

INTERNATIONAL STANDARD



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



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IEC 61162-450

Edition 3.0 2024-04
COMMENTED VERSION

INTERNATIONAL STANDARD



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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 47.020.70

ISBN 978-2-8322-8714-9

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CONTENTS

FOREWORD	7
1 Scope	9
2 Normative references	9
3 Terms and definitions	10
4 General network and equipment requirements	14
4.1 Network topology example	14
4.2 Basic requirements	15
4.2.1 Requirements for equipment to be connected to the network.....	15
4.2.2 Additional requirements for network infrastructure equipment.....	16
4.3 Network function (NF) requirements	16
4.3.1 General requirements	16
4.3.2 Maximum data rate requirements	16
4.3.3 Error logging function	17
4.3.4 Provisions for network traffic filtering – IGMP	19
4.4 System function block (SF) requirements.....	19
4.4.1 General requirements	19
4.4.2 Implementing configurable transmission groups.....	19
4.4.3 Assignment of unique system function ID (SFI).....	20
4.5 Serial to network gateway function (SNGF) requirements.....	20
4.5.1 General requirements	20
4.5.2 Serial line output buffer management	22
4.5.3 Datagram output requirements	23
4.5.4 Multi SF serial port	23
4.5.5 Handling malformed data received on serial line	24
4.6 PGN to network gateway function (PNGF) requirements	24
4.6.1 General requirements	24
4.6.2 Output buffer management from IEC 61162-450 network to IEC 61162-3 network.....	24
4.6.3 Datagram output requirements	25
4.6.4 PGN group number.....	25
4.7 Other network function (ONF) requirements.....	25
5 Low level network requirements.....	25
5.1 Electrical and mechanical requirements.....	25
5.2 Network protocol requirements.....	26
5.3 IP address assignment for equipment.....	27
5.4 Multicast address range	27
5.5 Device address for instrument networks	28
6 Transport layer specification.....	28
6.1 General.....	28
6.2 UDP messages.....	29
6.2.1 UDP multicast protocol	29
6.2.2 Use of multicast addresses and port numbers.....	29
6.2.3 UDP checksum.....	31
6.2.4 Datagram size	32
7 Application layer specification	32
7.1 Datagram header.....	32

7.1.1	Valid header.....	32
7.1.2	Error logging	32
7.2	General IEC 61162-1 sentence transmissions.....	32
7.2.1	Application of this protocol.....	32
7.2.2	Types of messages for which this protocol can be used	32
7.2.3	TAG block parameters for sentences transmitted in the datagram	33
7.2.4	Requirements for processing incoming datagrams	39
7.2.5	Error logging for processing incoming datagrams.....	39
7.3	Binary file transfer using UDP multicast – Single transmitter, multiple receivers.....	40
7.3.1	Application of this protocol.....	40
7.3.2	Binary file structure	40
7.3.3	61162-450 header	41
7.3.4	Binary file descriptor structure	43
7.3.5	Binary file data fragment.....	43
7.3.6	Sender process for binary file transfer.....	44
7.3.7	Receiver process for binary file transfer	47
7.3.8	Other requirements.....	49
7.3.9	Error logging	51
7.4	General IEC 61162-3 PGN message transmissions.....	51
7.4.1	Message structure	51
7.4.2	Message format.....	52
7.4.3	Address translation requirements.....	52
7.4.4	Message processing.....	53
7.4.5	Additional management requirements.....	53
7.5	System function ID resolution.....	53
7.5.1	General.....	54
7.5.2	Transmitter functions	54
7.6	Binary file transfer using TCP point-to-point.....	54
7.6.1	Definition.....	54
7.6.2	Data field structure for transfer of files	55
7.6.3	Structure of the transfer stream.....	57
7.6.4	TCP port and IP addresses.....	58
7.6.5	Implementation guidance	58
8	Methods of test and required results	59
8.1	Test set-up and equipment.....	59
8.2	Basic requirements	60
8.2.1	Equipment to be connected to the network	60
8.2.2	Network infrastructure equipment.....	60
8.2.3	Documentation	60
8.3	Network function (NF).....	60
8.3.1	Maximum data rate	60
8.3.2	Error logging function	60
8.4	System function block (SF)	61
8.4.1	General.....	61
8.4.2	Assignment of unique system function ID (SFI).....	61
8.4.3	Implementing configurable transmission groups.....	61
8.5	Serial to network gateway function (SNGF).....	61
8.5.1	General.....	61

8.5.2	Serial line output buffer management	62
8.5.3	Datagram output.....	62
8.5.4	Datagram output Multi SF serial port	62
8.5.5	Handling malformed data received on serial line	63
8.6	Other network function (ONF)	66
8.7	Low level network	66
8.7.1	Electrical and mechanical requirements	66
8.7.2	Network protocol	66
8.7.3	IP address assignment for equipment.....	66
8.7.4	Multicast address range.....	67
8.8	Transport layer	67
8.9	Application layer	67
8.9.1	Application	67
8.9.2	Datagram header.....	67
8.9.3	Types of messages.....	68
8.9.4	TAG block parameters	68
8.9.5	General authentication.....	69
8.10	Error logging	69
8.11	Binary file transfer using UDP multicast – Single transmitter, multiple receiver.....	70
8.11.1	Sender process test.....	70
8.11.2	Receiver process test	71
8.11.3	Binary file descriptor test	72
8.11.4	Binary file transfer error logging.....	72
8.11.5	Maximum outgoing rate.....	72
8.12	PGN to network gateway function (PNGF)	72
8.12.1	General.....	72
8.12.2	Output buffer management	72
8.12.3	Datagram output.....	73
8.12.4	PGN group	73
8.12.5	Address conflicts	73
8.13	System function ID resolution.....	73
8.14	Binary file transfer using TCP point-to-point.....	73
8.14.1	Test of transmit client	73
8.14.2	Test of receiver server.....	74
8.14.3	Maximum outgoing rate.....	75
8.14.4	TCP port and IP addresses.....	75
Annex A (normative)	Classification of IEC 61162-1 talker identifier mnemonics and sentences	76
A.1	General.....	76
A.2	Talker identifier mnemonic to transmission group mapping.....	76
A.3	List of all sentence formatters and the sentence type	78
Annex B (normative)	TAG block definitions	83
B.1	Validity.....	83
B.2	Valid TAG block characters.....	83
B.3	TAG block format.....	83
B.4	TAG block "hexadecimal checksum" (*hh)	84
B.5	TAG block "line"	84
B.6	TAG block parameter-code dictionary.....	85

Annex C (normative) Reliable transmission of command-response pair messages.....	86
C.1 Purpose	86
C.2 Information exchange examples	86
C.3 Characteristics	86
C.4 Requirements	86
C.5 Data flow description	87
C.5.1 Heartbeat message	87
C.5.2 Command response pair	87
Annex D (informative) Compatibility between IEC 61162-450 nodes based on IEC 61162-450:2011 connected to a network which uses methods based on later editions of IEC 61162-450:2018.....	88
D.1 General	88
D.2 Alternative methods for compatibility	88
D.2.1 Use of IGMP proxy node	88
D.2.2 Use of virtual LAN (VLAN)	88
D.2.3 Use of static multicast switch configuration.....	89
Annex E (informative) Use of switch setup configuration to filter network traffic	90
Annex F (normative) Sentence to support SFI collision detection	91
F.1 General	91
F.2 SRP – System function ID resolution protocol	91
Annex G (informative) Examples for SRP sentences and SFI collision detection.....	92
G.1 SFI collision detection.....	92
G.2 Examples for SRP sentences	92
G.2.1 Redundancy on network level only	92
G.2.2 Examples for redundancy on network and serial (to network) level	96
G.3 Other uses of SRP sentence	98
Annex H (normative) Reserved cluster identifiers	99
Bibliography.....	100
List of comments.....	102
Figure 1 – Network topology example	15
Figure 2 – SNGF examples.....	21
Figure 3 – SNGF example, multi SF serial port.....	21
Figure 4 – Ethernet frame example for a SBM from a rate of turn sensor.....	28
Figure 5 – Non re-transmittable sender process	45
Figure 6 – Re-transmittable sender process	47
Figure 7 – Re-transmittable receive process	49
Figure C.1 – Command response communications	86
Figure G.1 – Two separate network interfaces connected to the same single network.....	92
Figure G.2 – An example of two equipment.....	93
Figure G.3 – Two separate networks interfaces connected to the same single network, but only one of the network interfaces is sending at any one time	94
Figure G.4 – An example of two equipment.....	94
Figure G.5 – Two separate network interfaces connected to the same single network but a network switch makes the equipment to be seen as one	95
Figure G.6 – An example of two equipment.....	96

Figure G.7 – One equipment with two separate serial interfaces connected through separate SNGFs to the network	97
Table 1 – Syslog message format	18
Table 2 – Syslog error message codes	19
Table 3 – Interfaces, connectors and cables	26
Table 4 – Destination multicast addresses and port numbers.....	30
Table 5 – Destination multicast addresses and port numbers for binary data transfer	31
Table 6 – Destination multicast addresses and port numbers for other services.....	31
Table 7 – Description of terms	40
Table 8 – Binary file structure	40
Table 9 – 61162-450 header format	41
Table 10 – Binary file descriptor format.....	43
Table 11 – Examples of MIME content type for DataType codes	43
Table 12 – Binary file data fragment format.....	44
Table 13 – Structure for PGN message	51
Table 14 – PGN message descriptor.....	52
Table 15 – Description of terms	55
Table 16 – Binary file structure	55
Table 17 – Header structure	56
Table 18 – Package data structure.....	57
Table A.1 – Classification of IEC 61162-1 talker identifier mnemonics.....	76
Table A.2 – Classification of IEC 61162-1 sentences.....	78
Table B.1 – Defined parameter-codes.....	85
Table H.1 – List of reserved cluster identifiers.....	99

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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This commented version (CMV) of the official standard IEC 61162-450:2024 edition 3.0 allows the user to identify the changes made to the previous IEC 61162-450:2018 edition 2.0. 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 61162-450 has been prepared by IEC technical committee 80: Maritime navigation and radiocommunication equipment and systems. It is an International Standard.

This third edition cancels and replaces the second edition published in 2018. This edition constitutes a technical revision.

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

- a) clarification of serial to network gateway function (SNGF) in 4.5 with the addition of two new figures;
- b) addition of further destination multicast addresses and port numbers in 6.2;
- c) clarification of TAG block parameters in 7.2 together with Annex B, a new Annex H and associated tests in 8.9.4;
- d) clarification of the sender process for binary files in 7.3.6 and the receiver process for binary files in 7.3.7 with updated Figure 6 and Figure 7;
- e) clarifications of SFI collision detection and use of SRP sentence in 7.5 together with a new Annex G;
- f) revision of tests for handling malformed data received on the serial line in 8.5.5.

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

Draft	Report on voting
80/1094/FDIS	80/1098/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.

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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 document 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 document specifies an Ethernet based bus type network where any listener can receive messages from any sender with the following properties.

- This document 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 file), for example between radar and VDR, and also includes provisions for multicast distribution of information formatted according to IEC 61162-3, for example position fixes and other measurements.
- This document 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 document provides requirements only for equipment interfaces. By specifying protocols for transmission of IEC 61162-1 sentences, IEC 61162-3 PGN messages and general binary file data, these requirements will guarantee interoperability between equipment implementing this document as well as a certain level of safe behaviour of the equipment itself.
- This document permits equipment using other protocols than those specified in this document to share a network infrastructure, provided that it is supplied with interfaces which satisfy the requirements described for ONF.
- This document includes provisions for filtering of the network traffic in order to limit the amount of traffic to manageable level for each individual equipment.

This document does not contain any system requirements other than the ones that can be inferred from the sum of individual equipment requirements. An associated standard, IEC 61162-460, further addresses system requirements.

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

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

IEC 61162-1:~~2016~~, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 1: Single talker and multiple listeners* **1**

IEC 61162-3:~~2008~~, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 3: Serial data instrument network* **1**

IEEE Std 802.3-~~2015~~2022, *IEEE Standard for Ethernet* **2**

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)~~ **3**

~~RFC 793:1981, Transmission Control Protocol (TCP)~~ **3**

ISOC RFC 826, *An ethernet Address Resolution Protocol*

ISOC RFC 1112, *Host Extensions for IP Multicasting, Standard STD0005 (and updates), (include IGMP version 1)*

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

ISOC RFC 2236, *Internet Group Management Protocol, Version 2*

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

ISOC RFC 3376, *Internet Group Management Protocol, Version 3*

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~~ **3**

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>.

3 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>