

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

BS EN 61162-1:2016



BSI Standards Publication

Maritime navigation and radiocommunication equipment and systems — Digital interfaces

Part 1: Single talker and multiple listeners

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

This British Standard is the UK implementation of EN 61162-1:2016. It is identical to IEC 61162-1:2016. It supersedes BS EN 61162-1:2011 which will be withdrawn on 5 October 2019.

The UK participation in its preparation was entrusted to Technical Committee EPL/80, Maritime navigation and radiocommunication equipment and systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2017.

Published by BSI Standards Limited 2017

ISBN 978 0 580 90399 1

ICS 47.020.70

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2017.

Amendments/corrigenda issued since publication

Date	Text affected
-------------	----------------------

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

EUROPÄISCHE NORM

December 2016

ICS 47.020.70

Supersedes EN 61162-1:2011

English Version

Maritime navigation and radiocommunication equipment
and systems - Digital interfaces -
Part 1: Single talker and multiple listeners
(IEC 61162-1:2016)

Matériels et systèmes de navigation et de
radiocommunication maritimes - Interfaces numériques -
Partie 1: Émetteur unique et récepteurs multiples
(IEC 61162-1:2016)

Navigations- und Funkkommunikationsgeräte und -systeme
für die Seeschifffahrt - Digitale Schnittstellen -
Teil 1: Ein Datensender und mehrere Datenempfänger
(IEC 61162-1:2016)

This European Standard was approved by CENELEC on 2016-10-05. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

European foreword

The text of document 80/799/FDIS, future edition 5 of IEC 61162-1, prepared by IEC/TC 80 "Maritime navigation and radiocommunication equipment and systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61162-1:2016.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2017-07-05
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-10-05

This document supersedes EN 61162-1:2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61162-1:2016 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61023	NOTE	Harmonized as EN 61023.
IEC 61097-1	NOTE	Harmonized as EN 61097-1.
IEC 61108-1	NOTE	Harmonized as EN 61108-1.
IEC 61108-2	NOTE	Harmonized as EN 61108-2.
IEC 61108-3	NOTE	Harmonized as EN 61108-3.
IEC 61108-4	NOTE	Harmonized as EN 61108-4.
IEC 61993-2	NOTE	Harmonized as EN 61993-2.
IEC 61996-1	NOTE	Harmonized as EN 61996-1.
IEC 61996-2	NOTE	Harmonized as EN 61996-2.
IEC 62065	NOTE	Harmonized as EN 62065.
IEC 62252	NOTE	Harmonized as EN 62252.
IEC 62287-1	NOTE	Harmonized as EN 62287-1.

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

IEC 62288	NOTE	Harmonized as EN 62288.
IEC 62320-1	NOTE	Harmonized as EN 62320-1.
IEC 62320-2	NOTE	Harmonized as EN 62320-2.
IEC 62320-3	NOTE	Harmonized as EN 62320-3.
IEC 62388	NOTE	Harmonized as EN 62388.
ISO 9875	NOTE	Harmonized as EN ISO 9875.
ISO 11606	NOTE	Harmonized as EN ISO 11606.

This is a preview of "BS EN 61162-1:2016". Click here to purchase the full version from the ANSI store.

(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60945	2002	Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results	EN 60945	2002
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	series	Maritime navigation and radiocommunication equipment and systems - Global navigation satellite systems (GNSS)	EN 61108	series
IEC 61162	series	Maritime navigation and radiocommunication equipment and systems - Digital interfaces	EN 61162	series
IEC 61162-2	1998	Maritime navigation and radiocommunication equipment and systems - Digital interfaces - Part 2: Single talker and multiple listeners, high-speed transmission	EN 61162-2	1998
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	EN 61174	-

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

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	EN 61924-2	2013
IEC 61996	series	Maritime navigation and radiocommunication equipment and systems - Shipborne voyage data recorder (VDR)	EN 61996	series
ISO/IEC 8859	series	Information technology - 8-bit single-byte coded graphic character sets	-	-
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)	-	-
ITU-R Recommendation M.493	-	Digital selective-calling system for use in the maritime mobile service	-	-
ITU-R Recommendation M.625	-	Direct-printing telegraph equipment employing automatic identification in the maritime mobile service	-	-
ITU-R Recommendation M.821	-	Optional expansion of the digital selective-calling system for use in the maritime mobile service	-	-
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	-	-
ITU-R Recommendation M.1371	-	Technical characteristics for an automatic identification system using time-division multiple access in the VHF maritime mobile band	-	-
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 908E	-	International SafetyNET Manual	-	-
IMO 951E	-	NAVTEX Manual	-	-
IMO MSC.252(83)	-	Performance Standards for Integrated Navigation Systems (INS)	-	-
IMO MSC.302(87)	-	Performance standards for Bridge Alert Management (BAM)	-	-

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

CONTENTS

FOREWORD	8
INTRODUCTION	10
1 Scope	11
2 Normative references	11
3 Terms and definitions	13
3.1 General	13
3.2 Terms and definitions	13
4 Manufacturer's documentation	13
5 Hardware specification	13
5.1 General	13
5.2 Interconnecting wire	13
5.3 Conductor definitions	13
5.4 Electrical connections/shield requirements	14
5.5 Connector	14
5.6 Electrical signal characteristics	14
5.6.1 General	14
5.6.2 Signal state definitions	14
5.6.3 Talker drive circuits	14
5.6.4 Listener receive circuits	14
5.6.5 Electrical isolation	15
5.6.6 Maximum voltage on bus	15
6 Data transmission	15
7 Data format protocol	16
7.1 Characters	16
7.1.1 General	16
7.1.2 Reserved characters	16
7.1.3 Valid characters	16
7.1.4 Undefined characters	16
7.1.5 Character symbols	16
7.2 Fields	16
7.2.1 String	16
7.2.2 Address field	16
7.2.3 Data fields	17
7.2.4 Checksum field	18
7.2.5 Sequential message identifier field	18
7.3 Sentences	19
7.3.1 General structure	19
7.3.2 Description of approved sentences	19
7.3.3 Parametric sentences	20
7.3.4 Encapsulation sentences	21
7.3.5 Query sentences	23
7.3.6 Proprietary sentences	23
7.3.7 Command sentences	24
7.3.8 Valid sentences	25
7.3.9 Multi-sentence messages	25

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

7.3.10	Sentence transmission timing.....	25
7.3.11	Additions to approved sentences.....	25
7.4	Error detection and handling	26
7.5	Handling of deprecated sentences.....	26
8	Data content.....	26
8.1	Character definitions	26
8.2	Field definitions	28
8.3	Approved sentences	32
8.3.1	General format.....	32
8.3.2	AAM – Waypoint arrival alarm	32
8.3.3	ABK – AIS addressed and binary broadcast acknowledgement	32
8.3.4	ABM – AIS addressed binary and safety related message	33
8.3.5	ACA – AIS channel assignment message	34
8.3.6	ACK – Acknowledge alarm	36
8.3.7	ACN – Alert command.....	36
8.3.8	ACS – AIS channel management information source	37
8.3.9	AIR – AIS interrogation request.....	37
8.3.10	AKD – Acknowledge detail alarm condition	38
8.3.11	ALA – Report detailed alarm condition.....	39
8.3.12	ALC – Cyclic alert list.....	40
8.3.13	ALF – Alert sentence	41
8.3.14	ALR – Set alarm state	43
8.3.15	APB – Heading/track controller (autopilot) sentence B	43
8.3.16	ARC – Alert command refused	44
8.3.17	BBM – AIS broadcast binary message.....	45
8.3.18	BEC – Bearing and distance to waypoint – Dead reckoning	46
8.3.19	BOD – Bearing origin to destination	46
8.3.20	BWC – Bearing and distance to waypoint – Great circle.....	46
8.3.21	BWR – Bearing and distance to waypoint – Rhumb line	46
8.3.22	BWW – Bearing waypoint to waypoint	47
8.3.23	CUR – Water current layer – Multi-layer water current data	47
8.3.24	DBT – Depth below transducer.....	48
8.3.25	DDC – Display dimming control.....	48
8.3.26	DOR – Door status detection.....	49
8.3.27	DPT – Depth.....	50
8.3.28	DSC – Digital selective calling information.....	50
8.3.29	DSE – Expanded digital selective calling	51
8.3.30	DTM – Datum reference	51
8.3.31	EPV – Command or report equipment property value.....	52
8.3.32	ETL – Engine telegraph operation status	54
8.3.33	EVE – General event message.....	55
8.3.34	FIR – Fire detection	55
8.3.35	FSI – Frequency set information.....	56
8.3.36	GBS – GNSS satellite fault detection.....	57
8.3.37	GEN – Generic binary information	58
8.3.38	GFA – GNSS fix accuracy and integrity	59
8.3.39	GGA – Global positioning system (GPS) fix data	60
8.3.40	GLL – Geographic position – Latitude/longitude.....	61

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

8.3.41	GNS – GNSS fix data.....	61
8.3.42	GRS – GNSS range residuals	64
8.3.43	GSA – GNSS DOP and active satellites.....	65
8.3.44	GST – GNSS pseudorange noise statistics.....	67
8.3.45	GSV – GNSS satellites in view	68
8.3.46	HBT – Heartbeat supervision sentence.....	69
8.3.47	HCR – Heading correction report	70
8.3.48	HDG – Heading, deviation and variation	70
8.3.49	HDT – Heading true	71
8.3.50	HMR – Heading monitor receive.....	71
8.3.51	HMS – Heading monitor set	72
8.3.52	HRM – heel angle, roll period and roll amplitude measurement device	72
8.3.53	HSC – Heading steering command.....	73
8.3.54	HSS – Hull stress surveillance systems.....	73
8.3.55	HTC – Heading/track control command; HTD – Heading /track control data	73
8.3.56	LR1 – AIS long-range reply sentence 1	75
8.3.57	LR2 – AIS long-range reply sentence 2	75
8.3.58	LR3 – AIS long-range reply sentence 3	76
8.3.59	LRF – AIS long-range function	76
8.3.60	LRI – AIS long-range interrogation	77
8.3.61	MOB – Man over board notification	78
8.3.62	MSK – MSK receiver interface.....	80
8.3.63	MSS – MSK receiver signal status.....	80
8.3.64	MTW – Water temperature	80
8.3.65	MWD – Wind direction and speed.....	80
8.3.66	MWV – Wind speed and angle	81
8.3.67	NAK – Negative acknowledgement.....	81
8.3.68	NRM – NAVTEX receiver mask	82
8.3.69	NRX – NAVTEX received message	83
8.3.70	NSR – Navigation status report	85
8.3.71	OSD – Own ship data.....	86
8.3.72	POS – Device position and ship dimensions report or configuration command.....	87
8.3.73	PRC – Propulsion remote control status	88
8.3.74	RLM – Return link message	89
8.3.75	RMA – Recommended minimum specific LORAN-C data	90
8.3.76	RMB – Recommended minimum navigation information	90
8.3.77	RMC – Recommended minimum specific GNSS data.....	91
8.3.78	ROR – Rudder order status.....	92
8.3.79	ROT – Rate of turn.....	93
8.3.80	RRT – Report route transfer.....	93
8.3.81	RPM – Revolutions	94
8.3.82	RSA – Rudder sensor angle	94
8.3.83	RSD – Radar system data	94
8.3.84	RTE – Routes	95
8.3.85	SFI – Scanning frequency information	96
8.3.86	SMI – SafetyNET Message, All Ships/NavArea	96
8.3.87	SM2 – SafetyNET Message, Coastal Warning Area	98

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

8.3.88	SM3 – SafetyNET Message, Circular Area address	100
8.3.89	SM4 – SafetyNET Message, Rectangular Area Address	102
8.3.90	SMB – IMO SafetyNET Message Body	105
8.3.91	SPW – Security password sentence	106
8.3.92	SSD – AIS ship static data	107
8.3.93	STN – Multiple data ID	107
8.3.94	THS – True heading and status	108
8.3.95	TLB – Target label	108
8.3.96	TLL – Target latitude and longitude	108
8.3.97	TRC – Thruster control data	109
8.3.98	TRL – AIS transmitter-non-functioning log	110
8.3.99	TRD – Thruster response data	111
8.3.100	TTD – Tracked target data	111
8.3.101	TTM – Tracked target message	113
8.3.102	TUT – Transmission of multi-language text.....	114
8.3.103	TXT – Text transmission	115
8.3.104	UID – User identification code transmission.....	116
8.3.105	VBW – Dual ground/water speed.....	116
8.3.106	VDM – AIS VHF data-link message	117
8.3.107	VDO – AIS VHF data-link own-vessel report	118
8.3.108	VDR – Set and drift.....	118
8.3.109	VER – Version	119
8.3.110	VHW – Water speed and heading.....	119
8.3.111	VLW – Dual ground/water distance.....	120
8.3.112	VPW – Speed measured parallel to wind	120
8.3.113	VSD – AIS voyage static data.....	120
8.3.114	VTG – Course over ground and ground speed	121
8.3.115	WAT – Water level detection	121
8.3.116	WCV – Waypoint closure velocity	122
8.3.117	WNC – Distance waypoint to waypoint	123
8.3.118	WPL – Waypoint location	123
8.3.119	XDR – Transducer measurements	123
8.3.120	XTE – Cross-track error, measured	124
8.3.121	XTR – Cross-track error, dead reckoning.....	125
8.3.122	ZDA – Time and date	125
8.3.123	ZDL – Time and distance to variable point.....	125
8.3.124	ZFO – UTC and time from origin waypoint.....	125
8.3.125	ZTG – UTC and time to destination waypoint.....	126
9	Applications.....	126
9.1	Example parametric sentences.....	126
9.1.1	General	126
9.1.2	Example 1 – LORAN-C latitude/longitude	126
9.1.3	Example 2 – LORAN-C arrival alarm	126
9.1.4	Example 3 – Proprietary sentence	127
9.1.5	Example 4 – RMA examples.....	127
9.1.6	Example 5 – FSI examples.....	128
9.1.7	Example 6 – MSK/MSS examples.....	128
9.1.8	Example 7 – DSC and DSE sentences	128

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

9.1.9	Example 8 – FIR, DOR and WAT sentences	129
9.2	Example encapsulation sentences.....	129
9.3	Examples of receiver diagrams.....	130
Annex A (informative)	Glossary.....	131
Annex B (normative)	Guidelines for methods of testing and required test results	138
B.1	General	138
B.2	Definition of environmental conditions for the tests	138
B.3	Examination of the manufacturer's documentation	138
B.4	Test of hardware.....	139
B.4.1	Interface units.....	139
B.4.2	Input circuit test	139
B.4.3	Check of electrical isolation	139
B.4.4	Maximum input voltage test.....	139
B.4.5	Test arrangement for performance tests according to IEC 60945	139
B.4.6	Test under maximum interface workload.....	139
B.4.7	Test for correct parsing of sentences	140
B.4.8	Test under long term conditions	141
B.4.9	Protocol test of the interface of the EUT	141
Annex C (normative)	Six-bit binary field conversion.....	147
Annex D (normative)	Alarm system fields	150
Annex E (informative)	Example of use of FIR, DOR and WAT sentences	159
E.1	Example of the use of system status messages	159
E.2	Use of system division codes	159
E.3	Send complete status.....	160
E.4	Change measurement point status	161
E.5	Point status change during a status update	161
E.6	Failure in a sub-system	161
E.7	Status updates when a sub-system is in fault	162
E.8	Signal a correction of a sub-system fault	162
Annex F (informative)	Example encapsulation sentence	163
F.1	Example encapsulation sentence	163
F.2	AIS VHF data-link message VDM sentence encapsulation example	163
F.3	Background discussion – Encapsulation coding.....	163
F.4	Decoding the encapsulated string.....	165
F.5	Conversion from symbols to binary bits	165
F.6	Organising the binary message data	166
F.7	Interpreting the decoded binary strings.....	166
Bibliography	169
Figure 1	– Listener receive circuit	15
Figure 2	– Data transmission format.....	15
Figure 3	– Example 1, J-FET, N channel, opto-isolator based listener circuit	130
Figure 4	– Example 2, NPN opto-isolator based listener circuit.....	130
Figure C.1	– 6-bit binary code converted to valid IEC 61162-1 character	148
Figure C.2	– Valid IEC 61162-1 character converted to 6-bit binary code.....	149
Figure E.1	– Example system diagram	160

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

Figure F.1 – Message data format.....	164
Figure F.2 – Work sheet for decoding and interpreting encapsulated string.....	168
Table 1 – Reserved characters	26
Table 2 – Valid characters	26
Table 3 – Character symbol	27
Table 4 – Talker identifier mnemonics.....	28
Table 5 – Field type summary	31
Table B.1 – Example – Special characters	140
Table B.2 – Example – Parsing	140
Table B.3 – Example – Future extensions	141
Table B.4 – Example – Data string GGA sent by the EUT to the test receiver (listener).....	142
Table B.5 – Example – Checksum data sent	143
Table B.6 – Example – Data string GNS received by the EUT.....	144
Table B.7 – Example – Checksum data received	145
Table B.8 – Example – Break of data line.....	146
Table B.9 – Example – Receiving interval	146
Table B.10 – Example – Talker ID.....	146
Table C.1 – Six-bit binary field conversion table	147
Table D.1 – System alarm fields.....	150
Table F.1 – Example message from ITU-R M.1371	167

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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;

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

- 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.

This is a preview of "BS EN 61162-1:2016". [Click here to purchase the full version from the ANSI store.](#)

INTRODUCTION

IEC 61162 Maritime navigation and radiocommunication equipment and systems – Digital interfaces consists of 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 – 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 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.

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 4.10.

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*