

TEST REPORT

REPORT CERTIFICATE issued by a FCC listed Test Laboratory

CUSTOMER AND

MANUFACTURER: Precise Biometrics AB
Scheelevägen 19 C
SE-223 70 Lund
Sweden

Project no: 05255

EQUIPMENT UNDER

TEST (EUT): Combined Fingerprint and Smart Card Reader, Type Precise 250MC,
p/n MS 010114-P1C, without s/n.

TEST SPEC:

47 Cfr Ch. 1 (10-1-04 Edition):
Part 15, Subpart B, Class B.
§15.107: Conducted Emission, AC power line
§15.109: Radiated Emission

DATE OF TEST:

June 1 - 7, 2005

TEST SITE:

Svenska EMC Lab AB, Karlskrona, Sweden.
FCC registration number: 90967.

CONFORMITY:

The EUT (Equipment Under Test), did pass the above mentioned tests.
The test result shows full compliance with the technical specification
for Class B Digital Devices.

Approved, Karlskrona June 6, 2005



Hans Östergren
Manager Svenska EMC Lab AB

DATE OF RECEIPT:

June 1, 2005

CONDITION OF EUT:

No remarks. Operates as intended.

TEST PERSONNEL:

Svenska EMC Lab AB: Bo Gidlöw.

ASSISTANT PERSONNEL:

Precise Biometrics AB: Per Ola Olsson.

EUT DESCRIPTION:

EUT is a combined fingerprint reader and smart card reader. Its primary use is logical access.
EUT has only one fixed cable for connection to USB port. EUT is powered through the USB cable.

CALIBRATION DECLARATION:

The test equipment is calibrated with tractability to national or international standards.
All instruments were within the calibration interval. Before starting the tests, the conducted emission test system and the radiated emission test system were checked with Generator CNE III as reference source.

ESTIMATED UNCERTAINTY:

Expanded uncertainty ($k = 2$):

Conducted Emission, 0.45 – 30 MHz:	± 1.1 dB
Field Strength, emission 30 – 300 MHz:	± 2.2 dB
Field Strength, emission 300 – 700 MHz:	± 2.3 dB
Field Strength, emission 700 – 2000 MHz:	± 2.4 dB
Field Strength, emission 1 to 2 GHz:	± 3.0 dB
Frequency:	± 100 Hz

The uncertainties are for a confidence level of not less than 95 %.

TEST EQUIPMENT LIST:

Type/Manufacturer/Bandwidth	s/n	p/n	Calibration information	
			Date	Interval
EMI Test System, Monitor EZM,	860157/014	93-1110	2004-07	12 months
Rohde & Schwarz EP-6, 20 Hz - 1300 MHz				
Test Receiver, Rohde & Schwarz ESH-3,	894979/013	93-1108	2004-07	12 months
9 kHz - 30 MHz				
Test Receiver, Rohde & Schwarz ESVP,	893497/006	93-1109	2004-07	12 months
20 - 1300 MHz				
Pulse Limiter, Rohde & Schwarz ESH3-Z2	357881052	93-1113	2004-07	12 months
DC - 30 MHz				
Plotter, Rohde & Schwarz DOP 2	893117/0108	93-1112	NA	NA
Spectrum Analyzer Tektronix 2755AP,	B010111	93-1106	2004-07	12 months
10 kHz - 21 GHz				
Preamplifier, Mini-Circuits ZHL-42,	-	860701	2005-02	12 months
0.7 – 4.2 GHz				
LISN 50 OHM/50 μ H, Electro Metrics EM-7820	2771	95-1247	2004-07	12 months
10 kHz - 30 MHz, 16 A				
Cable to Test Receiver, RG 223	006	93-1222	2004-08	12 months
Cable to LISN, RG 223	015	93-1231	2004-08	12 months
Biconical Antenna, Schwarzbeck BBA9106	-	93-92196.1	2004-07	24 months
30 - 300 MHz				
Log-periodic Antenna, Schwarzbeck	91071205	93-92196	2004-07	24 months
UHALP9107, 300 - 1000 MHz				
Double Ridged Guide Antenna, EMCO 3115,	2338	93-85122	2003-07	36 months
1 - 18 GHz				
Antenna Cable, RG 214	001	93-1217	2004-08	12 months
Antenna Cable, Sucoflex 104	171288/4	93-1239	2004-08	12 months
Antenna Mast System, Jyske EMC, h = 1 - 4 m	02	93-90172	NA	NA
Turn Table, Jyske EMC, h = 1 m	01	93-90171	NA	NA
Anechoic Chamber, 8 x 4.5 x 3 m	1	93-87151	2003-04	36 months
Open Area Test Site for 3 m antenna distance	1	93-1108	2003-12	36 months

TEST SET-UP AND PROCEDURE:

As laid out in ANSI C.63.4:2001 Document. Tested as tabletop equipment.
See Appendix 1 and 2.

TEST CONDITIONS:

Rating:

- PC: 115 VAC, 50-60 Hz, 0.7 A. Class I.
- EUT: 5 VDC, 0.5 A.

Clock Frequency: 7.38 MHz, 12.0 MHz, 192.0 MHz.

Measured frequency range: 0.15 – 2 000 MHz.

Configuration: See Appendix 3. A minimum system was configured with a PC and its peripherals. EUT was connected to the USB port, other devices to the serial and parallel ports (15.31(i)).

The system consists of:

- PC, IBM Thinkpad 600E, Type 2645-4BG, s/n 5528TVC02/99, FCC ID: Tested to comply with FCC regulations.
- AC/DC Adapter, IBM IZORV 860 PF, Type OZK6543, s/n 2M04T7782PF, FCC ID: Tested to comply with FCC regulations.
- Printer, HP Deskjet 895cxi, Type C6410A, s/n HU0151N087, FCC ID: Tested to comply with FCC regulations.
- AC/DC Adapter to Printer, Type C6409-60014, s/n T5844428252, FCC ID: Tested to comply with FCC regulations.
- Mouse, Microsoft Wheelhouse, Type X05-51692, s/n 0304842-00000, FCC ID: Tested to comply with FCC regulations.

Cables:

- Unshielded mains cable of 1.8 m length with safety ground to the AC/DC Adapter (PC).
- Shielded DC cable of 1.8 m length without safety ground from AC/DC Adapter to PC.
- Shielded USB (signal and power) cable of 2 m length from EUT 250MC to the PC (USB port).
- Shielded Printer cable of 1.8 m length from PC to Printer (parallel port).
- Unshielded mains cable of 1.8 m length without safety ground to the AC/DC Adapter (Printer).
- Shielded DC cable of 2 m length without safety ground from AC/DC Adapter to Printer.
- Shielded Mouse cable of 1.8 m length from PC to external Mouse (serial port).

See also Appendix 3.

Operating Conditions: Operating in a test application with continuous reading of the smart card and scanning the fingerprints, and with communication between the PC and the peripherals.

Ambient Humidity: 43 % RH

Ambient temperature: 22 °C.

Mains voltage at test: 116 VAC.

TEST PERFORMANCE:

§15.107: Conducted Emission test, AC power line:

The conducted emission was measured on the 115 VAC power input terminals (PC Power Supply) through a 50 ohm 50 micro-Henry LISN (Line Impedance Stabilization Network) in the frequency range 0.15 to 30 MHz. The two lines were measured with a quasi-peak detector and also with an average detector. Worst cases were recorded. See Appendix 4 and 5.

§15.109: Radiated Emission:

Pre-test: Tested in the Anechoic Chamber at 3 m antenna distance with vertical and horizontal antenna polarizations to find the radiating frequencies in the range 30 – 2 000 MHz.

Final test: Measured in the frequency range 30 MHz – 2 000 MHz at an antenna distance of 3 m, on the open area test site. The emission was maximized by rotating the table, varying the antenna height 1 – 4 m and the antenna polarization. Measured with CISPR quasi-peak detector. See Appendix 6 and 7.

SUMMARY OF RESULTS:

§15.107: Conducted Emission test, AC power line. See Appendix 4 and 5.

The margin to limit was – 17.7 dB(QP) at 0.1535 MHz, and – 9.8 dB(AV.) at 0.5653 MHz.

§15.109: Radiated Emission. See Appendix 6 and 7.


The margin to limit was – 4.3 dB(QP) at 132.0 MHz.

The Combined Fingerprint and Smart Card Reader, Type Precise 250MC, p/n MS 010114-P1C without s/n, did pass the above mentioned tests for Class B Digital Devices.

REMARK:

The above test results relates to the tested item only.

Karlskrona June 6, 2005



Hans Östergren

Test Engineer

Manager Svenska EMC Lab AB

Sr. EMC Engineer

Test set-up, Conducted Emission



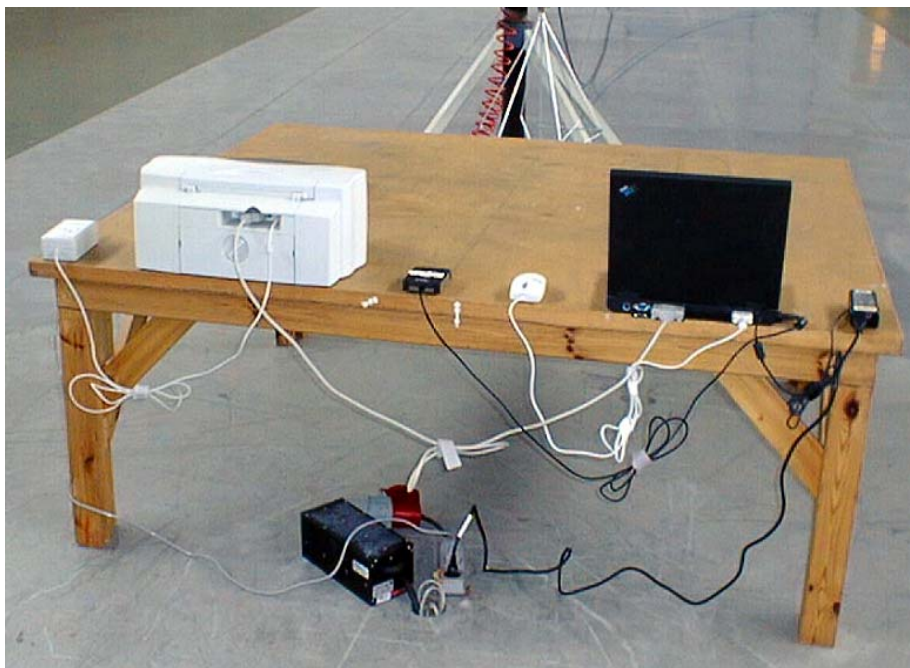
Test set-up, Conducted Emission



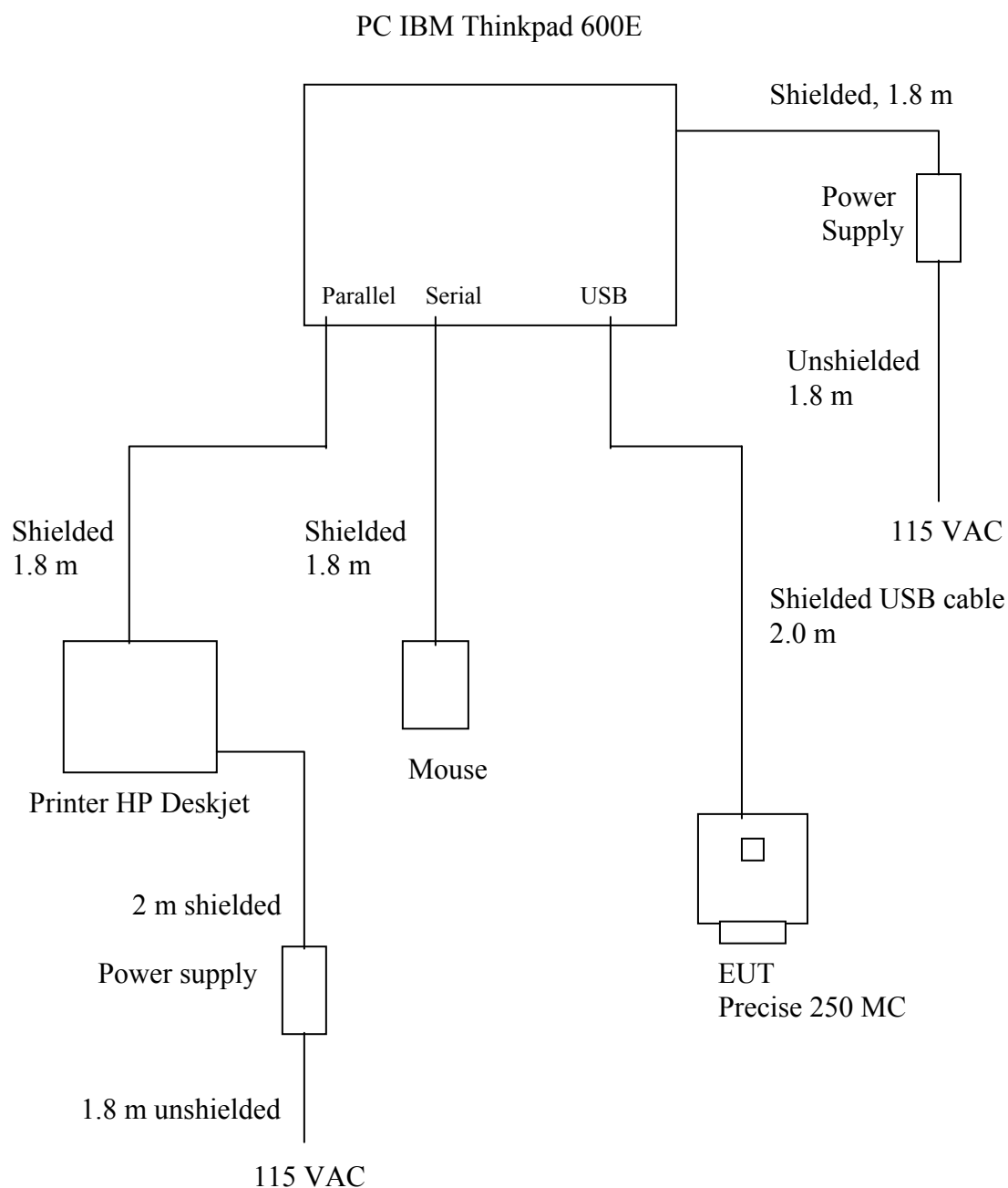
Test set-up, Radiated Emission



Test set-up, Radiated Emission



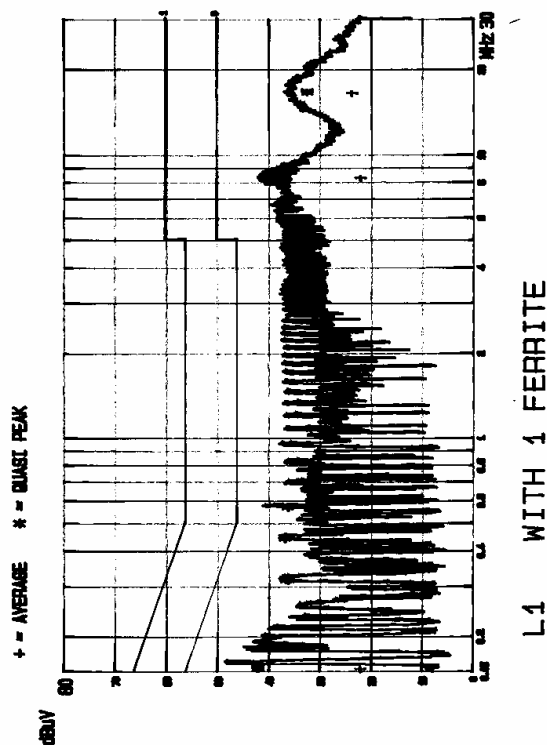
Configuration



Frequency MHz	Average dBuV	AV-Margin dBuV	Quasi dBuV	Peak dBuV	GP-Margin dBuV
0.1532	22.2	-33.8		42.8	-23.2
0.1883	37.1	-17.1		41.3	-22.9
0.3140	36.3	-13.7		37.5	-22.6
0.4388	36.9	-10.3		37.7	-19.6
0.5653	36.2	-9.8		37.1	-18.9
8.2743	22.3	-27.7		38.8	-21.2
15.6235	23.8	-26.2		33.2	-26.8

* Limit exceeded

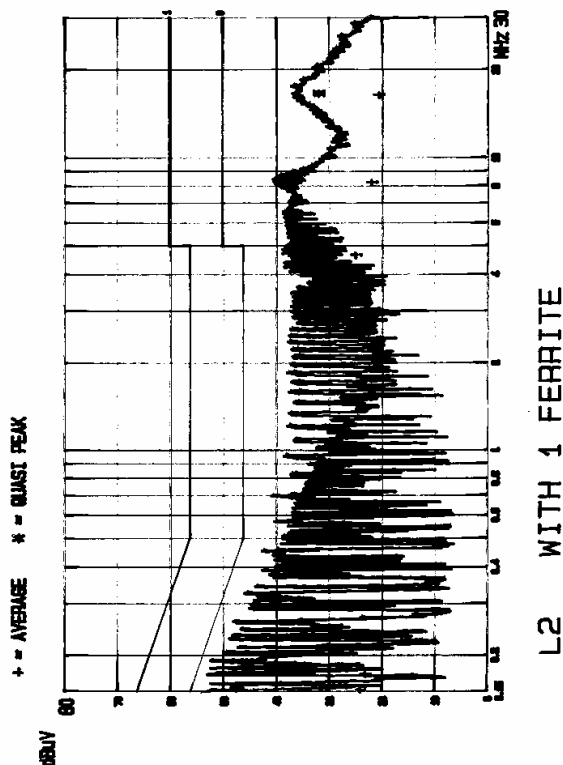
PRECISE BIOMETRICS AB
Conducted Emission Test
Start of Test: 07.JUN.: 5 . 12:13
E.U.T.: 250 MC M8010114-P1C
Oper. Condition: ACTIVE
Operator: HANS OSTERBERG
Test Spec: FCC Part 15, Subpart B Conducted RFI, Class B, 04 Ed
Start Fr. Stop Fr. IF-BW Display Att. Transducer
MHz kHz Mode dB type
0.1500 30.0000 10.00 Max Hold 0 EM7820L1



Frequency MHz	Average dBuV	AV-Margin dBuV	Quasi dBuV	Peak dBuV	GP-Margin dBuV
0.1535	24.3	-31.8		48.3	-17.7
0.1729	23.3	-31.7		48.0	-19.0
0.1880	40.3	-14.0		46.3	-18.1
0.5801	35.5	-10.5		35.5	-18.5
4.5872	25.0	-21.0		37.0	-22.0
8.5875	22.1	-29.3		32.7	-27.3
18.5070					

* Limit exceeded

PRECISE BIOMETRICS AB
Conducted Emission Test
Start of Test: 07.JUN'5. 12:01
E.U.T.: 250 MC MS01014-P1C
Oper. Condition: ACTIVE
Operator: HANS OSTERBERN
Test Spec: FCC Part 15, Subpart B Conducted RFI, Class B, 04 Ed
Start Fr. Stop Fr. IF-BW Display Att. Transducer
MHz KHz Mode dB type
0.1500 30.0000 10.00 Max Hold 0 EM7820L1



PRECISE BIOMETRICS AB Radiated Emission test on OATS

Start of Test: 30.MAY'85 . 15:18

E.U.T.: 250 MC MB010114-P1C 8N

Oper. Condition: ACTIVE

Operator: HANS OSTERBERG

Test Spec:

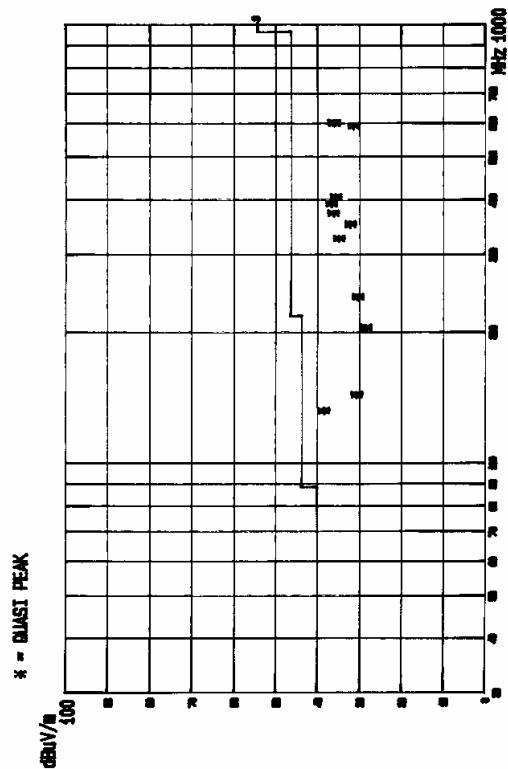
FCC Part 15, Subpart B, Class B, 3 m OATS

Start Fr. Stop Fr. IF-BW Detec Att. Meas.T. Transd.
MHz kHz dB g type

30.0000 299.9999 120 Peak LN 0.020 LOW9105
300.0000 1000.0000 120 Peak LN 0.020 LOW9107

Frequency MHz	measured Level dBμV/m	Margin dB	G P	Poi h/V	Height m	Azimuth deg.
132.0040	39.2	-12.2		>	1.00	80
144.0049	31.3	-12.4		>	1.00	80
204.0140	39.1	-14.3		>	1.00	80
240.0500	31.1	-14.3		>	1.00	270
326.1080	35.7	-10.3		>	1.50	290
351.4820	32.9	-13.1		>	2.00	290
372.5520	35.8	-8.2		>	1.50	180
391.4209	37.4	-8.7		>	1.50	180
408.4300	35.3	-9.0		>	1.20	0
589.6850	32.0	-14.4		>	1.00	180
598.2550	35.5	-9.1		>	1.00	180
599.2700	35.9			>	1.00	0

* Limit exceeded



3 M ANTENNA DISTANCE. WITH 1 FERRITE

Radiated Fieldstrength Test. Calculation of Final Emission Levels

EUT: Combined Fingerprint and Smart Card Reader, Type Precise 250MC,
p/n MS 010114-P1C, without s/n.

TEST SPEC: 47 Cfr Ch. 1 (10-1-04 Edition):
Part 15, Subpart B, Class B.
§15.109: Radiated Emission
3 m antenna distance.

DATE OF TEST: June 1 - 7, 2005

OPERATION: Active with continuous transmitting of data at highest speed.

Field strength (dB μ V/m) = Amplitude (dB μ V) + Antenna factor (dB/m) + cable loss (dB)

Tested frequency range: 30 – 2 000 MHz

Measured quasi-peak values of the 6 highest levels in the frequency range 30 – 2 000 MHz.

Freq.	Level	Cable loss	Antenna factor	Field strength	Limit	Distance	Margin	Antenna height	Antenna polaris.
MHz	dB μ V	dB	dB	dB μ V/m	dB μ V/m	m	dB	m	V/H
132.0	22.0	3.1	14.1	39.2	43.5	3	- 4.3	1.0	V
326.1	12.5	5.1	17.3	35.7	46.0	3	- 10.3	1.5	V
372.6	11.4	5.4	17.8	36.8	46.0	3	- 9.2	1.5	V
391.4	14.4	5.6	17.8	37.4	46.0	3	- 8.6	1.5	V
406.4	12.6	5.7	18.0	36.3	46.0	3	- 9.7	1.2	V
599.3	10.8	7.2	22.5	36.9	46.0	3	- 9.1	1.0	V