

EMISSION -- TEST REPORT

Test Report File No. : **T 22158-1-01 AA** Date of issue : November 25, 2002

Type Designation : IS-TR-241

Kind of Product : Radio Frequency Identification

Applicant : DTE Automation GmbH

Manufacturer : DTE Automation GmbH

Licence holder : DTE Automation GmbH

Address : Heidestrasse 38

32051 Herford, Germany

Test result accdg. to the regulation(s) at page 3 : **Positive**

This test report with attachment consists of **32** pages.
The test result only corresponds to the tested sample. It is not permitted to copy this report, in part or in full, without the permission of the test laboratory.

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TEST REGULATIONS

The tests were performed according to following regulations :

- o - EN 50081-1 / 2.1991
- o - EN 50081-2 / 7.1993

-
- o - EN 55011 / 3.1991

- o - Group 1
- o - class A
- o - Group 2
- o - class B

- o - EN 55014 / 4.1993

- o - Household appliances and similar
- o - tools
- o - Semiconductor devices

- o - EN 55014 / A2:1990
- o - EN 55104 / 5.1995

Category:

- o - EN 55015 / A1:1990
- o - EN 55015 / 12.1993

- o - EN 55022 / 5.1995

- o - class A
- o - class B

- o - prEN 55103-1 / 3.1995
- o - prEN 50121-3-2 / 3.1995
- o - EN 60601-1-2 / 4.1994

- o - VCCI

- o - class 1

- o - class 2

- - Part 15 Subpart C (15.209)
- o - Part 15 Subpart C (15.231)

ADDRESS OF THE TEST LABORATORY

■ - MIKES BABT PRODUCT SERVICE GmbH
Ohmstrasse 2-4
D - 94342 Strasskirchen

o - _____

ENVIRONMENTAL CONDITIONS

Temperature: 15-35 ° C

Humidity 45-60 %

Atmospheric pressure 860-1060 mbar

POWER SUPPLY SYSTEM UTILIZED

Power supply system	☐ 230V/50 Hz / 1 ϕ	☒ 24 VDC
	☐ 400V/50 Hz 3PE	☐ 400V/50 Hz 3NPE

STATEMENT OF 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 accdg. to NIS 81 /5.1994 „The Treatment of Uncertainty in EMC Measurements“ and is documented in the MIKES BABT Product Service quality system accdg. to EN 45001. 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.

SHORT DESCRIPTION OF THE EQUIPMENT UNDER TEST (EuT)

The EuT IS-TR-241 is a reader working in continuous read mode. It can read the level and wedge information out of a transponder whenever a transponder appears. If the level and wedge number is the same as stored in its configuration block a relay and a red LED will be switched on.

Number of received/tested samples: **2 / 1**

Serial Number: 2501 / 2504

DEFINITIONS FOR SYMBOLS USED IN THIS TEST REPORT

■ The black square indicates that the listed condition, standard or equipment is applicable for this report.

o Blank box indicates that the listed condition, standard or equipment was not applicable for this report.

MEASUREMENT PROTOCOL FOR FCC, VCCI AND AUSTEL

Test Methodology

Conducted and radiated emission testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22 (1993), European Standard EN 55022 and Australian Standard AS 3548 (which are based on CISPR 22).

The Japanese standard, "Voluntary Control Council for Interference (VCCI) by Data Processing Equipment and Electronic Office Machines, Technical Requirements" is technically equivalent to CISPR 22 (1993). For official compliance, a conformance report must be sent to and accepted by the VCCI.

In compliance with FCC Docket 92-152, "Harmonization of Rules for Digital Devices Incorporate International Standards", testing for FCC compliance may be done following the ANSI C63.4-1992 procedures and using the FCC limits or the CISPR 22 Limits.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. These test systems have a measurement uncertainty of ± 4.5 dB. The equipment comprising the test systems are calibrated on an annual basis.

Justification

The Equipment Under Test (EuT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

General Standard Information

The test methods used comply with CISPR Publication 22 (1993), EN 55022 (1987) and AS 3548 (1992) - "Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment" and with ANSI C63.4-1992 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

For detailed description of each measurement please refer to section test results.

DISCOVERY OF WORST CASE MEASUREMENT CONDITION:

The IS-TR-241 is designed for the operation on the fixed transmitter frequency range of $134.2 \text{ kHz} \pm 0.5 \text{ kHz}$. To find out the worst case conditions for the complete measurement the following tests have been performed:

- Measurement of the radiated fieldstrength of the operating frequency measured in permanent operation mode in the specified channel. This measurement have been performed in order to find out the maximum transmitted fieldstrength of the detector.
- Measurement of the radiated spurious emissions measured in permanent operation mode in the specified channel. This measurement have been performed in order to find out the maximum spurious emissions of the detector.

Based on this test results, the measurements have been performed completely on the specified channel. This test results are documented in the following sections of the testreport.

TEST RESULT**CONDUCTED EMISSIONS - 10/150 kHz - 30 MHz**

■ - Test not applicable

Test location :

- o - Shielded room no. 1
- o - Shielded room no. 2
- o - Shielded room no. 3
- o - Shielded room no. 4
- o - Shielded room no. 5
- o - Shielded room no. 6
- o - Shielded room no. 7
- o - Anechoic chamber
- o - Full compact chamber

For test instruments and test accessories used please see attachment B A4

Description of Measurement

The final level, expressed in dB μ V, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC Limit or to the CISPR limit, which is equivalent to the Australian AS 3548 limit.

To convert between dB μ V and μ V, the following conversions apply:

$$\text{dB}\mu\text{V} = 20(\log \mu\text{V})$$

$$\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$$

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EuT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω /50 μ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeter's above the floor and is positioned 40 centimeter's from the vertical ground plane (wall) of the screen room. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

Test result:

The requirements are

o - MET

o - NOT MET

Min. limit margin

_____ dB at _____ MHz

Max. limit exceeding

_____ dB at _____ MHz

Remarks: _____

SPURIOUS EMISSION

Spurious emissions from the EuT are measured in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions.

Spurious emissions from the EuT are measured in the frequency range of 30 MHz to 10 times the highest used frequency using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection, remeasurement of results which may be critical will be repeated in average mode. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization's and the EuT are rotated 360 degrees.

SPURIOUS EMISSION (MAGNETIC FIELD) 9 kHz - 30 MHz

o - Test not applicable

- o - in a shielded room
- - at a non - reflecting open-site and
- - in a test distance of 3 meters.
- - in a test distance of 30 meters.

For test instruments and test accessories used please see attachment B SER1

Description of Measurement

The final level, expressed in dB μ V/m, is arrived at by taking the reading from the EMI receiver (Level dB μ V) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.

The resolution bandwidth during the measurement is as follows:

9 kHz – 150 kHz: ResBW: 200 Hz

150 kHz – 30 MHz: ResBW: 10 kHz

Example:

Frequency (MHz)	Level (dB μ V)	+	Factor (dB)	=	Level (dB μ V/m)	Limit (dB μ V/m)	=	Delta (dB)
1.705	5	+	20	=	25	30	=	5

Testresult in detail:

Test distance: 3m

Frequency [kHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]
149.0	-	70.8	-	20.0	-	90.8	-	104.0
411.0	-	47.4	-	20.0	-	67.4	-	95.0
678.0	-	-	37.3	20.0	-	-	57.3	71.0
945.0	-	-	31.7	20.0	-	-	51.7	68.0
1216.0	-	-	28.0	20.0	-	-	48.0	66.0
1483.0	-	-	25.3	20.0	-	-	45.3	64.0
1750.0	-	-	23.8	20.0	-	-	43.8	69.5
2012.0	-	-	21.6	20.0	-	-	41.6	69.5
2288.0	-	-	20.7	20.0	-	-	40.7	69.5
24600.0	-	-	24.8	20.0	-	-	44.8	69.5

Test distance: 30m

Frequency [kHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]
149.0	-	<-5	-	20.0	-	-	-	64.0
411.0	-	<-5	-	20.0	-	-	-	55.0
678.0	-	-	<-5	20.0	-	-	-	31.0
945.0	-	-	<-5	20.0	-	-	-	28.0
1216.0	-	-	<-5	20.0	-	-	-	26.0
1483.0	-	-	<-5	20.0	-	-	-	24.0
1750.0	-	-	<-5	20.0	-	-	-	29.5
2012.0	-	-	<-5	20.0	-	-	-	29.5
2288.0	-	-	<-5	20.0	-	-	-	29.5
24600.0	-	-	<-5	20.0	-	-	-	29.5

The requirements are

■ - MET

○ - NOT MET

Min. limit margin

13.2 dB at 149.0 kHz

Max. limit exceeding

 dB at MHzRemarks: The limits are kept.

SPURIOUS EMISSIONS (electric field) 30 MHz - 1000 MHz

o - Test not applicable

Test location :

- - Open-site 1
- o - Open-site 2
- - 3 meters
- o - 10 meters
- o - 30 meters

For test instruments and test accessories used please see attachment B SER2

Description of Measurement

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page 24 - 25. The CISPR 22 limit is equivalent to the Australian AS 3548 limit.

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	Limit (dBµV/m)	=	Delta (dB)
719	75	+	32.6	=	107.6	110	=	-2.4

Testresult in detail:

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]
53.0	12.3	6.8	11.0	10.4	22.7	17.2	21.4	40.0
67.6	16.1	12.9	15.3	8.6	24.7	21.5	23.9	40.0
69.1	11.8	7.6	11.3	8.6	20.4	16.2	19.9	40.0
70.7	11.2	6.2	10.3	8.6	19.8	14.8	18.9	40.0
73.7	19.9	13.8	18.1	8.7	28.6	22.5	26.8	40.0
79.9	24.1	18.4	22.9	8.9	33.0	27.3	31.8	40.0
86.0	27.0	23.0	27.0	10.5	37.5	33.5	37.3	40.0
110.6	25.7	22.9	24.6	13.6	39.3	36.5	38.2	40.0
116.7	19.1	15.4	18.7	15.4	34.5	30.8	34.1	40.0
122.9	23.5	18.6	22.9	16.6	40.1	35.2	39.5	40.0

Test result:

The requirements are

■ - MET

o - NOT MET

Min. limit margin

0.5 dB at 122.9 MHz

Max. limit exceeding

 dB at MHz

Remarks: The limits are met.

SPURIOUS EMISSION 1 GHz - 18 GHz

■ - Test not applicable

Testlocation :

- o - Open-site 1
- o - Open-site 2
- o - Anechoic chamber
- o - Full compact chamber

- o - 1 meters
- o - 3 meters
- o - 10 meters

For test instruments and test accessories used please see attachment B SER3

Description of Measurement

The final level, expressed in dB μ V/m, is arrived by taking the reading from the Spectrumalyzer in dB μ V and adding the correction factors of the test setup incl. cables.

Example of the correction value at 1.8 GHz

Level reading at 1.8 GHz	Correction EMCO 3115	correction Amplifier AWT 4534 + cable	Correction factor (summarized)	corrected level
56 dB μ V	+27.3 dB	-41.2 dB	-15.8 dB	42.1 dB μ V/m

Testresult in detail:

Frequency [MHz]	L: PK [dB μ V]	L: AV [dB μ V]	L: QP [dB μ V]	Correct. [dB]	L: PK [dB μ V/m]	L: AV [dB μ V/m]	L: QP [dB μ V/m]	Limit [dB μ V/m]

Testresult

The requirements are

o - MET

o - NOT MET

Min. limit margin

_____ dB at _____ MHz

Max. limit exceeding

_____ dB at _____ MHz

Remarks: Test not applicable.

FIELD STRENGTH OF THE FUNDAMENTAL WAVE

o - Test not applicable

- - Open-site 1
- o - Open-site 2
- - 3 meters
- - 10 meters
- o - 30 meters
- o - 300 meters

For test instruments and test accessories used please see attachment B CPR1

Description of Measurement

The final level, expressed in dB μ V/m, is arrived by taking the reading from the EMI receiver (Level dB μ V) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page 24 - 25. The CISPR 22 limit is equivalent to the Australian AS 3548 limit.

Example:

Frequency (MHz)	Level (dB μ V)	+	Factor (dB)	=	Level (dB μ V/m)	-	Limit (dB μ V/m)	=	Delta (dB)
315	45	+	22.5	=	67.5	-	74.3	=	-6.8

Testresult in detail:

Test distance: 3m

Frequency [kHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]
134.3	80.8	72.0	79.6	20	100.8	92.0	99.6

Test distance: 10m

Frequency [kHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]
134.3	56.6	42.1	54.8	20	76.6	62.1	74.8

Test distance: 30m

These values are not measured. The values have been interpolated up to 30m.

Frequency [kHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]
134.3	40.8	32.0	39.6	20	60.8	52.0	59.6

Test distance: 300m

These values are not measured. The values have been interpolated up to 300m.

Frequency [kHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]
134.3	0.8	-8.0	-0.4	20	20.8	12.0	19.6	25.1

Testresult

The requirements are

■ - MET

○ - NOT MET

Min. limit margin

4.3 dB at 134.3 kHz

Max. limit exceeding

 dB at MHzRemarks: The limits are kept.

CONDUCTED POWER OF THE FUNDAMENTAL WAVE MEASURED ON THE ANTENNA TERMINALS

■ - Test not applicable

Testlocation :

- o - Shielded room no. 1
- o - Shielded room no. 2
- o - Shielded room no. 3
- o - Shielded room no. 4
- o - Shielded room no. 5
- o - Shielded room no. 6
- o - Shielded room no. 7
- o - Anechoic chamber
- o - Full compact chamber
- o - Climatic test chamber VLK

For test instruments and test accessories used please see attachment B CPC2

Description of Measurement

The conducted power of the fundamental wave measured on the antenna terminals in a climatic test chamber. The antenna jack was connected to the input of a communication test receiver. The internal batteries have been removed also and a variable DC power supply was used instead. The measurements have been made with the EuT unmodulated. During the test the supply voltage and the temperature were varied and applied simultaneously. The lower supply voltage was given by the manufacturer. In case the equipment was switching off before, the switch off voltage was used instead.

Testresult

The requirements are

o - MET

o - NOT MET

Frequency range of equipment								
Temperature °C	DC supply voltage V	Power dBm	Power dBm	Power dBm	Power dBm	Power dBm	Power dBm	Power dBm
-30								
-20								
-10								
0								
+10								
+20								
+30								
+40								
+50								

Remarks: Test not applicable.

EQUIPMENT UNDER TEST

Operation - mode of the EuT.:

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

- ☐ - Standby
- ☐ - Test program (H - Pattern)
- ☐ - Test program (colour bar)
- ☒ - Test program (customer specific)

Continuous transmitting (tag reading)

Configuration of the equipment under test: see attachment D

Following periphery devices and interface cables were connected during the measurement:

- | | |
|---|---|
| ☒ -DC power cable with ferrite 18 coils | Type : <u>Ferrite: 7427015 (Würth Elektronik)</u> |
| ☒ -RS232 cable with ferrite 5 coils | Type : <u>Ferrite: 7427014 (Würth Elektronik)</u> |
| ☒ -Control cable with ferrite 5 coils | Type : <u>Ferrite: 7427014 (Würth Elektronik)</u> |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
|
 | |
| ☐ - unshielded power cable | |
| ☐ - unshielded cables | |
| ☐ - shielded cables | MBPS.No.: |
| ☐ - customer specific cables | |
| ☐ - _____ | |
| ☐ - _____ | |

S U M M A R Y

GENERAL REMARKS:

The product IS-TR-241 has been tested on the following frequency:
TX-Mode: 134.3kHz

The unit measurements met also the bandwidth requirements.

FINAL JUDGEMENT:

The requirements according to the technical regulations and tested operation modes are

- - met.
- o - not met.

The Equipment Under Test

- - **Fulfils** the general approval requirements according to page 3.
- o - Does not fulfil the general approval requirements according to page 3.

Date of receipt of test sample : accdg. to storage record of MBPS

Testing Start Date : May 25, 2002

Testing End Date : November 11, 2002

Checked by:

i. V.



Günter Mikes
Dipl.Ing.(FH)

Tested by:



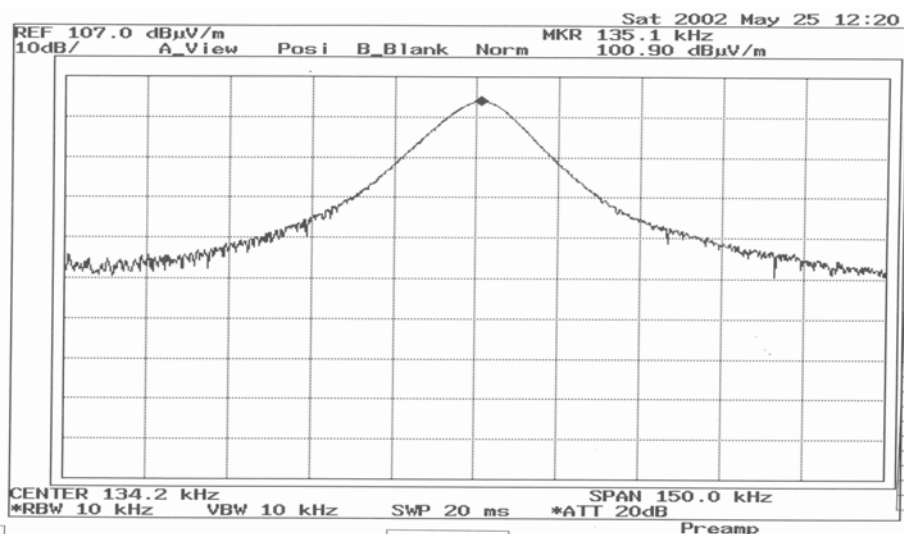
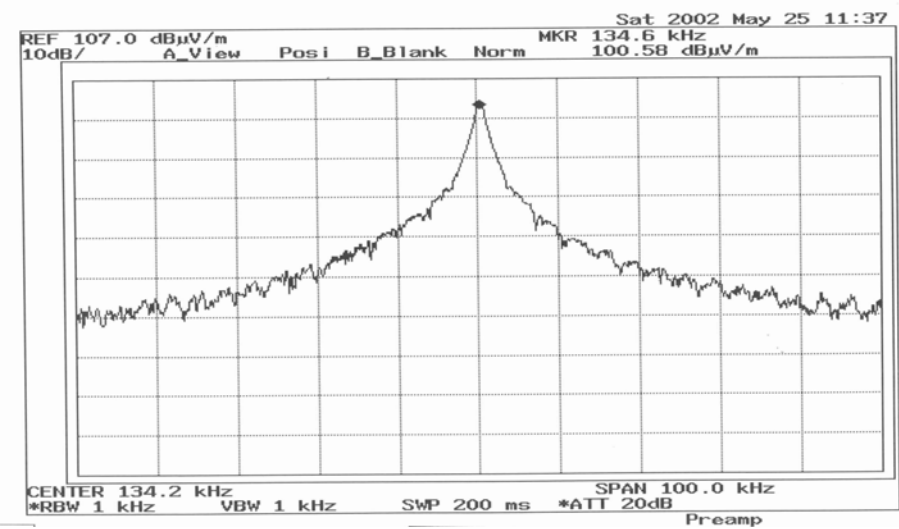
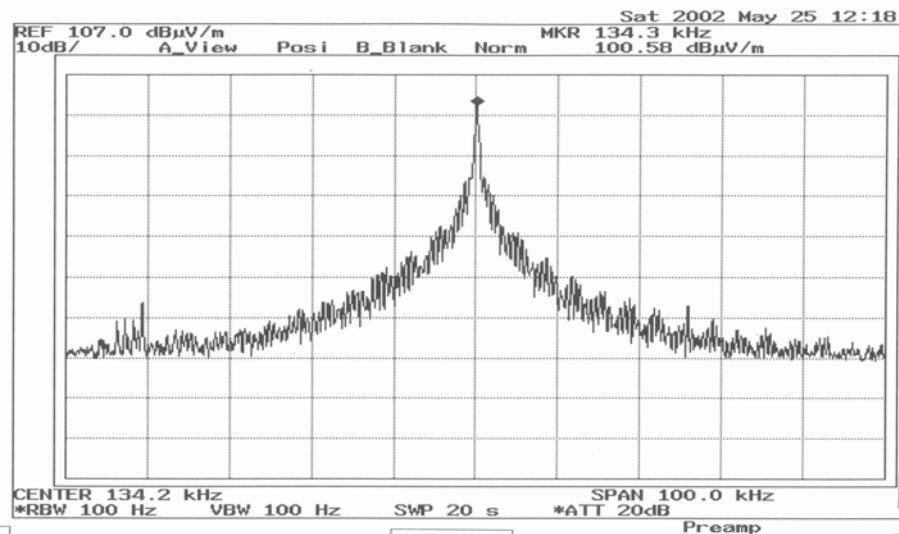
Anton Altmann
Dipl.Ing.(FH)

Attachment A1

IS-TR-241 FCC ID: PMF-IS-TR-241

File No. T 22158-01 AA

Bandwith plots



List of Test Equipment

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

Test Report No: T 22158-1-01 AA
 Beginning of Testing: 25.Mai.2002
 End of Testing: 11.November.2002

Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.	Next Cal. Date
CPR1	PS-2403-D	Power Supply 2 x 40 V	Conrad Elektronik GmbH	04-07/49-98-001	N/A
	FMZB 1516	Antenna	Schwarzbeck Mess-Elektronik	04-07/62-90-018	10.07.03
	ESCS-30	Test Receiver	Rohde & Schwarz München	04-07/63-01-001	23.09.03
	R 3162	Spectrum Analyser	Advantest	04-07/74-00-001	13.03.03
MB	PS-2403-D	Power Supply 2 x 40 V	Conrad Elektronik GmbH	04-07/49-98-001	N/A
	HZ-10	Magnetic Field Antenna	Rohde & Schwarz München	04-07/62-95-320	N/A
	R 3162	Spectrum Analyser	Advantest	04-07/74-00-001	13.03.03
SER1	PS-2403-D	Power Supply 2 x 40 V	Conrad Elektronik GmbH	04-07/49-98-001	N/A
	FMZB 1516	Antenna	Schwarzbeck Mess-Elektronik	04-07/62-90-018	10.07.03
	R 3162	Spectrum Analyser	Advantest	04-07/74-00-001	13.03.03
SER2	PS-2403-D	Power Supply 2 x 40 V	Conrad Elektronik GmbH	04-07/49-98-001	N/A
	Controller for Turntable	Controller	EMISYS Vertriebs GmbH	04-07/59-89-157	N/A
	HCC	Controller Ant.-Mast	Rohde & Schwarz München	04-07/59-97-001	N/A
	RG 214/U	RF Cable 2 m	Huber+Suhner	04-07/60-89-463	N/A
	HF 7/8 inch	Antenna Cable 13 m	Huber+Suhner	04-07/60-99-001	N/A
	HF 7/8 inch	Antenna Cable 20 m	Huber+Suhner	04-07/60-99-002	N/A
	HF 7/8 inch	Antenna Cable 40 m	Huber+Suhner	04-07/60-99-003	N/A
	KR - 200	Coax Antenna Switch	Rosenberger HF-Technik	04-07/60-99-004	N/A
	BBA-9106	Antenna	Schwarzbeck Mess-Elektronik	04-07/62-92-048	09.03.03
	UHALP-9108A	Antenna	Schwarzbeck Mess-Elektronik	04-07/62-97-079	02.02.03
	ESVP	Test Receiver	Rohde & Schwarz München	04-07/63-89-008	18.02.03
	ESVP-EZM	Spectrum Monitor	Rohde & Schwarz München	04-07/74-86-016	N/A
	Antenna Mast	Antenna Mast	Rohde & Schwarz München	04-07/92-97-001	N/A
	DMM-830	TRMS Multimeter	Tektronix GmbH	04-10/34-97-003	29.11.02

CONSTRUCTIONAL DATAFORM FOR TESTING OF RADIO EQUIPMENT

Licence holder:	DTE Automation GmbH		
Address:	Heidestrasse 38, 32051 Herford, Germany, Tel. +49 5221 101 2200		
Manufacturer:	DTE Automation GmbH		
Address:	Heidestrasse 38, 32051 Herford, Germany, Tel. +49 5221 101 2200		
Type:	Radio Frequency Identification		
Model:	IS-TR-241		
Serial-No.:	2504	Protection class:	IP54

Additional informations to the above named model:

Antenna: transmitter: receiver:	Type: Air coil 44 uH +/- 5 % @ 134.2 kHz +/- 0.5 kHz		
	Length/size: 145 mm x 105 mm x 5 mm		
	Type: same		
	Length/size:		
Power supply of the transmitter: Type:	5 V linear regulator nominal voltage: 5 V		
	lowest voltage: 4.5 V		
	highest voltage: 5.5 V		
	current consumption		
Power supply of the receiver: Type:	nominal voltage: 24 V		
	IS-TR-241 total current consumption 0.20 A		

Ancillary equipment:

Description:	External Power Supply	Type:	24 V DC	Serial-no.:	
Description:		Type:		Serial-no.:	
Description:		Type:		Serial-no.:	

Extreme temperature range in which the approval test should be performed:

☐ Category I: General (-20°C to +55°C)

☐ Category II: Portable (-10°C to +55°C)

☒ **Category III: Equipment for normal indoor use (0°C to +55°C)**

Connectable cables:

Name of the cable	Digital	Length/m	shielded
Interface & Power Supply	☒ yes ☐ no	2 m	☒ yes ☐ no
	☐ yes ☐ no		☐ yes ☐ no
	☐ yes ☐ no		☐ yes ☐ no
	☐ yes ☐ no		☐ yes ☐ no
	☐ yes ☐ no		☐ yes ☐ no

O If applicable, if necessary complete overleaf

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Type designation: IS-TR-241 Radio Frequency Identifier			
Name and type designation of individual units comprising the radio equipment: Micro-reader RI-STU-MRD1 (vendor Texas Instruments)			
Type of equipment:			
☐ Radiotelephone equipment	☐ Remote-control equipment	☐ Radiomaritime equipment	☐ LPD
☐ One-way radiotelephone equipment	☐ Inductive loop system	☐ Inland waterways equipment	☐ RLAN
☐ Personal paging system	☐ Radio-relay system	☐ Radionavigation equipm.	☒ Short Range Device
☐ Satellite earth station	☐ CB radiotelephone equipment	☐ Antenna	☐
☐ Data transmission equipment	☐ Movement detector	☐ Aeronautical equipment	☐
Technical characteristics:			
	Transmitter-receiver	Transmitter	Receiver
Frequency range	134.2 kHz +/- 0.5 kHz		
Maximum no. of channels	1		
Channel spacing			
Class of emission (type of modulation)	134K2 P0D		
Maximum RF output power			
Maximum effective radiated power (ERP)	40 dBμA/m at 10m		
Output power variable	no		
Channel switching frequency range			
Method of frequency generation	☐ Synthesizer ☒ Crystal ☐ Other		
Frequency generation TX	17.177 MHz		
Frequency generation RX	17.177 MHz		
IF	1st IF	2nd IF	3rd IF
Integral selective calling			
Audio-frequency interface level at external data socket			
Modes of operation	☐ Duplex mode ☒ Semi-duplex mode ☐ Simplex mode		
Power source	☒ Mains ☐ Vehicle-regulated ☐ Integral		
Antenna socket	☐ BNC ☐ TNC ☐ N ☐ M ☐ UHF ☐ Adapter ☒ None ☐		
Test specifications: FCC Part 15.209			

Declarations:

- We declare that the above information are correct and the named model was supplied with the maximum configuration to the accredited test laboratory.

Herford, Germany
15 November, 2002

place of issue

DTE Automation GmbH

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Andreas Rehsöft
Executive Director of Engineering

Seal and signature of applicant