

# Gantner Electronic **TEST REPORT**

**SCOPE OF WORK**

EMC TESTING – GAT ECO. Side Lock 7000 BA

**REPORT NUMBER**

2231426KAU-008

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**DOCUMENT CONTROL NUMBER**

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**MODEL:** GAT ECO.Side Lock 7000  
**TYPE:** BA  
**DESCRIPTION:** Battery Powered RFID Lock  
**SERIAL NO:** 1747040242

All measurement results refer to the equipment which was tested

**MANUFACTURER:** Gantner Electronic GmbH  
**CUSTOMER NAME:** Gantner Electronic GmbH  
**ADDRESS (CUSTOMER):** Montafonerstrasse 8  
AT-6780 SCHRUNS  
AUSTRIA

**REPORT NO:** 2231426KAU-008

**TEST RESULT:** The FCC, part 15 B, Class B, verification and ICES-003, Class B requirements are fulfilled.

**TEST LABORATORY:** Intertek Deutschland GmbH  
Innovapark 20, 87600 Kaufbeuren  
Germany

**FCC DESIGNATION NUMBER:** DE0014

**FCC TEST FIRM REGISTRATION NUMBER.** 359260

**INDUSTRY CANADA REGISTRATION.** 8882A-1; 8882A-2

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Technical Manager EMC/Radio

**APPROVED BY:** U. Gronert  
Senior Project Engineer

*R. Dressler*  
*Uwe Gronert*



## Details about Accreditations/Acceptances

### EMC / Radio National



The Intertek Deutschland EMC-Lab is accredited by the Deutsche Akkreditierungsstelle GmbH (DAkkS)

Registration Number (EMC general): **D-PL-12085-01-01**

Registration Number (EMC Med): **D-PL-12085-01-03**

### International



The Intertek Deutschland EMC-Lab is accepted to participate in the IECEE (IEC Conformity assessment for Electrotechnical Equipment and Components) CB-Scheme

CB Test Laboratory: **TL118**



The Intertek Deutschland EMC-Lab is listed at the Federal Communications Commission (FCC)

Designation Number: **DE0014**

Test Firm Registration Number: **359260**



BNetzA-CAB-16/21-10

The *Bundesnetzagentur* recognizes Intertek Deutschland GmbH as Conformity Assessment Body in the sector electromagnetic compatibility (EMC).



The Intertek Deutschland EMC-Lab is listed at Industry Canada

No.**8882A-1** (OATS) and **8882A-2** (3 m alternative test site)

### Automotive



The Intertek Deutschland EMC-Lab is recognized as technical service of the Kraftfahrt-Bundesamt (KBA)

Registration Number: **KBA-P 00046-03**

Anerkennungsstelle

Anerkannt unter  
**KBA-P 00046-03**

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## SECTION 2

### MEASUREMENT AND TEST SPECIFICATION

FCC, Part 15 B, Class B, verification

The test setup and test was done according to: **ANSI C63.4: 2014**  
American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

#### ISED Canada

ICES-003, Issue 6, January 2016

Information Technology Equipment (Including digital apparatus) – Limits and methods of measurement

Tests according to:

ANSI C63.4

American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz, ANSI C63.4-2014 (Revision of ANSI C63.4-2009).

The test results detailed in this report apply only to the GAT ECO.Side Lock 7000 BA with the test setup described. Any modification such as a change, addition to or inclusion of another device into this product will require an additional evaluation. The support equipment listed as part of the emission tests is required to properly exercise and test the device under test.

**SECTION 3**  
**GENERAL INFORMATION**

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Possible test case verdicts:

Test case does not apply to the test object: N/A (Not Applicable)

Test object does meet the requirement: P (Pass)

Test object does not meet the requirements: F (Fail)

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Samples arrived: 2018-01-31

Testing: 2018-02-01

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Decimal separator:  Point  Comma

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Temperature: 15 °C - 35 °C

Humidity: 20 % - 60 %

Atmospheric pressure: 900 mbar - 1000 mbar

Environmental conditions during testing:

If explicitly required by a basic standard the measured climatic conditions are documented in the corresponding test section.

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**SECTION 4**  
**SUMMARY OF TESTING****4.1 Measurement uncertainty**

For each test method, an uncertainty evaluation was carried out. The results of the evaluation can be provided upon request from Intertek Deutschland GmbH.

**4.2 Document History**

| REVISION        | DATE       | REPORT         | CHANGES       | AUTHOR |
|-----------------|------------|----------------|---------------|--------|
| Initial release | 2018-02-26 | 2231426KAU-008 | Initial issue | RDR    |

**SECTION 5**  
**TEST RESULTS – OVERVIEW**

| EMISSION                               | REQUESTED | VERDICT | DATE       |
|--|-----------|---------|------------|
| Radiated emissions<br>(30 MHz - 1 GHz) | Class B   | P       | 2018-02-01 |

**Omission of tests:**

Conducted emissions is not applicable, because the EUT is battery operated.

## SECTION 6

### INFORMATION ABOUT THE EUT

#### 6.1 Description of the EUT

|   |   |        |         |
|---|---|--------|---------|
| <input checked="" type="checkbox"/> table-top EUT   | <input type="checkbox"/> floor-standing EUT   |        |         |
| Dimensions:   | Height:   | Width: | Length: |
|   | 100 mm  | 25 mm  | 125 mm  |
| Software version:   | A special test firmware was written for the EMC/Radio tests, to have a continuous transmission with a 100 ms interval. In reality the RFID and Bluetooth modules are just transmitting, when the lock button is pushed. They are never transmitting at the same time. |        |         |
| Prototype or Product version:   | 2.3   |        |         |
| <p>Description: With the GAT ECO.Side Lock 7xxx (NW) xx, lockers and depot boxes can be electronically locked and unlocked. The user simply presses the locker door shut and holds their data carrier next to the RFID reading center on the locker door. This action activates the lock electronics and the authorization of the user's data carrier is checked. If the authorization is valid, the locker door is locked or unlocked by the GAT ECO.Side Lock 7xxx (NW) xx accordingly.</p> <p>System users are identified at the lock using contactless RFID data carriers (Radio Frequency Identification).</p> |   |        |         |

#### 6.1.1 Photo of the rating plate



#### 6.2 Power interface

| MODE | VOLTAGE (V) | FREQUENCY (Hz) | COMMENT |
|------|-------------|----------------|---------|
| 1    | 3.6 V       | DC             | SIZE AA |

#### Power sources/associated test equipment

| DESCRIPTION     | MANUFACTURER | TYPE               | SN | ASSET NO. |
|-----------------|--------------|--------------------|----|-----------|
| Lithium battery | TADIRAN      | High Energy, 3.6 V | -  | -         |

### 6.3 Configuration mode

| MODE | DESCRIPTION   |
|------|---|
| 1    | The lock and the booster were fixed with a cable tie (the push button was pushed).<br>The test card was placed in front of the lock, thus the light went green and the beep was hearable. |

### 6.4 Operation mode

| MODE | DESCRIPTION         |
|------|---------------------|
| 1    | Pulse mode with tag |

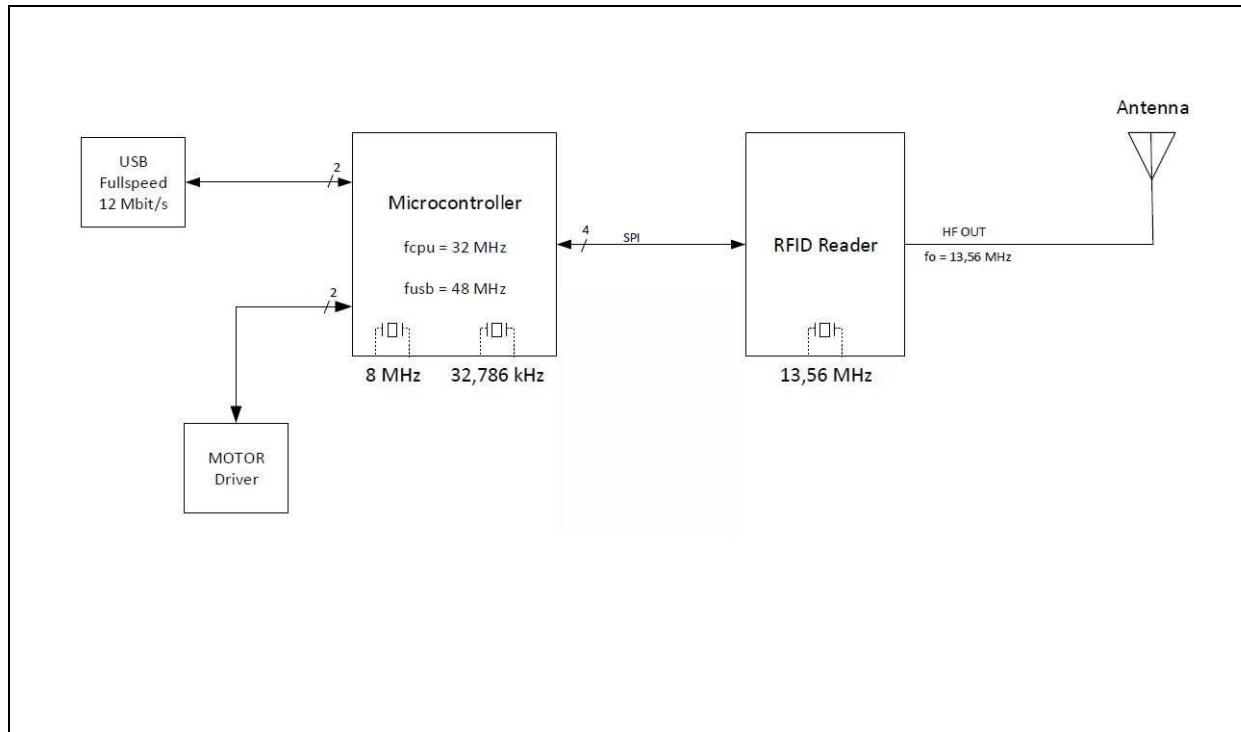
### 6.5 Peripheral devices used for testing

| DEVICE | MANUFACTURER | TYPE | SN | FCC ID |
|--------|--------------|------|----|--------|
| none   |              |      |    |        |

### 6.6 Supply and interconnecting cables used for testing

| LINE | LENGTH (cm) | SHIELDING |
|------|-------------|-----------|
| none |             |           |

### 6.7 Block diagram of the EUT with clock frequencies



## SECTION 7

### EMISSIONS

#### 7.1 Radiated emissions – Electric field strength

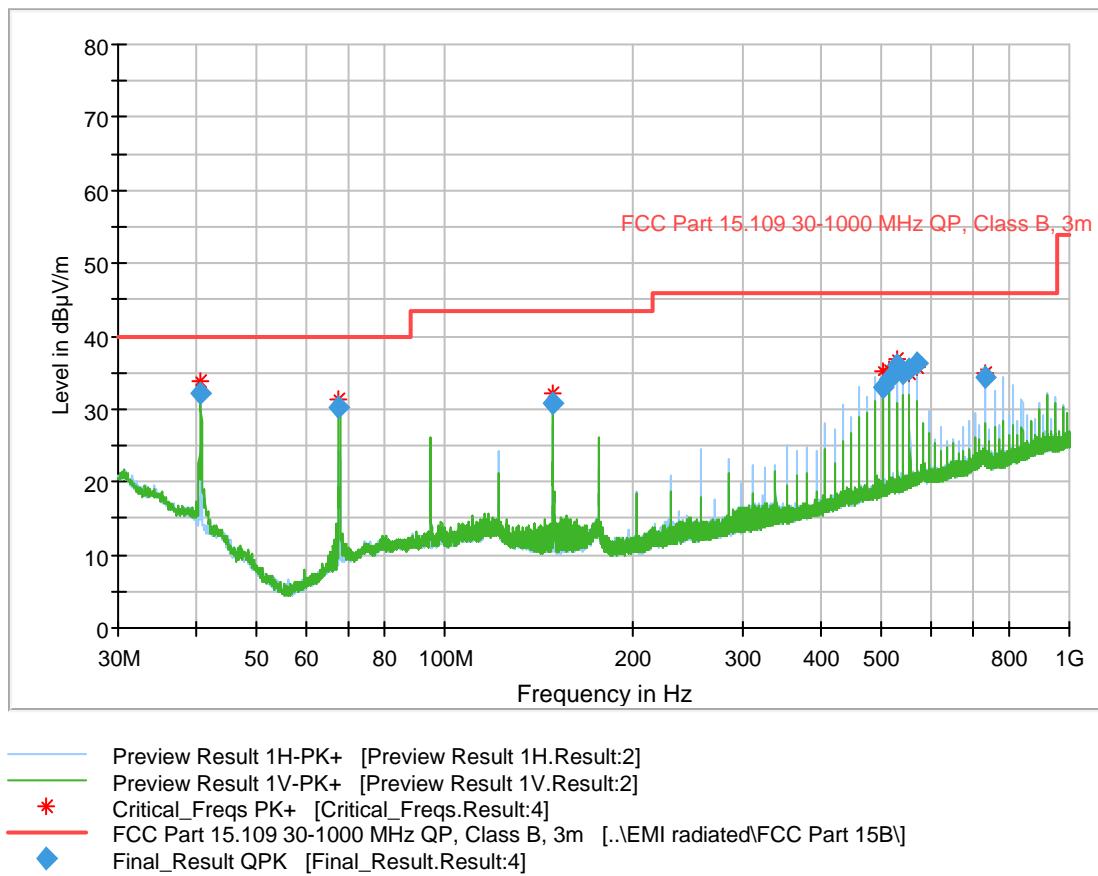
| NORMATIVE REFERENCES                 |                        | RESULT         |          |
|--------------------------------------|------------------------|----------------|----------|
| Limits according to:                 | <b>FCC, Part 15 B</b>  |                | <b>P</b> |
| Methods of measurement according to: | <b>ANSI C63.4</b>      |                |          |
| Equipment mode                       | Power interface        | 1              | <b>P</b> |
|                                      | EUT configuration mode | 1              |          |
|                                      | Operation mode         | 1              |          |
| Test requirements                    | Frequency range        | 30 MHz - 1 GHz | <b>P</b> |
|                                      | Antenna distance       | 3 m            |          |
|                                      | Class                  | B              |          |

#### Test equipment

| DESCRIPTION               | MANUFACTURER    | TYPE                 | SN      | ASSET NO.     | CALIBRATION       |
|---------------------------|-----------------|----------------------|---------|---------------|-------------------|
| Semi-Anechoic chamber     | Siepel          | REF W460SLB          | -       | PM KF 1150-01 | 2016-12 (3 years) |
| Turntable                 | Inn-Co          | -                    | -       | PM KF 2949-04 | -                 |
| Tower                     | Inn-Co          | MA4484-XPET          | -       | PM KF 2949-03 | -                 |
| Controller                | Inn-Co          | CO 3000              | 4970815 | PM KF 2949    | -                 |
| Receiver<br>10 Hz - 7 GHz | Rohde & Schwarz | ESR7                 | 101095  | PM KF 2441    | 2017-10 (1 year)  |
| Antenna<br>30 MHz - 3GHz  | Rohde & Schwarz | HL 562               | 100354  | PM KF 1123    | 2016-02 (2 years) |
| Test software             | Rohde & Schwarz | EMC 32<br>V.10.01.00 | -       | PM KF 2983-2  | -                 |

## Measurement results – Radiated emissions:

EUT: GAT ECO.Side Lock 7000 BA  
 Test Verdict: Passed  
 Test Description: Radiated emissions, FCC Part 15.109  
 Operating Conditions: Pulse mode with tag  
 Operator Name: RDR  
 Project Number: 31426  
 Date: 2018-02-01  
 Comment: No.: 1747040242

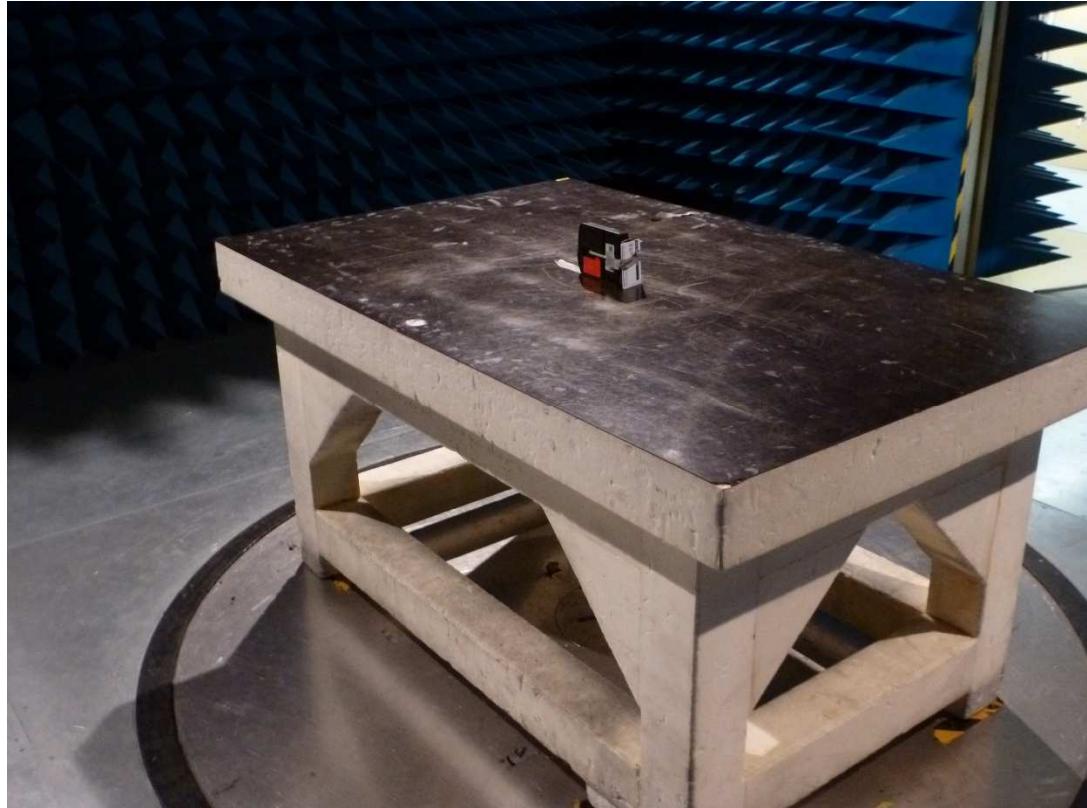


| Frequency (MHz) | QuasiPeak (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|--------------------------|----------------------|-------------|-----------------|-----------------|-------------|-----|---------------|------------|
| 40.680000       | 32.16                    | 40.00                | 7.84        | 1000.0          | 120.000         | 104.0       | V   | 15.0          | 14.4       |
| 67.800000       | 30.18                    | 40.00                | 9.82        | 1000.0          | 120.000         | 150.0       | V   | 6.0           | 9.1        |
| 149.160000      | 30.71                    | 43.50                | 12.79       | 1000.0          | 120.000         | 105.0       | V   | 14.0          | 10.3       |
| 501.720000      | 33.05                    | 46.00                | 12.95       | 1000.0          | 120.000         | 170.0       | H   | 0.0           | 17.7       |
| 515.280000      | 34.03                    | 46.00                | 11.97       | 1000.0          | 120.000         | 173.0       | H   | 8.0           | 18.0       |
| 528.840000      | 35.98                    | 46.00                | 10.02       | 1000.0          | 120.000         | 163.0       | H   | -3.0          | 18.2       |
| 542.400000      | 34.86                    | 46.00                | 11.14       | 1000.0          | 120.000         | 164.0       | H   | 174.0         | 18.3       |
| 555.960000      | 35.51                    | 46.00                | 10.49       | 1000.0          | 120.000         | 157.0       | H   | 356.0         | 18.6       |
| 569.520000      | 36.21                    | 46.00                | 9.79        | 1000.0          | 120.000         | 147.0       | H   | -6.0          | 18.9       |
| 732.240000      | 34.30                    | 46.00                | 11.70       | 1000.0          | 120.000         | 116.0       | H   | 6.0           | 21.4       |

## EMI Auto Test Template: FCC-RE-R12-AN08

|                            |   |                  |              |                   |               |
|----------------------------|---|------------------|--------------|-------------------|---------------|
| Hardware Setup:            | EN-RE-R12-AN08  |                  |              |                   |               |
| Measurement Type:          | Open-Area-Test-Site   |                  |              |                   |               |
| Frequency Range:           | 30 MHz - 1 GHz  |                  |              |                   |               |
| Graphics Level Range:      | 0 dB $\mu$ V/m - 80 dB $\mu$ V/m                              |                  |              |                   |               |
| Preview Measurements:      |   |                  |              |                   |               |
| Antenna height:            | 100 - 355 cm , Step Size = 85 cm , Positioning Speed = 8      |                  |              |                   |               |
| Polarization:              | H + V   |                  |              |                   |               |
| Turntable position:        | 0 - 352 deg , Step Size = 22 deg , Positioning Speed = 8      |                  |              |                   |               |
| Graphics Display:          | Show separate traces for horizontal and vertical polarization |                  |              |                   |               |
| Scan Test Template:        | EN-RE-R12-AN08_PRE  |                  |              |                   |               |
| <b>Subrange</b>            | <b>Step Size</b>  | <b>Detectors</b> | <b>IF BW</b> | <b>Meas. Time</b> | <b>Preamp</b> |
| Receiver: [ESR 7]          |   |                  |              |                   |               |
| 30 MHz - 1 GHz             | 30 kHz  | PK+              | 120 kHz      | 0,1 s             | 20 dB         |
| 1 GHz - 3 GHz              | 250 kHz   | PK+              | 1 MHz        | 0,1 s             | 20 dB         |
| Frequency Zoom:            |   |                  |              |                   |               |
| Zoom Scan Template:        | EN-RE-R12-AN08_ZOOM   |                  |              |                   |               |
| Adjustment:                |   |                  |              |                   |               |
| Antenna height:            | Range = 90 cm , Measuring Speed = 3                           |                  |              |                   |               |
| Turntable position:        | Range = 30 deg , Measuring Speed = 3                          |                  |              |                   |               |
| Template for Single Meas.: | EN-RE-R12-AN08_MAX  |                  |              |                   |               |
| Final Measurements:        |   |                  |              |                   |               |
| Template for Single Meas.: | EN-RE-R12-AN08_FIN  |                  |              |                   |               |
| <b>Subrange</b>            | <b>Step Size</b>  | <b>Detectors</b> | <b>IF BW</b> | <b>Meas. Time</b> | <b>Preamp</b> |
| Receiver: [ESR 7]          |   |                  |              |                   |               |
| 30 MHz - 1 GHz             | 40 kHz  | QPK              | 120 kHz      | 1 s               | 20 dB         |
| 1 GHz - 3 GHz              | 40 kHz  | QPK              | 1 MHz        | 1 s               | 20 dB         |

## Photos of the test setup:



## Anechoic chamber

### Test procedure

The test site is an anechoic chamber suitable for radiated emission measurements in the frequency range of 30 MHz – 18 GHz (26 GHz). It includes automatic antenna mast of height 4 m and turntable of radius 2 m. It enables both manual and fully automatic measurements. To find the highest level of radiation

- the height of the antenna is scanned in range 1m to 4 m with antenna in horizontal and vertical polarization;
- the turntable is rotated in range from 0° to 360°.

The system was configured for testing in a typical worst case fashion (as a customer may use it). All interface cables were moved to determine the position which resulted in the highest emission levels.

### Correction factors

The field strength is calculated by adding the antenna factor and cable attenuation.

The calculations are performed automatically by the measurement software EMC 32.

As example consider the following input values and result:

| FREQUENCY<br>(MHZ) | RECEIVER<br>READING<br>U<br>(dB $\mu$ V) | ANTENNA<br>FACTOR<br>AF<br>(dB/m) | CABLE<br>ATTENUATION<br>A<br>(dB) | CORRECTION<br>ANTENNA +<br>CABLE<br>(dB) | RADIATED FIELD<br>STRENGTH<br>E<br>(dB $\mu$ V/m) |
|--------------------|--|-----------------------------------|-----------------------------------|--|---|
| 30.0               | 20                                       | 20.6                              | 0.8                               | 21.4                                     | 41.4  |

$$E = U + AF + A$$

## SECTION 8

### Product labelling

#### FCC, Part 15 B, Class A/ B verification

##### Information to the user:

For a **Class A** digital device or peripheral, the instructions furnished the user shall include the following or similar statement, **placed in a prominent location in the text of the manual**:

NOTE: This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of these equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

For a **Class B** digital device or peripheral, the instructions furnished the user shall include the following or similar statement, **placed in a prominent location in the text of the manual**:

NOTE: This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/ TV technician for help

##### Systems incorporating several digital devices:

For systems incorporating several digital devices, the statement mentioned above needs to be contained only in the instruction manual for the main control unit.

##### Manual is provided in a form other than paper:

In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

**Label on the device:**

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

*(Where a device is constructed in two or more sections connected by wires and marketed together, the statement of this section is required to be affixed only on the main control unit.)*

**Small devices:**

When the device is so small or for such use that it is not practicable to place the statement specified under paragraph "Label on the device" of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed.

## Canadian ICES-003, Labelling Requirements

### **Self-Declaration of Compliance (SDoC):**

ITE subject to ICES-003 is approved through the method of Self-Declaration of Compliance (SDoC) by the manufacturer, importer or distributor of ITE who shall ensure that compliance with all technical requirements prescribed by ICES-003 has been demonstrated and the results compiled into a test report.

### **Test Report:**

The test report shall be **retained** by the manufacturer or importer **for a minimum period of five years** from the date the model of ITE is first offered for sale, distributed and/or leased in Canada, and shall be made available to Industry Canada upon request.

### **Industry Canada ICES-003 Compliance Label:**

*CAN ICES-3 (\*)/NMB-3(\*)*

\* Insert either "A" or "B" but not both to identify the applicable Class of ITE.

The label shall be permanently affixed to the ITE or displayed electronically and its text must be clearly legible. When the dimension of the device is too small or it is otherwise not practical to place the label on the ITE, the label shall be placed in a prominent location in the user manual supplied with the ITE. The user manual may be in an electronic format and must be readily available.

The manufacturer, importer or supplier shall meet the labelling requirements set out in this section for every ITE unit <sup>3</sup>:

- (i) Prior to marketing in Canada, for ITE manufactured in Canada, and;
- (ii) Prior to importation into Canada, for imported ITE.

The presence of the label on the ITE represents the manufacturer's or importer's Self-Declaration of Compliance (SDoC) to Industry Canada ICES-003.

Each unit of an ITE model shall bear a label indicating the model's compliance with ICES-003.

<sup>3</sup> The labelling requirements apply to new models. Existing models may continue with the requirements in Issue 4 or adopt the requirements in Issue 5.

**End of test report**