

SLOVENSKI STANDARD
SIST EN 61850-6:2010/A1:2018
01-december-2018

Komunikacijska omrežja in sistemi v postajah - 6. del: Jezik za opisovanje konfiguracije za komunikacijo v postajah z inteligentnimi elektronskimi napravami (IED) - Dopolnilo A1

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

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 elektrischen Geräten (IED)

SIST EN 61850-6:2010/A1:2018
<https://standards.ich.at/catalog/standards/sist/61850-6-2010-a1-2018>
Système 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)

Ta slovenski standard je istoveten z: EN 61850-6:2010/A1:2018

ICS:

29.240.30	Krmilna oprema za elektroenergetske sisteme	Control equipment for electric power systems
33.200	Daljinsko krmiljenje, daljinske meritve (telemetrija)	Telecontrol. Telemetry

SIST EN 61850-6:2010/A1:2018 en

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EUROPEAN STANDARD

EN 61850-6:2010/A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2018

ICS 33.200

English Version

Communication networks and systems for power utility
automation - Part 6: Configuration description language for
communication in power utility automation systems related to
IEDs
(IEC 61850-6:2009/A1:2018)

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)
(IEC 61850-6:2009/A1:2018)

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/A1:2018)

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This amendment A1 modifies the European Standard EN 61850-6:2010; it was approved by CENELEC on 2018-07-12. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 CEN-CENELEC Management Centre or to any CENELEC member.

<https://standards.iteh.ai/catalog/standards/sist/c3cf651c-d62a-4593-b7f9-334a7efbda7c/sist-en-61850-6-2010-a1-2018>

This amendment 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN 61850-6:2010/A1:2018 (E)**European foreword**

The text of document 57/1918/FDIS, future edition 2 of IEC 61850-6/A1, prepared by IEC/TC 57 "Power systems management and associated information exchange" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61850-6:2010/A1:2018.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2019-04-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-07-12

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

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Endorsement notice

SIST EN 61850-6:2010/A1:2018

The text of the International Standard IEC 61850-6:2009/A1:2018 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Add the following references:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61850-4	-	Communication networks and systems for power utility automation -- Part 4: System and project management	EN 61850-4	-
IEC/IEEE 61850-9-3	-	Communication networks and systems for power utility automation - Part 9-3: Precision time protocol profile for power utility automation	-	-

<https://standards.iec/catalog/standards/sist/c3cf651c-d62a-4593-b7f9-334a7efbda7c/sist-en-61850-6-2010-a1-2018>

Replace the existing reference to IEC 61850-7-1 with the following new reference:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61850-7-1	2011	Communication networks and systems for power utility automation -- Part 7-1: Basic communication structure - Principles and models	EN 61850-7-1	2011

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IEC 61850-6

Edition 2.0 2018-06

INTERNATIONAL STANDARD



AMENDMENT 1

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

[SIST EN 61850-6:2010/A1:2018](https://standards.iteh.ai/catalog/standards/sist/c3cf651c-d62a-4593-b7f9-334a7efbda7c/sist-en-61850-6-2010-a1-2018)

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.200

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Warning! Make sure that you obtained this publication from an authorized distributor.

FOREWORD

This amendment has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

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

FDIS	Report on voting
57/1918/FDIS	57/1940/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

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>.

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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.

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

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 Amendment 1 aims to amend the original content of IEC 61850-6:2009 and to correct its content in order ensure a better interoperability of the components implementing it.

This Amendment 1 brings two distinct sets of changes

- 1) Resolved Interop Issues (covered by Clause 3 of this Amendment 1) 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 (Technical Issues) (covered by Clause 4 of this Amendment 1) 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 Amendment 1 strictly respects the scope of the original edition.

Because some of the corrected issues may have a widespread impact on many pages of the original standard, a complete consolidation of these changes into IEC 61850-6:2009 is circulated through the reference 57/xxxx/INF, which reflects the content of IEC 61850-6:2009 as amended by this Amendment 1.

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 in this Amendment 1 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	

N°	Subject	Cat	Clause	Paragraph
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	
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	Annex 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
1328	Limitation of the size of identifiers	IntOp2	9.5.2, 9.5.3, 9.5.6	
1354	Changes to SICS	Ed2	Annex G	
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	originalSciVersion management in SCT	Ed2	9.3.2	
1402	Extref during engineering	Ed2	9.3.13, Annex H(new)	

N°	Subject	Cat	Clause	Paragraph
1415	SICS-S110 IID import mandatory	Ed2	Annex G	Table G.2
1419	Support of IdName 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	Table 11
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		

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SIST EN 61850-6:2010/A1:2018

<https://standards.iteh.ai/catalog/standards/sist/c3cf51c-d62a-4593-b7f9-334a7efbda7c/sist-en-61850-6-2010-a1-2018>

INTRODUCTION

Add, after the first paragraph of the Introduction, the following new paragraph:

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.

1 Scope

Replace the existing text of the Scope with the following new text:

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:

```
<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 definition 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.
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    <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"/>
  </CodeComponent>
</IECManifest>
```

```

<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

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Add the following two new references:

IEC 61850-4, *Communication networks and systems for power utility automation – Part 4: System and project management* [SIST EN 61850-6:2010/A1:2018](#)

[https://standards.iteh.ai/catalog/standards/sist/c3cf651c-d62a-4593-b7f9-](https://standards.iteh.ai/catalog/standards/sist/c3cf651c-d62a-4593-b7f9-334a7e84d7c/sist-en-61850-6-2010-a1-2018)

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

Replace the existing reference to IEC 61850-7-1 with the following new reference:

IEC 61850-7-1:2011, *Communication networks and systems for power utility automation – Part 7-1: Basic communication structure – Principles and models*

5 Intended engineering process with SCL

5.3 Use of SCL in the engineering process

Add, after the first sentence of the second paragraph of 5.3, the following new sentence:

Clause 10 provides more details about the engineering rights of the tool roles.

6 The SCL object model

6.1 General

Replace the existing text of the first numbered point in the fifth paragraph by the following:

- 1) Substation / Line / Process: this part describes the primary process related functions and devices like switch yard, respectively any primary process in the functional view according to IEC 81346-1, electrical connections on single line level (topology), and the designation of equipment and functions;

Replace existing Figure 6 with the following new Figure 6:

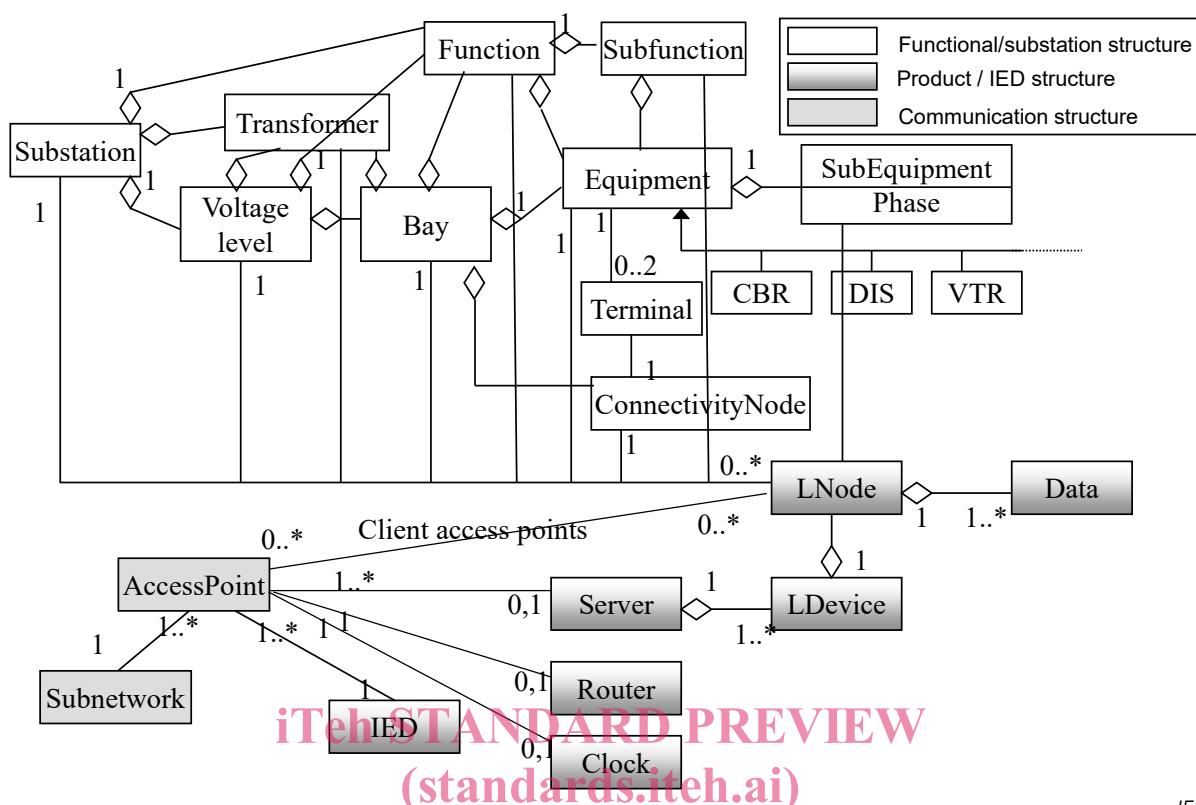


Figure 6 – SCL Substation object model

6.2 The substation model

Replace the existing title and text of Subclause 6.2 with the following new title and text:

6.2 The process model

The process model (upper part of Figure 6 for substations) is an object hierarchy based on the functional structure of the primary process. A special primary process is the Substation, which has its own SCL element. Another is the Line, which connects electrically bays of substations. The generic *Process* element shall be used to model any additionally needed structuring levels of a power grid above the substation and for all other primary processes. Although each object is self-contained, its reference designation is derived from its place in the hierarchy. Because LNs perform functions within the complete context of the Process / Substation respective Line hierarchy, they can be attached as functional objects at each function level. Typically, a switch controller LN is attached to a switching device, while a measuring LN is attached to the bay, which delivers the measurands, and transformer-related LNs are attached to the appropriate transformer.

NOTE 1 In the CIM model measurands are allocated to primary device terminals. This is a topological allocation, while the allocation in SCL in first line serves functional naming. However, if the single line topology is modelled completely, by means of the transformers (VTR, CTR) and their data acquisition nodes (TVTR, TCTR) also some primary device terminal in the topology can be found to which the measurands belong according to the CIM model.

The purpose of the process model is

- to relate a logical node and its function to a function of or at the primary process (process part or substation part or line part or equipment or subequipment);
- to derive a functional designation for the logical node from the process structure.