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Report On

Limited FCC and Industry Canada Testing of the
ETELM SAS NetisB25 (451.000 MHz to 455.025 MHz)
In accordance with FCC 47 CFR Part 90, FCC 47 CFR Part 2 and
Industry Canada RSS-119

COMMERCIAL-IN-CONFIDENCE

FCC ID: 2AF3I-BSTETRA451
IC: 20543-BSTETRA451

Document 75932976 Report 03 Issue 1 December 2015

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REPORT ON

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December 2015

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APPROVED BY

Matthew Russell
Authorised Signatory

DATED 16 December 2015

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 90, FCC 47 CFR Part 2 and Industry Canada RSS-119. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

J Tuckwell

UKAS TESTING 0141

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SECTION 1

REPORT SUMMARY

Limited FCC and Industry Canada Testing of the
ETELM SAS NetisB25 (451.000 MHz to 455.025 MHz)
In accordance with FCC 47 CFR Part 90, FCC 47 CFR Part 2 and Industry Canada RSS-119

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1.1 INTRODUCTION

The information contained in this report is intended to show the verification of Limited FCC and Industry Canada Testing of the ETELM SAS NetisB25 (451.000 MHz to 455.025 MHz) to the requirements of FCC 47 CFR Part 90, FCC 47 CFR Part 2 and Industry Canada RSS-119.

Objective	To perform Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	ETELM SAS
Model Number(s)	NetisB25
Serial Number(s)	0165
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 90 (2014) FCC 47 CFR Part 2 (2014) Industry Canada RSS-119 (Issue 11, 2011)
Incoming Release Date	Application Form 14 August 2015
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	7883 16 July 2015
Start of Test	19 August 2015
Finish of Test	19 August 2015
Name of Engineer(s)	J Tuckwell
Related Document(s)	ANSI C63.4: 2009

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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 90, FCC 47 CFR Part 2 and Industry Canada RSS-119 is shown below.

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 90	Part 2	RSS-119			
Tetra						
2.1	90.210 (c)(3)	2.1051	5.8	Transmitter Unwanted Emissions	Pass	

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1.3 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	NetisB25
Part Number	352
Hardware Version	1
Software Version	9.05e
FCC ID (if applicable)	2AF3I-BSTETRA451
Industry Canada ID (if applicable)	20543-BSTETRA451
Technical Description (Please provide a brief description of the intended use of the equipment)	Tetra Base Station which can work in stand-alone mode or which can be connected to others Base Station to create a Tetra Network.

POWER SOURCE				
☐ AC mains		State voltage		
AC supply frequency	(Hz)			
VAC				
Max Current				
Hz				
☐ Single phase		☐ Three phase		
And / Or				
☒ External DC supply				
Nominal voltage		48 V	Max Current 15	A
Extreme upper voltage		55.2 V		
Extreme lower voltage		40.8 V		
Battery				
☐ Nickel Cadmium		☐ Lead acid (Vehicle regulated)		
☐ Alkaline		☐ Leclanche		
☐ Lithium		☐ Other Details :		
Volts nominal.				
End point voltage as quoted by equipment manufacturer		V		

FREQUENCY INFORMATION					
Frequency Range	451 to 455.025	MHz			
Channel Spacing (where applicable)	5				
Receiver Frequency Range (if different)	456 to 460.025	MHz			
Channel Spacing (if different)					
Test Frequencies*	Bottom	451	MHz	Channel Number (if applicable)	2040
	Middle	453	MHz	Channel Number (if applicable)	2120
	Top	455.025	MHz	Channel Number (if applicable)	2200
Intermediate Frequencies		23.3 MHz			
Highest Internally Generated Frequency :		TX freq+23.3 MHz			

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POWER CHARACTERISTICS				
Maximum TX power	25	W		
Minimum TX power		W (if variable)		
Is transmitter intended for :				
Continuous duty			☒ Yes	☐ No
Intermittent duty			☐ Yes	☒ No
If intermittent state DUTY CYCLE				
Transmitter ON		seconds		
Transmitter OFF		seconds		

ANTENNA CHARACTERISTICS					
☒	Antenna connector		State impedance	50	Ohm
☐	Temporary antenna connector		State impedance		Ohm
☐	Integral antenna	Type	State impedance		dBi
☐	External antenna	Type	State impedance		dBi

MODULATION CHARACTERISTICS					
☐	Amplitude		☐	Frequency	
☒	Phase		☐	Other (please provide details):	
Can the transmitter operate un-modulated?				☐ Yes	☐ No

CLASS OF EMISSION USED
ITU designation or Class of Emission:
1
(if applicable) 2
(if applicable) 3
If more than three classes of emission, list separately:

BATTERY POWER SUPPLY	
Model name/number	Identification/Part number
Manufacturer	Country of Origin

ANCILLARIES (If applicable)	
Model name/number	Identification/Part number
Manufacturer	Country of Origin

EXTREME CONDITIONS					
Extreme test voltages (Max)	55.2	V	Extreme test voltages (Mix)	40.8	V
Nominal DC Voltage	48	V	DC Maximum Current	15	A
Maximum temperature	55	°C	Minimum temperature	-10	°C

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature:  Name: VELTZ

Position held: Tests Manager Date: 14/08/15

Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a ETELM SAS NetisB25 (451.000 MHz to 455.025 MHz). A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 48 VDC supply.

FCC Measurement Facility Registration Number
90987 Octagon House, Fareham Test Laboratory

Industry Canada Company Address Code
IC2932B-1 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard were made during testing.

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.

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SECTION 2

TEST DETAILS

Limited FCC and Industry Canada Testing of the
ETELM SAS NetisB25 (451.000 MHz to 455.025 MHz)
In accordance with FCC 47 CFR Part 90, FCC 47 CFR Part 2 and Industry Canada RSS-119

Product Service

2.1 TRANSMITTER UNWANTED EMISSIONS

2.1.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.210 (c)(3)
FCC 47 CFR Part 2, Clause 2.1051
Industry Canada RSS-119, Clause 5.8

2.1.2 Equipment Under Test and Modification State

NetisB25 S/N: 0165 - Modification State 0

2.1.3 Date of Test

19 August 2015

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

The test was performed in accordance with ANSI C63.10, Clause 6.3, 6.5, and 6.6

Remarks

All final measurements were assessed against the emission limits in Industry Canada RSS-119, Clause 5.8.10 and FCC 47 CFR Part 90, Clause 90.210 (c)(3)

2.1.6 Environmental Conditions

Ambient Temperature	19.3°C
Relative Humidity	54.0%

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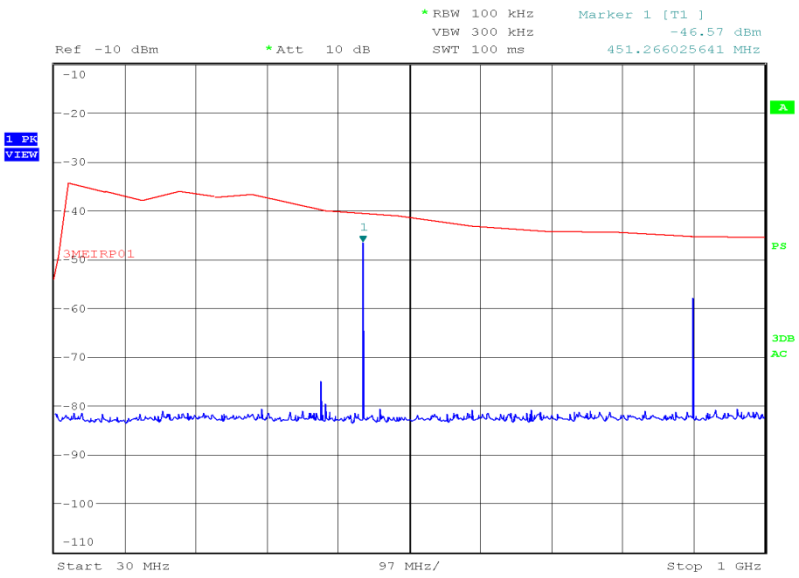
2.1.7 Test Results

Radiated

451.000 MHz

30 MHz to 1 GHz



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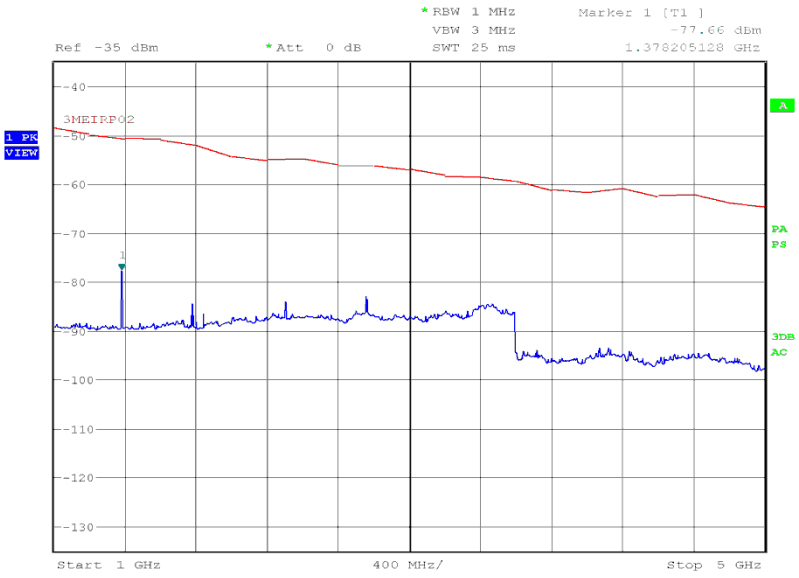
1 GHz to 5 GHz



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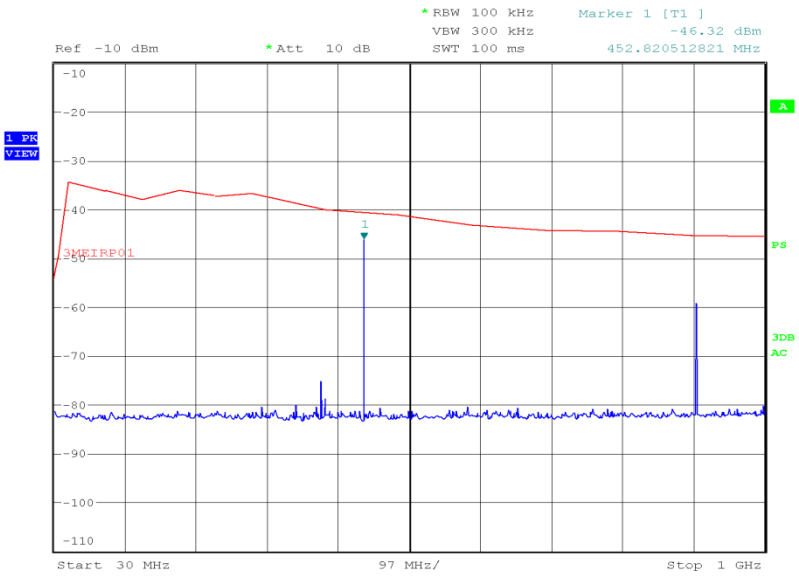
453.000 MHz

30 MHz to 1 GHz



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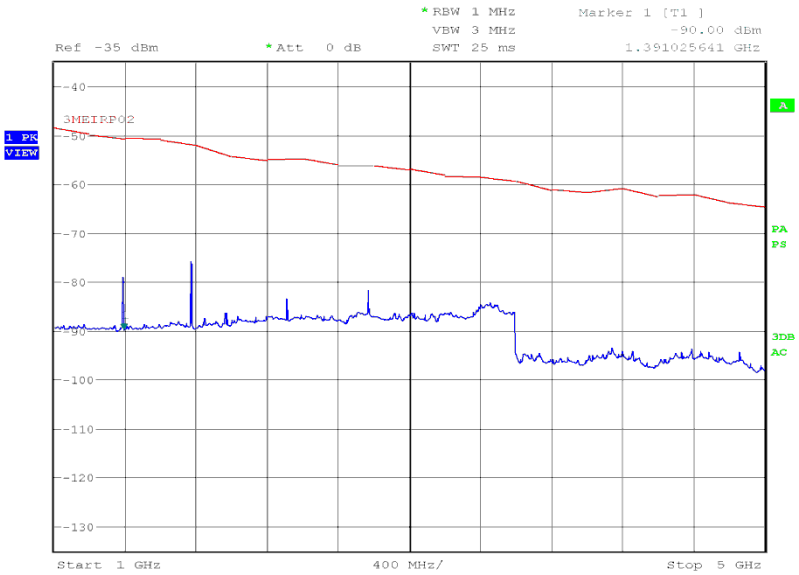
1 GHz to 5 GHz



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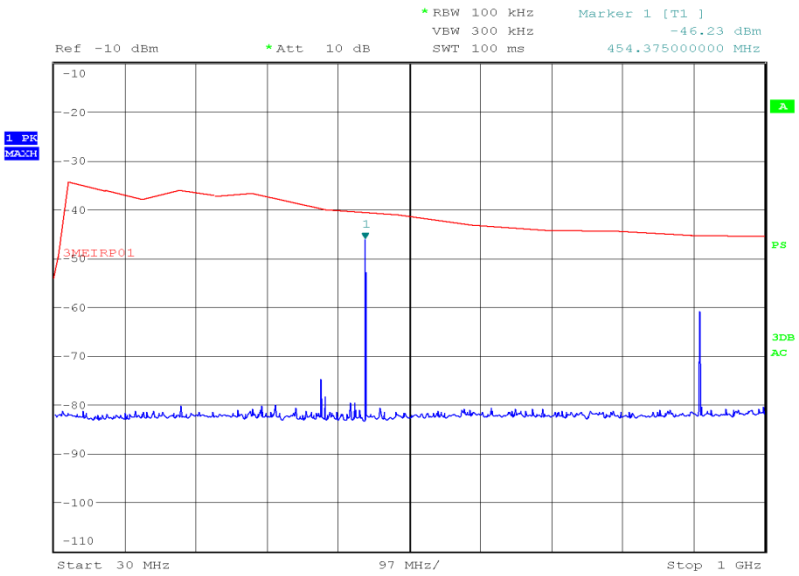
455.025 MHz

30 MHz to 1 GHz



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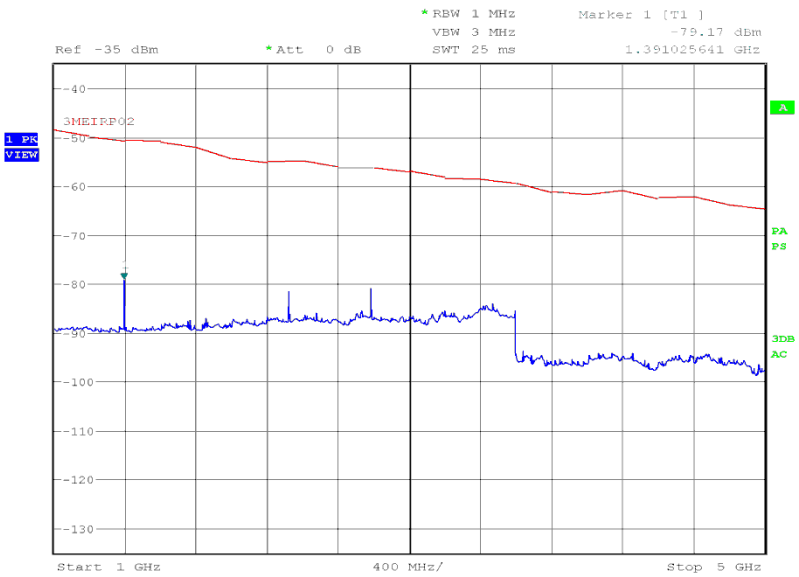
1 GHz to 5 GHz



Date: 19.AUG.2015 14:42:36

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Remarks

EIRP 01 limit line refers to a -13 dBm limit line which has been derived from -57 dBc from the cutomers declared power of 44 dBm using a Bilog antenna between 30 MHz and 1 GHz

EIRP 02 limit line refers to a -13 dBm limit line which has been derived from -57 dBc from the cutomers declared power of 44 dBm using a Double Ridge Guide (DRG) antenna between 1 GHz and 5 GHz, 48 V DC Supply

FCC 47 CFR Part 90, Limit Clause 90.210 (c)(3)

On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

Industry Canada RSS-119, Limit Clause 5.8.10

Emission Mask Y

Displacement Frequency, f_d (kHz)	Minimum Attenuation (dB)
$12.375 < f_d \leq 13.975$	Whichever is the lesser attenuation: $30 + 16.67(f_d - 12.375)$ or $55 + 10\log_{10}(p)$
$f_d > 13.975$	Whichever is the lesser attenuation: 57 or $55 + 10\log_{10}(p)$

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SECTION 3

TEST EQUIPMENT USED

Product Service

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 - Transmitter Spurious Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	29-Apr-2016
Screened Room (5)	Rainford	Rainford	1545	0	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	11-Jun-2017
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
50 ohm load	Delta Ohm	06 150 011	Not serialised	-	TU

TU – Traceability Unscheduled

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3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
Transmitter Unwanted Emissions	Radiated: 30 MHz to 1 GHz: ± 5.1 dB Radiated: 1 GHz to 40 GHz: ± 6.3 dB

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SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).