

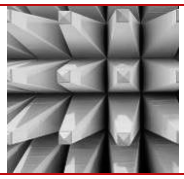

CETECOM™
CETECOM ICT Services
consulting - testing - certification

# TEST REPORT

**Test report no.: 1-4695/12-01-03-C**

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-01

## Testing laboratory


**CETECOM ICT Services GmbH**
Untertuerkheimer Strasse 6 – 10
66117 Saarbruecken / Germany
Phone: + 49 681 5 98 - 0
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**Accredited Testing Laboratory:**
The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)
The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01
Area of Testing: Radio/Satellite Communications

## Applicant


**Philips Medizin Systeme Böblingen GmbH**
Hewlett-Packard-Strasse 2
71034 Böblingen / GERMANY
Phone: -/-
Fax: +49 7031 463-2944
Contact: Hansjörg Geywitz
e-mail: hansjoerg.geywitz@philips.com
Phone: +49 7031 463-1879


## Manufacturer


**Philips Medizin Systeme Böblingen GmbH**
Hewlett-Packard-Strasse 2
71034 Böblingen / GERMANY


## Test standard/s

| | |
|---|---|
| 47 CFR Part 95 | Title 47 of the Code of Federal Regulations; Chapter I<br>Subpart H—Wireless Medical Telemetry Service (WMTS); Part 95 - Personal radio services |
| RSS - 210 Issue 8 | Spectrum Management and Telecommunications - Radio Standards Specification<br>Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands):<br>Category I Equipment |

For further applied test standards please refer to section 3 of this test report.

## Test Item

| | |
|---|---|
| **Kind of test item:** | **CTG Base Station** |
| **Model name:** | **866074** |
| **FCC ID:** | **PQC-OBRBSBV1** |
| **IC:** | **3549C-OBRBSBV1** |
| Frequency: | 608 MHz – 614 MHz<br>Lowest Channel 3 (608.375 MHz) /<br>Highest Channel 38 (613.625 MHz) |
| Antenna: | Integrated antenna |
| Power Supply: | 6.0 V Base station with 6V DC inlet powered by external connected fetal monitor) |
| Temperature Range: | -20°C to +55 °C |

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

## Test report authorised:

cn=Marco Bertolino, o=CETECOM ICT Services GmbH, ou=BTL-100826, email=marco.bertolino@cetecom.com, c=DE
2013.07.09 15:32:21 +02'00'

Marco Bertolino
Testing Manager

## Test performed:

cn=Stefan Boes, o=CETECOM ICT Services GmbH, ou=BOE-111011, email=Stefan.Boes@cetecom.com, c=DE
2013.07.09 10:55:47 +02'00'

Stefan Bös
Senior Testing Manager

# 1 Table of contents

# 2 General information

## 2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.
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This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

## 2.2 Application details

| | |
|---|---|
| Date of receipt of order: | 2012-06-12 |
| Date of receipt of test item: | 2012-11-27 |
| Start of test: | 2012-11-27 |
| End of test: | 2013-02-13 |
| Person(s) present during the test: | -/- |

# 3 Test standard/s

| Test standard | Date | Test standard description |
|---|---|---|
| 47 CFR Part 95 | 2010-10 | Title 47 of the Code of Federal Regulations; Chapter I Subpart H—Wireless Medical Telemetry Service (WMTS); Part 95 - Personal radio services |
| RSS - 210 Issue 8 | 2010-12 | Spectrum Management and Telecommunications - Radio Standards Specification<br>Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment |

## 4 Test environment

| | | | |
|---|---|---|---|
| Temperature: | $T_{nom}$ | +22 °C | during room temperature tests |
| | $T_{max}$ | +55 °C | during high temperature tests |
| | $T_{min}$ | -20 °C | during low temperature tests |
| Relative humidity content: | | 54 % | |
| Barometric pressure: | | not relevant for this kind of testing | |
| Power supply: | $V_{nom}$ | 6.0 V | Base station with 6V DC inlet powered by external connected fetal monitor) |
| | $V_{max}$ | 7.9 V | |
| | $V_{min}$ | 5.5 V | |

## 5 Test item

| | | |
|---|---|---|
| **Kind of test item** | **:** | **CTG Base Station** |
| **Type identification** | **:** | **866074** |
| | | |
| **S/N serial number** | **:** | **DE24600128** |
| **HW hardware status** | **:** | **1304** |
| **SW software status** | **:** | **A.02.04** |
| **Frequency band [MHz]** | **:** | **608 MHz – 614 MHz<br>Lowest Channel 3 (608.375 MHz) / Highest Channel 38 (613.625 MHz)** |
| **Type of modulation** | **:** | **GFSK** |
| **Antenna** | **:** | **Integrated antenna** |
| **Power supply** | **:** | **6.0 V Base station with 6V DC inlet powered by external connected fetal monitor)** |
| **Temperature range** | **:** | **-20°C to +55 °C** |

## 6 Test laboratories sub-contracted

None

## 7 Additional information

Test setup - and EUT - photos are included in the following test reports:

External EUT photos: 1-4695/12-01-03_AnnexA
Internal EUT photos: 1-4695/12-01-03_AnnexB
Test setup: 1-4695/12-01-03_AnnexC

## 8 Summary of measurement results

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

☐ There were deviations from the technical specifications ascertained

| TC Identifier | Description | Verdict | Date | Remark |
|---|---|---|---|---|
| RF-Testing | 47 CFR Part 2<br>47 CFR Part 95 H<br>RSS Gen Issue 3<br>RSS 210 Issue 8 Annex 4 | Passed | 2013-07-09 | -/- |

| Test Specification Clause | Test Case | Temperature Conditions | Power Source Voltages | Pass | Fail | NA | NP | Remark |
|---|---|---|---|---|---|---|---|---|
| FCC 47 CFR § 2.1046<br>§ 95.1115(a)<br>RSS 210 Issue 8 A4.4 | Radiated field strength | Nominal | Nominal | ☒ | ☐ | ☐ | ☐ | complies |
| FCC 47 CFR § 2.1055<br>§ 95.1115(e)<br>RSS Gen Issue 3 4.7 | Frequency stability | Nominal | Extreme | ☒ | ☐ | ☐ | ☐ | complies |
| | | Extreme | Nominal | ☒ | ☐ | ☐ | ☐ | |
| FCC 47 CFR § 2.1049 (1)<br>RSS Gen Issue 3 4.6 | Occupied bandwidth | Nominal | Nominal | ☐ | ☐ | ☐ | ☐ | No Pass/Fail criteria |
| FCC 47 CFR § 2.1053<br>§ 95.1115(b)<br>RSS Gen Issue 3 4.9 | Field strength of spurious radiation<br>Transmitter unwanted emissions | Nominal | Nominal | ☒ | ☐ | ☐ | ☐ | complies |
| FCC 47 CFR § 15.209<br>RSS Gen Issue 3 4.10 | Receiver spurious emissions (radiated) | Nominal | Nominal | ☒ | ☐ | ☐ | ☐ | complies |
| CFR Part 15.107<br>ICES-003, Issue 5 | RX-Spurious Emissions Conducted < 30 MHz | Nominal | Nominal | ☒ | ☐ | ☐ | ☐ | complies |

**Note:** NA = Not Applicable; NP = Not Performed

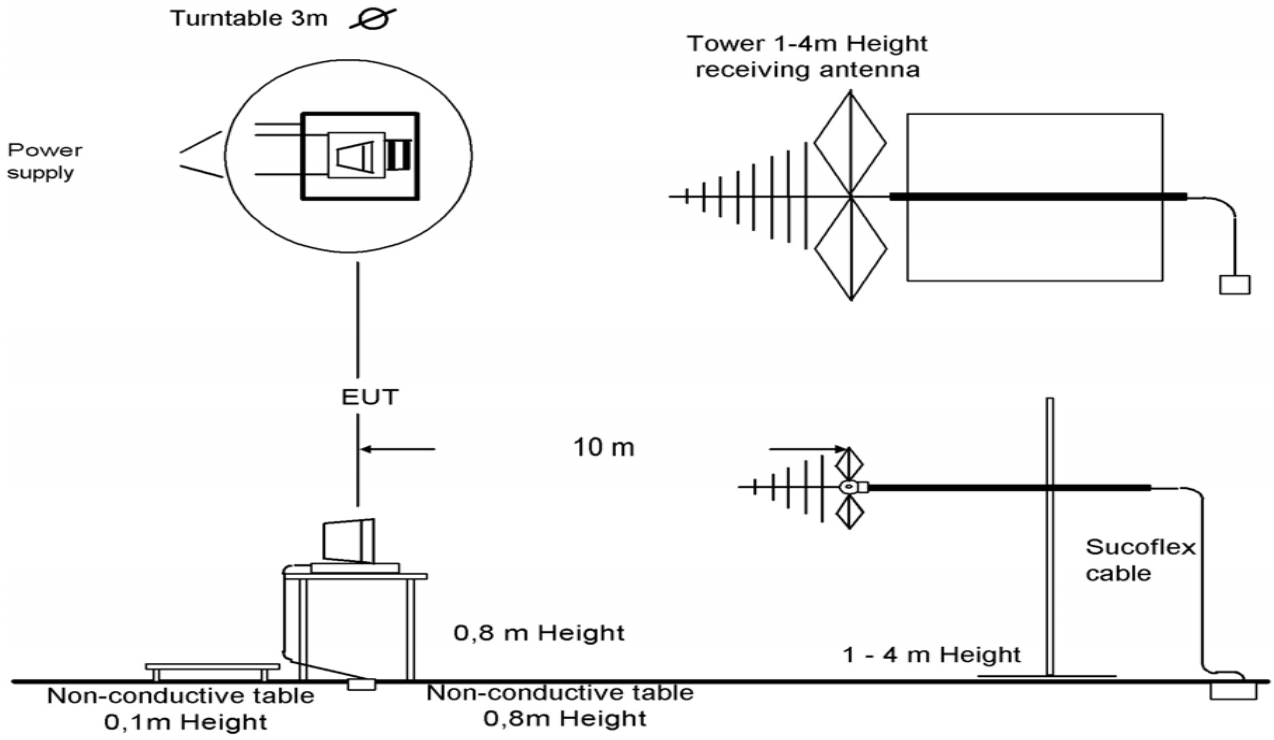
# 9 RF measurements

## 9.1 Description of test setup

### 9.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63.2-1996 clause 15 and ANSI C63.4-2009 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63-4-2009 clause 4.2.
Antennas are confirmed with ANSI C63.2-1996 item 15.

Semi anechoic chamber



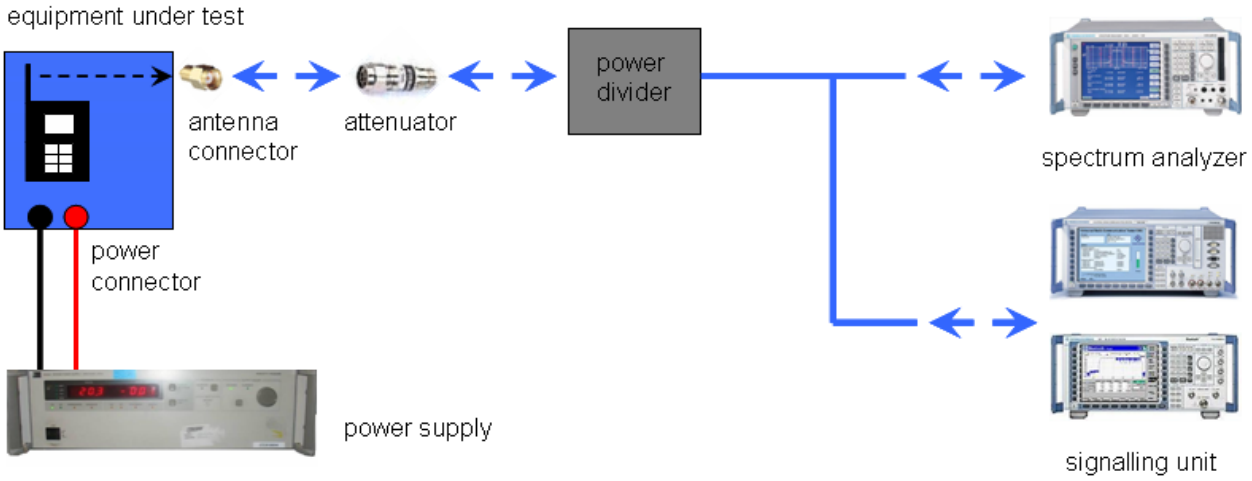

**Picture 1: Diagram radiated measurements**

| | |
|---|---|
| 9 kHz - 30 MHz: | active loop antenna |
| 30 MHz – 1 GHz: | tri-log antenna |
| > 1 GHz: | horn antenna |

The EUT is powered by an external power supply with nominal voltage. The signalling is performed from outside the chamber with a signalling unit (CMU200 or other) by air link using signalling antenna.

## 9.1.2 Conducted measurements

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is first 10dB attenuated before it is power divided (~6dB loss per branch). One of the signal paths is connected to the communication base Station (CMU200 or other), the other one is connected to the spectrum analyzer. The specific losses for both signal paths are first checked within a calibration. The measurement readings on the signalling unit/spectrum analyzer are corrected by the specific test set-up loss. The attenuator, power divider, signalling unit and the spectrum analyzer are impedance matched on 50 Ohm.




**Picture 2: Diagram conducted measurements**

## 9.2 Additional comments

Reference documents: None

Special test descriptions: None

Configuration descriptions: None

## 9.3 RSP100 test report cover sheet / performance test data

| | | |
|---|---|---|
| Test Report Number | : | 1-4695/12-01-03-C |
| Equipment Model Number | : | 866074 |
| Certification Number | : | 3549C-OBRBSBV1 |
| Manufacturer (complete Address) | : | Philips Medizin Systeme Böblingen GmbH<br>Hewlett-Packard-Strasse 2<br>71034 Böblingen / GERMANY |
| Tested to radio standards specification no. | : | RSS 210, Issue 8, Annex 4 |
| Open Area Test Site IC No. | : | IC 3462C-1 |
| Frequency Range or fixed frequency | : | 608 MHz – 614 MHz<br>Lowest Channel 3 (608.375 MHz) /<br>Highest Channel 38 (613.625 MHz) |
| Field Strength [dBµV/m] (@ 3m) | : | 103.8 |
| Occupied bandwidth (99%-BW) [kHz] | : | 111.0 kHz |
| Type of modulation | : | GFSK |
| Emission Designator (TRC-43) | : | 111KF1D |
| Antenna Information | : | Integrated antenna |
| Transmitter Spurious (worst case) [µV/m @ 3m] | : | 58.2 µV/m @ 624.2 MHz |

**ATTESTATION:**

**DECLARATION OF COMPLIANCE:**

I attest that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

**Laboratory Manager:**

| | | |
|---|---|---|
| 2013-07-09 | Stefan Bös | cn=Stefan Boes, o=CETECOM ICT Services GmbH, ou=BOE-111011, email=Stefan.Boes@cetecom.com, c=DE 2013.07.09 10:55:24 +02'00' |
| Date | Name | Signature |

# 10 Measurement results

## 10.1 Radiated field strength

**Measurement:**

| Measurement parameter | |
|---|---|
| Detector: | Quasi peak |
| Sweep time: | Auto |
| Resolution bandwidth: | 120kHz |
| Video bandwidth: | Auto |
| Span: | > EBW |
| Trace-Mode: | Max. hold |

**Limits:**

| FCC | IC |
|---|---|
| CFR § 2.1046<br>CFR § 95.1115 (a) | RSS 210 Issue 8 A4.4 |
| Radiated field strength | |
| 200 mW/m @ 3 m (106 dBµV/m @ 3 m) | |

**Result:**

| Frequency | Radiated field strength |
|---|---|
| 608.375 MHz | 103.7 dBµV/m @ 3m |
| 610.925 MHz | 103.6 dBµV/m @ 3m |
| 613.625 MHz | 103.8 dBµV/m @ 3m |

**Result:** **Passed**

## 10.2 Frequency stability

**Measurement:**

| Measurement parameter | |
|---|---|
| Detector: | Peak |
| Sweep time: | Auto |
| Resolution bandwidth: | 100 Hz |
| Video bandwidth: | 100 Hz |
| Span: | 1 kHz |
| Trace-Mode: | Max. hold |

**Limits:**

| FCC | IC |
|---|---|
| CFR § 2.1055<br>CFR § 95.1115 (e) | RSS Gen Issue 3 4.7 |
| Manufacturers of wireless medical telemetry devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all of the manufacturer's specified conditions. | |

**Results: lowest channel**

| Temperature | Deviation (kHz) | Emission within band |
|---|---|---|
| -20 °C | -0.26 | Yes |
| -10 °C | -0.38 | Yes |
| 0 °C | -0.34 | Yes |
| 10 °C | -0.29 | Yes |
| 20 °C (V nom) | -0.33 | Yes |
| 30 °C | -0.74 | Yes |
| 40 °C | -1.14 | Yes |
| 55 °C | -1.55 | Yes |
| Voltage | | |
| 90 % | -0.33 | Yes |
| 110 % | -0.33 | Yes |

**Results: highest channel**

| Temperature | Deviation (kHz) | Emission within band |
|---|---|---|
| -20 °C | -0.26 | Yes |
| -10 °C | -0.38 | Yes |
| 0 °C | -0.34 | Yes |
| 10 °C | -0.29 | Yes |
| 20 °C (V nom) | -0.35 | Yes |
| 30 °C | -0.77 | Yes |
| 40 °C | -1.17 | Yes |
| 55 °C | -1.55 | Yes |
| Voltage | | |
| 90 % | -0.35 | Yes |
| 110 % | -0.35 | Yes |

**Result: Passed**

## 10.3 Occupied bandwidth

**Measurement:**

| Measurement parameter | |
|---|---|
| Detector: | Peak |
| Sweep time: | Auto |
| Resolution bandwidth: | 1 kHz |
| Video bandwidth: | 300 kHz |
| Span: | 300 kHz |
| Trace-Mode: | Max. hold |

**Limits:**

| FCC | IC |
|---|---|
| 47 CFR § 2.1049 (1) | RSS Gen Issue 3 4.6 |
| When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured. | |
| Not limited | |

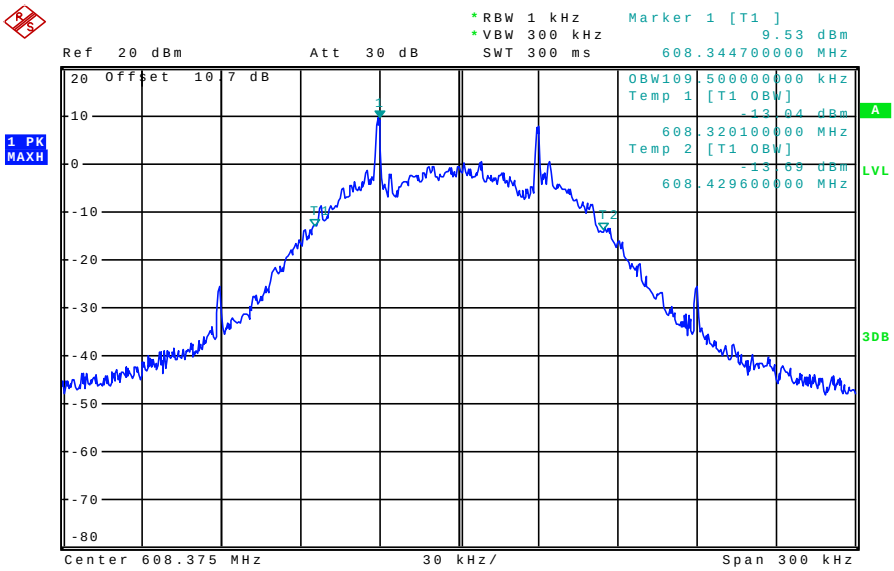
**Result:**

| Frequency | 99% Bandwidth |
|---|---|
| 608.375 MHz | 109.5 kHz |
| 610.925 MHz | 111.0 kHz |
| 613.625 MHz | 110.7 kHz |

**Result:** **Not rated**

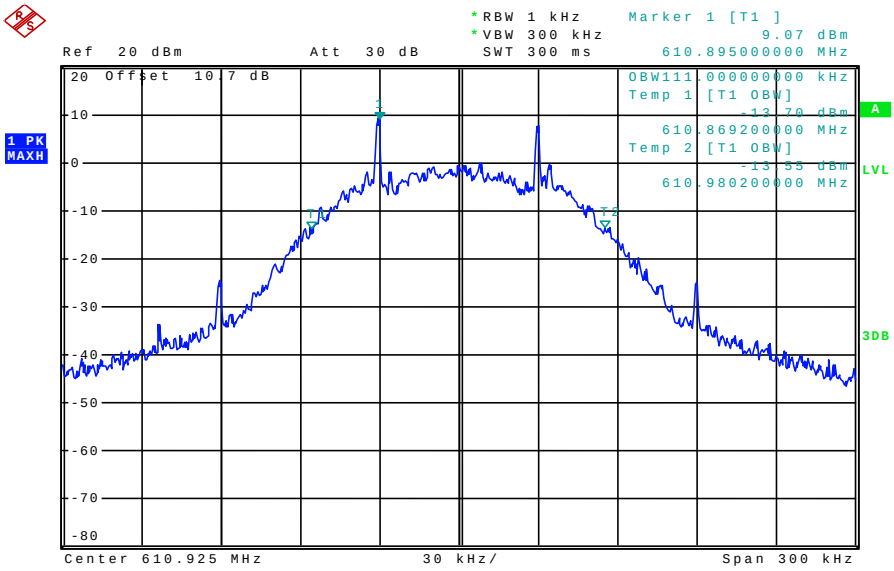
## Plots of the measurements

Plot 1: low channel



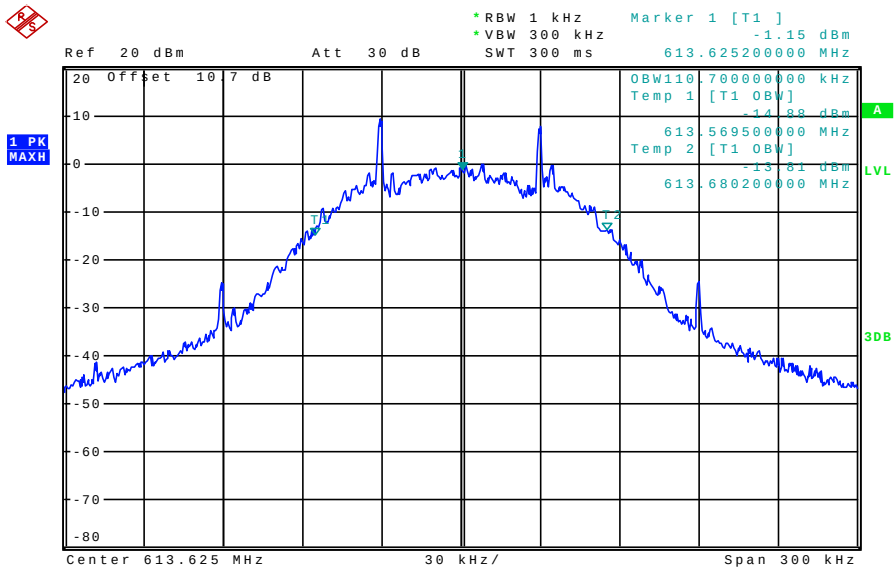

Date: 14.JAN.2013 11:09:39

Plot 2: middle channel




Date: 14.JAN.2013 11:10:41

Plot 3: high channel




Date: 14.JAN.2013 11:02:23

## 10.4 Field strength of spurious radiation.

**Measurement:**

| Measurement parameter | |
|---|---|
| Detector: | Peak / AVG |
| Sweep time: | Auto |
| Resolution bandwidth: | f < 1 GHz : 100 kHz<br>f ≥ 1GHz : 1 MHz |
| Video bandwidth: | f < 1 GHz : 100 kHz<br>f ≥ 1GHz : 1 MHz |
| Trace-Mode: | Max. hold |

**Limits:**

| FCC | IC |
|---|---|
| 47 CFR § 2.1053<br>47 CFR § 95.1115 (b) | RSS Gen Issue 3 4.9 |
| Out-of band emissions below 960 MHz are limited to 200 microvolts/meter, as measured at a distance of 3 meters, using measuring instrumentation with a CISPR quasi-peak detector.<br>Out-of-band emissions above 960 MHz are limited to 500 microvolts/meter as measured at a distance of 3 meters, using measuring equipment with an averaging detector and a 1 MHz measurement bandwidth. | |

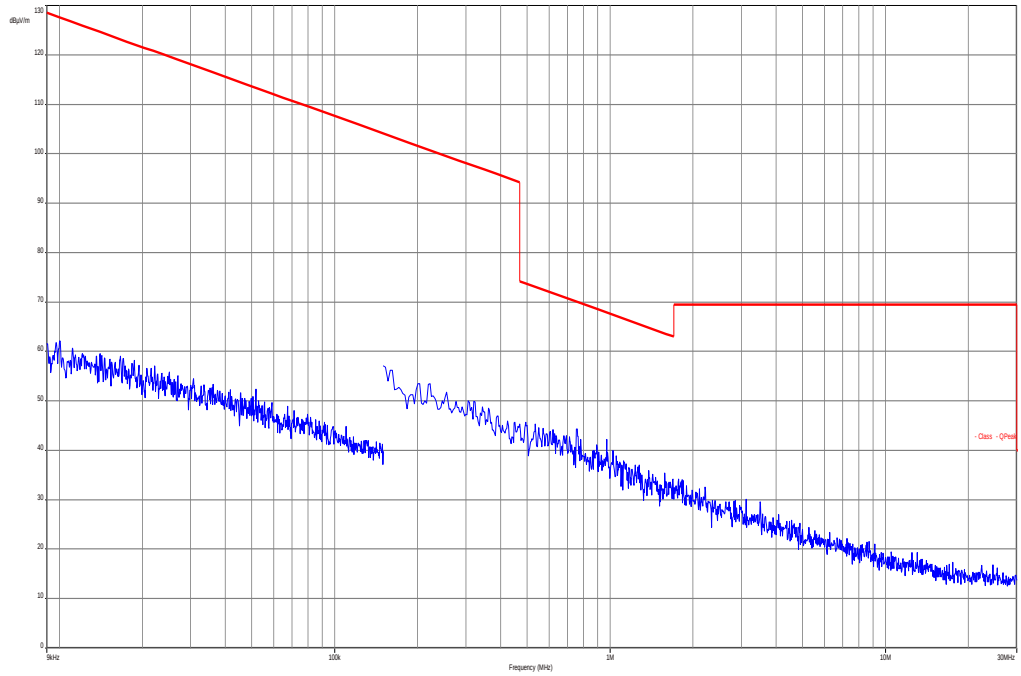
**Result:**

| SPURIOUS EMISSIONS LEVEL (dBµV/m) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Lowest channel | | | Middle channel | | | Highest channel | | |
| Frequency [MHz] | Detector | Level [dBµV/m] | Frequency [MHz] | Detector | Level [dBµV/m] | Frequency [MHz] | Detector | Level [dBµV/m] |
| 1824.1 | Pk | 46.1 | 1832.8 | Pk | 46.6 | 1841.8 | Pk | 46.5 |
| | AVG | 34.2 | | AVG | 34.7 | | AVG | 34.6 |
| 2432.2 | Pk | 51.3 | 2443.6 | Pk | 50.9 | 2455.6 | Pk | 51.6 |
| | AVG | 39.4 | | AVG | 39.0 | | AVG | 39.7 |
| 3648.4 | Pk | 54.4 | 3665.5 | Pk | 55.0 | 3683.5 | Pk | 53.9 |
| | AVG | 42.5 | | AVG | 43.1 | | AVG | 42.0 |
| 4256.4 | Pk | 49.2 | 4276.5 | Pk | 47.2 | 4297.5 | Pk | 48.3 |
| | AVG | 37.3 | | AVG | 35.3 | | AVG | 36.4 |
| 4864.5 | Pk | 47.6 | 4887.3 | Pk | 46.1 | 4911.8 | Pk | 45.8 |
| | AVG | 35.7 | | AVG | 34.2 | | AVG | 33.9 |
| 5472.6 | Pk | 49.2 | 5498.0 | Pk | 47.0 | 5525.1 | Pk | 48.9 |
| | AVG | 37.3 | | AVG | 35.1 | | AVG | 37.0 |
| Measurement uncertainty<br>± 3 dB | | | | | | | | |

**Result:** Passed

**Plots of the measurements**

Plot 1: 150 kHz – 30 MHz, low channel



Plot 2: 30 MHz – 1 GHz, low channel

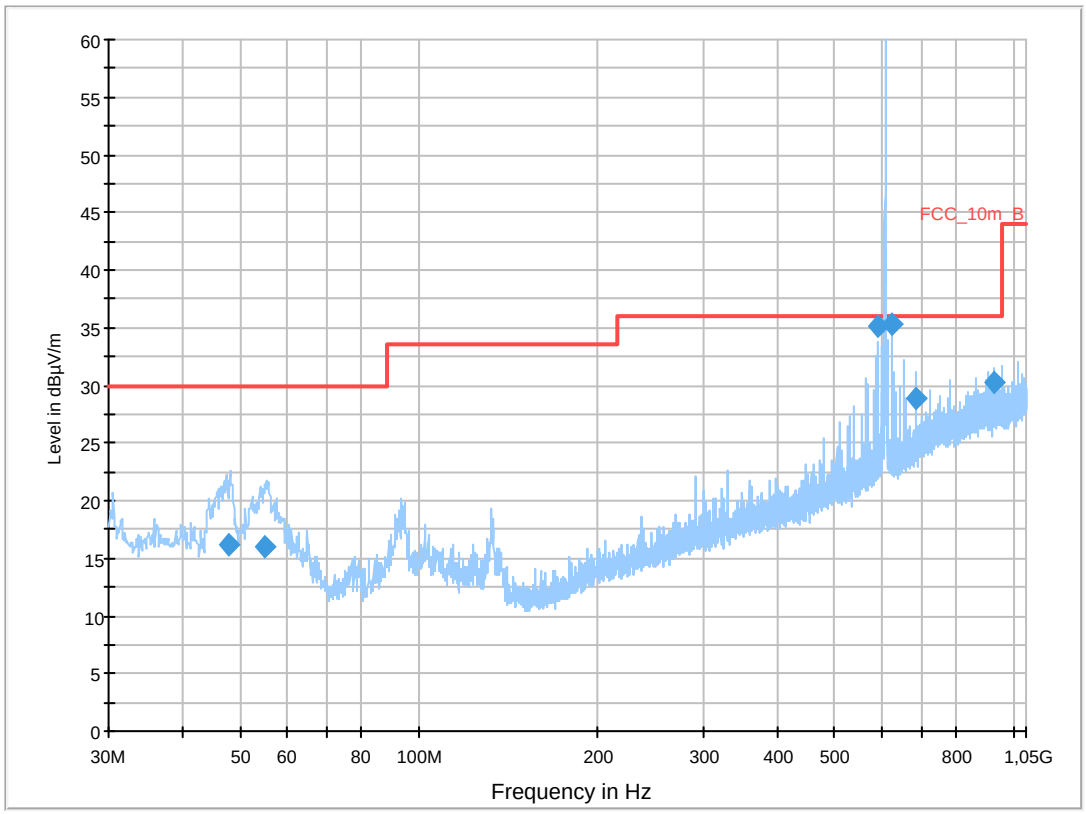
## Common Information

| | |
|---|---|
| EUT: | 866074 Avalon CL Base Station |
| Serial Number: | DE24600128 |
| Test Description: | FCC part 15 |
| Operating Conditions: | TX channel 1 |
| Operator Name: | Kraus |
| Comment: | system powered |

## Scan Setup: STAN_Fin [EMI radiated]

| | |
|---|---|
| Hardware Setup: | Electric Field (NOS) |
| Receiver: | [ESCI 3] |
| Level Unit: | dBµV/m |

| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|---|---|---|---|---|---|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |




## Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.825700 | 16.1 | 1000.0 | 120.000 | 106.0 | V | 185.0 | 13.3 | 13.9 | 30.0 | |
| 54.979050 | 15.9 | 1000.0 | 120.000 | 281.0 | V | 247.0 | 12.9 | 14.1 | 30.0 | |
| 591.924150 | 35.2 | 1000.0 | 120.000 | 180.0 | H | 197.0 | 20.6 | 0.8 | 36.0 | |
| 624.242250 | 35.3 | 1000.0 | 120.000 | 147.0 | H | 201.0 | 21.0 | 0.7 | 36.0 | |
| 684.245700 | 28.9 | 1000.0 | 120.000 | 113.0 | H | 198.0 | 22.1 | 7.1 | 36.0 | |
| 927.344100 | 30.2 | 1000.0 | 120.000 | 100.0 | V | -5.0 | 25.3 | 5.8 | 36.0 | |

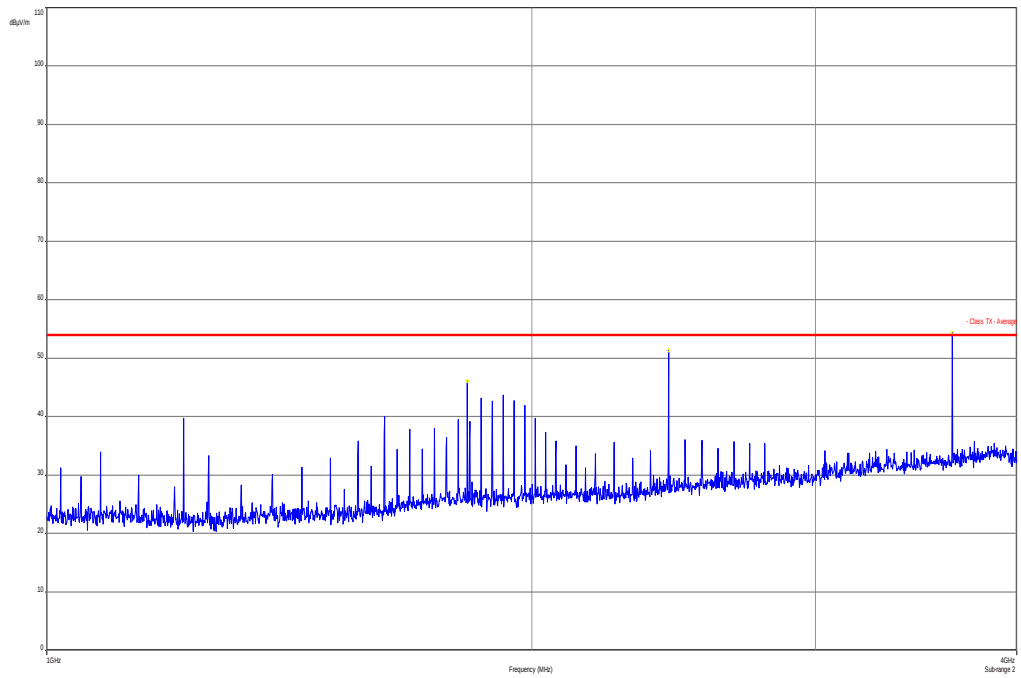
# Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

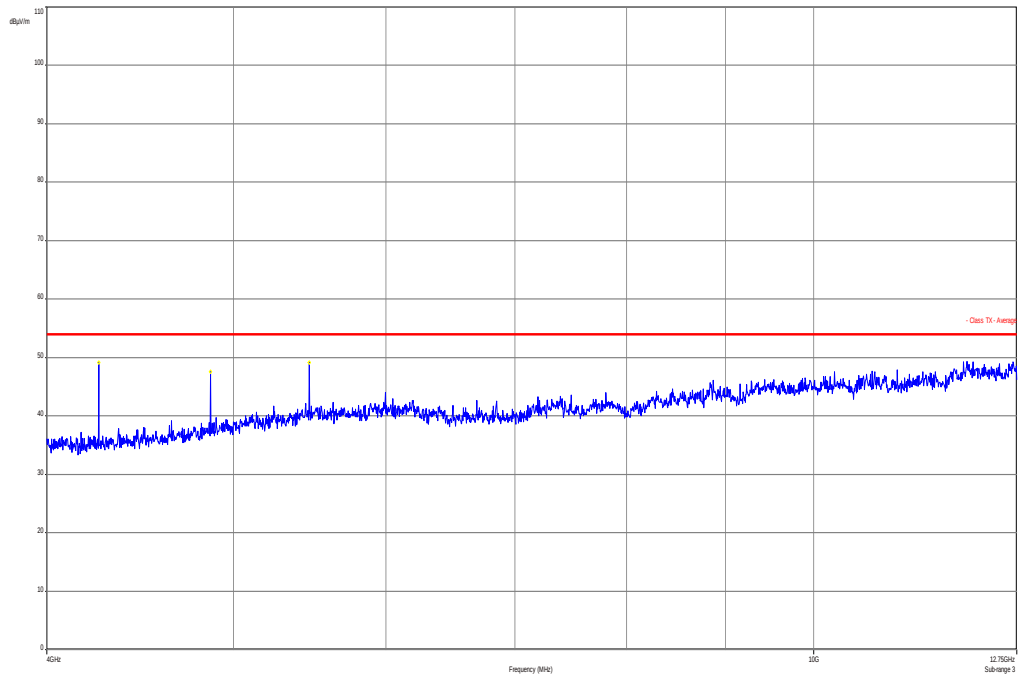
| | |
|---|---|
| Frequency Range: | 30 MHz - 2 GHz |
| Receiver: | Receiver [ESCI 3]<br>@ GPIB0 (ADR 20), SN 100083/003, FW 4.42 |
| Signal Path: | without Notch<br>FW 1.0 |
| Antenna: | VULB 9163<br>SN 9163-295, FW ---<br>Correction Table (vertical): VULP6113<br>Correction Table (horizontal): VULP6113<br>Correction Table (vertical): Cable_EN_1GHz (1005)<br>Correction Table (horizontal): Cable_EN_1GHz (1005) |
| Antenna Tower: | Tower [EMCO 2090 Antenna Tower]<br>@ GPIB0 (ADR 8), FW REV 3.12 |
| Turntable: | Turntable [EMCO Turntable]<br>@ GPIB0 (ADR 9), FW REV 3.12 |

EMC 32 Version 8.52

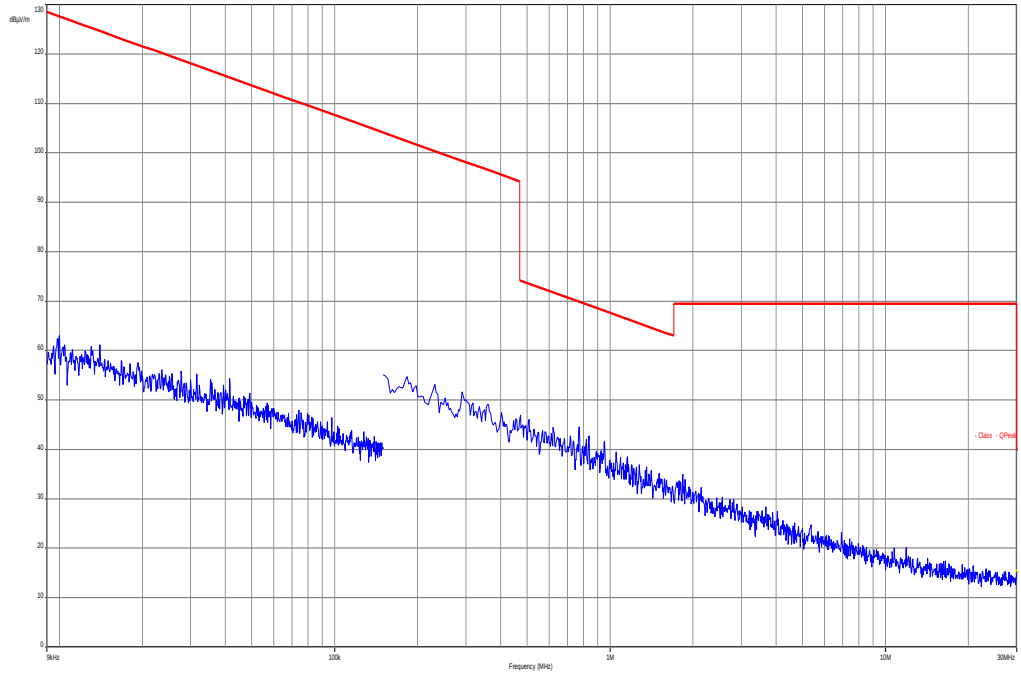
Plot 3: 1 GHz – 4 GHz, low channel, antenna horizontal/vertical



Plot 4: 4 GHz – 12.75 GHz, low channel, antenna horizontal/vertical




Plot 5: 150 kHz – 30 MHz, middle channel



Plot 6: 30 MHz – 1 GHz, middle channel

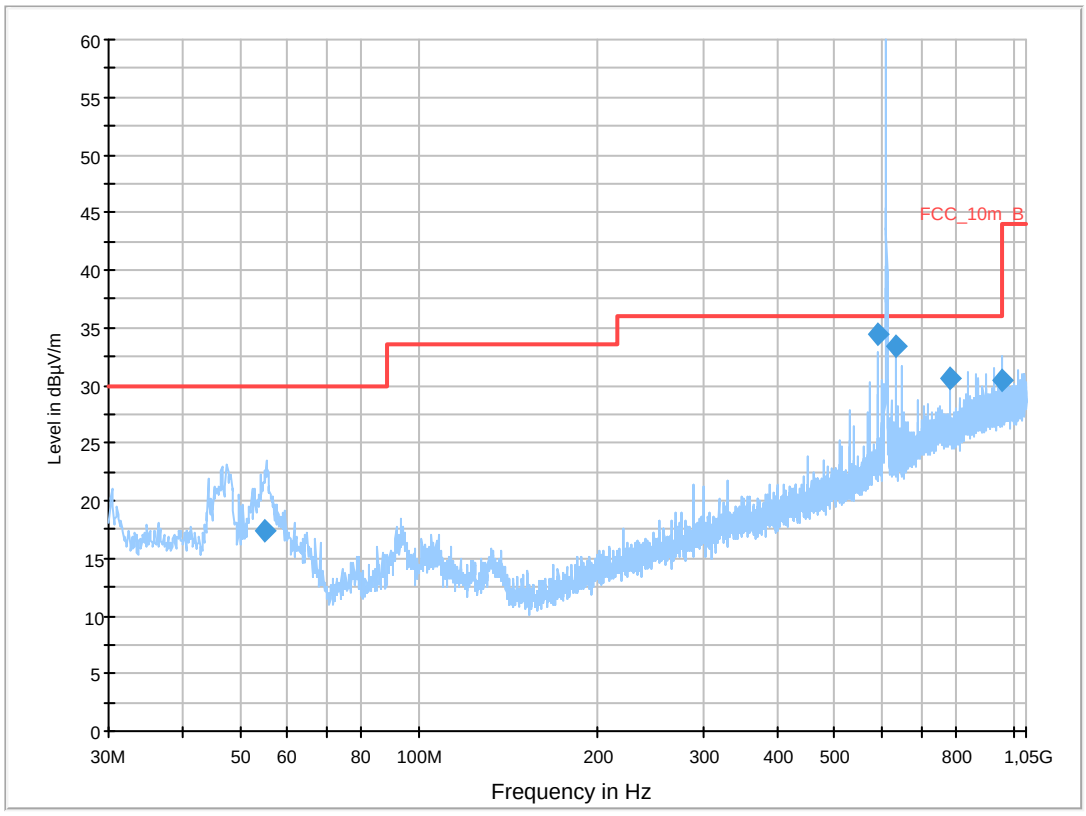
## Common Information

| | |
|---|---|
| EUT: | 866074 Avalon CL Base Station |
| Serial Number: | DE24600128 |
| Test Description: | FCC part 15 |
| Operating Conditions: | TX channel 20 |
| Operator Name: | Kraus |
| Comment: | system powered |

## Scan Setup: STAN_Fin [EMI radiated]

| | |
|---|---|
| Hardware Setup: | Electric Field (NOS) |
| Receiver: | [ESCI 3] |
| Level Unit: | dBµV/m |

| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|---|---|---|---|---|---|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |




## Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 55.037250 | 17.4 | 1000.0 | 120.000 | 313.0 | V | 139.0 | 12.9 | 12.6 | 30.0 | |
| 589.071300 | 34.5 | 1000.0 | 120.000 | 180.0 | H | 187.0 | 20.5 | 1.5 | 36.0 | |
| 632.769600 | 33.4 | 1000.0 | 120.000 | 169.0 | H | 197.0 | 21.0 | 2.6 | 36.0 | |
| 779.992200 | 30.6 | 1000.0 | 120.000 | 113.0 | H | 26.0 | 23.7 | 5.4 | 36.0 | |
| 959.994300 | 30.4 | 1000.0 | 120.000 | 106.0 | H | 277.0 | 25.4 | 5.6 | 36.0 | |

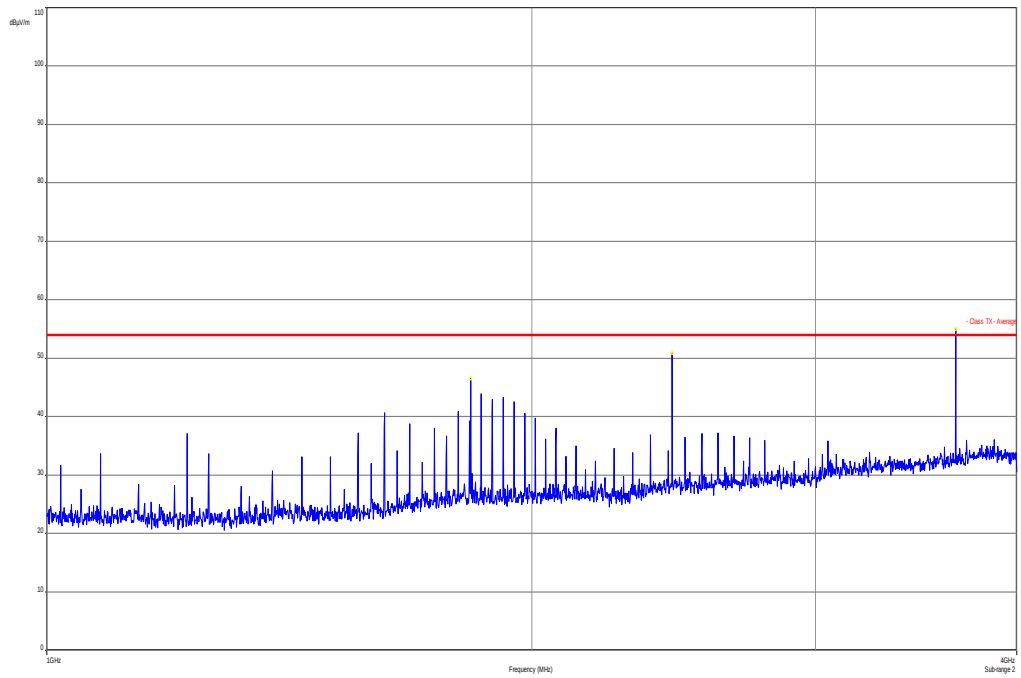
# Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

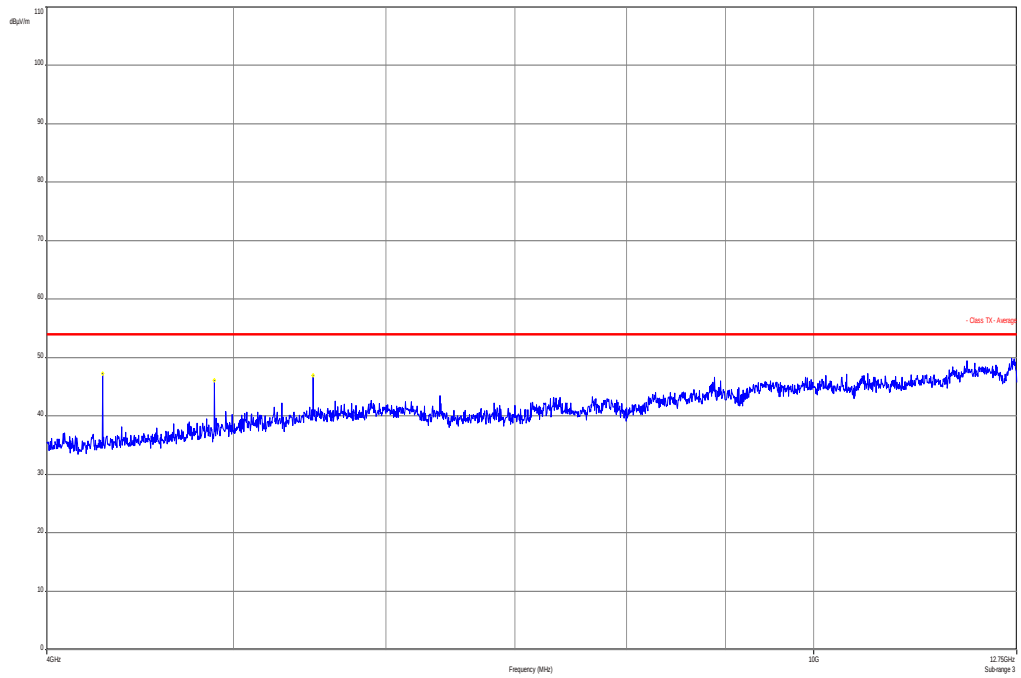
| | |
|---|---|
| Frequency Range: | 30 MHz - 2 GHz |
| Receiver: | Receiver [ESCI 3]<br>@ GPIB0 (ADR 20), SN 100083/003, FW 4.42 |
| Signal Path: | without Notch<br>FW 1.0 |
| Antenna: | VULB 9163<br>SN 9163-295, FW ---<br>Correction Table (vertical): VULP6113<br>Correction Table (horizontal): VULP6113<br>Correction Table (vertical): Cable_EN_1GHz (1005)<br>Correction Table (horizontal): Cable_EN_1GHz (1005) |
| Antenna Tower: | Tower [EMCO 2090 Antenna Tower]<br>@ GPIB0 (ADR 8), FW REV 3.12 |
| Turntable: | Turntable [EMCO Turntable]<br>@ GPIB0 (ADR 9), FW REV 3.12 |

EMC 32 Version 8.52

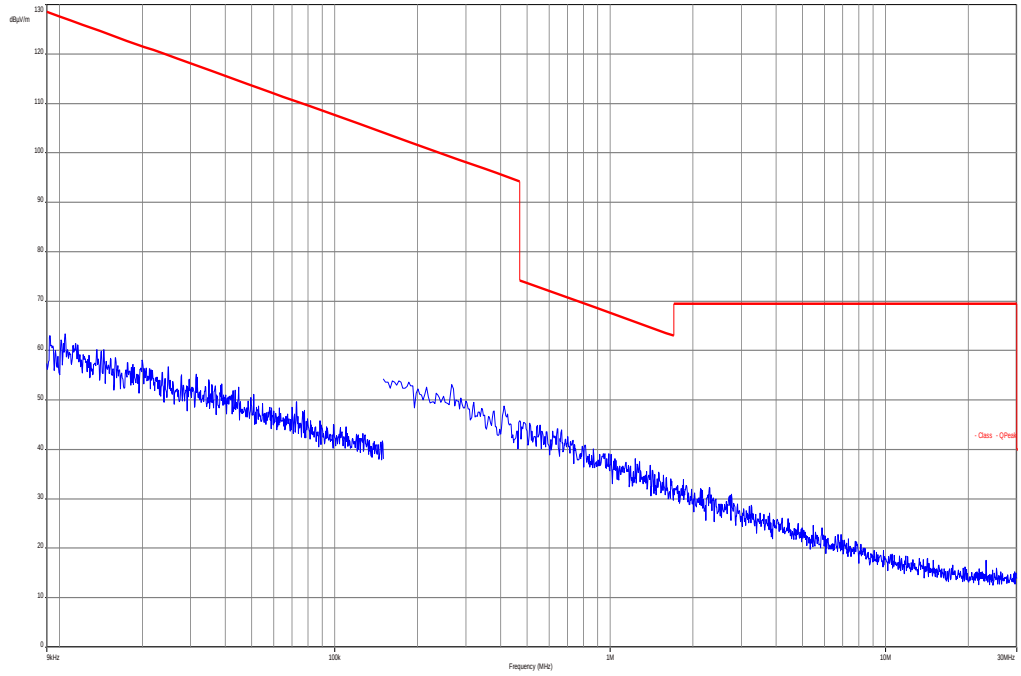
Plot 7: 1 GHz – 4 GHz, middle channel, antenna horizontal/vertical



Plot 8: 4 GHz – 12.75 GHz, low channel, antenna horizontal/vertical




Plot 9: 150 kHz – 30 MHz, high channel



Plot 10: 30 MHz – 1 GHz, high channel

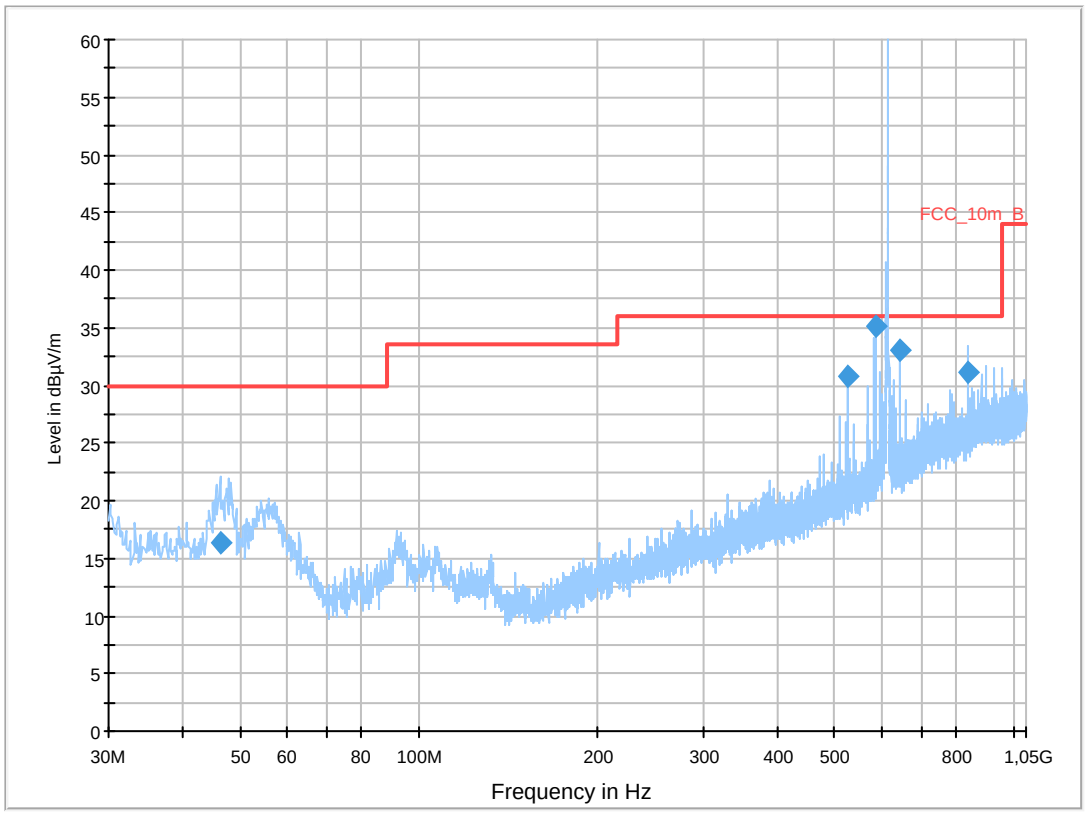
## Common Information

| | |
|---|---|
| EUT: | 866074 Avalon CL Base Station |
| Serial Number: | DE24600128 |
| Test Description: | FCC part 15 |
| Operating Conditions: | TX channel 40 |
| Operator Name: | Kraus |
| Comment: | system powered |

## Scan Setup: STAN_Fin [EMI radiated]

| | |
|---|---|
| Hardware Setup: | Electric Field (NOS) |
| Receiver: | [ESCI 3] |
| Level Unit: | dBµV/m |

| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|---|---|---|---|---|---|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |




## Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 46.494300 | 16.3 | 1000.0 | 120.000 | 98.0 | V | 280.0 | 13.3 | 13.7 | 30.0 | |
| 526.080000 | 30.7 | 1000.0 | 120.000 | 170.0 | H | 190.0 | 19.0 | 5.3 | 36.0 | |
| 586.074900 | 35.1 | 1000.0 | 120.000 | 170.0 | H | 190.0 | 20.4 | 0.9 | 36.0 | |
| 641.790150 | 33.1 | 1000.0 | 120.000 | 135.0 | H | 190.0 | 21.1 | 2.9 | 36.0 | |
| 840.004350 | 31.1 | 1000.0 | 120.000 | 120.0 | H | 180.0 | 24.4 | 4.9 | 36.0 | |

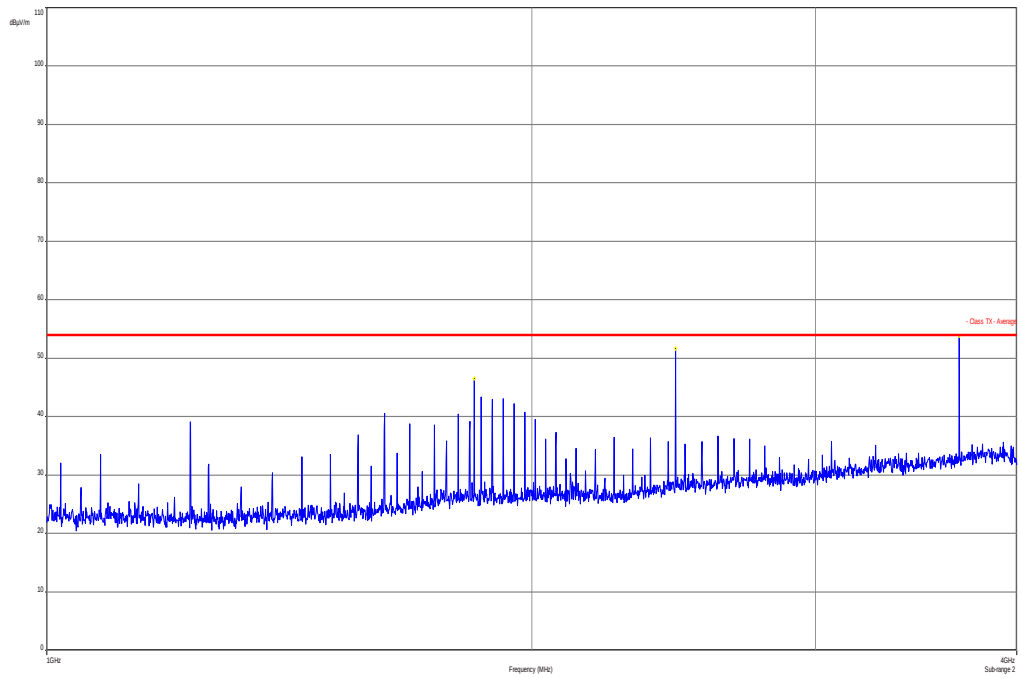
# Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

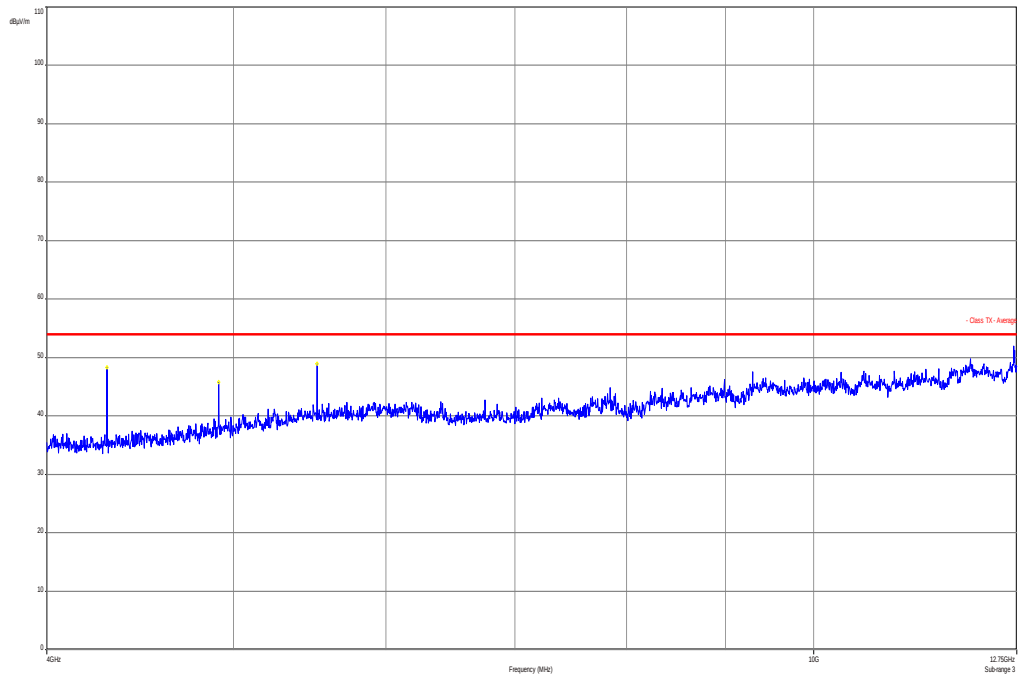
| | |
|---|---|
| Frequency Range: | 30 MHz - 2 GHz |
| Receiver: | Receiver [ESCI 3]<br>@ GPIB0 (ADR 20), SN 100083/003, FW 4.42 |
| Signal Path: | without Notch<br>FW 1.0 |
| Antenna: | VULB 9163<br>SN 9163-295, FW ---<br>Correction Table (vertical): VULP6113<br>Correction Table (horizontal): VULP6113<br>Correction Table (vertical): Cable_EN_1GHz (1005)<br>Correction Table (horizontal): Cable_EN_1GHz (1005) |
| Antenna Tower: | Tower [EMCO 2090 Antenna Tower]<br>@ GPIB0 (ADR 8), FW REV 3.12 |
| Turntable: | Turntable [EMCO Turntable]<br>@ GPIB0 (ADR 9), FW REV 3.12 |

EMC 32 Version 8.52

Plot 11: 1 GHz – 4 GHz, high channel, antenna horizontal/vertical



Plot 12: 4 GHz – 12.75 GHz, low channel, antenna horizontal/vertical



## 10.5 Receiver spurious emissions (radiated)

**Measurement:**

| Measurement parameter | |
|---|---|
| Detector: | Peak / Quasi peak |
| Sweep time: | Auto |
| Video bandwidth: | F < 1 GHz: 100 kHz<br>F > 1 GHz: 1 MHz |
| Resolution bandwidth: | Sweep: 100 kHz<br>Remeasurement: 10 Hz |
| Span: | 30 MHz to 25 GHz |
| Trace-Mode: | Max Hold |

**Limits:**

| FCC | IC | |
|---|---|---|
| SUBCLAUSE § 15.109 | RSS-GEN Issue 3 4.10 | |
| Receiver Spurious Emission (radiated) | | |
| **Frequency (MHz)** | **Field strength (µV/m)** | **Measurement distance (m)** |
| 30 - 88 | 100 (40 dBµV/m) | 3 |
| 88 - 216 | 150 (43.5 dBµV/m) | 3 |
| 216 - 960 | 200 (46 dBµV/m) | 3 |
| above 960 | 500 (54 dBµV/m) | 3 |

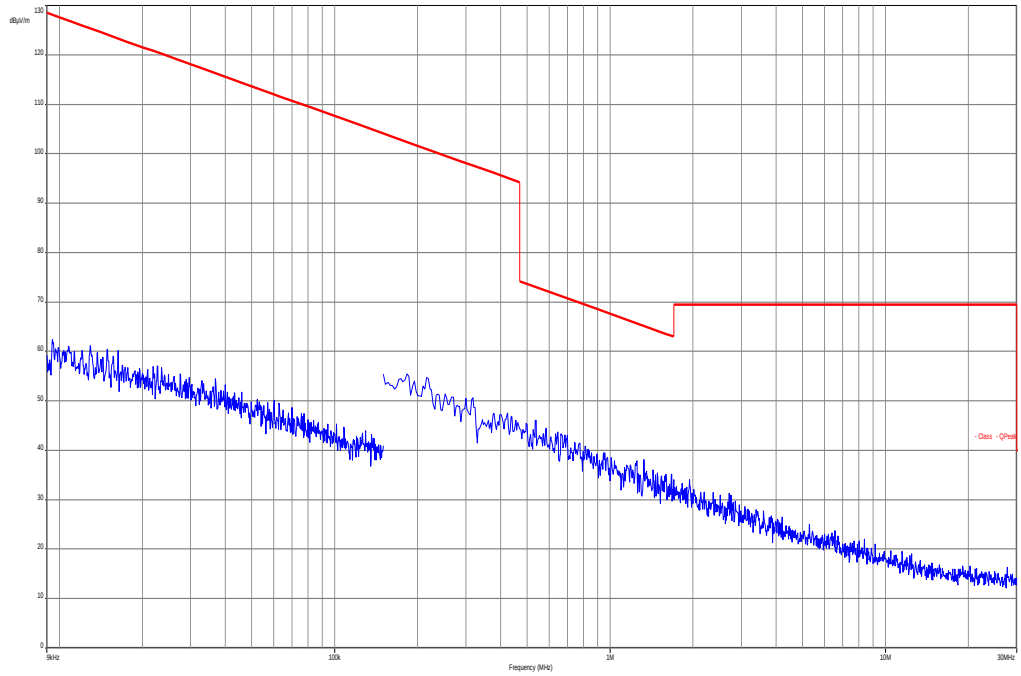
**Result:**

| SPURIOUS EMISSIONS LEVEL (dBµV/m) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Idle / RX | | | | | | | | |
| Frequency [MHz] | Detector | Level [dBµV/m] | Frequency [MHz] | Detector | Level [dBµV/m] | Frequency [MHz] | Detector | Level [dBµV/m] |
| All emissions measured with peak detector are more than 6 dB below the average limit. | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Measurement uncertainty ± 3 dB | | | | | | | | |

**Result:** Passed

**Plots of the measurements**

Plot 1: 150 kHz – 30 MHz



Plot 2: 30 MHz – 1 GHz

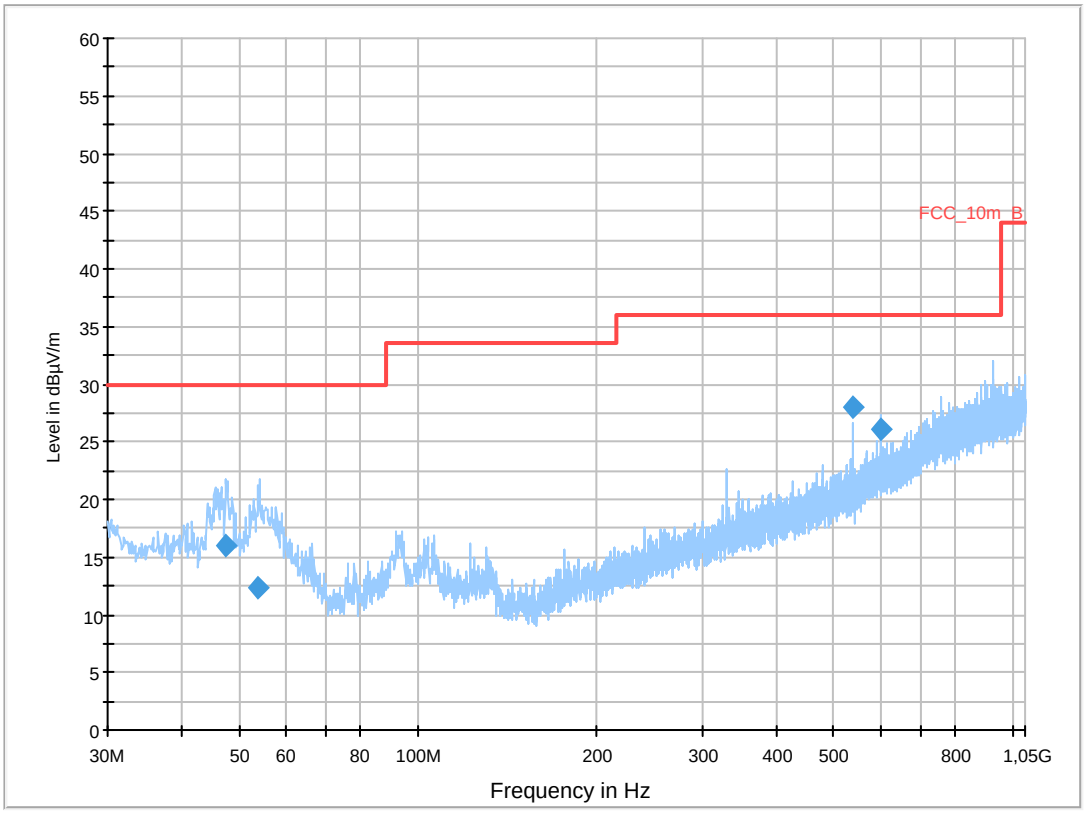
## Common Information

| | |
|---|---|
| EUT: | 866074 Avalon CL Base Station |
| Serial Number: | DE24600128 |
| Test Description: | FCC part 15 |
| Operating Conditions: | RX |
| Operator Name: | Kraus |
| Comment: | system powered |

## Scan Setup: STAN_Fin [EMI radiated]

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

| Subrange | Step Size | Detectors | IF BW | Meas. Time | Preamp |
|---|---|---|---|---|---|
| 30 MHz - 2 GHz | 60 kHz | QPK | 120 kHz | 1 s | 20 dB |




## Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 47.426400 | 16.0 | 1000.0 | 120.000 | 170.0 | V | 190.0 | 13.3 | 14.0 | 30.0 | |
| 53.560050 | 12.3 | 1000.0 | 120.000 | 98.0 | V | 171.0 | 13.0 | 17.7 | 30.0 | |
| 539.998350 | 28.1 | 1000.0 | 120.000 | 145.0 | H | 81.0 | 19.2 | 7.9 | 36.0 | |
| 600.006600 | 26.1 | 1000.0 | 120.000 | 170.0 | H | 80.0 | 20.8 | 9.9 | 36.0 | |

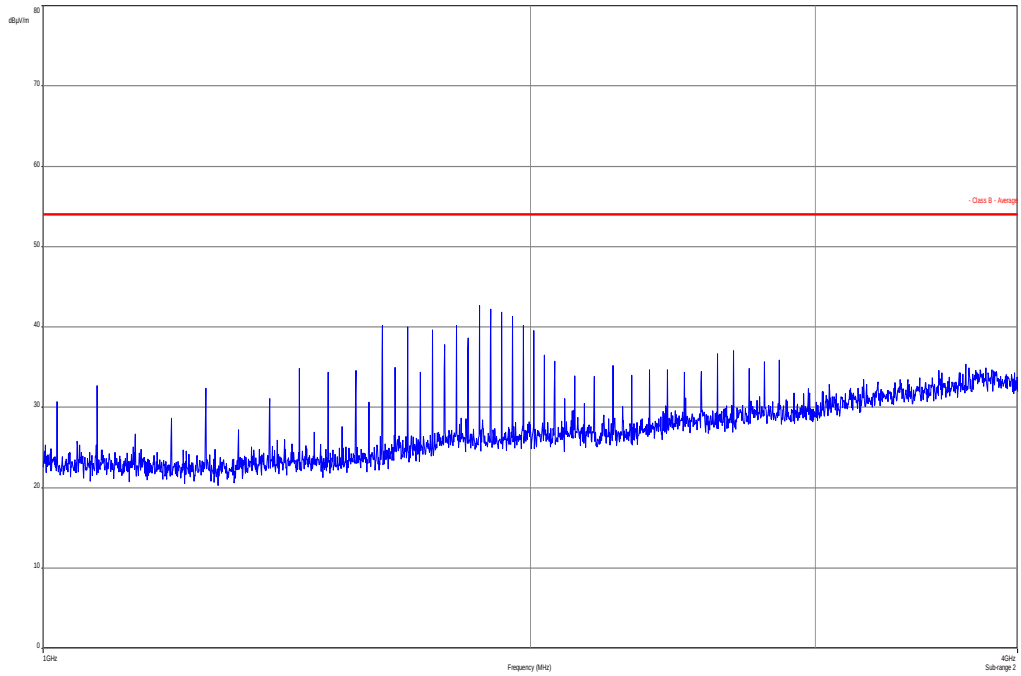
# Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

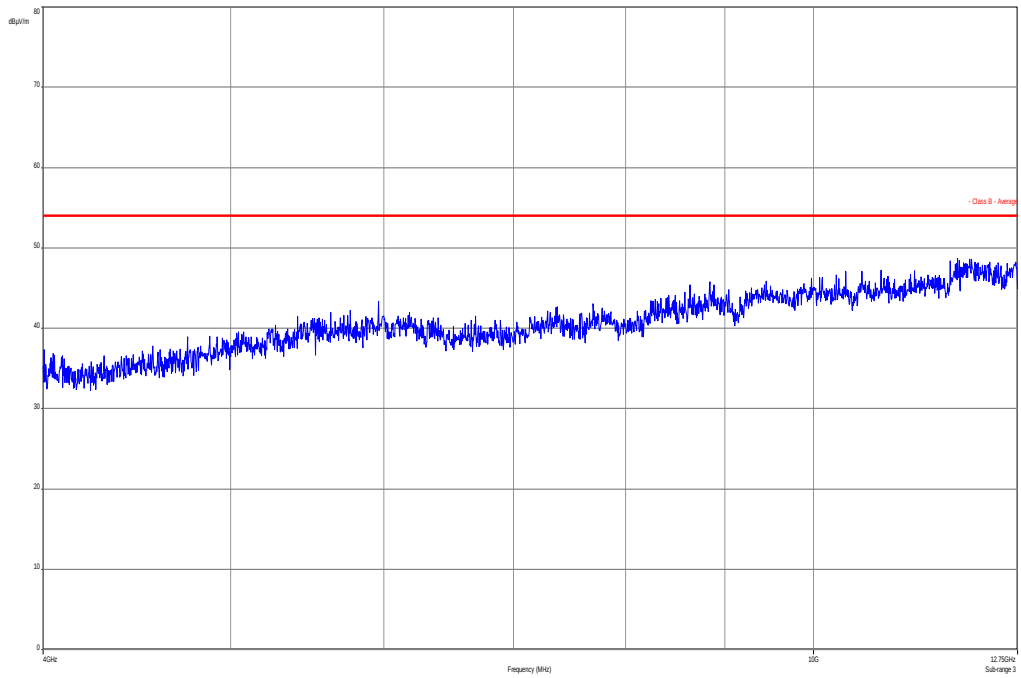
| | |
|---|---|
| Frequency Range: | 30 MHz - 2 GHz |
| Receiver: | Receiver [ESCI 3]<br>@ GPIB0 (ADR 20), SN 100083/003, FW 4.42 |
| Signal Path: | without Notch<br>FW 1.0 |
| Antenna: | VULB 9163<br>SN 9163-295, FW ---<br>Correction Table (vertical): VULP6113<br>Correction Table (horizontal): VULP6113<br>Correction Table (vertical): Cable_EN_1GHz (1005)<br>Correction Table (horizontal): Cable_EN_1GHz (1005) |
| Antenna Tower: | Tower [EMCO 2090 Antenna Tower]<br>@ GPIB0 (ADR 8), FW REV 3.12 |
| Turntable: | Turntable [EMCO Turntable]<br>@ GPIB0 (ADR 9), FW REV 3.12 |

EMC 32 Version 8.52

Plot 3: 1 GHz – 4 GHz, antenna horizontal/vertical



Plot 4: 4 GHz – 12.75 GHz, antenna horizontal/vertical



## 10.6 RX Spurious Emissions Conducted < 30 MHz

**Description:**

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to Idle mode. Both power lines, phase and neutral line, are measured. Found peaks are remeasured with average and quasi peak detection to show compliance to the limits.

**Measurement:**

| Measurement parameter | |
|---|---|
| Detector: | Peak - Quasi Peak / Average |
| Sweep time: | Auto |
| Video bandwidth: | F < 150 kHz: 200 Hz<br>F > 150 kHz: 9 kHz |
| Resolution bandwidth: | F < 150 kHz: 1 kHz<br>F > 150 kHz: 100 kHz |
| Span: | 9 kHz to 30 MHz |
| Trace-Mode: | Max Hold |

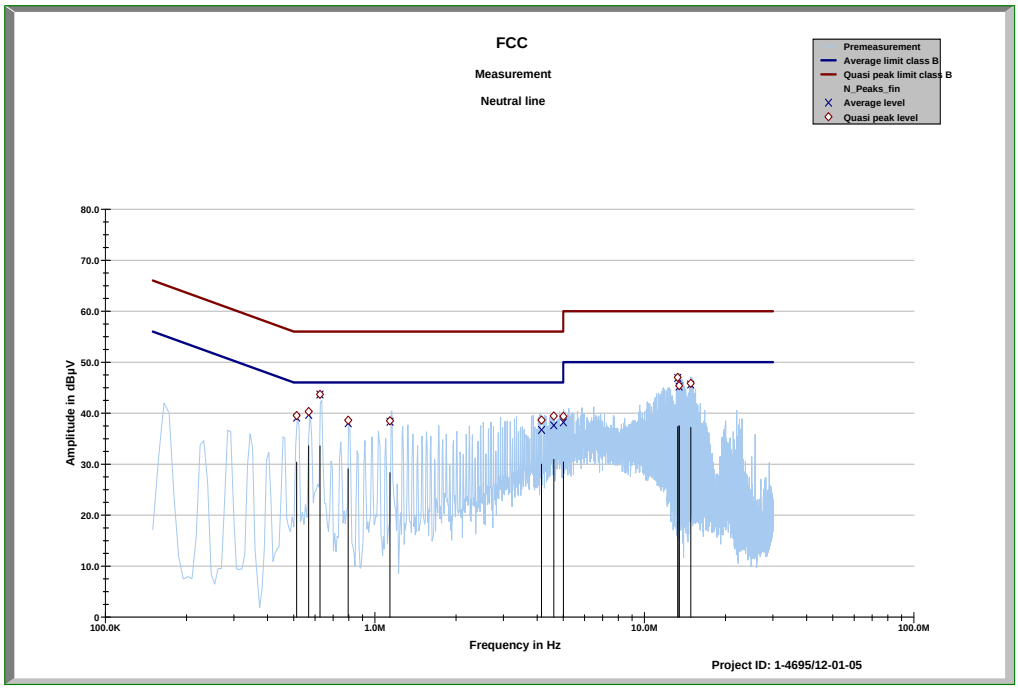
**Limits:**

| FCC | | IC |
|---|---|---|
| CFR Part 15.107(a) | | ICES-003, Issue 5 |
| RX Spurious Emissions Conducted < 30 MHz | | |
| Frequency (MHz) | Quasi-Peak (dBµV/m) | Average (dBµV/m) |
| 0.15 – 0.5 | 66 to 56* | 56 to 46* |
| 0.5 – 5 | 56 | 46 |
| 5 – 30.0 | 60 | 50 |

*Decreases with the logarithm of the frequency

**Result:** **Passed**

**Plots:**



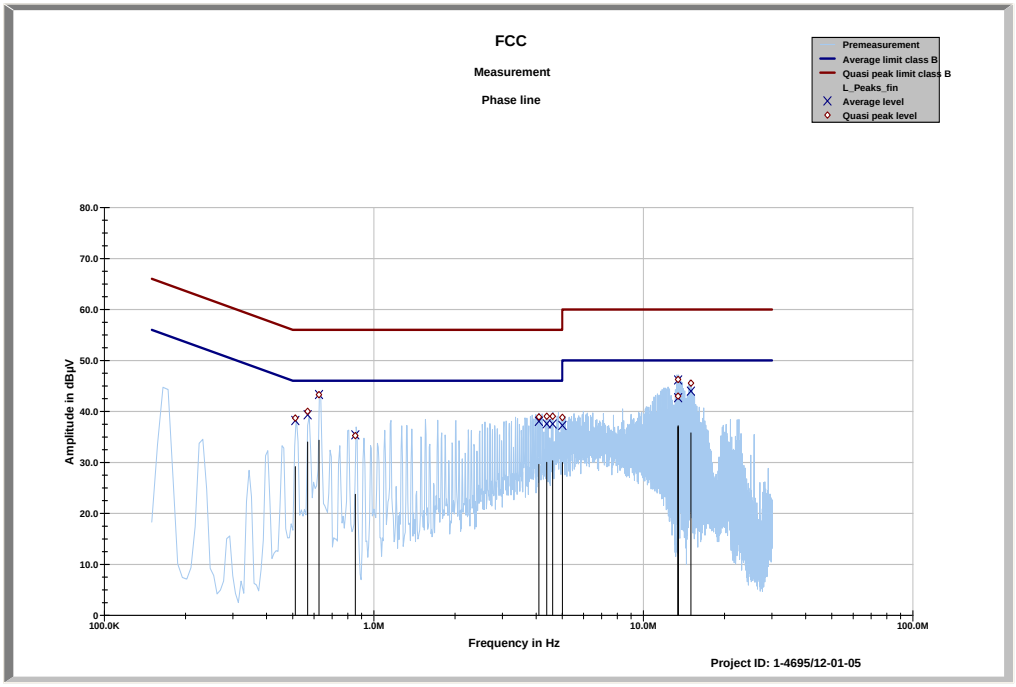

FCC
Neutral line tbl

Project ID: 1-4695/12-01-05

11:55:55 AM, Friday, November 30, 2012

| Frequency | Quasi peak level | Margin quasi peak | Average level | Margin average |
|---|---|---|---|---|
| MHz | dBµV | dBµV | dBµV | dBµV |
| | | | | |
| **0.51265** | 39.53 | 16.47 | 39.11 | 6.89 |
| **0.56822** | 40.32 | 15.68 | 39.65 | 6.35 |
| **0.62541** | 43.68 | 12.32 | 43.67 | 2.33 |
| **0.79605** | 38.61 | 17.39 | 38.01 | 7.99 |
| **1.1371** | 38.50 | 17.50 | 38.30 | 7.70 |
| **4.1517** | 38.63 | 17.37 | 36.71 | 9.29 |
| **4.6066** | 39.44 | 16.56 | 37.60 | 8.40 |
| **5.0037** | 39.36 | 20.64 | 38.20 | 11.80 |
| **13.282** | 46.99 | 13.01 | 46.90 | 3.10 |
| **13.44** | 45.39 | 14.61 | 45.21 | 4.79 |
| **14.845** | 45.85 | 14.15 | 45.60 | 4.40 |

Project ID - 1-4695/12-01-05
EUT - 866074 Avalon Cableless Base
Serial Number - DE2460128
Operating mode - TX charging, 115V/60Hz




FCC
Phase line tbl

Project ID: 1-4695/12-01-05

11:55:55 AM, Friday, November 30, 2012

| Frequency | Quasi peak level | Margin quasi peak | Average level | Margin average |
|---|---|---|---|---|
| MHz | dBµV | dBµV | dBµV | dBµV |
| | | | | |
| **0.51093** | 38.71 | 17.29 | 38.21 | 7.79 |
| **0.56766** | 40.02 | 15.98 | 39.33 | 6.67 |
| **0.62541** | 43.28 | 12.72 | 43.31 | 2.69 |
| **0.85309** | 35.25 | 20.75 | 35.40 | 10.60 |
| **4.0935** | 38.92 | 17.08 | 38.05 | 7.95 |
| **4.3786** | 39.03 | 16.97 | 37.56 | 8.44 |
| **4.6043** | 39.04 | 16.96 | 37.54 | 8.46 |
| **5.0041** | 38.81 | 21.19 | 37.25 | 12.75 |
| **13.439** | 46.27 | 13.73 | 46.17 | 3.83 |
| **13.441** | 43.00 | 17.00 | 42.69 | 7.31 |
| **15.001** | 45.56 | 14.44 | 43.97 | 6.03 |

Project ID - 1-4695/12-01-05
EUT - 866074 Avalon Cableless Base
Serial Number - DE2460128
Operating mode - TX charging, 115V/60Hz

## 11 Test equipment and ancillaries used for tests

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Labor/Item).

| No. | Lab / Item | Equipment | Type | Manufact. | Serial No. | INV. No Cetecom | Kind of Calibration | Last Calibration | Next Calibration |
|---|---|---|---|---|---|---|---|---|---|
| 1 | n. a. | DC power supply, 60Vdc, 50A, 1200 W | 6032A | HP Meßtechnik | 2818A03450 | 300001040 | Ve | 12.01.2012 | 12.01.2015 |
| 2 | n. a. | Double-Ridged Waveguide Horn Antenna 1-18.0GHz | 3115 | EMCO | 8812-3088 | 300001032 | vlKI! | 11.05.2011 | 11.05.2013 |
| 3 | n. a. | Active Loop Antenna | 6502 | EMCO | 2210 | 300001015 | ne | | |
| 4 | n. a. | Anechoic chamber | FAC 3/5m | MWB / TDK | 87400/02 | 300000996 | ev | | |
| 5 | n. a. | Switch / Control Unit | 3488A | HP Meßtechnik | * | 300000199 | ne | | |
| 6 | n. a. | Switch / Control Unit | 3488A | HP Meßtechnik | 2719A15013 | 300001156 | ne | | |
| 7 | 9 | Isolating Transformer | MPL IEC625 Bus Regeltrennt ravo | Erfi | 91350 | 300001155 | ne | | |
| 8 | n. a. | Three-Way Power Splitter, 50 Ohm | 11850C | HP Meßtechnik | | 300000997 | ne | | |
| 9 | n. a. | Amplifier | js42-00502650-28-5a | Parzich GMBH | 928979 | 300003143 | ne | | |
| 10 | | Band Reject filter | WRCG2400/2483-2375/2505-50/10SS | Wainwright | 11 | 300003351 | ev | | |
| 11 | n. a. | Highpass Filter | WHKX7.0/18G-8SS | Wainwright | 18 | 300003789 | ne | | |
| 12 | n. a. | TRILOG Broadband Test-Antenna 30 MHz - 3 GHz | VULB9163 | Schwarzbeck | 371 | 300003854 | vlKI! | 14.10.2011 | 14.10.2014 |
| 13 | n. a. | MXE EMI Receiver 20 Hz bis 26,5 GHz | N9038A | Agilent Technologies | MY51210197 | 300004405 | k | 19.12.2011 | 19.12.2014 |

**Agenda:** Kind of Calibration

| | | | |
|---|---|---|---|
| k | calibration / calibrated | EK | limited calibration |
| ne | not required (k, ev, izw, zw not required) | zw | cyclical maintenance (external cyclical maintenance) |
| ev | periodic self verification | izw | internal cyclical maintenance |
| Ve | long-term stability recognized | g | blocked for accredited testing |
| vlkI! | Attention: extended calibration interval | | |
| NK! | Attention: not calibrated | *) | next calibration ordered / currently in progress |

## 12 Observations

No observations exceeding those reported with the single test cases have been made.

## Annex A Document history

| Version | Applied changes | Date of release |
|---|---|---|
| 1.0 | Initial release | 2013-03-20 |
| -A | Editorial corrections | 2013-04-18 |
| -B | Editorial corrections (Voltage limits corrected) | 2013-05-14 |
| -C | Model name changed and photos extracted from test report | 2013-07-09 |

## Annex B Further information

**Glossary**

AVG - Average
DUT - Device under test
EMC - Electromagnetic Compatibility
EN - European Standard
EUT - Equipment under test
ETSI - European Telecommunications Standard Institute
FCC - Federal Communication Commission
FCC ID - Company Identifier at FCC
HW - Hardware
IC - Industry Canada
Inv. No. - Inventory number
N/A - Not applicable
PP - Positive peak
QP - Quasi peak
S/N - Serial number
SW - Software

## Annex C Accreditation Certificate

DAkkS Deutsche Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH
German Accreditation Body

**Entrusted according to Section 8 subsection1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV**
Signatory to the Multilateral Agreements of
EA, ILAC and IAF for Mutual Recognition

**Accreditation**

The Deutsche Akkreditierungsstelle GmbH (German Accreditation Body) attests that the testing laboratory

**CETECOM ICT Services GmbH**
**Untertürkheimer Straße 6-10**
**66117 Saarbrücken**

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

**Wired communications and DECT**
**Acoustic**
**Radio**
**Short Range Devices (SRD)**
**RFID**
**WiMax and Richtfunk**
**Mobile radio (GSM / DCS), Over the Air (OTA) Performance**
**Electromagnetic Compatibility (EMC) incl. Automotive**
**Product safety**
**SAR and Hearing Aid Compatibility (HAC)**
**Environmental simulation**
**Smart Card Terminals**
**Bluetooth**
**Wi-Fi-Services**

The accreditation certificate shall only apply in connection with the notice of accreditation of 13.04.2011 with the accreditation number D-PL-12076-01 and is valid until 03.09.2014. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 82 pages.

Registration number of the certificate: **D-PL-12076-01-01**

Frankfurt am Main, 13.04.2011

Dipl.-Ing. (FH) Rolf Egner
Head of Division 2

This document is a translation. The definitive version is the original German accreditation certificate.

Deutsche Akkreditierungsstelle GmbH

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Spittelmarkt 10
10117 Berlin

Office Frankfurt am Main
Gartenstraße 6
60594 Frankfurt am Main

Office Braunschweig
Bundesallee 100
38116 Braunschweig

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**Note:**
**The current certificate including annex is published on our website (see link below) or may be received from CETECOM ICT Services on request.**

http://www.cetecom.com/fileadmin/de/CETECOM_D_Saarbruecken/accreditations_Jan_2010/DAKKS_Akkredi_Urk_EN17025-En_incl_Annex.pdf