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BSI Standards Publication

Communication networks and systems for power utility automation

Part 9-3: Precision time protocol profile for power utility automation

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The UK participation in its preparation was entrusted to Technical Committee PEL/57, Power systems management and associated information exchange.

A list of organizations represented on this committee can be obtained on request to its secretary.

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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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The text of this PAS is based on the following document:	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document
Draft PAS	**Report on voting**
57/1551/PAS	57/1575/RVD

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

INTRODUCTION

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

This PAS applies Layer 2 communication according to IEC 61588:2009, Annex F, and uses peer-to-peer delay measurement according to the IEC 61588:2009, Annex J.4, default profile with restricted range values.

When clocks have a single attachment, this profile is a subset of IEC 61588:2009 with the above restrictions.

When clocks have an optional double attachment, this profile extends the BMCA of IEC 61588:2009 as IEC 62439-3:2015, Annex A, specifies.

COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 9-3: Precision time protocol profile for power utility automation

1 Scope

This PAS specifies a precision time protocol (PTP) profile of IEC 61588:2009 applicable in power utility automation which allows compliance with the highest synchronization class set 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*

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

IEC 62439-3:2015, *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*

3 Terms, definitions, abbreviations and acronyms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61588:2009 and IEC 62439-3:2015, as well as the following, apply:

3.1.1
grandmaster-capable
ordinary clock or boundary clock that is able to take the role of a grandmaster

Note 1 to entry: A grandmaster-capable clock is not necessarily connected to a recognized time source.

3.1.2
time error
deviation from the time reference used for measurement or synchronization caused by a network element, evaluated over a short time span (a few Sync intervals)