

SLOVENSKI STANDARD SIST EN 62541-13:2015

01-september-2015

Enotna arhitektura OPC - 13. del: Agregati (IEC 62541-13:2015)

OPC Unified Architecture -- Part 13: Aggregates (IEC 62541-13:2015)

OPC Unified Architecture - Teil 13: Aggregation von Daten (IEC 62541-13:2015)

Architecture unifiée OPG - Partie 13: Agrégats (IEC 62541-13:2015)

Ta slovenski standard je istoveten z: EN 62541-13:2015

SIST EN 62541-13:2015

https://standards.iteh.ai/catalog/standards/sist/5d56b7a3-b3d5-4ab0-9be8-b0f9adfd0120/sist-en-62541-13-2015

ICS:

25.040.40 Merjenje in krmiljenje Industrial process

industrijskih postopkov measurement and control

35.240.50 Uporabniške rešitve IT v IT applications in industry

industriji

SIST EN 62541-13:2015 en,fr,de

SIST EN 62541-13:2015

iTeh STANDARD PREVIEW (standards.iteh.ai)

<u>SIST EN 62541-13:2015</u> https://standards.iteh.ai/catalog/standards/sist/5d56b7a3-b3d5-4ab0-9be8-b0f9adfd0120/sist-en-62541-13-2015 **EUROPEAN STANDARD**

EN 62541-13

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2015

ICS 25.040.40; 35.100

English Version

OPC unified architecture - Part 13: Aggregates (IEC 62541-13:2015)

Architecture unifiée OPC - Partie 13: Agrégats (IEC 62541-13:2015)

OPC Unified Architecture - Teil 13: Aggregation von Daten (IEC 62541-13:2015)

This European Standard was approved by CENELEC on 2015-04-29. 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Roland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom. https://standards.iteh.ai/catalog/standards/sist/5d56b7a3-b3d5-4ab0-9be8-

b0f9adfd0120/sist-en-62541-13-2015



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

Foreword

The text of document 65E/379CDV, future edition 1 of IEC 62541-13, prepared by SC 65E "Devices and integration in enterprise systems", of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62541-13:2015.

The following dates are fixed:

- latest date by which the document has to be implemented at (dop) 2016-01-29 national level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with (dow) 2018-04-29 the document have to be withdrawn

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.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

SIST EN 62541-13:2015

https://standards.iteh.aEndorsementsnotice13-b3d5-4ab0-9be8-

b0f9adfd0120/sist-en-62541-13-2015

The text of the International Standard IEC 62541-13:2015 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 62541-7 NOTE Harmonized as EN 62541-7.

IEC 62541-9 NOTE Harmonized as EN 62541-9.

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: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	EN/HD	<u>Year</u>
IEC/TR 62541-1	-	OPC unified architecture - Part 1: Overview and concepts	CLC/TR 62541-1	-
IEC 62541-3	- iT	OPC unified architecture - PREVIE Part 3: Address Space Model	EN 62541-3	-
IEC 62541-4	-	OPC Unified Architecture iteh.ai) Part 4: Services	EN 62541-4	-
IEC 62541-5	https://sta	OPC unified architecture 13:2015 Part 5: Information Moderist/5d56b7a3-b3d5-4a b0f9adfd0120/sist-en-62541-13-2015	EN 62541-5 b0-9be8-	-
IEC 62541-8	-	OPC Unified Architecture - Part 8: Data Access	EN 62541-8	-
IEC 62541-11	-	OPC unified architecture - Part 11: Historical Access	EN 62541-11	-

SIST EN 62541-13:2015

iTeh STANDARD PREVIEW (standards.iteh.ai)

<u>SIST EN 62541-13:2015</u> https://standards.iteh.ai/catalog/standards/sist/5d56b7a3-b3d5-4ab0-9be8-b0f9adfd0120/sist-en-62541-13-2015



IEC 62541-13

Edition 1.0 2015-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE



OPC unified architecture STANDARD PREVIEW Part 13: Aggregates (standards.iteh.ai)

Architecture unifiée OPC – SIST EN 62541-13:2015

Partie 13: Agrégats standards.iteh.ai/catalog/standards/sist/5d56b7a3-b3d5-4ab0-9be8-b0f9adfd0120/sist-en-62541-13-2015

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 25.040.40; 35.100 ISBN 978-2-8322-2365-9

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

FC	REWO	RD	7
1	Scop	e	9
2	Norm	ative references	9
3	Term	s, definitions, and abbreviations	9
	3.1	Terms and definitions	9
	3.2	Abbreviations	12
4	Aggre	egate Information Model	12
	4.1	General	12
	4.2	Aggregate Objects	
	4.2.1	General	
	4.2.2	AggregateFunction Object	13
	4.3	MonitoredItem AggregateFilter	16
	4.3.1	MonitoredItem AggregateFilter Defaults	16
	4.3.2	MonitoredItem Aggregates and Bounding Values	16
	4.4	Exposing Supported Functions and Capabilities	16
5	Aggre	egate specific usage of Services	17
	5.1	General	17
	5.2	General. Aggregate data handling ANDARD PREVIEW	18
	5.2.1	Overview (standards.iteh.ai) ReadProcessedDetails structure overview	18
	5.2.2	ReadProcessedDetails structure overview	18
	5.2.3	AggregateFilter structure overview 132015	18
	5.3	Aggregates Status Godes i/catalog/standards/sist/5d56b7a3-b3d5-4ab0-9be8	
	5.3.1	Overview b0f9adfd0120/sist-en-62541-13-2015	
	5.3.2	Operation level result codes	19
	5.3.3	Aggregate Information Bits	
	5.4	Aggregate details	
	5.4.1	General	
	5.4.2	Common characteristics	
	5.4.3	Specific Aggregated data handling	
Ar	,	informative) Aggregate specific examples – Historical access	
		Historical Aggregate specific characteristics	
	A.1.1	Example Aggregate data – Historian 1	
	A.1.2	- 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2	
	A.1.3	1 33 3	
	A.1.4	1 00 0	
	A.2	Interpolative	
	A.2.1	Description	
	A.2.2	to be an experience	
		Average	
	A.3.1	Description	
	A.3.2	3	
	A.4	TimeAverage	
	A.4.1 A.4.2	Description	
	A.4.2 A.5	TimeAverage data TimeAverage2	
	A.5.1	Description	
	7.J.I	D636Hp40H	\circ

A.5.2	TimeAverage2 data	64
A.6 Tota	al	65
A.6.1	Description	65
A.6.2	Total data	66
A.7 Tota	al2	67
A.7.1	Description	67
A.7.2	Total2 data	67
A.8 Min	mum	68
A.8.1	Description	68
A.8.2	Minimum data	68
A.9 Max	rimum	69
A.9.1	Description	69
A.9.2	Maximum data	69
A.10 Min	inumActualTime	69
A.10.1	Description	69
A.10.2	MinimumActualTime data	69
A.11 Max	rimumActualTime	70
A.11.1	Description	70
A.11.2	MaximumActualTime data	70
A.12 Rar	ge	71
A.12.1	Description STANDARD PREVIEW	71
A.12.2		
A.13 Min	Range data (standards.iteh.ai)	71
A.13.1	Description	
A.13.2	Minimum2 data https://stanuards.iteh.a/catalog/standards/sist/SdS6b7a3-b3d5-4ab0-9be8-	71
A.14 Max	imum2	72
A.14.1	Description	
A.14.2	Maximum2 data	72
A.15 Min	imumActualTime2	73
A.15.1	Description	73
A.15.2	MinimumActualTime2 data	73
A.16 Max	rimumActualTime2	73
A.16.1	Description	73
A.16.2	MaximumActualTime2 data	73
A.17 Rar	ge2	74
A.17.1	Description	74
A.17.2	Range2 data	74
A.18 Ann	otationCount	75
A.18.1	Description	75
A.18.2	AnnotationCount data	75
A.19 Cou	nt	75
A.19.1	Description	75
A.19.2	Count data	75
A.20 Dur	ationInStateZero	76
A.20.1	Description	76
A.20.2	DurationInStateZero data	76
A.21 Dur	ationInStateNonZero	76
A.21.1	Description	76

- 4 - IEC 62541-13:2015 © IEC 2015

A.22	NumberOfTransitions	76
A.22	.1 Description	76
A.22	.2 NumberOfTransitions data	77
A.23	Start	77
A.23	.1 Description	77
A.23	.2 Start data	78
A.24	End	78
A.24	.1 Description	78
A.24	.2 End data	78
A.25	StartBound	79
A.25	.1 Description	79
A.25	.2 StartBound data	79
A.26	EndBound	79
A.26	.1 Description	79
A.26	.2 EndBound data	80
A.27	Delta	80
A.27	.1 Description	80
A.27	·	
	DeltaBounds	
A.28		
A.28		81
A.29		
A.29	DurationGood	81
A.29		
A.30	DurationBad SIST EN 62541-13:2015 https://standards.iteh.al/catalog/standards/sist/5d56b7a3-b3d5-4ab0-9be8-	82
A.30	1 Descriptionb0f9adfil01:20/sist-en-62541-13-2015	82
A.30		
	PercentGood	
A.31		
A.31	•	
	PercentBad	
A.32		
A.32	·	
	WorstQuality	
A.33	•	
A.33	·	
	WorstQuality2	
A.34	•	
A.34	·	
	StandardDeviationSample	
A.35	·	
A.35	•	
	VarianceSample	
A.36	•	
A.36	·	
	StandardDeviationPopulation	
A.37	·	
A.37	•	
	VariancePopulation	
7.50	variancer opulation	00

A.38.1 Description	
A.38.2 VariancePopulation data	
Bibliography	90
Figure 1 - Penropentation of Aggregate Configuration information in the Address Space	4.5
Figure 1 – Representation of Aggregate Configuration information in the AddressSpace	
Figure 2 – Variable with Stepped = False and Simple Bounding Values	
Figure 3 – Variable with Stepped = True and Interpolated Bounding Values	20
Table 1 – Interpolation examples	10
Table 2 – AggregateConfigurationType Definition	
Table 3 – Aggregate Functions Definition	
Table 4 – AggregateFunctionType Definition	14
Table 5 – Standard AggregateType Nodes	
Table 6 – ReadProcessedDetails	18
Table 7 – AggregateFilter structure	18
Table 8 – Bad operation level result codes	19
Table 9 – Uncertain operation level result codes	19
Table 10 – Data location	19
Table 11 – Additional information TANDARD PREVIEW	
Table 12 – History Aggregate interval informationteh.ai	22
Table 13 – Standard History Aggregate Data Type information	23
Table 14 – Aggregate table descriptionSTEN 62541-132015	28
Table 15 – Interpolative Aggregate summary bull add 0120/sist-en-62541-13-2015	29
Table 16 – Average Aggregate summary	30
Table 17 – TimeAverage Aggregate summary	31
Table 18 – TimeAverage2 Aggregate summary	32
Table 19 – Total Aggregate summary	
Table 20 – Total2 Aggregate summary	33
Table 21 – Minimum Aggregate summary	34
Table 22 – Maximum Aggregate summary	35
Table 23 – MinimumActualTime Aggregate summary	36
Table 24 – MaximumActualTime Aggregate summary	37
Table 25 – Range Aggregate summary	37
Table 26 – Minimum2 Aggregate summary	38
Table 27 – Maximum2 Aggregate summary	
Table 28 – MinimumActualTime2 Aggregate summary	40
Table 29 – MaximumActualTime2 Aggregate summary	
Table 30 – Range2 Aggregate summary	
Table 31 – AnnotationCount Aggregate summary	
Table 32 – Count Aggregate summary	
Table 33 – DurationInStateZero Aggregate summary	
Table 34 – DurationInStateNonZero Aggregate Summary	
Table 35 – NumberOfTransitions Aggregate summary	44

6 –	IEC 62541-13:2015	© IFC 2015
0 –	120 02071-10.2010	© 1LC 2013

Table 36 – Start Aggregate summary	45
Table 37 – End Aggregate summary	45
Table 38 – Delta Aggregate summary	46
Table 39 – StartBound Aggregate summary	46
Table 40 – EndBound Aggregate summary	47
Table 41 – DeltaBounds Aggregate summary	48
Table 42 – DurationGood Aggregate summary	48
Table 43 – DurationBad Aggregate summary	49
Table 44 – PercentGood Aggregate summary	50
Table 45 – PercentBad Aggregate summary	51
Table 46 – WorstQuality Aggregate summary	51
Table 47 – WorstQuality2 Aggregate summary	52
Table 48 – StandardDeviationSample Aggregate summary	53
Table 49 – VarianceSample Aggregate summary	53
Table 50 – StandardDeviationPopulation Aggregate summary	54
Table 51 – VariancePopulation Aggregate summary	55

iTeh STANDARD PREVIEW (standards.iteh.ai)

<u>SIST EN 62541-13:2015</u> https://standards.iteh.ai/catalog/standards/sist/5d56b7a3-b3d5-4ab0-9be8-b0f9adfd0120/sist-en-62541-13-2015

INTERNATIONAL ELECTROTECHNICAL COMMISSION

OPC UNIFIED ARCHITECTURE -

Part 13: Aggregates

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/5d56b7a3-b3d5-4ab0-9be85) 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 62541-13 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation.

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

CDV	Report on voting
65E/379/CDV	65E/411/RVC

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.

IEC 62541-13:2015 © IEC 2015

A list of all parts of the IEC 62541 series, published under the general title *OPC Unified Architecture*, can be found on the IEC website.

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

- 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)

<u>SIST EN 62541-13:2015</u> https://standards.iteh.ai/catalog/standards/sist/5d56b7a3-b3d5-4ab0-9be8-b0f9adfd0120/sist-en-62541-13-2015

– 8 –

IEC 62541-13:2015 © IEC 2015

-9-

OPC UNIFIED ARCHITECTURE -

Part 13: Aggregates

1 Scope

This part of IEC 62541 is part of the overall OPC Unified Architecture specification series and defines the information model associated with *Aggregates*.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC TR 62541-1, OPC Unified Architecture - Part 1: Overview and Concepts

IEC 62541-3, OPC Unified Architecture – Part 3: Address Space Model ITeh STANDARD PREVIEW

IEC 62541-4, OPC Unified Architecture – Part 4: Services (Standards.iten.ai)

IEC 62541-5, OPC Unified Architecture – Part 5: Information Model SIST EN 62541-13:2015

IEC 62541-8, OPC Unified Architecture — Part 8: Data Access b019adid0120/sist-en-62541-13-2015

IEC 62541-11, OPC Unified Architecture - Part 11: Historical Access

3 Terms, definitions, and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC TR 62541-1, IEC 62541-3, IEC 62541-4, and IEC 62541-11 as well as the following apply.

3.1.1

ProcessingInterval

timespan for which derived values are produced based on a specified Aggregate

Note 1 to entry: The total time domain specified for ReadProcessed is divided by the *ProcessingInterval*. For example, performing a 10-minute Average over the time range 12:00 to 12:30 would result in a set of three intervals of *ProcessingInterval* length, with each interval having a start time of 12:00, 12:10 and 12:20 respectively. The rules used to determine the interval *Bounds* are discussed in 5.4.2.2.

3.1.2

interpolated

data that is calculated from data samples

Note 1 to entry: Data samples may be historical data or buffered real time data. An *interpolated* value is calculated from the data points on either side of the requested timestamp.

3.1.3

EffectiveEndTime

time immediately before endTime