CETECOM ICT Services GmbH
Untertürkheimer Straße 6-10 . D-66117 Saarbrücken Phone: +49 (0) 681-598-0 Fax:-9075
EMC-Laboratory

Accredited testing-laboratory

DAR registration number: DAT-P-176/94-D1

Federal Motor Transport Authority (KBA)
DAR registration number: KBA-P 00070-97

Recognized by the Federal Communications Commission
Anechoic chamber registration no.: 90462 (FCC)
Anechoic chamber registration no.: 3462C-1 (IC)
Certification ID: DE 0001
Accreditation ID: DE 0002

Recognized by the Voluntary Control Council for Interference by Information Technology Equipment under the no.:
T-169, C-2043, R-1896

Test report no.	**:**	**4-3273-01-01/09_B**
Type identification	**:**	**PSD-II**
Applicant	**:**	**FRAMA AG**
FCC ID	**:**	**SSGPSD-II**
Test standards	**:**	**47CFR15**
		ICES-003, Issue 4

Table of Contents

1 General Information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

Test laboratory manager:

2009-12-03	David Lang	
Date	Name	Signature

Technical responsibility for area of testing:

2009-12-03	Uli Kraus	
Date	Name	Signature

1.2 Testing Laboratory

CETECOM ICT Services GmbH

Untertürkheimer Straße 6 - 10
66117 Saarbrücken
Germany
Phone: **+ 49 681 5 98 - 0**
Fax: **+ 49 681 5 98 - 9075**
e-mail: **info@ict.cetecom.de**
Internet: **http://www.cetecom-ict.de**

State of accreditation: The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025
DAR registration number: DAT-P-176/94-D1

Testing location, if different from CETECOM ICT Services GmbH:

Name :
Street :
Town :
Country :
Phone :
Fax :

1.3 Details of Applicant

Name:	FRAMA AG
Street:	Unterdorf
Town:	CH-3438 Lauperswil
Country:	
Telephone:	+41 34 496 98 98
Fax:	+41 34 496 98 00
Contact:	Mr Beat Wälti
E-mail:	
Telephone:	

1.4 Application Details

Date of receipt of order:	2009-06-09
Date of receipt of test item:	2009-06-15
Date of start test:	2009-06-15
Date of end test	2009-06-15
Person(s) who have been present during the test:	Mr Christoph Müller

1.5 Information about Test Item

1.5.1 Details of Manufacturer

Name	**:**	FRAMA AG
Street	**:**	Unterdorf
Town	**:**	CH-3438 Lauperswil
Country	**:**	

1.5.2 Test Item

Kind of test item	**:**	cryptographic device for office equipments		
Type identification	**:**	**PSD-II**		
Equipment classification:		Equipment for fixed use		
Environment classification:		Residential, commercial and light industry		
Supply voltage	**:**	AC 115 V/ 60 Hz		
Ports	**:**	**Description**	**Direction**	**Length**
(maximum cable lengths		DC power port 5V	Input	> 3m
declared by manufacturer)		Signal/control port	In / output	> 3m
Is mounting position / usual operating position defined?				No
Additional information:				
The device is listed with the FCC ID: SSGPSD-II				

1.5.3 EUT: Type, S/N etc. and Short Descriptions Used in this Test Report

short descrip-tion*)	EUT	Type	S/N serial number	HW hardware status	SW software status
EUT A	cryptographic device for office equipments	PSD II	0000001	V.1.0	V.2.0.0

*) EUT short description is used to simplify the identification of the EUT in this test report.

1.5.4 Auxiliary Equipment (AE): Type, S/N etc. and Short Descriptions

AE description*)	Auxiliary equipment	Type	S/N serial number	HW hardware status	SW software status
AE A	AC/DC Adaptor	A25B3-02MP	A990210366	Unknown	Unknown
AE B	Customers Notebook	ASUS L3800 C	2ANP004451	Unknown	Windows 2000

*) AE short description is used to simplify the identification of the auxiliary equipment in this test report.

1.5.5 EUT Set-up's

EUT set-up no.*)	Combination of EUT and AE	Remarks
set. 1	EUT A + AE A + AE B	-/-

*) EUT set-up no. is used to simplify the identification of the EUT set-up in this test report.

1.5.6 EUT Operating Modes

EUT operating mode no.*)	Description of operating modes	Additional information
op. 1	Read data	Read data from EUT

*) EUT operating mode no. is used to simplify the test report.

1.5.7 Photo Documentation of Test Item

Photo 1: EUT A (top view)

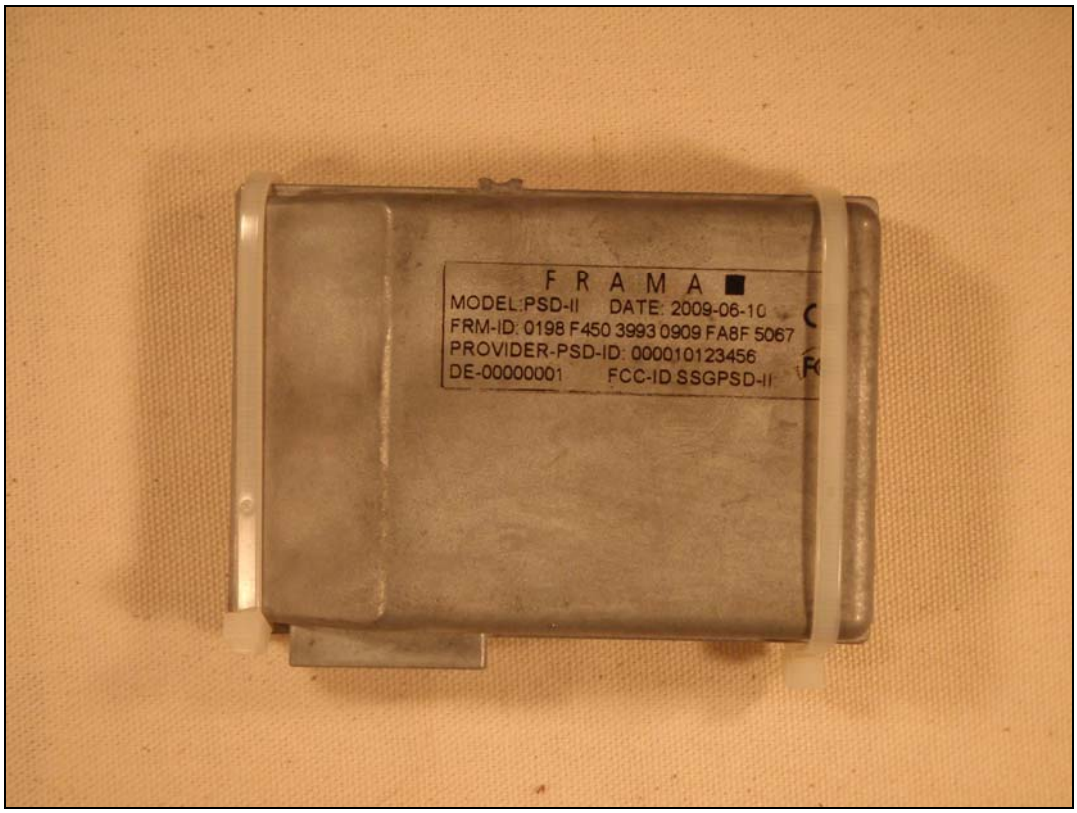


Photo 2: EUT A (side view)

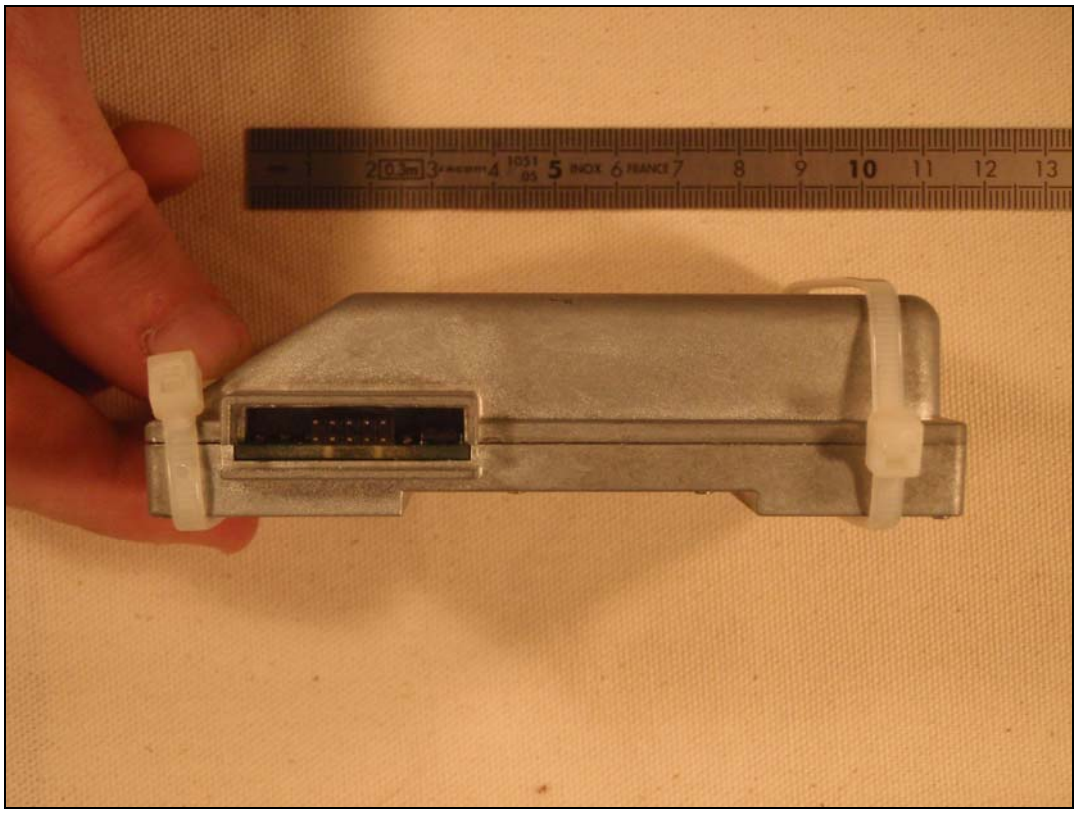


Photo 3: EUT A (rear view)

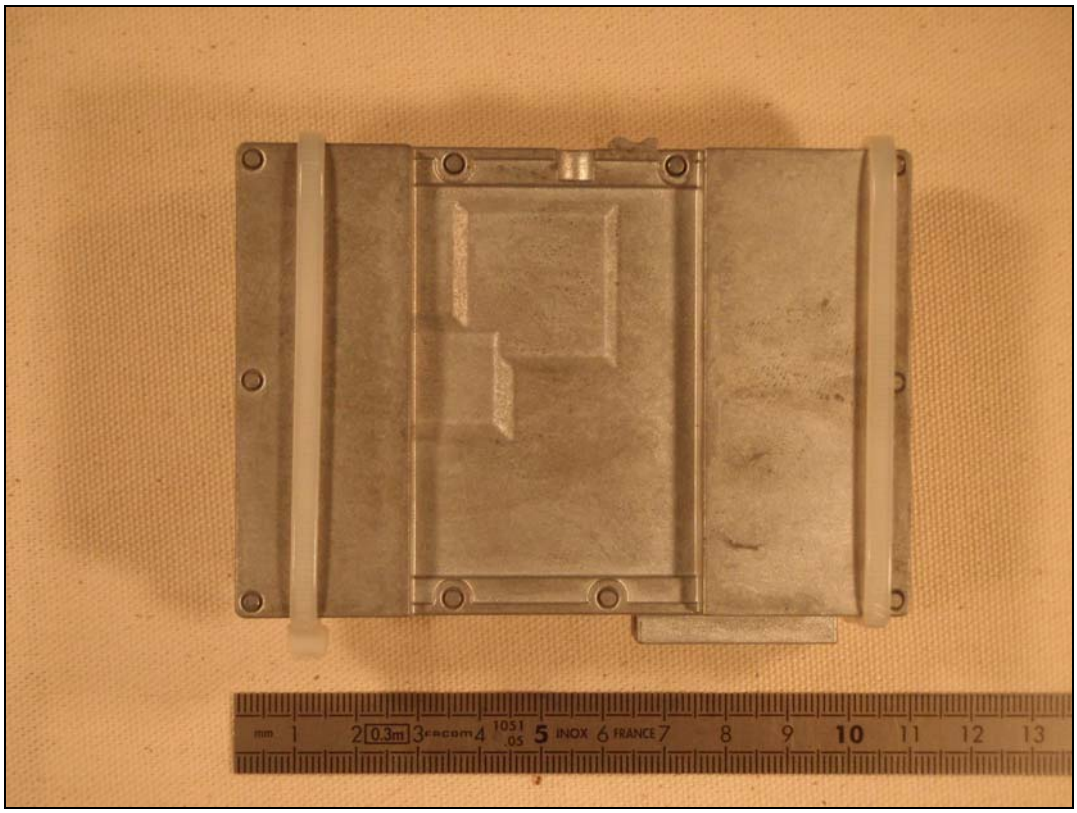


Photo 4: EUT A (interior view)

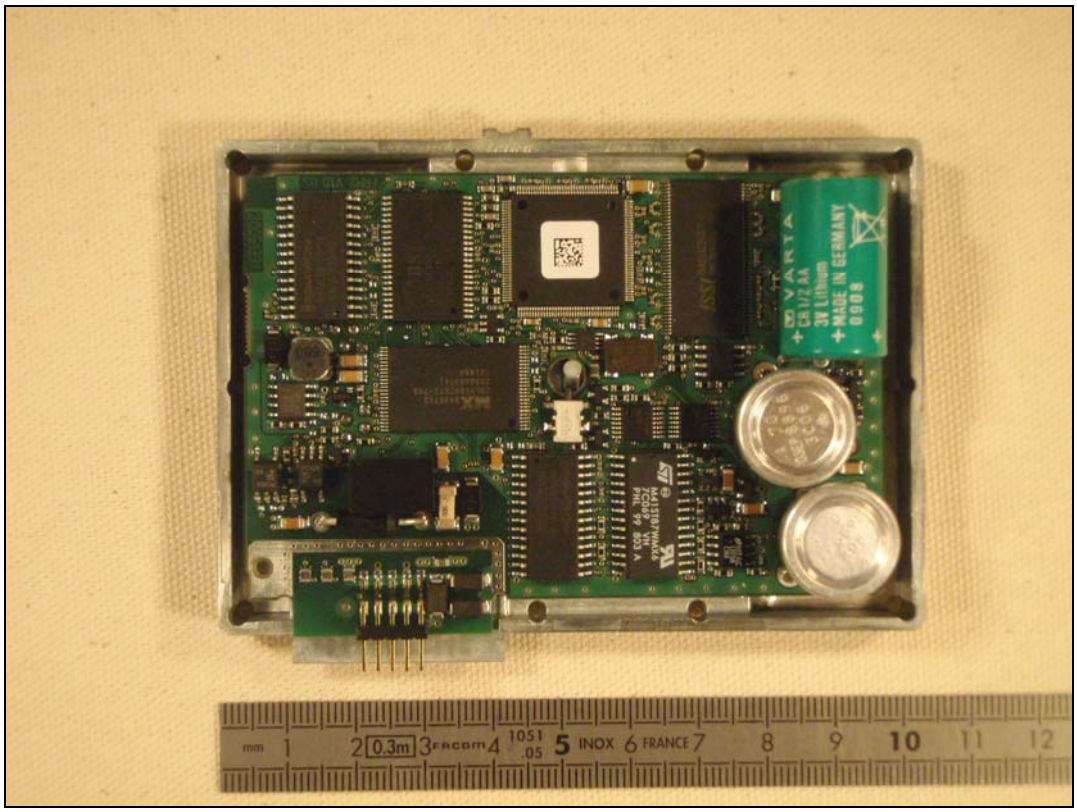


Photo 5: EUT A (interior view)

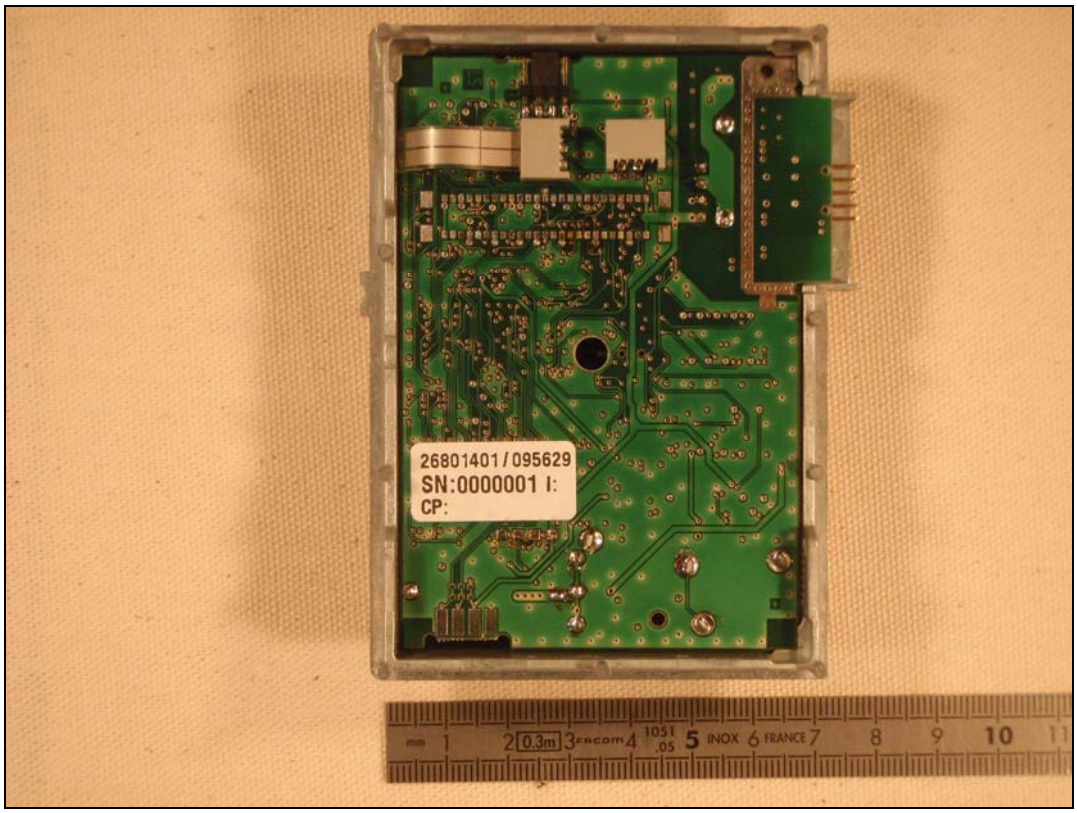


Photo 6: EUT A (interior view)

1.6 Test Standard/s:

47CFR15	**2008-07**	**Subpart B - Unintentional Radiators**
ICES-003, Issue 4	**2004-02**	**Interference-Causing Equipment Standard Digital Apparatus**

2 Technical Tests

2.1 Summary of Test Results

☒ **No deviations from the technical specifications were ascertained**
☐ There were deviations from the technical specifications ascertained

2.1.1 Emission

2.1.1.1 Enclosure

EMI Phenomenon	Frequency range	Emission level (Limit) Class B		Basic standard	Result	Remark
		Quasi-peak				
Radiated Interference Field Strength	30 – 88 MHz 88 - 216 MHz 216 - 960 MHz 960 - 1000 MHz	30,0 dBµV/m 33,5 dBµV/m 36,0 dBµV/m 44,0 dBµV/m	10m 10m 10m 10m	FCC Part 15	Passed	Set 1
Radiated Interference Field Strength	1 GHz – 6 GHz	44,0 dBµV/m	10m	FCC Part 15	-/-	NA 6

2.1.1.2 AC Mains Power Input/Output Ports

EMI Phenomenon	Frequency range	Emission level (Limit) Class B		Basic standard	Result	Remark
		Quasi-peak	Average			
Conducted interference voltage	0,15 – 0,5 MHz 0,5 – 5 MHz 5 – 30 MHz	66 – 56 dBµV 56 dBµV 60 dBµV	56 – 46 dBµV 46 dBµV 50 dBµV	FCC Part 15	Passed	Set 1

Remarks:

NA1	Not tested because not required by used standard
NA2	Test not applicable because port does not exists
NA3	Test not applicable because port only for services
NA4	Test not applicable because port lengths not longer than 3m
NA5	Not tested because not required by customer
NA6	Not tested because used frequency < 108 MHz

2.2 Laboratory Environment

Temperature : 21°C – 23°C

Relative humidity content : 55 %

Air pressure : 1020 hPa

Details of mains power : AC 230 V +/- 5%

2.3 Measurement and Test Set-up

Note: The test configuration is in accordance with the requirements given in the standards in point 1.6

2.4 Measurement uncertainty

The uncertainty of the measurement equipment fulfils CISPR 16 and the related European and national standards.

The semi anechoic chamber fulfils the requirements of CISPR 16-1 (ANSI C63.4) for a test volume of 3m ∅.

Measurement uncertainty calculations are on file and available from the test laboratory upon request.

2.5 Test Equipment Utilised

To simplify the identification of the test equipment used on each page of the test report, each item of test equipment and ancillaries such as probes are identified throughout the report by numbers in brackets according to the table below.

No.	Instrument/Ancillary	Manufacturer	Type	Serial-No.	Internal identification
	Radiated emission in chamber F				
F-1	Control Computer	F+W		FW0502032	300003303
F-2	Trilog-Antenna	Schwarzbeck	VULB 9163	9163-295	---
F-3a	Amplifier	Veritech Microwave Inc.	0518C-138	- / -	- / -
F-4b	Switch	HP	3488A	- / -	300000368
F-5	EMI Test receiver	R&S	ESCI	100083	300003312
F-6	Turntable Interface-Box	EMCO / ETS-LINDGREN	Model 105637	44583	300003747
F-7	Tower/Turntable Controller	EMCO / ETS-LINDGREN	Model 2090	64672	300003746
F-8	Tower	EMCO / ETS-LINDGREN	Model 2175	64762	300003745
F-9	Ultra Notch-Filter Rejected band Ch. 62	WRCD		9	
	Radiated immunity in chamber F				
F-10	Control Computer	F+W		FW0502032	300003303
F-11	Signal Generator	R&S	SML 03	102519	300003407
F-12	RF-Amplifier	ar	50W1000	12932	300001438
F-13	Directional Coupler	ar	DC 3010	12708	300001428
F-14	Logper Antenna	R&S	HL023A1	323704/016	300001476
F-15	RF-Amplifier	ar	60S1G3	313649	300003410
F-16	Directional Coupler	ar	DC7144A	312786	300003411
F-17	Horn Antenna	ar	AT 4002	19739	300000633
F-18	Power Meter	R&S	NRV	860327/024	F033
F-19	Power sensor	R&S	URV5-Z2	839080/005	300002844.02
F-20	Power sensor	R&S	URV5-Z2	830755/057	F032
	Harmonics and flicker in front of chamber F				
F-21	Flicker and Harmonics Test System	Spitzenberger & Spies	PHE4500/B I PHE4500/B II	B5983 B5984	300000210
F-22	Control Unit	Spitzenberger & Spies	STE	B5980	300000210
F-23	Power Amplifier	Spitzenberger & Spies	EP 4500/B	B5976	300000210
F-24	Conect Panel	Spitzenberger & Spies	Conect panel	B5982	300000210
F-25	Power Supply	Spitzenberger & Spies	NT-EP 4500	B3977	300000210
F-26	Additional transformer	Spitzenberger & Spies	UT-EP 4500	B5978	300000210
F-27	Analyzer Reference System	Spitzenberger & Spies	ARS 16/1	A3509 07/0 0205	300003314
F-28	Power Supply	Hewlett Packard	6032 A	2920 A 04466	300000580
	Radiated emission in chamber F > 1GHz				
F-29	Horn antenna	Schwarzbeck	BBHA 9120 B	9120B188	300003896
F-30	Spectrum Analyzer	R&S	FSU 26	200809	
F-31	Amplifier	Miteq	42-00502650-28-5A	1103782	300003379

No.	Instrument/Ancillary	Manufacturer	Type	Serial-No.	Internal identification
	Conducted emission in chamber G				
G-1	EMI Receiver	Hewlett Packard	8542 E	3617A00170	300000568
G-2	V-ISN	Rohde & Schwarz	ESH 3-Z5	893045/004	300000584
G-2a	V-ISN	Rohde & Schwarz	ESH 2-Z5	892602/024	300000587
G-3	2-Wire ISN	Schaffner	ISN T200	19075	300003422
G-4	4-Wire ISN	Schaffner	ISN T400	22325	300003423
G-5	Shielded wire ISN	Schaffner	ISN ST08	22583	300003433
G-6	Unshielded 8 wire ISN	Teseq	ISN T800	26113	300003833
G-7	Unshielded 8 wire ISN	Teseq	ISN T8-Cat. 6	26374	300003851
G-8	RF Current probe	FCC	F-33-4	46	300003257
G-9	V-ISN	Schaffner	ISN PLC-150	21579	300003318
G-10	V-ISN	Schaffner	ISN PLC-25-30	21584	300003319
G 10a	PLC Filter	TESEQ	Filter PLC	23436	300003598
G 10b	Coupling unit 75 Ohm	Fiedler	AC	----	300003272.04
	Conducted immunity in chamber G				
G-11	Signal generator	HP	8657A	2838 A 00638	300000369
G-12	RF-Amplifier	BONN	BSA 0125-75	066502-01	300003545
G-13	Power Meter	R&S	URV 5	837723/025	300002844.01
G-14	Power Sensor	R&S	URV 5-Z2	832874/021	300002239
G-15	Directional coupler	emv	DC 2000	9401-1677	300000592
G-16	Attenuator 6dB	Alan	50HP6-100 N	121048 0348	300003148
G-17	EM-Injection Clamp	FCC	203i	232	300000626
G-18	CDN	FCC	FCC-801-M3-16	237	300000627
G-19	CDN	FCC	FCC-801-T2	78	300000629
G-20	CDN	FCC	FCC-801-AF 2	62	300000630
G-21	CDN	FCC	FCC-801-AF 4	61	300000631
G-22	CDN	FCC	FCC-801-M1	2027	300002761
G-23	CDN	Lüthi	CDN 801-M2/M3	9350105	300000534
G-24	Transformator for 50Hz Loop Antenna	EM-Test	MC2630	0200-10	300002659.01
G-25	50Hz Loop Antenna	EM-Test	MS 100	none	300002659
	Surge, Burst, Dips and Interruptions in chamber G				
G-26	Hybrid-Generator	EM-Test	UCS 500M6	0399-07	300002599
G-27	Motor Variac	EM-Test	MV 2616	0600-01	300002658
G-28	Capacitive Coupling Clamp	MWB	KKS 100	---	300000589
G-29	Coupling Decoupling Network	EMC-Partner	CDN-UTP	00014	300003226
	ESD in chamber G				
G-30	ESD generator	Schaffner	NSG 435	308	300002249
	Emission on bench in chamber G				
G-31	Absorbing Clamp	R&S	MDS-21	832 231/006	300000527

3 Test Performed

3.1 Emission Tests

3.1.1 Conducted Emission

3.1.1.1 Instrumentation for Test (see equipment list)

G 1	G 2	F 23	F 21								

3.1.1.2 Test Plan

EUT set-up	Set 1		
Operating mode	**Port / Line**	**Limit**	**Result**
Op 1	AC power line	FCC Part 15	passed

Remark :	Powered by external power supply AE A (115V / 60Hz)

3.1.1.3 Conducted Limits (Power-Line)

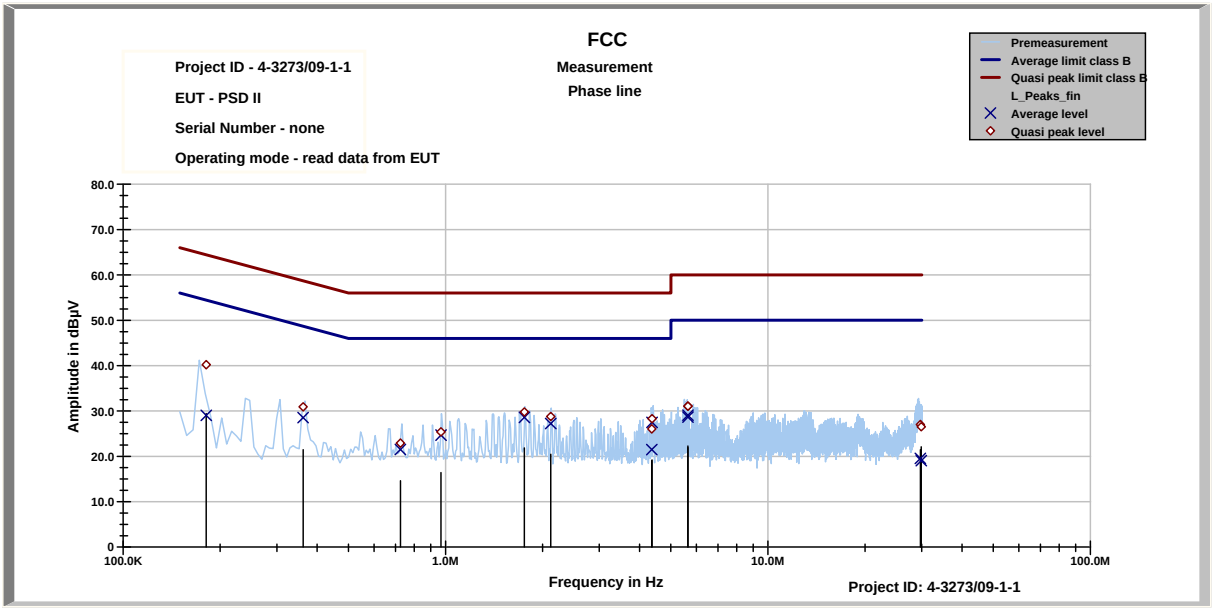
	47CFR15: (FCC part 15 B) Class B		**47CFR15: (FCC part 15 B) Class A**	
Frequency- range	Quasi-Peak (dBµV)	Average (dBµV)	Quasi-Peak (dBµV)	Average (dBµV)
0,15 MHz – 0,5 MHz	66-56	56-46	79	66
0,5 MHz -5 MHz	56	46	73	60
5 MHz -30 MHz	60	50	73	60

3.1.1.4 Calibration Information

Device	**Serial number**	**ICT Number**	**Calibration valid until**	**Calibration interval**
HP 8542 EMI Receiver with RF Filter Unit	3617A00170	300000568	01 / 2010	12 month
ESCI	100083	3000003312	01 / 2010	12 month
VISN ESH 3-Z5	893045/004	300000584	01 / 2010	24 month
VISN ESH 2-Z5	892602/024	300000587	01 / 2010	24 month

Remarks: All emission components and the shielded room were checked weekly
Cable loss: 0.6 to 2.4 dB (150kHz to 30 MHz)

3.1.1.5 Test Results of Main

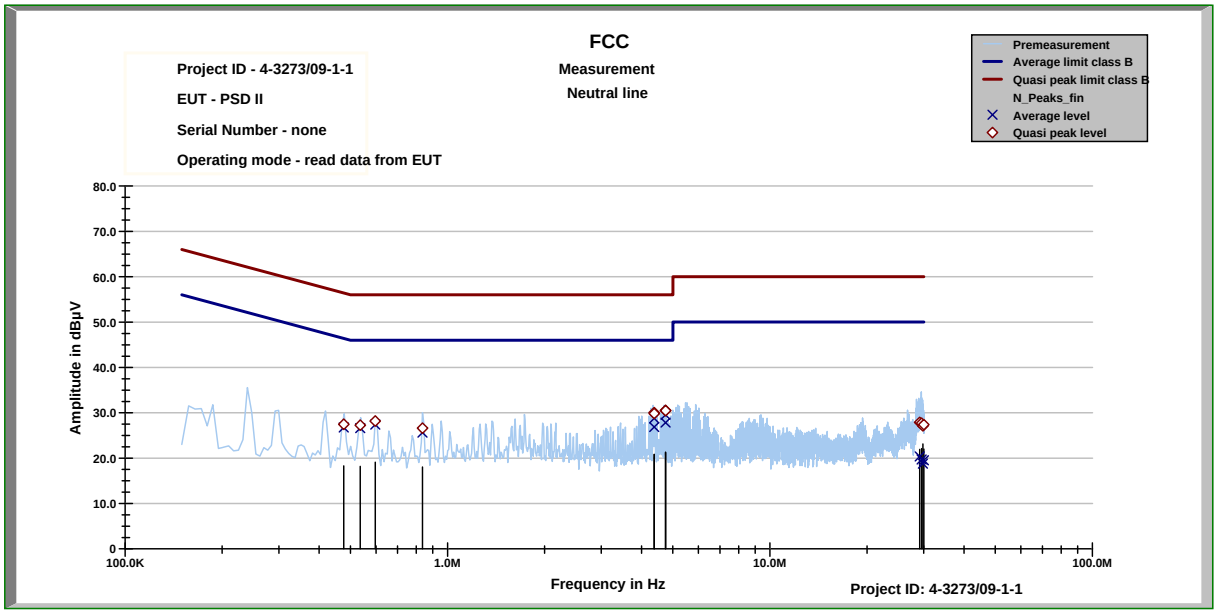


FCC
Phase line tbl
Project ID: 4-3273/09-1-1

11:57:30 AM, Monday, June 15, 2009

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.18118	40.20	24.23	29.01	26.10
0.36165	30.90	27.79	28.52	21.43
0.72447	22.90	33.10	21.50	24.50
0.96796	25.39	30.61	24.68	21.32
1.7559	29.77	26.23	28.59	17.41
2.1199	28.76	27.24	27.20	18.80
4.3612	26.03	29.97	21.48	24.52
4.3675	28.30	27.70	27.48	18.52
5.6436	31.06	28.94	28.66	21.34
5.647	31.05	28.95	29.05	20.95
29.667	27.00	33.00	19.52	30.48
29.866	26.51	33.49	19.02	30.98

Project ID - 4-3273/09-1-1
EUT - PSD II
Serial Number - 0000001
Operating mode - read data from EUT



FCC
Neutral line tbl
Project ID: 4-3273/09-1-1

11:57:30 AM, Monday, June 15, 2009

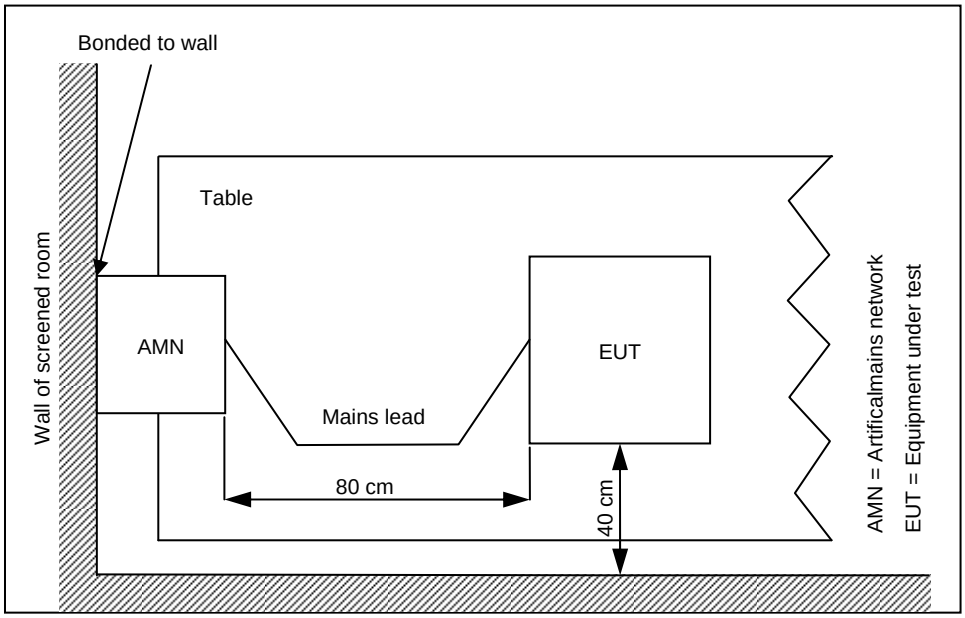
Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.47692	27.45	28.94	26.76	19.90
0.53622	27.25	28.75	26.60	19.40
0.59668	28.18	27.82	27.37	18.63
0.83605	26.60	29.40	25.61	20.39
4.3708	30.02	25.98	28.74	17.26
4.3746	29.84	26.16	26.85	19.15
4.7416	30.51	25.49	29.55	16.45
4.7444	30.47	25.53	27.82	18.18
29.099	27.87	32.13	20.36	29.64
29.514	27.68	32.32	19.69	30.31
29.7829	27.11	32.89	18.78	31.22
29.9909	27.38	32.62	19.51	30.49

Project ID - 4-3273/09-1-1
EUT - PSD II
Serial Number - 0000001
Operating mode - read data from EUT

3.1.1.6 Test Set-up

According to EMC basic standard **47CFR15: (FCC part 15 B)**

A measurement with spectrum analyzer and peak-detector is performed. If no limit exceeding of specified limits occur, the measurement is concluded at this stage. If the limit exceeding occurs, measurements are carried out with the quasi-peak detector at the frequencies at which the exceeding occur.



3.1.1.7 Photo Documentation of Test Set-up

Photo 7: Conducted emission test-setup

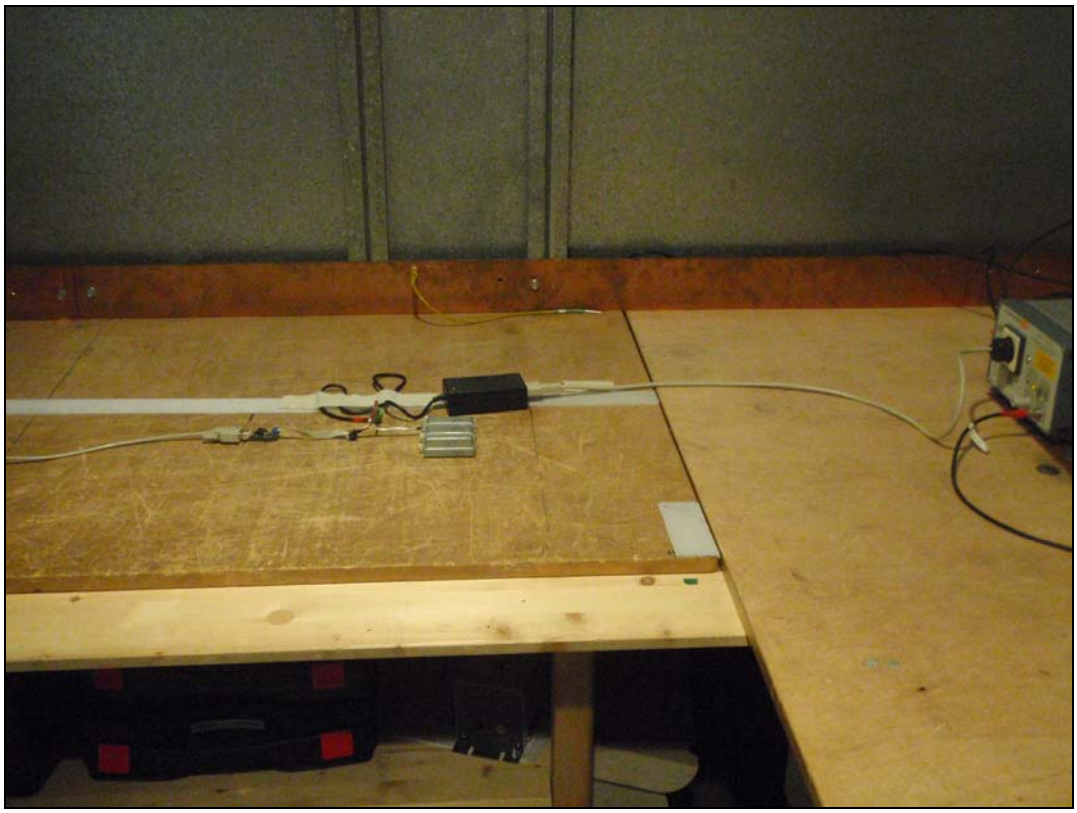
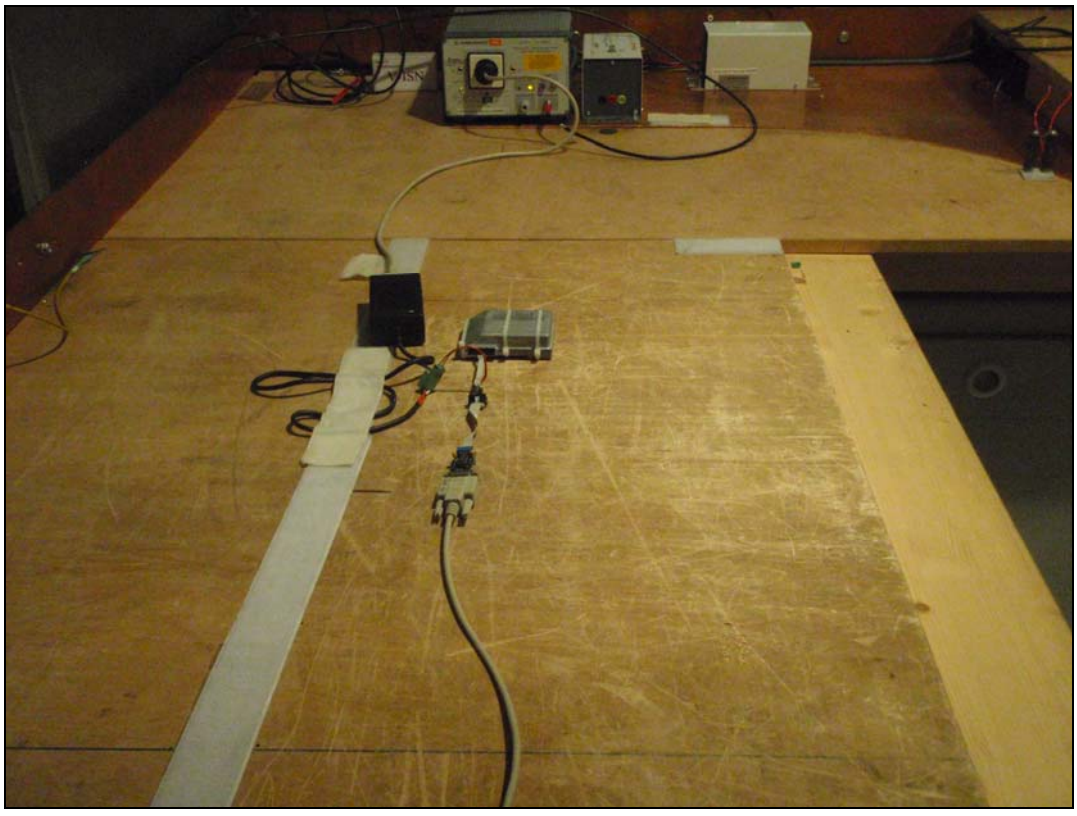


Photo 8: Conducted emission test-setup



3.1.2 Electromagnetic Radiated Emissions (Distance 10 m)

3.1.2.1 Instrumentation for Test (see equipment list)

F 1	F 2	F 3	F 4	F 5	F 6	F 23					

3.1.2.2 Test Plan

EUT set-up	Set 1		
Operating mode	**Application**	**Limit**	**Result**
Op 1	Enclosure	FCC part 15 B Class B	passed

Remarks:	-/-

3.1.2.3 Radiated Limits

Frequency- range	**47CFR15: (FCC part 15 B) Class B ***	**47CFR15: (FCC part 15 B) Class A**
30 MHz – 88 MHz	30 dBµV/m	39,1 dBµV/m
88 MHz – 216 MHz	33,5 dBµV/m	43,5 dBµV/m
216 MHz – 960 MHz	36 dBµV/m	46,4 dBµV/m
960 MHz – 1000 MHz	44 dBµV/m	49,5 dBµV/m
	* This values are recalculated from the class B limits at 3 m antenna distance in §15.109 (g 2) of the FCC rules	.

3.1.2.4 Calibration Information

Device	**Serial number**	**ICT Number**	**Calibration valid until**	**Calibration interval**
ESCI 3 Receiver	100083/003	300003312	01/2010	12 month
Trilog Antenna	9163-295	---	04/2010	24 month
Remarks: System check of all relevant devices and the chamber (weekly) Cable loss: 0.5 to 4.2 dB (30 MHz to 2 GHz); the cable and connectors loss is re-measured every 3 month				

3.1.2.5 Test Results

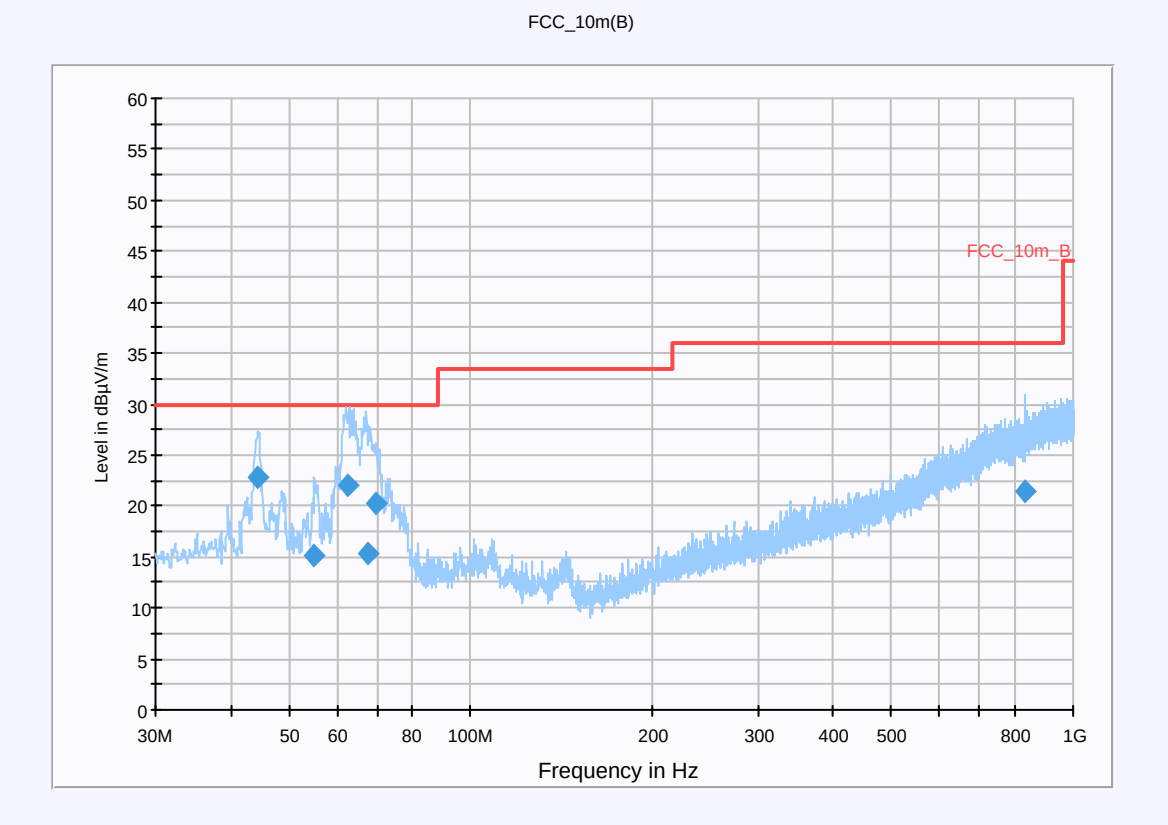
Common Information

EUT:	PSD II
Serial Number:	0000001
Test Description:	FCC part 15 B class B
Operating Conditions:	read data from EUT
Operator Name:	Lang
Comment:	Powerd with AC/DC Adaptor 115 V/ 60 Hz – 5 V DC

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

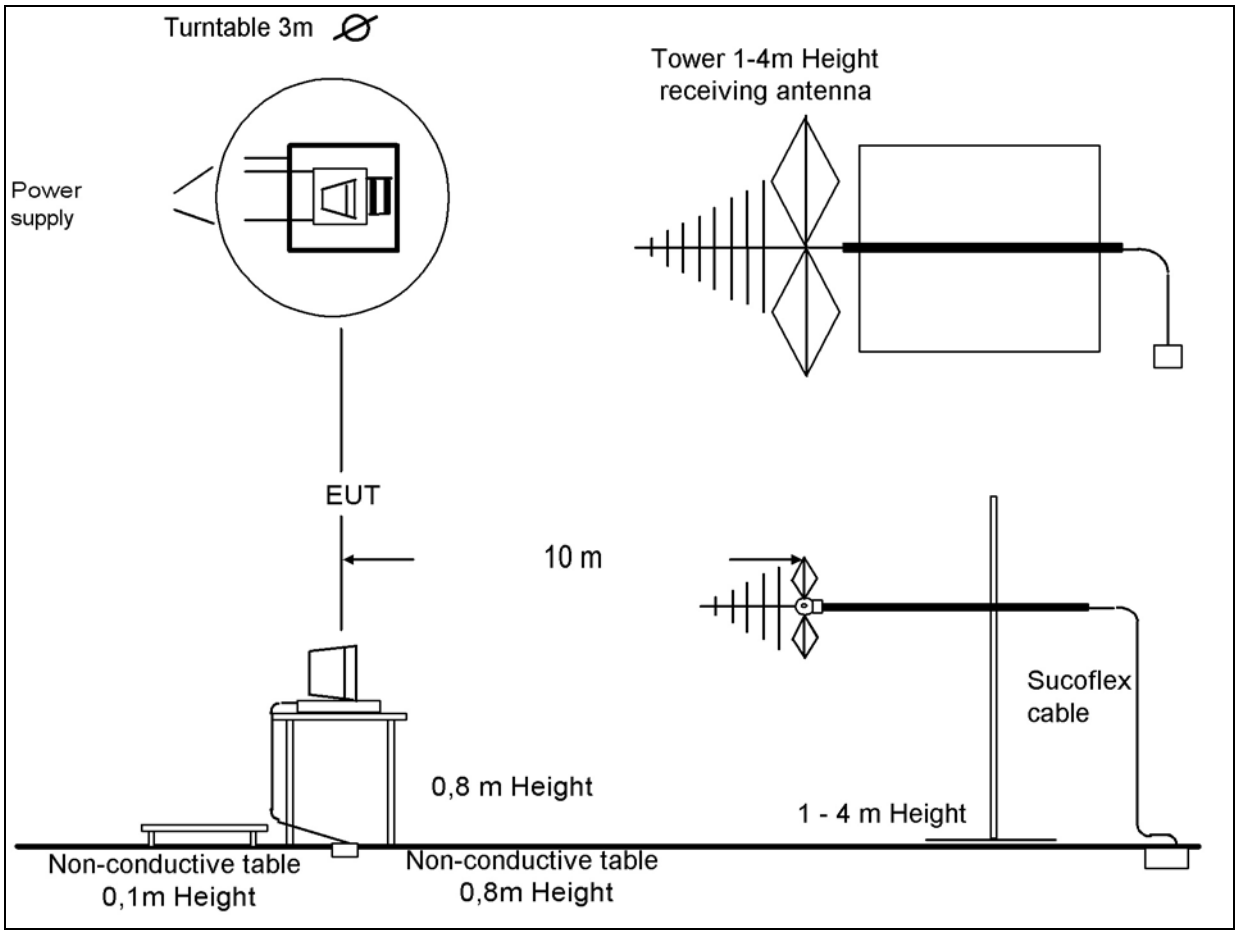
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
44.411300	22.9	15000.000	120.000	128.0	V	72.0	13.4	7.1	30.0	
55.061000	15.1	15000.000	120.000	400.0	V	267.0	13.1	14.9	30.0	
62.682050	22.0	15000.000	120.000	287.0	V	317.0	11.2	8.0	30.0	
67.333500	15.3	15000.000	120.000	285.0	V	5.0	10.1	14.7	30.0	
69.693000	20.2	15000.000	120.000	217.0	V	296.0	9.6	9.8	30.0	
829.875450	21.5	15000.000	120.000	198.0	V	108.0	24.8	14.5	36.0	

3.1.2.6 Hardware Set-up

Subrange 1

Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0109)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12
	EMC 32 Version 8.10.00

3.1.2.7 Test Set-up



3.1.2.8 Photo Documentation of Test Set-up

Photo 9: Radiated emission test-setup

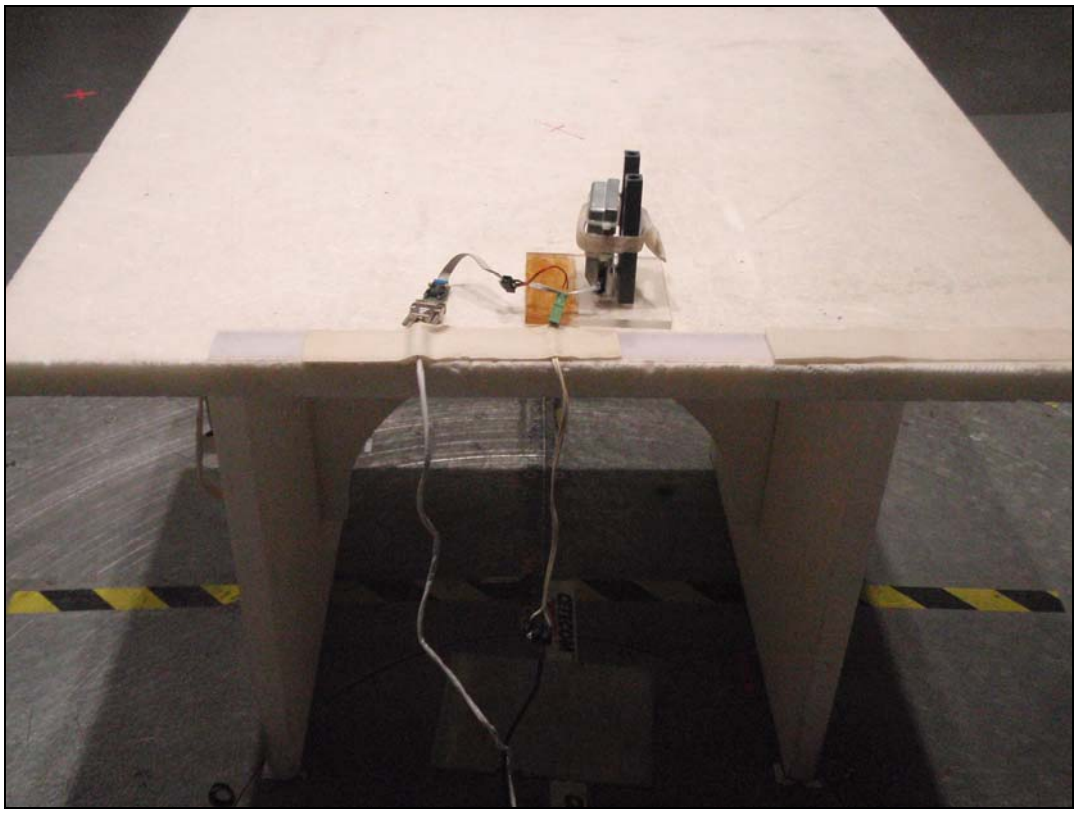


Photo 10: Radiated emission test-setup