Test report

Customer:

Identive GmbH.
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85737 Ismaning
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Fax: +49 89 9595-5555

EMC test report

120276-AU01+E01

CE

Identive GmbH

USB Contact Card Reader

CLOUD 2700 F

EMV TESTHAUS

The test results refer exclusively
to the model tested.

Revision: 1.3

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-12155-01-01

EMV **TESTHAUS** GmbH

Gustav-Hertz-Straße 35
94315 Straubing
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Fax: +49 9421 56868-100
Email: company@emv-testhaus.com

Accreditation:

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-12155-01-01

Location of Testing:

EMV **TESTHAUS** GmbH
Gustav-Hertz-Straße 35
94315 Straubing

The technical accuracy is guaranteed through the quality management of the EMV **TESTHAUS** GmbH.

Table of contents

1. Test regulation

Emission

EN 55022:2010 +AC:2011	Information technology equipment Radio disturbance characteristics – Limits and methods of measurement
☐ Class A:	Class A ITE is a category of all other ITE which satisfies the Class A ITE limits but not the Class B ITE limits. Such equipment should not be restricted in its sale but the following warning shall be included in the instructions for use.

Warning:
This is a class A product. In a domestic environment this product may cause radio interferences in which case the user may be required to take adequate measures.

☑ Class B	Class B ITE is a category of apparatus which satisfies the class B disturbance limits. Class B ITE is intended primarily for use in the domestic environment and may include -equipment with no fixed place of use; for example portable equipment powered by built-in batteries; -telecommunication terminal equipment powered by a telecommunication network; -personal computers and auxiliary connected equipment.

Includes the following tests:

Measurement of the conducted disturbance at mains ports in a frequency range from 150 kHz to 30 MHz.

Measurement of the conducted common mode disturbance at telecommunication ports in a frequency range from 150 kHz to 30 MHz.

Measurement of radiated disturbance in a frequency range from 30 MHz to 1GHz.

Measurement of radiated disturbance in a frequency range from 1GHz to max. 6 GHz.

Emission in the frequency range of ≤ 2 kHz:

EN 61000-3-2:2006 + A1:2009 + A2:2009	Harmonic current emissions (equipment input current ≤ 16 A per phase)
EN 61000-3-3:2008	Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤ 16 A

Deviation of regulations and standards: No

Susceptibility

EN 55024:2010	Information technology equipment - Immunity characteristics
Includes Basic EMC Publications:	
EN 61000-4-2:2009	Testing and measurement techniques - Electrostatic discharge immunity test.
EN 61000-4-3:2006 +A1:2008 +A2:2010	Testing and measurement techniques - Radiated, radio frequency, immunity test.
EN 61000-4-4:2004 +A1:2010	Testing and measurement techniques - Electrical fast transient (EFT)/burst immunity test.
EN 61000-4-5:2006	Testing and measurement techniques - Surge immunity test.
EN 61000-4-6:2009	Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields.
EN 61000-4-8:2010	Testing and measurement techniques - Power frequency magnetic field immunity test.
EN 61000-4-11:2004	Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests.

Deviation of Regulation and Standards: No

Not applied tests:

EN 55022:2010 +AC:2011	Measurement of radiated disturbance in a frequency range from 1GHz to max. 6 GHz.
Remark:	Pursuant to customer information the EUT has no internal frequencies above 108MHz.
EN 55022:2010 +AC:2011	Measurement of the conducted common mode disturbance at telecommunication ports in a frequency range from 150 kHz to 30 MHz.
Remark:	The EUT has no telecommunication ports.
EN 61000-3-2:2006 +A1:2009 +A2:2009	Harmonic current emissions (equipment input current ≤ 16 A per phase)
EN 61000-3-3:2008	Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤ 16 A.
EN 61000-4-8:2010	Testing and measurement techniques - Power frequency magnetic field immunity test.
Remark:	Only for equipment containing devices susceptible to magnetic fields.
EN 61000-4-11:2004	Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests.
EN 61000-4-6:2009	Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields.
EN 61000-4-5:2006	Testing and measurement techniques - Surge immunity test.
EN 61000-4-4:2004 +A1:2010	Testing and measurement techniques - Electrical fast transient (EFT)/burst immunity test.
Remark:	The EUT is USB powered.

2. Equipment under test

Product type:	USB Contact Card Reader
Model name:	CLOUD 2700 F
Serial number:	5399YYWWMNNNNN
Manufacturer:	Identive GmbH.
Operational description of the EUT:	Continuously reading

Photo documentation

Picture 1: EUT

3. Test configuration and mode of operation

Test configuration

Numbers:	Description:	Serial No.:
1	EUT: Identive CLOUD 2700 F	5399YYWWMNNNN
1	Fujitsu test notebook	N/A
1	Identive chip card	N/A

Mode of operation

The EUT was tested in the following mode of operation:

Settings: Continuously reading

Applied Software: CE Test V1.0.0, build 1

Failure criterion for test of immunity from disturbances:

It was observed whether the EUT is influenced in any form or program interruptions occurred.

4. Measurement of conducted emission

according to EN 55022 Class B

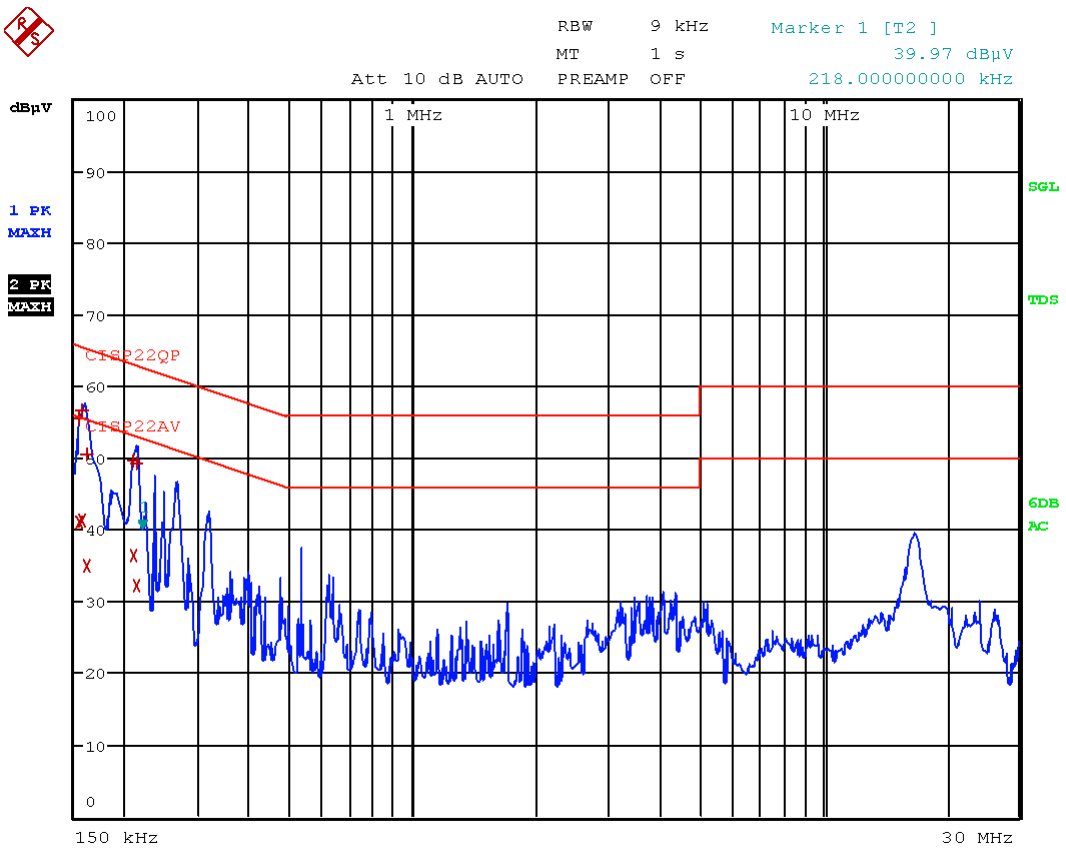
Location of measurement

Description	Manufacturer	Inventory No.
Shielded chamber	Siemens - Matsushita	E00107

Measurement equipment

	Description	Manufacturer	Inventory No.
☐	ESH 3	Rohde & Schwarz	E00007
☐	ESCS 30	Rohde & Schwarz	E00003
☐	ESCI	Rohde & Schwarz	E00001
☑	ESU	Rohde & Schwarz	W00002
☐	ESH3 Z2	Rohde & Schwarz	E00028
☐	ESH 2-Z5	Rohde & Schwarz	E00004
☑	ESH 2-Z5	Rohde & Schwarz	E00005
☐	ENY 41	Rohde & Schwarz	E00041
☐	ENY 22	Rohde & Schwarz	E00042
☐	ISN LAN	EMV **TESTHAUS** GmbH	E00357

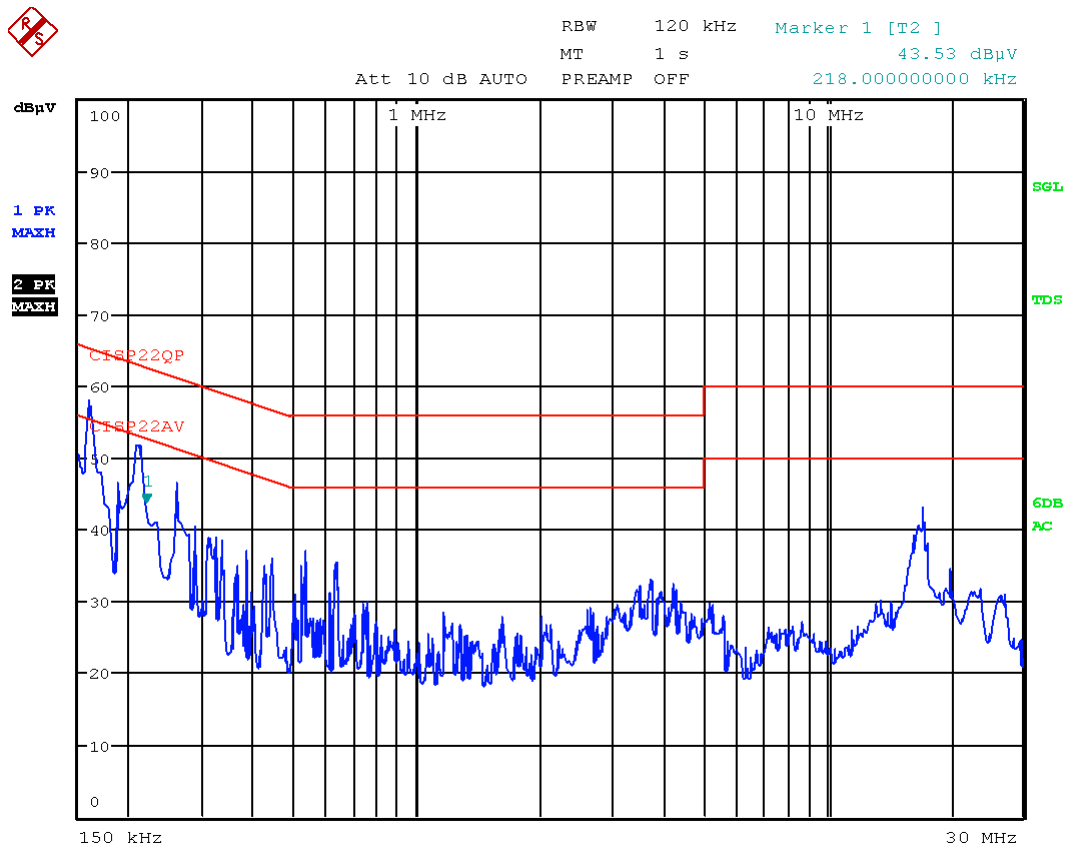
Test related measurement inaccuracies have to be taken into consideration when evaluating the test results.
All used test instrument as well as the test accessories are calibrated at regular intervals.



Picture 2: Measurement report of conducted emission (phase L1)

Trace	Frequency	Level (dBµV)	Detector	Delta Limit/dB
2	154.000000000 kHz	41.04	Average	-14.74
1	154.000000000 kHz	55.66	Quasi Peak	-10.12
2	158.000000000 kHz	41.19	Average	-14.38
1	158.000000000 kHz	56.62	Quasi Peak	-8.95
2	162.000000000 kHz	34.90	Average	-20.46
1	162.000000000 kHz	50.62	Quasi Peak	-14.74
2	210.000000000 kHz	36.41	Average	-16.80
1	210.000000000 kHz	49.73	Quasi Peak	-13.48
2	214.000000000 kHz	32.35	Average	-20.70
1	214.000000000 kHz	49.29	Quasi Peak	-13.76

Picture 3: Frequency table of conducted emission (Phase L1)



Picture 4: Measurement report of conducted emission (Neutral N)

Trace	Frequency	Level (dBµV)	Detector	Delta Limit/dB
2	154.000000000 kHz	41.04	Average	-14.74
1	154.000000000 kHz	55.66	Quasi Peak	-10.12
2	158.000000000 kHz	41.19	Average	-14.38
1	158.000000000 kHz	56.62	Quasi Peak	-8.95
2	162.000000000 kHz	34.90	Average	-20.46
1	162.000000000 kHz	50.62	Quasi Peak	-14.74
2	210.000000000 kHz	36.41	Average	-16.80
1	210.000000000 kHz	49.73	Quasi Peak	-13.48
2	214.000000000 kHz	32.35	Average	-20.70
1	214.000000000 kHz	49.29	Quasi Peak	-13.76

Picture 5: Frequency table of conducted emission (Neutral N)

Photo documentation

Picture 6: Test setup conducted emission

Test result

The requirements according to EN 55022 Class B are

☑ **Kept**

☐ **Not kept**

Information about measurement uncertainty is on page 31.

Comments:

5. Measurement of radiated emission

according to EN 55022 Class B

Procedure of radiated emission measurement:

☑ Scan with max-peak detector in 3 m CDC

☑ Final CISPR measurement with quasi peak detector on 10m OATS.

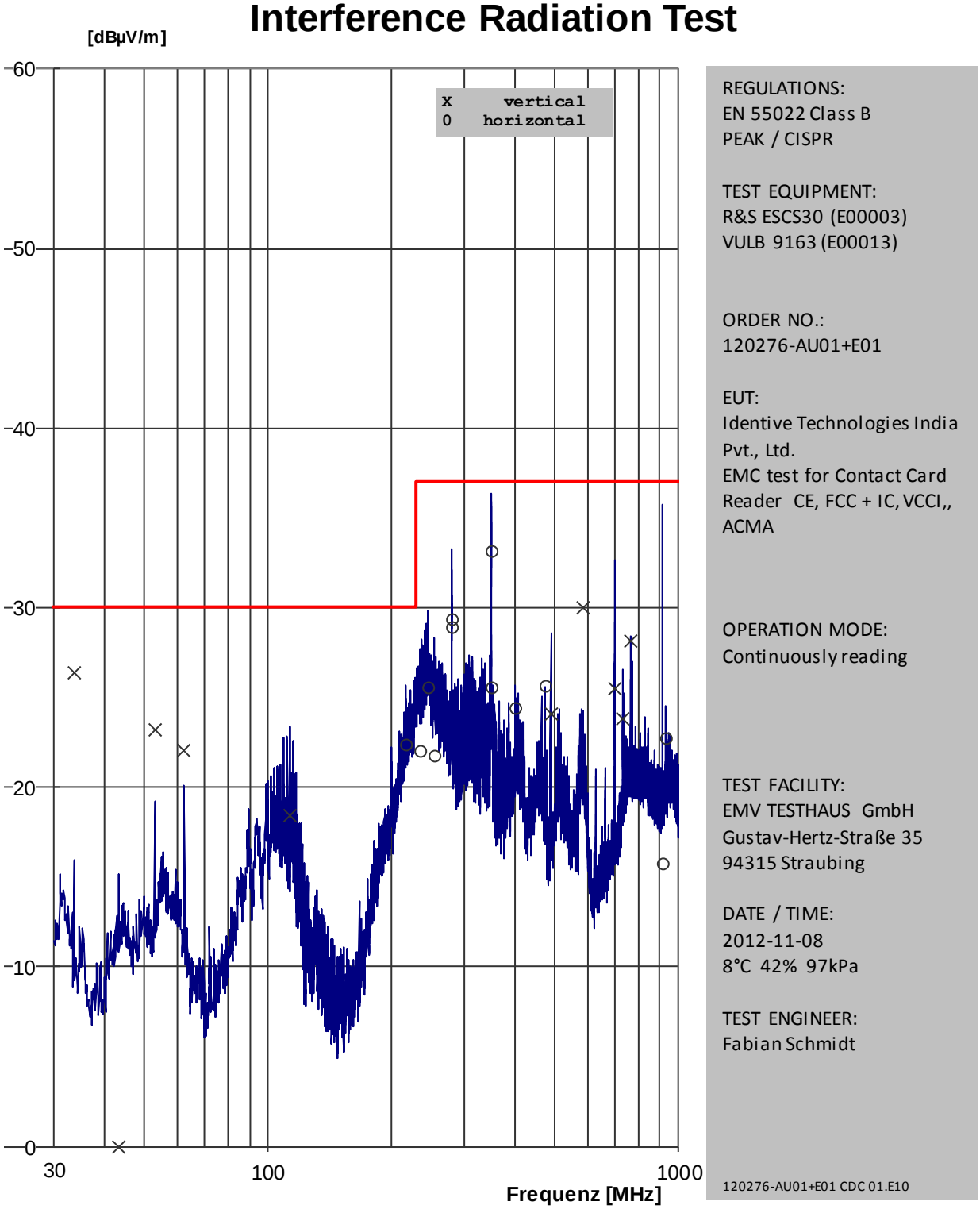
Location of measurement

Description	Manufacturer	Inventory No.
Compact Diagnostic Chamber	Albatross Projects	E00026
Open Area Test Site	EMV **TESTHAUS** GmbH	E00354

Measurement equipment

	Description	Manufacturer	Inventory No.
☑	ESCS 30 (OATS)	Rohde & Schwarz	E00003
☑	ESCI (CDC)	Rohde & Schwarz	E00001
☐	ESU26	Rohde & Schwarz	W00002
☑	VULB 9163 (OATS)	Schwarzbeck	E00013
☑	VULB 9160 (CDC)	Schwarzbeck	E00011
☐	MDS 20	Rohde & Schwarz	E00132
☐	MDS 21	Rohde & Schwarz	E00010

Test related measurement inaccuracies have to be taken into consideration when evaluating the test results.
All used test instrument as well as the test accessories are calibrated at regular intervals.



Picture 7: Measurement report of radiated emission

Interference Radiation Test

Freq. [MHz]	U_Rec [dBµV/m]	Limit [dBµV/m]	Corr. [dB]	U_Ant. [dBµV]	delta_U [dB]	Turn-table	Antenna	Pol.	Remark 120276-AU01+E01_CDC 01.E10
33,60	26,4	30,0	12,6	13,8	3,6	18°	100 cm	V	
43,20	0,0	30,0	14,6	-14,6	30,0	0°	100 cm	V	
52,80	23,2	30,0	14,6	8,7	6,8	182°	128 cm	V	
62,40	22,0	30,0	13,0	9,0	8,0	86°	100 cm	V	
112,80	18,4	30,0	6,3	12,1	11,6	95°	100 cm	V	
216,00	22,4	30,0	13,1	9,2	7,6	48°	255 cm	H	
233,70	22,1	37,0	14,1	8,0	14,9	190°	250 cm	H	
244,50	25,6	37,0	10,5	15,2	11,4	104°	100 cm	H	
253,90	21,7	37,0	14,4	7,4	15,3	282°	250 cm	H	
278,80	29,3	37,0	14,7	14,7	7,7	299°	374 cm	H	
279,90	29,0	37,0	10,3	18,7	8,0	116°	100 cm	H	
348,70	33,2	37,0	11,8	21,4	3,8	83°	112 cm	H	
349,30	25,6	37,0	16,9	8,6	11,5	73°	250 cm	H	
400,00	24,4	37,0	18,4	6,0	12,6	73°	250 cm	H	
473,20	25,6	37,0	19,6	6,1	11,4	154°	250 cm	H	
487,90	24,1	37,0	13,7	10,4	12,9	127°	100 cm	V	
583,00	30,0	37,0	22,0	8,1	7,0	230°	100 cm	V	
697,00	25,5	37,0	14,8	10,7	11,5	85°	100 cm	V	
731,90	23,8	37,0	23,5	0,3	13,2	335°	138 cm	V	
766,70	28,2	37,0	24,1	4,1	8,8	137°	100 cm	V	
911,00	15,8	37,0	19,2	-3,4	21,2	27°	100 cm	H	
930,00	22,8	37,0	26,8	-4,0	14,2	312°	245 cm	H	

Picture 8: Frequency table of radiated emission

Photo documentation

Picture 9: Test setup of radiated emission

Test result

The requirements according to EN 55022 Class B are

☑ **Kept**

☐ **Not kept**

Information about measurement uncertainty is on page 31.

Comments:

6. Electrostatic discharge immunity test

according to EN 61000-4-2

Location of measurement

Description	Manufacturer	Inventory No.
Shielded chamber	Siemens - Matsushita	E00107

Measurement equipment

	Description	Manufacturer	Inventory No.
☐	ESD 3000	EMC Partner	E00040
☑	NSG 435	Teseq	E00412
☑	VCP	EMV **TESTHAUS** GmbH	E00047
☑	HCP	EMV **TESTHAUS** GmbH	E00048

Test related measurement inaccuracies have to be taken into consideration when evaluating the test results.
All used test instrument as well as the test accessories are calibrated at regular intervals.

Test conditions

Air discharge

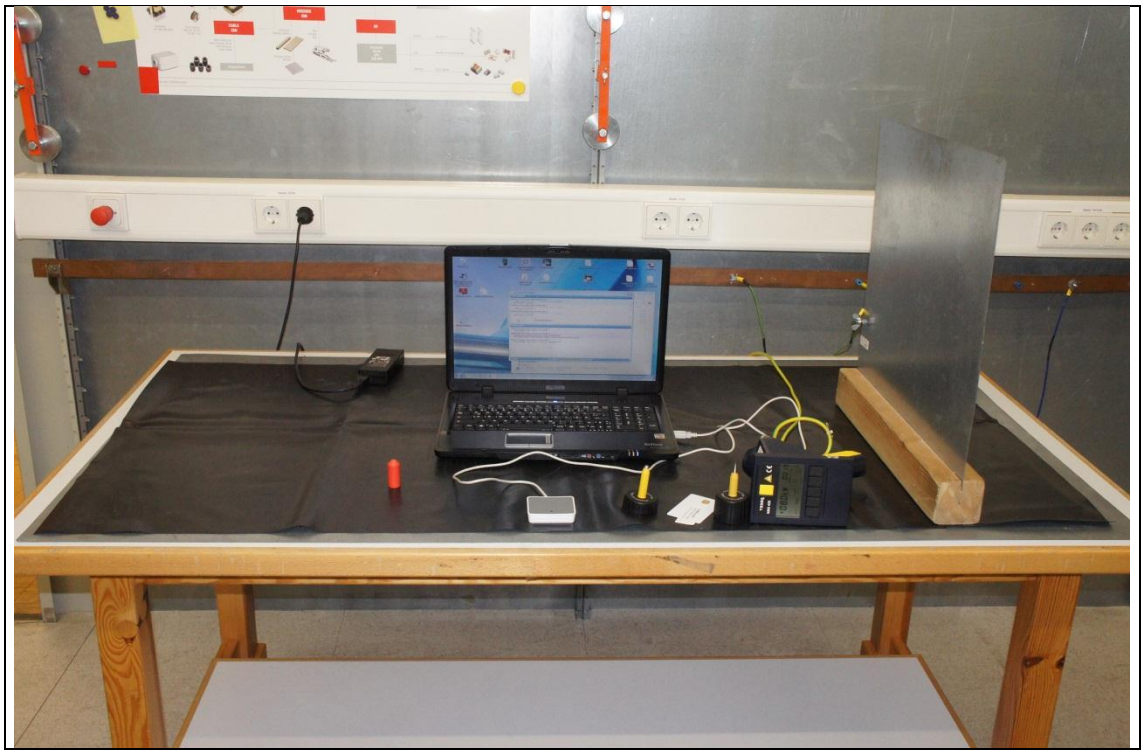
Test voltage:	☑ 2 kV	test level 1
	☑ 4 kV	test level 2
	☑ 8 kV	test level 3
	☐ 15 kV	test level 4
	☐ kV	test level x
Polarity:	☑ positive	
	☑ negative	
Discharges:	≥ 10 discharges per polarity	
Discharging points:	Card slot	

Contact discharge

Test voltage:	☑ 2 kV	test level 1
	☑ 4 kV	test level 2
	☐ 6 kV	test level 3
	☐ 8 kV	test level 4
	☐ kV	test level x
Polarity:	☑ positive	
	☑ negative	
Discharges:	≥ 25 discharges per polarity	
Discharging points:	direct:	USB shield
	indirect:	HCP, VCP

Climatic conditions:	Ambient temp.:	20	° C
	Relative humidity.:	41	%
	Barometric pressure:	96,8	kPa

Photo documentation



Picture 10: Test setup ESD

Test result

The requirements according to EN 61000-4-2 are

☑ **Kept**

☐ **Not kept**

Information about measurement uncertainty is on page 31.

Operating conditions during test:

Criterion

☑ A The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

☐ B After the test, the equipment shall continue to operate as intended without operator invention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.
If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

☐ C Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

Comments: During the test the function of the EUT was observed. Influences in any form or program interruptions did not occur.

7. Radiated, radio-frequency, electromagnetic field immunity test

according to EN 61000-4-3

Location of measurement

Description	Manufacturer	Inventory No.
Anechoic chamber	EMV **TESTHAUS** GmbH	E00100

Measurement equipment

	Model	Description	Manufacturer	Inventory
☑	SMT06	Signal Generator	Rohde & Schwarz	E00036
☑	BTA 0122-150W	Amplifier 9 kHz-220 MHz	Bonn	E00071
☑	BLWA 2010-100W	Amplifier 200-1000 MHz	Bonn	E00072
☐	AS0104-55/30	Amplifier 1 - 4GHz	Milmega	E00070
☑	VULB 9163	Antenna 30 – 3000 MHz	Schwarzbeck	E00012
☐	HL 023 A	Antenna 80 – 1300 MHz	Rohde & Schwarz	E00027
☐	BBHA 9120E	Antenne 1000 – 2700 MHz	Schwarzbeck	E00018
☑	COSF 3312	Power Switching Unit	Conformitas	E00037
☑	NRVD	Power Meter	Rohde & Schwarz	E00038
☑	NRV-Z51	Power Measuring Head	Rohde & Schwarz	E00075
☑	NRV-Z51	Power Measuring Head	Rohde & Schwarz	E00076

Test related measurement inaccuracies have to be taken into consideration when evaluating the test results.
All used test instrument as well as the test accessories are calibrated at regular intervals.

Test Conditions

Frequency range:	☑ 80 MHz - 1000 MHz	
	☐ 1400 MHz - 2000 MHz	
	☐ 2000 MHz - 2700 MHz	
Step size:	☑ 1 % of output frequency	
	☐ 4 % of output frequency	
Field strength:	☐ 1 V/m	test level 1
	☑ 3 V/m	test level 2
	☐ 10 V/m	test level 3
	☐ V/m	test level x
Modulation:	Kind of Modulation:	AM
	Modulation factor:	80 %
	Modulation frequency:	1 kHz
Dwell time:	☑ 3 seconds	
	☐ X seconds	
Antenna polarization:	☑ vertical	
	☑ horizontal	
Test distance:	☐ 1 m	
	☑ 3 m	
EUT position:	☑ front side	
	☑ rear side	
	☑ left side	
	☑ right side	
	☐ top	
	☐ bottom	
Observation of EUT:	Via video camera	

Climatic conditions:	Ambient temp.:	19	° C
	Relative humidity.:	43	%
	Barometric pressure:	96,8	kPa

Photo documentation

Picture 11: Test setup of radiated immunity test

Test result

The requirements according to EN 61000-4-3 are

☑ **Kept**

☐ **Not Kept**

Information about measurement uncertainty is on page 31.

Operating conditions during test:

Criterion

☑ A The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

☐ B After the test, the equipment shall continue to operate as intended without operator invention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.
If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

☐ C Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

Comments: During the test the function of the EUT was observed. Influences in any form or program interruptions did not occur.

8. Measurement uncertainty

Standard	Description	Max. deviation	k=
EN 55022	Conducted emission AMN (150kHz to 30 MHz)	+/- 4,1 dB	2
EN 55022	Radiated emission open field (30 MHz to 300 MHz) (300MHz to 1 GHz)	 +/- 5,4 dB +/- 4,7 dB	2
EN 61000-4-2	ESD	inside specification *	
EN 61000-4-3	Radiated immunity	+/- 1,8 dB a.)	1,64

Comment: The uncertainty stated is the expanded uncertainty obtained by multiplying the standard uncertainty by the coverage factor k. If k=2 the value of the measurands lies within the assigned range of values with a probability of 95 %.

* The specific requirements regarding to the standard was kept

a.) To maintain the claimed test level with a probability of 90 % an additional test level of 38 % percent must be added.

9. Summary

The EMC regulations according to the marked specifications are

☑ Kept

The Equipment under Test fulfills the general approval requirements mentioned.

☐ Not kept

The Equipment under Test does not fulfill the general approval requirements mentioned.

Straubing, November 8th, 2012

Fabian Schmidt	Markus Biberger
Test engineer	Technical executive
EMV **TESTHAUS** GmbH	EMV **TESTHAUS** GmbH