

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



.....
Hans Östergren
Manager Svenska EMC Lab AB

TEST REPORT

FCC Part 15, Subpart 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 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



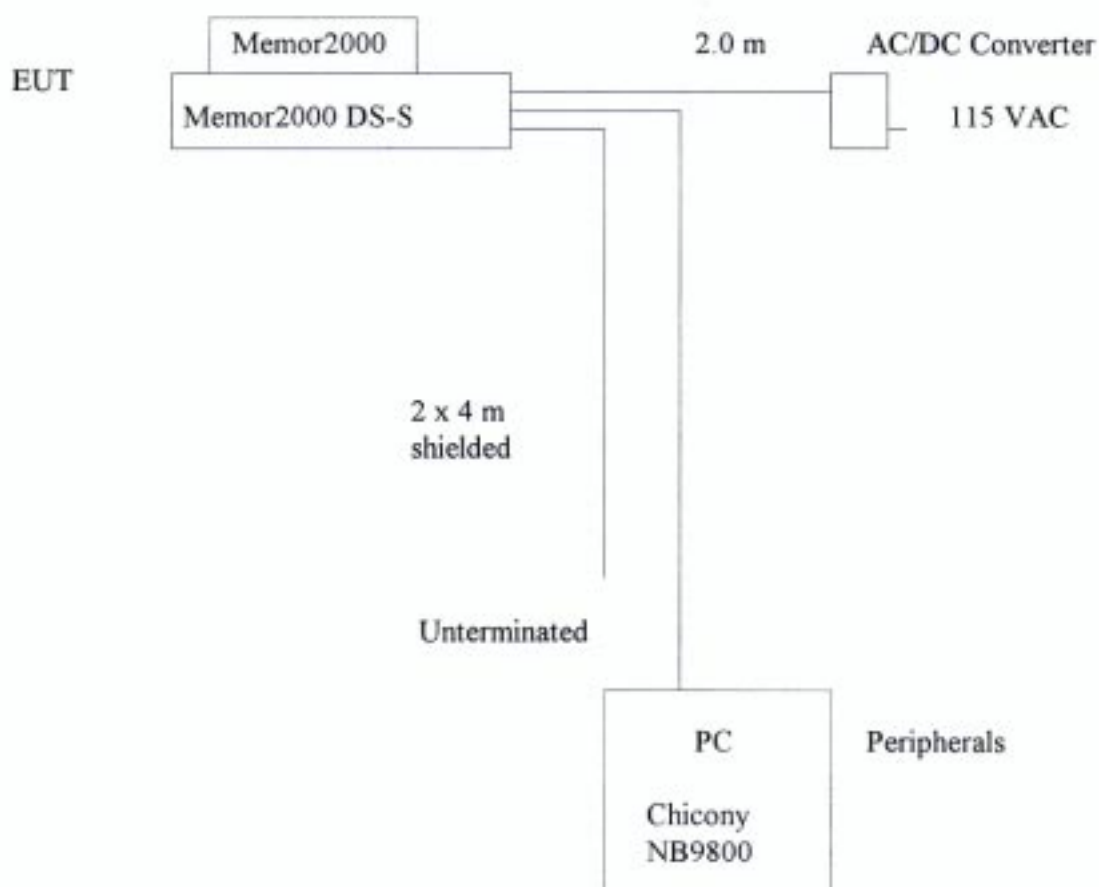
Test set-up, Radiated Emission



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 Gidlöw

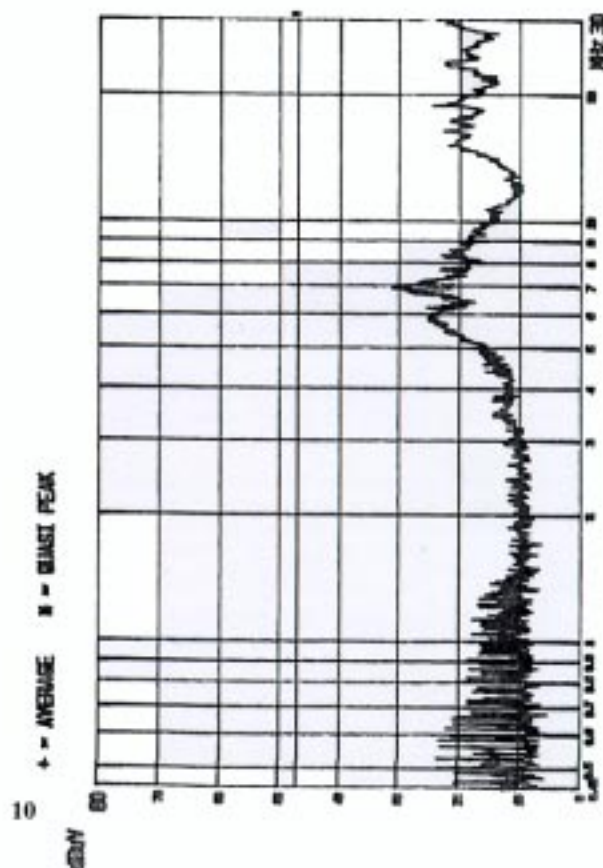
Test Spec:
FCC Part 15, Subpart B, Conducted RFI, Class B.

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	Guess dBuV	Peak dBuV	GP-Margin dBuV
0.4500	-	-	-	11.9	36.1
0.4600	-	-	-	12.0	36.0
0.4700	-	-	-	11.5	36.5
0.5190	-	-	-	14.4	33.6
0.5203	-	-	-	15.2	32.8
0.5300	-	-	-	14.5	33.5
0.5500	-	-	-	15.3	32.7
0.6300	-	-	-	13.0	35.0
6.8343	-	-	-	24.1	22.9
6.8664	-	-	-	25.1	21.9
6.9307	-	-	-	26.7	21.3
7.0000	-	-	-	22.5	25.9
7.0586	-	-	-	22.5	25.9
7.1073	-	-	-	22.7	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

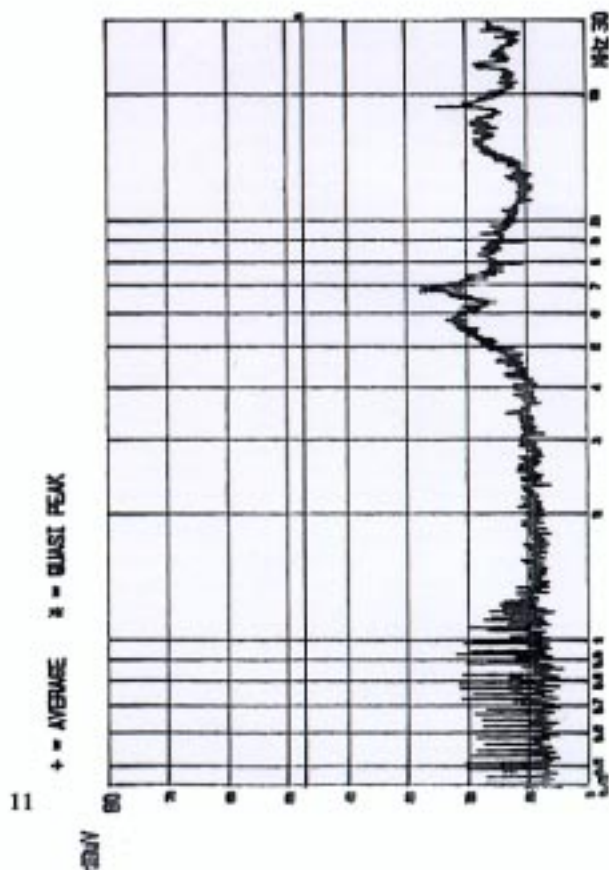
Test Spec: FCC Part 15, Subpart B, Conducted RFI, Class B.

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	-35.5
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]