AS IEC 61850.6:2025

IEC 61850-6:2009+AMD1:2018+AMD2:2024 CSV

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# Communication networks and systems for power utility automation

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



# AS IEC 61850.6:2025

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# Communication networks and systems for power utility automation

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

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(3) A Bibliography lists documents referenced in the Standard but not as part of requirements.

Many Standards include notes. Notes provide recommendations and/or guidance only. They never contain requirements.

# Contents

Page

**FOREWORD** ..... **xi**
**INTRODUCTION** ..... **xv**
**1 Scope** ..... **1**
1.1 General ..... 1
1.2 Published versions of the standard and related namespace names ..... 1
1.3 Identification of the namespace ..... 1
1.4 Code Component distribution ..... 2
**2 Normative references** ..... **2**
**3 Terms and definitions** ..... **3**
**4 Abbreviations** ..... **5**
**5 Intended engineering process with SCL** ..... **5**
5.1 General ..... 5
5.2 Scope of SCL ..... 6
5.3 Use of SCL in the Engineering process ..... 6
5.4 IED modifications ..... 8
5.5 Data exchange between projects ..... 9
**6 The SCL object model** ..... **11**
6.1 General ..... 11
6.2 The process model ..... 14
6.3 The product (IED) model ..... 15
6.4 The communication system model ..... 16
6.5 Modelling of redundancy ..... 17
6.6 Data flow modelling ..... 17
**7 SCL description file types** ..... **18**
**8 SCL language** ..... **20**
8.1 Specification method ..... 20
8.2 Language versions and compatibility ..... 22
8.2.1 MustUnderstand rules ..... 23
8.2.2 SCL name space and versions ..... 24
8.2.3 Incompatibilities to earlier versions ..... 25
8.3 SCL language extensions ..... 25
8.3.1 General ..... 25
8.3.2 Data model extensions ..... 26
8.3.3 Additional semantics to existing syntax elements ..... 26
8.3.4 Data type constraints ..... 26
8.3.5 XML name spaces ..... 26
8.3.6 Private data ..... 27
8.3.7 Another XML syntax ..... 28
8.3.8 Summary: Standard conformance for extension handling ..... 28
8.3.9 Extension example ..... 28
8.4 General structure ..... 29
8.5 Object and signal designation ..... 30
8.5.1 General ..... 30
8.5.2 Object designations in an object hierarchy ..... 30
8.5.3 Signal identifications to be used in the communication system ..... 31
8.5.4 Signal identifications usable by applications ..... 32
8.5.5 Naming example ..... 33
8.5.6 Universal Unique Identifier ..... 33
**9 The SCL syntax elements** ..... **34**
9.1 Header ..... 34
9.2 Process description ..... 38

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9.2.1 General ... 38
9.2.2 Voltage level ... 42
9.2.3 Bay level ... 44
9.2.4 Power equipment ... 45
9.2.5 SubEquipment level ... 54
9.2.6 Process function logical nodes ... 55
9.2.7 Non power equipment ... 56
9.2.8 Substation section example ... 58
9.3 IED description ... 60
9.3.1 General ... 60
9.3.2 The IED, Services and Access Point ... 62
9.3.3 The IED server ... 78
9.3.4 The logical device ... 79
9.3.5 LN0 and other Logical Nodes ... 80
9.3.6 Data object (DOI) definition ... 83
9.3.7 Data set definition ... 85
9.3.8 Report control block ... 88
9.3.9 Log control block ... 92
9.3.10 GSE control block ... 94
9.3.11 Sampled value control block ... 96
9.3.12 Setting control block ... 98
9.3.13 Binding to external signals ... 99
9.3.14 Associations ... 103
9.3.15 Binding to external controls ... 104
9.4 Communication system description ... 106
9.4.1 General ... 106
9.4.2 Subnetwork definition ... 107
9.4.3 Address definition ... 108
9.4.4 GSE address definition ... 109
9.4.5 SMV address definition ... 110
9.4.6 Physical connection parameters ... 110
9.4.7 Communication section example ... 111
9.5 Data type templates ... 112
9.5.1 General ... 112
9.5.2 LNodeType definitions ... 114
9.5.3 DO type definition ... 115
9.5.4 Data attribute (DA) definition ... 116
9.5.5 Data attribute structure type ... 122
9.5.6 Enumeration types ... 123
9.5.7 Data type template examples ... 124

**10 Tool and project engineering rights ... 124**
10.1 IED configurator ... 124
10.2 System configurator ... 125
10.3 Right transfer between projects ... 126

**Annex A** (normative) **SCL syntax: XML schema definition ... 128**

**Annex B** (informative) **SCL enumerations according to IEC 61850-7-3 and IEC 61850-7-4 ... 129**

**Annex C** (informative) **Syntax extension examples - Extension syntax for drawing layout coordinates ... 130**

**Annex D** (informative) **Example ... 133**

**Annex E** (informative) **SCL syntax: General XML schema definition ... 135**

**Annex F** (informative) **XML schema definition of SCL variants ... 199**

**Annex G** (normative) **SCL Implementation Conformance Statement (SICS) ... 205**

**Annex H** (informative) **ExtRef use cases ... 211**

**Annex I** (normative) **SCL - mixed version projects ... 222**

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**Bibliography ..... 244**

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# List of Figures

Page

Figure 1 – Reference model for information flow in the configuration process ..... 7
Figure 2 – IED type description to System Configurator ..... 8
Figure 3 – IED instance description to System Configurator ..... 8
Figure 4 – Modification process ..... 9
Figure 5 – Engineering right handling in projects ..... 10
Figure 6 – SCL Substation object model ..... 12
Figure 7 – SA System Configuration example ..... 13
Figure 8 – ICD files describing implementable IED types of a general IED class ..... 20
Figure 9 – UML diagram overview of SCL schema ..... 22
Figure 10 – Elements of the signal identification as defined in IEC 61850-7-2 ..... 31
Figure 11 – Elements of the signal name using product naming ..... 32
Figure 12 – Possible elements of the signal name using functional naming ..... 32
Figure 13 – Names within different structures of the object model ..... 33
Figure 14 – UML diagram of Header section ..... 34
Figure 25 – SCL file references ..... 36
Figure 26 – IED file references ..... 37
Figure 15 – UML diagram of Substation section ..... 39
Figure 24 – UML diagram of Process and Line elements ..... 41
Figure 16 – UML diagrams for equipment type inheritance and relations ..... 46
Figure 17 – Substation section example ..... 58
Figure 18 – IED structure and access points ..... 60
Figure 19 – UML description of IED-related schema part - Base ..... 61
Figure 20 – UML description of IED-related schema part for Control blocks ..... 61
Figure 21 – UML description of IED-related schema part - LN definition ..... 61
Figure 22 – UML diagram overview of the Communication section ..... 106
Figure 23 – UML overview of DataTypeTemplate section ..... 113
Figure C.1 – Coordinate example ..... 130
Figure D.1 – T1-1 Substation configuration ..... 133
Figure D.2 – T1-1 Communication configuration ..... 133
Figure D.3 – T1-1 Transformer bay ..... 134
Figure I.1 – Edition 1-Edition 2 - Area of compatibility ..... 222
Figure I.2 – Edition 1-Edition 2 Mixed engineering with different SCL versions ..... 224
Figure I.3 – Edition 1-Edition 2 Mixed engineering with different SCL versions with one SCT managing data flow restriction ..... 225
Figure I.4 – Edition 1-Edition 2 Mixed engineering with same SCL version - restricted to (Ed1∩Ed2)UEd2 ..... 226
Figure I.5 – Workflow with SED 2007B4 import following mustUnderstand/mayIgnore rules ..... 237
Figure I.6 – Workflow with ICT A imports SCD 2007B4 following the mustUnderstand rules ..... 237
Figure I.7 – Workflow with SCT exports SCD 2007B following the downgrading rules ..... 238

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# List of Tables

Page

Table 53 – Attributes of the IEC 61850-6 XML namespace ..... 2
Table 1 – The files composing the XML schema definition for SCL ..... 21
Table 2 – Attributes of the Private element ..... 27
Table 3 – Attributes of the Header element ..... 35
Table 54 – Attributes of the tSclFileUUIDReference element ..... 36
Table 4 – Attributes of the History item (Hitem) element ..... 38
Table 5 – Primary apparatus device type codes ..... 53
Table 6 – Attributes of the Terminal element ..... 54
Table 7 – Attributes of the SubEquipment element ..... 55
Table 8 – Attributes of the LNode element ..... 55
Table 9 – General Equipment codes from IEC 61850-7-4 ..... 58
Table 10 – Attributes of the IED element ..... 62
Table 11 – List of service capabilities and setting elements and attributes ..... 65
Table 12 – Attributes of the Access point element ..... 73
Table 50 – Usage of Service element at IED level and Server / ServerAt level ..... 74
Table 13 – Attributes of the IED server element ..... 78
Table 14 – Attributes of the Authentication element ..... 79
Table 15 – Attributes of the LDevice element ..... 79
Table 16 – Attributes of the LN0 element ..... 81
Table 17 – Attributes of the LN element ..... 82
Table 18 – Attributes of the DOI element ..... 84
Table 19 – Attributes of the DAI element ..... 84
Table 20 – Attributes of the SDI element ..... 85
Table 21 – Attributes of the DataSet element ..... 86
Table 22 – Attributes of the FCDA element ..... 86
Table 23 – Attributes of the report control block element ..... 88
Table 24 – Attributes of the RptEnabled element ..... 91
Table 25 – Attributes of the ClientLN element ..... 91
Table 26 – Attributes of the log control block element ..... 93
Table 27 – Attributes of the GSE control block element ..... 94
Table 28 – Attributes of the IEDName element ..... 95
Table 29 – Attributes of the sampled value control block element ..... 96
Table 30 – Attributes of the Smv Options element ..... 97
Table 31 – Deprecated Smv options ..... 98
Table 32 – Attributes of the setting control block element ..... 99
Table 33 – Attributes of the Input/ExtRef element ..... 101
Table 51 – Usage of ExtRef attributes in different use cases ..... 102
Table 34 – Attributes of the association element ..... 104
Table 55 – Attributes of the Outputs/ExtCtrl element ..... 105
Table 35 – Attributes of the Subnetwork element ..... 107
Table 36 – Attributes of the ConnectedAP element ..... 108
Table 37 – Attributes of the GSE element ..... 110
Table 38 – Attributes of the SMV element ..... 110
Table 39 – PhysConn P-Type definitions ..... 111
Table 40 – Template definition elements ..... 114
Table 41 – Attributes of the LNodeType element ..... 114
Table 42 – Attributes of the DO element ..... 115
Table 43 – Attributes of the DOType element ..... 115
Table 44 – Attributes of the SDO element ..... 116
Table 45 – Data type mapping ..... 116
Table 46 – Attribute value kind (valKind) meaning ..... 118
Table 47 – Attributes of the DA element ..... 119
Table 48 – Attributes of the BDA element ..... 123
Table 49 – Attributes of the EnumType element ..... 124
Table 52 – Allowed SCT engineering actions ..... 127
Table G.1 – IED configurator conformance statement ..... 205

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Table G.2 – System configurator conformance statement ..... 207

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**This consolidated version of the official IEC Standard and its amendments has been prepared for user convenience.**

**IEC 61850-6 edition 2.2 contains the second edition (2009-12) [documents 57/1025/FDIS and 57/1041/RVD], its amendment 1 (2018-06) [documents 57/1918/FDIS and 57/1940/RVD] and its amendment 2 (2024-11) [documents 57/2711/FDIS and 57/2733/RVD].**

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

This second amendment constitutes a technical revision.

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The main changes with respect to IEC 61850-6:2009+AMD1:2018 are as follows:

a) functional extensions concerning the engineering process to improve files exchange follow up, SCL elements identification and control configuration handling, added;

b) provision of clarifications and corrections. Issues that require clarification are published in a database available at https://iec61850.tissue-db.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 labelled in this standard as a Code Component. In the current version of this document, such indication is made at the beginning of Annex A which identifies the list of XSD files and refers to the code component definition in Subclause 1.3.

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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 led to interoperability issues.

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

The only new features compared to the previous IEC 61850-6:2009+AMD1:2018 are the introduction of the UUID to identify elements and files, the modelling of controls binding from a client perspective, and the definition of translated labels for elements which may be represented in any user interface. Apart from this, this consolidated edition strictly respects the scope of the original edition.

**Technical issues summary**

NA, Subject, Clause and Paragraph are as they appear on the Tissue database hosted at https://iec61850.tissue-db.com/ where all technical issues have been stored from the origin ofIEC 61850.

"Subject" defines very briefly the topic under focus.

The Tissues which have been considered are:

| NA | Subject | Clause | Paragraph |
|---|---|---|---|
| 1590 | RCB: Offline changes increment ConfRev by 10000? | 9.3.8 | Table 23 |
| 1647 | SDO@count definition inconsistent | 9.5.3 | Table 44 |
| 1648 | DA@count definition needs restriction | 9.5.4.1 | Table 47 |
| 1669 | Incorrect example of header | 9.1 | 1 |
| 1672 | Allow connection Server and ServerAt to the same SCL.Subnetwork | 9.3.2 | Below Table 50 |
| 1674 | Harmonization with 62351-6 | 9.3.2 | Services Element |
| 1675 | SCSM support capability - Harmonization with 62351-6 | 9.3.2 | Services |

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| NA | Subject | Clause | Paragraph |
|---|---|---|---|
| 1683 | ICD file for IED functionality spanning for multiple VL and BAY | 9.2.1 | The name value is also a global identification of |
| 1708 | Presence of Sample Mode field not controllable through SmvOpts | 9.3.11 | Smv Options element |
| 1729 | Incorrect SCL example in (informative) Annex | D.2 | 2 |
| 1734 | Improved schema validation | A.5 | 1 |
| 1740 | Exceptions of enumeration types for IEC 61850-7-4 | 9.5.6 | last in 9.5.6 |
| 1745 | Definition of type and id in DataTypeTemplates not consistent | 9.5.6 | Table 49 |
| 1768 | Server associate-request has no SCL parameters | 9.3.2 | Table 11 |
| 1771 | SCL Services ReportControl max vs. Indexed | 9.3.8 | 8 |
| 1774 | Missing description of KDC | 9.3.2 | 4 |
| 1786 | Downgrade of SCD Exports not Mandatory | Annex G | Table G.2 |
| 1787 | There is no clear mapping of all 7-2 ACSI type to SCL basic types | 9.5.4.2 | 1 |
| 1808 | Please clarify if ix first index is 0 or 1 | 9.3.6 Data object (DOI) definition | Table 19 and Table 20 |
| 1813 | Typo "Valkind" | 9.5.4.1 | Table 46 |
| 1816 | Add SICS statement for xsi:type usage in P elements | 9.4.3<br>Annex G | 7<br>Table G.1 and G.2 |
| 1818 | Clarification of ExtRef attributes usage | 9.3.13 | Table 51 |
| 1823 | Clarify iedType attribute usage in DataTypeTemplates | 9.5.1 | 2 |
| 1831 | ldInst reference should concretized | 9.3.7 | Table 22 |
| 1832 | SICS I45 not clear enough | Annex G | Table G.1 |
| 1833 | Service SettingGroups.ConfSG clarification | 9.3.2 | Table 11 |
| 1834 | SICS I211 text not inline with Service section | Annex G | Table G.1 |
| 1839 | Not clear definition of lnInst to LN0 type elements | 9.3.5 | 5 |
| 1843 | SCT handle different OriginalSclXxx and SCL version/revision/release | 9.3.2<br>I.4.3.3 | G.1 |
| 1854 | SupSubscription | 9.3.2 | Table 11 |
| 1885 | sAddr length | I.5.3.5 | 1 |
| 1886 | Part 6 - Typo in Abbreviation | 4 | ICT |

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed
- withdrawn,
- replaced by a revised edition, or
- amended.

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# INTRODUCTION

This part of IEC 61850 specifies a description language for the configuration of electrical substation 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 61850-8-1 and IEC 61850-9-2, 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.

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# Australian Standard®

# Communication networks and systems for power utility automation

## Part 6: Configuration description language for communication in electrical substations 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 Published versions of the standard and related namespace names

The table below provides a reference between all published editions, amendments or corrigenda of this document and the full name of the 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 |
| Amendment 2 of Edition 2.0 | 2024 | IEC 61850-6:2009/AMD2:2023 | IEC 61850-6:2007C5 |
| Edition 2.2 | 2024 | IEC 61850-6:2009+AMD2:2023 CSV | IEC 61850-6:2007C5 |

### 1.3 Identification of the namespace

The namespace associated with this document is an XML schema (XSD) for the System Configuration Language (SCL). The parameters which are identifying the namespace are provided in Table 53:

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**Table 53 — Attributes of the IEC 61850-6 XML namespace**

| Attribute | Content |
|---|---|
| **Namespace nameplate** | |
| Namespace Identifier (xmlns) | http://www.iec.ch/61850/2003/SCL |
| Version | 2007 |
| Revision | C |
| Release | 5 |
| XSD version header attribute | 2007C5 |
| Code Component Name | IEC_61850-6.SCL.2007C5.Full |

## 1.4 Code Component distribution

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 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 in case of urgent fixes of InterOp Tissues, thus without need to publish an amendment.

Consequently, new releases of the Code Component may be released, which supersedes the previous release, and will be distributed through the IEC TC57 web site at: https://www.iec.ch/tc57/supportdocuments

The latest version/release of the code component will be found by selecting the file for the code component with the highest value for VersionStateInfo, e.g. IEC_61850-6.SCL.{VersionStateInfo}.full.zip.

The code component associated to this document is an XML schema file (XSD). It is available as a full version only. It is freely accessible on the IEC website for download at https://www.iec.ch/tc57/supportdocuments, but the usage remains under the licensing conditions.

In case of any differences between the downloadable code component and the IEC pdf published content, the downloadable code component is the valid one; it may be subject to updates. See included history files.

# 2 Normative references

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.

IEC 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 in substations – 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 in substations – Part 7-2: Basic communication structure for substation and feeder equipment – Abstract communication service interface (ACSI)*

IEC 61850-7-3, *Communication networks and systems in substations – Part 7-3: Basic communication structure for substation and feeder equipment – Common data classes*

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