



SLOVENSKI STANDARD

SIST EN 62940:2017

01-april-2017

Pomorska navigacijska in radiokomunikacijska oprema in sistemi - Integrirani komunikacijski sistemi (ICS) - Zahteve za delovanje in lastnosti, preskusne metode in zahtevani rezultati preskušanja (IEC 62940:2016)

Maritime navigation and radiocommunication equipment equipment and systems - Integrated communication system (ICS) - Operational and performance requirements, methods of testing and required test results (IEC 62940:2016)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 62940:2017](https://standards.iteh.ai/catalog/standards/sist/64223319-f3d2-449d-b1ac-3d76f5060344/sist-en-62940-2017)

<https://standards.iteh.ai/catalog/standards/sist/64223319-f3d2-449d-b1ac-3d76f5060344/sist-en-62940-2017>

Ta slovenski standard je istoveten z: EN 62940:2017

ICS:

47.020.70	Navigacijska in krmilna oprema	Navigation and control equipment
-----------	--------------------------------	----------------------------------

SIST EN 62940:2017

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 62940:2017](#)

<https://standards.iteh.ai/catalog/standards/sist/64223319-f3d2-449d-b1ac-3d76f5060344/sist-en-62940-2017>

EUROPEAN STANDARD

EN 62940

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2017

ICS 47.020.70

English Version

Maritime navigation and radiocommunication equipment and systems - Integrated communication system (ICS) - Operational and performance requirements, methods of testing and required test results
(IEC 62940:2016)

Matériels et systèmes de navigation et de radiocommunication maritimes - Système intégré de communication (ICS) - Exigences opérationnelles et de performance, méthodes d'essai et résultats d'essai exigés
(IEC 62940:2016)

Navigations- und Funkkommunikationsgeräte und -systeme für die Seeschifffahrt - Integriertes Kommunikationssystem (ICS) - Betriebs- und Leistungsanforderungen; Prüfverfahren und geforderte Prüfergebnisse
(IEC 62940:2016)

This European Standard was approved by CENELEC on 2016-11-30. 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.

standards.iteh.ai
SIST EN 62940:2017

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, Serbia, 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

EN 62940:2017**European foreword**

The text of document 80/816/FDIS, future edition 1 of IEC 62940, 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 62940:2017.

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) 2017-08-30
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-11-30

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 62940:2016 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 60812	NOTE	Harmonized as EN 60812.
IEC 61162-2	NOTE	Harmonized as EN 61162-2.
IEC 61162-3	NOTE	Harmonized as EN 61162-3.
IEC 62616	NOTE	Harmonized as EN 62616.

Annex ZA (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	-	Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results	EN 60945	-
IEC 61162-1	-	Maritime navigation and radiocommunication equipment and systems - Digital interfaces - Part 1: Single talker and multiple listeners	EN 61162-1	-
IEC 61162-450	-	Maritime navigation and radiocommunication equipment and systems - Digital interfaces - Part 450: Multiple talkers and multiple listeners - Ethernet interconnection	EN 61162-450	-
IEC 61162-460	2015	Maritime navigation and radiocommunication equipment and systems - Digital interfaces - Part 460: Multiple talkers and multiple listeners - Ethernet interconnection - Safety and security	EN 61162-460	2015
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 62288	2014	Maritime navigation and radiocommunication equipment and systems - Presentation of navigation-related information on shipborne navigational displays - General requirements, methods of testing and required test results	EN 62288	2014
IMO Resolution A.694 (17)	-	General requirements for shipborne radio equipment forming part of the Global Maritime Distress and Safety System (GMDSS) and for electronic navigational aids	-	-

EN 62940:2017

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IMO Resolution MSC.191(79)	-	Performance standards for the presentation of navigation-related information on shipborne navigational displays	-	-
IMO MSC.1/Circ.1389	-	Guidance on procedures for updating shipborne navigation and communication equipment	-	-
ITU-R Recommendation M.493	-	Digital selective-calling system for use in the maritime mobile service	-	-

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 62940:2017](https://standards.iteh.ai/catalog/standards/sist/64223319-f3d2-449d-b1ac-3d76f5060344/sist-en-62940-2017)

<https://standards.iteh.ai/catalog/standards/sist/64223319-f3d2-449d-b1ac-3d76f5060344/sist-en-62940-2017>



IEC 62940

Edition 1.0 2016-10

INTERNATIONAL STANDARD



**Maritime navigation and radiocommunication equipment and systems –
Integrated communication system (ICS) – Operational and performance
requirements, methods of testing and required test results**

[SIST EN 62940:2017](https://standards.iteh.ai/catalog/standards/sist/64223319-f3d2-449d-b1ac-3d76f5060344/sist-en-62940-2017)

<https://standards.iteh.ai/catalog/standards/sist/64223319-f3d2-449d-b1ac-3d76f5060344/sist-en-62940-2017>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 47.020.70

ISBN 978-2-8322-3708-3

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms, definitions and abbreviations	9
3.1 Terms and definitions.....	9
3.2 Abbreviations	9
4 General and operational requirements	10
4.1 General requirements	10
4.1.1 Requirements	10
4.1.2 Methods of testing and required test results.....	11
4.2 Test site.....	11
4.3 Functional requirements.....	11
4.3.1 GMDSS equipment	11
4.3.2 Non-GMDSS equipment/function	12
4.4 Operational requirements of ICS	12
4.4.1 Requirements	12
4.4.2 Methods of testing and required test results.....	12
4.5 Operational requirements of the COM-HMI.....	13
4.5.1 General	13
4.5.2 Interconnection with automatic identification systems (AIS)	14
4.5.3 GMDSS COM-HMI.....	14
4.5.4 Maritime Safety Information.....	17
4.5.5 Remote COM-HMI	17
4.6 Optional common storage media for electronic printing	19
4.6.1 Requirements	19
4.6.2 Methods of testing and required test results.....	20
4.7 Software and firmware maintenance	20
4.7.1 Requirements	20
4.7.2 Methods of testing and required test results.....	20
5 Technical requirements	21
5.1 Network integrating the ICS	21
5.1.1 Requirements	21
5.1.2 Methods of testing and required test results.....	22
5.2 Malfunctions and restoration	22
5.2.1 Requirements	22
5.2.2 Methods of testing and required test results.....	23
5.3 Accuracy and performance.....	24
5.3.1 Requirements	24
5.3.2 Methods of testing and required test results.....	24
5.4 Integrity monitoring	25
5.4.1 Requirements	25
5.4.2 Methods of testing and required test results.....	25
6 ICS alert management.....	26
6.1 Classification of alerts.....	26
6.1.1 Requirements	26

6.1.2	Methods of testing and required test results.....	26
6.2	Alert management.....	27
6.2.1	General	27
6.2.2	Unacknowledged warnings	28
6.2.3	Remote acknowledgement and silencing of alerts	28
7	Interfacing	28
7.1	IEC 61162 interfaces	28
7.1.1	Requirements	28
7.1.2	Methods of testing and required test results.....	32
7.2	BNWAS interface	32
7.2.1	Requirements	32
7.2.2	Methods of testing and required test results.....	33
7.3	INS/EPFS interface.....	33
7.3.1	Requirements	33
7.3.2	Methods of testing and required test results.....	33
7.4	Optional communication access interface	33
7.4.1	Requirements	33
7.4.2	Methods of testing and required test results.....	34
Annex A (normative)	Distress alerting	35
Annex B (informative)	Extracts from IMO performance standards for alarms and indications	37
B.1	Alarms	37
B.1.1	VHF radio installations.....	37
B.1.2	MF/HF radio installations.....	37
B.1.3	Inmarsat-C ship earth stations.....	37
B.1.4	Inmarsat ship earth stations.....	37
B.1.5	NAVTEX	37
B.1.6	EGC equipment	38
B.1.7	Automatic battery chargers	38
B.2	Indications	38
B.2.1	VHF radio installations.....	38
B.2.2	MF/HF radio installations	38
B.2.3	NAVTEX	38
B.2.4	EGC equipment	39
Annex C (normative)	Communication access interface implementation details	40
C.1	HTTP communication.....	40
C.2	Paths, directories and URIs	41
C.3	Meta information for the file transport.....	42
C.4	Vessel-id and shore entity identifier	43
C.5	Access to files by multiple on-board systems	43
C.6	Authentication and authorization	44
C.7	Implementation examples for data transfer scenarios.....	44
C.7.1	Ship system sends data to shore-system "TrackingSys" at "Acme"	44
C.7.2	On-shore system "controlpanel-update" at GadgetCorp sends data to ship system "controlpanel".....	44
C.7.3	Ship client (ECDIS) requests the latest chart from shore.....	44
Annex D (informative)	Ship/shore and shore/ship communication implementation in support of e-navigation	46
D.1	General.....	46

D.2	One alternative for data transfer	46
D.2.1	General	46
D.2.2	Vessel to shore data transfer	47
D.2.3	Shore to vessel data transfer	47
D.2.4	Vessel to vessel data transfer	48
D.3	Another alternative for data transfer	48
Annex E (informative)	Digital interface sentence to parameter group number equivalence	49
	Bibliography	51
Figure 1	– Example of ICS supporting distress communications	16
Figure 2	– Remote COM-HMI	18
Figure 3	– ICS interfaces	21
Figure 4	– Example of alert management in an ICS	27
Figure 5	– Interfaces of an ICS	29
Figure 6	– Role of communication access interface	34
Figure A.1	– Distress alert procedure	35
Figure A.2	– Follow up voice procedure	36
Figure C.1	– Example of a shore to ship transfer	45
Figure D.1	– Example of communication for e-navigation	46
Figure D.2	– Shore to vessel data transfer	47
Table 1	– Minimum integrity/status information to be presented by COM-HMI	25
Table 2	– Classification of GMDSS equipment alerts for alert management purposes	26
Table 3	– Mandatory IEC 61162-1 sentences received by the ICS equipment	30
Table 4	– Mandatory IEC 61162-1 sentences transmitted by the ICS equipment	30
Table 5	– IEC 61162-1 sentences received by the ICS equipment from remote COM- HMI and from external devices using MSI	30
Table 6	– IEC 61162-1 sentences transmitted by ICS equipment to remote COM-HMI and to external devices using MSI	31
Table 7	– IEC 61162-1 sentences received by ICS equipment from an external navigation equipment	31
Table 8	– IEC 61162-1 sentences transmitted by the ICS equipment to an external navigation equipment	31
Table 9	– Optional IEC 61162-1 sentences received by the ICS equipment from external equipment	32
Table 10	– Optional IEC 61162-1 sentences transmitted by ICS equipment to external equipment	32
Table C.1	– Information elements HTTP communication	41
Table C.2	– Communication access interface directories	42
Table C.3	– Information elements file transport	43
Table C.4	– Communications access interface operations	44
Table E.1	– Digital sentence to PGN equivalence	49

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARITIME NAVIGATION AND
RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS –
INTEGRATED COMMUNICATION SYSTEM (ICS) –
OPERATIONAL AND PERFORMANCE REQUIREMENTS,
METHODS OF TESTING AND REQUIRED TEST RESULTS**

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 62940 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems.

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

FDIS	Report on voting
80/816/FDIS	80/821/RVD

Full information on the voting for the approval of this document 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 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.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 62940:2017](#)

<https://standards.iteh.ai/catalog/standards/sist/64223319-f3d2-449d-b1ac-3d76f5060344/sist-en-62940-2017>

INTRODUCTION

IEC 62940 incorporates the applicable parts of the performance standards included in IMO Resolution A.811(19) for an integrated radiocommunication system. It also incorporates the applicable requirements for the presentation of information included in IMO Resolution MSC.191(79) which is associated with IEC 62288, applicable requirements for bridge alert management included in IMO Resolution MSC.302(87) based on, and in compliance with applicable requirements for Ethernet interconnection in IEC 61162-450.

The ICS is a system in which individual radiocommunication equipment and installations are used as subsystems, i.e. without the need for their own control units, providing outputs to and accepting inputs from a communications human machine interface (COM-HMI). Each subsystem is in compliance with the type approval requirements for that subsystem where applicable, and is in compliance with the interface requirements in this document. An ICS consists of at least two individual GMDSS subsystems.

The COM-HMI is designed so that it can be made available on a bridge workstation either dedicated to communications or as part of a multi-function display.

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

[SIST EN 62940:2017](https://standards.iteh.ai/catalog/standards/sist/64223319-f3d2-449d-b1ac-3d76f5060344/sist-en-62940-2017)

<https://standards.iteh.ai/catalog/standards/sist/64223319-f3d2-449d-b1ac-3d76f5060344/sist-en-62940-2017>

MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT AND SYSTEMS – INTEGRATED COMMUNICATION SYSTEM (ICS) – OPERATIONAL AND PERFORMANCE REQUIREMENTS, METHODS OF TESTING AND REQUIRED TEST RESULTS

1 Scope

IEC 62940 specifies the minimum operational and performance requirements, technical characteristics and methods of testing, and required test results, for shipborne integrated communication systems (ICS) designed to perform ship external communication and distress and safety communications (GMDSS) and the functions of onboard routing of this communication. It takes account of IMO Resolution A.694(17) and is associated with IEC 60945. When a requirement in this document is different from IEC 60945, the requirement in this document takes precedence.

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

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

IEC 61162-450, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 450: Multiple talkers and multiple listeners – Ethernet interconnection*

IEC 61162-460:2015, *Maritime navigation and radiocommunication equipment and systems – Digital interface – Part 460: Multiple talker and multiple listeners – Ethernet interconnection – Safety and security*

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 62288:2014, *Maritime navigation and radiocommunication equipment and systems – Presentation of navigation-related information on shipborne navigational displays – General requirements, methods of testing and required test results*

IMO Resolution A.694(17), *General requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids*

IMO Resolution MSC.191(79), *Performance standards for the presentation of navigation-related information on shipborne navigational displays*

IMO MSC.1/Circ.1389, *Guidance on procedures for updating shipborne navigation and communication equipment*

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

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

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

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

3.1.1

COM-HMI

communications human machine interface

human machine interface for presentation and handling of communication tasks on the bridge

3.1.2

CCRS

consistent common reference system

sub-system or function of an INS for acquisition, processing, storage, surveillance and distribution of data and information providing identical and obligatory reference to sub-systems and subsequent functions within an INS and to other connected equipment, if available

3.1.3

ICS

integrated communication system

composite communication system designed to perform ship external communication and distress and safety communications and the functions of onboard routing of this communication

3.1.4

radio communication

wireless transmission of information

Note 1 to entry: Examples of radio communication are voice radio communication and the wireless exchange of data.

3.1.5

remote COM-HMI

remote communications human machine interface

human machine interface for presentation and handling of communication tasks, placed outside the ICS

3.1.6

subsystem

communication-related device within the ICS

3.2 Abbreviations

AIS	automatic identification system
BAM	bridge alert management
BNWAS	bridge navigational watch alarm system
CAM	central alert management
DSC	digital selective calling