

SLOVENSKI STANDARD SIST EN 62656-3:2015

01-julij-2015

Register ontologije standardiziranih izdelkov in prenos prek razpredelnic - 3. del: Vmesnik za splošni informacijski model (IEC 62656-3:2015)

Standardized product ontology register and transfer by spreadsheets - Part 3: Interface for Common Information Model (IEC 62656-3:2015)

Standardisierte Übertragung und Registrierung von Ontologien für Produkte mittels Tabellen - Teil 3: Schnittstellen für das allgemeine Informationsmodell (IEC 62656-3:2015)

(standards.iteh.ai)

Enregistrement d'ontologie de produits normalisés et transfert par tableurs - Partie 3: Interface pour un modèle d'information commun (IEC 62656-3:2015)

fld9b56191a4/sist-en-62656-3-2015

Ta slovenski standard je istoveten z: EN 62656-3:2015

ICS:

01.040.01 Splošno. Terminologija. Generalities. Terminology.

Standardizacija. Standardization.

Dokumentacija (Slovarji) Documentation
(Vacabularios)

(Vocabularies)

01.110 Tehnična dokumentacija za Technical product

izdelke documentation

SIST EN 62656-3:2015 en

SIST EN 62656-3:2015

iTeh STANDARD PREVIEW (standards.iteh.ai)

EUROPEAN STANDARD

EN 62656-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2015

ICS 01.040.01; 01.110

English Version

Standardized product ontology register and transfer by spreadsheets - Part 3: Interface for Common Information Model (IEC 62656-3:2015)

Enregistrement d'ontologie de produits normalisés et transfert par tableurs - Partie 3: Interface pour un modèle d'information commun (IEC 62656-3:2015)

Standardisierte Übertragung und Registrierung von Ontologien für Produkte mittels Tabellen - Teil 3: Schnittstellen für das allgemeine Informationsmodell (IEC 62656-3:2015)

This European Standard was approved by CENELEC on 2015-03-31. 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.

SIST EN 62656-3:2015

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, 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: Avenue Marnix 17, B-1000 Brussels

- 2 -

Foreword

The text of document 3D/234/FDIS, future edition 1 of IEC 62656-3, prepared by IEC/SC 3D "Product properties and classes and their identification", of IEC/TC 3 "Information structures, documentation and graphical symbols", was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62656-3.

The following dates were fixed:

latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement

| Interest date by which the national standard or by endorsement | Interest date by which the national standard or by which the national | Interest date | Interest date

(dop) 2015-12-31

 latest date by which the national standards conflicting with the document have to be withdrawn

(dow) 2018-03-31

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

Endorsement notice

The text of the International Standard IEC 62656-3:2015 was approved by CENELEC as a European Standard without any modification.

iTeh STANDARD PREVIEW (standards.iteh.ai)

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 When 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:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	EN/HD	<u>Year</u>
IEC 61360-1	2009	Standard data elements types with associated classification scheme for electric items Part 1: Definitions - Principles and methods	EN 61360-1	2010
IEC 61360-4	- iTe	Standard data element types with associated classification scheme for electric	EN 61360-4	-
		and component classes.iteh.ai)	La amira and usa Dan	
IEC 61968-1	2003	Application integration at electric utilities - System interfaces for distribution	+corrigendum Dec. EN 61968-1	2004
	https://sta	management Part 1: Interface architecture and general requirements 656-3-2015	<u>3</u> -9463-	
IEC 61968-11	2010	Application integration at electric utilities - System interfaces for distribution management Part 11: Common Information Model (CIM) extensions for	EN 61968-11	2010
IEC 61970-1	2005	distribution Energy management system application program interface (EMS-API) Part 1:	EN 61970-1	2006
IEC 61970-301	2013	Guidelines and general requirements Energy management system application program interface (EMS-API) Part 301:	EN 61970-301	2014
IEC 61970-501	2006	Common information model (CIM) base Energy management system application program interface (EMS-API) Part 501: Common Information Model Resource	EN 61970-501	2006
IEC 62325-301	2014	Description Framework (CIM RDF) schema Framework for energy market communications Part 301: Common Information Model (CIM) extensions for	EN 62325-301	2014
IEC 62656-1	2014	markets Standardized product ontology register and transfer by spreadsheets Part 1: Logical	EN 62656-1	2015
ISO 639-1	2002	structure for data parcels Codes for the representation of names of languages Part_1: Alpha-2 code	-	-

EN 62656-3:2015 - 4 -

ISO 8601	2004	Data elements and interchange formats - Information interchange - Representation of dates and times		-
IEC/TS 61970-2	2004	Energy management system application program interface (EMS-API) Part 2: Glossary	CLC/TS 61970-2	2005
ISO/IEC directives Supplement	2013	Procedures specific to IEC	-	-

iTeh STANDARD PREVIEW (standards.iteh.ai)



Edition 1.0 2015-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Standardized product ontology register and transfer by spreadsheets – Part 3: Interface for Common Information Model

Enregistrement d'ontologie de <u>produits normalisés</u> et transfert par tableurs – Partie 3: Interface pour un modèle d'information commun-9463-

fld9b56191a4/sist-en-62656-3-2015

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 01.040.01; 01.110 ISBN 978-2-8322-2258-4

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

	_	RD	
IN	TRODU	CTION	9
1	Scop	e	.10
2	Norm	ative references	.10
3	Term	s, definitions and abbreviations	.11
	3.1	Terms and definitions	
	3.2	Abbreviations	
4	Gene	eric rules and principles for the design of CIM interface	
	4.1	Comparative analysis of the structures and functionalities of POM and CIM	
	4.2	CIM standard series	
5		s of transformation from CIM to POM	
	5.1	General rules	
	5.2	CIM Class	
	5.2.1	General	
	5.2.2		
	5.2.3		
	5.2.4	'	
	5.3	Generalization-specialization CIM class attributes ANDARD PREVIEW	. 18
	5.3.1	General (standards.iteh.ai)	
	5.3.2	Name	. 18
	5.3.3	Native attributesist En 62656-3-2015	.18
	5.3.4	<u> </u>	
	5.3.5	Description <u>fld9b56191a4/sist-en-62656-3-2015</u>	.18
	5.4	CIM association	.19
	5.4.1	General	.19
	5.4.2	CIM association end structure	. 19
	5.4.3	General transformation rule for association	. 20
	5.4.4	General transformation rule for association end	.20
	5.5	CIM Enumeration class	
	5.5.1	General	
	5.5.2	Name	.25
	5.5.3	•	
	5.6	CIM Enumeration Attribute	
	5.6.1	General	
	5.6.2		
	5.6.3	•	
	5.7	Data type	
	5.7.1	CIM basic datatype	
	5.7.2	71	
	5.8	Package	
	5.8.1	General	
	5.8.2	,	
6	5.8.3	1 3	
6		description in IEC 62656 format	
	6.1	General	
	6.2	Class	.34

7

6.2.1	General	34
6.2.2	Code	34
6.2.3	Version number	34
6.2.4	Revision number	35
6.2.5	Date of original definition	35
6.2.6	Date of current version	35
6.2.7	Preferred name	35
6.2.8	Short name	36
6.2.9	Definition	36
6.2.1	0 Note	36
6.2.1	1 Superclass	36
6.2.1	2 Class type	37
6.2.1	3 Alternate ID	37
6.2.1	4 CIM package	37
6.2.1	5 Applicable properties	38
6.3	Property	38
6.3.1	General	38
6.3.2	Property data element type	38
6.3.3	Definition class	38
6.3.4		
6.3.5	Applicable relations ANDARD PREVIEW	39
6.3.6	Condition	39
6.3.7	Condition Unit in text (Standards.iteh.ai)	39
6.3.8	Alternative units <u>SIST EN 62656-3:2015</u>	40
6.4	Data type https://standards.iteh.ai/catalog/standards/sist/fice252f-ffc1-4942-9463	40
6.4.1	General	40
6.4.2	Definition class	40
6.4.3	Unit in text	40
6.4.4	Alternative units	41
6.4.5	Data type	41
6.5	Enumeration	41
6.5.1	General	41
6.5.2	Definition class	41
6.5.3	Enumerated list of terms	41
6.5.4	Enumerate code list	42
6.6	Term meta-class	42
6.6.1	General	42
6.6.2	Preferred letter symbol in text	42
6.7	Relation	42
6.7.1	General	42
6.7.2	Relation type	43
6.7.3	Domain of the relation	43
6.7.4	Domain of the function	43
6.7.5	Codomain of the function	43
6.7.6	Domain element type	44
6.7.7	Role of the relation	44
XML	schema for updated CIM instances in IEC CDD	44
7.1	General	44
7 2	Principles	45

8 Version of	control mechanism in POM for the parcellized CIM	46
	mative) Mapping rules from CIM to POM – Mapping rules described in meta-class	47
	mative) CIM in IEC 62656 format – Normative meta-properties of the 2656 model	56
Annex C (info	rmative) XML Schema for parcellized CIM	63
C.1 XM	L schema for POM models	63
C.2 XM	L schema for a class	63
C.2.1	General	63
C.2.2	class.xsd	63
C.2.3	class1.xsd	64
C.2.4	class2.xsd	64
C.2.5	class3.xsd	64
C.2.6	class4.xsd	65
C.3 XM	L schema for a property	65
C.3.1	General	65
C.3.2	property.xsd	65
C.3.3	property1.xsd	66
C.3.4	property2.xsd	
C.3.5	property4.xsd. STANDARD PREVIEW	67
C.3.6		
C.4 XM	L schema for a property derived from an association end General	68
C.4.1		
C.4.2	association.xsd <u>SIST EN 62656-3:2015</u>	68
C.4.3	association1.xsd:iteh:ai/catalog/standards/sist/ffcc252f-f1-c1-4942-9463	68
C.4.4	association2.xsd .f1d9b56191a4/sist-en-62656-3-2015.	
C.4.5	association3.xsd	70
C.4.6	association4.xsd	70
C.5 XM	L schema for a data type	
C.5.1	General	
C.5.2	datatype.xsd	71
C.5.3	datatype1.xsd	
C.5.4	datatype2.xsd	71
C.5.5	datatype3.xsd	
C.5.6	datatype4.xsd	
	L schema for an enumeration and its enumerators	
C.6.1	General	73
C.6.2	enum_term.xsd	
C.6.3	enum_term1.xsd	73
C.6.4	enum_term2.xsd	
C.6.5	enum_term3.xsd	
C.6.6	enum_term4.xsd	
	L schema for a CIM package	
C.7.1	General	
C.7.2	package.xsd example	
C.7.3	package1.xsd example	
C.7.4	package2.xsd example	
C.7.5	package3.xsd example	
C.7.6	package4.xsd example	77

Annex D (informative) XML examples for parcellized CIM	78
D.1 XML example for a CIM class with extended attributes	78
D.2 XML example for a property with extended attributes	78
D.3 XML example for a CIM association and aggregation with extended attributes	79
D.4 XML example for a CIM data type with extended attributes	81
D.5 XML example for a CIM enumeration and its enumerators with extended attributes	81
D.6 XML example for a CIM package with extended attributes	
Annex E (informative) Property reference between CIM and IEC CDD – "Power transformer" definitions in both IEC CDD and CIM	
Annex F (informative) Four Layer architecture of UML and POM – Four layer architecture of MOF (meta object facility)	87
Annex G (informative) POM Relation usage in IEC 62656-3	88
G.1 General	
G.2 Meta-model mapping rules between UML and POM(M2)	
G.3 UML Association(M1)	
G.4 Model level relation definition(M1)	88
Annex H (informative) Parcellized CIM files access – URL for the parcellized CIM files	89
Bibliography	90
iTeh STANDARD PREVIEW	
Figure 1 – CIM generalization example (from Figure 2 of IEC 61970-301:2013)	17
Figure 2 – Simple association example (from Figure 3 of IEC 61970-301:2013)	21
Figure 3 – Aggregation example (from Figure 4 of LEO 61970-301:2013)	21
Figure 4 - Property data element typic definitionards/sist/ffce252f-f1c1-4942-9463-	23
fld9b56191a4/sist-en-62656-3-2015 Figure 5 – CIM package example (from Figure 1 of IEC 61970-301:2013)	30
Figure 6 – POM relation model explanation in UML	
Figure 7 – Class instances of parcellized CIM	45
Figure 8 – Conceptual reference mechanism with ID in POM	46
Table 1 – Mapping of CIM objects and POM objects	15
Table 2 – Correspondence between a CIM class in UML and a POM class	17
Table 3 – Mapping of CIM class attribute and POM property	
Table 4 – CIM association end structure	
Table 5 –CIM associations defined as POM relations	
Table 6 – Mapping of CIM association end and POM property	
Table 7 – CIM association ends described as POM properties	
Table 8 – Mapping of CIM enumeration and POM enumeration	25
Table 9 – Mapping of CIM enumeration attribute and POM term	
Table 10 – Mapping of CIM basic data type and POM simple data type	26
Table 11 – Mapping of CIM data type and a named data type in POM	
Table 12 – Mapping of CIM package and POM relation	
Table 13 – CIM package described as POM relation	
Table A.1 – Mapping rule from CIM class to POM class	
Table A.2 – Mapping rule from CIM class attribute to POM property	
Table A.3 – Mapping rule from CIM association to POM relation	50

Table A.4 – Mapping rule from CIM association end to POM property	51
Table A.5 – Mapping rule between CIM enumeration and POM enumeration	52
Table A.6 – Mapping rule between CIM enumeration attribute and POM term	52
Table A.7 – Mapping rule between CIM data type and POM data type	53
Table A.8 – Mapping rule between CIM Package and POM relation	54
Table A.9 – Mapping rule from POM property to CIM aggregation/association/class attribute	55
Table B.1 – Meta-properties for class meta-class	57
Table B.2 – Meta-properties for property meta-class	58
Table B.3 –Meta-properties for datatype meta-class	59
Table B.4 – Meta-properties for enumeration meta-class	60
Table B.5 – Meta-properties for term meta-class	61
Table B.6 – Meta-properties for relation meta-class	62
Table C.1 – POM models and XML schemas	63
Table E.1 – Native properties of Power transformer class in the IEC CDD	85
Table E.2 – Native properties of Power transformer class in IEC 61970-301:2013	86

iTeh STANDARD PREVIEW (standards.iteh.ai)

INTERNATIONAL ELECTROTECHNICAL COMMISSION

STANDARDIZED PRODUCT ONTOLOGY REGISTER AND TRANSFER BY SPREADSHEETS –

Part 3: Interface for Common Information Model

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. (Standards.11eh.al)
- 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/ffce252f-f1c1-4942-9463-
- 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 62656-3 has been prepared by subcommittee 3D, Product properties and classes and their identification, of IEC technical committee 3: Information structures, documentation and graphical symbols.

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

FDIS	Report on voting
3D/234/FDIS	3D/245/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 the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62656 series, published under the general title *Standardized* product ontology register and transfer by spreadsheets, 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 website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication 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.

iTeh STANDARD PREVIEW (standards.iteh.ai)

INTRODUCTION

The IEC 62656 series, Standardized product ontology register and transfer by spreadsheets is a series of International standards that collectively define the methods for transferring and registering the ontologies of various products and services to and from the ontology registries and applications based on IEC 61360 / ISO13584 common data dictionary model. The IEC common data dictionary, or IEC CDD for short, is one of such registries maintained online as an IEC 61360-4 International Standard based on IEC database procedure stipulated in ISO/IEC Directives Supplement – Procedures specific to IEC. The IEC CDD is a cross-domain data dictionary covering all electro-technical products and services, maintained and updated through a database administered by IEC Central Office.

The common information model originally defined in IEC 61968 and IEC 61970 series of standards, often called by its short name "CIM" provides a standard way to represent all the major objects in an electric utility enterprise typically needed to model the operational aspects of a utility. This model includes public classes and attributes for these objects, as well as the relationships between them. It is known as an information model for energy management system (EMS) of power grids and currently is recognized as a standard ontology model for smart grids. An ontology specification conformant to the CIM data model is available in UML format according to IEC 61970-301, and in RDF format according to IEC 61970-501.

The IEC 62656 series consists of the following parts, under the general title *Standardized* product ontology transfer and register by spreadsheets:

- Part 1: Logical structure for data/parcels; ARD PREVIEW
- Part 2: Application guide for use with the IEC common data dictionary (CDD);
- Part 3: Interface for common information model.