PHOENIX TESTLAB

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# TEST REPORT

**Test Report Reference: R70753_A second version**

**Equipment under Test: Lightweight Tracker**

**FCC ID: U92-2**

**IC: 4919D-2**

**Serial Number: None**

**Applicant: Stryker Leibinger GmbH & Co. KG**

**Manufacturer: Stryker Leibinger GmbH & Co. KG**

**Test Laboratory**
**(CAB)**
**accredited by**
**DATech GmbH**
**in compliance with DIN EN ISO/IEC 17025**
**under the**
**Reg. No. DAT-P-105/99-21,**
**FCC Test site registration number 90877**
**and**
**Industry Canada Test site registration IC3469**

**Contents:** **Page**

# 1 IDENTIFICATION

## 1.1 APPLICANT

| | |
|---|---|
| Name: | Stryker Leibinger GmbH & Co. KG |
| Address: | Bötzinger Strasse 41 |
| | 79111 Freiburg |
| Country: | Germany |
| Name for contact purposes: | Mr. Hans-Paul ARNDT |
| Tel: | + 49 761 45 12-464 |
| Fax: | + 49 761 45 12-44 94 64 |
| e-mail address: | Hanspaul.arndt@stryker.com |

## 1.2 MANUFACTURER

| | |
|---|---|
| Name: | Stryker Leibinger GmbH & Co. KG |
| Address: | Bötzinger Strasse 41 |
| | 79111 Freiburg |
| Country: | Germany |
| Name for contact purposes: | Mr. Hans-Paul ARNDT |
| Tel: | + 49 761 45 12-464 |
| Fax: | + 49 761 45 12-44 94 64 |
| e-mail address: | Hanspaul.arndt@stryker.com |

## 1.3 DATES

| | |
|---|---|
| Date of receipt of test sample: | 23 May 2007 |
| Start of test: | 23 May 2007 |
| Finish of test: | 15 June 2007 |

## 1.4 TEST LABORATORY

The tests were carried out at: **PHOENIX TESTLAB GmbH**
**Königswinkel 10**
**D-32825 Blomberg** **Phone:** **+49 (0) 52 35 / 95 00-0**
**Germany** **Fax:** **+49 (0) 52 35 / 95 00-10**

accredited by DATech GmbH in compliance with DIN EN ISO/IEC 17025 under Reg. No. DAT-P-105/99-21, FCC Test site registration number 90877 and Industry Canada Test site registration IC3469

| | | | |
|---|---|---|---|
| Test engineer: | Thomas KÜHN | | 07 December 2007 |
| | Name | Signature | Date |
| Test report checked: | Frank EIKERMANN | | 07 December 2007 |
| | Name | Signature | Date |

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Stamp

## 1.5 RESERVATION

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The test results herein refer only to the tested sample. PHOENIX TESTLAB GmbH is not responsible for any generalisations or conclusions drawn from these test results concerning further samples. Any modification of the tested samples is prohibited and leads to the invalidity of this test report. Each page necessarily contains the PHOENIX TESTLAB Logo and the TEST REPORT REFERENCE.

## 1.6 NORMATIVE REFERENCES

[1] **ANSI C63.4-2003** American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

[2] **FCC 47 CFR Part 15 (May 2007)** Radio Frequency Devices

[3] **RSS-210 Issue 7 (June 2007)** Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

[4] **RSS-Gen Issue 2 (June 2007)** General Requirements and Information for the Certification of Radiocommunication Equipment

## 1.7 TEST RESULTS

The requirements of this test document are fulfilled by the equipment under test. The complete test results are presented in the following.

# 2 TECHNICAL DATA OF EQUIPMENT

## 2.1 DEVICE UNDER TEST

| | |
|---|---|
| Type of equipment: | 125 kHz RFID transponder reader device |
| Type designation: | Lightweight Tracker |
| FCC ID: | U92-2 |
| IC: | 4919D-2 |
| Serial No.: | None |
| Modulation: | 100 % AM (OOK) by passive transponder |
| Lowest internal frequency: | 125 kHz |
| Highest internal frequency: | 12 MHz |
| Antenna type: | Integral |
| Supply Voltage: | 3 V DC by internal lithium battery type CR2 |

**The following external I/O cables were used:**

| Cable | Length | Shielding | Connector |
|---|---|---|---|
| - | - | - | - |
| - | No cables are connectable to the EUT | | - |
| - | | | - |
| - | - | - | - |
| - | - | - | - |

*: Length during the test

## 2.2 PERIPHERY DEVICES

**The following equipment was used as control unit and ancillary equipment:**

During all measurements a 125 kHz transponder type GLASS TAG Hitag S – 2.12 x 12.0 mm was used.

## 2.3 SPECIAL EMC MEASURES

**The following EMC measures were necessary to reach the documented results:**

None.

# 3 OPERATIONAL STATES AND PHYSICAL BOUNDARIES

All tests were carried out with an unmodified test sample. During all tests, the EUT was powered by the internal battery and equipped with a transponder.

If a variation of the supply voltage was necessary, it was done in the range 3.0 V DC to 2.55 V DC. This range was declared by the applicant as extreme supply voltage range.

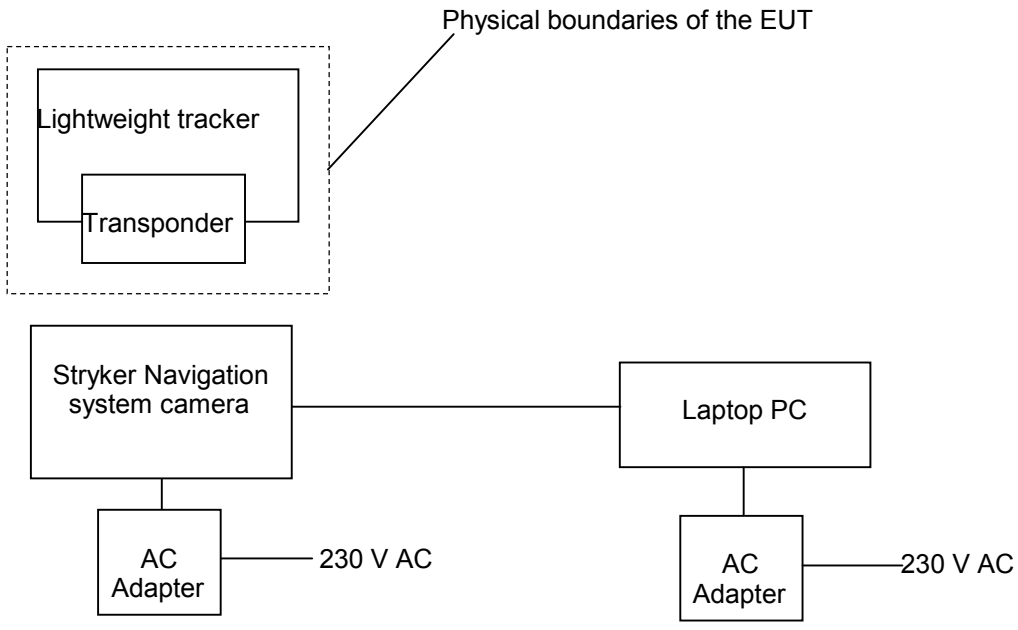
The EUT was set in operation with the help of a Stryker Navigation system camera. This camera initiates the EUT to flash its IR-LEDs and transmit the transponder information via IR back to the camera. The received information was transferred to a laptop PC with a Stryker Navigation-software. The Laptop displays the position of the EUT in relation to the camera and the transponder data. After receiving the correct information, the system requests the next data from the EUT.

For the whole frequency range a preliminary measurement in a fully anechoic chamber with a measuring distance of 3 m was carried out to determine the frequencies, which were radiated by the EUT.
The final measurements on the detected frequencies were carried out on an outdoor test site without ground plane (for the frequency range 9 kHz to 30 MHz) and on an open area test site with ground plane (for the frequency range 30 MHz to 1 GHz).

No spurious emissions measurement of the receiver was carried out, because the co located transmitter transmits continuously.

Because all actions of the EUT were initiated by the Stryker Navigation camera and the laptop PC via an optical path (IR), the camera and the PC have to be placed inside the test site. To minimize the influence of this system, most components were placed inside a shielded box, and the camera on top of the shielded box.

The physical boundaries of the EUT are shown below.



# 4 ADDITIONAL INFORMATION

EUT´s transponder reader is intended for reading transponder data over distances below 1 mm. The antenna is build in a metal housing, with a hole, where the transponder (also with metal housing) is intended to be placed inside. For details of the antenna and transponder construction refer also the photographs in annex B and C of this test report. This construction is the reason for the low 125 kHz output signal during the radiated measurements.

# 5 APPLICATION OVERVIEW

| Application | Frequency range [MHz] | FCC 47 CFR Part 15 section | RSS 210, Issue 7 [3] or RSS-Gen, Issue 2 [4] | Status | Refer page |
|---|---|---|---|---|---|
| Conducted emissions on supply line | 0.15 – 30 | 15.207 (a) | 7.2.2 [4] | Not applicable | - |
| Radiated emissions (transmitter) | 0.009 – 1,000 | 15.205 (a)<br>15.209 (a) | A8.5 [3],<br>4.7 [4] | Passed | 13 et seq. |
| Radiated emissions (receiver) | 0.009 – 1,000 | - | 2.6 [3],<br>7.2.3 [4] | Not applicable | 6 |
| Antenna requirement | General | 15.203 | 7.1.4 [4] | Passed | 5 |

# 6 METHOD OF MEASUREMENT

## 6.1 RADIATED EMISSIONS 9 kHz to 30 MHz

The radiated emission measurement is divided into two stages.

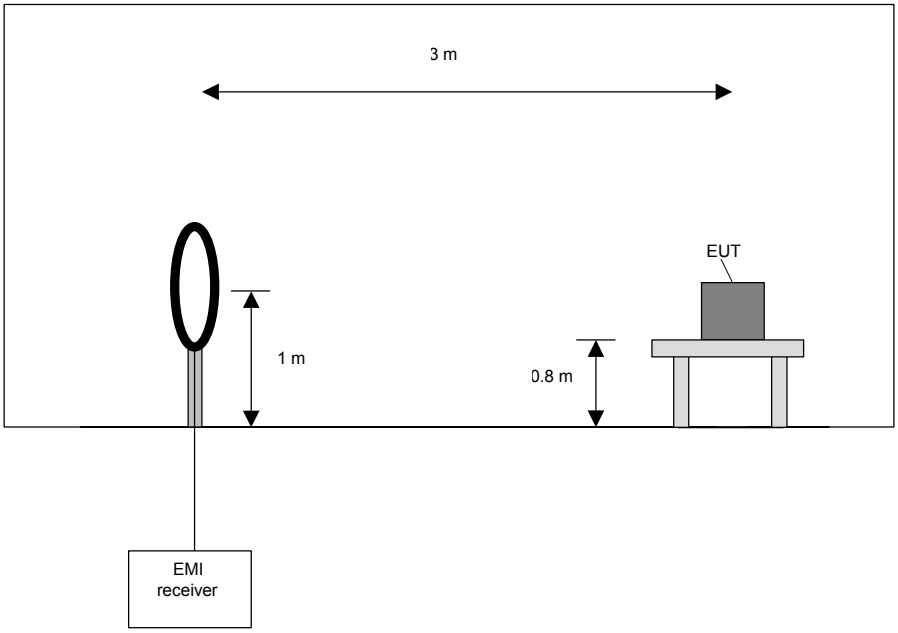
**Preliminary measurement:**

In the first stage a preliminary measurement will be performed in a shielded room with a measuring distance of 3 meters. Tabletop devices will set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm. Floor-standing devices will be placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 [1].

The frequency range 9 kHz to 30 MHz will be monitored with a spectrum analyser while the system and its cables will be manipulated to find out the configuration with the maximum emission levels if applicable. The EMI Receiver will be set to MAX Hold mode. The EUT and the measuring antenna will be rotated around their vertical axis to found the maximum emissions.

The resolution bandwidth of the spectrum analyser will be set to the following values:

| Frequency range | Resolution bandwidth |
|---|---|
| 9 kHz to 150 kHz | 200 Hz |
| 150 kHz to 30 MHz | 10 kHz |



Preliminary measurement procedure:

Prescans were performed in the frequency range 9 kHz to 150 kHz and 150 kHz to 30 MHz.

The following procedure will be used:

1) Monitor the frequency range at horizontal polarisation and a EUT azimuth of 0 °.
2) Manipulate the system cables within the range to produce the maximum level of emission.
3) Rotate the EUT by 360 ° to maximize the detected signals.
4) Make a hardcopy of the spectrum.
5) Measure the frequencies of highest detected emission with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
6) Repeat steps 1) to 4) with the other orthogonal axes of the EUT.
7) Rotate the measuring antenna and repeat steps 1) to 5).

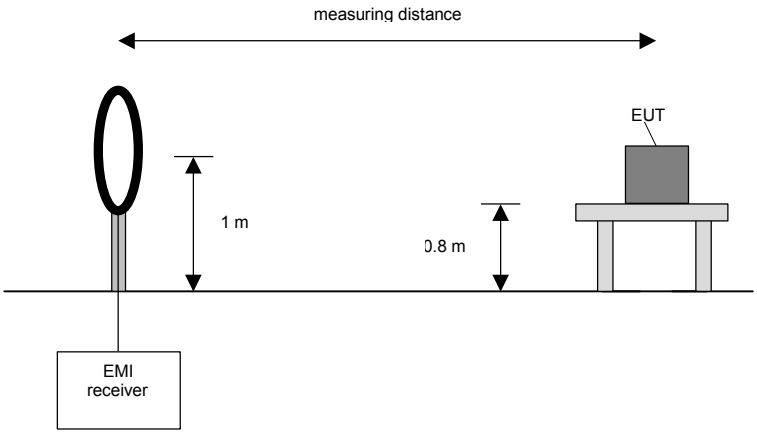
**Final measurement:**

In the second stage a final measurement will be performed on an open area test site with no conducting ground plane in a measuring distances of 3 m, 10 m and 30 m. In the case where larger measuring distances are required the results will be extrapolated based on the values measured on the closer distances according to Section 15.31 (f) (2) [2]. The final measurement will be performed with a EMI Receiver set to Quasi Peak detector except for the frequency bands 9 kHz to 90 kHz and 110 kHz to 490 kHz where an average detector will be used according Section 15.209 (d) [2].

On the during the preliminary measurement detected frequencies the final measurement will be performed while rotating the EUT and the measuring antenna in the range of 0 ° to 360 ° around their vertical axis until the maximum value is found.

The resolution bandwidth of the EMI Receiver will be set to the following values:

| Frequency range | Resolution bandwidth |
|---|---|
| 9 kHz to 150 kHz | 200 Hz |
| 150 kHz to 30 MHz | 9 kHz |



Final measurement procedure:

The following procedure will be used:

1) Monitor the frequency range with the measuring antenna at vertical orientation parallel to the EUT at an azimuth of 0 °.
2) Rotate the EUT by 360 ° to maximize the detected signals and note the azimuth and orientation.
3) Rotate the measuring antenna to find the maximum and note the value.
4) Rotate the measuring antenna and repeat steps 1) to 3) until the maximum value is found.
5) Repeat steps 1) to 4) with the other orthogonal axes of the EUT if applicable (handheld equipment).

## 6.2 RADIATED EMISSIONS 30 MHz to 1 GHz

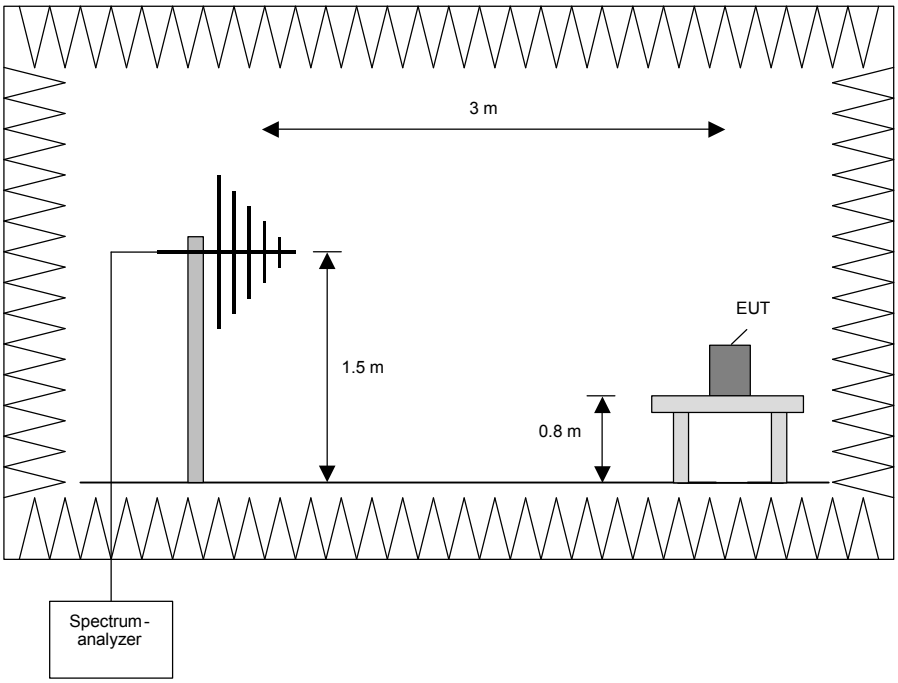
The radiated emission measurement is divided into two stages.

**Preliminary measurement:**
In the first stage a preliminary measurement will be performed in a fully anechoic chamber with a measuring distance of 3 meter. Tabletop devices will set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm. Floor-standing devices will be placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 [1].

The frequency range 30 MHz to 1 GHz will be measured with an EMI Receiver set to MAX Hold mode and a resolution bandwidth of 100 kHz. The measurement will be performed in horizontal and vertical polarisation of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 ° to 360 °.

The resolution bandwidth of the EMI Receiver will be set to the following values:

| Frequency range | Resolution bandwidth |
|---|---|
| 30 MHz to 1 GHz | 100 kHz |



Procedure preliminary measurement:

Prescans were performed in the frequency range 30 MHz to 230 MHz and 230 MHz to 1 GHz.
The following procedure will be used:

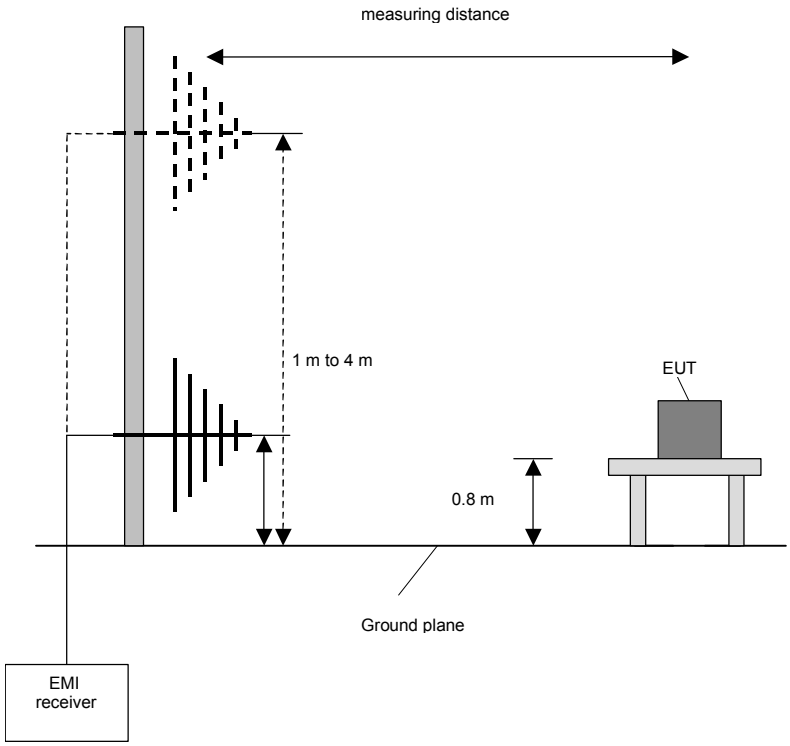
1. Monitor the frequency range at horizontal polarisation and a EUT azimuth of 0 °.
2. Manipulate the system cables within the range to produce the maximum level of emission.
3. Rotate the EUT by 360 ° to maximize the detected signals.
4. Make a hardcopy of the spectrum.
5. Measure the frequency of 3 highest detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
6. Repeat steps 1) to 4) with the other orthogonal axes of the EUT.
7. Repeat steps 1) to 5) with the vertical polarisation of the measuring antenna.

**Final Measurement:**

In the second stage a final measurement on an open area test site will be performed on selected frequencies found in the preliminary measurement. During this test the EUT will be rotated in the range of 0 ° to 360 °, the measuring antenna will be set to horizontal and vertical polarisation and raised and lowered in the range from 1 m to 4 m to find the maximum level of emissions.

The resolution bandwidth of the EMI Receiver will be set to the following values:

| Frequency range | Resolution bandwidth |
|---|---|
| 30 MHz to 1 GHz | 120 kHz |



Procedure final measurement:

The following procedure will be used:

1) Measure on the selected frequencies at an antenna height of 1 m and a EUT azimuth of 23 °.
2) Move the antenna from 1 m to 4 m and note the maximum value at each frequency.
3) Rotate the EUT by 45 ° and repeat 2) until an azimuth of 337 ° is reached.
4) Repeat 1) to 3) for the other orthogonal antenna polarization.
5) Move the antenna and the turntable to the position where the maximum value is detected.
6) Measure while moving the antenna slowly +/- 1 m.
7) Set the antenna to the position where the maximum value is found.
8) Measure while moving the turntable +/- 45 °.
9) Set the turntable to the azimuth where the maximum value is found.
10) Measure with Final detector (QP or AV) and note the value.
11) Repeat 5) to 10) for each frequency.
12) Repeat 1) to 11) for each orthogonal axes of the EUT if handheld equipment.

# 7 TEST RESULTS EMISSION TEST

## 7.1 PRELIMINARY RADIATED EMISSION TEST (9 kHz to 30 MHz)

| | | | |
|---|---|---|---|
| Ambient temperature: | 21 °C | Relative humidity: | 43 % |

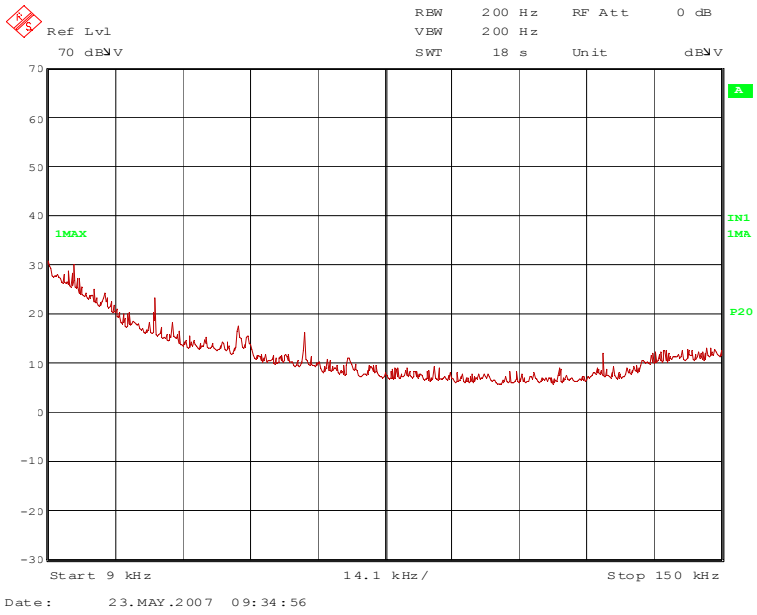
Position of EUT: The EUT was set-up on a non-conducting table of a height of 0.8 m. The distance between EUT and antenna was 3 m.

Cable guide: No cables were connectable to the EUT. For further information refer to the pictures in annex A of this test report.

Test record: The test was carried out in normal operation mode of the EUT (reading a TAG). All results are shown in the following.

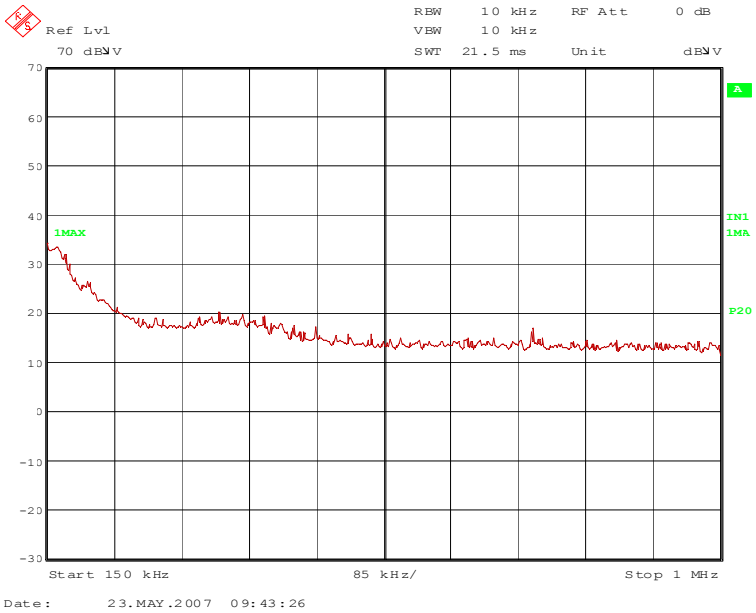
Remark: The emissions found at 31 kHz, 42 kHz and 53 kHz caused by the measuring system and not by the EUT.

70573_1.wmf: Spurious emissions from 9 kHz to 150 kHz:

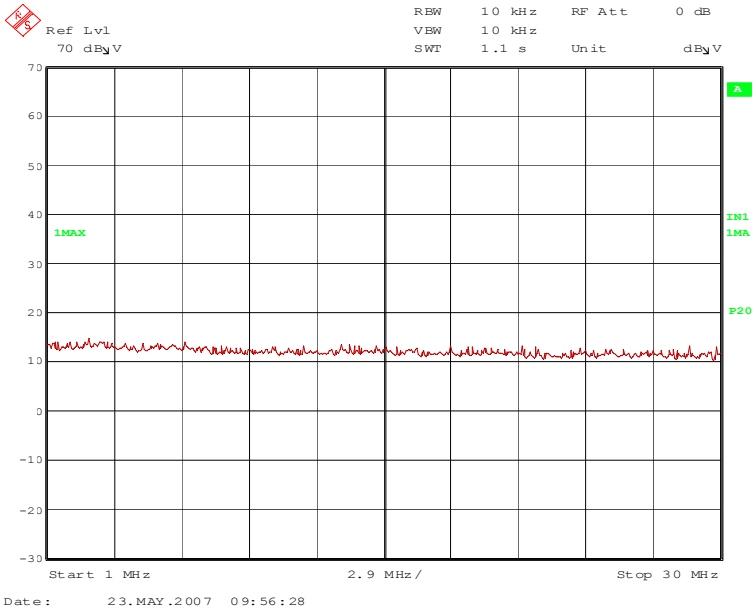



| TEST EQUIPMENT USED THE TEST: |
|---|
| 29, 31 – 33, 54, 56 |

70573_2.wmf: Spurious emissions from 150 kHz to 1 MHz:




70573_3.wmf: Spurious emissions from 1 MHz to 30 MHz:




The following emission was found according to FCC 47 CFR Part 15 section 15.209 (a).

125.000 kHz.

This frequency has to be measured on the outdoor test site. The result of this final measurement is shown in subclause 6.3 of this test report.

## 7.2 PRELIMINARY RADIATED EMISSION TEST (30 MHz to 1 GHz)

| | | | |
|---|---|---|---|
| Ambient temperature: | 20 °C | Relative humidity: | 45 % |

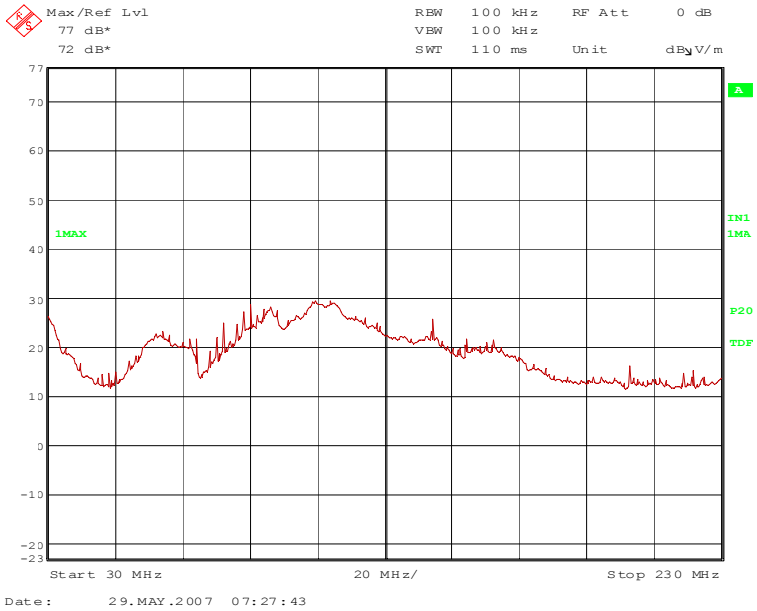
Position of EUT: The EUT was set-up on a non-conducting table of a height of 0.8 m. The distance between EUT and antenna was 3 m.

Cable guide: No cables were connectable to the EUT. For further information refer to the pictures in annex A of this test report.

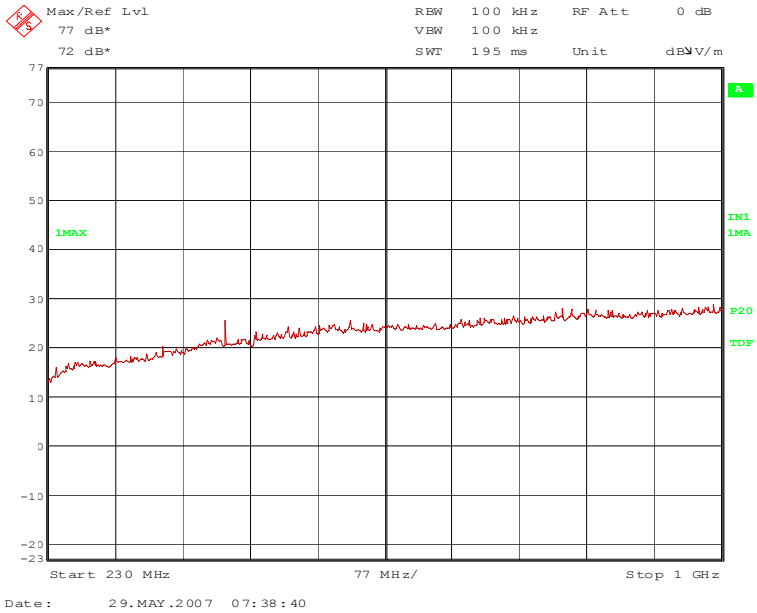
Test record: The test was carried out in normal operation mode of the EUT (reading a TAG). All results are shown in the following.

Supply voltage: The EUT was supplied with 3.0 V DC, because no difference was noticeable with supply voltages from 3.0 V DC to 2.55 V DC.

70573_6.wmf: Spurious emissions from 30 MHz to 230 MHz:



70573_7.wmf: Spurious emissions from 230 MHz to 1 GHz:




The following frequencies were found during the preliminary radiated emission test:

64.000 MHz, 82.000 MHz, 90.000 MHz, 108.376 MHz and 432.000 MHz

These frequencies were caused by the camera system and not by the EUT. So no final emission measurement on the open area test site were carried out.

| EST EQUIPMENT USED FOR THE TEST: |
|---|
| 29, 31 – 35, 43, 54 |

## 7.3 FINAL RADIATED EMISSION TEST (9 kHz to 30 MHz)

| | | | |
|---|---|---|---|
| Ambient temperature: | 21 °C | Relative humidity: | 52 % |

Position of EUT: The EUT was set-up on a non-conducting table of a height of 0.8 m. The distance between EUT and antenna was 3 m.

Cable guide: No cables were connectable to the EUT. For further information refer to the pictures in annex A of this test report.

Test record: The test was carried out in normal operation mode of the EUT (reading a TAG). All results are shown in the following.

Supply voltage: The EUT was supplied with 3.0 V DC, because no difference was noticeable with supply voltages from 3.0 V DC to 2.55 V DC.

Remark: It was not possible to measure the transmitter output power on the outdoor testsite either at 10 m nor at 3 m measuring distance, because the output signal was below the noise floor of the system. The given level was calculated with the level measured during the preliminary measurement inside a fully anechoic chamber. Because the level of the signal measured during the preliminary measurement is measured with a peak detector, the level with the required average detector will be lower.

| **Results with measuring distance of 3 m inside fully anechoic chamber** | | | | | | |
|---|---|---|---|---|---|---|
| Frequency | Result dBµV/m | Limit dBµV/m | Margin dB | Detector | Readings dBµV | Antenna factor * dB/m |
| 125.0 kHz | <32.0 | 105.6 | >73.4 | PK | <12.0 | 20.0 |
| Measurement uncertainty | | | +2.2 dB / -3.6 dB | | | |

*: Cable loss included

Test: Passed

| TEST EQUIPMENT USED FOR THE TEST: |
|---|
| 54 – 57 |

# 8 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

| Emission measurement at AC mains and DC in / out ports at M4 | | | | | |
|---|---|---|---|---|---|
| No. | Test equipment | Type | Manufacturer | Serial No. | PM-No |
| 1 | Shielded chamber M4 | - | Siemens | B83117S1-X158 | 480088 |
| 2 | Measuring receiver | ESAI | Rohde & Schwarz | 831953/001<br>833181/018 | 480025<br>480026 |
| 3 | LISN | NSLK8128 | Schwarzbeck | 8128155 | 480058 |
| 4 | LISN | NSLK 8128- | Schwarzbeck | 8128161 | 480138 |
| 5 | AC-filter | B84299-D87-E3 | Siemens | 930262292 | 480097 |
| 6 | EMI-Software | ES-K1 | Rohde & Schwarz | - | 480111 |

| Radiated emission measurement at M5 | | | | | |
|---|---|---|---|---|---|
| No. | Test equipment | Type | Manufacturer | Serial No. | PM-No |
| 7 | Fully anechoic chamber M5 | - | Siemens | B83177-S1-X156 | 480073 |
| 8 | Measuring receiver | ESVS30 | Rohde & Schwarz | 829673/012 | 480024 |
| 9 | Controller | HD100 | Deisel | 100/324 | 480067 |
| 10 | Antenna support | MA240 | Deisel | 228/314 | 480069 |
| 11 | Turntable | DS412 | Deisel | 412/317 | 480070 |
| 12 | Antenna | CBL6112C | Chase | 2689 | 480327 |
| 13 | EMI Software | ES-K1 | Rohde & Schwarz | - | 480111 |

| Radiated emission measurement at M6 | | | | | |
|---|---|---|---|---|---|
| No. | Test equipment | Type | Manufacturer | Serial No. | PM-No |
| 14 | Open area test site | - | Phoenix Test-Lab | - | 480085 |
| 15 | Measuring receiver | ESVS30 | Rohde & Schwarz | 829673/012 | 480024 |
| 16 | Controller | HD100 | Deisel | 100/670 | 480139 |
| 17 | Turntable | DS420HE | Deisel | 420/620/80 | 480087 |
| 18 | Antenna support | AS615P | Deisel | 615/310 | 480086 |
| 19 | Antenna | CBL6111 A | Chase | 1643 | 480147 |
| 20 | EMI Software | ES-K1 | Rohde & Schwarz | - | 480111 |

| Radiated emission measurement at M8 | | | | | |
|---|---|---|---|---|---|
| No. | Test equipment | Type | Manufacturer | Serial No. | PM-No |
| 21 | Fully anechoic chamber M8 | - | Siemens | B83117-E7019-T231 | 480190 |
| 22 | Measuring receiver | ESMI | Rohde & Schwarz | 843977/001<br>843530/018 | 480179<br>480180 |
| 23 | Measuring receiver | ESCS 30 | Rohde & Schwarz | 828985/014 | 480270 |
| 24 | Controller | HD100 | Deisel | 100/427 | 480181 |
| 25 | Turntable | DS420 | Deisel | 420/435/97 | 480186 |
| 26 | Antenna support | AS615P | Deisel | 615/310 | 480187 |
| 27 | Antenna | CBL6112 A | Chase | 2034 | 480185 |
| 28 | EMI Software | ES-K1 | Rohde & Schwarz | - | 480111 |

| Radiated emission measurement at M20 | | | | | |
|---|---|---|---|---|---|
| No. | Test equipment | Type | Manufacturer | Serial No. | PM-No |
| 29 | Fully anechoic chamber M20 | - | Albatross Projects | B83107-E2439-T232 | 480303 |
| 30 | Measuring receiver | ESMI | Rohde & Schwarz | 843977/001<br>843530/018 | 480179<br>480180 |
| 31 | Measuring receiver | ESI 40 | Rohde & Schwarz | 100064 | 480355 |
| 32 | Controller | HD100 | Deisel | 100/670 | 480326 |
| 33 | Turntable | DS420HE | Deisel | 420/620/80 | 480315 |
| 34 | Antenna support | AS615P | Deisel | 615/310 | 480187 |
| 35 | Antenna | CBL6112 B | Chase | 2688 | 480328 |
| 36 | Antenna | 3115 A | EMCO | 9609-4918 | 480183 |
| 37 | Standard Gain Horn<br>11.9 GHz – 18 GHz | 18240-20 | Flann Microwave | 483 | 480294 |
| 38 | Standard Gain Horn<br>11.9 GHz – 18 GHz | 18240-20 | Flann Microwave | 482 | 480295 |
| 39 | Standard Gain Horn<br>17.9 GHz – 26.7 GHz | 20240-20 | Flann Microwave | 411 | 480297 |
| 40 | Standard Gain Horn<br>17.9 GHz – 26.7 GHz | 20240-20 | Flann Microwave | 410 | 480296 |
| 41 | Standard Gain Horn<br>26.4 GHz – 40.1 GHz | 22240-20 | Flann Microwave | 469 | 480299 |

| No. | Test equipment | Type | Manufacturer | Serial No. | PM-No |
|---|---|---|---|---|---|
| 42 | Standard Gain Horn 26.4 GHz – 40.1 GHz | 22240-20 | Flann Microwave | 468 | 480298 |
| 43 | RF-cable No. 30 | RTK 081 | Rosenberger | - | 410141 |
| 44 | RF-cable No. 31 | RTK 081 | Rosenberger | - | 410142 |
| 45 | RF-cable 1m | KPS-1533-400-KPS | Insulated Wire | - | 480300 |
| 46 | RF-cable 1m | KPS-1533-400-KPS | Insulated Wire | - | 480301 |
| 47 | RF-cable 2m | KPS-1533-400-KPS | Insulated Wire | - | 480302 |
| 48 | RF-cable No. 5 | RTK 081 | Rosenberger | | 410097 |
| 49 | Preamplifier | JS3-00101200-23-5A | Miteq | 681851 | 480337 |
| 50 | Preamplifier | JS3-12001800-16-5A | Miteq | 571667 | 480343 |
| 51 | Preamplifier | JS3-18002600-20-5A | Miteq | 658697 | 480342 |
| 52 | Preamplifier | JS3-26004000-25-5A | Miteq | 563593 | 480344 |
| 53 | EMI Software | ES-K1 | Rohde & Schwarz | - | 480111 |

| Ancillary equipment used for testing | | | | | |
|---|---|---|---|---|---|
| No. | Test equipment | Type | Manufacturer | Serial No. | PM-No |
| 54 | Power supply | TOE 8852 | Toellner | 51712 | 480233 |
| 55 | Outdoor test site | - | Phoenix Test-Lab | - | 480293 |
| 56 | Loop antenna | HFH2-Z2 | Rohde & Schwarz | 832609/014 | 480059 |
| 57 | EMI test receiver | ESPC | Rohde & Schwarz | 843756/006 | 480150 |
| 58 | Loop Antenna ∅ = 225 mm | - | Phoenix Test-Lab | - | 410085 |
| 59 | RF-cable No. 10 | RG223 | Phoenix-Test-Lab | - | 410102 |
| 60 | AC power source / analyser | 6813A | Hewlett Packard | 3524A-00484 | 480155 |
| 61 | Climatic chamber | MK 240 | BINDER | 05-79022 | 480462 |

All used measurement equipment was calibrated (if necessary). The calibration intervals and the calibration history will be given out on request.

# 9 LIST OF ANNEXES

| | | |
|---|---|---|
| **ANNEX A** | **PHOTOGRAPHS OF THE TEST SET-UPS**: | **3 pages** |
| | Lightweight Tracker, test set-up fully anechoic chamber | 70573_k.jpg |
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| | Lightweight Tracker, test set-up fully anechoic chamber | 70573_g.jpg |
| **ANNEX B** | **EXTERNAL PHOTOGRAPHS OF THE TEST SAMPLE**: | **3 pages** |
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| **ANNEX C** | **INTERNAL PHOTOGRAPHS OF THE TEST SAMPLE**: | **4 pages** |
| | Lightweight Tracker, internal view | 70573_2.jpg |
| | Lightweight Tracker, detail view to battery housing / antenna | 70573_4.jpg |
| | Lightweight Tracker, PCB, top view * | 70573_3.jpg |
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* PHOTOGRAPHS SUPPLIED BY THE APPLICANT