SLOVENSKI STANDARD
SIST EN IEC 62541-21:2026

01-maj-2026

Enotna arhitektura OPC - 21. del: Vzpostavitev naprav (IEC 62541-21:2026)

OPC Unified architecture - Part 21: Device onboarding (IEC 62541-21:2026)

OPC Unified Architecture – Teil 21: Onboarding von Geräten (IEC 62541-21:2026)

Architecture unifiée OPC - Partie 21: Mise en service d'appareils (IEC 62541-21:2026)

Ta slovenski standard je istoveten z: **EN IEC 62541-21:2026**

ICS:

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
35.240.50	Uporabniške rešitve IT v industriji	IT applications in industry

SIST EN IEC 62541-21:2026 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62541-21

February 2026

ICS 25.040

English Version

OPC Unified architecture - Part 21: Device Onboarding (IEC 62541-21:2026)

Architecture unifiée OPC - Partie 21: Mise en service d'appareils
(IEC 62541-21:2026)

OPC Unified Architecture - Teil 21: Onboarding von Geräten
(IEC 62541-21:2026)

This European Standard was approved by CENELEC on 2026-02-09. 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 62541-21:2026 E

European foreword

The text of document 65E/1046/CDV, future edition 1 of IEC 62541-21, 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 IEC 62541-21:2026.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2027-02-28
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2029-02-28

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62541-21:2026 was approved by CENELEC as a European Standard without any modification.

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.

NOTE 1 Where 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.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 62541-1	-	OPC Unified Architecture - Part 1: Overview and concepts	EN IEC 62541-1	-
IEC 62541-2	-	OPC unified architecture - Part 2: Security model	EN IEC 62541-2[1]	-
IEC 62541-3	-	OPC Unified Architecture - Part 3: Address Space Model	EN IEC 62541-3	-
IEC 62541-4	-	OPC unified architecture - Part 4: Services	EN IEC 62541-4	-
IEC 62541-5	-	OPC Unified architecture - Part 5: Information Model	EN IEC 62541-5	-
IEC 62541-6	-	OPC unified architecture - Part 6: Mappings	EN IEC 62541-6	-
IEC 62541-9	-	OPC Unified Architecture - Part 9: Alarms and Conditions	EN IEC 62541-9	-
IEC 62541-12	-	OPC unified architecture - Part 12: Discovery and global services	EN IEC 62541-12	-
IEC 62541-22	-	OPC unified architecture - Part 22: Base Network Model	EN IEC 62541-22	-
IEC 62541-100	-	OPC unified architecture - Part 100: Devices	EN IEC 62541-100	-
IEEE Std 802.1AR-2018	-	IEEE Standard for Local and Metropolitan Area Networks - Secure Device Identity	-	-
IETF RFC 2045	-	Multipurpose Internet Mail Extensions (MIME) Part 1: Format of Internet Message Bodies	-	-
IETF RFC 4648	-	The Base16, Base32, and Base64 Data Encodings	-	-

[1] Under preparation. Stage at the time of publication: FprEN IEC 62541-2:2025.

IETF RFC 5280	-	Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile	-	-
IETF RFC 7515	-	JSON Web Signature (JWS)	-	-
IETF RFC 7518	-	JSON Web Algorithms (JWA)	-	-

IEC 62541-21

Edition 1.0 2026-01

INTERNATIONAL STANDARD

OPC Unified architecture –
Part 21: Device Onboarding

ICS 25.040

ISBN 978-2-8327-0847-7

IEC 62541-21:2026-01(en)

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

OPC unified architecture - Part 21: Device Onboarding

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 62541-21 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/1046/CDV	65E/1103/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 the life cycle of *Devices* and *Composites* and mechanisms to verify their authenticity, set up their security and maintain their configuration.

The *NodeIds* of all *Nodes* described in this standard are only symbolic names. Annex A defines the *NamespaceUri* for all *NodeIds* and the actual *NodeIds*.

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 62541-2, *OPC Unified Architecture - Part 2: Security*

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 62541-9, *OPC Unified Architecture - Part 9: Alarms and Conditions*

IEC 62541-12, *OPC Unified Architecture - Part 12: Discovery and Global Services*

IEC 62541-22, *OPC Unified Architecture - Part 22: Base Network Model*

IEC 62541-100, *OPC Unified Architecture - Part 100: Device Model*

IEEE Std 802.1AR-2018, *IEEE Standard for Local and Metropolitan Area Networks - Secure Device Identity*

IETF RFC 2045, N. Freed, N. Borenstein, *Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies, November 1996,* available at https://tools.ietf.org/html/rfc2045

IETF RFC 4648, S. Josefsson, *The Base16, Base32, and Base64 Data Encodings, Octobre 2006, a*vailable at https://tools.ietf.org/html/rfc4648

IETF RFC 5280, D. Cooper, S. Santesson, S. Farrell, S. Boeyen, T. Polk, Russ Housley, *Internet X.509 Public Key Infrastructure Certificate, May 2008, a*vailable at https://tools.ietf.org/html/rfc5280

IETF RFC 7515, M. Jones, J. Bradley, N. Sakimura, *JSON Web Signature (JWS), May 2015, a*vailable at https://tools.ietf.org/html/rfc7515

IETF RFC 7518, M. Jones, *JSON Web Algorithms (JWA), May 2015,* available at https://tools.ietf.org/html/rfc7518

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62541-1, IEC 62541-2, IEC 62541-3, IEC 62541-4, IEC 62541-6, IEC 62541-9 and IEC 62541-100 and the following 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

3.1.1
Application
a program that runs on a *Device* and communicates with other *Applications* on the network.

Note 1 to entry: Each *Application* has an identifier that is unique within the network.

Note 2 to entry: An *OPC UA Application* is an *Application* that supports OPC UA.

3.1.2
ApplicationUri
a globally unique identifier for an *OPC UA Application* running on a particular *Device*.

Note 1 to entry: The *Application Instance Certificate* has the *ApplicationUri* in the *subjectAltName* field.

3.1.3
Composite
collection of *Devices* or *Composites* assembled into a single unit

Note 1 to entry: Each *Composite* has a globally unique identifier.

Note 2 to entry: A *Composite* can act as a single *Device* when connected to a network.

Note 3 to entry: A *Composite* can appear as multiple *Devices* when connected to a network.

3.1.4
CompositeBuilder
organization that creates *Composites*

3.1.5
CompositeInstanceUri
globally unique resource identifier assigned by a builder to a *Composite*

3.1.6
DCA Client
DCA which is a *Client* and supports *PullManagement*

3.1.7
DCA Server
DCA which is a *Server* and supports *PushManagement*

3.1.8
Device
independent physical entity capable of performing one or more specified functions in a particular context and delimited by its interfaces as defined in IEC 62541-100

Note 1 to entry: For this document a *Device* also executes one or more *OPC UA Applications.*

Note 2 to entry: a generic computer or mobile device can be a *Device* if it has a *DeviceIdentity Certificate*

3.1.9
Device Configuration Application (DCA)
Client or *Server* installed on a *Device* used to configure other applications installed on the same *Device*

Note 1 to entry: a DCA which is a *Client* uses *PullManagement* (see 7.2) to interact with the *Registrar.*

Note 2 to entry: the *Registrar* uses *PushManagement* (see 7.3) to interact with a DCA which is a *Server.*

3.1.10
DeviceIdentity Certificate
Certificate issued to a *Device* that identifies the *Device*

Note 1 to entry: All *DeviceIdentity Certificates* have the *ProductInstanceUri* as a *subjectAltName*.

Note 2 to entry: All *DeviceIdentity Certificates* are IDevID or LDevID Certificates as defined by IEEE Std 802.1AR-2018.

Note 3 to entry: The *ProductInstanceUri* is the *ApplicationUri* when the *DeviceIdentity Certificate* is used to create a *SecureChannel*.

3.1.11
Distributor
organization that re-sells *Devices* and/or Composites

Note 1 to entry: A *Distributor* can enhance *Devices* and *Composites* by adding customized products or services.

3.1.12
Manufacturer
organization that creates *Devices*

3.1.13
OwnerOperator
organization deploying and operating a system that comprises of *Devices*, *Composites* or other computers connected via a network

3.1.14
Privilege
named set of permissions or access rights which are needed to perform a task

3.1.15
ProductInstanceUri
globally unique resource identifier assigned by the manufacturer to a *Device*

3.1.16
Registrar
OPC UA Application that registers and authenticates *Devices* added to the network

3.1.17
SystemIntegrator
organization that installs and configures a system for an *OwnerOperator* that comprises of *Devices*, *Composites* or other computers connected via a network