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Entwurf

**Kommunikationsnetze und -systeme für die Automatisierung in der elektrischen Energieversorgung –
Teil 7-2: Grundlegende Informations- und Kommunikationsstruktur –
Abstrakte Schnittstelle für Kommunikationsdienste (ACSI)
(IEC 57/1707/CDV:2016);
Englische Fassung EN 61850-7-2:2010/prA1:2016**

Communication networks and systems for power utility automation –
Part 7-2: Basic information and communication structure –
Abstract communication service interface (ACSI)
(IEC 57/1707/CDV:2016);
English version EN 61850-7-2:2010/prA1:2016

Réseaux de communication pour l'automatisation des systèmes des compagnies d'électricité –
Partie 7-2: Principes des structures d'informations et de communication –
Interface de services abstraits de communication (ACSI)
(IEC 57/1707/CDV:2016);
Version anglaise EN 61850-7-2:2010/prA1:2016

Anwendungswarnvermerk

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Gesamtumfang 117 Seiten

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Nationales Vorwort

Die Englische Fassung des europäischen Dokuments EN 61850-7-2:2010/prA1:2016 „Kommunikationsnetze und -systeme für die Automatisierung in der elektrischen Energieversorgung – Teil 7-2: Grundlegende Informations- und Kommunikationsstruktur – Abstrakte Schnittstelle für Kommunikationsdienste (ACSI)“ (Entwurf in der Umfrage) ist unverändert in diesen Norm-Entwurf übernommen worden.

Die Internationale Elektrotechnische Kommission (IEC) und das Europäische Komitee für Elektrotechnische Normung (CENELEC) haben vereinbart, dass ein auf IEC-Ebene erarbeiteter Entwurf für eine Internationale Norm zeitgleich (parallel) bei IEC und CENELEC zur Umfrage (CDV-Stadium) und Abstimmung als FDIS (en: Final Draft International Standard) bzw. Schluss-Entwurf für eine Europäische Norm gestellt wird, um eine Beschleunigung und Straffung der Normungsarbeit zu erreichen. Dem entsprechend ist das internationale Dokument IEC 57/1707/CDV:2016 „Communication networks and systems for power utility automation – Part 7-2: Basic information and communication structure – Abstract communication service interface (ACSI)“ unverändert in den Entwurf EN 61850-7-2:2010/prA1:2016 übernommen worden.

Das internationale Dokument wurde vom TC 57 „Power systems management and associated information exchange“ der Internationalen Elektrotechnischen Kommission (IEC) erarbeitet.

Bei der Abstimmung zu dem Europäischen Schluss-Entwurf bei CENELEC und dem Internationalen Schluss-Entwurf bei IEC [Final Draft International Standard (FDIS)] sind jeweils nur „JA/NEIN“-Entscheidungen möglich, wobei „NEIN“-Entscheidungen fundiert begründet werden müssen. Dokumente, die bei CENELEC als Europäische Norm angenommen und ratifiziert werden, sind unverändert als Deutsche Normen zu übernehmen.

Für dieses Dokument ist das nationale Arbeitsgremium K 952 „Netzleittechnik“ der DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE (www.dke.de) zuständig.

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Da sich die Benutzer der vorliegenden Norm der englischen Sprache als Fachsprache bedienen, wird die Englische Fassung der EN 61850-7-2/prA1 veröffentlicht. Zu deren Abschnitt 1, der den Anwendungsbereich festlegt, und Abschnitt 3, der die Begriffe festlegt, wurde eine Übersetzung angefertigt und als Nationaler Anhang NA des vorliegenden Normentwurfs hinzugefügt. Für einige der verwendeten Begriffe existieren keine gebräuchlichen deutschen Benennungen, da sich die deutschen Anwender in der Regel ebenfalls der englischen Benennungen bedienen. Dieser Normentwurf steht nicht in unmittelbarem Zusammenhang mit Rechtsvorschriften und ist nicht als Sicherheitsnorm anzusehen.

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Nationaler Anhang NA (informativ)

Auszugsweise Übersetzung^{N1)}

1 Anwendungsbereich

Anmerkung hinzufügen:

Die Inhalte in Abschnitt 6 und 7, einige UML-Diagramme sowie die Anhänge B und E werden automatisch aus der Modelldatei wg10uml02v19-wg18uml02v11b-wg17uml02v17c-jwg25uml02v04d.eap generiert. Die Namensraumbezeichnung lautet „IEC 61850-7-2:2007B“.

3 Begriffe

Keine Änderungen.

^{N1)} Nationale Fußnote: Die Nummerierung aus IEC 57/1707/CDV:2016-06 wurde beibehalten.

– Leerseite –

Document history

Any person intervening in the present document is invited to complete the table below before sending the document elsewhere. The purpose is to allow all actors to see all changes introduced and the intervening persons.

Any important message to IEC editors should also be included in the table below.

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Ch Brunner	Th Dufaure	22/03/16	Deleted comments; Sent "61850-7-2-Ed2-1_Amd_CDV_r19a.docx"	H. Englert	22/03/16
M. Noeth	Ch.Brunner	2016-03-22	CDV document	CO	2016-04-04

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**COMMUNICATION NETWORKS AND SYSTEMS
FOR POWER UTILITY AUTOMATION –****Part 7-2: Basic information and communication structure –
Abstract communication service interface (ACSI)**

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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International Standard IEC 61850-7-2 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

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

FDIS	Report on voting
57/1065/FDIS	57/1083/RVD

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

53 This document amends the second edition published in 2010. It constitutes a technical
54 revision.

55 Compared to the second edition, this first revision of the second edition:

- 56 • provides clarification and correction to the second edition of IEC 61850-7-2 based on the
57 tissues { 728, 730, 778, 780, 783, 786, 813, 820, 850, 852, 858, 860, 861, 869, 875, 876,
58 943, 970, 1038, 1050, 1061, 1062, 1071, 1091, 1092, 1116, 1122, 1127, 1145, 1154,
59 1194, 1202, 1232, 1242, 1252, 1276, 1283, 1307, 1308, 1319, 1338, 1341, 1356, 1377,
60 1386, 1428, 1432, 1433, 1435, 1439, 1455 }
- 61 • updates the class diagrams,
- 62 • harmonizes with part 6:2016: basic data type naming,
- 63 • corrected errors and typos,
- 64 • removal of CDCs for service tracking for control blocks to IEC 61850-7-3:2016,
- 65 • harmonizes several terms with those in the other parts.
- 66 • Reformat the class definition tables: Definition and explanation of values for each attribute
67 were moved from texts into the tables. These changes are not individually documented in
68 this amendment.
- 69 • Reformat the service parameter definition: Definition and explanation of values were
70 moved to service parameter definition tables. These changes are not individually
71 documented in this amendment.
- 72 • added services as defined in IEC 61850-90-5 TR2012.

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

75 In this document, the following print types are used:

- 76 – **bold** is used to highlight defined terms,
- 77 – Tahoma is used where the difference between a capital i (I) and a small L (l) is important
78 to see.
- 79 – Table numbering with additional characters 'A-C' (e.g. Table 42A) are new inserted tables
80 following the Ed 2.0 numbering.
- 81 – Table numbering with additional characters 'N' (e.g. Table 16N) are new tables following
82 the Ed 2.1 numbering.

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

86 The committee has decided that the contents of this publication will remain unchanged until
87 the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data
88 related to the specific publication. At this date, the publication will be

- 89 • reconfirmed,
- 90 • withdrawn,
- 91 • replaced by a revised edition, or
- 92 • amended.

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

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 document is part of a set of definitions which details a layered utility communication architecture. This architecture has been chosen to provide abstract definitions of classes and services such that the definitions are independent of specific protocol stacks, implementations, and operating systems.

The IEC 61850 series is intended to provide interoperability between a variety of devices. Communication between these devices is achieved by the definition of a hierarchical class model (for example, logical device, logical node, data, DataSet, report control, or log) and services provided by these classes (for example, get, set, report, define, delete) in IEC 61850-7-x.

This part of IEC 61850 defines the abstract communication service interface (ACSI) for use in the utility application domain that requires real-time cooperation of intelligent electronic devices. The ACSI has been defined so as to be independent of the underlying communication systems. Specific communication service mappings¹⁾ (SCSM) are specified in IEC 61850-8-x and IEC 61850-9-x.

This part of IEC 61850 defines the abstract communication service interface in terms of

- a hierarchical class model of all information that can be accessed via a communication network,
- services that operate on these classes, and
- parameters associated with each service.

The ACSI description technique abstracts away from all the different approaches to implement the cooperation of the various devices.

NOTE 1 Abstraction in ACSI has two meanings. First, only those aspects of a real device (for example, a breaker) or a real function that are visible and accessible over a communication network are modelled. This abstraction leads to the hierarchical class models and their behaviour defined in IEC 61850-7-2, IEC 61850-7-3, and IEC 61850-7-4. Second, the ACSI abstracts from the aspect of concrete definitions on how the devices exchange information; only a conceptual cooperation is defined. The concrete information exchange is defined in the SCSMs.

NOTE 2 This part of IEC 61850 does not provide comprehensive tutorial material. It is recommended that IEC 61850-5 and IEC 61850-7-1 be read first in conjunction with IEC 61850-7-2 and IEC 61850-7-3.

NOTE 3 Examples use names of classes (for example XCBR for a class of a logical node) defined in IEC 61850-7-4 and IEC 61850-7-3. The normative names are defined in IEC 61850-7-4 and IEC 61850-7-3 only.

¹⁾ The ACSI is independent of the specific mapping. Mappings to standard application layers or middle ware technologies are possible.

130 Some restructuring of the document were done between Ed 2 and Ed 2.1. The following table
 131 provides a cross reference.

132

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		6.2.2.8	INT16U (P_INT16U basic)
		6.2.2.9	INT24U (P_INT24U basic)
		6.2.2.10	INT32U (P_INT32U basic)
		6.2.2.11	FLOAT32 (P_FLOAT32 basic)
		6.2.2.12	Octet64 (P_Octet64 basic)
		6.2.2.13	VisString64 (P_VisString64 basic)
		6.2.2.14	VisString129 (P_VisString129 basic)
		6.2.2.15	VisString255 (P_VisString255 basic)
		6.2.2.16	Unicode255 (P_Unicode255 basic)
6.1.2	CommonACSI Types	6.2.3	Domain types (general)
6.1.2.1	General	6.2.3.1	General
		6.2.3.2	PhyComAddr (P_PhyComAddr basic)
6.1.2.2	ObjectName	6.2.3.3	ObjectName (ObjectName basic)
6.1.2.3	ObjectReference	6.2.3.4	ObjectReference (P_ObjectReference basic)

6.1.2.4	PHYCOMADDR type	6.2.3.2	PhyComAddr (P_PhyComAddr basic) <i>moved to clause 6.1</i>
6.1.2.5	ARRAY type		<i>moved to clause 6.2.4.3</i>
6.1.2.6	ServiceError type	6.2.3.5	EntryID (P_EntryID basic) <i>moved to clause 6.1</i>
6.1.2.7	EntryID type		
6.1.2.8	Packed list type	6.2.3.6	Currency (P_Currency basic)
		6.2.3.7	Timestamp (P_Timestamp packed list) <i>moved to clause 6.2.3.7</i>
6.1.2.9	TimeStamp type		<i>moved to clause 6.2.3.7</i>
6.1.2.9.1	General		<i>moved to clause 6.2.3.7</i>
6.1.2.9.2	TimeStamp syntax		<i>moved to clause 6.2.3.7</i>
6.1.2.9.3	TimeStamp attributes		<i>moved to clause 6.2.3.7</i>
6.1.2.9.3.1	SecondSinceEpoch		<i>moved to clause 6.2.3.7</i>
6.1.2.9.3.2	FractionOfSecond		<i>moved to clause 6.2.3.7</i>
6.1.2.9.3.3	TimeQuality	6.2.3.8	TimeQuality (TimeQuality packed list)
		6.2.3.9	Quality (P_Quality packed list)
		6.2.3.10	DetailQual (DetailQual packed list)
6.1.2.10	EntryTime type	6.2.3.11	EntryTime (P_EntryTime basic)
6.1.2.11	TriggerConditions type	6.2.3.12	TriggerConditions (P_TriggerConditions packed list)
		6.2.3.13	RCBReportOptions (P_RCBReportOptions packed list)
		6.2.3.14	LCBLogEntryOptions (P_LCBLogEntryOptions packed list)
		6.2.3.15	SVMessageOptions (P_SVMessageOptions packed list)
		6.2.3.16	CheckConditions (P_CheckConditions packed list)
		6.2.3.17	Originator (S_Originator structured)
		6.2.4	Domain types (enumerated)
		6.2.4.1	General
		6.2.4.2	Service name (ServiceNameKind enumeration)
		6.2.4.3	Service status (ServiceStatusKind enumeration)
		6.2.4.4	Originator category (OriginatorCategoryKind enumeration)
		6.2.4.5	Control service status / additional cause (ControlServiceStatusKind enumeration)
		6.2.4.6	Sampling mode (SamplingModeKind enumeration)
		6.2.5	Domain types (coded enumerated)
		6.2.5.1	General
		6.2.5.2	Step control (StepControlKind coded enumeration)
		6.2.5.3	Double point status (DpStatusKind coded enumeration)
		6.2.5.4	Source (SourceKind coded enumeration)
		6.2.5.5	Validity (ValidityKind coded enumeration)
		6.3	ACSI - service parameter types
		6.3.1	General
		6.3.2	Basic types
		6.3.3	Domain types
		6.3.3.1	General
		6.3.3.2	Ident8 (Ident8)
6.1.2.12	ReasonCode (ReasonForInclusion)	6.3.3.3	Reason for inclusion in reports (ReasonForInclusionInReport packed list)

		6.3.3.4	Reason for inclusion in logs (ReasonForInclusionInLog packed list)
		6.3.4	ACSI enumerated types
		6.3.4.1	General
		6.3.4.2	ACSI class (ACSIClassKind enumeration)
7	GenServerClass model	7	GenServerClass model
7.1	GenServerClass definition	7.1	GenServerClass definition
7.1.1	GenServerClass syntax		<i>moved to clause 7.1</i>
7.1.2	GenServerClass attributes		<i>moved to clause 7.1</i>
7.1.2.1	ServiceAccessPoint [1..n]		<i>moved to clause 7.1</i>
7.1.2.2	LogicalDevice [1..n]		<i>moved to clause 7.1</i>
7.1.2.3	FileSystem [0..n]		<i>moved to clause 7.1</i>
7.1.2.4	TPAppAssociation [0..n] - two-party application association		<i>moved to clause 7.1</i>
7.1.2.5	MCAAppAssociation [0..n] - multicast application association		<i>moved to clause 7.1</i>
7.2	Server class services	7.2	Server class services
7.2.1	Overview of directory and GetDefinition services	7.2.1	Overview of directory and GetDefinition services
7.2.2	GetServerDirectory	7.2.2	GetServerDirectory
7.2.2.1	GetServerDirectory parameter table		<i>moved to clause 7.2.2</i>
7.2.2.2	Request		<i>moved to clause 7.2.2</i>
7.2.2.2.1	ObjectClass		<i>moved to clause 7.2.2</i>
7.2.2.3	Response+		<i>moved to clause 7.2.2</i>
7.2.2.3.1	Reference [0..n]		<i>moved to clause 7.2.2</i>
7.2.2.4	Response-		<i>moved to clause 7.2.2</i>
8	Application association model	8	Application association model
8.1	Introduction	8.1	Introduction
8.2	Concept of application associations	8.2	Concept of application associations
8.3	TWO-PARTY-APPLICATION- ASSOCIATION (TPAA) class model	8.3	TWO-PARTY-APPLICATION-ASSOCIATION (TPAA) class model
8.3.1	TWO-PARTY-APPLICATION- ASSOCIATION (TPAA) class definition	8.3.1	TWO-PARTY-APPLICATION-ASSOCIATION (TPAA) class definition
8.3.1.1	TWO-PARTY-APPLICATION- ASSOCIATION (TPAA) class syntax		<i>moved to clause 8.3.1</i>
8.3.1.2	TWO-PARTY-APPLICATION- ASSOCIATION (TPAA) class attributes		<i>moved to clause 8.3.1</i>
8.3.1.2.1	AssociationId		<i>moved to clause 8.3.1</i>
8.3.1.2.2	AuthenticationParameter		<i>moved to clause 8.3.1</i>
8.3.2	Two-party application association services	8.3.2	Two-party application association services
8.3.2.1	Overview	8.3.2.1	Overview
8.3.2.2	Associate	8.3.2.2	Associate
8.3.2.2.1	Associate parameter		<i>moved to clause 8.3.2.2</i>
8.3.2.2.2	Request		<i>moved to clause 8.3.2.2</i>
8.3.2.2.2.1	ServerAccessPointReference		<i>moved to clause 8.3.2.2</i>
8.3.2.2.2.2	AuthenticationParameter		<i>moved to clause 8.3.2.2</i>
8.3.2.2.3	Response+		<i>moved to clause 8.3.2.2</i>
8.3.2.2.4	Result		<i>moved to clause 8.3.2.2</i>
8.3.2.2.5	Response-		<i>moved to clause 8.3.2.2</i>
8.3.2.3	Abort	8.3.2.3	Abort
8.3.2.3.1	Abort parameter		<i>moved to clause 8.3.2.3</i>

8.3.2.3.2	Request		<i>moved to clause 8.3.2.3</i>
8.3.2.3.2.1	AssociationId		<i>moved to clause 8.3.2.3</i>
8.3.2.3.2.2	Reason		<i>moved to clause 8.3.2.3</i>
8.3.2.3.3	Indication		<i>moved to clause 8.3.2.3</i>
8.3.2.3.3.1	AssociationId		<i>moved to clause 8.3.2.3</i>
8.3.2.3.3.2	Reason		<i>moved to clause 8.3.2.3</i>
8.3.2.4	Release	8.3.2.4	Release
8.3.2.4.1	Release parameter		<i>moved to clause 8.3.2.4</i>
8.3.2.4.2	Request		<i>moved to clause 8.3.2.4</i>
8.3.2.4.3	Response+		<i>moved to clause 8.3.2.4</i>
8.3.2.4.3.1	AssociationId		<i>moved to clause 8.3.2.4</i>
8.3.2.4.3.2	Result		<i>moved to clause 8.3.2.4</i>
8.3.2.4.4	Response-		<i>moved to clause 8.3.2.4</i>
8.4	MULTICAST-APPLICATION-ASSOCIATION (MCAA) class	8.4	MULTICAST-APPLICATION-ASSOCIATION (MCAA) class
8.4.1	MULTICAST-APPLICATION-ASSOCIATION (MCAA) class definition	8.4.1	MULTICAST-APPLICATION-ASSOCIATION (MCAA) class definition
8.4.2	MULTICAST-Application-association (MCAA) class attributes		<i>moved to clause 8.4.1</i>
8.4.2.1	AuthenticationParameter		<i>moved to clause 8.4.1</i>
9	GenLogicalDeviceClass model	9	GenLogicalDeviceClass model
9.1	GenLogicalDeviceClass definition	9.1	GenLogicalDeviceClass definition
9.1.1	GenLogicalDeviceClass syntax		<i>moved to clause 9.1</i>
9.1.2	GenLogicalDeviceClass attributes		<i>moved to clause 9.1</i>
9.1.2.1	LDName - logical device name		<i>moved to clause 9.1</i>
9.1.2.2	LogicalNode [1..n]		<i>moved to clause 9.1</i>
9.2	GenLogicalDeviceClass services	9.2	GenLogicalDeviceClass services
9.2.1	GetLogicalDeviceDirectory	9.2.1	GetLogicalDeviceDirectory
9.2.1.1	GetLogicalDeviceDirectory parameter table		<i>moved to clause 9.2.1</i>
9.2.1.2	Request		<i>moved to clause 9.2.1</i>
9.2.1.2.1	LDname - logical device object name		<i>moved to clause 9.2.1</i>
9.2.1.3	Response+		<i>moved to clause 9.2.1</i>
9.2.1.4	Response-		<i>moved to clause 9.2.1</i>
10	GenLogicalNodeClass model	10	GenLogicalNodeClass model
10.1	GenLogicalNodeClass definition	10.1	GenLogicalNodeClass definition
10.1.1	GenLogicalNodeClass diagram	10.1.1	GenLogicalNodeClass diagram
10.1.2	GenLogicalNodeClass syntax	10.1.2	GenLogicalNodeClass attributes
10.1.3	GenLogicalNodeClass attributes		<i>moved to clause 10.1.2</i>
10.1.3.1	LNName - Logical node name		<i>moved to clause 10.1.2</i>
10.1.3.2	LNRef - Logical node ObjectReference		<i>moved to clause 10.1.2</i>
10.1.3.3	DataObject [1..n]		<i>moved to clause 10.1.2</i>
10.1.3.4	DataSet [0..n]		<i>moved to clause 10.1.2</i>
10.1.3.5	BufferedReportControlBlock [0..n]		<i>moved to clause 10.1.2</i>
10.1.3.6	UnbufferedReportControlBlock [0..n]		<i>moved to clause 10.1.2</i>
10.1.3.7	Log [0..n]		<i>moved to clause 10.1.2</i>
10.1.3.8	LogControlBlock [0..n]		<i>moved to clause 10.1.2</i>
10.1.3.9	SettingGroupControlBlock [0..1]		<i>moved to clause 10.1.2</i>
10.1.3.10	GOOSEControlBlock [0..n]		<i>moved to clause 10.1.2</i>
10.1.3.11	MulticastSampledValueControlBlock [0..n]		<i>moved to clause 10.1.2</i>
10.1.3.12	UnicastSampledValueControlBlock [0..n]		<i>moved to clause 10.1.2</i>

10.2	GenLogicalNodeClass services	10.2	GenLogicalNodeClass services
10.2.1	Overview	10.2.1	Overview
10.2.2	GetLogicalNodeDirectory	10.2.2	GetLogicalNodeDirectory
10.2.2.1	GetLogicalNodeDirectory parameter table		<i>moved to clause 10.2.2</i>
10.2.2.2	Request		<i>moved to clause 10.2.2</i>
10.2.2.2.1	LNReference		<i>moved to clause 10.2.2</i>
10.2.2.2.2	ACSIClass		<i>moved to clause 10.2.2</i>
10.2.2.3	Response+		<i>moved to clause 10.2.2</i>
10.2.2.4	Response-		<i>moved to clause 10.2.2</i>
10.2.3	GetAllDataValues	10.2.3	GetAllDataValues
10.2.3.1	GetAllDataValues parameter table		<i>moved to clause 10.2.3</i>
10.2.3.2	Request		<i>moved to clause 10.2.3</i>
10.2.3.2.1	LNReference		<i>moved to clause 10.2.3</i>
10.2.3.2.2	FunctionalConstraint [0..1]		<i>moved to clause 10.2.3</i>
10.2.3.3	Response+		<i>moved to clause 10.2.3</i>
10.2.3.3.1	DataAttributeReference [1..n]		<i>moved to clause 10.2.3</i>
10.2.3.3.2	DataAttributeValue [1..n]		<i>moved to clause 10.2.3</i>
10.2.3.4	Response-		<i>moved to clause 10.2.3</i>
11	Generic data object class model	11	Generic data object class model
11.1	GenDataObjectClass diagram	11.1	GenDataObjectClass diagram
11.2	GenDataObjectClass syntax	11.2	GenDataObjectClass syntax
11.3	GenDataObjectClass attributes		<i>moved to clause 11.2</i>
11.3.1	DataObjectName		<i>moved to clause 11.2</i>
11.3.2	DataObjectRef - data object reference		<i>moved to clause 11.2</i>
11.3.3	m/o/c		<i>moved to clause 11.2</i>
11.3.4	DataObjectType		<i>moved to clause 11.2</i>
11.4	GenDataObjectClass services	11.3	GenDataObjectClass services
11.4.1	General definitions and overview	11.3.1	General definitions and overview
11.4.2	GetDataValues	11.3.2	GetDataValues
11.4.2.1	GetDataValues parameter table		<i>moved to clause 11.3.2</i>
11.4.2.2	Request		<i>moved to clause 11.3.2</i>
11.4.2.3	Response+		<i>moved to clause 11.3.2</i>
11.4.2.4	Response-		<i>moved to clause 11.3.2</i>
11.4.3	SetDataValues	11.3.3	SetDataValues
11.4.3.1	SetDataValues parameter table		<i>moved to clause 11.3.3</i>
11.4.3.2	Request		<i>moved to clause 11.3.3</i>
11.4.3.2.1	Reference		<i>moved to clause 11.3.3</i>
11.4.3.2.2	DataAttributeValue [1..n]		<i>moved to clause 11.3.3</i>
11.4.3.3	Response+		<i>moved to clause 11.3.3</i>
11.4.3.4	Response-		<i>moved to clause 11.3.3</i>
11.4.4	GetDataDirectory	11.3.4	GetDataDirectory
11.4.4.1	GetDataDirectory parameter table		<i>moved to clause 11.3.4</i>
11.4.4.2	Request		<i>moved to clause 11.3.4</i>
11.4.4.2.1	DataObjectReference - data object reference		<i>moved to clause 11.3.4</i>
11.4.4.3	Response+		<i>moved to clause 11.3.4</i>
11.4.4.4	Response-		<i>moved to clause 11.3.4</i>
11.4.5	GetDataDefinition	11.3.5	GetDataDefinition
11.4.5.1	GetDataDefinition parameter table		<i>moved to clause 11.3.5</i>
11.4.5.2	Request		<i>moved to clause 11.3.5</i>
11.4.5.3	Response+		<i>moved to clause 11.3.5</i>
11.4.5.4	Response-		<i>moved to clause 11.3.5</i>
12	Generic common data class model	12	Generic common data class model

12.1	General	12.1	General
12.2	GenCommonDataClass	12.2	GenCommonDataClass
12.2.1	GenCommonDataClass diagram	12.2.1	GenCommonDataClass diagram
12.2.2	GenCommonDataClass syntax	12.2.2	GenCommonDataClass syntax
12.2.3	GenCommonDataClass attributes		<i>moved to clause 12.2.2</i>
12.2.3.1	CDC-ID - Common data class identifier		<i>moved to clause 12.2.2</i>
12.2.3.2	SubDataObjectClass [0..n]		<i>moved to clause 12.2.2</i>
12.2.3.3	DataAttribute [0..n]		<i>moved to clause 12.2.2</i>
12.3	GenDataAttributeClass	12.3	GenDataAttributeClass
12.3.1	GenDataAttributeClass diagram	12.3.1	GenDataAttributeClass diagram
12.3.2	GenDataAttributeClass syntax	12.3.2	GenDataAttributeClass syntax
12.3.3	GenDataAttributeClass attributes	12.3.3	Details of some GenDataAttributeClass attributes
12.3.3.1	DataAttributeName		<i>moved to clause 12.2.3</i>
12.3.3.2	FunctionalConstraint (FC)		<i>moved to clause 12.2.3</i>
12.3.3.2.1	General	12.3.3.1	Functionally constrained data and data attributes
12.3.3.2.2	Functional constrained data (FCD)	12.3.3.1.1	Functional constrained data (FCD)
12.3.3.2.3	Functional constrained data attribute (FCDA)	12.3.3.1.2	Functional constrained data attribute (FCDA)
12.3.3.3	TrgOp [0..2] - trigger option	12.3.3.2	Trigger option
12.3.3.4	M/O/C		<i>moved to clause 12.3.2</i>
12.3.3.5	Type		<i>moved to clause 12.3.2</i>
12.4	GenConstructedAttributeClass	12.4	GenConstructedAttributeClass
12.4.1	GenConstructedAttributeClass diagram	12.4.1	GenConstructedAttributeClass diagram
12.4.2	GenConstructedAttributeClass syntax	12.4.2	GenConstructedAttributeClass syntax
12.4.3	GenConstructedAttributeClass attributes		<i>moved to clause 12.4.2</i>
12.4.3.1	DAT-ID - Data attribute class identifier		<i>moved to clause 12.4.2</i>
12.4.3.2	SubDataAttribute [1..n]		<i>moved to clause 12.4.2</i>
12.5	GenSubDataAttributeClass	12.5	GenSubDataAttributeClass
12.5.1	SubDataAttributeClass diagram	12.5.1	SubDataAttributeClass diagram
12.5.2	SubDataAttributeClass syntax	12.5.2	SubDataAttributeClass syntax
12.5.3	GenSubDataAttributeClass attributes		<i>moved to clause 12.5.2</i>
12.5.3.1	SubDataAttributeName		<i>moved to clause 12.5.2</i>
12.5.3.2	m/o/c		<i>moved to clause 12.5.2</i>
12.5.3.3	Type		<i>moved to clause 12.5.2</i>
12.6	Referencing data objects and their components	12.6	Referencing data objects and their components
12.6.1	General	12.6.1	General
12.6.2	Reference syntax	12.6.2	Reference syntax
12.6.3	Base types and their relation	12.6.3	Base types and their relation
12.6.4	Example of using references	12.6.4	Example of using references
13	DATA-SET class model	13	DATA-SET class model
13.1	General	13.1	General
13.2	DATA-SET class definition	13.2	DATA-SET class definition
13.2.1	DATA-SET class syntax	13.2.1	DATA-SET class syntax
13.2.2	DATA-SET class attributes	13.2.2	DATA-SET class attributes
13.2.2.1	DSName	13.2.2.1	DSName
13.2.2.2	DSRef	13.2.2.2	DSRef
13.2.2.3	DSMemberRef [1..n] - data set member reference	13.2.2.3	DSMemberRef [1..n] – data set member reference
13.3	DATA-SET class services	13.3	DATA-SET class services

13.3.1	Overview	13.3.1	Overview
13.3.2	GetDataSetValues	13.3.2	GetDataSetValues
13.3.2.1	GetDataSetValues parameter table		<i>moved to clause 13.3.2</i>
13.3.2.2	Request		<i>moved to clause 13.3.2</i>
13.3.2.3	Response+		<i>moved to clause 13.3.2</i>
13.3.2.4	Response-		<i>moved to clause 13.3.2</i>
13.3.3	SetDataSetValues		<i>moved to clause 13.3.2</i>
13.3.3.1	SetDataSetValues parameter table	13.3.3	SetDataSetValues
13.3.3.2	Request		<i>moved to clause 13.3.3</i>
13.3.3.2.1	DataSetReference - data set ObjectReference		<i>moved to clause 13.3.3</i>
13.3.3.2.2	DataAttributeValue [1..n]		<i>moved to clause 13.3.3</i>
13.3.3.3	Response+		<i>moved to clause 13.3.3</i>
13.3.3.4	Result		<i>moved to clause 13.3.3</i>
13.3.3.5	Response-		<i>moved to clause 13.3.3</i>
13.3.4	CreateDataSet	13.3.4	CreateDataSet
13.3.4.1	CreateDataSet parameter table		<i>moved to clause 13.3.4</i>
13.3.4.2	Request		<i>moved to clause 13.3.4</i>
13.3.4.2.1	DataSetReference - data set ObjectReference		<i>moved to clause 13.3.4</i>
13.3.4.2.2	DSMemberRef [1..n] - data set member ObjectReference		<i>moved to clause 13.3.4</i>
13.3.4.3	Response+		<i>moved to clause 13.3.4</i>
13.3.4.4	Response-		<i>moved to clause 13.3.4</i>
13.3.5	DeleteDataSet	13.3.5	DeleteDataSet
13.3.5.1	DeleteDataSet parameter table		<i>moved to clause 13.3.5</i>
13.3.5.2	Request		<i>moved to clause 13.3.5</i>
13.3.5.2.1	DataSetReference - data set ObjectReference		<i>moved to clause 13.3.5</i>
13.3.5.3	Response+		<i>moved to clause 13.3.5</i>
13.3.5.4	Response-		<i>moved to clause 13.3.5</i>
13.3.6	GetDataSetDirectory	13.3.6	GetDataSetDirectory
13.3.6.1	GetDataSetDirectory parameter table		<i>moved to clause 13.3.6</i>
13.3.6.2	Request		<i>moved to clause 13.3.6</i>
13.3.6.3	Response+		<i>moved to clause 13.3.6</i>
13.3.6.4	Response-		<i>moved to clause 13.3.6</i>
14	Service tracking	14	Service tracking
14.1	General	14.1	General service tracking
14.2	Common service tracking (CST)	14.2	Control block service tracking
		14.3	Control service tracking
15	Modelling of control block classes	15	Modelling of control block classes
15.1	General	15.1	General
15.2	Control block class models	15.2	Control block class models
15.2.1	Control block attributes		<i>moved to clause 15.2</i>
15.2.1.1	CBName		<i>moved to clause 15.2</i>
15.2.1.2	CBRef		<i>moved to clause 15.2</i>
15.2.1.3	Attribute 1 to Attribute n		<i>moved to clause 15.2</i>
15.2.2	Control block services		<i>moved to clause 15.2</i>
15.2.3	Attribute type		<i>moved to clause 15.2</i>
15.3	Control block tracking services		
15.3.1	General		<i>moved to clause 14.2</i>
15.3.2	Common data classes for control block service tracking		

15.3.2.1	General	<i>moved to IEC 61850-7-3</i>
15.3.2.2	Tracking of service for buffered reporting - Buffered report tracking service (BTS)	<i>moved to IEC 61850-7-3</i>
15.3.2.2.1	ServiceType = SetBRCBValues	<i>moved to IEC 61850-7-3</i>
15.3.2.2.2	ServiceType = InternalChange	<i>moved to IEC 61850-7-3</i>
15.3.2.2.3	ServiceType = Report	<i>moved to IEC 61850-7-3</i>
15.3.2.2.4	ServiceType = GetBRCBValues	<i>moved to IEC 61850-7-3</i>
15.3.2.3	Tracking of service for unbuffered reporting - Unbuffered report tracking service (UTS)	<i>moved to IEC 61850-7-3</i>
15.3.2.3.1	ServiceType = SetURCBValues	<i>moved to IEC 61850-7-3</i>
15.3.2.3.2	ServiceType = InternalChange	<i>moved to IEC 61850-7-3</i>
15.3.2.3.3	ServiceType = Report	<i>moved to IEC 61850-7-3</i>
15.3.2.3.4	ServiceType = GetURCBValues	<i>moved to IEC 61850-7-3</i>
15.3.2.4	Tracking of service for log control block - Log control block tracking service (LTS)	<i>moved to IEC 61850-7-3</i>
15.3.2.4.1	ServiceType = SetLCBValues	<i>moved to IEC 61850-7-3</i>
15.3.2.4.2	ServiceType = GetLCBValues	<i>moved to IEC 61850-7-3</i>
15.3.2.5	Tracking of service for log - Log tracking service (OTS)	<i>deprecated</i>
15.3.2.5.1	ServiceType = QueryLogByTime	<i>deprecated</i>
15.3.2.5.2	ServiceType = QueryLogAfter	<i>deprecated</i>
15.3.2.5.3	ServiceType = GetLogStatusValues	<i>deprecated</i>
15.3.2.6	Tracking of service for GOOSE control block - GOOSE control block tracking service (GTS)	<i>moved to IEC 61850-7-3</i>
15.3.2.6.1	ServiceType = SendGOOSEMessage	<i>moved to IEC 61850-7-3</i>
15.3.2.6.2	ServiceType = GetGoReference	<i>moved to IEC 61850-7-3</i>
15.3.2.6.3	ServiceType = GetGOOSEElementNumber	<i>moved to IEC 61850-7-3</i>
15.3.2.6.4	ServiceType = GetGoCBValues	<i>moved to IEC 61850-7-3</i>
15.3.2.6.5	ServiceType = SetGoCBValues	<i>moved to IEC 61850-7-3</i>
15.3.2.7	Tracking of service for MSVCB control block - MSVCB tracking service (MTS)	<i>moved to IEC 61850-7-3</i>
15.3.2.7.1	ServiceType = SendMSVMessage	<i>moved to IEC 61850-7-3</i>
15.3.2.7.2	ServiceType = GetMSVCBValues	<i>moved to IEC 61850-7-3</i>
15.3.2.7.3	ServiceType = SetMSVCBValues	<i>moved to IEC 61850-7-3</i>
15.3.2.8	Tracking of service for USVCB control block - USVCB tracking service (NTS)	<i>moved to IEC 61850-7-3</i>
15.3.2.8.1	ServiceType = SendUSVMessage	<i>moved to IEC 61850-7-3</i>
15.3.2.8.2	ServiceType = GetUSVCBValues	<i>moved to IEC 61850-7-3</i>
15.3.2.8.3	ServiceType = SetUSVCBValues	<i>moved to IEC 61850-7-3</i>
15.3.2.9	Tracking of service for SGCB - SGCB tracking service (STS)	<i>moved to IEC 61850-7-3</i>
15.3.2.9.1	ServiceType = SelectActiveSG	<i>moved to IEC 61850-7-3</i>
15.3.2.9.2	ServiceType = SelectEditSG	<i>moved to IEC 61850-7-3</i>
15.3.2.9.3	ServiceType = SetEditSGValue	<i>moved to IEC 61850-7-3</i>
15.3.2.9.4	ServiceType = ConfirmEditSGValues	<i>moved to IEC 61850-7-3</i>
15.3.2.9.5	ServiceType = GetEditSGValue	<i>moved to IEC 61850-7-3</i>
15.3.2.9.6	ServiceType = GetSGCBValues	<i>moved to IEC 61850-7-3</i>

16.1	General	16.1	General
16.2	SGCB class definition	16.2	SGCB class definition
16.2.1	SGCB class syntax		<i>moved to clause 16.2</i>
16.2.2	SGCB class attributes		<i>moved to clause 16.2</i>
16.2.2.1	SGCBName - setting group control name		<i>moved to clause 16.2</i>
16.2.2.2	SGCBRef - setting group control ObjectReference		<i>moved to clause 16.2</i>
16.2.2.3	NumOfSG - number of setting groups		<i>moved to clause 16.2</i>
16.2.2.4	ActSG - active setting group		<i>moved to clause 16.2</i>
16.2.2.5	EditSG - edit setting group		<i>moved to clause 16.2</i>
16.2.2.6	CnfEdit - confirm editing		<i>moved to clause 16.2</i>
16.2.2.7	LActTm - last activation time		<i>moved to clause 16.2</i>
16.2.2.8	ResvTms - reservation of SettingGroup in seconds		<i>moved to clause 16.2</i>
16.3	SGCB class services	16.3	SGCB class services
16.3.1	Overview	16.3.1	Overview
16.3.2	SelectActiveSG	16.3.2	SelectActiveSG
16.3.2.1	SelectActiveSG parameter table		<i>moved to clause 16.3.2</i>
16.3.2.2	Request		<i>moved to clause 16.3.2</i>
16.3.2.2.1	SGCBReference		<i>moved to clause 16.3.2</i>
16.3.2.2.2	SettingGroupNumber		<i>moved to clause 16.3.2</i>
16.3.2.3	Response+		<i>moved to clause 16.3.2</i>
16.3.2.4	Response-		<i>moved to clause 16.3.2</i>
16.3.3	SelectEditSG	16.3.3	SelectEditSG
16.3.3.1	SelectEditSG parameter table		<i>moved to clause 16.3.3</i>
16.3.3.2	Request		<i>moved to clause 16.3.3</i>
16.3.3.2.1	SGCBReference		<i>moved to clause 16.3.3</i>
16.3.3.2.2	SettingGroupNumber		<i>moved to clause 16.3.3</i>
16.3.3.3	Response+		<i>moved to clause 16.3.3</i>
16.3.3.4	Response-		<i>moved to clause 16.3.3</i>
16.3.4	SetEditSGValue	16.3.4	SetEditSGValue
16.3.4.1	SetEditSGValue parameter table		<i>moved to clause 16.3.4</i>
16.3.4.2	Request		<i>moved to clause 16.3.4</i>
16.3.4.2.1	Reference		<i>moved to clause 16.3.4</i>
16.3.4.2.2	DataAttributeValue [1..n]		<i>moved to clause 16.3.4</i>
16.3.4.3	Response+		<i>moved to clause 16.3.4</i>
16.3.4.4	Response-		<i>moved to clause 16.3.4</i>
16.3.5	ConfirmEditSGValues	16.3.5	ConfirmEditSGValues
16.3.5.1	ConfirmEditSGValues parameter table		<i>moved to clause 16.3.5</i>
16.3.5.2	Request		<i>moved to clause 16.3.5</i>
16.3.5.3	Response+		<i>moved to clause 16.3.5</i>
16.3.5.4	Response-		<i>moved to clause 16.3.5</i>
16.3.6	GetEditSGValue	16.3.6	GetEditSGValue
16.3.6.1	GetEditSGValue parameter table		<i>moved to clause 16.3.6</i>
16.3.6.2	Request		<i>moved to clause 16.3.6</i>
16.3.6.3	Response+		<i>moved to clause 16.3.6</i>
16.3.6.4	Response-		<i>moved to clause 16.3.6</i>
16.3.7	GetSGCBValues	16.3.7	GetSGCBValues
16.3.7.1	GetSGCBValues parameter table		<i>moved to clause 16.3.7</i>
16.3.7.2	Request		<i>moved to clause 16.3.7</i>
16.3.7.3	Response+		<i>moved to clause 16.3.7</i>
16.3.7.3.1	NumberOfSettingGroup - number of setting group controls		<i>moved to clause 16.3.7</i>
16.3.7.3.2	ActiveSettingGroup - active setting group		<i>moved to clause 16.3.7</i>

16.3.7.3.3	EditSettingGroup - edit setting group		<i>moved to clause 16.3.7</i>
16.3.7.3.4	LastActivateTime - last time of activation of a setting group		<i>moved to clause 16.3.7</i>
16.3.7.4	Response-		<i>moved to clause 16.3.7</i>
17	REPORT-CONTROL-BLOCK and LOG-CONTROL-BLOCK class models	17	REPORT-CONTROL-BLOCK and LOG-CONTROL-BLOCK class models
17.1	Overview	17.1	Overview
17.2	REPORT-CONTROL-BLOCK class model	17.2	REPORT-CONTROL-BLOCK class model
17.2.1	Basic concepts	17.2.1	Basic concepts
17.2.2	BUFFERED-REPORT-CONTROL-BLOCK (BRCB) class definition	17.2.2	BUFFERED-REPORT-CONTROL-BLOCK (BRCB) class definition
17.2.2.1	BRCB class Syntax	17.2.2.1	BRCB class syntax
17.2.2.2	BRCBName - buffered report control name	17.2.2.2	BRCBName – buffered report control name
17.2.2.3	BRCBRef - buffered report control ObjectReference	17.2.2.3	BRCBRef – buffered report control ObjectReference
17.2.2.4	RptID - report identifier	17.2.2.4	RptID – report identifier
17.2.2.5	RptEna - report enable	17.2.2.5	RptEna – report enable
17.2.2.6	DatSet - Data set reference	17.2.2.6	DatSet – Data set reference
17.2.2.7	ConfRev - configuration revision	17.2.2.7	ConfRev – configuration revision
17.2.2.8	OptFlds - optional fields to include in report	17.2.2.8	OptFlds – optional fields to include in report
17.2.2.9	BufTm - buffer time	17.2.2.9	BufTm – buffer time
17.2.2.10	SqNum - sequence number	17.2.2.10	SqNum – sequence number
17.2.2.11	TrgOps - trigger options	17.2.2.11	TrgOps – trigger options
17.2.2.12	IntgPd - integrity period	17.2.2.12	IntgPd – integrity period
17.2.2.13	GI - general-interrogation	17.2.2.13	GI – general-interrogation
17.2.2.14	PurgeBuf - purge buffer	17.2.2.14	PurgeBuf – purge buffer
17.2.2.15	EntryID - entry identifier	17.2.2.15	EntryID – entry identifier
17.2.2.16	TimeOfEntry - time of entry	17.2.2.16	TimeOfEntry – time of entry
17.2.2.17	ResvTms - reservation time	17.2.2.17	ResvTms – reservation time
17.2.2.18	Owner - the owner of the control block instance	17.2.2.18	Owner – the owner of the control block instance
17.2.3	BRCB class services	17.2.3	BRCB class services
17.2.3.1	Overview	17.2.3.1	Overview
17.2.3.2	Report	17.2.3.2	Report
17.2.3.2.1	Report parameter table	17.2.3.2.1	Report parameter table
17.2.3.2.2	Request		<i>moved to clause 17.2.3.2.1</i>
17.2.3.2.2.1	ReportFormat Syntax	17.2.3.2.2	ReportFormat Syntax
17.2.3.2.2.2	RptID - report ID		<i>moved to clause 17.2.3.2.2</i>
17.2.3.2.2.3	OptFlds - optional fields to include in report		<i>moved to clause 17.2.3.2.2</i>
17.2.3.2.2.4	SqNum - sequence number		<i>moved to clause 17.2.3.2.2</i>
17.2.3.2.2.5	SubSqNum - subsequence number		<i>moved to clause 17.2.3.2.2</i>
17.2.3.2.2.6	MoreSegmentsFollow - more report segments follow		<i>moved to clause 17.2.3.2.2</i>
17.2.3.2.2.7	DatSet - data set reference		<i>moved to clause 17.2.3.2.2</i>
17.2.3.2.2.8	BufOvfl - possible information loss		<i>moved to clause 17.2.3.2.2</i>
17.2.3.2.2.9	Entry		<i>moved to clause 17.2.3.2.2</i>
17.2.3.2.3	Procedures for report generation	17.2.3.2.3	Procedures for report generation
17.2.3.2.3.1	Overview	17.2.3.2.3.1	Overview
17.2.3.2.3.2	Data-change, quality-change, and data-update	17.2.3.2.3.2	Data-change, quality-change, and data-update

17.2.3.2.3.3	Integrity	17.2.3.2.3.3	Integrity
17.2.3.2.3.4	GI (general interrogation)	17.2.3.2.3.4	GI (general interrogation)
17.2.3.2.3.5	Time sequence order of reports	17.2.3.2.3.5	Time sequence order of reports
17.2.3.2.3.6	Buffering events	17.2.3.2.3.6	Buffering events
17.2.3.3	GetBRCBValues	17.2.3.3	GetBRCBValues
17.2.3.3.1	GetBRCBValues parameter table		<i>moved to clause 17.2.3.3</i>
17.2.3.3.2	Request		<i>moved to clause 17.2.3.3</i>
17.2.3.3.2.1	BRCBReference		<i>moved to clause 17.2.3.3</i>
17.2.3.3.3	Response+		<i>moved to clause 17.2.3.3</i>
17.2.3.3.3.1	ReportIdentifier		<i>moved to clause 17.2.3.3</i>
17.2.3.3.3.2	ReportEnable		<i>moved to clause 17.2.3.3</i>
17.2.3.3.3.3	DataSetReference		<i>moved to clause 17.2.3.3</i>
17.2.3.3.3.4	ConfigurationRevision		<i>moved to clause 17.2.3.3</i>
17.2.3.3.3.5	OptionalFields		<i>moved to clause 17.2.3.3</i>
17.2.3.3.3.6	BufferTime		<i>moved to clause 17.2.3.3</i>
17.2.3.3.3.7	SequenceNumber		<i>moved to clause 17.2.3.3</i>
17.2.3.3.3.8	TriggerOptionsEnabled		<i>moved to clause 17.2.3.3</i>
17.2.3.3.3.9	IntegrityPeriod		<i>moved to clause 17.2.3.3</i>
17.2.3.3.3.1	GeneralInterrogation		<i>moved to clause 17.2.3.3</i>
0			
17.2.3.3.3.1	PurgeBuf		<i>moved to clause 17.2.3.3</i>
1			
17.2.3.3.3.1	EntryIdentifier		<i>moved to clause 17.2.3.3</i>
2			
17.2.3.3.3.1	TimeOfEntry		<i>moved to clause 17.2.3.3</i>
3			
17.2.3.3.3.1	ReserveTimeSecond [0..1]		<i>moved to clause 17.2.3.3</i>
4			
17.2.3.3.4	Response-		<i>moved to clause 17.2.3.3</i>
17.2.3.4	SetBRCBValues	17.2.3.4	SetBRCBValues
17.2.3.4.1	SetBRCBValues parameter table		<i>moved to clause 17.2.3.4</i>
17.2.3.4.2	Request		<i>moved to clause 17.2.3.4</i>
17.2.3.4.2.1	BRCBReference		<i>moved to clause 17.2.3.4</i>
17.2.3.4.2.2	ReportIdentifier [0..1]		<i>moved to clause 17.2.3.4</i>
17.2.3.4.2.3	ReportEnable [0..1]		<i>moved to clause 17.2.3.4</i>
17.2.3.4.2.4	DataSetReference [0..1]		<i>moved to clause 17.2.3.4</i>
17.2.3.4.2.5	OptionalFields [0..1]		<i>moved to clause 17.2.3.4</i>
17.2.3.4.2.6	BufferTime [0..1]		<i>moved to clause 17.2.3.4</i>
17.2.3.4.2.7	TriggerOptionsEnabled [0..1]		<i>moved to clause 17.2.3.4</i>
17.2.3.4.2.8	IntegrityPeriod [0..1]		<i>moved to clause 17.2.3.4</i>
17.2.3.4.2.9	GeneralInterrogation [0..1]		<i>moved to clause 17.2.3.4</i>
17.2.3.4.2.1	PurgeBuffer [0..1]		<i>moved to clause 17.2.3.4</i>
0			
17.2.3.4.2.1	EntryIdentifier[0..1]		<i>moved to clause 17.2.3.4</i>
1			
17.2.3.4.2.1	ReserveTimeSecond[0..1]		<i>moved to clause 17.2.3.4</i>
2			
17.2.3.4.3	Response+		<i>moved to clause 17.2.3.4</i>
17.2.3.4.4	Response-		<i>moved to clause 17.2.3.4</i>
17.2.4	UNBUFFERED-REPORT-CONTROL-BLOCK (URCB) class definition	17.2.4	UNBUFFERED-REPORT-CONTROL-BLOCK (URCB) class definition
17.2.4.1	URCB class syntax	17.2.4.1	URCB class syntax
17.2.4.2	URCBName - unbuffered report control name	17.2.4.2	URCBName – unbuffered report control name
17.2.4.3	URCBRef - unbuffered report control ObjectReference	17.2.4.3	URCBRef – unbuffered report control ObjectReference

17.2.4.4	RptEna - report enable	17.2.4.4	RptEna – report enable
17.2.4.5	Resv - reserve URCB	17.2.4.5	SqNum – sequence number
17.2.5	URCB class services	17.2.5	URCB class services
17.2.5.1	Overview	17.2.5.1	Overview
17.2.5.2	Report	17.2.5.2	Report
17.2.5.3	GetURCBValues	17.2.5.3	GetURCBValues
17.2.5.4	SetURCBValues	17.2.5.4	SetURCBValues
17.3	LOG-CONTROL-BLOCK class model	17.3	LOG-CONTROL-BLOCK class model
17.3.1	General	17.3.1	General
17.3.1.1	Basic concepts	17.3.1.1	Basic concepts
17.3.1.2	The log buffer concept	17.3.1.2	The log buffer concept
17.3.2	LCB class definition	17.3.2	LCB class definition
17.3.2.1	LCB class syntax		<i>moved to clause 17.3.2</i>
17.3.2.2	LCB class attributes		<i>moved to clause 17.3.2</i>
17.3.2.2.1	LCBName - log control name		<i>moved to clause 17.3.2</i>
17.3.2.2.2	LCBRef - log control ObjectReference		<i>moved to clause 17.3.2</i>
17.3.2.2.3	LogEna - log enable		<i>moved to clause 17.3.2</i>
17.3.2.2.4	DatSet - data set reference		<i>moved to clause 17.3.2</i>
17.3.2.3	OptFlds - optional fields to include in log		<i>moved to clause 17.3.2</i>
17.3.2.3.1	BufTm - buffer time		<i>moved to clause 17.3.2</i>
17.3.2.3.2	TrgOps - trigger options		<i>moved to clause 17.3.2</i>
17.3.2.3.3	IntgPd - integrity period		<i>moved to clause 17.3.2</i>
17.3.2.3.4	LogRef - log reference		<i>moved to clause 17.3.2</i>
17.3.2.4	LCB services - Overview	17.3.3	LCB services
		17.3.3.1	Overview
17.3.2.5	GetLCBValues	17.3.3.2	GetLCBValues
17.3.2.5.1	Request		<i>moved to clause 17.3.3.2</i>
17.3.2.5.1.1	LCBReference		<i>moved to clause 17.3.3.2</i>
17.3.2.5.2	Response+		<i>moved to clause 17.3.3.2</i>
17.3.2.5.2.1	LogEnable		<i>moved to clause 17.3.3.2</i>
17.3.2.5.2.2	DataSetReference		<i>moved to clause 17.3.3.2</i>
17.3.2.5.2.3	TriggerOptions		<i>moved to clause 17.3.3.2</i>
17.3.2.5.2.4	IntegrityPeriod		<i>moved to clause 17.3.3.2</i>
17.3.2.5.2.5	LogReference		<i>moved to clause 17.3.3.2</i>
17.3.2.5.2.6	OptionalFields [0..1]		<i>moved to clause 17.3.3.2</i>
17.3.2.5.2.7	BufferTime [0..1]		<i>moved to clause 17.3.3.2</i>
17.3.2.5.3	Response-		<i>moved to clause 17.3.3.2</i>
17.3.2.6	SetLCBValues	17.3.3.3	SetLCBValues
17.3.2.6.1	Request		<i>moved to clause 17.3.3.3</i>
17.3.2.6.1.1	LCBReference		<i>moved to clause 17.3.3.3</i>
17.3.2.6.1.2	LogEnable [0..1]		<i>moved to clause 17.3.3.3</i>
17.3.2.6.1.3	DataSetReference [0..1]		<i>moved to clause 17.3.3.3</i>
17.3.2.6.1.4	OptionalFields [0..1]		<i>moved to clause 17.3.3.3</i>
17.3.2.6.1.5	IntegrityPeriod [0..1]		<i>moved to clause 17.3.3.3</i>
17.3.2.6.1.6	LogReference [0..1]		<i>moved to clause 17.3.3.3</i>
17.3.2.6.1.7	TriggerOptionsEnabled [0..1]		<i>moved to clause 17.3.3.3</i>
17.3.2.6.1.8	BufferTime [0..1]		<i>moved to clause 17.3.3.3</i>
17.3.2.6.2	Response+		<i>moved to clause 17.3.3.3</i>
17.3.2.6.3	Response-		<i>moved to clause 17.3.3.3</i>
17.3.3	LOG class definition	17.3.4	LOG class definition
17.3.3.1	LOG class syntax		<i>moved to clause 17.3.4</i>
17.3.3.2	LOG class attributes		<i>moved to clause 17.3.4</i>
17.3.3.2.1	LogName - log name		<i>moved to clause 17.3.4</i>
17.3.3.2.2	LogRef - log reference		<i>moved to clause 17.3.4</i>

17.3.3.2.3	OldEntrTm - oldest log entry time of LOG		<i>moved to clause 17.3.4</i>
17.3.3.2.4	NewEntrTm - newest log entry time of LOG		<i>moved to clause 17.3.4</i>
17.3.3.2.5	OldEntr - oldest log entry sequence number		<i>moved to clause 17.3.4</i>
17.3.3.2.6	NewEntr - newest log entry sequence number		<i>moved to clause 17.3.4</i>
17.3.3.2.7	Entry [1..n]		<i>moved to clause 17.3.4</i>
17.3.3.2.7.1	TimeOfEntry - time of log entry		<i>moved to clause 17.3.4</i>
17.3.3.2.7.2	EntryID - entry identifier		<i>moved to clause 17.3.4</i>
17.3.3.2.7.3	EntryData [1..n] - Data of Entry		<i>moved to clause 17.3.4</i>
17.3.4	Reason code for log entries	17.3.5	Reason code for log entries
17.3.4.1	Overview	17.3.5.1	Overview
17.3.4.2	Reason code data-change, quality-change, or data-update	17.3.5.2	Reason code data-change, quality-change, or data-update
17.3.4.3	Reason code integrity	17.3.5.3	Reason code integrity
17.3.4.4	Reason code application-trigger	17.3.5.4	Reason code application-trigger
17.3.5	LOG services	17.3.6	LOG services
17.3.5.1	Overview	17.3.6.1	Overview
17.3.5.2	QueryLogByTime	17.3.6.2	QueryLogByTime
17.3.5.2.1	QueryLogByTime parameter table		<i>moved to clause 17.3.6.2</i>
17.3.5.2.2	Request		<i>moved to clause 17.3.6.2</i>
17.3.5.2.2.1	LogReference		<i>moved to clause 17.3.6.2</i>
17.3.5.2.2.2	RangeStartTime [0..1]		<i>moved to clause 17.3.6.2</i>
17.3.5.2.2.3	RangeStopTime [0..1]		<i>moved to clause 17.3.6.2</i>
17.3.5.2.3	Response+		<i>moved to clause 17.3.6.2</i>
17.3.5.2.4	Response-		<i>moved to clause 17.3.6.2</i>
17.3.5.3	QueryLogAfter	17.3.6.3	QueryLogAfter
17.3.5.3.1	QueryLogAfter parameter table		<i>moved to clause 17.3.6.3</i>
17.3.5.3.2	Request		<i>moved to clause 17.3.6.3</i>
17.3.5.3.2.1	LogReference		<i>moved to clause 17.3.6.3</i>
17.3.5.3.2.2	RangeStartTime		<i>moved to clause 17.3.6.3</i>
17.3.5.3.2.3	Entry		<i>moved to clause 17.3.6.3</i>
17.3.5.3.3	Response+		<i>moved to clause 17.3.6.3</i>
17.3.5.3.3.1	ListOfLogEntries		<i>moved to clause 17.3.6.3</i>
17.3.5.3.4	Response-		<i>moved to clause 17.3.6.3</i>
17.3.5.4	GetLogStatusValues	17.3.6.4	GetLogStatusValues
17.3.5.4.1	Request		<i>moved to clause 17.3.6.4</i>
17.3.5.4.1.1	LogReference		<i>moved to clause 17.3.6.4</i>
17.3.5.4.2	Response+		<i>moved to clause 17.3.6.4</i>
17.3.5.4.2.1	OldestEntryTime		<i>moved to clause 17.3.6.4</i>
17.3.5.4.2.2	NewestEntryTime		<i>moved to clause 17.3.6.4</i>
17.3.5.4.2.3	OldestEntry		<i>moved to clause 17.3.6.4</i>
17.3.5.4.2.4	NewestEntry		<i>moved to clause 17.3.6.4</i>
17.3.5.4.3	Response-		<i>moved to clause 17.3.6.4</i>
18	Generic substation event class model (GSE)	18	Generic substation event class model (GSE)
18.1	Overview	18.1	Overview
18.2	GOOSE-CONTROL-BLOCK (GoCB) class	18.2	GOOSE-CONTROL-BLOCK (GoCB) class
18.2.1	GoCB definition	18.2.1	GoCB definition
18.2.1.1	GoCBName - GOOSE control block name		<i>moved to clause 18.2.1</i>

18.2.1.2	GoCBRef - GOOSE control block reference		<i>moved to clause 18.2.1</i>
18.2.1.3	GoEna - GOOSE enable		<i>moved to clause 18.2.1</i>
18.2.1.4	GoID - GOOSE identifier		<i>moved to clause 18.2.1</i>
18.2.1.5	DatSet - data set reference		<i>moved to clause 18.2.1</i>
18.2.1.6	ConfRev - configuration revision		<i>moved to clause 18.2.1</i>
18.2.1.7	NdsCom - needs commissioning		<i>moved to clause 18.2.1</i>
18.2.1.8	DstAddress		<i>moved to clause 18.2.1</i>
18.2.2	GOOSE service definitions	18.2.2	GOOSE service definitions
18.2.2.1	Overview	18.2.2.1	Overview
18.2.2.2	SendGOOSEMessage	18.2.2.2	SendGOOSEMessage
18.2.2.2.1	SendGOOSEMessage parameter table		<i>moved to clause 18.2.2.2</i>
18.2.2.2.2	Request		<i>moved to clause 18.2.2.2</i>
18.2.2.3	GetGoReference	18.2.2.3	GetGoReference
18.2.2.3.1	GetGoReference parameter table		<i>moved to clause 18.2.2.3</i>
18.2.2.3.2	Request		<i>moved to clause 18.2.2.3</i>
18.2.2.3.2.1	GoCBReference		<i>moved to clause 18.2.2.3</i>
18.2.2.3.2.2	MemberOffset [1..n]		<i>moved to clause 18.2.2.3</i>
18.2.2.3.3	Response+		<i>moved to clause 18.2.2.3</i>
18.2.2.3.3.1	GoCBReference		<i>moved to clause 18.2.2.3</i>
18.2.2.3.3.2	ConfigurationRevision		<i>moved to clause 18.2.2.3</i>
18.2.2.3.3.3	DatSet		<i>moved to clause 18.2.2.3</i>
18.2.2.3.3.4	MemberReference [1..n]		<i>moved to clause 18.2.2.3</i>
18.2.2.3.4	Response-		<i>moved to clause 18.2.2.3</i>
18.2.2.4	GetGOOSEElementNumber	18.2.2.4	GetGOOSEElementNumber
18.2.2.4.1	GetGOOSEElementNumber parameter table		<i>moved to clause 18.2.2.4</i>
18.2.2.4.2	Request		<i>moved to clause 18.2.2.4</i>
18.2.2.4.2.1	GoCBReference		<i>moved to clause 18.2.2.4</i>
18.2.2.4.2.2	MemberReference [1..n]		<i>moved to clause 18.2.2.4</i>
18.2.2.4.3	Response+		<i>moved to clause 18.2.2.4</i>
18.2.2.4.3.1	GoCBReference		<i>moved to clause 18.2.2.4</i>
18.2.2.4.3.2	ConfigurationRevision		<i>moved to clause 18.2.2.4</i>
18.2.2.4.3.3	DatSet		<i>moved to clause 18.2.2.4</i>
18.2.2.4.3.4	MemberOffset [1..n]		<i>moved to clause 18.2.2.4</i>
18.2.2.4.4	Response-		<i>moved to clause 18.2.2.4</i>
18.2.2.5	GetGoCBValues	18.2.2.5	GetGoCBValues
18.2.2.5.1	Request		<i>moved to clause 18.2.2.5</i>
18.2.2.5.1.1	GoCBReference		<i>moved to clause 18.2.2.5</i>
18.2.2.5.2	Response+		<i>moved to clause 18.2.2.5</i>
18.2.2.5.2.1	GoEnable		<i>moved to clause 18.2.2.5</i>
18.2.2.5.2.2	GOOSEID		<i>moved to clause 18.2.2.5</i>
18.2.2.5.2.3	DataSetReference		<i>moved to clause 18.2.2.5</i>
18.2.2.5.2.4	ConfigurationRevision		<i>moved to clause 18.2.2.5</i>
18.2.2.5.2.5	NeedsCommissioning		<i>moved to clause 18.2.2.5</i>
18.2.2.5.2.6	DestinationAddress [0..1]		<i>moved to clause 18.2.2.5</i>
18.2.2.5.3	Response-		<i>moved to clause 18.2.2.5</i>
18.2.2.6	SetGoCBValues	18.2.2.6	SetGoCBValues
18.2.2.6.1	Request		<i>moved to clause 18.2.2.6</i>
18.2.2.6.1.1	GoCBReference		<i>moved to clause 18.2.2.6</i>
18.2.2.6.1.2	GoEnable [0..1]		<i>moved to clause 18.2.2.6</i>
18.2.2.6.1.3	GOOSEID [0..1]		<i>moved to clause 18.2.2.6</i>
18.2.2.6.1.4	DataSetReference [0..1]		<i>moved to clause 18.2.2.6</i>
18.2.2.6.2	Response+		<i>moved to clause 18.2.2.6</i>
18.2.2.6.3	Response-		<i>moved to clause 18.2.2.6</i>

18.2.3	Generic object oriented substation event (GOOSE) message	18.2.3	Generic object oriented substation event (GOOSE) message
18.2.3.1	GOOSE message syntax		<i>moved to clause 18.2.3</i>
18.2.3.2	DatSet - data set		<i>moved to clause 18.2.3</i>
18.2.3.3	GoID - application identifier		<i>moved to clause 18.2.3</i>
18.2.3.4	GoCBRef - GOOSE control block reference		<i>moved to clause 18.2.3</i>
18.2.3.5	T - time stamp		<i>moved to clause 18.2.3</i>
18.2.3.6	StNum - state number		<i>moved to clause 18.2.3</i>
18.2.3.7	SqNum - sequence number		<i>moved to clause 18.2.3</i>
18.2.3.8	Simulation - Simulation		<i>moved to clause 18.2.3</i>
18.2.3.9	ConfRev - configuration revision		<i>moved to clause 18.2.3</i>
18.2.3.10	NdsCom - needs commissioning		<i>moved to clause 18.2.3</i>
18.2.3.11	GOOSEData [1..n]		<i>moved to clause 18.2.3</i>
19	Transmission of sampled value class model	19	Transmission of sampled value class model
19.1	Overview	19.1	Overview
19.2	Transmission of sampled values using multicast	19.2	Transmission of sampled values using multicast
		19.2.1	General
19.2.1	MSVCB class definition	19.2.2	MSVCB class definition
19.2.1.1	MsvCBName - multicast sampled value control name		<i>moved to clause 19.2.2</i>
19.2.1.2	MsvCBRef - multicast sampled value control reference		<i>moved to clause 19.2.2</i>
19.2.1.3	SvEna - sampled value enable		<i>moved to clause 19.2.2</i>
19.2.1.4	MsvID - multicast sampled value identifier		<i>moved to clause 19.2.2</i>
19.2.1.5	DatSet		<i>moved to clause 19.2.2</i>
19.2.1.6	ConfRev - configuration revision		<i>moved to clause 19.2.2</i>
19.2.1.7	SmpMod		<i>moved to clause 19.2.2</i>
19.2.1.8	SmpRate		<i>moved to clause 19.2.2</i>
19.2.1.9	OptFlds - optional fields to include in SV message		<i>moved to clause 19.2.2</i>
19.2.1.10	DstAddress		<i>moved to clause 19.2.2</i>
19.2.2	Multicast sampled value class services	19.2.3	MSVCB class services
19.2.2.1	Overview	19.2.3.1	Overview
19.2.2.2	SendMSVMessage	19.2.3.2	SendMSVMessage
19.2.2.2.1	SendMSVMessage parameter table		<i>moved to clause 19.2.3.2</i>
19.2.2.2.2	Request		<i>moved to clause 19.2.3.2</i>
19.2.2.2.2.1	MSV message		<i>moved to clause 19.2.3.2</i>
19.2.2.3	GetMSVCBValues	19.2.3.3	GetMSVCBValues
19.2.2.3.1	Request		<i>moved to clause 19.2.3.3</i>
19.2.2.3.1.1	MsvCBReference		<i>moved to clause 19.2.3.3</i>
19.2.2.3.2	Response+		<i>moved to clause 19.2.3.3</i>
19.2.2.3.2.1	SvEnable		<i>moved to clause 19.2.3.3</i>
19.2.2.3.2.2	MulticastSampleValueID		<i>moved to clause 19.2.3.3</i>
19.2.2.3.2.3	DataSetReference		<i>moved to clause 19.2.3.3</i>
19.2.2.3.2.4	ConfigurationRevision		<i>moved to clause 19.2.3.3</i>
19.2.2.3.2.5	SampleMode [0..1]		<i>moved to clause 19.2.3.3</i>
19.2.2.3.2.6	SampleRate		<i>moved to clause 19.2.3.3</i>
19.2.2.3.2.7	OptionalFields		<i>moved to clause 19.2.3.3</i>
19.2.2.3.2.8	DestinationAddress [0..1]		<i>moved to clause 19.2.3.3</i>
19.2.2.3.3	Response-		<i>moved to clause 19.2.3.3</i>

19.2.2.4	SetMSVCBValues	19.2.3.4	SetMSVCBValues
19.2.2.4.1	Request		<i>moved to clause 19.2.3.4</i>
19.2.2.4.1.1	MsvCBReference		<i>moved to clause 19.2.3.4</i>
19.2.2.4.1.2	SvEnable [0..1]		<i>moved to clause 19.2.3.4</i>
19.2.2.4.1.3	MulticastSampleValueID [0..1]		<i>moved to clause 19.2.3.4</i>
19.2.2.4.1.4	DataSetReference [0..1]		<i>moved to clause 19.2.3.4</i>
19.2.2.4.1.5	SampleMode [0..1]		<i>moved to clause 19.2.3.4</i>
19.2.2.4.1.6	SampleRate [0..1]		<i>moved to clause 19.2.3.4</i>
19.2.2.4.1.7	OptionalFields [0..1]		<i>moved to clause 19.2.3.4</i>
19.2.2.4.2	Response+		<i>moved to clause 19.2.3.4</i>
19.2.2.4.3	Response-		<i>moved to clause 19.2.3.4</i>
		19.2.3.5	GetMsvReference
		19.2.3.6	GetMSVElementNumber
19.3	Transmission of sampled values using unicast	19.3	Transmission of sampled values using unicast
		19.3.1	General
19.3.1	USVCB class definition	19.3.2	USVCB class definition
19.3.1.1	UsvCBName - unicast sampled value control name		<i>moved to clause 19.3.2</i>
19.3.1.2	UsvCBRef - unicast sampled value control reference		<i>moved to clause 19.3.2</i>
19.3.1.3	SvEna - sampled value enable		<i>moved to clause 19.3.2</i>
19.3.1.4	Resv - reserve USVCB		<i>moved to clause 19.3.2</i>
19.3.1.5	UsvID		<i>moved to clause 19.3.2</i>
19.3.1.6	DatSet		<i>moved to clause 19.3.2</i>
19.3.1.7	ConfRev - configuration revision		<i>moved to clause 19.3.2</i>
19.3.1.8	SmpMod		<i>moved to clause 19.3.2</i>
19.3.1.9	SmpRate		<i>moved to clause 19.3.2</i>
19.3.1.10	OptFlds - optional fields to include in SV message		<i>moved to clause 19.3.2</i>
19.3.1.11	DstAddress		<i>moved to clause 19.3.2</i>
19.3.2	Unicast sampled value services	19.3.3	USVCB services
19.3.2.1	Overview	19.3.3.1	Overview
19.3.2.2	SendUSVMessage	19.3.3.2	SendUSVMessage
19.3.2.2.1	SendUSVMessage parameter table		<i>moved to clause 19.3.3.2</i>
19.3.2.2.2	Request		<i>moved to clause 19.3.3.2</i>
19.3.2.3	GetUSVCBValues	19.3.3.3	GetUSVCBValues
19.3.2.3.1	Request		<i>moved to clause 19.3.3.3</i>
19.3.2.3.2	Response+		<i>moved to clause 19.3.3.3</i>
19.3.2.3.2.1	SvEnable		<i>moved to clause 19.3.3.3</i>
19.3.2.3.2.2	CBReserved		<i>moved to clause 19.3.3.3</i>
19.3.2.3.2.3	UnicastSampleValueID		<i>moved to clause 19.3.3.3</i>
19.3.2.3.2.4	DataSetReference		<i>moved to clause 19.3.3.3</i>
19.3.2.3.2.5	ConfigurationRevision		<i>moved to clause 19.3.3.3</i>
19.3.2.3.2.6	SampleMode [0..1]		<i>moved to clause 19.3.3.3</i>
19.3.2.3.2.7	SampleRate		<i>moved to clause 19.3.3.3</i>
19.3.2.3.2.8	OptionalFields [0..1]		<i>moved to clause 19.3.3.3</i>
19.3.2.3.2.9	DestinationAddress [0..1]		<i>moved to clause 19.3.3.3</i>
19.3.2.3.3	Response-		<i>moved to clause 19.3.3.3</i>
19.3.2.4	SetUSVCBValues	19.3.3.4	SetUSVCBValues
19.3.2.4.1	Request		<i>moved to clause 19.3.3.4</i>
19.3.2.4.1.1	UsvCBReference		<i>moved to clause 19.3.3.4</i>
19.3.2.4.1.2	SvEnable [0..1]		<i>moved to clause 19.3.3.4</i>
19.3.2.4.1.3	CBReserved [0..1]		<i>moved to clause 19.3.3.4</i>
19.3.2.4.1.4	UnicastSampleValueID [0..1]		<i>moved to clause 19.3.3.4</i>
19.3.2.4.1.5	DataSetReference [0..1]		<i>moved to clause 19.3.3.4</i>

19.3.2.4.1.6	SampleMode [0..1]		<i>moved to clause 19.3.3.4</i>
19.3.2.4.1.7	SampleRate [0..1]		<i>moved to clause 19.3.3.4</i>
19.3.2.4.1.8	OptionalFids [0..1]		<i>moved to clause 19.3.3.4</i>
19.3.2.4.2	Response+		<i>moved to clause 19.3.3.4</i>
19.3.2.4.3	Response-		<i>moved to clause 19.3.3.4</i>
		19.3.3.5	GetUsvReference
		19.3.3.6	GetUSVElementNumber
19.4	Sampled value format	19.4	Sampled value format
19.4.1	MsvID or UsvID		<i>moved to clause 19.4</i>
19.4.2	OptFids		<i>moved to clause 19.4</i>
19.4.3	DatSet		<i>moved to clause 19.4</i>
19.4.4	Sample [1..n]		<i>moved to clause 19.4</i>
19.4.5	SmpCnt		<i>moved to clause 19.4</i>
19.4.6	RefrTm		<i>moved to clause 19.4</i>
19.4.7	ConfRev		<i>moved to clause 19.4</i>
19.4.8	SmpSynch		<i>moved to clause 19.4</i>
19.4.9	SmpRate		<i>moved to clause 19.4</i>
19.4.10	SmpMod		<i>moved to clause 19.4</i>
19.4.11	Simulation		<i>moved to clause 19.4</i>
20	CONTROL class model	20	CONTROL class model
20.1	Introduction	20.1	Introduction
20.2	Control with normal security	20.2	Control with normal security
20.2.1	Direct control with normal security	20.2.1	Direct control with normal security
20.2.2	SBO control with normal security	20.2.2	SBO control with normal security
20.3	Control with enhanced security	20.3	Control with enhanced security
20.3.1	Introduction	20.3.1	Introduction
20.3.2	Direct control with enhanced security	20.3.2	Direct control with enhanced security
20.3.3	SBO control with enhanced security	20.3.3	SBO control with enhanced security
20.4	Time-activated operate	20.4	Time-activated operate
20.5	CONTROL class service definitions	20.5	CONTROL class service definitions
20.5.1	Overview	20.5.1	Overview
20.5.2	Service parameter definition	20.5.2	Service parameter definition
20.5.2.1	ControlObjectReference		<i>moved to clause 20.5.2</i>
20.5.2.2	ctlVal		<i>moved to clause 20.5.2</i>
20.5.2.3	origin		<i>moved to clause 20.5.2</i>
20.5.2.4	ctlNum		<i>moved to clause 20.5.2</i>
20.5.2.5	T - control time-stamp		<i>moved to clause 20.5.2</i>
20.5.2.6	Test - test status		<i>moved to clause 20.5.2</i>
20.5.2.7	Check - Check condition		<i>moved to clause 20.5.2</i>
20.5.2.8	operTm - Operate time		<i>moved to clause 20.5.2</i>
20.5.2.9	AddCause - additional cause diagnosis		<i>moved to clause 20.5.2</i>
20.5.3	Service specification	20.5.3	Service specification
20.5.3.1	General	20.5.3.1	General
20.5.3.2	Select (Sel)	20.5.3.2	Select (Sel)
20.5.3.3	SelectWithValue (SelVal)	20.5.3.3	SelectWithValue (SelVal)
20.5.3.4	Cancel (Cancel)	20.5.3.4	Cancel (Cancel)
20.5.3.5	Operate (Oper)	20.5.3.5	Operate (Oper)
20.5.3.6	CommandTermination (CmdTerm)	20.5.3.6	CommandTermination (CmdTerm)
20.5.3.7	TimeActivatedOperate (TimOper)	20.5.3.7	TimeActivatedOperate (TimOper)
20.5.3.8	TimeActivatedOperateTermination (TimOperTermination)	20.5.3.8	TimeActivatedOperateTermination (TimOperTermination)
20.6	Tracking of control services		
20.6.1	General		<i>moved to clause 14.3</i>
20.6.2	Control service tracking (CTS)		<i>moved to IEC 61850-7-3</i>

21	Time and time-synchronization model	21	Time and time-synchronization model
21.1	General	21.1	General
21.2	External information	21.2	External information
22	Naming conventions	22	Naming conventions
22.1	Class naming and class specializations	22.1	Class naming and class specializations
22.2	Referencing an instance of a class	22.2	Referencing an instance of a class
22.3	Scope	22.3	Scope
23	File transfer model	23	File transfer model
23.1	File class	23.1	File class
23.1.1	FileName		<i>moved to clause 23.1</i>
23.1.2	FileSize		<i>moved to clause 23.1</i>
23.1.3	LastModified		<i>moved to clause 23.1</i>
23.2	File services	23.2	File services
23.2.1	GetFile	23.2.1	Overview
23.2.1.1	GetFile parameter	23.2.2	GetFile
23.2.1.2	Request		<i>moved to clause 23.2.2</i>
23.2.1.3	Response+		<i>moved to clause 23.2.2</i>
23.2.1.4	Response-		<i>moved to clause 23.2.2</i>
23.2.2	SetFile	23.2.3	SetFile
23.2.2.1	SetFile parameter		<i>moved to clause 23.2.3</i>
23.2.2.2	Request		<i>moved to clause 23.2.3</i>
23.2.2.2.1	FileName		<i>moved to clause 23.2.3</i>
23.2.2.2.2	File-Data		<i>moved to clause 23.2.3</i>
23.2.2.3	Response+		<i>moved to clause 23.2.3</i>
23.2.2.4	Response-		<i>moved to clause 23.2.3</i>
23.2.3	DeleteFile	23.2.4	DeleteFile
23.2.3.1	DeleteFile parameter		<i>moved to clause 23.2.4</i>
23.2.3.2	Request		<i>moved to clause 23.2.4</i>
23.2.3.2.1	FileName		<i>moved to clause 23.2.4</i>
23.2.3.3	Response+		<i>moved to clause 23.2.4</i>
23.2.3.4	Response-		<i>moved to clause 23.2.4</i>
23.2.4	GetFileAttributeValues	23.2.5	GetFileAttributeValues
23.2.4.1	GetFileAttributeValues parameter		<i>moved to clause 23.2.5</i>
23.2.4.2	Request		<i>moved to clause 23.2.5</i>
23.2.4.3	Response+		<i>moved to clause 23.2.5</i>
23.2.4.3.1	FileName		<i>moved to clause 23.2.5</i>
23.2.4.3.2	FileSize		<i>moved to clause 23.2.5</i>
23.2.4.3.3	LastModified		<i>moved to clause 23.2.5</i>
23.2.4.4	Response-		<i>moved to clause 23.2.5</i>
Annex A (normative)	ACSI conformance statement	Annex A (normative)	ACSI conformance statement
A.1	General	A.1	General
A.2	ACSI basic conformance statement	A.2	ACSI basic conformance statement
A.3	ACSI models conformance statement	A.3	ACSI models conformance statement
A.4	ACSI service conformance statement	A.4	ACSI service conformance statement
		Annex B (normative)	SCL enumerations
Annex B (normative)	Formal definition of IEC 61850-7-2 Common Data Classes		<i>moved to IEC 61850-7-3</i>
B.1	Introduction		

B.2 Formal CDC definition

Annex C (informative)	Generic substation state event (GSSE) control block (GsCB)	Annex C (informative)	Generic substation state event (GSSE) control block (GsCB)
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Annex D (normative)	Clarification on usage of quality
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D.1	Relation of the detailed quality identifiers with invalid or questionable quality
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D.2	Quality in the client server
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D.3	Relation between quality identifier
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COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 7-2: Basic information and communication structure – Abstract communication service interface (ACSI)

1 Scope

Add note:

Content in clause 6 and 7, some UML diagrams as well as annexes B and E are automatically generated from the model file wg10uml02v19-wg18uml02v11b-wg17uml02v17c-jwg25uml02v04d.eap . Namespace definition is IEC 61850-7-2:2007B.

2 Normative references

Replace title by reference IEC61850-6 with:

IEC 61850-6, *Communication networks and systems for power utility automation – Part 6: Configuration description language for communication in power utility automation systems related to IEDs*

Replace revision indication for IEC 61850-7-1, IEC 61850-7-3, IEC 61850-7-4, IEC 61850-8-1 and IEC 61850-9-2 to:

IEC 61850-7-1:2016, *Communication networks and systems for power utility automation – Part 7-1: Basic communication structure – Principles and models*

IEC 61850-7-3:2016, *Communication networks and systems for power utility automation – Part 7-3: Basic communication structure – Common data classes*

IEC 61850-7-4:2016, *Communication networks and systems for power utility automation – Part 7-4: Basic communication structure – Compatible logical node classes and data object classes*

IEC 61850-8-1:2016, *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 61850-9-2:2016, *Communication networks and systems for power utility automation – Part 9-2: Specific communication service mapping (SCSM) – Sampled values over ISO/IEC 8802-3*

3 Terms and definitions

No change.

4 Abbreviated terms

Replace or add following abbreviated terms with:

PIXIT protocol Implementation extra information for testing

PresCond	presence condition
SCL	system configuration language (IEC 61850-6)
ICD	IED Configuration Description file
IID	Instantiated IED Description file

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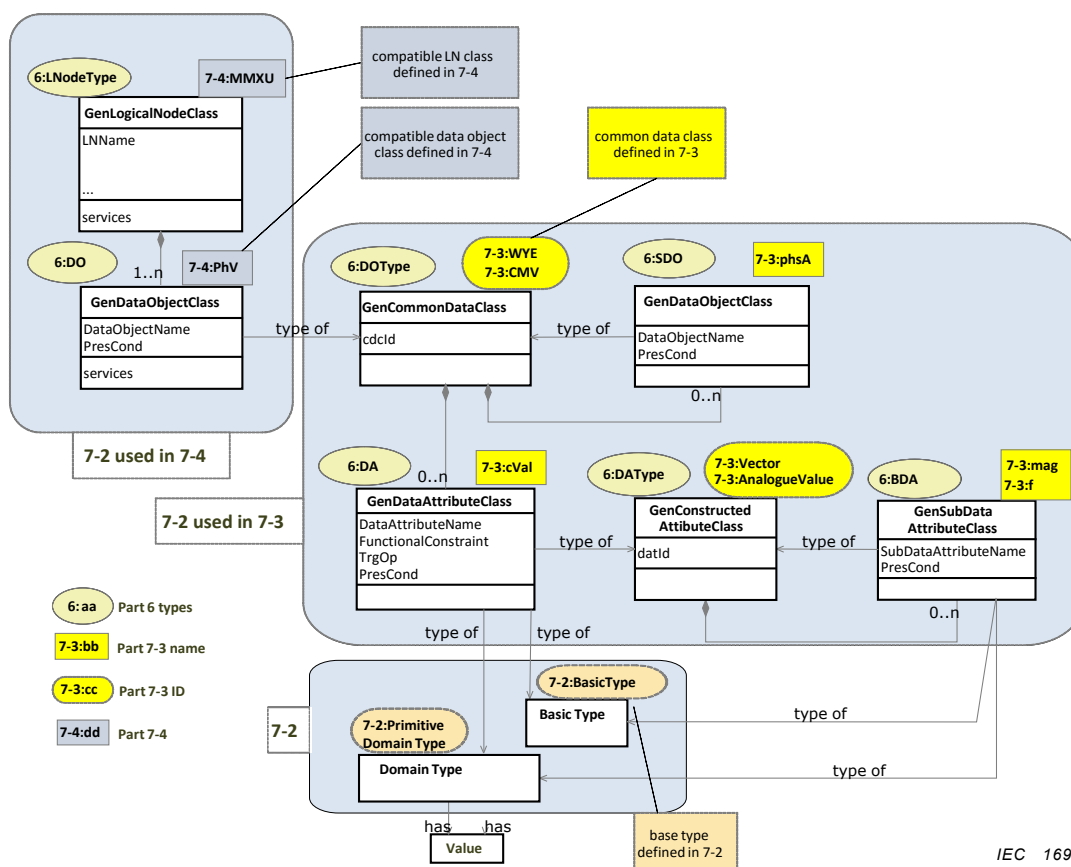
178 **5 ACSI overview and basic concepts**179 **5.1 Conceptual model of IEC 61850**180 *No change.*181 **5.2 The meta-meta model**182 *No change.*183 **5.3 The meta model**184 **5.3.1 General**185 *No change.*186 **5.3.2 Information modelling classes**187 *No change.*

188

189 **5.3.3 Information exchange modelling classes**190 *Remove Substitution from the enumeration since it is entirely defined in IEC 61850-7-3.*

191

192 *Add in table 1 the following services in 'Transmission of sampled values model':*193 GetMsvReference and GetMSVElementNumber under MULTICAST-SAMPLE-VALUE-
194 CONTROL-BLOCK.195 GetUsvReference and GetUSVElementNumber UNICAST-SAMPLE-VALUE-CONTROL-
196 BLOCK.197 **5.3.4 Relations between classes**198 *Replace Figure 4 with:*



IEC 1691/10

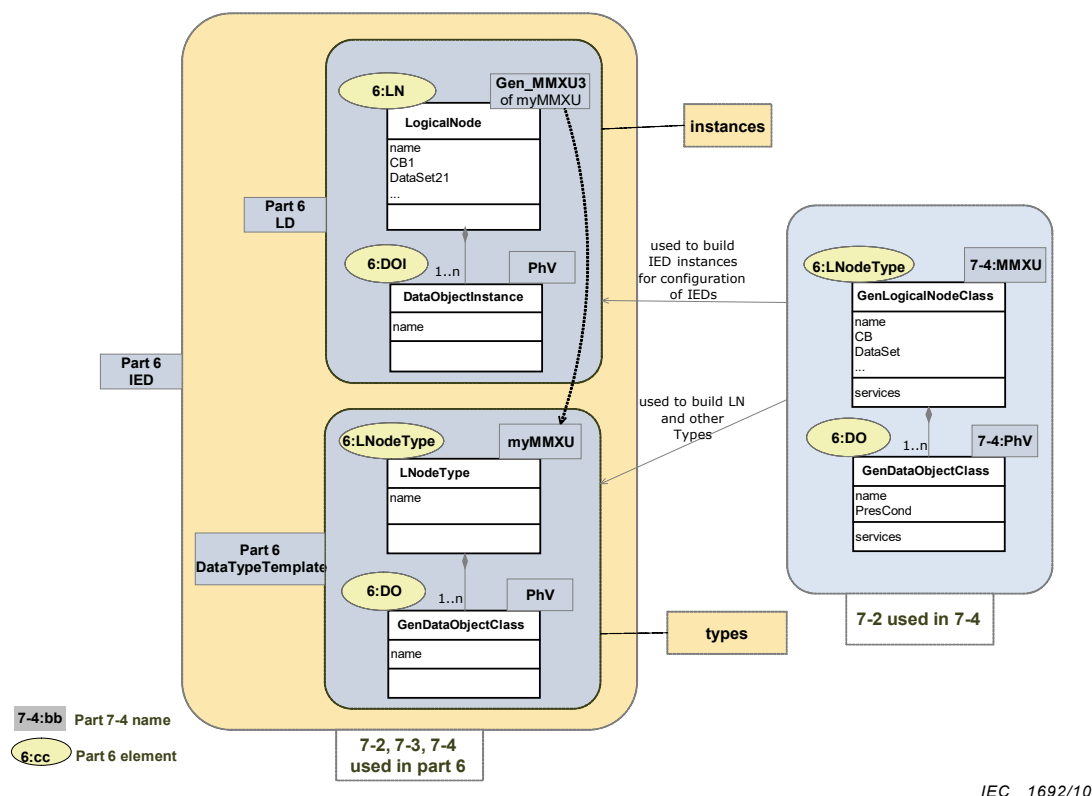
Figure 4 – Core of the conceptual meta model and relationship

5.4 The domain type model

No change.

5.5 The data instance model

Replace Figure 5 with:



IEC 1692/10

Figure 5 – Data instance model (conceptual)

Add the following 3 clauses:

5.6 Conditions for element presence

Used to be defined in IEC 61850-7-3 and IEC 61850-7-4.

This clause introduces conditions that specify presence of elements in a given context (one LN, or one CDC, or one data attribute type, or one data object for dataNs).

Table 1A shows presence conditions.

Table 1A – Conditions for presence of elements within a context

Condition name	Definition
M	Element is mandatory.
O	Element is optional.
F	Element is forbidden.
na	Element is not applicable.
Mmulti	At least one element shall be present; all instances have an instance number >0.
Omulti	Zero or more elements may be present; all instances have an instance number >0.
AtLeastOne(n)	Parameter n: group number (>0). At least one of marked elements of a group n shall be present.
AtMostOne	At most one of marked elements shall be present.
AllOrNonePerGroup(n)	Parameter n: group number (>0). All or none of the elements of a group n shall be present.
AllOnlyOneGroup(n)	Parameter n: group number (>0).