



SLOVENSKI STANDARD

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Komunikacijska omrežja in sistemi za avtomatizacijo porabe električne energije - 5. del: Komunikacijske zahteve za funkcije in modeli naprav (IEC 61850-5:2013)

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

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

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

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

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

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 57/1286/FDIS, future edition 2 of IEC 61850-5, 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.

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) 2013-12-06
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-03-06

This document supersedes EN 61850-5:2003.

EN 61850-5:2013 includes the following significant technical changes with respect to EN 61850-5:2003:

- extension from substation automation systems to utility automation systems;
- including the interfaces for communication between substations (interfaces 2 and 11);
- requirements from communication beyond the boundary of the substation.

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The text of the International Standard IEC 61850-5:2013 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60834-1:1999	NOTE	Harmonised as EN 60834-1.
IEC 60870-5 Series	NOTE	Harmonised as EN 60870-5 Series (not modified).
IEC 61000-4-30	NOTE	Harmonised as EN 61000-4-30.
IEC 61850-3	NOTE	Harmonised as EN 61850-3.
IEC 61850-7 Series	NOTE	Harmonised as EN 61850-7 Series (not modified).
IEC 61850-7-1	NOTE	Harmonised as EN 61850-7-1.
IEC 61850-7-2	NOTE	Harmonised as EN 61850-7-2.
IEC 61850-7-3	NOTE	Harmonised as EN 61850-7-3.
IEC 61850-7-4	NOTE	Harmonised as EN 61850-7-4.
IEC 61850-8 Series	NOTE	Only Part 8-1 is Harmonised as EN 61850-8-1.
IEC 61850-9 Series	NOTE	Harmonised as EN 61850-9-2 Series (not modified).
IEC 61850-10	NOTE	Harmonised as EN 61850-10.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61000-4-15	-	Electromagnetic compatibility (EMC) - Part 4-15: Testing and measurement techniques - Flickermeter - Functional and design specifications	EN 61000-4-15	-
IEC/TS 61850-2	-	Communication networks and systems in substations - Part 2: Glossary	-	-
IEC 61850-6	-	Communication networks and systems for power utility automation - Part 6: Configuration description language for communication in electrical substations related to IEDs	EN 61850-6	-
IEC 81346	Series	Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations	EN 81346	Series
Cigre JWG 34./35.11	2007	Protection using telecommunication, Cigre Technical Brochure (TB) 192	-	-

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NORME INTERNATIONALE



**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
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**Partie 5: Exigences de communication pour les modèles de fonctions et
d'appareils**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**COMMUNICATION NETWORKS AND SYSTEMS
FOR POWER UTILITY AUTOMATION –**
**Part 5: Communication requirements
for functions and device models**

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

This second edition cancels and replaces the first edition published in 2003. It constitutes a technical revision.

The major technical changes with regard to the previous edition are as follows:

- extension from substation automation systems to utility automation systems;
- including the interfaces for communication between substations (interfaces 2 and 11);
- requirements from communication beyond the boundary of the substation.

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

FDIS	Report on voting
57/1286/FDIS	57/1309/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 61850 series, published under the general title *Communication networks and systems for power utility automation*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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IMPORTANT – The 'colour inside' logo on the cover page of this publication 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.

INTRODUCTION

This part of IEC 61850 is part of set of standards, the IEC 61850 series. The IEC 61850 series is intended to provide interoperability between all devices in power utility automation systems. Therefore, it defines communication networks and systems for power utility automation, and more specially the communication architecture for subsystems like substation automation systems. The sum of all subsystems may result also in the description of the communication architecture for the overall power system management.

Communication between these devices in subsystems and between the subsystems within the overall power utility automation system fulfils a lot of requirements imposed by all the functions to be performed in power utility automation systems starting from the core requirements in substations. These requirements are stated both for the data to be organized in a data model and for the data exchange resulting in services. Performance of the data exchange means not only transfer times but also the quality of the data exchange avoiding losses of information in the communication.

Depending on the philosophy both of the vendor and the user and on the state-of-the-art in technology, the allocation of functions to devices and control levels is not commonly fixed. Therefore, the standard shall support any allocation of functions. This results in different requirements for the different communication interfaces within the substation or plant, at its border and beyond.

The standard series shall be long living but allow following the fast changes in communication technology by both its technical approach and its document structure. Figure 1 shows the relationship of Part 5 to subsequent parts of IEC 61850 series.

The standard series IEC 61850 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 Part 5 will not change the requirements defined in Part 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.

This Part 5 of the standard IEC 61850 defines the communication requirements for functions and device models for power utility automation systems.

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 Part 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 Part 8 and Part 9. A System configuration language (Part 6) for strong formal description of the system usable for software tools and a standardized conformance testing (Part 10) complement the standard. Figure 1 shows the general structure of the documents of IEC 61850 as well as the position of the clauses defined in this document.

NOTE 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 Part 5 (requirements). In Parts 7 (modelling), 8 and 9 (specific communication service mapping) terms belonging to application requirements like PICOM are normally not used.