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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 [IEC 62320-2:2016](#)

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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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IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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Maritime navigation and radiocommunication equipment and systems –
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**MARITIME NAVIGATION AND RADIOTRANSFER EQUIPMENT
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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.

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|-------------|------------------|
| 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.

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MARITIME NAVIGATION AND RADIOTRANSFER 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).

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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.

<https://standards.iteh.ai/catalog/standards/sist/5abd42f0-0275-44ae-8dca->

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. **iTeh STANDARD PREVIEW
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3.1.4

synthetic AIS AtoN

Message 21 transmitted from an AIS station located remotely from the aid to navigation [IEC 62320-2-2016](https://standards.iteh.ai/catalog/standards/sist/5abd42f0-0275-44ae-8dca-5804fa85892/iec-62320-2-2016)

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.

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[IEC 62320-2:2016](#)

<https://standards.iteh.ai/catalog/standards/sist/5abd42f0-0275-44ae-8dca-56604a83893/iec-62320-2-2016>

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 <i>iTeh STANDARD PREVIEW</i> standards.iteh.ai) | | | Single frequency |
| Synthetic and Virtual AtoN | Not Required https://standards.iteh.ai/utc/iso/standards/sist/5abd42f0-0275-56604a8389f3/iec-62320-2-2016 | | | Yes |
| Positioning device | EPFS and surveyed position https://standards.iteh.ai/utc/iso/standards/sist/5abd42f0-0275-56604a8389f3/iec-62320-2-2016 | | | Surveyed position only (no EPFS) |
| UTC synchronisation | https://standards.iteh.ai/utc/iso/standards/sist/5abd42f0-0275-56604a8389f3/iec-62320-2-2016 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 = 00000000 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 | | | |