

---

**Pomorska navigacijska in radiokomunikacijska oprema in sistemi – Digitalni vmesniki - 2. del: En govorec (pošiljatelj) in več poslušalcev (prejemnikov); povezava sistemov - hitri prenos**

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

Navigations- und Funkkommunikationsgeräte und -systeme für die Seeschifffahrt - Digitale Schnittstellen -- Teil 2: Ein Datensender und mehrere Datenempfänger, Hochgeschwindigkeitsübertragung

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

**Ta slovenski standard je istoveten z: EN 61162-2:1998**

**ICS:**

33.060.01	Radijske komunikacije na splošno	Radiocommunications in general
47.020.70	Navigacijska in krmilna oprema	Navigation and control equipment

**SIST EN 61162-2:2004****en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 61162-2:2004

<https://standards.iteh.ai/catalog/standards/sist/4dc1e576-4608-4122-b2b1-9aa4e802ce12/sist-en-61162-2-2004>

EUROPEAN STANDARD  
 NORME EUROPÉENNE  
 EUROPÄISCHE NORM

**EN 61162-2**

October 1998

ICS 47.020.70

English version

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

Navigations- und  
 Funkkommunikationsgeräte  
 und -systeme für die Seeschifffahrt  
 Digitale Schnittstellen  
 Teil 2: Ein Datensender und mehrere  
 Datenempfänger,  
 Hochgeschwindigkeitsübertragung  
 (IEC 61162-2:1998)

<https://standards.iteh.ai/catalog/standards/sist/4dc1162-2-2004/iec-61162-2-1998-9aa4e802ce12/sist-en-61162-2-2004>

This European Standard was approved by CENELEC on 1998-10-01. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**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 80/189/FDIS, future edition 1 of IEC 61162-2, 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 61162-2 on 1998-10-01.

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) 1999-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2001-07-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annexes A and B are informative.

Annex ZA has been added by CENELEC.

---

### Endorsement notice

The text of the International Standard IEC 61162-2:1998 was approved by CENELEC as a European Standard without any modification.

SIST EN 61162-2:2004

<https://standards.iteh.ai/catalog/standards/sist/4dc1e576-4608-4122-b2b1-9aa4e802ce12/sist-en-61162-2-2004>

## Annex ZA (normative)

Normative references to international publications  
with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 60945	1996	Maritime navigation and radiocommunication equipment and systems General requirements, methods of testing and required test results	EN 60945	1997
IEC 61162-1	1995	Maritime navigation and radiocommunication equipment and systems Digital interfaces Part 1: Single talker and multiple listeners	EN 61162-1	1996
ITU-T V.11	1996	Electrical characteristics for balanced double-current interchange circuits operating at data signalling rates up to 10 Mbits/s	-	-
NMEA 0183 Version 2.30	1998	National marine electronics association (USA) - Standard for interfacing marine electronic navigational devices	-	-
EIA 485	1991	Electrical characteristics of generators and receivers for use in balanced digital multipoint systems	-	-

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 61162-2:2004

<https://standards.iteh.ai/catalog/standards/sist/4dc1e576-4608-4122-b2b1-9aa4e802ce12/sist-en-61162-2-2004>

# INTERNATIONAL STANDARD

# IEC 61162-2

First edition  
1998-09

---



---

## Maritime navigation and radiocommunication equipment and systems – Digital interfaces –

### Part 2:

### Single talker and multiple listeners, high-speed transmission (standards.iteh.ai)

SIST EN 61162-2:2004

<https://standards.iteh.ai/catalog/standards/sist/4dc1e576-4608-4122-b2b1-9aa4c6023c12/sist-61162-2-2004>

### Matériels et systèmes de navigation et de radiocommunication maritimes – Interfaces numériques –

### Partie 2:

### Émetteur unique et récepteurs multiples, transfert rapide de données

© IEC 1998 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission  
Telefax: +41 22 919 0300

3, rue de Varembé Geneva, Switzerland  
IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

PRICE CODE

T

For price, see current catalogue

## CONTENTS

	Page
FOREWORD .....	3
Clause	
1 General.....	4
1.1 Scope .....	4
1.2 Normative references .....	4
1.3 Definitions.....	5
2 Manufacturer's documentation.....	5
2.1 Standard documents .....	5
2.2 Additional information.....	5
3 Hardware specification .....	5
3.1 Interconnecting wires .....	5
3.2 Conductor definitions .....	6
3.3 Electrical connection/shield requirements .....	6
3.4 Connector .....	6
3.5 Electrical signal characteristics.....	6
4 Data transmission.....	7
5 Data format protocol.....	7
5.1 Characters .....	7
5.2 Fields.....	8
5.3 Sentences.....	9
5.4 Error detection and handling.....	12
6 Data content .....	13
7 Applications .....	13
8 Methods of testing and required test results.....	13
8.1 Test preparation.....	13
8.2 Test sequence .....	13
8.3 Standard test signals.....	13
8.4 Test of the interface .....	13
Figure 1 – Talker/listener connections.....	15
Figure 2 – Cables – Electrical shield requirements .....	15
Figure 3 – Data transmission format .....	15
Annex A (informative) IMO resolutions and ITU recommendations and relevant IEC/ISO standards to which this standard applies for maritime navigation and radiocommunication equipment and systems .....	16
Annex B (informative) Glossary.....	24



## INTERNATIONAL ELECTROTECHNICAL COMMISSION

---

**MARITIME NAVIGATION AND RADIOCOMMUNICATION  
EQUIPMENT AND SYSTEMS – DIGITAL INTERFACES –**
**Part 2: Single talker and multiple listeners,  
high-speed transmission**

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61162-2 has been prepared by technical committee 80: Maritime navigation and radiocommunication equipment and systems.

This part of IEC 61162 is based upon NMEA 0183, version 2.30, and it is the intention of IEC and NMEA to maintain this commonality as far as possible.

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

FDIS	Report on voting
80/189/FDIS	80/206/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.

Annexes A and B are for information only.

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

# MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – DIGITAL INTERFACES –

## Part 2: Single talker and multiple listeners, high-speed transmission

### 1 General

#### 1.1 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 interface.

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 any information as specified by approved sentences or information coded according to the rules for proprietary sentences. Typical messages may be from 11 to a maximum of 79 characters in length and generally require repetition rates up to once per 20 ms.

The electrical definitions in this standard are intended to accommodate higher data rates than are specified in IEC 61162-1. 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.

Annex A contains a list of relevant IMO resolutions and ITU recommendations to which this standard applies.

#### 1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61162. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 61162 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60945:1996, *Maritime navigation and radiocommunication equipment and systems – General requirements, methods of testing and required test results*

IEC 61162-1:1995, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 1: Single talker and multiple listeners*

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

NMEA 0183 – Version 2.30:1998, *National marine electronics association (USA) – Standard for interfacing marine electronic navigational devices*

EIA 485:1991, *Electrical characteristics of generators and receivers for use in balanced digital multipoint systems*

### 1.3 Definitions

Common terms are defined in the glossary of annex B. Where there is a conflict, terms shall be interpreted, wherever possible, in accordance with the references in 1.2.

For the purposes of this part of IEC 61162, the following definitions apply.

**talker**

any device which sends data to other devices. The type of talker is identified by a two-character mnemonic as listed in 6.2 (table 4) of IEC 61162-1.

**listener**

any device which receives data from another device

**latency**

time interval between an event and its resulting information, including time for processing, transmission and/or reception

## 2 Manufacturer's documentation

### 2.1 Standard documents

Operator manuals or other appropriate literature provided for equipment that is intended to meet the requirements of this standard shall contain as a minimum the following information:

- a) identification of the A, B and common (C) signal lines;
- b) the output drive capability as a talker;
- c) a list of approved sentences, noting unused fields, proprietary sentences transmitted as a talker, data latency 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 by, or are acceptable to, 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.

### 2.2 Additional information

As latency, filtering, error handling and data transmission interval can have a serious influence on the performance of a system, the manufacturer shall give careful consideration to these aspects. Documentation should include such data where applicable.

## 3 Hardware specification

One talker and multiple listeners may be connected in parallel over interconnecting wires. Because of EMC requirements shielded cables are recommended. The number of listeners depends on the output capability, the input drive requirements of the connected devices, and on the use of termination resistors.

### 3.1 Interconnecting wires

Interconnection between devices may be by means of a shielded two-conductor twisted-pair wire (A, B) plus any means to secure common signal ground potential (C) for transmitting and receiving devices. For this purpose, a third wire additional to the twisted pair or the inner shield of double-shielded cable with insulated shields may be used.

### 3.2 Conductor definitions

The conductors referred to in this standard are the signal lines A, B, C (common) and shield.

### 3.3 Electrical connection/shield requirements

All signal and common line connections A, B and C are connected in parallel.

With single-shielded cables and a separate wire as common line C (signal ground), the shield shall be connected to the talker chassis and shall not be connected to any listener. However, the shield shall be continuous (unbroken) between all listeners (see figure 1 and figure 2a)).

With double-shielded cables and the inner shield used as common line C (signal ground), the outer shield shall be connected to the talker chassis and shall not be connected to any listener. However, the outer shield shall be continuous (unbroken) between all listeners (see figure 1 and figure 2b)).

With double-shielded cables and a separate wire as common line C (signal ground), the inner shield shall be connected to the talker chassis and shall not be connected to any listener. However, the inner shield shall be continuous (unbroken) between all listeners. The outer shield may be connected to the chassis on either side if required (see figure 1 and figure 2c)).

The cabling shall be designed in a way that stubs are avoided or kept as short as possible. If long cables are necessary, termination at the end of the line according to ITU-T V.11 shall be considered.

### 3.4 Connector

No standard connector is specified. Wherever possible readily available commercial connectors shall be used. Manufacturers shall provide means for user identification of the connections used.

### 3.5 Electrical signal characteristics

This subclause describes the electrical characteristics of transmitters and receivers.

#### 3.5.1 Signal state definitions

The idle, marking, logical 1, OFF or stop bit state is defined by a negative voltage on line A with respect to line B, as in IEC 61162-1.

The active, spacing, logical 0, ON or start bit state is defined by a positive voltage on line A with respect to line B, as in IEC 61162-1.

#### 3.5.2 Talker drive circuits

No provision is made for more than a single talker to be connected to the bus. The drive circuit shall meet, as a minimum, the requirements of ITU-T V.11.

Improved and compatible driver circuits (e.g. EIA-485) used in a compliant way are allowed.

#### 3.5.3 Listener receive circuits

Multiple listeners may be connected to a single talker. The listener's receive circuit shall comply with ITU-T V.11. Optional termination resistors for the line shall be provided. The input terminals A, B and C shall be electrically isolated from the remaining electronics of the listening device. Reference is made to 3.5.4 and a sample circuit shown in figure 1 of this standard.