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OPC unified architecture - Part 16: State Machines

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IEC 62541-16 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.

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

Draft	Report on voting
65E/1041/CDV	65E/1132/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 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 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 also often 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– withdrawn, or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 defines an Information Model. The Information Model describes the basic infrastructure to model state machines.

NOTE State Machines were dealt with in IEC 62541-5:2020, Annex B. In newer versions of IEC 62541-5 this Annex B was removed and replaced by this document

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: 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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62541-1, IEC 62541-3, and IEC 62541-5 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

– IEC Electropedia: available at https://www.electropedia.org/
– ISO Online browsing platform: available at https://www.iso.org/obp

4 State Machine model

4.1 General

This document describes the basic infrastructure to model state machines. It defines *ObjectTypes*, *VariableTypes* and *ReferenceTypes* and explains how they should be used.

The types in this document can be directly utilized. However, it is not required but strongly recommended that a *Server* uses these types to expose its state machines. The defined types can be subtyped to refine their behaviour.

When a *Server* exposes its state machine using the types defined in this document, it can provide a simplified view on its internal state machine, hiding for example substates or putting several internal states into one exposed state.

The scope of the state machines described in this document is to provide an appropriate foundation for state machines required for IEC 62541-9 and IEC 62541-10. It does not provide more complex functionality of a state machine like parallel states, forks and joins, history states, choices, and junctions, etc. However, the base state machine defined in this document can be extended to support such concepts.