

Communication networks and systems for power utility automation - Part 10: Conformance testing (IEC 61850-10:2012)

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**Communication networks and systems for power utility automation -
Part 10: Conformance testing
(IEC 61850-10:2012)**

Réseaux et systèmes de communication
pour l'automatisation des systèmes
électriques -
Partie 10: Essais de conformité
(CEI 61850-10:2012)

Kommunikationsnetze und -systeme in
Stationen -
Teil 10: Konformitätsprüfung
(IEC 61850-10:2012)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 57/1284/FDIS, future edition 2 of IEC 61850-10, 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 61850-10:2013.

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) 2014-01-05
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-01-18

This document supersedes EN 61850-10:2005.

EN 61850-10:2013 includes the following significant technical changes with respect to EN 61850-10:2005:

- server device conformance test procedures have been updated;
- client device conformance test procedures have been added;
- sampled values device conformance test procedures have been added;
- (engineering) tool related conformance test procedures have been added;
- GOOSE performance test procedures have been added.

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

Endorsement notice

The text of the International Standard IEC 61850-10:2013 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, 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/TS 61850-2	-	Communication networks and systems in substations - Part 2: Glossary	-	-
IEC 61850-3	-	Communication networks and systems for power utility automation - Part 3: General requirements	EN 61850-3	-
IEC 61850-4	2011	Communication networks and systems for power utility automation - Part 4: System and project management	EN 61850-4	2011
IEC 61850-5	2003	Communication networks and systems in substations - Part 5: Communication requirements for functions and device models	EN 61850-5 ¹⁾	2003
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
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
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
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
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

¹⁾ EN 61850-5 is superseded by EN 61850-5:2013, which is based on IEC 61850-5:2013.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
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
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
IEC 62439-3	2012	Industrial communication networks - High availability automation networks - Part 3: Parallel Redundancy Protocol (PRP) and High availability Seamless Redundancy (HSR)	EN 62439-3	2012
ISO 9001	-	Quality management systems - Requirements	EN ISO 9001	-
ISO 9506	Series	Industrial automation systems - Manufacturing Message Specification	-	-
ISO/IEC 9646	Series	Information technology - Open Systems Interconnection - Conformance testing methodology and framework	EN ISO/IEC 9646	-
IEEE 1588	2008	IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems	-	-

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INTRODUCTION

This part of IEC 61850 is part of a set of specifications which details a layered power utility communication architecture.

This part of IEC 61850 defines:

- the methods and abstract test cases for conformance testing of client, server and sampled values devices used in power utility automation systems, and
- the methods and abstract test cases for conformance testing of engineering tools used in power utility automation systems, and
- the metrics to be measured within devices according to the requirements defined in IEC 61850-5.

The intended readers are IEC 61850 developers, test engineers and test system developers.

NOTE 1 Tests regarding EMC requirements and environmental conditions are subject to IEC 61850-3 and not included in this part of IEC 61850.

It is recommended that IEC 61850-5 and IEC 61850-7-1 be read first in conjunction with IEC 61850-7-2, IEC 61850-7-3, and IEC 61850-7-4.

NOTE 2 Abbreviations used in IEC 61850-10 are listed in Clause 4 or may be found in other parts of IEC 61850 that are relevant for conformance testing.

COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 10: Conformance testing

1 Scope

This part of IEC 61850 specifies standard techniques for testing of conformance of client, server and sampled value devices and engineering tools, as well as specific measurement techniques to be applied when declaring performance parameters. The use of these techniques will enhance the ability of the system integrator to integrate IEDs easily, operate IEDs correctly, and support the applications as intended.

NOTE The role of the test facilities for conformance testing and certifying the results is beyond the scope of this part of IEC 61850.

2 Normative references

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

IEC 61850-3, *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 61850-5:2003, *Communication networks and systems for power utility automation – Part 5: Communication requirements for functions and devices models*

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

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

IEC 61850-7-4:2011, *Communication networks and systems for power utility automation – Part 7-4: Basic communication structure – Compatible logical node classes and data object classes*

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/IEC 9506-1 and ISO/IEC 9506-2) and to ISO/IEC 8802-3*

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*

IEC 62439-3:2012, *Industrial communication networks – High availability automation networks – Part 3: Parallel Redundancy Protocol (PRP) and High Availability Seamless Redundancy (HSR)*

ISO/IEC 9646 (all parts), *Information technology – Open Systems Interconnection – Conformance testing methodology and framework*

ISO 9001 (all parts), *Quality management systems*

ISO 9506 (all parts), *Industrial automation systems – Manufacturing Message Specification*

IEEE 1588:2008, *Standard for a precision clock synchronization protocol for networked measurement and control systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61850-2 and the following apply.

3.1

factory acceptance test

FAT

customer-agreed functional tests of the specifically manufactured power utility automation system or its parts using the parameter set for the planned application as specified in a specific customer specification

Note 1 to entry: The FAT will be carried out in the factory of the manufacturer or other agreed-upon location by the use of process simulating test equipment.

3.2

hold point

point, defined in the appropriate document beyond which an activity shall not proceed without the approval of the initiator of the conformance test

Note 1 to entry: The test facility shall provide a written notice to the initiator at an agreed time prior to the hold point. The initiator or his representative is obligated to verify the hold point and approve the proceeding of the activity.

3.3

interoperability

ability of two or more IEDs from the same vendor (or different vendors) to exchange information and use that information for correct co-operation.

Set of values having defined correspondence with the quantities or values of another set

3.4

model implementation conformance statement

MICS

statement that details the standard data object model elements supported by the system or device