



Registration No. DAT-P-207/05

EMC - TEST REPORT

Test Report No. : E33047-00-00NL	04. November 2008
	Date of issue

Type / Model Name : HCP Integra

Product Description : Cash register with integrated GPRS terminal

Applicant : HCP D.O.O.

Address : Mirka Tomića, Pasaž

37000 Kreševac, Serbia

Manufacturer : HCP D.O.O.

Address : Mirka Tomića, Pasaž

37000 Kreševac, Serbia

Test Result according to the standards listed in clause 1 test standards:	POSITIVE
---	-----------------



The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

Contents

1	<u>TEST STANDARDS</u>	3
2	<u>SUMMARY</u>	4
2.1	GENERAL REMARKS	4
2.2	SUMMARY FOR ALL EMC TESTS	4
2.3	FINAL ASSESSMENT	4
3	<u>EQUIPMENT UNDER TEST</u>	5
3.1	POWER SUPPLY SYSTEM UTILISED	5
3.2	SHORT DESCRIPTION OF THE EQUIPMENT UNDER TEST (EUT)	5
3.3	PERFORMANCE LEVEL	6
4	<u>TEST ENVIRONMENT</u>	7
4.1	ADDRESS OF THE TEST LABORATORY	7
4.2	REPRESENTATIVE OF THE APPLICANT DURING MEASUREMENTS	7
4.3	ENVIRONMENTAL CONDITIONS	7
4.4	STATEMENT OF THE MEASUREMENT UNCERTAINTY	7
5	<u>TEST CONDITIONS AND RESULTS</u>	8
5.1	CONDUCTED DISTURBANCE	8
5.2	RADIATED DISTURBANCE (ELECTRIC FIELD)	11
5.3	ELECTROSTATIC DISCHARGE	13
5.4	RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD	16
5.5	ELECTRICAL FAST TRANSIENTS / BURST	17
5.6	SURGE	19
5.7	CONDUCTED DISTURBANCES INDUCED BY RADIO-FREQUENCY FIELDS	21
5.8	POWER FREQUENCY MAGNETIC FIELD	23
6	<u>USED TEST EQUIPMENT AND ACCESSORIES</u>	24
7	<u>DETAILED MEASUREMENT UNCERTAINTY</u>	26
7.1	OVERVIEW	26
7.2	DEFINITIONS AND SYMBOLS	26
7.3	MEASUREMENT UNCERTAINTY	26

1 TEST STANDARDS

The tests were performed according to following standards:

EMC emission:

- EN 55022 : 2006+ A1:2007
 CISPR 22 (modified) : 2005
 Class A
 Class B
- EN 55024 : 1998 +A1: 2001 + A2: 2003
 CISPR 24 (modified) : 1997 +A1: 2001 + A2: 2002

The standard above refers to following basic standards:

- EN 61000-4-2 : 1995 + A1: 1998 + A2: 2001
 IEC 61000-4-2 : 1995 + A1: 1998 + A2: 2000
 Electrostatic discharge immunity test (ESD) "12"
- EN 61000-4-3 : 1996 + A1: 1998 + A2: 2001
 IEC 61000-4-3 : 1996 + A1: 1998 + A2: 2001
 Radiated, radio-frequency, electromagnetic field immunity test "13"
- EN 61000-4-4 : 1995 + A1: 2001 + A2: 2001
 IEC 61000-4-4 : 1995 + A1: 2000 + A2: 2001
 Electrical fast transient / burst immunity test (BURST) "14"
- EN 61000-4-5 : 1995 + A1: 2001
 IEC 61000-4-5 : 1995 + A1: 2000
 Surge immunity test (Surge) „15“
- EN 61000-4-6 : 1996 + A1: 2001
 IEC 61000-4-6 : 1996 + A1: 2000
 Immunity to conducted disturbances, induced by radio-frequency fields "16"
- EN 61000-4-8 : 1993 + A1: 2001
 IEC 61000-4-8 : 1993 + A1: 2000
 Power frequency magnetic field immunity test "18"
- EN 61000-4-11 : 1994 + A1: 2001
 IEC 61000-4-11 : 1994 + A1: 2001
 Voltage dips, short interruptions and voltage variations immunity test "11"
- EN301489-7 V1.3.1 :2005 Parly

2 SUMMARY

2.1 General remarks

None

2.2 Summary for all EMC tests

Type of test		Test result	
EMC emission:			
A4	Conducted emissions (AC mains power / DC power)	Fulfilled	
A5	Radiated emissions	Fulfilled	
Immunity:			
			Performance criteria
I2	Electrostatic discharge (ESD)	Fulfilled	A
I3	Radio frequency electromagnetic field	Fulfilled	A
I4	Fast transients, common mode (BURST)	Fulfilled	A
I5	Surges	Fulfilled	A
I6	Radio frequency, common mode	Fulfilled	A
I8	Power frequency magnetic field	Fulfilled	A
I11	Voltage dips and interruptions		Not Applicable
I11	Short interruptions		Not Applicable

2.3 Final assessment

Date of receipt of test sample : acc. to storage records

Testing commenced on : 29. October 2008

Testing concluded on : 30. October 2008

Checked by:

Tested by:

Harald Buchwald
Dipl. Ing.(FH)
Manager: EMC

Norbert Lange

3 EQUIPMENT UNDER TEST

3.1 Power supply system utilised

Power supply voltage : 24 V DC

3.2 Short description of the Equipment under Test (EuT)

Cash register for retail stores with integrated GPRS Terminal for remote administration.

Number of tested samples: 1
Serial number: 000001

Essential Performance of the EuT based on customer definition:

No data errors

EuT operation mode:

The equipment under test was operated during the measurement under the following conditions:

- continuous display data and GPRS signal

EuT monitoring:

The equipment under test was monitored during the measurement by following method:

Controlled was the display and the GPRS communication.

EuT configuration:

(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurements:

- none _____ Model : _____
- _____ Model : _____
- unscreened power cables

Modifications during the EMC test:

None

3.3 Performance level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level defined by its manufacturer or the requestor of the test, or agreed between the manufacturer and the purchaser of the product.

Definition related to the performance level:

- based on the used product standard
- based on the declaration of the manufacturer, requestor or purchaser

Criterion A:

Definition: normal performance within limits specified by the manufacturer, requestor or purchaser:

No data errors

Criterion B:

Definition: temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention:

none

Criterion C:

Definition: temporary loss of function or degradation of performance, the correction of which requires operator intervention:

none

Criterion D:

Definition: loss of function or degradation of performance, which is not recoverable, owing to damage to hardware or software, or loss of data:

none

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

**mikes-testingpartners gmbh
Ohmstrasse 2-4
94342 STRASSKIRCHEN
GERMANY**

4.2 Representative of the applicant during measurements

Mr. Mijajlovic and Mr. Vraštić was present at all times during the EMC assessment testing. He also participated in the performance assessment of the device with regard to the *ESSENTIAL PERFORMANCE*.

4.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:

15-35 ° C

Humidity:

30-60 %

Atmospheric pressure:

86-106 kPa

4.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 /11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. For all measurements shown in this report, the measurement uncertainty of the test laboratory, mikes-testingpartners gmbh, is below the measurement uncertainty as defined by CISPR. Therefore, no special measures must be taken into consideration with regard to the limits according to CISPR.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

5 TEST CONDITIONS AND RESULTS

5.1 Conducted disturbance

For test instruments and accessories used see section 6 Part A 4.

Legend for tables:

QP-L ... QuasiPeak reading including correction factor

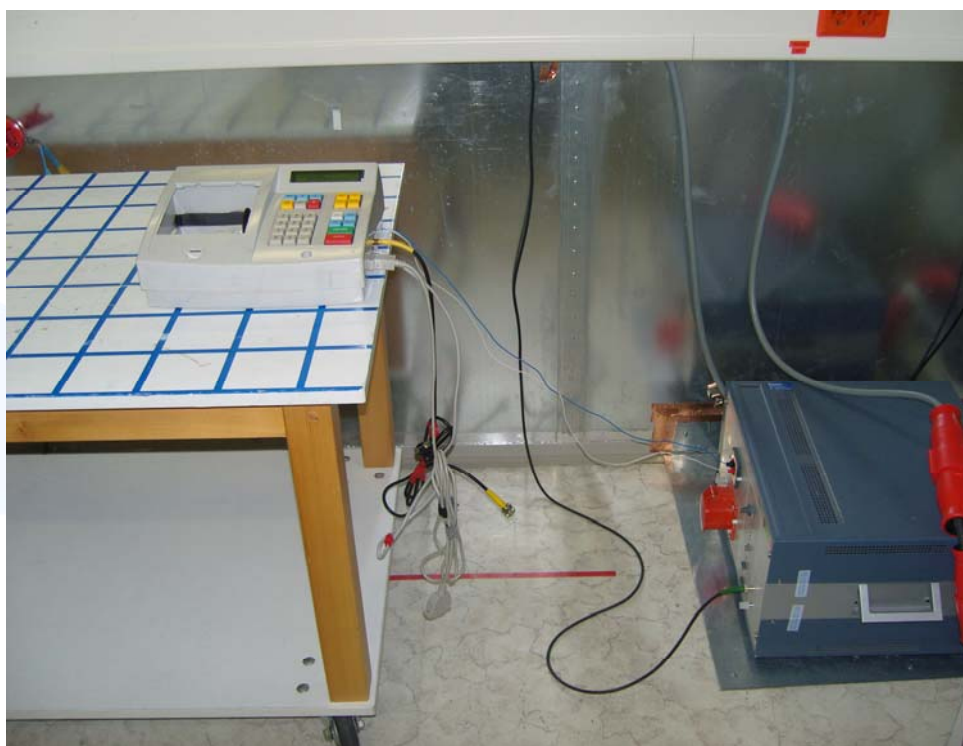
AV-L ... Average reading including correction factor

D-Limit... Measured value to limit delta (margin)

5.1.1 Description of the test location

Test location: Shielded Room S2

5.1.2 Photo documentation of the test set-up



5.1.3 Test result

Frequency range: 0.15 MHz - 30 MHz

Min. limit margin >5 dB

The requirements are **FULFILLED**.

Remarks: None

5.2 Radiated disturbance (electric field)

For test instruments and accessories used see section 6 Part A 5.

Legend for tables:

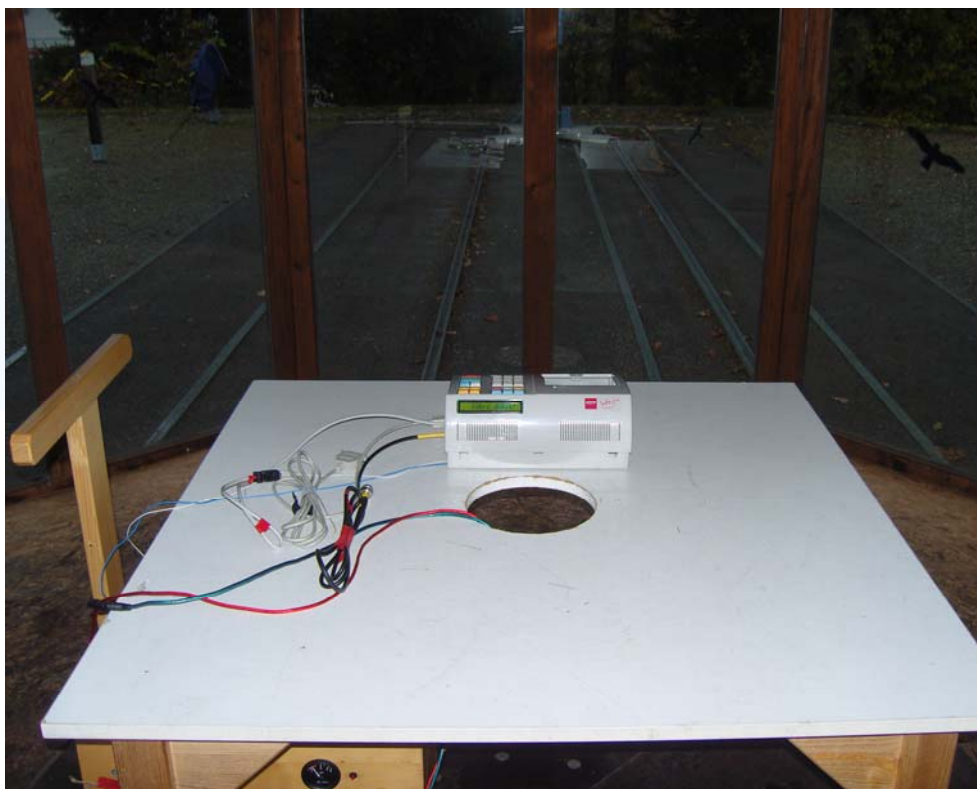
Level vert. QuasiPeak reading including correction factor with vertical polarization of the antenna
 Level hor. QuasiPeak reading including correction factor with horizontal polarization of the antenna
 Limit Limit of the appropriate standard
 DLimit... Measured value to limit delta (margin)
 Noise Characteristic of disturbance (narrowband or broadband)

5.2.1 Description of the test location

Test location: OATS 2

Test distance: 10 metres

5.2.2 Photo documentation of the test set-up



5.2.3 Test result

Frequency range: 30 MHz - 1000 MHz

Min. limit margin >5 dB

The requirements are **FULFILLED**.

Remarks: None

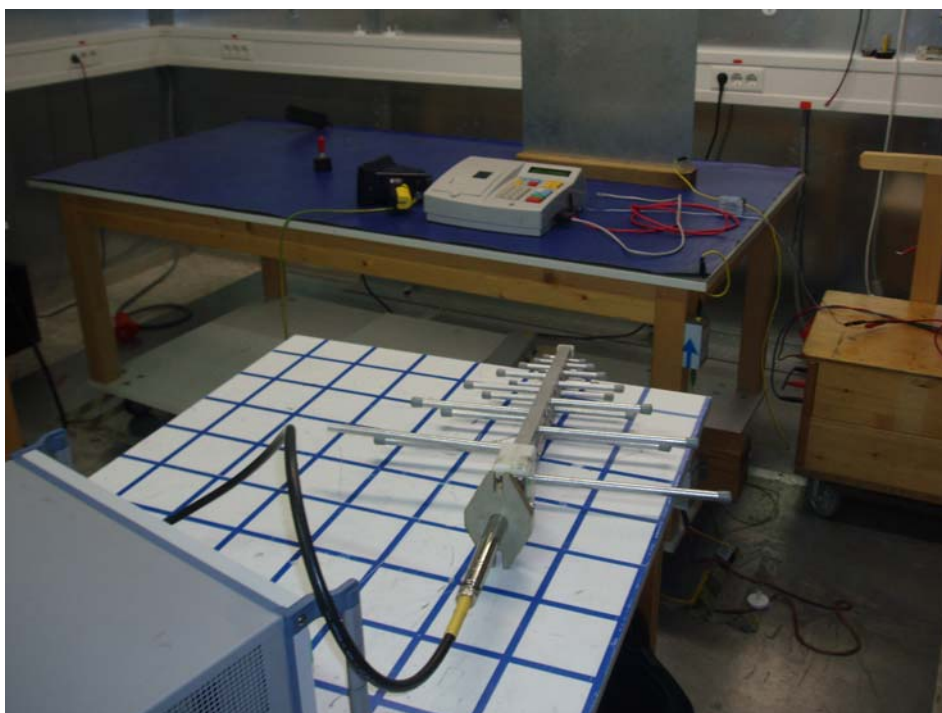
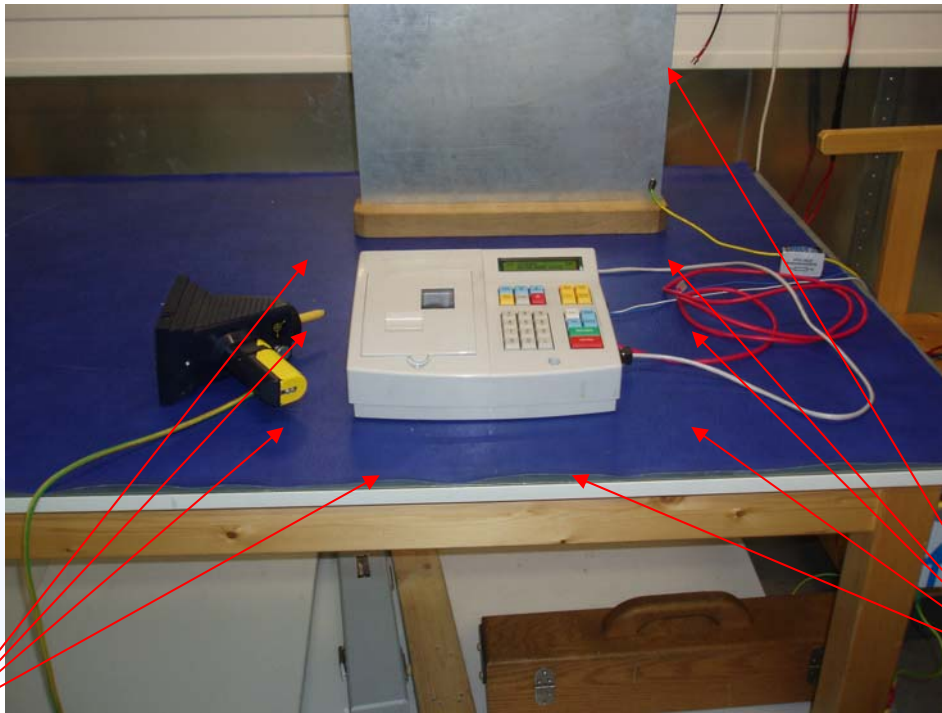
5.3 Electrostatic discharge

For test instruments and accessories used see section 6 Part I 2.

5.3.1 Description of the test location

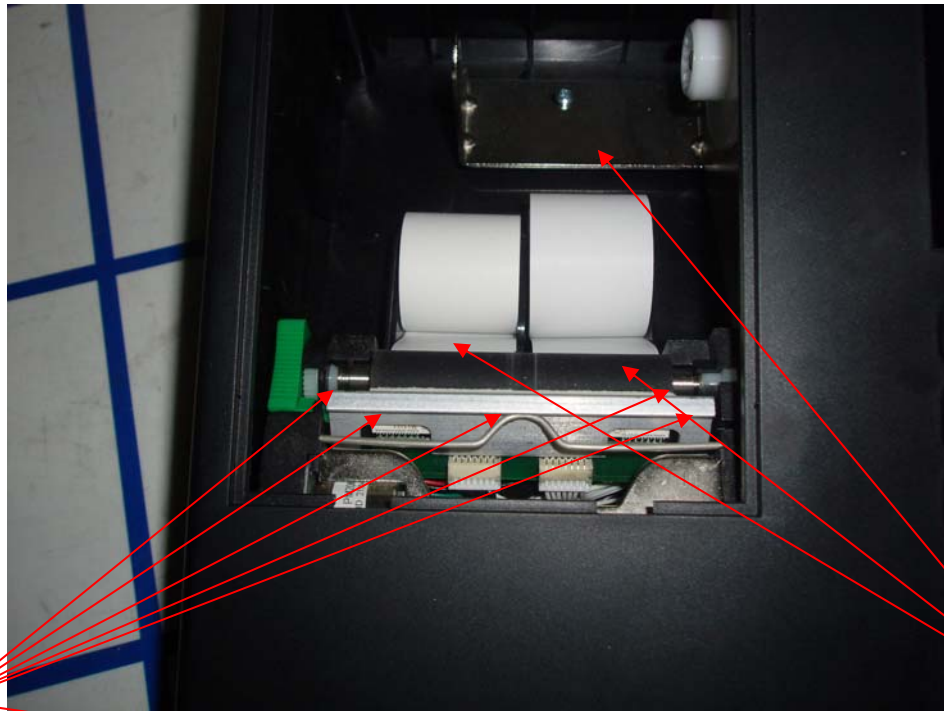
Test location: Shielded Room S3

5.3.2 Photo documentation of the test set-up



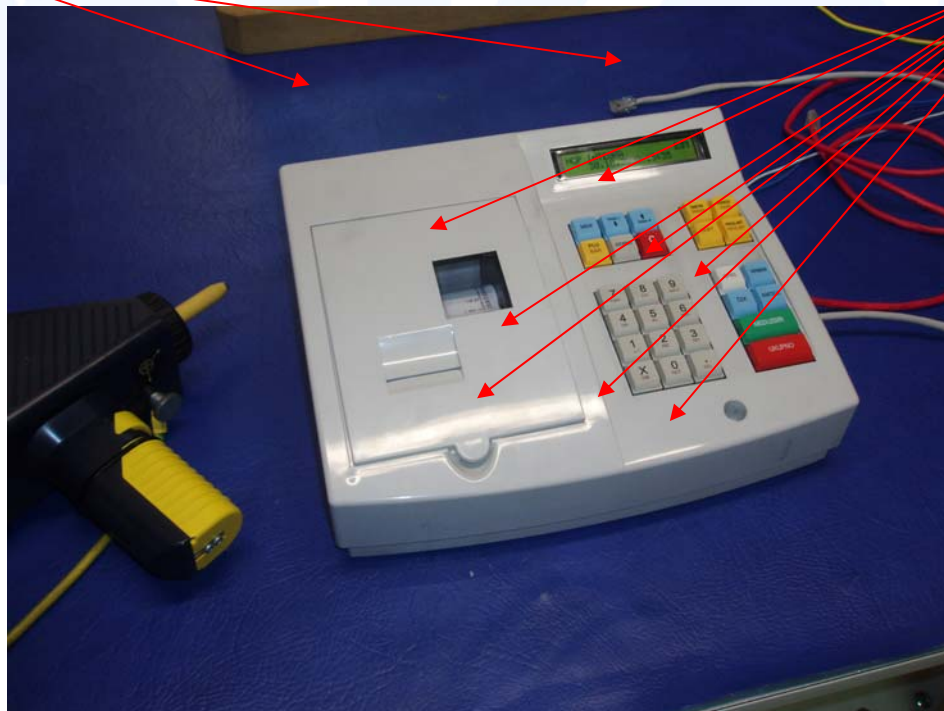
Legend

C: Contact discharge



C

A



Legend

C: Contact discharge

A: Air discharge

5.3.3 Test specification

Contact discharge voltage: 2 kV / 4 kV

Air discharge voltage: 2 kV / 4 kV / 8 kV

Discharge impedance: 330 Ω / 150 pF

Discharge factor: ≥ 1 sec.

Number of discharges: ≥ 10

Type of discharge: Direct discharge: - Contact discharge
- Air discharge
Indirect discharge: - Contact discharge

Polarity: - negative - positive

Discharge location: - see photo documentation of the test set-up

5.3.4 Test result

The requirements are **FULFILLED**.

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

5.4 Radiated, radio-frequency, electromagnetic field

For test instruments and accessories used see section 6 Part I 3.

5.4.1 Description of the test location

Test location: Anechoic Chamber A2

5.4.2 Photo documentation of the test set-up



5.4.3 Test specification

<u>Frequency range:</u>	80 MHz to 1000 MHz
<u>Field strength:</u>	3 V/m
<u>EuT - antenna distance:</u>	3 m
<u>Modulation:</u>	AM: 80 % / sinusoidal: 1000Hz
<u>Frequency step:</u>	1 % with 3 s dwell time
<u>Antenna polarisation:</u>	- horizontal - vertical

5.4.4 Test result

The requirements are **FULFILLED**.

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

5.5 Electrical fast transients / Burst

For test instruments and accessories used see section 6 Part I 4.

5.5.1 Description of the test location

Test location: Shielded Room S3

5.5.2 Photo documentation of the test set-up



5.5.3 Test specification

<u>Coupling network:</u>	0.5 kV	
<u>Coupling clamp:</u>	0.5 kV	
<u>Burst frequency:</u>	5.0 kHz	
<u>Coupling duration:</u>	≥ 60 sec.	
<u>Polarity:</u>	- negative	- positive

5.5.4 Coupling points

Cable description: DC power line

Screening: unscreened
Status: active
Signal transmission: analogue
Length: 1 m

Cable description: RS 232

Screening: screened
Status: passive
Signal transmission: digital
Length: 3 m

5.5.5 Test result

The requirements are **FULFILLED**.

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

5.6 Surge

For test instruments and accessories used see section 6 Part I 5.

5.6.1 Description of the test location

Test location: AREA 4

5.6.2 Photo documentation of the test set-up



5.6.3 Test specification

<u>Pulse amplitude-Power line unsym:</u>	0.5 kV
<u>Source impedance:</u> 12 Ω + 9 μ F	
<u>Number of surges:</u>	5 Surges/Phase angle
<u>Phase angle:</u>	0 °
<u>Repetition rate:</u>	60 sec.
<u>Polarity:</u>	- negative - positive

5.6.4 Coupling points

Cable description:	DC power line
Screening:	unscreened
Status:	active
Signal transmission:	analogue
Length:	1 m

5.6.5 Test result

The requirements are **FULFILLED**.

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

mikes

5.7 Conducted disturbances induced by radio-frequency fields

For test instruments and accessories used see section 6 Part I 6.

5.7.1 Description of the test location

Test location: Shielded Room S3

5.7.2 Photo documentation of the test set-up



5.7.3 Test specification

<u>Frequency range:</u>	0.15 MHz to 80 MHz
<u>Test voltage:</u>	3 V
<u>Modulation:</u>	AM: 80 % / sinusoidal: 1000Hz
<u>Frequency step:</u>	1 % with 3 s dwell time

5.7.4 Coupling points

Cable description (Port1): DC power line

Screening:
Status:
Signal transmission:
Length:

Cable description (Port2): RS 232

Screening: screened
Status: passive
Signal transmission: digital
Length: 3 m

The following CDN's were connected during the test at the ports:

Tested Port	Number of CDN at port (Refer to O.-No. According to Used Test Equipment)					
	1	2	3	4	5	6
1	004	043				
2	004	043				
3						
4						
5						
6						

5.7.5 Test result

The requirements are **FULFILLED**.

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

5.8 Power frequency magnetic field

For test instruments and accessories used see section 6 Part I 8.

5.8.1 Description of the test location

Test location: AREA 1

5.8.2 Photo documentation of the test set-up



5.8.3 Test specification

Test frequency: 50 Hz / 60 Hz

Continuous field: 1 A/m

Duration (Continuous field): 60 sec. each Axis

Axis: x-axis y-axis z-axis

5.8.4 Test result

The requirements are **FULFILLED**.

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used, in addition to the test accessories, are calibrated and verified regularly.

Test ID	Model / Type	Kind of Equipment	Manufacturer	Equipment No.
A 4	ESHS 30	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-002
	NNLK 8129	LISN	Schwarzbeck Mess-Elektronik	02-02/20-05-001
	ESH 2 - Z 5	LISN	Rohde & Schwarz München	02-02/20-05-004
	N-4000-BNC	RF Cable	mikes-testingpartners gmbh	02-02/50-05-138
	N-1500-N	RF Cable	mikes-testingpartners gmbh	02-02/50-05-140
	ESH 3 - Z 2	Pulse Limiter	Rohde & Schwarz München	02-02/50-05-155
A 5	ESVS 30	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-003
	BBA 9106 / VHA 9103	Biconical Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-002
	UHALP 9108 A	Log. Per. Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-003
	KK-EF393-21N-16	RF Cable 20 m	Huber + Suhner	02-02/50-05-035
	HF 7/8 inch	Antenna Cable 20 m	Huber + Suhner	02-02/50-05-116
	RG 214/U	RF Cable 2 m	Huber + Suhner	02-02/50-05-117
I 2	CMU 200	Radio Communication Test	Rohde & Schwarz München	02-02/05-07-001
	NSG 435	ESD Generator	Schaffner Elektrottest GmbH	02-02/09-05-002
	THL-313	Thermo-Hygro-Meter	PTL Dr. Grabenhorst GmbH	02-02/15-05-001
	UHALP 9108 A	Log. Per. Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-022
I 3	SMT 03	Signal Generator	Rohde & Schwarz München	02-02/05-05-009
	CMU 200	Radio Communication Test	Rohde & Schwarz München	02-02/05-07-001
	NRVD	Dual Channel Power Meter	Rohde & Schwarz München	02-02/07-05-004
	NRV-Z1	Diode Power Sensor	Rohde & Schwarz München	02-02/07-05-017
	NRV-Z1	Diode Power Sensor	Rohde & Schwarz München	02-02/07-05-018
	500W1000A	RF Amplifier	Amplifier Research	02-02/17-05-010
	CBL6140A	Bilog Antenna	Schaffner Elektrottest GmbH	02-02/24-05-018
	UHALP 9108 A	Log. Per. Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-022
	KK-RG393/U-3	RF Cable 3 m	Huber + Suhner	02-02/50-05-018
	50 Ohm / 10 dB	Attenuator	Huber + Suhner	02-02/50-05-064
	DC6180A	Coupler	Amplifier Research	02-02/50-05-107
	N-2000-N	RF Cable	mikes-testingpartners gmbh	02-02/50-05-108
	RG 393/U 50 Ohm	RF Cable	mikes-testingpartners gmbh	02-02/50-06-024
I 4	CMU 200	Radio Communication Test	Rohde & Schwarz München	02-02/05-07-001
	NSG 2025	Burst Generator	Schaffner Elektrottest GmbH	02-02/09-05-003
	CDN 8014	Coupling Clamp	Schaffner Elektrottest GmbH	02-02/22-05-001
	UHALP 9108 A	Log. Per. Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-022
I 5	CMU 200	Radio Communication Test	Rohde & Schwarz München	02-02/05-07-001
	NSG 2050	Surge Generator	Schaffner Elektrottest GmbH	02-02/09-05-004
	PNW 2050	Pulse Network	Schaffner Elektrottest GmbH	02-02/09-05-007
	CDN 133	Coupling Network	Schaffner Elektrottest GmbH	02-02/22-05-019
	UHALP 9108 A	Log. Per. Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-022

Test ID	Model / Type	Kind of Equipment	Manufacturer	Equipment No.
I 6	SML 01	Signal Generator	Rohde & Schwarz München	02-02/05-05-001
	CMU 200	Radio Communication Test	Rohde & Schwarz München	02-02/05-07-001
	URV 5 - Z 4	RF Probe 100 V	Rohde & Schwarz München	02-02/07-05-002
	NRVS	Single Channel Power Mete	Rohde & Schwarz München	02-02/07-05-007
	75A250	RF Amplifier	Amplifier Research	02-02/17-05-008
	CDN M216	Coupling Network	Schaffner Elektrotest GmbH	02-02/22-05-004
	CDN S900	Coupling Network	MEB Messelektronik	02-02/22-05-043
	UHALP 9108 A	Log. Per. Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-022
	10 dB / 18 GHz / 50 Ohm	Attenuator 10 dB	Huber + Suhner	02-02/50-05-037
	JFW 50FH-006-100-2	RF Attenuator 6 dB/100 W	jfw	02-02/50-05-056
	N-500-N	RF Cable	mikes-testingpartners gmbh	02-02/50-05-059
	N-3000-N	RF Cable	mikes-testingpartners gmbh	02-02/50-05-226
	N-140-BNC	RF Cable	mikes-testingpartners gmbh	02-02/50-06-035
	I 8	Helmholtz	Magnetic Field Coil	mikes-testingpartners gmbh
EMV D 30000/PAS		Testsystem	Spitzenberger + Spies	02-02/30-05-006
ARS 16/3		Analysers Reference System	Spitzenberger + Spies	02-02/30-05-007

mikes

7 Detailed measurement uncertainty

7.1 Overview

Measurement instrumentation uncertainty shall be taken into account when determining compliance or non-compliance with a disturbance limit.

The measurement instrumentation uncertainty for a test laboratory shall be evaluated. The standard uncertainty $u(x_i)$ in decibels and the sensitivity coefficient c_i shall be evaluated for the estimate x_i of each quantity. The combined standard uncertainty $u_c(y)$ of the estimate y of the measurand shall be calculated as

$$u_c(y) = \sqrt{\sum_i c_i^2 u^2(x_i)}$$

The expanded measurement instrumentation uncertainty U_{lab} for a test laboratory shall be calculated as $U_{lab} = 2 u_c(y)$

$$U_{lab} = 2 u_c(y)$$

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{CISPR} in the table below, then:

- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.

If U_{lab} is greater than U_{CISPR} in the table below, then:

- compliance is deemed to occur if no measured disturbance, increased by $(U_{lab} - U_{CISPR})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance, increased by $(U_{lab} - U_{CISPR})$, exceeds the disturbance limit.

7.2 Definitions and symbols

X_i	Input quantity
x_i	estimate of X_i
$u(x_i)$	standard uncertainty of x_i
c_i	sensitivity coefficient
$u_c(y)$	(combined) standard uncertainty of y
Y	result of a measurement, (the estimate of the measurand), corrected for all recognised significant systematic effects
U	expanded uncertainty of y

7.3 Measurement uncertainty

Measurement	U_{lab} [dB]	U_{CISPR} [dB]
Conducted disturbance	+ 3,60 / - 3,64	4,00
Radiated disturbance (electric field)	+ 3,86 / - 3,91	5,20
- 10 m test distance		
- Frequency range: 30 MHz – 300 MHz		
Radiated disturbance (electric field)	+ 4,11 / - 4,11	5,20
- 10 m test distance		
- Frequency range: 300 MHz – 1000 MHz		