

CERTIFICATE OF CONFORMITY

FCC Part 15, Subpart B, Class B.

**CUSTOMER
AND**

MANUFACTURER: Minec Systems AB
Box 7278
S-187 14 Täby
Sweden

**EQUIPMENT
UNDER**

TEST (EUT): 1. Hand hold Computer, Memor2000, s/n 3201132, with
Memor2000 Laser Scanner Module
2. Docking Station - Charger, Memor2000 DS-S, s/n 4201036.

TEST SPEC.: 47 Cfr Ch. 1 (10-1-97 Edition):
Part 15, Subpart B, Class B.
§15.107: Conducted Emission test, AC power line
§15.109: Radiated Emission

DATE OF TEST: February 2 - 6, 1998.

TEST SITE: Svenska EMC Lab AB, Karlskrona, Sweden.
FCC List No 31040/SIT 1300F2.

TEST REPORT: Test ref. No: 98/1857 of February 27, 1998.

CONFORMITY: The Equipment Under Test (EUT), did pass the above mentioned tests.

.....
Karlskrona February 27, 1998



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Hans Östergren
Manager Svenska EMC Lab AB

TEST REPORT

FCC Part 15, Subpart B.

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TEST PERSONNEL: Svenska EMC Lab AB: Bo Gidlöw.

CALIBRATION DECLARATION:

The test equipment is calibrated as the calibration information in the Test Equipment list. Before starting of the tests the check points in Check-List CE and in Check-List RE (Appendix 1 - 2) were confirmed.

EUT:

The EUT is a hand-hold Computer designed for manual data logging in light industry. On the top end of the Computer is a Laser Scanner mounted for detection of bar codes. The power is supplied from an internal battery or from a separated AC/DC Converter connected to a Docking Station - Charger. The Docking Station has two serial ports (RS 232) and two power input ports (in parallel). The communication Computer - serial port is by an IR. link. The only galvanic connection between the Computer and the Docking Station is by the battery charging contact.

TEST EQUIPMENT:

Type/Manufacturer/Bandwidth	s/n	Calibration information	
		Date	Interval
EMI Test System, Monitor EZM,	860157/014	9707	12 months
Rohde & Schwarz EP-6, 20 Hz - 1300 MHz			
Test Receiver, Rohde & Schwarz ESH-3,	894979/013	9707	12 months
9 kHz - 30 MHz			
Test Receiver, Rohde & Schwarz ESVP,	893497/006	9708	12 months
20 - 1300 MHz			
Plotter Tektronix HC 100	JP05851	-	-
Pulse Limiter Rohde & Schwarz ESH3-Z2	357881052	9707	12 months
DC-30 MHz			
LISN 50 OHM/50 uH, Electro Metrics EM-7820	2771	9707	12 months
10 kHz - 30 MHz, 16 A			
Biconical Antenna, Schwarzbeck BBA9106	93-92196.1	9706	12 months
30 - 300 MHz			
Log-periodic Antenna, Schwarzbeck UHALP9107,	91071205	9706	12 months
300 - 1000 MHz			
Antenna Mast System, Jyske EMC, h = 1 - 5 m	93-90172	NA	NA
Turn Table, Jyske EMC, h = 1.0 m	93-90171	NA	NA
Anechoic Chamber, 8 x 4.5 x 3 m	93-87151	9704	36 months
Open Area Test Site for 3 m antenna distance	-	9704	36 months

TEST SET-UP AND PROCEDURE:

As laid out in ANSI C.63.4:1992 Document. See Appendix 3 and 4.

TEST PERFORMANCE:

Rating: 115 VAC, 60 Hz, 8 W to external AC/DC Converter. 9 VDC (internal battery)
in Memor2000.

Power Supply: AC/DC Converter of plug-in type, Radio Shaek, p/n 273-1662, s/n 9720.

Peripherals: Personal Computer, Chicony NB9800, s/n NB980093520344, FCC ID: FMA8200M.

TEST PERFORMANCE (CONTINUED):

Cables: Unshielded 9 VDC cable of 2.0 m length from the AC/DC Converter to the EUT. Shielded cable of 4 m length from the EUT to the Personal Computer. Unterminated shielded cable of 4 m length from the EUT.

Configuration: See Appendix 5.

Modifications: No modifications.

Operating Conditions: Tested with the test software "Kommunikation", "Programkörning" and "Laser". The "Kommunikation" program was used as worst case, with continuous sending - receiving data by the RS232 port to the peripheral PC.

§15.107: Conducted Emission test, AC power line. The conducted emission was measured on the 115 VAC power input terminals on the AC/DC Converter through a 50 ohm 50 micro-Henry LISN (Line Impedance Stabilization Network) in the frequency range 0.45 to 30 MHz. Both the neutral and the line was measured with a quasi-peak detector. The two Power Supplies were connected to a single mains cable. Worst case was recorded. See Appendix 6 and 7.

§15.109: Radiated Emission:

Measured in the frequency range 30 MHz - 1000 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 and the antenna polarization. Measured with CISPR quasi-peak detector. Test instruments: Rohde & Schwarz EP-6 System, 9 kHz - 1300 MHz. Antennas: Schwarzbeck BBA9106, 30 - 300 MHz and UHALP9107, 300 - 1000 MHz. Worst case was recorded. See Appendix 8.

SUMMARY OF RESULTS:

§15.107: The conducted emission on mains terminals: See Appendix 6 and 7.

The margin to limit was - 21.2 dB(QP) at 6.9094 MHz.

§15.109: Final test of radiated emission: See Appendix 8.

The margin to limit was - 12.8 dB(QP) at 156.0 MHz.

The hand hold Computer, Memor2000, s/n 3201132, with Memor2000 Laser Scanner Module and with Docking Station - Charger, Memor2000 DS-S, s/n 4201036, did pass the above mentioned tests.

Certificate of Conformity will be issued for Class B Digital Equipment. Verification procedure is used.

REMARK:

The above test results is valid for the tested sample only.

Karlskrona February 27, 1998



Hans Östergren
EMC Engineer
Manager Svenska EMC Lab AB



Bo Gidlöv
Test Engineer

CHECK-LIST, CE
(conducted emission)

**EQUIPMENT
 UNDER**

TEST (EUT): 1. Computer, Memor2000, s/n 3201132, with Memor2000 Laser scanner module
 2. Docking Station - Charger, Memor2000 DS-S, s/n 4201036.

TEST SPEC.: 47 Cfr Ch. 1 (10-1-97 Edition):
 Part 15, Subpart B, Class B.
 §15.107: Conducted Emission test, AC power line

DATE OF TEST: February 2 - 6, 1998.

Check point. (REF. NO: 97011)	Checked by Sign/Date	Not applicable Sign/Date
A. EUT set-up in accordance with the standard	BG 980202	
B. All instruments calibrated with traceability	BG 980202	
C. LISN, ISN, HF-Probes: No defects	BG 980202	
D. Calibrated LISN, ISN, HF-Probes used:		
LISN, 0.15 - 30 MHz: EM 7820	BG 980202	
ISN, 0.15 - 30 MHz:		BG 980202
HF-Probe, 0.15 - 30 MHz:		BG 980202
E. No additional equipment in 1 m distance from EUT:	BG 980202	
Tested in the shielded room no: 1	BG 980202	
F. Calibrated cables used:		
LISN - feed through - receiver:		
Cables No 002, 003	BG 980202	
ISN - feed through - receiver:		BG 980202
Cables No 1		
HF-Probe - feed through - receiver:		BG 980202
Cables No 1		
G. Reference measurement with CNE III and adapter CNE A. The deviation is within the tolerance for Conducted Emission	BG 980202	

CHECK-LIST, RE
(radiated emission)

**EQUIPMENT
 UNDER**

TEST (EUT): 1. Computer, Memor2000, s/n 3201132, with Memor2000
 Laser scanner module
 2. Docking Station - Charger, Memor2000 DS-S, s/n 4201036.

TEST SPEC.: 47 Cfr Ch. 1 (10-1-97 Edition):
 Part 15, Subpart B, Class B.
 §15.109: Radiated Emission

DATE OF TEST: February 2 - 6, 1998.

Check point. (REF. NO: 97010)	Checked by Sign/Date	Not applicable Sign/Date
A. EUT set-up in accordance with the standard:	BG980203	
B. All instruments calibrated with traceability:	BG980203	
C. Antennas: No defects:	BG980203	
D. Calibrated antennas used:		
30 - 300 MHz, BBA9106 No: 93-92196-1	BG980203	
300 - 1000 MHz, UHALP9107 No: 91071205	BG980203	
1 - 18 GHz, 3115 No:		BG980203
E. Antenna Mast position: 3 m:	BG980203	
10 m:		BG980203
F. No equipment in the obstruction free area:	BG980203	
G. Calibrated cables used:		
Antenna - receiver: Cable No 001	BG980203	
H. Reference measurement with CNE III.		
The deviation is within the tolerance for Radiated Emission:	BG980203	

Test set-up, Conducted Emission



Test set-up, Conducted Emission



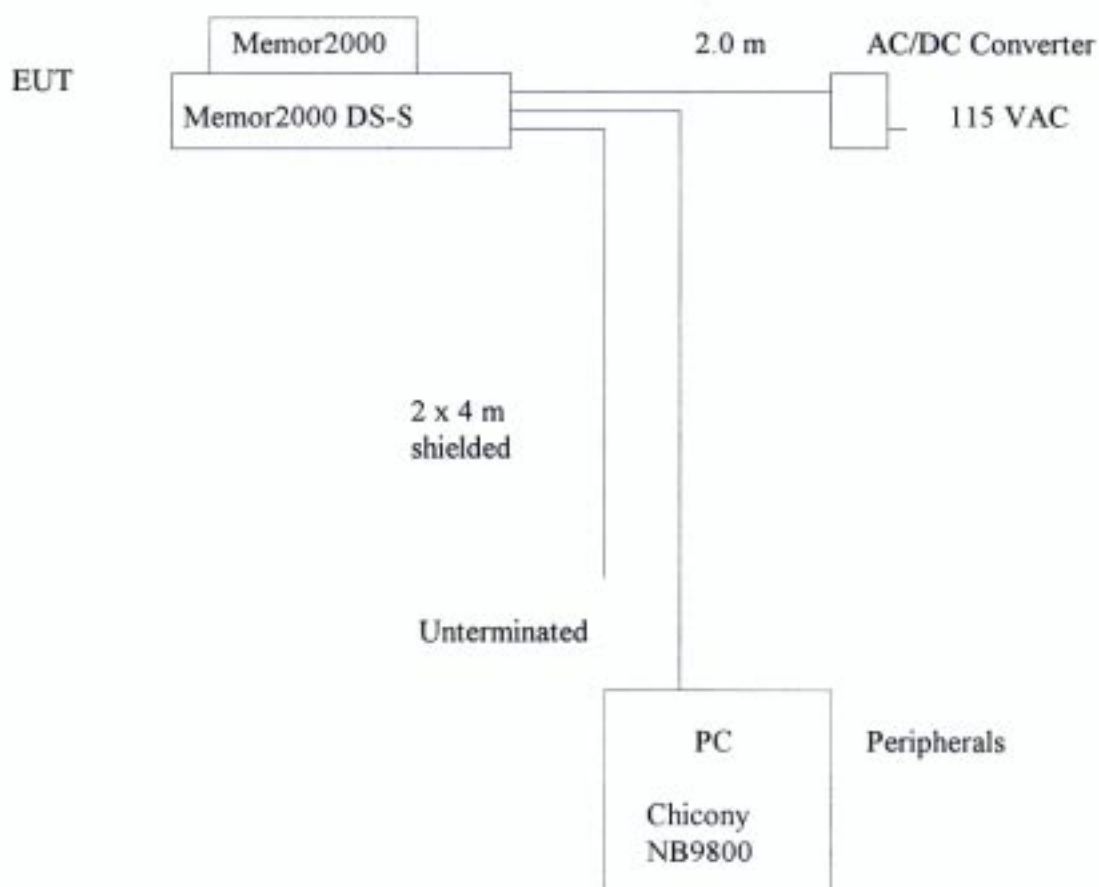
Test set-up, Radiated Emission



Test set-up, Radiated Emission



Configuration



MINEX SYSTEMS AB

Conducted Emission Test

Start of Test: 06.FEB'98 . 15:18

E.U.T.: MEMOR 2000 Laser and DS-6

Oper. Condition: Active in "Comm. mode"

Operator: Bo Sjöloew

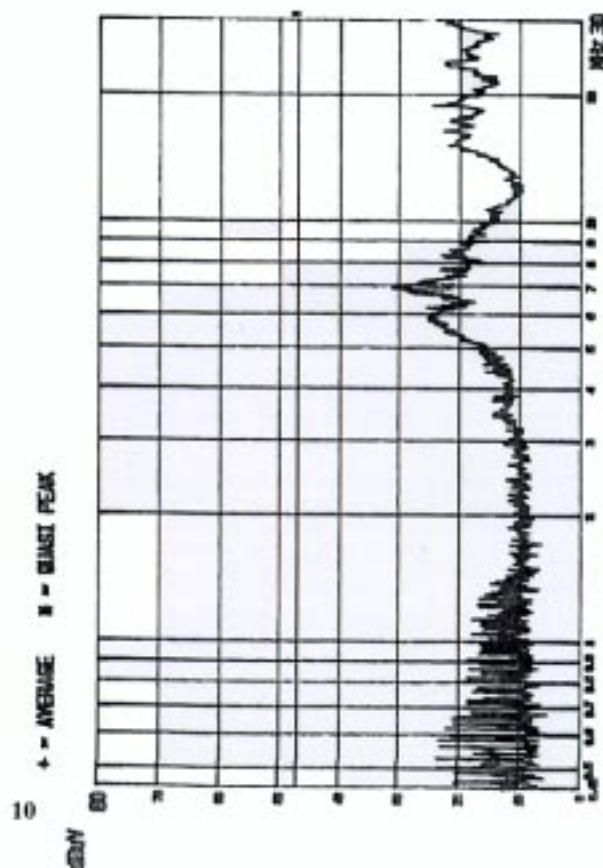
Test Spec:
FCC Part 15, Subpart B, Conducted RFI, Class B.

Start Fr. Stop Fr. IF-BW Display Att. Transducer
MHz kHz Mode dB type

0.4500 30.0000 10.00 Max Hold 0 EM 7620

Frequency MHz	Average dBuV	AV-Margin dBuV	GP-Margin dBuV	Peak dBuV
0.4500	-	-	-	11.9
0.4500	-	-	-	12.0
0.4700	-	-	-	11.5
0.5190	-	-	-	14.4
0.5203	-	-	-	15.2
0.5300	-	-	-	14.5
0.5500	-	-	-	15.3
0.6300	-	-	-	13.0
5.8343	-	-	-	24.1
5.8664	-	-	-	25.1
6.9307	-	-	-	26.7
7.0000	-	-	-	22.5
7.0586	-	-	-	22.9
7.1073	-	-	-	22.7

* Limit exceeded



CONDUCTED EMISSION ON 115 V, AC 60 Hz, NEUTRAL TERMINAL

MINEX SYSTEMS AB

Conducted Emission Test

Start of Test: 06.FEB'98 . 15.40

E.U.T.: MEMOR 2000 Laser and DS-S

Oper. Condition: Active in "Comm. mode"

Operator: Bo Bidloew

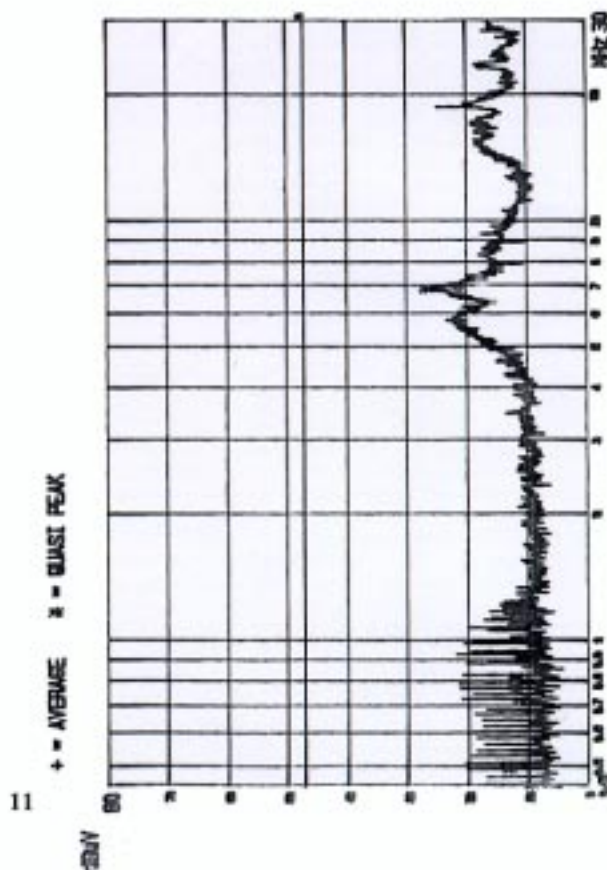
Test Spec: FCC Part 15, Subpart B, Conducted RFI, Class B.

Start Fr. Stop Fr. IF-BW Display Att. Transducer

MHz KHz Mode dB type
0.4500 30.0000 10.00 Max Hold 0 EM 7520

Frequency MHz	Average dBuV	AV-Margin dBuV	Quasi dBuV	Peak dBuV	GP-Margin dBuV
0.4500	-	-	-	9.9	-38.1
0.4963	-	-	-	13.4	-34.6
0.5128	-	-	-	13.8	-34.2
0.7311	-	-	-	11.7	-36.3
0.7732	-	-	-	12.5	-35.5
0.7914	-	-	-	12.5	-35.4
0.8331	-	-	-	12.5	-35.5
0.9318	-	-	-	11.4	-36.6
6.8777	-	-	-	22.1	-26.9
6.9094	-	-	-	26.8	-21.2
6.9252	-	-	-	23.0	-25.0
6.9414	-	-	-	22.5	-25.5
6.9571	-	-	-	24.1	-23.9
6.9734	-	-	-	23.7	-24.3
6.9916	-	-	-	21.9	-26.1
7.0711	-	-	-	22.1	-26.9

X Limit exceeded



CONDUCTED EMISSION ON 115 V, AC 60 HZ, LINE TERMINAL

Radiated Fieldstrength Test. Calculation of Final Emission Levels

EUT: Computer, Memor2000, s/n 3201132, with Memor2000 Laser Scanner Module and with Docking Station - Charger, Memor2000 DS-S, s/n 4201036.

Test spec.: 47 Cfr Ch. 1 (10-1-97 Edition):
Part 15, Subpart B, Class B.
§15.109: Radiated Emission, Open Area Test Site
3 m antenna distance.

Date of test: February 2 - 6, 1998.

Operation: Sending "H" to/from the peripheral PC by the RS232 port.

$$\text{Field strength (dBuV/m)} = \text{Amplitude (dBuV)} + \text{Antenna factor (dB/m)} + \text{cable loss (dB)}$$

Tested frequency range: 30 - 1000 MHz

Measured quasi-peak values of the 7 highest levels.

[illegible]