

STN	Integrácia aplikácií v energetických spoločnostiach Systém rozhrania na riadenie dodávky elektrickej energie Časť 100: Implementačné profily IEC pre integráciu aplikácií	STN EN IEC 61968-100 33 4620
------------	--	--

Application integration at electric utilities - System interfaces for distribution management - Part 100: IEC Implementation profiles for application integration

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 05/22

Obsahuje: EN IEC 61968-100:2022, IEC 61968-100:2022

Oznámením tejto normy sa od 23.03.2025 ruší
STN EN 61968-100 (33 4620) z apríla 2014

134908



EUROPEAN STANDARD

EN IEC 61968-100

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2022

ICS 33.200

Supersedes EN 61968-100:2013 and all of its
amendments and corrigenda (if any)

English Version

**Application integration at electric utilities - System interfaces for
distribution management - Part 100: IEC Implementation profiles
for application integration
(IEC 61968-100:2022)**

Intégration d'applications pour les services électriques -
Interfaces système pour la gestion de la distribution - Partie
100: Profils de mise en oeuvre IEC pour l'intégration
d'application
(IEC 61968-100:2022)

Integration von Anwendungen in Anlagen der
Elektrizitätsversorgung - Systemschnittstellen für
Netzführung -Teil 100: Implementierungsprofile für die
Anwendungsintegration
(IEC 61968-100:2022)

This European Standard was approved by CENELEC on 2022-03-23. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, 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 61968-100:2022 (E)

European foreword

The text of document 57/2446/FDIS, future edition 2 of IEC 61968-100, 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 61968-100:2022.

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) 2022-12-23
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-03-23

This document supersedes EN 61968-100:2013 and all of its amendments and corrigenda (if any).

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 Standardization Request given to CENELEC by the European Commission and the European Free Trade Association.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 61968-100:2022 was approved by CENELEC as a European Standard without any modification.

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 62325-301	2018	Framework for energy market communications - Part 301: Common information model (CIM) extensions for markets	EN IEC 62325-301	2018
IEC/TS 61968-2	2011	Application integration at electric utilities - System interfaces for distribution management - Part 2: Glossary	-	-
IEC 61968-9	2013	Application integration at electric utilities - System interfaces for distribution management - Part 9: Interfaces for meter reading and control	EN 61968-9	2014
IEC 61968-11	2013	Application integration at electric utilities - System interfaces for distribution management - Part 11: Common information model (CIM) extensions for distribution	EN 61968-11	2013
IEC 61970-301	2020	Energy management system application program interface (EMS-API) - Part 301: Common information model (CIM) base	EN IEC 61970-301	2020
IEC 61970-552	2016	Energy management system application program interface (EMS-API) - Part 552: CIMXML Model exchange format	EN 61970-552	2016
ISO/IEC 21320-1	2015	Information technology - Document Container File - Part 1: Core	-	-
ISO 8601	2004	Data elements and interchange formats - Information interchange - Representation of dates and times	-	-
Java Message Service (version 1.0.2 November 9, 1999)			-	-
RFC 1952	-	GZIP file format specification - Version 4.3	-	-
RFC 4122	-	A Universally Unique Identifier (UUID) URN Namespace	-	-

EN IEC 61968-100:2022 (E)

RFC 4648	-	The Base16, Base32, and Base64 Data Encodings	-	-
SOAP (Simple Object Access Protocol)			-	-



IEC 61968-100

Edition 2.0 2022-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Application integration at electric utilities – System interfaces for distribution management –

Part 100: IEC implementation profiles for application integration

Intégration d'applications pour les services électriques – Interfaces système pour la gestion de la distribution –

Partie 100: Profils de mise en œuvre IEC pour l'intégration d'application

**THIS PUBLICATION IS COPYRIGHT PROTECTED****Copyright © 2022 IEC, Geneva, Switzerland**

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

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

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

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC - webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 300 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 19 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.



IEC 61968-100

Edition 2.0 2022-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Application integration at electric utilities – System interfaces for distribution management –
Part 100: IEC implementation profiles for application integration**

**Intégration d'applications pour les services électriques – Interfaces système pour la gestion de la distribution –
Partie 100: Profils de mise en œuvre IEC pour l'intégration d'application**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.200

ISBN 978-2-8322-1071-4

**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.....	14
INTRODUCTION.....	16
1 Scope.....	17
1.1 General.....	17
1.2 About this document	17
1.3 What is not covered by this document.....	17
1.4 Future considerations	17
1.4.1 Choice of Encoding Mechanisms	17
1.4.2 Choice of Web Service Technologies.....	17
2 Normative references	18
3 Terms, definitions and abbreviated terms	18
3.1 Terms and definitions.....	18
3.2 Abbreviated terms.....	19
4 Overview	19
4.1 General.....	19
4.2 Message format	19
4.3 Profiles	20
4.4 Message archetypes	20
4.5 Header verb and noun	20
4.6 Example IEC 61968-100 messages.....	21
4.7 Message exchange patterns	21
4.7.1 General	21
4.7.2 Request/response message exchange pattern.....	21
4.7.3 Unsolicited event message exchange pattern	21
4.7.4 Consequential event message exchange pattern	22
4.8 Basic request/response message types	22
5 Message archetypes.....	23
5.1 General.....	23
5.2 Request message	23
5.2.1 General	23
5.2.2 Root element.....	23
5.2.3 Structure	23
5.2.4 Header element.....	24
5.2.5 Application-specific data.....	24
5.2.6 Side-effects of a request message.....	24
5.3 Response message.....	24
5.3.1 General	24
5.3.2 Root element.....	24
5.3.3 Structure	24
5.3.4 Header element.....	25
5.3.5 Application-specific data and status notifications	25
5.3.6 Simple acknowledgement message	25
5.4 Event message	26
5.4.1 General	26
5.4.2 Root element.....	26
5.4.3 Structure	26

5.4.4	Header element	26
5.4.5	Application-specific data	26
5.5	Fault message	27
5.5.1	General	27
5.5.2	Root element	27
5.5.3	Structure	27
5.5.4	Reply element	27
6	Elementary message exchange patterns	27
6.1	General	27
6.2	Request/response message exchange pattern	27
6.2.1	General	27
6.2.2	Response messages	28
6.3	Unsolicited event message exchange pattern	29
6.4	Consequential event message exchange pattern	29
6.5	Simple acknowledgement message exchange patterns	30
6.5.1	General	30
6.5.2	Request/response message exchange pattern with simple acknowledgement messages	31
6.5.3	Unsolicited event message exchange pattern with simple acknowledgement message	32
6.5.4	Consequential event message exchange pattern with simple acknowledgement messages	32
7	Message details	33
7.1	General	33
7.2	Message encoding	34
7.3	Schema definition and validation	34
7.4	Top-level structure	34
7.4.1	General	34
7.4.2	Structure of request messages	34
7.4.3	Structure of response messages	37
7.4.4	Structure of event messages	39
7.5	The <Header> element	42
7.5.1	General	42
7.5.2	Message header subelements	42
7.5.3	Message header for request messages	44
7.5.4	Message header for response messages	46
7.5.5	Message header for event messages	48
7.6	The <Reply> element	50
7.6.1	General	50
7.6.2	Structure	51
7.6.3	Reply subelements	51
7.6.4	The <Reply><Status> subelement	51
7.6.5	Combining the <Reply><Status><ObjectID>, <OperationSet>, <UpdateID> and <TransactionID> elements	58
7.6.6	The <Reply><Transaction> element	59
7.7	The <Payload> element	59
7.7.1	General	59
7.7.2	Payload subelements	59
7.7.3	The <Payload><OperationSet> element	60

7.7.4	The <Payload><ObjectUpdate> element.....	66
7.7.5	AbstractPayloadType data	68
7.7.6	Multiple abstract payloads	68
7.8	The <CompressedPayload> element.....	68
7.8.1	General	68
7.8.2	Structure	68
7.8.3	CompressedPayload elements.....	69
7.8.4	The <CompressedPayload><CompressionType> subelement	69
7.8.5	The <CompressedPayload><Base64> subelement	69
7.9	The Transaction Type	69
8	Constraints and conventions.....	70
8.1	General.....	70
8.2	Application-specific data	70
8.2.1	General	70
8.2.2	The AbstractPayloadType.....	71
8.2.3	Application-specific customisation	71
8.2.4	RDF data	71
8.3	Object management requests and notifications	71
8.3.1	General	71
8.3.2	Create request message.....	72
8.3.3	Change request message	72
8.3.4	Delete request message	73
8.3.5	Update request message	73
8.3.6	Object management notifications	74
8.4	Get requests	74
8.4.1	Making a get request	74
8.4.2	Specifying multiple constraints in a request message	75
8.4.3	Responding to a get request.....	76
8.5	Cancelling transactions	76
8.5.1	General	76
8.5.2	Message exchange pattern.....	76
8.5.3	Transactions IDs.....	77
8.5.4	Receiving a transaction ID	78
8.5.5	Sending a cancellation request message	78
8.5.6	Responding to a cancellation request message	78
8.6	Object identification	78
8.6.1	General	78
8.6.2	Rules for object identification.....	79
8.6.3	Identifying objects using an <mRID> element.....	79
8.6.4	Identifying objects using a <Name> element.....	79
8.6.5	Referencing objects	80
8.7	The ObjectIdentificationRevisionSets profile	81
8.7.1	General	81
8.7.2	Structure	81
8.7.3	Using the ObjectIdentificationRevisionSets profile	83
8.7.4	Adding one or more new identifiers.....	83
8.7.5	Removing one or more identifiers	84
8.7.6	Possible Errors Pertaining To ObjectIdentificationRevisionSets Requests	84

9	Transporting messages	84
9.1	General.....	84
9.2	Transporting over SOAP web services	85
9.2.1	General	85
9.2.2	Encoding of IEC 61968-100 messages inside SOAP messages	85
9.2.3	Example SOAP message	85
9.2.4	Mapping of IEC 61968-100 messages to SOAP messages.....	85
9.2.5	WSDL files.....	86
9.3	Transporting over JMS.....	87
9.3.1	General	87
9.3.2	Message exchange patterns	88
9.3.3	Application-level acknowledgement messages	88
9.3.4	JMS headers	88
Annex A	(normative) XSD files.....	90
A.1	General.....	90
A.2	The Message.xsd file	90
A.3	The AbstractPayloadType.xsd file	102
A.4	The LegacyObjectIdentificationRevisionSets.xsd File.....	103
A.5	The RDF.xsd file	108
Annex B	(normative) Template files	110
B.1	General.....	110
B.2	The GenericMessageWsdITemplate.txt file.....	110
B.3	The StrongMessageXsdTemplate.txt file	116
B.4	The StrongMessageWsdITemplate.txt file.....	128
Annex C	(informative) Example XSD profiles inheriting from AbstractPayloadType	135
C.1	GetMeterReadings profile	135
C.2	BinaryData profile	136
Annex D	(informative) Example IEC 61968-100:2021 messages	138
D.1	General.....	138
D.2	Messages dealing with object instantiation.....	138
D.2.1	General	138
D.2.2	Sequence diagram.....	138
D.2.3	Meter instantiation request (request message)	139
D.2.4	Meter instantiation response (step 4, success case).....	141
D.2.5	Meter instantiation response (step 4, failure case).....	141
D.3	Messages dealing with the event notification of object instantiation	142
D.3.1	General	142
D.3.2	Sequence diagram.....	142
D.3.3	Publication of a meter instantiation (event message)	142
D.3.4	Publication of a meter instantiation (simple acknowledgement message).....	146
D.4	Messages dealing with requests for information concerning an object instantiation	146
D.4.1	General	146
D.4.2	Sequence diagram.....	146
D.4.3	Request for information concerning a meter instantiation (request message).....	147
D.4.4	Request for information concerning a meter instantiation (response message).....	148
D.5	Messages utilizing an operationset to enforce transactional integrity.....	149

D.5.1	General	149
D.5.2	Sequence diagram.....	149
D.5.3	Using an operationset to enforce transactional integrity (request message).....	150
D.5.4	Using an operationset to enforce transactional integrity (response message).....	153
D.6	Messages dealing with the publication of data	153
D.6.1	General	153
D.6.2	Sequence diagram.....	153
D.6.3	Publication of meter readings (event message).....	154
D.6.4	Publication of meter readings (simple acknowledgement message)	155
D.7	Messages dealing with an on-demand data request resulting in a single response.....	156
D.7.1	General	156
D.7.2	Sequence Diagram	156
D.7.3	On-demand meter reading message (request message)	157
D.7.4	On-demand meter reading message (response message).....	158
D.8	Messages dealing with an on-demand data request resulting in multiple responses	159
D.8.1	General	159
D.8.2	Sequence diagram.....	159
D.8.3	Request for an on-demand meter ping (request message)	160
D.8.4	Request for an on-demand meter ping (response message 1)	161
D.8.5	Request for an on-demand meter ping (response message 2)	162
D.8.6	Request for an on-demand meter ping (simple acknowledgement of message 2).....	163
D.8.7	Request for an on-demand meter ping (response message 3)	164
D.8.8	Request for an on-demand meter ping (simple acknowledgement of message 3).....	165
D.9	Messages dealing with historical data request	165
D.9.1	General	165
D.9.2	Sequence diagram.....	165
D.9.3	Historical meter read (request message)	166
D.9.4	Historical meter read (response message).....	167
D.10	Messages dealing with historical data request (responses spread over several messages).....	168
D.10.1	General	168
D.10.2	Historical meter read (response message 1 of 4)	169
D.10.3	Historical meter read (response message 2 of 4)	169
D.10.4	Historical meter read (response message 3 of 4)	170
D.10.5	Historical meter read (response message 4 of 4)	171
D.11	Messages dealing with multiple statuses within a response.....	172
D.11.1	General	172
D.11.2	Sequence diagram.....	173
D.11.3	Historical meter read (response message).....	174
D.12	Messages dealing with a consequential event message	176
D.12.1	General	176
D.12.2	Sequence diagram.....	176
D.12.3	Request for a meter connect (request message).....	177
D.12.4	Request for a meter connect (response message)	178

D.12.5	Request for a meter connect (event message)	179
D.12.6	Request for a meter connect (simple acknowledgement message).....	180
D.13	Using two operationsets to sequence multiple operations with transactional integrity.....	180
D.13.1	General	180
D.13.2	Using two OperationSets to read two meters before disconnecting them (request message).....	181
D.13.3	Using two OperationSets to read two meters before disconnecting them (response message)	182
D.14	Messages dealing with object deletion	184
D.14.1	General	184
D.14.2	Sequence diagram.....	184
D.14.3	Request to delete a meter (request message).....	185
D.14.4	Request to delete a meter (response message)	185
D.15	Messages dealing with cancellation of a single transaction	185
D.15.1	Meter control request message.....	185
D.15.2	Response message containing a single transaction id	186
D.15.3	Cancellation request (request message)	187
D.15.4	Cancellation request (response message)	187
D.16	Messages dealing with cancellation of multiple transactions	188
D.16.1	Response message containing multiple transaction IDs	188
D.16.2	Cancellation request (request message)	189
D.16.3	Cancellation request (response message)	190
D.17	Messages dealing with failed XSD validation	190
D.17.1	General	190
D.17.2	Message that fails XSD validation (request message).....	191
D.17.3	Message that fails XSD validation (response message)	191
D.18	Messages dealing with malformed requests	192
D.18.1	General	192
D.18.2	Message that is malformed (request message)	192
D.18.3	Message that is malformed (response message)	193
Annex E (informative)	Example IEC 61968-100:2021 messages for updating objects.....	194
E.1	General.....	194
E.2	CreateMeterConfig.xml	194
E.3	ModifyFormNumber.xml	195
E.4	RemoveFormNumber.xml.....	196
E.5	AddMeterMultiplier.xml	196
E.6	ModifyMeterMultiplierKind.xml	197
E.7	ModifyMeterMultiplierValue.xml.....	198
E.8	RemoveMeterMultiplierValue.xml	199
E.9	RemoveMeterMultiplier.xml	200
E.10	AddMeterSeal.xml.....	201
E.11	AddMeterSealKind.xml.....	201
E.12	ModifyMeterSealCondition.xml	202
E.13	RemoveMeterSealCondition.xml	203
E.14	RemoveMeterSeal.xml	204
E.15	ModifyProgramId.xml	205
E.16	RemoveProgramId.xml.....	205
E.17	AddChannel.xml.....	206

E.18	ModifyChannelReadingType.xml	207
E.19	RemoveChannel.xml	208
E.20	AddConnectDisconnectFunction.xml	209
E.21	RemoveConnectDisconnectFunction.xml.....	210
E.22	DeleteMeterConfig.xml.....	211
E.23	DeleteMeterConfig.xml.....	211
E.24	CreateMeterConfigs.xml.....	212
E.25	MultipleObjectChanges.xml.....	214
E.26	MultipleObjectChangesWithOperationSet.xml	216
Annex F	(informative) Examples of ObjectIdentificationRevisionSets Messages	220
F.1	General.....	220
F.2	Add an mRID for the meter object	220
F.3	Modify name two of the meter object.....	222
F.4	Add name three of the meter object	223
F.5	Remove Name One of the Meter Object	225
F.6	Modify the mRID of the meter object	226
F.7	Remove the mRID of the meter object.....	228
F.8	Add an mRID and modify name two of the meter object	229
F.9	Modify name two of the meter object and add name one of the customer object.....	230
F.10	Add name two of the customer object to carry a new IdentifiedObject.name.....	233
Annex G	(informative) Example IEC 61968-100:2021 messages illustrating the cross- product rule	235
G.1	General.....	235
G.2	Specifying "OR" operations over the selection criteria	235
G.3	Specifying "AND" operations over the selection criteria.....	235
G.4	Specifying a combination of logical "AND" and "OR" operations	236
G.5	Example of multiple AbstractPayloadType profiles in a single message	237
Annex H	(informative) Validation of received messages	239
H.1	General.....	239
H.2	Example message validation using Altova XMLSpy	239
H.3	Example message validation using a Java validator	240
Annex I	(informative) Significant changes between IEC 61968-100:2013 and IEC 61968-100:2021	241
Bibliography	247
Figure 1	– Structure of a request message.....	24
Figure 2	– Structure of a ResponseMessage.....	25
Figure 3	– Structure of an EventMessage	26
Figure 4	– Structure of a FaultMessage	27
Figure 5	– Request/response message exchange pattern	28
Figure 6	– Unsolicited event message exchange pattern.....	29
Figure 7	– Consequential event message exchange pattern.....	30
Figure 8	– Request/response message exchange pattern with simple acknowledgement messages	31
Figure 9	– Unsolicited message exchange pattern with simple acknowledgement messages	32

Figure 10 – Consequential event message exchange pattern with simple acknowledgement messages	33
Figure 11 – Structure of the <CancelRequestMessage> element.....	35
Figure 12 – Structure of the <ChangeRequestMessage> element.....	35
Figure 13 – Structure of the <CreateRequestMessage> element.....	35
Figure 14 – Structure of the <DeleteRequestMessage> element.....	36
Figure 15 – Structure of the <ExecuteRequestMessage> element.....	36
Figure 16 – Structure of the <GetRequestMessage> element.....	36
Figure 17 – Structure of the <UpdateRequestMessage> element.....	37
Figure 18 – Structure of the <CancelResponseMessage> element.....	37
Figure 19 – Structure of the <ChangeResponseMessage> element.....	38
Figure 20 – Structure of the <CreateResponseMessage> element.....	38
Figure 21 – Structure of the <DeleteResponseMessage> element.....	38
Figure 22 – Structure of the <ExecuteResponseMessage> element.....	39
Figure 23 – Structure of the <GetResponseMessage> element.....	39
Figure 24 – Structure of the <UpdateResponseMessage> element.....	39
Figure 25 – Structure of the <CanceledEventMessage> element.....	40
Figure 26 – Structure of the <ChangedEventMessage> element.....	40
Figure 27 – Structure of the <CreatedEventMessage> element.....	41
Figure 28 – Structure of the <DeletedEventMessage> element.....	41
Figure 29 – Structure of the <ExecutedEventMessage> element.....	41
Figure 30 – Structure of the <UpdatedEventMessage> element.....	42
Figure 31 – Structure of the <Header> element for request messages	45
Figure 32 – Structure of the <Header> element for response messages	47
Figure 33 – Structure of the <Header> element for event messages	49
Figure 34 – Structure of the <Reply> element.....	51
Figure 35 – Structure of the <Reply><Status> element	52
Figure 36 – Example of error indications in a <Reply> element	58
Figure 37 – Structure of the <Payload><OperationSet> element for request messages	61
Figure 38 – Structure of the <Payload><OperationSet> element for response messages	62
Figure 39 – Structure of the <Payload><OperationSet> element for event messages	62
Figure 40 – Structure of the <Payload><OperationSet><Operation> element for request messages.....	64
Figure 41 – Structure of the <Payload><OperationSet><Operation> element for response messages	65
Figure 42 – Structure of the <Payload><OperationSet><Operation> element for event messages.....	66
Figure 43 – Structure of the <Payload><ObjectUpdate> element	67
Figure 44 – Structure of the <CompressedPayload> element.....	69
Figure 45 – Structure of the TransactionType	70

Figure 46 – Message Exchange Pattern for a Cancellation Request.....	77
Figure 47 – General Naming Scheme.....	80
Figure 48 – Structure of an <ObjectID> element	80
Figure 49 – ObjectIdentificationRevisionSets profile	82
Figure 50 – Example SOAP message	85
Figure A.1 – Contents of Message.xsd file	102
Figure A.2 – Contents of AbstractPayloadType.xsd file	102
Figure A.3 – Contents of LegacyObjectIdentificationRevisionSets.xsd file.....	108
Figure A.4 – Contents of the RDF.xsd file	109
Figure B.1 – Contents of GenericMessageXsdTemplate.txt file	115
Figure B.2 – Contents of StrongMessageXsdTemplate.txt file	128
Figure B.3 – Contents of StrongMessageWsdITemplate.txt file	134
Figure C.1 – Example XSD profile illustrating inheritance from AbstractPayloadType.....	136
Figure C.2 – Example XSD profile suitable for the transmission of binary data.....	137
Figure D.1 – Example sequence diagram for a meter instantiation request	139
Figure D.2 – Example meter instantiation request message	141
Figure D.3 – Example meter instantiation response message (success case)	141
Figure D.4 – Example meter instantiation response message (failure case)	141
Figure D.5 – Example sequence diagram for the publication of a meter instantiation.....	142
Figure D.6 – Example publication of a meter instantiation (event message)	146
Figure D.7 – Example publication of a meter instantiaion (simple acknowledgement message).....	146
Figure D.8 – Example sequence diagram for requests for information concerning an object instantiation.....	147
Figure D.9 – Example request for information concerning a meter instantiation (request message).....	148
Figure D.10 – Example request for information concerning a meter instantiation (response message)	149
Figure D.11 – Example sequence diagram for an OperationSet request.....	150
Figure D.12 – Example OperationSet message to enforce transactional integrity (request message).....	153
Figure D.13 – Example OperationSet message to enforce transactional integrity (response message)	153
Figure D.14 – Example sequence diagram for the publication of meter readings	154
Figure D.15 – Example publication of routine meter readings (event message).....	155
Figure D.16 – Example publication of routine meter readings (simple acknowledgement message).....	156
Figure D.17 – Example sequence diagram for the retrieval of on-demand meter readings.....	157
Figure D.18 – Example on-demand meter readings request message	158
Figure D.19 – Example on-demand meter readings response message.....	159
Figure D.20 – Example sequence diagram for an on-demand meter ping request	160
Figure D.21 – Example on-demand meter ping request (request message)	161
Figure D.22 – Example on-demand meter ping request (response message)	162
Figure D.23 – Example on-demand meter ping request (response message 2)	163

Figure D.24 – Example on-demand meter ping request (simple acknowledgement message 2).....	164
Figure D.25 – Example on-demand meter ping request (response message 3)	164
Figure D.26 – Example on-demand meter ping request (simple acknowledgement message 3).....	165
Figure D.27 – Example sequence diagram for the retrieval of historical meter readings	166
Figure D.28 – Example historical meter read request (request message).....	167
Figure D.29 – Example historical meter read request (response message)	168
Figure D.30 – Example historical meter read request (response message 1 of 4).....	169
Figure D.31 – Example historical meter read request (response message 2 of 4).....	170
Figure D.32 – Example historical meter read request (response message 3 of 4).....	171
Figure D.33 – Example historical meter read request (response message 4 of 4).....	172
Figure D.34 – Example sequence diagram for the retrieval of historical meter readings (request message).....	173
Figure D.35 – Example historical meter read request, mixed success and failure cases (request message).....	174
Figure D.36 – Example historical meter read request, mixed success and failure cases (response message)	176
Figure D.37 – Example sequence diagram for the requesting a meter connect.....	177
Figure D.38 – Example meter connect (request message)	178
Figure D.39 – Example meter connect (response message).....	179
Figure D.40 – Example meter connect (event message).....	180
Figure D.41 – Example meter connect (simple acknowledgement message)	180
Figure D.42 – Using two OperationSets to read two meters before disconnecting them (request message).....	182
Figure D.43 – Using two OperationSets to Read two meters before disconnecting them (response message)	183
Figure D.44 – Example sequence diagram for the deletion of a meter.....	184
Figure D.45 – Example meter deletion (request message)	185
Figure D.46 – Example meter deletion (response message).....	185
Figure D.47 – Example create(EndDeviceControls) request message	186
Figure D.48 – Example response message containing a single transaction ID.....	187
Figure D.49 – Example cancellation request message	187
Figure D.50 – Example response to a cancellation request message	188
Figure D.51 – Example response message containing several transaction IDs.....	189
Figure D.52 – Example cancellation request message	190
Figure D.53 – Example response to a cancellation request message	190
Figure D.54 – Example message that fails XSD validation (request message)	191
Figure D.55 – Example message that fails XSD validation (response message).....	192
Figure D.56 – Example malformed message (request message)	192
Figure D.57 – Example malformed message (response message).....	193
Figure E.1 – CreateMeterConfig.xml	195
Figure E.2 – ModifyFormNumber.xml	196
Figure E.3 – RemoveFormNumber.xml.....	196
Figure E.4 – AddMeterMultiplier.xml	197

Figure E.5 – ModifyMeterMultiplierKind.xml	198
Figure E.6 – ModifyMeterMultiplierValue.xml	199
Figure E.7 – RemoveMeterMultiplierValue.xml	200
Figure E.8 – RemoveMeterMultiplier.xml	200
Figure E.9 – AddMeterSeal.xml	201
Figure E.10 – AddMeterSealKind.xml	202
Figure E.11 – ModifyMeterSealCondition.xml	203
Figure E.12 – RemoveMeterDealCondition.xml	204
Figure E.13 – RemoveMeterSeal.xml	204
Figure E.14 – ModifyProgramId.xml	205
Figure E.15 – RemoveProgramId.xml	206
Figure E.16 – AddChannelId.xml	207
Figure E.17 – ModifyChannelReadingType.xml	208
Figure E.18 – RemoveChannel.xml	209
Figure E.19 – AddConnectDisconnectFunction.xml	210
Figure E.20 – RemoveConnectDisconnectFunction.xml	211
Figure E.21 – DeleteMeterConfig.xml	211
Figure E.22 – DeleteMeterConfig.xml	212
Figure E.23 – CreateMeterConfigs.xml	214
Figure E.24 – MultipleObjectChanges.xml	216
Figure E.25 – MultipleObjectChangesWithOperationSet.xml	219
Figure F.1 – Add an mRID for the Meter Object	221
Figure F.2 – Modify name two of the meter object	223
Figure F.3 – Add name three of the meter object	224
Figure F.4 – Remove name one of the meter object	226
Figure F.5 – Modify the mRID of the meter object	227
Figure F.6 – Remove the mRID of the meter object	228
Figure F.7 – Add an mRID and modify name two of the meter object	230
Figure F.8 – Add name one of the customer object and modify name two of the meter object	232
Figure F.9 – Add name two of the customer object to carry a new IdentifiedObject.name	234
Figure G.1 – Example get(MeterConfig) request illustrating a logical "OR" operation	235
Figure G.2 – Example get(MeterReadings) request illustrating a logical "AND" operation	236
Figure G.3 – Example request message illustrating combined logical "AND" and "OR" operations	237
Figure G.4 – Example of multiple AbstractPayloadType profiles in a single message	238
Figure H.1 – Example message suitably modified to specify the locations of the relevant XSD files	240
Figure H.2 – Example of local modifications made to the Message.xsd file	240
Table 1 – List of top-level root elements in request messages	34
Table 2 – List of top-level root elements in response messages	37
Table 3 – List of top-level root elements in event messages	40

Table 4 – Elements in the Message <Header> element.....	42
Table 5 – Verbs used in request messages.....	45
Table 6 – Verbs used in event messages.....	49
Table 7 – Subelements within the <Reply> element.....	51
Table 8 – Subelements within the <Reply><Status> element	53
Table 9 – Values of the <Reply><Status><Level> element	54
Table 10 – Normative values for the <Reply><Status><Code> element	54
Table 11 – Subelements within the <Payload> element.....	60
Table 12 – Subelements within the <Payload><OperationSet> element.....	61
Table 13 – Subelements within the <Payload><OperationSet><Operation> element.....	63
Table 14 – Subelements within the <Payload><ObjectUpdate> element.....	67
Table 15 – Subelements within the <Payload><ObjectUpdate><UpdateAction> element.....	68
Table 16 – Subelements within the <CompressedPayload> element.....	69
Table 17 – Values of the <CompressedPayload><CompressionType> element.....	69
Table 18 – Elements of a transaction type	70
Table 19 – Subelements within an <ObjectID> element.....	81
Table 20 – Elements of an ObjectIdentificationRevisionSets profile	83
Table 21 – Generic WSDL template variable names.....	86
Table 22 – Strongly-typed message XSD template variable names	87
Table 23 – Strongly-typed WSDL template variable names	87
Table F.1 – Initial naming states of the example meter object	220
Table F.2 – Initial naming states of the example customer object.....	220
Table F.3 – Add an mRID for the meter object	221
Table F.4 – Modify name two of the meter object	222
Table F.5 – Add name three of the meter object.....	224
Table F.6 – Remove name one of the meter object	225
Table F.7 – Modify the mRID of the meter object	227
Table F.8 – Remove the mRID of the meter object.....	228
Table F.9 – Add an mRID and modify name two of the meter object.....	229
Table F.10 – Modify name two of the meter object	231
Table F.11 – Add name one of the customer object.....	231
Table F.12 – Add name two of the customer object to carry a new IdentifiedObject.name	233
Table I.1 – Significant changes introduced in IEC 61968-100:2021 since IEC 61968- 100:2013	242
Table I.2 – Detailed changes introduced from IEC 61968-100:2013 to IEC 61968- 100:2021	243
Table I.3 – Elements removed from IEC 61968-100:2013.....	244

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 100: IEC implementation profiles for application integration

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.
- 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.

IEC 61968-100 has been prepared by IEC technical committee 57: Power systems management and associated information exchange. It is an International Standard.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

This IEC 61968-100:2022 edition cancels and replaces the IEC 61968-100:2013 edition published in 2013. This edition constitutes a technical revision.

- a) This edition includes the following significant technical changes with respect to the previous edition: IEC 61968-100:2022 has been refined to remove ambiguities and redundancies. Informative and normative clauses are marked as such and, in the latter case, appropriate verbal forms of language are used;
- b) The messages defined by IEC 61968-100:2022 are in general not backwards compatible with those of IEC 61968-100:2013. Annex I lists the significant technical changes introduced since the publication of IEC 61968-100:2013 and provides appropriate suggestions for migrating to IEC 61968-100:2022.

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

Draft	Report on voting
57/2446/FDIS	57/2455/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/standardsdev/publications.

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

NOTE

The following print types are used:

- Literal text such as program fragments or XML elements in `Courier New 10`.

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 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.

INTRODUCTION

This document specifies how implementations of IEC 61968 may be made interoperable using common enterprise integration technologies. In particular, it describes how message payloads defined in IEC 61968 (Parts 3 to 9 and Part 13), IEC 61970 and IEC 62325 are to be exchanged between systems using transport mechanisms such as web services and the Java Message Service.

This document may also find usage beyond information exchanges defined for these International Standards such as for the integration of market systems or for general enterprise integration.

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

Part 100: IEC implementation profiles for application integration

1 Scope

1.1 General

This part of IEC 61968 defines how messages may be exchanged between cooperating systems in order to facilitate the transfer of application-specific data. Such application-specific data include but are not limited to the message payloads defined in IEC 61968 (Parts 3 to 9 and Part 13), IEC 61970 and IEC 62325.

1.2 About this document

This document provides normative definitions for:

- a set of message archetypes (Clause 5);
- a set of message exchange patterns that both sending and receiving systems are expected to implement (Clause 6);
- the exact format of the messages that are to be transmitted over the various integration technologies including a precise description of the information that each message must contain (Clause 7);
- a set of constraints and conventions to which applications must adhere in order to facilitate message exchange using IEC 61968-100 (Clause 8);
- the details of how IEC 61968-100 messages should be implemented using various underlying transport mechanisms (Clause 9).

1.3 What is not covered by this document

Security considerations lie outside the scope of IEC 61968-100. This document defers to the IEC 62351 series for definitions and practices relating to the secure transmission of messages.

1.4 Future considerations

1.4.1 Choice of Encoding Mechanisms

This document prescribes XML as the normative encoding mechanism for all messages defined by this document.

Future editions of IEC 61968-100 may specify additional normative encoding methods including support for JSON (RFC 4627) documents whose semantics are defined by the IEC CIM and whose syntax is defined by an IETF JSON schema.

1.4.2 Choice of Web Service Technologies

This document provides normative definitions for the use of SOAP Web Services (9.2) and Java Message Service (9.3) for the transport of messages.

Future editions of IEC 61968-100 may specify additional normative web service technologies such as REST.

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 62325-301:2018, *Framework for energy market communications – Part 301: Common information model (CIM) extensions for markets*

IEC TS 61968-2:2011, *Application integration at electric utilities – System interfaces for distribution management – Part 2: Glossary*

IEC 61968-9:2013, *Application integration at electric utilities – System interfaces for distribution management – Part 9: Interfaces for meter reading and control*

IEC 61968-11:2013, *Application integration at electric utilities – System interfaces for distribution management – Part 11: Common information model (CIM) extensions for distribution*

IEC 61970-301:2020, *Energy management system application program interface (EMS-API) – Part 301: Common information model (CIM) base*

IEC 61970-552:2016, *Energy management system application program interface (EMS-API) – Part 552: CIMXML Model exchange format*

ISO IEC 21320-1:2015, *Information technology – Document Container File – Part 1: Core*

ISO 8601:2004, *Data elements and interchange formats – Information interchange – Representation of dates and times*

Java Message Service (version 1.0.2 November 9, 1999). Available from <https://docs.oracle.com/cd/E19957-01/816-5904-10/816-5904-10.pdf>

RFC 1952, GZIP file format specification version 4.3. Available from <https://tools.ietf.org/html/rfc1952>.

RFC 4122, A Universally Unique IDentifier (UUID) URN Namespace. Available from <https://tools.ietf.org/html/rfc4122>

RFC 4648, The Base16, Base32, and Base64 Data Encodings. Available from <https://tools.ietf.org/html/rfc4648>

SOAP (Simple Object Access Protocol). Available from <http://www.w3.org/TR/2000/NOTE-SOAP-20000508/>

koniec náhľadu – text ďalej pokračuje v platenej verzii STN