



IEC 61162-460

Edition 3.0 2024-04  
COMMENTED VERSION

# INTERNATIONAL STANDARD



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**Maritime navigation and radiocommunication equipment and systems –  
Digital interfaces –  
Part 460: Multiple talkers and multiple listeners – Ethernet interconnection –  
Safety and security**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

#### Part 460: Multiple talkers and multiple listeners – Ethernet interconnection – Safety and security

#### FOREWORD

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**This commented version (CMV) of the official standard IEC 61162-460:2024 edition 3.0 allows the user to identify the changes made to the previous IEC 61162-460:2018+AMD1:2020 CSV edition 2.1. 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 61162-460 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 and Amendment 1:2020. This edition constitutes a technical revision.

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

- a) term application server in the 460-Gateway has been changed to application service and application services have been clarified;
- b) based on field experience the alert limit of the network monitoring load has been changed from 80 % to 90 %;
- c) default time for escalation of a warning to an alarm has been changed from max 60 seconds to max 5 minutes as allowed by IMO BAM rules and escalation from caution to warning has been removed from the use of direct access;
- d) recorded event size in network monitoring function has been changed from 1 000 bytes to 1 472 bytes (i.e. size of an ethernet datagram in the network);
- e) requirements have been incorporated for cyber resilience given by the International Association of Classification Societies (IACS) in their documents UR E26 and UR E27. A new Annex H has been added giving a cross reference between the IACS documents and this document.

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

Draft	Report on voting
80/1103/FDIS	80/1112/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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

This International Standard is to be used in conjunction with IEC 61162-450:2023.

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](http://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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## Introduction to the Amendment

~~This amendment provides greater clarity to the external security requirements in 6.3, updates the alert management in 8.2.7 and associated tests in 10.11.6 to comply with bridge alert management and provides an improved test of firewalls in 10.8.4.~~

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

## Part 460: Multiple talkers and multiple listeners – Ethernet interconnection – Safety and security

### 1 Scope

This part of IEC 61162 is an add-on to IEC 61162-450 where higher safety and security standards are needed, for example due to higher exposure to external threats or to improve network integrity. This document provides requirements and test methods for equipment to be used in an IEC 61162-460 compliant network as well as requirements for the network itself and requirements for interconnection from the network to other networks. This document also contains requirements for a redundant IEC 61162-460 compliant network.

This document does not introduce new application level protocol requirements to those that are defined in IEC 61162-450.

### 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 61162-450:2018/2023 **1**, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 450: Multiple talkers and multiple listeners – Ethernet interconnection*

IEC 62923-1, *Maritime navigation and radiocommunication equipment and systems – Bridge alert management – Part 1: Operational and performance requirements, methods of testing and required test results*

IEC 62923-2, *Maritime navigation and radiocommunication equipment and systems – Bridge alert management – Part 2: Alert and cluster identifiers and other additional features*

IEEE 802.1D-2004, *IEEE Standard for Local and metropolitan area networks: Media Access Control (MAC) Bridges*

IEEE 802.1Q, *IEEE Standard for Local and metropolitan area networks: Virtual Bridged Local Area Networks*

~~INTERNET SOCIETY (ISOC). RFC 792, Internet Control Message Protocol (ICMP), Standard STD0005 (and updates) [online]. Edited by J. Postel. September 1981 [viewed 2018-01-08]. Available at <https://tools.ietf.org/html/rfc792>~~

~~INTERNET SOCIETY (ISOC). RFC 1112, Host Extensions for IP Multicasting [online]. Edited by S. Deering. August 1989 [viewed 2018-01-08]. Available at <https://www.ietf.org/rfc/rfc1112.txt>~~

~~INTERNET SOCIETY (ISOC). RFC 1157, *A Simple Network Management Protocol (SNMP)* [online]. Edited by J. Case et al. May 1990 [viewed 2018-01-08]. Available at <https://tools.ietf.org/html/rfc1157>~~

~~INTERNET SOCIETY (ISOC). RFC 2021, *Remote Network Monitoring Management Information Base Version 2* [online]. Edited by S. Waldbusser. January 1997 [viewed 2018-01-08]. Available at <https://tools.ietf.org/html/rfc2021>~~

~~INTERNET SOCIETY (ISOC). RFC 2236, *Internet Group Management Protocol, Version 2* [online]. Edited by W. Fenner. November 1997 [viewed 2018-01-08]. Available at <https://tools.ietf.org/html/rfc2236>~~

~~INTERNET SOCIETY (ISOC). RFC 2819, *Remote Network Monitoring Management Information Base* [online]. Edited by S. Waldbusser. May 2000 [viewed 2018-01-08]. Available at <https://tools.ietf.org/html/rfc2819>~~

~~INTERNET SOCIETY (ISOC). RFC 3411, *An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks* [online]. Edited by D. Harrington. December 2002 [viewed 2018-01-08]. Available at <https://www.ietf.org/rfc/rfc3411.txt>~~

~~INTERNET SOCIETY (ISOC). RFC 3577, *Introduction to the Remote Monitoring RMON family of MIB modules* [online]. Edited by S. Waldbusser. August 2003 [viewed 2018-01-08]. Available at <https://tools.ietf.org/html/rfc3577>~~

~~INTERNET SOCIETY (ISOC). RFC 4604, *Using Internet Group Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source-Specific Multicast* [online]. Edited by H. Holbrook et al. August 2006 [viewed 2018-01-08]. Available at <https://tools.ietf.org/html/rfc4604>~~

~~INTERNET SOCIETY (ISOC). RFC 5424, *The Syslog Protocol* [online]. Edited by R. Gerhards. March 2009 [viewed 2018-01-08]. Available at <https://tools.ietf.org/html/rfc5424>~~

# INTERNATIONAL STANDARD



**Maritime navigation and radiocommunication equipment and systems – Digital interfaces –  
Part 460: Multiple talkers and multiple listeners – Ethernet interconnection –  
Safety and security**

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# INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

### Part 460: Multiple talkers and multiple listeners – Ethernet interconnection – Safety and security

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IEC 61162-460 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 and Amendment 1:2020. This edition constitutes a technical revision.

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

- a) term application server in the 460-Gateway has been changed to application service and application services have been clarified;
- b) based on field experience the alert limit of the network monitoring load has been changed from 80 % to 90 %;

- c) default time for escalation of a warning to an alarm has been changed from max 60 seconds to max 5 minutes as allowed by IMO BAM rules and escalation from caution to warning has been removed from the use of direct access;
- d) recorded event size in network monitoring function has been changed from 1 000 bytes to 1 472 bytes (i.e. size of an ethernet datagram in the network);
- e) requirements have been incorporated for cyber resilience given by the International Association of Classification Societies (IACS) in their documents UR E26 and UR E27. A new Annex H has been added giving a cross reference between the IACS documents and this document.

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

Draft	Report on voting
80/1103/FDIS	80/1112/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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

This International Standard is to be used in conjunction with IEC 61162-450:2023.

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](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

**IMPORTANT – The "colour inside" logo on the cover page of this document 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.**

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

## Part 460: Multiple talkers and multiple listeners – Ethernet interconnection – Safety and security

### 1 Scope

This part of IEC 61162 is an add-on to IEC 61162-450 where higher safety and security standards are needed, for example due to higher exposure to external threats or to improve network integrity. This document provides requirements and test methods for equipment to be used in an IEC 61162-460 compliant network as well as requirements for the network itself and requirements for interconnection from the network to other networks. This document also contains requirements for a redundant IEC 61162-460 compliant network.

This document does not introduce new application level protocol requirements to those that are defined in IEC 61162-450.

### 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 61162-450:2023, *Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 450: Multiple talkers and multiple listeners – Ethernet interconnection*

IEC 62923-1, *Maritime navigation and radiocommunication equipment and systems – Bridge alert management – Part 1: Operational and performance requirements, methods of testing and required test results*

IEC 62923-2, *Maritime navigation and radiocommunication equipment and systems – Bridge alert management – Part 2: Alert and cluster identifiers and other additional features*

IEEE 802.1D-2004, *IEEE Standard for Local and metropolitan area networks: Media Access Control (MAC) Bridges*

IEEE 802.1Q, *IEEE Standard for Local and metropolitan area networks: Virtual Bridged Local Area Networks*

ISOC RFC 792, *Internet Control Message Protocol (ICMP), Standard STD0005 (and updates)*  
Available at <https://tools.ietf.org/html/rfc792>

ISOC RFC 1112, *Host Extensions for IP Multicasting*  
Available at <https://www.ietf.org/rfc/rfc1112.txt>

ISOC RFC 1157, *A Simple Network Management Protocol (SNMP)*  
Available at <https://tools.ietf.org/html/rfc1157>

ISOC RFC 2021, *Remote Network Monitoring Management Information Base Version 2*  
Available at <https://tools.ietf.org/html/rfc2021>

ISOC RFC 2236, *Internet Group Management Protocol, Version 2*  
Available at <https://tools.ietf.org/html/rfc2236>

ISOC RFC 2819, *Remote Network Monitoring Management Information Base*  
Available at <https://tools.ietf.org/html/rfc2819>

ISOC RFC 3411, *An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks*  
Available at <https://www.ietf.org/rfc/rfc3411.txt>

ISOC RFC 3577, *Introduction to the Remote Monitoring RMON family of MIB modules*  
Available at <https://tools.ietf.org/html/rfc3577>

ISOC RFC 4604, *Using Internet Group Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source-Specific Multicast*  
Available at <https://tools.ietf.org/html/rfc4604>

ISOC RFC 5424, *The Syslog Protocol*  
Available at <https://tools.ietf.org/html/rfc5424>