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

FOREWORD ........................................................................................................................... 7

INTRODUCTION .................................................................................................................. 12
1 Scope .................................................................................................................................. 13
   1.1 General .................................................................................................................... 13
   1.2 Namespace name and version ............................................................................... 13
   1.3 Code Component distribution ............................................................................. 14
2 Normative references ..................................................................................................... 15
3 Terms and definitions ....................................................................................................... 16
4 Abbreviations .................................................................................................................... 17
5 Intended engineering process with SCL ........................................................................ 18
   5.1 General .................................................................................................................... 18
   5.2 Scope of SCL .......................................................................................................... 18
   5.3 Use of SCL in the engineering process ............................................................... 19
   5.4 IED modifications ................................................................................................. 22
   5.5 Data exchange between projects ....................................................................... 23
6 The SCL object model ..................................................................................................... 26
   6.1 General .................................................................................................................... 26
   6.2 The process model ................................................................................................. 29
   6.3 The product (IED) model ..................................................................................... 30
   6.4 The communication system model ...................................................................... 31
   6.5 Modelling of redundancy .................................................................................... 32
   6.6 Data flow modelling ............................................................................................. 33
7 SCL description file types .............................................................................................. 33
8 SCL language .................................................................................................................. 35
   8.1 Specification method ............................................................................................. 35
   8.2 Language versions and compatibility .................................................................. 38
      8.2.1 MustUnderstand rules .................................................................................. 39
      8.2.2 SCL name space and versions ..................................................................... 40
      8.2.3 Incompatibilities to earlier versions .............................................................. 41
   8.3 SCL language extensions ....................................................................................... 41
      8.3.1 General ............................................................................................................ 41
      8.3.2 Data model extensions .................................................................................. 42
      8.3.3 Additional semantics to existing syntax elements ....................................... 42
      8.3.4 Data type constraints .................................................................................... 42
      8.3.5 XML name spaces ......................................................................................... 42
      8.3.6 Private data .................................................................................................... 43
      8.3.7 Another XML syntax .................................................................................... 44
      8.3.8 Summary: Standard conformance for extension handling ......................... 44
      8.3.9 Extension example ........................................................................................ 44
   8.4 General structure ...................................................................................................... 44
   8.5 Object and signal designation ................................................................................. 45
      8.5.1 General ............................................................................................................ 45
      8.5.2 Object designations in an object hierarchy .................................................. 45
      8.5.3 Signal identifications to be used in the communication system .................. 46
      8.5.4 Signal identifications usable by applications ............................................... 48
IEC 61850-6:2009+AMD1:2018 CSV

8.5.5 Naming example ................................................................. 49

9 The SCL syntax elements .......................................................... 49

9.1 Header ................................................................................. 49

9.2 Process description ............................................................... 52

9.2.1 General .............................................................................. 52

9.2.2 Voltage level ....................................................................... 57

9.2.3 Bay level ............................................................................. 58

9.2.4 Power equipment ............................................................... 59

9.2.5 SubEquipment level ........................................................... 66

9.2.6 Process function logical nodes ........................................... 67

9.2.7 Non power equipment ....................................................... 68

9.2.8 Substation section example ............................................... 69

9.3 IED description ..................................................................... 71

9.3.1 General .............................................................................. 71

9.3.2 The IED, Services and Access Point .................................. 75

9.3.3 The IED server ................................................................. 87

9.3.4 The logical device .............................................................. 88

9.3.5 LN0 and other Logical Nodes ............................................. 89

9.3.6 Data object (DOI) definition ............................................. 91

9.3.7 Data set definition ............................................................. 94

9.3.8 Report control block ......................................................... 96

9.3.9 Log control block ............................................................. 99

9.3.10 GSE control block .......................................................... 100

9.3.11 Sampled value control block ......................................... 102

9.3.12 Setting control block ...................................................... 104

9.3.13 Binding to external signals ............................................. 105

9.3.14 Associations .................................................................... 109

9.4 Communication system description ...................................... 110

9.4.1 General .............................................................................. 110

9.4.2 Subnetwork definition ....................................................... 111

9.4.3 Address definition ............................................................ 113

9.4.4 GSE address definition ..................................................... 114

9.4.5 SMV address definition ...................................................... 115

9.4.6 Physical connection parameters ....................................... 115

9.4.7 Communication section example ....................................... 116

9.5 Data type templates ................................................................ 117

9.5.1 General .............................................................................. 117

9.5.2 LNodeType definitions ..................................................... 119

9.5.3 DO type definition ............................................................ 120

9.5.4 Data attribute (DA) definition ........................................... 122

9.5.5 Data attribute structure type ............................................. 126

9.5.6 Enumeration types .......................................................... 128

9.5.7 Data type template examples .......................................... 129

10 Tool and project engineering rights ........................................ 129

10.1 IED configurator ................................................................. 129

10.2 System configurator ............................................................ 130

10.3 Right transfer between projects ......................................... 130

Annex A (normative) SCL syntax: XML schema definition ............. 133
Table 15 – Attributes of the LDevice element ........................................................................ 89
Table 16 – Attributes of the LN0 element .............................................................................. 90
Table 17 – Attributes of the LN element ................................................................................ 91
Table 18 – Attributes of the DOI element .............................................................................. 92
Table 19 – Attributes of the DAI element .............................................................................. 93
Table 20 – Attributes of the SDI element ............................................................................... 93
Table 21 – Attributes of the DataSet element ......................................................................... 94
Table 22 – Attributes of the FCDA element ........................................................................... 95
Table 23 – Attributes of the report control block element ....................................................... 96
Table 24 – Attributes of the RptEnabled element ................................................................... 98
Table 25 – Attributes of the ClientLN element ....................................................................... 98
Table 26 – Attributes of the log control block element ........................................................... 100
Table 27 – Attributes of the GSE control block element ......................................................... 101
Table 28 – Attributes of the IEDName element ..................................................................... 102
Table 29 – Attributes of the sampled value control block element ....................................... 103
Table 30 – Attributes of the Smv Options element .................................................................. 104
Table 31 – Deprecated Smv options ................................................................................... 104
Table 32 – Attributes of the setting control block element ................................................... 105
Table 33 – Attributes of the Input/ExtRef element ................................................................ 107
Table 34 – Attributes of the association element ................................................................... 110
Table 35 – Attributes of the Subnetwork element .................................................................. 112
Table 36 – Attributes of the ConnectedAP element ............................................................. 113
Table 37 – Attributes of the GSE element ........................................................................... 114
Table 38 – Attributes of the SMV element ........................................................................... 115
Table 39 – PhysConn P-Type definitions ............................................................................. 116
Table 40 – Template definition elements ............................................................................. 119
Table 41 – Attributes of the LNodeType element ................................................................... 120
Table 42 – Attributes of the DO element ............................................................................. 120
Table 43 – Attributes of the DOType element ...................................................................... 121
Table 44 – Attributes of the SDO element ........................................................................... 121
Table 45 – Data type mapping ............................................................................................ 122
Table 46 – Attribute value kind (Valkind) meaning ............................................................... 123
Table 47 – Attributes of the DA element .............................................................................. 124
Table 48 – Attributes of the BDA element ............................................................................ 127
Table 49 – Attributes of the EnumType element .................................................................. 128
Table 50 – Usage of Service element at IED level and Server / ServerAt level ....................... 85
Table 51 – Usage of ExtRef attributes in different use cases ................................................ 108
Table 52 – Allowed SCT engineering actions ....................................................................... 132
Table G.1 – IED configurator conformance statement ......................................................... 240
Table G.2 – System configurator conformance statement .................................................... 242
INTERNATIONAL ELECTROTECHNICAL COMMISSION

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.

2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.

3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.

4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.

5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.

6) All users should ensure that they have the latest edition of this publication.

7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.

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.

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

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:

<table>
<thead>
<tr>
<th>N°</th>
<th>Subject</th>
<th>Cat</th>
<th>Clause</th>
<th>Paragraph</th>
</tr>
</thead>
<tbody>
<tr>
<td>658</td>
<td>Tracking related features</td>
<td>IntOp2</td>
<td>Annex A</td>
<td></td>
</tr>
<tr>
<td>660</td>
<td>XML encoding header repeat</td>
<td>Ed2</td>
<td>Annex A.4</td>
<td></td>
</tr>
<tr>
<td>663</td>
<td>FCDA element cannot be a “functionally constrained logical node”</td>
<td>IntOp2</td>
<td>9.3.7</td>
<td>Table 22</td>
</tr>
<tr>
<td>668</td>
<td>Modeling of autotransformer</td>
<td>IntOp2</td>
<td>9.2.4</td>
<td></td>
</tr>
<tr>
<td>678, 699</td>
<td>DO type description table</td>
<td>Ed2</td>
<td></td>
<td>Table 43</td>
</tr>
<tr>
<td>687</td>
<td>ResvTms attribute at the SGCB</td>
<td>Ed2</td>
<td>9.3.12</td>
<td></td>
</tr>
<tr>
<td>719</td>
<td>ConfDataSet maxAttributes defineds FCDA elements in data set</td>
<td>IntOp2</td>
<td>9.3.2</td>
<td>Table 11</td>
</tr>
<tr>
<td>721</td>
<td>Log element name</td>
<td>IntOp2</td>
<td>9.3.5</td>
<td></td>
</tr>
<tr>
<td>731</td>
<td>SCL example inconsistent</td>
<td>Ed2</td>
<td>9.3.4§</td>
<td></td>
</tr>
<tr>
<td>752</td>
<td>Input section naming</td>
<td>Ed2</td>
<td>9.3.13</td>
<td></td>
</tr>
<tr>
<td>768</td>
<td>bType VisString65 is missing</td>
<td>IntOp2</td>
<td>Annex A</td>
<td></td>
</tr>
<tr>
<td>779</td>
<td>Relative object references</td>
<td>IntOp2</td>
<td>9.5.4.1</td>
<td></td>
</tr>
<tr>
<td>787</td>
<td>SICS I45 inconsistency</td>
<td>Ed2</td>
<td>Annex G</td>
<td></td>
</tr>
<tr>
<td>788</td>
<td>SICS S56 from optional to mandatory</td>
<td>IntOp2</td>
<td>Annex G</td>
<td></td>
</tr>
<tr>
<td>789</td>
<td>ConfldName for services applies to client and server</td>
<td>IntOp2</td>
<td>9.3.2</td>
<td>Table 11</td>
</tr>
<tr>
<td>804</td>
<td>valKind and IED versus system configurator</td>
<td>IntOp2</td>
<td>9.5.4.1</td>
<td></td>
</tr>
<tr>
<td>806</td>
<td>Max length of log name inconsistent to part 7-2</td>
<td>Ed2</td>
<td>Annex A</td>
<td>SCL_BaseSimpleTypes</td>
</tr>
<tr>
<td>807</td>
<td>Indicate if ‘owner’ is present in RCB</td>
<td>Ed2</td>
<td>9.3.2</td>
<td>Table 11</td>
</tr>
<tr>
<td>823</td>
<td>valKind for structured data attributes</td>
<td>IntOp2</td>
<td>9.5.4.1</td>
<td></td>
</tr>
<tr>
<td>824</td>
<td>Short addresses at structured data attributes</td>
<td>IntOp2</td>
<td>9.3.6, 9.5.4.1</td>
<td></td>
</tr>
<tr>
<td>825</td>
<td>Floating point values</td>
<td>IntOp2</td>
<td>9.5.4.1</td>
<td>Table 45</td>
</tr>
<tr>
<td>845</td>
<td>SGCB ResvTms</td>
<td>IntOp2</td>
<td>9.3.2</td>
<td>Table 11</td>
</tr>
<tr>
<td>853</td>
<td>SBO and ProtNs</td>
<td>IntOp2</td>
<td>9.5.5</td>
<td></td>
</tr>
<tr>
<td>855</td>
<td>recursive SubFunction</td>
<td>Ed2</td>
<td>9.2.7</td>
<td></td>
</tr>
<tr>
<td>856</td>
<td>Voltage level frequency and phases</td>
<td>Ed2</td>
<td>9.2.2</td>
<td></td>
</tr>
<tr>
<td>857</td>
<td>Function/SubFunction for primary equipment</td>
<td>Ed2</td>
<td>9.2.4</td>
<td></td>
</tr>
<tr>
<td>873</td>
<td>Examples for “curvpts”</td>
<td>Ed2</td>
<td>9.3.6</td>
<td>end of paragraph</td>
</tr>
<tr>
<td>886</td>
<td>Missing 8-1 P-Types</td>
<td>Ed2</td>
<td>Annex A</td>
<td></td>
</tr>
<tr>
<td>N°</td>
<td>Subject</td>
<td>Cat</td>
<td>Clause</td>
<td>Paragraph</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>901</td>
<td>tServices at Ap and at IED</td>
<td>Ed2</td>
<td>9.3.2</td>
<td>below Table 12</td>
</tr>
<tr>
<td>936</td>
<td>SupSubscription parameter usage is difficult</td>
<td>IntOp2</td>
<td>9.3.2</td>
<td>Table 11</td>
</tr>
<tr>
<td>948</td>
<td>Enumeration (string) value format</td>
<td>IntOp2</td>
<td>9.5.6</td>
<td></td>
</tr>
<tr>
<td>949</td>
<td>type of LN inst is ambiguous</td>
<td>Ed2</td>
<td>9.3.5</td>
<td>Table 17</td>
</tr>
<tr>
<td>1118</td>
<td>RpENabled definition</td>
<td>Ed2</td>
<td>9.3.8</td>
<td></td>
</tr>
<tr>
<td>1147</td>
<td>Filehandling service capability</td>
<td>Ed2</td>
<td>9.3.2</td>
<td>Table 11</td>
</tr>
<tr>
<td>1195</td>
<td>Typographical error</td>
<td>Ed2</td>
<td>9.3.2</td>
<td></td>
</tr>
<tr>
<td>1208</td>
<td>IP V6 address format</td>
<td>IntOp2</td>
<td>A.5</td>
<td></td>
</tr>
<tr>
<td>1284</td>
<td>SCSM mapping may require a communication section in an ICD file</td>
<td>Ed2</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>1298</td>
<td>How to differentiate preconfigured Report data sets from those</td>
<td>Ed2</td>
<td>9.3.2</td>
<td>Table 11</td>
</tr>
<tr>
<td></td>
<td>generated by the system tool</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1304</td>
<td>Error in SCL object model</td>
<td>Ed2</td>
<td>9.2.6</td>
<td>Figure 6</td>
</tr>
<tr>
<td>1318</td>
<td>SSD will not validate against XSD</td>
<td>Ed2</td>
<td>9.2.6</td>
<td>Note 2</td>
</tr>
<tr>
<td>1327</td>
<td>SICS: import of SCD by IED tool</td>
<td>Ed2</td>
<td>Annex G</td>
<td>Table G.1</td>
</tr>
<tr>
<td>1328</td>
<td>Limitation of the size of identifiers</td>
<td>Ed2</td>
<td>9.5.2, 9.5.3, 9.5.6</td>
<td></td>
</tr>
<tr>
<td>1354</td>
<td>Changes to SICS</td>
<td>Ed2</td>
<td>Annex G</td>
<td>Tables G.1, G.2</td>
</tr>
<tr>
<td>1359</td>
<td>Replace “c37_238” with “61850-9-3”</td>
<td>Ed2</td>
<td>9.3.2</td>
<td></td>
</tr>
<tr>
<td>1365</td>
<td>Need to tighten up the XSD in regards to IED name usage</td>
<td>IntOp2</td>
<td>9.2.6</td>
<td>3</td>
</tr>
<tr>
<td>1395</td>
<td>Client LN attributes</td>
<td>IntOp2</td>
<td>9.3.8</td>
<td></td>
</tr>
<tr>
<td>1396</td>
<td>The use and configuration flow of LGOS and LSVS is Unclear</td>
<td>Ed2</td>
<td>9.3.2</td>
<td>Table 11</td>
</tr>
<tr>
<td>1397</td>
<td>Subscription limitation visible in IxD file</td>
<td>Ed2</td>
<td>Annex G</td>
<td></td>
</tr>
<tr>
<td>1398</td>
<td>originalSclVersion management in SCT</td>
<td>Ed2</td>
<td>9.3.2</td>
<td></td>
</tr>
<tr>
<td>1402</td>
<td>Extref during engineering</td>
<td>Ed2</td>
<td>9.3.13, Annex H(new)</td>
<td></td>
</tr>
<tr>
<td>1415</td>
<td>SICS-S110 IID import mandatory</td>
<td>Ed2</td>
<td>Annex G</td>
<td>Table G.2</td>
</tr>
<tr>
<td>1419</td>
<td>Support of IdName on other IEDs</td>
<td>Ed2</td>
<td>Annex G</td>
<td>Table G.1</td>
</tr>
<tr>
<td>1434</td>
<td>Add capability to change noASDU is missing</td>
<td>Ed2</td>
<td>9.3.2</td>
<td>Table 11</td>
</tr>
<tr>
<td>1444</td>
<td>Need to support fixed and SCT controlled data sets</td>
<td>Ed2</td>
<td>9.3.2</td>
<td></td>
</tr>
<tr>
<td>1445</td>
<td>ConfReportControl and a fixed reportSettings</td>
<td>Ed2</td>
<td>9.3.2</td>
<td></td>
</tr>
<tr>
<td>1447</td>
<td>Restriction on EnumTypes in SCL</td>
<td>Ed2</td>
<td>9.3.2</td>
<td></td>
</tr>
<tr>
<td>1448</td>
<td>Not possible to determine the restriction on number of BRCBs if</td>
<td>Ed2</td>
<td>9.3.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rptMod=both</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1450</td>
<td>originalSclXxx computation rules</td>
<td>IntOp2</td>
<td>9.3.2</td>
<td></td>
</tr>
<tr>
<td>1457</td>
<td>Multiple DOI nodes with the same name</td>
<td>Ed2</td>
<td>9.3.2</td>
<td></td>
</tr>
<tr>
<td>1458</td>
<td>New ExtRef attributes for later binding</td>
<td>Ed2</td>
<td>9.3.2</td>
<td></td>
</tr>
</tbody>
</table>
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.
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.