SLOVENSKI STANDARD
SIST EN 61850-5:2013/A1:2022

01-julij-2022

Komunikacijska omrežja in sistemi za avtomatizacijo porabe električne energije - 5. del: Komunikacijske zahteve za funkcije in modeli naprav - Dopolnilo A1

Communication networks and systems for power utility automation - Part 5: Communication requirements for functions and device models

Kommunikationsnetze und -systeme für die Automatisierung in der elektrischen Energieversorgung - Teil 5: Kommunikationsanforderungen für Funktionen und Gerätemodelle

Réseaux et systèmes de communication pour l'automatisation des systèmes électriques - Partie 5: Exigences de communication pour les modèles de fonctions et d'appareils

Ta slovenski standard je istoveten z: **EN 61850-5:2013/A1:2022**

ICS:

29.240.30	Krmilna oprema za elektroenergetske sisteme	Control equipment for electric power systems
33.200	Daljinsko krmiljenje, daljinske meritve (telemetrija)	Telecontrol. Telemetering

SIST EN 61850-5:2013/A1:2022 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61850-5:2013/A1

May 2022

ICS 33.200

English Version

Communication networks and systems for power utility automation - Part 5: Communication requirements for functions and device models (IEC 61850-5:2013/AMD1:2022)

Réseaux et systèmes de communication pour l'automatisation des systèmes électriques - Partie 5: Exigences de communication pour les fonctions et les modèles d'appareils
(IEC 61850-5:2013/AMD1:2022)

Kommunikationsnetze und -systeme für die Automatisierung in der elektrischen Energieversorgung - Teil 5: Kommunikationsanforderungen für Funktionen und Gerätemodelle
(IEC 61850-5:2013/AMD1:2022)

This amendment A1 modifies the European Standard EN 61850-5:2013; it was approved by CENELEC on 2022-04-27. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 amendment 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, Turkey and the United Kingdom.

CENELEC

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 61850-5:2013/A1:2022 E

European foreword

The text of document 57/2448/FDIS, future IEC 61850-5/AMD1, prepared by IEC/TC 57 "Power systems management and associated information exchange" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61850-5:2013/A1:2022.

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) 2023-01-27
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-04-27

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 61850-5:2013/AMD1:2022 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.cenelec.eu.

Replace the references in Clause 2 with the following references:

Publication	Year	Title	EN/HD	Year
IEC 60617	-	Graphical symbols for diagrams - 12-month subscription to regularly updated online database comprising parts 2 to 13 of IEC 60617	-	-
IEC 60834-1	1999	Teleprotection equipment of power systems - Performance and testing - Part 1: Command systems	EN 60834-1	1999
IEC 60834-2 (mod)	1993	Performance and testing of teleprotection equipment of power systems - Part 2: Analogue comparison systems	HD 543.2 S1	1995
IEC 60870-4	1990	Telecontrol equipment and systems. Part 4: Performance requirements	HD 546.4 S1	1992
IEC 60870-5	series	Telecontrol equipment and systems. Part 5: Transmission protocols	EN 60870-5	series
IEC 61000-4-15	2010	Electromagnetic compatibility (EMC) - Part 4-15: Testing and measurement techniques - Flickermeter - Functional and design specifications	EN 61000-4-15	2011
IEC 61000-4-30	2015	Electromagnetic compatibility (EMC) - Part 4-30: Testing and measurement techniques - Power quality measurement methods	EN 61000-4-30	2015
IEC 61508	series	Functional safety of electrical/electronic/programmable electronic safety-related systems	EN 61508	series
IEC/TR 61850-1	2013	Communication networks and systems for power utility automation – Part 1: Introduction and overview	-	-
IEC/TS 61850-2	2019	Communication networks and systems in substations - Part 2: Glossary	-	-

IEC 61850-3	2013	Communication networks and systems for power utility automation - Part 3: General requirements	EN 61850-3	2014
IEC 61850-4	2011	Communication networks and systems for power utility automation - Part 4: System and project management	EN 61850-4	2011
IEC 61850-6	2009	Communication networks and systems for power utility automation - Part 6: Configuration description language for communication in electrical substations related to IEDs	EN 61850-6	2010
+ A1	2018		+ A1	2018
IEC 61850-7-1	2011	Communication networks and systems for power utility automation - Part 7-1: Basic communication structure - Principles and models	EN 61850-7-1	2011
+ A1	2020		+ A1	2020
IEC 61850-7-2	2010	Communication networks and systems for power utility automation - Part 7-2: Basic information and communication structure - Abstract communication service interface (ACSI)	EN 61850-7-2	2010
+ A1	2020		+ A1	2020
IEC 61850-7-3	2010	Communication networks and systems for power utility automation - Part 7-3: Basic communication structure - Common data classes	EN 61850-7-3	2011
+ A1	2020		+ A1	2020
IEC 61850-7-4	2010	Communication networks and systems for power utility automation - Part 7-4: Basic communication structure - Compatible logical node classes and data object classes	EN 61850-7-4	2010
+ A1	2020		+ A1	2020
IEC/TR 61850-7-5	-	Communication networks and systems for power utility automation - Part 7-5: IEC 61850 modelling concepts	-	-
IEC/TR 61850-7-500	2017	Communication networks and systems for power utility automation - Part 7-500: Basic information and communication structure - Use of logical nodes for modelling application functions and related concepts and guidelines for substations	-	-
IEC/TR 61850-7-510	2012	Communication networks and systems for power utility automation - Part 7-510: Basic communication structure - Hydroelectric power plants - Modelling concepts and guidelines	-	-

IEC/TR 61850-7-6	2019	Communication networks and systems for power utility automation - Part 7-6: Guideline for definition of Basic Application Profiles (BAPs) using IEC 61850	-	-
IEC/TS 61850-7-7	2018	Communication networks and systems for power utility automation - Part 7-7: Machine-processable format of IEC 61850-related data models for tools	-	-
IEC 61850-8-1	2011	Communication networks and systems for power utility automation - Part 8-1: Specific communication service mapping (SCSM) - Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3	EN 61850-8-1	2011
+ A1	2020		+ A1	2020
IEC 61850-8-2	2018	Communication networks and systems for power utility automation - Part 8-2: Specific communication service mapping (SCSM) - Mapping to Extensible Messaging Presence Protocol (XMPP)	EN IEC 61850-8-2	2019
IEC 61850-9-2	2011	Communication networks and systems for power utility automation - Part 9-2: Specific communication service mapping (SCSM) - Sampled values over ISO/IEC 8802-3	EN 61850-9-2	2011
+ A1	2020		+ A1	2020
IEC/IEEE 61850-9-3	2016	Communication networks and systems for power utility automation - Part 9-3: Precision time protocol profile for power utility automation	-	-
IEC 61850-10	2012	Communication networks and systems for power utility automation - Part 10: Conformance testing	EN 61850-10	2013
IEC/TR 61850-80-3	2015	Communication networks and systems for power utility automation - Part 80-3: Mapping to web protocols - Requirements and technical choices	-	-
IEC/TR 61850-90-1	2010	Communication networks and systems for power utility automation - Part 90-1: Use of IEC 61850 for the communication between substations	-	-
IEC/TR 61850-90-2	2016	Communication networks and systems for power utility automation - Part 90-2: Using IEC 61850 for communication between substations and control centres	-	-
IEC/TR 61850-90-4	2020	Communication networks and systems for power utility automation - Part 90-4: Network engineering guidelines	-	-
IEC/TR 61850-90-5	2012	Communication networks and systems for power utility automation - Part 90-5: Use of IEC 61850 to transmit synchrophasor information according to IEEE C37.118	-	-

IEC/TR 61850-90-12	2020	Communication networks and systems for power utility automation - Part 90-12: Wide area network engineering guidelines	-	-
IEC 61869	series	Instrument transformers	EN 61869	series
IEC/TR 62357-1	2016	Power systems management and associated information exchange - Part 1: Reference architecture	-	-
IEC 81346	series	Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations	EN IEC 81346	series
IEEE Std C37.2-2008	2008	Electrical Power System Device Function Numbers, Acronyms, and Contact Designations	-	-

IEC 61850-5

Edition 2.0 2022-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

AMENDMENT 1
AMENDEMENT 1

Communication networks and systems for power utility automation – Part 5: Communication requirements for functions and device models

Réseaux et systèmes de communication pour l'automatisation des systèmes électriques – Partie 5: Exigences de communication pour les fonctions et les modèles d'appareils

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 5: Communication requirements for functions and device models

AMENDMENT 1

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

Amendment 1 to IEC 61850-5:2013 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The text of this Amendment is based on the following documents:

Draft	Report on voting
57/2448/FDIS	57/2467/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 Amendment 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/standardsdev/publications/.

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,
- replaced by a revised edition, or
- amended.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

FOREWORD

In the FOREWORD, below item 9), replace the first paragraph through the third paragraph including its bullet points with the following new paragraphs:

International Standard IEC 61850-5 Edition 2 and its Amendment 1 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

DISCLAIMER

This Consolidated version is not an official IEC Standard and has been prepared for user convenience. Only the current versions of the standard and its amendment(s) are to be considered the official documents.

This consolidated version of IEC 61850-5:2013 bears the edition number 2.1. It replaces the second edition (2013-01) and its amendment (2021-XX). The technical content is identical to the base edition and its Amendment.

International Standard IEC 61850-5 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The changes, corrections and updates have been made mainly according to the comments received.

The major changes of this consolidated version with regard to Edition 2 are as follows:

a) extensions of the requirements with some Logical Nodes;
b) errors and typos have been corrected;
c) harmonization of all Logical Node descriptions (impact on all Logical Node tables);
d) re-organization of selected clause structures;
e) updating of headlines;
f) re-ordering subclauses in the chapter about performances.

to provide

– ease of reading and understanding of the requirements for the IEC 61850 series
– consistent and updated requirement references for the data model and communication service parts

INTRODUCTION

Delete the existing fourth paragraph of the Introduction. Replace the existing text of the fifth paragraph of the Introduction with the following new text:

The IEC 61850 series shall be long living but allow following the fast changes in communication technology by both its technical approach and its document structure. The IEC 61850 series has been organized so that at least minor changes to one part do not require a significant rewriting of another part. For example, the derived data models in subsequent parts (IEC 61850-7-x) and mappings to dedicated stacks (IEC 61850-8-x and IEC 61850-9-x) based on the communication requirements in IEC 61850-5 will not change the requirements defined in IEC 61850-5. In addition, the general parts, the requirement specification and the modelling parts are independent from any implementation. The implementation needed for the use of the standard is defined in some few dedicated parts referring to main stream communication means thus supporting the long living of the standard and its potential for later technical changes.

Replace the existing text of the sixth paragraph of the Introduction with the following new text:

This consolidated version of IEC 61850-5:2013 and its Amendment 1 defines the communication requirements for functions and device models for power utility automation systems.

Replace the existing text of the seventh paragraph and the Note of the Introduction with the following new text:

The modelling of communication requires the definition of objects (e.g., data objects, data sets, report control, log control) and services accessing the objects (e.g., get, set, report, create, delete). This is defined in IEC 61850-7 with a clear interface to implementation. To use the benefits of communication technology, in this standard no new protocol stacks are defined but a standardized mapping on existing stacks is given in IEC 61850-8 and IEC 61850-9. A System configuration language (IEC 61850-6) for strong formal description of the system usable for software tools and a standardized conformance testing (IEC 61850-10) complement the standard.

NOTE 1 To keep the layered approach of the standard not mixing application and implementation requirements, terms like client, server, data objects, etc. are normally not used in IEC 61850-5 (requirements). In IEC 61850-7 (modelling), -8 and -9 (specific communication service mapping) terms belonging to application requirements like PICOM are normally not used.

NOTE 2 Specific requirements concerning extensions of part 8 are covered in separate technical reports, e.g. IEC TR 61850-80-3.

Figure 1 – Relative position of this part of the standard

Delete existing Figure 1.

1 Scope

Replace the existing text of Clause 1 by the following new text:

The specifications of this document refer to general, respectively core, communication requirements of the application functions in all domains of power utility automation systems. Dedicated communication requirements and most examples of application functions in this document are from the domain substation automation but may be reused in or extended to other domains within power utility automation systems. Note that sometimes instead of the term substation automation domain the term substation domain is used, especially if both the switchyard devices (primary system) and the automation system (secondary system) are regarded.

The description of the application functions is not used to standardize these functions, but to identify communication requirements between Intelligent Electronic Devices (IEDs) hosting these functions within plants and substations in the power system, between such stations (e.g. between substation for line protection) and between the plant or substation and higher-level remote operating places (e.g. network control centres) and maintenance places. In addition interfaces to remote technical services (e.g. maintenance centres) are considered. The general scope is the communication requirements for power utility automation systems. The basic goal is interoperability for all interactions providing a seamless communication system for the overall power system management. Another prerequisite for interoperability is a commonly defined method for time synchronization.

Standardizing application functions and their implementation is completely outside the scope of this document. Therefore, it cannot be assumed a single philosophy of allocating application functions to devices. To support the resulting request for free allocation of these functions, a proper breakdown of these functions into parts relevant for communication is defined. The exchanged data and their required performance are defined.

The same or similar IEDs from substations like protective and control devices are found in other domains like power plants also. Using this document for such devices in these plants facilitates the system integration e.g. between the power plant control and the related substation automation system. For some of such other application domains like wind power plants, hydro power plants and distributed energy resources specific standard parts according to the IEC 61850 series have been already defined and published.

2 Normative references

Replace the existing text of Clause 2 by the following new text:

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) applies.

IEC 60617, *Graphical symbols for diagrams – 12-month subscription to regularly updated online database comprising parts 2 to 13 of IEC 60617*

IEC 60834-1:1999, *Teleprotection equipment of power systems – Performance and testing – Part 1: Command systems*

IEC 60834-2:1993, *Performance and testing of teleprotection equipment of power systems – Part 2: Analogue comparison systems*

IEC 60870-4:1990, *Telecontrol equipment and systems. Part 4: Performance requirements*

IEC 60870-5 (all parts), *Telecontrol equipment and systems – Part 5: Transmission protocols*

IEC 61000-4-15:2010, *Electromagnetic compatibility (EMC) – Part 4-15: Testing and measurement techniques – Flickermeter – Functional and design specifications*

IEC 61000-4-30:2015, *Electromagnetic compatibility (EMC) – Part 4-30: Testing and measurement techniques – Power quality measurement methods*

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

IEC TR 61850-1:2013, *Communication networks and systems for power utility automation – Part 1: Introduction and overview*

IEC TS 61850-2:2019, *Communication networks and systems for power utility automation – Part 2: Glossary*

IEC 61850-3:2013, *Communication networks and systems for power utility automation – Part 3: General requirements*

IEC 61850-4:2011, *Communication networks and systems for power utility automation – Part 4: System and project management*

IEC 61850-6:2009, *Communication networks and systems for power utility automation – Part 6: Configuration description language for communication in electrical substations related to IEDs*
IEC 61850-6:2009/AMD1:2018

IEC 61850-7-1:2011, *Communication networks and systems for power utility automation – Part 7-1: Basic communication structure – Principles and models*
IEC 61850-7-1:2011/AMD1:2020

IEC 61850-7-2:2010, *Communication networks and systems for power utility automation – Part 7-2: Basic information and communication structure – Abstract communication service interface (ACSI)*
IEC 61850-7-2:2010/AMD1:2020

IEC 61850-7-3:2010, *Communication networks and systems for power utility automation – Part 7-3: Basic communication structure – Common data classes*
IEC 61850-7-3:2010/AMD1:2020

IEC 61850-7-4:2010, *Communication networks and systems for power utility automation – Part 7-4: Basic communication structure – Compatible logical node classes and data object classes*
IEC 61850-7-4:2010/AMD1:2020

IEC TR 61850-7-5, *Communication networks and systems for power utility automation – Part 7-5: IEC 61850 modelling concepts*

IEC TR 61850-7-500:2017, *Communication networks and systems for power utility automation – Part 7-500: Basic information and communication structure – Use of logical nodes for modeling application functions and related concepts and guidelines for substations*

IEC TR 61850-7-510:2012, *Communication networks and systems for power utility automation – Part 7-510: Basic communication structure – Hydroelectric power plants – Modelling concepts and guidelines*