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Communication networks and systems for power utility automation - Part 10: Conformance testing

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Communication networks and systems for power utility automation - Part 10: Conformance testing

FOREWORD

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 61850-10 edition 2.1 contains the second edition (2012-12) [documents 57/1284/FDIS and 57/1303/RVD] and its amendment 1 (2025-07) [documents 57/2769/FDIS and 57/2797/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 61850-10 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 2005. It constitutes a technical revision.

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

– 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.

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

FDIS	Report on voting
57/1284/FDIS	57/1303/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 parts of IEC 61850 series, under the general title *Communication networks and systems for power utility automation*, can be found on the IEC website.

The committee has decided that the contents of this document and its amendment 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- withdrawn, or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

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.

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.

Cyber security extensions provided by IEC 62351 are conformance tested against the IEC 62351-100-4 and IEC 62351-100-6.

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*

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IEC 61869-9:2016, *Instrument transformers – Part 9: Digital interface for instrument transformers*

~~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*

IEC/IEEE 61850-9-3:2016, *Communication networks and systems for power utility automation – Part 9-3: Precision time protocol profile for power utility*

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

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

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