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INTERNATIONAL STANDARD

**Communication networks and systems for power utility automation –
Part 9-3: Precision time protocol profile for power utility automation**

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COMMUNICATION NETWORKS AND
SYSTEMS FOR POWER UTILITY AUTOMATION –

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International Standard IEC IEEE 61850-9-3 has been prepared by IEC Technical Committee 57, Power systems management and associated information exchange, in cooperation with

IEC subcommittee 65C, Industrial networks, and with IEEE Power Systems Relaying Committee Working Group H24/Substation Committee Working Group C7, of the Power & Energy Society[1] of the IEEE, under the IEC/IEEE Dual Logo Agreement.

This standard cancels and replaces IEC/PAS 61850-9-3 published in 2015.

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

FDIS	Report on voting
57/1679/FDIS	57/1713/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.

International standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

A list of all 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.

The IEC Technical Committee and IEEE Technical Committee have decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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• withdrawn,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.

A bilingual version of this publication may be issued at a later date.

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1 A list of IEEE participants can be found at the following URL: http://standards.ieee.org/downloads/61850-9-3/61850-9-3-2016/61850-9-3-2016_wg-participants.pdf

INTRODUCTION

General

This part of IEC 61850 specifies a precision time protocol (PTP) profile of IEC 61588:2009 ¦ IEEE Std 1588-2008 applicable to power utility automation, which allows compliance with the highest synchronization classes of IEC 61850-5 and IEC 61869-9.

This part of IEC 61850 applies Layer 2 communication according to IEC 61588:2009 ¦ IEEE Std 1588-2008, Annex F, and uses peer-to-peer delay measurement according to the default profile of IEC 61588:2009 ¦ IEEE Std 1588-2008, Annex J.4, with restricted range of values.

When clocks are singly attached, this profile is a subset of IEC 61588:2009 ¦ IEEE Std 1588-2008 with above restrictions.

When clocks are doubly attached, this profile extends the BMCA of IEC 61588:2009 ¦ IEEE Std 1588-2008 as IEC 62439-3:2016, Annex A, specifies.

NOTE   IEC 62439-3:2016, Annex B is identical to this part of IEC 61850, except that doubly attached clocks are mandatory, while this part of IEC 61850 leaves them optional.

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1 Scope

This part of IEC 61850 specifies a precision time protocol (PTP) profile of IEC 61588:2009 ¦ IEEE Std 1588-2008 applicable to power utility automation, which allows compliance with the highest synchronization classes of IEC 61850-5 and IEC 61869-9.

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 61588:2009, *Precision clock synchronization protocol for networked measurement and control systems* ¦ IEEE Std 1588-2008, *IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems*[2]

IEC TR 61850-90-4:2013, *Communication networks and systems for power utility automation – Part 90-4: Network engineering guidelines*

IEC 62439-3:2016, *Industrial communication networks – High availability automation networks – Part 3: Parallel Redundancy Protocol (PRP) and High availability Seamless Redundancy (HSR)*

ISO/IEC 9646-7, *Open systems interconnection – Conformance testing methodology and framework – Part 7: Implementation conformance statements*

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[2] IEEE Std 1588-2008 was adopted as IEC 61588:2009.