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Industriell processtyrning – Nät med hög driftsäkerhet – Del 2: Media Redundancy Protocol (MRP)

*Industrial communication networks –
High availability automation networks –
Part 2: Media Redundancy Protocol (MRP)*

Som svensk standard gäller europastandarden EN IEC 62439-2:2022. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 62439-2:2022.

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NORME EUROPÉENNE

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**Industrial communication networks - High availability automation
networks - Part 2: Media Redundancy Protocol (MRP)
(IEC 62439-2:2021)**

Réseaux de communication industriels - Réseaux de haute
disponibilité pour l'automatisation - Partie 2: Protocole de
redondance du support (MRP)
(IEC 62439-2:2021)

Industrielle Kommunikationsnetze: Hochverfügbare
Automatisierungsnetze - Teil 2: Medienredundanz-Protokoll
(MRP)
(IEC 62439-2:2021)

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SS-EN IEC 62439-2, utg 3:2022

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The text of document 65C/1118/FDIS, future edition 3 of IEC 62439-2, prepared by SC 65C "Industrial networks" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62439-2:2022.

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IEC 61158-1 NOTE Harmonized as EN IEC 61158-1

IEC 61784-1 NOTE Harmonized as EN IEC 61784-1

IEC 61784-2 NOTE Harmonized as EN IEC 61784-2

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

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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 60050-192	-	International Electrotechnical Vocabulary (IEV) - Part 192: Dependability	-	-
IEC 61158-6-10	2019	Industrial communication networks - Fieldbus specifications - Part 6-10: Application layer protocol specification - Type 10 elements	EN IEC 61158-6-10	2019
IEC 62439-1	2010	Industrial communication networks - High availability automation networks - Part 1: General concepts and calculation methods	EN 62439-1	2010
AMD1	2012		A1	2012
AMD2	2016		A2	2017
ISO/IEC 10164-1		Information technology - Open Systems Interconnection - Systems Management: Object Management Function	-	-
ISO/IEC/IEEE 8802-3		Telecommunications and exchange between information technology systems - Requirements for local and metropolitan area networks - Part 3: Standard for Ethernet	-	-
IEEE Std 802.1Q	2018	IEEE Standard for Local and Metropolitan Area Network - Bridges and Bridged Networks	-	-
IEEE Std 802.3	2018	IEEE Standard for Ethernet	-	-



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**Industrial communication networks – High availability automation networks –
Part 2: Media Redundancy Protocol (MRP)**

**Réseaux de communication industriels – Réseaux de haute disponibilité pour
l'automatisation –
Partie 2: Protocole de redondance du support (MRP)**

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HIGH AVAILABILITY AUTOMATION NETWORKS –****Part 2: Media Redundancy Protocol (MRP)**

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IEC 62439-2 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

This third edition cancels and replaces the second edition published in 2016. This edition constitutes a technical revision.

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

- a) improvements for the Continuity Check Protocol,
- b) introduction of further specifiers for the rings, the interconnection links, and the device roles,
- c) extensions and information on the use of baudrates smaller than 100 Mbit/s,
- d) information on using MRP together with scheduling and shaping mechanisms,
- e) introduction of an MRP Interconnection profile for a 30 ms reconfiguration time.

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

Draft	Report on voting
65C/1118/FDIS	65C/1137/RVD

Full information on the voting for the approval of this International Standard 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/standardsdev/publications.

This International Standard is to be read in conjunction with IEC 62439-1.

A list of all parts of the IEC 62439 series, published under the general title *Industrial communication networks – High availability automation networks*, can be found on the IEC website.

This IEC standard includes Code Components i.e. components that are intended to be directly processed by a computer. Such content is any text found between the markers <CODE BEGINS> and <CODE ENDS>, or otherwise is clearly labeled in this standard as a Code Component.

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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,
- replaced by a revised edition, or
- amended.

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.

INTRODUCTION

The IEC 62439 series specifies relevant principles for high availability networks that meet the requirements for industrial automation networks.

In the fault-free state of the network, the protocols of the IEC 62439 series provide ISO/IEC/IEEE 8802-3 (IEEE Std 802.3™) compatible, reliable data communication, and preserve determinism of real-time data communication. In cases of fault, removal, and insertion of a component, they provide deterministic recovery times.

These protocols retain fully the typical Ethernet communication capabilities as used in the office world, so that the software involved remains applicable.

The market is in need of several network solutions, each with different performance characteristics and functional capabilities, matching diverse application requirements. These solutions support different redundancy topologies and mechanisms which are introduced in IEC 62439-1 and specified in the other Parts of the IEC 62439 series. IEC 62439-1 also distinguishes between the different solutions, giving guidance to the user.

The IEC 62439 series follows the general structure and terms of the IEC 61158 series.

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent. IEC takes no position concerning the evidence, validity, and scope of this patent right.

The holder of this patent right has assured IEC that s/he is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with IEC. Information may be obtained from the patent database available at <http://patents.iec.ch>.

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INDUSTRIAL COMMUNICATION NETWORKS – HIGH AVAILABILITY AUTOMATION NETWORKS –

Part 2: Media Redundancy Protocol (MRP)

1 Scope

1.1 General

The IEC 62439 series is applicable to high-availability automation networks based on the ISO/IEC/IEEE 8802-3 (IEEE Std 802.3) (Ethernet) technology.

This part of the IEC 62439 series specifies a recovery protocol based on a ring topology, designed to react deterministically on a single failure of an inter-switch link or switch in the network, under the control of a dedicated media redundancy manager node.

1.2 Code component distribution

Each Code Component is a ZIP package containing at least the electronic representation of the Code Component itself and a file describing the content of the package (IECManifest.xml).

The IECManifest contains different sections giving information on:

- the copyright notice;
- the identification of the code component;
- the publication related to the code component;
- the list of the electronic files which compose the code component;
- an optional list of history files to track changes during the evolution process of the code component.

The Code Components included in this IEC standard are a set of SNMP MIBs. The Code Component IEC-62439-2-MIB.mib is a file containing the MIB with the management and monitoring view. It will be available in a full version, which contains the MIB defined in this document with the documentation associated and access is restricted to purchaser of this document.

The Code Component (full version) is freely accessible on the IEC website for download at: https://www.iec.ch/sc65c/supportingdocuments/IEC_62439-2.MIB.{VersionStateInfo}.full.zip but the usage remains under the licensing conditions.

The life cycle of a code component is not restricted to the life cycle of the related publication. The publication life cycle goes through two stages, Version (corresponding to an edition) and Revision (corresponding to an amendment). Consequently, new release(s) of the Code Component(s) may be released, which supersede(s) the previous release, and will be distributed through the IEC website at: <https://www.iec.ch/sc65c/supportingdocuments>.

The latest version/release of the document will be found by selecting the file IEC_62439-2.MIB.{VersionStateInfo}.full.zip for the code component with the highest value for VersionStateInfo.

In case of any differences between the downloadable code and the IEC pdf published content, the downloadable code(s) is(are) the valid one; it may be subject to updates. See history files.

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 60050-192, *International Electrotechnical Vocabulary – Part 192: Dependability* (available at www.electropedia.org)

IEC 61158-6-10:2019, *Industrial communication networks – Fieldbus specifications – Part 6-10: Application layer protocol specification – Type 10 elements*

IEC 62439-1:2010, *Industrial communication networks – High availability automation networks – Part 1: General concepts and calculation methods*

IEC 62439-1:2010/AMD1:2012

IEC 62439-1:2010/AMD2:2016¹

ISO/IEC 10164-1, *Information technology – Open Systems Interconnection – Systems Management: Object Management Function*

ISO/IEC/IEEE 8802-3, *Telecommunications and exchange between information technology systems – Requirements for local and metropolitan area networks – Part 3: Standard for Ethernet*

IEEE Std 802.1Q-2018, *IEEE Standard for Local and Metropolitan Area Networks – Bridges and Bridged Networks*

IEEE Std 802.3-2018, *IEEE Standard for Ethernet*

¹ A consolidated version of this publication exists, comprising IEC 62439-1:2010, IEC 62439-1:2010/AMD1:2012 and IEC 62439-1:2010/AMD2:2016.