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CD IEC 61850-7-3, Amendment 1

Communication networks and systems in substations

Part 7-3: Basic communication structure for substations and feeder equipment - Common data classes

Amendment 1: Clarifications and Corrections, and Extensions for Power Quality and Representation of Historical and Statistical Information

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMUNICATION NETWORKS AND SYSTEMS IN SUBSTATIONS**Part 7-3: Basic communication structure for substations and feeder equipment - Common data classes****Amendment 1: Clarifications and Corrections and Extensions for Power Quality and Representation of Historical and Statistical Information**

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This CD of the Amendment to International Standard IEC 61850-7-3 has been prepared by the working group 10 of IEC technical committee 57.

This document contains amendments to Parts 7-3 of the standard series IEC 61850, a set of specifications for communication networks and systems in substations.

At time of publication of this part, the following parts were part of IEC 61850:

- IEC 61850-1: Communication networks and systems in substations – Part 1: Introduction and overview*
- IEC 61850-2: Communication networks and systems in substations – Part 2: Glossary*
- IEC 61850-3: Communication networks and systems in substations – Part 3: General requirements*
- IEC 61850-4: Communication networks and systems in substations – Part 4: System and project management*

- IEC 61850-5: Communication networks and systems in substations – Part 5: Communication requirements for functions and device models*
- IEC 61850-6: Communication networks and systems in substations – Part 6: Substation automation system configuration language*
- IEC 61850-7-1: Communication networks and systems in substations – Part 7-1: Basic communication structure for substation and feeder equipment – Principles and models*
- IEC 61850-7-2: Communication networks and systems in substations – Part 7-2: Basic communication structure for substation and feeder equipment – Abstract communication service interface (ACSI)*
- IEC 61850-7-3: Communication networks and systems in substations – Part 7-3: Basic communication structure for substation and feeder equipment – Common data classes*
- IEC 61850-7-4: Communication networks and systems in substations – Part 7-4: Basic communication structure for substation and feeder equipment – Compatible logical node classes and data classes*
- IEC 61850-8-1: Communication networks and systems in substations – Part 8-1: Specific communication service mapping (SCSM) – Mapping to MMS(ISO/IEC 9506 Part 1 and Part 2)*
- IEC 61850-9-1: Communication networks and systems in substations – Part 9-1: Specific communication service mapping (SCSM) – Serial unidirectional multidrop point to point link*
- IEC 61850-9-2: Communication networks and systems in substations – Part 9-2: Specific communication service mapping (SCSM) – Mapping on a IEEE 802.3 based process bus*
- IEC 61850-10: Communication networks and systems in substations – Part 10: Conformance Testing*

INTRODUCTION

This document is an amendment to the standard IEC 61850-7-3

- defines new common data classes used for the power quality models and for the representation of statistical and historical data,
- provides clarifications and corrections to the published edition 1 of IEC 61850-7-3.

ABOUT THIS VERSION:

This version covers the following TISSUES: 28, 54, 55, 56, 58, 59, 60, 61, 63, 65, 68, 138, 161, 164 and 182. TISSUE 57 is editorial and makes no sense to be changed in an Amendment.

In addition, this version includes the changes required for the representation of statistical and historical data.

NORMATIVE REFERENCES

IEC 61850-7-3:2003 Communication networks and systems in substations – Part 7-3: Basic communication structure for substation and feeder equipment – Common data classes

COMMUNICATION NETWORKS AND SYSTEMS IN SUBSTATIONS

Part 7-3: Basic communication structure for substations and feeder equipment - Common data classes

Amendment 1: Clarifications and Corrections and Extensions for Power Quality and Representation of Historical and Statistical Information

1 Scope

Change 3rd bullet to

- Common data classes for controls

Delete 4th bullet

5 Conditions for attribute inclusions

Change the text in the second column of table 1 for following entries

Abbreviation	Condition
...	
AC_SG_M	The attribute is mandatory, if <i>this data shall be member of a setting group</i>
AC_SG_O	The attribute is optional, if <i>this data shall be member of a setting group</i>
AC_NSQ_M	The attribute is mandatory, if <i>this data shall be a setting outside the setting group.</i>
AC_NSQ_O	The attribute is optional, if <i>this data shall be a setting outside the setting group.</i>

6.5 Range configuration

Add the following row to table 6:

RangeConfig Type Definition			
Attribute Name	Attribute Type	Value/Value Range	M/O/C
...			
limDb	INT32U	0 ... 100 000	O

Add the following text at the end of clause 6.5:

limDb: The value is used to introduce a hysteresis in the calculation of range. Range is immediately set to the higher value, when a high limit has been crossed (to the lower value, when a low limit has been crossed). However, range is only set back to the lower value, when the value of the high limit minus limDb has been crossed (to the higher value when the value of the low limit plus limDb has been crossed). The value shall represent the percentage between max and min in units of 0.001%. If limDb is not present, no hysteresis calculation is made.

6.11 Point definition

Change the text in first row of table 11 to *Point Type Definition*

Change in the first line following table 11 cVal to xVal

7.3.1 Application of services

Change title

In table 13, change the row entry "reporting model" with the following:

Reporting model	Report	ALL	as specified within the data set that is used to define the content of the message
GSE model	SendGOOSEMessage SendGSSEMessage		
Sampled values model	SendMSVMessage SendUSVMessage		

7.3.5 Protection activation information

Add the following row to table 17 [CB8](before row *configuration, description and extension*)

origin	Originator	ST		0
--------	------------	----	--	---

Add the following note after the table 17

NOTE – the attribute origin may be used to identify the originator when a data of the CDC ACT is used to perform an operation. An example would be the data OpOpn of the LN CSWI being used to open a breaker (LN XCBR) through a GOOSE message. The LN XCBR receives the data CSWI.OpOpn including the originator as a GOOSE message. Once operated, the new status information in XCBR.Pos will include the originator information it received as part of the GOOSE message that triggered the operation.

7.4.1 Application of services

Change title

In table 21, change the row entry "reporting model" with the following:

Reporting model	Report	ALL	as specified within the data set that is used to define the content of the message
GSE model	SendGOOSEMessage SendGSSEMessage		
Sampled values model	SendMSVMessage SendUSVMessage		

7.5 Common data class specification for controls

Title to be changed.

7.5.1 Application of services

Add in row 5 of table 31 *measured attributes*

Delete in table 31 the service synchrocheck listed under the row control model

In table 31, change the row entry "reporting model" with the following:

Reporting model	Report	ALL	as specified within the data set that is used to define the content of the message
GSE model	SendGOOSEMessage SendGSSEMessage		
Sampled values model	SendMSVMessage SendUSVMessage		

7.5.7 Controllable analogue process value (APC)

Clause to be moved here from clause 7.6.2; title changed

In the first paragraph and in the title of the table replace analogue setpoint information with analogue process value.

In Table 38, replace setpoint with control in 5th row; delete FC=MX and dchg for the attribute setMag, rename this attribute to ctIVal; replace FC=SP with FC=CO; add a new optional attribute mxVal with FC=MX and dchg; refer to table 31 instead of 37 in the last row. The table is now as follows:

Table 38– Controllable analogue process value

APC class					
Attribute Name	Attribute Type	FC	TrgOp	Value/Value Range	M/O/C
DataName	Inherited from Data Class (see IEC 61850-7-2)				
DataAttribute					
<i>control and measured attributes</i>					
ctIVal	AnalogueValue	CO			M
origin	Originator	CO, MX			O
operTm	TimeStamp	CO			O
mxVal	AnalogueValue	MX	dchg		O
q	Quality	MX	qchg		M
t	TimeStamp	MX			M
<i>configuration, description and extension</i>					
ctIModel	CtlModels	CF			M
units	Unit	CF		see Annex A	O
sVC	ScaledValueConfig	CF			AC_SCAV
minVal	AnalogueValue	CF			O
maxVal	AnalogueValue	CF			O
stepSize	AnalogueValue	CF		1 ... (maxVal – minVal)	O
d	VISIBLE STRING255	DC		Text	O
dU	UNICODE STRING255	DC			O
cdcNs	VISIBLE STRING255	EX			AC_DLND_A_M
cdcName	VISIBLE STRING255	EX			AC_DLND_A_M
dataNs	VISIBLE STRING255	EX			AC_DLN_M
Services					
As defined in Table 31					

EDITOR NOTE – now that this is declared as process value; should we add substitution capabilities?

7.6 Common data class specification for controllable analogue information

Delete this clause including clause 7.6.1. Move 7.6.2 to 7.5.7 with the changes indicated above.

7.7.1 Application of services

In table 39, change the row entry "reporting model" with the following:

Reporting model GSE model	Report SendGOOSEMessage SendGSSEMessage	ALL	as specified within the data set that is used to define the content of the message
Sampled values model	SendMSVMessage SendUSVMessage		

Insert the following new clause 7.7.4[CB18]

7.7.4 Object reference setting group (REF)

Table 1 defines the common data class “object reference setting group”. This common data class is used to specify the object reference to the logical node of which the statistical data have been calculated. This CDC shall be used, i.e., for the DATA CalcSrc to be included in the “Optional Logical Node Information” of the Common Logical Node defined in IEC 61850-7-4:2003.

NOTE The conceptual model of the statistical data model is defined in the first amendment to IEC 61850-7-1:2003.

Table 1 – Object reference setting group common data class specification

REF class					
Attribute Name	Attribute Type	FC	TrgOp	Value/Value Range	M/O/C
DataName	Inherited from Data Class (see IEC 61850-7-2)				
DataAttribute					
<i>Setting</i>					
setRef	VISIBLE STRING129	SP		Object Reference	AC_NS_G_M
setRef	VISIBLE STRING129	SG, SE		Object Reference	AC_SG_M
<i>configuration, description and extension</i>					
d	VISIBLE STRING255	DC		Text	O
dU	UNICODE STRING255	DC			O
cdcNs	VISIBLE STRING255	EX			AC_DL_NDA_M
cdcName	VISIBLE STRING255	EX			AC_DL_NDA_M
dataNs	VISIBLE STRING255	EX			AC_DL_N_M
Services					
As defined in Table 39					

7.8.1 Application of services

In table 42, change the row entry "reporting model" with the following:

Reporting model GSE model	Report SendGOOSEMessage SendGSSEMessage	ALL	as specified within the data set that is used to define the content of the message
Sampled values model	SendMSVMessage SendUSVMessage		

7.9.1 Application of services

Change title

In table 45, change the row entry "reporting model" with the following:

Reporting model	Report	ALL	as specified within the data set that is used to define the content of the message
GSE model	SendGOOSEMessage		
Sampled values model	SendGSSEMessage SendMSVMessage SendUSVMessage		

8 Data attribute semantic

Add to table 49 the following entries:

Data attribute name	Semantics
mxVal	Measured analogue process value. The back indication from a controllable analogue process value.
SetRef	The value of an object reference setting. The attribute may be used to reference a logical node instance.

Modify the row entry for cVal of table 49 as follows[CB24]:

... The deadband calculation is done both on instCVal.mag as well as on instCVal.ang independently *based on the same configuration parameter db.* ...

Modify the row entry for mag of table 49 as follows:

Shall be based on a deadband calculation from *the instantaneous value modelled as instMag* as ...

Add the following note in the row entry for mag of table 49:

NOTE – the data attribute mag explained here is not the same like the data attribute component mag of the common data attribute type vector. Therefore in particular the value instCVal.mag is NOT a deadbanded value.

Add in the row entry for net the following text at the end of the explanation: *For further details see phsA (WYE)*

Modify the explanation for neut (WYE) as follows:

Value of the measured phase neutral. If a direct measurement of this value is not available, it is acceptable to substitute an estimate computed by creating the algebraic sum of the instantaneous values of currents flowing through all live conductors. In that case, 'neut' is identical to 'res'. For further details see phsA (WYE).

Add in the row entry for res the following text at the end of the explanation: *For further details see phsA (WYE)*

Annex A

Value range for units and multipliers

In table A2, change the text in the unit name for value 30 as follows:

Value	Quantity	Unit name	Symbol
30	Electric resistance	ohm (V/A)	Ω