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Edition 6.0 2024-04
COMMENTED VERSION

INTERNATIONAL STANDARD

colour inside

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



IEC 61162-1:2024-04 CMV(en)



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

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – DIGITAL INTERFACES –

Part 1: Single talker and multiple listeners

FOREWORD

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This commented version (CMV) of the official standard IEC 61162-1:2024 edition 6.0 allows the user to identify the changes made to the previous IEC 61162-1:2016 edition 5.0. Furthermore, comments from IEC TC 80 experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

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

This sixth edition cancels and replaces the fifth edition published in 2016. This edition constitutes a technical revision.

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

a) alternative hardware is given in 5.1 which may now be as specified in this document or as specified in IEC 61162-2;
b) the data transmission rate given in Clause 6 is now configurable. The default remains as 4 800 (bits/s) but higher rates may be provided;
c) new identifiers have been added to Table 4;
d) new sentences AGL, EPM, GDC, NLS, SEL, SLM, SMV and VBC have been added;
e) revisions have been made to ABK, ABM, ACN, ALC, ALF, ARC, BBM, DDC, DTM, EPV, FIR, GBS, GFA, GLL, GNS, GRS, GSA, GST, GSV, HRM, NRX, POS, RLM, ROR, RSA, TLB, TTD, VSD and XDR;
f) the previous Annex A, Glossary, has been deleted as being of historical interest.

The text of this International Standard is based on the following documents:

Draft	Report on voting
80/1093/FDIS	80/1097/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

IMPORTANT – The "colour inside" logo on the cover page of this document 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

The IEC 61162 series consists of 5 parts which specify digital interfaces for application in marine navigation, radiocommunication and system integration, as follows:

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;

IEC 61162-450: Multiple talkers and multiple listeners – Ethernet interconnection;

IEC 61162-460: 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 document 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 removed some sentences which were not in use, added some new sentences for new applications and made some corrections and additions. In particular, the sentences of relevance to satellite navigation receivers were expanded to facilitate the description of new satellite systems.

The fifth edition also removed some sentences which were no longer in use, added some new sentences for new applications and made some corrections and additions.

This sixth edition 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 and possible with NMEA 0183 version 4.10. **1**

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 document 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~~ can include information such as position, speed, depth, frequency allocation, etc. Typical messages ~~may~~ can 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 document 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, it is important this document ~~should be~~ is used with caution in all safety applications.

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

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

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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~~:2002~~ **2**, *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)* **3**~~

~~IEC 61108 (all parts), *Maritime navigation and radiocommunication equipment and systems – Global navigation satellite systems (GNSS)* **3**~~

~~IEC 61162 (all parts), *Maritime navigation and radiocommunication equipment and systems – Digital interface* **3**~~

~~IEC 61162-2:1998, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 2: Single talker and multiple listeners, high-speed transmission* **3**~~

~~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*~~ **3**

~~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*~~ **3**

~~IEC 61996 (all parts), *Maritime navigation and radiocommunication equipment and systems – Shipborne voyage data recorder (VDR)*~~ **3**

~~ISO/IEC 8859 (all parts), *Information technology – 8-bit single-byte coded graphic character sets*~~ **3**

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

~~ISO/IEC 10646, *Information technology – Universal Coded Character Set (UCS)*~~ **3**

~~ITU-R Recommendation M.493, *Digital selective-calling system for use in the maritime mobile service*~~ **3**

~~ITU-R M.625, *Direct printing telegraph equipment employing automatic identification in the maritime mobile service*~~ **3**

~~ITU-R Recommendation M.821, *Optional expansion of the digital selective-calling system for use in the maritime mobile service*~~ **3**

~~ITU-R Recommendation M.1084, *Interim solutions for improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service*~~ **3**

~~ITU-R Recommendation M.1371, *Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile band*~~ **3**

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

~~IMO GMDSS.1/Circ.18, *Master plan of shore-based facilities for the global maritime distress and safety system (GMDSS master plan)*~~ **3**

~~IMO, *International Convention on Load Lines*~~ **3**

~~IMO, *International SafetyNET Manual*~~ **3**

~~IMO MSC.252(83*), Performance standards for integrated navigation systems (INS)*~~ **3**

~~IMO MSC.302(87), *Performance standards for Bridge Alert Management (BAM)*~~ **3**

~~IMO Publication 951E, *NAVTEX Manual*~~ **3**

3 Terms and definitions

~~**3.1 General**~~

~~Common terms are defined in the glossary of Annex A. Where there is a conflict, terms are interpreted, wherever possible, in accordance with the references in Clause 2.~~

~~**3.2 Terms and definitions**~~

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

~~**3.2.2**~~**3.1**
listener
~~any~~ device which receives data from another device

~~**3.2.1**~~**3.2**
talker
~~any~~ device which sends data to other devices

Note 1 to entry: The type of talker is identified by a 2-character mnemonic as listed in 8.2 (see Table 4).

4 Manufacturer's documentation

~~Operator~~ Installation manuals ~~or other appropriate literature~~ **4** provided for equipment that is intended to meet the requirements of this document shall contain the following information:

a) identification of the A and B signal lines (see Figure 1);
b) the output drive capability as a talker;
c) a list of approved sentences, noting unused fields, proprietary sentences transmitted as a talker and transmission interval for each sentence;
d) the load requirements as a listener;
e) a list of sentences and associated data fields that are required as a listener;
f) the current software and hardware revision, if this is relevant to the interface;
g) an electrical description or schematic of the listener/talker input/output circuits citing actual components and devices used, including connector type and part number;
h) the version number and date of update of the standard for which compliance is sought;
i) list of supported baud rates (bits/s) including any limitations per each baud rate supported. **5**

5 Hardware specification

5.1 General

NOTE Guidelines on methods of testing are given in Annex B.

One talker and multiple listeners may be connected in parallel over an interconnecting wire. The number of listeners depends on the output capability and input drive requirements of individual devices.

There are two alternatives for the hardware: