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Report On

FCC and Industry Canada Testing of the
SRT Marine Technology Ltd AtoN Express
In accordance with FCC CFR 47 Part 80 and
Industry Canada RSS-182

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FCC ID: UYW-4180013
IC: 7075A-4180013

Document 75925174 Report 02 Issue 1

May 2014



Product Service

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COMMERCIAL-IN-CONFIDENCE

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SRT Marine Technology Ltd AtoN Express
In accordance with FCC CFR 47 Part 80 and
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Document 75925174 Report 02 Issue 1

May 2014

PREPARED FOR

SRT Marine Technology Ltd
Wireless House
Westfield Industrial Estate
Midsomer Norton
Bath
BA3 4BS

PREPARED BY

Natalie Bennett
Senior Administrator, Technical Solutions

APPROVED BY

Ryan Henley
Authorised Signatory

DATED

22 May 2014

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 CFR 47 Part 80 and Industry Canada RSS-182. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

N Rousell

M Russell



P Joynton



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SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
SRT Marine Technology Ltd AtoN Express
In accordance with FCC CFR 47 Part 80 and Industry Canada RSS-182



Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show the verification of FCC and Industry Canada Testing of the SRT Marine Technology Ltd AtoN Express to the requirements of FCC CFR 47 Part 80 and Industry Canada RSS-182.

Objective	To perform FCC and 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	SRT Marine Technology Ltd
Model Number(s)	AtoN Express
Serial Number(s)	#4 #5
Number of Samples Tested	2
Test Specification/Issue/Date	FCC CFR 47 Part 80 (2013) Industry Canada RSS-182 (Issue 5, 2012)
Incoming Release Date	Application Form 11 April 2014
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	POR004373 19 December 2013
Start of Test	16 April 2014
Finish of Test	12 May 2014
Name of Engineer(s)	N Rousell M Russell P Joynson



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 80 and Industry Canada RSS-182 is shown below.

Section	Spec Clause		Test Description	Result	Comments/Base Standard
	Pt 80	RSS-182			
Transmit					
2.1	80.205	7.3	Bandwidths	Pass	
2.2	80.209	5.1 and 7.4	Transmitter Frequency Tolerances	Pass	
2.3	80.211	7.9	Emission Limitations	Pass	
2.4	80.213	7.3	Modulation Requirements	Pass	
2.5	80.213 (a)(2)	7.3	Transmitter Frequency Deviation	Pass	
2.6	80.215	5.2 and 7.5	Transmitter Power	Pass	
2.7	80.215 (e)(g)(1)(2)(3)	7.5	Transmitter Carrier Power Reduction	N/A	See Customer Waiver
2.8	80.217 (b)	-	Suppression of Interference Aboard Ships	N/A	See Customer Waiver



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1.3 APPLICATION FORM

APPLICANT'S DETAILS			
COMPANY NAME :SRT-Marine Technology Ltd...			
ADDRESS Wireless House, Westfield Industrial Estate, Midsomer Norton, Bath England.BA3 4BS			
NAME FOR CONTACT PURPOSES : Richard McMahon			
TELEPHONE NO+44(0)1761409500		FAX NO: +44(0)1761410093	
		E-MAIL: richard.mcmahon@srt-marine.com	

EQUIPMENT INFORMATION			
Model name/number	AtoN Express.	Identification/Part number	418-0013.
Hardware Version	418-0012.1/PCBA:011-0072.1.	Software Version	090200.01.00.04.
Manufacturer	SRT-Marine Technology Ltd.	Country of Origin	Hungary.
FCC ID	UYW-4180013	Industry Canada ID	7075A-4180013
Technical description (a brief description of the intended use and operation)			
Type 1 AtoN for use on land or buoy			
<u>Supply Voltage:</u>			
<input type="checkbox"/> []	AC mains	State AC voltage	V and AC frequency Hz
<input type="checkbox"/> []	DC (external)	State DC voltage	V and DC current A
<input checked="" type="checkbox"/> [x]	DC (internal)	State DC voltage	3.7 V and Battery type Li-on....
<u>Frequency characteristics:</u>			
Transmitter Frequency range	156.025 MHz to 162.025MHz		Channel spacing 25kHz. (if channelized)
Receiver Frequency range (if different)	...N/A.... MHz to MHz		Channel spacing (if channelized)
Designated test frequencies:			
Bottom: MHz		Middle: MHz Top: MHz	
Intermediate Frequencies : 19.655... MHz			
Highest Internally Generated Frequency : LO=142.37MHz and RF = 162.025 MHz			
<u>Power characteristics:</u>			
Maximum transmitter power2 W		Minimum transmitter power W (if variable)
<input type="checkbox"/> []	Continuous transmission		
<input checked="" type="checkbox"/> [x]	Intermittent transmission		
If intermittent, can transmitter be set to continuous transmit test mode? Y/N			
<u>Antenna characteristics:</u>			
<input type="checkbox"/> []	Antenna connector		State impedance ohm
<input type="checkbox"/> []	Temporary antenna connector		State impedance ohm
<input checked="" type="checkbox"/> [x]	Integral antenna Type		State gain 1 dBi
<input type="checkbox"/> []	External Antenna Type		State gain dBi
<u>Modulation characteristics:</u>			
<input type="checkbox"/> []	Amplitude		<input type="checkbox"/> [] Other
<input checked="" type="checkbox"/> [x]	Frequency		Details: GMSK-TDMA.
<input type="checkbox"/> []	Phase		(GMSK, QSPK etc)
Can the transmitter operate un-modulated? Y/N			
ITU Class of emission: 25K0Q1DDT			
<u>Battery/Power Supply</u>			
Model name/number	LIC/18650-22L	Identification/Part number	160-0001
Manufacturer	VARTA	Country of Origin	China
<u>Ancillaries (if applicable)</u>			
Model name/number	...N/A.....		Identification/Part numberN/A.....
Manufacturer		Country of Origin
<u>Extreme conditions:</u>			
Maximum temperature	...+55 °C		Minimum temperature-20 °C
Maximum supply voltage	...4.1 V		Minimum supply voltage ...3.66... V



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

Signature :

A handwritten signature in black ink, consisting of a large, stylized 'S' followed by a horizontal line that tapers off to the right.

Name : Richard McMahon
Position held : Certification Engineer
Date : 11.04.14



Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a SRT Marine Technology Ltd AtoN Express. 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 3.7 V DC 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

FCC and Industry Canada Testing of the
SRT Marine Technology Ltd AtoN Express
In accordance with FCC CFR 47 Part 80 and Industry Canada RSS-182



Product Service

2.1 BANDWIDTHS

2.1.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.205
Industry Canada RSS-182, Clause 7.3

2.1.2 Equipment Under Test and Modification State

AtoN Express S/N: #4 - Modification State 0

2.1.3 Date of Test

16 April 2014 & 22 April 2014

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 applied in accordance with the test method requirements of FCC CFR 47 Part 80.205, Part 2.1049 and KDB 971168.

The EUT was transmitting at maximum power, modulated by the standard AIS test signals using PRS, 01010101 and 00001111 packet payloads. The EUT was connected to a spectrum analyser via a cable and attenuator, the RBW of the spectrum analyser was set to at least 1% of the emission bandwidth and a video bandwidth of 3 times RBW, the occupied bandwidth measurement function of the analyser was used and the 99% bandwidth recorded.

The plots on the following pages show the resultant display from the Spectrum Analyser.

2.1.6 Environmental Conditions

Ambient Temperature	23.8°C
Relative Humidity	30.4%



Product Service

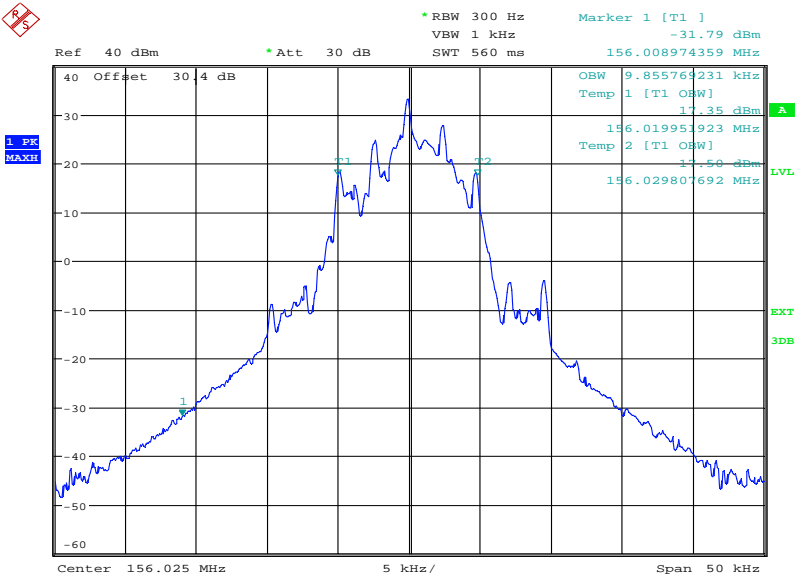
2.1.7 Test Results

AIS

Frequency	Test Signal	Authorised Bandwidth (kHz)	Result (kHz)
156.025 MHz	01010101	16	9.855
	00001111	16	9.375
	PRS	16	9.535
162.025 MHz	01010101	16	9.535
	00001111	16	9.535
	PRS	16	9.535

156.025 MHz

01010101

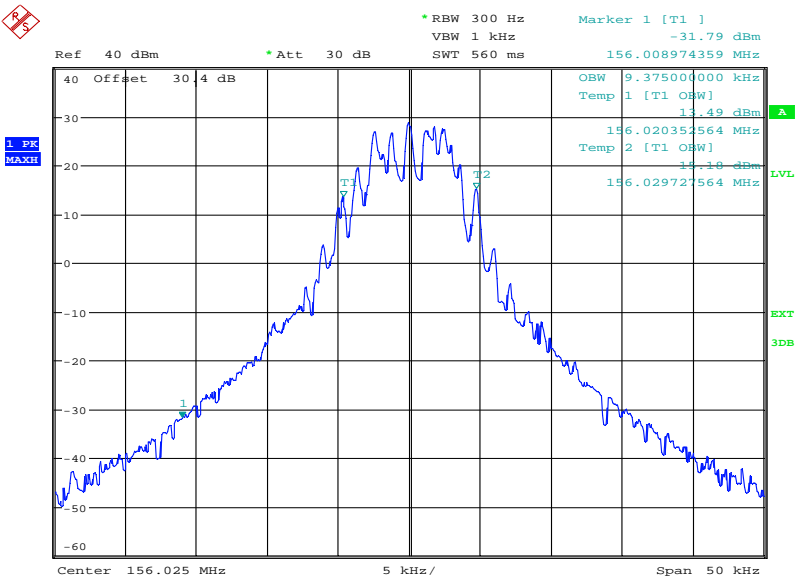


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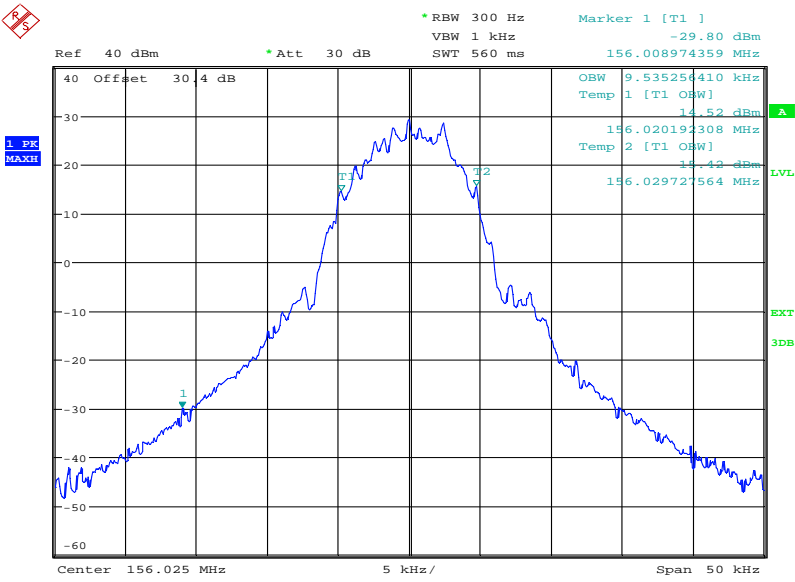
Product Service

00001111



Date: 16.APR.2014 15:01:05

PRS



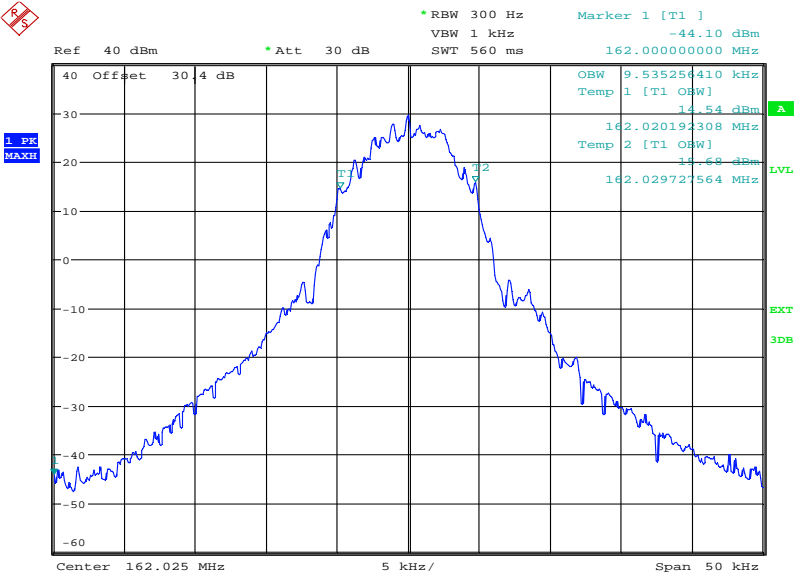
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Product Service

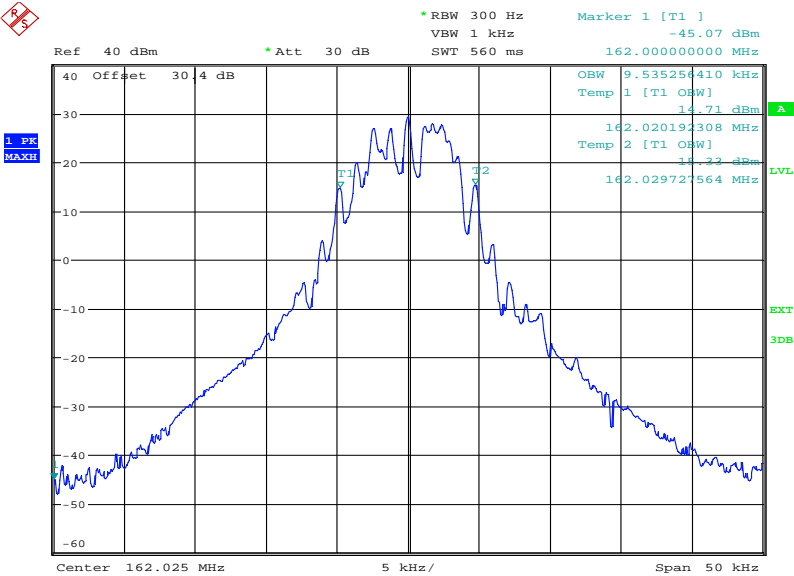
162.025 MHz

01010101



Date: 16.APR.2014 15:37:27

00001111

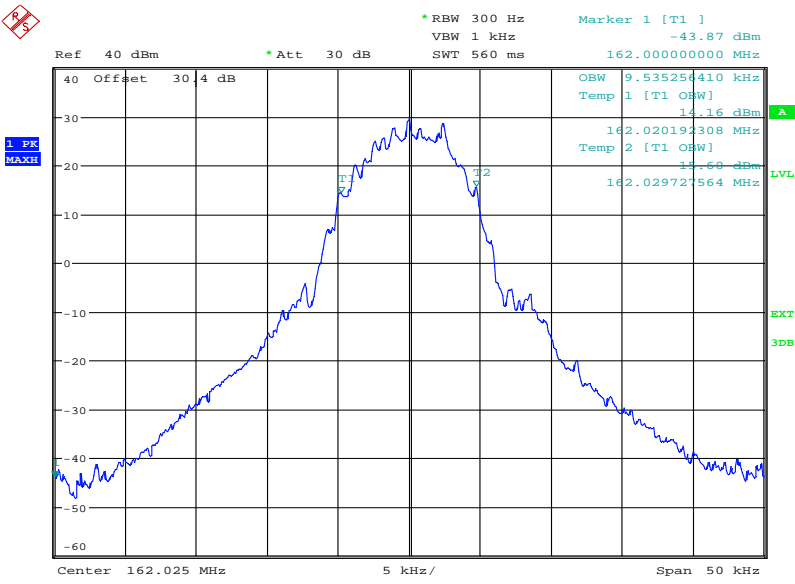


Date: 16.APR.2014 15:50:00



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PRS



Date: 16.APR.2014 16:00:12

Limit Clause

For data modulation, an authorised bandwidth of 16 kHz is permitted.



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2.2 TRANSMITTER FREQUENCY TOLERANCES

2.2.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.209
Industry Canada RSS-182, Clause 5.1 and 7.4

2.2.2 Equipment Under Test and Modification State

AtoN Express S/N: #4 - Modification State 0

2.2.3 Date of Test

22 April 2014 & 25 April 2014

2.2.4 Test Equipment Used

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

2.2.5 Test Procedure

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 80.209 (a) and FCC CFR 47 Part 2.1055 (a) (2), (d) (1).

The EUT was set to transmit on maximum power with an un-modulated carrier on bottom and top channels. The EUT was connected to the spectrum analyser via a cable and attenuator. The external frequency reference of the spectrum analyser was locked to a 10 MHz rubidium frequency reference. The FM DEMOD function of the spectrum analyser was used which records the carrier frequency error. In accordance with 2.1055, the temperature was varied from -20°C to +50° in 10° steps at both minimum and maximum voltage extremes.

2.2.6 Environmental Conditions

Ambient Temperature	22.8°C
Relative Humidity	39.7%



2.2.7 Test Results

156.025 MHz

Temperature	Frequency Error (ppm)	
	4.1 V DC	3.66 V DC
-20°C	2.25	2.20
-10°C	2.23	2.25
0°C	1.82	1.88
+10°C	1.00	1.01
+20°C	0.26	0.26
+30°C	1.07	1.07
+40°C	1.88	1.80
+50°C	2.28	2.26

162.025 MHz

Temperature	Frequency Error (ppm)	
	4.1 V DC	3.66 V DC
-20°C	2.20	2.24
-10°C	2.18	2.25
0°C	1.71	1.71
+10°C	0.99	1.07
+20°C	0.16	0.16
+30°C	0.92	0.77
+40°C	1.86	1.87
+50°C	2.22	2.16

Limit Clause

No limit is defined 80.209. Therefore limit from ITU 1371 is used.

±3ppm.



2.3 EMISSION LIMITATIONS

2.3.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.211
Industry Canada RSS-182, Clause 7.9

2.3.2 Equipment Under Test and Modification State

AtoN Express S/N: #4 - Modification State 1

2.3.3 Date of Test

2 May 2014 to 16 May 2014

2.3.4 Test Equipment Used

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

2.3.5 Test Procedure

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 80.211(f).

For emissions where the frequency is removed less than 250% of the authorized bandwidth measurements were performed using a conducted method as follows:

The EUT was connected to a spectrum analyser via a cable and attenuator. The EUT was transmitting at maximum power in turn on the bottom AIS channel. The EUT was modulated using the standard AIS test signal with PRS packet payload. The path loss between the EUT and analyser was calibrated using a network analyser and entered into the spectrum analyser as a reference level offset. The reference level for the mask was established using an RBW of 100 kHz and VBW of 300 kHz. The RBW and VBW were then reduced to 1 kHz and 3 kHz respectively and the mask as per FCC CFR 47 Part 80.211 (f) was applied. This was repeated on the top AIS channel.

For emissions where the frequency is removed more than 250% of the authorized bandwidth measurements were performed both conducted and radiated as follows:

Conducted: A network analyser was used to measure the path loss and the worst case was entered as a reference level offset into the spectrum analyser. The EUT was connected to a spectrum analyser via an attenuator and cable other than between 200 MHz and 300 MHz where a notch filter was used and tuned to the frequency of the fundamental and between 300 MHz and 2 GHz where a 300 MHz high pass filter was used. The EUT was configured to maximum power on the bottom AIS channel with normal modulation. The spectrum analyser was configured with an RBW of 100 kHz and a VBW of 300 kHz with the trace set to max hold using a peak detector. This was repeated on the top AIS channel.

Radiated; A preliminary profile of the Spurious Radiated Emissions was obtained up to the 10th harmonic by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.



Using the information from the preliminary profiling of the EUT, the list of emissions was then confirmed or updated under Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

The EUT was set to transmit on maximum power on the bottom AIS channel. This procedure was then repeated at maximum power on the top AIS channel.

For any emissions found the EUT was then removed from the chamber and replaced with a substitution antenna. Using a signal generator the level was adjusted to achieve the same value on the measuring instrument as previously recorded with the EUT. The final result was determined by a calculation using the signal generator level, antenna gain and cable loss.

The measurements were performed at a 3m distance unless otherwise stated.

2.3.6 Environmental Conditions

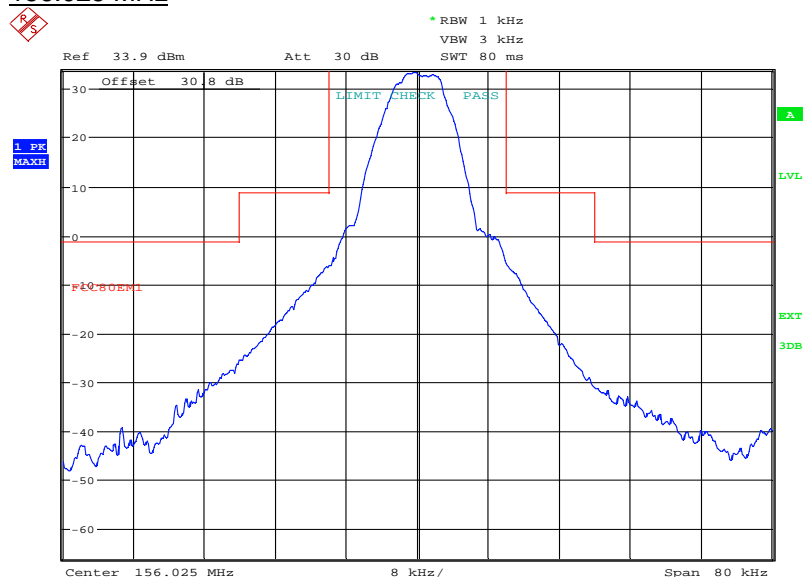
Ambient Temperature 19.5 - 24.6°C
Relative Humidity 40.0 - 45.0%

2.3.7 Test Results

3.7 V DC Supply

Conducted

156.025 MHz

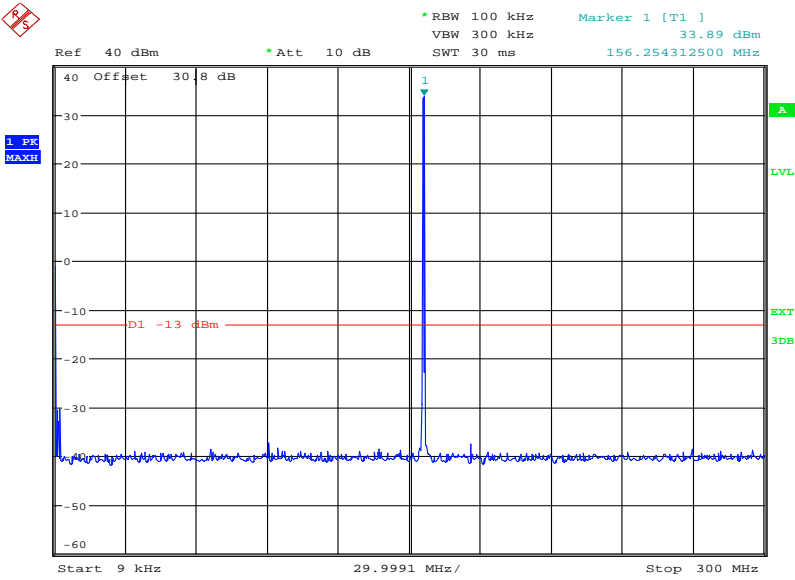


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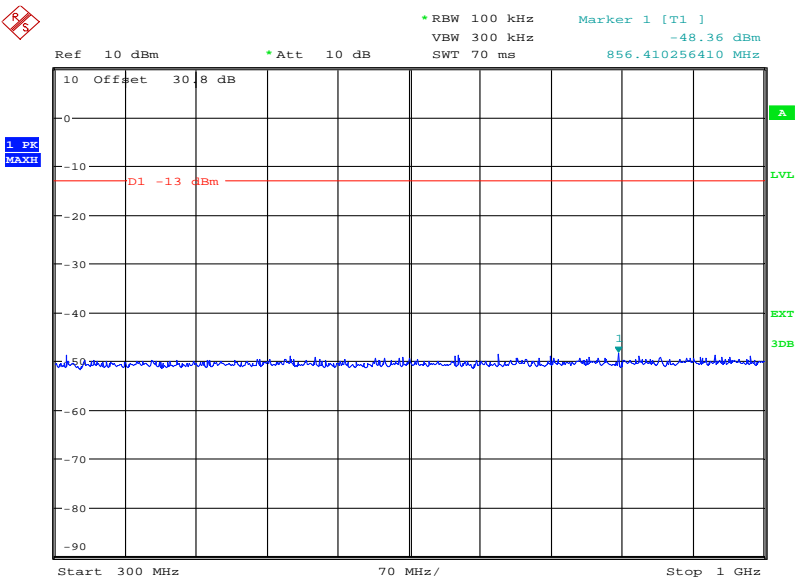
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9 kHz to 300 MHz



Date: 7.MAY.2014 16:20:47

300 MHz to 1 GHz

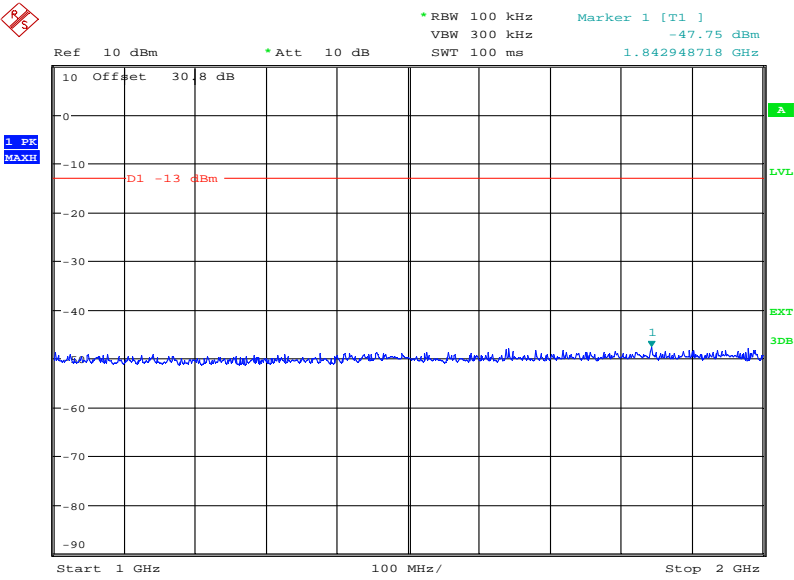


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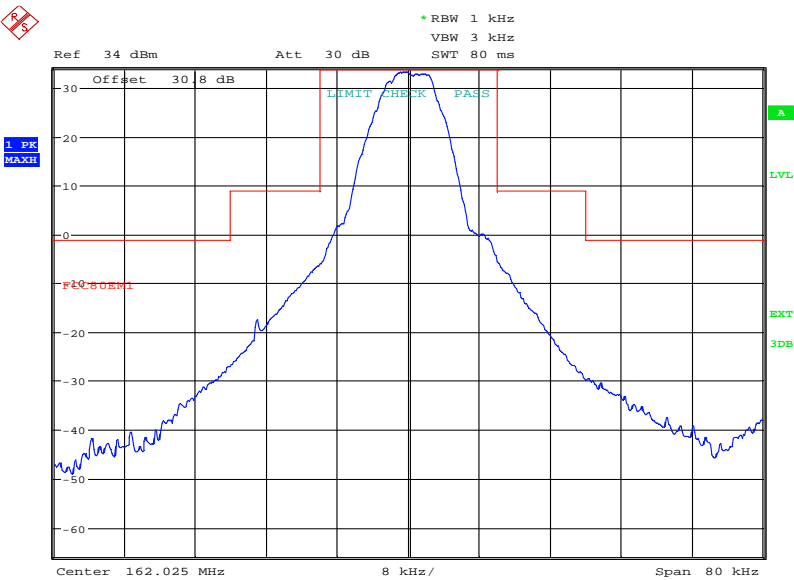
Product Service

1 GHz to 2 GHz



Date: 7.MAY.2014 16:18:40

162.025 MHz

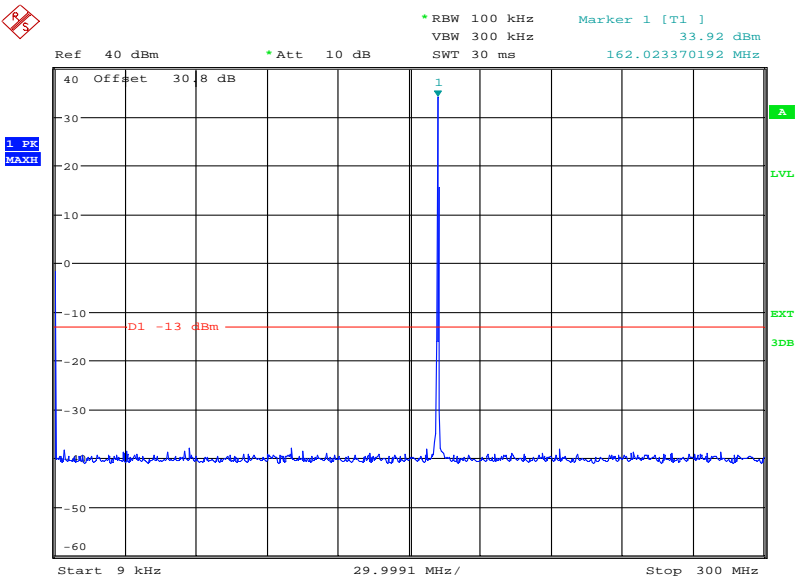


Date: 16.MAY.2014 10:21:40



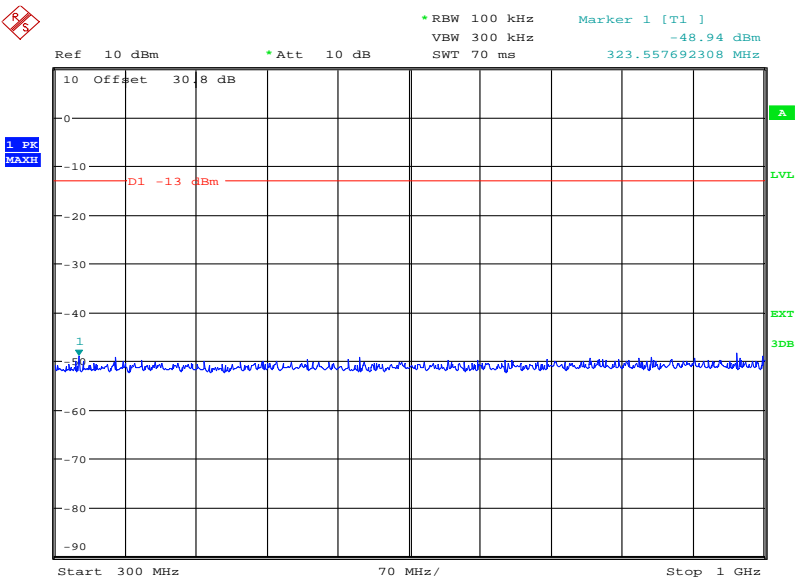
Product Service

9 kHz to 300 MHz



Date: 7.MAY.2014 15:45:37

300 MHz to 1 GHz

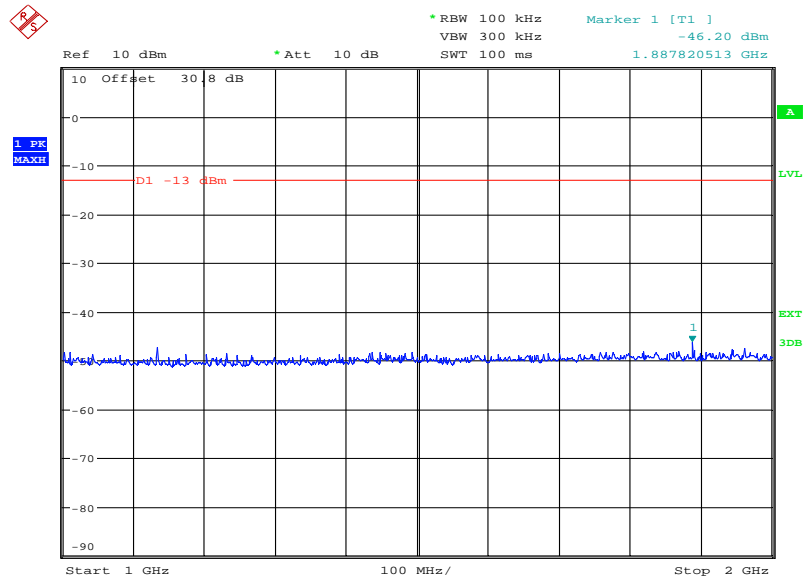


Date: 7.MAY.2014 16:08:30



Product Service

1 GHz to 2 GHz



Date: 7.MAY.2014 16:10:02

Limit Clause

Emission Mask

On any frequency removed from the assigned frequency by more than 50 % up to and including 100 % of the authorized bandwidth: At least 25 dB

On any frequency removed from the assigned frequency by more than 100 % up to and including 250 % of the authorized bandwidth: At least 35 dB

Outside the Emission Mask

>250 % of authorised bandwidth $43 + 10 \log P$ OR -13 dBm



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2.4 MODULATION REQUIREMENTS

2.4.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.213
Industry Canada RSS-182, Clause 7.3

2.4.2 Equipment Under Test and Modification State

AtoN Express S/N: #4 - Modification State 0

2.4.3 Date of Test

7 May 2014

2.4.4 Test Equipment Used

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

2.4.5 Test Procedure

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 80.213 (d).

The EUT was transmitting at maximum power, modulated by the standard AIS test signals using either PRS, 01010101 or 00001111 packet payloads. The EUT was connected to a spectrum analyser via a cable and attenuator, using the FM demodulation function of the spectrum analyser, the peak frequency deviation was observed and shown in the plots on the following pages.

2.4.6 Environmental Conditions

Ambient Temperature	23.7°C
Relative Humidity	33.3%



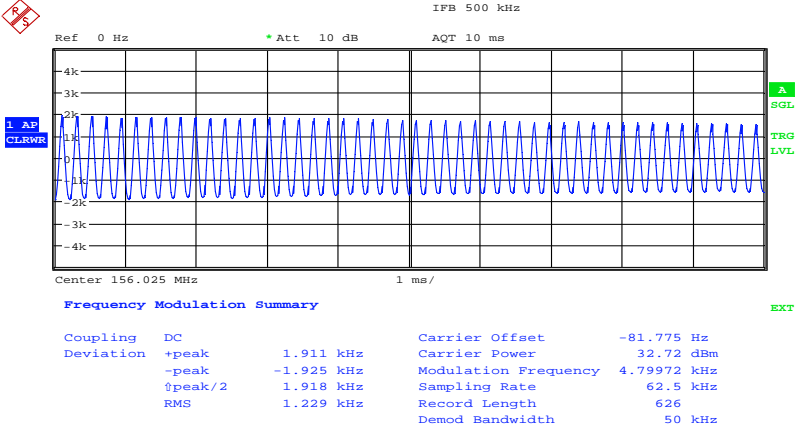
Product Service

2.4.7 Test Results

AIS

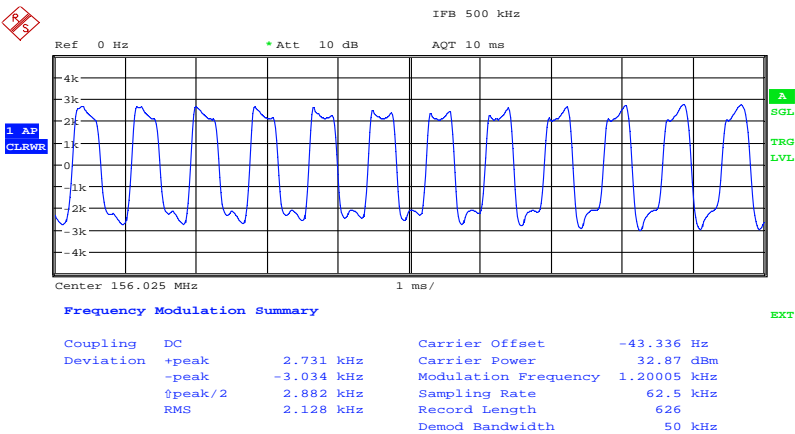
156.025 MHz

01010101



Date: 7.MAY.2014 11:00:51

00001111

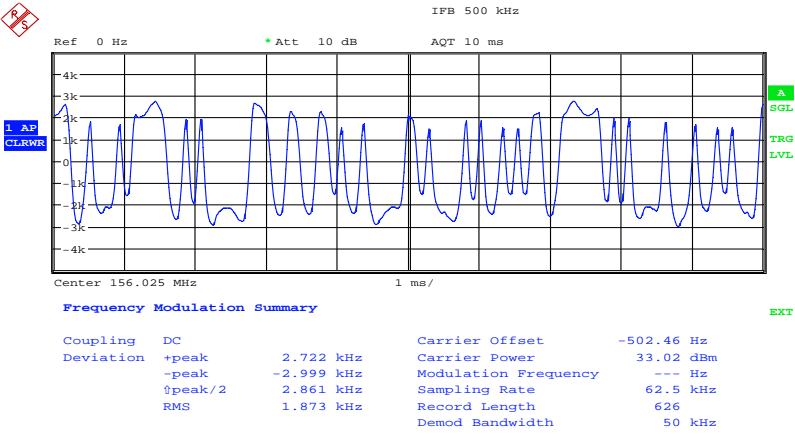


Date: 7.MAY.2014 11:01:22



Product Service

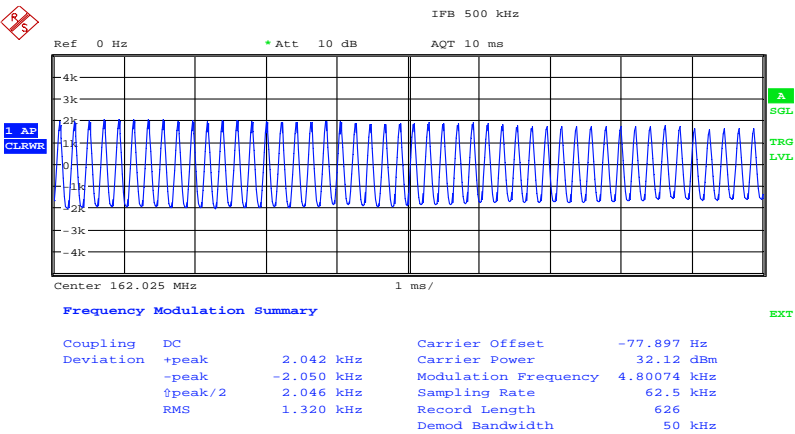
PRS



Date: 7.MAY.2014 11:02:02

162.025 MHz

01010101

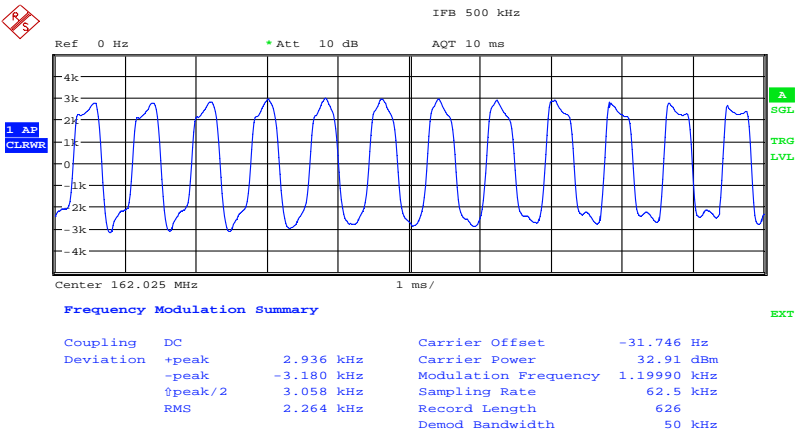


Date: 7.MAY.2014 11:00:08



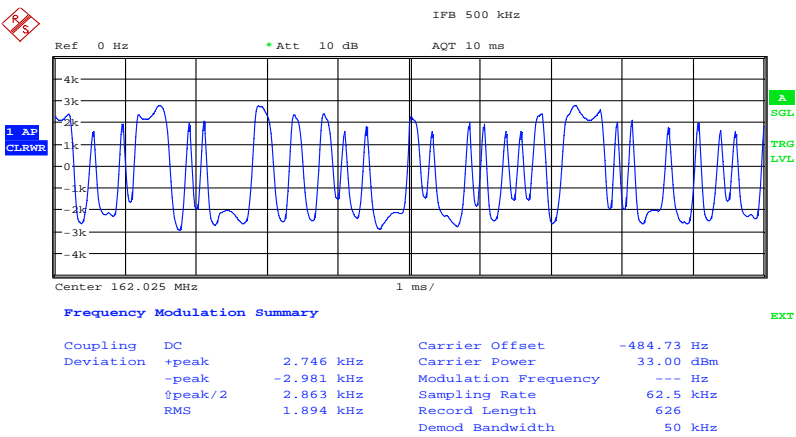
Product Service

00001111



Date: 7.MAY.2014 10:59:42

PRS



Date: 7.MAY.2014 10:58:04

Limit Clause

Ship and cost station transmitters operating in the 156-162 MHz and 216-220 MHz bands must be capable of proper operation with a frequency deviation that does not exceed ± 5 kHz.



Product Service

2.5 TRANSMITTER FREQUENCY DEVIATION

2.5.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.213 (a)(2)
Industry Canada RSS-182, Clause 7.3

2.5.2 Equipment Under Test and Modification State

AtoN Express S/N: #5 - Modification State 0

2.5.3 Date of Test

7 May 2014

2.5.4 Test Equipment Used

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

2.5.5 Test Procedure

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 80.213 (d).

The EUT was transmitting at maximum power, modulated by the standard AIS test signals using either PRS, 01010101 or 00001111 packet payloads. The EUT was connected to a spectrum analyser via a cable and attenuator, using the FM demodulation function of the spectrum analyser, the peak frequency deviation was observed and shown in the plots on the following pages.

2.5.6 Environmental Conditions

Ambient Temperature	23.7°C
Relative Humidity	33.3 - 33.7%

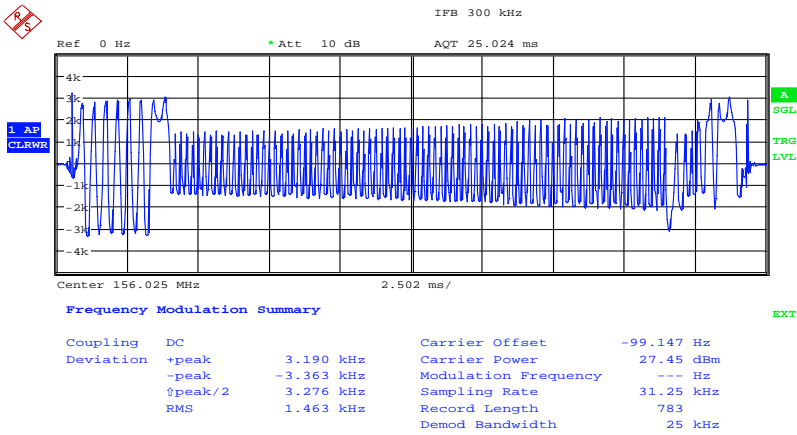


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2.5.7 Test Results

Confirm that the frequency deviation does not exceed 5 kHz	Yes
--	-----

AIS 1 – 01010101

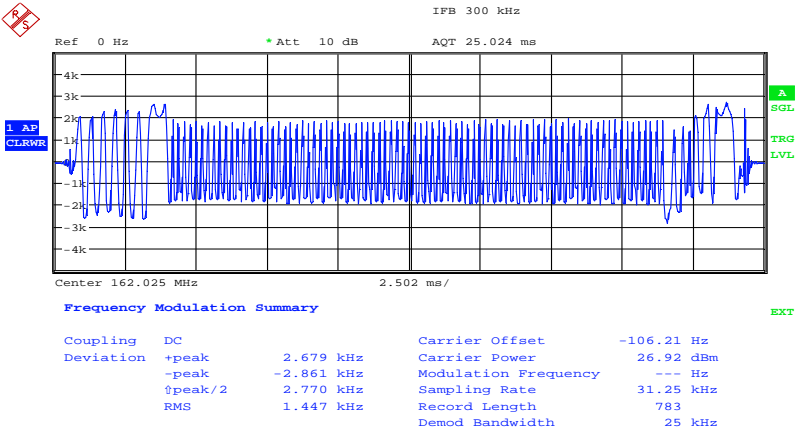


Date: 7.MAY.2014 09:42:13



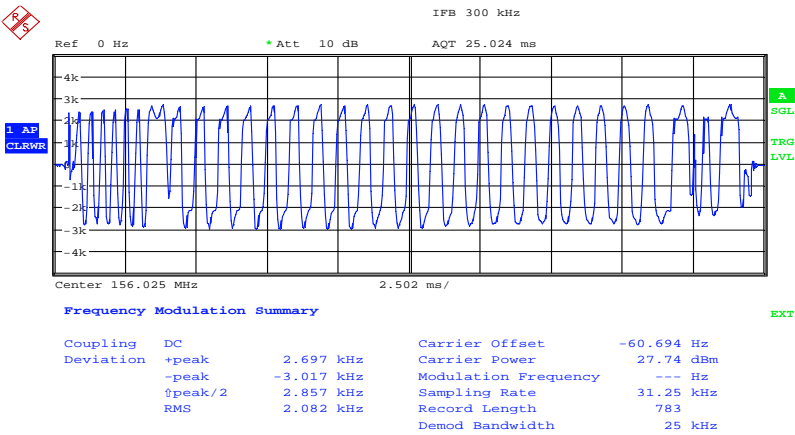
Product Service

AIS 2 – 01010101



Date: 7.MAY.2014 09:47:37

AIS 1 – 00001111

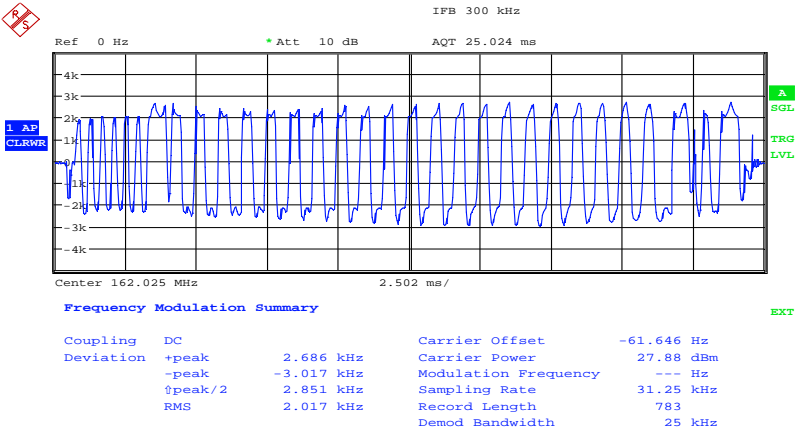


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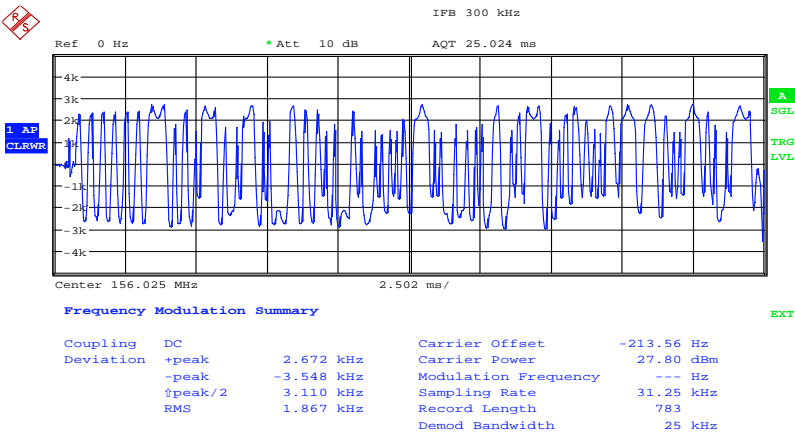
Product Service

AIS 2 – 00001111



Date: 7.MAY.2014 09:47:07

AIS 1 – PRS

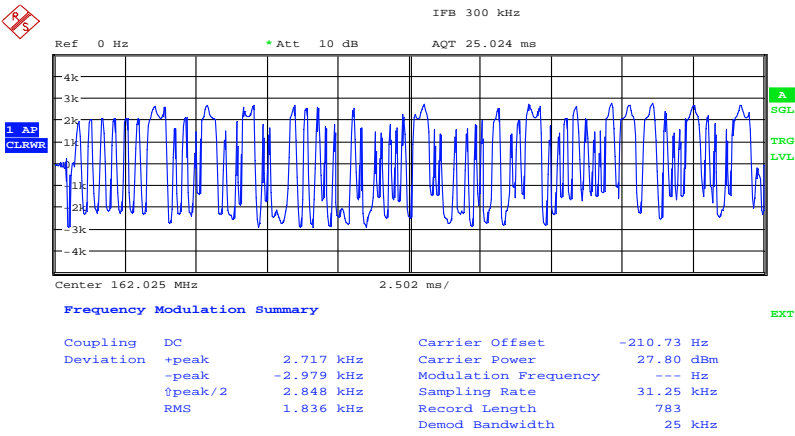


Date: 7.MAY.2014 09:45:06



Product Service

AIS 1 – PRS



Date: 7.MAY.2014 09:46:19

Limit Clause

Ship and coast station transmitters operating in the 156-162 MHz and 216-220 bands must be capable of proper operation with a frequency deviation that does not exceed ± 5 kHz.



Product Service

2.6 TRANSMITTER POWER

2.6.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.215,
Industry Canada RSS-182, Clause 5.2 and 7.5

2.6.2 Equipment Under Test and Modification State

AtoN Express S/N: #4 - Modification State 0

2.6.3 Date of Test

16 April 2014

2.6.4 Test Equipment Used

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

2.6.5 Test Procedure

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 80.215 (e) and KDB 971168.

The EUT was set to transmit on maximum power in turn on the bottom AIS channel. The EUT was modulated using the standard AIS test signal with PRS packet payload. The EUT was connected to a spectrum analyser via a cable and attenuator. The path loss was measured using a network analyser and entered as a reference level offset in the spectrum analyser including the manufacturers declared maximum antenna gain. The RBW of the spectrum analyser was set to 100 kHz and the video bandwidth to 300 kHz with the trace set to max hold using a peak detector and the result was recorded.

The EUT was then configured to transmit on maximum power on the bottom AIS channel. The EUT was set to transmit an un-modulated carrier. The EUT was connected to a spectrum analyser via a cable and attenuator. The path loss was measured using a network analyser and entered as a reference level offset in the spectrum analyser including the manufacturers declared maximum antenna gain. The RBW of the spectrum analyser was set to 100 kHz and the video bandwidth to 300 kHz with the trace set to max hold using a peak detector and the result was recorded.

This procedure was repeated on the top AIS channel.

2.6.6 Environmental Conditions

Ambient Temperature	23.8°C
Relative Humidity	30.4%



Product Service

2.6.7 Test Results156.025 MHz

Result (dBm)	Result (W)
33.26 (unmodulated)	2.118
33.86 (modulated PRS)	2.432

162.025 MHz

Result (dBm)	Result (W)
33.29 (unmodulated)	2.133
33.96 (modulated PRS)	2.488

Limit Clause<12.5 W and 2 W \pm 1.5 dB



Product Service

2.7 TRANSMITTER CARRIER POWER REDUCTION

2.7.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.215 (e)(g)(1)(2)(3)
Industry Canada RSS-182, Clause 7.5

2.7.2 Equipment Under Test

AtoN Express



Product Service

2.7.3 Test Results



Software
Radio Technology

Software Radio Technology PLC
Tel: +44 (0)1761 409 500
Fax: +44 (0)1410 093
Email: enquiries@softwarerad.com

12 May, 2014

TUV SUD BABT
Octagon House,
Concorde Way
Segensworth North
Fareham
Hampshire
PO15 5RL

To whom it may concern,

SRT-Marine Technology AtoN Express

Request for waiver against non applicable clauses Of CFR 47 and RSS-182.

CFR 47 80.217(b) Suppression of Interface Aboard Ships: this is not applicable as this is a class 1 AtoN and therefore does not have a receiver.

CFR 47 80.215 is not applicable as the device is not capable of reducing the output power. AIS is an automated system therefore this is an exception to the FCC requirement.

RSS-182 clause 7.5 allows an exception for DSC equipment, and the same exception applies to AIS.

Yours faithfully,

A handwritten signature in black ink, appearing to be 'Richard McMahon'.

Richard McMahon
Certification Engineer
richard.mcmahon@srt-marine.com
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Product Service

2.8 SUPPRESSION OF INTERFERENCE ABOARD SHIPS

2.8.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.217 (b)

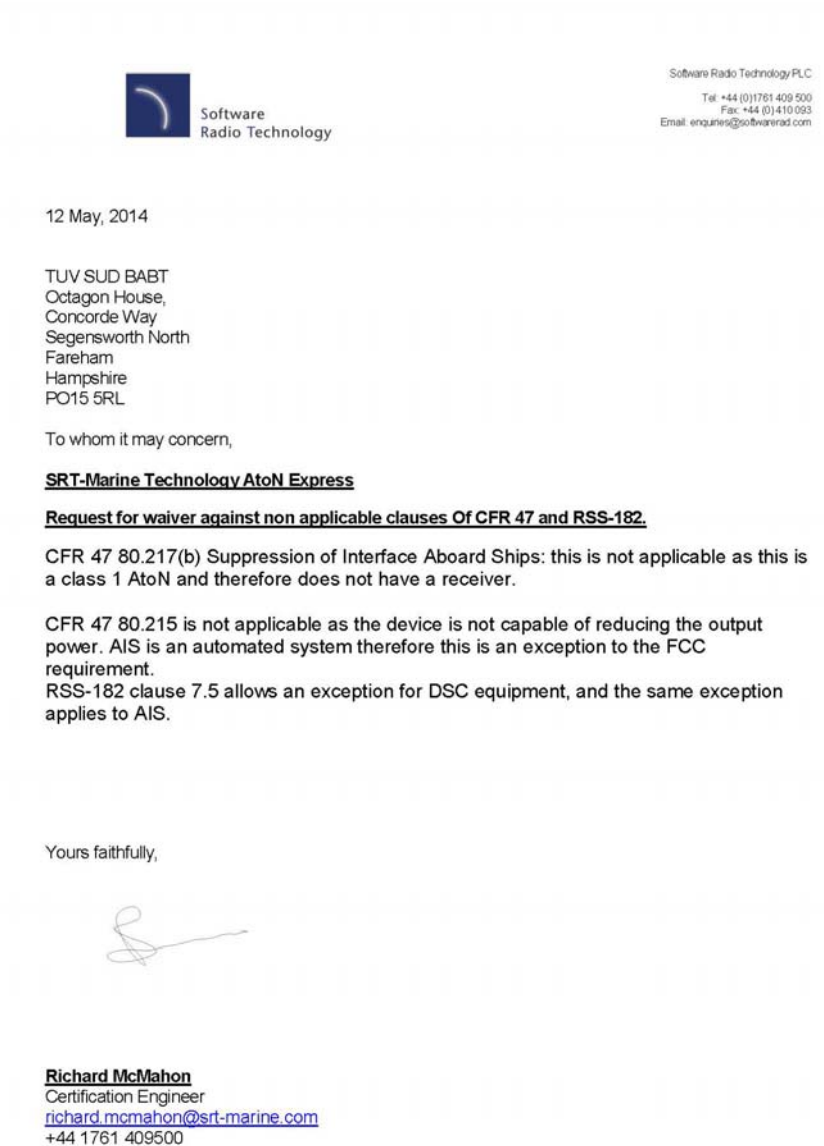
2.8.2 Equipment Under Test

AtoN Express



Product Service

2.8.3 Test Results





Product Service

SECTION 3

TEST EQUIPMENT USED



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 - Bandwidths					
Power Supply Unit	Hewlett Packard	6267B	21	-	TU
Digital Temperature Indicator + T/C	Fluke	51	412	12	12-Feb-2015
Temperature Chamber	Montford	2F3	467	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	22-Jul-2014
Multimeter	Iso-tech	IDM101	2419	12	9-Oct-2014
Hygrometer	Rotronic	I-1000	3220	12	16-Jul-2014
Attenuator (30dB, 150W)	Narda	769-30	3369	12	29-May-2014
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	4-Jul-2014
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	22-Jul-2014
Section 2.2- Transmitter Frequency Tolerances					
Digital Temperature Indicator + T/C	Fluke	51	412	12	12-Feb-2015
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	22-Jul-2014
Power Supply	Hewlett Packard	6104A	1948	-	TU
Multimeter	Fluke	79 Series II	3057	12	24-Sep-2014
Hygrometer	Rotronic	I-1000	3220	12	16-Jul-2014
Attenuator (30dB, 150W)	Narda	769-30	3369	12	29-May-2014
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	4-Jul-2014
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	13-Sep-2014
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	28-Feb-2015
1m N-Type Cable	Rhophase		4233	12	11-Mar-2015
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	18-Sep-2014
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	22-Jul-2014
Section 2.3 - Emission Limitations					
Power Supply Unit	Hewlett Packard	6267B	21	-	TU
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	02-May-2015
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	22-Jul-2014
Screened Room (5)	Rainford	Rainford	1545	24	10-Jan-2015
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
High Pass Filter	Mini-Circuits	NHP-300	1640	12	21-Aug-2014
Multimeter	Iso-tech	IDM101	2419	12	9-Oct-2014
Antenna (Bilog)	Chase	CBL6143	2904	24	10-Jun-2015
Hygrometer	Rotronic	I-1000	3220	12	16-Jul-2014
Compliance 5 Emissions	Schaffner	C5e Software V.5.00.00	3275	-	N/A - Software
Attenuator (30dB, 150W)	Narda	769-30	3369	12	29-May-2014
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	22-Oct-2014
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	4-Jul-2014
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	13-Sep-2014
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	18-Sep-2014
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	22-Jul-2014



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Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.4 - Modulation Requirements					
Signal Generator	Rohde & Schwarz	SMY 01	49	12	11-Sep-2014
Power Splitter	Weinschel	1506A	606	12	14-Jan-2015
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	22-Jul-2014
Multimeter	Iso-tech	IDM101	2419	12	9-Oct-2014
Power Supply	Farnell	LT30-2	2903	-	TU
Hygrometer	Rotronic	I-1000	3220	12	16-Jul-2014
Attenuator (30dB, 150W)	Narda	769-30	3369	12	29-May-2014
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	4-Jul-2014
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	22-Jul-2014
Section 2.5 - Transmitter Frequency Deviation					
Signal Generator	Rohde & Schwarz	SMY 01	49	12	11-Sep-2014
Power Splitter	Weinschel	1506A	606	12	14-Jan-2015
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	22-Jul-2014
Multimeter	Iso-tech	IDM101	2419	12	9-Oct-2014
Power Supply	Farnell	LT30-2	2903	-	TU
Hygrometer	Rotronic	I-1000	3220	12	16-Jul-2014
Power Divider	Weinschel	1506A	3345	12	23-May-2014
Attenuator (30dB, 150W)	Narda	769-30	3369	12	29-May-2014
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	22-Jul-2014
Section 2.6 - Transmitter Power					
Power Supply Unit	Hewlett Packard	6267B	21	-	TU
Digital Temperature Indicator + T/C	Fluke	51	412	12	12-Feb-2015
Temperature Chamber	Montford	2F3	467	-	O/P Mon
Multimeter	Iso-tech	IDM101	2419	12	9-Oct-2014
Hygrometer	Rotronic	I-1000	3220	12	16-Jul-2014
Attenuator (30dB, 150W)	Narda	769-30	3369	12	29-May-2014
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	4-Jul-2014
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	13-Sep-2014
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	18-Sep-2014

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	MU
Modulation Requirements	-
Transmitter Frequency Deviation	-
Bandwidths	± 58.05 Hz
Transmitter Power	± 0.70 dB
Transmitter Frequency Tolerances	± 11 Hz
Suppression of Interference Aboard Ships	-
Transmitter Carrier Power Reduction	-
Emission Limitations	Radiated: ± 3.08 dB Conducted: ± 3.454 dB



Product Service

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
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