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Report On

Radio Testing of the SRT Marine Technology AIS AtoN Express In accordance with IEC 62320-2, Section 8

COMMERCIAL-IN-CONFIDENCE

Document 75925174 Report 04 Issue 1

June 2014



Product Service

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DATED

05 June 2014



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SECTION 1

REPORT SUMMARY

Radio Testing of the SRT Marine Technology AIS AtoN Express In accordance with IEC 62320-2 Section 8



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Radio Testing of the SRT Marine Technology AIS AtoN Express to the requirements of IEC 62320-2, Section 8

Objective	To perform Radio 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)	S04905141484
Number of Samples Tested	1
Test Specification/Issue/Date	IEC 62320-2 (2008)
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	14 April 2014
Finish of Test	16 May 2014
Name of Engineer(s)	N Forsyth



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with IEC 62320 is shown below.

Section	Spec Clause	Test Description Re		Comments
2.1	8.1	Tests for configuration method	Pass	
2.2	8.2	Tests for synchronisation accuracy	Pass	
2.3	8.3	Tests for EPFS	Pass	
2.4	8.4	Additional messages	N/A	Not applicable for a type 1 AtoN.
-	8.5	Additional functionality	Pass	
-	8.6	Test for BIIT	N/A	The EUT does not implement a BIIT, the manufacturer has declared that as the EUT has no receiver and the antenna is integral to the product, it is not possible to disconnect the antenna.
-	8.7	Transmitter shutdown procedure	Pass	Annex A shows the hardware transmitter time out circuitry which prevents the transmitter from transmitting continuously for more than approximately 500ms.
2.5	8.8	Tests for power supply	Pass	Subject to user manual inclusion of power consumption data as per section 2.5 and 2.6.
-	8.9	Environmental tests	N/T	
2.6	8.10	Other tests	Pass	Subject to user manual inclusion of power consumption data as per section 2.5 and 2.6.

N/A = Not Applicable N/T = Not Tested



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 INFORM	MATION ation/Part number 418,0013				
Hardware Version Hardware Version Manufacturer FCC ID Technical description (a brief description of the intended use and a Type 1 AtoN for use on land or buoy	e Version 090200.01.00.04. / of Origin Hungary. / Canada ID 7075-4180013 operation)				
Supply Voltage [] AC mains State AC voltage V [] DC (external) State DC voltage V [] x] DC (internal) State DC voltage 3.7 V	and AC frequency Hz and DC current A and Battery type Li-on				
Frequency characteristics: Transmitter Frequency range 156.025 MHz to 162.025MHz	Channel spacing 25kHz. (if channelized)				
Receiver Frequency rangeN/A MHz to MHz (if different)	Channel spacing (if channelized)				
Designated test trequencies: Bottom:	MHz Top: MHz				
Power characteristics: Maximum transmitter power	Minimum transmitter power				
Continuous transmission X Intermittent transmission If intermittent, can transmitter be set to continue	State duty cycle<1% ous transmit test mode? Y/N				
Antenna characteristics:					
Antenna connector Temporary antenna connector	State impedance ohm State impedance				
[X] Integral antenna Type [] External Antenna Type	State gain 1 dBi State gain dBi				
Modulation characteristics: [] Other [] Amplitude [] Other [X] Frequency Details: GMSK-TDMA. [] Phase (GMSK, QSPK etc)					
Can the transmitter operate un-modulated? ITU Class of emission: 25K0Q1DDT	Y/N				
Battery/Power SupplyModel name/numberLIC/18650-22LManufacturerVARTACountry	ation/Part number 160-0001 / of Origin China				
Ancillaries (if applicable) Model name/number N/A Manufacturer Country of Origin					
Extreme conditions: Maximum temperature+55 °C Minimum temperature20 °C Maximum supply voltage4.1 V Minimum supply voltage3.66 V					



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 : Date :

Richard McMahon Position held : Certification Engineer 11.04.14



1.4 **PRODUCT INFORMATION**

1.4.1 Technical Description

The Equipment Under Test (EUT) was a SRT Marine Technology AIS AtoN Express as shown in the photograph below. A full technical description can be found in the manufacturer's documentation.



Equipment Under Test



1.5 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.6 MODIFICATION RECORD

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted	
Serial Number: T	SR0004 (AtoN Express #5)			
0	As supplied by manufacturer.	N/A	N/A	
1	Updated software from 090200.01.00.04 to 090200.01.00.05, to fix a problem with off position behaviour, as per clause 8.3.3 of the specification.	N Forsyth	12/05/2014	

The table above details modifications made to the EUT during the test programme. The modifications incorporated during each test are recorded on the appropriate test pages.



SECTION 2

TEST DETAILS

Radio Testing of the SRT Marine Technology AIS AtoN Express In accordance with IEC 62320-2, Section 8



2.1 TESTS FOR CONFIGURATION METHOD

2.1.1 Specification Reference

IEC 62320-2, Clause 8.1

2.1.2 Equipment Under Test

AIS AtoN Express, S/N: S04906140773

2.1.3 Date of Test and Modification State

14 and 15 April 2014 - Modification State 0

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 Environmental Conditions

Ambient Temperature21.6°CRelative Humidity53.1%

2.1.6 Test Results

8.1.1 Configure test Message 21

The EUT was initially sent a query for ACE, ACF and AID sentence, the sentences receive were as follows:

\$AIACE,991234567,00,0200,1,0,0,TEST FLOATING AIS ATON STATION4,0050050505,R*15 \$AIACF,991234567,1,5052.3333,N,00114.6667,W,0,0,0,2087,2088,0,20,0,R*20 \$AIAID,991234567,,991234567,R,R*68

The power was removed for 5 minutes and re-applied, then EUT was sent a query for ACE, ACF and AID sentence, the sentences receive were as follows:

\$AIACE,991234567,00,0200,1,0,0,TEST FLOATING AIS ATON STATION4,0050050505,R*15 \$AIACF,991234567,1,5052.3333,N,00114.6667,W,0,0,0,2087,2088,0,20,0,R*20 \$AIAID,991234567,,991234567,R,R*68



Parameter	Initial Value	Value after Power Cycle	Verdict
MMSI	991234567	991234567	✓
Type of AtoN	20 – Cardinal Mark North	20	✓
Name of AtoN	TEST FLOATING AIS ATON STATION4	TEST FLOATING AIS ATON STATION4	✓
Position accuracy	to accuracy of EPFS	1	✓
Assigned position	50°52.333N 1°14.6667W	50°52.333N 1°14.6667W	✓
Dimension/Reference for position	A=B=C=D=5	A=B=C=D=5	✓
Type of EPFS	1 - GPS	1 - GPS	✓
Off position threshold	200 m	200 m	✓
Set power level	0	0	✓
Channel 1	2087	2087	✓
Channel 2	2088	2088	✓
Virtual AtoN Flag	0	0	✓
AtoN Status	0	0	✓
Off position behaviour	0	0	✓
UTC lost behaviour	0	0	✓

8.1.2 Schedule mode A FATDMA Message 21 (single report, alternating channel operation)

Requirement	Result	Verdict
EUT transmits Test Message 21 in the configured slots on both channels.	See results below.	\checkmark
EUT starts transmission within one reporting interval and should not wait until UTC minute 1	Yes.	✓
Reporting behaviour is consistent through the hour and day boundaries	See results below.	\checkmark
Transmitted data is correct	Data is correct.	\checkmark



Time	Slot	Channel	Message
08:52:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3u>KAop50```Vf23k`4m0E2Ckd@0,4*18
08:55:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*18
08:58:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
09:01:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*18
09:04:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3u>KAop50```Vf23k`4m0E2Ckd@0,4*18
09:07:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
09:10:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
09:13:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*18
09:16:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
09:19:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*18
09:22:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
09:25:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*18
09:28:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
09:31:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*18
09:34:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
09:37:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAop50```Vf23k`4m0E2Ckd@0,4*19
09:40:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAop50```Vf23k`4m0E2Ckd@0,4*1A
09:43:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*18
09:46:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
09:49:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*18
09:52:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
09:55:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*18
09:58:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
10:01:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3u>KAop50```Vf23k`4m0E2Ckd@0,4*1B
10:04:13	512	A	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAop50```Vf23k`4m0E2Ckd@0,4*1A
10:07:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAop50```Vf23k`4m0E2Ckd@0,4*19
10:10:13	512	A	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
10:13:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAop50```Vf23k`4m0E2Ckd@0,4*19
10:16:13	512	A	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAop50```Vf23k`4m0E2Ckd@0,4*1A

Time	Slot	Channel	Message
23:55:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*46
23:58:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*45
00:01:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
00:04:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*45
00:07:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47



8.1.3 Schedule mode B FATDMA Message 21 (dual report, dual channel operation)

Requirement	Result	Verdict
EUT transmits Test Message 21 in the configured slots on both channels.	See results below.	\checkmark
EUT starts transmission within one reporting interval and should not wait until UTC minute 1	Yes.	~
Reporting behaviour is consistent through the hour and day boundaries	See results below.	✓
Transmitted data is correct	Data is correct.	\checkmark

Time	Slot	Channel	Message
00:35:16	612	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0b?oi3v>KAop50````>03k`4m0E2Ckd@0,4*04
00:38:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
00:41:16	612	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50````>23k`4m0E2Ckd@0,4*76
00:44:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
00:47:16	612	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0b?oi3v>KAop50````>03k`4m0E2Ckd@0,4*04
00:50:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
00:53:16	612	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0b?oi3v>KAop50````>03k`4m0E2Ckd@0,4*04
00:56:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*45
00:59:16	612	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0b?oi3v>KAop50````>03k`4m0E2Ckd@0,4*04
01:02:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*45
01:05:16	612	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0b?oi3v>KAp050````>03k`4m0E2Ckd@0,4*5B
01:08:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*44
01:11:16	612	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0b?oi3v>KAop50````>03k`4m0E2Ckd@0,4*04
01:14:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*44
01:17:16	612	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0b?oi3v>KAp050````>03k`4m0E2Ckd@0,4*5B
01:20:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*44
01:23:16	612	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0b?oi3w>KAp050````>03k`4m0E2Ckd@0,4*5A
01:26:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
01:29:16	612	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0b?oi3v>KAop50````>03k`4m0E2Ckd@0,4*04
01:32:13	512	A	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi40>KAop50```Vf23k`4m0E2Ckd@0,4*5A
01:35:16	612	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0b?oi3w>KAop50````>03k`4m0E2Ckd@0,4*05
01:38:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*44

Time	Slot	Channel	Message
23:56:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*44
23:59:16	612	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0b?oi3v>KAp050````>03k`4m0E2Ckd@0,4*5B
00:02:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*1B
00:05:16	612	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0b?oi3w>KAp050````>03k`4m0E2Ckd@0,4*5A
00:08:13	512	А	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*45



8.1.4 Schedule mode C FATDMA Message 21 (Single report, single channel operation)

Requirement	Result	Verdict
EUT transmits Test Message 21 in the configured slots on one channel.	See results below.	\checkmark
EUT starts transmission within one reporting interval and should not wait until UTC minute 1	Yes.	√
Reporting behaviour is consistent through the hour and day boundaries	See results below.	✓
Transmitted data is correct	Data is correct.	\checkmark

Time	Slot	Channel	Message
22:52:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*46
22:55:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
22:58:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAoh50```Vf23k`4m0E2Ckd@0,4*00
23:01:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*46
23:04:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAoh50```Vf23k`4m0E2Ckd@0,4*00
23:07:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
23:10:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
23:13:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
23:16:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*18
23:19:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
23:22:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*46
23:25:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*46
23:28:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
23:31:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*18
23:34:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
23:37:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
23:40:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*46
23:43:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*18
23:46:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
23:49:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
23:52:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
23:55:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAop50```Vf23k`4m0E2Ckd@0,4*18
23:58:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*46
00:01:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*46
00:04:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47
00:07:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAoh50```Vf23k`4m0E2Ckd@0,4*00
00:10:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*46
00:13:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3w>KAp050```Vf23k`4m0E2Ckd@0,4*46
00:16:13	512	В	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*47



2.2 TESTS FOR SYNCHRONISATION ACCURACY

2.2.1 Specification Reference

IEC 62320-2, Clause 8.2

2.2.2 Equipment Under Test

AIS AtoN Express, S/N: S04906140773

2.2.3 Date of Test and Modification State

16 April 2014 - Modification State 0

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 Environmental Conditions

Ambient Temperature	22.2°C
Relative Humidity	42.3%

2.2.6 Test Results

The EUT will only transmit when it has a valid GPS position. Therefore it is not possible to evaluate the perfomance in UTC indirect or semaphore synchronisation modes.







2.3 TESTS FOR EPFS

2.3.1 Specification Reference

IEC 62320-2, Clause 8.3

2.3.2 Equipment Under Test

AIS AtoN Express, S/N: S04906140773

2.3.3 Date of Test and Modification State

17 April and 16 May 2014 - Modification State 0 & 1

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 Environmental Conditions

Ambient Temperature	23.1°C
Relative Humidity	33.4%

2.3.6 Test Results

8.3.1 Position Source (Modification State 0)

Part a)		
Received Message: !AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0	bOoi3v>KAp050```Vf23k`4m0E2Ckd@0,4*	*47
Requirement	Result	Verdict
The position field is valid, with a simulated position of 50°25.4016N	Decoded position: 50°25.4016N	1
3°35.8338.	3°35.8338.	•
The time stamp field is valid.	13, slot 512 occurs during second 13.	\checkmark

Part b)		
Received Message: !AIVDM,1,1,,A,E>iD:1lb2ab@367Pb4W3h0Tah	0b02lbq>SIL850``cvP03k`4m0E2CkP,0*00	
Requirement	Result	Verdict
Type of electronic position fixing device = Surveyed	7 - Surveyed.	✓
RAIM flag = 0	0	\checkmark

8.3.2 Invalid position

The EUT will not transmit without a valid GPS position. When GPS is lost, the last known position will be transmitted, after this, transmission ceases.



8.3.3 Off-position monitor (Modification State 1)

Step	Method	Requirement	Result	Verdict
a)	EPFS Antenna at assigned position.	Off position indicator = 0	0	✓
b)	EDES Antonno moved to off position	Off position indicator = 1	1	✓
D)	EFFS Antenna moved to on position.	Reporting schedule unchanged	3 minutes	\checkmark
c)	EPFS Antenna moved to on position.	Off position indicator = 0	0	✓
d)	EUT reporting rate set to new interval.	Off position indicator = 1	EUT does not implement	
u)	EPFS Antenna moved to off position.	Reporting schedule changed	a configurable off	N1/A
	EDEC Antenna moved to an excition	Off position indicator = 0	position reporting	IN/A
e)	EFFS Antenna moved to on position.	Reporting schedule reverts	interval	

Results					
Time	Slot	Message	Latitude	Longitude	Off Position
23:32:49	512	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EN>oR7`50```Vf23k`4m0E2Cke@0,4*63	51 57.9837 N	1 14.0002 W	0
23:35:49	512	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EO>oR7`50```Vf23k`4m0E2Cke@0,4*61	51 57.9837 N	1 14.0001 W	0
23:38:49	512	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EN>oR7h50```Vf23k`4m0E2Cke@0,4*6B	51 57.9838 N	1 14.0002 W	0
23:41:49	512	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EL>oR7P50```Vf23k`4m0E2Cke@0,4*52	51 57.9836 N	1 14.0004 W	0
23:44:49	512	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EN>oR7P50```Vf23k`4m0E2Cke@0,4*53	51 57.9836 N	1 14.0002 W	0
23:47:49	512	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EN>oR7`50```Vf23k`4m0E2Cke@0,4*60	51 57.9837 N	1 14.0002 W	0
23:50:49	512	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EO>oR7H50```Vf23k`4m0E2Cke@0,4*4A	51 57.9835 N	1 14.0001 W	0
23:53:45	512	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EM?L9o@50```Vf23k`4m0E2Cke@0,4*52	53 57.9834 N	1 14.0003 W	0
23:56:45	512	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EN?L9o`50```Vf23k`4m0E2Cke@0,4*72	53 57.9837 N	1 14.0002 W	0
23:59:45	512	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EN?L9o`50```Vv23k`4m0E2Cke@0,4*61	53 57.9837 N	1 14.0002 W	1
00:02:45	512	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EN?L9oH50```Vv23k`4m0E2Cke@0,4*4A	53 57.9835 N	1 14.0002 W	1
00:05:45	512	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EO?L9oP50```Vv23k`4m0E2Cke@0,4*50	53 57.9836 N	1 14.0001 W	1
00:08:45	512	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EM?L9oH50```Vv23k`4m0E2Cke@0,4*49	53 57.9835 N	1 14.0003 W	1
00:11:45	512	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EO?L9oP50```Vv23k`4m0E2Cke@0,4*50	53 57.9836 N	1 14.0001 W	1
00:14:45	512	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EN>oR7`50```Vv23k`4m0E2Cke@0,4*73	51 57.9837 N	1 14.0002 W	1
00:17:45	512	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EN>oR7P50```Vf23k`4m0E2Cke@0,4*50	51 57.9836 N	1 14.0002 W	0
00:20:45	512	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EM>oR7`50```Vf23k`4m0E2Cke@0,4*60	51 57.9837 N	1 14.0003 W	0
00:23:45	512	!AIVDM,1,1,,B,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EN>oR7`50```Vf23k`4m0E2Cke@0,4*60	51 57.9837 N	1 14.0002 W	0
00:26:45	512	!AIVDM,1,1,,A,E>iD:1r:2ab@367Pb4W3h0Tah0bOu;EO>oR7H50```Vf23k`4m0E2Cke@0,4*4A	51 57.9835 N	1 14.0001 W	0



2.4 ADDITIONAL FUNCTIONALITY

2.4.1 Specification Reference

IEC 62320-2, Clause 8.5

2.4.2 Equipment Under Test

AIS AtoN Express, S/N: S04906140773

2.4.3 Date of Test and Modification State

16 May 2014 - Modification State 1

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 Environmental Conditions

Ambient Temperature22.8°CRelative Humidity35.5%

2.4.6 Test Results

8.5.1 Test for configuration of the receiver turn-on times (Types 2 and 3)

Not applicable for a type 1 AtoN.

8.5.2 Test for configure proprietary AtoN control

The EUT does not support the configuration of proprietary AtoN control data.

8.5.3 Test for configuration of payload re-broadcast

The EUT does not support payload re-broadcast.

8.5.4 Test for forced broadcast

The EUT does not support the forced broadcast of a message.



8.5.5 Test for version information

Message sent to EUT: \$AIAIQ,VER*3C			
Received Message: \$AIVER,1,1,,AN,SMT,991234567,S04905141484,1,090200.01.00.04,3*79			
Data Field	Result	Verdict	
Total number of sentences needed	1	✓	
Sentence number	1	✓	
Sequential message identifier	Null	✓	
Device type	AN	✓	
Vendor ID	SMT	✓	
Unique identifier	991234567	✓	
Manufacturer serial number	S04905141484	✓	
Model code	1	✓	
Software revision	090200.01.00.05	✓	
Hardware revision	3	✓	

8.5.6 Test for AFC – AtoN function ID capability

The EUT does not support the ability to provide a list of supported functionality.

8.5.6.4 Test for assigning an encryption key for VDL configuration

The EUT does not support encryption keys.

8.5.7 Test for VDL configuration using chaining (Types 2 and 3)

Not applicable for a type 1 AtoN.



2.5 TESTS FOR POWER SUPPLY

2.5.1 Specification Reference

IEC 62320-2, Clause 8.8

2.5.2 Equipment Under Test

AIS AtoN Express, S/N: S04906140773

2.5.3 Date of Test and Modification State

06 May 2014 - Modification State 0

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 Environmental Conditions

Ambient Temperature20.6°CRelative Humidity24.7%

2.5.6 Test Results

The EUT was connected to a 12 V DC supply via a power box which is supplied with the EUT by the manufacturer. The EUT was fully charged before the test commenced.

The average current was measured as being 31 mA over a 30 minute period. The manufacturer has declared that power consumption will be stated in the user manual as being 1.2 Ah/day. This information was not present in the supplied draft user manual at the time of test. The measured value equates to 0.744 Ah/day, which is less than the manufacturer declared value.

Limit Clause 8.8.1.3

The average power consumption of the EUT does not exceed 110 % of the value stated in the manufacturer's documentation



2.6 OTHER TESTS

2.6.1 Specification Reference

IEC 62320-2, Clause 8.10

2.6.2 Equipment Under Test

AIS AtoN Express, S/N: S04906140773

2.6.3 Test Results

8.10.1 Quality assurance

SRT Marine Technology operate an ISO9001 Quality system administered through BSI, certificate number: FS 548550 (see Annex A)

8.10.2 Additional features

The EUT does not support any additional features.



8.10.3 Manual

The manual was checked for information concerning the following items.

Information	Comments	Verdict
Factory default MMSI	Does not detail a default MMSI, but explains that an MMSI number is required in order for the AIS transceiver to operate.	~
External connectors	The manual does not mention a connector but it is implied by describing how to insert the EUT into a configuration dock.	~
Correct installation of the unit and antennae	Information detailed in section 3 of the user manual.	~
Configuration	Information detailed in section 4 of the user manual.	~
Power consumption	This information was available but not in the version of the manual submitted at the time of test. The manufacturer has declared this will be added to the final version.	~
Firmware upgrades	No information in manual, it will not be possible for a user to upgrade the firmware.	~
Configuration interface, including hardware and electrical details.	Information in section 4 on how to connect the EUT to a PC for configuration.	~

8.10.4 Marking and identification

Information	Comments	Verdict
Identification of the manufacturer	The manufacturer is clearly displayed.	✓
Model identification	The model name is clearly displayed.	✓
Serial number of the unit	The serial number was not displayed on the sample submitted for test. The manufacturer has declared this will be displayed on a "ratings label" on the final build.	~
Operating voltage	The operating voltage was not displayed on the sample submitted for test. The manufacturer has declared this will be displayed on a "ratings label" on the final build. (see Annex A)	~
The title and version of each software element included in the installed software system shall be either marked on the equipment or displayed on command.	Software version is displayed via the VER sentence. See section 2.5 of this test report.	~



SECTION 3

TEST EQUIPMENT USED

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3.1 TEST EQUIPMENT USED

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

Instrument Description	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1, 2.2 and 2.3 -	Tests for Synchronisation	Accuracy, Active Mo	de Tests ar	nd Test Mode	Tests
VDL Analyser/Generator	Attingimus	AIS Tester	4057	-	TU
Power Supply Unit	Iso-Tech	IP2302A	2437	-	TU
GPS Simulator	Spirent	STR4500	3056	-	TU
Hygrometer	Rotronic	I-1000	3068	12	10-Apr-2015
Humidity & Temperature Meter	Radio Spares	1361C	4420	12	01-May-2015

TU – Traceability Unscheduled



SECTION 4

PHOTOGRAPHS



4.1 PHOTOGRAPHS OF EQUIPMENT UNDER TEST (EUT)



View 1



View 2



SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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5.1 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).

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ANNEX A

CUSTOMER SUPPLIED INFORMATION



bsi. Certificate of Registration QUALITY MANAGEMENT SYSTEM - ISO 9001:2008 Software Radio Technology Plc This is to certify that: Wireless House Westfield Industrial Estate Midsomer Norton Bath **BA3 4BS** United Kingdom Holds Certificate Number: FS 548550 and operates a Quality Management System which complies with the requirements of ISO 9001:2008 for the following scope: Design and supply of digital wireless communication technology and product solutions. For and on behalf of BSI: Gary Fenton, Global Assurance Director Originally registered: 04/03/2010 Latest Issue: 25/02/2013 04/03/2016 Expiry Date: Page: 1 of 1 ...making excellence a habit." This certificate was issued electronically and remains the property of BSI and is bound by the conditions of contract. An electronic certificate can be authenticated <u>conline.</u> Printed copies can be validated at www.bsigroup.com/ClientDirectory

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SRT Marine Technology

03/06/14

P238 AtoN Express

Transmitter shutdown procedure IEC62320-2 Clause 8.7

SRT Marine Technology Ltd of Wireless house Westfield Industrial Estate Midsomer Norton England BA3 4BS, hereby declare that the AtoN Express being a Type 1 Aid to Navigation (AtoN) is in compliance with Clause 5.1.1.4, Transmitter shutdown requirements.

The AtoN Express hardware contains transmitter time out circuitry which prevents the transmitter from transmitting continuously for more than approximately 500ms and therefore functions as required.



FIT R35 TO DISABLE TIME-OUT CIRCUIT.

Richard McMahon-Certification Engineer SRT-Marine Technology