SLOVENSKI STANDARD

SIST EN 62287-1:2007

januar 2007

Pomorska navigacijska in radiokomunikacijska oprema in sistemi - Ladijska oprema razreda B avtomatičnega identifikacijskega sistema (AIS) - 1. del: Tehnike uporabniško občutljivega časovno porazdeljenega večuporabniškega sodostopa (CSTDMA) (IEC 62287-1:2006)

(istoveten EN 62287-1:2006)

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 62287-1:2006)

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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 62287-1:2006)

Matériels et systèmes de navigation et de radiocommunications maritimes - Transpondeur embarqué du système d'identification automatique (AIS) de classe B
Partie 1: Technique d'accès multiple par répartition dans le temps avec écoute de porteuse (CSTDMA)
(CEI 62287-1:2006)

Navigations- und Funkkommunikationsgeräte und -systeme für die Seeschifffahrt - Geräte der Klasse B des automatischen Identifikationssystems (AIS) für Schiffe
Teil 1: Zeitmultiplex-Vielfachzugriffstechniken mit Aktivitätserkennung (CSTDMA)
(IEC 62287-1:2006)

This European Standard was approved by CENELEC on 2006-04-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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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

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Foreword

The text of document 80/426/FDIS, future edition 1 of IEC 62287-1, 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 62287-1 on 2006-04-01.

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)	2007-01-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2009-04-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62287-1:2006 was approved by CENELEC as a European Standard without any modification.

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.

Publication	Year	Title	EN/HD	Year
IEC 60945	- [1)]	Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results	EN 60945	2002 [2)]
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	Series	Maritime navigation and radiocommunication equipment and systems - Digital interfaces	EN 61162	Series
IEC 61993-1	- [1)]	Maritime navigation and radiocommunication equipment and systems Part 1: Shipborne automatic transponder system installation using VHF digital selective calling (DSC) techniques - Operational and performance requirements, methods of testing and required test results	EN 61993-1	1999 [2)]
IEC 61993-2	- [1)]	Maritime navigation and radiocommunication equipment and systems - Automatic identification systems (AIS) Part 2: Class A shipborne equipment of the universal automatic identification system (AIS) - Operational and performance requirements, methods of test and required test results	EN 61993-2	2002 [2)]
ISO/IEC 3309	1993	Information technology - Telecommunications and information exchange between systems - High-level data link control (HDLC) procedures - Frame structure	-	-
IMO MSC.140(76)	- [1)]	Recommendation for the protection of the AIS VHF data link	-	-

[1)] Undated reference.
[2)] Valid edition at date of issue.

Publication	Year	Title	EN/HD	Year
ITU-R Recommendation M.493-11	- [1)]	Digital selective-calling system for use in the maritime mobile service	-	-
ITU-R Recommendation M.825-3	- [1)]	Characteristics of a transponder system using digital selective calling techniques for use with vessel traffic services and ship-to-ship identification	-	-
ITU-R Recommendation M.1084-4	- [1)]	Interim solutions to improve efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service	-	-
ITU-R Recommendation M.1371-1	- [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	-	-

INTERNATIONAL STANDARD

IEC 62287-1

First edition
2006-03

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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 62287-1 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
80/426/FDIS	80/434/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.

IEC 62287 consists of the following parts, under the general title *Maritime navigation and radiocommunication and systems – Class B shipborne equipment of the automatic identification system (AIS)*

Part 1: Carrier-sense time division multiple access (CSTDMA) techniques

Part 2: Self-organising time division multiple access (SOTDMA) techniques

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.

INTRODUCTION

In the ITU Radiocommunications Sector Recommendation ITU-R M.1371-1 "Technical characteristics for a universal shipborne Automatic Identification System (AIS) using SOTDMA (Self-Organising Time Division Multiple Access) in the VHF maritime mobile band", provision is made for a Class B AIS for use on craft not covered by a mandatory carriage requirement under SOLAS Chapter V, Regulation 19. This part of IEC 62287 sets out the requirements, methods of test and required test results for such a Class B AIS.

The International Maritime Organization (IMO), in its Resolution MSC.140(76), recognised that the radio channels used by AIS, particularly AIS 1 (161,975 MHz) and AIS 2 (162,025 MHz), are regarded as an AIS network, and any disruption to those channels by any one AIS device could affect the operation of all AIS devices on that network. IMO also recognised that Administrations should take steps necessary to ensure the integrity of the radio channels used for AIS in their waters.

IEC Technical Committee 80 (TC 80) allocated a new work item 80/287/NP to Working Group 8a (WG 8a), tasking them with producing a test standard for Class B AIS equipment. During the development of this test standard, Administrations expressed concern that large numbers of Class B AIS equipped vessels could have a detrimental effect on the safe operation of the AIS network by SOLAS Class A vessels, Base Stations and AIS on Aids to Navigation (AtoN AIS). As a result, a new network access technology was developed, which allows large numbers of Class B fitted vessels to coexist with Class A with a negligible detrimental effect on AIS network.

The new technology, hereinafter referred to as “Carrier-Sense TDMA (CSTDMA)”, requires that the Class B“CS”AIS listens to the AIS network to determine if the network is free of activity and, only if the network is free, can it transmit its information. This Class B AIS is also required to listen for reservations from base stations and comply with these reservations. This polite operation ensures that this Class B AIS minimises the probability of interference with Class A, Base Station or AtoN AIS operations. Extensive computer models simulation and practical laboratory testing and sea trials were undertaken to validate CSTDMA during its development (see Annex A).

WG8a recognised that the primary function of a Class B AIS is for fitted vessels to be visible and participate in the AIS network. CSTDMA was designed to fulfil these requirements.

This Class B AIS is backward compatible with ITU-R Recommendation M.1371-1 (see Annex B).

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

1 Scope

This part of IEC 62287 specifies the minimum operational and performance requirements, methods of testing and required test results for Class B shipborne AIS equipment using CSTDMA techniques. This standard takes into account other associated IEC International Standards and existing national standards, as applicable.

It is applicable for AIS equipment used on craft that are not covered by the mandatory carriage requirement of AIS under SOLAS Chapter V.

An AIS station intended to operate in receive-only mode shall not be considered a Class B shipborne mobile AIS station.

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 61108-1, *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 (all parts), *Maritime navigation and radiocommunication equipment and systems – Digital interfaces*

IEC 61993-1, *Maritime navigation and radiocommunication equipment and systems – Part 1: Shipborne automatic transponder system installation using VHF digital selective calling (DSC) techniques – Operational and performance requirements, methods of testing and required test results*

IEC 61993-2, *Maritime navigation and radiocommunication equipment and systems – Automatic identification systems (AIS) – Part 2: Class A shipborne equipment of the universal automatic identification system (AIS) – Operational and performance requirements, methods of test and required test results*

ISO/IEC 3309:1993, *Information technology – Telecommunications and information exchange between systems – High-level data link control (HDLC) procedures – Frame structure*

IMO MSC.140(76), *Recommendation for the protection of the AIS VHF data link*

ITU-R Recommendation M.493-11, *Digital selective-calling system for use in the maritime mobile service*

ITU-R Recommendation M.825-3, *Characteristics of a transponder system using digital selective calling techniques for use with vessel traffic services and ship-to-ship identification*

ITU-R Recommendation 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 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, *Basic parameters for the measurement of error performance at bit rates below the primary rate*

3 Abbreviations

AIS	Automatic Identification System
BER	Bit Error Rate
BT	Bandwidth Time product
COG	Course over ground
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check
CS	Carrier-Sense
CSTDMA	Carrier-Sense Time Division Multiple Access
DGNSS	Differential Global Navigation Satellite System
DLS	Data Link Service
DSC	Digital Selective Calling
ECDIS	Electronic Chart Display and Information System
EPFS	Electronic Position Fixing System
ETA	Estimated Time of Arrival
EUT	Equipment Under Test
FCS	Frame Check Sequence
FM	Frequency Modulation
GMSK	Gaussian Minimum Shift Keying
GNSS	Global Navigation Satellite System
HDG	Heading
HDLC	High level Data Link Control
HSC	High Speed Craft
IHO	International Hydrographic Office
IMO	International Maritime Organization
LME	Link Management Entity
LR	Long Range
MAC	Medium Access Control
MMSI	Maritime Mobile Service Identity
NM	Nautical Miles (refer to ISO 19018)