

**TEST REPORT CONCERNING THE COMPLIANCE OF
SPEED RADAR ANTENNA
OPERATING IN THE FREQUENCY RANGE
24075 – 24175 MHz
BRAND Gatso,
MODEL RT3 Radar
WITH 47 CFR PART 15 (10-1-12 EDITION) AND THE
REQUIREMENTS OF INDUSTRY CANADA:
ICES-003 (ISSUE 5, AUGUST 2012)**

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| | |
|-------------------------------|---------|
| FCC listed | 90828 |
| Industry Canada | 2932G-2 |
| R&TTE, LVD, EMC Notified Body | 1856 |

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MEASUREMENT/TECHNICAL REPORT

Brand: Gatso
Model: RT3 Radar
FCC ID: TVO-RT3
IC: 6271A-RT3

This report concerns: Original grant/certification Class 2 change Verification Verification

Equipment type: JBP Class B Computing Device Peripheral

| | |
|---------------------|-------------------------------------|
| Report prepared by: | Name : R. van der Meer |
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The data taken for this test and report herein was done in accordance with 47 CFR Part 15 (10-1-12 Edition), ICES-003 (ISSUE 5, AUGUST 2012) and the measurement procedures of ANSI C63.4-2009. TÜV Rheinland EPS at Leek, The Netherlands, certifies that the data is accurate and contains a true representation of the emission profile of the Equipment Under Test (EUT) on the date of the test as noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: August 16, 2013

Signature:



O. Hoekstra
Senior Engineer Telecom TÜV Rheinland EPS

Summary

The device under test does:

- fulfill the general approval requirements as identified in this test report
- not fulfill the general approval requirements as identified in this test report

Description of test item

| | | |
|-----------------|---|---|
| Test item (EUT) | : | Speed Radar Antenna / JBP Class B Computing Device Peripheral |
| Manufacturer | : | Gatsometer BV |
| Brand | : | Gatso |
| Model | : | RT3 Radar |
| Serial number | : | 201301001992 |
| FCC ID | : | TVO-RT3 |
| IC | : | 6271A-RT3 |
| Receipt date | : | July 26, 2013 |

Applicant information

| | | |
|----------------------------|---|-----------------------|
| Applicant's representative | : | Mr. Ben van de Pavert |
| Company | : | Gatsometer BV |
| Address | : | Claes Tillyweg 2 |
| Postal code | : | 2031CW |
| City | : | Haarlem |
| Country | : | The Netherlands |
| Telephone number | : | +31 23 5255050 |
| Fax number | : | +31 23 5276961 |

Test(s) performed

| | | |
|-----------------------|---|---|
| Location | : | Leek |
| Test(s) started | : | July 26, 2013 |
| Test(s) completed | : | August 12, 2013 |
| Purpose of test(s) | : | Equipment Authorization (Original grant/certification) |
| Test specification(s) | : | 47 CFR Part 15 (10-1-12 Edition), ICES-003 (ISSUE 5 AUGUST 2012) AND ANSI C63.4-2009 |
| Compliance statement | : | The test has demonstrated that this unit complies with stipulated standards. |
| Test engineer(s) | : | R. van der Meer  |
| Report written by | : | R. van der Meer  |
| Report date | : | August 16, 2013 |

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 The test results relate only to the item(s) tested.**

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1 General information.

1.1 Product description.

1.1.1 Introduction.

The brand Gatso, model RT3 Radar (hereafter referred to as EUT), is used in the Speed Inforcement System and is designed to operate in the 24 GHz frequency band (24075 MHz to 24175 MHz). The EUT's center frequency is swept by ± 50 MHz with a sawtooth signal.

The content of this report and measurement results have not been changed other than the way of presenting the data.

1.2 Related submittal(s) and/or Grant(s).

1.2.1 General.

This test report supports the original grant/certification in equipment authorization (for the Digital Device part) files under registration number.

FCC ID: TVO-RT3 and IC: 6271A-RT3.

1.3 Tested system details.

Details and an overview of the system and all of its components, as it has been tested, may be found below.

| | | |
|------------------------------|---|--|
| EUT | : | Speed Radar Antenna |
| Manufacturer | : | Gatsometer BV |
| Brand | : | Gatso |
| Model | : | RT3 Radar |
| Serial number | : | 201301001992 |
| Voltage input rating | : | 12Vdc |
| Voltage output rating | : | -- |
| Current input rating | : | -- |
| Antenna | : | Internal, declared Gain= 10.0 dBi |
| Remarks | : | See photos of the EUT on the next page |
| Auxiliary equipment (AUX1) | : | Multifunction DAC/Simulator |
| Manufacturer | : | National Instruments |
| Brand | : | National Instruments |
| Model | : | USB X Series |
| Serial number | : | -- |
| Voltage input rating | : | 10.8 – 15.0 VDC |
| Voltage output rating | : | -- |
| Remark | : | used to simulate vehicles |
| Auxiliary equipment 2 (AUX2) | : | Notebook computer with power supply adapter |
| Brand | : | Dell |
| Model | : | Latitude |
| Serial number | : | 515XLQ1 |
| Voltage input rating | : | 12 Vdc |
| Current input rating | : | -- |
| Remark | : | used for programming the EUT, property applicant |

| | | |
|------------------------------|---|----------------------------|
| Auxiliary equipment 3 (AUX3) | : | CAN-USB connection device |
| Brand | : | PEAK System |
| Model | : | IPEH-002021 |
| Serial number | : | 111674 |
| Current input rating | : | -- |
| Voltage output rating | : | -- |
| Current output rating | : | -- |
| Remarks | : | used to convert CAN to USB |
| Auxiliary equipment 4 (AUX4) | : | DC Power Supply |
| Manufacturer | : | Delta Electronics B.V. |
| Brand | : | Delta |
| Model | : | E030-3 |
| Voltage input rating | : | 100 – 240 Vac |
| Current input rating | : | -- |
| Voltage output rating | : | 0 – 30 Vdc |
| Current output rating | : | 3A max |
| Remarks | : | Power supply for EUT |

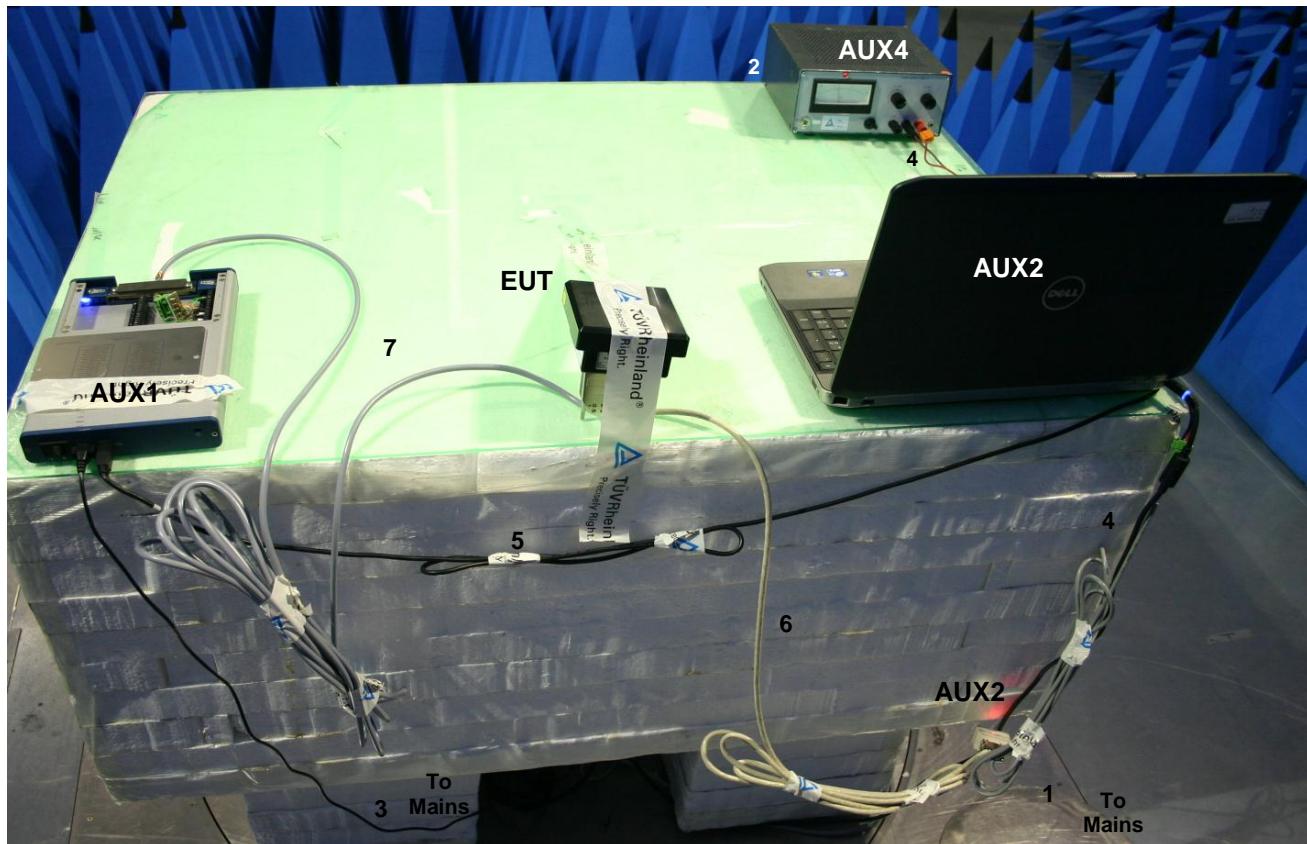


Photo 1: basic setup

1.3.1 Description of input and output ports.

| Number | Terminal | From | To | Remarks |
|--------|----------|-------|-----------------|-----------------------------|
| 1 | Mains | Mains | AUX2 | Unshielded cable <3m length |
| 2 | Mains | Mains | AUX4 | Unshielded cable <3m length |
| 3 | Mains | Mains | AUX1 | Unshielded cable <3m length |
| 4 | 12Vdc | AUX4 | EUT | Unshielded cable <3m length |
| 5 | comms | AUX1 | AUX2-usb port 2 | Shielded cable <3m length |
| 6 | comms | AUX3 | AUX2-usb port 1 | Shielded cable <3m length |
| 7 | Comms | AUX1 | AUX3 | Shielded cable <3m length |

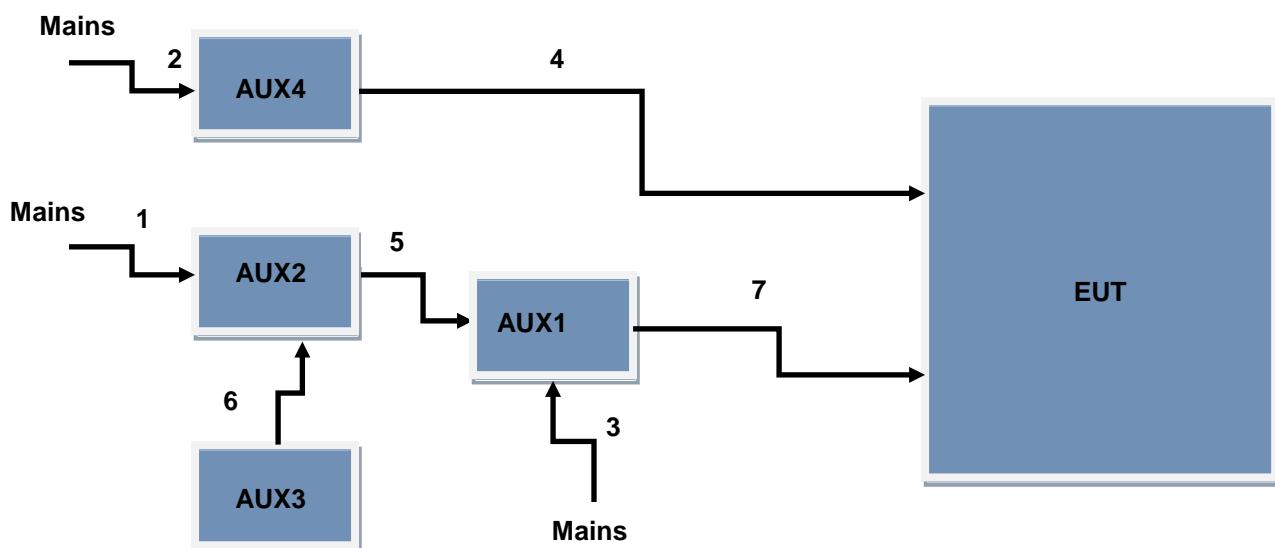


Figure 1. Basic set-up

1.4 Test Summary

The EUT was tested in accordance with the specifications given in Table 1 below.

| Test Standard | | Description | Page | Pass / Fail |
|-------------------------------------|------------------------------------|---------------------|---------|-------------|
| 47 CFR Part 15 (10-1-12 Edition) | ICES-0003 Issue 5 (AUGUST 2012) | | | |
| 15.107(a) Class B | Section 5 Class B | Conducted emissions | 15 - 18 | Pass |
| 15.109(a) Class B | Section 6 Class B | Radiated emissions | 12 - 14 | Pass |

Table 1: Test specifications

Testmethods: ANSI C63.4:2009 and RSS-Gen Issue 3, December 2010

1.5 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15 (10-1-12 Edition), sections 15.31, 15.35, 15.205, 15.107, 15.109 and ICES-003 Issue 5.

The test methods, which have been used, are based on ANSI C63.4: 2009.

Radiated emission tests above 30 MHz were performed at a measurement distance of 3 meters.

The receivers are switching automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. The antenna factors are programmed in the test receiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate antenna factor for the cable loss. The total correction is automatically added to the measured value.

1.6 Test facility.

The Federal Communications Commission and Industry Canada has reviewed the technical characteristics of the test facilities at TÜV Rheinland EPS , located at Eiberkamp 10, 9351 VT Leek, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948.

The description of the test facilities has been filed at the Office of the Federal Communications Commission under registration number 90828. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The description of the test facilities has been filed to Industry Canada under registration number 2932G-2. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

1.7 Test conditions.

Normal test conditions:

Temperature (*) : +15°C to +35°C
Relative humidity(*) : 20 % to 75 %
Supply voltage : 120Vac / 60Hz
Air pressure : 950 – 1050 hPa

When it was impracticable to carry out the tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests are stated separately.

2 System test configuration.

2.1 Justification.

The system was configured for testing in a typical situation as a customer would normally use it. The test sample was configured by software as described in section 2.3 to enable continuous transmit in various modes (described in section 2.2).

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.10: 2009.

2.2 EUT mode of operation.

The EUT has been tested in the modes as described in table below

| Test channel | Remark |
|--------------|-----------------------------|
| Setting 1 | Not used for USA and Canada |
| Setting 2 | Frequency = 24080 MHz |
| Setting 3 | Frequency = 24100 MHz |
| Setting 4 | Not used for USA and Canada |

Note: EUT is based on a free running VCO and actual frequency may differ.

2.3 Test Software

The applicant has provided the following testsoftware on AUX3 to enable control over testparameters. Only frequencies could be selected in the form of Setting 2 and Setting 3. Power level is set at maximum by default.

Testsoftware: TCAN Simulator

Version:

Use: turn EUT TX On/Off

Testsoftware: PCAN-view

Version:

Use: monitoring datatraffic

Testsoftware: RTxEmulator

Version:

Use: simulates a speeding vehicle

Testsoftware: CANopen Device Monitor

Version: 3.2.4

Use: setting the frequency

2.4 Special accessories.

No special accessories are used and/or needed to achieve compliance.

2.5 Equipment modifications.

No modifications have been made to the equipment.

2.6 Product Labeling

The product labeling information is available in the technical documentation package.

2.7 Block diagram of the EUT.

The block diagram is available in the technical documentation package.

2.8 Schematics of the EUT.

The schematics are available in the technical documentation package.

2.9 Part list of the EUT.

The part list is available in the technical documentation package.

3 Radiated emission data.

3.1 Requirements:

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

| Freq. [MHz] | Limit [μ V/m] | Limit [dB μ V/m] |
|----------------|-----------------------|-------------------------|
| 30 – 88 | 100 | 40.0 |
| 88 – 216 | 150 | 43.05 |
| 216 – 960 | 200 | 46.0 |
| Above 960 | 500 | 54.0 |

3.2 Testresults, Radiated field strength measurements (30 MHz – 1 GHz, E-field)

| Freq. [MHz] | Antenna Orientation | Level QP [dB μ V/m] | Limit [dB μ V/m] | Margin [dB] |
|----------------|------------------------|----------------------------|-------------------------|----------------|
| 51.48 | Horizontal | 30.1 | 40.0 | Pass |
| 60.00 | Horizontal | 35.2 | 43.5 | Pass |
| 120.00 | Horizontal | 40.8 | 43.5 | Pass |
| 216.00 | Horizontal | 40.8 | 43.5 | Pass |
| 240.00 | Horizontal | 37.3 | 46.0 | Pass |
| 336.00 | Horizontal | 36.0 | 46.0 | Pass |

Table 2 Radiated emissions of the EUT

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.205, 15.109(a) and ICES-003 are depicted in Table 2. See notes on the following page.

Notes:

1. Field strength values of radiated emissions at frequencies not listed in Table 2 above are more than 20 dB below the applicable limit.
2. Measurement uncertainty is ± 5.0 dB.
3. The EUT was varied in three positions, the measuring antenna was varied in horizontal and vertical orientations and also around it's axis and height. The reported value is the worst case found at the reported frequency.
4. Tested with EUT in operation modes as described in section 2.2, worst case values noted.
5. A Quasi-peak detector was used with a bandwidth of 120 kHz.

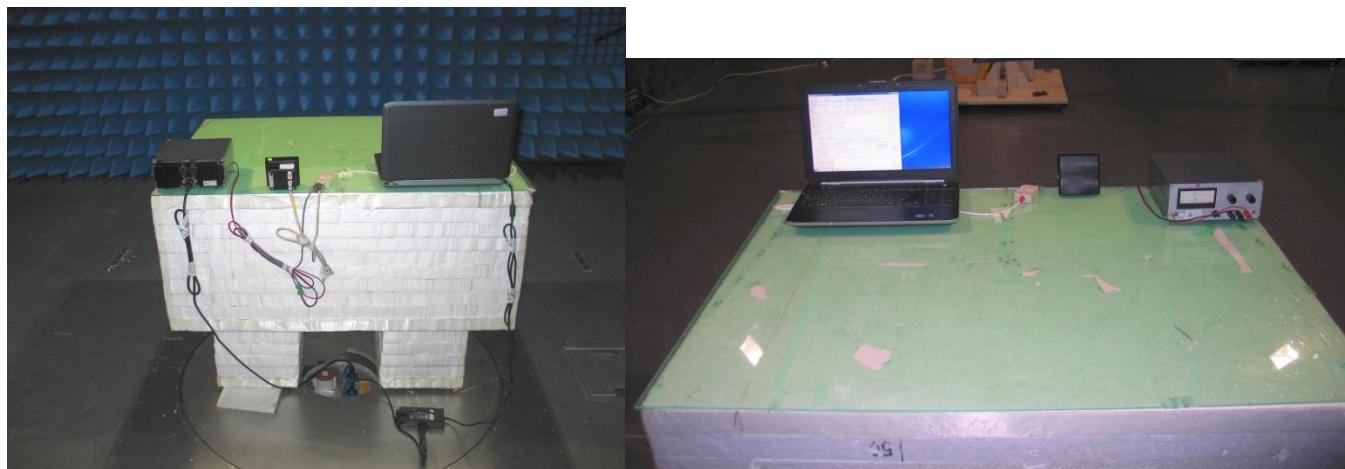
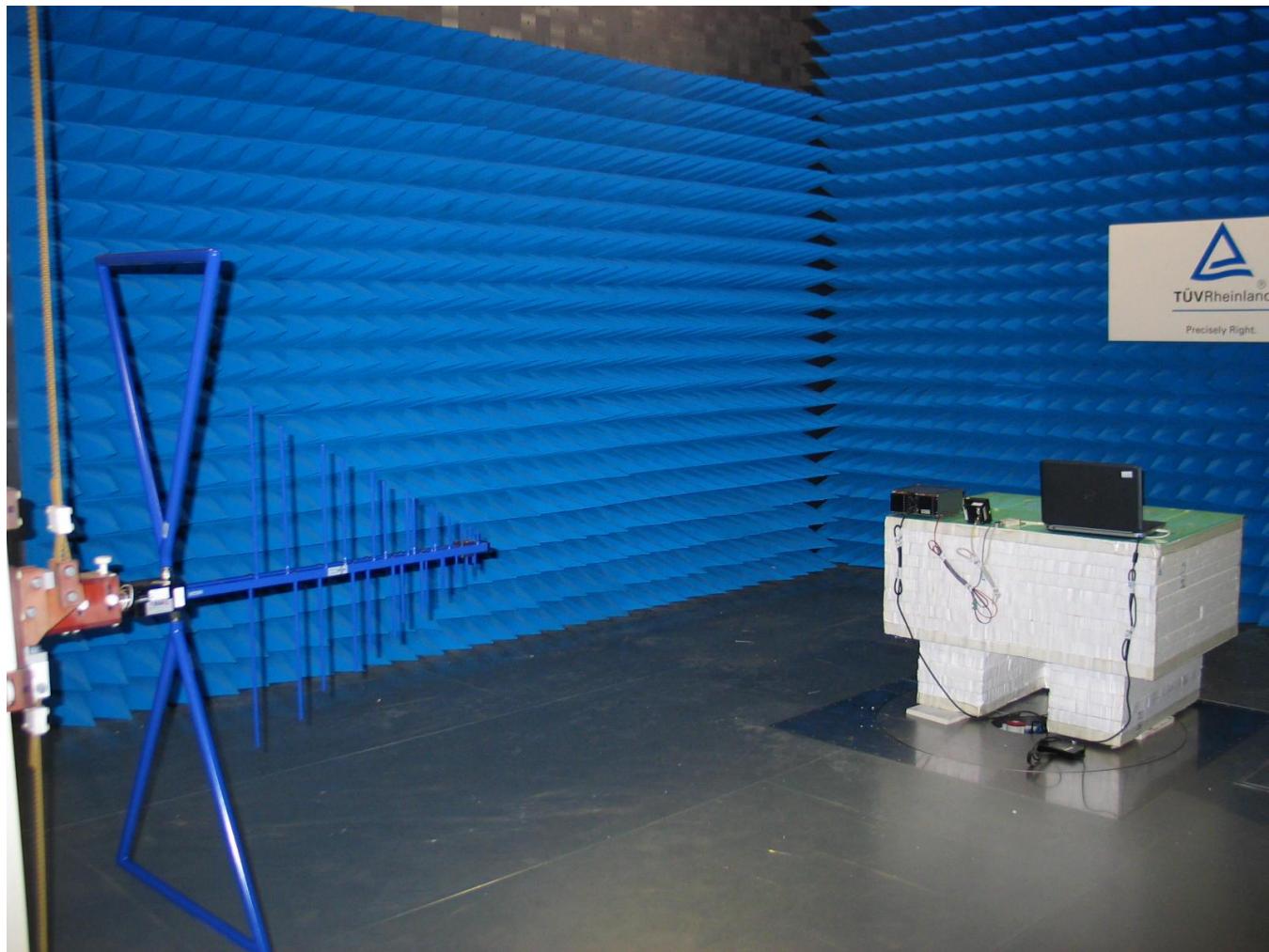
3.2.1 Test equipment used (for reference see test equipment listing).

| | | | | | | | | |
|-------|-------|-------|-------|-------|-------------|-------|-------|-------|
| 99608 | 99699 | 99609 | 99861 | 99858 | 99580/99847 | 99877 | 99045 | 99161 |
| | | | | | | | | |

Test engineer

Signature : 

Name : R. van der Meer
Date : 31-07-2013



Testsetup photographs

4 Conducted emission data.

4.1 Requirements

Except for Class A digital devices, for equipment that is designed to be connected to the public utility AC power line, either directly or indirectly, the radio frequency voltage that is conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the following table. The tighter limit applies at the frequency range boundaries.

| Frequency of Emission (MHz) | Conducted Limit (dB μ V) Quasi-Peak | Conducted Limit (dB μ V) Average |
|-----------------------------|--|---|
| 0.15 – 0.5 | 66 to 56* | 56 to 46* |
| 0.5 – 5 | 56 | 46 |
| 5 - 30 | 46 | 50 |

*Decreases with the logarithm of the frequency.

4.2 Testresults, Conducted emission data of the EUT

| Frequency (MHz) | Measurement results (dB μ V) Neutral/L2 | | Measurement results (dB μ V) Line 1 | | Limits (dB μ V) | | Result |
|-----------------|--|------|--|------|---------------------|------|--------|
| | QP | AV | QP | AV | QP | AV | |
| 0.150 | 55.1 | 23.4 | 56.2 | 26.2 | 66.0 | 56.0 | PASS |
| 0.170 | 54.0 | 22.3 | 54.7 | 24.2 | 65.0 | 55.0 | PASS |
| 0.185 | 52.3 | 20.6 | 53.3 | 22.6 | 64.3 | 54.3 | PASS |
| 0.230 | 51.4 | 19.7 | 53.0 | 21.8 | 62.4 | 52.4 | PASS |
| 0.255 | 52.8 | 21.0 | 54.1 | 23.2 | 61.6 | 51.6 | PASS |
| 0.285 | 52.1 | 20.1 | 53.9 | 23.3 | 60.7 | 50.7 | PASS |
| 0.320 | 45.8 | 14.1 | 47.5 | 18.6 | 59.7 | 49.7 | PASS |
| 1.075 | 38.0 | 7.5 | 27.8 | 3.0 | 56.0 | 46.0 | PASS |
| 12.000 | 44.7 | 44.0 | 45.3 | 44.5 | 60.0 | 50.0 | PASS |

Table 3

The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15 section 15.207(a) and RSS-Gen section 7.2.4, at the 120 Volts/ 60 Hz AC mains connection terminals of AUX4 which connects to the EUT, are depicted in Table 3 above. The system is tested as in whole, so with all equipment as shown in Figure 1 in place and functioning. Being the worst case situation. See note on the next page.

Notes:

1. Measurement uncertainty is $\pm 3.5\text{dB}$
2. The resolution bandwidth used was 9 kHz
3. The EUT was tested in on Setting 2 and Setting 3 of the frequencyband (24075 – 24175 MHz) wherein it operates. Worst case values noted.
4. Values of conducted emissions at frequencies not listed in Table 3 are more than 20 dB below the applicable limit.

Used test equipment and ancillaries:

| | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|
| 13313 | 99161 | 12512 | 15667 | 99852 | 99855 | 99848 |
| | | | | | | |

Test engineer

Signature : 

Name : R. van der Meer
Date : 01-08-2013

Test specification(s): FCC Part 15, ICES-003
Description of EUT: JBP Class B Computing Device Peripheral
Manufacturer: Gatsometer BV
Brand mark: Gatso
Model: RT3 Radar
FCC ID: TVO-RT3
IC: 6271A-RT3



Test specification(s): FCC Part 15, ICES-003
Description of EUT: JBP Class B Computing Device Peripheral
Manufacturer: Gatsometer BV
Brand mark: Gatso
Model: RT3 Radar
FCC ID: TVO-RT3
IC: 6271A-RT3



Testsetup photographs

5 List of utilized test equipment.

| Inventory number | Description | Brand | Model | Last cal. | Next cal. |
|------------------|---------------------------------------|------------|----------------------------------|-----------|-----------|
| 12512 | LISN | EMCO | 3625/2 | 01/2012 | 01/2014 |
| 13313 | Pulse limiter | R&S | ESH3-Z2 | 01/2013 | 01/2014 |
| 99045 | Power Supply | Delta | E030-3 | 04/2013 | 04/2014 |
| 99877 | Biconilog Test antenna | Chase | CBL 6111D | 06-2013 | 06-2014 |
| 99161 | Variac 250V 6A | RFT | LTS006 | NA | NA |
| 99580/99847 | Semi Anechoic Room | Siepel | FCC listed: 90828 IC: 2935G-2 | 12-2011 | 12-2014 |
| 99848 | Shielded room for Conducted emissions | Euroshield | RFD-100 359 | NA | NA |
| 99609 | Antenna mast | EMCS | AP-4702C | NA | NA |
| 99608 | Antenna mast controller | EMCS | DOC202 | NA | NA |
| 99852/ 99855 | Temperature-Humiditymeter | Extech | SD500 | 02-2012 | 02-2014 |
| 99861 | Controller turntable | Maturo | SCU/088/8090811 | NA | NA |
| 99877 | Biconilog Test antenna | Teseq | CBL 6111B | 06-2013 | 06-2014 |
| 99699 | Measuring receiver | R&S | ESCI | 03-2013 | 03-2014 |

NA= Not Applicable