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Komunikacijska omrežja in sistemi v podpostajah - 7-420. del: Komunikacijski sistemi za porazdeljene energijske vire (DER) - Logična vozlišča (IEC 61850-7-420:2009)

Communication networks and systems in substations - Part 7-420: Communications systems for distributed energy resources (DER) - Logical nodes (IEC 61850-7-420:2009)

Kommunikationsnetze und -systeme für die Automatisierung in der elektrischen Energieversorgung - Teil 7-420: Grundlegende Kommunikationsstruktur - Logische Knoten für die dezentrale Energieversorgung (IEC 61850-7-420:2009)

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Systèmes et réseaux de communication pour l'automatisation des services de distribution d'énergie - Partie 7-420: Structure de communication de base - Noeuds logiques de ressources d'énergie distribuées (CEI 61850-7-420:2009)

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**Communication networks and systems for power utility automation -
Part 7-420: Basic communication structure -
Distributed energy resources logical nodes
(IEC 61850-7-420:2009)**

Systèmes et réseaux de communication
pour l'automatisation des services
de distribution d'énergie -
Partie 7-420: Structure
de communication de base -
Nœuds logiques de ressources
d'énergie distribuées
(CEI 61850-7-420:2009)

Kommunikationsnetze und -systeme
für die Automatisierung
in der elektrischen Energieversorgung -
Teil 7-420: Grundlegende
Kommunikationsstruktur -
Logische Knoten für die
dezentrale Energieversorgung
(IEC 61850-7-420:2009)

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 57/981/FDIS, future edition 1 of IEC 61850-7-420, prepared by IEC TC 57, Power systems management and associated information exchange, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61850-7-420 on 2009-05-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2010-02-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2012-05-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61850-7-420:2009 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60364-7-712	NOTE	Harmonized as HD 60364-7-712:2005 (not modified).
IEC 60870-5-101	NOTE	Harmonized as EN 60870-5-101:2003 (not modified).
IEC 60870-5-104	NOTE	Harmonized as EN 60870-5-104:2006 (not modified).
IEC 61800-4	NOTE	Harmonized as EN 61800-4:2003 (not modified).
IEC 61850	NOTE	Harmonized in EN 61850 series (not modified).
IEC 61850-6	NOTE	Harmonized as EN 61850-6:2004 (not modified).
IEC 61850-7-1	NOTE	Harmonized as EN 61850-7-1:2003 (not modified).
IEC 61850-8	NOTE	Harmonized in EN 61850-8 series (not modified).
IEC 61850-9	NOTE	Harmonized in EN 61850-9 series (not modified).
IEC 61850-10	NOTE	Harmonized as EN 61850-10:2005 (not modified).
IEC 61968	NOTE	Harmonized in EN 61968 series (not modified).
IEC 61970-301	NOTE	Harmonized as EN 61970-301:2004 (not modified).
IEC 62056	NOTE	Harmonized in EN 62056 series (not modified).
ISO/IEC 7498-1	NOTE	Harmonized as EN ISO/IEC 7498-1:1995 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application of this document. 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 61850-7-2	2003	Communication networks and systems in substations - Part 7-2: Basic communication structure for substation and feeder equipment - Abstract communication service interface (ACSI)	EN 61850-7-2	2003
IEC 61850-7-3	2003	Communication networks and systems in substations - Part 7-3: Basic communication structure for substation and feeder equipment - Common data classes	EN 61850-7-3	2003
IEC 61850-7-4	2003	Communication networks and systems in substations - Part 7-4: Basic communication structure for substation and feeder equipment - Compatible logical node classes and data classes	EN 61850-7-4	2003
IEC 61850-7-410	¹⁾	Communication networks and systems for power utility automation - Part 7-410: Hydroelectric power plants - Communication for monitoring and control	EN 61850-7-410	2007 ²⁾
ISO 4217	- ¹⁾	Codes for the representation of currencies and funds	-	-

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

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

FOREWORD

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International Standard IEC 61850-7-420 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

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

FDIS	Report on voting
57/981/FDIS	57/988/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.

In Clauses 5 to 8 of this document, each subclause contains an initial informative clause, followed by normative clauses. Specifically, any subclause identified as informative is informative; any clause with no identification is considered normative.

A list of all parts of the 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 publication will remain unchanged until the maintenance result 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.

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

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INTRODUCTION

Increasing numbers of DER (distributed energy resources) systems are being interconnected to electric power systems throughout the world. As DER technology evolves and as the impact of dispersed generation on distribution power systems becomes a growing challenge - and opportunity, nations worldwide are recognizing the economic, social, and environmental benefits of integrating DER technology within their electric infrastructure.

The manufacturers of DER devices are facing the age-old issues of what communication standards and protocols to provide to their customers for monitoring and controlling DER devices, in particular when they are interconnected with the electric utility system. In the past, DER manufacturers developed their own proprietary communication technology. However, as utilities, aggregators, and other energy service providers start to manage DER devices which are interconnected with the utility power system, they are finding that coping with these different communication technologies present major technical difficulties, implementation costs, and maintenance costs. Therefore, utilities and DER manufacturers recognize the growing need to have one international standard that defines the communication and control interfaces for all DER devices. Such standards, along with associated guidelines and uniform procedures would simplify implementation, reduce installation costs, reduce maintenance costs, and improve reliability of power system operations.

The logical nodes in this document are intended for use with DER, but may also be applicable to central-station generation installations that are comprised of groupings of multiple units of the same types of energy conversion systems that are represented by the DER logical nodes in this document. This applicability to central-station generation is strongest for photovoltaics and fuel cells, due to their modular nature.

Communications for DER plants involve not only local communications between DER units and the plant management system, but also between the DER plant and the operators or aggregators who manage the DER plant as a virtual source of energy and/or ancillary services. This is illustrated in Figure 1.

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