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INTERNATIONAL STANDARD

REDLINE VERSION

**OPC unified architecture -
Part 13: Aggregates**

CONTENTS

FOREWORD.....	3
1 Scope.....	6
2 Normative references	6
3 Terms, definitions and abbreviated terms	6
3.1 Terms and definitions	6
3.2 Abbreviated terms	9
4 Aggregate information model	10
4.1 General.....	10
4.2 Aggregate Objects	10
4.2.1 General	10
4.2.2 AggregateFunction Object.....	11
4.3 MonitoredItem AggregateFilter	13
4.3.1 MonitoredItem AggregateFilter Defaults	13
4.3.2 MonitoredItem Aggregates and Bounding Values	13
4.4 Exposing Supported Functions and Capabilities	14
5 Aggregate specific usage of Services	15
5.1 General.....	15
5.2 Aggregate data handling	15
5.2.1 Overview	15
5.2.2 ReadProcessedDetails structure overview	15
5.2.3 AggregateFilter structure overview	15
5.3 Aggregates StatusCodes	16
5.3.1 Overview	16
5.3.2 Operation level result codes	16
5.3.3 Aggregate Information Bits	17
5.4 Aggregate details	18
5.4.1 General	18
5.4.2 Common characteristics	18
5.4.3 Specific aggregated data handling	21
Annex A (informative) Aggregate Specific examples — Historical Access	64
Figure 1 – Representation of Aggregate Configuration information in the AddressSpace.....	14
Figure 2 – Variable with Stepped = False and Simple Bounding Values.....	23
Figure 3 – Variable with Stepped = True and Interpolated Bounding Values	24
Table 1 – Interpolation examples.....	7
Table 2 – AggregateConfigurationType Definition	10
Table 3 – Aggregate Functions Definition	11
Table 4 – AggregateFunctionType Definition	12
Table 5 – Standard AggregateType Nodes	12
Table 6 – ReadProcessedDetails	15
Table 7 – AggregateFilter structure	16
Table 8 – Bad operation level result codes	16
Table 9 – Uncertain operation level result codes.....	17

Table 10 – Data location	17
Table 11 – Additional information	17
Table 12 – History Aggregate interval information	19
Table 13 – Standard History Aggregate Data Type information	20
Table 14 – Aggregate table description	25
Table 15 – Interpolative Aggregate summary	27
Table 16 – Average Aggregate summary	28
Table 17 – TimeAverage Aggregate summary	29
Table 18 – TimeAverage2 Aggregate summary	30
Table 19 – Total Aggregate summary	31
Table 20 – Total2 Aggregate summary	32
Table 21 – Minimum Aggregate summary	33
Table 22 – Maximum Aggregate summary	34
Table 23 – MinimumActualTime Aggregate summary	35
Table 24 – MaximumActualTime Aggregate summary	36
Table 25 – Range Aggregate summary	37
Table 26 – Minimum2 Aggregate summary	38
Table 27 – Maximum2 Aggregate summary	39
Table 28 – MinimumActualTime2 Aggregate summary	40
Table 29 – MaximumActualTime2 Aggregate summary	41
Table 30 – Range2 Aggregate summary	42
Table 31 – AnnotationCount Aggregate summary	43
Table 32 – Count Aggregate summary	44
Table 33 – DurationInStateZero Aggregate summary	45
Table 34 – DurationInStateNonZero Aggregate summary	46
Table 35 – NumberOfTransitions Aggregate summary	47
Table 36 – Start Aggregate summary	48
Table 37 – End Aggregate summary	49
Table 38 – Delta Aggregate summary	50
Table 39 – StartBound Aggregate summary	51
Table 40 – EndBound Aggregate summary	52
Table 41 – DeltaBounds Aggregate summary	53
Table 42 – DurationGood Aggregate summary	54
Table 43 – DurationBad Aggregate summary	55
Table 44 – PercentGood Aggregate summary	56
Table 45 – PercentBad Aggregate summary	57
Table 46 – WorstQuality Aggregate summary	58
Table 47 – WorstQuality2 Aggregate summary	59
Table 48 – StandardDeviationSample Aggregate summary	60
Table 49 – VarianceSample Aggregate summary	61
Table 50 – StandardDeviationPopulation Aggregate summary	62
Table 51 – VariancePopulation Aggregate summary	63

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OPC unified architecture - Part 13: Aggregates

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 62541-13:2020. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

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. It is an International Standard.

This third edition cancels and replaces the second edition published in 2020. This edition constitutes a technical revision.

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

a) Multiple fixes for the computation of aggregates

- The Raw status bit is always set for non-bad StatusCodes for the Start and End aggregates.
- Entries in the Interpolative examples Tables A2.2 Historian1, Historian2, and Historian3 have been changed from Good to Good, Raw status codes when the timestamp matches with the timestamp of the data source.
- Missing tables have been added for DurationInStateZero and DurationInStateNonZero.
- The value of zero has been removed for results with a StatusCode of bad.
- Data Type was listed as "Status Code" when it is "Double" for both Standard Deviation and both Variance Aggregates.
- Rounding Error in TimeAverage and TimeAverage2 have been corrected.
- The status codes have been corrected for the last two intervals and the value has been corrected in the last interval.
- The wording has been changed to be more consistent with the certification testing tool.
- UsedSlopedExtrapolation set to true for Historian2 and all examples locations needed new values or status' are modified.
- Values affected by percent good and percent bad have been updated.
- PercentGood/PercentBad are now accounted for in the calculation.
- TimeAverage uses SlopedInterpolation but the Time aggregate is incorrectly allowed to use Stepped Interpolation.
- Partial bit is now correctly calculated.
- Unclear sentence was removed.
- Examples have been moved to a CSV.
- The value and status code for Historian 3 have been updated.
- TimeAverage2 Historian1 now takes uncertain regions into account when calculating StatusCodes.
- TimeAverage2 Historian2 now takes uncertain regions into account when calculating StatusCodes.
- Total2 Historian1 now takes uncertain regions into account when calculating StatusCodes
- Total2 Historian2 now takes uncertain regions into account when calculating StatusCodes
- Maximum2 Historian1 now takes uncertain regions into account when calculating StatusCodes
- MaximumActualTime2 Historian1 now takes uncertain regions into account when calculating StatusCodes
- Minimum2 Historian1 now takes uncertain regions into account when calculating StatusCodes
- MinimumActualTime2 Historian1 now has the StatusCodes calculated while using the TreatUncertainAsBad flag.

- Range2 Historian1 now looks at TreatUncertainAsBad in the calculation of the StatusCodes.
- Clarifications have been made to the text defining how PercentGood/PercentBad are used. The table values and StatusCodes of the TimeAverage2 and Total2 aggregates have been corrected.

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

Draft	Report on voting
65E/1059/CDV	65E/1098/RVC

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/publications.

Throughout this document and the other parts of the IEC 62541 series, certain document conventions are used:

Italics are used to denote a defined term or definition that appears in the "Terms and definitions" clause in one of the parts of the IEC 62541 series.

Italics are also used to denote the name of a service input or output parameter or the name of a structure or element of a structure that are usually defined in tables.

The *italicized terms and names* are, with a few exceptions, written in camel-case (the practice of writing compound words or phrases in which the elements are joined without spaces, with each element's initial letter capitalized within the compound). For example, the defined term is *AddressSpace* instead of Address Space. This makes it easier to understand that there is a single definition for *AddressSpace*, not separate definitions for Address and Space.

A list of all parts in 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 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, or
- revised.

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.

Programmatically produced aggregate examples are listed in Annex A.

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 and errata) applies.

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

IEC 62541-3, *OPC Unified Architecture - Part 3: Address Space Model*

IEC 62541-4, *OPC Unified Architecture - Part 4: Services*

IEC 62541-5, *OPC Unified Architecture - Part 5: Information Model*

IEC 62541-8, *OPC Unified Architecture - Part 8: Data Access*

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