


MiCOM C434

Feeder Management and Bay Control Unit

PICS and MICS

This document does not replace the Technical Manual

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Schneider
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1 Protocol Implementation Conformance Statement (PICS)

1.1 Introduction

This specification is the Protocol Implementation Conformance Statement (PICS) and presents the ACSI conformance statements as defined in Annex A of part 7-2 of the IEC 61850 standard specifications.

1.2 ACSI Basic Conformance Statement

The basic conformance statement shall be as defined in Table 1

Table 1 – Basic conformance statement

		Client / Subscriber		Server / Publisher		Value / Comments
Client-Server roles						
B11	Server side (of TWO-PARTY-APPLICATION-ASSOCIATION)	—	—	c1	Y	
B12	Client side (of TWO-PARTY-APPLICATION-ASSOCIATION)	c1	N	—	—	
SCSMs supported						
B21	SCSM: IEC 61850-8-1 used		N		Y	
B22	SCSM: IEC 61850-9-1 used					
B23	SCSM: IEC 61850-9-2 used					
B24	SCSM: other					
Generic substation event model (GSE)						
B31	Publisher side	—	—	O	Y	
B32	Subscriber side	O	Y	—	—	
Transmission of sampled value model (SVC)						
B41	Publisher side	—	—	O	N	
B42	Subscriber side	O	N	—	—	

c1 – shall be 'M' if support for LOGICAL-DEVICE model has been declared.

O – Optional

M – Mandatory

Y – Yes (supported)

N – No (not supported)

ACSI Models Conformance Statement

1.3 ACSI Models Conformance Statement

The ACSI models conformance statement shall be as defined in Table 2.

Table 2 – ACSI models conformance statement

		Client / Subscriber		Server / Publisher		Value / Comments
If Server side (B1) supported						
M1	Logical device	a	N	c2	Y	
M2	Logical node	c3	N	c3	Y	
M3	Data	c4	N	c4	Y	
M4	Data set	c5	N	c5	Y	
M5	Substitution	O	N	O	N	
M6	Setting group control	O	N	O	y	supp.Phase 2
Reporting						
M7	Buffered report control	O	N	O	y	supp.Phase 2
M7-1	sequence-number				y	supp.Phase 2
M7-2	report-time-stamp				y	supp.Phase 2
M7-3	reason-for-inclusion				y	supp.Phase 2
M7-4	data-set-name				y	supp.Phase 2
M7-5	data-reference				y	supp.Phase 2
M7-6	buffer-overflow				y	supp.Phase 2
M7-7	entryID				y	supp.Phase 2
M7-8	BufTim				y	supp.Phase 2
M7-9	IntgPd				y	supp.Phase 2
M7-10	GI				y	supp.Phase 2
M7-11	conf-revision				Y	supp.Phase 2
M8	Unbuffered report control	O	N	O	Y	
M8-1	sequence-number		N		Y	
M8-2	report-time-stamp		N		Y	
M8-3	reason-for-inclusion		N		Y	
M8-4	data-set-name		N		Y	
M8-5	data-reference		N		Y	
M8-6	BufTim		N		Y	
M8-7	IntgPd		N		Y	
M8-8	GI		N		Y	
M8-9	conf-revision		N		Y	supp.Phase 2
Logging		O	N	O	N	
M9	Log control	O	N	O	N	
M9-1	IntgPd		N		N	
M10	Log	O	N	O	N	
M11	Control	M	N	M	Y	

		Client / Subscriber		Server / Publisher		Value / Comments
If GSE (B31/32) is supported						
	GOOSE	O	Y	O	Y	
M12-1	entryID		Y	O	Y	
M12-2	DataRefInc		Y	O	Y	
M13	GSSE	O	Y	O	Y	
If SVC (41/42) is supported						
M14	Multicast SVC	O	N	O	N	
M15	Unicast SVC	O	N	O	N	
M16	Time	M	Y	M	N	Time source with required accuracy shall be available
M17	File Transfer	O	N	O	Y	

c2 – shall be 'M' if support for LOGICAL-NODE model has been declared

c3 – shall be 'M' if support for DATA model has been declared

c4 – shall be 'M' if support for DATA-SET, Substitution, Report, Log Control, or Time model has been declared

c5 – shall be 'M' if support for Report, GSE, or SMV models has been declared

1.4 ACSI Service Conformance Statement

The ACSI service conformance statement shall be as defined in Table 3 – ACSI service Conformance statement (depending on the statements in Table 1).

Table 3 – ACSI service Conformance statement

	Services	AA: TP/MC	Client/ Subscriber		Server/ Publisher		Comments
Server (clause 6)							
S1	ServerDirectory	TP		N	M	Y	
Application association (clause 7)							
S2	Associate		M	N	M	Y	
S3	Abort		M	N	M	Y	
S4	Release		M	N	M	Y	
Logical device (clause 8)							
S5	LogicalDeviceDirectory	TP	M	N	M	Y	

ACSI Service Conformance Statement

	Services	AA: TP/MC	Client/ Subscriber		Server/ Publisher		Comments
Logical node (clause 9)							
S6	LogicalNodeDirectory	TP	M	N	M	Y	
S7	GetAllDataValues	TP	O	N	M	Y	
Data (clause 10)							
S8	GetDataValues	TP	M	N	M	Y	
S9	SetDataValues	TP	O	N	O	Y	
S10	GetDataDirectory	TP	O	N	M	Y	
S11	GetDataDefinition	TP	O	N	M	Y	
Data set (clause 11)							
S12	GetDataSetValues	TP	O	N	M	Y	
S13	SetDataSetValues	TP	O	N	O	N	
S14	CreateDataSet	TP	O	N	O	N	
S15	DeleteDataSet	TP	O	N	O	N	
S16	GetDataSetDirectory	TP	O	N	O	Y	
Substitution (clause 12)							
S17	SetDataValues	TP	M	N	M	Y	
Setting group control (clause 13)							
S18	SelectActiveSG	TP	O	N	O	Y	supp.by Phase 2
S19	SelectEditSG	TP	O	N	O	N	
S20	SetSGValues	TP	O	N	O	N	
S21	ConfirmEditSGValues	TP	O	N	O	N	
S22	GetSGValues	TP	O	N	O	N	
S23	GetSGCBValues	TP	O	N	O	N	
Reporting (clause 14)							
Buffered report control block (BRCB)							
S24	Report	TP	c6	N	c6	Y	supp.by Phase 2
S24-1	data-change (dchg)					Y	supp.by Phase 2
S24-2	qchg-change (qchg)					Y	supp.by Phase 2
S24-3	data-update (dupd)					N	
S25	GetBRCBValues	TP	c6	N	c6	Y	supp.by Phase 2
S26	SetBRCBValues	TP	c6	N	c6	Y	supp.by Phase 2

	Services	AA: TP/MC	Client/ Subscriber		Server/ Publisher		Comments
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Unbuffered report control block (URCB)

S27	Report	TP	c6	N	c6	Y	
S27-1	data-change (dchg)			N		Y	
S27-2	qchg-change (qchg)			N		Y	
S27-3	data-update (dup)			N		N	
S28	GetURCBValues	TP	c6	N	c6	Y	
S29	SetURCBValues	TP	c6	N	c6	Y	supp.by Phase 2

c6 – shall declare support for at least one (BRCB or URCB)

Logging (clause 14)**Log control block**

S30	GetLCBValues	TP	M	N	M	N	
S31	SetLCBValues	TP	O	N	M	N	

Log

S32	QueryLogByTime	TP	c7	N	M	N	
S33	QueryLogAfter	TP	c7	N	M	N	
S34	GetLogStatusValues	TP	M	N	M	N	

c7 – shall declare support for at least one (QueryLogByTime or QueryLogByEntry)

Generic substation event model (GSE) (clause 15)**GOOSE-CONTROL-BLOCK**

S35	SendGOOSEMessage	MC	c8	N	c8	Y	
S36	GetGoReference	TP	O	N	c9	Y	
S37	GetGOOSEElementNumber	TP	O	N	c9	Y	
S38	GetGoCBValues	TP	O	N	O	Y	
S39	SetGoCBValues	TP	O	N	O	Y	

GSSE-CONTROL-BLOCK

S40	SendGSSEMessage	MC	c8	N	c8	N	
S41	GetGsReference	TP	O	N	c9	N	
S42	GetGSSEElementNumber	TP	O	N	c9	N	
S43	GetGsCBValues	TP	O	N	O	N	
S44	SetGsCBValues	TP	O	N	O	N	

c8 – shall declare support for at least one (SendGOOSEMessage or SendGSSEMessage)

c9 – shall declare support if TP association is available

ACSI Service Conformance Statement

	Services	AA: TP/MC	Client/ Subscriber		Server/ Publisher		Comments
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Transmission of sampled value model (SVC) (clause 16)

Multicast SVC

S45	SendMSVMessage	MC	c10	N	c10	N	
S46	GetMSVCBValues	TP	O	N	O	N	
S47	SetMSVCBValues	TP	O	N	O	N	

Unicast SVC

S48	SendUSVMessage	TP	c10	N	c10	N	
S49	GetUSVCBValues	TP	O	N	O	N	
S50	SetUSVCBValues	TP	O	N	O	N	

c10 – shall declare support for at least one (SendMSVMessage or SendUSVMessage)

Control (clause 17.5.1)

S51	Select		M	N	O	Y	
S52	SelectWithValue	TP	M	N	O	Y	
S53	Cancel	TP	O	N	O	Y	
S54	Operate	TP	M	N	M	Y	
S55	Command-Termination	TP	M	N	O	Y	
S56	TimeActivated-Operate	TP	O	N	O	N	

File transfer (clause 20)

S57	GetFile	TP	O	N	M	Y	
S58	SetFile	TP	O	N	O	N	
S59	DeleteFile	TP	O	N	O	N	
S60	GetFileAttributeValues	TP	O	N	M	Y	

Time (5.5)

T1	Time resolution of internal clock		1ms		1ms		Nearest negative power of 2 in seconds
T2	Time accuracy of internal clock				1ms		T0
					N		T1
					N		T2
					N		T3
					N		T4
					N		T5
T3	Supported TimeStamp resolution	-			1ms		Nearest value of 2 ^{**} -n in seconds according to 5.5.3.7.3.3

2 Model Implementation Conformance Statement (MICS)

2.1 Introduction

This specification is the Model Implementation Conformance Statement (MICS) and presents the top-level IEC 61850 data model that has been implemented. The definitions of all used Logical Nodes and their associated Common Data Classes, components and associated enumerated values are also included for completeness.

The reader is expected to be conversant with the terminology presented within the IEC 61850 part 7 series of specifications.

2.2 Objective

To provide comprehensive details of the standard data object model elements supported by the device. The MICS is conformant to the devices associated ICD (Substation Configuration Language) file, according to part 6 of the IEC 61850 standards. The layout of the presented tables within this document are conformant to the part 7 series of the IEC 61850 standard specifications with the following exceptions:

- The "Trigger Options" field is not presented.
- The "M/O" field is not present as the definitions are as deployed within the model.
- An additional column "X" is used to signify custom attributes.

2.3 Logical Device Definitions

The MiCOM relay implements an IEC 61850 server that can contain one or more Logical Devices. Each Logical Device contains a data model built from instances of specific Logical Nodes and must consist of at least an instance of the LPHD Logical Node (which is responsible for providing physical device information) and an instance of the LLN0 Logical Node (for addressing common issues across the Logical Device).

The IEC 61850 data model is contained within the Logical Devices detailed in the table below. All MiCOM devices will name the supported Logical Devices consistently to ensure that data model variables with the same purpose will have the same name within each MiCOM server.

Logical Device	Comment / Usage
Control	CX434 Controls Domain
Measurements	CX434 Measurements Domain
System	CX434 System Domain

Logical Device Definitions

2.3.1 IEC 61850 Logical Device Data Model

The IEC 61850 Logical Device top-level data model consists of instances of Logical Nodes. The data model name for a Logical Node instance is constructed from an optional prefix (known as the wrapper), the Logical Node name, and an instance ID (or suffix).

The presented data model is in an alphabetically sorted order, rather than a logical order, because this is the natural order of the data when presented by a native MMS browser.

(Higher level browsers can of course impart any ordering that they desire.)

LD	LN Instance	LN Type	Description
Control			
	CILO1	tp30_CILO_1	Interlocking
	CILO10	tp30_CILO_1	Interlocking
	CILO11	tp30_CILO_1	Interlocking
	CILO12	tp30_CILO_1	Interlocking
	CILO13	tp30_CILO_1	Interlocking
	CILO14	tp30_CILO_1	Interlocking
	CILO15	tp30_CILO_1	Interlocking
	CILO16	tp30_CILO_1	Interlocking
	CILO17	tp30_CILO_1	Interlocking
	CILO18	tp30_CILO_1	Interlocking
	CILO19	tp30_CILO_1	Interlocking
	CILO2	tp30_CILO_1	Interlocking
	CILO20	tp30_CILO_1	Interlocking
	CILO21	tp30_CILO_1	Interlocking
	CILO22	tp30_CILO_1	Interlocking
	CILO23	tp30_CILO_1	Interlocking
	CILO24	tp30_CILO_1	Interlocking
	CILO3	tp30_CILO_1	Interlocking
	CILO4	tp30_CILO_1	Interlocking
	CILO5	tp30_CILO_1	Interlocking
	CILO6	tp30_CILO_1	Interlocking
	CILO7	tp30_CILO_1	Interlocking
	CILO8	tp30_CILO_1	Interlocking
	CILO9	tp30_CILO_1	Interlocking
	CSWI1	tp30_CSWI_1	Switch controller
	CSWI10	tp30_CSWI_1	Switch controller
	CSWI11	tp30_CSWI_1	Switch controller
	CSWI12	tp30_CSWI_1	Switch controller
	CSWI13	tp30_CSWI_1	Switch controller
	CSWI14	tp30_CSWI_1	Switch controller
	CSWI15	tp30_CSWI_1	Switch controller
	CSWI16	tp30_CSWI_1	Switch controller

LD	LN Instance	LN Type	Description
	CSWI17	tp30_CSWI_1	Switch controller
	CSWI18	tp30_CSWI_1	Switch controller
	CSWI19	tp30_CSWI_1	Switch controller
	CSWI2	tp30_CSWI_1	Switch controller
	CSWI20	tp30_CSWI_1	Switch controller
	CSWI21	tp30_CSWI_1	Switch controller
	CSWI22	tp30_CSWI_1	Switch controller
	CSWI23	tp30_CSWI_1	Switch controller
	CSWI24	tp30_CSWI_1	Switch controller
	CSWI3	tp30_CSWI_1	Switch controller
	CSWI4	tp30_CSWI_1	Switch controller
	CSWI5	tp30_CSWI_1	Switch controller
	CSWI6	tp30_CSWI_1	Switch controller
	CSWI7	tp30_CSWI_1	Switch controller
	CSWI8	tp30_CSWI_1	Switch controller
	CSWI9	tp30_CSWI_1	Switch controller
	LLN0	tp30_LLNO_1	Logical node device
	LPHD1	tp30_LPHD_1	Physical device
	RSYN1	tp30_RSYN_1	Synchroncheck
	XCBR1	tp30_XCBR_1	Circuit breaker
	XCBR2	tp30_XCBR_1	Circuit breaker
	XSWI1	tp30_XSWI_1	Switch
	XSWI10	tp30_XSWI_1	Switch
	XSWI11	tp30_XSWI_1	Switch
	XSWI12	tp30_XSWI_1	Switch
	XSWI13	tp30_XSWI_1	Switch
	XSWI14	tp30_XSWI_1	Switch
	XSWI15	tp30_XSWI_1	Switch
	XSWI16	tp30_XSWI_1	Switch
	XSWI17	tp30_XSWI_1	Switch
	XSWI18	tp30_XSWI_1	Switch
	XSWI19	tp30_XSWI_1	Switch
	XSWI2	tp30_XSWI_1	Switch
	XSWI20	tp30_XSWI_1	Switch
	XSWI21	tp30_XSWI_1	Switch
	XSWI22	tp30_XSWI_1	Switch
	XSWI23	tp30_XSWI_1	Switch
	XSWI24	tp30_XSWI_1	Switch
	XSWI3	tp30_XSWI_1	Switch
	XSWI4	tp30_XSWI_1	Switch
	XSWI5	tp30_XSWI_1	Switch
	XSWI6	tp30_XSWI_1	Switch

Logical Device Definitions

LD	LN Instance	LN Type	Description
	XSWI7	tp30_XSWI_1	Switch
	XSWI8	tp30_XSWI_1	Switch
	XSWI9	tp30_XSWI_1	Switch
Measurements			
	LLN0	tp30_LLNO_2	Logical node device
	LPHD1	tp30_LPHD_1	Physical device
	MmuMMTR1	tp30_MMTR_1	Metering
	MmuMMTR2	tp30_MMTR_1	Metering
	MmuPriMMXU1	tp30_MMXU_1	Primary Basic Measurements
	MmuPriMMXU2	tp30_MMXU_1	Primary Basic Measurements
	MmuPriMSTA1	tp30_MSTA_1	Metering statistics
	MmuPriMSTA2	tp30_MSTA_1	Metering statistics
	MmuSecMMXU1	tp30_MMXU_2	Secondary Basic Measurements
	MmuSecMMXU2	tp30_MMXU_2	Secondary Basic Measurements
	MmuSecMSTA1	tp30_MSTA_1	Measuring statistics
	MmuSecMSTA2	tp30_MSTA_1	Measuring statistics
System			
	AlmGGIO1	tp30_GGIO_1	Generic process I/O
	AlmGGIO2	tp30_GGIO_2	Generic process I/O
	AlmGGIO3	tp30_GGIO_3	Generic process I/O
	AlmGGIO4	tp30_GGIO_4	Generic process I/O
	CtlGGIO1	tp30_GGIO_5	Generic process I/O
	CtlGGIO2	tp30_GGIO_5	Generic process I/O
	CtlGGIO3	tp30_GGIO_5	Generic process I/O
	CtlGGIO4	tp30_GGIO_5	Generic process I/O
	CtlGGIO5	tp30_GGIO_6	Generic process I/O
	CtlGGIO6	tp30_GGIO_7	Generic process I/O
	CtlGGIO7	tp30_GGIO_7	Generic process I/O
	CtlGGIO8	tp30_GGIO_8	Generic process I/O
	GosGGIO1	tp30_GGIO_9	Generic process I/O
	GosGGIO2	tp30_GGIO_10	Generic process I/O
	IdcGGIO1	tp30_GGIO_11	Generic process I/O
	LLN0	tp30_LLNO_3	Logical node device
	LPHD1	tp30_LPHD_1	Physical device
	PloGGIO1	tp30_GGIO_12	Generic process I/O
	PloGGIO10	tp30_GGIO_13	Generic process I/O
	PloGGIO2	tp30_GGIO_13	Generic process I/O
	PloGGIO3	tp30_GGIO_13	Generic process I/O
	PloGGIO4	tp30_GGIO_12	Generic process I/O
	PloGGIO5	tp30_GGIO_13	Generic process I/O
	PloGGIO6	tp30_GGIO_13	Generic process I/O
	PloGGIO7	tp30_GGIO_13	Generic process I/O

LD	LN Instance	LN Type	Description
	PloGGIO8	tp30_GGIO_13	Generic process I/O
	PloGGIO9	tp30_GGIO_13	Generic process I/O
	RtdGGIO1	tp30_GGIO_14	Generic process I/O

2.4 Logical Node Definitions

The definition tables for each of the Logical Nodes in the top-level data model are presented in the following sub-sections.

The following table presents a summary of the Logical Node templates used across the Logical Devices within the overall IEC 61850 product data model:

LN Type	(LN Class)	Description	Name Space
tp30_CILO_1	(CILO)	Interlocking	
tp30_CSWI_1	(CSWI)	Switch controller	
tp30_GGIO_1	(GGIO)	Generic process I/O	
tp30_GGIO_10	(GGIO)	Generic process I/O	
tp30_GGIO_11	(GGIO)	Generic process I/O	
tp30_GGIO_12	(GGIO)	Generic process I/O	
tp30_GGIO_13	(GGIO)	Generic process I/O	
tp30_GGIO_14	(GGIO)	Generic process I/O	
tp30_GGIO_2	(GGIO)	Generic process I/O	
tp30_GGIO_3	(GGIO)	Generic process I/O	
tp30_GGIO_4	(GGIO)	Generic process I/O	
tp30_GGIO_5	(GGIO)	Generic process I/O	
tp30_GGIO_6	(GGIO)	Generic process I/O	
tp30_GGIO_7	(GGIO)	Generic process I/O	
tp30_GGIO_8	(GGIO)	Generic process I/O	
tp30_GGIO_9	(GGIO)	Generic process I/O	
tp30_LLNO_1	(LLNO)	Logical node device	
tp30_LLNO_2	(LLNO)	Logical node device	
tp30_LLNO_3	(LLNO)	Logical node device	
tp30_LPHD_1	(LPHD)	Physical device	
tp30_MMTR_1	(MMTR)	Metering	
tp30_MMXU_1	(MMXU)	Primary Basic Measurements	
tp30_MMXU_2	(MMXU)	Secondary Basic Measurements	
tp30_MSTA_1	(MSTA)	Measuring statistics	
tp30_RSYN_1	(RSYN)	Synchroncheck	
tp30_XCBR_1	(XCBR)	Circuit breaker	
tp30_XSWI_1	(XSWI)	Switch	

Logical Node Definitions

2.4.1 LOGICAL NODE : tp30_CILO_1

Description : Interlocking**LN Class** : CILO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Beh	tp30_Beh_1	Behaviour	
Health	tp30_Health_1	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
EnaOpn	tp30_Alm10_1	Enable open	
EnaCls	tp30_Alm10_1	Enable close	

2.4.2 LOGICAL NODE : tp30_CSWI_1

Description : Switch controller**LN Class** : CSWI

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Beh	tp30_Beh_1	Behaviour	
Health	tp30_Health_1	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
Loc	tp30_Alm10_1	Local operation	
Pos	tp30_Pos_1	Switch position	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.3 LOGICAL NODE : tp30_GGIO_1

Description : Generic process I/O**LN Class** : GGIO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Beh	tp30_Beh_1	Behaviour	
Health	tp30_Health_1	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
Alm1	tp30_Alm10_1	Alarm	
Alm2	tp30_Alm10_1	Alarm	
Alm3	tp30_Alm10_1	Alarm	
Alm4	tp30_Alm10_1	Alarm	
Alm5	tp30_Alm10_1	Alarm	
Alm6	tp30_Alm10_1	Alarm	
Alm7	tp30_Alm10_1	Alarm	
Alm8	tp30_Alm10_1	Alarm	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.4 LOGICAL NODE : tp30_GGIO_10

Description : Generic process I/O

LN Class : GGIO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_2	Mode	
Beh	tp30_Beh_2	Behaviour	
Health	tp30_Health_2	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
Ind1	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind2	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind3	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind4	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind5	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind6	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind7	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind8	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind9	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind10	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind11	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind12	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind13	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind14	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind15	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind16	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind17	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind18	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind19	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind20	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind21	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind22	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind23	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind24	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind25	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind26	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind27	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind28	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind29	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind30	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind31	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind32	tp30_Alm10_1	Gen. ind. (bin. input)	

Logical Node Definitions

2.4.5 LOGICAL NODE : tp30_GGIO_11

Description : Generic process I/O**LN Class** : GGIO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_2	Mode	
Beh	tp30_Beh_2	Behaviour	
Health	tp30_Health_2	Health	
NamPlt	tp30_NamPlt_2	Name Plate	
urcbST	tp30_URCB	Unb. rep. control for status	
urcbMX	tp30_URCB	Unb. rep. control for measurement	
AnIn1	tp30_AnIn1_1	Analogue input	
AnIn2	tp30_AnIn1_1	Analogue input	

2.4.6 LOGICAL NODE : tp30_GGIO_12

Description : Generic process I/O**LN Class** : GGIO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_2	Mode	
Beh	tp30_Beh_2	Behaviour	
Health	tp30_Health_2	Health	
NamPlt	tp30_NamPlt_2	Name Plate	
Ind1	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind2	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind3	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind4	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind5	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind6	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind7	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind8	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind9	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind10	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind11	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind12	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind13	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind14	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind15	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind16	tp30_Alm10_1	Gen. ind. (bin. input)	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.7 LOGICAL NODE : tp30_GGIO_13

Description : Generic process I/O

LN Class : GGIO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_2	Mode	
Beh	tp30_Beh_2	Behaviour	
Health	tp30_Health_2	Health	
NamPlt	tp30_NamPlt_2	Name Plate	
Ind1	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind2	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind3	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind4	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind5	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind6	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind7	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind8	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind9	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind10	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind11	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind12	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind13	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind14	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind15	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind16	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind17	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind18	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind19	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind20	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind21	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind22	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind23	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind24	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind25	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind26	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind27	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind28	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind29	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind30	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind31	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind32	tp30_Alm10_1	Gen. ind. (bin. input)	
urcbST	tp30_URCB	Unb. rep. control for status	

Logical Node Definitions

2.4.8 LOGICAL NODE : tp30_GGIO_14

Description : Generic process I/O**LN Class** : GGIO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_2	Mode	
Beh	tp30_Beh_2	Behaviour	
Health	tp30_Health_2	Health	
NamPlt	tp30_NamPlt_2	Name Plate	
urcbST	tp30_URCB	Unb. rep. control for status	
urcbMX	tp30_URCB	Unb. rep. control for measurement	
AnIn1	tp30_AnIn1_1	Analogue input	
AnIn2	tp30_AnIn1_1	Analogue input	
AnIn3	tp30_AnIn1_1	Analogue input	

2.4.9 LOGICAL NODE : tp30_GGIO_2

Description : Generic process I/O**LN Class** : GGIO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Beh	tp30_Beh_1	Behaviour	
Health	tp30_Health_1	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
Alm1	tp30_Alm10_1	Alarm	
Alm2	tp30_Alm10_1	Alarm	
Alm3	tp30_Alm10_1	Alarm	
Alm4	tp30_Alm10_1	Alarm	
Alm5	tp30_Alm10_1	Alarm	
Alm6	tp30_Alm10_1	Alarm	
Alm7	tp30_Alm10_1	Alarm	
Alm8	tp30_Alm10_1	Alarm	
Alm9	tp30_Alm10_1	Alarm	
Alm10	tp30_Alm10_1	Alarm	
Alm11	tp30_Alm10_1	Alarm	
Alm12	tp30_Alm10_1	Alarm	
Alm13	tp30_Alm10_1	Alarm	
Alm14	tp30_Alm10_1	Alarm	
Alm15	tp30_Alm10_1	Alarm	
Alm16	tp30_Alm10_1	Alarm	
Alm17	tp30_Alm10_1	Alarm	
Alm18	tp30_Alm10_1	Alarm	
Alm19	tp30_Alm10_1	Alarm	
Alm20	tp30_Alm10_1	Alarm	

Attribute	Attr. Type	Explanation	X
Alm21	tp30_Alm10_1	Alarm	
Alm22	tp30_Alm10_1	Alarm	
Alm23	tp30_Alm10_1	Alarm	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.10 LOGICAL NODE : tp30_GGIO_3

Description : Generic process I/O

LN Class : GGIO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Beh	tp30_Beh_1	Behaviour	
Health	tp30_Health_1	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
Alm1	tp30_Alm10_1	Alarm	
Alm2	tp30_Alm10_1	Alarm	
Alm3	tp30_Alm10_1	Alarm	
Alm4	tp30_Alm10_1	Alarm	
Alm5	tp30_Alm10_1	Alarm	
Alm6	tp30_Alm10_1	Alarm	
Alm7	tp30_Alm10_1	Alarm	
Alm8	tp30_Alm10_1	Alarm	
Alm9	tp30_Alm10_1	Alarm	
Alm10	tp30_Alm10_1	Alarm	
Alm11	tp30_Alm10_1	Alarm	
Alm12	tp30_Alm10_1	Alarm	
Alm13	tp30_Alm10_1	Alarm	
Alm14	tp30_Alm10_1	Alarm	
Alm15	tp30_Alm10_1	Alarm	
Alm16	tp30_Alm10_1	Alarm	
Alm17	tp30_Alm10_1	Alarm	
Alm18	tp30_Alm10_1	Alarm	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.11 LOGICAL NODE : tp30_GGIO_4

Description : Generic process I/O

LN Class : GGIO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Beh	tp30_Beh_1	Behaviour	
Health	tp30_Health_1	Health	

Logical Node Definitions

Attribute	Attr. Type	Explanation	X
NamPlt	tp30_NamPlt_1	Name Plate	
Alm1	tp30_Alm10_1	Alarm	
Alm2	tp30_Alm10_1	Alarm	
Alm3	tp30_Alm10_1	Alarm	
Alm4	tp30_Alm10_1	Alarm	
Alm5	tp30_Alm10_1	Alarm	
Alm6	tp30_Alm10_1	Alarm	
Alm7	tp30_Alm10_1	Alarm	
Alm8	tp30_Alm10_1	Alarm	
Alm9	tp30_Alm10_1	Alarm	
Alm10	tp30_Alm10_1	Alarm	
Alm11	tp30_Alm10_1	Alarm	
Alm12	tp30_Alm10_1	Alarm	
Alm13	tp30_Alm10_1	Alarm	
Alm14	tp30_Alm10_1	Alarm	
Alm15	tp30_Alm10_1	Alarm	
Alm16	tp30_Alm10_1	Alarm	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.12 LOGICAL NODE : tp30_GGIO_5

Description : Generic process I/O

LN Class : GGIO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Health	tp30_Health_1	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
Beh	tp30_Beh_1	Behaviour	
Ind1	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind2	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind3	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind4	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind5	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind6	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind7	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind8	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind9	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind10	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind11	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind12	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind13	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind14	tp30_Alm10_1	Gen. ind. (bin. input)	

Attribute	Attr. Type	Explanation	X
Ind15	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind16	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind17	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind18	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind19	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind20	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind21	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind22	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind23	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind24	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind25	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind26	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind27	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind28	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind29	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind30	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind31	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind32	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind33	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind34	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind35	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind36	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind37	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind38	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind39	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind40	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind41	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind42	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind43	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind44	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind45	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind46	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind47	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind48	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind49	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind50	tp30_Alm10_1	Gen. ind. (bin. input)	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.13 LOGICAL NODE : tp30_GGIO_6

Description : Generic process I/O

LN Class : GGIO

Logical Node Definitions

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Health	tp30_Health_1	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
Beh	tp30_Beh_1	Behaviour	
Ind1	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind2	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind3	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind4	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind5	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind6	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind7	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind8	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind9	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind10	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind11	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind12	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind13	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind14	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind15	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind16	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind17	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind18	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind19	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind20	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind21	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind22	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind23	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind24	tp30_Alm10_1	Gen. ind. (bin. input)	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.14 LOGICAL NODE : tp30_GGIO_7

Description : Generic process I/O

LN Class : GGIO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Health	tp30_Health_1	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
Beh	tp30_Beh_1	Behaviour	
SPCSO1	tp30_MTRRs_1	Single point controllable status output	
SPCSO2	tp30_MTRRs_1	Single point controllable status output	
SPCSO3	tp30_MTRRs_1	Single point controllable status output	

Attribute	Attr. Type	Explanation	X
SPCSO4	tp30_MTRRs_1	Single point controllable status output	
SPCSO5	tp30_MTRRs_1	Single point controllable status output	
SPCSO6	tp30_MTRRs_1	Single point controllable status output	
SPCSO7	tp30_MTRRs_1	Single point controllable status output	
SPCSO8	tp30_MTRRs_1	Single point controllable status output	
SPCSO9	tp30_MTRRs_1	Single point controllable status output	
SPCSO10	tp30_MTRRs_1	Single point controllable status output	
SPCSO11	tp30_MTRRs_1	Single point controllable status output	
SPCSO12	tp30_MTRRs_1	Single point controllable status output	
SPCSO13	tp30_MTRRs_1	Single point controllable status output	
SPCSO14	tp30_MTRRs_1	Single point controllable status output	
SPCSO15	tp30_MTRRs_1	Single point controllable status output	
SPCSO16	tp30_MTRRs_1	Single point controllable status output	
SPCSO17	tp30_MTRRs_1	Single point controllable status output	
SPCSO18	tp30_MTRRs_1	Single point controllable status output	
SPCSO19	tp30_MTRRs_1	Single point controllable status output	
SPCSO20	tp30_MTRRs_1	Single point controllable status output	
SPCSO21	tp30_MTRRs_1	Single point controllable status output	
SPCSO22	tp30_MTRRs_1	Single point controllable status output	
SPCSO23	tp30_MTRRs_1	Single point controllable status output	
SPCSO24	tp30_MTRRs_1	Single point controllable status output	
SPCSO25	tp30_MTRRs_1	Single point controllable status output	
SPCSO26	tp30_MTRRs_1	Single point controllable status output	
SPCSO27	tp30_MTRRs_1	Single point controllable status output	
SPCSO28	tp30_MTRRs_1	Single point controllable status output	
SPCSO29	tp30_MTRRs_1	Single point controllable status output	
SPCSO30	tp30_MTRRs_1	Single point controllable status output	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.15 LOGICAL NODE : tp30_GGIO_8

Description : Generic process I/O

LN Class : GGIO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Health	tp30_Health_1	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
Beh	tp30_Beh_1	Behaviour	
SPCSO1	tp30_MTRRs_1	Single point controllable status output	
SPCSO2	tp30_MTRRs_1	Single point controllable status output	
SPCSO3	tp30_MTRRs_1	Single point controllable status output	
SPCSO4	tp30_MTRRs_1	Single point controllable status output	

Logical Node Definitions

Attribute	Attr. Type	Explanation	X
SPCSO5	tp30_MTRRs_1	Single point controllable status output	
SPCSO6	tp30_MTRRs_1	Single point controllable status output	
SPCSO7	tp30_MTRRs_1	Single point controllable status output	
SPCSO8	tp30_MTRRs_1	Single point controllable status output	
SPCSO9	tp30_MTRRs_1	Single point controllable status output	
SPCSO10	tp30_MTRRs_1	Single point controllable status output	
SPCSO11	tp30_MTRRs_1	Single point controllable status output	
SPCSO12	tp30_MTRRs_1	Single point controllable status output	
SPCSO13	tp30_MTRRs_1	Single point controllable status output	
SPCSO14	tp30_MTRRs_1	Single point controllable status output	
SPCSO15	tp30_MTRRs_1	Single point controllable status output	
SPCSO16	tp30_MTRRs_1	Single point controllable status output	
SPCSO17	tp30_MTRRs_1	Single point controllable status output	
SPCSO18	tp30_MTRRs_1	Single point controllable status output	
SPCSO19	tp30_MTRRs_1	Single point controllable status output	
SPCSO20	tp30_MTRRs_1	Single point controllable status output	
SPCSO21	tp30_MTRRs_1	Single point controllable status output	
SPCSO22	tp30_MTRRs_1	Single point controllable status output	
SPCSO23	tp30_MTRRs_1	Single point controllable status output	
SPCSO24	tp30_MTRRs_1	Single point controllable status output	
SPCSO25	tp30_MTRRs_1	Single point controllable status output	
SPCSO26	tp30_MTRRs_1	Single point controllable status output	
SPCSO27	tp30_MTRRs_1	Single point controllable status output	
SPCSO28	tp30_MTRRs_1	Single point controllable status output	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.16 LOGICAL NODE : tp30_GGIO_9

Description : Generic process I/O**LN Class** : GGIO

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_2	Mode	
Beh	tp30_Beh_2	Behaviour	
Health	tp30_Health_2	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
Ind1	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind2	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind3	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind4	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind5	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind6	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind7	tp30_Alm10_1	Gen. ind. (bin. input)	

Attribute	Attr. Type	Explanation	X
Ind8	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind9	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind10	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind11	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind12	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind13	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind14	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind15	tp30_Alm10_1	Gen. ind. (bin. input)	
Ind16	tp30_Alm10_1	Gen. ind. (bin. input)	

2.4.17 LOGICAL NODE : tp30_LLNO_1

Description : Logical node device

LN Class : LLN0

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_2	Mode	
Health	tp30_Health_2	Health	
NamPlt	tp30_NamPlt_3	Name Plate	
Beh	tp30_Beh_2	Behaviour	
Loc	tp30_Loc_1	Local operation	
Lock	tp30_CiRej_1	Interlocking	
OrdRun	tp30_CiRej_1	Switch reservation	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.18 LOGICAL NODE : tp30_LLNO_2

Description : Logical node device

LN Class : LLN0

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Beh	tp30_Beh_2	Behaviour	
Health	tp30_Health_2	Health	
NamPlt	tp30_NamPlt_3	Name Plate	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.19 LOGICAL NODE : tp30_LLNO_3

Description : Logical node device

LN Class : LLN0

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_2	Mode	
Beh	tp30_Beh_2	Behaviour	

Logical Node Definitions

Attribute	Attr. Type	Explanation	X
Health	tp30_Health_2	Health	
NamPlt	tp30_NamPlt_3	Name Plate	
Loc	tp30_Loc_1	Local operation	
LEDRs	tp30_LEDRs_1	Led Reset	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.20 LOGICAL NODE : tp30_LPHD_1

Description : Physical device**LN Class** : LPHD

Attribute	Attr. Type	Explanation	X
PhyHealth	tp30_PhyHealth_1	Physical device health	
PhyNam	tp30_PhyNam_1	Physical device name plate	
Proxy	tp30_Loc_1	Indicates if the LN is a proxy	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.21 LOGICAL NODE : tp30_MMTR_1

Description : Metering**LN Class** : MMTR

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Beh	tp30_Beh_1	Behaviour	
Health	tp30_Health_1	Health	
SupWh	tp30_DmdVARh_1	Real energy supply	
NamPlt	tp30_NamPlt_1	Name Plate	
SupVARh	tp30_DmdVARh_1	Reactive energy supply	
DmdWh	tp30_DmdVARh_1	Real energy demand	
DmdVARh	tp30_DmdVARh_1	Reactive energy demand	
MTRRs	tp30_MTRRs_1	Metering reset	
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.22 LOGICAL NODE : tp30_MMXU_1

Description : Primary Basic Measurements**LN Class** : MMXU

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Beh	tp30_Beh_2	Behaviour	
Health	tp30_Health_2	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
TotW	tp30_AnIn1_1	Total active power	

Attribute	Attr. Type	Explanation	X
TotVAr	tp30_AnIn1_1	Total reactive power	
TotVA	tp30_AnIn1_1	Total apparent power	
Hz	tp30_AnIn1_1	Frequency	
PPV	tp30_PPV_1	Phase to phase voltage	
PhV	tp30_A_1	Phase to ground voltage	
A	tp30_A_1	Phase current	
urcbMX	tp30_URCB	Unb. rep. control for measurement	

2.4.23 LOGICAL NODE : tp30_MMXU_2

Description : Secondary Basic Measurements

LN Class : MMXU

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Beh	tp30_Beh_2	Behaviour	
Health	tp30_Health_2	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
AngN	tp30_AnIn1_1	Angle between U0/I0	
LodAngC	tp30_AnIn1_1	Load angle Phase C	
LodAngB	tp30_AnIn1_1	Load angle Phase B	
LodAngA	tp30_AnIn1_1	Load angle Phase A	
TotW	tp30_AnIn1_1	Total active power	
TotVAr	tp30_AnIn1_1	Total reactive power	
TotVA	tp30_AnIn1_1	Total apparent power	
TotPF	tp30_AnIn1_1	Average power factor (Total PF)	
PPV	tp30_PPV_1	Phase to phase voltage	
PhV	tp30_A_1	Phase to ground voltage	
A	tp30_A_1	Phase current	
urcbMX	tp30_URCB	Unb. rep. control for measurement	

2.4.24 LOGICAL NODE : tp30_MSTA_1

Description : Measuring statistics

LN Class : MSTA

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Beh	tp30_Beh_2	Behaviour	
Health	tp30_Health_2	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
MaxAmpsMe	tp30_MaxAmpsMe_1	Maximum current (measured)	
MaxAmpsDI	tp30_AnIn1_1	Maximum current (delayed)	
MinAmps	tp30_AnIn1_1	Minimum current	

Logical Node Definitions

Attribute	Attr. Type	Explanation	X
MinVpp	tp30_AnIn1_1	Minimum phase to phase voltage	
MaxVpp	tp30_AnIn1_1	Maximum phase to phase voltage	
MinVpg	tp30_AnIn1_1	Minimum phase to ground voltage	
MaxVpg	tp30_AnIn1_1	Maximum phase to ground voltage	
MaxAmps	tp30_AnIn1_1	Maximum current	
urcbMX	tp30_URCB	Unb. rep. control for measurement	

2.4.25 LOGICAL NODE : tp30_RSYN_1

Description : Synchroncheck**LN Class** : RSYN

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_3	Mode	
Beh	tp30_Beh_2	Behaviour	
Health	tp30_Health_2	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
DifVClc	tp30_AnIn1_1	Difference voltage	
DifHzClc	tp30_AnIn1_1	Difference frequency	
DifAngClc	tp30_AnIn1_1	Difference angle	
MeasRefV	tp30_MaxAmpsMe_1	Reference Voltage	
MeasLoopV	tp30_MaxAmpsMe_1	Measuring loop	
Rel	tp30_AIm10_1	Release	
ClRej	tp30_ClRej_1	Close rejection	
urcbST	tp30_URCB	Unb. rep. control for status	
urcbMX	tp30_URCB	Unb. rep. control for measurement	

2.4.26 LOGICAL NODE : tp30_XCBR_1

Description : Circuit breaker**LN Class** : XCBR

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Beh	tp30_Beh_1	Behaviour	
Health	tp30_Health_1	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
Loc	tp30_AIm10_1	Local operation	
OpCnt	tp30_OpCnt_1	Operation counter	
Pos	tp30_Pos_1	Switch position	
BlkOpn	tp30_BlkJcls_1	Block opening	
BlkJcls	tp30_BlkJcls_1	Block closing	
CBOpCap	tp30_CBOpCap_1	Circuit breaker operating capability	
MaxOpCap	tp30_MaxOpCap_1	Max operating Capability	

Attribute	Attr. Type	Explanation	X
urcbST	tp30_URCB	Unb. rep. control for status	

2.4.27 LOGICAL NODE : tp30_XSWI_1

Description : Switch

LN Class : XSWI

Attribute	Attr. Type	Explanation	X
Mod	tp30_Mod_1	Mode	
Beh	tp30_Beh_1	Behaviour	
Health	tp30_Health_1	Health	
NamPlt	tp30_NamPlt_1	Name Plate	
Loc	tp30_Alm10_1	Local operation	
OpCnt	tp30_OpCnt_1	Operation counter	
Pos	tp30_Pos_1	Switch position	
BlkOpn	tp30_BlkCls_1	Block opening	
BlkCls	tp30_BlkCls_1	Block closing	
SwTyp	tp30_SwTyp_1	Type of switch	
SwOpCap	tp30_SwOpCap_1	Switch operating capability	
MaxOpCap	tp30_MaxOpCap_1	Max operating Capability	
urcbST	tp30_URCB	Unb. rep. control for status	

2.5 Extended Logical Nodes

2.5.1 LN: Switch-onto-Fault Protection Name: PSOF

Closing of a circuit breaker might inadvertently lead to a short-circuit fault due to a feeder grounding connection not yet removed, for example. The manual close command is monitored for a settable period of time. During this period, an undelayed trip command may be issued automatically on initialization of the general starting (depending on the chosen operating mode).

PSOF				
Attribute Name	Attr. Type	Explanation	T	M/O
LNName		Shall be inherited from Logical-Node Class (see IEC 61850-7-2)		
Data				
Common Logical Node Information				
		LN shall inherit all Mandatory Data from Common Logical Node Class		M
Status Information				
Str	ACD	Start	T	M
Op	ACT	Operate		M
ParArcExt	SPS	Parallel ARC Running	T	O
Settings				

Data Objects

PSOF				
Attribute Name	Attr. Type	Explanation	T	M/O
StrVal	ASG	Start Value	T	O
OpTmms	ING	Operate Time	T	O

Legend: T = TransientData
M – Mandatory
O – Optional

2.6 Data Objects

DO Name vendor specific	description
AngN	Angle Voltage/Current ground
Blk	Blocking Timer external
BlkThm1	Blocking external
BlkThm2	Blocking Timer external
CBTripped	Circuit breaker tripped
CIRej	Close rejection
CntGGIORS	Reset of counter
CurSG	Actual Parameter Subset
GenCntRs1	Actual value of counter 1
GenCntRs2	Actual value of counter 2
GenCntRs3	Actual value of counter 3
GenCntRs4	Actual value of counter 4
LaTrRs	Reporting reset of latched trip
Lock	Status of Interlocking
LodAngA	Angle Voltage/Current Phase A (Load Angle A)
LodAngB	Angle Voltage/Current Phase B (Load Angle B)
LodAngC	Angle Voltage/Current Phase C (Load Angle C)
MaxAmpsD1	Metering statistic maximum current delayed IA
MaxAmpsD2	Metering statistic maximum current delayed IB
MaxAmpsD3	Metering statistic maximum current delayed IC
MaxAmpsDI	Metering statistic maximum current delayed
MaxAmpsM1	Metering statistic maximum current stored IA
MaxAmpsM2	Metering statistic maximum current stored IB
MaxAmpsM3	Metering statistic maximum current stored IC
MaxAmpsMe	Metering statistic maximum current stored
MaxVpg	Metering statistic maximum phase to ground voltage
MaxVpp	Metering statistic maximum phase to phase voltage
MeasLoopV	Voltage of the measured loop
MeasRefV	Voltage of the reference voltage
MinVpg	Metering statistic minimum phase to ground voltage
MinVpp	Metering statistic minimum phase to phase voltage

DO Name vendor specific	description
MTRRs	Reset command for energy counters
OrdRun	Uniqueness of control
OverOpTmh	Motor running hours
RecHsr	(Re)close command High speed
RecTdr	(Re)close command Time delayed
StrEf	Starting ground fault
SumSwARsA	Sum of Switches Ameres Phase A
SumSwARsB	Sum of Switches Ameres Phase B
SumSwARsC	Sum of Switches Ameres Phase C
SyncSt	Time Synchronisation Status
TrBlk	Trip Command Blocked
TrPhIG	Trip Phase Overcurrent I>
TrResIG	Trip Ground Overcurrent I>
POSx (x=1-32)	position of switch (as DPS)

2.7 Common Data Class Definitions

The definition tables for each of the Common Data Classes used in the Logical Node definitions are presented in the following sub-sections.

From an application point-of-view the data attributes of a Common Data Class are classified according to their specific use. The characterisation of data attributes, and the services that they support/provide, will be through the use of 'Functional Constraints'. The Functional Constraints are specified by the table below:

Semantic

FC	Name Source Definition
BR	Buffered reports IEC 61850-7-2
CF	Configuration IEC 61850-7-2
CO	Control IEC 61850-7-2
DC	Description IEC 61850-7-2
EX	Extended Definition IEC 61850-7-2
GO	GOOSE Control IEC 61850-7-2
GS	GSSE Control (UCA2 GOOSE) IEC 61850-7-2
LG	Logging IEC 61850-7-2
MS	Multicast sampled value control IEC 61850-7-2
MX	Measurands (Analogue values) IEC 61850-7-2
RP	Unbuffered reports IEC 61850-7-2
SE	Setting Group Editable IEC 61850-7-2
SG	Setting Group IEC 61850-7-2
SP	Set Point IEC 61850-7-2
ST	Status Information IEC 61850-7-2
SV	Substitution Values IEC 61850-7-2
US	Unicast sampled value control IEC 61850-7-2

Common Data Class Definitions

FC	Name	Source	Definition
XX	Data attribute service parameters	IEC 61850-7-2	

2.7.1 COMMON DATA CLASS : tp30_A_1

Description :

CDC Class : Vector

Attribute	Type	FC	Enumeration	Comment	X
phsA	tp30_neut_1	MX		Deadbanded magnitude of the instantaneous value of a measured value or harmonic value. Updated to the current value of instMag when the value has changed according to the configuration parameter db.	
phsB	tp30_neut_1	MX		Deadbanded magnitude of the instantaneous value of a measured value or harmonic value. Updated to the current value of instMag when the value has changed according to the configuration parameter db.	
phsC	tp30_neut_1	MX		Deadbanded magnitude of the instantaneous value of a measured value or harmonic value. Updated to the current value of instMag when the value has changed according to the configuration parameter db.	
neut	tp30_neut_1	MX		Deadbanded magnitude of the instantaneous value of a measured value or harmonic value. Updated to the current value of instMag when the value has changed according to the configuration parameter db.	
res	tp30_neut_1	MX		Deadbanded magnitude of the instantaneous value of a measured value or harmonic value. Updated to the current value of instMag when the value has changed according to the configuration parameter db.	
d	Vstring255	DC		Description of the status element	

2.7.2 COMMON DATA CLASS : tp30_Alm10_1

Description :

CDC Class : SPS

Attribute	Type	FC	Enumeration	Comment	X
stVal	BOOLEAN	ST		Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection, activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
d	Vstring255	DC		Description of the status element	

2.7.3 COMMON DATA CLASS : tp30_AnIn1_1

Description :

CDC Class : MV

Attribute	Type	FC	Enumeration	Comment	X
mag	tp30_mag_1	MX		Deadbanded magnitude of the instantaneous value of a measured value or harmonic value. Updated to the current value of instMag when the value has changed according to the configuration parameter db.	
q	Quality	MX		Quality of the protection,activation information	
t	TimeStamp	MX		Timestamp of the last change in state of protection, activation information	
units	tp30_units_1	CF	SIUnit	Unit of the attribute representing the data	
db	INT32U	CF		Measurement deadband	
d	Vstring255	DC		Description of the status element	

2.7.4 COMMON DATA CLASS : tp30_Beh_1

Description :

CDC Class : INS

Attribute	Type	FC	Enumeration	Comment	X
stVal	Enum	ST	Beh	Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
d	Vstring255	DC		Description of the status element	

2.7.5 COMMON DATA CLASS : tp30_Beh_2

Description :

CDC Class : INS

Attribute	Type	FC	Enumeration	Comment	X
stVal	Enum	ST	Beh	Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	

2.7.6 COMMON DATA CLASS : tp30_BlKCls_1

Description :

CDC Class : SPC

Attribute	Type	FC	Enumeration	Comment	X
stVal	BOOLEAN	ST		Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	

Common Data Class Definitions

Attribute	Type	FC	Enumeration	Comment	X
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
ctlModel	Enum	CF	ctlModel	Control model (Corresponding to the behaviour of the data)	
d	Vstring255	DC		Description of the status element	

2.7.7 COMMON DATA CLASS : tp30_CBOpCap_1

Description :
CDC Class : INS

Attribute	Type	FC	Enumeration	Comment	X
stVal	Enum	ST	CBOpCap	Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
d	Vstring255	DC		Description of the status element	

2.7.8 COMMON DATA CLASS : tp30_Cancel_1

Description :
CDC Class : CANCEL

Attribute	Type	FC	Enumeration	Comment	X
ctlVal	BOOLEAN	CO		Determines the control activity	
origin	tp30_origin_1	CO	orCategory	Related to the originator of the last change of data	
ctlNum	INT8U	CO		Show the control sequence number of the control service	
T	TimeStamp	CO		Timestamp of the last change in state of protection, activation information	
Test	BOOLEAN	CO		Test	

2.7.9 COMMON DATA CLASS : tp30_ClRej_1

Description :
CDC Class : SPS

Attribute	Type	FC	Enumeration	Comment	X
stVal	BOOLEAN	ST		Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
dataNs	Vstring255	EX		Data Name Space	

2.7.10 COMMON DATA CLASS : tp30_DmdVArh_1

Description :

CDC Class : BCR

Attribute	Type	FC	Enumeration	Comment	X
actVal	INT128	ST		Binary counter status	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
units	tp30_units_1	CF	SIUnit	Unit of the attribute representing the data	
pulsQty	FLOAT32	CF		Magnitude of the countered value per count	
d	Vstring255	DC		Description of the status element	

2.7.11 COMMON DATA CLASS : tp30_Health_1

Description :

CDC Class : INS

Attribute	Type	FC	Enumeration	Comment	X
stVal	Enum	ST	Health	Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
d	Vstring255	DC		Description of the status element	

2.7.12 COMMON DATA CLASS : tp30_Health_2

Description :

CDC Class : INS

Attribute	Type	FC	Enumeration	Comment	X
stVal	Enum	ST	Health	Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	

2.7.13 COMMON DATA CLASS : tp30_LEDRs_1

Description :

CDC Class : SPC

Attribute	Type	FC	Enumeration	Comment	X
stVal	BOOLEAN	ST		Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
ctlModel	Enum	CF	ctlModel	Control model (Corresponding to the behaviour)	

Common Data Class Definitions

Attribute	Type	FC	Enumeration	Comment	X
				of the data)	
dataNs	Vstring255	EX		Data Name Space	
Oper	tp30_Oper_1	CO		Determines the control activity	

2.7.14 COMMON DATA CLASS : tp30_LnCfg_1

Description :

CDC Class : SPS

Attribute	Type	FC	Enumeration	Comment	X
stVal	BOOL	ST		Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
d	Vstring255	DC		Description of the status element	

2.7.15 COMMON DATA CLASS : tp30_Loc_1

Description :

CDC Class : SPS

Attribute	Type	FC	Enumeration	Comment	X
stVal	BOOLEAN	ST		Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	

2.7.16 COMMON DATA CLASS : tp30_MTRRs_1

Description :

CDC Class : SPC

Attribute	Type	FC	Enumeration	Comment	X
ctlModel	Enum	CF	ctlModel	Control model (Corresponding to the behaviour of the data)	
Oper	tp30_Oper_1	CO		Determines the control activity	

2.7.17 COMMON DATA CLASS : tp30_MaxAmpsMe_1

Description :

CDC Class : MV

Attribute	Type	FC	Enumeration	Comment	X
mag	tp30_mag_1	MX		Deadbanded magnitude of the instantaneous value of a measured value or harmonic value. Updated to the current value of instMag when the value has changed according to the configuration parameter db.	

Attribute	Type	FC	Enumeration	Comment	X
q	Quality	MX		Quality of the protection,activation information	
t	TimeStamp	MX		Timestamp of the last change in state of protection, activation information	
units	tp30_units_1	CF	SIUnit	Unit of the attribute representing the data	
db	INT32U	CF		Measurement deadband	
d	Vstring255	DC		Description of the status element	
dataNs	Vstring255	EX		Data Name Space	

2.7.18 COMMON DATA CLASS : tp30_MaxOpCap_1

Description :

CDC Class : INS

Attribute	Type	FC	Enumeration	Comment	X
stVal	Enum	ST	CBOpCap	Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
d	Vstring255	DC		Description of the status element	

2.7.19 COMMON DATA CLASS : tp30_Mod_1

Description :

CDC Class : INC

Attribute	Type	FC	Enumeration	Comment	X
stVal	Enum	ST	Mod	Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
d	Vstring255	DC		Description of the status element	
ctlModel	Enum	CF	ctlModel	Control model (Corresponding to the behaviour of the data)	

2.7.20 COMMON DATA CLASS : tp30_Mod_2

Description :

CDC Class : INC

Attribute	Type	FC	Enumeration	Comment	X
stVal	Enum	ST	Mod	Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
ctlModel	Enum	CF	ctlModel	Control model (Corresponding to the behaviour	

Common Data Class Definitions

Attribute	Type	FC	Enumeration	Comment	X
				of the data)	

2.7.21 COMMON DATA CLASS : tp30_Mod_3

Description :
CDC Class : INC

Attribute	Type	FC	Enumeration	Comment	X
stVal	Enum	ST	Mod	Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
ctlModel	Enum	CF	ctlModel	Control model (Corresponding to the behaviour of the data)	
Oper	tp30_Oper_2	CO		Determines the control activity	

2.7.22 COMMON DATA CLASS : tp30_NamPlt_1

Description :
CDC Class : LPL

Attribute	Type	FC	Enumeration	Comment	X
vendor	Vstring255	DC		Unit of the attribute representing the data	
swRev	Vstring255	DC		Software revision	
d	Vstring255	DC		Description of the status element	

2.7.23 COMMON DATA CLASS : tp30_NamPlt_2

Description :
CDC Class : LPL

Attribute	Type	FC	Enumeration	Comment	X
vendor	Vstring255	DC		Unit of the attribute representing the data	
swRev	Vstring255	DC		Software revision	
d	Vstring255	DC		Description of the status element	
configRev	Vstring255	DC		Uniquely identifies the configuration of a local device instance	

2.7.24 COMMON DATA CLASS : tp30_NamPlt_3

Description :
CDC Class : LPL

Attribute	Type	FC	Enumeration	Comment	X
vendor	Vstring255	DC		Unit of the attribute representing the data	
swRev	Vstring255	DC		Software revision	

Attribute	Type	FC	Enumeration	Comment	X
d	Vstring255	DC		Description of the status element	
configRev	Vstring255	DC		Uniquely identifies the configuration of a local device instance	
ldNs	Vstring255	EX		Logical Device name space	

2.7.25 COMMON DATA CLASS : tp30_OpCnt_1

Description :
CDC Class : INS

Attribute	Type	FC	Enumeration	Comment	X
stVal	INT32	ST		Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection, activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
d	Vstring255	DC		Description of the status element	

2.7.26 COMMON DATA CLASS : tp30_Oper_1

Description :
CDC Class : OPER

Attribute	Type	FC	Enumeration	Comment	X
ctlVal	BOOLEAN	CO		Determines the control activity	
origin	tp30_origin_1	CO	orCategory	Related to the originator of the last change of data	
ctlNum	INT8U	CO		Show the control sequence number of the control service	
T	TimeStamp	CO		Timestamp of the last change in state of protection, activation information	
Test	BOOLEAN	CO		Test	
Check	VBSTR2	CO		Check	

2.7.27 COMMON DATA CLASS : tp30_Oper_2

Description :
CDC Class : OPER

Attribute	Type	FC	Enumeration	Comment	X
ctlVal	INT32	CO		Determines the control activity	
origin	tp30_origin_1	CO	orCategory	Related to the originator of the last change of data	
ctlNum	INT8U	CO		Show the control sequence number of the control service	
T	TimeStamp	CO		Timestamp of the last change in state of protection, activation information	
Test	BOOLEAN	CO		Test	

Common Data Class Definitions

Attribute	Type	FC	Enumeration	Comment	X
Check	VBSTR2	CO		Check	

2.7.28 COMMON DATA CLASS : tp30_PPV_1

Description :

CDC Class : Vector

Attribute	Type	FC	Enumeration	Comment	X
phsAB	tp30_neut_1	MX		Deadbanded magnitude of the instantaneous value of a measured value or harmonic value. Updated to the current value of instMag when the value has changed according to the configuration parameter db.	
phsBC	tp30_neut_1	MX		Deadbanded magnitude of the instantaneous value of a measured value or harmonic value. Updated to the current value of instMag when the value has changed according to the configuration parameter db.	
phsCA	tp30_neut_1	MX		Deadbanded magnitude of the instantaneous value of a measured value or harmonic value. Updated to the current value of instMag when the value has changed according to the configuration parameter db.	
d	Vstring255	DC		Description of the status element	

2.7.29 COMMON DATA CLASS : tp30_PhyHealth_1

Description :

CDC Class : INS

Attribute	Type	FC	Enumeration	Comment	X
stVal	Enum	ST	Health	Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection, activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	

2.7.30 COMMON DATA CLASS : tp30_PhyNam_1

Description :

CDC Class : DPL

Attribute	Type	FC	Enumeration	Comment	X
vendor	Vstring255	DC		Unit of the attribute representing the data	
hwRev	Vstring255	DC		Hardware revision	
swRev	Vstring255	DC		Software revision	
serNum	Vstring255	DC		Serial Number	

2.7.31 COMMON DATA CLASS : tp30_Pos_1

Description :

CDC Class : DPC

Attribute	Type	FC	Enumeration	Comment	X
stVal	Dbpos	ST		Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
stSeld	BOOLEAN	ST		The controllable data is in the status selected	
d	Vstring255	DC		Description of the status element	
ctlModel	Enum	CF	tp30_ctlModel	Control model (Corresponding to the behaviour of the data)	
Oper	tp30_Oper_1	CO		Determines the control activity	
SBOw	tp30_SBOw_1	CO		Determines the control activity	
Cancel	tp30_Cancel_1	CO		Determines the control activity	

2.7.32 COMMON DATA CLASS : tp30_SBOw_1

Description :

CDC Class : SBOW

Attribute	Type	FC	Enumeration	Comment	X
ctlVal	BOOLEAN	CO		Determines the control activity	
origin	tp30_origin_1	CO	orCategory	Related to the originator of the last change of data	
ctlNum	INT8U	CO		Show the control sequence number of the control service	
T	TimeStamp	CO		Timestamp of the last change in state of protection, activation information	
Test	BOOLEAN	CO		Test	
Check	VBSTR2	CO		Check	

2.7.33 COMMON DATA CLASS : tp30_SwOpCap_1

Description :

CDC Class : INS

Attribute	Type	FC	Enumeration	Comment	X
stVal	Enum	ST	CBOpCap	Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
d	Vstring255	DC		Description of the status element	

Common Data Class Definitions

2.7.34 COMMON DATA CLASS : tp30_SwTyp_1

Description :

CDC Class : INS

Attribute	Type	FC	Enumeration	Comment	X
stVal	Enum	ST	SwTyp	Status value of the data (Intermediate state, Off, On or Bad-state)	
q	Quality	ST		Quality of the protection,activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection, activation information	
d	Vstring255	DC		Description of the status element	

2.7.35 COMMON DATA CLASS : tp30_URCB

Description :

CDC Class :

Attribute	Type	FC	Enumeration	Comment	X
	BASRCB	RP			

2.7.36 COMMON DATA CLASS : tp30_cVal_1

Description :

CDC Class : Vector

Attribute	Type	FC	Enumeration	Comment	X
mag	tp30_mag_1	MX		Deadbanded magnitude of the instantaneous value of a measured value or harmonic value. Updated to the current value of instMag when the value has changed according to the configuration parameter db.	

2.7.37 COMMON DATA CLASS : tp30_mag_1

Description :

CDC Class : MV

Attribute	Type	FC	Enumeration	Comment	X
f	FLOAT32	MX		Deadbanded magnitude of the instantaneous value of a measured value or harmonic value. Updated to the current value of instMag when the value has changed according to the configuration parameter db.	

2.7.38 COMMON DATA CLASS : tp30_neut_1

Description :

CDC Class : Vector

Attribute	Type	FC	Enumeration	Comment	X
cVal	tp30_cVal_1	MX		Deadbanded magnitude of the instantaneous value of a measured value or harmonic value. Updated to the current value of instMag when	

Attribute	Type	FC	Enumeration	Comment	X
				the value has changed according to the configuration parameter db.	
q	Quality	MX		Quality of the protection, activation information	
t	TimeStamp	MX		Timestamp of the last change in state of protection, activation information	
units	tp30_units_1	CF	SIUnit	Unit of the attribute representing the data	
db	INT32U	CF		Measurement deadband	

2.7.39 COMMON DATA CLASS : tp30_origin_1

Description :

CDC Class : OPER

Attribute	Type	FC	Enumeration	Comment	X
orCat	Enum	CO	orCategory	Related to the originator of the last change of data	
orIdent	VOSTR64	CO		Related to the originator of the last change of data	

2.7.40 COMMON DATA CLASS : tp30_units_1

Description :

CDC Class : MV

Attribute	Type	FC	Enumeration	Comment	X
SIUnit	Enum	CF	SIUnit	Unit of the attribute representing the data	
multiplier	Enum	CF	multiplier	Unit of the attribute representing the data	

2.8 Common Data Attribute Type Definitions

Common data attribute types, known herein as components, are defined for use in the Common Data Classes defined in the sections above.

2.9 Extra Defined Data attributes

additional DA for configured values	description
measCyc	update cycle for measurements in seconds
enCyc	update cycle for energy counters in seconds
comtrade	comtrade mode for file transfer (ASCII or binary)
distExtr	comtrade file transfer enabled

Enumerated Type Definitions

2.10 Enumerated Type Definitions

The following sub-sections specify the enumerations that are associated to some Common Data Class attributes. The definition of the enumerations are according to IEC 61850-7-3 and IEC 61850-7-4 unless otherwise stated.

2.10.1 Enumerated Type : AutoRecSt

Description :

Ordinal	Semantic
1	Ready
2	InProgress
3	Successful

2.10.2 Enumerated Type : Beh

Description : Behaviour

Ordinal	Semantic
1	on
2	blocked
3	test
4	test/blocked
5	off

2.10.3 Enumerated Type : CBOpCap

Description : Circuit breaker operating capability

Ordinal	Semantic
1	None
2	Open
3	Close-Open
4	Open-Close-Open
5	Close-Open-Close-Open

2.10.4 Enumerated Type : Dbpos

Description :

Ordinal	Semantic
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Ordinal	Semantic
0	intermediate
1	off
2	on
3	bad

2.10.5 Enumerated Type : Health

Description : Health

Ordinal	Semantic
1	Ok
2	Warning
3	Alarm

2.10.6 Enumerated Type : Mod

Description : Mode

Ordinal	Semantic
1	on
2	blocked
3	test
4	test/blocked
5	off

2.10.7 Enumerated Type : SIUnit

Description : Unit of the attribute representing the data

Ordinal	Semantic
1	none
2	m
3	kg
4	s
5	A
6	K
7	mol
8	cd
9	deg
10	rad
11	sr

Enumerated Type Definitions

Ordinal	Semantic
21	Gy
22	q
23	°C
24	Sv
25	F
26	C
27	S
28	H
29	V
30	ohm
31	J
32	N
33	Hz
34	lx
35	Lm
36	Wb
37	T
38	W
39	Pa
41	m ²
42	m ³
43	m/s
44	m/s ²
45	m ³ /s
46	m/m ³
47	M
48	kg/m ³
49	m ² /s
50	W/m K
51	J/K
52	ppm
53	1/s
54	rad/s
61	VA
62	Watts
63	VAr
64	theta
65	cos(theta)
66	Vs
67	V ²
68	As
69	A ²

Ordinal	Semantic
70	A [†]
71	VAh
72	Wh
73	VArh
74	V/Hz

2.10.8 Enumerated Type : SwTyp

Description : Type of switch

Ordinal	Semantic
1	Load Break
2	Disconnecter
3	Earthing Switch
4	High Speed Earthing Switch

2.10.9 Enumerated Type : Tcmd

Description :

Ordinal	Semantic
0	stop
1	rise
2	lower
3	reserved

2.10.10 Enumerated Type : ctlModel

Description : Control model (Corresponding to the behaviour of the data)

Ordinal	Semantic
0	status-only
1	direct-with-normal-security
2	sbo-with-normal-security
3	direct-with-enhanced-security
4	sbo-with-enhanced-security

Enumerated Type Definitions

2.10.11 Enumerated Type : dir

Description :

Ordinal	Semantic
0	unknown
1	forward
2	backward
3	both

2.10.12 Enumerated Type : multiplier

Description : Unit of the attribute representing the data

Ordinal	Semantic
-24	y
-21	z
-18	a
-15	f
-12	p
-9	n
-6	μ
-3	m
-2	c
-1	d
0	
1	da
2	h
3	k
6	M
9	G
12	T
15	P
18	E
21	Z
24	Y

2.10.13 Enumerated Type : orCategory

Description : Related to the originator of the last change of data

Ordinal	Semantic
0	not-supported

Ordinal	Semantic
1	bay-control
2	station-control
3	remote-control
4	automatic-bay
5	automatic-station
6	automatic-remote
7	maintenance
8	process

2.10.14 Enumerated Type : seqT

Description :

Ordinal	Semantic
0	pos-neg-zero

2.10.15 Enumerated Type : tp30_TapChgCtl

Description :

Ordinal	Semantic
0	stop
1	lower
2	higher
3	reserved

2.10.16 Enumerated Type : tp30_ctlModel

Description : Control model (Corresponding to the behaviour of the data)

Ordinal	Semantic
0	status-only
3	direct-with-enhanced-security
4	sbo-with-enhanced-security

MMS Data-Type Conversions

2.11 MMS Data-Type Conversions

The following table shows the relationships between the Part 7 and Part 8-1 data types. The definitions presented above use Part 7 data types, however these are subject to 'translation' when exposed over an MMS (Part 8-1) interface:

Part 7 Type	MMS Type	Part 7 Description
BOOLEAN	Bool	Logical TRUE/FALSE value
BVstring13	BVstring13	Variable bit string (upto 13 bits)
CODED_ENUM	Byte	Coded enumeration
CODED_ENUM2	Byte	Coded enumeration (2)
EntryTime	Btime6	8.1 Section 8.1.3.7
ENUMERATED16	Short	16 bit enumerated value
ENUMERATED8	Byte	8 bit enumerated value
FLOAT32	Float	32 bit floating point value
FLOAT64	Double	64 bit floating point value
INT128	Long	128 bit signed integer value
INT16	Short	16 bit signed integer value
INT16U	Ushort	16 bit unsigned integer value
INT24U	Ulong	24 bit unsigned integer value
INT32	Long	32 bit signed integer value
INT32U	Ulong	32 bit unsigned integer value
INT8	Byte	8 bit signed integer value
INT8U	Ubyte	8 bit unsigned integer value
OCTET_STRING6	Ostring6	6 character string (8 bits per character)
OCTET_STRING64	Ostring64	64 character string (8 bits per character)
OCTET_STRING8	Ostring8	8 character string (8 bits per character)
Quality	BVstring13	IEC61850 Quality
RTYP_BOOL	Bool	Reporting type - BOOLEAN
RTYP_BSTR6	Bstring6	Reporting type - 6 bit string
RTYP_BSTR8	Bstring8	Reporting type - 8 bit string
RTYP_BSTR9	Bstring9	Reporting type - 9 bit string
RTYP_BTIME6	Btime6	Reporting type - 6 byte timestamp
RTYP_BVSTR10	BVstring10	Reporting type - Variable bit string (upto 10 bits)
RTYP_BVSTR6	BVstring6	Reporting type - Variable bit string (upto 6 bits)
RTYP_BVSTR8	Bvstring8	Reporting type - Variable bit string (upto 8 bits)
RTYP_INT16U	Ushort	Reporting type - 16 bit unsigned integer value
RTYP_INT32U	Ulong	Reporting type - 32 bit unsigned integer value
RTYP_INT8U	Ubyte	Reporting type - 8 bit unsigned integer value
RTYP_OSTR8	Ostring8	Reporting type - 8 character string (8 bits per character)
RTYP_VSTR32	Vstring32	Reporting type - 32 character string
RTYP_VSTR65	Vstring65	Reporting type - 65 character string
TimeStamp	Utctime	IEC61850 Time stamp
UNICODE_STRING255	UTF8Vstring255	255 character string (16 bits per unicode character)

Part 7 Type	MMS Type	Part 7 Description
UTC_TM	Utctime	UTC Timestamp
VISIBLE_STRING255	Vstring65	255 character string
VISIBLE_STRING64	Vstring64	64 character string
VISIBLE_STRING65	Vstring65	65 character string
VISIBLE_STRING97	Vstring97	97 character string

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