InterLab®

FCC Measurement/Technical Report on

GSM gateway
ECOTEL VTMpro

Report Reference: 4_Vierl_0105_ERF_FCCb

Test Laboratory:

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Borsigstrasse 11
40880 Ratingen
Germany
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FCC Registration Number
96716

Note:
The following test results relate only to the devices specified in this document. This report shall not be reproduced in parts without the written approval of the testing laboratory.

Table of Contents

0 Summary

0.1 Technical Report Summary

Type of Authorization
RF Exposure Report (MPE, Maximum Permissible Exposure) for a GSM cellular multiple transmitter radiotelephone device

Applicable FCC Rules

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in 47 CFR Ch.1 Parts 0 to 19 and Parts 20 to 69. The following subparts are applicable to the results in this test report.

Part 1

§ 1.1307 Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared

§ 1.1310 Radiofrequency radiation exposure limits

Additionally, the results are obtained following the

FCC OET Bulletin 65, Edition 97-01 (August 1997)

Summary Test Results:

The EUT complied with all performed tests as listed in chapter 0.2 Measurement Summary and subject to the conditions given in chapter 3.2.4 Evaluation of Exposure to RF Emissions.

The measurements are performed following the requirements of FCC Part 1 § 1.1310 and FCC OET Bulletin 65.

The applicant proposed the measurements.

0.2 Measurement Summary

Radiated Field Strength

The measurement was performed according to FCC §1.1310 10-01-2004

OP-Mode	Setup	Port	Final Result *)
op-mode 1	Setup_a01	antenna connector	compliant
op-mode 2	Setup_a01	antenna connector	compliant
op-mode 3	Setup_a01	antenna connector	compliant
op-mode 4	Setup_a01	antenna connector	compliant
op-mode 5	Setup_a01	antenna connector	compliant
op-mode 6	Setup_a01	antenna connector	compliant

*) under the terms of chapter **3.2.4 Evaluation of Exposure to RF Emissions**

Responsible for Accreditation Scope: _____ Responsible for Test Report: _____

7 layers AG, Borsigstr. 11
40880 Ratingen, Germany
Phone +49 (0)2102 749 0

1 Administrative Data

1.1 Testing Laboratory

Company Name:	7 Layers AG
Address	Borsigstr. 11 40880 Ratingen Germany

This facility has been fully described in a report submitted to the FCC and accepted under the registration number 96716.

The test facility is also accredited by the following accreditation organisation:

- Deutscher Akkreditierungs Rat	DAR-Registration no. DAT-P-192/99-01
Responsible for Accreditation Scope:	Dipl.-Ing. Bernhard Retka Dipl.-Ing. Arndt Stöcker Dipl.-Ing. Thomas Hoell
Report Template Version:	2005-06-24

1.2 Project Data

Responsible for testing and report:	Dipl.-Ing. Andreas Petz
Receipt of EUT:	2005-04-05
Date of Test(s):	2005-04-05 to 2005-04-07
Date of Report:	2005-07-20

1.3 Applicant Data

Company Name:	Vierling Communication GmbH
Address:	Pretzfelder Str. 21 91320 Ebermannstadt Germany
Contact Person:	Mr. Friedrich

1.4 Manufacturer Data

Company Name:	please see applicant data
Address:	
Contact Person:	

2 Testobject Data

2.1 General EUT Description

Equipment under	GSM gateway
Type Designation:	ECOTEL VTMpro
Kind of Device:	GSM 850/1800/1900
(optional)	
Voltage Type:	AC 50 Hz / 60 Hz
Voltage level:	100 - 240 V

General product description:

The Equipment Under Test (EUT) is a GSM 850/1800/1900 gateway.
In GSM 850 mode the EUT operates in channel blocks A and B from 824,2 MHz (lowest channel = 128) to 848,8 MHz (highest channel = 251).
In PCS1900 mode the EUT operates in blocks A through F from 1850,2 MHz (lowest channel = 512) to 1909,8 MHz (highest channel = 810).

The EUT provides the following ports:

Ports
antenna connector
enclosure

The main components of the EUT are listed and described in Chapter 2.2

2.2 EUT Main components

Type, S/N, Short Descriptions etc. used in this Test Report

Short Description	Equipment under Test	Type Designation	Serial No.	HW Status	SW Status	Date of Receipt
EUT A (Code: BN000a01)	GSM gateway	VTMpro	IPC9907702	1.1	0.1.38	2005-04-05
Remark: EUT A is equipped with a permanent antenna connector.						

NOTE: The short description is used to simplify the identification of the EUT in this test report.

2.3 Ancillary Equipment

For the purposes of this test report, ancillary equipment is defined as equipment which is used in conjunction with the EUT to provide operational and control features to the EUT. It is necessary to configure the system in a typical fashion, as a customer would normally use it. But nevertheless Ancillary Equipment can influence the test results.

Short Description	Equipment under Test	Type Designation	HW Status	SW Status	Serial no.	FCC ID
AE1	external antenna	Kathrein Dual-band Omni Antenna VPol Omni 824–960/1805–2170 360° 2dBi Type No. 800 10147	–	–	–	–

2.4 EUT Setups

This chapter describes the combination of EUT's and ancillary equipment used for testing.

Setup No.	Combination of EUTs	Description
setup_a01	EUT A + AE1	setup for radiated tests (1 GSM module operating, 1 antenna)

2.5 Operating Modes

This chapter describes the operating modes of the EUT's used for testing.

Op. Mode	Description of Operating Modes	Remarks
op-mode 1	Call established on Traffic Channel (TCH) 512, Carrier Frequency 1850,2 MHz	512 is the lowest channel
op-mode 2	Call established on Traffic Channel (TCH) 661, Carrier Frequency 1880 MHz	661 is a mid channel of the full GSM band
op-mode 3	Call established on Traffic Channel (TCH) 810, Carrier Frequency 1909,8 MHz	810 is the highest channel
op-mode 4	Call established on Traffic Channel (TCH) 128, Carrier Frequency 824,2 MHz	128 is the lowest channel
op-mode 5	Call established on Traffic Channel (TCH) 190, Carrier Frequency 836,6 MHz	190 is a mid channel of the full GSM band
op-mode 6	Call established on Traffic Channel (TCH) 251, Carrier Frequency 848,8 MHz	251 is the highest channel

3 Test Results

3.1 Radiated Field Strength

Standard FCC Part 1, 10-01-2004

The test was performed according to: FCC §1.1310, 10-01-2004 and FCC OET Bulletin 65, Edition 97-01, August 1997.

3.1.1 Test Description

1) The EUT was placed inside an anechoic chamber. Refer to chapter "Setup Drawings". Between the R&S CMD55 / CMU200 Digital Communication Tester which was located outside the chamber and the EUT a GSM link was established over air (no cable connections).

2) A speech call was established on a Traffic Channel (TCH) between the EUT and the base station simulator (R&S CMD55 / CMU200 Digital Communication Tester).
Important Settings:
- Discontinuous Transmission: OFF
- Modulation Signal: PSR16-1 (Pseudo Random Sequence)
- Output Power: Maximum
- Channel : Varied during measurements

3) The electric field strength transmitted from the EUT / Ancillary Equipment was recorded for the different positions of the turntable while the turntable is rotating in steps of 15 degrees. The RF radiated field strength was determined by using a calibrated field probe which measures the vectorial sum of all three axis (x-, y-, z-axis). The measurement result is the average value of the electric field strength (spatial and time averaged).
The measurement was performed at a distance between the EUT and the field probe of 1.0 and 0.2 meters.

3.1.2 Test Protocol (GSM 1900)

Temperature: 25 °C
Air Pressure: 1025 hPa
Humidity: 30 %

Op. Mode	Setup	Port
op-mode 1	setup_a01	antenna connector

RF Radiated Field Strength

Frequency MHz	Height of Field Probe m	Distance EUT – Field Probe m	Measured Average Field Strength V / m	Limit V / m
1850.2	1.65	1.0	2.22	-
1850.2	1.65	0.2	8.08	-

Remark: The height is the height above the ground of the fully anechoic chamber. In the table above the value of the field strength is given for the worst case position of the turntable.

Temperature: 25 °C
Air Pressure: 1025 hPa
Humidity: 30 %

Op. Mode	Setup	Port
op-mode 2	setup_a01	antenna connector

RF Radiated Field Strength

Frequency MHz	Height of Field Probe m	Distance EUT – Field Probe m	Measured Average Field Strength V / m	Limit V / m
1880.0	1.65	1.0	1.78	-
1880.0	1.65	0.2	7.58	-

Remark: The height is the height above the ground of the fully anechoic chamber. In the table above the value of the field strength is given for the worst case position of the turntable.

Temperature: 25 °C
Air Pressure: 1025 hPa
Humidity: 30 %

Op. Mode	Setup	Port
op-mode 3	setup_a01	antenna connector

RF Radiated Field Strength

Frequency MHZ	Height of Field Probe m	Distance EUT – Field Probe m	Measured Average Field Strength V / m	Limit V / m
1909.8	1.65	1.0	1.63	-
1909.8	1.65	0.2	6.81	-

Remark: The height is the height above the ground of the fully anechoic chamber. In the table above the value of the field strength is given for the worst case position of the turntable.

3.1.3 Test Protocol (GSM 850)

Temperature: 25 °C
Air Pressure: 1025 hPa
Humidity: 30 %

Op. Mode	Setup	Port
op-mode 4	setup_a01	antenna connector

RF Radiated Field Strength

Frequency MHZ	Height of Field Probe m	Distance EUT – Field Probe m	Measured Average Field Strength V / m	Limit V / m
824.2	1.65	1.0	2.85	-
824.2	1.65	0.2	9.97	-

Remark: The height is the height above the ground of the fully anechoic chamber. In the table above the value of the field strength is given for the worst case position of the turntable.

Temperature: 25 °C
Air Pressure: 1025 hPa
Humidity: 30 %

Op. Mode	Setup	Port
op-mode 5	setup_a01	antenna connector

RF Radiated Field Strength

Frequency MHZ	Height of Field Probe m	Distance EUT – Field Probe m	Measured Average Field Strength V / m	Limit V / m
836.6	1.65	1.0	2.76	-
836.6	1.65	0.2	9.89	-

Remark: The height is the height above the ground of the fully anechoic chamber. In the table above the value of the field strength is given for the worst case position of the turntable.

Temperature: 25 °C
Air Pressure: 1025 hPa
Humidity: 30 %

Op. Mode	Setup	Port
op-mode 6	setup_a01	antenna connector

RF Radiated Field Strength

Frequency MHZ	Height of Field Probe m	Distance EUT – Field Probe m	Measured Average Field Strength V / m	Limit V / m
848.8	1.65	1.0	2.69	-
848.8	1.65	0.2	10.01	-

Remark: The height is the height above the ground of the fully anechoic chamber. In the table above the value of the field strength is given for the worst case position of the turntable.

3.2 Calculation and Evaluation of MPE

3.2.1 Calculation of the worst case MPE

The calculation is based on the measured values of the electric field strength (E-Field) at the distance as reported in the test protocol(s).

The Power Density is calculated according to

$$S = \frac{E^2}{120p\Omega} \qquad (1)$$

The minimum distance is calculated as the distance at which the limit is just reached according to

$$S_L = \frac{P_S \cdot g_S}{4p \cdot r_L^2} \qquad (2)$$

where S_L is the power density limit and r_L the related distance. P_S is the RF power and g_S the numerical antenna gain (e.g. for a half-wave dipole with a gain of 2.14 dBi is $g_S = 1.64$).

$$S_M = \frac{P_S \cdot g_S}{4p \cdot r_M^2} \qquad (3)$$

where S_M is the measured power density at the distance r_M.

Equation (2) and (3) can be solved for r_L to obtain the distance where 100% or 5% of the limit is reached:

$$r_{L,100\%} = r_M \cdot \sqrt{\frac{S_M}{S_L}} \qquad (4)$$

and

$$r_{L,5\%} = r_M \cdot \sqrt{\frac{S_M}{0{,}05 \cdot S_L}} \qquad (5)$$

The calculations are performed within the tables below. The first table shows the values for a single transmitter, the second table uses the calculated values of the first one and the calculation is performed for multiple RF sources (e.g. n transmitters, n channels, n antennas).

The limits of §1.1310, table 1, part B (Limits for General Population/Uncontrolled Exposure) are applied:

Frequency range MHz	Power Density mW/cm²	Averaging time minutes
300 – 1500	f / 1500	30
1500 – 100000	1.0	30

f is the operating frequency in MHz.

The limit depends on the operating frequency. Where several sources and frequencies are involved the fraction of each limit shall be determined. The sum of all fractional contributions shall not exceed 1.0 (100%).

RF Signal		Measured Values		Calculated Values				MPE Evaluation		
TCH	Fre-quency / MHz	E-Field / V/m	Distance / cm	Power Density / mW/cm²	active time slots [1]	max. reflection [2]	Single TX PD [3] / mW/cm²	Limit / mW/cm²	exceed / below	Fraction of Limit
128	824,2	9,97	20	0,03	1	2	0,105	0,549	below	0,192
128	824,2	2,85	100	0,00	1	2	0,009	0,549	below	0,016
190	836,0	9,89	20	0,03	1	2	0,104	0,557	below	0,186
190	836,0	2,76	100	0,00	1	2	0,008	0,557	below	0,015
251	848,8	10,01	20	0,03	1	2	0,106	0,566	below	0,188
251	848,8	2,69	100	0,00	1	2	0,008	0,566	below	0,014
512	1850,2	8,08	20	0,02	1	2	0,069	1,000	below	0,069
512	1850,2	2,22	100	0,00	1	2	0,005	1,000	below	0,005
661	1880,0	7,58	20	0,02	1	2	0,061	1,000	below	0,061
661	1880,0	1,78	100	0,00	1	2	0,003	1,000	below	0,003
810	1909,8	6,81	20	0,01	1	2	0,049	1,000	below	0,049
810	1909,8	1,63	100	0,00	1	2	0,003	1,000	below	0,003

Copied from above			Calculation for Multiple RF Sources				MPE Evaluation		Min. Distances [6]	
TCH	Fraction of Limit	Single TX PD / mW/cm²	No. of sources [4]	30 min. duty cycle [5]	Added up PD / mW/cm²	Added up frac-tions	Limit for added up fractions	exceed / below	100% of Limit / m	5% of Limit / m
128	0,192	0,105	32	1	3,37	6,14	1	exceed	**0,50**	**2,22**
128	0,016	0,009	32	1	0,28	0,50	1	below	**0,71**	**3,17**
190	0,186	0,104	32	1	3,32	5,96	1	exceed	**0,49**	**2,18**
190	0,015	0,008	32	1	0,26	0,46	1	below	**0,68**	**3,05**
251	0,188	0,106	32	1	3,40	6,01	1	exceed	**0,49**	**2,19**
251	0,014	0,008	32	1	0,25	0,43	1	below	**0,66**	**2,95**
512	0,069	0,069	32	1	2,22	2,22	1	exceed	**0,30**	**1,33**
512	0,005	0,005	32	1	0,17	0,17	1	below	**0,41**	**1,83**
661	0,061	0,061	32	1	1,95	1,95	1	exceed	**0,28**	**1,25**
661	0,003	0,003	32	1	0,11	0,11	1	below	**0,33**	**1,47**
810	0,049	0,049	32	1	1,57	1,57	1	exceed	**0,25**	**1,12**
810	0,003	0,003	32	1	0,09	0,09	1	below	**0,30**	**1,34**

1) correction factor if the transmitter is active at more than one time slot (number of time slots) and if not yet included in E-Field
2) correction factor if antenna is placed directly on a metallic ground plane (double field strength => 4 times power density)
3) worst case power density (PD) if only one RF source (module) is active at the same time
4) worst case estimation: no. of sources (modules) which are simultaneously active at the same time
5) duty cycle during the averaging time of 30 min. (fraction (on time)/(off time); 1 = 100% = always on)
6) minimum distance at which the exposure is compliant to the MPE Limit of §1.1310 (100% resp. 5% of the limit is reached)

The calculation is based on the measured values of the electric field strength (E-Field) at the distance as reported in the test protocol(s).

3.2.2 Verification for the electric field strength

With the known values for the antenna gain and the TX on/of ratio and the measured value for the RF power the theoretical field strength (time averaged) is calculated in order to verify the measurements.

The measurement of the RF power is performed at the RF connector of the antenna (including RF cable between the transmitter and the antenna).

The average electric field strength $\overline{E}$ is calculated from the given values for the transmitter's average RF power $\overline{P_S}$, the antenna gain g_S and the distance r according to the equations

$$\overline{S} = \frac{\overline{E}^2}{120p\Omega} \qquad (6)$$

and

$$\overline{S} = \frac{\overline{P_S} \cdot g_S}{4p \cdot r^2} \qquad (7)$$

which can be solved for E :

$$\overline{E} = \frac{\sqrt{30\Omega \cdot \overline{P_S} \cdot g_S}}{r} \qquad (8).$$

The average RF power is the measured RF power of one time slot multiplied by the TX on/off Ratio which is the ratio of the active time slots to the inactive time slots.

Temperature: 24 °C
Air Pressure: 1002 hPa
Humidity: 33 %

Frequency MHZ	RF Power (conducted measurement) dBm	Antenna Gain dBi	TX on / off Ratio	Electric Field Strength at 1.0 m V / m	Electric Field Strength at 0.2 m V / m
824.2	31.4	2.0	0.125	2.86	14.32
836.0	31.5	2.0	0.125	2.90	14.49
848.8	31.4	2.0	0.125	2.86	14.32
1850.2	28.4	2.0	0.125	2.03	10.14
1880.0	27.5	2.0	0.125	1.83	9.14
1909.8	27.4	2.0	0.125	1.81	9.04

3.2.3 Far field conditions (GSM 1900 and GSM 850)

A minimum distance between the field strength test probe and the transmitting antenna is required where the vectors of the electric field strength and the magnetic field strength are perpendicular and in phase to each other.

A phase error $\frac{2p}{16}$ which is 22.5° is usually acceptable. The minimum distance r_{FF} to fulfil the far field condition can be calculated as

$$r_{FF} \geq 2 \cdot \frac{d^2}{l_0} \qquad (9)$$

where d is the greatest antenna dimension (e.g. the length or the diameter of the aperture) and l_0 is the wavelength of the free space.

All formulas within this report are only valid for the far field.

Frequency MHz	Wavelength m	Antenna Length m	Far Field Distance m
836.6 (GSM850)	0.36	0.216	0.26
1880.0 (GSM1900)	0.16	0.216	0.58

Remark: The antenna length is taken from the data sheet of the antenna.

3.2.4 Evaluation of Exposure to RF Emissions

From the previous calculations it is found that there exist a noticeable deviation between the measured and calculated values of the electric field strength at a distance of 0.2 m, but at 1.0 m both values correspond well to each other.

At a distance of 0.2 m the far field condition was not fulfilled. Phase differences may affect the measurement result for the electric field strength.

Therefore only the calculations for the electric field strength at a distances of 1.0 m are taken into account. The results at 0.2 m are completely neglected.
Furthermore, the calculated values for the minimum distance where the MPE (Maximum Permissible Exposure) is just reached are found to be more stringent at 1.0 m as at 0.2 m. So the worst case condition is calculated.

Assuming that all transmitters transmit at the same time at the frequency which contributes the highest fraction of the MPE limit of §1.1310 the minimum distance is:

Relative Amount of the MPE Limit	Minimum Distance m
100%	0.71
5%	3.17

The calculated Minimum Distance is the worst case condition at which the RF exposure is compliant to the MPE Limit of §1.1310 (where 100% resp. 5% of the limit is reached).

On the applicant's demand the applicant specifies 1.0 m (100%) and 4.5 m (5%) as Minimum Distance in order to reference directly to the measurement results which have been obtained in 1.0 m distance and also following a conservative inspection.

4 Test Equipment

EUT Digital Signalling System

Equipment	Type	Serial No.	Manufacturer
Digital Radio Communication Tester	CMD 55	831050/020	Rohde & Schwarz
Signalling Unit for Bluetooth Spurious Emissions	PTW60	100004	Rohde & Schwarz
Universal Radio Communication Tester	CMU 200	102366	Rohde & Schwarz

EMI Test System

Equipment	Type	Serial No.	Manufacturer
Comparison Noise Emitter	CNE III	99/016	York
EMI Analyzer	ESI 26	830482/004	Rohde & Schwarz
Signal Generator	SMR 20	846834/008	Rohde & Schwarz

EMI Radiated Auxiliary Equipment

Equipment	Type	Serial No.	Manufacturer
Antenna mast 4m	MA 240	240/492	HD GmbH H. Deisel
Biconical dipole	VUBA 9117	9117108	Schwarzbeck
Broadband Amplifier 18MHz-26GHz	JS4-18002600-32	849785	Miteq
Broadband Amplifier 30MHz-18GHz	JS4-00101800-35	896037	Miteq
Broadband Amplifier 45MHz-27GHz	JS4-00102600-42	619368	Miteq
Cable "ESI to EMI Antenna"	EcoFlex10	W18.01-2 + W38.01-2	Kabel Kusch
Cable "ESI to Horn Antenna"	UFB311A + UFB293C	W18.02-2 + W38.02-2	Rosenberger-Microcoax
Double-ridged horn	HF 906	357357/002	Rohde & Schwarz
Double-ridged horn	HF 906	357357/001	Rohde & Schwarz
High Pass Filter	5HC3500/12750-1.2-KK	200035008	Trilithic
High Pass Filter	5HC2700/12750-1.5-KK	9942012	Trilithic
High Pass Filter	4HC1600/12750-1.5-KK	9942011	Trilithic
KUEP pre amplifier	Kuep 00304000	001	7layers
Log.-per. Antenna	HL 562 Ultralog	830547/003	Rohde & Schwarz
Loop Antenna	HFH2-Z2	829324/006	Rohde & Schwarz
Pyramidal Horn Antenna 26,5 GHz	Model 3160-09	9910-1184	EMCO

EMI Conducted Auxiliary Equipment

Equipment	Type	Serial No.	Manufacturer
Cable "LISN to ESI"	RG214	W18.03+W48.03	Huber+Suhner
Two-Line V-Network	ESH 3-Z5	828304/029	Rohde & Schwarz
Two-Line V-Network	ESH 3-Z5	829996/002	Rohde & Schwarz

Auxiliary Test Equipment

Equipment	Type	Serial No.	Manufacturer
Broadband Resist. Power Divider N	1506A / 93459	LM390	Weinschel
Broadband Resist. Power Divider SMA	1515 / 93459	LN673	Weinschel
Digital Multimeter 01	Voltcraft M-3860M	IJ096055	Conrad
Digital Multimeter 02	Voltcraft M-3860M	IJ095955	Conrad
Digital Oscilloscope	TDS 784C	B021311	Tektronix
Fibre optic link Satellite	FO RS232 Link	181-018	Pontis
Fibre optic link Transceiver	FO RS232 Link	182-018	Pontis
I/Q Modulation Generator	AMIQ-B1	832085/018	Rohde & Schwarz
Notch Filter ultra stable	WRCA800/960-6E	24	Wainwright
Spectrum Analyzer 9 kHz to 3 GHz	FSP3	838164/004	Rohde & Schwarz
Temperature Chamber	VT 4002	58566002150010	Vötsch
Temperature Chamber	KWP 120/70	59226012190010	Weiss
ThermoHygro Datalogger 03	Opus10 THI (8152.00)	7482	Lufft Mess- und Regeltechnik GmbH

Anechoic Chamber

Equipment	Type	Serial No.	Manufacturer
Air Compressor (pneumatic)			Atlas Copco
Controller	HD 100	100/603	HD GmbH H. Deisel
EMC Camera	CE-CAM/1		CE-SYS
EMC Camera for observation of EUT	CCD-400E	0005033	Mitsubishi
Filter ISDN	B84312-C110-E1		Siemens&Matsushita
Filter telephone systems / modem	B84312-C40-B1		Siemens&Matsushita
Filter Universal 1A	B84312-C30-H3		Siemens&Matsushita
Fully/Semi AE Chamber	10.58x6.38x6		Frankonia
Turntable	DS 420S	420/573/99	HD GmbH, H. Deisel
Valve Control Unit (pneum.)	VE 615P	615/348/99	HD GmbH, H. Deisel

Additional Equipment

Equipment	Type	Serial No.	Manufacturer
EM Radiation Meter (Field Probe)	EMR-200	R-0071	Wandel&Goltermann

Equipment	Type	Serial No.	Manufacturer
10 MHz Reference	MFS	5489/001	Efratom
Power Meter 832025/059	NRVD	832025/059	Rohde & Schwarz
Power Sensor A 832279/013	NRV-Z1	832279/013	Rohde & Schwarz
Power Sensor B 832279/015	NRV-Z1	832279/015	Rohde & Schwarz
Power Supply	E3632A	MY40003776	Agilent
Power Supply	PS-2403D	-	Conrad
RF Step Attenuator 833695/001	RSP	833695/001	Rohde & Schwarz
Rubidium Frequency Normal	MFS	002	Efratom
Signal Analyzer FSIQ26 832695/007	FSIQ26	832695/007	Rohde & Schwarz
Signal Generator 833680/003	SMP 03	833680/003	Rohde & Schwarz
Signal Generator A 834344/002	SMIQ03B	834344/002	Rohde & Schwarz
Signal Generator B 832870/017	SMIQ03B	832870/017	Rohde & Schwarz
Signal Switching and Conditioning Unit	SSCU	338826/005	Rohde & Schwarz
Signalling Unit PTW60 838312/014	PTW60 for TS8960	838312/014	Rohde & Schwarz
System Controller 829323/008	PSM12	829323/008	Rohde & Schwarz

5 Photo Report

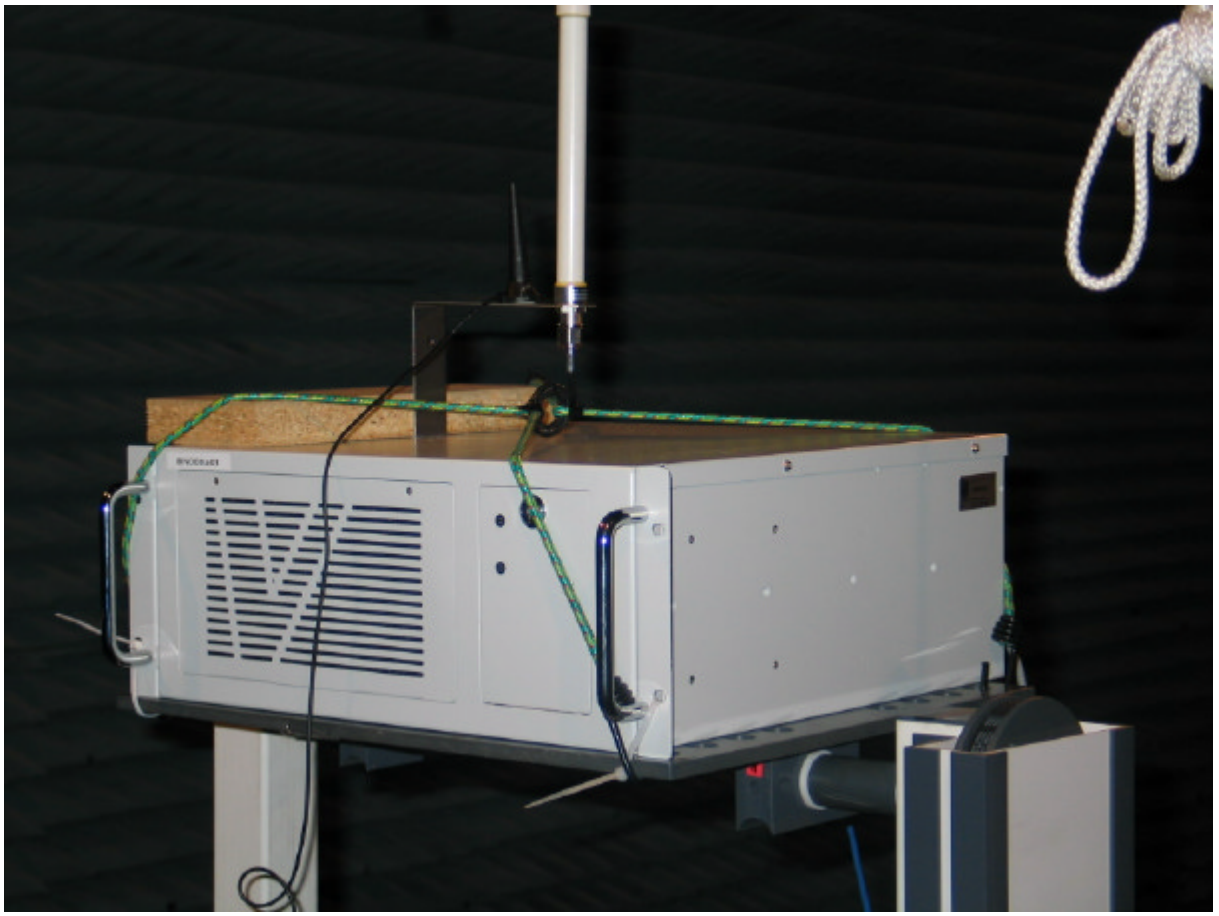


Photo 1: EUT (front and right side)

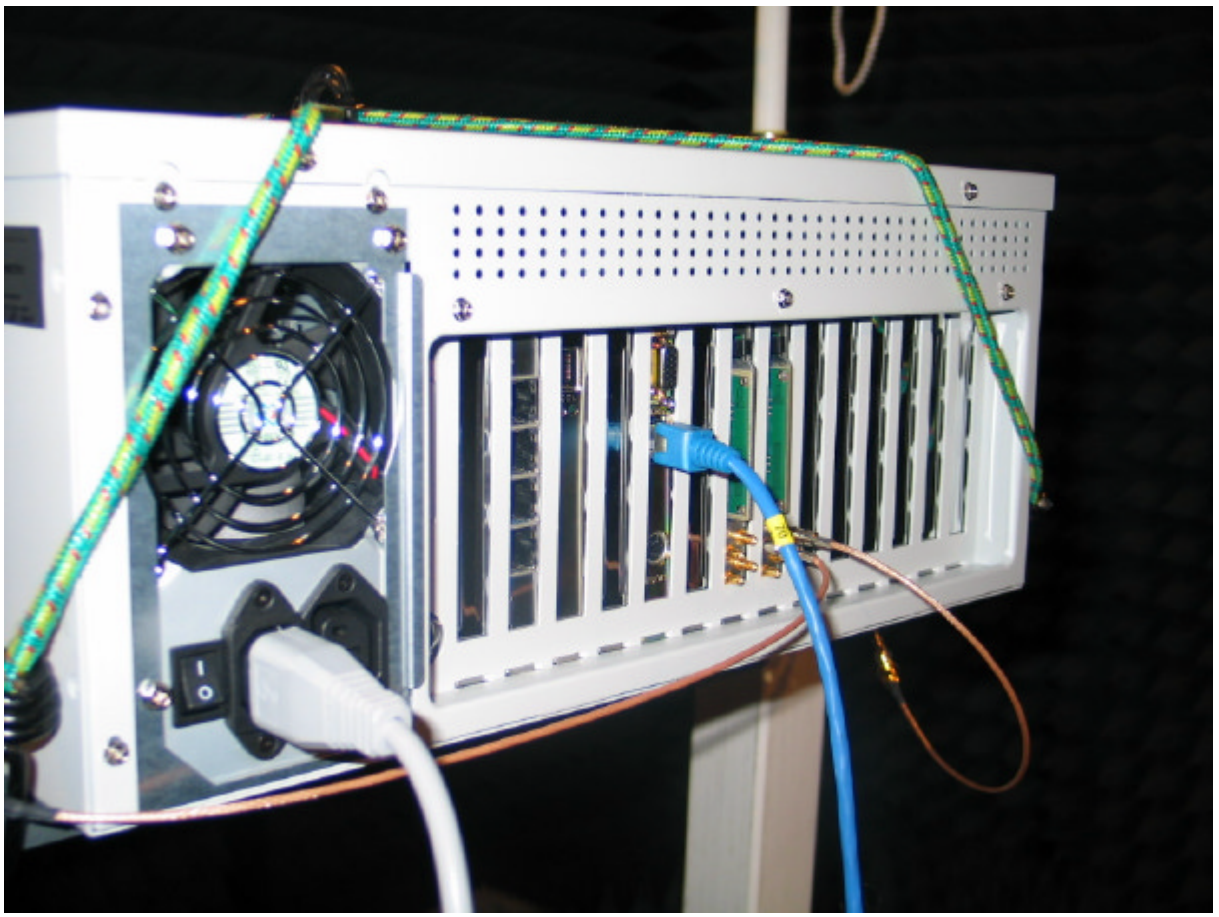


Photo 2: EUT (rear side, two GSM gateway cards inserted)

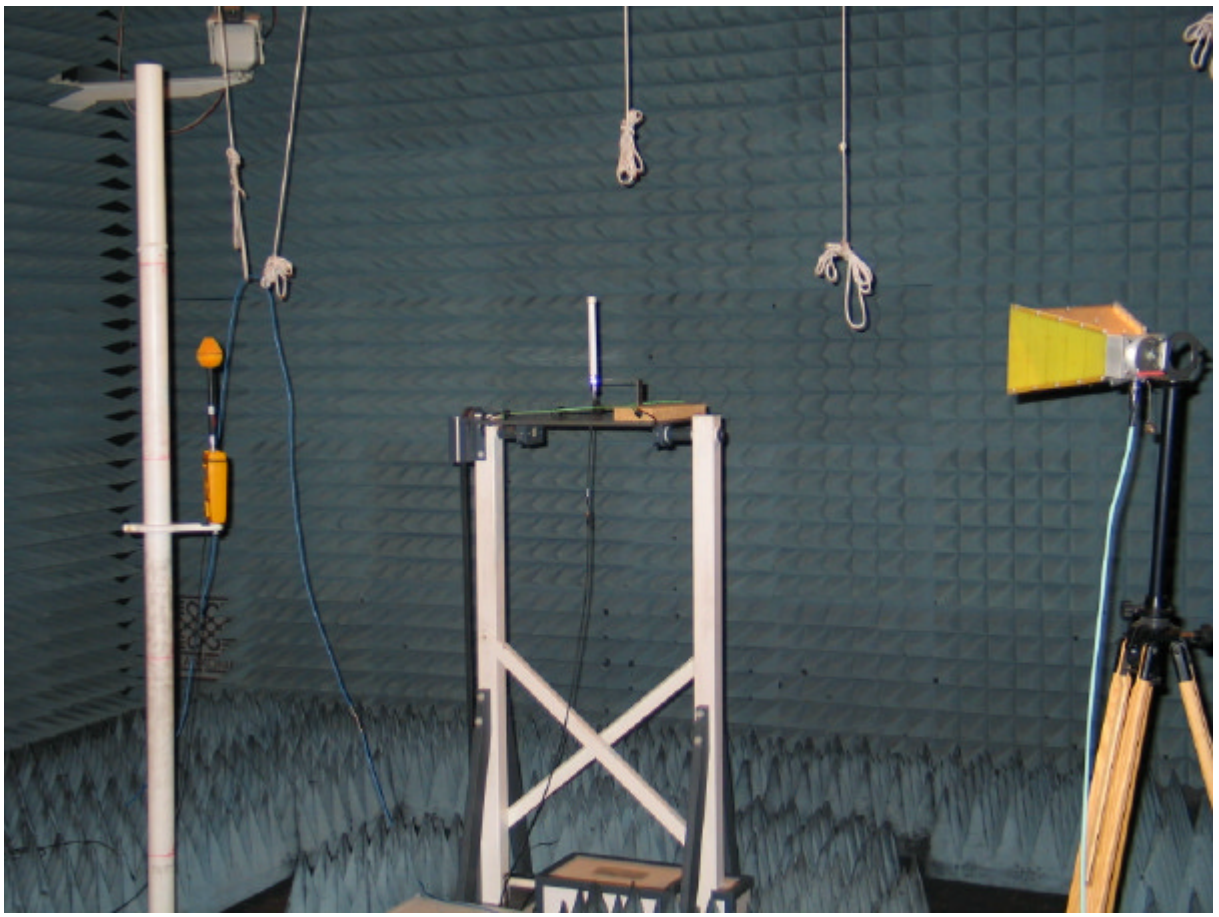


Photo 3: Setup for RF radiated field strength tests (distance: 1.0 meters)

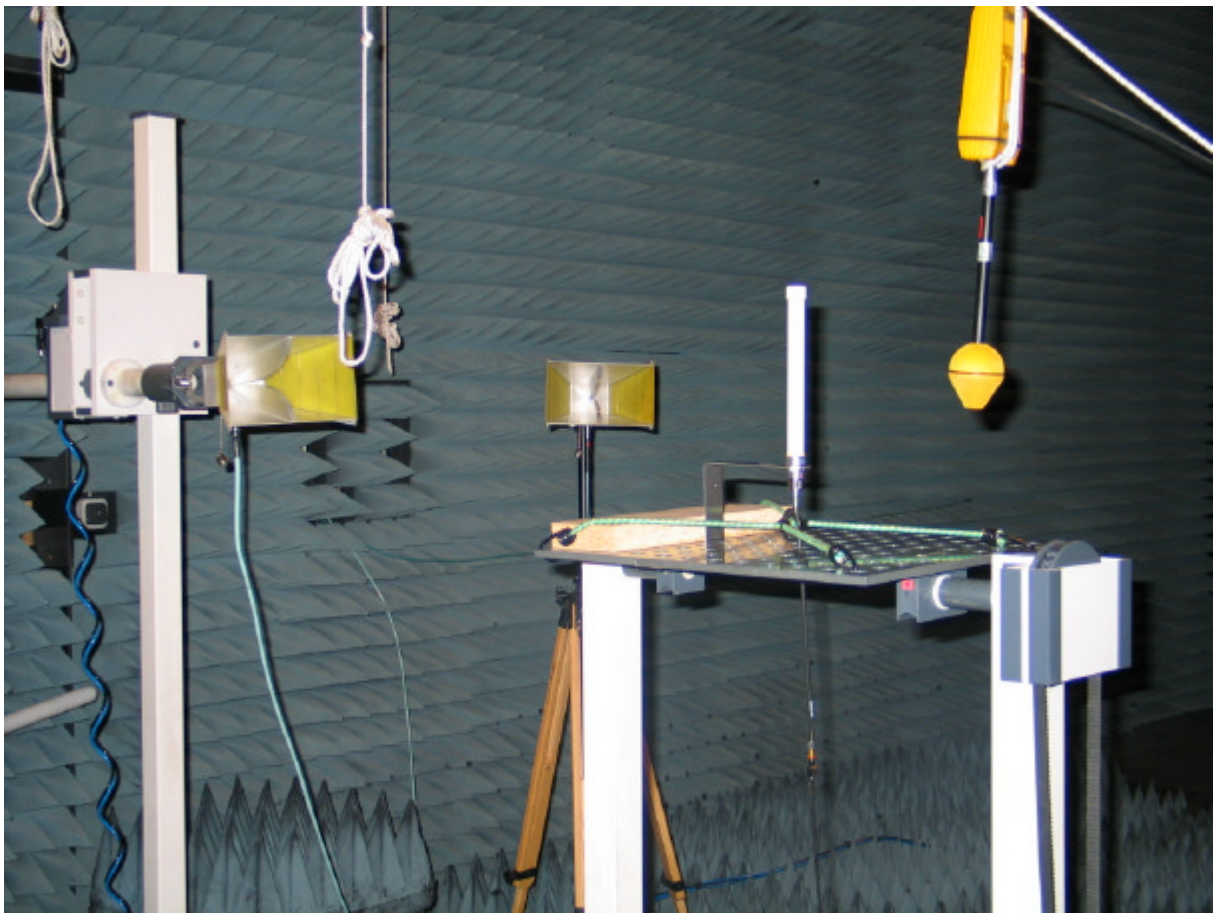
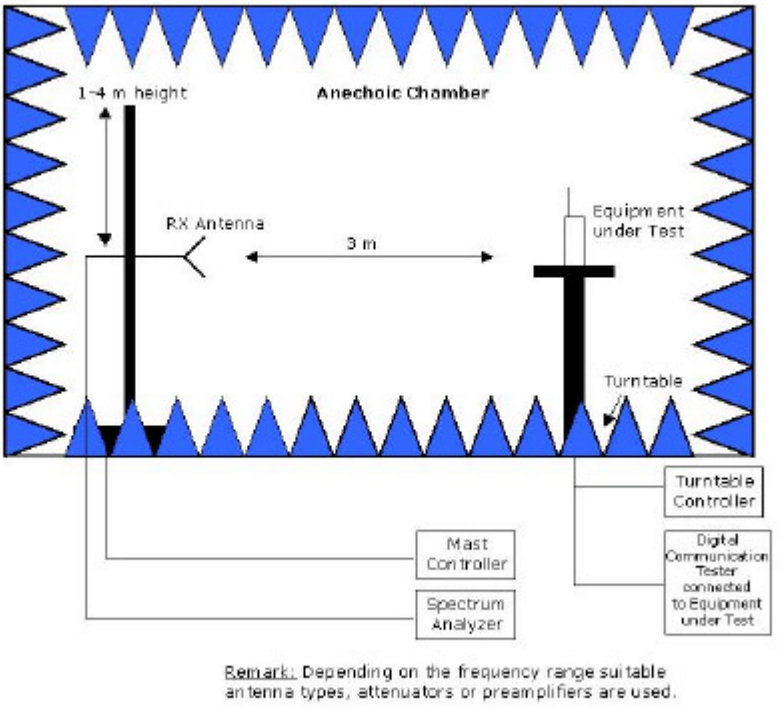


Photo 4: Setup for RF radiated field strength tests (distance: 0.2 meters)

6 Setup Drawings



Drawing 1: Principle Setup in the Anechoic chamber.
For the measurement of the radiated field strength a field probe is used instead of the RX antenna.
For details please refer to the text of sub-clauses 2 to 5.