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IEC/TR 61850-1:2013, IDT

(ICS 33.200)

TECHNICAL REFERENCE

Communication networks and systems for power utility automation

– Part 1: Introduction and overview

Singapore Standards Council

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Communication networks and systems for power utility automation

– Part 1: Introduction and overview

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National Foreword

This Technical Reference (TR) was prepared by the Working Group on Smart Grids set up by the Technical Committee on Power System and Utilisation under the purview of the Electrical and Electronic Standards Committee.

This TR is an identical adoption of IEC/TR 61850-1:2013, “Communication networks and systems for power utility automation – Part 1: Introduction and overview” published by the International Electrotechnical Commission.

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TECHNICAL REPORT

RAPPORT TECHNIQUE

Communication networks and systems for power utility automation – Part 1: Introduction and overview

Réseaux et systèmes de communication pour l'automatisation des systèmes électriques – Partie 1: Introduction et présentation

IEC/TR 61850-1:2013

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TECHNICAL REPORT

RAPPORT TECHNIQUE

Communication networks and systems for power utility automation – Part 1: Introduction and overview

Réseaux et systèmes de communication pour l'automatisation des systèmes électriques – Partie 1: Introduction et présentation

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 1: Introduction and overview

FOREWORD

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IEC 61850-1, which is a technical report, 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. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- Extended application scope of the IEC 61850 standard
  - for the power quality domain;
  - for statistical and historical data;

  - for distributed generation monitoring and automation purpose;
  - for feeder automation purpose;
  - for substation to substation communication;
  - for monitoring functions according to IEC 62271.
- Smart grid considerations.
- Extensions (and provisions for extensions) of the documentation system relating to IEC 61850, especially with part 7-5xx (Application guides) and part 90-xx (Technical report and guidelines).

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
57/1233/DTR	57/1304/RVC

Full information on the voting for the approval of this technical report 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 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 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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INTRODUCTION

IEC 61850 consists of the following parts, under the general title *Communication networks and systems for power utility automation* (all parts may have not been published yet).

Part 1: Introduction and overview

Part 2: Glossary

Part 3: General requirements

Part 4: System and project management

Part 5: Communication requirements for functions and device models

Part 6: Configuration description language for communication in electrical substations related to IEDs

Part 7-1: Basic communication structure – Principles and models

Part 7-2: Basic communication structure – Abstract communication service interface (ACSI)

Part 7-3: Basic communication structure – Common data classes

Part 7-4: Basic communication structure – Compatible logical node classes and data classes

Part 7-410: Hydroelectric power plants – Communication for monitoring and control

Part 7-420: Basic communication structure – Distributed energy resources logical nodes

Part 7-5: IEC 61850 – Modelling concepts[1]

Part 7-500: Use of logical nodes to model functions of a substation automation system[1]

Part 7-510: Use of logical nodes to model functions of a hydro power plant

Part 7-520: Use of logical nodes to model functions of distributed energy resources[1]

Part 8-1: Specific communication service mapping (SCSM) – Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3

Part 80-1: Guideline to exchange information from a CDC based data model using IEC 60870-5-101/104

Part 9-2: Specific communication service mapping (SCSM) – Sampled values over ISO/IEC 8802-3

Part 90-1: Use of IEC 61850 for the communication between substations

Part 90-2: Using IEC 61850 for the communication between substations and control centres[1]

Part 90-3: Using IEC 61850 for condition monitoring[1]

Part 90-4: Network Engineering Guidelines - Technical report[1]

Part 90-5: Using IEC 61850 to transmit synchrophasor information according to IEEE C37.118

Part 10: Conformance testing

In addition to the above parts IEC technical committee 88 has published the IEC 61850 basic communication structure for Wind Turbines as IEC 61400-25, *Wind turbines – Communications for monitoring and control of wind power plants*.

IEC 61850-1 is an introduction and overview of the IEC 61850 standard series. It describes the philosophy, work approach and contents of the other parts.

1 Under consideration.

COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 1: Introduction and overview

1 Scope

This technical report is applicable to *power utility automation systems* (PUAS). It defines the communication between intelligent electronic devices (IEDs) in such a system, and the related system requirements.

This part gives an introduction and overview of the IEC 61850 standard series. It refers to and might include text and figures coming from other parts of the IEC 61850 standard series.

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 60870-5-103, *Telecontrol equipment and systems – Part 5-103: Transmission Protocols - Companion standard for the informative interface of protection equipment*

IEC 60870-5-104, *Telecontrol equipment and systems – Part 5-104: Transmission protocols – Network access for IEC 60870-5-101 using standard transport profiles*

IEC 61400-25 (all parts), *Communications for monitoring and control of wind power plants*

IEC 61850-2, *Communication networks and systems in substations – Part 2: Glossary*

IEC 61850-3, *Communication networks and systems in substations – Part 3: General requirements*

IEC 61850-4, *Communication networks and systems for power utility automation – Part 4: System and project management*

IEC 61850-5, *Communication networks and systems in substations – Part 5: Communication requirements for functions and device models*

IEC 61850-6, *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, *Communication networks and systems for power utility automation – Part 7-1: Basic communication structure – Principles and models*

IEC 61850-7-2, *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, *Communication networks and systems for power utility automation – Part 7-3: Basic communication structure – Common data classes*

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

IEC 61850-7-410, *Communication networks and systems for power utility automation – Part 7-410: Hydroelectric power plants – Communication for monitoring and control*

IEC 61850-7-420, *Communication networks and systems for power utility automation – Part 7-420: Basic communication structure – Distributed energy resources logical nodes*

IEC 61850-7-510, *Communication networks and systems for power utility automation – Part 7-510: Basic communication structure – Hydroelectric power plants – Modelling concepts and guidelines*

IEC 61850-8-1, *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*

IEC 61850-80-1, *Communication networks and systems for power utility automation – Part 80-1: Guideline to exchanging information from a CDC-based data model using IEC 60870-5-101 or IEC 60870-5-104*

IEC 61850-9-2, *Communication networks and systems for power utility automation – Part 9-2: Specific communication service mapping (SCSM) – Sampled values over ISO/IEC 8802-3*

IEC/TR 61850-90-1, *Communication networks and systems for power utility automation – Part 90-1: Use of IEC 61850 for the communication between substations*

IEC 61850-10, *Communication networks and systems in substations – Part 10: Conformance testing*

IEC 62351 (all parts), *Power systems management and associated information exchange – Data and communications security*

IEC/TR 62357-1, *Power systems management and associated information exchange – Part 1: Reference architecture*

IEC 81346-1, *Industrial systems, installations and equipment and industrial products – Structuring principles and reference designations – Part 1: Basic rules*

ISO 9001:2008, *Quality management systems – Requirements*

IEEE C37.2, *IEEE standard electrical power system device function numbers, acronyms and contact designations*

IEEE 100:2000, *The authoritative dictionary of IEEE standards terms seventh edition*

IEEE-SA TR 1550, *Utility Communications Architecture (UCA) Version 2.0 – Part 4: UCA Generic Object Models for Substation and Feeder Equipment (GOMSFE)*

RFC 2246, *The TLS Protocol, Version 1.0*