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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

### Performed for Precise Biometrics AB

REC-E703141\_3F

Project no.: E703141

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19 Feb.2012

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DELTA

<b>Title</b>	EMC emission test of Sense MC
<b>Test object</b>	Sense MC
<b>Report no.</b>	REC-E703141_3F
<b>Project no.</b>	E703141
<b>Test period</b>	15 Feb. 2012
<b>Client</b>	Precise Biometrics AB Scheelevägen 30 SE-220 07 Lund  Sweden Tel.: 046-3111100
<b>Contact person</b>	Lena Strutz E-mail: <a href="mailto:Lena.strutz@precisebiometrics.com">Lena.strutz@precisebiometrics.com</a>
<b>Manufacturer</b>	Precise Biometrics AB
<b>Specifications</b>	FCC Part 15 Subpart B
<b>Results</b>	The test object was found to be in compliance with the specifications, as listed in Section 1
<b>Test personnel</b>	Daniela Coman
<b>Date</b>	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
Model / type	Precise Sense MC
Part no.	SAA 103 1001
Serial no.	0-4
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

## 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

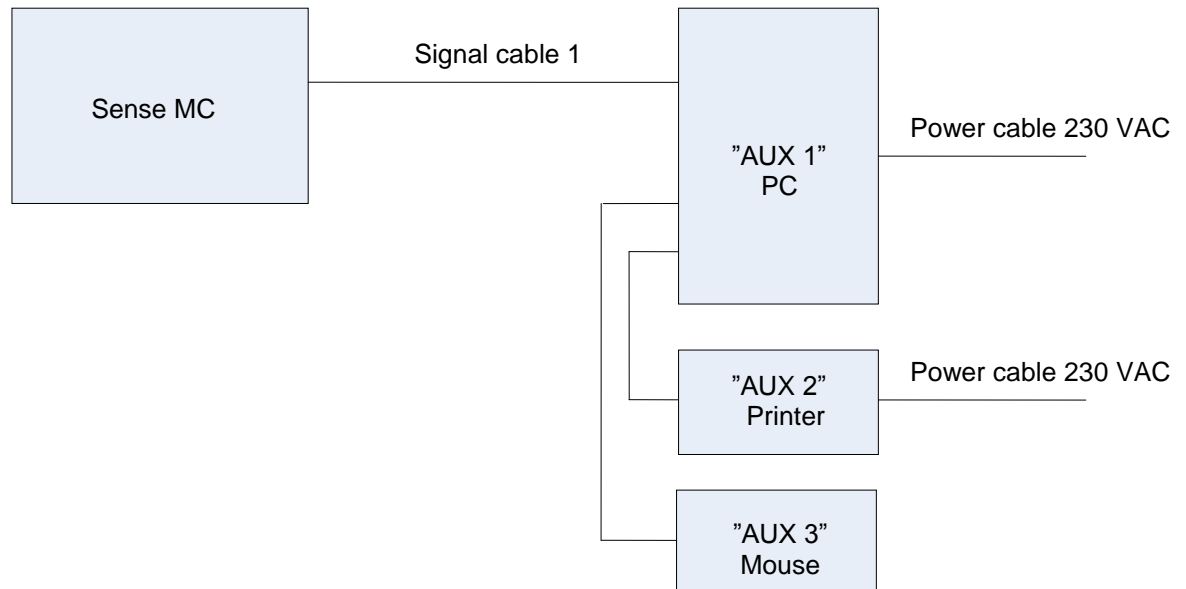


Figure 3.1.1 Block diagram of test object(s) with cables and auxiliary equipment.

Name	Cat.	Type	Max. Length
Signal Cable 1	Shielded	USB Cable with ferrite	1.5 m
Power cable	Unshielded	3 x 1.5 mm <sup>2</sup>	1.8 m
Power cable	Unshielded	3 x 1.5 mm <sup>2</sup>	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

< 200 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"><li>1. Measurement of radio frequency electromagnetic field</li><li>2. Measurement of radio frequency voltage on mains</li></ol> |
|--|





## 4. Test results

### 4.1 Measurement of radio frequency voltage on mains

Test object	Sense MC	Sheet	CE-3
Type	Precise Sense MC	Project no.	E703141
Serial no.	0-4	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 $\Omega$ , 50 $\mu$ 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

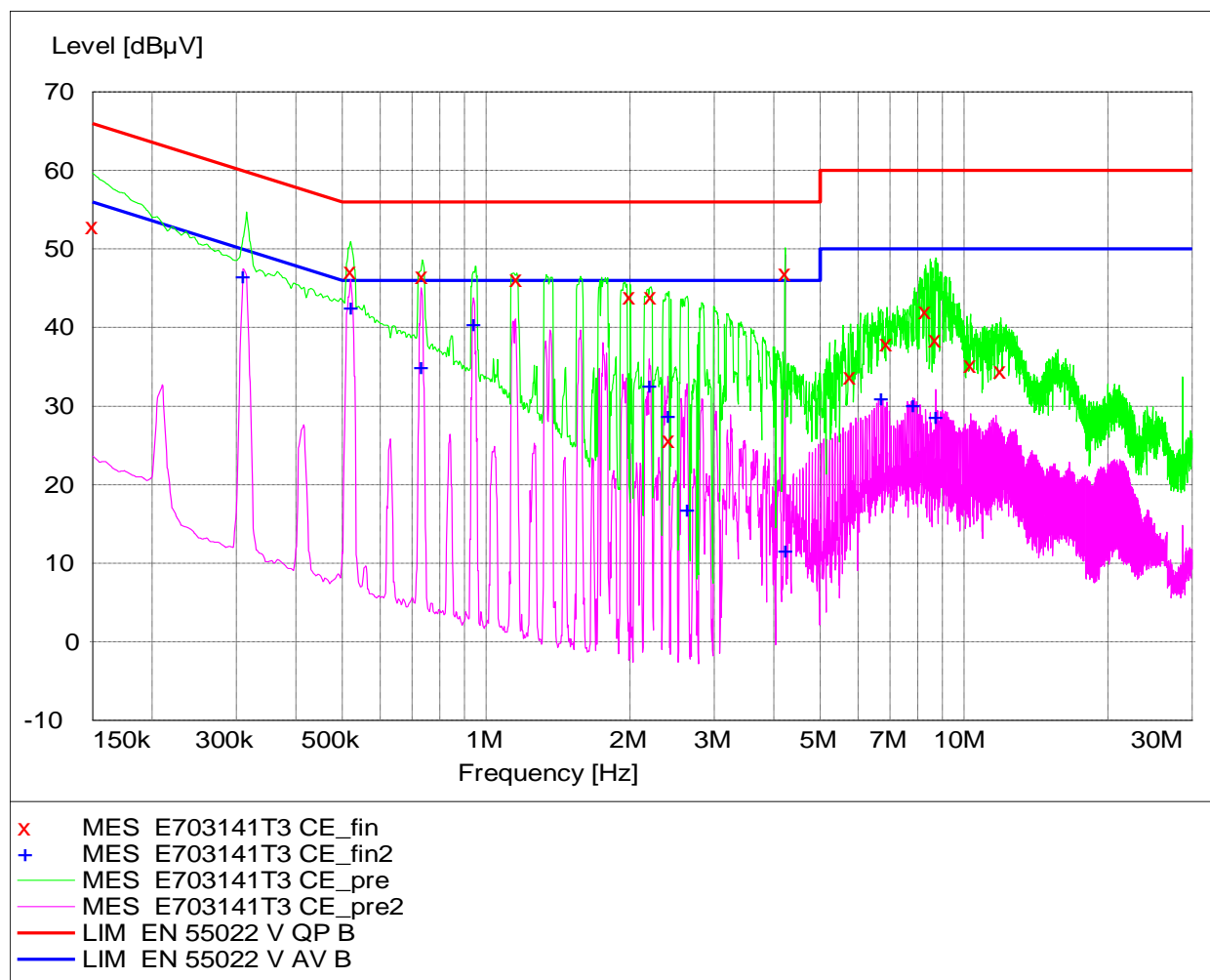
Line under test	Maximum of Line and Neutral
Test result	The measured voltages were below the limit of Class B equipment.
Compliant	Yes
Comments	Mains voltage: 230 VAC to the personal computer to which Sense MC is connected.  During test an artificial hand was applied to the test object, please see photo



**Conducted emission 2012-02-13**

**Complete measurement 0.15 - 30 MHz**

EUT: Sense MC 0-4  
Manufacturer: Precise Biometrics AB  
Operating Condition: 230 VAC 50Hz  
Test Site: Delta Development Technology AB  
Operator: Daniela Coman  
Test Specification: EN 55022 Class B



**MEASUREMENT RESULT: "E703141T3 CE\_fin"**

13-02-2012 13:59

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	52.90	0.3	66	13.1	QP	N	FLO
0.520000	47.20	0.2	56	8.8	QP	L1	FLO
0.735000	46.60	0.4	56	9.4	QP	N	FLO
1.160000	46.10	0.4	56	9.9	QP	N	FLO
2.000000	44.00	0.6	56	12.0	QP	N	FLO
2.210000	43.90	0.6	56	12.1	QP	N	FLO
2.415000	25.60	0.6	56	30.4	QP	N	FLO
4.220000	46.90	0.6	56	9.1	QP	L1	FLO
8.300000	42.10	0.9	60	17.9	QP	L1	FLO
8.730000	38.50	1.2	60	21.5	QP	N	FLO

**MEASUREMENT RESULT: "E703141T3 CE\_fin2"**

13-02-2012 13:59

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.310000	46.50	0.2	50	3.5	AV	L1	FLO
0.520000	42.50	0.3	46	3.5	AV	N	FLO
0.730000	34.90	0.3	46	11.1	AV	L1	FLO
0.940000	40.50	0.4	46	5.5	AV	N	FLO
2.195000	32.60	0.6	46	13.4	AV	N	FLO
2.400000	28.80	0.6	46	17.2	AV	N	FLO
6.695000	31.00	0.8	50	19.0	AV	L1	FLO
7.810000	30.10	1.1	50	19.9	AV	N	FLO





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

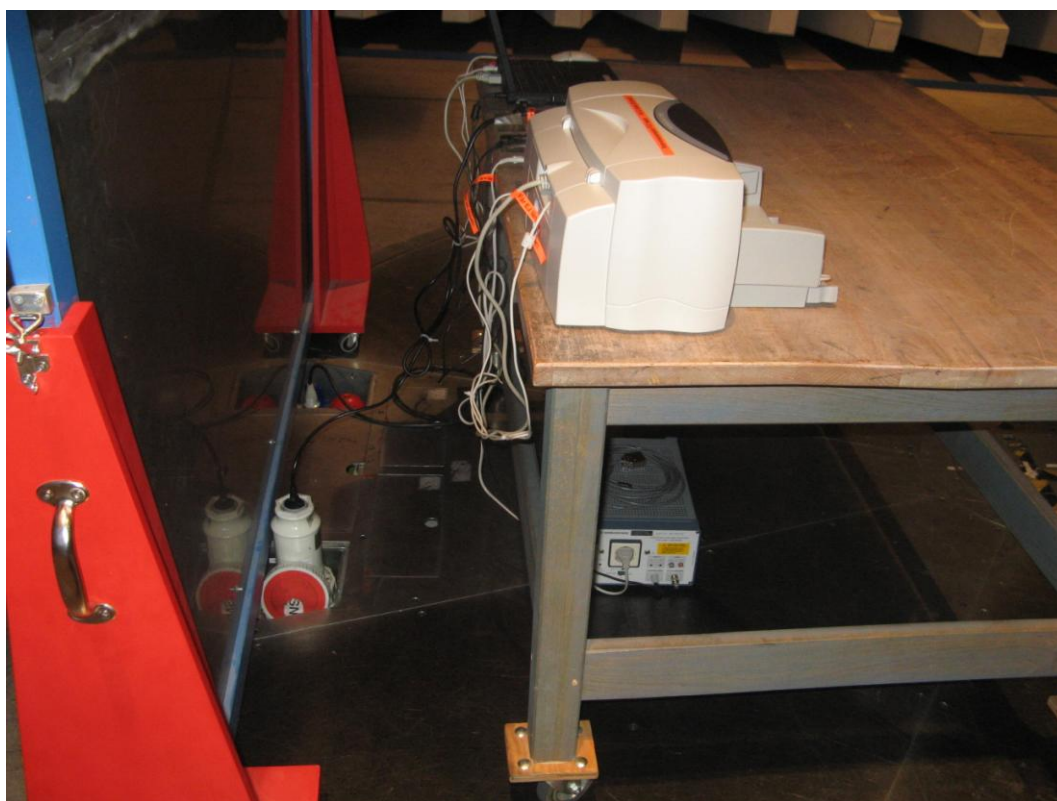


Photo 4.1.2 Test setup regarding measurement of radio frequency voltage on mains.



## 4.2 Measurement of radio frequency electromagnetic field

Test object	Sense MC	Sheet	RE-3
Type	Precise Sense MC	Project no.	E703141
Serial no.	0-4	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	21 °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.

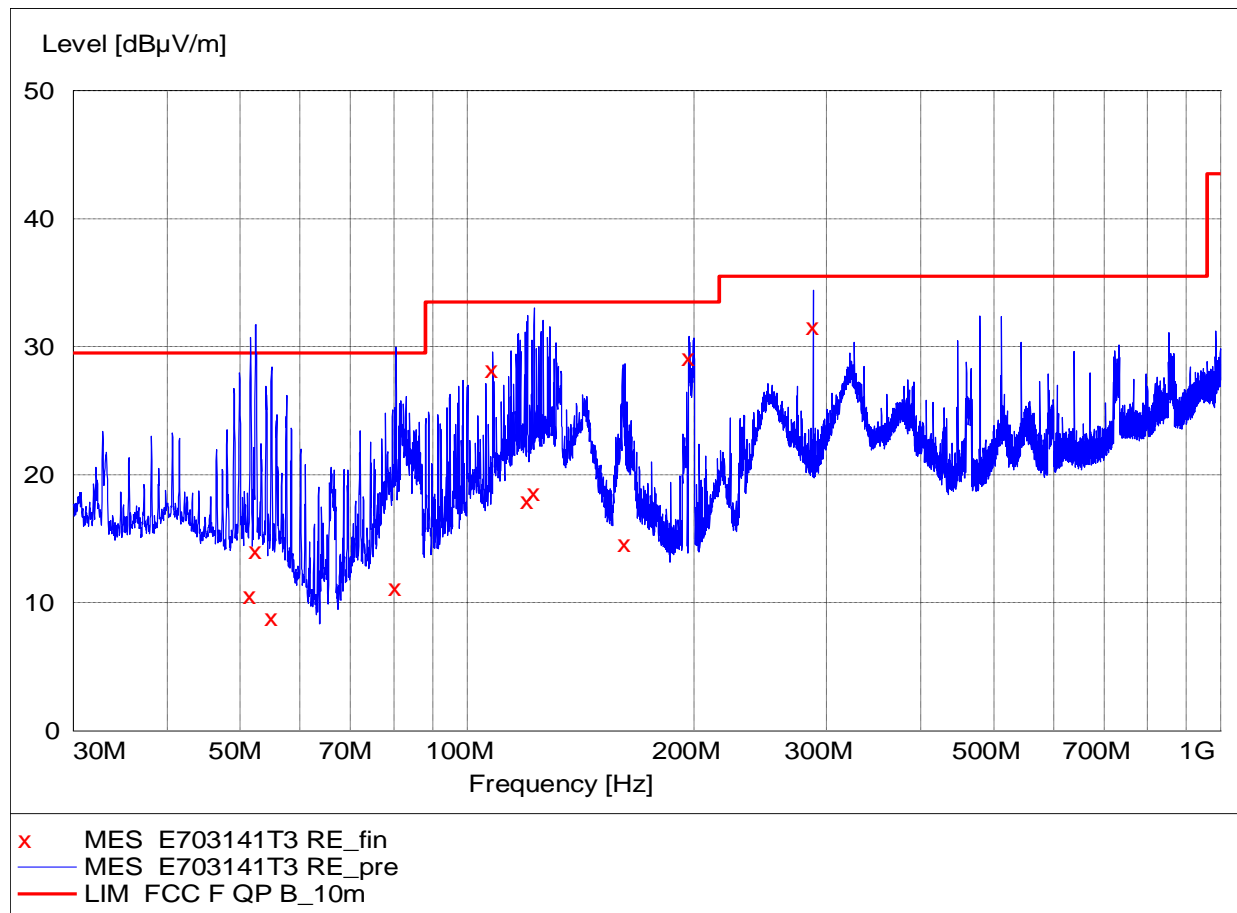
Compliant                      Yes

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 0-4  
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: "E703141T3 RE\_fin"**

13-02-2012 11:49

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
51.570000	10.50	-18.9	29.5	19.0	QP	122.0	33.00	VERTICAL
52.440000	14.10	-19.2	29.5	15.4	QP	109.0	23.00	VERTICAL
55.050000	8.80	-20.1	29.5	20.7	QP	107.0	0.00	VERTICAL
80.460000	11.20	-18.8	29.5	18.3	QP	314.0	296.00	VERTICAL
108.180000	28.20	-15.2	33.1	4.9	QP	112.0	343.00	VERTICAL
120.240000	18.00	-14.2	33.1	14.9	QP	128.0	354.00	VERTICAL
122.760000	18.60	-14.2	33.1	14.5	QP	150.0	202.00	VERTICAL
162.150000	14.60	-15.2	33.1	18.5	QP	102.0	325.00	VERTICAL
197.070000	29.10	-17.0	33.1	4.4	QP	112.0	292.00	VERTICAL
288.270000	31.50	-11.8	35.5	4.0	QP	375.0	259.00	HORIZONTAL







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

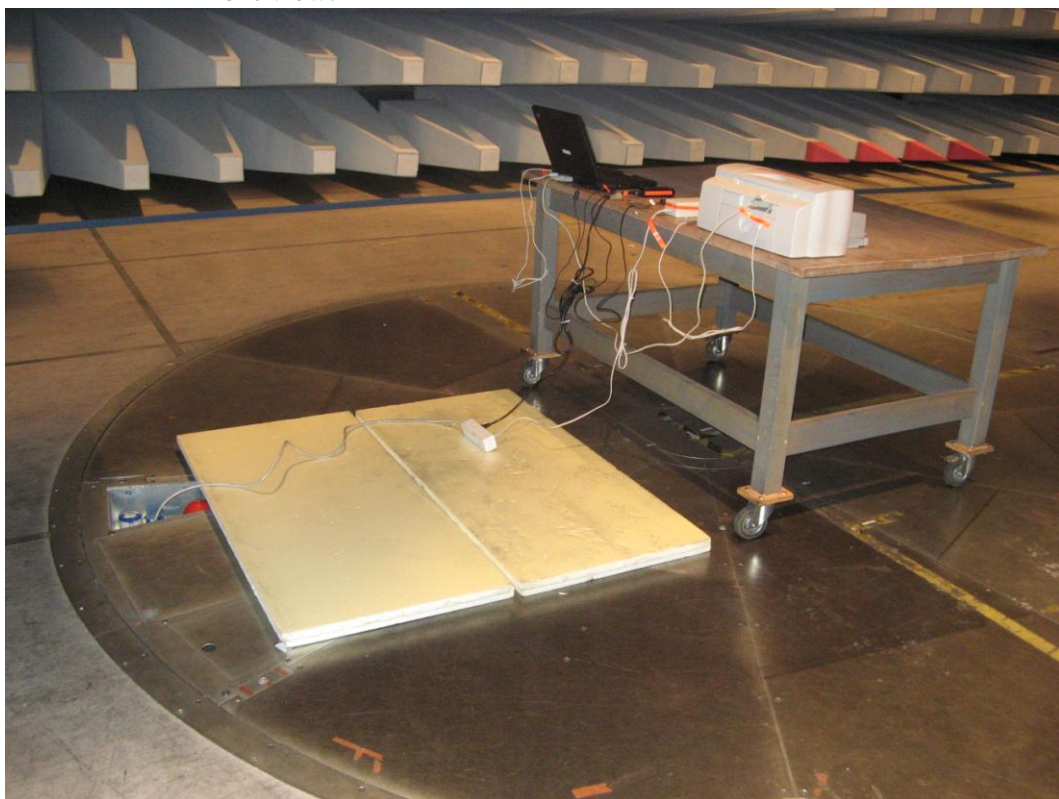


Photo 4.2.2 Test setup regarding measurement of radio frequency electromagnetic field.  
Side view.



## 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](http://www.swedac.se) and [www.ilac.org](http://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	

