IEC 62541-9

Edition 4.0 2026-04

INTERNATIONAL STANDARD

OPC unified architecture -
Part 9: Alarms and Conditions

ICS 25.040.40; 35.100.05

ISBN 978-2-8327-1193-4

IEC 62541-9:2026-04(en)

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

OPC unified architecture - Part 9: Alarms and Conditions

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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62541-9 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 fourth edition cancels and replaces the third edition published in 2020. This edition constitutes a technical revision.

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

a) addition of "Comment" parameter to Alarm shelving methods;
b) addition of method that allows a client to get the members of a group, since it is possible that the AddressSpace does not expose instances of alarms;
c) addition of deadband properties for all limits in the limit AlarmType (from which all other types described in this issue are derived);

d) addition of text explaining the disabling of alarms is no longer supported in ISA 18.2 and that it is maintained in this document for backward compatibility, but that it is recommended that Alarm not be disabled;

e) addition of optional severities for limit alarms;

f) addition of new AlarmState variable type that can be used to collect alarm information for displays on graphics;

g) addition of SupportsFilterRetain property to improve Client filtering;

h) removal of ConditionSubClassId and ConditionSubClassNames from the conditiontype definition since they are now defined in BaseEventType.

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

Draft	Report on voting
65E/1056/CDV	65E/1109/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 specifies the representation of *Alarms* and *Conditions* in the OPC Unified Architecture. Included is the *Information Model* representation of *Alarms* and *Conditions* in the OPC UA address space. Other aspects of alarm systems like alarm philosophy, life cycle, alarm response times, alarm types and many other details are captured in standards such as IEC 62682 and ISA 18.2. The *Alarms* and *Conditions Information Model* in this document, is designed in accordance with IEC 62682 and ISA 18.2. Annex C specifies a recommended mapping between OPC Classic Alarm & Events (A&E) servers to the model described in this document.

Annex A describes recommended localized names for *Alarm* states.

Annex B describes examples (e.g. *Event* sequences, *Alarm* areas in *AddressSpace*).

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 62541-1, *OPC Unified Architecture - Part 1: 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 62541-6, *OPC Unified Architecture - Part 6: Mappings*

IEC 62541-7, *OPC Unified Architecture - Part 7: Profiles*

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

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

IEC 62541-16, *OPC Unified Architecture - Part 16: State Machines*

IEC 62682, *Management of alarm systems for the process industries*

ISA 18.2, *Management of Alarm Systems for the Process Industries*

Bibliography

EEMUA Publication 191, *Alarm System – A guide to design, management and procurement, second edition*

IETF RFC 2045, N. Freed, N. Borenstein, *Multipurpose Internet Mail Extensions (MIME) - Part One: Format of Internet Message Bodies,* November 19696, *available at* https://www.ietf.org/rfc/rfc2045.txt

IETF RFC 2046, N. Freed, N. Borenstein, *Multipurpose Internet Mail Extensions (MIME) - Part Two:* Media Types, November 1996, available at https://www.ietf.org/rfc/rfc2046.txt

IETF RFC 2047, K. Moore, *Multipurpose Internet Mail Extensions (MIME) Part Three: Message Header Extensions for Non-ASCII Text, November 1996,* available at https://www.ietf.org/rfc/rfc2047.txt

_____