IEC 62320-2

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INTERNATIONAL STANDARD

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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

Matériels et systèmes de navigation et de radiocommunication maritimes – Système d'identification automatique (AIS) – Partie 2: Stations d'aides à la navigation AIS – Exigences opérationnelles et de fonctionnement, méthodes d'essai et résultats d'essai exigés

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International Standard IEC 62320-2 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

This second edition cancels and replaces the first edition, published in 2008, and constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- additional cyber security measures;
- updated description of configuration via VDL;
- updated VDL access scheme requirements;
- new PI sentences and VDL message structures with added description for optional TAG blocks;

- added requirement for at least one standard method for configuration using Standard PI sentences;
- updated test methods and updated Annexes.

This bilingual version (2018-01) corresponds to the monolingual English version, published in 2016-10.

The text of this standard is based on the following documents:

FDIS	Report on voting
80/817/FDIS	80/822/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62320 series, published under the general title *Maritime navigation and radiocommunication equipment and systems – Automatic identification system (AIS)*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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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

1 Scope

This part of IEC 62320 specifies the operational and performance requirements, methods of testing and required test results for AIS AtoN Stations compatible with the performance standards adopted by IMO Resolution MSC.74(69), Annex 3, Universal AIS. It incorporates the technical characteristics of non-shipborne AIS AtoN equipment, included in Recommendation ITU-R M.1371 and IALA Recommendation A-126. Where applicable, it also takes into account the ITU Radio Regulations. This standard takes into account other associated IEC International Standards and existing national standards, as applicable.

This document is applicable for automatic identification system (AIS) installations on aids to navigation (AtoN).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60945, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results*

IEC 61108 (all parts), *Maritime navigation and radiocommunication equipment and systems – Global navigation satellite systems (GNSS)*

IEC 62287-1, *Maritime navigation and radiocommunication equipment and systems – Class B shipborne equipment of the automatic identification system (AIS) – Part 1: Carrier-sense time division multiple access (CSTDMA) techniques*

IEC 62320-3:2015, *Maritime navigation and radiocommunication equipment and systems – Automatic identification systems (AIS) – Part 3: Repeater station – Minimum operational and performance requirements – Methods of test and required test results*

ITU Radio Regulations, Appendix 18, *Table of transmitting frequencies in the VHF maritime mobile band*

ITU-R Recommendation M.1371-5:2014, *Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile band*

IALA Recommendation A-126, *The Use of Automatic Identification System (AIS) in Marine Aids to Navigation*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
aids to navigation
AtoN
device or system external to vessels that is designed and operated to enhance the safe and efficient navigation of vessels and/or vessel traffic

Note 1 to entry: This note applies to the French language only.

3.1.2
Message 21
AtoN report transmitted on the VHF data link by an AIS station

3.1.3
real AIS AtoN
AIS AtoN station which is physically located on the aid to navigation

Note 1 to entry: IMO MSC.1/Circ.1473 states that physical AIS AtoN is an AIS Message 21 representing an aid to navigation that physically exists.

Note 2 to entry: This note applies to the French language only.

3.1.4
synthetic AIS AtoN
Message 21 transmitted from an AIS station located remotely from the aid to navigation

Note 1 to entry: IMO MSC.1/Circ.1473 states that physical AIS AtoN is an AIS Message 21 representing an aid to navigation that physically exists.

3.1.5
virtual AIS AtoN
Message 21 transmitted from an AIS station for an aid to navigation which does not physically exist

3.2 Abbreviated terms

AES	Advanced Encryption Standard
AIS	automatic identification system
BIIT	built-in integrity test
BT	bandwidth-time product
CSTDMA	carrier sense time division multiple access
DGNSS	differential global navigation satellite system
EPFS	electronic position fixing system
EUT	equipment under test
FATDMA	fixed access time division multiple access
GNSS	global navigation satellite system
IMO	International Maritime Organization
MMSI	Maritime Mobile Service Identity
NRZI	non-return to zero inverted
PER	packet error rate
PI	presentation interface

RAIM	receiver autonomous integrity monitoring
RATDMA	random access time division multiple access
RF	radio frequency
Rx	receive
SBAS	satellite-based augmentation system
SOTDMA	self-organizing time division multiple access
TDMA	time division multiple access
Tx	transmit
UTC	Coordinated Universal Time
VDL	VHF data link
VHF	very high frequency
VSWR	voltage standing wave ratio

4 Description

4.1 Types of AIS AtoN stations

There are three types of AIS AtoN stations as defined in Table 1. The AIS AtoN stations may optionally include additional capabilities as defined in the comments column. Table 2 describes the use of the messages.

Table 1 – Description of AIS AtoN stations

Requirements	Type 1 AIS AtoN station	Type 2 AIS AtoN station	Type 3 AIS AtoN station	Comments
VDL receiver	No receiver	Receiver for query, configuration, or control functions only	Two receiving processes for autonomous mode (RATDMA)	When RATDMA is not used, only one receiving process is required for autonomous mode.
Transmitted messages	21			See Table 2.
Access mode for Message 21	FATDMA	FATDMA	FATDMA & RATDMA	
Access Mode for messages other than 21, if implemented	FATDMA	FATDMA	FATDMA & RATDMA	CSTDMA (Type 3)
Configuration / communication method	Standard sentences of Table 14 Physical interface defined by manufacturer			Defined by the manufacturer with standard sentences and optionally using TAG Blocks.
Physical communication interface	At least one shall be provided by the manufacturer for test. Not required for operation.			The electrical and physical characteristics shall be defined by the manufacturer.
Transmit power	Nominal 12,5 W			As defined by the manufacturer
Transmitter capability	Frequency agile			Single frequency
Synthetic and Virtual AtoN	Not Required			Yes
Positioning device	EPFS and surveyed position			Surveyed position only (no EPFS)
UTC synchronisation	UTC Direct			UTC indirect or semaphore (Type 3)
Assignment	Shall not respond to assignment Messages 16 and 23			
Interrogation	Shall respond with the Message 21 of the Real AIS AtoN MMSI only.			
Default (initial factory setting)	MMSI = 000000000 No schedule configured No virtual AtoN configured Radio parameters configured per Table 6 No surveyed position Encryption key = all zeros AtoN status bits = all zeros			