



# REPORT

Issued by an FCC listed Laboratory Reg. no. 93866.  
The test site complies with RSS Gen, Issue 2, file no: IC 3482A/2.

SWEDAC  
KREDITERING  
1002  
ISO/IEC 17025

Date  
2010-04-30

Reference  
FX006697-2

Page  
1 (2)

Handled by, department

Martin Forsberg

Electronics – EMC

+46 10 516 5768, martin.forsberg@sp.se

Per Ola Olsson  
Precise Biometrics  
Box 798  
220 07 Lund

## EMC tests of Precise 200 MC

(3 appendices)

### Test object

Product name: Combined Fingerprint and Smart Card reader

Product number: Precise 200 MC

Serial number: 0-50037

### Summary

| Standard                           | Compliant | Appendix | Remarks |
|------------------------------------|-----------|----------|---------|
| <b>FCC 47 CFR part 15 B</b>        | Yes       |          |         |
| 15.107 Conducted emission, class B | Yes       | 2        | Note 1  |
| 15.109 Radiated emission, class B  | Yes       | 3        | Note 1  |

Note 1: The measurements were performed with the EUT connected to a minimal system.

**SP Technical Research Institute of Sweden**  
**Electronics - EMC**

  
Christer Karlsson  
Technical Manager

  
Martin Forsberg  
Technical Officer

**SP Technical Research Institute of Sweden**

Postal address  
SP  
Box 857  
SE-501 15 Borås  
SWEDEN

Office location  
Västeråsen  
Brinellgatan 4  
SE-504 62 Borås  
SWEDEN

Phone / Fax / E-mail  
+46 10 516 50 00  
+46 33 13 55 02  
info@sp.se

Laboratories are accredited by the Swedish Board for Accreditation and Conformity Assessment (SWEDAC) under the terms of Swedish legislation. This report may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

## Table of contents

|  |            |
|--|------------|
| Purpose of test and operation mode during measurements | Appendix 1 |
| Conducted emission measurements, AC power port         | Appendix 2 |
| Radiated emission measurements                         | Appendix 3 |

**Appendix 1****Purpose of test**

The tests were performed to verify that the electromagnetic emission from the test object meet the requirements of FCC Part 15 B.

**Test facility**

The used anechoic chamber (15:115) is compliant with the requirements of section 2.948 of the FCC rules and listed, registration number 96866, as a facility accepted for certification under parts 15 and 18. The site complies with RSS Gen, Issue 2 and is accepted by Industry Canada for the performance of radiated measurements, file number IC 3482A-2.

**Measurement equipment**

| Measurement equipment                    | Calibration Due | SP number |
|--|-----------------|-----------|
| Test site Tesla                          | 2010-10         | 503 881   |
| Test site Edison                         | 2009-07         | 504 114   |
| R&S EMI test receiver ESIB 26            | 2009-07         | 503 292   |
| R&S EMI test receiver ESIB 26            | 2009-07         | 503 885   |
| LISN Schwarzbeck NNLA 8120               | 2011-04         | 500 574   |
| LISN Schwartzbeck NNLK 8121              | 2011-02         | 502 112   |
| LISN Schwarzbeck NSLK 8126               | 2011-04         | 503 114   |
| Chase Bilog antenna CBL 6111A            | 2011-11         | 503 182   |
| Antenna Schaffner CBL 6143               | 2010-03         | 504 079   |
| EMCO Horn Antenna 3115                   | 2011-02         | 501 548   |
| EMCO Horn Antenna 3115                   | 2011-01         | 502 175   |
| EMCO Horn Antenna 3115                   | 2012-03         | 504 194   |
| Flann Standard gain horn 16240-25        | -               | 503 939   |
| Flann Standard gain horn 18240-25        | -               | 503 900   |
| Flann Standard gain horn 20240-20        | -               | 503 674   |
| MITEQ Low Noise Amplifier                | 2009-06         | 503 277   |
| MITEQ Low Noise Amplifier                | 2009-06         | 503 285   |
| MITEQ Low Noise Amplifier                | 2009-08         | 504 160   |
| Temperature and humidity meter Testo 615 | 2009-11         | 503 505   |
| Temperature and humidity meter Testo 625 | 2009-08         | 504 117   |

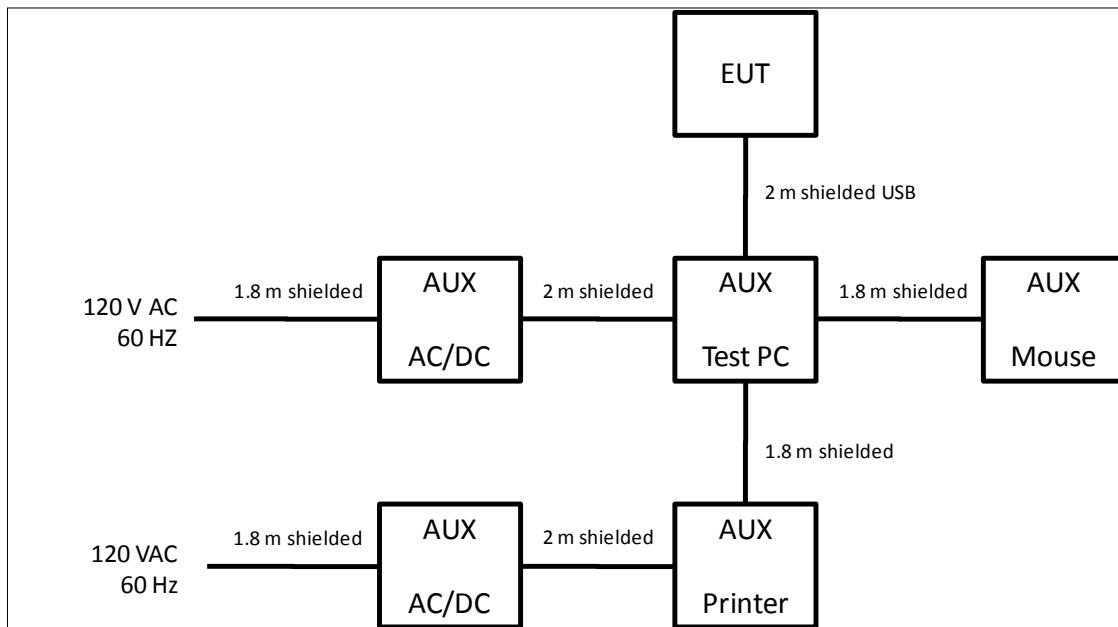
## Appendix 1

**Operational test mode**

The EUT was connected to the minimal system through a USB connection.

The highest frequencies generated in the EUT is a 12 MHz clock signal.

The EUT was exercised by a test program called CE-TEST 200 MC running on the test PC

**Connected equipment during the test (“minimum system”)**

|  |                   |
|--|-------------------|
| Laptop Computer<br>IBM 2545-4BG<br>S/N: 5528TVC 02/99                | Clients equipment |
| AC/DC Adapter for Laptop computer<br>IBM 02K6543<br>S/N: 2M04T7792PF | Clients equipment |
| Printer HP Deskjet 895 CXi (C6410A)<br>S/N: HU0151N087               | Clients equipment |
| AC/DC Adapter for Printer<br>HP C6409-60014<br>S/N: T5844428252      | Clients equipment |
| Mouse<br>X05-51692<br>8851-576-0304842-00000                         | Clients equipment |

**Appendix 1****Uncertainties**

Measurement and test instrument uncertainties are described in the quality assurance documentation "EL-QD 8.2". The measurement uncertainties can be found in the table below. The uncertainties are calculated with a coverage factor k=2 (95% level of confidence).

The measurement uncertainties can be found in the table below:

| <b>Method</b>                    | <b>Uncertainty</b>                           |
|----------------------------------|--|
| Radiated emission, 30 – 1000 MHz | 4.9/5.6 dB (V/H-pol)<br>4.8/5.6 dB (V/H-pol) |
| Radiated emission, 1 – 40 GHz    | 2.6 dB                                       |
| Conducted emission               | 3.5 dB                                       |

**Reservation**

The test results in this report apply only to the particular test object as declared in the report.

**Delivery of test object**

The test object was delivered 2010-04-08

**Test participant**

Dick Ström

**Test engineers**

Martin Forsberg

## Appendix 2

**Conducted emission measurements according to  
FCC 47 CFR part 15.107, class B**

|                    |                             |                        |
|--------------------|-----------------------------|------------------------|
| Date<br>2010-04-08 | Temperature<br>22 °C ± 3 °C | Humidity<br>29 % ± 5 % |
|--------------------|-----------------------------|------------------------|

**Test set-up and procedure**

The measurements were performed according to ANSI C63.4-2003.

Measurements were performed on the 120 V AC/60 Hz, phase and neutral conductors of the test PC.

Test set-up during the tests can be found on page 2.

| Measurement equipment                    | SP number |
|--|-----------|
| Semi anechoic chamber, Edison            | 504 114   |
| EMI measurement computer                 | -         |
| R&S EMI test receiver ESIB 26            | 503 885   |
| Software: R&S EMC32, ver. 6.10.10        | 503 897   |
| LISN Schwarzbeck NNLA 8120               | 500 574   |
| Temperature and humidity meter Testo 625 | 504 117   |

**Result**

The conducted emission spectra can be found in appendix 2.1:

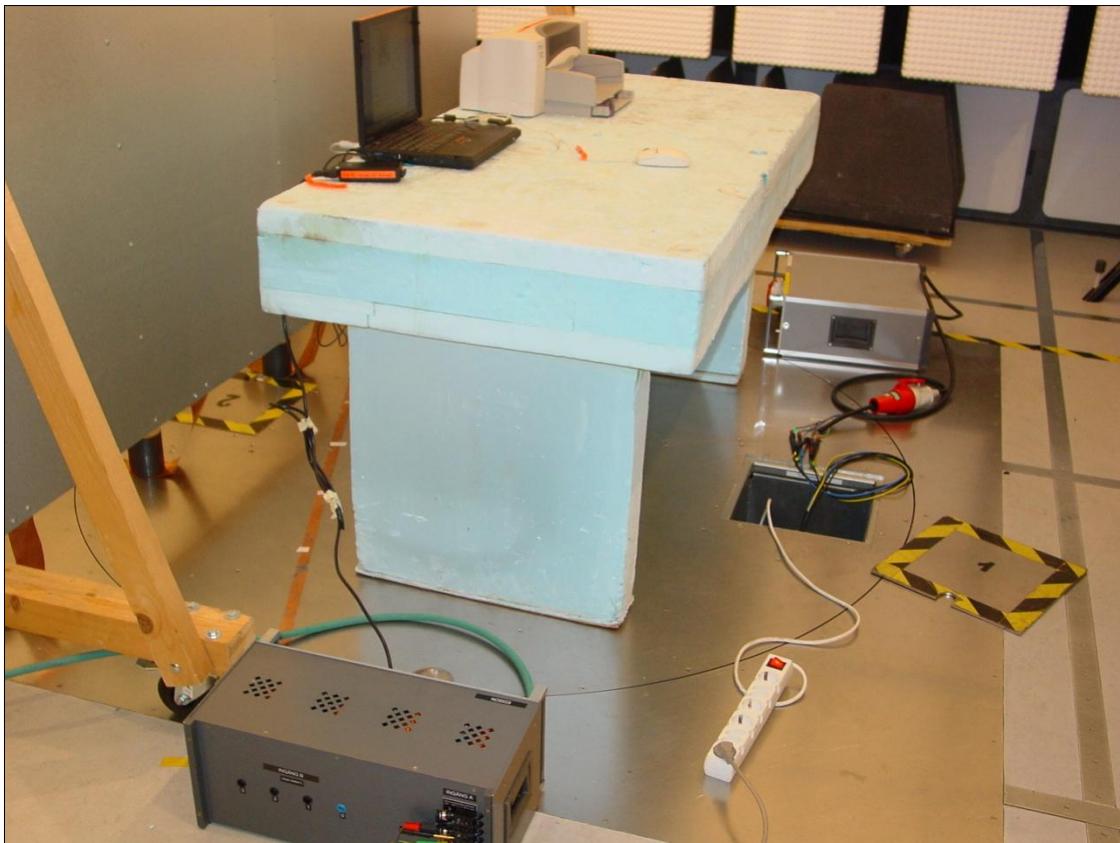
|            |                   |
|------------|-------------------|
| Diagram 1: | Phase conductor   |
| Diagram 2: | Neutral conductor |

The limit lines indicated as EN 55022 in the diagrams are the same limit lines as of FCC part 15.

|                       |     |
|-----------------------|-----|
| Emission below limit? | Yes |
|-----------------------|-----|

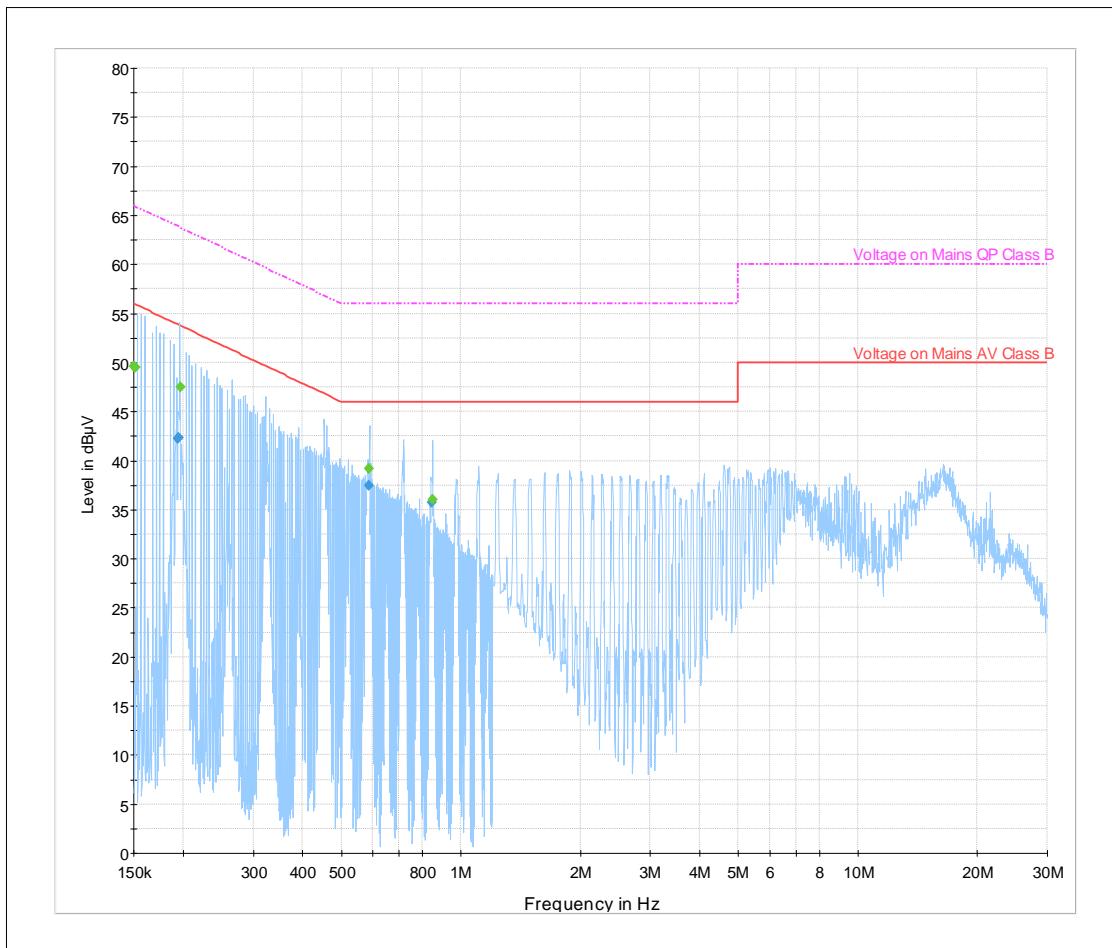
## Appendix 2

Test set-up, Conducted emission



## Appendix 2.1

## Diagram 1

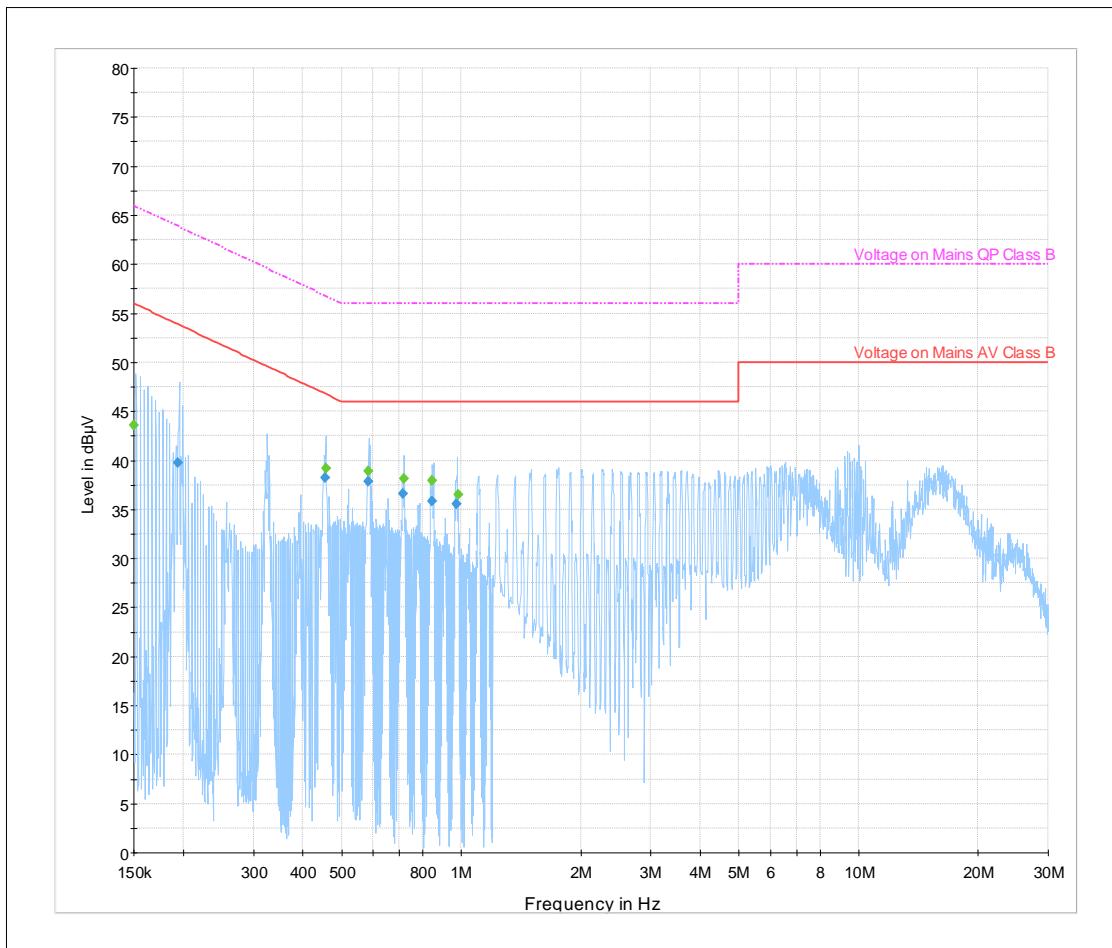


| Frequency | Average    | Meas. Time | Bandwidth | Corr. | Margin | Limit      |
|-----------|------------|------------|-----------|-------|--------|------------|
| MHz       | dB $\mu$ V | ms         | kHz       | dB    | dB     | dB $\mu$ V |
| 0.194     | 42.22      | 1000       | 9         | 0.07  | 11.70  | 53.86      |
| 0.195     | 42.38      | 1000       | 9         | 0.07  | 11.40  | 53.83      |
| 0.585     | 37.47      | 1000       | 9         | 0.12  | 8.50   | 46.00      |
| 0.843     | 35.79      | 1000       | 9         | 0.13  | 10.20  | 46.00      |

| Frequency | QuasiPeak  | Meas. Time | Bandwidth | Corr. | Margin | Limit      |
|-----------|------------|------------|-----------|-------|--------|------------|
| MHz       | dB $\mu$ V | ms         | kHz       | dB    | dB     | dB $\mu$ V |
| 0.150     | 49.62      | 1000       | 9         | 0.07  | 16.40  | 66.00      |
| 0.152     | 49.47      | 1000       | 9         | 0.07  | 16.40  | 65.89      |
| 0.197     | 47.50      | 1000       | 9         | 0.07  | 16.20  | 63.75      |
| 0.587     | 39.22      | 1000       | 9         | 0.12  | 16.80  | 56.00      |
| 0.851     | 36.03      | 1000       | 9         | 0.13  | 20.00  | 56.00      |

## Appendix 2.1

## Diagram 2



| Frequency | Average    | Meas. Time | Bandwidth | Corr. | Margin | Limit      |
|-----------|------------|------------|-----------|-------|--------|------------|
| MHz       | dB $\mu$ V | ms         | kHz       | dB    | dB     | dB $\mu$ V |
| 0.194     | 39.79      | 1000       | 9         | 0.07  | 14.10  | 53.86      |
| 0.454     | 38.26      | 1000       | 9         | 0.10  | 8.50   | 46.80      |
| 0.584     | 37.81      | 1000       | 9         | 0.12  | 8.20   | 46.00      |
| 0.715     | 36.64      | 1000       | 9         | 0.12  | 9.40   | 46.00      |
| 0.846     | 35.83      | 1000       | 9         | 0.13  | 10.20  | 46.00      |
| 0.973     | 35.56      | 1000       | 9         | 0.14  | 10.40  | 46.00      |

| Frequency | QuasiPeak  | Meas. Time | Bandwidth | Corr. | Margin | Limit      |
|-----------|------------|------------|-----------|-------|--------|------------|
| MHz       | dB $\mu$ V | ms         | kHz       | dB    | dB     | dB $\mu$ V |
| 0.150     | 43.55      | 1000       | 9         | 0.07  | 22.40  | 66.00      |
| 0.456     | 39.16      | 1000       | 9         | 0.10  | 17.60  | 56.76      |
| 0.584     | 38.92      | 1000       | 9         | 0.12  | 17.10  | 56.00      |
| 0.717     | 38.11      | 1000       | 9         | 0.12  | 17.90  | 56.00      |
| 0.846     | 37.97      | 1000       | 9         | 0.13  | 18.00  | 56.00      |
| 0.981     | 36.49      | 1000       | 9         | 0.14  | 19.50  | 56.00      |

## Appendix 3

## Radiated emission measurements according to FCC 47 CFR part 15.109, class B

|                    |                             |                        |
|--------------------|-----------------------------|------------------------|
| Date<br>2010-04-09 | Temperature<br>22 °C ± 3 °C | Humidity<br>29 % ± 5 % |
|--------------------|-----------------------------|------------------------|

### Test set-up and procedure

The measurements were performed according to ANSI C63.4-2003.

The test of radiated emission was performed in a semi anechoic chamber. The measurements were performed with both horizontal and vertical polarizations of the antenna. The antenna distance was 3 m.

The measurement procedure is as the following:

1. A pre-measurement is performed with peak detector. The test object is measured in eight directions with the antenna at three heights, 1.0 m, 1.5 m and 2.0 m.
2. If the emission is close or above the limit during the pre-measurement, the test object is scanned 360 degrees and the antenna height scanned from 1 to 4 m for maximum response. Then the emission is measured with the quasi-peak detector on frequencies below 1 GHz and with the average detector above 1 GHz.

Test set-up during the tests can be found on page 2.

| Measurement equipment                    | SP number |
|--|-----------|
| Anechoic chamber, Edison                 | 504 114   |
| R&S EMI test receiver ESIB 26            | 503 885   |
| Control computer, Fujitsu Siemens        | -         |
| Software: R&S EMC32, ver. 6.10.10        | 503 899   |
| Antenna Schaffner CBL 6143               | 504 079   |
| Temperature and humidity meter Testo 615 | 503 505   |

### Result

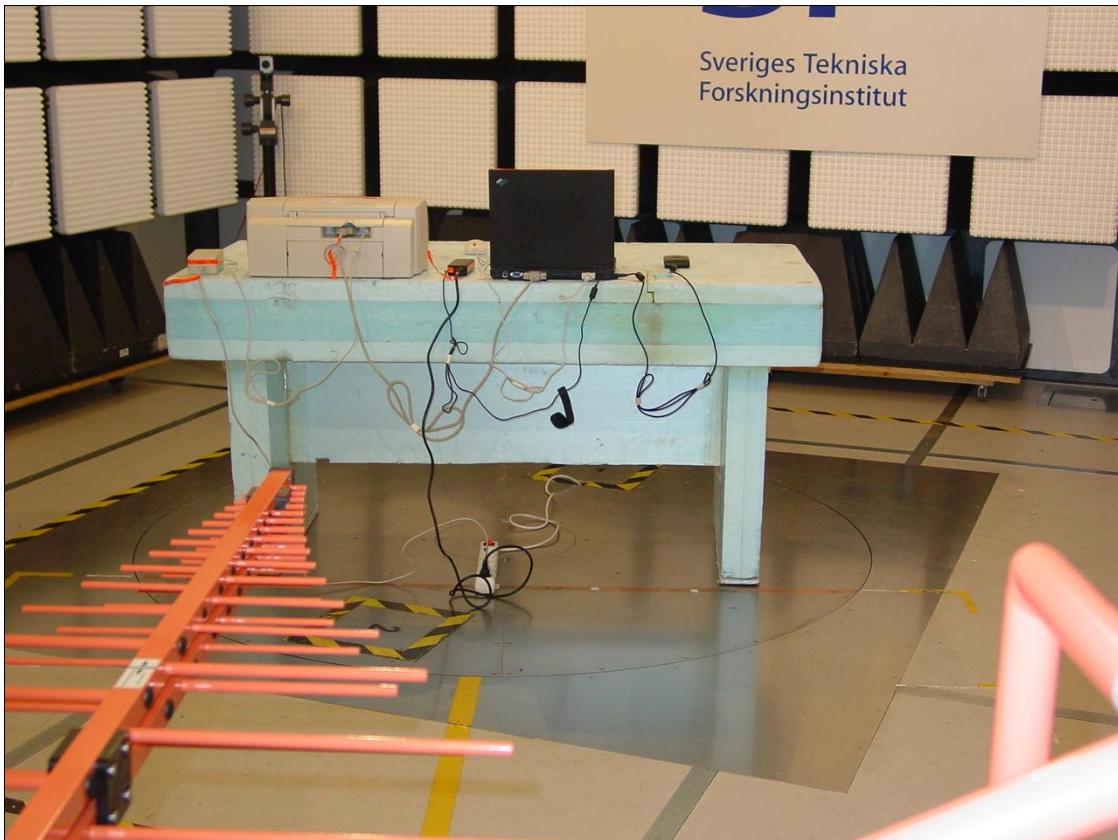
The emission spectrum/spectra can be found Appendix 3.1:

|           |   |
|-----------|---|
| Diagram 1 | Radiated emission 30-1000 MHz vertical and horizontal polarizations |
|-----------|---|

|                       |     |
|-----------------------|-----|
| Emission below limit? | Yes |
|-----------------------|-----|

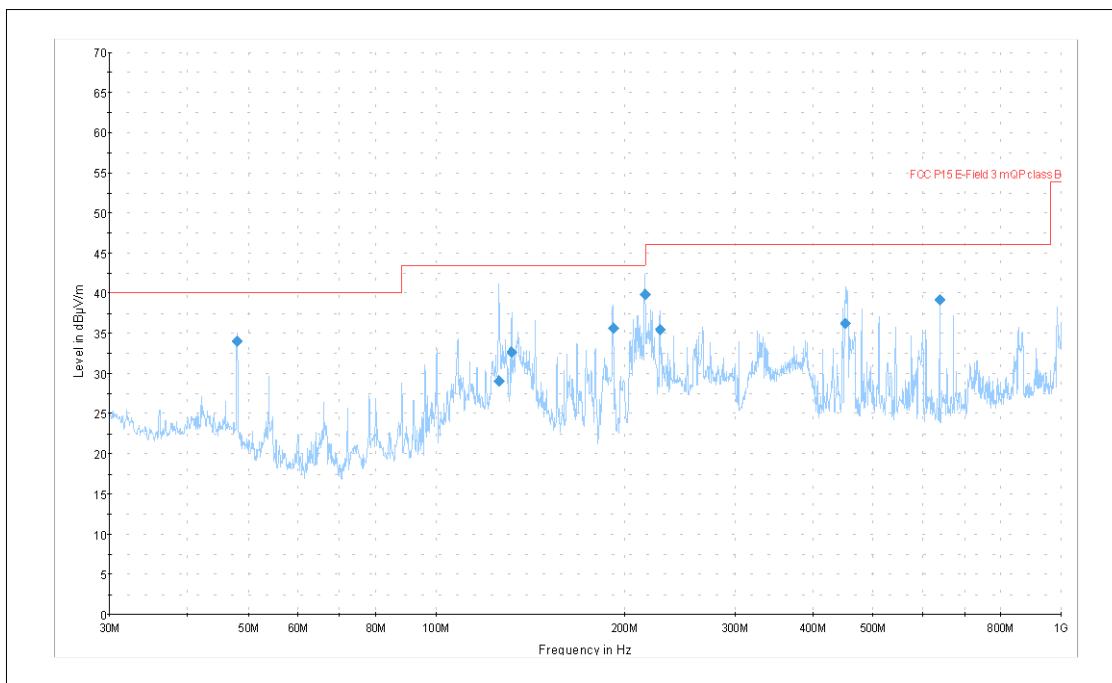
## Appendix 3

Test set-up, Radiated emission



## Appendix 3.1

## Diagram 1



| Frequency<br>MHz | QuasiPeak<br>dBμV/m | Antenna<br>height<br>cm | Polarity | Turntable<br>position<br>deg | Margin<br>dB | Limit  |  |
|------------------|---------------------|-------------------------|----------|------------------------------|--------------|--------|--|
|                  |                     |                         |          |                              |              | dBμV/m |  |
| 48.00            | 34.0                | 144                     | V        | 314                          | 6.0          | 40.0   |  |
| 125.88           | 29.0                | 100                     | V        | 335                          | 14.5         | 43.5   |  |
| 131.90           | 32.7                | 132                     | V        | 352                          | 10.8         | 43.5   |  |
| 192.04           | 35.7                | 191                     | H        | 356                          | 7.8          | 43.5   |  |
| 215.82           | 39.8                | 138                     | H        | 21                           | 3.7          | 43.5   |  |
| 227.92           | 35.5                | 138                     | H        | 5                            | 10.5         | 46.0   |  |
| 451.12           | 36.3                | 100                     | V        | 15                           | 9.7          | 46.0   |  |
| 639.08           | 39.2                | 109                     | H        | 317                          | 6.8          | 46.0   |  |