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OPC Unified Architecture - Part 15: Safety

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 06/25

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EN IEC 62541-15

NORME EUROPÉENNE

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**OPC Unified Architecture - Part 15: Safety
(IEC 62541-15:2025)**Architecture unifiée OPC - Partie 15: Sécurité
(IEC 62541-15:2025)OPC Unified Architecture - Teil 15: Sicherheit
(IEC 62541-15:2025)

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EN IEC 62541-15:2025 (E)**European foreword**

The text of document 65C/1334/FDIS, future edition 1 of IEC 62541-15, prepared by SC 65C "Industrial networks" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62541-15:2025.

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IEC 61000-6-7	NOTE	Approved as EN 61000-6-7
IEC 61511 series	NOTE	Approved as EN 61511 series
IEC 62061	NOTE	Approved as EN IEC 62061
ISO 13849 series	NOTE	Approved as EN ISO 13849 series
ISO 13849-1	NOTE	Approved as EN ISO 13849-1
ISO 13849-2	NOTE	Approved as EN ISO 13849-2
IEC 62541-7	NOTE	Approved as EN IEC 62541-7
IEC 62541-8	NOTE	Approved as EN IEC 62541-8

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

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<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61508	series	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 1: General requirements (see Functional Safety and IEC 61508)	EN 61508	series
IEC 61784-3	2021	Industrial communication networks - Profiles - Part 3: Functional safety fieldbuses - General rules and profile definitions	EN IEC 61784-3	2021
IEC 62443	series	Security for industrial automation and control systems	EN IEC 62443	series
IEC/TR 62541-1	2020	OPC Unified Architecture - Part 1: Overview and concepts	CLC IEC/TR 62541-1	2021
IEC 62541-3	2020	OPC Unified Architecture - Part 3: Address Space Model	EN IEC 62541-3	2020
IEC 62541-4	2020	OPC Unified Architecture - Part 4: Services	EN IEC 62541-4	2020
IEC 62541-5	2020	OPC Unified Architecture - Part 5: Information Model	EN IEC 62541-5	2020
IEC 62541-6	2020	OPC Unified Architecture - Part 6: Mappings	EN IEC 62541-6	2020
IEC 62541-14	-	OPC unified architecture - Part 14: PubSub	EN IEC 62541-14	-
ISO/IEC 9834-8	2014	Information technology - Procedures for the operation of object identifier registration authorities - Part 8: Generation of universally unique identifiers (UUIDs) and their use in object identifiers	-	-



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Edition 1.0 2025-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**OPC Unified Architecture –
Part 15: Safety**

**Architecture unifiée OPC –
Partie 15: Sécurité**





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INTERNATIONAL STANDARD

NORME INTERNATIONALE

**OPC Unified Architecture –
Part 15: Safety**

**Architecture unifiée OPC –
Partie 15: Sécurité**

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OPC UNIFIED ARCHITECTURE –

Part 15: Safety

FOREWORD

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IEC 62541-15 has been prepared by subcommittee 65C: Industrial networks, 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
65C/1334/FDIS	65C/1339/RVD

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 referenced 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 Clause 3 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, 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 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 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.

INTRODUCTION

OPC UA safety extends OPC UA to fulfill the requirements of functional safety as defined in the IEC 61508 series and IEC 61784-3 series of standards.

Figure 1 shows the relationship between this document and the relevant safety and OPC UA standards in an industrial environment. An arrow from Document A to Document B means "Document A is referenced in Document B". This reference can be either normative or informative. Not all of these standards are applicable or required for a given product.

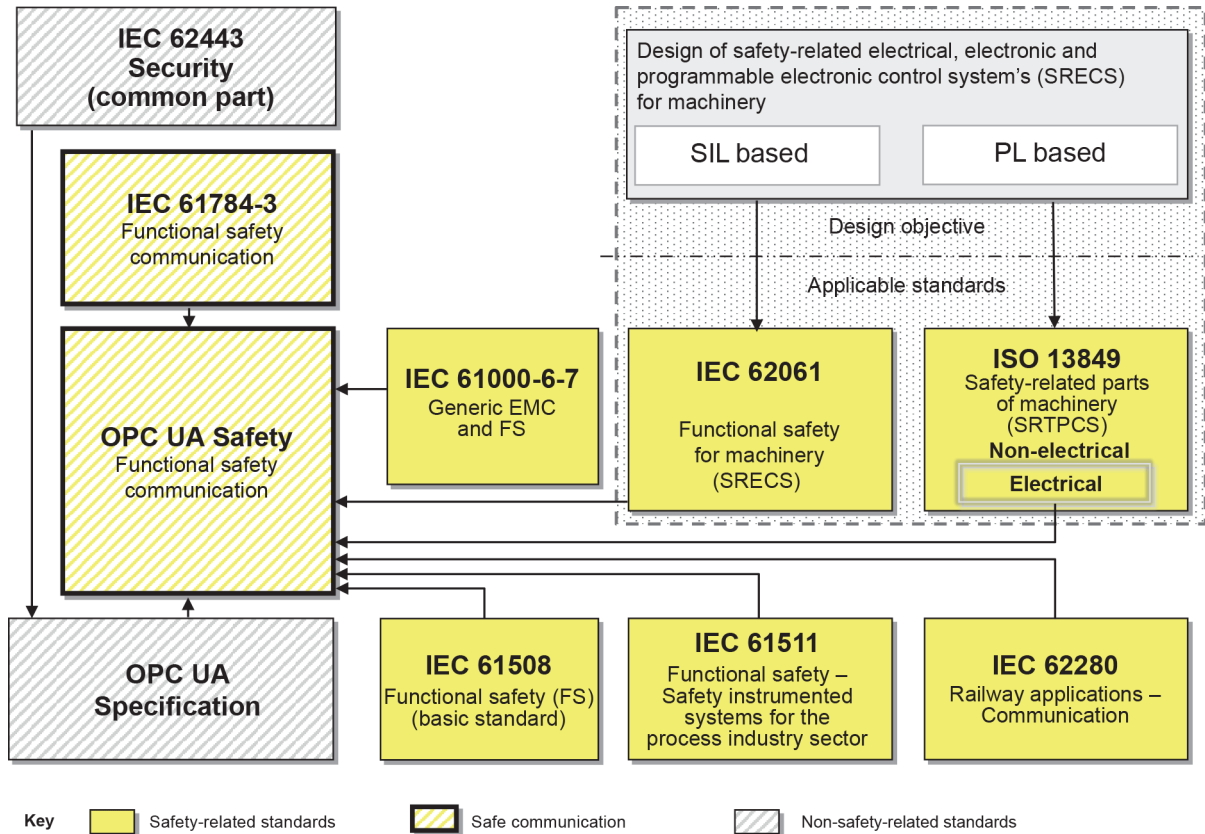


Figure 1 – Relationships of OPC UA safety with other standards

Implementing this document allows for detecting all types of communication errors encountered in the lower network layers. In case an error is detected, this information is shared with the safety applications in the user layer which can then act in an appropriate way, e.g. by switching to a safe state.

The document describes the behaviour of the individual endpoints for safe communication, as well as the OPC UA *Information Model* which is used to access these endpoints.

This document is application-independent and does not pose requirements on the structure and length of the application data. Application-specific requirements are expected to be described in appropriate companion specifications.

This document can be used for applications requiring functional safety up to the *safety integrity level (SIL) 4*.

OPC UNIFIED ARCHITECTURE –

Part 15: Safety

1 Scope

This document describes a *safety communication layer* (services and a protocol) for the exchange of *SafetyData* using IEC 62541 mechanisms. It identifies the principles for functional safety communications defined in IEC 61784-3 that are relevant for this *safety communication layer*. This *safety communication layer* is intended for implementation in *safety* devices only.

NOTE 1 This document targets controller-to-controller communication. However, easy expandability to other use-cases (e.g. OPC UA field level communication) has already been considered in the design of this document.

NOTE 2 This document does not cover electrical safety and intrinsic safety aspects. Electrical safety relates to hazards such as electrical shock. Intrinsic safety relates to hazards associated with potentially explosive atmospheres.

This document defines mechanisms for the transmission of safety-relevant messages among participants within a network using OPC UA technology in accordance with the requirements of the IEC 61508 series and IEC 61784-3 for functional safety. These mechanisms can be used in various industrial applications such as process control, manufacturing, automation, and machinery.

This document provides guidelines for both developers and assessors of compliant devices and systems.

NOTE 3 The resulting *SIL* claim of a system depends on the implementation of this document within the system – implementation of this document in a standard device is not sufficient to qualify it as a safety device.

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 61508 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems*

IEC 61784-3:2021, *Industrial communication networks – Profiles – Part 3: Functional safety fieldbuses – General rules and profile definitions*

IEC 62443 (all parts), *Industrial communication networks – Network and system security*

IEC 62541-1:2020, *OPC Unified Architecture – Part 1: Overview and Concepts*

IEC 62541-3:2020, *OPC Unified Architecture – Part 3: Address Space Model*

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IEC 62541-5:2020, *OPC Unified Architecture – Part 5: Information Model*

IEC 62541-6:2020, *OPC Unified Architecture – Part 6: Mappings*

IEC 62541-14, *OPC Unified Architecture – Part 14: PubSub*

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