IEC 61162-1

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REDLINE VERSION

INTERNATIONAL STANDARD

colour inside

Maritime navigation and radiocommunication equipment and systems – Digital interfaces –
Part 1: Single talker and multiple listeners

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – DIGITAL INTERFACES –

Part 1: Single talker and multiple listeners

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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 61162-1 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

This fifth edition cancels and replaces the fourth edition published in 2010, and constitutes a technical revision.

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

- new identifiers have been added to Table 4;
- the sentences CBR and MEB have been removed as they are now solely used by AIS shore based equipment:
- new sentences ACN, ALC, ALF, ARC, EPV, HCR, HRM, MOB, NSR, RLM, RRT, SM1, SM2, SM3, SM4, SMB, SPW and TRL have been added;
- revisions have been made to ABK, ABM, GNS, NAK, NRM, RMC, ROR and TTD;
- the methods of testing in Annex B have been revised.

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

FDIS	Report on voting
80/799/FDIS	80/806/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.

A list of all parts in the IEC 61162 series, published under the general title *Maritime navigation and radiocommunication equipment and systems – Digital interface*, can be found on the IEC website.

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

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

IEC 61162 Maritime navigation and radiocommunication equipment and systems – Digital interfaces consists of ~~4~~ 5 parts which specify digital interfaces for application in marine navigation, radiocommunication and system integration, as follows:

Part 1: *Single talker and multiple listeners;*

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

Part 3: *Multiple talkers and multiple listeners – Serial data instrument network;*

Part 450: *Multiple talkers and multiple listeners – ~~Ship systems~~ Ethernet interconnection;*

Part 460: *Multiple talkers and multiple listeners – Ethernet interconnection – Safety and security*

IEC technical committee 80 interface standards are developed with input from manufacturers, private and government organisations and equipment operators. The information is intended to meet the needs of users at the time of publication, but users should recognise that as applications and technology change, interface standards should change as well. Users of this standard are advised to immediately inform the IEC of any perceived inadequacies therein.

The first edition of IEC 61162-1 was published in 1995. The second edition published in 2000 removed some sentences which were no longer in use, added some new sentences and included details of the ship equipment defined in IMO resolutions together with appropriate sentences for communication between them. This information was subsequently removed from the third edition when it became the practice to specify the sentence formatters in the individual standards for equipment.

The third edition published in 2007 introduced a re-arrangement of the text and new sentences particularly to support the Automatic Identification System and the Voyage Data Recorder. The third edition also introduced a further type of start of sentence delimiter. The conventional delimiter “$” was retained for the conventional sentences which are now called parametric sentences. The new delimiter “!” identifies sentences that conform to special purpose encapsulation.

The fourth edition ~~removes~~ removed some sentences which ~~are~~ were not in use, ~~adds~~ added some new sentences for new applications and ~~makes~~ made some corrections and additions. In particular the sentences of relevance to satellite navigation receivers ~~have been~~ were expanded to facilitate the description of new satellite systems.

This fifth edition also removes some sentences which are no longer in use, adds some new sentences for new applications and makes some corrections and additions.

Liaison has been maintained with NMEA and this edition has been aligned where appropriate with NMEA 0183 version ~~4.00~~ 4.10.

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – DIGITAL INTERFACES –

Part 1: Single talker and multiple listeners

1 Scope

This part of IEC 61162 contains the requirements for data communication between maritime electronic instruments, navigation and radiocommunication equipment when interconnected via an appropriate system.

This part of IEC 61162 is intended to support one-way serial data transmission from a single talker to one or more listeners. These data are in printable ASCII form and may include information such as position, speed, depth, frequency allocation, etc. Typical messages may be from about 11 to a maximum of 79 characters in length and generally require transmission no more rapidly than one message per second.

The electrical definitions in this standard are not intended to accommodate high-bandwidth applications such as radar or video imagery, or intensive database or file transfer applications. Since there is no provision for guaranteed delivery of messages and only limited error checking capability, this standard should be used with caution in all safety applications.

For applications where a faster transmission rate is necessary, reference should be made to IEC 61162-2.

For applications to shore based equipment of the automatic identification system (AIS) reference should be made to the IEC 62320 series.

2 Normative references

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

IEC 60945:2002, *Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results*

IEC 61097-6, *Global maritime distress and safety system (GMDSS) – Part 6: Narrowband direct-printing telegraph equipment for the reception of navigational and meteorological warnings and urgent information to ships (NAVTEX)*

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

IEC 61162 (all parts), *Maritime navigation and radiocommunication equipment and systems – Digital interface*

IEC 61162-2:1998, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 2: Single talker and multiple listeners, high-speed transmission*

IEC 61174, *Maritime navigation and radiocommunication equipment and systems – Electronic chart display and information system (ECDIS) – Operational and performance requirements, methods of testing and required test results*

IEC 61924-2:2012, *Maritime navigation and radiocommunication equipment and systems – Integrated navigation systems – Part 2: Modular structure for INS – Operational and performance requirements, methods of testing and required test results*

IEC 61996 (all parts), *Maritime navigation and radiocommunication equipment and systems – Shipborne voyage data recorder (VDR)*

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Edition 5.0 2016-08

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Maritime navigation and radiocommunication equipment and systems – Digital interfaces –
Part 1: Single talker and multiple listeners

Matériels et systèmes de navigation et de radiocommunication maritimes – Interfaces numériques –
Partie 1: Emetteur unique et récepteurs multiples

IEC 61162-1:2016-08(en-fr)

CONTENTS

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MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – DIGITAL INTERFACES –

Part 1: Single talker and multiple listeners

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

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SOMMAIRE

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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MATÉRIELS ET SYSTÈMES DE NAVIGATION ET DE RADIOCOMMUNICATION MARITIMES – INTERFACES NUMÉRIQUES –

Partie 1: Emetteur unique et récepteurs multiples

AVANT-PROPOS

1) La Commission Electrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. A cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
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9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets et de ne pas avoir signalé leur existence.

La Norme internationale IEC 61162-1 a été établie par le comité d'études 80 de l'IEC: Matériels et systèmes de navigation et de radiocommunication maritimes.

La présente version bilingue (2018-02) correspond à la version anglaise monolingue publiée en 2016-08.

Le texte anglais de cette norme est issu des documents 80/799/FDIS et 80/806/RVD.

Le rapport de vote 80/806/RVD donne toute information sur le vote ayant abouti à l'approbation de cette norme.

La version française de cette norme n'a pas été soumise au vote.

Cette cinquième édition annule et remplace la quatrième édition parue en 2010, dont elle constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- de nouveaux identificateurs ont été ajoutés dans le Tableau 4;
- les sentences CBR et MEB ont été supprimées, car elles sont maintenant uniquement utilisées par le matériel côtier SIA;
- les nouvelles sentences ACN, ALC, ALF, ARC, HRC, HRM, MOB, NSR, RLM, RRT, SM1, SM2, SM3, SM4, SMB, SPW et TRL ont été ajoutées;
- des révisions ont été apportées à ABK, ABM, GNS, NAK, NRM, RMC, ROR et TTD;
- les méthodes d'essai à l'Annex B ont été révisées.

Une liste de toutes les parties de la série IEC 61162, publiées sous le titre général *Matériels et systèmes de navigation et de radiocommunication maritimes — Interfaces numériques*, peut être consultée sur le site web de l'IEC.

Cette publication a été rédigée selon les Directives ISO/IEC, Partie 2.

Le comité a décidé que le contenu de cette publication ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives à la publication recherchée. A cette date, la publication sera

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INTRODUCTION

L'IEC 61162, Matériels et systèmes de navigation et de radiocommunication maritimes — Interfaces numériques, est une norme composée de 5 parties qui spécifient les interfaces numériques pour une application en navigation maritime, en radiocommunication et en intégration système, dont voici les titres:

Partie 1: *émetteur unique et récepteurs multiples;*

Partie 2: *émetteur unique et récepteurs multiples, transfert rapide de données;*

Partie 3: *Multiple talkers and multiple listeners — Serial data instrument network* (disponible en anglais seulement)*;*

Partie 450: *Multiple talkers and multiple listeners — Ethernet interconnection* (disponible en anglais seulement)*;*

Partie 460: *Multiple talkers and multiple listeners — Ethernet interconnection — Safety and security* (disponible en anglais seulement)*.*

Les normes d'interface du comité d'études 80 de l'IEC sont développées à partir de contributions des fabricants, des organismes privés et gouvernementaux et des opérateurs d'équipements. Les informations sont destinées à satisfaire aux besoins des utilisateurs au moment de la publication, mais il convient que les utilisateurs reconnaissent que, dans la mesure où les applications et la technologie évoluent, il convient que les normes d'interface évoluent aussi. Les utilisateurs de la présente norme sont invités à informer immédiatement l'IEC de toute insuffisance éventuelle.

La première édition de l'IEC 61162-1 a été publiée en 1995. La deuxième édition publiée en 2000 a supprimé certaines sentences qui n'étaient plus utilisées, a ajouté quelques nouvelles sentences et a inclus des détails sur le matériel navire défini dans les résolutions de l'OMI avec des sentences appropriées pour la communication entre eux. Ces informations ont ensuite été retirées de la troisième édition lorsque la pratique établit de spécifier les données de formatage des sentences dans les normes individuelles de l'équipement.

La troisième édition publiée en 2007 a introduit une nouvelle disposition du texte et de nouvelles sentences, en particulier pour prendre en charge le système d'identification automatique et l'enregistreur des données du voyage. La troisième édition a également introduit un autre type de délimiteur de début de sentence. Le délimiteur traditionnel "$" a été conservé pour les sentences conventionnelles qui sont désormais désignées par le terme sentences paramétriques. Le nouveau délimiteur "!" identifie les sentences qui sont conformes à une encapsulation à usage spécifique.

La quatrième édition a supprimé certaines sentences qui n'étaient plus utilisées, ajouté quelques nouvelles sentences pour de nouvelles applications et apporté quelques corrections et ajouts. En particulier, les sentences pertinentes par rapport aux récepteurs de navigation par satellite ont été élargies pour faciliter la description de nouveaux systèmes satellite.

Cette cinquième édition supprime également certaines sentences qui ne sont plus utilisées, ajoute quelques nouvelles sentences pour de nouvelles applications et apporte quelques corrections et ajouts.

La liaison avec la NMEA a été maintenue et la présente édition a été alignée le cas échéant sur la NMEA 0183 version 4.10.

MATÉRIELS ET SYSTÈMES DE NAVIGATION ET DE RADIOCOMMUNICATION MARITIMES – INTERFACES NUMÉRIQUES –

Partie 1: Emetteur unique et récepteurs multiples

1 Domaine d'application

La présente partie de l'IEC 61162 contient les exigences pour la communication des données entre les instruments maritimes électroniques, les équipements de navigation et de radiocommunications lorsqu'ils sont interconnectés via un système approprié.

La présente partie de l'IEC 61162 est destinée à supporter l'émission unidirectionnelle de données série entre un émetteur unique et un ou plusieurs récepteurs. Ces données sont au format ASCII imprimable et peuvent inclure des informations telles que la position, la vitesse, la profondeur, l'allocation de fréquences, etc. Les messages types peuvent être de longueur comprise entre environ 11 et 79 caractères au maximum et nécessitent généralement une émission pas plus rapide qu'un seul message par seconde.

Les définitions électriques de la présente norme ne sont pas destinées à gérer les applications à large bande passante comme les radars ou l'imagerie vidéo, ou encore les bases de données intensives et les applications de transfert de fichiers. En l'absence de disposition garantissant l'émission des messages et compte tenu de la capacité limitée de vérification des erreurs, il convient que la présente norme soit utilisée avec précaution dans toutes les applications de sécurité.

Pour les applications dans lesquelles un débit d'émission plus rapide est nécessaire, il convient de se référer à l'IEC 61162-2.

Pour les applications relatives aux matériels côtiers du système d'identification automatique (SIA), il convient de se référer à la série IEC 62320.

2 Références normatives

Les documents ci-après, dans leur intégralité ou non, sont des références normatives indispensables à l'application du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60945:2002, *Matériels et systèmes de navigation et de radiocommunication maritimes - Spécifications générales - Méthodes d'essai et résultats exigibles*

IEC 61097-6, *Global maritime distress and safety system (GMDSS) — Part 6: Narrowband direct-printing telegraph equipment for the reception of navigational and meteorological warnings and urgent information to ships (NAVTEX)* (disponible en anglais seulement)

IEC 61108 (toutes les parties), *Matériels et systèmes de navigation et de radiocommunication maritimes — Système mondial de navigation par satellite (GNSS)*

IEC 61162 (toutes les parties), *Matériels et systèmes de navigation et de radiocommunication maritimes — Interfaces numériques*

IEC 61162-2:1998, *Matériels et systèmes de navigation et de radiocommunication maritimes - Interfaces numériques - Partie 2: Emetteur unique et récepteurs multiples, transfert rapide de données*

IEC 61174, *Maritime navigation and radiocommunication equipment and systems — Electronic chart display and information system (ECDIS) — Operational and performance requirements, methods of testing and required test results* (disponible en anglais seulement)

IEC 61924-2:2012, *Maritime navigation and radiocommunication equipment and systems — Integrated navigation systems — Part 2: Modular structure for INS — Operational and performance requirements, methods of testing and required test results* (disponible en anglais seulement)

IEC 61996 (toutes les parties), *Maritime navigation and radiocommunication equipment and systems — Shipborne voyage data recorder (VDR)* (disponible en anglais seulement)

ISO/IEC 8859 (toutes les parties), *Information technology — 8-bit single-byte coded graphic character sets* (disponible en anglais seulement)

ISO/IEC 8859-1:1998, *Information technology — 8-bit single-byte coded graphic character sets — Part 1: Latin alphabet No.1 (disponible en anglais seulement)*

ISO/IEC 10646, *Information technology — Universal Coded Character Set (UCS)* (disponible en anglais seulement)

Recommandation UIT-R M.493, *Système d'appel sélectif numérique à utiliser dans le service mobile maritime*

Recommandation UIT-R M.625, *Equipements télégraphiques à impression directe utilisant l'identification automatique dans le service mobile maritime*

Recommandation UIT-R M.821, *Extension facultative du système d'appel sélectif numérique à utiliser dans le service mobile maritime*

Recommandation UIT-R M.1084, *Solutions intérimaires pour améliorer l'efficacité d'utilisation de la bande 156-174 MHz par les stations du service mobile maritime*

Recommandation UIT-R M.1371, *Caractéristiques techniques d'un système d'identification automatique utilisant l'accès multiple par répartition dans le temps et fonctionnant dans la bande attribuée aux services mobiles maritimes en ondes métriques*

Recommandation UIT-T X.27/V.11:1996, *Electrical characteristics for balanced double-current interchange circuits operating at data signalling rates up to 10 Mbit/s* (disponible en anglais seulement)

IMO GMDSS.1/Circ.18, *Master plan of shore-based facilities for the global maritime distress and safety system (GMDSS master plan)* (disponible en anglais seulement)

OMI, *Convention internationale de 1966 sur les lignes de charge*

OMI, *Manuel SafetyNET international*

IMO MSC.252(83*), Performance standards for integrated navigation systems (INS)* (disponible en anglais seulement)

IMO MSC.302(87), *Performance standards for Bridge Alert Management (BAM)* (disponible en anglais seulement)

IMO Publication 951E, *NAVTEX Manual* (disponible en anglais seulement)