

TEST REPORT
of the accredited test laboratory

TÜV Nr.:M/EMV-02/104
about
the following EMC - test/- research

Division Medical
Technology/
Communication
Technology/ EMC

Testing Body for
Communication
Technology/ EMC

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Applicant: Adcon Telemetry AG
Inkustrasse 24
A-3400 Klosterneuburg

Product: Telemetry Gateway; A840

Serial Number: 100147

Standard: FCC Part 15 (alternative method:
Measurement according to CISPR 22 Ed. 3.0:1997 Class B)

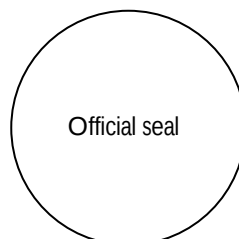
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TÜV Österreich
Test laboratory for EMC

Deputy Supervisor of EMC-
laboratory

Checked by



Ing. Wilhelm Seier

14. 1. 2002

Ing. Klaus Röttsch

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The results of this test report only refer to the provided equipment.

DVR 0047 333
UID ATU 37086005

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1. Applicant

Company	Adcon Telemetry AG
Department	
Address	A-3400 Klosterneuburg; Industriestrasse 24
Contact person	Mr. G. Chvatal

EUT received on	11. 1. 2002
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Tests were performed on	11. 1. 2002
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2. Description of EUT

EUT	Telemetry Gateway; A840
Serial Number	100147
Manufacturer	Adcon Telemetry AG A-3400 Klosterneuburg; Industriestrasse 24
Description	Adcon Telemetry AG provided the following configuration for the measurements: pre-production model
Operating mode	The measurements were carried out at the following running states: operating with LAN and RS232 connection and an A440 connected to the RS485 port via a 30m cable The modem line was not connected through all tests because the modem is already tested according to european and US. emc-standards.

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3. Standards / Final result

Name	Title	Deviation	Result
CISPR 22 Ed. 3.0:1997	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	none	PASS
PASS EUT passed FAIL EUT failed			

4. Test results

4. 1. Conducted emission on the AC-mains line

Limits

Frequency range	Limit	
Detector	Quasi Peak	Average
0,150 - 0,5 MHz	66 - 56 dB μ V decreasing with the logarithm of frequency	56 - 46 dB μ V decreasing with the logarithm of frequency
0,5 - 5 MHz	56 dB μ V	46 dB μ V
5 - 30 MHz	60 dB μ V	50 dB μ V
Remark: Quasi Peak and Average limits must be both met		

Measuring apparatus parameters:

Parameter	Preview measurement	Final measurement	Parameter	Preview measurement	Final measurement
Start frequency	150 kHz	150 kHz	Detector	Max Peak	Quasi Peak
Stop frequency	30 MHz	30 MHz	Measuring time	10 ms	1 s
Stepsize	5 kHz	5 kHz	RF-attenuation	0dB	0dB
IF- Bandwidth	9 kHz	9 kHz	Preamplifier	10 dB	10 dB

Operating mode	Measuring result
operating with LAN and RS232 connection and an A440 connected to the RS485 port via a 30m cable	Measurement diagram 1

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Test result:

4. 1.1.) Measurement with QP-Detector

Frequency MHz	Level dB μ V	Limit dB μ V	Margin dB	Exceed- Mark	Phase	PE
0,605	46,8	56,0	9,2		L1	GND
0,705	51,1	56,0	4,9		L1	GND
0,905	48,0	56,0	8,0		L1	GND
1,005	46,9	56,0	9,1		L1	GND
2,315	46,2	56,0	9,8		L1	GND
2,415	46,1	56,0	9,9		L1	GND

4. 1.2.) Measurement with AV-Detector

Frequency MHz	Level dB μ V	Limit dB μ V	Margin dB	Exceed- Mark	Phase	PE
0,605	42,8	46,0	3,2		L1	GND
0,705	45,1	46,0	0,9		L1	GND
0,905	43,1	46,0	2,9		L1	GND
1,005	42,3	46,0	3,7		L1	GND
2,215	41,2	46,0	4,8		L1	GND
2,415	41,0	46,0	5,0		L1	GND

4. 2. Conducted emission on the Network line

Limits

Frequency range	Limit	
Detector	Quasi Peak	Average
0,150 - 0,5 MHz	40 - 30 dB μ A decreasing with the logarithm of frequency	30 - 20 dB μ A decreasing with the logarithm of frequency
0,5 - 30 MHz	30 dB μ A	20 dB μ A
Remark: Quasi Peak and Average limits must be both met		

Measuring apparatus parameters:

Parameter	Preview measurement	Final measurement	Parameter	Preview measurement	Final measurement
Start frequency	150 kHz	150 kHz	Detector	Max Peak	Quasi Peak
Stop frequency	30 MHz	30 MHz	Measuring time	10 ms	1 s
Stepsize	5 kHz	5 kHz	RF-attenuation	0dB	0dB
IF- Bandwidth	9 kHz	9 kHz	Preamplifier	10 dB	10 dB

Operating mode	Measuring result
operating with LAN and RS232 connection and an A440 connected to the RS485 port via a 30m cable	Measurement diagram 2

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4. 2.1.) Measurement with QP-Detector

Due to the large margin of the measurement results to the limit, no final measurement was performed.

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4. 2.2.) Measurement with AV-Detector

Due to the large margin of the measurement results to the limit, no final measurement was performed.

4. 3. Radiated emission

Limits :

Frequency range	Limit (quasi peak)
30 - 230 MHz	39,6 dB μ V/m
230 - 1000 MHz	46,6 dB μ V/m

Measuring apparatus parameters:

Parameter	Preview measurement	Final measurement	Parameter	Preview measurement	Final measurement
Start frequency	30 MHz	30 MHz	Detector	Max Peak	Quasi Peak
Stop frequency	1000 MHz	1000 MHz	Measuring time	10 ms	1 s
Stepsize	50 kHz	50 kHz	RF-attenuation	0dB	0dB
IF- Bandwidth	120 kHz	120 kHz	Preamplifier	10 dB	10 dB

Operating mode	Measuring result
operating with LAN and RS232 connection and an A440 connected to the RS485 port via a 30m cable	Measurement diagram 3, 4

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Test result:

4. 3.1.) Measurement with QP-Detector (30 MHz - 200 MHz)

Frequency MHz	Level dB μ V/m	Limit dB μ V/m	Margin dB	Exceed- Mark	Height cm	Azimuth deg	Polarization
106,8	18,7	39,6	20,9		256	44	horizontal
108,3	18,4	39,6	21,2		104	83	vertical
110,0	22,5	39,6	17,1		328	224	horizontal
110,6	35,7	39,6	3,9		282	212	horizontal
116,2	26,4	39,6	13,2		103	44	vertical
124,1	28,7	39,6	10,9		102	76	vertical
130,9	27,8	39,6	11,8		275	65	horizontal
166,1	22,7	39,6	16,9		102	225	vertical
184,3	24,2	39,6	15,4		104	225	horizontal

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4. 3.2.) Measurement with QP-Detector (200 MHz - 1000 MHz)

Frequency MHz	Level dB μ V/m	Limit dB μ V/m	Margin dB	Exceed- Mark	Height cm	Azimuth deg	Polarization
276,7	32,8	46,6	13,8		100	37	vertical
479,2	34,4	46,6	12,2		100	100	horizonta
552,8	30,2	46,6	16,4		100	182	vertical
626,7	36,7	46,6	9,9		299	191	horizontal
903,2	35,9	46,6	10,7		100	135	horizontal
959,6	35,8	46,6	10,8		100	0	vertical

Appendix 1

Test equipment used

☒	Anechoic Chamber with 3m measurement distance	NT-100	☐	Switchbox	NT-202
☒	MA 240 - Antenna mast 1 - 4 m height	NT-110	☐	ESPC - Test receiver 9 kHz - 2,5 GHz	NT-203
☒	DS 412 - Turntable 0 - 400 ° Azimuth	NT-111	☒	ESI26 – Test receiver 20 Hz – 26,5 GHz	NT-207
☒	HD 100 Controller Mast+Turntable	NT-112	☐	Digital Radio Tester CTS55	NT-208
☐	HUF-Z2 - Bicon. Antennna 20 - 300 MHz	NT-120	☐	Noise-gen., ITU-R 559-2 20 Hz – 20 kHz	NT-209
☐	HUF-Z3 - Log. Per. Antenna 200 - 1000 MHz	NT-121	☐	CMTA - Radiocommunication analyzer ; 0,1 - 1000 MHz	NT-210
☐	HFH-Z2 - Loop Antenna. 9 kHz - 30 MHz	NT-122	☐	3271 - Spectrum analyzer 100 Hz - 26,5 GHz	NT-211
☐	HFH-Z6 - Rod Antenna 9 kHz - 30 MHz	NT-123	☐	2855S - Communication analyzer	NT-213
☐	3121C - Dipole Antenna 28 - 1000 MHz	NT-124	☐	Mixer M28HW 26,5 GHz - 40 GHz	NT-214
☐	3115 - Horn Antenna 1 - 18 GHz	NT-125	☐	Diode Detector 0,01 GHz - 26,5 GHz	NT-215
☐	3116 - Horn Antenna 18 - 40 GHz	NT-126	☐	3160-10 Horn Antenna 26,5 GHz - 40 GHz	NT-216
☐	SAS-200/543 - Bicon. Ant. 20 MHz - 300 MHz	NT-127	☐	Radiocommunicationanalyzer SWR 1180 MD	NT-217
☐	AT-1080 - Log. Per. Ant. 80 - 1000 MHz	NT-128	☐	TDS - 540 DSO Digital scope	NT-220
☒	HK-116 - bicon. Ant. 20 MHz - 300 MHz	NT-129	☐	PM97 Scopemeter	NT-221
☐	HK-116 - bicon. Ant. 20 MHz - 300 MHz	NT-130	☐	B9-DSP-IS Digital Analyzer for voltage fluctuations	NT-230
☒	3146 - Log. Per. Ant. 200 - 1000MHz	NT-131	☐	DFT 555 - Power and harmonics analyzer	NT-231
☐	Loop Antenna H-Field	NT-132	☐	EFA-3 H-field- / E-field probe	NT-243
☐	Horn Antenna 500 MHz - 2900 MHz	NT-133	☐	E-field measuring instrument EMR-200; 100 kHz – 3 GHz	NT-244
☐	Log. per. Antenna 800 MHz - 2500 MHz	NT-134	☐	E-field probe (for use with EMR-200)	NT-245
☐	Log. per. Antenna 800 MHz - 2500 MHz	NT-135	☐	Magneticfield-Sensor 300 kHz – 30 MHz	NT-246
☐	BiConiLog Antenna 26 MHz – 2000 MHz	NT-137	☐	MDS 21 - Absorbing clamp 30 - 1000 MHz	NT-250
☐	Conical Dipol Antenna PCD8250	NT-138	☐	FCC-203I EM Injection clamp	NT-251
☐	HZ-1 Antenna tripod	NT-150	☐	FCC-203I-DCN Ferrite decoupling network	NT-252
☐	BN 1500 Antenna tripod	NT-151	☐	PR50 Current Probe	NT-253
☐	ESVP - Test receiver 20 - 1000 MHz	NT-201	☐	Model 2000 Digital Multimeter	NT-261

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Test equipment used

☐	Fluke 97 Digital Multimeter	NT-262	☐	TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-344
☐	Fluke 97 Digital Multimeter	NT-263	☐	TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-345
☒	ESH2-Z5 Artificial mains network 4x25A	NT-300	☐	VDS 200 Mobil-impuls-generator	NT-350
☐	ESH3-Z5 Artificial mains network 2x10A	NT-301	☐	LD 200 Mobil-impuls-generator	NT-351
☐	ESH3-Z6 Artificial mains network 1x100A	NT-302	☐	MPG 200 Mobil-Impuls-Generators	NT-352
☐	ESH3-Z4 T-Artificial network	NT-303	☐	EFT 200 Mobil-impuls-generator	NT-353
☒	PHE 4500/B Power amplifier	NT-304	☐	FP 16/3-1 3 ph. Coupling filter (Burst)	NT-400
☐	EZ10 T-Artificial network	NT-305	☒	PHE 4500 - Mains impedance network	NT-401
☐	MidiStar Telephone exchange	NT-306	☐	FP-SURGE 32.1 3 ph. Coupling filter (Surge)	NT-402
☐	SMG - Signal generator 0,1 - 1000 MHz	NT-310	☐	IP 6.2 Coupling filter for data lines (Surge)	NT-403
☐	PM 5518 TXVPS Video generator	NT-311	☐	ESH2-Z3 - Probe 9 kHz - 30 MHz	NT-410
☐	RefRad Reference generator	NT-312	☐	IP 4 - Capacitive clamp (Burst)	NT-411
☐	SMP 02 Signal generator 10 MHz - 20 GHz	NT-313	☐	HV-Attenuator 54,5 dB (Burst)	NT-420
☐	PEFT - Burst generator up to 4 kV	NT-320	☐	RF-Attenuator 20 dB 0,1 - 1000 MHz / 25 W	NT-421
☐	PSD - ESD generator up to 25 kV	NT-321	☐	RF-Attenuator 10 dB 0,1 - 1000 MHz / 20 W	NT-422
☐	ESD-Pistol	NT-322	☐	RF-Attenuator 30 dB 0,1 - 1000 MHz / 1 W	NT-423
☐	Vacuum-Relais up to 8 kV	NT-323	☐	RF-Attenuator 30 dB	NT-424
☐	PSURGE 4.1 Surge generator	NT-324	☐	RF-Attenuator 6 dB 0,1 - 1000 MHz / 1 W	NT-425
☐	TRANSIENT 1000 Immunity test system	NT-325	☐	RF-Attenuator 6 dB 0,1 - 1000 MHz / 1 W	NT-426
☐	VCS 500-M6 Surge-Generator	NT-326	☐	Voltage-divider 1:100	NT-427
☐	BTA-250 - RF-Amplifier 9 kHz - 220 MHz / 250 W	NT-330	☐	RF-Attenuator 6 dB	NT-428
☐	500W1000M7 - RF-Amplifier 80 - 1000 MHz / 500 W	NT-332	☐	RF-Attenuator 0 dB - 81 dB	NT-429
☐	AS0102-65R - RF-Amplifier 1 GHz - 2 GHz	NT-333	☐	WRU 27 - Band blocking 27 MHz	NT-430
☐	Preamplifier 20 MHz - 3000 MHz	NT-334	☐	WHI450C9 AA - High pass 450 MHz	NT-431
☐	2-97201 Electronic load	NT-341	☐	WHI250C9 AA - High pass 250 MHz	NT-432

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Test equipment used

☐	RF-Load 150 W	NT-433	☐	Noise power test apparatus according to EN 55014	NT-530
☐	Impedance transducer 50 Ohm – 800 Ohm	NT-435	☐	Vertical coupling plane (ESD)	NT-531
☐	I+P 7780 Directional coupler 100 - 2000 MHz	NT-440	☐	Equipment for ESD-pulse verification.	NT-532
☒	ESH3-Z2 - Pulse limiter 9 kHz - 30 MHz	NT-441	☐	TEM-Zelle	NT-533
☐	Power Divider 6 dB/1 W/50 Ohm	NT-443	☐	ESV-24 Plotter adapter	NT-540
☐	Directional coupler 0,1 MHz – 70 MHz	NT-444	☒	Test cables	NT-550
☐	Directional coupler 0,1 MHz – 70 MHz	NT-445	☐	Test cable #4 for EN 61000-4-6	NT-553
☐	Tube imitations according to EN 55015	NT-450	☒	Test cable #3 for conducted emission	NT-554
☐	FCC-801-M5-25 Coupling decoupling network	NT-460	☐	Test cable #5 ESD-cable (2x470k)	NT-555
☐	FCC-801-AF10 Coupling decoupling network	NT-461	☐	Test cable #6 ESD-cable (2x470k)	NT-556
☐	FCC-801-S25 Coupling decoupling network	NT-462	☐	Serial data - fiber optic link	NT-557
☐	FCC-801-T4 Coupling decoupling network	NT-463	☐	Test cable #8 Sucoflex 104EA	NT-559
☐	FCC-801-C1 Coupling decoupling network	NT-464	☐	Test cable #9 (for outdoor measurements)	NT-580
☒	F-16A - Current probe 1kHz - 70MHz	NT-465	☐	Test cable #10 (for outdoor measurements)	NT-581
☐	PC P450 - Test computer	NT-500	☐	Test cable #13 PBA-33PBC-10	NT-584
☐	SE 284 GPIB - Plotter	NT 502	☐	Shield chamber	NT-600
☐	PC P133 Test computer #2	NT-504	☐	Climatic chamber -55°C to +180°C	M-512
☐	PC P200 MMX Notebook	NT-505	☐	Control and simulation equipment for EUT	---
☐	PC PIII 933 MHz Notebook	NT-506			
☐	7110 - Controlling device for E-Field probe	NT-510			
☐	Monitoring camera with Monitor	NT-511			
☐	BSR-V1 - Video transmission system (optical fiber link)	NT-512			
☒	ES-K1 Test software	NT-520			
☐	ESPC-K1 Test software	NT-521			
☐	SPS_PHE - Test software voltage fluctuations/harmonics	NT-525			
☐	SPS_EM - Test software for PHE 4500/B	NT-527			

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