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

**Réseaux de communication industriels – Réseaux d'automatisme à haute
disponibilité –
Partie 2: Protocole de redondance du support (MRP)**



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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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CONTENTS

FOREWORD.....	7
INTRODUCTION.....	9
1 Scope.....	11
2 Normative references.....	11
3 Terms, definitions, abbreviations, acronyms, and conventions	12
3.1 Terms and definitions	12
3.2 Abbreviations and acronyms.....	12
3.3 Conventions.....	12
4 MRP Overview.....	12
5 MRP Media redundancy behavior.....	16
5.1 General.....	16
5.2 Ring ports	16
5.3 Media Redundancy Manager (MRM)	17
5.4 Media Redundancy Client (MRC).....	19
5.5 Redundancy domain.....	19
5.6 Media Link Check.....	19
5.7 Application of the Continuity Check protocol	19
5.7.1 General	19
5.7.2 Continuity Check Message Interval.....	20
5.7.3 Maintenance Domain Level	20
5.7.4 Maintenance Association ID (MAID).....	20
5.7.5 Maintenance Association End Point ID (MEPID).....	20
5.7.6 Sender ID TLV	20
5.7.7 Port Status TLV	21
5.7.8 Interface Status TLV	21
5.8 Usage with diagnosis and alarms.....	21
5.9 Ring diagnosis	21
5.10 Multiple MRM in a single ring: Manager voting option.....	21
5.10.1 General	21
5.10.2 Basic principle of the manager voting process	22
5.10.3 The manager voting process	23
5.11 BLOCKED not supported (Option).....	25
5.12 Interconnection port	25
5.13 Media redundancy Interconnection Manager (MIM)	26
5.14 Media redundancy Interconnection Client (MIC)	29
5.15 Interconnection domain	29
5.16 Interconnection diagnosis.....	30
6 MRP Class specification	30
6.1 General.....	30
6.2 Template.....	30
6.2.1 Media redundancy template.....	30
6.2.2 Media redundancy Interconnection template	31
6.3 Attributes	32
7 MRP Service specification	36
7.1 Start MRM	36

7.2	Stop MRM.....	38
7.3	State Change.....	38
7.4	Start MRC.....	39
7.5	Stop MRC.....	41
7.6	Read MRM.....	41
7.7	Read MRC.....	43
7.8	Start MIM.....	45
7.9	Stop MIM.....	46
7.10	Interconnection State Change.....	47
7.11	Start MIC.....	48
7.12	Stop MIC.....	49
7.13	Read MIM.....	50
7.14	Read MIC.....	52
8	MRP protocol specification.....	54
8.1	PDU description.....	54
8.1.1	Basic data types.....	54
8.1.2	DLPDU abstract syntax reference.....	54
8.1.3	Coding of the DLPDU field SourceAddress.....	54
8.1.4	Coding of the DLPDU field DestinationAddress.....	55
8.1.5	Coding of the field TagControlInformation.....	55
8.1.6	Coding of the field LT.....	56
8.1.7	MRP APDU abstract syntax.....	56
8.1.8	Coding of the field MRP_TLVHeader.....	57
8.1.9	Coding of the field MRP_SubTLVHeader.....	58
8.1.10	Coding of the field MRP_Ed1Type and MRP_Ed1ManufacturerData.....	58
8.1.11	Coding of the field MRP_Version.....	59
8.1.12	Coding of the field MRP_SequenceID.....	59
8.1.13	Coding of the field MRP_SA.....	59
8.1.14	Coding of the field MRP_OtherMRMSA.....	59
8.1.15	Coding of the field MRP_Prio.....	60
8.1.16	Coding of the field MRP_OtherMRMPrio.....	60
8.1.17	Coding of the field MRP_PortRole.....	60
8.1.18	Coding of the field MRP_RingState.....	60
8.1.19	Coding of the field MRP_Interval.....	61
8.1.20	Coding of the field MRP_Transition.....	61
8.1.21	Coding of the field MRP_TimeStamp.....	61
8.1.22	Coding of the field MRP_Blocked.....	61
8.1.23	Coding of the field MRP_ManufacturerOUI.....	62
8.1.24	Coding of the field MRP_IECOUI.....	62
8.1.25	Coding of the field MRP_ManufacturerData.....	62
8.1.26	Coding of the field MRP_DomainUUID.....	62
8.1.27	Coding of the field MRP_InState.....	62
8.1.28	Coding of the field MRP_InID.....	63
8.2	Protocol machines.....	63
8.2.1	MRM protocol machine.....	63
8.2.2	MRC protocol machine.....	74
8.2.3	MRA protocol machine.....	80
8.2.4	MRA, MRM and MRC functions.....	100
8.2.5	FDB clear timer.....	105

8.2.6	Topology change timer	105
8.2.7	MIM protocol machine	106
8.2.8	MIC protocol machine	115
8.2.9	MIM and MIC functions.....	123
8.2.10	Interconnection Topology Change timer.....	127
8.2.11	Interconnection Link Status Poll timer.....	127
9	MRP installation, configuration and repair	128
9.1	Ring port and Interconnection port parameters.....	128
9.2	Ring topology parameters.....	128
9.3	MRM parameters.....	128
9.4	MRC parameters and constraints.....	129
9.5	MRA compatibility to earlier Automanager protocol version	129
9.6	Interconnection topology parameters	130
9.7	MIM parameters	130
9.8	MIC parameters and constraints	130
9.9	Calculation of MRP ring recovery time	131
9.9.1	Overview	131
9.9.2	Deduction of formula.....	131
9.9.3	Worst case calculation for recovery time of 10 ms.....	133
9.9.4	Worst case calculation for 50 devices	134
9.10	Calculation of MRP Automanager voting time.....	134
10	MRP Management Information Base (MIB)	134
10.1	General.....	134
10.2	MRP MIB with a monitoring view.....	134
10.3	MRP MIB with a management and monitoring view	147
Annex A (normative)	Optional earlier version of the Automanager protocol.....	162
Bibliography	163
Figure 1	– Two MRP rings redundantly connected via MRP Interconnection	14
Figure 2	– MRP stack	16
Figure 3	– MRP ring topology with one manager and clients	17
Figure 4	– MRP open ring with MRM	18
Figure 5	– MRP ring with MRA at network startup	22
Figure 6	– MRP ring after the manager voting process.....	22
Figure 7	– Manager voting process	24
Figure 8	– MRA located outside the MRP ring.....	25
Figure 9	– MRP Interconnection topology	27
Figure 10	– MRP ring interconnection open	28
Figure 11	– MRP protocol machine for MRM.....	63
Figure 12	– MRP protocol machine for MRC	74
Figure 13	– MRP protocol machine for MRA	81
Figure 14	– MRP protocol machine for MIM in RC-mode and LC-mode.....	107
Figure 15	– MRP protocol machine for MIC in RC-mode and LC-mode	116
Table 1	– Patent information	9
Table 2	– Coding of the Maintenance Association ID (MAID).....	20

Table 3 – MRP Start MRM	36
Table 4 – MRP Stop MRM.....	38
Table 5 – MRP Change State	39
Table 6 – MRP Start MRC.....	40
Table 7 – MRP Stop MRC	41
Table 8 – MRP Read MRM.....	42
Table 9 – MRP Read MRC	44
Table 10 – MRP Start MIM.....	45
Table 11 – MRP Stop MIM	47
Table 12 – MRP Interconnection Change State.....	47
Table 13 – MRP Start MIC	48
Table 14 – MRP Stop MIC.....	50
Table 15 – MRP Read MIM	51
Table 16 – MRP Read MIC.....	53
Table 17 – MRP DLPDU syntax for ISO/IEC/IEEE 8802-3 (IEEE 802.3)	54
Table 18 – MRP OUI.....	55
Table 19 – MRP MulticastMACAddress	55
Table 20 – MRP TagControlInformation.Priority field.....	56
Table 21 – MRP LT field	56
Table 22 – MRP APDU syntax.....	56
Table 23 – MRP Substitutions	57
Table 24 – MRP_TLVHeader.Type	58
Table 25 – MRP_SubTLVHeader.Type	58
Table 26 – MRP_Ed1Type and MRP_Ed1ManufacturerData	59
Table 27 – MRP_Ed1Type and MRP_Ed1ManufacturerData	59
Table 28 – MRP_Version	59
Table 29 – Coding of the field MRP_OtherMRMSA	60
Table 30 – MRP_Prio.....	60
Table 31 – Coding of the field MRP_OtherMRMPrio.....	60
Table 32 – MRP_PortRole.....	60
Table 33 – MRP_RingState.....	61
Table 34 – MRP_Interval.....	61
Table 35 – MRP_Transition.....	61
Table 36 – MRP_TimeStamp.....	61
Table 37 – MRP_Blocked.....	62
Table 38 – MRP_DomainUUID	62
Table 39 – MRP_InState	62
Table 40 – MRP Local variables of MRM protocol machine	65
Table 41 – MRM State machine	66
Table 42 – MRP Local variables of MRC protocol machine.....	75
Table 43 – MRC state machine	76
Table 44 – MRP local variables of MRA protocol machine.....	82
Table 45 – MRA state machine.....	83

Table 46 – MRP functions and macros	101
Table 47 – MRP FDB clear timer	105
Table 48 – MRP topology change timer	106
Table 49 – MRP Local variables of MIM protocol machine.....	108
Table 50 – MIM State machine for LC-mode	109
Table 51 – MIM State machine for RC-mode	112
Table 52 – MRP Local variables of MIC protocol machine	117
Table 53 – MIC State machine for LC-mode	118
Table 54 – MIC State machine for RC-mode.....	121
Table 55 – MRP Interconnection functions.....	124
Table 56 – MRP Interconnection topology change timer.....	127
Table 57 – MRP Interconnection link status poll timer	128
Table 58 – MRP Network/Connection parameters	128
Table 59 – MRP MRM parameters.....	129
Table 60 – MRP MRC parameters	129
Table 61 – MRP MIM parameters	130
Table 62 – MRP MIC parameters	131
Table A.1 – Compatible mode MRP_Option for MRP_Test Substitutions	162
Table A.2 – Compatible mode MRP_Option frames MRP_TestMgrNAck and MRP_TestPropagate Substitutions	162

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

FOREWORD

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

This second edition cancels and replaces the first edition published in 2010. This edition constitutes a technical revision.

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

- adding a protocol extension to select the media redundancy manager automatically;
- adding a protocol to redundantly connect media redundancy protocol rings.

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

FDIS	Report on voting
65C/834/FDIS	65C/841/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 ISO/IEC Directives, Part 2.

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.

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

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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 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 concerning ring protocol given in Clause 5. Table 1 gives an overview of the relevant patents.

Table 1 – Patent information

No.	Status	Country	Granted Patent Number or Application Number (if pending)	Title
1	granted	US	US 6430151	Local networking with redundancy properties having a redundancy manager
	granted	CA	CA 2323429	
	granted	CN	CN 117195	
	granted	NO	NO 330908	
	granted	EP (AT, BE, CH, DE, DK, ES, FR, GB, IT, NL, SE)	EP 1062787	

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INDUSTRIAL COMMUNICATION NETWORKS – HIGH AVAILABILITY AUTOMATION NETWORKS –

Part 2: Media Redundancy Protocol (MRP)

1 Scope

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

2 Normative references

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.

IEC 60050-191, *International Electrotechnical Vocabulary – Chapter 191: Dependability and quality of service*

IEC 61158-6-10:2014, *Industrial communication networks – Fieldbus specifications – Part 6-10: Application layer protocol specification – Type 10 elements*

IEC 61784-1, *Industrial communication networks – Profiles – Part 1: Fieldbus profiles*

IEC 61784-2, *Industrial communication networks – Profiles – Part 2: Additional fieldbus profiles for real-time networks based on ISO/IEC 8802-3*

IEC 62439-1:2010, *Industrial communication networks – High availability automation networks – Part 1: General concepts and calculation methods*
IEC 62439-1:2010/AMD1:2012¹

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

ISO/IEC/IEEE 8802-3 *Standard for Ethernet*

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

IEEE 802.1Q:2011, *IEEE Standard for Local and metropolitan area networks – Media Access Control (MAC) Bridges and Virtual Bridge Local Area Network*

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