

## EMISSION -- TEST REPORT

Test Report File No. : T 21804-1-01 AA Date of issue : April 22, 2002

Type Designation : micron 5

Kind of Product : Remote Control Transmitter

Applicant : HBC-radiomatic GmbH

Manufacturer : HBC-radiomatic GmbH

Licence holder : HBC-radiomatic GmbH

Address : Haller Str. 49-53

74564 Crailsheim

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

This test report with attachment consists of **38** 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

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- o - EN 55011 / 3.1991
  - o - EN 55014 / 4.1993
  - o - EN 55014 / A2:1990
  - o - EN 55104 / 5.1995
  - o - EN 55015 / A1:1990
  - o - EN 55015 / 12.1993
  - o - EN 55022 / 5.1995
  - o - prEN 55103-1 / 3.1995
  - o - prEN 50121-3-2 / 3.1995
  - o - EN 60601-1-2 / 4.1994
  - o - VCCI
  - o - Part 15 Subpart C (15.209)
  - - Part 15 Subpart C (15.249)
- o - Group 1
  - o - class A
  - o - Household appliances and similar
  - o - tools
  - o - Semiconductor devices
  - Category:
  - o - class A
  - o - class B
  - o - class 1
  - o - class 2
- o - Group 2
  - o - class B



## **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  $\pm 4.5$  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 micron 5 transmitter was equipped with three different modules (902, 910, 918 MHz).

To find out the worst case conditions for the complete measurement the following tests have been performed:

- Measurement of the radiated fieldstrength of all three operating frequencies 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 transmitter.
- 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 transmitter .

Based on this test results, the measurements have been performed completely on the specified channels. 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 $\mu$ 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 $\mu$ V and  $\mu$ 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 $\Omega$ /50  $\mu$ 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 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 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**

■ - Test not applicable

- o - in a shielded room
- o - at a non - reflecting open-site and
- o - in a test distance of 3 meters.
- o - 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 dBµV/m, is arrived at by taking the reading from the EMI receiver (Level dBµV) 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<br>(MHz) | Level<br>(dBµV) | + | Factor<br>(dB) | = | Level<br>(dBµV/m) | Limit<br>(dBµV/m) | = | Delta<br>(dB) |
| 1.705              | 5               | + | 20             | = | 25                | 30                | = | 5             |



**Testresult in detail:**

| Frequency<br>[MHz] | L: PK<br>[dBµV] | L: AV<br>[dBµV] | L: QP<br>[dBµV] | Correct.<br>[dB] | L: PK<br>[dBµV/m] | L: AV<br>[dBµV/m] | L: QP<br>[dBµV/m] | Limit<br>[dBµV/m] |
|--------------------|-----------------|-----------------|-----------------|------------------|-------------------|-------------------|-------------------|-------------------|
|                    |                 |                 |                 |                  |                   |                   |                   |                   |
|                    |                 |                 |                 |                  |                   |                   |                   |                   |
|                    |                 |                 |                 |                  |                   |                   |                   |                   |

The requirements are

**o - MET**

**o - NOT MET**

Min. limit margin

\_\_\_\_\_ dB

\_\_\_\_\_ MHz

Min. limit margin

\_\_\_\_\_ dB

\_\_\_\_\_ MHz

Remarks:

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**SPURIOUS EMISSIONS (electric field) 30 MHz - 1000 MHz**

- Test not applicable

**Test location :**

- - Open-site 1
- - Open-site 2
- - 3 meters
- - 10 meters
- - 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<br>(MHz) | Level<br>(dBµV) | + | Factor<br>(dB) | = | Level<br>(dBµV/m) | Limit<br>(dBµV/m) | = | Delta<br>(dB) |
| 719                | 75              | + | 32.6           | = | 107.6             | 110               | = | -2.4          |

**Testresult in detail:**

**Module 902 MHz**

| 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] |
|-----------------|--------------|--------------|--------------|---------------|----------------|----------------|----------------|----------------|
| 451.02          | 18.0         | 16.2         | 17.4         | 24.2          | 42.2           | 40.4           | 41.6           | 44.0           |

**Module 910 MHz**

| 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] |
|-----------------|--------------|--------------|--------------|---------------|----------------|----------------|----------------|----------------|
| 454.97          | 16.5         | 13.8         | 15.4         | 24.2          | 40.7           | 38.0           | 39.6           | 44.0           |

**Module 918 MHz**

| 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] |
|-----------------|--------------|--------------|--------------|---------------|----------------|----------------|----------------|----------------|
| 458.98          | 16.5         | 14.8         | 16.0         | 24.2          | 40.7           | 39.0           | 40.2           | 44.0           |

**Test result:**

The requirements are

■ - MET

○ - NOT MET

Min. limit margin

2.4 dB

451.02 MHz

Max. limit exceeding

\_\_\_\_\_ dB

\_\_\_\_\_ MHz

Remarks:

The limits are met.

**SPURIOUS EMISSION 1 GHz - 18 GHz**

- Test not applicable

**Testlocation :**

- Open-site 1
- Open-site 2
- Anechoic chamber
- Full compact chamber
  
- 1 meters
- 3 meters
- 10 meters

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

**Description of Measurement**

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

Example of the correction value at 1.8 GHz

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

**Testresult in detail:**

**Module 902 MHz**

| Frequency [MHz] | L: PK [dBµV] | L: AV [dBµV] | Correct. [dB] | L: PK [dBµV/m] | L: AV [dBµV/m] | Limit [dBµV/m] |
|-----------------|--------------|--------------|---------------|----------------|----------------|----------------|
| 1355.0          | 58.8         | --           | -15.2         | 43.6           | --             | 74.0           |
| 1806.0          | 73.6         | 62.4         | -12.8         | 60.8           | 49.6           | 74.0           |
| 2257.0          | 60.7         | 50.8         | -11.1         | 49.6           | 39.7           | 74.0           |
| 2707.0          | 60.3         | 50.7         | -10.4         | 49.9           | 40.3           | 74.0           |
| 3158.0          | 62.5         | 52.7         | -9.5          | 53.0           | 43.2           | 74.0           |

**Module 910 MHz**

| Frequency [MHz] | L: PK [dBµV] | L: AV [dBµV] | Correct. [dB] | L: PK [dBµV/m] | L: AV [dBµV/m] | Limit [dBµV/m] |
|-----------------|--------------|--------------|---------------|----------------|----------------|----------------|
| 1361.0          | 59.1         | 48.1         | -15.0         | 44.1           | 33.1           | 74.0           |
| 1818.0          | 67.5         | 57.3         | -12.8         | 54.7           | 44.5           | 74.0           |
| 2275.0          | 58.6         | --           | -11.1         | 47.5           | --             | 74.0           |
| 2732.0          | 57.5         | 49.1         | -10.1         | 47.4           | 39.0           | 74.0           |
| 3188.0          | 62.4         | 51.6         | -9.2          | 53.2           | 42.4           | 74.0           |

**Module 918 MHz**

| Frequency [MHz] | L: PK [dBµV] | L: AV [dBµV] | Correct. [dB] | L: PK [dBµV/m] | L: AV [dBµV/m] | Limit [dBµV/m] |
|-----------------|--------------|--------------|---------------|----------------|----------------|----------------|
| 1373.0          | 60.0         | 48.6         | -15.1         | 44.9           | 33.5           | 74.0           |
| 1836.0          | 68.1         | 57.6         | -12.9         | 55.2           | 44.7           | 74.0           |
| 2755.0          | 60.3         | 50.4         | -10.2         | 50.1           | 40.2           | 74.0           |
| 3212.0          | 64.2         | 51.9         | -9.3          | 54.9           | 42.6           | 74.0           |

**Testresult**

The requirements are

■ - MET

○ - NOT MET

Min. limit margin

24.4 dB

1806.0 MHz

Max. limit exceeding

\_\_\_\_\_ dB

\_\_\_\_\_ MHz

Remarks: The measurement was performed up to the 10<sup>th</sup> harmonic (9180 MHz).

**FIELD STRENGTH OF THE FUNDAMENTAL WAVE**

- Test not applicable

- - 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 CPR2

**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<br>(MHz) | Level<br>(dBµV) | + | Factor<br>(dB) | = | Level<br>(dBµV/m) | - | Limit<br>(dBµV/m) | = | Delta<br>(dB) |
| 315                | 45              | + | 22.5           | = | 67.5              | - | 74.3              | = | -6.8          |

**Testresult in detail:**

**Module 902 MHz**

| 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] |
|-----------------|--------------|--------------|--------------|---------------|----------------|----------------|----------------|----------------|
| 902.03          | 44.5         | 41.9         | 45.4         | 36.7          | 81.2           | 78.6           | 82.1           | 94.0           |

**Module 910 MHz**

| 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] |
|-----------------|--------------|--------------|--------------|---------------|----------------|----------------|----------------|----------------|
| 909.96          | 43.3         | 37.6         | 44.0         | 36.7          | 80.0           | 74.3           | 80.7           | 94.0           |

**Module 918 MHz**

| 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] |
|-----------------|--------------|--------------|--------------|---------------|----------------|----------------|----------------|----------------|
| 917.95          | 55.0         | 50.3         | 57.0         | 36.7          | 91.7           | 87.0           | 93.7           | 94.0           |

**Testresult**

The requirements are

■ - MET

○ - NOT MET

Min. limit margin

0.3 dB

917.95 MHz

Max. limit exceeding

\_\_\_\_\_ dB

\_\_\_\_\_ MHz

Remarks: 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: \_\_\_\_\_  
 \_\_\_\_\_



**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  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Configuration of the equipment under test:** see attachment D  
**Following periphery devices and interface cables were connected during the measurement:**

- \_\_\_\_\_ Type : \_\_\_\_\_
- \_\_\_\_\_ Type : \_\_\_\_\_
- \_\_\_\_\_ Type : \_\_\_\_\_
- \_\_\_\_\_ 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 micron5 has been tested with three different modules on the following frequencies:

TX-Mode: 902.0 MHz  
910.0 MHz  
918.0 MHz

The unit measurements met also the bandwidth requirements.

**FINAL JUDGEMENT:**

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

- - met.
- - **not** met.

The Equipment Under Test

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

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

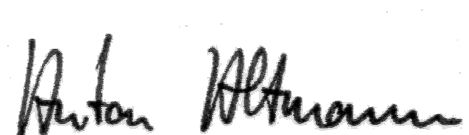
Testing start date : March 18, 2002

Testing end date : March 18, 2002

Checked by:

Tested by:

i. A. 



\_\_\_\_\_  
Günter Mikes  
Dipl.Ing.(FH)

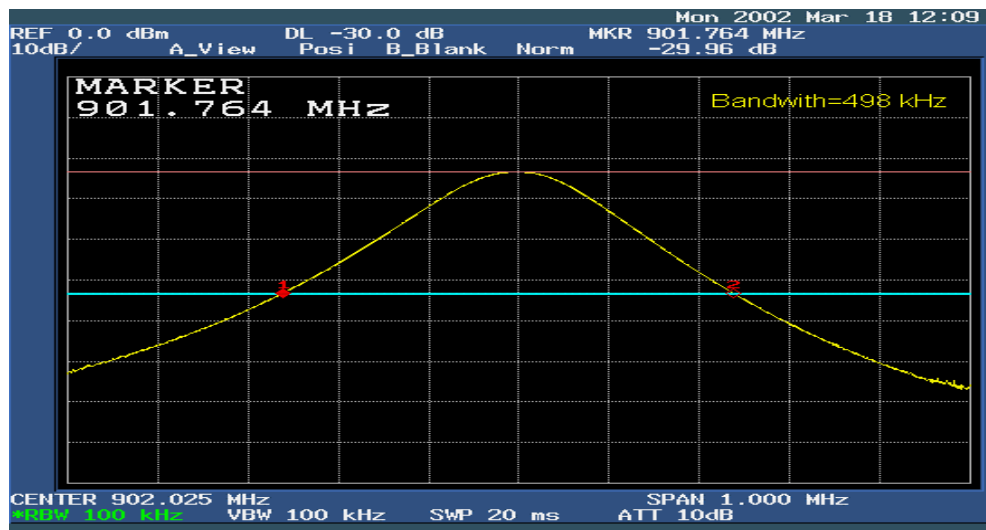
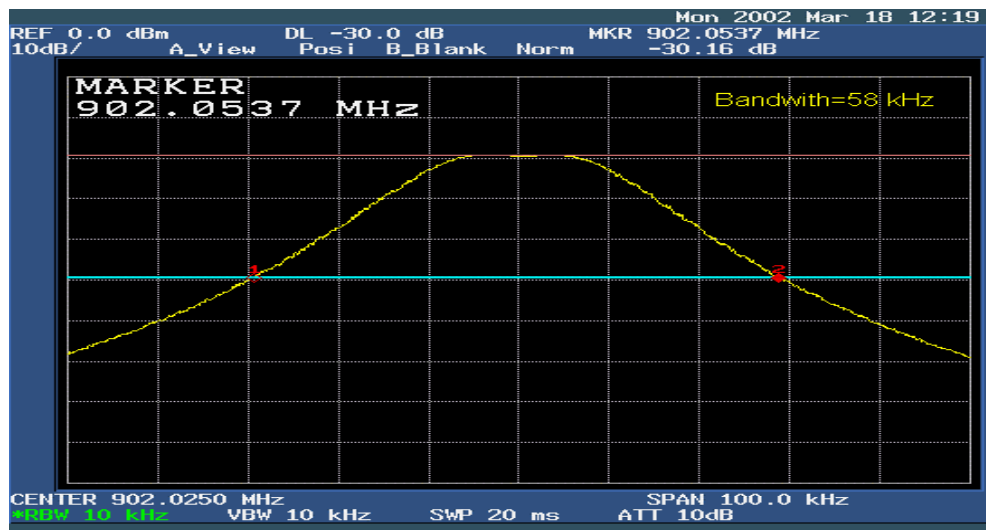
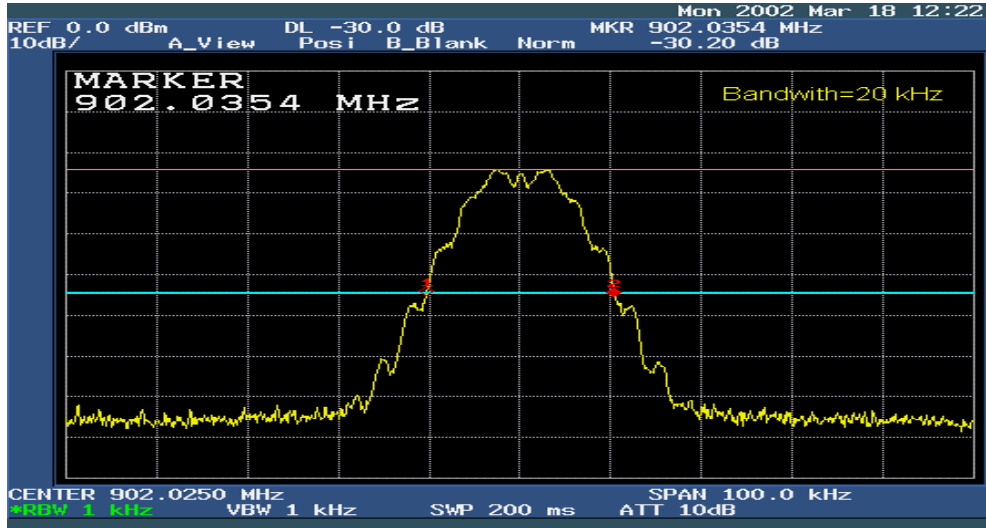
\_\_\_\_\_  
Anton Altmann  
Dipl.Ing.(FH)

# Attachment A1

micron 5 FCC ID: NO9M50004

File No. T 21804-01 AA

Module 902 MHz

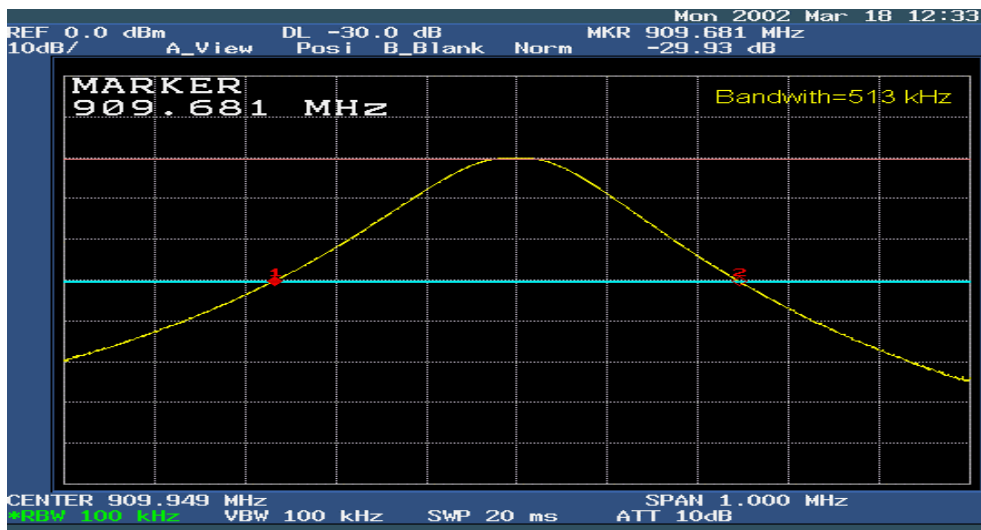
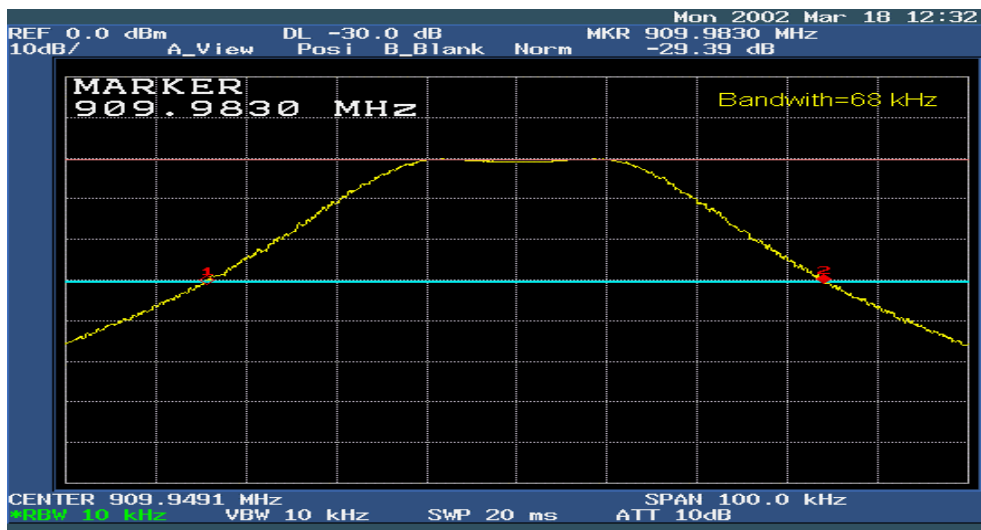
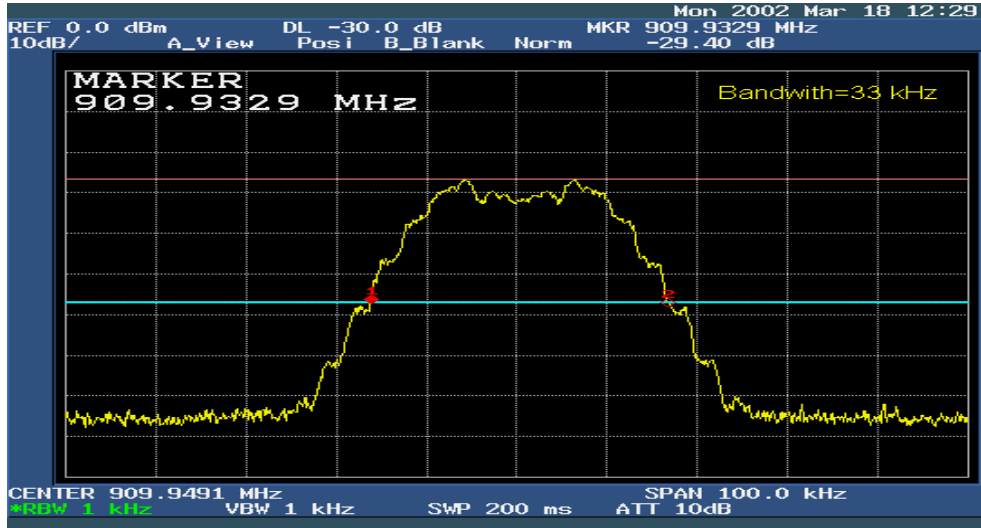


# Attachment A2

micron 5 FCC ID: NO9M50004

File No. T 21804-01 AA

Module 910 MHz

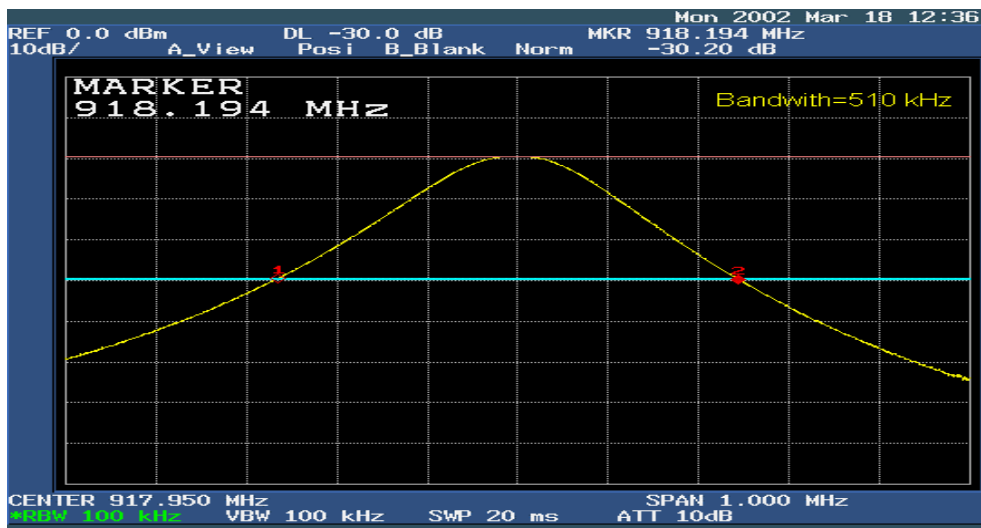
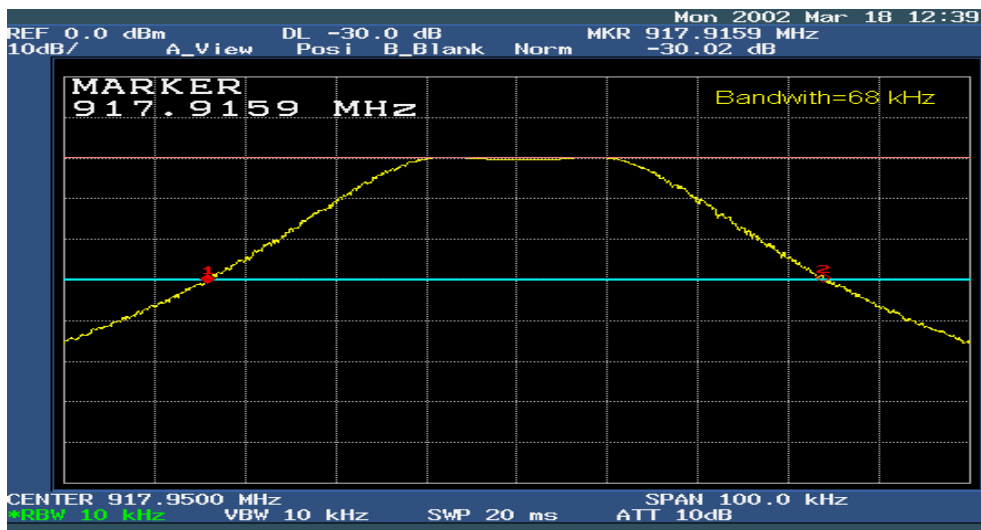
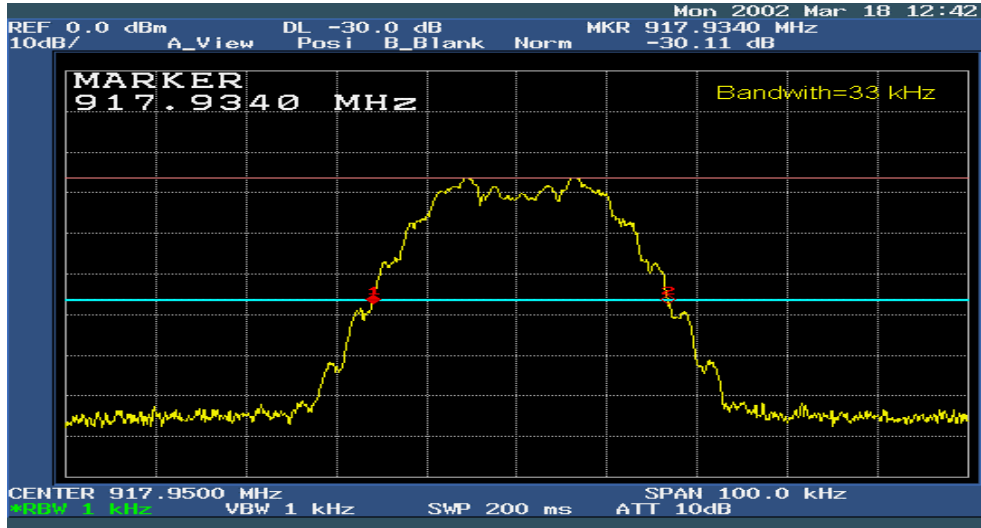


# Attachment A3

micron 5 FCC ID: NO9M50004

File No. T 21804-01 AA

Module 918 MHz



## Attachment : B

### List of Test Equipment

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

Test Report No: T 21804-1-01 AA  
 Beginning of Testing: 18-März-2002

| Test ID | Model Type               | Kind of Equipment      | Manufacturer                | Equipment No.   |
|---------|--------------------------|------------------------|-----------------------------|-----------------|
| CPR2    | Controller for Turntable | Controller             | EMISYS Vertriebs GmbH       | 04-07/59-89-157 |
|         | HCC                      | Controller Ant.-Mast   | Rohde & Schwarz München     | 04-07/59-97-001 |
|         | RG 214 U                 | Antenna Cable 2 m      | Huber+Suhner                | 04-07/60-89-463 |
|         | HF 7/8 inch              | Antenna Cable 13 m     | Huber+Suhner                | 04-07/60-99-001 |
|         | HF 7/8 inch              | Antenna Cable 20 m     | Huber+Suhner                | 04-07/60-99-002 |
|         | HF 7/8 inch              | Antenna Cable 40 m     | Huber+Suhner                | 04-07/60-99-003 |
|         | KR - 200                 | Coax Antenna Switch    | Rosenberger HF-Technik      | 04-07/60-99-004 |
|         | VULB - 9165              | Super Broadband Antenn | Schwarzbeck Mess-Elektronik | 04-07/62-00-001 |
|         | ESCS-30                  | Test Receiver          | Rohde & Schwarz München     | 04-07/63-01-001 |
|         | Turntable 2 m            | Turntable              | EMISYS Vertriebs GmbH       | 04-07/92-89-156 |
|         | Antenna Mast             | Antenna Mast           | Rohde & Schwarz München     | 04-07/92-97-001 |
| MB      | UHALP-9108A              | Antenna                | Schwarzbeck Mess-Elektronik | 04-07/62-97-009 |
|         | R 3162                   | Spectrum Analyser      | Advantest                   | 04-07/74-00-001 |
| SER2    | Controller for Turntable | Controller             | EMISYS Vertriebs GmbH       | 04-07/59-89-157 |
|         | HCC                      | Controller Ant.-Mast   | Rohde & Schwarz München     | 04-07/59-97-001 |
|         | RG 214 U                 | Antenna Cable 2 m      | Huber+Suhner                | 04-07/60-89-463 |
|         | HF 7/8 inch              | Antenna Cable 13 m     | Huber+Suhner                | 04-07/60-99-001 |
|         | HF 7/8 inch              | Antenna Cable 20 m     | Huber+Suhner                | 04-07/60-99-002 |
|         | HF 7/8 inch              | Antenna Cable 40 m     | Huber+Suhner                | 04-07/60-99-003 |
|         | KR - 200                 | Coax Antenna Switch    | Rosenberger HF-Technik      | 04-07/60-99-004 |
|         | VULB - 9165              | Super Broadband Antenn | Schwarzbeck Mess-Elektronik | 04-07/62-00-001 |
|         | ESCS-30                  | Test Receiver          | Rohde & Schwarz München     | 04-07/63-01-001 |
|         | Turntable 2 m            | Turntable              | EMISYS Vertriebs GmbH       | 04-07/92-89-156 |
|         | Antenna Mast             | Antenna Mast           | Rohde & Schwarz München     | 04-07/92-97-001 |
| SER3    | Sucoflex 104, SMA        | RF Cable 2 m           | Huber+Suhner                | 04-07/60-97-485 |
|         | Sucoflex 104, N          | RF Cable 3 m           | Huber+Suhner                | 04-07/60-97-492 |
|         | Model 3115               | Horn Antenna           | EMCO Elektronik GmbH        | 04-07/62-96-458 |
|         | AWT-4534                 | Microwave Amplifier    | TransTech Hochfrequenztechn | 04-07/66-90-217 |
|         | FSEM 30                  | Spectrum Analyser      | Rohde & Schwarz München     | 04-07/74-97-001 |
|         | Turntable 2 m            | Turntable              | EMISYS Vertriebs GmbH       | 04-07/92-89-160 |

# CONSTRUCTIONAL DATAFORM FOR TESTING OF RADIO EQUIPMENT

|                 |                                    |                   |       |
|-----------------|------------------------------------|-------------------|-------|
| Licence holder: | HBC-radiomatic GmbH                |                   |       |
| Address:        | 74564 Crailsheim Haller Str. 49-53 |                   |       |
| Manufacturer:   | HBC-radiomatic GmbH                |                   |       |
| Address:        | 74564 Crailsheim Haller Str. 49-53 |                   |       |
| Type:           | Remote Control Transmitter         |                   |       |
| Model:          | micron 5                           |                   |       |
| Serial-No.:     | prototype                          | Protection class: | IP 55 |

**Additional informations to the above named model:**

|  |                   |                     |       |
|--|-------------------|---------------------|-------|
| <b>Antenna:</b><br>transmitter:                  | Type: PCB antenna |                     |       |
|  | Length/size:      |                     |       |
| receiver:  | Type:             |                     |       |
|  | Length/size:      |                     |       |
| <b>Power supply of the transmitter:</b><br>Type: | DC                | nominal voltage:    | 6,0 V |
|  |                   | lowest voltage:     | 5,7 V |
|  |                   | highest voltage:    | 7,2 V |
|  |                   | current consumption | A     |
|  |                   | nominal voltage:    | V     |
| <b>Power supply of the receiver:</b><br>Type:    |                   | nominal voltage:    | V     |
|  |                   | current consumption | A     |

**Ancillary equipment:**

|              |                   |       |                    |             |   |
|--------------|-------------------|-------|--------------------|-------------|---|
| Description: | <u>NC-Battery</u> | Type: | <u>FuB 3A</u>      | Serial-no.: | - |
| Description: | <u>Charger</u>    | Type: | <u>FLG 105/115</u> | 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   |
|-------------------|------------|----------|------------|
|                   | O yes O no |          | O yes O no |
|                   | O yes O no |          | O yes O no |
|                   | O yes O no |          | O yes O no |
|                   | O yes O no |          | O yes O no |
|                   | O yes O no |          | O yes O no |

**O If applicable, if necessary complete overleaf**

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|  |  |  |  |
|--|--|--|--|
| <b>Type designation: micron 5</b>  |  |  |  |
| <b>Name and type designation of individual units comprising the radio equipment:</b> |  |  |  |
| FuS 680/3      902-918 MHz      25/50 KHz channel spacing                            |  |  |  |
| <b>Type of equipment:</b>  |  |  |  |
| <input type="checkbox"/> Radiotelephone equipment                                    | <input checked="" type="checkbox"/> Remote-control equipment   | <input type="checkbox"/> Radiomaritime equipment   | <input type="checkbox"/> LPD   |
| <input type="checkbox"/> One-way radiotelephone equipment                            | <input type="checkbox"/> Inductive loop system   | <input type="checkbox"/> Inland waterways equipment  | <input type="checkbox"/> RLAN  |
| <input type="checkbox"/> Personal paging system                                      | <input type="checkbox"/> Radio-relay system  | <input type="checkbox"/> Radionavigation equipm.   | <input type="checkbox"/>   |
| <input type="checkbox"/> Satellite earth station                                     | <input type="checkbox"/> CB radiotelephone equipment   | <input type="checkbox"/> Antenna   | <input type="checkbox"/>   |
| <input type="checkbox"/> Data transmission equipment                                 | <input type="checkbox"/> Movement detector   | <input type="checkbox"/> Aeronautical equipment  | <input type="checkbox"/>   |
| <b>Technical characteristics:</b>  |  |  |  |
|  | Transmitter-receiver   | Transmitter  | Receiver   |
| Frequency range  |  | <b>See above</b>   |  |
| Maximum no. of channels  |  | <b>128</b>   |  |
| Channel spacing  |  | <b>12,5, 20, 25 kHz</b>  |  |
| Class of emission (type of modulation)   |  | <b>F2D</b>   |  |
| Maximum RF output power  |  | -  |  |
| Maximum effective radiated power (ERP)   |  | <b>40 mV/m</b>   |  |
| Output power variable  |  | -  |  |
| Channel switching frequency range  |  | <b>W4: 902,000-905,175</b><br><b>W5: 905,200-908,375</b><br><b>W6: 908,400-911,575</b><br><b>W7: 911,600-914,775</b><br><b>W8: 914,800-917,975</b> |  |
| Method of frequency generation   | <input checked="" type="checkbox"/> Synthesizer  | <input type="checkbox"/> Crystal   | <input type="checkbox"/> Other   |
| Frequency generation TX  | <b>f<sub>Synthesizer</sub> · 2</b>   |  |  |
| Frequency generation RX  |  |  |  |
| IF   | 1st IF   | 2nd IF   | 3rd IF   |
| Integral selective calling   |  |  |  |
| Audio-frequency interface level at external data socket                              |  |  |  |
| Modes of operation   | <input type="checkbox"/> Duplex mode   | <input type="checkbox"/> Semi-duplex mode  | <input checked="" type="checkbox"/> Simplex mode   |
| Power source   | <input type="checkbox"/> Mains   | <input type="checkbox"/> Vehicle-regulated   | <input checked="" type="checkbox"/> Integral   |
| Antenna socket   | <input type="checkbox"/> BNC<br><input type="checkbox"/> M<br><input checked="" type="checkbox"/> None | <input type="checkbox"/> TNC<br><input type="checkbox"/> UHF<br><input type="checkbox"/>   | <input type="checkbox"/> N<br><input type="checkbox"/> Adapter<br><input type="checkbox"/> |
| <b>Test specifications:</b>  |  |  |  |



Applicant: HBC-radiomatic GmbH

Model-name: micron 5

**Declarations:**

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

**HBC-radiomatic GmbH**  
Haller Str. 49-53 · 74564 Crailsheim  
Telefon (07951) 393-0 · Fax 393-50

Crailsheim, date 05-04-02

place of issue

i.v. S. Leber

Seal and signature of applicant

**O If applicable, if necessary complete overleaf**

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MIKES BAPT PRODUCT SERVICE GmbH Ohmstr. 2-4 D-94342 Strasskirchen  
Tel.: +49 94 24 94 07-0 Fax.: +49 94 24 94 07-60

Rev.No.: 3.3