Unshielded	3 x 1.5 mm ²	1.8 m
Printer cable	Shielded		1.9 m

3.1.1 Description and intended use of test object

Combined fingerprint and smart card reader intended for office or personal use.

3.1.2 Test modes during emission tests

Continuous fingerprint sensor image capture and smart card communication.

3.1.3 Nominal power consumption

< 150 mA



3.2 Modifications of the test object

No modification was implemented to the test object.

3.3 Test sequence

The tests described in this test report were performed in the following sequence:

- | |
|--|
| <ol style="list-style-type: none">1. Measurement of radio frequency electromagnetic field2. Measurement of radio frequency voltage on mains |
|--|



4. Test results

4.1 Measurement of radio frequency voltage on mains

Test object	Sense MC-S	Sheet	CE-1
Type	Precise Sense MC-S	Project no.	E703141
Serial no.	0-1	Date	13 Feb. 2012
Client	Precise Biometrics AB	Initials	DAC
Specification	FCC Part 15 Subpart B, Class B	Frequency	0.15-30 MHz

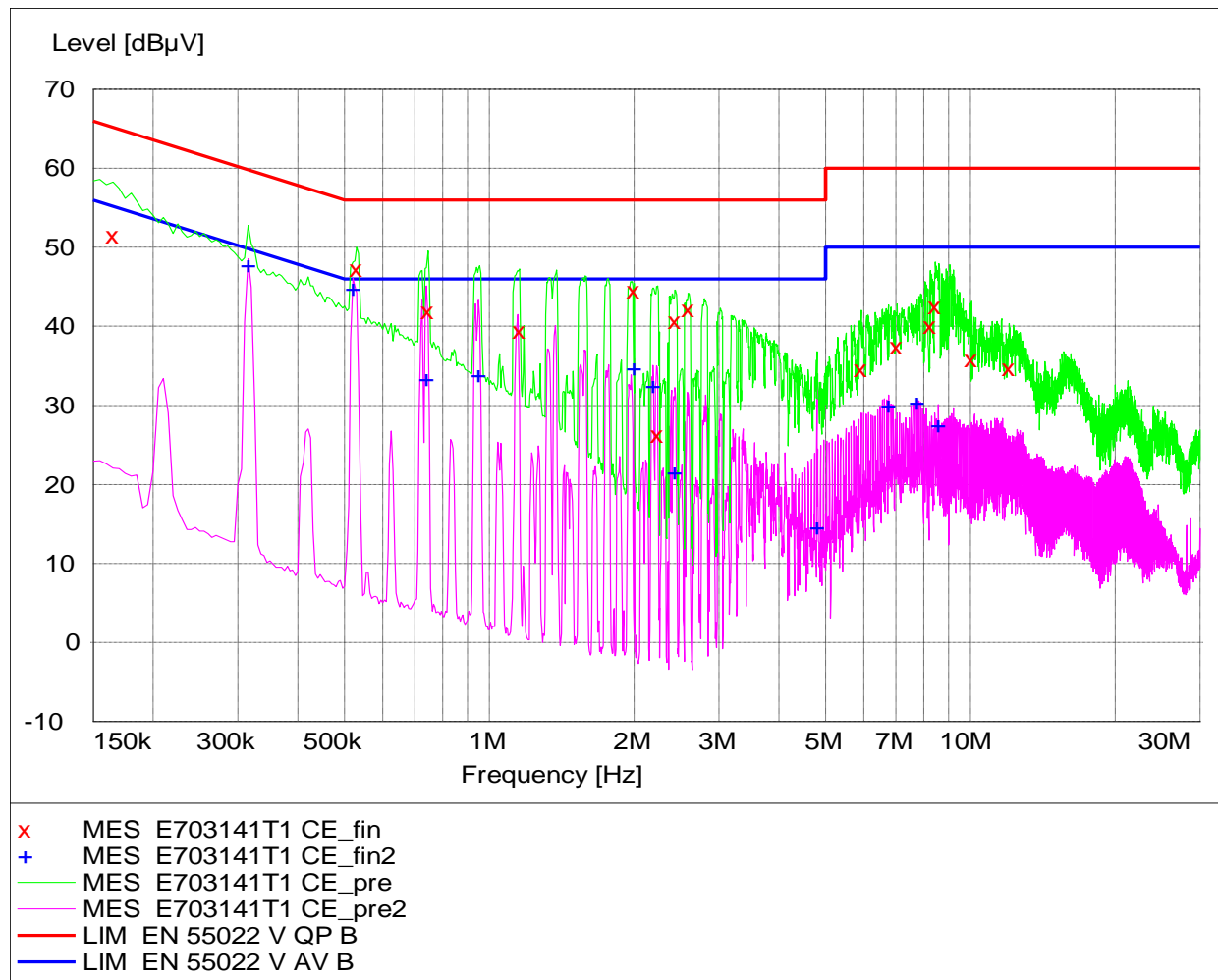
Test method	ANSI C63.4:2009	Temperature	21 °C
Characteristics	Artificial mains network: 50 Ω , 50 μ H	Humidity	31 % RH
Detector	Peak, quasi peak, and average	Bandwidth	9 kHz
Test equipm.	EMC Hall A Västerås Setup VEA1	Uncertainty	1.8 dB

Line under test	Maximum of Line and Neutral
Test result	The measured voltages were below the limit of Class B equipment.
Compliant	Yes
Comments	Mains voltage: 230 VAC to the personal computer to which Sense MC-S is connected. During test an artificial hand was applied to the test object, please see photo

Conducted emission 2012-02-13

Complete measurement 0.15 - 30 MHz

EUT: Sense MC-S 0-1
Manufacturer: Precise Biometrics AB
Operating Condition: 230 VAC 50Hz
Test Site: Delta Development Technology AB
Operator: Daniela Coman
Test Specification: FCC Part 15 Subpart B Class B



MEASUREMENT RESULT: "E703141T1 CE_fin"

13-02-2012 14:11

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.165000	51.50	0.3	65	13.7	QP	N	FLO
0.530000	47.30	0.2	56	8.7	QP	L1	FLO
0.745000	42.00	0.4	56	14.0	QP	N	FLO
1.155000	39.50	0.3	56	16.5	QP	L1	FLO
2.000000	44.60	0.5	56	11.4	QP	L1	FLO
2.435000	40.60	0.5	56	15.4	QP	L1	FLO
2.595000	42.20	0.5	56	13.8	QP	L1	FLO
8.455000	42.50	1.1	60	17.5	QP	N	FLO

MEASUREMENT RESULT: "E703141T1 CE_fin2"

13-02-2012 14:11

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.315000	47.80	0.2	50	2.0	AV	L1	FLO
0.520000	44.70	0.3	46	1.3	AV	N	FLO
0.740000	33.40	0.3	46	12.6	AV	L1	FLO
0.950000	33.80	0.3	46	12.2	AV	L1	FLO
2.000000	34.70	0.5	46	11.3	AV	L1	FLO
2.190000	32.50	0.6	46	13.5	AV	N	FLO
7.740000	30.40	0.9	50	19.6	AV	L1	FLO





Photo 4.1.1 Test setup regarding measurement of radio frequency voltage on mains.

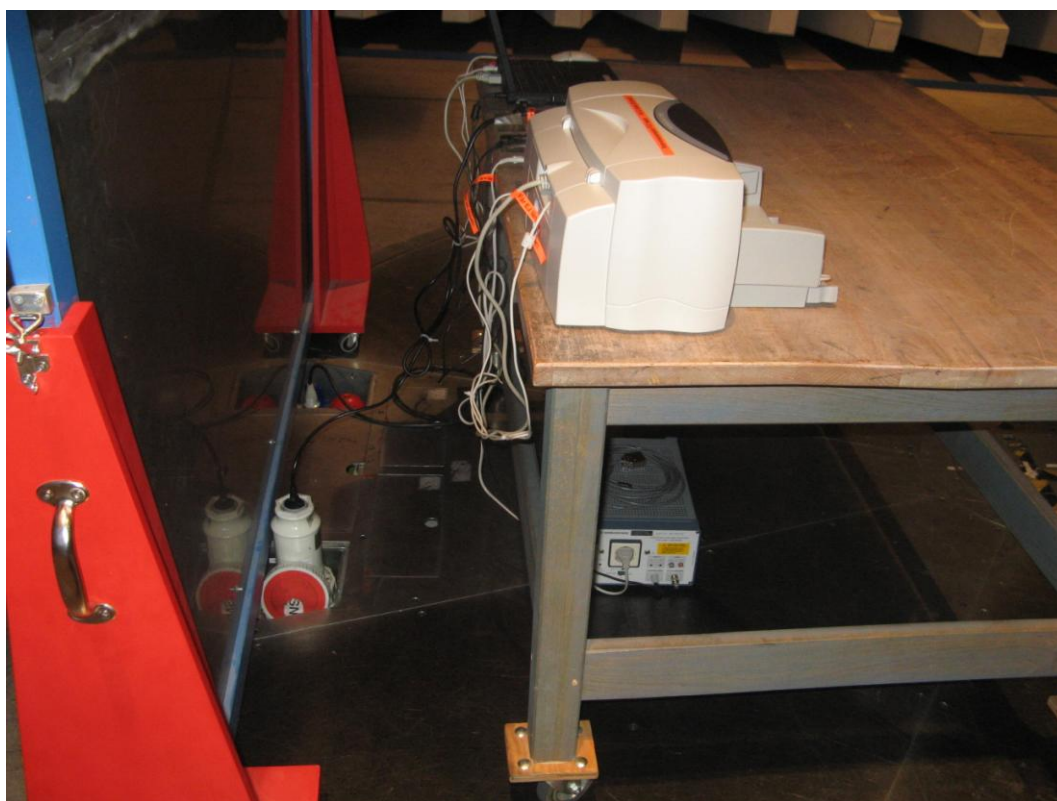


Photo 4.1.2 Test setup regarding measurement of radio frequency voltage on mains.



4.2 Measurement of radio frequency electromagnetic field

Test object	Sense MC-S	Sheet	RE-1
Type	Precise Sense MC-S	Project no.	E703141
Serial no.	0-1	Date	13 Feb. 2012
Client	Precise Biometrics AB	Initials	DAC
Specification	FCC Part 15 Subpart B, Class B	Frequency	30-1000 MHz

Test method	ANSI C63.4:2009	Temperature	22 °C
Characteristics	Complete test, height: 1-4 m, v/h pol.	Humidity	31 % RH
Detector	Peak and quasi peak	Bandwidth	120 kHz
Test equipm.	EMC Hall A Västerås Setup VEC1	Uncertainty	5.1 dB

Test result The measured field strengths are below the limit of Class B equipment.

Compliant Yes

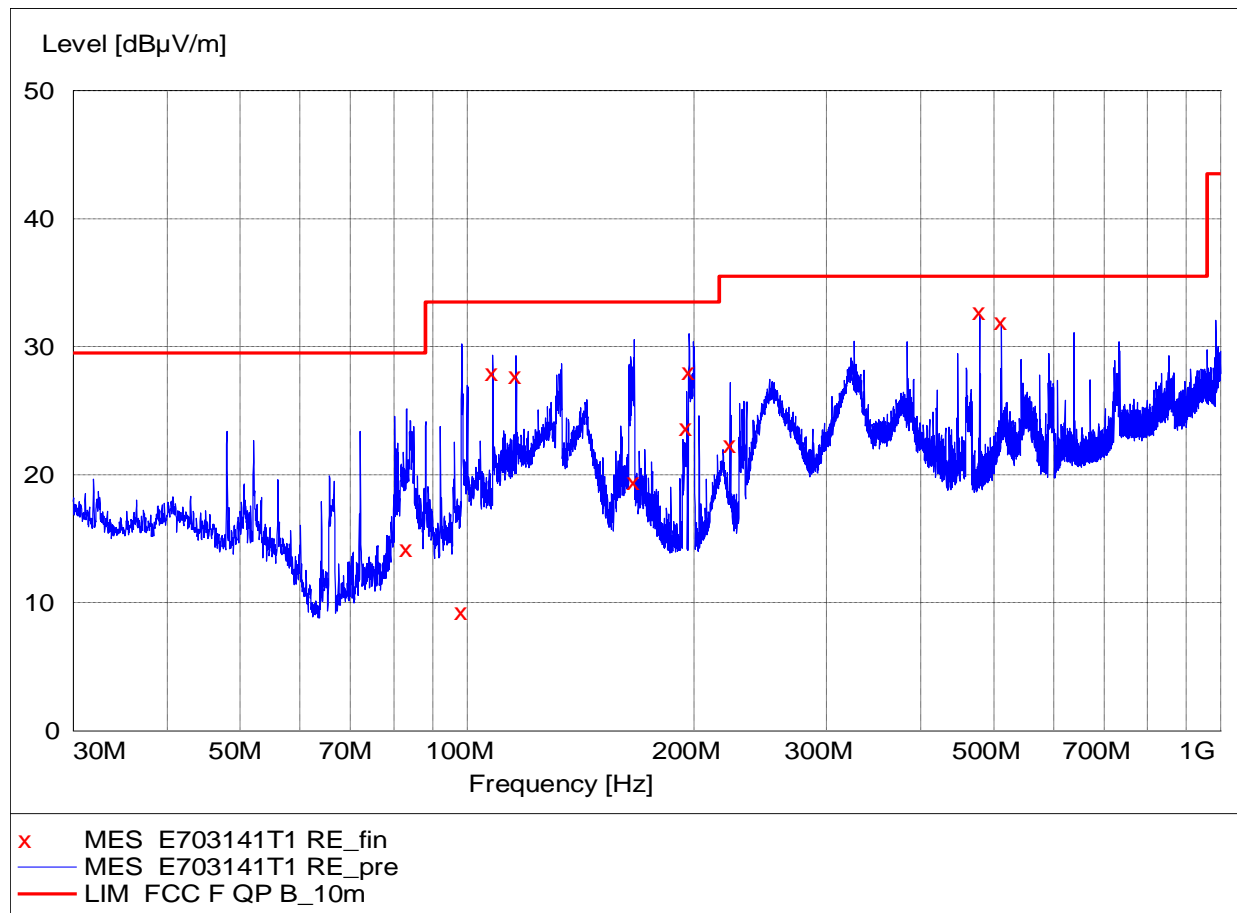
Comments Final maximal measurements by variation of turntable azimuth, antenna height, and antenna polarisation



Radiated emission 2012-02-13

Complete measurement 30-1000 MHz

EUT: Sense MC-S 0-1
Manufacturer: Precise Biometrics AB
Operating Condition: Powered via USB from PC
Test Site: DELTA Development Technology AB
Operator: Daniela Coman
Test Specification: FCC Part 15B Class B
Comment: Measured at 10 m measuring distance.



MEASUREMENT RESULT: "E703141T1 RE_fin"

13-02-2012 09:57

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
83.160000	14.20	-18.3	29.5	15.3	QP	250.0	256.00	VERTICAL
98.460000	9.30	-16.2	33.1	23.8	QP	107.0	229.00	VERTICAL
108.150000	27.90	-15.2	33.1	5.2	QP	119.0	342.00	VERTICAL
116.190000	27.70	-14.5	33.2	5.4	QP	117.0	356.00	VERTICAL
166.650000	19.40	-15.7	33.1	13.7	QP	111.0	220.00	VERTICAL
195.660000	23.70	-17.0	33.1	9.4	QP	105.0	286.00	VERTICAL
197.010000	28.00	-17.0	33.1	5.1	QP	100.0	284.00	VERTICAL
223.680000	22.30	-15.5	35.5	13.2	QP	150.0	224.00	VERTICAL
479.310000	32.70	-8.2	35.5	2.8	QP	222.0	86.00	HORIZONTAL
511.260000	31.90	-7.6	35.5	3.6	QP	100.0	202.00	VERTICAL



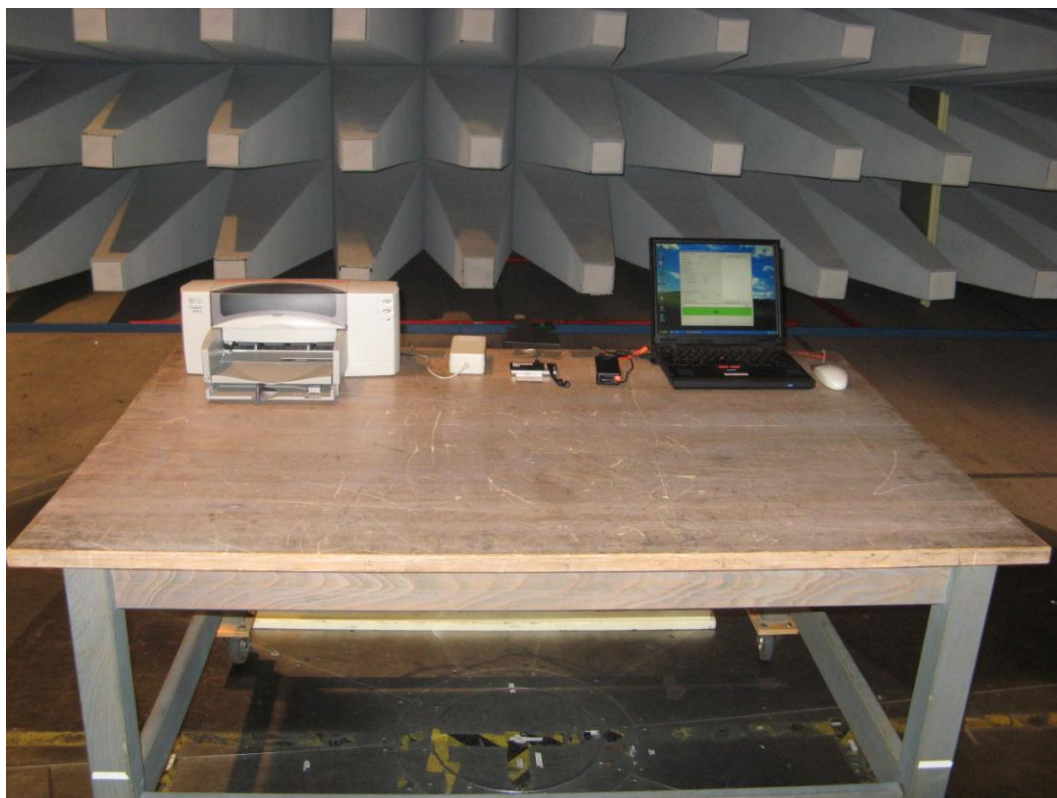


Photo 4.2.1 Test setup regarding measurement of radio frequency electromagnetic field.
Front view.

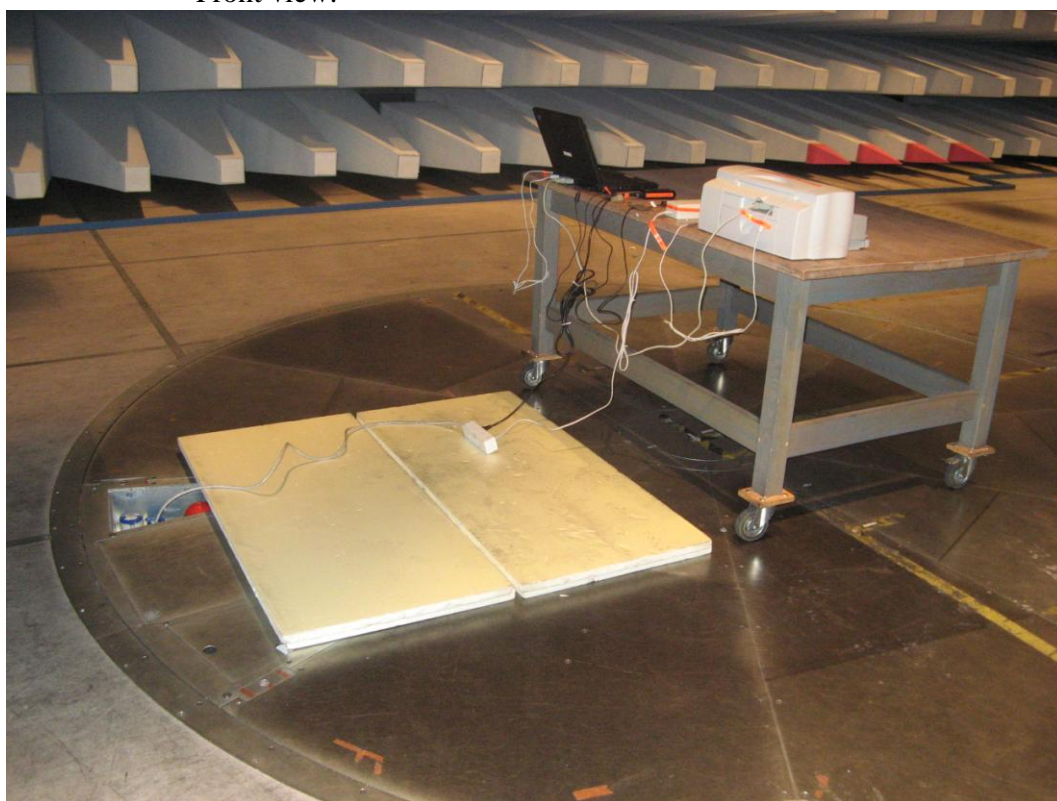


Photo 4.2.2 Test setup regarding measurement of radio frequency electromagnetic field.
Side view.



5. National registrations and accreditations

5.1 FCC Registrations

Organization: Federal Communications Commission, USA

Registration Number: 516880

Facilities: EMC chamber A, 3 m and 10 m

5.2 SWEDAC Accreditation

Organization: Swedish Board for Accreditation and Conformity Assessment - SWEDAC, see www.swedac.se and www.ilac.org

Registration Number: 1688

SWEDAC is part of ILAC (International Laboratory Accreditation Cooperation) including its MRA (Mutual Recognition Arrangement).



6. List of instruments

Setup VEA1					
Measurement of radio frequency voltage on mains					
Used	ID no.	Description	Manufacturer	Type no.	Setup uncertainty
<input checked="" type="checkbox"/>	36032	Software	Rohde & Schwarz	ES-K1 ver 1.71 SP2	1.8 dB
<input checked="" type="checkbox"/>	36020	Measuring receiver	Rohde & Schwarz	ESU26	
<input checked="" type="checkbox"/>	IE-B918	LISN 4 x 100 A 800 V	Schwarzbeck	NNLK 8129	
<input checked="" type="checkbox"/>	IE-B919	LISN 2 x 10 A 250 V	Rohde & Schwarz	ESH3-Z5	

Setup VEC1					
Measurement of radio frequency electromagnetic field					
Used	ID no.	Description	Manufacturer	Type no.	Setup uncertainty
<input checked="" type="checkbox"/>	36032	Software	Rohde & Schwarz	ES-K1 ver 1.71 SP2	5.1 dB
<input checked="" type="checkbox"/>	36020	Measuring receiver	Rohde & Schwarz	ESU26	
<input checked="" type="checkbox"/>	IE-B928	Antenna Bilog	Chase	CBL6111A	
<input checked="" type="checkbox"/>	IE-B758	Preamplifier	HP	8447F	
<input checked="" type="checkbox"/>	IE-B918	LISN 4 x 100 A 800 V	Schwarzbeck	NNLK 8129	
<input checked="" type="checkbox"/>	IE-B920	Controller	Heinrich Deisel	HD 100	
<input checked="" type="checkbox"/>		Turntable	Heinrich Deisel	DT 440	
<input checked="" type="checkbox"/>		Antenna mast	Heinrich Deisel	MA 240	

Other instruments used					
Used	ID no.	Description	Manufacturer	Type no.	Setup uncertainty
<input checked="" type="checkbox"/>	IM-A308	Temperature- and hygrometer	Vaisala	HMI31	

