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INTERNATIONAL STANDARD

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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

FOREWORD.....	5
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	8
4 General network and equipment requirements	11
4.1 Network topology example	11
4.2 Basic requirements.....	12
4.2.1 Requirements for equipment to be connected to the network	12
4.2.2 Additional requirements for network infrastructure equipment	12
4.3 Network function (NF) requirements	13
4.3.1 General requirements	13
4.3.2 Maximum data rate requirements.....	13
4.3.3 Error logging function	13
4.4 System function (SF) requirements.....	15
4.4.1 General requirements	15
4.4.2 Assignment of unique system function ID (SFI).....	15
4.4.3 Implementing configurable transmission groups.....	15
4.5 Serial to network gateway function (SNGF) requirements	16
4.5.1 General requirements	16
4.5.2 Serial line output buffer management	16
4.5.3 Datagram output requirements	17
4.6 Other network function (ONF) requirements	17
5 Low level network requirements.....	17
5.1 Electrical and mechanical requirements.....	17
5.2 Network protocol requirements	19
5.3 IP Address assignment for equipment	19
5.4 Multicast address range	19
6 Transport layer specification.....	19
6.1 General	19
6.2 UDP messages.....	20
6.2.1 UDP multicast protocol	20
6.2.2 Use of multicast addresses and port numbers.....	20
6.2.3 UDP checksum	21
6.2.4 Datagram size	21
7 Application layer specification	22
7.1 Datagram header	22
7.1.1 Valid header	22
7.1.2 Error logging.....	22
7.2 General IEC 61162-1 sentence transmissions	22
7.2.1 Application of this protocol	22
7.2.2 Types of messages for which this protocol can be used.....	22
7.2.3 TAG block parameters for sentences transmitted in the datagram	22
7.2.4 Requirements for processing incoming datagrams	24
7.2.5 Error logging.....	24
7.3 Binary image transfer using UDP multicast.....	24
7.3.1 Application of this protocol	24

7.3.2	Binary image structure.....	25
7.3.3	Header	25
7.3.4	Binary image descriptor structure	27
7.3.5	Binary image data fragment.....	28
7.3.6	Sender process for binary image transfer	28
7.3.7	Receiver process for binary image transfer.....	29
7.3.8	Other requirements.....	30
7.3.9	Error logging.....	31
8	Methods of test and required results.....	32
8.1	Test set-up and equipment.....	32
8.2	Basic requirements.....	32
8.2.1	Equipment to be connected to the network	32
8.2.2	Network infrastructure equipment	32
8.3	Network function (NF)	32
8.3.1	Maximum data rate.....	32
8.3.2	Error logging function	33
8.4	System function (SF).....	33
8.4.1	General	33
8.4.2	Assignment of unique system function ID (SFI).....	33
8.4.3	Implementing configurable transmission groups.....	33
8.5	Serial to network gateway function (SNGF)	33
8.5.1	General	33
8.5.2	Serial line output buffer management	33
8.5.3	Datagram output.....	34
8.6	Other network function (ONF).....	34
8.7	Low level network.....	34
8.7.1	Electrical and mechanical requirements.....	34
8.7.2	Network protocol	34
8.7.3	IP address assignment for equipment.....	35
8.7.4	Multicast address range.....	35
8.8	Transport layer	35
8.9	Application layer.....	35
8.9.1	Application	35
8.9.2	Datagram header.....	35
8.9.3	Types of messages.....	36
8.9.4	TAG block parameters	36
8.10	Error logging	36
8.11	Binary image transfer using UDP multicast.....	37
8.11.1	Sender process test.....	37
8.11.2	Receiver process test.....	38
8.11.3	Image descriptor test.....	38
8.11.4	Image transfer error logging	38
Annex A (normative)	Classification of IEC 61162-1 talker identifier mnemonics and sentences	39
Annex B (informative)	TAG block example	45
Annex C (normative)	Reliable transmission of command-response pair messages.....	47
Annex D (informative)	Network and system design guidance	52
Bibliography.....		60

Figure 1 – Network topology example	12
Figure 2 – Ethernet frame example for a SBM from a rate of turn sensor	20
Figure C.1 – Command response communications.....	47
Figure C.2 – State diagram.....	49
Figure D.1 – General system design architecture	52
Figure D.2 – Example of ship-shore communication architecture	53
Figure D.3 – Security infrastructure	54
Figure D.4 – Decoupled system	56
Figure D.5 – Loosely coupled system.....	56
Figure D.6 – Strongly coupled system.....	57
Table 1 – Syslog message format	14
Table 2 – Syslog error message codes	14
Table 3 – Interfaces, connectors and cables	18
Table 4 – Destination multicast addresses and port numbers	21
Table 5 – Destination multicast addresses and port numbers for binary data transfer	21
Table 6 – Destination multicast addresses and port numbers for other services	21
Table 7 – Description of terms	25
Table 8 – Binary image structure	25
Table 9 – Header format	26
Table 10 – Binary image descriptor format.....	27
Table 11 – Examples of MIME content type for DataType codes	28
Table 12 – Binary image data fragment format.....	28
Table A.1 – Classification of IEC 61162-1 talker identifier mnemonics	39
Table A.2 – Classification of IEC 61162-1 sentences	41
Table B.1 – Defined parameter-codes.....	46
Table D.1 – Overview of possible security functions.....	55
Table D.2 – Network failure propagation possibilities	58

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

**Part 450: Multiple talkers and multiple listeners –
Ethernet interconnection**

FOREWORD

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International Standard IEC 61162-450 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
80/615/FDIS	80/621/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.

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The committee has decided that the contents of this publication will remain unchanged until the stability 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

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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

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

**Part 450: Multiple talkers and multiple listeners –
Ethernet interconnection**

1 Scope

This part of IEC 61162 specifies interface requirements and methods of test for high speed communication between shipboard navigation and radiocommunication equipment as well as between such systems and other ship systems that need to communicate with navigation and radio-communication equipment. This part of IEC 61162 is based on the application of an appropriate suite of existing international standards to provide a framework for implementing data transfer between devices on a shipboard Ethernet network.

This standard provides a higher speed and higher capacity alternative to the IEC 61162-1 and IEC 61162-2 standards while retaining these standards' basic data format. This standard provides a higher data capacity than IEC 61162-3.

This standard specifies an Ethernet based bus type network where any listener may receive messages from any sender with the following properties.

- This standard includes provisions for multicast distribution of information formatted according to IEC 61162-1, for example position fixes and other measurements, as well as provisions for transmission of general data blocks (binary image), for example between radar and VDR.
- This standard is limited to protocols for equipment (Network nodes) connected to a single Ethernet network consisting only of OSI level one or two devices and cables (Network infrastructure).
- This standard provides requirements only for equipment interfaces. By specifying protocols for transmission of IEC 61162-1 sentences and general binary image data these requirements will guarantee interoperability between equipment implementing this standard as well as a certain level of safe behaviour of the equipment itself.
- This standard permits equipment using other protocols than those specified in this standard to share a network infrastructure provided that it is supplied with interfaces which satisfy the requirements described for ONF (see 4.6).
- This standard does not contain any system requirements other than the ones that can be inferred from the sum of individual equipment requirements. Thus, to ascertain system properties that cannot be derived from equipment requirements alone, additional analysis or standards will be required. In particular, this applies to requirements to maintain system functionality in the face of a single point failure in equipment or networks. Informative Annex D contains guidance on how to address such issues.

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 60825-2, *Safety of laser products – Part 2: Safety of optical fibre communication systems (OFCS)*

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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*

IEEE 802.3, *IEEE Standards for Local Area Networks: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications*

ISOC RFC 768, *User Datagram Protocol, Standard STD0006*

ISOC RFC 791, *Internet Protocol (IP), Standard STD0005 (and updates)*

ISOC RFC 792, *Internet Control Message Protocol (ICMP), Standard STD0005 (and updates)*

ISOC RFC 826, *An ethernet Address Resolution Protocol*

ISOC RFC 1918, *Address Allocation for Private Internets, Best Current Practice BCP0005*

ISOC RFC 2474, *Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers*

ISOC RFC 5000, *Internet Official Protocol Standards, Standard 0001*

ISOC RFC 5227, *IPv4 Address Conflict Detection*

ISOC RFC 5424, *The Syslog Protocol*

NMEA 0183:2008, *Standard for interfacing marine electronic devices, Version 4.00*

NOTE The standards of the Internet Society (ISOC) are available on the IETF websites <http://www.ietf.org>. Later updates can be tracked at <http://www.rfc-editor.org/rfcsearch.html>