INTERNATIONAL STANDARD

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Maritime navigation and radiocommunication equipment and systems – Digital interfaces

Part 1: Single talker and multiple listeners

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – DIGITAL INTERFACES –

Part 1: Single talker and multiple listeners

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

This third edition cancels and replaces the second edition published in 2000, and constitutes a technical revision. This part of IEC 61162 is closely aligned with NMEA 0183 version 3.01. It also replaces PAS 61162-100 (2002), PAS 61162-101 (2003) and PAS 61162-102 (2003).

The main changes with respect to the previous edition are listed below:

- Normative references have been renumbered from 1.2 to 2, Terms and definitions from 1.3 to 3 and Manufacturers documentation from 2 to 4. Thereafter all clauses are numbered two ahead of those in the previous edition.
- Clause 7 (Clause 5 in the previous edition) has been expanded to include two types of start of sentence delimiters. The conventional delimiter "$" is used with the conventional sentences which are now called parametric sentences. A new delimiter "!" identifies

sentences that conform to special purpose encapsulation. The example applications in Clause 9 (Clause 7 in the previous edition) have been expanded to describe both types.

- The tables in Clause 8 (Clause 6 in the previous edition) have been updated. The previous Table 5 (Approved sentence formatters) and the associated Annex A (Minimum required sentences) have been deleted.
- Clause 8 has been expanded to include new and revised sentences.
- Four new annexes have been added to support the text.

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

FDIS	Report on voting
80/464/FDIS	80/473/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.

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

International standard IEC 61162 is a four part standard which specifies four digital interfaces for application in marine navigation, radiocommunication and system integration. The four parts are:

IEC 61162-1 Single talker and multiple listeners

IEC 61162-2 Single talker and multiple listeners, high speed transmission

IEC 61162-3 Multiple talkers and multiple listeners – Serial data instrument network (under consideration)

IEC 61162-4 Multiple talkers and multiple listeners – Ship systems interconnection

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.

This edition is a complete revision of the second edition of IEC 61162-1. Liaison has been maintained with NMEA and this edition has been aligned as closely as possible with NMEA 0183 version 3.01. It incorporates three previously issued publicly available specifications: PAS 61162-100 *Extra requirements to IEC 61162-1 for UAIS*, PAS 61162-101 *Modified sentences and requirements for IEC 61162* and PAS 61162-102 *Extra requirements to IEC 61162-1 for the voyage data recorder.*

The second edition included details of the ship equipment defined in IMO resolutions together with appropriate sentences for communication between them. It is now the practice to specify the sentence formatters in the individual standards for equipment, so, in this edition the previous Table 5 (Approved sentence formatters) and Annex A (Minimum required sentences) have not been included.

NOTE The equipment responses and behaviour is beyond the scope for this standard and should be included in the individual equipment standards, for example alarm handling.

This edition introduces (from PAS 61162-100) two types of start of sentence delimiters. The conventional delimiter “$” is used with the conventional sentences which are now called parametric sentences. The new delimiter “!” identifies sentences that conform to special purpose encapsulation. The example applications in Clause 9 (Clause 7 in second edition) have been expanded to describe both types.

The list of sentences in Clause 8 (Clause 6 in second edition) has been updated to include all the sentences which were developed in the three public available specifications together with new sentences for display dimming (DDC), NAVTEX (NRM and NRX), rudder order (ROR), heading (THS) and user identification code transmission (UID).

As a result of experience the sentences given in PAS 61162-102 for the voyage data recorder; ALA, AKD, DOR, ETL, EVE, FIR, GEN, HSS, PRC, TRC, TRD and WAT have been modified in this edition.

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 standard is intended to support one-way serial data transmission from a single talker to one or more listeners. This data is 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.

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

ISO/IEC 8859-1:1998, *Information technology – 8-bit single-byte coded graphic character sets – Part 1: Latin alphabet No.1*

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

ITU-R M.821, *Optional expansion of the digital selective-calling system for use in the maritime mobile service*

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

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

ITU-T X.27/V.11:1996, *Electrical characteristics for balanced double-current interchange circuits operating at data signalling rates up to 10 Mbit/s*