



SLOVENSKI STANDARD

SIST EN 62320-1:2008

01-januar-2008

Pomorska navigacijska in radiokomunikacijska oprema in sistemi - Sistemi za avtomatično identifikacijo (AIS) - 1. del: Bazne postaje AIS - Minimalne operativne in tehnične zahteve, preskusne metode in zahtevani rezultati preskušanj (IEC 62320-1:2007)

Maritime navigation and radiocommunication equipment and systems - Automatic Identification System (AIS) - Part 1: AIS Base Stations - Minimum operational and performance requirements, methods of testing and required test results

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Navigations- und Funkkommunikationsgeräte und -systeme für die Seeschifffahrt – Automatische Identifikationssysteme (AIS) - Teil 1: AIS-Basisstationen - Mindest-Betriebs- und -Leistungsanforderungen, Prüfverfahren und geforderte Prüfergebnisse

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Equipements et systèmes de navigation et de radiocommunication maritimes - Systèmes d'identification automatique (AIS) - Partie 1: Stations de base AIS - Exigences minimales opérationnelles et de performance, méthodes de mesure et résultats de test minimum attendus

Ta slovenski standard je istoveten z: EN 62320-1:2007

ICS:

47.020.70

Navigacijska in krmilna oprema

Navigation and control equipment

SIST EN 62320-1:2008

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**Maritime navigation and radiocommunication equipment and systems -
Automatic Identification Systems (AIS) -
Part 1: AIS Base Stations -
Minimum operational and performance requirements,
methods of testing and required test results
(IEC 62320-1:2007)**

Equipements et systèmes de navigation
et de radiocommunication maritimes -
Systèmes d'identification
automatique (AIS) -
Partie 1: Stations de base AIS -
Exigences minimales opérationnelles
et de performance, méthodes de mesure
et résultats de test minimum attendus
(CEI 62320-1:2007)

Navigations- und
Funkkommunikationsgeräte
und -systeme für die Seeschifffahrt -
Automatische Identifikationssysteme -
Teil 1: AIS-Basisstationen -
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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 80/460/FDIS, future edition 1 of IEC 62320-1, prepared by IEC TC 80, Maritime navigation and radiocommunication equipment and systems, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62320-1 on 2007-03-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2007-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-03-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62320-1:2006 was approved by CENELEC as a European Standard without any modification.

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Annex ZA
(normative)

**Normative references to international publications
with their corresponding European publications**

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61108-1	- ¹⁾	Maritime navigation and radiocommunication equipment and systems - Global navigation satellite systems (GNSS) - Part 1: Global positioning system (GPS) - Receiver equipment - Performance standards, methods of testing and required test results	EN 61108-1	2003 ²⁾
IEC 61162-1	- ¹⁾	Maritime navigation and radiocommunication equipment and systems - Digital interfaces - Part 1: Single talker and multiple listeners	EN 61162-1	2000 ²⁾
ITU-R Recommendation M.1084-4	- ¹⁾	Interim solutions for improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service	-	-
ITU-R Recommendation M.1371	- ¹⁾	Technical characteristics for a universal shipborne automatic identification system using time division multiple access in the VHF maritime mobile band	-	-
ITU-T Recommendation O.153	- ¹⁾	Basic parameters for the measurement of error performance at bit rates below the primary rate	-	-
IALA Recommendation A-124	- ¹⁾	On Automatic Identification System (AIS) Shore Station networking aspects relating to the AIS Service	-	-
RTCM SC104	- ¹⁾	RTCM Recommended Standards for Differential GNSS (Global Navigation Satellite Systems) Service	-	-

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

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INTERNATIONAL STANDARD

IEC 62320-1

First edition
2007-02

Maritime navigation and radiocommunication equipment and systems – Automatic identification system (AIS) –

Part 1:

AIS Base Stations – Minimum operational and performance requirements, methods of testing and required test results

<https://standards.iteh.ai/catalog/standards/sist/41031928-6c88-48e5-87fc-626177faa214/sist-en-62320-1-2008>

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International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE **XD**

For price, see current catalogue

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARITIME NAVIGATION AND RADIOCOMMUNICATION
EQUIPMENT AND SYSTEMS –
AUTOMATIC IDENTIFICATION SYSTEM (AIS) –**

**Part 1: AIS Base Stations –
Minimum operational and performance requirements,
methods of testing and required test results**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62320-1 has been prepared by IEC Technical Committee 80: Maritime navigation and radiocommunication equipment and systems.

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

FDIS	Report on voting
80/460/FDIS	80/468/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.

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

A list of all parts of IEC 62320 series, under the general title: *Maritime navigation and radio-communication 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 maintenance result 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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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INTRODUCTION

Chapter V of the International Convention for the Safety of Life at Sea 1974 (SOLAS) requires mandatory carriage of Automatic Identification System (AIS) equipment on all vessels constructed on or after 01 July 2002. Carriage for other types and sizes of SOLAS Convention vessels was required to be completed not later than 31 December 2004.

SOLAS Chapter V, Regulation 19, clause 2.4.5 states that AIS shall:

- 1 provide automatically to appropriate equipped shore stations, other ships and aircraft information, including ship's identity, type, position, course, speed, navigational status and other safety-related information;
- 2 receive automatically such information from similarly fitted ships;
- 3 monitor and track ships; and
- 4 exchange data with shore-based facilities.

In addition, the IMO performance standards for AIS state that:

- The AIS should improve the safety of navigation by assisting in the efficient navigation of ships, protection of the environment, and operation of Vessel Traffic Services (VTS), by satisfying the following functional requirements:
 - 1 in a ship-to-ship mode for collision avoidance;
 - 2 as a means for littoral States to obtain information about a ship and its cargo; and
 - 3 as a VTS tool, i.e. ship-to-shore (traffic management).
- The AIS should be capable of providing to ships and to competent authorities, information from the ship, automatically and with the required accuracy and frequency, to facilitate accurate tracking. Transmission of the data should be with the minimum involvement of ship's personnel and with a high level of availability.

The provision of Shore Based AIS will be necessary to attain the full benefit of the SOLAS Convention requirements.

This part of IEC 62320 provides the minimum operational and performance requirements, methods of test and the required test results for AIS Base Stations. The testing is divided into three sections, the transceiver tests, the logical tests and the Presentation Interface tests. These are captured in Clauses 8, 9 and 10 respectively. The method used for testing is that the EUT should meet all the tests requirements of Clause 8 before proceeding to Clause 9. Likewise, the unit should meet all of the test requirements before proceeding to Clause 10. Clause 10 has also been prioritised so that the tests are progressive

Clauses 5 to 7 provide functional requirement information and Clause 8 provides the general test environment for the EUT.

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – AUTOMATIC IDENTIFICATION SYSTEM (AIS) –

Part 1: AIS Base Stations – Minimum operational and performance requirements, methods of testing and required test results

1 Scope

This part of IEC 62320 specifies the minimum operational and performance requirements, methods of testing and required test results for AIS Base Stations, compatible with the performance standards adopted by IMO Res. MSC.74 (69), Annex 3, Universal AIS. It incorporates the technical characteristics of non-shipborne, fixed station AIS equipment, included in recommendation ITU-R M.1371 and IALA Recommendation A-124. 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 standard is applicable for AIS Base Stations. It does not include specifications for the display of AIS data on shore.

2 Normative references

SIST EN 62320-1:2008

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 61108-1, *Maritime navigation and radiocommunication equipment and systems – Global navigation satellite systems (GNSS) – Part 1: Global positioning system (GPS) – Receiver equipment – Performance standards, methods of testing and required test results*

IEC 61162-1, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 1: Single talker and multiple listeners*

ITU-R M.1084-4, *Interim solutions for improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service*

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

ITU-T O.153, *Basic parameters for the measurement of error performance at bit rates below the primary rate*

IALA Recommendation A-124 *on Automatic Identification System (AIS). Shore Station and networking aspects relating to the AIS Service*

IALA technical clarifications to ITU Recommendation ITU-R M.1371-1

RTCM SC104 – *RTCM Recommended Standards for Differential GNSS (Global Navigation Satellite Systems) Service*

3 Symbols and abbreviations

AIS	Automatic Identification System
BER	Bit Error Rate
BIIT	Built-In Integrity Tests
BT	Bandwidth Time product
CPU	Central Processing Unit
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
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IHO	International Hydrographic Office
IMO	International Maritime Organization
ITU	International Telecommunications Union
kn	Knots
MAC	Medium Access Control
MKD	Minimum Keyboard and Display
MMSI	Maritime Mobile Service Identity
NM	Nautical Mile
NRZI	Non-Return to Zero Inverted
PER	Packet Error Rate
P_c	Carrier Power
PI	Presentation Interface
PPS	Pulse Per Second
PSS	Physical Shore Station
RAIM	Receiver Autonomous Integrity Monitoring
RATDMA	Random Access Time Division Multiple Access
Rx	Receive
TDMA	Time Division Multiple Access
Tx	Transmit
UTC	Universal Time Co-ordinated
VDL	VHF Data Link
VSWR	Voltage Standing Wave Ratio
VTS	Vessel Traffic Services

NOTE Abbreviations related to IEC 61162-1 are not included in the above list. For their meaning refer to that standard and Annex A.

4 Functional layout of an AIS Base Station

4.1 General

The Base Station may be designed for dependent only operation or independent operation. Both are under some control of the Physical Shore Station (PSS) as defined in the IALA Recommendation A-124.

- A dependent Base Station accesses the VHF data link (VDL) using only the combination of linked TSA+VDM sentences (see Table 1), as provided by the PSS.
- An independent Base Station accesses the VDL using either the combination of linked TSA+VDM sentences as provided by the PSS or by using internal control. When operated as an independent Base Station the unit may be delegated certain autonomous functionality under the supervisory control of the PSS.

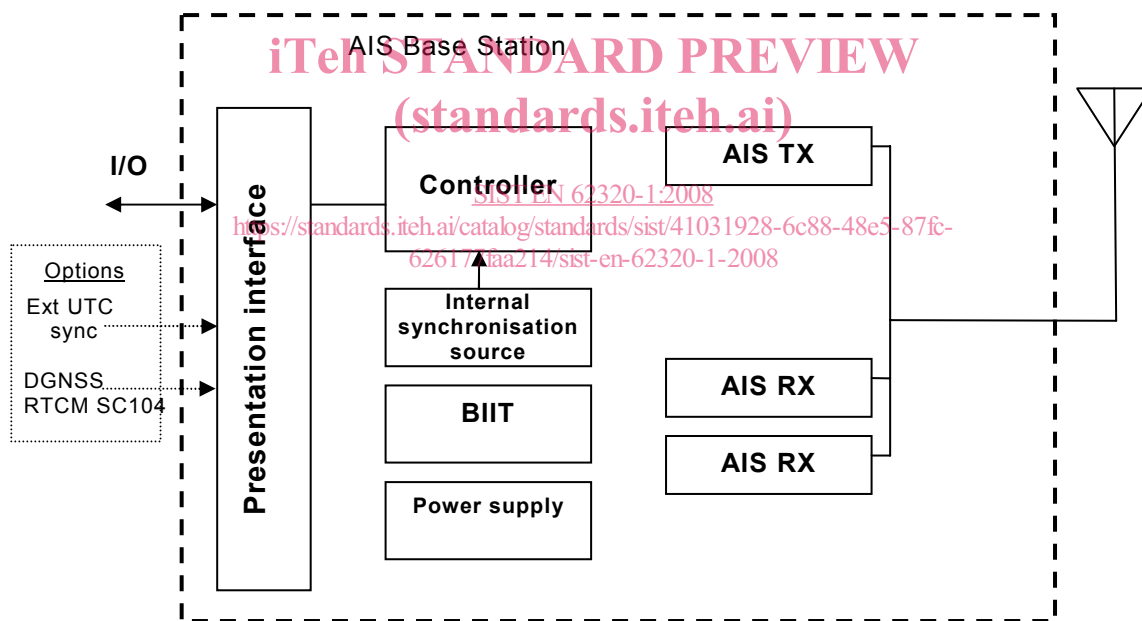
The PSS, or external controlling entity, is responsible for Base Station configuration, transmission scheduling, and processing of received information. Presentation Interface (PI) text sentences are used to configure the Base Station, schedule message transmissions, and output information.

When TSA and VDM sentences are used, the PSS is responsible for ensuring the integrity of the VDL.

The tests in this standard are for all Base Stations. Additional tests for independent Base Stations are indicated by a note located at the beginning of each appropriate test section.

4.2 Functional block diagram of an AIS Base Station

Figure 1 shows the principal components of the AIS Base Station.



IEC 150/07

Figure 1 – Functional block diagram of an AIS Base Station

As a minimum, the following functional elements are required for the AIS Base Station:

- two multi-channel receivers;
- one multi-channel TDMA transmitter;
- NOTE Since the minimum configuration of the AIS Base Station has only one transmitter, the AIS Base Station cannot transmit on both AIS Channels (AIS A and AIS B) simultaneously.
- a controlling unit;
- an internal synchronisation source, which may also be used as a position sensor for independent Base Stations. If used as a position source, the internal GNSS receiver shall meet the appropriate requirements of IEC 61108-1;
- a Built-In-Integrity-Test unit (BIIT), which shall provide alarms;