



Bundesrepublik Deutschland

Federal Republic of Germany

Bundesamt für Seeschifffahrt und Hydrographie

Federal Maritime and Hydrographic Agency

Conformance test report of an

AIS AtoN system

Equipment under test: **AIS AtoN**

Type: **easyAtoN**

Applying test standards: IEC 62320-2 Ed. 2.0 [Section 8]: 2016

Test Report No.: BSH/454.AIS-Aton/ Weatherdock
easyAtoN/001

Applicant: **Weatherdock AG**
Emmericher Str. 17
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Germany

Hamburg, 2020-03-17

For the Federal Maritime and Hydrographic Agency

This document was created electronically and is valid without signature.

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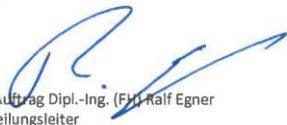
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Registrierungsnummer der Urkunde: **D-PL-12084-01-00**

Frankfurt am Main, 20.04.2017


Im Auftrag Dipl.-Ing. (FH) Ralf Egner
Abteilungsleiter

Siehe Hinweise auf der Rückseite

General

Applicant: Weatherdock AG , Emmericher Str. 17, D-90411
Nürnberg

Equipment under test:

Type: easyAtoN

Manufacturer: Weatherdock AG , Emmericher Str. 17, D-90411
Nürnberg

Place of test: BSH test laboratory Hamburg, Room 916

Start of test: 09 March, 2020

End of test: 11 March, 2020

Test standards¹:

IEC 62320-2 Ed. 2.0 : 2016

Maritime navigation and radiocommunication equipment and systems-
Automatic Identification System (AIS) -

Part 2: AIS AtoN Stations - Operational and performance requirements, methods of testing and required test results

IEC 61162-1 Ed. 5.0 : 2016

Maritime navigation and radiocommunication equipment and systems – Digital Interfaces –

Part 1: Single talker and multiple listeners /

IEC 61162-2 : 1998

Maritime navigation and radiocommunication equipment and systems – Digital Interfaces –

Part 2: Single talker and multiple listeners, high speed transmission

Other relevant standards:

Recommendation ITU-R M.1371-5 (2014)

Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile band

¹ Numbers listed in the titles of the test sections of this report refer to the respective sections of IEC 62320-2 if not stated otherwise.

Summary of Section 8 Functional Tests

Test No.	Reference	Section	Result (passed/ not passed / not applicable / not tested)
1	IEC 62320-2	8.1 Configuration method	Passed
2	IEC 62320-2	8.2 Synchronisation accuracy	Passed
3	IEC 62320-2	8.3 EPFS	Passed
4	IEC 62320-2	8.4 Receive addressed messages	Passed
5	IEC 62320-2	8.5 Interrogation response	Passed
6	IEC 62320-2	8.6 Repeat AIS SART Messages	Passed
7	IEC 62320-2	8.7 Additional functionality	Passed
8	IEC 62320-2	8.8 BIIT	Passed
9	IEC 62320-2	8.9 Transmitter shutdown procedure	Passed
7	IEC 62320-2	8.10 Power supply	Passed
8	IEC 62320-2	8.11 Environmental	Passed
7	IEC 62320-2	8.12 External removable media	Passed
8	IEC 62320-2	8.13 Other tests	Passed
10	IEC 62320-2	8.10 Power supply	Passed

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1 General

1.1 Equipment history

For each Transponder unit under test an numbered entry is provided here. For the two test environment it is recorded which EUT system is under test in that environment

1.1.1 EUT system

Transponder				
Type	easyAtoN		Part No.:	A20004
Delivery date	09.03.2020		Serial number	000000010
HW Version:	Delivery date	09.03.2020	Version no	2
	Installation date			
SW Version:	Delivery date	09.03.2020	Version no	2.0.0
	Installation date			
SW Version:	Delivery date		Version no	
	Installation date			
SW Version:	Delivery date		Version no	
	Installation date			
SW Version:	Delivery date		Version no	
	Installation date			
SW Version:	Delivery date		Version no	
	Installation date			

GPS antenna				
Type	GARMIN GA 30		Part No.:	
Delivery date	09.03.2020		Serial number	1TU006503
HW Version:	Delivery date	09.03.2020	Version no	---
	Installation date			

1.2 Test environment

Here it is intended to record:

- lab room conditions,
- equipment under test conditions and type,
- for which period of time which EUT system is under test.

This test environment is completely equipped as described in Annex A.

Location	
Lab room no.	BSH Room 916 (9 th floor)
Geographical location	9° 59,103 E 53° 32,822 N (WGS84)
Lab room air temperature	Within the specification of IEC 60945, Section 5.2.1
Lab room air pressure	980 – 1030 mBar
Lab room relative air humidity	Within the specification of IEC 60945, Section 5.2.1

Equipment under test	
Position in lab room	
<input type="checkbox"/> relevant	<input checked="" type="checkbox"/> not relevant
Mounting at test bed	
<input type="checkbox"/> relevant	<input checked="" type="checkbox"/> not relevant
Type of equipment	
1 Transponder	Prototyp
2 GPS Antenna	Production sample
	...
Refer to Annex A – Photos of Equipment under Test	
Remarks	

Test engineer: Bründel,	

Equipment no	Start of test	End of test	Test engineer
1	09.03.2020	11.03.2020	Bründel

1.3 Composition

Type of AIS AtoN Station

Type 1 Type 2 Type 3

Configuration method

Standard PI sentences Proprietary manufacturer sentences

Control receiver AIS Standard VDL messages

Positioning device

EPFS and surveyed position Surveyed position only

Transmission

Single channel transmission AtoN Tx message 21 for synthetic/ virtual

Transmit power: 5 W

Access mode msg 21

FATDMA RATDMA (type 3 only)

Access mode other messages

FATDMA RATDMA (type 3 only) CSTDMA (type 3 only)

Synchronisation:

Indirect UTC (type 3 only) Semaphore station (type 3 only)

Chaining: chaining implemented (type 2 and 3 only)

Implemented alternatives

According to last column of table 1

Option	For AtoN type	Implemented	Remark
Tx of message 6	1, 2, 3	Yes	MEB, CBR configuration
Tx of message 7	3	Yes	
Tx of message 8	1, 2, 3	Yes	MEB, CBR configuration
Tx of message 12	1, 2, 3	No	
Tx of message 13	3	No	
Tx of message 14	1, 2, 3	No	
Tx of message 25	1, 2, 3	No	

External Interfaces: 1 x RS-232, USB

1.4 Legend

Result marking (in the “result” column)²:

Passed	Item is ok, test was successful
Not passed	Test of a required item was not successful, change required
N/T	Not tested
N/A	Not applicable

Specific remarks (in the “remark” column, marked “bold italic”):

REC	recommendation (in terms of IEC17025 “opinion”); an improvement or change is recommended
Note	note or comment (in terms of IEC17025 “interpretation”) ; rationale for specific results or interpretation of requirements as appropriate

Template for additional test notes (copy if required):

Date	Result	Status

1.5 General observations

General observations not specific to any test item of the test standard are listed here.

General problems			
Date	Item	Remark	Result

² Test items maybe colour marked in draft versions of the report as follows:

Passed	no colour marking
Not passed	yellow
N/T	blue
N/A	no colour marking
REC	green

1.6 Basics of assesment

Manufacturers documentation			
No.	File name	Document title/ description	Issuer
1	WaiverDoc_easyAtoN_Implementation_200203.docx	Declaration of Manufacturer	Weatherdock AG
2	Test-Report: BSH/4542/001/4323111/18-1	BSH Testreport	BSH
3	WaiverDoc_easyAtoN_IEC62320-8.10_Power supply.docx	Declaration of Manufacturer Power Supply	Weatherdock AG
4	easyTRX3_AtoN_A20004_Bedienungsa nleitung_v1_EN_20200302.docx	Manual	Weatherdock AG
5	ISO 9001:2015 Zertifikat	ISO 9001:2015 Zertifikat	Dommel GmbH

2 8 Functional tests

2.1 8.1 Configuration method

2.1.1 8.1.1 General

For all of the functional tests the setup for the method of measurement shall be as defined by the manufacturer:

- using standard configuration sentences via direct connection to an interface, or
- using standard configuration sentences via VDL, or
- using the manufacturer's proprietary method.

09.03.2020	Test details - Configuration method	
Configuration methode	Remark	Result
Standard configuration sentences	Implemented	Passed
Standard configuration sentences via VDL	Not implemented	N/A
Proprietary methode	For special functions	Passed

2.1.2 8.1.2 Configuration for Message 21

8.1.2.1 Purpose

The purpose of this test is to ensure that Message 21 parameters can be entered into the EUT and are retained after the power off/on cycle.

8.1.2.2 Method of measurement

Set-up the standard test environment.

a) With the MMSI of EUT set to 000000000, configure a valid transmission schedule for Message 21, using the CBR sentence with MMSI in the first field set to 000000000 to match the MMSI of EUT.

b) Configure the EUT with the following parameters for transmission of Message 21:

- MMSI number: 991234567;
- type of AtoN: "20" – Cardinal Mark North;
- name of AtoN: "TEST FLOATING AIS ATON STATION";
- position accuracy: to accuracy of EPFS;
- assigned position (longitude and latitude): "within off-position threshold of current EPFS position";
- dimension/reference for position: "A=B=C=D=5";
- type of EPFS: Enter EUT's EPFS type (for example "1" for GPS);
- off-position threshold: 200 m;
- set power level;
- channel 1 set to channel 2087; if receiver supported, set channel 1 receiver to same;
- channel 2 set to channel 2088; if receiver supported, set channel 2 receiver to same;
- Virtual AtoN Flag set to 0 = default = Real AtoN at indicated position;
- set AtoN status default (00000000);
- off-position behaviour set to "maintain current transmission schedule";
- set UTC lost behaviour as per manufacturer's declaration;

Read configuration from EUT.

c) Remove power from the EUT for 5 min. Switch on the EUT. Read configuration from EUT.

NOTE Standard configuration sentences via configuration port: the Message 21 content is configured using the AID, ACF and ACG sentence combination.

Standard configuration sentences via VDL: the Message 21 content is configured via VDL using Message 25 or Message 6 with the appropriate application identifier/function identifier and binary data.

8.1.2.3 Required results

Verify that configuration is:

- a) not accepted by EUT and the EUT does not start transmission of Message 21;
- b) accepted by EUT and that the parameters have been correctly set;
- c) retained after power cycle.

2.1.2.1 Configuration using AID, ACF and ACG sentence combination

09.03.2020		Test details - Configuration using AID, ACF and ACG sentence combination Check by query for AID, ACF and ACG	
Test item	Check	Remark	Result
a) MMSI is set to 0			
Query for AID	Check that there is an output of AID		Passed
	Check Unique identifier of AtoN		Passed
	Check create/ delete field = null		Passed
	Check MMSI		Passed
	Check virtual, real or chained		Passed
	Check Sentence status flag = "R"		Passed
Apply a Tx schedule for Msg 21 Query for CBR	Check that there is an output of CBR		Passed
	Check MMSI of AtoN		Passed
	Check that the Tx schedule of Msg 21 is not active		Passed
b) Apply AID, ACF and ACG sentence combination with an appropriate configuration.			
Query for AID	Check that there is an output of AID for each MMSI		Passed
	Check MMSI of AtoN (UID)		Passed
	Check create/ delete field = null		Passed
	Check MMSI		Passed
	Check virtual, real or chained		Passed
	Check Sentence status flag = "R"		Passed
Query for ACG	Check MMSI of AtoN		Passed
	Check AtoN status		Passed
	Check Off-position threshold		Passed
	Check Ackn. procedure (0/1)		Passed
	Check Off-position behaviour (0/1)		Passed
	Check Synch lost behaviour (0/1)		Passed
	Check Name of AtoN		Passed
	Check dimensions		Passed
Query for ACF	Check Sentence status flag = "R"		Passed
	Check that there is an output of ACF on response		Passed
	Check MMSI		Passed
	Check type of EPFS		Passed
	Check latitude – N/S		Passed
	Check longitude – E/W		Passed
	Check position accuracy (0/1)		Passed
	Check Rx channel 1		Passed
	Check Rx channel 2		Passed
	Check Tx channel 1		Passed
	Check Tx channel 2		Passed
	Check Power level		Passed
	Check Type of AtoN		Passed
Check virtual flag		Passed	
Check Sentence status flag = "R"		Passed	

09.03.2020		Test details - Configuration using AID, ACF and ACG sentence combination Check of message 21 transmission	
Test item	Check	Remark	Result
b) Apply AID, ACF and ACG sentences with an appropriate configuration.			
Check transmission of message 21	Check that message 21 is transmitted		Passed
	Check channels A and B		Passed
Check content of message 21	Check message ID		Passed
	Check Repeat indicator		Passed
	Check MMSI		Passed
	Check Type of AtoN		Passed
	Check Name of AtoN		Passed
	Check longitude		Passed
	Check latitude		Passed
	Check dimensions		Passed
	Check type of EPFS		Passed
	Check time stamp		Passed
	Check off position indicator		Passed
	Check AtoN status		Passed
	Check RAIM flag		Passed
	Check Virtual AtoN flag		Passed
	Check assigned mode flag		Passed
Check Name of AtoN extension		Passed	

2.1.2.2 Check that configuration is retained after power cycle

09.03.2020	Test details - Configuration using AID, ACF, ACG and CBR sentence combination Check by query for VDL response		
Test item	Check	Remark	Result
c) Remove the power for 5 min. Switch on the EUT and check the configuration			
Query for AID	Check that there is an output of AID for each MMSI		Passed
	Check MMSI of AtoN		Passed
	Check create/ delete field = null		Passed
	Check MMSI		Passed
	Check virtual, real or chained		Passed
	Check Sentence status flag = "R"		Passed
Query for ACG	Check MMSI of AtoN		Passed
	Check AtoN status		Passed
	Check Off-position threshold		Passed
	Check Ackn. procedure (0/1)		Passed
	Check Off-positon behaviour (0/1)		Passed
	Check Synch lost behaviour (0/1)		Passed
	Check Name of AtoN		Passed
	Check dimensions		Passed
Check Sentence status flag = "R"		Passed	
Query for ACF	Check that there is an output of ACF on response		Passed
	Check MMSI		Passed
	Check type of EPFS		Passed
	Check latitude – N/S		Passed
	Check longitude – E/W		Passed
	Check position accuracy (0/1)		Passed
	Check Rx channel 1		Passed
	Check Rx channel 2		Passed
	Check Tx channel 1		Passed
	Check Tx channel 2		Passed
	Check Power level		Passed
	Check Type of AtoN		Passed
	Check virtual flag		Passed
Check Sentence status flag = "R"		Passed	
Query for CBR	Check that there is an output of CBR for each configured transmission schedule on response		Passed
	Check MMSI		Passed
	Check Message ID		Passed
	Check Message ID Index		Passed
	Check Start UTC channel A		Passed
	Check Start slot, channel A		Passed
	Check Interval, channel A		Passed
	Check FATDMA/ RATDMA		Passed
	Check Start UTC channel B		Passed
	Check Start slot, channel B		Passed
	Check Interval, channel B		Passed
Check Sentence status flag = "R"		Passed	

09.03.2020		Test details - Configuration using AID, ACF and ACG sentence combination Check of message 21 transmission	
Test item	Check	Remark	Result
c) After power off for 5 minute check the content of message 21			
Check transmission of message 21	Check that message 21 is transmitted		Passed
	Check channels A and B		Passed
Check content of message 21	Check message ID		Passed
	Check Repeat indicator		Passed
	Check MMSI		Passed
	Check Type of AtoN		Passed
	Check Name of AtoN		Passed
	Check longitude		Passed
	Check latitude		Passed
	Check dimensions		Passed
	Check type of EPFS		Passed
	Check time stamp		Passed
	Check off position indicator		Passed
	Check AtoN status		Passed
	Check RAIM flag		Passed
	Check Virtual AtoN flag		Passed
	Check assigned mode flag		Passed
Check Name of AtoN extension		Passed	

2.1.3 8.1.3 Schedule mode A FATDMA Message 21 (single report, alternating channel operation)

8.1.3.1 Purpose

Test that the AIS AtoN Station operates in accordance with the configured reporting schedule (see 5.2.5.2).

8.1.3.2 Method of measurement

Set-up the standard test environment and use the configuration as defined in 8.1.2.

a) Configure reporting of Message 21 to have the following parameters:

- start on Channel 2;
- start slot: 512;
- reporting interval: 3 min;
- frame for the first transmission in every UTC hour: UTC minute: 1;
- start the EUT 2 min ahead of a schedule transmission.

b) Run the test over the hour and day boundary.

If Synthetic and Virtual AIS AtoN Message 21 reports are implemented (see 5.2.2.1.2):

- c) Change the configuration of the EUT to be a Synthetic AIS AtoN. Repeat the test.
- d) Change the configuration of the EUT to be a Virtual AIS AtoN. Repeat the test
- e) Repeat test a). Apply Message 20 on channel A and B reserving the slots assigned for FATDMA transmission.

NOTE Standard configuration sentences via configuration port: the Schedule for Mode A FATDMA transmission is configured using the CBR sentence.

Standard configuration sentences via VDL: the schedule for Mode A FATDMA transmissions via VDL is configured using Message 25 or Message 6 with the appropriate application identifier/function identifier, and binary data.

8.1.3.3 Required results

Verify that the:

- a) EUT transmits Test Message 21 in the configured slots on both channels. EUT starts transmission in the correct UTC frames and alternates channels at the reporting interval within one reporting interval (3 min in this case), and should not wait until UTC minute 1. (The channel 1 transmissions shall occur in minutes 4, 10, 16, 22, 28, 34, 40, 46, 52 or 58 with an increment of 6 min, The channel 2 transmissions shall occur in minutes 1, 7, 13, etc. with an increment of 6 min.);
- b) reporting behaviour is consistent through the hour and day boundaries and transmitted data is correct;

If Synthetic and Virtual AIS AtoN Message 21 reports are implemented:

- c) Message 21 repeat indicator is 1;
- d) Message 21 Virtual flag is set.
- e) EUT continues transmission of Message 21 using the reserved slots.

09.03.2020		Test details - Configuration by CBR sentence	
Test item	Check	Remark	Result
a) Apply an CBR sentence with the appropriate configuration			
Query for CBR sentence			
Check the contents of the CBR	Check that there is an output of CBR on response		Passed
	Check MMSI		Passed
	Check message ID = 21		Passed
	Check message index (0)		Passed
Channel 1	Check UTC hour and minute		Passed
	Check start slot		Passed
	Check slot interval		Passed
FATDMA or RATDMA/CSTDMA setup	Check value = 0 (FATDMA)		Passed
Channel 2	Check UTC hour and minute		Passed
	Check start slot		Passed
	Check slot interval		Passed
	Check Sentence Status Flag = "R"		Passed
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		Passed
Transmission on channel 1	Check that message 21 is transmitted in minute 4, 10, 16, 22, 28, 34, 40, 46, 52 or 58		Passed
	Check Tx slot = 512		Passed
Transmission on channel 2	Check that message 21 is transmitted in minute 1, 7, 13, 19, 25, 31, 37, 43, 49, 55		Passed
	Check Tx slot = 512		Passed
b) Check transmission over hour boundary			
Channel 1	Check that transmission continues in the configured schedule		Passed
Channel 2	Check that transmission continues in the configured schedule		Passed
b) Check transmission over day boundary			
Channel 1	Check that transmission continues in the configured schedule		Passed
Channel 2	Check that transmission continues in the configured schedule		Passed



09.03.2020	Test details - Configuration by CBR sentence		
Test item	Check	Remark	Result
e) Apply Message 20 on channel A and B reserving the slots assigned for FATDMA transmission			
Transmission of Message 21	Check that Message 20 is received	Covered by Test-Report: BSH/4542/001/4323111/18-1, Test 13.5 "Slot reuse and FATDMA reservations"	Passed
	Check that the EUT continues the transmission of message 20 using the reserved slots		Passed
If Synthetic and Virtual AIS AtoN Message 21 reports are implemented:			
c) Apply ACF sentence with Virtual flag set to 2 = synthetic AtoN	Check that repeat indicator > 0		Passed
	Check that virtual flag in message 21 = 0		Passed
d) Apply ACF sentence with Virtual flag set to 1 = virtual AtoN	Check that virtual flag in message 21 = 1		Passed

09.03.2020		Test details d) - Configuration of virtual AtoNs	
Test item	Check	Remark	Result
d) Apply AID, ACF and ACG sentence combination with an appropriate configuration of 4 virtual AtoNs.			
Query for AID	Check that there is an output of AID for each MMSI		Passed
	Check MMSI of AtoN (UID)		Passed
	Check create/ delete field = null		Passed
	Check MMSI		Passed
	Check virtual, real or chained		Passed
	Check Sentence status flag = "R"		Passed
Query for ACG	Check MMSI of AtoN		Passed
	Check AtoN status		Passed
	Check Off-position threshold		Passed
	Check Ackn. procedure (0/1)		Passed
	Check Off-positon behaviour (0/1)		Passed
	Check Synch lost behaviour (0/1)		Passed
	Check Name of AtoN		Passed
	Check dimensions		Passed
	Check Sentence status flag = "R"		Passed
Query for ACF	Check that there is an output of ACF on response		Passed
	Check MMSI		Passed
	Check type of EPFS		Passed
	Check latitude – N/S		Passed
	Check longitude – E/W		Passed
	Check position accuracy (0/1)		Passed
	Check Rx channel 1		Passed
	Check Rx channel 2		Passed
	Check Tx channel 1		Passed
	Check Tx channel 2		Passed
	Check Power level		Passed
	Check Type of AtoN		Passed
	Check virtual flag		Passed
		Check Sentence status flag = "R"	

09.03.2020	Test details d) - Check of virtual AtoN transmissions		
Test item	Check	Remark	Result
Apply CFR sentences sentences with an appropriate configuration.			
Query for CFR	Check that there is a CBR output for each virtual AtoN		Passed
	Check MMSI of virtual AtoN		Passed
	Check Message ID = 21		Passed
	Check Message ID index = 0		Passed
	Check transmission schedule		Passed
Check transmission of message 21 of the virtual AtoNs	Check that message 21 is transmitted		Passed
	Check the Tx schedule AtoN 1		Passed
	Check the Tx schedule AtoN 2		Passed
	Check the Tx schedule AtoN 3		Passed
Check content of message 21 of all virtual AtoNs	Check the Tx schedule AtoN 4		Passed
	Check message ID		Passed
	Check Repeat indicator		Passed
	Check MMSI		Passed
	Check Type of AtoN		Passed
	Check Name of AtoN		Passed
	Check longitude		Passed
	Check latitude		Passed
	Check dimensions		Passed
	Check type of EPFS		Passed
	Check time stamp		Passed
	Check off position indicator		Passed
	Check AtoN status		Passed
	Check RAIM flag		Passed
	Check Virtual AtoN flag		Passed
	Check assigned mode flag		Passed
Check Name of AtoN extension		Passed	

2.1.4 8.1.4 Schedule mode B FATDMA Message 21 (dual report, dual channel operation)

8.1.4.1 Purpose

Test that the AIS AtoN Station operates in accordance with configured reporting schedule 5.2.5.3.1 and transmits correct data.

8.1.4.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.2.

a) Configure reporting of Message 21 to have the following parameters:

- start Channel 1: start slot 512;
 - Channel 2: start slot: 612;
 - reporting interval: 3 min,
 - frame for the first transmission in every UTC hour: UTC minute 2;
 - start the EUT 2 min ahead of a schedule transmission.
- b) Run the test over the hour and day boundary.

NOTE Standard configuration sentences via configuration port: the schedule for Mode B FATDMA transmission is configured using the CBR sentence.
Standard configuration sentences via VDL: the schedule for Mode B FATDMA transmissions via VDL is configured using Message 25 or Message 6 with the appropriate application identifier/function identifier, and binary data.

8.1.4.3 Required results

Verify that the:

- a) EUT transmits Test Message 21 in the configured slots on both channels. EUT starts transmission in the correct UTC frame and continues with the correct increment within one reporting interval and should not wait until UTC minute 2;
- b) reporting behaviour is consistent through the hour and day boundaries and transmitted data is correct.

09.03.2020		Test details - Configuration by CBR sentence	
Test item	Check	Remark	Result
a) Apply an CBR sentence with the appropriate configuration			
Query for CBR sentence			
Check the contents of the CBR	Check that there is an output of CBR on response		Passed
	Check MMSI		Passed
	Check message ID = 21		Passed
	Check message index (0)		Passed
Channel 1	Check UTC our and minute		Passed
	Check start slot		Passed
	Check slot interval		Passed

FATDMA or RATDMA/CSTDMA setup	Check value = 0 (FATDMA)		Passed
Channel 2	Check UTC hour and minute		Passed
	Check start slot		Passed
	Check slot interval		Passed
	Check Sentence Status Flag = "R"		Passed
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		Passed
Transmission on channel 1	Check that message 21 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		Passed
	Check Tx slot = 512		Passed
Transmission on channel 2	Check that message 21 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		Passed
	Check Tx slot = 612		Passed
			Passed
b) Check transmission over hour boundary			
Channel 1	Check that transmission continues in the configured schedule		Passed
Channel 2	Check that transmission continues in the configured schedule		Passed
b) Check transmission over day boundary			
Channel 1	Check that transmission continues in the configured schedule		Passed
Channel 2	Check that transmission continues in the configured schedule		Passed

2.1.5 8.1.5 Schedule mode C FATDMA Message 21 (Single report, single channel operation)

8.1.5.1 Purpose

The purpose is to test that the AIS AtoN Station operates in accordance with the configured reporting.

8.1.5.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.2.

a) Configure reporting of Message 21 to have the following parameters:

- transmit channel: A or B;
- start slot: 512;
- reporting interval: 3 min;
- frame for the first transmission in every UTC hour: UTC minute: 1;
- start the EUT 2 min ahead of a schedule transmission;

b) Run the test over the hour and day boundary.

NOTE Standard configuration sentences via configuration port: the schedule for Mode C FATDMA transmission is configured using the CBR sentence.

Standard configuration sentences via VDL: the schedule for Mode C FATDMA transmissions via VDL is configured using Message 25 or Message 6 with the appropriate application identifier/function identifier, and binary data.

8.1.5.3 Required results

Verify that the:

- a) EUT transmits test Message 21 in the configured slots on the designated transmit channel, EUT starts transmission in the correct UTC frame on the designated transmit channel at the reporting interval within one reporting interval and should not wait until UTC minute 1;
- b) reporting behaviour is consistent through the hour and day boundaries and transmitted data is correct.

09.03.2020		Test details - Configuration by CBR sentence	
Test item	Check	Remark	Result
a) Apply an CBR sentence with the appropriate configuration, transmission on channel B			
Query for CBR sentence			
Check the contents of the CBR	Check that there is an output of CBR on response		Passed
	Check MMSI		Passed
	Check message ID = 21		Passed
	Check message index (0)		Passed
Channel 1	Check no schedule		Passed
	Check no start slot		Passed
	Check no interval		Passed
FATDMA or RATDMA/CSTDMA setup	Check value = 0 (FATDMA)		Passed
Channel 2	Check UTC hour and minute		Passed
	Check start slot		Passed
	Check slot interval		Passed
	Check Sentence Status Flag = "R"		Passed
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		Passed
Transmission on channel 1	Check that there is no transmission on channel A		Passed
Transmission on channel 2	Check that message 21 is transmitted in minute 1,4,7 ..., reporting interval = 3 min.		Passed
	Check Tx slot = 612		Passed
b) Check transmission over hour boundary			
Channel 1	Check no transmission		Passed
Channel 2	Check that transmission continues in the configured schedule		Passed
b) Check transmission over day boundary			
Channel 1	Check no transmission		Passed
Channel 2	Check that transmission continues in the configured schedule		Passed

2.1.6 8.1.6 Schedule mode A RATDMA Message 21 (Type 3) (single report, alternating channel operation)

8.1.6.1 Purpose

The purpose of this test is to ensure that the EUT can be configured to operate in accordance with 5.2.4.2, ensuring the slot selection is random within the 1 min interval and that the slot reuse algorithm is properly implemented.

8.1.6.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.1 with a VDL loading of 10 %.

- a) Configure reporting of Message 21 with the following parameters:
 - FATDMA setup or RATDMA setup: RATDMA;
 - UTC minute for CH1: 1;
 - UTC minute for CH2: 4;
 - time interval CH1: 360 (6 min);
 - time interval CH2: 360 (6 min).
- b) Apply a VDL load that necessitates intentional slot reuse and repeat the test;
- c) Apply invalid RATDMA reporting intervals for transmission of Message 21. The valid intervals are defined in 5.2.3;
- d) Configure the AtoN with the highest possible reporting rate. Apply Message 20 reserving 50 % of the slots including the RATDMA selection interval. Run the test for 12 hours;
- e) Apply an SPO sentence to activate a VSI and FSR sentence. Apply some targets to the VDL.

NOTE Standard configuration sentences via configuration port: the schedule for Mode A RATDMA transmission is configured using the CBR sentence.

Standard configuration sentences via VDL: the schedule for Mode A RATDMA transmissions via VDL is configured using Message 25 or Message 6 with the appropriate application identifier/function identifier, and binary data.

8.1.5.3 Required results

- a) Verify that the EUT transmits Test Message 21:
 - using RATDMA so that the slot selection is random within the correct frames, and alternates the transmission channel between successive reports;
 - with the correct reporting intervals;
 - with the correct data.

EUT selects its slots randomly.

- b) EUT applies the slot reuse algorithm as defined in Recommendation ITU-R M.1371.
- c) invalid reporting intervals are not accepted;
- d) slots reserved by Message 20 are not used for the transmission of Message 21 for at least 12 h. Using means declared by the manufacturer, verify that the receiver remains on for 7 min at least once every 12 h;

e) Verify that the information provided in the VSI and FSR sentences are in accordance with the manufacturer's documentation.

09.03.2020		Test details - Configuration by CBR sentence	
Test item	Check	Remark	Result
a) Apply an CBR sentence with the appropriate configuration			
Query for CBR sentence			
Check the contents of the CBR	Check that there is an output of CBR on response		Passed
	Check MMSI		Passed
	Check message ID = 21		Passed
	Check message index (0)		Passed
Channel 1	Check UTC hour and minute		Passed
	Check slot interval		Passed
FATDMA or RATDMA/CSTDMA setup	Check value = 1 (RATDMA)		Passed
Channel 2	Check UTC hour and minute		Passed
	Check slot interval		Passed
	Check Sentence Status Flag = "R"		Passed
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		Passed
Transmission on channel 1	Check that message 21 is transmitted in minute 1, 7, 13, 19, 25, 31, 37, 43, 49, 55, Interval = 6 min.		Passed
	Check Tx slot is randomly selected within a 150 slot interval starting with the start slot configured by CBR		Passed
Transmission on channel 2	Check that message 21 is transmitted in minute 4, 10, 16, 22, 28, 34, 40, 46, 52 or 58, Interval = 6 min		Passed
	Check Tx slot is randomly selected within a 150 slot interval starting with the start slot configured by CBR		Passed
Transmitted data	Check that the transmitted data are correct		Passed
b) Increase channel load to 100%			
Slot reuse	Check that slots of the most distant targets are used	Covered by Test-Report: BSH/4542/001/4323111/18-1, Test 13.5 "Slot reuse and FATDMA reservations"	Passed

2.1.7 8.1.7 Schedule mode B RATDMA Message 21 (Type 3) (dual report, dual channel operation)

8.1.6.1 Purpose

The purpose of this test is to ensure that the AIS AtoN Station can be configured to operate in accordance with 5.2.4.2.

8.1.6.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.1 with a VDL loading of 10 %.

Configure reporting of Message 21 with the following parameters:

- FATDMA setup or RATDMA setup: RATDMA;
- UTC minute for CH1: 1;
- UTC minute for CH2: 4;
- time interval CH1: 180 (3 min);
- time interval CH2: 180 (3 min).

NOTE Standard configuration sentences via configuration port: the schedule for Mode B RATDMA transmission is configured using the CBR sentence.

Standard configuration sentences via VDL: the schedule for Mode B RATDMA transmissions via VDL is configured using Message 25 or Message 6 with the appropriate application identifier/function identifier, and binary data.

8.1.6.3 Required results

Verify that the EUT transmits Test Message 21:

- using RATDMA so that the slot selection is random within the 1 min interval, with dual reports on both channels;
- sending in correct intervals;
- with correct transmitted data.

09.03.2020		Test details - Configuration by CBR sentence	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration			
Query for CBR sentence			
Check the contents of the CBR	Check that there is an output of CBR on response		Passed
	Check MMSI		Passed
	Check message ID = 21		Passed
	Check message index (0)		Passed
Channel 1	Check UTC hour and minute		Passed
	Check start slot		Passed
	Check slot interval		Passed
FATDMA or RATDMA/CSTDMA setup	Check value = 1 (RATDMA)		Passed
Channel 2	Check UTC hour and minute		Passed
	Check start slot		Passed
	Check slot interval		Passed
	Check Sentence Status Flag = "R"		Passed
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		Passed
Transmission on channel 1	Check that message 21 is transmitted in minute 1, 4, 7, ..., reporting interval = 3 min.		Passed
	Check Tx slot is randomly selected within the minute		Passed
Transmission on channel 2	Check that message 21 is transmitted in minute 1, 4, 7, ..., reporting interval = 3 min.		Passed
	Check Tx slot is randomly selected within the minute		Passed
Transmitted data	Check that the transmitted data are correct		Passed

2.1.8 8.1.8 Schedule mode C RATDMA Message 21 (Type 3) (single channel operation)

8.1.8.1 Purpose

The purpose of this test is to ensure that the AIS AtoN Station can be configured to operate in accordance with 5.2.4.2.

8.1.7.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.1 with a VDL loading of 10 %.

Configure reporting of Message 21 with the following parameters:

- FATDMA setup or RATDMA setup: RATDMA;
- UTC minute for CH1: 1;
- time interval CH1: 180 (3 min).

NOTE Standard configuration sentences via configuration port: the schedule for Mode C RATDMA transmission is configured using the CBR sentence.

Standard configuration sentences via VDL: the schedule for Mode C RATDMA transmissions via VDL is configured using Message 25 or Message 6 with the appropriate application identifier/function identifier, and binary data.

8.1.7.3 Required results

Verify that the EUT transmits Test Message 21:

- using RATDMA so that the slot selection is random within the 1 min interval with single reports on a single channel;
- sending in correct intervals;
- with correct transmitted data.

09.03.2020		Test details - Configuration by CBR sentence	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration, Tx on channel A only			
Query for CBR sentence			
Check the contents of the CBR	Check that there is an output of CBR on response		Passed
	Check MMSI		Passed
	Check message ID = 21		Passed
	Check message index (0)		Passed
Channel 1	Check UTC hour and minute		Passed
	Check start slot		Passed
	Check slot interval		Passed
FATDMA or RATDMA/CSTDMA setup	Check value = 1 (RATDMA)		Passed
Channel 2	Check UTC hour and minute		Passed
	Check start slot		Passed
	Check slot interval		Passed
	Check Sentence Status Flag = "R"		Passed
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		Passed
Transmission on channel 1	Check no Tx on channel B		Passed
Transmission on channel 1	Check that message 21 is transmitted in minute 1, 4, 7, ..., reporting interval = 3 min.		Passed
	Check Tx slot is randomly selected within the minute		Passed
	Check that the transmitted data are correct		Passed

2.1.9 8.1.9 Scheduled transmission of Message 6

8.1.9.1 Purpose

The purpose of this test is to verify that the Message 6 operation of the EUT using the implemented access methods.

8.1.9.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.1 and transmission schedule for Message 21 as defined in 8.1.2 with an “intended recipient” MMSI.

The recipient shall acknowledge the message.

a) *Configure the EUT as defined by manufacturer’s documentation for transmission of a scheduled addressed binary data Message 6 with test binary data consisting of the bit pattern Hex “7E 3B 3C 3E 7E” forming a message by setting the parameters for the following operation modes, where implemented:*

- *FATDMA (see 8.1.2 for Mode A setup; 8.1.3 for Mode B setup; 8.1.4 for Mode C setup);*
- *RATDMA (see 8.1.5 for Mode A setup; 8.1.6 for Mode B setup; 8.1.7 for Mode C setup);*
- *CSTDMA: time (hour, minute), channel(s), reporting interval.*

b) *Repeat the test for a type 3 without an acknowledgement from the intended recipient.*

c) *If possible to use externally generated data, repeat the test exceeding the maximum length of Message 6.*

d) *Repeat the test for the maximum length of Message 6 by repeating the bit pattern Hex “7E 3B 3C 3E 7E” sequence in the binary data field.*

8.1.9.3 Required results

Verify that the EUT continues transmitting Message 21 in all cases and that:

- a) *the message sent by the EUT conforms to message content, access method, channel, slot number and reporting interval;*
- b) *the EUT behaves as configured;*
- c) *the message is not sent;*
- d) *the message is sent with the correct content.*

NOTE CSTDMA access of Message 6 should comply with IEC 62287-1 with regard of VDL access and message length.

2.1.9.1 FATDMA Mode A

09.03.2020		Test details a) - Configuration by CBR/ MEB sentence	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 6 payload			
Query for CBR and MEB sentence			
Check the contents of the CBR response	Check that there is an output of CBR on response		Passed
	Check message ID = 6		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check the contents of the MEB response	Check that there is an output of MEB on response		Passed
	Check MMSI		Passed
	Check message ID = 6		Passed
	Check message index (1)		Passed
	Check Broadcast behaviour = 0		Passed
	Check destination MMSI		Passed
	Check encapsulated data		Passed
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		Passed
Transmission on channel 1	Check that message 6 is transmitted in minute 4, 10, 16, 22, 28, 34, 40, 46, 52 or 58		Passed
	Check Tx slot = 600		Passed
Transmission on channel 2	Check that message 6 is transmitted in minute 1, 7, 13, 19, 25, 31, 37, 43, 49, 55		Passed
	Check Tx slot = 600		Passed
Message content	Check destination MMSI		Passed
	Check the content of message 6		Passed

2.1.9.2 FATDMA Mode B

09.03.2020		Test details a) - Configuration by CBR/ MEB sentence	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode B			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 6		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
Transmission on channel 1	Check that message 6 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		Passed
	Check Tx slot = 600		Passed
Transmission on channel 2	Check that message 6 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		Passed
	Check Tx slot = 700		Passed
Message content	Check destination MMSI		Passed
	Check the content of message 6		Passed

2.1.9.3 FATDMA Mode C

09.03.2020		Test details a) - Configuration by CBR/ MEB sentence	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode C			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 6		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
Transmission on channel 1	Check that message 6 is transmitted in minute 1,4,7 ..., reporting interval = 3 min.		Passed
	Check Tx slot = 600		Passed
Transmission on channel 2	Check that there is no transmission on channel B		Passed
Message content	Check destination MMSI		Passed
	Check the content of message 6		Passed

2.1.9.4 RATDMA Mode A

09.03.2020		Test details a) - Configuration by CBR/ MEB sentence	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for RATDMA mode A			
Query for CBR sentence			
Check the contents of the CBR response	Check that there is an output of CBR on response		Passed
	Check message ID = 6		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		Passed
Transmission on channel 1	Check that message 6 is transmitted in minute 2, 8, 14, 20, 26, 32 ...		Passed
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		Passed
Transmission on channel 2	Check that message 6 is transmitted in minute 5, 11, 17, 23, 29, 35, ...		Passed
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		Passed
Message content	Check destination MMSI		Passed
	Check the content of message 6		Passed

2.1.9.5 *RATDMA Mode B*

09.03.2020	Test details a) - Configuration by CBR/ MEB sentence		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for RATDMA mode B			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 6		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
Transmission on channel 1	Check that message 6 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		Passed
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		Passed
Transmission on channel 2	Check that message 6 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		Passed
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		Passed
Message content	Check destination MMSI		Passed
	Check the content of message 6		Passed

2.1.9.6 *RATDMA Mode C*

09.03.2020	Test details a) - Configuration by CBR/ MEB sentence		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for RATDMA mode C			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 6		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
Transmission on channel 1	Check that message 6 is transmitted in minute 2, 5, 8, 11, ..., reporting interval = 3 min.		Passed
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		Passed
Transmission on channel 2	Check that there is no transmission on channel A		Passed
Message content	Check destination MMSI		Passed
	Check the content of message 6		Passed

2.1.9.7 Acknowledgement behaviour

09.03.2020		Test details b) - Acknowledgement behaviour	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 6 payload and destination MMSI			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 6		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Apply ACG sentence with Acknowledge procedure set up Send Message 6 "AIABM_bin.sst" from EUT Check repetition of Message 6, no acknowledgement applied from the recipient.			
Set the acknowledgement behaviour to "No acknowledgement expected" using ACG sentence	Check that the EUT does not repeat Message 6	ABM sentence is not implemented	N/A
Set the acknowledgement behaviour to "Acknowledgement expected"	Check that the EUT repeats Message 6 three times		N/A

2.1.9.8 Maximum length message

09.03.2020		Test details c) - Maximum length message	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 6 payload, exceeding the maximum length of Message 6.			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 6		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
	Check that message 6 is not transmitted		Passed

2.1.9.9 Bit stuffing

09.03.2020		Test details d) - Bit stuffing	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 6 payload, with the maximum length of Message 6.			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 6		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
VDL transmission	Check that message 6 is transmitted		Passed
	Check message content		Passed

2.1.10 8.1.10 Scheduled transmission of Message 8

8.1.10.1 Purpose

The purpose of this test is to verify that Message 8 can be entered into the EUT.

8.1.10.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.1 and transmission schedule for Message 21 as defined in 8.1.2.

- a) Configure the EUT as defined by the manufacturer's documentation for transmission of a scheduled binary data Message 8 with test binary data consisting of the bit pattern Hex "7E 3B 3C 3E 7E" forming a message by setting the parameters for the following operation modes, where implemented:
 - FATDMA (see 8.1.2 for mode A setup; 8.1.3 for mode B setup; 8.1.4 for mode C setup);
 - RATDMA (see 8.1.5 for mode A setup; 8.1.6 for mode B setup; 8.1.7 for mode C setup);
 - CSTDMA: time (hour, minute), channel(s), reporting interval.
- b) If possible, use externally generated data, repeat the test exceeding the maximum length of Message 8.
- c) Repeat the test for the maximum length of Message 8 by repeating the bit pattern Hex "7E 3B 3C 3E 7E" sequence in the binary data field.

8.1.10.3 Required results

Verify that:

- a) the message sent by the EUT conforms to message content, access method, channel, slot number and reporting interval;

- b) message is not sent;
c) message is sent with the correct content.

In all cases, the EUT should continue transmitting Message 21.

NOTE CSTDMA access of Message 6 should comply with IEC 62287-1 with regard to VDL access and message length.

2.1.10.1 FATDMA Mode A

10.03.2020	Test details a) - FATDMA Mode A		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 8 payload			
Query for CBR and MEB sentence			
Check the contents of the CBR response	Check that there is an output of CBR on response		Passed
	Check message ID = 8		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check the contents of the MEB response	Check that there is an output of MEB on response		Passed
	Check MMSI		Passed
	Check message ID = 6		Passed
	Check message index (1)		Passed
	Check Broadcast behaviour = 0		Passed
	Check destination MMSI = null		Passed
	Check encapsulated data		Passed
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		Passed
Transmission on channel 1	Check that message 8 is transmitted in minute 4, 10, 16, 22, 28, 34, 40, 46, 52 or 58		Passed
	Check Tx slot = 800		Passed
Transmission on channel 2	Check that message 8 is transmitted in minute 1, 7, 13, 19, 25, 31, 37, 43, 49, 55		Passed
	Check Tx slot = 800		Passed
Message content	Check the content of message 8		Passed

2.1.10.2 FATDMA Mode B

10.03.2020	Test details a) - FATDMA Mode B		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode B			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 8		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
Transmission on channel 1	Check that message 8 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		Passed
	Check Tx slot = 800		Passed
Transmission on channel 2	Check that message 8 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		Passed
	Check Tx slot = 900		Passed
Message content	Check the content of message 8		Passed

2.1.10.3 FATDMA Mode C

10.03.2020	Test details a) - FATDMA Mode C		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode C			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 8		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
Transmission on channel 1	Check that there is no transmission on channel A		Passed
Transmission on channel 2	Check that message 8 is transmitted in minute 1,4,7 ..., reporting interval = 3 min.		Passed
	Check Tx slot = 800		Passed
Message content	Check the content of message 8		Passed

2.1.10.4 RATDMA Mode A

10.03.2020		Test details a) - RATDMA Mode A	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for RATDMA mode A			
Query for CBR sentence			
Check the contents of the CBR response	Check that there is an output of CBR on response		Passed
	Check message ID = 8		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		Passed
Transmission on channel 1	Check that message 8 is transmitted in minute 3, 9, 15, 21, ..		Passed
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		Passed
Transmission on channel 2	Check that message 8 is transmitted in minute 0, 6, 12, 18,..		Passed
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		Passed
Message content	Check the content of message 8		Passed

2.1.10.5 RATDMA Mode B

10.03.2020		Test details a) - RATDMA Mode B	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for RATDMA mode B			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 8		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
Transmission on channel 1	Check that message 8 is transmitted in minute 0, 3, 6, 9, ..., reporting interval = 3 min.		Passed
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		Passed
Transmission on channel 2	Check that message 8 is transmitted in minute 0, 3, 6, 9, ..., reporting interval = 3 min.		Passed
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		Passed
Message content	Check the content of message 8		Passed

2.1.10.6 RATDMA Mode C

10.03.2020		Test details a) - RATDMA Mode C	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for RATDMA mode C			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 6		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
Transmission on channel 1	Check that there is no transmission on channel A		Passed
Transmission on channel 2	Check that message 8 is transmitted in minute 0, 3, 6, 9, ..., reporting interval = 3 min.		Passed
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		Passed
Message content	Check the content of message 8		Passed

2.1.10.7 Too long sentence

10.03.2020	Test details b) - Too long sentence		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 8 payload, exceeding the maximum length of Message 8.			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 8		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
	Check that message 8 is not transmitted		Passed

2.1.10.8 Maximum length sentence

10.03.2020	Test details c) - Maximum length sentence		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 8 payload, with the maximum length of Message 8. repeating the bit pattern Hex "7E 3B 3C 3E 7E" sequence in the binary data field.			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 8		Passed
	Check message index (1)		Passed
	Check the test schedule setting		Passed
Check transmission schedule on VDL			
	Check that message 8 is transmitted		Passed
	Check message content		Passed

2.1.11 8.1.11 AIS AtoN configuration Messages 12

Repeat tests 8.1.8 and 8.1.9 for Message 12.

2.1.11.1 FATDMA Mode A

10.03.2020	Test details a) - FATDMA Mode A		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 12 payload and destination ID			
Query for CBR and MEB sentence			
Check the contents of the CBR response	Check that there is an output of CBR on response	Message 12 is not implemented	N/A
	Check message ID = 12		N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check the contents of the MEB response	Check that there is an output of MEB on response		N/A
	Check MMSI		N/A
	Check message ID = 6		N/A
	Check message index (1)		N/A
	Check Broadcast behaviour = 0		N/A
	Check destination MMSI		N/A
	Check encapsulated data		N/A
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		N/A
Transmission on channel 1	Check that message 12 is transmitted in minute 4, 10, 16, 22, 28, 34, 40, 46, 52 or 58		N/A
	Check Tx slot = 1200		N/A
Transmission on channel 2	Check that message 12 is transmitted in minute 1, 7, 13, 19, 25, 31, 37, 43, 49, 55		N/A
	Check Tx slot = 1200		N/A
Message content	Check destination MMSI		N/A
	Check the content of message 12		N/A

2.1.11.2 FATDMA Mode B

10.03.2020	Test details a) - FATDMA Mode B		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode B			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 12	Message 12 is not implemented	N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
Transmission on channel 1	Check that message 12 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		N/A
	Check Tx slot = 1200		N/A
Transmission on channel 2	Check that message 12 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		N/A
	Check Tx slot = 1300		N/A
Message content	Check destination MMSI		N/A
	Check the content of message 12		N/A

2.1.11.3 FATDMA Mode C

10.03.2020	Test details a) - FATDMA Mode C		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode C			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 12	Message 12 is not implemented	N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
Transmission on channel 1	Check that there is no transmission on channel A		N/A
Transmission on channel 2	Check that message 12 is transmitted in minute 1,4,7 ..., reporting interval = 3 min.		N/A
	Check Tx slot = 1200		N/A
Message content	Check destination MMSI		N/A
	Check the content of message 12		N/A

2.1.11.4 RATDMA Mode A

10.03.2020		Test details a) - RATDMA Mode A	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for RATDMA mode A			
Query for CBR sentence			
Check the contents of the CBR response	Check that there is an output of CBR on response	Message 12 is not implemented	N/A
	Check message ID = 12		N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		N/A
Transmission on channel 1	Check that message 12 is transmitted in minute 2, 8, 14, 20, 26, 32 ...		N/A
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		N/A
Transmission on channel 2	Check that message 2 is transmitted in minute 5, 11, 17, 23, 29, 35, ...		N/A
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		N/A
Message content	Check destination MMSI		N/A
	Check the content of message 12		N/A

2.1.11.5 RATDMA Mode B

10.03.2020	Test details a) - RATDMA Mode B		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for RATDMA mode B			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 12	Message 12 is not implemented	N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
Transmission on channel 1	Check that message 12 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		N/A
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		N/A
Transmission on channel 2	Check that message 12 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		N/A
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		N/A
Message content	Check destination MMSI		N/A
	Check the content of message 12		N/A

2.1.11.6 RATDMA Mode C

10.03.2020	Test details a) - FATDMA Mode A		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for RATDMA mode C			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 12	Message 12 is not implemented	N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
Transmission on channel 1	Check that message 12 is transmitted in minute 1,4,7 ..., reporting interval = 3 min.		N/A
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		N/A
Transmission on channel 2	Check that there is no transmission on channel A		N/A
Message content	Check destination MMSI		N/A
	Check the content of message 12		N/A

2.1.11.7 Acknowledgement behaviour

10.03.2020	Test details b) - Acknowledgement behaviour		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 12 payload and destination MMSI			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 12	Message 12 is not implemented	N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Apply ACG sentence with Acknowledge procedure set up Send Message 12 "AIABM_safety.sst" from EUT Check repetition of Message 12, no acknowledgement applied from the recipient.			
Set the acknowledgement behaviour to "No acknowledgement expected" using ACG sentence	Check that the EUT does not repeat Message 12		N/A
Set the acknowledgement behaviour to "Acknowledgement expected"	Check that the EUT repeats Message 12 three times		N/A

2.1.11.8 Too long sentence

10.03.2020	Test details c) - Too long sentence		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 12 payload, exceeding the maximum length of Message 12.			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 12	Message 12 is not implemented	N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
	Check that message 12 is not transmitted		N/A

2.1.11.9 *Maximum length sentence*

10.03.2020	Test details d) Maximum length sentence		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 12 payload, with the maximum length of Message 12, repeating the bit pattern Hex "7E 3B 3C 3E 7E" sequence in the binary data field			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 12	Message 12 is not implemented	N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
Message transmission	Check that message 12 is transmitted		N/A
	Check message content		N/A

2.1.12 8.1.12 AIS AtoN configuration Messages 14

Repeat tests 8.1.10 for Message 14.

2.1.12.1 FATDMA Mode A

10.03.2020		Test details a) - FATDMA Mode A	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 8 payload			
Query for CBR and MEB sentence			
Check the contents of the CBR response	Check that there is an output of CBR on response	Message 14 is not implemented	N/A
	Check message ID = 14		N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check the contents of the MEB response	Check that there is an output of MEB on response		N/A
	Check MMSI		N/A
	Check message ID = 6		N/A
	Check message index (1)		N/A
	Check Broadcast behaviour = 0		N/A
	Check destination MMSI = null		N/A
	Check encapsulated data		N/A
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		N/A
Transmission on channel 1	Check that message 14 is transmitted in minute 4, 10, 16, 22, 28, 34, 40, 46, 52 or 58		N/A
	Check Tx slot = 1400		N/A
Transmission on channel 2	Check that message 14 is transmitted in minute 1, 7, 13, 19, 25, 31, 37, 43, 49, 55		N/A
	Check Tx slot = 1400		N/A
Message content	Check the content of message 14		N/A

2.1.12.2 FATDMA Mode B

10.03.2020	Test details a) - FATDMA Mode B		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode B			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 14	Message 14 is not implemented	N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
Transmission on channel 1	Check that message 8 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		N/A
	Check Tx slot = 1400		N/A
Transmission on channel 2	Check that message 14 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		N/A
	Check Tx slot = 1500		N/A
Message content	Check the content of message 14		N/A

2.1.12.3 FATDMA Mode C

10.03.2020	Test details a) - FATDMA Mode C		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode C			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 14	Message 14 is not implemented	N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
Transmission on channel 1	Check that there is no transmission on channel A		N/A
Transmission on channel 2	Check that message 14 is transmitted in minute 1,4,7 ..., reporting interval = 3 min.		N/A
	Check Tx slot = 1400		N/A
Message content	Check the content of message 14		N/A

2.1.12.4 RATDMA Mode A

10.03.2020		Test details a) - RATDMA Mode A	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for RATDMA mode A			
Query for CBR sentence			
Check the contents of the CBR response	Check that there is an output of CBR on response	Message 14 is not implemented	N/A
	Check message ID = 14		N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
Start of transmission	Check that EUT starts transmission in the next scheduled slot, not waiting for the UTC hour/minute defined in CBR		N/A
Transmission on channel 1	Check that message 14 is transmitted in minute 3, 9, 15, 21, ...		N/A
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		N/A
Transmission on channel 2	Check that message 14 is transmitted in minute 0, 6, 12, 18, ...		N/A
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		N/A
Message content	Check the content of message 14		N/A

2.1.12.5 RATDMA Mode B

10.03.2020		Test details a) - RATDMA Mode B	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for RATDMA mode B			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 14	Message 14 is not implemented	N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
Transmission on channel 1	Check that message 14 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		N/A
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		N/A
Transmission on channel 2	Check that message 14 is transmitted in minute 2, 5, 8, ..., reporting interval = 3 min.		N/A
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		N/A
Message content	Check the content of message 14		N/A

2.1.12.6 RATDMA Mode C

10.03.2020		Test details a) - RATDMA Mode C	
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for RATDMA mode C			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 14	Message 14 is not implemented	N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
Transmission on channel 1	Check that there is no transmission on channel A		N/A
Transmission on channel 2	Check that message 14 is transmitted in minute 0, 3, 6, 9, ..., reporting interval = 3 min.		N/A
	Check Tx slot is randomly selected within the 150 slot interval configured by CBR (start slot)		N/A
Message content	Check the content of message 14		N/A

2.1.12.7 *Too long sentence*

10.03.2020	Test details b) - Too long sentence		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 14 payload, exceeding the maximum length of Message 14.			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 14	Message 14 is not implemented	N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
	Check that message 14 is not transmitted		N/A

2.1.12.8 *Maximum length sentence*

10.03.2020	Test details c) - Maximum length sentence		
Test item	Check	Remark	Result
Apply an CBR sentence with the appropriate configuration for FATDMA mode A			
Apply a MEB sentence with the message 14 payload, with the maximum length of Message 14, repeating the bit pattern Hex "7E 3B 3C 3E 7E" sequence in the binary data field			
Query for CBR sentence			
Check the contents of the CBR response	Check message ID = 14	Message 14 is not implemented	N/A
	Check message index (1)		N/A
	Check the test schedule setting		N/A
Check transmission schedule on VDL			
	Check that message 14 is transmitted		N/A
	Check message content		N/A

2.1.13 8.1.13 Unscheduled transmission

8.1.9.1 Purpose

Unscheduled transmissions are those transmissions that are not planned, and the competent authority wishes the AtoN station to broadcast them autonomously, such as an unexpected alarm condition. The VDL access method for these message types is RATDMA. This test will verify the AtoN operation when such a message is input.

This test is only applicable for type 3 AtoN stations.

8.1.9.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.2 and transmission schedule for Message 21 as defined in 8.1.3 with an "intended recipient" MMSI.

- a) *Apply a BBM sentence with Message 8.*
- b) *Apply a BBM sentence with Message 14.*
- c) *Configure the acknowledgement behaviour to 1 (acknowledgement expected). Apply an ABM sentence with Message 6. Do not apply an acknowledgement on the VDL.*
- d) *Apply an ABM sentence with Message 6. Apply an acknowledgement Message 7 on the VDL within 4 s after the transmission of Message 6.*
- e) *Configure the acknowledgement behaviour to 0 (no acknowledgement expected). Apply an ABM sentence with Message 6. Do not apply an acknowledgement on the VDL.*
- f) *Apply an ABM sentence with Message 12. Do not apply an acknowledgement on the VDL.*

NOTE Standard IEC 61162 sentences: an unscheduled message using standard format would be ABM, ABK or BBM.

8.1.9.3 Required results

Check that the EUT continues to transmit Message 21 in all cases.

- a) *Check that Message 8 is transmitted within 4 s using RATDMA with correct content. Check that there is an ABK output with correct content and status 3.*
- b) *Check that Message 14 is transmitted within 4 s using RATDMA with correct content. Check that there is an ABK output with correct content and status 3.*
- c) *Check that Message 6 is transmitted within 4 s using RATDMA with correct content. Check that Message 6 is repeated 3 times, 4 to 8 s after the previous transmission. Check that there is an ABK output with correct content and status 1.*
- d) *Check that Message 6 is transmitted within 4 s. Check that Message 6 is not repeated. Check that there is an ABK output with correct content and status 0.*
- e) *Check that Message 6 is transmitted within 4 s. Check that Message 6 is not repeated. Check that there is an ABK output with correct content and status 3.*
- f) *Check that Message 12 is transmitted within 4 s. Check that Message 12 is not repeated. Check that there is an ABK output with correct content and status 3.*

10.03.2020		Test details - Unscheduled transmission	
Test item	Check	Remark	Result
a) Apply an BBM sentence with message 8			
Transmission of broadcast message 8	Check that the message 8 is transmitted within 4 s	Use MEB instead (Broadcast Behaviour = 1) of BBM or ABM	Passed
	Check the access methode		Passed
	Check the message content		Passed
	Check the ABK output		Passed
b) Apply an BBM sentence with message 14			
Transmission of broadcast message	Check that the message 14 is transmitted within 4 s	Not implemented	N/A
	Check the access methode		N/A
	Check the message content		N/A
	Check the ABK output		N/A
c) Configure the Acknowledgement behaviour to 0 (acknowledgement expected). Apply an ABM sentence with message 6, no ackn from recipient			
Query for	Check that the Acknowledgement behaviour	Use MEB instead (Broadcast Behaviour = 1) of BBM or ABM	Passed
Transmission of Messag 6	Check that the message 6 is transmitted within 4 s		Passed
	Check the access methode		Passed
	Check the message content		Passed
	Check that the message is repeated 3 times, with 4...8 s delay		Passed
	Check the ABK output		Passed
d) Apply an ABM sentence with message 6, with ackn from recipient.			
Transmission of Message 6	Check that the message 6 is transmitted within 4 s	Use MEB instead (Broadcast Behaviour = 1) of BBM or ABM	Passed
	Check the access methode		Passed
	Check the message content		Passed
	Check that the acknowledgement message has been received		Passed
	Check the ABK output		Passed

e) Configure the Acknowledgement behaviour to 1 (no acknowledgement expected). Apply an ABM sentence with message 6, no ackn from recipient			
Transmission of Message 6	Check that the message 6 is transmitted within 4 s	Use MEB instead (Broadcast Behaviour = 1) of BBM or ABM	Passed
	Check the access methode		Passed
	Check the message content		Passed
	Check that Message 6 is not repeated		Passed
	Check the ABK output		Passed
f) Apply an ABM sentence with message 12, no ackn from recipient			
Transmission of Message 12	Check that the message 12 is transmitted within 4 s	Not implemented	N/A
	Check the access methode		N/A
	Check the message content		N/A
	Check that Message 6 is not repeated		N/A
	Check the ABK output		N/A

2.2 8.2 Tests for synchronisation accuracy

2.2.1 8.2.1 Implemented synchronisation modes and synchronisation error

8.2.1.1 Purpose

The purpose is to verify the implemented synchronisation modes and measure the synchronisation error of the EUT.

8.2.1.2 Method of measurement

Set up the standard test environment and operate EUT in normal mode. Set the EUT reporting interval to 1 min for Message 21 and all other implemented messages.

Operate the EUT in all implemented synchronisation modes:

- EUT using UTC direct synchronisation;
- EUT using UTC indirect synchronisation;
- EUT using semaphore synchronisation.

Record VDL messages and measure the time between the nominal beginning of the slot interval and the initiation of the 'transmitter on' function by evaluating the start flag and calculating back to T_0 .

8.2.1.3 Required results

The synchronisation error with its additive jitter shall not exceed:

- $\pm 104 \mu\text{s}$ using UTC direct synchronisation;
- $\pm 312 \mu\text{s}$ using UTC indirect synchronisation;
- $\pm 312 \mu\text{s}$ referenced to the semaphore's synchronisation.

10.03.2020		Test details - Synchronisation Jitter	
Test item	Check	Remark	Result
Set EUT to an reporting interval of 1 min for message 21 Set other implemented messages to an reporting interval of 1 min			
UTC Direct synchronisation	Check that T2 is in the range of 3.328 ms \pm 104 μs	Covered by Test-Report: BSH/4542/001/4323111/18-1, Test 12.3 "Synchronisation Jitter"	Passed
Disconnect the GPS antenna. Provide other AIS station with UTC direct on the VDL	Check that T2 is in the range of 3.328 ms \pm 312 μs	Covered by Test-Report: BSH/4542/001/4323111/18-1, Test 12.3 "Synchronisation Jitter"	Passed
Set other station without UTC	Check that T2 is in the range of 3.328 ms \pm 312 μs	Covered by Test-Report: BSH/4542/001/4323111/18-1, Test 12.3 "Synchronisation Jitter"	Passed

2.2.2 8.2.2 Synchronisation test without UTC (Types 2 and 3)

8.2.2.1 Purpose

The purpose of this test is to verify that the EUT can synchronise without UTC.

8.2.2.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.2. Choose test conditions in a way that EUT receives messages from a synchronisation source with the following synchronisation states:

- a) Base Station direct acting as a semaphore synchronisation and no stations with direct or UTC indirect synchronisation. Disable internal synchronisation source;*
- b) mobile direct acting as a semaphore synchronisation and no stations with direct or UTC indirect synchronisation. Disable internal synchronisation source;*
- c) mobile station indicating UTC indirect synchronisation and receiving no stations with direct synchronisation or Base Stations with UTC indirect synchronisation. Disable internal synchronisation source;*
- d) enable internal synchronisation source.*

Record transmitted messages.

8.2.2.3 Required results

Verify that the EUT transmits according to its implemented synchronisation modes in each case.

- a) Verify that the EUT synchronises to the Base Station acting as semaphore.*
- b) Verify that the EUT synchronises to the mobile station acting as semaphore.*
- c) Verify that the EUT does not synchronise to any station.*
- d) Verify that the EUT returns to UTC direct synchronisation.*

10.03.2020	Optional - Test details - Synchronisation Jitter		
Test item	Check	Remark	Result
Set EUT to an reporting interval of 1 min for message 21 Disconnect internal synchronisation source			
a) Provide base station in semaphore mode	Check by evaluation of T2 timing that the EUT synchronises to the base station	Covered by Test-Report: BSH/4542/001/4323111/18-1, Test 12.3 "Synchronisation Jitter"	Passed
b) Provide Class A mobile station in semaphore mode	Check by evaluation of T2 timing that the EUT synchronises to the mobile station		Passed
c) Provide Class A mobile or base station in UTC indirect mode	Check by evaluation of T2 timing that the EUT does not synchronise to the mobile station		Passed
d) Enable internal synchronisation source	Check by evaluation of T2 timing that the EUT returns to UTC direct synchronisation		Passed

2.3 8.3 EPFS

2.3.1 8.3.1 Position source

8.3.1.1 Purpose

The purpose of this test is to verify that the position source correctly populates the fields in Message 21.

8.3.1.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.1.

- a) Using the transmission schedule for Message 21 as defined in 8.1.2, record the EUT transmissions.
- b) Repeat the test with a surveyed position.

8.3.1.3 Required results

Verify that:

- a) the position and time stamp fields are valid;
- b) the EUT has the correct parameter settings for “type of electronic position fixing device” and “RAIM-flag”.

10.03.2020	Test details - Position source		
Test item	Check	Remark	Result
Set EUT to an reporting interval of 1 min for message 21			
a) Internal GNSS position available	Check that Latitude in msg 21 is correct		Passed
	Check that Longitude in msg 21 is correct		Passed
	Check that time stamp in msg 21 is correct		Passed
	Check that the Type of EPFS in msg 21 is correct		Passed
	Check PA flag	= 0	Passed
	Check the RAIM flag	= 0	Passed
Valid internal position Provide an ACF sentence with a valid position and “Type of EPFS” set to 7 = surveyed			
b) Surveyed position	Check that Latitude in msg 21 is correct		Passed
	Check that Longitude in msg 21 is correct		Passed
	Check that time stamp in msg 21 is correct		Passed
	Check that the Type of EPFS in msg 21 is correct		Passed
	Check PA flag		Passed
	Check the RAIM flag		Passed

Internal position not available		
Provide an ACF sentence with a valid position and "Type of EPFS" set to 7 = surveyed		
Surveyed position	Check that Latitude in msg 21 is correct	Passed
	Check that Longitude in msg 21 is correct	Passed
	Check that time stamp in msg 21 is correct	Passed
	Check that the Type of EPFS in msg 21 is correct	Passed
	Check PA flag	Passed
	Check the RAIM flag	Passed

2.3.2 8.3.2 Invalid position

8.3.2.1 Purpose

The purpose of this test is to verify that the EUT responds correctly when the EPFS outputs an invalid position.

8.3.2.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.2 and transmission schedule for Message 21 as defined in 8.1.2. Prevent the EPFS receiver from generating position fixes.

8.3.2.3 Required results

If the EUT is configured to continue transmission, verify the EUT transmits Message 21 with the parameters latitude and longitude set to "not available" and the time stamp is set to "63".

10.03.2020		Test details - Invalid position	
Test item	Check	Remark	Result
Set EUT to an reporting interval of 1 min for message 21			
Set ACF to use internal position source			
Disable internal position source	Check that Latitude in msg 21 is 91°		Passed
	Check that Longitude in msg 21 is 181°		Passed
	Check that time stamp in msg 21 is 63		Passed
	Check that PA flag = 0		Passed
	Check the RAIM flag = 0		Passed

2.3.3 8.3.3 Off-position monitor

8.3.3.1 Purpose

The purpose of this test is to verify that the EUT responds correctly when it is off position.

8.3.3.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.1 and transmission schedule for Message 21 as defined in 8.1.2.

- a) *Set the EUT EPFS antenna at its assigned position and with off-position behaviour set to maintain current broadcast schedule.*
- b) *After verification of the off-position indicator in Message 21, the EUT EPFS antenna shall be moved to off-position.*
- c) *Move the EUT EPFS antenna to be on-position.*
- d) *If implemented, configure the EUT with off-position behaviour set to a new reporting interval and the EUT EPFS antenna shall be moved to off-position.*
- e) *After verification of the off-position indicator in Message 21, the EUT EPFS antenna shall be moved to on-position.*

8.3.3.3 Required results

Verify that:

- a) *message 21 has the off-position indicator field set to "0";*
- b) *message 21 has the off-position indicator field set to "1" within a time period stated by the manufacturer and that the original reporting schedule has not changed;*
- c) *message 21 has the off-position indicator field set to "0" within a time period stated by the manufacturer;*
- d) *message 21 has the off-position indicator field set to "1" within a time period stated by the manufacturer and that the original reporting schedule has changed to the new reporting interval;*
- e) *message 21 has the off-position indicator field set to "0" within a time period stated by the manufacturer and the reporting interval returns to the original reporting schedule.*

10.03.2020		Test details - Off position monitor	
Test item	Check	Remark	Result
a) Set reference position with GPS position inside threshold, Off-position behaviour = 0, off-position threshold = 200. Set Tx schedule (index 0) to: FATDMA mode A, interval = 3 min Set alternative schedule (index 1) to: RATDMA mode A, interval = 1 min			
Check configuration	Check off-position behaviour = 0		Passed
	Check off-position threshold = 100		Passed
	Check position: EPFS position within threshold		Passed
a) Position on-position	Check off-position flag in msg 21 = 0		Passed
	Check that the normal transmission schedule is used		Passed
b) Position off-position	Check off-position flag in msg 21 = 1		Passed
	Check that the normal transmission schedule is used		Passed
c) Position on-position	Check off-position flag in msg 21 = 0		Passed
	Check that the normal transmission schedule is used		Passed
Off-position behaviour = 1			
Query configuration	Check off-position behaviour = 1		Passed
	Check msg 21, index 0: FATDMA mode A, 3 min	RATDMA used	Passed
	Check msg 21, index 1: FATDMA mode A, 1 min	RATDMA used	Passed
d) Position off-position	Check off-position flag in msg 21 = 1		Passed
	Check that the alternativ transmission schedule is used		Passed
e) Position on-position	Check off-position flag in msg 21 = 0		Passed
	Check that the normal transmission schedule is used		Passed

2.4 8.4 Receive addressed message (Types 2 and 3)

8.4.1 Purpose

The purpose of this test is to verify that the EUT correctly receives and, if so configured, processes an addressed message.

8.4.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.1 and transmission schedule for Message 21 as defined in 8.1.2. Record received messages and frame structure.

- Apply an addressed binary message (Message 6; EUT as destination) to the VDL.
- Apply an addressed binary message (Message 6; other station as destination) to the VDL.

8.4.3 Required results

Verify that:

- a) EUT receives and processes the message in accordance with the manufacturer's specification;
- b) EUT does not process the received message.

10.03.2020	Test details - Receive addressed messages		
Test item	Check	Remark	Result
Set "Acknowledgment procedure" field of ACG to 0			
a) Message 6 to EUT	Check that the "Acknowledgment procedure" field of ACG is set to 0		Passed
	Check that there is a VDM output		Passed
	Check that ackn. message 7 is transmitted		Passed
	Check the content of message 7		Passed
b) message to other ID	Check there is no VDM output		Passed
Set "Acknowledgment procedure" field of ACG to 1			
a) Message 6 to EUT	Check that the "Acknowledgment procedure" field of ACG is set to 1		Passed
	Check that there is a VDM output		Passed
	Check that no ackn. message 7 is transmitted		Passed
b) message to other ID	Check there is no VDM output		Passed

2.5 8.5 Interrogation response (Type 3)

8.5.1 Purpose

The purpose of this test is to verify that the EUT correctly receives and processes an interrogation correctly.

8.5.2 Method of measurement

Setup the standard test environment and use the configuration as defined in 8.1.1 and transmission schedule for Message 21 as defined in 8.1.2. Record received messages and frame structure. Configure at least one virtual AtoN.

- a) Apply an interrogation message for Message 21 of the real AtoN to the VDL;
- b) Apply an interrogation message for Message 21 of the virtual AtoN to the VDL;
- c) Apply an interrogation message for Message 21 of an MMSI not used by the EUT to the VDL;
- d) Apply an interrogation message addressed to the real AtoN for a message other than

Message 21 to the VDL.

8.5.3 Required results

Verify that the:

- a) EUT receives and processes the message and responds with a Message 21 that contains the MMSI and position of the real AtoN;
- b) EUT receives and processes the message and responds with a Message 21 that contains the MMSI and position of the real AtoN;
- c) EUT receives and processes the message and does not respond;
- d) EUT receives and processes the message and does not respond.

10.03.2020		Test details - Interrogation response	
Test item	Check	Remark	Result
Send an interrogation for message 21 on the VDL			
a) Addressed to the real AtoN MMSI of the EUT	Check that there is a VDM output of Message 15		Passed
	Check that the response message 21 is transmitted.		Passed
	Check the content of message 21, MMSI and position of the real AtoN		Passed
b) Addressed to a virtual AtoN MMSI of the EUT	Check that there is a VDM output of Message 15		Passed
	Check that the response message 21 is transmitted.		Passed
	Check the content of message 7, MMSI and position of the virtual AtoN		Passed
c) Addressed to a MMSI not used by the EUT	Check that there is a VDM output of Message 15		Passed
	Check that there is no response transmitted.		Passed
d) Addressed to the real AtoN MMSI of the EUT, interrogation for other Message than 21.	Check that there is a VDM output of Message 15		Passed
	Check that the response message 21 is transmitted.		Passed
	Check the content of message 7, MMSI and position of the real AtoN		Passed

2.6 8.6 Repeat AIS-SART messages

8.6.1 Purpose

The purpose of this test is to verify that the active AIS-SART messages are repeated if this option is implemented.

8.6.2 Method of measurement

Setup the standard test environment and use the configuration as defined in 8.1.1 and transmission schedule for Message 21 as defined in 8.1.2. Record received messages and frame structure. Configure at least one virtual AtoN.

- a) *Apply an active AIS-SART message burst including Message 1 and 14 to the VDL;*
- b) *Apply an AIS-SART test message to the VDL.*

8.6.3 Required results

Verify that the:

- a) *EUT receives and processes the message and repeats Message 14 and only one of the Message 1 active AIS-SART messages, and increments the repeat indicator;*
- b) *EUT does not repeat the AIS-SART test messages.*

10.03.2020	Test details - Repetition of SART messages		
Test item	Check	Remark	Result
a) Apply active SART messages to the VDL			
A burst of Message 1	Check that there is a VDM output	Not implemented	N/A
	Check that Message 1 is repeated		N/A
	Check that only one Message 1 of a burst is repeated		N/A
	Check that the Repeat Indicator is incremented		N/A
A Message 14 with text "SART ACTIVE"	Check there is a VDM output		N/A
	Check that Message 14 is repeated		N/A
	Check that the Repeat Indicator is incremented		N/A
b) Apply SART test messages to the VDL			
A burst of Message 1	Check that there is a VDM output	Not implemented	N/A
	Check that Message 1 is not repeated		N/A
A Message 14 with text "SART TEST"	Check there is a VDM output		N/A
	Check that Message 14 is not repeated		N/A

2.7 8.7 Additional functionality as implemented by the manufacturer.

2.7.1 8.7.1 Test for configuration of the receiver turn-on times (Types 2 and 3)

8.5.1.1 Purpose

The purpose of this test is to ensure that the operational time period for the receivers can be configured using the configuration port of the EUT or the appropriate VDL message.

8.5.1.2 Method of measurement

Set up the standard test environment and operate EUT in normal mode.

Configure the receiver turn-on times of the EUT with the following parameters:

- MMSI of the AtoN Station,
- receiver on or interval,
- time of first turn on period,
- duration of receiver wake up,
- interval between receiver activation.

Using the implemented methods (one or both), enter the appropriate data with the parameter “operational mode”.

- a) Configure the receiver to be on all the time (operational mode = 1).
- b) Enter the appropriate data with a definition of a turn on interval.
- c) Query the COP configuration of the receiver turn-on times via the configuration port using the query sentence or other means provided by the manufacturer.
- d) Query the COP configuration of the receiver turn-on times via the VDL and define a FATDMA slot for the VDL replay.
- e) Repeat step b) with an invalid time interval between periods parameter.
- f) Repeat step c) to validate that the schedule has not changed.

NOTE Standard configuration sentences via configuration port: the receiver turn-on times are configured using the COP sentence.

Standard configuration sentences via VDL: the receiver turn-on times are configured via the VDL using Message 25 or Message 6 with the appropriate application identifier/function identifier, and binary data

8.5.1.3 Required results

Verify that:

- a) the EUT receiver is turned on all the time;
- b) the EUT receiver is turned on during the defined time period and interval;
- c) the EUT returns on a query with the appropriate message content via PI using the COP sentence;
- d) the EUT returns on a query via the VDL with the appropriate VDL message on the assigned slot and channel using the appropriate application identifier and binary data;
- e) the EUT returns a NAK using reason code 11 with the NAK descriptive text “invalid interval”, and the COP shall be ignored;
- f) the EUT returns on a query with the appropriate message content from the previous configuration via PI using the COP sentence.

10.03.2020		Test details - Receiver turn-on times	
Test item	Check	Remark	Result
Set the AtoN to 3 min reporting interval of Message 21 in FATDMA mode, all other messages disabled			
a) Configure the receivers to always on Operational mode = 1 Duration of period = 86400	Check that the receivers are always on (VDM output on both channels)	Not implemented	N/A
b) Specify a turn-on interval Operational mode = 1 Appropriate values for <ul style="list-style-type: none"> • Start time, • Time interval between periods • duration of period 	Check that the receivers are on during the specified intervals (VDM output on both channels)	Not implemented	N/A
c) Query for COP using PI port sentence	Check that the EUT outputs a COP with the correct content according to the configuration of b)	Not implemented	N/A
d) Send a VDL message 6, DAC 990, FI 34 Requested FI = 36	Check that a response with DAC 990, FI=36 is transmitted	Not implemented	N/A
	Check that the channel according to the request is used		N/A
	Check that the slot according to the request is used		N/A
	Check that the content of the response message is correct.		N/A
e) Specify a turn-on interval Operational mode = 1 Invalid value for Time interval between periods	Check that a NAK sentence is output	Not implemented	N/A
	Check that reason code is 11 and text = "Invalid interval"		N/A
f) Query for COP using PI port sentence	Check that the COP indicates that the configuration is not changed	Not implemented	N/A

2.7.2 8.7.2 Test for configuration of payload transmission

8.7.2.1 Purpose

The purpose of this test is to ensure that the EUT can be commanded to transmit a payload using the slots reserved by a preceding CBR with message ID = 0 and message ID index = 0. The payload can be entered into the EUT using the configuration port of the EUT or the appropriate VDL configuration message.

8.7.2.2 Method of measurement

Set up the standard test environment and operate the EUT in normal mode.

Configure an FATDMA transmission schedule for message ID = 0, message ID index = 0, slot interval = 750 slots on channel A and B, slot distance between channel A and B = 375 slot.

- a) Apply an MEB with Message ID = 6, Message ID index = 0, broadcast behaviour = 1 and a valid destination MMSI.
- b) Apply an MEB with Message ID = 12, Message ID index = 0, broadcast behaviour = 1 and a valid destination MMSI.
- c) Apply an MEB with Message ID = 8, Message ID index = 0, broadcast behaviour = 1.
- d) Apply an MEB with Message ID = 14, Message ID index = 0, broadcast behaviour = 1.

8.7.2.3 Required results

Verify that:

- a) a single Message 6 is transmitted in the next available slot, defined by the CBR sentence, with correct content according to the MEB input;
- b) a single Message 12 is transmitted in the next available slot, defined by the CBR sentence, with correct content according to the MEB input;
- c) a single Message 8 is transmitted in the next available slot, defined by the CBR sentence, with correct content according to the MEB input;
- d) a single Message 14 is transmitted in the next available slot, defined by the CBR sentence, with correct content according to the MEB input.

10.03.2020	Test details - Payload transmission		
Test item	Check	Remark	Result
Configure with CBR a FATDMA Tx schedule, Message ID 0, index 0, slot interval 750 slot, slot distance between channel A and B = 375 slot. Apply for each message type an MEB, with Message ID index 0, broadcast behaviour 1			
Apply an MEB, Message ID 6,	Check that a single Message 6 is transmitted	See 8.1.13 Unscheduled transmission	Passed
	Check that the next available slot defined by CBR is used		Passed
	Check the content of Message 6		Passed
Apply an MEB, Message ID 12,	Check that a single Message 12 is transmitted		Passed
	Check that the next available slot defined by CBR is used		Passed
	Check the content of Message 12		Passed
Apply an MEB, Message ID 8,	Check that a single Message 8 is transmitted		Passed
	Check that the next available slot defined by CBR is used		Passed
	Check the content of Message 8		Passed
Apply an MEB, Message ID 14,	Check that a single Message 14 is transmitted		Passed
	Check that the next available slot defined by CBR is used		Passed
	Check the content of Message 14		Passed

2.7.3 8.7.3 Test for forced broadcast

8.7.3.1 Purpose

The purpose of this test is to ensure that the EUT can be forced to broadcast a specified VDL message via the PI or the VDL.

8.7.3.2 Method of measurement

Set up the standard test environment and operate the EUT in normal mode. Enter the forced broadcast data to the EUT with the following parameters:

- message type;
- message identifier;
- VDL channel for message transmission;
- time and slot message transmission;
- number of consecutive slots for message transmission.

Using the implemented methods (one or both) enter the appropriate forced broadcast data to the EUT.

NOTE Standard configuration sentences via configuration port: the forced broadcast data is configured using the AFB sentence.

Standard configuration sentences via VDL: the forced broadcast data is configured via the VDL using Message 25 or Message 6 with the appropriate application identifier/function identifier, and binary data.

8.7.3.3 Required results

Verify that the EUT transmits the requested VDL message at the defined time and slot.

10.03.2020	Test details - Forced broadcast		
Test item	Check	Remark	Result
Send AFB sentence to PI port			
Send AFB sentence for message 21	Check that message 21 is transmitted	Not implemented	N/A
	Check Tx channel		N/A
	Check that the correct slot (UTC hour, minute and slot number) is used for transmission		N/A
Send AFB sentence for message 6	Check that message 6 is transmitted	Not implemented	N/A
	Check that the correct slot (UTC hour, minute and slot number) is used for transmission		N/A
Send AFB sentence for message 8	Check that message 8 is transmitted	Not implemented	N/A
	Check that the correct slot (UTC hour, minute and slot number) is used for transmission		N/A
Send AFB sentence for message 12	Check that message 12 is transmitted	Not implemented	N/A
	Check that the correct slot (UTC hour, minute and slot number) is used for transmission		N/A
Send AFB sentence for message 14	Check that message 14 is transmitted	Not implemented	N/A
	Check that the correct slot (UTC hour, minute and slot number) is used for transmission		N/A

2.7.4 8.7.4 Test for version information

8.7.4.1 Purpose

The purpose of this test is to ensure that the EUT can provide version information.

8.7.4.2 Method of measurement

Set up the standard test environment and operate the EUT in normal mode. Enter the query for version information to the EUT using the manufacturer implemented methods.

NOTE Standard configuration sentences via configuration port: the version information is queried using the QVER sentence and the response is provided using VER.

Standard configuration sentences via VDL: the version information is queried via VDL using Message 25 or Message 6 with the appropriate application identifier/function identifier, and binary data

8.7.4.3 Required results

Verify that the EUT provides with the requested version information.

10.03.2020		Test details - Version information	
Test item	Check	Remark	Result
Query for VER	Check that there is a VER sentence response		Passed
Length of sentence	Check that the maximum length of 80 characters (without <cr>, <lf>) is not exceeded		Passed
Device type	Note the Device type Check it for allowed values		Passed
Vendor Id	Note the vendor Id	WDC@@@	Passed
Unique Identifier	Note the Unique Identifier	Not available	Passed
Manufacturers serial number	Note serial number	000000010	Passed
Model code	Note the model code	A20004	Passed
Software revision	Note the software revision	2.0.0	Passed
Hardware revision	Note the software revision	2	Passed

2.7.5 8.7.5 Test for DCR – AtoN function ID capability

8.7.5.1 Purpose

The purpose of this test is to ensure that the EUT can provide a list of supported functionality.

8.7.5.2 Method of measurement

Set up the standard test environment and use the configuration as defined in 8.1.1 and transmission schedule for Message 21 as defined in 8.1.2. Enter the query for the function supported.

NOTE Standard configuration sentences via configuration port: the list of supported functions is queried using the QAFC sentence and the response is provided using AFC.

Standard configuration sentences via VDL: the list of supported functions is queried via the VDL using Message 25 or Message 6 with the appropriate application identifier/function identifier, and binary data.

8.7.5.3 Required results

Verify that the EUT provides the list of functions that are supported by the AtoN Station.

10.03.2020	Test details - AFC request		
Test item	Check	Remark	Result
Query on PI port			
Query for DCR	Check the DCR response	Not implemented	N/A
Send message 6 with FI = 27 (Query for AtoN function ID capability)			
Send message 6	Check the VDL response message 6	Not implemented	N/A
Send message 25 with FI = 27 (Query for AtoN function ID capability)			
Send message 25	Check the VDL response message 25	Not implemented	N/A

2.7.6 8.7.6 Test for assigning an encryption key for VDL configuration

8.7.6.1 Purpose

The purpose of this test is to ensure that the encryption key for VDL configuration can be entered into the EUT using the configuration port or the appropriate VDL message.

The initial encryption key, when shipped from the manufacturer, will be all zeros.

8.7.6.2 Method of measurement

Setup standard test environment and operate the EUT in normal mode.

a) Configure the EUT with the initial factory default encryption key of all zero.

Send a configuration message encrypted with the initial factory default AES encryption key;

b) Configure the EUT with a different AES encryption key.

Send a configuration message encrypted with the new AES encryption key;

- c) Send a configuration message encrypted with a different AES encryption key;

NOTE Via configuration port: enter the encryption key via the configuration port using the CEK sentence or any other means provided by the manufacturer. The sentence used on the configuration port allows for an encryption key of up to 256 bits to be entered using multiple sentences.

Via VDL: enter the encryption key via the VDL using Message 25 or Message 6 with the appropriate application identifier and binary data. The VDL message allows the entire key of up to 256 bits to be modified.

8.7.6.3 Required results

Verify that:

- a) the EUT does not accept the new configuration;
- b) the EUT accepts the new configuration;
- c) the EUT does not accept the new configuration.

Test details - Assigning the AES encryption key			
Test item	Check	Remark	Result
Set the encryption key to the default value (all 0)			
Apply a configuration message	Check that the new configuration is not accepted	Not implemented	N/A
Set the encryption key to a value different to the default value (all 0)			
Apply a configuration message encrypted with the correct key	Check that the new configuration is accepted	Not implemented	N/A
Apply a configuration message encrypted with a different key	Check that the new configuration is not accepted	Not implemented	N/A

2.7.7 8.7.7 Test for VDL configuration using chaining (Type 3)

2.7.7.1 8.7.7.1 Purpose and setup

The purpose of these tests is to verify that, if chaining is implemented, the AtoN station supports receiving information from a base station via intermediate AtoN stations and then transmits the response back through the intermediate AtoN stations to the base station.

Perform the following tests with Message 25 if no other message is specified. All involved AtoN stations are of the EUT type. The manufacturer has to supply a sufficient number of units to perform the test.

In the following test the base station is simulated by the test environment. The ID values of the test setup diagrams are only examples. The RF connections are set up in a way that all stations can receive each other. All EUTs shall be configured to have their receivers permanently enabled.

2.7.7.2 8.7.7.2 Basic chaining test with 2 AtoN stations

8.7.7.2.1 Purpose

The purpose of this test section is to verify the basic chaining functions in a simple environment with two AtoN stations.

8.7.7.2.2 Method of measurement

The test scenario shown in Figure 20 shall be set up.

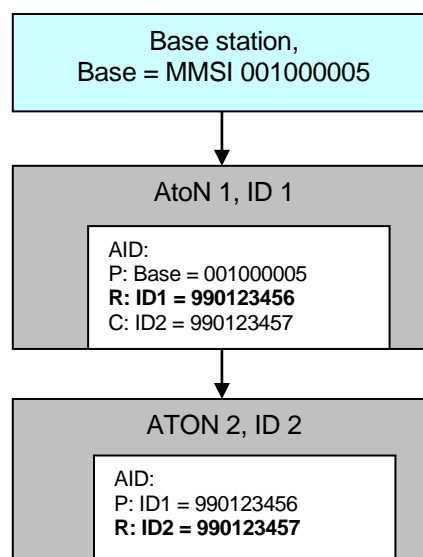


Figure 20 – Test scenario for basic chaining test

- Configure AtoN station 1 with appropriate MMSIs for parent = base, real AtoN = ID1 and child = ID2 using the AID sentence;
- Configure AtoN station 2 with appropriate MMSIs for parent = ID1, real AtoN = ID2 and no child using the AID sentence;
- Send a configuration message from the base station to AtoN 1, source ID = base and MMSI of AtoN = ID1;
- Query the configuration of AtoN 1 and AtoN 2 using PI port sentences;
- Send a query message for the applied configuration from the base station to AtoN 1, source ID = base and MMSI of AtoN = ID1;
- Send a configuration message from the base station to AtoN 2, source ID = base and MMSI of AtoN = ID2;
- Query the configuration of AtoN 1 and AtoN 2 using PI port sentences;
- Send a query message for the applied configuration from the base station to AtoN 2, source ID = base and MMSI of AtoN = ID2.

8.7.7.2.3 Required results

Verify:

- a) *by query for the AID sentence that the configuration of AtoN 1 is correctly stored;*
- b) *by query for the AID sentence that the configuration of AtoN 2 is correctly stored;*
- c) *that AtoN 1 does not retransmit the configuration message;*
- d) *that the configuration of AtoN 2 is not affected and that AtoN 1 has accepted and stored the new configuration;*
- e) *that AtoN 1 does not retransmit the query message. Verify that AtoN 1 responds with the requested message, source ID = ID1 and MMSI of AtoN = ID1. Verify that AtoN 2 does not retransmit the query and the response message;*
- f) *that AtoN 1 retransmits the configuration message, source ID = ID1 and MMSI of AtoN = ID2;*
- g) *that the configuration of AtoN 1 is not affected and that AtoN 2 has accepted and stored the new configuration;*
- h) *that AtoN 1 retransmits the query message, source ID = ID1 and MMSI of AtoN = ID2. Verify that AtoN 2 responds with the requested message, source ID = ID2 and MMSI of AtoN = ID2. Verify that AtoN 1 retransmits the response message, source ID = ID1 and MMSI of AtoN = ID2.*

10.03.2020		Test details - Test with two AtoN stations in a chain	
Test item	Check	Remark	Result
Test is performed with a base station and two AtoN stations in a chain.			
a) Configure AtoN station 1	Set and verify own MMSI = ID1	Not implemented	N/A
	Set and verify parent MMSI = Base station ID		N/A
	Set and verify child MMSI = ID2		N/A
b) Configure AtoN station 2	Set and verify own MMSI = ID2		N/A
	Set and verify parent MMSI = ID1		N/A
Send Message 25 broadcast, FI = 12 (CBR configuration), from base station to AtoN 1: Source ID = Base station ID, MMSI of AtoN = ID1			
c) Retransmission	Check that AtoN 1 does not retransmit Message 25	Not implemented	N/A
d) Query AtoN 1 and 2 for CBR using PI port sentences			
AtoN 1	Check that the new configuration is correctly stored		N/A
AtoN 2	Check that the CBR configuration is not changed		N/A
e) Send Message 25 broadcast, FI = 14 (Query for CBR config.), from base station to AtoN 1: Source ID = Base station ID, MMSI of AtoN = ID1			
AtoN 1 Transmission of response	Check that AtoN 1 does not retransmit the query	Not implemented	N/A
	Check that AtoN 1 transmits a response message		N/A
	Check that Source ID = ID1		N/A
	Check that MMSI of AtoN = ID1		N/A
AtoN 2	Check that AtoN 2 does not retransmit the query	Not implemented	N/A
	Check that AtoN 2 does not transmit a response message		N/A
f) Send Message 25 broadcast, FI = 12 (CBR configuration) from base station to AtoN 2: Source ID = Base station ID, MMSI of AtoN = ID2			
AtoN 1 Retransmission	Check that AtoN 1 retransmits Message 25 to AtoN 2	Not implemented	N/A
	Check content of message 25		N/A
	Check Source ID = ID1		N/A
	Check MMSI of AtoN = ID2		N/A
g) Query AtoN 1 and 2 for CBR using PI port sentences			
AtoN 1	Check that the CBR configuration is not changed	Not implemented	N/A
AtoN 2	Check that the new configuration is correctly stored		N/A

10.03.2020

Test details - Test with two AtoN stations in a chain

Test item	Check	Remark	Result
h) Send Message 25 broadcast, FI = 14 (Query for CBR config.), from base station to AtoN 2: Source ID = Base station ID, MMSI of AtoN = ID2			
AtoN 1 Retransmission	Check that AtoN 1 retransmits the query message	Not implemented	N/A
	Check that Source ID = ID1		N/A
	Check that MMSI of AtoN = ID2		N/A
	Check content of the query message		N/A
AtoN 2 Transmission of response	Check that AtoN 2 transmits the response	Not implemented	N/A
	Check Source ID = ID2		N/A
	Check MMSI of AtoN = ID2		N/A
	Check content of request message		N/A
AtoN 1 Retransmission	Check that AtoN 1 retransmits the response to the base station	Not implemented	N/A
	Check Source ID = ID1		N/A
	Check MMSI of AtoN = ID2		N/A
	Check content of response message		N/A

2.7.7.3 8.7.7.3 Configuration by a parent AtoN

8.7.7.3.1 Purpose

The purpose of this test section is to verify that the EUT can be configured and queried by the parent AtoN. In the previous test the EUT receives the message from the base station in addition to the message from AtoN 1. So it is not sure that it has responded on the message from the parent AtoN. Therefore the test is repeated with simulated messages from the parent AtoN, without any messages from the base station.

8.7.7.3.2 Method of measurement

The EUT is only connected to the test environment which simulates the parent AtoN (AtoN 1). AtoN station 2 is configured from the previous test.

- Send a message from the test environment to the EUT which simulates a configuration message from AtoN 1 to AtoN 2, source ID = AtoN 2 and MMSI of AtoN = ID2.
- Query the configuration of AtoN 2 using PI port sentences.
- Send a message from the test environment to the EUT which simulates a query message for the applied configuration from AtoN 1 to AtoN 2, source ID = AtoN 1 and MMSI of AtoN = ID2.

8.7.7.3.3 Required results

Verify that:

- the EUT has received the simulated message;
- AtoN 2 has accepted and stored the new configuration;
- AtoN 2 responds with the requested message, source ID = ID2 and MMSI of AtoN = ID2.

10.03.2020	Test details - Configuration by parent AtoN		
Test item	Check	Remark	Result
Test is performed with the configuration of the previous test but without the base station			
Send Message 25 broadcast, FI = 12 (CBR configuration), from AtoN 1 to AtoN 2: Source ID = ID 1, MMSI of AtoN = ID2			
a) Reception	Check that AtoN 2 has received Message 25	Not implemented	N/A
g) Query AtoN 1 and 2 for CBR using PI port sentences			
AtoN 1	Check that the CBR configuration is not changed	Not implemented	N/A
AtoN 2	Check that the new configuration is correctly stored	Not implemented	N/A
c) Send Message 25 broadcast, FI = 14 (Query for CBR config.), from AtoN 1 to AtoN 2: Source ID = ID1, MMSI of AtoN = ID2			
AtoN 2	Check that AtoN 2 does not retransmit the query	Not implemented	N/A
	Check that AtoN 2 transmits a response message		N/A
	Check that Source ID = ID2		N/A
	Check that MMSI of AtoN = ID2		N/A

2.7.7.4 8.7.7.4 Chaining test with 3 AtoN stations

8.7.7.4.1 Purpose

The purpose of this test is to verify the chaining functions in a more complex environment consisting of a linear row of three AtoN stations.

8.7.7.4.2 Method of measurement

The test scenario shown in Figure 21 shall be set up.

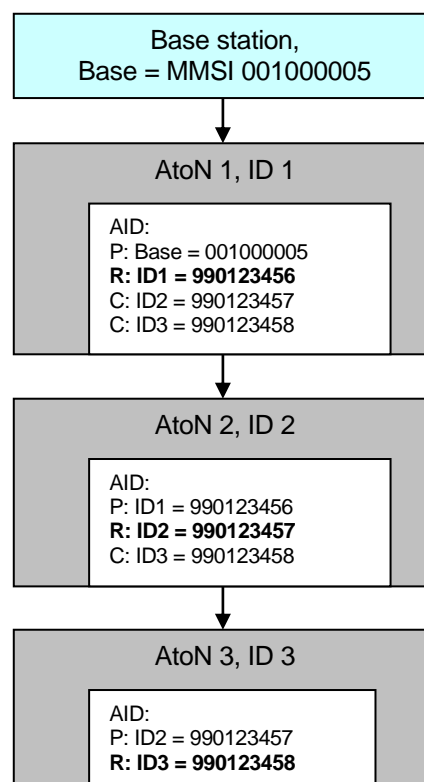


Figure 21 – Test scenario for linear chaining test

- Configure AtoN station 1 with appropriate MMSIs for parent = base, real AtoN = ID1 and child = ID2 and ID3 using the AID sentence.
- Configure AtoN station 2 with appropriate MMSIs for parent = ID1, real AtoN = ID2 and child ID 3 using the AID sentence.
- Configure AtoN station 3 with appropriate MMSIs for parent = ID2, real AtoN = ID3 and no child using the AID sentence.
- Send a configuration message from the base station to AtoN 3, source ID = base and MMSI of AtoN = ID3.
- Query the configuration of AtoN 1, AtoN 2 and AtoN 3 using PI port sentences

- f) *Send a query message for the applied configuration from the base station to AtoN 3, source ID = base and MMSI of AtoN = ID3.*

8.7.7.4.3 Required results

Verify:

- a) *by query for the AID sentence that the configuration of AtoN station 1 is correctly stored;*
- b) *by query for the AID sentence that the configuration of AtoN station 2 is correctly stored;*
- c) *by query for the AID sentence that the configuration of AtoN station 3 is correctly stored;*
- d) *that AtoN 1 retransmits the configuration message, source ID = ID1 and MMSI of AtoN = ID3. Verify that AtoN 2 retransmits the configuration message, source ID = ID2 and MMSI of AtoN = ID3;*
- e) *that the configuration of AtoN 1 and AtoN 2 is not affected and that AtoN 3 has accepted and stored the new configuration;*
- f) *that AtoN 1 retransmits the query message, source ID = ID1 and MMSI of AtoN = ID3. Verify that AtoN 2 retransmits the query message, source ID = ID2 and MMSI of AtoN = ID3. Verify that AtoN 3 responds with the requested message, source ID = ID3 and MMSI of AtoN = ID3. Verify that AtoN 2 retransmits the response message, source ID = ID2 and MMSI of AtoN = ID3. Verify that AtoN 1 retransmits the response message, source ID = ID1 and MMSI of AtoN = ID3. Verify the content of the response message transmitted by AtoN 1.*

10.03.2020		Test details - Test with 3 AtoN stations in a chain	
Test item	Check	Remark	Result
Test is performed with a base station and three AtoN stations in a chain. Verify the configuration by query sentence for AID			
a) Configure AtoN station 1	Set and verify own MMSI = ID1	Not implemented	N/A
	Set and verify parent MMSI = Base station ID		N/A
	Set and verify child MMSI = ID2		N/A
	Set and verify child MMSI = ID3		N/A
b) Configure AtoN station 2	Set and verify own MMSI = ID2		N/A
	Set and verify parent MMSI = ID1		N/A
	Set and verify child MMSI = ID3		N/A
c) Configure AtoN station 3	Set and verify own MMSI = ID3		N/A
	Set and verify parent MMSI = ID2		N/A
d) Send Message 25 broadcast, FI = 12 (CBR configuration) from base station to AtoN 3: Source ID = Base station ID, MMSI of AtoN = ID3			
AtoN 1 Retransmission	Check that AtoN 1 retransmits the configuration message	Not implemented	N/A
	Check that Source ID = ID1		N/A
	Check that MMSI of AtoN = ID3		N/A
	Check content of the retransmitted message		N/A
AtoN 2 Retransmission	Check that AtoN 2 retransmits the configuration message		N/A
	Check that Source ID = ID2		N/A
	Check that MMSI of AtoN = ID3		N/A
	Check content of the retransmitted message		N/A
e) Query AtoN 1, 2 and 3 for CBR using PI port sentences			
AtoN 1	Check that the CBR configuration is not changed	Not implemented	N/A
AtoN 2	Check that the CBR configuration is not changed		N/A
AtoN 3	Check that the new configuration is correctly stored		N/A
f) Send Message 25 broadcast, FI = 14 (Query for CBR config.), from base station to AtoN 3: Source ID = Base station ID, MMSI of AtoN = ID3			
AtoN 1 Retransmission of query	Check that AtoN 1 retransmits the query message	Not implemented	N/A
	Check that Source ID = ID1		N/A
	Check that MMSI of AtoN = ID3		N/A
	Check content of the query message		N/A
AtoN 2 Retransmission of query	Check that AtoN 2 retransmits the query message		N/A
	Check that Source ID = ID2		N/A



	Check that MMSI of AtoN = ID3		N/A
	Check content of the query message		N/A
AtoN 3 Transmission of response	Check that AtoN 3 transmits the response message	Not implemented	N/A
	Check Source ID = ID3		N/A
	Check MMSI of AtoN = ID3		N/A
	Check content of requested message		N/A
AtoN 2 Retransmission of response	Check that AtoN 2 retransmits the response to the base station	Not implemented	N/A
	Check Source ID = ID2		N/A
	Check MMSI of AtoN = ID3		N/A
	Check content of response message		N/A
AtoN 1 Retransmission of response	Check that AtoN 1 retransmits the response to the base station	Not implemented	N/A
	Check Source ID = ID1		N/A
	Check MMSI of AtoN = ID3		N/A
	Check content of response message		N/A

2.7.7.5 8.7.7.5 Chaining test with 3 AtoN stations in other configuration

8.7.7.5.1 Purpose

The purpose of this test is to verify the chaining functions in a more complex environment consisting of a forked layout of three AtoN stations.

8.7.7.5.2 Method of measurement

The test scenario shown in Figure 22 shall be set up.

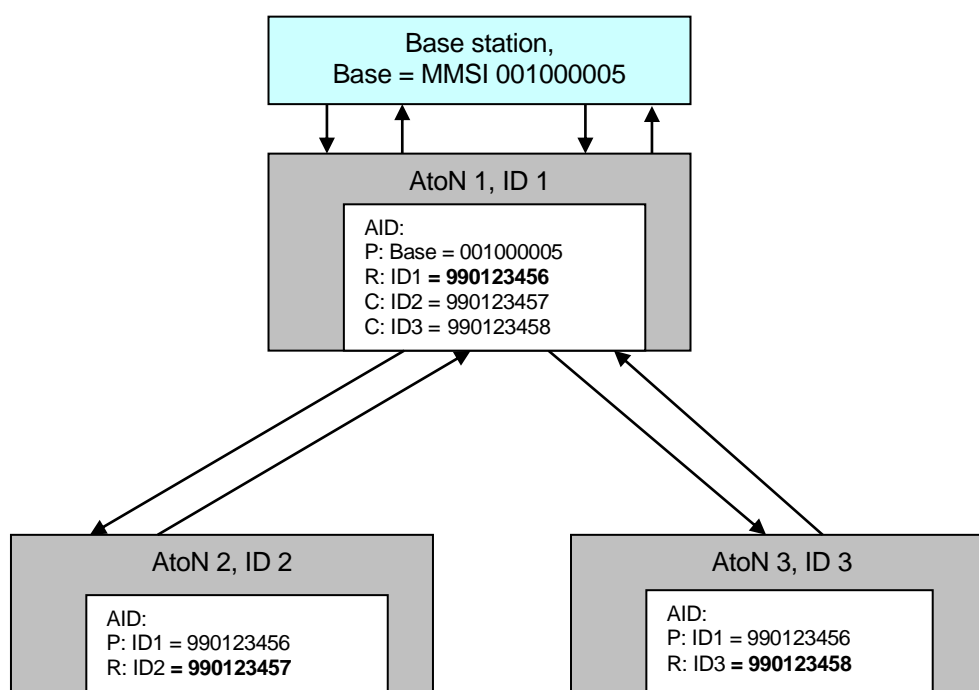


Figure 22 – Test scenario for forked chaining test

- Configure AtoN station 1 with appropriate MMSIs for parent = base, real AtoN = ID1 and child = ID2 and ID3 using the AID sentence.
- Configure AtoN station 2 with appropriate MMSIs for parent = ID1, real AtoN = ID2 and no child using the AID sentence.
- Configure AtoN station 3 with appropriate MMSIs for parent = ID1, real AtoN = ID3 and no child using the AID sentence.
- Send a configuration message from the base station to AtoN 3, Source ID = base and MMSI of AtoN = ID3.
- Query the configuration of AtoN 1, AtoN 2 and AtoN 3 using PI port sentences.
- Send a query message for the applied configuration from the base station to AtoN 3, Source ID = base and MMSI of AtoN = ID3.

8.7.7.5.3 Required results

Verify:

- a) by query for the AID sentence that the configuration of AtoN 1 is correctly stored;
- b) by query for the AID sentence that the configuration of AtoN 2 is correctly stored;
- c) by query for the AID sentence that the configuration of AtoN 3 is correctly stored;
- d) that AtoN 1 retransmits the configuration message, source ID = ID1 and MMSI of AtoN = ID3. Verify that AtoN 2 does not retransmit the configuration message;
- e) that the configuration of AtoN 1 and AtoN 2 is not affected and that AtoN 3 has accepted and stored the new configuration;
- f) that AtoN 1 retransmits the query message, source ID = ID1 and MMSI of AtoN = ID3. Verify that AtoN 3 responds with the requested message, source ID = ID3 and MMSI of AtoN = ID3. Verify that AtoN 2 does not respond to the query message. Verify that AtoN 2 does not retransmit the response message. Verify that AtoN 1 retransmits the response message, source ID = ID1 and MMSI of AtoN = ID3. Verify the content of the response message transmitted by AtoN 1.

10.03.2020	Test details - Test with 3 AtoN stations		
Test item	Check	Remark	Result
Test is performed with a base station and three AtoN stations according to the test scenario. Verify the configuration by query sentence for AID			
a) Configure AtoN station 1	Set and verify own MMSI = ID1	Not implemented	N/A
	Set and verify parent MMSI = Base station ID		N/A
	Set and verify child MMSI = ID2		N/A
	Set and verify child MMSI = ID3		N/A
b) Configure AtoN station 2	Set and verify own MMSI = ID2		N/A
	Set and verify parent MMSI = ID1		N/A
c) Configure AtoN station 3	Set and verify own MMSI = ID3		N/A
	Set and verify parent MMSI = ID1		N/A
d) Send Message 25 broadcast, FI = 12 (CBR configuration) from base station to AtoN 3: Source ID = Base station ID, MMSI of AtoN = ID3			
AtoN 1 Retransmission	Check that AtoN 1 retransmits the configuration message	Not implemented	N/A
	Check that Source ID = ID1		N/A
	Check that MMSI of AtoN = ID3		N/A
	Check content of the retransmitted message		N/A
AtoN 2	Check that AtoN 2 does not retransmits the configuration message		N/A
e) Query AtoN 1, 2 and 3 for CBR using PI port sentences			
AtoN 1	Check that the CBR configuration is not changed	Not implemented	N/A
AtoN 2	Check that the CBR configuration is not changed		N/A
AtoN 3	Check that the new configuration is correctly stored		N/A

10.03.2020		Test details - Test with 3 AtoN stations	
Test item	Check	Remark	Result
f) Send Message 25 broadcast, FI = 14 (Query for CBR config.), from base station to AtoN 3: Source ID = Base station ID, MMSI of AtoN = ID3			
AtoN 1 Retransmission of query	Check that AtoN 1 retransmits the query message	Not implemented	N/A
	Check that Source ID = ID1		N/A
	Check that MMSI of AtoN = ID3		N/A
	Check content of the query message		N/A
AtoN 2	Check that AtoN 2 does not retransmit the query message		N/A
	Check that AtoN 2 does not transmit a response message		N/A
AtoN 3 Transmission of response	Check that AtoN 3 transmits the response message		N/A
	Check Source ID = ID3		N/A
	Check MMSI of AtoN = ID3		N/A
	Check content of requested message	Not implemented	N/A
AtoN 2	Check that AtoN 2 does not retransmit the response to the base station		N/A
AtoN 1 Retransmission of response	Check that AtoN 1 retransmits the response to the base station		N/A
	Check Source ID = ID1		N/A
	Check MMSI of AtoN = ID3		N/A
	Check content of response message		N/A

2.7.7.6 8.7.7.6 Chaining test with Message 6

8.7.7.6.1 Purpose

The purpose of this test is to verify the basic chaining functions with Message 6 instead of Message 25. The test layout of 8.7.7.5 shall be used. It is assumed that the units are already configured according to the layout of 8.7.7.5.

8.7.7.6.2 Method of measurement

The measurement procedure shall be as follows:

- a) send a configuration message from the base station to AtoN 3 via the chain, source ID = base, destination ID = ID1 and MMSI of AtoN = ID3;
- b) query the configuration of AtoN 1, AtoN 2 and AtoN 3 using PI port sentences;
- c) send a query message for the applied configuration from the base station to AtoN 3 via the chain, source ID = base, destination ID = ID1 and MMSI of AtoN = ID3.

8.7.7.6.3 Required results

Verify that:

- a) AtoN 1 retransmits the configuration message, source ID = ID1, destination ID = 0 and MMSI of AtoN = ID3. Verify that AtoN 2 does not retransmit the configuration message;
- b) the configuration of AtoN 1 and AtoN 2 is not affected and that AtoN 3 has accepted and stored the new configuration;
- c) AtoN 1 retransmits the query message, source ID = ID1, destination ID = 0 and MMSI of AtoN = ID3. Verify that AtoN 3 responds with the requested message, source ID = ID3, destination ID = ID1 and MMSI of AtoN = ID3. Verify that AtoN 2 does not respond on the query message. Verify that AtoN 2 does not retransmit the response message. Verify that AtoN 1 retransmits the response message, source ID = ID1, destination ID = base and MMSI of AtoN = ID3. Verify the content of the response message transmitted by AtoN 1.

10.03.2020		Test details - Chaining test with Message 6	
Test item	Check	Remark	Result
Test is performed with a base station and three AtoN stations according to the test scenario of test 8.7.7.5.			
a) Send Message 16, FI = 12 (CBR configuration) from base station to AtoN 3: Source ID = Base station ID, destination = 0, MMSI of AtoN = ID3			
AtoN 1 Retransmission	Check that AtoN 1 retransmits the configuration message	Not implemented	N/A
	Check that Source ID = ID1		N/A
	Check destination = 0		N/A
	Check that MMSI of AtoN = ID3		N/A
	Check content of the retransmitted message		N/A
AtoN 2	Check that AtoN 2 does not retransmits the configuration message		N/A
b) Query AtoN 1, 2 and 3 for CBR using PI port sentences			
AtoN 1	Check that the CBR configuration is not changed	Not implemented	N/A
AtoN 2	Check that the CBR configuration is not changed		N/A
AtoN 3	Check that the new configuration is correctly stored		N/A
c) Send Message 6, FI = 14 (Query for CBR config.), from base station to AtoN 3: Source ID = Base station ID, Destination ID = ID1, MMSI of AtoN = ID3			
AtoN 1 Retransmission of query	Check that AtoN 1 retransmits the query message	Not implemented	N/A
	Check that Source ID = ID1		N/A
	Check destination = 0		N/A
	Check that MMSI of AtoN = ID3		N/A
	Check content of the query message		N/A
AtoN 2	Check that AtoN 2 does not retransmit the query message	Not implemented	N/A
	Check that AtoN 2 does not transmit a response message		N/A
AtoN 3 Transmission of response	Check that AtoN 3 transmits the response message	Not implemented	N/A
	Check Source ID = ID3		N/A
	Destination ID = ID1		N/A
	Check MMSI of AtoN = ID3		N/A
	Check content of requested message		N/A
AtoN 2	Check that AtoN 2 does not retransmit the response to the base station	Not implemented	N/A
AtoN 1 Retransmission of response	Check that AtoN 1 retransmits the response to the base station		N/A
	Check Source ID = ID1		N/A
	Destination = base station ID		N/A
	Check MMSI of AtoN = ID3		N/A
	Check content of response message		N/A

2.8 8.8 BIIT

8.8.1 Purpose

The purpose of this test is to prove the correct response by the EUT to its BIIT.

8.8.2 Method of measurement

Set up the standard test environment and operate the EUT in normal mode.

- a) *Disconnect the antenna from the EUT.*
- b) *Check the documentation for Tx malfunction*
- c) *Check the documentation for a fault of the channel 1 receiver (not applicable for type 1).*
- d) *Check the documentation for a fault of the channel 2 receiver (not applicable for type 1).*
- e) *Disable the augmentation system, if fitted.*

8.8.3 Required results

Verify that:

- a) *EUT shall cease transmission, an ADS sentence is output with the alarm status = A, if implemented an ALR sentence with alarm ID = 002 shall be output;*
- b) *EUT shall cease transmission, an ADS sentence is output with the alarm status = A, if implemented an ALR sentence with alarm ID = 001 shall be output;*
- c) *EUT shall cease transmission on channel 1, the AtoN health bit shall be set to 1, an ADS sentence is output with the alarm status = A, if implemented an ALR sentence with alarm ID = 003 shall be output;*
- d) *EUT shall cease transmission on channel 2, the AtoN health bit shall be set to 1, an ADS sentence is output with the alarm status = A, if implemented an ALR sentence with alarm ID = 004 shall be output;*
- e) *EUT shall continue transmission, the AtoN health bit shall be set to 1, an ADS sentence is output with the alarm status = A, if implemented an ALR sentence with alarm ID = 038 shall be output.*

10.03.2020		Test details - BIIT test	
Test item	Check	Remark	Result
This test is performed with EUT No. 3 because of the special preparations.			
a) Disconnect VHF antenna	Check that EUT ceases transmission	Covered by Test-Report: BSH/4542/001/4323111/18-1, Test 10.7.1 "Built in integrity test"	Passed
	Check that the alarm status in ADS is set to "A"		Passed
	Check that an ALR ID 002 is output, if implemented		Passed
b) Tx malfunction Check manufacturer's documentation	Check that EUT ceases transmission		Passed
	Check that the alarm status in ADS is set to "A"		Passed
	Check that an ALR ID 003 is output, if implemented		Passed
Only applicable for Type 3			
c) Channel 1 Receiver malfunction Check manufacturer's documentation	Check that EUT ceases transmission on channel 1	Covered by Test-Report: BSH/4542/001/4323111/18-1, Test 10.7.1 "Built in integrity test"	Passed
	Check that the AtoN health bit of the AtoN status in Msg 21 is set to 1		Passed
	Check that the alarm status in ADS is set to "A"		Passed
	Check that an ALR ID 003 is output, if implemented		Passed
d) Channel 2 Receiver malfunction Check manufacturer's documentation	Check that EUT ceases transmission on channel 2		Passed
	Check that the AtoN health bit of the AtoN status in Msg 21 is set to 1		Passed
	Check that the alarm status in ADS is set to "A"		Passed
	Check that an ALR ID 004 is output, if implemented		Passed
If an augmentation system is implemented			
d) Disable the augmentation system. Check manufacturer's documentation	Check that EUT continues transmission	Covered by Test-Report: BSH/4542/001/4323111/18-1, Test 10.7.1 "Built in integrity test"	Passed
	Check that the AtoN health bit of the AtoN status in Msg 21 is set to 1		Passed
	Check that the alarm status in ADS is set to "A"		Passed
	Check that an ALR ID 038 is output, if implemented		Passed

2.9 8.9 Transmitter shutdown procedure

8.9.1 Purpose

The purpose of this test is to verify that the transmitter has an automatic shutdown.

8.9.2 Method of measurement

Review the manufacturer's declaration.

8.9.3 Required results

The manufacturer shall provide a declaration in the documentation that states the EUT will function as required.

10.03.2020	Test details - Transmitter shutdown procedure		
Test item	Check	Remark	Result
Check documentation	Covered by Test-Report: BSH/4542/001/4323111/18-1, Test 10.7.3		Passed

2.10 8.10 Power supply

8.10.1 Purpose

The purpose of this test is to ensure that the power consumption of the AIS AtoN Station is as stated in the manufacturer's documentation.

8.10.2 Method of measurement

Set up the standard test environment and operate the EUT in normal mode. Configure reporting of Message 21 to have the following parameters:

- transmit power level: 12,5 W, or the manufacturer's declared level;
- Channel 1 slots: 512 and 513;
- Channel 2 slots: 612 and 613;
- reporting interval: 3 min.

The test shall be run for 30 min with 10 full duty cycles to measure the average power consumption.

Optionally, repeat the test for RATDMA for the same transmit power and reporting interval.

8.10.3 Required results

Verify that for 10 full duty cycles, the average power consumption of the EUT does not exceed 110 % of the value stated in the manufacturer's documentation.

10.03.2020	Test details - Average power consumption		
Test item	Check	Remark	Result
Average power consumption			
FATDMA mode	Measured value	See: Waiver-Declaration of Manufacturer for Power supply	Passed
	Compare measured values with the average power consumption		Passed
RATDMA mode	Measured value	See: -Declaration of Manufacturer for Power supply	Passed
	Compare measured values with the average power consumption		Passed

2.11 8.11 Environmental tests

Tests shall be done in accordance with IEC 60945, 'Durability and resistance to environmental conditions'; Protected or Exposed, or as defined by manufacturer.

2.12 8.12 External removable media

8.12.1 Purpose

To ensure the number of external connection points are minimized and protected.

8.12.2 Method of measurement

Review manufacturer's documentation.

8.12.3 Required results

Refer to the device manufacturer's documentation and confirm by inspection of the documented evidence that the number of connection points for REDS (USB ports, disc drives, etc.) are those required by the manufacturer for operation, lifetime maintenance and support.

Confirm by observation that all other connection points are blocked or disabled in accordance with the information provided by the manufacturer.

2.13 8.13 Other tests

2.13.1 8.13.1 Quality assurance

The manufacturer shall declare the quality assurance standard to which the EUT is manufactured.

10.03.2020	Test details - Quality assurance		
Test item	Check	Remark	Result
Check manufacturers documentation	ISO 9001:2015 Zertifikat		Passed

2.13.2 8.13.2 Additional features

The manufacturer shall declare any additional features of the EUT. These features are not tested in accordance with this standard. The manufacturer's declaration shall confirm that additional features, including position accuracy augmentation, do not adversely affect Message 21 transmissions.

10.03.2020	Test details - Additional features		
Test item	Check	Remark	Result
Check documentation	No additional features		N/A

2.13.3 8.13.3 Manual

The manual shall include information concerning:

- external connectors, if applicable;
- correct installation of the unit and antennae;
- configuration;
- power consumption;
- firmware upgrades, if applicable;
- configuration interface, including hardware and electrical details.

10.03.2020	Test details – Requirements of IEC 62320-2		
Test item	Check	Remark	Result
Connectors	Check that a description of the external connectors is included		Passed
	Check that information about the pin-out is provided		Passed
Installation information	Check that information about siting the GPS antenna is included		Passed
	Check that information about siting the VHF antenna is included		Passed
	Check that mechanical dimension drawings of transponder are available		Passed
	Check that mechanical dimension drawings of GPS antenna are available		Passed
	Check that mechanical dimension drawings of VHF antenna are available if provided		Passed
Configuration	Check that information about configuration is included		Passed
Power consumption	Check that information about power consumption in FATDMA mode is provided		Passed
	Check that information about power consumption in RATDMA mode is provided		Passed
Firmware upgrade	Check that information about firmware upgrade is provided		Passed
Configuration interface	Check that information about configuration sentences is provided		Passed
	Check that information about configuration interface hardware is provided		Passed
	Check that electrical details of the configuration interface is provided.		Passed

2.13.4 8.13.4 Marking and identification

Verify that marking and identification complies with 5.4.3.

10.03.2020	Test details - Marking and identification		
Test item	Check	Remark	Result
Check that the marking and labeling includes:	Identification of the manufacturer	See Annex C.1.3	Passed
	Model identification	See Annex C.1.3	Passed
	Serial number	See Annex C.1.3	Passed
	Operating voltage	See Annex C.1.3	Passed
	Software version	2.0.0	Passed

Annex A Test equipment

A.1 Test equipment summary

#	description	type	identification
1	VDL Analyser / Generator	AIS Test unit MKII	S/N AA08PN Bund BSH/2012, 7200002112 BSH PC10745 SW AISterm V1.0rev47 AISmain V1.47011120R
2	Target simulator software	Furuno Navintra	BSH PC 9169
3	Presentation Interface Monitor	BSH	BSH PC 8441 BSH PC 9457 SW NewMoni V3.1
4	GMDSS-AIS-Testbox (DSC)	Futronic I/S	200 30 405
5	16 Port Serial Device Server	Moxa DE-303	06698, BSH Nr. 6084
6	Connection box for Moxa serial server With 8 converters RS 232 to RS 422	----	----
7	Active retransmitting GPS antenna	RA - 48	4800199
8	Trimble GPS reference receiver	4000RS, Part number 21000-76	S/N 3428A06700
	Auxiliaries:		
9	RMS Multimeter DMM 916	Tektronix	S/N 138531
10	2-Kanal-Digital-Oszilloskop	Le Croy Wavesurfer 422	LCRY 0301 J 15673
11	Unbalanced Standard Attenuator	Rhode & Schwarz DPR BN 18024/50	BUND KK 11201
12	2 fixed voltage power supply (24 V/10A)	SITOP	BUND 102452, 102453
13	1 fixed voltage power supply (12 V/4,5A)	Siemens	
14	2 adjustable power supplies (30 V/5 A)	PS 405 D	S/N 2737, 2768

Reserve equipment

#	description	type	identification
15	VDL Analyser / Generator	AIS equipment tester	S/N 218 Bund 102710/2002 Prüfgerät Nr. 1
16	VDL Analyser / Generator	AIS equipment tester	Prüfgerät Nr. 2

A.1.1 VDL Analyser / Generator

The VDL analyser/generator:

- receives the radio data telegrams transmitted by the AIS under test, slotwise evaluates their radio parameters (field strength, SNR, etc.) and provides a transparent display of the decoded radio data telegrams (VDL messages).
- transmits radio data telegrams which have been entered/edited via a control panel. The AIS under test receives these messages and either passes the received data to its presentation interface and/or responds as appropriate.
- records all data contained in the received radio telegrams and radio parameters in a data base for offline evaluation and documentation purposes.
- simulates AIS targets by transmitting position reports of virtual targets up to the maximum channel capacity of 100% channel load on both channels (4500 messages / minute). The data are provided via serial interface to the VDL analyser/Generator.

A.1.2 Target simulator

The target simulator consists of a standard PC with a special AIS Target Simulator software.

For tests of AIS transponders the data of up to 75 moving targets defined in text file in plain language are transferred to the „TS“ input of the VDL Analyser/ Generator as VDM sentences and transmitted on the VHF data link (VDL) . Thus the AIS VHF data link is loaded with simulated AIS targets in fixed slots or in slots selected by the VDL Analyser/Generator.

A.1.3 Presentation Interface Monitor

The Presentation Interface Monitor is a PC software running on four standard PCs. It is used to

- analyse the AIS high speed input / output
- analyse the AIS long range function
- generate DSC calls for the DSC test box and to display, log and evaluate the received DSC calls from EUT.

For that purpose it includes the functions:

- coding / decoding of NMEA 6-bit data fields
- online AIS message filtering
- online AIS message editing
- load and transmit predefined sequences
- online modification of transmitted sequences

A.1.4 Sensor Data Simulator

The Sensor Data Simulator provides simulated sensor data to the serial sensor data inputs of the EUT. The sensor data are provided in text files to the Sensor Data Simulator which modifies the sensor data sentences e.g. adding the actual UTC time, modify some time-varying data and by adding a checksum.

The Sensor Data Simulator is basically the same software as the Presentation Interface Monitor using a special part of the functionality of the software.

A.1.5 DSC Testbox

The DSC test box is a standard GMDSS-AIS Test box used for the survey of ship stations.

For the DSC testing of AIS equipment it includes a software extension that provides a remote control input/output facility

- to transmit DSC calls according to ITU 825-3 generated in an external PC on DSC channel 70 and
- to output received DSC calls from the EUT to the external PC.

A special PC software is used to generate the DSC calls and to display, log and evaluate received DSC calls. It communicates via the serial remote control interface to the DSC Testbox.

A.1.6 Serial Interface Server

The Serial Interface Server provides 16 serial lines which can be connected in a flexible way to the EUT and to equipment of the test environment like the DSC Testbox.

The Serial Interface Server is connected to the controlling PCs via Ethernet Network. It includes:

- 8 serial lines according to RS-422 and IEC 61162-1/2
- 8 serial lines according to RS-232

A.1.7 Laboratory Network

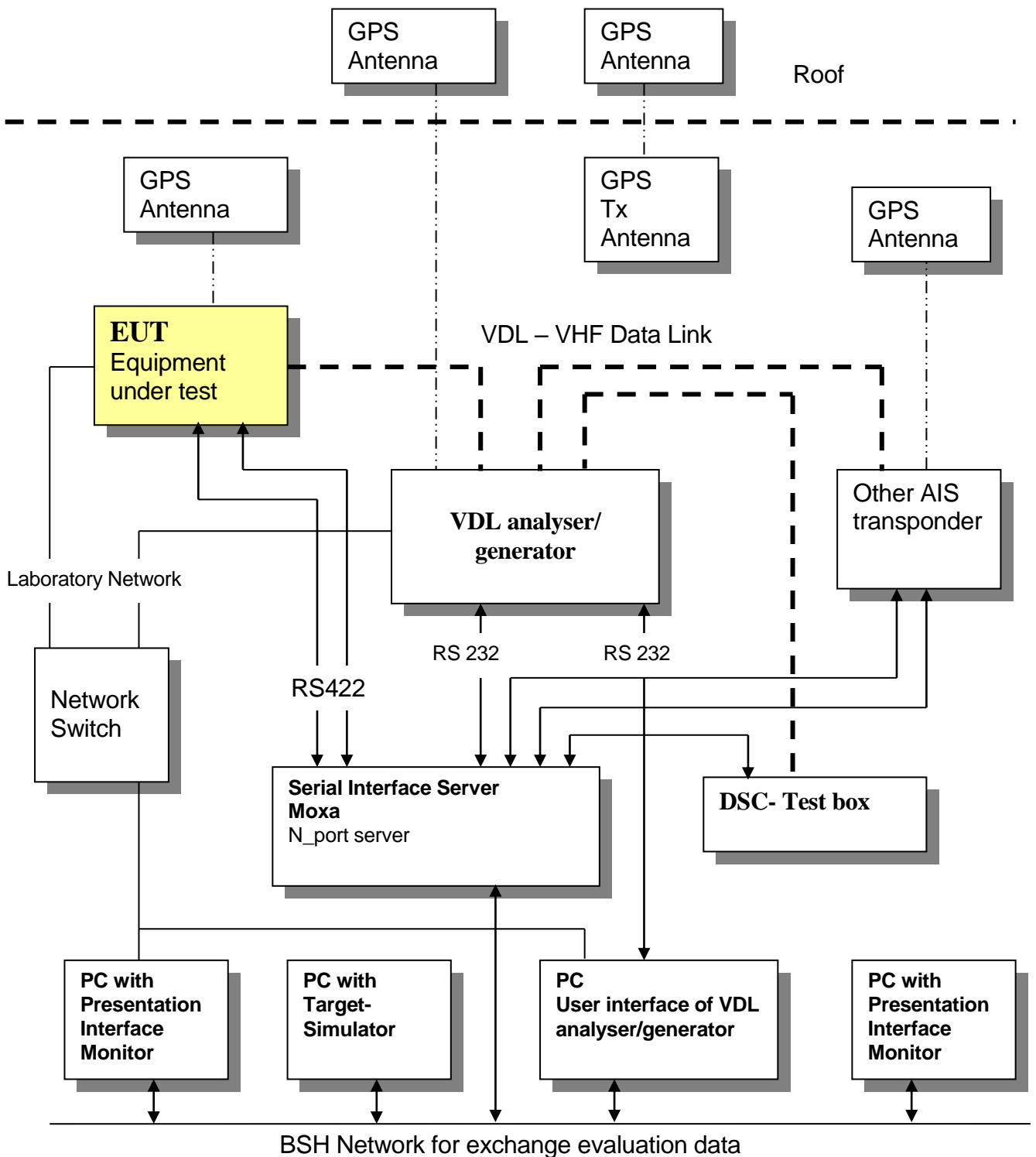
A special laboratory network connect controlling PCs with equipment of the test environment (VDL Generator/ analyser) and with EUT if equipped with an ethernet interface.

A.1.8 GPS Retransmitter

All AIS equipment includes a GPS receiver for the exact timing and for getting position and speed information.

To avoid the need to connect all AIS equipment to GPS antennas outside the laboratory a re-transmitting GPS antenna is installed in the lab. It amplifies and radiates a GPS signal in the laboratory which is received by active GPS antenna on the roof.

A.2 Test environment overview



A.3 Test sentences

A.4 IEC 61162 test sentences

Many of the test sentences are modified manually during the test according to the requirements of the actual test items.

Mainly the MMSI in all addressed sentences are adapted to the actual MMSI of the EUT or of the unit the EUT communicates with.

A.4.1 General configuration

General configuration sentences	
File name	Description
Sentences	
Test_8_1_1_AID.SST	Setting real AtoN MMSI
\$VTAID,000000000,1,990123456,R,C	
Test_8_1_2_AID_virtual_MMSI_4.SST	Setting 4 virtual AtoN MMSIs
\$VTAID,990123456,1,990111111,V,C	
\$VTAID,990123456,1,990222222,V,C	
\$VTAID,990123456,1,990333333,V,C	
\$VTAID,990123456,1,990444444,V,C	
Test_8_1_2_AID_virtual_MMSI_4_delete.SST	Deleting the 4 virtual AtoNs
\$VTAID,990123456,0,990111111,V,C	
\$VTAID,990123456,0,990222222,V,C	
\$VTAID,990123456,0,990333333,V,C	
\$VTAID,990123456,0,990444444,V,C	
Test_8_1_1_ACF_ACE.SST	Standard ACF/ACE config of real AtoN
\$VTACF,990123456,1,5332.8200,N,00958.1000,E,0,2084,2086,2084,2086,0,20,0,C	
\$VTACE,990123456,00,0200,0,0,1,TEST FLOATING AIS ATON STATION,0050050505,C	
Test_8_1_1_ACF_ACE_synthetic.SST	ACF/ACE config of a synthetic AtoN
\$VTACF,990111111,7,5332.0000,N,01000.0000,E,0,2084,2086,2084,2086,0,21,2,C	
\$VTACE,990111111,00,0200,0,0,1,SYNTHETIC ATON STATION,0040040404,C	
Test_8_1_1_ACF_ACE_virtual.SST	ACF/ACE config of a virtual AtoN
\$VTACF,990111111,7,5332.0000,N,01000.0000,E,0,2084,2086,2084,2086,0,21,1,C	
\$VTACE,990111111,00,0200,0,0,1,VIRTUAL ATON STATION,0040040404,C	
Test_8_3_1_ACF_surveyed.SST	Setting surveyed position source
\$VTACF,990123456,7,5332.8200,N,00958.1000,E,1,2084,2086,2084,2086,0,20,0,C	

A.4.2 Transmission schedules

Message 21 configuration sentences	
File name	Description
Sentences	
Test_8_1_2_CBR_FATDMA_A.SST	FATDMA Mode A transmission schedule, 3 min interval
\$VTCBR,990123456,21,01,06,04,512,13500,0,06,01,512,13500,C	
Test_8_1_3_CBR_FATDMA_B.SST	FATDMA Mode B transmission schedule, 3 min interval
\$VTCBR,990123456,21,01,06,02,512,6750,0,06,02,612,6750,C	
Test_8_1_4_CBR_FATDMA_C.SST	FATDMA Mode C transmission schedule, 3 min interval
\$VTCBR,990123456,21,01,,, -1,,0,10,01,612,6750,C	
Test_8_1_5_CBR_RATDMA_A.SST	RATDMA Mode A transmission schedule, 3 min interval
\$VTCBR,990123456,21,01,06,01,400,360,1,06,04,400,360,C	
Test_8_1_6_CBR_RATDMA_B.SST	RATDMA Mode B transmission schedule, 3 min interval
\$VTCBR,990123456,21,01,06,01,400,180,1,06,04,500,180,C	
Test_8_1_7_CBR_RATDMA_C.SST	RATDMA Mode C transmission schedule, 3 min interval
\$VTCBR,990123456,21,00,06,01,-1,,1,06,04,500,180,C	
CBR_Remove_21_1.SST	Deleting Message 21 transmission schedule
\$VTCBR,990123456,21,01,12,02,-1,,0,12,01,-1,,C	

Message 6 configuration sentences	
File name	Description
Sentences	
Test_8_1_8_CBR_FATDMA_A.SST	FATDMA Mode A transmission schedule, 3 min interval
\$VT CBR, 990123456, 06, 01, 06, 04, 600, 13500, 0, 06, 01, 600, 13500, C	
Test_8_1_8_CBR_FATDMA_B.SST	FATDMA Mode B transmission schedule, 3 min interval
\$VT CBR, 990123456, 06, 01, 06, 02, 600, 6750, 0, 06, 02, 700, 6750, C	
Test_8_1_8_CBR_FATDMA_C	FATDMA Mode C transmission schedule, 3 min interval
\$VT CBR, 990123456, 06, 01, , , -1, , 0, 06, 01, 600, 6750, C	
Test_8_1_8_CBR_RATDMA_A.SST	RATDMA Mode A transmission schedule, 3 min interval
\$VT CBR, 990123456, 06, 01, 06, 02, 600, 360, 1, 06, 05, 600, 360, C	
Test_8_1_8_CBR_RATDMA_B.SST	RATDMA Mode B transmission schedule, 3 min interval
\$VT CBR, 990123456, 06, 01, 06, 02, 600, 180, 1, 06, 02, 700, 180, C	
Test_8_1_8_CBR_RATDMA_C.SST	RATDMA Mode C transmission schedule, 3 min interval
\$VT CBR, 990123456, 06, 01, 06, 02, 600, 180, 1, 06, 02, -1, , C	
Test_8_1_8_MEB.SST	Providing content of message 6 using MEB
\$VT MPR, 990123456, 06, 01, 0, 01, 01, OSfGjwp, C	
Test_8_1_8_MEB.SST	Providing content of message 6 using MEB
\$VT MEB, 1, 1, 3, 0, 990123456, 06, 01, 0, 000001028, 1, C, OSfGjwp, 0	
Test_8_1_8_CBR_delete_6.SST	Deleting Message 6 transmission schedule
VT CBR, 990123456, 06, 01, 06, 04, -1, , 0, 06, 01, -1, , C	
Test_8_1_8_MEB_long_65byte.SST	Content for a too long message 6
\$VT MPR, 990123456, 06, 01, 0, 03, 01, OSdt?Wqv>khvOWps?3qvOSdt?Wqv>khvOWps?3qv, C	
\$VT MPR, 990123456, 06, 01, 0, 03, 02, OSdt?Wqv>khvOWps?3qvOSdt?Wqv>khvOWps?3qv, C	
\$VT MPR, 990123456, 06, 01, 0, 03, 03, OSdt?W, C	

Message 8 configuration sentences	
File name	Description
Sentences	
Test_8_1_10_CBR_FATDMA_A.SST	FATDMA Mode A transmission schedule, 3 min interval
\$VTCBR,990123456,08,01,06,04,800,13500,0,06,01,800,13500,C	
Test_8_1_10_CBR_FATDMA_B.SST	FATDMA Mode B transmission schedule, 3 min interval
\$VTCBR,990123456,08,01,06,02,800,6750,0,06,02,900,6750,C	
est_8_1_10_CBR_FATDMA_C.SST	FATDMA Mode C transmission schedule, 3 min interval
\$VTCBR,990123456,08,01,,, -1,,0,06,01,800,6750,C	
Test_8_1_10_CBR_RATDMA_A.SST	RATDMA Mode A transmission schedule, 3 min interval
\$VTCBR,990123456,08,01,06,03,800,360,1,06,06,800,360,C	
Test_8_1_10_CBR_RATDMA_B.SST	RATDMA Mode B transmission schedule, 3 min interval
\$VTCBR,990123456,08,01,06,03,800,180,1,06,03,900,180,C	
Test_8_1_10_CBR_RATDMA_C.SST	RATDMA Mode C transmission schedule, 3 min interv
\$VTCBR,990123456,08,01,06,03,900,180,1,06,03,-1,,C	
Test_8_1_10_CBR_delete.SST	Deleting Message 8 transmission schedule
\$VTCBR,990123456,08,01,06,04,-1,,0,06,01,-1,,C	
Test_8_1_10_MEB.SST	Providing content of message 8 using MEB
\$VTMPR,990123456,08,01,0,01,01,OSfGjwp,C	
Test_8_1_10_MEB.SST	Providing content of message 8 using MEB
\$VTMEB,1,1,3,0,990123456,08,01,0,,1,C,OSfGjwp,0	
Test_8_1_10_MEB_long_69.SST	Content for a too long message 8
\$VTMPR,990123456,08,01,0,03,01,OSdt?Wqv>khvOWps?3qvOSdt?Wqv>khvOWps?3qv,C	
\$VTMPR,990123456,08,01,0,03,02,OSdt?Wqv>khvOWps?3qvOSdt?Wqv>khvOWps?3qv,C	
\$VTMPR,990123456,08,01,0,03,03,OSdt?Wqv>khv,C	

Message 12 configuration sentences	
File name	Description
Sentences	
Test_8_1_11_CBR_FATDMA_A.SST	FATDMA Mode A transmission schedule, 3 min interval
\$VTCBR,990123456,12,01,06,04,1200,13500,0,06,01,1200,13500,C	
Test_8_1_11_CBR_FATDMA_B.SST	FATDMA Mode B transmission schedule, 3 min interval
\$VTCBR,990123456,12,01,06,02,1200,6750,0,06,02,1300,6750,C	
Test_8_1_11_CBR_FATDMA_C.SST	FATDMA Mode C transmission schedule, 3 min interval
\$VTCBR,990123456,12,01,,, -1,,0,06,01,1200,6750,C	
Test_8_1_11_CBR_RATDMA_A.SST	RATDMA Mode A transmission schedule, 3 min interval
\$VTCBR,990123456,12,01,06,03,1200,360,1,06,06,1200,360,C	
Test_8_1_11_CBR_RATDMA_B.SST	RATDMA Mode B transmission schedule, 3 min interval
\$VTCBR,990123456,12,01,06,02,1200,180,1,06,02,1300,180,C	
Test_8_1_11_CBR_RATDMA_C.SST	RATDMA Mode C transmission schedule, 3 min interv
\$VTCBR,990123456,12,01,06,01,1200,180,1,06,01,-1,,C	
Test_8_1_11_CBR_delete_12.SST	Deleting Message 12 transmission schedule
\$VTCBR,990123456,12,01,06,04,-1,,0,06,01,-1,,C	
Test_8_1_11_MEB.SST	Providing content of message 12 using MEB
\$VTMPR,990123456,12,01,0,01,01,=5CC175P6B?=P1D?>,C	
Test_8_1_11_MEB.SST	Providing content of message 12 using MEB
\$VTMEB,1,1,3,0,990123456,12,01,0,000001028,0,C,=5CC175P6B?=P1D?>,0	
Test_8_1_11_MEB_too_long_88_char.SST	Content for a too long message 12
\$VTMPR,990123456,12,01,0,03,01,OSdt?Wqv>khvOWps?3qvOSdt?Wqv>khvOWps?3qv,C	
\$VTMPR,990123456,12,01,0,03,02,OSdt?Wqv>khvOWps?3qvOSdt?Wqv>khvOWps?3qv,C	
\$VTMPR,990123456,12,01,0,03,03,OSdt?Wqv,C	

Message 14 configuration sentences	
File name	Description
Sentences	
Test_8_1_12_CBR_FATDMA_A.SST	FATDMA Mode A transmission schedule, 3 min interval
\$VTCBR,990123456,14,01,06,04,1400,13500,0,06,01,1400,13500,C	
Test_8_1_12_CBR_FATDMA_B.SST	FATDMA Mode B transmission schedule, 3 min interval
\$VTCBR,990123456,14,01,06,02,1400,6750,0,06,02,1500,6750,C	
Test_8_1_12_CBR_FATDMA_C.SST	FATDMA Mode C transmission schedule, 3 min interval
\$VTCBR,990123456,14,01,,, -1,,0,10,01,1400,6750,C	
Test_8_1_12_CBR_RATDMA_A.SST	RATDMA Mode A transmission schedule, 3 min interval
\$VTCBR,990123456,14,01,06,03,1400,360,1,06,06,1400,360,C	
Test_8_1_12_CBR_RATDMA_B.SST	RATDMA Mode B transmission schedule, 3 min interval
\$VTCBR,990123456,14,01,06,02,1400,180,1,06,02,1500,180,C	
Test_8_1_12_CBR_RATDMA_C.SST	RATDMA Mode C transmission schedule, 3 min interv
\$VTCBR,990123456,14,01,06,01,-1,,1,06,03,1500,180,C	
Test_8_1_12_CBR_delete.SST	Deleting Message 14 transmission schedule
\$VTCBR,990123456,14,01,06,04,-1,,0,06,01,-1,,C	
Test_8_1_12_MEB.SST	Providing content of message 14 using MEB
\$VTMPR,990123456,14,01,0,01,01,=5CC175P6B?=P1D?>P6?BP1<<,C	
Test_8_1_12_MEB.SST	Providing content of message 146 using MEB
\$VTMEB,1,1,3,0,990123456,14,01,0,,0,C,=5CC175P6B?=P1D?>P6?BP1<<,0	
Test_8_1_12_MEB_long_92_char.SST	Content for a too long message 14
\$VTMPR,990123456,14,01,0,03,01,OSdt?Wqv>khvOWps?3qvOSdt?Wqv>khvOWps?3qv,C	
\$VTMPR,990123456,14,01,0,03,02,OSdt?Wqv>khvOWps?3qvOSdt?Wqv>khvOWps?3qv,C	
\$VTMPR,990123456,14,01,0,03,03,OSdt?Wqv>khv,C	

A.4.3 Virtual/synthetic targets

Configuration of virtua/synthetic targets	
File name	Description
Sentences	
Test_8_1_2_AID_synth_MMSI.SST	Configuration of a synthetic AtoN MMSI
\$VTAID,990123456,1,990555555,V,C	
Test_8_1_2_AID_virtual_MMSI.SST	Configuration of a virtual AtoN MMSI
\$VTAID,990123456,1,990111111,V,C	
Test_8_1_2_AID_virtual_MMSI_4.SST	Configuration of 4 virtual AtoN MMSIs
\$VTAID,990123456,1,990111111,V,C	
\$VTAID,990123456,1,990222222,V,C	
\$VTAID,990123456,1,990333333,V,C	
\$VTAID,990123456,1,990444444,V,C	

Test 8_1_2_AID_virtual_MMSI_4_delete.SST	Removing of 4 virtual AtoN MMSIs
\$VTAID,990123456,0,990111111,V,C	
\$VTAID,990123456,0,990222222,V,C	
\$VTAID,990123456,0,990333333,V,C	
\$VTAID,990123456,0,990444444,V,C	
Test 8_1_1_ACF_ACE_synthetic.SST	ACF/ ACE configuration of a synthetic AtoN
\$VTACF,990555555,7,5332.0000,N,01000.0000,E,0,2084,2086,2084,2086,0,03,2,C	
\$VTACE,990555555,00,0200,0,0,1,SYNTHETIC ATON STATION,0050050505,C	
Test 8_1_1_ACF_ACE_virtual.SST	ACF/ ACE configuration of a virtual AtoN
\$VTACF,990111111,7,5332.0000,N,01000.0000,E,0,2084,2086,2084,2086,0,21,1,C	
\$VTACE,990111111,00,0200,0,0,1,VIRTUAL ATON STATION,0040040404,C	
Test 8_1_1_ACF_ACE_4_virt.SST	ACF/ ACE configuration of 4 virtual AtoNs
\$VTACF,990111111,7,5332.1000,N,01000.1000,E,1,,,,,21,1,C	
\$VTACE,990111111,00,0000,0,0,1,TEST_VIRTUAL_AIS_ATON_STATION1,0010010101,C	
\$VTACF,990222222,7,5332.2000,N,01000.2000,E,1,,,,,22,1,C	
\$VTACE,990222222,00,0000,0,0,1,TEST_VIRTUAL_AIS_ATON_STATION2,0020020202,C	
\$VTACF,990333333,7,5332.3000,N,01000.3000,E,1,,,,,23,1,C	
\$VTACE,990333333,00,0000,0,0,1,TEST_VIRTUAL_AIS_ATON_STATION3,0030030303,C	
\$VTACF,990444444,7,5332.4000,N,01000.4000,E,1,,,,,24,1,C	
\$VTACE,990444444,00,0000,0,0,1,TEST_VIRTUAL_AIS_ATON_STATION4,0040040404,C	
Test 8_1_7_CBR_FATDMA_synth_target.SST	FATDMA Tx schedule of a synthetic AtoN
\$VTACBR,990555555,21,01,06,02,2012,4500,0,06,03,2012,4500,C	
Test 8_1_7_CBR_FATDMA_4_virt_targets.SST	FATDMA Tx schedule 4 virtual AtoNs, diff. modes
\$VTACBR,990111111,21,01,06,04,1512,13500,0,06,01,1512,13500,C	
\$VTACBR,990222222,21,01,06,02,1512,6750,0,06,02,1612,6750,C	
\$VTACBR,990333333,21,01,06,03,1712,6750,0,,, -1,,C	
\$VTACBR,990444444,21,01,,, -1,,0,06,03,1812,6750,C	
Test 8_1_7_CBR_RATDMA_4_virt_targets.SST	RATDMA Tx schedule 4 virtual AtoNs, diff. modes
\$VTACBR,990111111,21,01,06,01,,360,1,06,04,,360,C	
\$VTACBR,990222222,21,01,06,02,,180,1,06,02,,180,C	
\$VTACBR,990333333,21,01,06,03,,180,1,06,03,-1,,C	
\$VTACBR,990444444,21,01,06,03,-1,,1,06,03,,180,C	
Test 8_1_7_CBR_delete_4_virt_targets.SST	Deleting Tx schedules of 4 virtual AtoNs
\$VTACBR,990111111,21,01,12,01,-1,,0,12,01,-1,,C	
\$VTACBR,990222222,21,01,12,01,-1,,0,12,01,-1,,C	
\$VTACBR,990333333,21,01,12,01,-1,,0,12,01,-1,,C	
\$VTACBR,990444444,21,01,12,01,-1,,0,12,01,-1,,C	

A.4.4 Chaining configuration

Configuration of chaining	
File name	Description
Sentences	
AID_main_parent_Base.SST	MMSI configuration of the parent of the main AtoN
\$VTAID,990123456,1,001000005,P,C	
AID_main_child_1.SST	MMSI configuration of the child 1 of the main AtoN
\$VTAID,990123456,1,990123457,C,C	
AID_main_child_2.SST	MMSI configuration of the child 2 of the main AtoN
\$VTAID,990123456,1,990123458,C,C	
AID_child1_parent.SST	MMSI configuration of the parent of the child 1 AtoN
\$VTAID,990123457,1,990123456,P,C	
AID_child1_own.SST	MMSI configuration of the child 1 AtoN
\$VTAID,000000000,1,990123457,R,C	
AID_child1_child.SST	MMSI configuration of the child of the child 1 AtoN
\$VTAID,990123457,1,990123458,C,C	
AID_child1_child_delete.SST	Delete the MMSI of the child AtoN in the Child 1
\$VTAID,990123457,0,990123458,C,C	
AID_child2_parent.SST	MMSI configuration of the parent of the child 2 AtoN
\$VTAID,990123458,1,990123457,P,C	
AID_child2_own.SST	MMSI configuration of the child 2 AtoN
\$VTAID,000000000,1,990123458,R,C	
CBR_FATDMA_ID0_main.SST	FATDMA Tx schedule for the chaining in the main AtoN
\$VTCBR,990123456,0,01,06,01,100,2250,0,06,01,110,2250,C	
CBR_FATDMA_ID0_child1.SST	FATDMA Tx schedule for the chaining in the child 1 AtoN
\$VTCBR,990123457,0,01,06,01,1100,2250,0,06,01,1110,2250,C	
CBR_FATDMA_ID0_delete.SST	Delete the chaining transmission schedule
\$VTCBR,990123456,0,01,06,01,-1,2250,0,06,01,-1,2250,C	



Annex B test diagrams

B.1 Test 8.1.2 Message 21 RATDMA mode A

StartLine		Filter EUT		<input checked="" type="checkbox"/> VDM	<input checked="" type="checkbox"/> VDO	MMSI	Message type		Channel	<input checked="" type="checkbox"/> Org	<input checked="" type="checkbox"/> RI	<input type="checkbox"/> CRC						
No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
129	11:54:05	1	0199	21	991234567	+0346	--	--	--	53° 32,8219 N	009° 58,0997 E	--	--	--	Crc Ok 5	-59	+0375	
130	11:57:02	2	0087	21	991234567	+0346	--	--	--	53° 32,8198 N	009° 58,1034 E	--	--	--	Crc Ok 2	-63	+0225	
131	12:00:01	1	0054	21	991234567	+0344	--	--	--	53° 32,8221 N	009° 58,1018 E	--	--	--	Crc Ok 1	-59	+0425	
132	12:03:03	2	0116	21	991234567	+0344	--	--	--	53° 32,8193 N	009° 58,1018 E	--	--	--	Crc Ok 2	-63	+0225	
133	12:06:05	1	0189	21	991234567	+0344	--	--	--	53° 32,8211 N	009° 58,1035 E	--	--	--	Crc Ok 4	-60	+0400	
134	12:09:02	2	0095	21	991234567	+0346	--	--	--	53° 32,8214 N	009° 58,1020 E	--	--	--	Crc Ok 2	-63	+0250	
135	12:12:01	1	0066	21	991234567	+0346	--	--	--	53° 32,8212 N	009° 58,1027 E	--	--	--	Crc Ok 1	-59	+0375	
136	12:15:01	2	0067	21	991234567	+0344	--	--	--	53° 32,8195 N	009° 58,1052 E	--	--	--	Crc Ok 1	-63	+0275	
137	12:18:01	1	0060	21	991234567	+0346	--	--	--	53° 32,8216 N	009° 58,1020 E	--	--	--	Crc Ok 1	-59	+0400	
138	12:21:05	2	0197	21	991234567	+0341	--	--	--	53° 32,8244 N	009° 58,0988 E	--	--	--	Crc Ok 5	-65	+0250	
139	12:24:04	1	0184	21	991234567	+0344	--	--	--	53° 32,8227 N	009° 58,1012 E	--	--	--	Crc Ok 4	-59	+0425	
140	12:27:01	2	0071	21	991234567	+0344	--	--	--	53° 32,8239 N	009° 58,0984 E	--	--	--	Crc Ok 1	-65	+0225	
141	12:30:04	1	0175	21	991234567	+0344	--	--	--	53° 32,8228 N	009° 58,1023 E	--	--	--	Crc Ok 4	-59	+0400	
142	12:33:03	2	0144	21	991234567	+0344	--	--	--	53° 32,8217 N	009° 58,1020 E	--	--	--	Crc Ok 3	-65	+0225	
143	12:36:05	1	0187	21	991234567	+0346	--	--	--	53° 32,8206 N	009° 58,1018 E	--	--	--	Crc Ok 4	-59	+0425	

B.2 Test 8.1.3 Message 21 FATDMA mode A

No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
147	12:55:13	1	0512	21	991234567	+0344	--	--	--	53° 32,8199 N	009° 58,1030 E	--	--	--	Crc Ok	13	-60	+0375
148	12:58:13	2	0512	21	991234567	+0341	--	--	--	53° 32,8195 N	009° 58,1013 E	--	--	--	Crc Ok	13	-65	+0450
149	13:01:13	1	0512	21	991234567	+0346	--	--	--	53° 32,8173 N	009° 58,0999 E	--	--	--	Crc Ok	13	-59	+0400

No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
155	13:18:26	2	1000	21	991234568	+0341	--	--	--	53° 32,8212 N	009° 58,1016 E	--	--	--	Crc Ok	26	-65	+0450
156	13:19:13	1	0512	21	991234567	+0346	--	--	--	53° 32,8207 N	009° 58,1008 E	--	--	--	Crc Ok	13	-59	+0425
157	13:19:26	1	1000	21	991234568	+0344	--	--	--	53° 32,8206 N	009° 58,1005 E	--	--	--	Crc Ok	26	-60	+0425
158	13:20:26	2	1000	21	991234568	+0339	--	--	--	53° 32,8213 N	009° 58,1021 E	--	--	--	Crc Ok	26	-63	+0425
159	13:21:26	1	1000	21	991234568	+0346	--	--	--	53° 32,8211 N	009° 58,1029 E	--	--	--	Crc Ok	26	-59	+0375

c) Synthetic

```

-----
Message type           : 21
Repeat Indicator       : 1
Source MMSI           : 991234568
AtoN type              : 20
Ships name             : TEST FLOATING AIS AT
PA-Flag                : 0 ; 0=low, 1=high
Longitude              : 009° 58,1010 E
Latitude               : 53° 32,8200 N
Dimension/Ref. A       : 23 ; m
Dimension/Ref. B       : 443 ; m
Dimension/Ref. C       : 23 ; m
Dimension/Ref. D       : 9 ; m
Type of EPFS           : 1 ; 1=GPS, 15=internal
Timestamp              : 26 ; s
Off position indicator : 0 ; 1=Off Position
AtoN status            : 0
RAIM flag              : 0 ; 1 = RAIM in use
Virtual AtoN flag     : 0 ; 1=virtual AtoN
Assigned flag          : 1 ; 1=assigned
Spare                  : 0
AtoN name extension    : ON VIR
  
```

d) Virtual

Display Message [X]

```

Date and time      : 2000-07-24 13:20:26
Channel           : 2
Transmission slot  : 1000
Frequency offset   : +0425
Rx Level          : -63           ; dBm
Start time        : +0339         ; uS
CRC check         : CRC Ok
Message length    : 52 Chars, 312 bit
-----
Message type      : 21
Repeat Indicator  : 0
Source MMSI      : 991234568
AtoN type        : 20
Ships name       : TEST FLOATING AIS AT
PA-Flag          : 0             ; 0=low, 1=high
Longitude        : 009° 58,1021 E
Latitude         : 53° 32,8213 N
Dimension/Ref. A : 23           ; m
Dimension/Ref. B : 443         ; m
Dimension/Ref. C : 23           ; m
Dimension/Ref. D : 9           ; m
Type of EPFS     : 1           ; 1=GPS, 15=internal
Timestamp        : 26         ; s
Off position indicator : 0       ; 1=Off Position
AtoN status      : 0
RAIM flag        : 0           ; 1 = RAIM in use
Virtual AtoN flag : 1         ; 1=virtual AtoN
Assigned flag    : 1           ; 1=assigned
Spare            : 0
AtoN name extension : ON VIR
    
```

No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq
162	13:23:26	1	1000	21	991234568	+0341	--	--	--	53° 32,8210 N	009° 58,1026 E	--	--	--	Crc Ok	26	-59	+0400
163	13:24:26	2	1000	21	991234568	+0341	--	--	--	53° 32,8200 N	009° 58,1010 E	--	--	--	Crc Ok	26	-64	+0400
164	13:25:13	1	0512	21	991234567	+0344	--	--	--	53° 32,8198 N	009° 58,1005 E	--	--	--	Crc Ok	13	-59	+0450
165	13:25:26	1	1000	21	991234568	+0341	--	--	--	53° 32,8197 N	009° 58,1005 E	--	--	--	Crc Ok	26	-60	+0400
166	13:26:26	2	1000	21	991234568	+0344	--	--	--	53° 32,8202 N	009° 58,1011 E	--	--	--	Crc Ok	26	-64	+0400
167	13:27:26	1	1000	21	991234568	+0344	--	--	--	53° 32,8201 N	009° 58,1014 E	--	--	--	Crc Ok	26	-60	+0400
168	13:28:13	2	0512	21	991234567	+0344	--	--	--	53° 32,8202 N	009° 58,1014 E	--	--	--	Crc Ok	13	-65	+0450
169	13:28:26	2	1000	21	991234568	+0344	--	--	--	53° 32,8202 N	009° 58,1016 E	--	--	--	Crc Ok	26	-64	+0450
170	13:29:26	1	1000	21	991234568	+0344	--	--	--	53° 32,8208 N	009° 58,1029 E	--	--	--	Crc Ok	26	-59	+0425
171	13:30:26	2	1000	21	991234568	+0346	--	--	--	53° 32,8216 N	009° 58,1021 E	--	--	--	Crc Ok	26	-64	+0375
172	13:31:13	1	0512	21	991234567	+0344	--	--	--	53° 32,8210 N	009° 58,1017 E	--	--	--	Crc Ok	13	-59	+0400
173	13:31:26	1	1000	21	991234568	+0346	--	--	--	53° 32,8209 N	009° 58,1014 E	--	--	--	Crc Ok	26	-59	+0400
174	13:31:29	2	1100	21	991234569	+0349	--	--	--	53° 32,8208 N	009° 58,1013 E	--	--	--	Crc Ok	29	-63	+0225
175	13:31:32	2	1200	21	991234570	+0346	--	--	--	53° 32,8208 N	009° 58,1013 E	--	--	--	Crc Ok	31	-63	+0200
176	13:31:34	1	1300	21	991234571	+0346	--	--	--	53° 32,8208 N	009° 58,1012 E	--	--	--	Crc Ok	34	-59	+0425
177	13:32:26	2	1000	21	991234568	+0341	--	--	--	53° 32,8212 N	009° 58,1022 E	--	--	--	Crc Ok	26	-64	+0400
178	13:32:29	1	1100	21	991234569	+0344	--	--	--	53° 32,8212 N	009° 58,1022 E	--	--	--	Crc Ok	29	-59	+0400
179	13:32:32	1	1200	21	991234570	+0344	--	--	--	53° 32,8212 N	009° 58,1023 E	--	--	--	Crc Ok	31	-60	+0425
180	13:32:34	2	1300	21	991234571	+0344	--	--	--	53° 32,8212 N	009° 58,1023 E	--	--	--	Crc Ok	34	-63	+0425
181	13:33:26	1	1000	21	991234568	+0344	--	--	--	53° 32,8209 N	009° 58,1023 E	--	--	--	Crc Ok	26	-59	+0400
182	13:33:29	2	1100	21	991234569	+0344	--	--	--	53° 32,8209 N	009° 58,1023 E	--	--	--	Crc Ok	29	-63	+0225
183	13:33:32	2	1200	21	991234570	+0344	--	--	--	53° 32,8209 N	009° 58,1023 E	--	--	--	Crc Ok	31	-65	+0200
184	13:33:34	1	1300	21	991234571	+0341	--	--	--	53° 32,8209 N	009° 58,1022 E	--	--	--	Crc Ok	34	-59	+0400



B.3 Test 8.1.4 Message 21 FATDMA mode B

StartLine <input type="text"/> Filter EUT <input checked="" type="checkbox"/> VDM <input checked="" type="checkbox"/> VDO MMSI <input type="text"/> Message type <input type="text"/> Channel <input type="text"/> <input checked="" type="checkbox"/> Org <input checked="" type="checkbox"/> RI <input type="checkbox"/> CRC																			
No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.	
221	14:05:13	1	0512	21	992110000	+0346	--	--	--	53° 32,8192 N	009° 58,1009 E	--	--	--	Crc Ok 13	13	-59	+0375	
222	14:05:16	2	0612	21	992110000	+0344	--	--	--	53° 32,8193 N	009° 58,1009 E	--	--	--	Crc Ok 16	16	-65	+0250	
223	14:08:13	1	0512	21	992110000	+0344	--	--	--	53° 32,8211 N	009° 58,1009 E	--	--	--	Crc Ok 13	13	-59	+0425	
224	14:08:16	2	0612	21	992110000	+0344	--	--	--	53° 32,8211 N	009° 58,1009 E	--	--	--	Crc Ok 16	16	-64	+0425	



B.4 Test 8.1.5 Message 21 FATDMA mode C

No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
229	14:19:13	1	0512	21	992110000	+0344	--	--	--	53° 32,8210 N	009° 58,0999 E	--	--	--	Crc Ok	13	-59	+0350
230	14:22:13	1	0512	21	992110000	+0346	--	--	--	53° 32,8200 N	009° 58,1018 E	--	--	--	Crc Ok	13	-59	+0350
231	14:25:13	1	0512	21	992110000	+0346	--	--	--	53° 32,8192 N	009° 58,1025 E	--	--	--	Crc Ok	13	-59	+0400



B.5 Test 8.1.6 Message 21 RATDMA mode A

No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
237	14:45:03	1	0148	21	992110000	+0346	--	--	--	53° 32,8214 N	009° 58,1028 E	--	--	--	Crc Ok 3		-59	+0375
238	14:48:04	2	0161	21	992110000	+0344	--	--	--	53° 32,8207 N	009° 58,1022 E	--	--	--	Crc Ok 4		-64	+0375
239	14:51:01	1	0041	21	992110000	+0346	--	--	--	53° 32,8200 N	009° 58,1015 E	--	--	--	Crc Ok 0		-59	+0375
240	14:54:02	2	0098	21	992110000	+0346	--	--	--	53° 32,8198 N	009° 58,1039 E	--	--	--	Crc Ok 2		-63	+0400

B.6 Test 8.1.7 Message 21 RATDMA mode B

StartLine		Filter EUT		<input checked="" type="checkbox"/> VDM	<input checked="" type="checkbox"/> VDO	MMSI	Message type	Channel	<input checked="" type="checkbox"/> Org	<input checked="" type="checkbox"/> RI	<input type="checkbox"/> CRC							
No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
244	15:03:13	1	0523	21	992110000	+0344	--	--	--	53° 32,8208 N	009° 58,1033 E	--	--	--	Crc Ok 13	-59	+0400	
245	15:03:17	2	0655	21	992110000	+0341	--	--	--	53° 32,8205 N	009° 58,1036 E	--	--	--	Crc Ok 17	-63	+0200	
246	15:06:14	2	0543	21	992110000	+0341	--	--	--	53° 32,8200 N	009° 58,1052 E	--	--	--	Crc Ok 14	-64	+0350	
247	15:06:14	1	0548	21	992110000	+0344	--	--	--	53° 32,8200 N	009° 58,1052 E	--	--	--	Crc Ok 14	-59	+0400	
248	15:09:14	2	0530	21	992110000	+0344	--	--	--	53° 32,8250 N	009° 58,1009 E	--	--	--	Crc Ok 13	-63	+0250	
249	15:09:17	1	0648	21	992110000	+0344	--	--	--	53° 32,8248 N	009° 58,1009 E	--	--	--	Crc Ok 17	-59	+0400	

B.7 Test 8.1.8 Message 21 RATDMA mode C

StartLine <input type="text"/> Filter EUT <input checked="" type="checkbox"/> VDM <input checked="" type="checkbox"/> VDO <input checked="" type="checkbox"/> MMSI <input type="text"/> Message type <input type="text"/> Channel <input type="text"/> <input checked="" type="checkbox"/> Org <input checked="" type="checkbox"/> RI <input type="checkbox"/> CRC																		
No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
250	15:12:15	1	0588	21	992110000	+0344	--	--	--	53° 32,8212 N	009° 58,1013 E	--	--	--	Crc Ok	15	-59	+0400
251	15:15:17	1	0637	21	992110000	+0341	--	--	--	53° 32,8210 N	009° 58,1016 E	--	--	--	Crc Ok	16	-59	+0375
252	15:18:14	1	0561	21	992110000	+0346	--	--	--	53° 32,8206 N	009° 58,1033 E	--	--	--	Crc Ok	14	-59	+0375

B.8 Test 8.1.9.1 Message 6 FATDMA mode A

StartLine <input type="text"/> Filter EUT <input checked="" type="checkbox"/> VDM <input checked="" type="checkbox"/> VDO <input checked="" type="checkbox"/> MMSI <input type="text"/> Message type <input type="text"/> Channel <input type="text"/> <input checked="" type="checkbox"/> Org <input checked="" type="checkbox"/> RI <input type="checkbox"/> CRC																		
No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
256	15:29:13	1	0512	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok	0	-59	+0375
257	15:30:17	1	0638	21	992110000	+0344	--	--	--	53° 32,8211 N	009° 58,1027 E	--	--	--	Crc Ok	16	-59	+0400
258	15:32:13	2	0512	6	992110000	+0341	--	--	--	---	---	--	--	--	Crc Ok	0	-63	+0425
259	15:33:14	1	0563	21	992110000	+0344	--	--	--	53° 32,8216 N	009° 58,1009 E	--	--	--	Crc Ok	14	-59	+0375
260	15:35:13	1	0512	6	992110000	+0341	--	--	--	---	---	--	--	--	Crc Ok	0	-59	+0375

B.9 Test 8.1.9.2 Message 6 FATDMA mode B

StartLine <input type="text"/> Filter EUT <input checked="" type="checkbox"/> VDM <input checked="" type="checkbox"/> VDO <input checked="" type="checkbox"/> MMSI <input type="text"/> Message type <input type="text"/> Channel <input type="text"/> <input checked="" type="checkbox"/> Org <input checked="" type="checkbox"/> RI <input type="checkbox"/> CRC																		
No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
1	15:39:13	1	0512	6	992110000	+0339	--	--	--	---	---	--	--	--	Crc Ok	0	-60	+0375
2	15:39:14	1	0528	21	992110000	+0341	--	--	--	53° 32,8216 N	009° 58,1031 E	--	--	--	Crc Ok	13	-60	+0400
3	15:39:16	2	0612	6	992110000	+0339	--	--	--	---	---	--	--	--	Crc Ok	0	-65	+0225
4	15:42:13	1	0512	6	992110000	+0341	--	--	--	---	---	--	--	--	Crc Ok	0	-59	+0425
5	15:42:14	1	0555	21	992110000	+0339	--	--	--	53° 32,8212 N	009° 58,1037 E	--	--	--	Crc Ok	14	-59	+0375
6	15:42:16	2	0612	6	992110000	+0346	--	--	--	---	---	--	--	--	Crc Ok	0	-65	+0375

B.10 Test 8.1.9.3 Message 6 FATDMA mode C

StartLine <input type="text"/> Filter EUT <input checked="" type="checkbox"/> VDM <input checked="" type="checkbox"/> VDO MMSI <input type="text"/> Message type <input type="text"/> Channel <input type="text"/> <input checked="" type="checkbox"/> Org <input checked="" type="checkbox"/> RI <input type="checkbox"/> CRC																		
No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
8	15:46:13	1	0512	6	992110000	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	-60	+0375	
9	15:48:16	1	0611	21	992110000	+0344	--	--	--	53° 32,8205 N	009° 58,1036 E	--	--	--	Crc Ok 16	-59	+0400	
10	15:49:13	1	0512	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0375	
11	15:51:16	1	0627	21	992110000	+0341	--	--	--	53° 32,8204 N	009° 58,1027 E	--	--	--	Crc Ok 16	-59	+0400	
12	15:52:13	1	0512	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0400	

B.11 Test 8.1.9 Message 6 RATDMA mode A

StartLine <input type="text"/> Filter EUT <input checked="" type="checkbox"/> VDM <input checked="" type="checkbox"/> VDO MMSI <input type="text"/> Message type <input type="text"/> Channel <input type="text"/> <input checked="" type="checkbox"/> Org <input checked="" type="checkbox"/> RI <input type="checkbox"/> CRC																		
No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
13	15:54:14	1	0535	21	992110000	+0341	--	--	--	53° 32,8197 N	009° 58,1026 E	--	--	--	Crc Ok 14	-59	+0400	
14	15:54:15	2	0583	6	992110000	+0339	--	--	--	---	---	--	--	--	Crc Ok 0	-65	+0350	
15	15:55:17	1	0638	6	992110000	+0346	--	--	--	---	---	--	--	--	Crc Ok 0	-60	+0400	
16	15:56:16	2	0621	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-65	+0400	
17	15:57:14	1	0548	6	992110000	+0346	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0375	
18	15:57:16	1	0623	21	992110000	+0346	--	--	--	53° 32,8201 N	009° 58,1028 E	--	--	--	Crc Ok 16	-59	+0350	

Remark: 1 minute

B.12 Test 8.1.9.2 Message 6 RATDMA mode B

StartLine <input type="text"/> Filter EUT <input checked="" type="checkbox"/> VDM <input checked="" type="checkbox"/> VDO MMSI <input type="text"/> Message type <input type="text"/> Channel <input type="text"/> <input checked="" type="checkbox"/> Org <input checked="" type="checkbox"/> RI <input type="checkbox"/> CRC																		
No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
67	16:19:13	2	0519	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-64	+0200	
68	16:19:17	1	0642	6	992110000	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	-60	+0400	
69	16:20:13	1	0515	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0400	
70	16:20:15	2	0585	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-65	+0400	
71	16:21:13	1	0522	6	992110000	+0346	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0400	
72	16:21:14	2	0548	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-64	+0225	
73	16:21:16	1	0611	21	992110000	+0344	--	--	--	53° 32,8210 N	009° 58,1004 E	--	--	--	Crc Ok 16	-59	+0375	
74	16:22:14	1	0544	6	992110000	+0346	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0375	
75	16:22:16	2	0632	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-63	+0350	
76	16:23:14	2	0527	6	992110000	+0346	--	--	--	---	---	--	--	--	Crc Ok 0	-63	+0175	
77	16:23:16	1	0615	6	992110000	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0375	
78	16:24:14	1	0540	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0350	
79	16:24:17	2	0655	6	992110000	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	-63	+0400	
80	16:24:17	1	0660	21	992110000	+0344	--	--	--	53° 32,8200 N	009° 58,1009 E	--	--	--	Crc Ok 17	-59	+0400	
81	16:25:15	1	0571	6	992110000	+0346	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0425	
82	16:25:16	2	0621	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-64	+0225	
83	16:26:14	1	0532	6	992110000	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0400	
84	16:26:16	2	0601	6	992110000	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	-65	+0400	
85	16:27:16	1	0603	6	992110000	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	-60	+0400	
86	16:27:16	1	0618	21	992110000	+0341	--	--	--	53° 32,8206 N	009° 58,1010 E	--	--	--	Crc Ok 16	-59	+0375	
87	16:27:16	2	0637	6	992110000	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	-63	+0200	
88	16:28:16	1	0613	6	992110000	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0375	
89	16:28:16	2	0627	6	992110000	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	-63	+0375	

Remark: 1 minute

B.13 Test 8.1.9.3 Message 6 RATDMA mode C

No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
90	16:29:15	1	0584	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0375
91	16:30:15	1	0594	6	992110000	+0346	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0375
92	16:30:16	1	0628	21	992110000	+0344	--	--	--	53° 32,8212 N	009° 58,1004 E	--	--	--	Crc Ok 16	0	-59	+0375
93	16:31:14	1	0556	6	992110000	+0346	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0400
94	16:32:16	1	0609	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0400
95	16:33:14	1	0550	6	992110000	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0375
96	16:33:15	1	0571	21	992110000	+0344	--	--	--	53° 32,8215 N	009° 58,1034 E	--	--	--	Crc Ok 15	0	-59	+0400

Remark: 1 minute

B.14 Test 8.1.10.1 Message 8 FATDMA mode A

No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
1236	08:28:26	1	1000	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0425
1237	08:28:33	2	1245	21	991234567	+0346	--	--	--	53° 32,8197 N	009° 58,1036 E	--	--	--	Crc Ok 33	0	-65	+0350
1238	08:29:26	2	1000	8	991234567	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	0	-64	+0125
1239	08:30:26	1	1000	8	991234567	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0425
1240	08:31:26	2	1000	8	991234567	+0346	--	--	--	---	---	--	--	--	Crc Ok 0	0	-64	+0100
1241	08:31:33	1	1239	21	991234567	+0346	--	--	--	53° 32,8184 N	009° 58,1041 E	--	--	--	Crc Ok 32	0	-59	+0250
1242	08:32:26	1	1000	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0275
1243	08:33:26	2	1000	8	991234567	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	0	-64	+0100
1244	08:34:26	1	1000	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0225
1245	08:34:30	2	1158	21	991234567	+0344	--	--	--	53° 32,8193 N	009° 58,1019 E	--	--	--	Crc Ok 30	0	-65	+0350

Remark: 1 minute

B.15 Test 8.1.10.1 Message 8 FATDMA mode B

StartLine		Filter EUT		<input checked="" type="checkbox"/> VDM	<input checked="" type="checkbox"/> VDO	MMSI	Message type		Channel	<input checked="" type="checkbox"/> Org	<input checked="" type="checkbox"/> RI	<input type="checkbox"/> CRC						
No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
1257	08:43:13	1	0512	8	991234567	+0346	--	--	--	--	--	--	--	--	Crc Ok 0	-59	+0275	
1258	08:43:16	2	0612	8	991234567	+0344	--	--	--	--	--	--	--	--	Crc Ok 0	-63	+0125	
1259	08:43:32	1	1233	21	991234567	+0344	--	--	--	53° 32,8204 N	009° 58,1027 E	--	--	--	Crc Ok 32	-59	+0275	
1260	08:44:13	1	0512	8	991234567	+0346	--	--	--	--	--	--	--	--	Crc Ok 0	-59	+0300	
1261	08:44:16	2	0612	8	991234567	+0341	--	--	--	--	--	--	--	--	Crc Ok 0	-63	+0375	
1262	08:45:13	1	0512	8	991234567	+0344	--	--	--	--	--	--	--	--	Crc Ok 0	-59	+0300	
1263	08:45:16	2	0612	8	991234567	+0344	--	--	--	--	--	--	--	--	Crc Ok 0	-63	+0125	
1264	08:46:13	1	0512	8	991234567	+0346	--	--	--	--	--	--	--	--	Crc Ok 0	-59	+0450	
1265	08:46:16	2	0612	8	991234567	+0344	--	--	--	--	--	--	--	--	Crc Ok 0	-63	+0325	
1266	08:46:31	2	1198	21	991234567	+0346	--	--	--	53° 32,8200 N	009° 58,1028 E	--	--	--	Crc Ok 31	-65	+0350	
1267	08:47:13	1	0512	8	991234567	+0346	--	--	--	--	--	--	--	--	Crc Ok 0	-59	+0325	
1268	08:47:16	2	0612	8	991234567	+0344	--	--	--	--	--	--	--	--	Crc Ok 0	-63	+0075	

Remark: 1 minute

B.16 Test 8.1.10.1 Message 8 FATDMA mode C

StartLine		Filter EUT		<input checked="" type="checkbox"/> VDM	<input checked="" type="checkbox"/> VDO	MMSI	Message type		Channel	<input checked="" type="checkbox"/> Org	<input checked="" type="checkbox"/> RI	<input type="checkbox"/> CRC						
No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
1269	08:48:13	1	0512	8	991234567	+0341	--	--	--	--	--	--	--	--	Crc Ok 0	-59	+0300	
1270	08:49:13	1	0512	8	991234567	+0341	--	--	--	--	--	--	--	--	Crc Ok 0	-59	+0425	
1271	08:49:31	1	1190	21	991234567	+0344	--	--	--	53° 32,8239 N	009° 58,1026 E	--	--	--	Crc Ok 31	-59	+0475	
1272	08:50:13	1	0512	8	991234567	+0346	--	--	--	--	--	--	--	--	Crc Ok 0	-59	+0275	
1273	08:51:13	1	0512	8	991234567	+0346	--	--	--	--	--	--	--	--	Crc Ok 0	-59	+0225	
1274	08:52:13	1	0512	8	991234567	+0344	--	--	--	--	--	--	--	--	Crc Ok 0	-59	+0300	

Remark: 1 minute

B.17 Test 8.1.10.1 Message 8 RATDMA mode A

No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
1278	08:55:15	2	0564	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-63	+0125	
1279	08:55:30	1	1143	21	991234567	+0344	--	--	--	53° 32,8236 N	009° 58,1031 E	--	--	--	Crc Ok 30	-59	+0325	
1280	08:56:17	1	0662	8	991234567	+0346	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0400	
1281	08:57:15	2	0575	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-63	+0100	
1282	08:58:14	1	0560	8	991234567	+0336	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0275	
1283	08:58:32	2	1204	21	991234567	+0344	--	--	--	53° 32,8223 N	009° 58,1027 E	--	--	--	Crc Ok 31	-63	+0325	
1284	08:59:15	2	0564	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-65	+0125	
1285	09:00:16	1	0606	8	991234567	+0346	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0425	

Remark: 1 minute

B.18 Test 8.1.10.1 Message 8 RATDMA mode B

No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
1286	09:01:15	2	0565	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-64	+0150	
1287	09:01:16	1	0608	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0300	
1288	09:01:29	1	1120	21	991234567	+0344	--	--	--	53° 32,8211 N	009° 58,1043 E	--	--	--	Crc Ok 29	-59	+0275	
1289	09:02:15	1	0572	8	991234567	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0300	
1290	09:02:16	2	0623	8	991234567	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	-63	+0300	
1291	09:03:14	2	0537	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-64	+0150	
1292	09:03:16	1	0626	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0275	
1293	09:04:15	2	0572	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-64	+0325	
1294	09:04:16	1	0602	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0275	
1295	09:04:32	2	1224	21	991234567	+0341	--	--	--	53° 32,8229 N	009° 58,1016 E	--	--	--	Crc Ok 32	-65	+0325	
1296	09:05:14	2	0532	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	-64	+0125	
1297	09:05:14	1	0557	8	991234567	+0341	--	--	--	---	---	--	--	--	Crc Ok 0	-59	+0250	

Remark: 1 minute

B.19 Test 8.1.10.1 Message 8 RATDMA mode C

No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
1300	09:07:16	1	0609	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	0	-60	+0275
1301	09:07:30	1	1124	21	991234567	+0341	--	--	--	53° 32,8091 N	009° 58,0975 E	--	--	--	Crc Ok 29	-59	+0300	
1302	09:08:13	1	0519	8	991234567	+0346	--	--	--	---	---	--	--	--	Crc Ok 0	0	-60	+0300
1303	09:09:14	1	0545	8	991234567	+0339	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0250
1304	09:10:17	1	0649	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0300
1305	09:10:31	2	1173	21	991234567	+0344	--	--	--	53° 32,8215 N	009° 58,1052 E	--	--	--	Crc Ok 31	-63	+0350	
1306	09:11:14	1	0536	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0300
1307	09:12:15	1	0569	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0450
1308	09:13:17	1	0638	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0300
1309	09:13:32	1	1225	21	991234567	+0346	--	--	--	53° 32,8199 N	009° 58,1042 E	--	--	--	Crc Ok 32	-59	+0275	

Remark: 1 minute

B.20 8.3.1 Position source

No	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/Inc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
1314	09:18:10	1	0396	8	991234567	+0344	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0300
1315	09:19:27	1	1014	21	991234567	+0344	--	--	--	53° 32,8179 N	009° 58,1043 E	--	--	--	Crc Ok 26	-59	+0350	
1316	09:19:49	1	1859	6	991234567	+0346	--	--	--	---	---	--	--	--	Crc Ok 0	0	-59	+0300
1318	09:22:27	2	1016	21	991234567	+0341	--	--	--	53° 32,8194 N	009° 58,1018 E	--	--	--	Crc Ok 26	-64	+0350	
1319	09:25:26	1	1010	21	991234567	+0346	--	--	--	53° 32,8198 N	009° 58,1047 E	--	--	--	Crc Ok 26	-59	+0300	
1320	09:28:27	2	1014	21	991234567	+0344	--	--	--	53° 32,8199 N	009° 58,1039 E	--	--	--	Crc Ok 26	-64	+0325	
1321	09:31:28	1	1052	21	991234567	+0344	--	--	--	53° 32,8215 N	009° 58,1009 E	--	--	--	Crc Ok 27	-59	+0275	
1322	09:34:41	1	1544	21	991234567	+0344	--	--	--	49° 29,1977 N	011° 06,1248 E	--	--	--	Crc Ok 41	-60	+0325	
1323	09:37:37	2	1421	21	991234567	+0346	--	--	--	49° 29,1977 N	011° 06,1248 E	--	--	--	Crc Ok 37	-64	+0100	
1324	09:40:41	1	1553	21	991234567	+0344	--	--	--	53° 32,8181 N	009° 58,1150 E	--	--	--	Crc Ok 41	-59	+0300	
1325	09:43:40	2	1505	21	991234567	+0341	--	--	--	53° 32,8123 N	009° 58,0627 E	--	--	--	Crc Ok 39	-64	+0125	
1326	09:46:39	1	1469	21	991234567	+0344	--	--	--	53° 32,8292 N	009° 58,1893 E	--	--	--	Crc Ok 39	-59	+0325	
1327	09:49:39	2	1477	21	991234567	+0331	--	--	--	53° 32,8316 N	009° 58,1254 E	--	--	--	Crc Ok 39	-63	+0100	
1328	09:55:39	2	1484	21	991234567	+0081	--	--	--	91° 00,0000 N	181° 00,0000 E	--	--	--	Crc Ok 63	-64	+0225	
1329	09:58:39	1	1474	21	991234567	+1516	--	--	--	91° 00,0000 N	181° 00,0000 E	--	--	--	Crc Ok 63	-59	+0325	
1330	10:01:35	2	1338	21	991234567	+0346	--	--	--	53° 32,8191 N	009° 58,1015 E	--	--	--	Crc Ok 37	-64	+0175	
1331	10:04:39	1	1488	21	991234567	+0344	--	--	--	53° 32,8171 N	009° 58,1013 E	--	--	--	Crc Ok 39	-59	+0350	

B.21 8.3.3 Off-position monitor

```
Display Message
Date and time      : 2000-07-25 10:13:15
Channel           : 2
Transmission slot  : 0589
Frequency offset   : +0200
Rx Level          : -65 ; dBm
Start time        : +0344 ; uS
CRC check         : Crc Ok
Message length    : 56 Chars, 336 bit
-----
Message type      : 21
Repeat Indicator  : 0
Source MMSI      : 991234567
AtoN type        : 20
Ships name       : TEST FLOATING AIS AT
PA-Flag          : 0 ; 0=low, 1=high
Longitude        : 009° 58,1020 E
Latitude         : 53° 32,8206 N
Dimension/Ref. A : 23 ; m
Dimension/Ref. B : 443 ; m
Dimension/Ref. C : 23 ; m
Dimension/Ref. D : 9 ; m
Type of EPFS     : 1 ; 1=GPS, 15=internal
Timestamp        : 15 ; s
Off position indicator : 1 ; 1=Off Position
AtoN status      : 0
RAIM flag        : 0 ; 1 = RAIM in use
Virtual AtoN flag : 0 ; 1=virtual AtoN
Assigned flag     : 0 ; 1=assigned
Spare            : 0
AtoN name extension : ON STATION
```

B.22 Test 8.4 Receive addressed message and 8.5 Interrogation Response

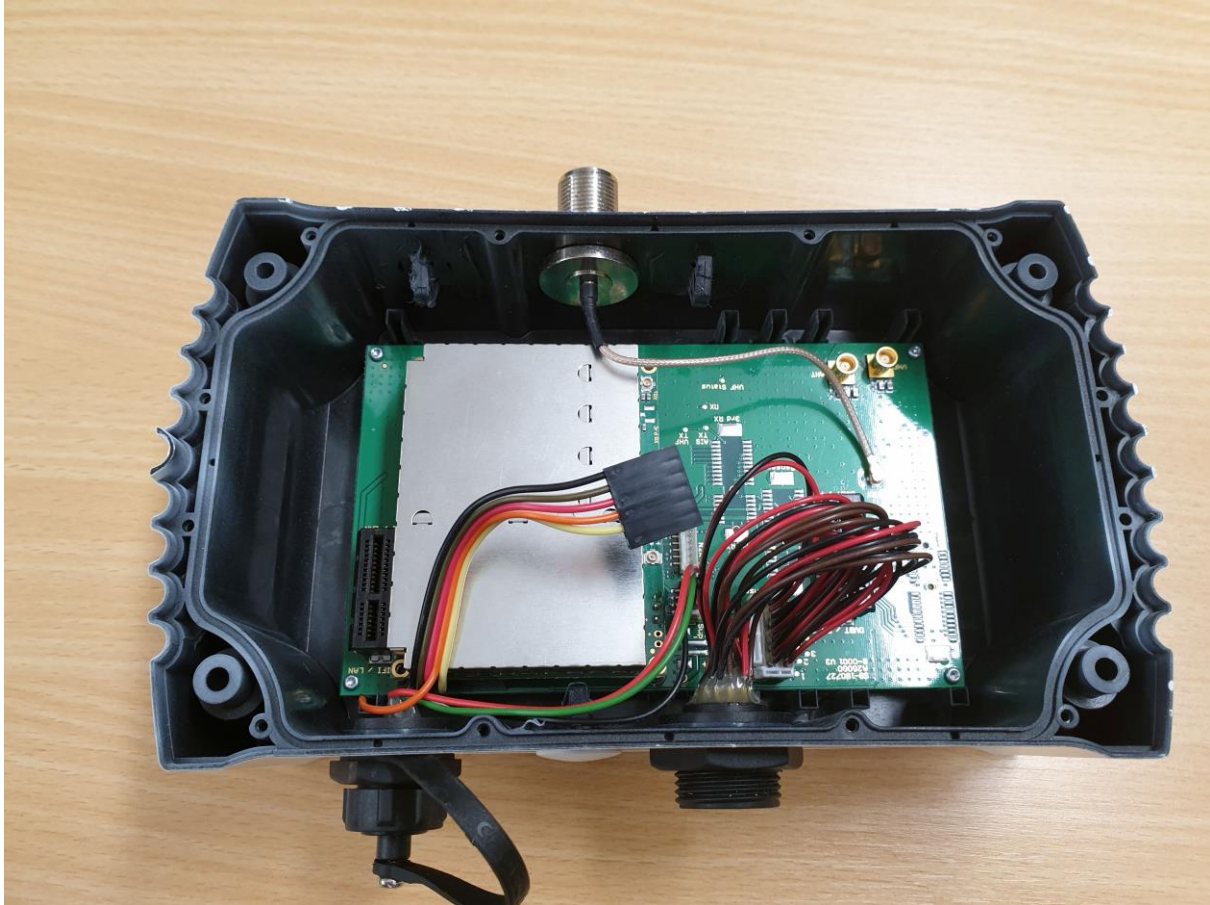
StartLine		Filter EUT		<input checked="" type="checkbox"/> VDM	<input checked="" type="checkbox"/> VDO	MMSI	Message type	Channel	<input checked="" type="checkbox"/> Org	<input checked="" type="checkbox"/> RI	<input type="checkbox"/> CRC							
No.	Time	Ch.	Slot	Msg	MMSI	Start	Sync	To/n-k	Sub/nc	Latitude	Longitude	SOG	COG	HDG	CRC	TS	Level	Freq.
1354	10:30:56	1	2118	6 >>	211000007		--	--	--	---	---	--	--	--	Crc Ok	0		
1355	10:30:58	1	2196	7	991234567	+0341	--	--	--	---	---	--	--	--	Crc Ok	0	-59	+0325
1356	10:31:41	2	1552	21	991234567	+0349	--	--	--	53° 32,8206 N	009° 58,1027 E	--	--	--	Crc Ok	41	-64	+0200
1358	10:32:03	1	0151	6 >>	211000007		--	--	--	---	---	--	--	--	Crc Ok	0		
1359	10:34:38	1	1431	21	991234567	+0344	--	--	--	53° 32,8209 N	009° 58,1024 E	--	--	--	Crc Ok	38	-60	+0325
1361	10:36:24	1	0931	15 >>	002110005		--	--	--	---	---	--	--	--	Crc Ok	0		
1362	10:36:25	1	0942	21	991234567	+0339	--	--	--	53° 32,8223 N	009° 58,1034 E	--	--	--	Crc Ok	24	-59	+0300
1364	10:36:33	1	1281	15 >>	002110005		--	--	--	---	---	--	--	--	Crc Ok	0		
1365	10:36:38	1	1428	21	991234567	+0341	--	--	--	53° 32,8221 N	009° 58,1033 E	--	--	--	Crc Ok	37	-59	+0325
1367	10:36:41	1	1568	15 >>	002110005		--	--	--	---	---	--	--	--	Crc Ok	0		
1368	10:36:42	1	1599	21	991234567	+0341	--	--	--	53° 32,8220 N	009° 58,1032 E	--	--	--	Crc Ok	42	-60	+0325
1369	10:37:37	2	1412	21	991234567	+0336	--	--	--	53° 32,8221 N	009° 58,1021 E	--	--	--	Crc Ok	37	-64	+0150
1371	10:38:50	1	1888	15 >>	002110005		--	--	--	---	---	--	--	--	Crc Ok	0		
1372	10:38:52	1	1967	21	991234568	+0341	--	--	--	53° 32,8149 N	009° 58,1028 E	--	--	--	Crc Ok	52	-59	+0325
1374	10:38:59	1	2246	15 >>	002110005		--	--	--	---	---	--	--	--	Crc Ok	0		
1375	10:39:01	1	0050	21	991234568	+0341	--	--	--	53° 32,8149 N	009° 58,1028 E	--	--	--	Crc Ok	1	-59	+0325
1377	10:40:29	1	1095	21	991234568	+0344	--	--	--	53° 32,8149 N	009° 58,1028 E	--	--	--	Crc Ok	29	-59	+0300
1378	10:40:29	1	1130	15 >>	002110005		--	--	--	---	---	--	--	--	Crc Ok	0		
1380	10:40:37	1	1426	15 >>	002110005		--	--	--	---	---	--	--	--	Crc Ok	0		
1381	10:40:39	1	1475	21	991234567	+0346	--	--	--	53° 32,8210 N	009° 58,1031 E	--	--	--	Crc Ok	39	-59	+0325
1383	10:41:47	1	1778	15 >>	002110005		--	--	--	---	---	--	--	--	Crc Ok	0		
1385	10:41:59	1	0001	15 >>	002110005		--	--	--	---	---	--	--	--	Crc Ok	0		
1386	10:42:00	1	0013	21	991234567	+0344	--	--	--	53° 32,8198 N	009° 58,1038 E	--	--	--	Crc Ok	0	-59	+0275

Annex C Photos of equipment under test

C.1 Transponder Unit



Annex C.1.1: Topview of the Transponder



Annex C.1.1: Inside view of the Transponder



Annex C.1.1: Identifications label of the Transponder

C.2 GPS antenna



Annex C.2: GPS Antenna