



SLOVENSKI STANDARD SIST EN IEC 61968-3:2018

01-oktober-2018

Nadomešča:
SIST EN 61968-3:2004

Združevanje aplikacij pri oskrbi z električno energijo - Sistemski vmesniki za upravljanje omrežja - 3. del: Vmesniki za delovanje omrežja

Application integration at electric utilities - System interfaces for distribution management - Part 3: Interface for network operations

Integration von Anwendungen in Anlagen der Elektrizitätsversorgung - Systemschnittstellen für Netzführung - Teil 3: Schnittstelle für Netzbetriebsarten
(standards.iteh.ai)

Intégration des applications dans les entreprises de distribution électrique - Système d'interfaces pour la gestion de la distribution - Partie 3: Interface pour l'exploitation du réseau
2375d5b1be30/sist-en-iec-61968-3-2018

Ta slovenski standard je istoveten z: EN IEC 61968-3:2018

ICS:

29.240.30	Krmilna oprema za elektroenergetske sisteme	Control equipment for electric power systems
35.200	Vmesniška in povezovalna oprema	Interface and interconnection equipment

SIST EN IEC 61968-3:2018

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN IEC 61968-3:2018

<https://standards.iteh.ai/catalog/standards/sist/bab844fb-6a19-48bc-820e-2375d5b1be30/sist-en-iec-61968-3-2018>

EUROPEAN STANDARD

EN IEC 61968-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2018

ICS 33.200

Supersedes EN 61968-3:2004

English Version

Application integration at electric utilities - System interfaces for
distribution management - Part 3: Interface for network
operations
(IEC 61968-3:2017)

Intégration d'applications pour les services électriques -
Interfaces système pour la gestion de la distribution - Partie
3: Interface pour l'exploitation du réseau
(IEC 61968-3:2017)

Integration von Anwendungen in Anlagen der
Elektrizitätsversorgung - Systemschnittstellen für
Netzführung - Teil 3: Schnittstelle für Netzbetriebsarten
(IEC 61968-3:2017)

This European Standard was approved by CENELEC on 2017-03-03. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

[https://standards.iteh.ai/catalog/standards/sist/bab844fb-6a19-48bc-820e-](https://standards.iteh.ai/catalog/standards/sist/bab844fb-6a19-48bc-820e-2375d5b1be30/sist-en-iec-61968-3-2018)

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 61968-3:2018 (E)**European foreword**

The text of document 57/1810/FDIS, future edition 2 of IEC 61968-3, prepared by IEC/TC 57 "Power systems management and associated information exchange" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61968-3:2018.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2018-11-18
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-05-18

This document supersedes EN 61968-3:2004.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

Endorsement notice

The text of the International Standard IEC 61968-3:2017 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61968-4	NOTE	Harmonized as EN 61968-4.
IEC 61968-6	NOTE	Harmonized as EN 61968-6.
IEC 61968-8	NOTE	Harmonized as EN 61968-8.
IEC 61968-9	NOTE	Harmonized as EN 61968-9.
IEC 61968-11	NOTE	Harmonized as EN 61968-11.
IEC 61968-13	NOTE	Harmonized as EN 61968-13.
IEC 62361-100	NOTE	Harmonized as EN 62361-100.

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

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 61968-1	-	Application integration at electric utilities - System interfaces for distribution management -- Part 1: Interface architecture and general requirements	EN 61968-1	-
IEC/TS 61968-2	-	Application integration at electric utilities - System interfaces for distribution management -- Part 2: Glossary	-	-
IEC 61968-100	-	Application integration at electric utilities - System interfaces for distribution management -- Part 100: Implementation profiles	EN 61968-100	-
IEC 61970-301	-	Energy Management System Application Program Interface (EMS-API) - Part 301: Common information model (CIM) base	EN 61970-301	-

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN IEC 61968-3:2018

<https://standards.iteh.ai/catalog/standards/sist/bab844fb-6a19-48bc-820e-2375d5b1be30/sist-en-iec-61968-3-2018>



IEC 61968-3

Edition 2.0 2017-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Application integration at electric utilities – System interfaces for distribution management –
Part 3: Interface for network operations**

**Intégration d'applications pour les services électriques – Interfaces système pour la gestion de la distribution –
Partie 3: Interface pour l'exploitation du réseau**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.200

ISBN 978-2-8322-4084-7

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	10
3 Terms, definitions and abbreviated terms	11
3.1 Terms and definitions.....	11
3.2 Abbreviated terms.....	11
4 Reference and Information Models	11
4.1 General approach to network operations.....	11
4.2 Reference Model.....	12
4.3 Interface Reference Model.....	13
4.4 Network operations functions and components	13
4.5 Static Information Model	15
4.5.1 General	15
4.5.2 Classes related to network operations	15
5 Network operations message payloads.....	15
5.1 General.....	15
5.2 OperationsConfiguration payload.....	16
5.2.1 General	16
5.2.2 Message payload.....	16
5.3 MeasurementsAndControls payload.....	17
5.3.1 General	17
5.3.2 Measurement.....	17
5.3.3 Control	18
5.3.4 Message payload.....	18
5.4 TemporaryNetworkChanges payload.....	21
5.4.1 General	21
5.4.2 Message payloads.....	22
5.5 SwitchingPlan payload	27
5.5.1 General	27
5.5.2 Message payload.....	28
5.6 OperationalTags payload	36
5.6.1 General	36
5.6.2 Message payload.....	37
5.7 TroubleTicket payload.....	38
5.8 Incident payload	39
5.8.1 General	39
5.8.2 Message payload.....	41
5.9 Outage payload	42
5.9.1 General	42
5.9.2 Message payload.....	44
5.10 Metering message payloads.....	45
5.10.1 EndDeviceEvent	45
5.10.2 MeterReading	45

5.11	Work message payloads.....	46
5.11.1	WorkOrder	46
5.12	SwitchingOrder	47
5.12.1	General.....	47
5.12.2	Message payload.....	48
5.13	TroubleOrder	49
5.13.1	General.....	49
5.13.2	Message payload.....	50
5.14	OutageSchedule	51
5.14.1	General.....	51
5.14.2	Message payload.....	52
6	Document Conventions.....	55
6.1	UML diagrams.....	55
6.2	Message payload definitions.....	55
6.2.1	General.....	55
6.2.2	Mandatory versus Optional.....	55
6.3	Synchronous versus Asynchronous Messages.....	55
6.4	Message exchanges.....	55
Annex A	(informative) Use Cases.....	56
A.1	General.....	56
A.2	FLISR.....	56
A.2.1	Overview.....	56
A.2.2	FLISR for SCADA-detected outage, SCADA switching.....	56
A.2.3	FLISR for trouble call and AMI outage crew switching.....	58
A.3	Planned outage.....	62
A.3.1	Planned outage for maintenance – Manual process.....	62
A.3.2	Planned outage for maintenance – Crew switching.....	63
Annex B	(normative) XML Schemas for message payloads.....	68
B.1	General.....	68
B.2	Incidents message payload.....	68
B.3	MeasurementsAndControls message payload.....	75
B.4	OperationalTags message payload.....	82
B.5	OperationsConfig message payload.....	85
B.6	OutagesAndFaults message payload.....	87
B.7	OutageSchedules message payload.....	96
B.8	SwitchingOrders message payload.....	117
B.9	SwitchingPlans message payload.....	123
B.10	TemporaryNetworkChanges message payload.....	140
B.11	TroubleOrders message payload.....	150
Bibliography	160
Figure 1	– IEC 61968-3 Scope.....	10
Figure 2	– IEC 61968-3 Reference Model.....	12
Figure 3	– OperationsConfiguration message payload.....	16
Figure 4	– MeasurementsAndControls	17

Figure 5 – MeasurementsAndControls message payload	19
Figure 6 – MeasurementsAndControls message payload, AnalogValue detail	20
Figure 7 – MeasurementsAndControls message payload, Setpoint (AnalogControl) detail	21
Figure 8 – Temporary Network Changes	22
Figure 9 – TemporaryNetworkChanges message payload	22
Figure 10 – TemporaryNetworkChanges message payload, Clamp detail	23
Figure 11 – TemporaryNetworkChanges message payload, Cut detail	24
Figure 12 – TemporaryNetworkChanges message payload, EnergySource Details	25
Figure 13 – TemporaryNetworkChanges message payload, Ground details	26
Figure 14 – TemporaryNetworkChanges message payload, Jumper Details	27
Figure 15 – Switching Plan	28
Figure 16 – SwitchingPlans message payload	29
Figure 17 – SwitchingPlans message payload, SafetyDocument detail	30
Figure 18 – SwitchingPlan message payload, ClearanceAction detail	31
Figure 19 – SwitchingPlan message payload, GenericAction detail	32
Figure 20 – SwitchingPlan message payload, EnergySourceAction detail	32
Figure 21 – SwitchingPlan message payload, CutAction detail	33
Figure 22 – SwitchingPlan message payload, GroundAction detail	34
Figure 23 – SwitchingPlan message payload, JumperAction detail	34
Figure 24 – SwitchingPlan message payload, SwitchingAction detail	35
Figure 25 – SwitchingPlan message payload, TagAction detail	36
Figure 26 – Tags	37
Figure 27 – OperationalTags message payload	38
Figure 28 – Trouble Ticket	39
Figure 29 – Incident	40
Figure 30 – Incident message payload	41
Figure 31 – Outage	42
Figure 32 – OutagesAndFaults message payload	44
Figure 33 – End Device Event	45
Figure 34 – Meter Reading	46
Figure 35 – Work Order	47
Figure 36 – Switching Order	48
Figure 37 – SwitchingOrder message payload	49
Figure 38 – Trouble Order	50
Figure 39 – TroubleOrder message payload	51
Figure 40 – Outage Schedule	52
Figure 41 – OutageSchedule message payload	53

Figure 42 – OutageSchedule message payload, PlannedOutages detail	54
Figure A.1 – FLISR for SCADA-Detected Outage, SCADA Switching	57
Figure A.2 – FLISR for trouble call and AMI outage, crew switching	60
Figure A.3 – Planned outage for maintenance – Manual process	63
Figure A.4 – Planned outage for maintenance, crew switching	65
Table 1 – Business Functions and Abstract Components	14
Table 2 – Interpretation of Network Operations Business Functions	15
Table 3 – Classes related to network operations	15
Table A.1 – Message Flow for FLISR SCADA-Detected Outage, SCADA Switching	58
Table A.2 – Message flows for FLISR for trouble call and AMI outage, crew switching	61
Table A.3 – Message flows for planned outage for maintenance, crew switching	66

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN IEC 61968-3:2018](https://standards.iteh.ai/catalog/standards/sist/bab844fb-6a19-48bc-820e-2375d5b1be30/sist-en-iec-61968-3-2018)

<https://standards.iteh.ai/catalog/standards/sist/bab844fb-6a19-48bc-820e-2375d5b1be30/sist-en-iec-61968-3-2018>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

APPLICATION INTEGRATION AT ELECTRIC UTILITIES – SYSTEM INTERFACES FOR DISTRIBUTION MANAGEMENT –

Part 3: Interface for network operations

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
<https://standards.iteh.ai/catalog/standards/sist/bab844fb-6a19-48bc-820e-355201b30201/iec-61968-3-2017>
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61968-3 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

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

FDIS	Report on voting
57/1810/FDIS	57/1841/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.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

This second edition cancels and replaces the first edition published in 2004. It constitutes a technical revision.

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

- a) Replaced Measurement list with Measurement and Controls.
- b) Replaced OperationalRestriction with Tag.
- c) Replaced OutageRecord with Outage.
- d) Replaced SafetyDocument with ClearanceDocument.
- e) Replaced SwitchingSchedule with SwitchingOrder.
- f) Added SwitchingPlan.
- g) Added Temporary Network Change.
- h) Added TroubleTicket.
- i) Added Incident.
- j) Added TroubleOrder.
- k) Added use cases and sequence diagrams.

In this standard, the following print types are used:

– **tokens: in arial black type**

A list of all parts of the IEC 61968 series, under the general title: *Application integration at electric utilities – System interfaces for distribution management* can be found on the IEC website.

iTeh STANDARD PREVIEW

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed, <https://standards.iteh.ai/catalog/standards/sist/bab844fb-6a19-48bc-820e-2375d5b1be30/sist-en-iec-61968-3-2018>
- 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 purpose of this part of IEC 61968 is to define a standard for the integration of network operations systems with each other and other systems and business functions within the scope of IEC 61968. The specific details of communication protocols those systems employ are outside the scope of this part of IEC 61968. Instead, this part of IEC 61968 will recognize and model the general capabilities that can be potentially provided by network operations systems. In this way, this part of IEC 61968 will not be impacted by the specification, development and/or deployment of next generation network operations systems, either through the use of standards or proprietary means.

The IEC 61968 series of standards is intended to facilitate inter-application integration as opposed to intra-application integration. Intra-application integration is aimed at programs in the same application system, usually communicating with each other using middleware that is embedded in their underlying runtime environment, and tends to be optimised for close, real-time, synchronous connections and interactive request/reply or conversation communication models. Therefore, these inter-application interface standards are relevant to loosely coupled applications with more heterogeneity in languages, operating systems, protocols and management tools. This series of standards is intended to support applications that need to exchange data every few seconds, minutes, or hours rather than waiting for a nightly batch run. This series of standards, which are intended to be implemented with middleware services that exchange messages among applications, will complement, not replace utility data warehouses, database gateways, and operational stores.

As used in IEC 61968, a distribution management system (DMS) consists of various distributed application components for the utility to manage electrical distribution networks. These capabilities include monitoring and control of equipment for power delivery, management processes to ensure system reliability, voltage management, demand-side management, outage management, work management, automated mapping and facilities management. Standard interfaces are defined for each class of applications identified in the interface reference model (IRM), which is described in IEC 61968-1.

APPLICATION INTEGRATION AT ELECTRIC UTILITIES – SYSTEM INTERFACES FOR DISTRIBUTION MANAGEMENT –

Part 3: Interface for network operations

1 Scope

Per the IEC 61968 Interface Reference Model, the Network Operations function defined in this part of IEC 61968 provides utilities the means to supervise main substation topology (breaker and switch state) and control equipment status. It also provides the means for handling network connectivity and loading conditions. Finally, it makes it possible for utilities to locate customer telephone complaints and supervise the location of field crews.

IEC 61968-3 specifies the information content of a set of message payloads that can be used to support many of the business functions related to network operations. Typical uses of the message payloads defined in IEC 61968-3 include data acquisition by external systems, fault isolation, fault restoration, trouble management, maintenance of plant, and the commissioning of plant.

The scope diagram shown in Figure 1 illustrates the possibility of implementing IEC 61968-3 functionality as either a single integrated advanced distribution management system or as a set of separate functions – OMS, DMS and SCADA. Utilities may choose to buy these systems from different vendors and integrate them using the IEC 61968-3 messages. Alternatively, a single vendor could provide two or all of these components as a single integrated system. In the case of more than one system being provided by the same vendor, the vendor may choose to use either extensions of the IEC 61968-messages or a proprietary integration mechanism to provide enhanced functionality over and above what is required/supported by the IEC 61968-3 specification.

An additional part of IEC 61968 will document integration scenarios or use cases, which are informative examples showing typical ways of using the message payloads defined in this document as well as message payloads to be defined in other parts of the IEC 61968 series.