Kommunikationsnät och system för kraftföretagsautomation – Del 6: Konfigurationsbeskrivande språk för kommunikation i system med IED för kraftföretagsautomation

Communication networks and systems for power utility automation –
Part 6: Configuration description language for communication in electrical substations related to IEDs

Som svensk standard gäller europastandarderna EN 61850-6:2010 och EN 61850-6:2010/A1:2018. Den svenska standarden innehåller de officiella engelska språkversionerna av EN 61850-6:2010 och EN 61850-6:2010/A1:2018[*].

Nationellt förord

Europastandarden EN 61850-6:2010

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 61850-6, Second edition, 2009[**] - Communication networks and systems for power utility automation - Part 6: Configuration description language for communication in electrical substations related to IEDs**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61850-6, utgåva 1, 2010, gäller ej fr o m 2021-07-12.

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[*] Amendment EN 61850-6:2010/A1:2018 till EN 61850-6:2010 ingår i standarden.
[**] Amendment No 1:2018 till IEC 61850-6:2009 är inarbetat i standarden.

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61850-6

February 2010

English version

Communication networks and systems for power utility automation - Part 6: Configuration description language for communication in electrical substations related to IEDs
(IEC 61850-6:2009)

Systèmes et réseaux de communication
pour l'automatisation des services
de distribution d'énergie -
Partie 6: Langage pour la description
de configuration pour la communication
dans les postes électriques,
entre les dispositifs électroniques
intelligents (IED)
(CEI 61850-6:2009)

Kommunikationsnetze und -systeme
für die Automatisierung in der elektrischen
Energieversorgung -
Teil 6: Sprache für die Beschreibung
der Konfiguration für die Kommunikation
in Stationen mit intelligenten
elektronischen Geräten (IED)
(IEC 61850-6:2009)

This European Standard was approved by CENELEC on 2010-02-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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 57/1025/FDIS, future edition 2 of IEC 61850-6, 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 61850-6 on 2010-02-01.

This European Standard supersedes EN 61850-6:2004.

The main changes with respect to EN 61850-6:2004 are as follows:

– functional extensions added based on changes in other Parts, especially Parts 7-2 and 7-3;

– functional extensions concerning the engineering process, especially for configuration data exchange between system configuration tools, added;

– provision of clarifications and corrections. Issues that require clarification are published in a database available at www.tissue.iec61850.com. Arising incompatibilities are listed in 8.2.3.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

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)   2010-11-01

– latest date by which the national standards conflicting
with the EN have to be withdrawn   (dow)   2013-02-01

Annex ZA has been added by CENELEC.

_____

Endorsement notice

The text of the International Standard IEC 61850-6:2009 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 61131-3   NOTE   Harmonized as EN 61131-3.

IEC 81346-2   NOTE   Harmonized as EN 81346-2.

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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.

Publication	Year	Title	EN/HD	Year
IEC/TS 61850-2	-	Communication networks and systems in substations - Part 2: Glossary	-	-
IEC 61850-5	-	Communication networks and systems in substations - Part 5: Communication requirements for functions and device models	EN 61850-5	-
IEC 61850-7-1	-	Communication networks and systems in substations - Part 7-1: Basic communication structure for substation and feeder equipment - Principles and models	EN 61850-7-1	-
IEC 61850-7-2	-	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	-
IEC 61850-7-3	-	Communication networks and systems in substations - Part 7-3: Basic communication structure for substation and feeder equipment - Common data classes	EN 61850-7-3	-
IEC 61850-7-4	-	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	-
IEC 61850-8-1	-	Communication networks and systems in substations - Part 8-1: Specific Communication Service Mapping (SCSM) - Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3	EN 61850-8-1	-
IEC 61850-9-2	-	Communication networks and systems in substations - Part 9-2: Specific Communication Service Mapping (SCSM) - Sampled values over ISO/IEC 8802-3	EN 61850-9-2	-

Publication	Year	Title	EN/HD	Year
IEC 81346-1	-	Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations - Part 1: Basic rules	EN 81346-1	-
ISO/IEC 8859-1	-	Information technology - 8-bit single-byte coded graphic character sets - Part 1: Latin alphabet No.1	-	-
RFC 1952	-	GZIP file format specification version 4.3	-	-
RFC 2045	-	Multipurpose Internet Mail Extensions (MIME) Part 1: Format of Internet Message Bodies	-	-
-	-	Extensible Markup Language (XML) 1.0	-	-
-	-	XML Schema Part 1: Structures	-	-
-	-	XML Schema Part 2: Datatypes	-	-

Publication	Year	Title	EN/HD	Year

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**COMMUNICATION NETWORKS AND SYSTEMS
FOR POWER UTILITY AUTOMATION –**

**Part 6: Configuration description language for communication
in power utility automation systems related to IEDs**

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

**DISCLAIMER
This Consolidated version is not an official IEC Standard and has been prepared for user convenience. Only the current versions of the standard and its amendment(s) are to be considered the official documents.**

This Consolidated version of IEC 61850-6 bears the edition number 2.1. It consists of the second edition (2009-12) [documents 57/1025/FDIS and 57/1041/RVD] and its amendment 1 (2018-06) [documents 57/1918/FDIS and 57/1940/RVD]. The technical content is identical to the base edition and its amendment.

International Standard IEC 61850-6 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

This second edition constitutes a technical revision.

The main changes with respect to the previous edition are as follows:

• functional extensions added based on changes in other Parts, especially Parts 7-2 and 7-3;

• functional extensions concerning the engineering process, especially for configuration data exchange between system configuration tools, added;

• provision of clarifications and corrections. Issues that require clarification are published in a database available at http://tissue.iec61850.com. Arising incompatibilities are listed in 8.2.3.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 61850 series, under the general title *Communication networks and systems for power utility automation*, can be found on the IEC website.

This IEC standard includes Code Components i.e. components that are intended to be directly processed by a computer. Such content is any text found between the markers <CODE BEGINS> and <CODE ENDS>, or otherwise is clearly labeled in this standard as a Code Component.

The purchase of this IEC standard carries a copyright license for the purchaser to sell software containing Code Components from this standard directly to end users and to end users via distributors, subject to IEC software licensing conditions, which can be found at: http://www.iec.ch/CCv1.

If any updates are required to the published code component that needs to apply immediately and can not wait for an amendment (i.e. fixing a major problem), a new release of the Code Component will be issued and distributed through the IEC WebSite. Any new release of the Code Component related to this part will supersede any previously published Code Component including the one published within the current document.

The Code Component(s) included in this IEC standard are a set of .xsd. This Code Component is published through the IEC WebSite; for details see 1.3 of the present IEC standard.

This consolidated edition brings two distinct sets of changes:

1) Resolved Interop Issues (covered by the table below) which have already followed the technical issues (Tissues) process as described in IEC 61850-1 and have reached the green "status".
2) Resolved Editorial Tissues which may have lead to interoperability issues.

The resolutions of these issues which lead to these changes are described in greater detail in the Tissue database hosted at http://tissue.iec61850.com.

The only new features compared to the original IEC 61850-6:2009 are the inclusion of the Process and Line elements supporting other application areas than substations, and necessary enhancements to fully support the amended communication related parts. Apart from this, this consolidated edition strictly respects the scope of the original edition.

Technical issues summary

N°, Subject, Cat, Clause and Paragraph are as they appear on the Tissue database hosted at http://tissue.iec61850.com where all technical issues have been stored from the origin of IEC 61850.

"Subject" defines very briefly the topic under focus.

"Cat" defines whether this has been considered as an Interoperability Issue (IntOp2) or just a need for amending IEC 61850-6:2009.

The Tissues which have been considered are:

N°	Subject	Cat	Clause	Paragraph
658	Tracking related features	IntOp2	Annex A	
660	XML encoding header repeat	Ed2	Annex A.4	
663	FCDA element cannot be a "functionally constrained logical node"	IntOp2	9.3.7	Table 22
668	Modeling of autotransformer	IntOp2	9.2.4	
678, 699	DO type description table	Ed2		Table 43
687	ResvTms attribute at the SGCB	Ed2	9.3.12	
719	ConfDataSet maxAttributes defineds FCDA elements in data set	IntOp2	9.3.2	Table 11
721	Log element name	IntOp2	9.3.5	
731	SCL example inconsistent	Ed2	9.3.4§	
752	Input section naming	Ed2	9.3.13	
768	bType VisString65 is missing	IntOp2	Annex A	
779	Relative object references	IntOp2	9.5.4.1	
787	SICS I45 inconsistency	Ed2	Annex G	
788	SICS S56 from optional to mandatory	IntOp2	Annex G	
789 (822)	ConfLdName for services applies to client and server	IntOp2	9.3.2	Table 11
804	valKind and IED versus system configurator	IntOp2	9.5.4.1	
806	Max length of log name incosnsten to part 7-2	Ed2	Annex A	SCL_BaseSimpleTypes
807	Indicate if 'owner' is present in RCB	Ed2	9.3.2	Table 11
823	valKind for structured data attributes	IntOp2	9.5.4.1	
824	Short addresses at structured data attributes	IntOp2	9.3.6, 9.5.4.1	
825	Floating point values	IntOp2	9.5.4.1	Table 45
845	SGCB ResvTms	IntOp2	9.3.2	Table 11
853	SBO and ProtNs	IntOp2	9.5.5	
855	recursive SubFunction	Ed2	9.2.7	
856	Voltage level frequency and phases	Ed2	9.2.2	
857	Function/SubFunction for primary equipment	Ed2	9.2.4	
873	Examples for "curvpts"	Ed2	9.3.6	end of paragraph
886	Missing 8-1 P-Types	Ed2	Annex A	

N°	Subject	Cat	Clause	Paragraph
901	tServices at Ap and at IED	Ed2	9.3.2	below Table 12
936	SupSubscription parameter usage is difficult	IntOp2	9.3.2	Table 11
948	Enumeration (string) value format	IntOp2	9.5.6	
949	type of LN inst is ambiguous	Ed2	9.3.5	Table 17
1118	RptEnabled definition	Ed2	9.3.8	
1147	Filehandling service capability	Ed2	9.3.2	Table 11
1195	Typographical error	Ed2	9.3.2	
1208	IP V6 address format	IntOp2	A.5	
1284	SCSM mapping may require a communication section in an ICD file	Ed2	7	
1298	How to differentiate preconfigured Report data sets from those generated by the system tool	Ed2	9.3.2	Table 11
1304	Error in SCL object model	Ed2		Figure 6
1318	SSD will not validate against XSD	Ed2	9.2.6	Note 2
1327	SICS: import of SCD by IED tool	Ed2	Annex G	Table G.1
1328	Limitation of the size of identifiers	Ed2	9.5.2, 9.5.3, 9.5.6	
1354	Changes to SICS	Ed2	Annex G	Tables G.1, G.2
1359	Replace "c37_238" with "61850-9-3"	Ed2	9.3.2	
1365	Need to tighten up the XSD in regards to IED name usage	IntOp2	9.2.6	3
1395	Client LN attributes	IntOp2	9.3.8	
1396	The use and configuration flow of LGOS and LSVS is Unclear	Ed2	9.3.2	Table 11
1397	Subscription limitation visible in IxD file	Ed2	Annex G	
1398	originalSclVersion management in SCT	Ed2	9.3.2	
1402	Extref during engineering	Ed2	9.3.13, Annex H(new)	
1415	SICS-S110 IID import mandatory	Ed2	Annex G	Table G.2
1419	Support of ldName on other IEDs	Ed2	Annex G	Table G.1
1434	Add capability to change nofASDU is missing	Ed2	9.3.2	Table 11
1444	Need to support fixed and SCT controlled data sets	Ed2		
1445	ConfReportControl and a fixed reportSettings	Ed2	9.3.2	
1447	Restriction on EnumTypes in SCL	Ed2		
1448	Not possible to determine the restriction on number of BRCBs if rptMod=both	Ed2		
1450	originalSclXxx computation rules	IntOp2	9.3.2	
1457	Multiple DOI nodes with the same name	Ed2		
1458	New ExtRef attributes for later binding	Ed2		

The committee has decided that the contents of the base publication and its amendment 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 61850 specifies a description language for the configuration of power utility IEDs. This language is called System Configuration description Language (SCL). It is used to describe IED configurations and communication systems according to IEC 61850-5 and IEC 61850-7-x. It allows the formal description of the relations between the utility automation system and the process (substation, switch yard). At the application level, the switch yard topology itself and the relation of the switch yard structure to the SAS functions (logical nodes) configured on the IEDs can be described.

While this part describes the language to describe the configuration of IEC 61850 systems, other parts of the standard describe how to configure the system and possible restrictions. Therefore implementations claiming conformance to this standard shall take into account constraints from the other normative references. Some references to the other parts have been included for the purpose of clarification but these references are not all inclusive.

NOTE   The process description, which is in this standard restricted to switch yards and general process functions, will be enhanced by appropriate add-ons for wind mills, hydro plants and distributed energy resources (DER).

SCL allows the description of an IED configuration to be passed to a communication and application system engineering tool, and to pass back the whole system configuration description to the IED configuration tool in a compatible way. Its main purpose is to allow the interoperable exchange of communication system configuration data between an IED configuration tool and a system configuration tool from different manufacturers.

IEC 61850-8-x and IEC 61850-9-x, which concern the mapping of IEC 61850-7-x to specific communication stacks, may extend these definitions according to their need with additional parts, or simply by restrictions on the way the values of objects have to be used.

COMMUNICATION NETWORKS AND SYSTEMS
FOR POWER UTILITY AUTOMATION –

Part 6: Configuration description language for communication in power utility automation systems related to IEDs

1   Scope

1.1   General

This part of IEC 61850 specifies a file format for describing communication-related IED (Intelligent Electronic Device) configurations and IED parameters, communication system configurations, switch yard (function) structures, and the relations between them. The main purpose of this format is to exchange IED capability descriptions, and SA system descriptions between IED engineering tools and the system engineering tool(s) of different manufacturers in a compatible way.

The defined language is called System Configuration description Language (SCL). The IED and communication system model in SCL is according to IEC 61850-5 and IEC 61850-7-x. SCSM specific extensions or usage rules may be required in the appropriate parts.

The configuration language is based on the Extensible Markup Language (XML) version 1.0 (see XML references in Clause 2).

This standard does not specify individual implementations or products using the language, nor does it constrain the implementation of entities and interfaces within a computer system. This part of the standard does not specify the download format of configuration data to an IED, although it could be used for part of the configuration data.

1.2   Namespace name and version

This new section is mandatory for any IEC 61850 namespace (as defined by IEC 61850-7-1:2011).

The parameters which are identifying this new release of the SCL namespace `xmlns:scl="http://www.iec.ch/61850/2003/SCL"` are:

- Namespace Version: 2007
- Namespace Revision: B
- Namespace Release: 4
- Namespace release date: 2018/01/22

The table below provides an overview of all published versions of this namespace.

Edition	Publication date	Webstore	Namespace
Edition 1.0	2004-03	IEC 61850-6:2004	IEC 61850-6:2003
Edition 2.0	2009-12	IEC 61850-6:2009	IEC 61850-6:2007B
Amendment 1 of Edition 2.0	2018	IEC 61850-6:2009/AMD1:2018	IEC 61850-6:2007B4
Edition 2.1	2018	IEC 61850-6:2009+AMD1:2018 CSV	IEC 61850-6:2007B4

1.3   Code Component distribution

The Code Components included in this IEC standard are also available as electronic machine readable file at:
http://www.iec.ch/tc57/supportdocuments/IEC_61850-6.2018.SCL.2007B4.full.zip

The Code Component(s) included in this IEC standard are potentially subject to maintenance works and user shall select the latest release in the repository located at:
http://www.iec.ch/tc57/supportdocuments

The latest version/release of the document will be found by selecting the file IEC_61850-6.2018.SCL.{VersionStateInfo}.full.zip with the filed VersionStateInfo of the highest value.

Each Code Component is a ZIP package containing the electronic representation of the Code Component itself, with a file describing the content of the package (IECManifest.xml).

The IECManifest contains different sections giving information on:

– The copyright notice

– The identification of the code component

– The publication related to the code component

– The list of the electronic files which compose the code component

– An optional list of history files to track changes during the evolution process of the code component

The IECManifest related to this publication is:

```xml
<IECManifest xmlns="http://www.iec.ch/CC/2017/IECManifest" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.iec.ch/CC/2017/IECManifest IECManifest.xsd">
    <Copyright>
        <Notice>
            COPYRIGHT (c) IEC, 2017. This version of this XSD is part of IEC 61850-6:2009/AMD1:2018; see the IEC 61850-6:2009/AMD1:2018 for full legal notices. In case of any differences between the here-below code and the IEC published content, the here-below defintion supersedes the IEC publication; it may contain updates. See history files. The whole document has to be taken into account to have a full description of this code component.
            See www.iec.ch/CCv1 for copyright details.
        </Notice>
        <License uri="www.iec.ch/CCv1">IEC License</License>
    </Copyright>
    <CodeComponent id="IEC_61850-6.2007B4.SCL.XSD" name="IEC 61850-6 SCL schema V2007B4" content="full" date="2018-01-22">
        <Publication name="IEC_61850-6.2018_ed2.1" comment="Configuration description language for communication in power utility automation systems related to IEDs"/>
        <File name="SCL.xsd" category="normative" content="full"/>
        <File name="SCL_Substation.xsd" category="normative" content="full"/>
        <File name="SCL_Communication.xsd" category="normative" content="full"/>
        <File name="SCL_IED.xsd" category="normative" content="full"/>
        <File name="SCL_DataTypeTemplates.xsd" category="normative" content="full"/>
        <File name="SCL_BaseTypes.xsd" category="normative" content="full"/>
        <File name="SCL_BaseSimpleTypes.xsd" category="normative" content="full"/>
        <File name="SCL_Enums.xsd" category="normative" content="full"/>
        <File name="SCL.Doc.HTML.zip" category="normative" content="full" comment="Zip archive containing the HTML documentation of the SCL. Contains the 'SCL.html' file and all related pictures"/>
        <HistoryFile name="history.2007B4.txt" startingDate="2014-06-11" endingDate="2017-07-05" startingVersion="SCL.XSD.v2007B" endingVersion="SCL.XSD.v2007B4"/>
    </CodeComponent>
</IECManifest>
```

The package is identified using the following naming rule:
{RefStandard}.{CodeComponentName}.{VersionRevision}.{LightFull}{PublicationStage}.zip
For current publication, the Code Component package name is:
IEC_61850-6.2018.SCL.2007B4.full.zip

The life cycle of a code component is not restricted to the life cycle of the related publication. The publication life cycle goes through two stages, Version (corresponding to an edition) and Revision (corresponding to an amendment). A third publication stage (Release) allow publication of Code Component without need to publish an amendment.

This is useful when InterOp Tissues need to be fixed. Then a new release of the Code Component will be released, which supersedes the previous release, and distributed through the IEC TC57 web site.

2   Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

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

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

IEC 61850-5, *Communication networks and systems for power utility automation – Part 5: Communication requirements for functions and device models*

IEC 61850-7-1:2011, *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 61850-8-1, *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 61850-9-2, *Communication networks and systems for power utility automation – Part 9-2: Specific communication service mapping (SCSM) – Sampled values over ISO/IEC 8802-3*

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

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

ISO/IEC 8859-1, *Information technology – 8-bit single-byte coded graphic character sets – Part 1: Latin alphabet No. 1*

RFC 1952, GZIP *file format specification version 4.3,* RFC, available at <http://www.ietf.org/rfc/rfc1952.txt>

RFC 2045, *Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies*, RFC, available at <http://www.ietf.org/rfc/rfc2045.txt>

Extensible Markup Language (XML) 1.0, W3C, available at <http://www.w3.org/TR/2000/REC-xml-20001006>

XML Schema Part 1: Structures, W3C, available at <http://www.w3.org/TR/2001/REC-xmlschema-1-20010502>

XML Schema Part 2: Datatypes, W3C, available at <http://www.w3.org/TR/2001/REC-xmlschema-2-20010502/>