GE VERNOVA

MiCOM P40 Agile

P741

MICS
Model Implementation Conformance Statement - IEC 61850 Edition 2

Hardware Version: M
Software Version: 91
Publication Reference: P741-MC2-EN-91E-Pd8.1

CONTENTS

1 MODEL IMPLEMENTATION CONFORMANCE STATEMENT (MICS)

1.1 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.

1.2 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 GE Vernova custom attributes

1.3 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
Measurements	Power System Measurements
ProtBbZn1	Busbar protection for zone 1
ProtBbZn2	Busbar protection for zone 2
ProtBbZn3	Busbar protection for zone 3
ProtBbZn4	Busbar protection for zone 4
ProtBbZn5	Busbar protection for zone 5
ProtBbZn6	Busbar protection for zone 6
ProtBbZn7	Busbar protection for zone 7
ProtBbZn8	Busbar protection for zone 8
ProtCz	Check Zone fault
Protection	Protection Logical Device
Records	
System	

1.3.1 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
Measurements			
	LLN0	LLN0_STANDARD	Measurements Logical Device
	LPHD1	LPHD_STANDARD	Physical Device Information
ProtBbZn1			
	CftGAPC1	GAPC_CFT	Circuitry fault supervision for zone 1
	LLN0	LLN0_STANDARD	Logical Device for Differential phases protection
	TrpCupPTRC1	PTRC_CU_OP	P740: Central trip zone 1
	TrpNeuPDIF1	PDIF_TRP_NEU	P740: Trip zone 1 for SEF
	TrpPhsPDIF1	PDIF_STR_SEG_OP_NOSEG	Differential Phases Protection: Trip Zone 1 for the three phases
	TrpPhsRBRF1	RBRF_87BB_TRIP_PHS	P740: Central breaker failure busbar 1
ProtBbZn2			
	CftGAPC2	GAPC_CFT	Circuitry fault supervision for zone 2
	LLN0	LLN0_STANDARD	Logical Device for Differential phases protection
	TrpCupPTRC2	PTRC_CU_OP	P740: Central trip zone 2
	TrpNeuPDIF2	PDIF_TRP_NEU	P740: Trip zone 2 for SEF
	TrpPhsPDIF2	PDIF_STR_SEG_OP_NOSEG	Differential Phases Protection: Trip Zone 2 for the three phases
	TrpPhsRBRF2	RBRF_87BB_TRIP_PHS	P740: Central breaker failure busbar 2
ProtBbZn3			
	CftGAPC3	GAPC_CFT	Circuitry fault supervision for zone 3
	LLN0	LLN0_STANDARD	Logical Device for Differential phases protection
	TrpCupPTRC3	PTRC_CU_OP	P740: Central trip zone 3
	TrpNeuPDIF3	PDIF_TRP_NEU	P740: Trip zone 3 for SEF
	TrpPhsPDIF3	PDIF_STR_SEG_OP_NOSEG	Differential Phases Protection: Trip Zone 3 for the three phases
	TrpPhsRBRF3	RBRF_87BB_TRIP_PHS	P740: Central breaker failure busbar 3
ProtBbZn4			
	CftGAPC4	GAPC_CFT	Circuitry fault supervision for zone 4
	LLN0	LLN0_STANDARD	Logical Device for Differential phases protection
	TrpCupPTRC4	PTRC_CU_OP	P740: Central trip zone 4
	TrpNeuPDIF4	PDIF_TRP_NEU	P740: Trip zone 4 for SEF
	TrpPhsPDIF4	PDIF_STR_SEG_OP_NOSEG	Differential Phases Protection: Trip Zone 4 for the three phases
	TrpPhsRBRF4	RBRF_87BB_TRIP_PHS	P740: Central breaker failure busbar 4
ProtBbZn5			
	CftGAPC5	GAPC_CFT	Circuitry fault supervision for zone 5
	LLN0	LLN0_STANDARD	Logical Device for Differential phases protection
	TrpCupPTRC5	PTRC_CU_OP	P740: Central trip zone 5
	TrpNeuPDIF5	PDIF_TRP_NEU	P740: Trip zone 5 for SEF

LD	LN Instance	LN Type	Description
	TrpPhsPDIF5	PDIF_STR_SEG_OP_NOSEG	Differential Phases Protection: Trip Zone 5 for the three phases
	TrpPhsRBRF5	RBRF_87BB_TRIP_PHS	P740: Central breaker failure busbar 5
ProtBbZn6			
	CftGAPC6	GAPC_CFT	Circuitry fault supervision for zone 6
	LLN0	LLN0_STANDARD	Logical Device for Differential phases protection
	TrpCupPTRC6	PTRC_CU_OP	P740: Central trip zone 6
	TrpNeuPDIF6	PDIF_TRP_NEU	P740: Trip zone 6 for SEF
	TrpPhsPDIF6	PDIF_STR_SEG_OP_NOSEG	Differential Phases Protection: Trip Zone 6 for the three phases
	TrpPhsRBRF6	RBRF_87BB_TRIP_PHS	P740: Central breaker failure busbar 6
ProtBbZn7			
	CftGAPC7	GAPC_CFT	Circuitry fault supervision for zone 7
	LLN0	LLN0_STANDARD	Logical Device for Differential phases protection
	TrpCupPTRC7	PTRC_CU_OP	P740: Central trip zone 7
	TrpNeuPDIF7	PDIF_TRP_NEU	P740: Trip zone 7 for SEF
	TrpPhsPDIF7	PDIF_STR_SEG_OP_NOSEG	Differential Phases Protection: Trip Zone 7 for the three phases
	TrpPhsRBRF7	RBRF_87BB_TRIP_PHS	P740: Central breaker failure busbar 7
ProtBbZn8			
	CftGAPC8	GAPC_CFT	Circuitry fault supervision for zone 8
	LLN0	LLN0_STANDARD	Logical Device for Differential phases protection
	TrpCupPTRC8	PTRC_CU_OP	P740: Central trip zone 8
	TrpNeuPDIF8	PDIF_TRP_NEU	P740: Trip zone 8 for SEF
	TrpPhsPDIF8	PDIF_STR_SEG_OP_NOSEG	Differential Phases Protection: Trip Zone 8 for the three phases
	TrpPhsRBRF8	RBRF_87BB_TRIP_PHS	P740: Central breaker failure busbar 8
ProtCz			
	CftGAPC9	GAPC_CFT	Circuitry fault supervision for check zone
	CzPTRC9	PTRC_CU_OP	Check zone fault Protection Trip Conditioning
	FltCzNPDIF1	PDIF_FLT_CZ_SEF	P740: SEF check zone fault
	FltCzPPDIF1	PDIF_OP_SEG_NO_STR	P740: Fault on the check zone for each phase
	LLN0	LLN0_STANDARD	Logical device for ProtCftCz
Protection			
	LLN0	LLN0_PROT_P741	Logical Device for Protection
	LPHD1	LPHD_STANDARD	Physical Device Information
Records			
	LLN0	LLN0_STANDARD	Records Logical Device
	LPHD1	LPHD_STANDARD	Physical Device Information
	RDRE1	RDRE_BASIC_CU	Disturbance Recorder
System			
	AlmGGIO1	GGIO_ALM_96	Alarms
	CbfOrdGGIO1	GGIO_IND_16	P740: 50BF order from PU and Opto
	FnkGGIO1	GGIO_IND_10	Function Keys
	GosGGIO1	GGIO_IND_64	GOOSE Input Signals
	GosGGIO2	GGIO_IND_32	GOOSE Output Signals

LD	LN Instance	LN Type	Description
	LckCbfGGIO1	GGIO_IND_8_WD	Breaker failure protection locked on the CU for each zone
	LckDifGGIO1	GGIO_IND_8_WD	87BB Differential protection locked from each zone
	LckNeuGGIO1	GGIO_IND_8	Ext. Blocking of the 87BB earth fault protection
	LckPhsGGIO1	GGIO_IND_8	Ext. Blocking of the 87BB phase protection
	LedGGIO1	GGIO_IND_18	Red LED Signals
	LedGGIO2	GGIO_IND_18	Green LED Signals
	LGOS1	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 1
	LGOS10	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 10
	LGOS11	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 11
	LGOS12	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 12
	LGOS13	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 13
	LGOS14	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 14
	LGOS15	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 15
	LGOS16	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 16
	LGOS17	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 17
	LGOS18	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 18
	LGOS19	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 19
	LGOS2	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 2
	LGOS20	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 20
	LGOS21	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 21
	LGOS22	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 22
	LGOS23	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 23
	LGOS24	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 24
	LGOS25	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 25
	LGOS26	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 26
	LGOS27	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 27
	LGOS28	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 28
	LGOS29	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 29
	LGOS3	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 3

LD	LN Instance	LN Type	Description
	LGOS30	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 30
	LGOS31	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 31
	LGOS32	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 32
	LGOS33	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 33
	LGOS34	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 34
	LGOS35	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 35
	LGOS36	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 36
	LGOS37	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 37
	LGOS38	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 38
	LGOS39	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 39
	LGOS4	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 4
	LGOS40	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 40
	LGOS41	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 41
	LGOS42	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 42
	LGOS43	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 43
	LGOS44	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 44
	LGOS45	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 45
	LGOS46	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 46
	LGOS47	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 47
	LGOS48	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 48
	LGOS49	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 49
	LGOS5	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 5
	LGOS50	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 50
	LGOS51	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 51
	LGOS52	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 52
	LGOS53	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 53
	LGOS54	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 54
	LGOS55	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 55

LD	LN Instance	LN Type	Description
	LGOS56	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 56
	LGOS57	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 57
	LGOS58	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 58
	LGOS59	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 59
	LGOS6	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 6
	LGOS60	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 60
	LGOS61	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 61
	LGOS62	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 62
	LGOS63	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 63
	LGOS64	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 64
	LGOS7	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 7
	LGOS8	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 8
	LGOS9	LGOS_SYSTEM	Monitoring of GOOSE Messages for External Publisher 9
	LLN0	LLN0_SYSTEM	System Logical Device
	LPHD1	LPHD_SYSTEM	Physical Device Information for System
	NP2LCCH1	LCCH_SYSTEM	Physical communication channel supervision for NP2 (stationbus port and its redundant port)
	OptGGIO1	GGIO_IND_8	Opto Inputs (8 off)
	OptVirGGIO1	GGIO_IND_16_WD	P740: Virtual Opto
	OrdRunGGIO1	GGIO_IND_64	Uniqueness of control "Order Running" indications for control operations
	PloGGIO1	GGIO_SPCSO_32	Controllable Inputs
	PueAlmGGIO1	GGIO_IND_8_WD	Alarm PU Error for each zone
	PueLckGGIO1	GGIO_IND_8_WD	Locking PU Error for each zone
	RlyGGIO1	GGIO_IND_8	Output Contacts (8 off)
	RlyVirGGIO1	GGIO_IND_16_WD	P740: Virtual Relay
	TrpManGGIO1	GGIO_IND_8_WD	P740: Manual trip order

1.4 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
GAPC_CFT	(GAPC)	Generic Automatic Process Control	IEC 61850-7-4:2007
GGIO_ALM_96	(GGIO)	Generic Process I/O (w.r.t 96 Alarm Elements)	IEC 61850-7-4:2007
GGIO_IND_10	(GGIO)	Generic Process I/O (w.r.t 10 Indication Elements)	IEC 61850-7-4:2007

LN Type	(LN Class)	Description	Name Space
GGIO_IND_16	(GGIO)	Generic Process I/O	IEC 61850-7-4:2007
GGIO_IND_16_WD	(GGIO)	Generic Process I/O (w.r.t 16 Indication Elements)	IEC 61850-7-4:2007
GGIO_IND_18	(GGIO)	Generic Process I/O (w.r.t 18 Indication Elements)	IEC 61850-7-4:2007
GGIO_IND_32	(GGIO)	Generic Process I/O (w.r.t 32 Indication Elements)	IEC 61850-7-4:2007
GGIO_IND_64	(GGIO)	Generic Process I/O (w.r.t 64 Indication Elements)	IEC 61850-7-4:2007
GGIO_IND_8	(GGIO)	Generic Process I/O (w.r.t 8 Indication Elements)	IEC 61850-7-4:2007
GGIO_IND_8_WD	(GGIO)	Generic process I/O	IEC 61850-7-4:2007
GGIO_SPCSO_32	(GGIO)	Generic process I/O (w.r.t 32 Indications Ctrl i/p)	IEC 61850-7-4:2007
LCCH_SYSTEM	(LCCH)	Physical communication channel supervision	IEC 61850-7-4:2007
LGOS_SYSTEM	(LGOS)	Monitoring of GOOSE messages	IEC 61850-7-4:2007
LLN0_STANDARD	(LLN0)	General Logical Node 0	IEC 61850-7-4:2007
LLN0_SYSTEM	(LLN0)	Logical Node 0	IEC 61850-7-4:2007
LLN0_PROT_P741	(LLN0)	Protection Domain Logical Node 0 for P741	IEC 61850-7-4:2007
LPHD_STANDARD	(LPHD)	Px40 Physical Device Information	IEC 61850-7-4:2007
LPHD_SYSTEM	(LPHD)	Px40 Physical Device Information (used for Logical Device System only)	IEC 61850-7-4:2007
PDIF_FLT_CZ_SEF	(PDIF)	Differential	IEC 61850-7-4:2007
PDIF_OP_SEG_NO_STR	(PDIF)	Differential	IEC 61850-7-4:2007
PDIF_STR_SEG_OP_NOSEG	(PDIF)	Differential	IEC 61850-7-4:2007
PDIF_TRP_NEU	(PDIF)	Differential	IEC 61850-7-4:2007
PTRC_CU_OP	(PTRC)	Protection trip conditioning	IEC 61850-7-4:2007
RBRF_87BB_TRIP_PHS	(RBRF)	Breaker Failure	IEC 61850-7-4:2007
RDRE_BASIC_CU	(RDRE)	Disturbance Recorder function	IEC 61850-7-4:2007

1.4.1 LOGICAL NODE: GAPC_CFT

Description: Generic Automatic Process Control

LN Class: GAPC

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
Alm1	SPS_D	Circuitry fault alarm		
Alm2	SPS_D	Circuitry fault alarm on phase A		
Alm3	SPS_D	Circuitry fault alarm on phase B		
Alm4	SPS_D	Circuitry fault alarm on phase C		
Alm5	SPS_D	Circuitry fault alarm on neutral		
Ind1	SPS_D	Circuitry fault block		
Ind2	SPS_D	Circuitry fault block on phase A		
Ind3	SPS_D	Circuitry fault block on phase B		
Ind4	SPS_D	Circuitry fault block on phase C		
Ind5	SPS_D	Circuitry fault block on neutral		

1.4.2 LOGICAL NODE: GGIO_ALM_96

Description: Generic Process I/O (w.r.t 96 Alarm Elements)

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Alm01	SPS_D	General single alarm		
Mod	ENC_MOD_THREE_STATUS	Mode		
Alm02	SPS_D	General single alarm		
Alm03	SPS_D	General single alarm		
Alm04	SPS_D	General single alarm		
Alm05	SPS_D	General single alarm		
Alm06	SPS_D	General single alarm		
Alm07	SPS_D	General single alarm		
Alm08	SPS_D	General single alarm		
Alm09	SPS_D	General single alarm		
Alm10	SPS_D	General single alarm		
Alm11	SPS_D	General single alarm		
Alm12	SPS_D	General single alarm		
Alm13	SPS_D	General single alarm		
Alm14	SPS_D	General single alarm		
Alm15	SPS_D	General single alarm		
Alm16	SPS_D	General single alarm		
Alm17	SPS_D	General single alarm		
Alm18	SPS_D	General single alarm		
Alm19	SPS_D	General single alarm		
Alm20	SPS_D	General single alarm		
Alm21	SPS_D	General single alarm		
Alm22	SPS_D	General single alarm		
Alm23	SPS_D	General single alarm		
Alm24	SPS_D	General single alarm		
Alm25	SPS_D	General single alarm		
Alm26	SPS_D	General single alarm		
Alm27	SPS_D	General single alarm		
Alm28	SPS_D	General single alarm		
Alm29	SPS_D	General single alarm		
Alm30	SPS_D	General single alarm		
Alm31	SPS_D	General single alarm		
Alm32	SPS_D	General single alarm		
Alm33	SPS_D	General single alarm		
Alm34	SPS_D	General single alarm		
Alm35	SPS_D	General single alarm		
Alm36	SPS_D	General single alarm		
Alm37	SPS_D	General single alarm		
Alm38	SPS_D	General single alarm		
Alm39	SPS_D	General single alarm		
Alm40	SPS_D	General single alarm		
Alm41	SPS_D	General single alarm		
Alm42	SPS_D	General single alarm		

Attribute	Attr. Type	Explanation	T	X
Alm43	SPS_D	General single alarm		
Alm44	SPS_D	General single alarm		
Alm45	SPS_D	General single alarm		
Alm46	SPS_D	General single alarm		
Alm47	SPS_D	General single alarm		
Alm48	SPS_D	General single alarm		
Alm49	SPS_D	General single alarm		
Alm50	SPS_D	General single alarm		
Alm51	SPS_D	General single alarm		
Alm52	SPS_D	General single alarm		
Alm53	SPS_D	General single alarm		
Alm54	SPS_D	General single alarm		
Alm55	SPS_D	General single alarm		
Alm56	SPS_D	General single alarm		
Alm57	SPS_D	General single alarm		
Alm58	SPS_D	General single alarm		
Alm59	SPS_D	General single alarm		
Alm60	SPS_D	General single alarm		
Alm61	SPS_D	General single alarm		
Alm62	SPS_D	General single alarm		
Alm63	SPS_D	General single alarm		
Alm64	SPS_D	General single alarm		
Alm65	SPS_D	General single alarm		
Alm66	SPS_D	General single alarm		
Alm67	SPS_D	General single alarm		
Alm68	SPS_D	General single alarm		
Alm69	SPS_D	General single alarm		
Alm70	SPS_D	General single alarm		
Alm71	SPS_D	General single alarm		
Alm72	SPS_D	General single alarm		
Alm73	SPS_D	General single alarm		
Alm74	SPS_D	General single alarm		
Alm75	SPS_D	General single alarm		
Alm76	SPS_D	General single alarm		
Alm77	SPS_D	General single alarm		
Alm78	SPS_D	General single alarm		
Alm79	SPS_D	General single alarm		
Alm80	SPS_D	General single alarm		
Alm81	SPS_D	General single alarm		
Alm82	SPS_D	General single alarm		
Alm83	SPS_D	General single alarm		
Alm84	SPS_D	General single alarm		
Alm85	SPS_D	General single alarm		
Alm86	SPS_D	General single alarm		
Alm87	SPS_D	General single alarm		
Alm88	SPS_D	General single alarm		
Alm89	SPS_D	General single alarm		
Alm90	SPS_D	General single alarm		
Alm91	SPS_D	General single alarm		
Alm92	SPS_D	General single alarm		

Attribute	Attr. Type	Explanation	T	X
Alm93	SPS_D	General single alarm		
Alm94	SPS_D	General single alarm		
Alm95	SPS_D	General single alarm		
Alm96	SPS_D	General single alarm		

1.4.3 LOGICAL NODE: GGIO_IND_10

Description: Generic Process I/O (w.r.t 10 Indication Elements)

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Ind01	SPS_D	General indication (binary input)		
Mod	ENC_MOD_THREE_STATUS	Mode		
Ind02	SPS_D	General indication (binary input)		
Ind03	SPS_D	General indication (binary input)		
Ind04	SPS_D	General indication (binary input)		
Ind05	SPS_D	General indication (binary input)		
Ind06	SPS_D	General indication (binary input)		
Ind07	SPS_D	General indication (binary input)		
Ind08	SPS_D	General indication (binary input)		
Ind09	SPS_D	General indication (binary input)		
Ind10	SPS_D	General indication (binary input)		

1.4.4 LOGICAL NODE: GGIO_IND_16

Description: Generic Process I/O

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
Ind01	SPS_D	General indication (binary input)		
Ind02	SPS_D	General indication (binary input)		
Ind03	SPS_D	General indication (binary input)		
Ind04	SPS_D	General indication (binary input)		
Ind05	SPS_D	General indication (binary input)		
Ind06	SPS_D	General indication (binary input)		
Ind07	SPS_D	General indication (binary input)		
Ind08	SPS_D	General indication (binary input)		
Ind09	SPS_D	General indication (binary input)		
Ind10	SPS_D	General indication (binary input)		
Ind11	SPS_D	General indication (binary input)		
Ind12	SPS_D	General indication (binary input)		
Ind13	SPS_D	General indication (binary input)		
Ind14	SPS_D	General indication (binary input)		
Ind15	SPS_D	General indication (binary input)		
Ind16	SPS_D	General indication (binary input)		

1.4.5 LOGICAL NODE: GGIO_IND_16_WD

Description: Generic Process I/O (w.r.t 16 Indication Elements)

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
Ind01	SPS_WD	General indication (binary input)		
Ind02	SPS_WD	General indication (binary input)		
Ind03	SPS_WD	General indication (binary input)		
Ind04	SPS_WD	General indication (binary input)		
Ind05	SPS_WD	General indication (binary input)		
Ind06	SPS_WD	General indication (binary input)		
Ind07	SPS_WD	General indication (binary input)		
Ind08	SPS_WD	General indication (binary input)		
Ind09	SPS_WD	General indication (binary input)		
Ind10	SPS_WD	General indication (binary input)		
Ind11	SPS_WD	General indication (binary input)		
Ind12	SPS_WD	General indication (binary input)		
Ind13	SPS_WD	General indication (binary input)		
Ind14	SPS_WD	General indication (binary input)		
Ind15	SPS_WD	General indication (binary input)		
Ind16	SPS_WD	General indication (binary input)		

1.4.6 LOGICAL NODE: GGIO_IND_18

Description: Generic Process I/O (w.r.t 18 Indication Elements)

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Mod	ENC_MOD_THREE_STATUS	Mode		
Health	ENS_HEALTH	Health		
Ind01	SPS_D	General indication (binary input)		
Ind02	SPS_D	General indication (binary input)		
Ind03	SPS_D	General indication (binary input)		
Ind04	SPS_D	General indication (binary input)		
Ind05	SPS_D	General indication (binary input)		
Ind06	SPS_D	General indication (binary input)		
Ind07	SPS_D	General indication (binary input)		
Ind08	SPS_D	General indication (binary input)		
Ind09	SPS_D	General indication (binary input)		
Ind10	SPS_D	General indication (binary input)		
Ind11	SPS_D	General indication (binary input)		
Ind12	SPS_D	General indication (binary input)		
Ind13	SPS_D	General indication (binary input)		
Ind14	SPS_D	General indication (binary input)		
Ind15	SPS_D	General indication (binary input)		
Ind16	SPS_D	General indication (binary input)		

Attribute	Attr. Type	Explanation	T	X
Ind17	SPS_D	General indication (binary input)		
Ind18	SPS_D	General indication (binary input)		

1.4.7 LOGICAL NODE: GGIO_IND_32

Description: Generic Process I/O (w.r.t 32 Indication Elements)

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
Ind01	SPS_D	General indication (binary input)		
Ind02	SPS_D	General indication (binary input)		
Ind03	SPS_D	General indication (binary input)		
Ind04	SPS_D	General indication (binary input)		
Ind05	SPS_D	General indication (binary input)		
Ind06	SPS_D	General indication (binary input)		
Ind07	SPS_D	General indication (binary input)		
Ind08	SPS_D	General indication (binary input)		
Ind09	SPS_D	General indication (binary input)		
Ind10	SPS_D	General indication (binary input)		
Ind11	SPS_D	General indication (binary input)		
Ind12	SPS_D	General indication (binary input)		
Ind13	SPS_D	General indication (binary input)		
Ind14	SPS_D	General indication (binary input)		
Ind15	SPS_D	General indication (binary input)		
Ind16	SPS_D	General indication (binary input)		
Ind17	SPS_D	General indication (binary input)		
Ind18	SPS_D	General indication (binary input)		
Ind19	SPS_D	General indication (binary input)		
Ind20	SPS_D	General indication (binary input)		
Ind21	SPS_D	General indication (binary input)		
Ind22	SPS_D	General indication (binary input)		
Ind23	SPS_D	General indication (binary input)		
Ind24	SPS_D	General indication (binary input)		
Ind25	SPS_D	General indication (binary input)		
Ind26	SPS_D	General indication (binary input)		
Ind27	SPS_D	General indication (binary input)		
Ind28	SPS_D	General indication (binary input)		
Ind29	SPS_D	General indication (binary input)		
Ind30	SPS_D	General indication (binary input)		
Ind31	SPS_D	General indication (binary input)		
Ind32	SPS_D	General indication (binary input)		

1.4.8 LOGICAL NODE: GGIO_IND_64

Description: Generic Process I/O (w.r.t 64 Indication Elements)

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
Ind01	SPS_D	General indication (binary input)		
Ind02	SPS_D	General indication (binary input)		
Ind03	SPS_D	General indication (binary input)		
Ind04	SPS_D	General indication (binary input)		
Ind05	SPS_D	General indication (binary input)		
Ind06	SPS_D	General indication (binary input)		
Ind07	SPS_D	General indication (binary input)		
Ind08	SPS_D	General indication (binary input)		
Ind09	SPS_D	General indication (binary input)		
Ind10	SPS_D	General indication (binary input)		
Ind11	SPS_D	General indication (binary input)		
Ind12	SPS_D	General indication (binary input)		
Ind13	SPS_D	General indication (binary input)		
Ind14	SPS_D	General indication (binary input)		
Ind15	SPS_D	General indication (binary input)		
Ind16	SPS_D	General indication (binary input)		
Ind17	SPS_D	General indication (binary input)		
Ind18	SPS_D	General indication (binary input)		
Ind19	SPS_D	General indication (binary input)		
Ind20	SPS_D	General indication (binary input)		
Ind21	SPS_D	General indication (binary input)		
Ind22	SPS_D	General indication (binary input)		
Ind23	SPS_D	General indication (binary input)		
Ind24	SPS_D	General indication (binary input)		
Ind25	SPS_D	General indication (binary input)		
Ind26	SPS_D	General indication (binary input)		
Ind27	SPS_D	General indication (binary input)		
Ind28	SPS_D	General indication (binary input)		
Ind29	SPS_D	General indication (binary input)		
Ind30	SPS_D	General indication (binary input)		
Ind31	SPS_D	General indication (binary input)		
Ind32	SPS_D	General indication (binary input)		
Ind33	SPS_D	General indication (binary input)		
Ind34	SPS_D	General indication (binary input)		
Ind35	SPS_D	General indication (binary input)		
Ind36	SPS_D	General indication (binary input)		
Ind37	SPS_D	General indication (binary input)		
Ind38	SPS_D	General indication (binary input)		
Ind39	SPS_D	General indication (binary input)		
Ind40	SPS_D	General indication (binary input)		
Ind41	SPS_D	General indication (binary input)		
Ind42	SPS_D	General indication (binary input)		

Attribute	Attr. Type	Explanation	T	X
Ind43	SPS_D	General indication (binary input)		
Ind44	SPS_D	General indication (binary input)		
Ind45	SPS_D	General indication (binary input)		
Ind46	SPS_D	General indication (binary input)		
Ind47	SPS_D	General indication (binary input)		
Ind48	SPS_D	General indication (binary input)		
Ind49	SPS_D	General indication (binary input)		
Ind50	SPS_D	General indication (binary input)		
Ind51	SPS_D	General indication (binary input)		
Ind52	SPS_D	General indication (binary input)		
Ind53	SPS_D	General indication (binary input)		
Ind54	SPS_D	General indication (binary input)		
Ind55	SPS_D	General indication (binary input)		
Ind56	SPS_D	General indication (binary input)		
Ind57	SPS_D	General indication (binary input)		
Ind58	SPS_D	General indication (binary input)		
Ind59	SPS_D	General indication (binary input)		
Ind60	SPS_D	General indication (binary input)		
Ind61	SPS_D	General indication (binary input)		
Ind62	SPS_D	General indication (binary input)		
Ind63	SPS_D	General indication (binary input)		
Ind64	SPS_D	General indication (binary input)		

1.4.9 LOGICAL NODE: GGIO_IND_8

Description: Generic Process I/O (w.r.t 8 Indication Elements)

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
Ind1	SPS_D	General indication (binary input)		
Ind2	SPS_D	General indication (binary input)		
Ind3	SPS_D	General indication (binary input)		
Ind4	SPS_D	General indication (binary input)		
Ind5	SPS_D	General indication (binary input)		
Ind6	SPS_D	General indication (binary input)		
Ind7	SPS_D	General indication (binary input)		
Ind8	SPS_D	General indication (binary input)		

1.4.10 LOGICAL NODE: GGIO_IND_8_WD

Description: Generic Process I/O

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		

Attribute	Attr. Type	Explanation	T	X
Ind1	SPS_WD	General indication (binary input)		
Ind2	SPS_WD	General indication (binary input)		
Ind3	SPS_WD	General indication (binary input)		
Ind4	SPS_WD	General indication (binary input)		
Ind5	SPS_WD	General indication (binary input)		
Ind6	SPS_WD	General indication (binary input)		
Ind7	SPS_WD	General indication (binary input)		
Ind8	SPS_WD	General indication (binary input)		

1.4.11 LOGICAL NODE: GGIO_SPCSO_32

Description: Generic Process I/O (w.r.t 32 Indications Ctrl i/p)

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
SPCSO01	SPC_CONTROL	Single point controllable status output		
SPCSO02	SPC_CONTROL	Single point controllable status output		
SPCSO03	SPC_CONTROL	Single point controllable status output		
SPCSO04	SPC_CONTROL	Single point controllable status output		
SPCSO05	SPC_CONTROL	Single point controllable status output		
SPCSO06	SPC_CONTROL	Single point controllable status output		
SPCSO07	SPC_CONTROL	Single point controllable status output		
SPCSO08	SPC_CONTROL	Single point controllable status output		
SPCSO09	SPC_CONTROL	Single point controllable status output		
SPCSO10	SPC_CONTROL	Single point controllable status output		
SPCSO11	SPC_CONTROL	Single point controllable status output		
SPCSO12	SPC_CONTROL	Single point controllable status output		
SPCSO13	SPC_CONTROL	Single point controllable status output		
SPCSO14	SPC_CONTROL	Single point controllable status output		
SPCSO15	SPC_CONTROL	Single point controllable status output		
SPCSO16	SPC_CONTROL	Single point controllable status output		
SPCSO17	SPC_CONTROL	Single point controllable status output		
SPCSO18	SPC_CONTROL	Single point controllable status output		
SPCSO19	SPC_CONTROL	Single point controllable status output		
SPCSO20	SPC_CONTROL	Single point controllable status output		
SPCSO21	SPC_CONTROL	Single point controllable status output		
SPCSO22	SPC_CONTROL	Single point controllable status output		
SPCSO23	SPC_CONTROL	Single point controllable status output		
SPCSO24	SPC_CONTROL	Single point controllable status output		
SPCSO25	SPC_CONTROL	Single point controllable status output		
SPCSO26	SPC_CONTROL	Single point controllable status output		
SPCSO27	SPC_CONTROL	Single point controllable status output		
SPCSO28	SPC_CONTROL	Single point controllable status output		
SPCSO29	SPC_CONTROL	Single point controllable status output		
SPCSO30	SPC_CONTROL	Single point controllable status output		
SPCSO31	SPC_CONTROL	Single point controllable status output		
SPCSO32	SPC_CONTROL	Single point controllable status output		

1.4.12 LOGICAL NODE: LCCH_SYSTEM

Description: Physical Communication Channel Supervision

LN Class: LCCH

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
ChLiv	SPS_D	Physical channel status: True, if channel receives telegrams within a specified time interval.		
RedChLiv	SPS_D	Physical channel status of redundant channel		

1.4.13 LOGICAL NODE: LGOS_SYSTEM

Description: Monitoring of GOOSE Messages

LN Class: LGOS

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
St	SPS_WD	Status of the subscription (True = active, False=not active)		
SimSt	SPS_WD	Status showing that really Sim messages are received and accepted		
GoCBRef	ORG_SRC_REF	Reference to the subscribed GOOSE control block		
OoSeqGo	SPS_WD_PRIV	Out of order GOOSE indication		X
DupPubAlm	SPS_WD_PRIV	Indication for detecting duplicate GOOSE publisher		X

1.4.14 LOGICAL NODE: LLN0_PROT_P741

Description: Protection Domain Logical Node 0 for P741

LN Class: LLN0

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LLN0	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_CTRL_LD_MOD	Mode		
PhsDifBeh	ENS_BEH_THREE_STATUS_DN	Phases differential protection Behaviour		
NeuDifBeh	ENS_BEH_THREE_STATUS_DN	Neutral differential protection Behaviour		
PhsCftBeh	ENS_BEH_THREE_STATUS_DN	Circuitry fault protection Behaviour		
NeuCftBeh	ENS_BEH_THREE_STATUS_DN	Neutral circuitry fault protection Behaviour		
BFBeh	ENS_BEH_THREE_STATUS_DN	Breaker failure Behaviour		
GrRef	ORG_SRC_REF	Reference to a higher-level logical device		

1.4.15 LOGICAL NODE: LLN0_STANDARD

Description: General Logical Node 0

LN Class: LLN0

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LLN0	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
GrRef	ORG_SRC_REF	Reference to a higher-level logical device		

1.4.16 LOGICAL NODE: LLN0_SYSTEM

Description: System Logical Node 0

LN Class: LLN0

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LLN0	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_CTRL_IED_MOD	Mode		
LEDRs	SPC_CONTROL	LED reset	T	
OrdRun	SPS_WD_PRIV	Order Running (IEC 61850 phase 2.0 and 2.1)		X
SyncSt	SPS_WD_PRIV	Time Synchronisation Indication (IEC 61850 phase 2.0 and 2.1)		X

1.4.17 LOGICAL NODE: LPHD_STANDARD

Description: Px40 Physical Device Information

LN Class: LPHD

Attribute	Attr. Type	Explanation	T	X
PhyNam	DPL_STANDARD	Physical device name plate		
PhyHealth	ENS_HEALTH	Physical device health		
Proxy	SPS_D	Indicates if this LN is a proxy		
PwrUp	SPS_D	Power up detected		

1.4.18 LOGICAL NODE: LPHD_SYSTEM

Description: Px40 Physical Device Information (Used for Logical Device System Only)

LN Class: LPHD

Attribute	Attr. Type	Explanation	T	X
PhyNam	DPL_STANDARD	Physical device name plate		
PhyHealth	ENS_HEALTH	Physical device health		
Proxy	SPS_D	Indicates if this LN is a proxy		
PwrUp	SPS_D	Power up detected		
Sim	SPC_CONTROL	Receive simulated GOOSE or simulated SV		

1.4.19 LOGICAL NODE: PDIF_FLT_CZ_SEF

Description: Differential

LN Class: PDIF

Attribute	Attr. Type	Explanation	T	X
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
Op	ACT_NEU	Operate	T	
DifAClc	WYE_NEU	Differential current		
RstA	WYE_NEU	Restraint current		
CftBeh	ENS_BEH_D_PRIV	circuitry fault blocked information		X
PueBeh	ENS_BEH_D_PRIV	PU error blocked information		X

1.4.20 LOGICAL NODE: PDIF_OP_SEG_NO_STR

Description: Differential

LN Class: PDIF

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
Op	ACT_SEG	Operate	T	
DifAClc	WYE_SEG	Differential current		
RstA	WYE_SEG	Restraint current		
CftBeh	ENS_BEH_D_PRIV	circuitry fault blocked information		X
PueBeh	ENS_BEH_D_PRIV	PU error blocked information		X

1.4.21 LOGICAL NODE: PDIF_STR_SEG_OP_NOSEG

Description: Differential

LN Class: PDIF

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
Str	ACD_SEG	Start		
Op	ACT_NO_SEG	Operate	T	
DifAClc	WYE_SEG	Differential current		
RstA	WYE_SEG	Restraint current		
CftBeh	ENS_BEH_D_PRIV	Circuitry Fault Blocking		X
PueBeh	ENS_BEH_D_PRIV	PU error blocking		X
CzBeh	ENS_BEH_D_PRIV	Check zone confirmation		X

1.4.22 LOGICAL NODE: PDIF_TRP_NEU

Description: Differential

LN Class: PDIF

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
Str	ACD_NEU	Start		
Op	ACT_NO_SEG	Operate	T	
DifAClc	WYE_NEU	Differential current		
RstA	WYE_NEU	Restraint current		
CftBeh	ENS_BEH_D_PRIV	Circuitry Fault Behaviour		X
PueBeh	ENS_BEH_D_PRIV	PU Error blocking		X
CzBeh	ENS_BEH_D_PRIV	Check zone status		X

1.4.23 LOGICAL NODE: PTRC_CU_OP

Description: Protection Trip Conditioning

LN Class: PTRC

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
Op	ACT_NO_SEG	Operate		
Str	ACD_SEG_NEU	Sum of all starts of all connected Logical Nodes		
Str	ACD_SEG	Start		
Op	ACT_SEG	Operate	T	

1.4.24 LOGICAL NODE: RBRF_87BB_TRIP_PHS

Description: Breaker Failure

LN Class: RBRF

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
OpEx	ACT_NO_SEG	Breaker failure trip ("External trip")	T	

1.4.25 LOGICAL NODE: RDRE_BASIC_CU

Description: Disturbance Recorder Function

LN Class: RDRE

Attribute	Attr. Type	Explanation	T	X
NamPlt	LPL_LN	Name Plate		
Beh	ENS_BEH_THREE_STATUS	Behaviour		

Attribute	Attr. Type	Explanation	T	X
Health	ENS_HEALTH	Health		
Mod	ENC_MOD_THREE_STATUS	Mode		
RcdMade	SPS_WD	Recording made		
FltNum	INS_BASIC	Fault number		
RcdTrg	SPC_CONTROL	Trigger recorder		

1.5 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 characterization 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:

FC Name	Semantic	Source Definition
BL	Blocking	IEC61850-7-2-2010
BR	Buffered reports	IEC61850-7-2
CF	Configuration	IEC61850-7-2
CO	Control	IEC61850-7-2
DC	Description	IEC61850-7-2
EX	Extended Definition	IEC61850-7-2
GO	GOOSE Control	IEC61850-7-2
GS	GSSE Control (UCA2 GOOSE)	IEC61850-7-2
LG	Logging	IEC61850-7-2
MS	Multicast sampled value control	IEC61850-7-2
MX	Measurands (Analogue values)	IEC61850-7-2
OR	Operate received	IEC61850-7-2-2010
RP	Unbuffered reports	IEC61850-7-2
SE	Setting Group Editable	IEC61850-7-2
SG	Setting Group	IEC61850-7-2
SP	Set Point	IEC61850-7-2
SR	Service response	IEC61850-7-2-2010
ST	Status Information	IEC61850-7-2
SV	Substitution Values	IEC61850-7-2
US	Unicast sampled value control	IEC61850-7-2
XX	Data attribute service parameters	IEC61850-7-2

1.5.1 COMMON DATA CLASS: ACD_NEU

Description: Directional Protection Activation Information (w.r.t Neutral)

CDC Class: ACD

Attribute	Type	FC	Enumeration	Comment	X
general	BOOLEAN	ST		Trip or start has happened	
dirGeneral	ENUMERATED8 (MMS Type: INT8)	ST	FaultDirectionKind	General direction (unknown, forward, backward or both)	
neut	BOOLEAN	ST		Trip or start event with earth current has happened	
dirNeut	ENUMERATED8 (MMS Type: INT8)	ST	PhaseFaultDirectionKin	Earth current direction (unknown, forward or backward)	
dq	Quality	ST		Quality of the protection activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection activation information	

1.5.2 COMMON DATA CLASS: ACD_SEG

Description: Directional Protection Activation Information (w.r.t No Phase Segregation)

CDC Class: ACD

Attribute	Type	FC	Enumeration	Comment	X
general	BOOLEAN	ST		Trip or start has happened	
dirGeneral	ENUMERATED8 (MMS Type: INT8)	ST	FaultDirectionKind	General direction (unknown, forward, backward or both)	
phsA	BOOLEAN	ST		Trip or start event of Phase A has happened	
dirPhsA	ENUMERATED8 (MMS Type: INT8)	ST	PhaseFaultDirectionKin	Phase A direction (unknown, forward or backward)	
dphsB	BOOLEAN	ST		Trip or start event of Phase B has happened	
dirPhsB	ENUMERATED8 (MMS Type: INT8)	ST	PhaseFaultDirectionKin	Phase B direction (unknown, forward or backward)	
dphsC	BOOLEAN	ST		Trip or start event of Phase C has happened	
dirPhsC	ENUMERATED8 (MMS Type: INT8)	ST	PhaseFaultDirectionKin	Phase C direction (unknown, forward or backward)	
dq	Quality	ST		Quality of the protection activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection activation information	

1.5.3 COMMON DATA CLASS: ACD_SEG_NEU

Description: Directional Protection Activation Information (w.r.t No Phase Segregation + Neutral)

CDC Class: ACD

Attribute	Type	FC	Enumeration	Comment	X
general	BOOLEAN	ST		Trip or start has happened	
dirGeneral	ENUMERATED8 (MMS Type: INT8)	ST	FaultDirectionKind	General direction (unknown, forward, backward or both)	
phsA	BOOLEAN	ST		Trip or start event of Phase A has happened	
dirPhsA	ENUMERATED8 (MMS Type: INT8)	ST	PhaseFaultDirectionKin	Phase A direction (unknown, forward or backward)	
dphsB	BOOLEAN	ST		Trip or start event of Phase B has happened	
dirPhsB	ENUMERATED8 (MMS Type: INT8)	ST	PhaseFaultDirectionKin	Phase B direction (unknown, forward or backward)	
dphsC	BOOLEAN	ST		Trip or start event of Phase C has happened	
dirPhsC	ENUMERATED8 (MMS Type: INT8)	ST	PhaseFaultDirectionKin	Phase C direction (unknown, forward or backward)	
dneut	BOOLEAN	ST		Trip or start event with earth current has happened	
dirNeut	ENUMERATED8 (MMS Type: INT8)	ST	PhaseFaultDirectionKin	Earth current direction (unknown, forward or backward)	
dq	Quality	ST		Quality of the protection activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection activation information	

1.5.4 COMMON DATA CLASS: ACT_NEU

Description: Protection Activation Information (w.r.t Neutral)

CDC Class: ACT

Attribute	Type	FC	Enumeration	Comment	X
general	BOOLEAN	ST		Trip or start has happened	
neut	BOOLEAN	ST		Trip or start event with earth current has happened	

Attribute	Type	FC	Enumeration	Comment	X
q	Quality	ST		Quality of the protection activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection activation information	

1.5.5 COMMON DATA CLASS: ACT_NO_SEG

Description: Protection Activation Information (w.r.t No Phase Segregation)

CDC Class: ACT

Attribute	Type	FC	Enumeration	Comment	X
general	BOOLEAN	ST		Trip or start has happened	
q	Quality	ST		Quality of the protection activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection activation information	

1.5.6 COMMON DATA CLASS: ACT_SEG

Description: Protection Activation Information (w.r.t Phase Segregation)

CDC Class: ACT

Attribute	Type	FC	Enumeration	Comment	X
general	BOOLEAN	ST		Trip or start has happened	
phsA	BOOLEAN	ST		Trip or start event of Phase A has happened	
phsB	BOOLEAN	ST		Trip or start event of Phase B has happened	
phsC	BOOLEAN	ST		Trip or start event of Phase C has happened	
q	Quality	ST		Quality of the protection activation information	
t	TimeStamp	ST		Timestamp of the last change in state of protection activation information	

1.5.7 COMMON DATA CLASS: CMV_MAG_FLOAT

Description: Complex Measured Value (w.r.t Floating Point Magnitude)

CDC Class: CMV

Attribute	Type	FC	Enumeration	Comment	X
cVal	Vector_Magnitude_Float	M		Deadbanded complex measured vector. Updated to the current value of instCVal when the value has changed according to the configuration parameter db.	
Xq	Quality	M		Quality of the measurement value	
Xt	TimeStamp	M		Time deadbanded magnitude last exceeded its db configuration parameter	
Xunits	Unit_Multiplier	CF		Unit of the attribute representing the data	
db	INT32U	CF		Measurement deadband	
rangeC	RangeConfig_Deadband	CF		Measurement range configuration attributes	

1.5.8 COMMON DATA CLASS: DPL_STANDARD

Description: Standard Device Name Plate

CDC Class: DPL

Attribute	Type	FC	Enumeration	Comment	X
vendor	VISIBLE_STRING255	DC		Name of the vendor	
hwRev	VISIBLE_STRING255	DC		Hardware revision	
swRev	VISIBLE_STRING255	DC		Software revision	

Attribute	Type	FC	Enumeration	Comment	X
serNum	VISIBLE_STRING255	DC		Serial Number	
model	VISIBLE_STRING255	DC		Model Number	
location	VISIBLE_STRING255	DC		Physical location of device	

1.5.9 COMMON DATA CLASS: ENC_CTRL_IED_MOD

Description: Controllable Enumerated Status

CDC Class: ENC

Attribute	Type	FC	Enumeration	Comment	X
ctlVal	ENUMERATED32 (MMS Type: INT8)	CO	Mod_3	Control value	
origin	Originator	ST		Originator of the last change of the controllable data	
stVal	ENUMERATED32 (MMS Type: INT8)	ST	Mod_3	Status value of the data	
q	Quality	ST		Quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state of status value	
ctlModel	ENUMERATED8 (MMS Type: INT8)	CF	ctlModel	Control model (Corresponding to the behaviour of the data)	
sboTimeout	INT32U	CF		Select Before Operate timeout period (in milliseconds)	
d	VISIBLE_STRING255	DC		Description of the status element	

1.5.10 COMMON DATA CLASS: ENC_CTRL_LD_MOD

Description: Controllable Enumerated Status

CDC Class: ENC

Attribute	Type	FC	Enumeration	Comment	X
ctlVal	ENUMERATED32 (MMS Type: INT8)	CO	Mod_2	Control value	
origin	Originator	ST		Originator of the last change of the controllable data	
stVal	ENUMERATED32 (MMS Type: INT8)	ST	Mod_2	Status value of the data	
q	Quality	ST		Quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state of status value	
ctlModel	ENUMERATED8 (MMS Type: INT8)	CF	ctlModel	Control model (Corresponding to the behaviour of the data)	
sboTimeout	INT32U	CF		Select Before Operate timeout period (in milliseconds)	
d	VISIBLE_STRING255	DC		Description of the status element	

1.5.11 COMMON DATA CLASS: ENC_MOD_THREE_STATUS

Description: Controllable Enumerated Mode Status (with 3 Status)

CDC Class: ENC

Attribute	Type	FC	Enumeration	Comment	X
stVal	ENUMERATED32 (MMS Type: INT8)	ST	Mod_3	Status value of the data	
q	Quality	ST		Quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state of status value	
ctlModel	ENUMERATED8 (MMS Type: INT8)	CF	ctlModel	Control model (Corresponding to the behaviour of the data)	

1.5.12 COMMON DATA CLASS: ENS_BEH_D_PRIV

Description: Enumerated Status

CDC Class: ENS

Attribute	Type	FC	Enumeration	Comment	X
stVal	ENUMERATED8 (MMS Type: INT8)	ST	Beh_4	The element status	
q	Quality	ST		The quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state	
d	VISIBLE_STRING255	DC		Description of the status element	
dataNs	VISIBLE_STRING255	EX		Data name space	

1.5.13 COMMON DATA CLASS: ENS_BEH_THREE_STATUS

Description: Enumerated Behaviour Status (with 3 Status)

CDC Class: ENS

Attribute	Type	FC	Enumeration	Comment	X
stVal	ENUMERATED8 (MMS Type: INT8)	ST	Beh_3	The element status	
q	Quality	ST		The quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state	

1.5.14 COMMON DATA CLASS: ENS_BEH_THREE_STATUS_DN

Description: Enumerated Status (with 3 Status and dataNs Used for the Beh in the Extended LN)

CDC Class: ENS

Attribute	Type	FC	Enumeration	Comment	X
stVal	ENUMERATED8 (MMS Type: INT8)	ST	Beh_3	The element status	
q	Quality	ST		The quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state	
dataNs	VISIBLE_STRING255	EX		Data name space	

1.5.15 COMMON DATA CLASS: ENS_HEALTH

Description: Enumerated Status

CDC Class: ENS

Attribute	Type	FC	Enumeration	Comment	X
stVal	ENUMERATED8 (MMS Type: INT8)	ST	Health	The element status	
q	Quality	ST		The quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state	

1.5.16 COMMON DATA CLASS: INC_MOD

Description: Standard Controllable Integer Status (w.r.t Mode)

CDC Class: INC

Attribute	Type	FC	Enumeration	Comment	X
stVal	INT32 (MMS Type: INT8)	ST	Mod	Status value of the data	
q	Quality	ST		Quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state of status value	

Attribute	Type	FC	Enumeration	Comment	X
ctlModel	ENUMERATED8 (MMS Type: INT8)	CF	ctlModel	Control model (Corresponding to the behaviour of the data)	

1.5.17 COMMON DATA CLASS: INS_BASIC

Description: Integer Status (w.r.t Mandatory Options Only)

CDC Class: INS

Attribute	Type	FC	Enumeration	Comment	X
stVal	INT32	ST		The element status	
q	Quality	ST		The quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state	

1.5.18 COMMON DATA CLASS: INS_BEH

Description: Integer Status (w.r.t Behaviour)

CDC Class: INS

Attribute	Type	FC	Enumeration	Comment	X
stVal	INT32 (MMS Type: INT8)	ST	Beh	The element status	
q	Quality	ST		The quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state	

1.5.19 COMMON DATA CLASS: INS_HEALTH

Description: Integer Status (w.r.t Health)

CDC Class: INS

Attribute	Type	FC	Enumeration	Comment	X
stVal	INT32 (MMS Type: INT8)	ST	Health	The element status	
q	Quality	ST		The quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state	

1.5.20 COMMON DATA CLASS: LPL_LLN0

Description: Logical Node 0 Name Plate

CDC Class: LPL

Attribute	Type	FC	Enumeration	Comment	X
vendor	VISIBLE_STRING255	DC		Name of the vendor	
swRev	VISIBLE_STRING255	DC		Software revision	
d	VISIBLE_STRING255	DC		Description	
configRev	VISIBLE_STRING255	DC		Uniquely identifies the configuration of a local device instance	
ldNs	VISIBLE_STRING255	EX		Logical Device name space	

1.5.21 COMMON DATA CLASS: LPL_LN

Description: Standard Logical Node Name Plate

CDC Class: LPL

Attribute	Type	FC	Enumeration	Comment	X
vendor	VISIBLE_STRING255	DC		Name of the vendor	
swRev	VISIBLE_STRING255	DC		Software revision	
d	VISIBLE_STRING255	DC		Description	

1.5.22 COMMON DATA CLASS: ORG_SRC_REF

Description: Object Reference Settings

CDC Class: ORG

Attribute	Type	FC	Enumeration	Comment	X
setSrcRef	ObjectReference	SP		The value of the object reference setting	

1.5.23 COMMON DATA CLASS: SPC_CONTROL

Description: Controllable Single Point

CDC Class: SPC

Attribute	Type	FC	Enumeration	Comment	X
ctlVal	BOOLEAN	CO		Control value (Off - FALSE, On - TRUE)	
origin	Originator	ST		Originator of the last change of the controllable data	
stVal	BOOLEAN	ST		Status value of the data	
q	Quality	ST		Quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state of status value	
ctlModel	ENUMERATED8 (MMS Type: INT8)	CF	ctlModel	Control model (Corresponding to the behaviour of the data)	
sboTimeout	INT32U	CF		Select Before Operate timeout period (in milliseconds)	

1.5.24 COMMON DATA CLASS: SPS_D

Description: Standard Single Point Status (with Description)

CDC Class: SPS

Attribute	Type	FC	Enumeration	Comment	X
stVal	BOOLEAN	ST		The element status (TRUE or FALSE)	
q	Quality	ST		The quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state	
d	VISIBLE_STRING255	DC		Description of the status element	

1.5.25 COMMON DATA CLASS: SPS_WD

Description: Single Point Status (without Description)

CDC Class: SPS

Attribute	Type	FC	Enumeration	Comment	X
stVal	BOOLEAN	ST		The element status (TRUE or FALSE)	
q	Quality	ST		The quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state	

1.5.26 COMMON DATA CLASS: SPS_WD_PRIV

Description: Single Point Status

CDC Class: SPS

Attribute	Type	FC	Enumeration	Comment	X
stVal	BOOLEAN	ST		The element status (TRUE or FALSE)	
q	Quality	ST		The quality of the status value	
t	TimeStamp	ST		Timestamp of the last change in state	
dataNs	VISIBLE_STRING255	EX		Data name space	

1.5.27 COMMON DATA CLASS: WYE_NEU

Description: Phase to Ground Measurements for a 3-Phase System

CDC Class: WYE

Attribute	Type	FC	Enumeration	Comment	X
neut	CMV_MAG_FLOAT	--		Measurement values for neutral input	

1.5.28 COMMON DATA CLASS: WYE_SEG

Description: Phase to Ground Measurements for a 3-Phase System (w.r.t Phase Segregation)

CDC Class: WYE

Attribute	Type	FC	Enumeration	Comment	X
phsA	CMV_MAG_FLOAT	--		Measurement values for Phase A	
phsB	CMV_MAG_FLOAT	--		Measurement values for Phase B	
phsC	CMV_MAG_FLOAT	--		Measurement values for Phase C	

1.6 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.

1.6.1 COMPONENT: ANALOGUEVALUE_FLOAT

Comment: General Analogue Value (w.r.t Floating Point Value)

Parent Type: AnalogueValue

Attribute	Type	Enumeration	Comment	X
f	FLOAT32		Floating point value	

1.6.2 COMPONENT: ORIGINATOR

Comment: Originator of the Last Change of Data Attribute Representing the Value of a Controllable Data Object

Parent Type:

Attribute	Type	Enumeration	Comment	X
orIdent	OCTET_STRING64		Originator identification (Null value indicates unknown or not reported)	

Attribute	Type	Enumeration	Comment	X
orCat	ENUMERATED8 (MMS Type: INT8)	orCategory	Originator category (Not-supported, bay-control, station-control, remote-control, automatic-bay, automatic-station, automatic-remote, maintenance or process)	

1.6.3 COMPONENT: RANGECONFIG_DEADBAND

Comment: Measurement Range Configuration

Parent Type: RangeConfig

Attribute	Type	Enumeration	Comment	X
min	AnalogueValue_Float		Minimum process measurement for which values of i and f are considered within limits	
max	AnalogueValue_Float		Maximum process measurement for which values of i and f are considered within limits	
llLim	AnalogueValue_Float		Low Low range limit	
lLim	AnalogueValue_Float		Low range limit	
hLim	AnalogueValue_Float		High range limit	
hhLim	AnalogueValue_Float		High High range limit	

1.6.4 COMPONENT: UNIT_MULTIPLIER

Comment: SI Unit Definitions

Parent Type: Unit

Attribute	Type	Enumeration	Comment	X
SIUnit	ENUMERATED16 (MMS Type: INT8)	SIUnit	SI Unit	
multiplier	ENUMERATED16 (MMS Type: INT8)	multiplier	Multiplier value, the default of which is 0 (i.e. multiplier = 1)	

1.6.5 COMPONENT: VECTOR_MAGNITUDE_FLOAT

Comment: Complex Vector (w.r.t Floating Point Magnitude Value)

Parent Type: Vector

Attribute	Type	Enumeration	Comment	X
mag	AnalogueValue_Float		The magnitude of the complex value	

1.7 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.

1.7.1 ENUMERATED TYPE: ADDCAUSE

Description: IEC 61850 Phase 2.0 and 2.1

Ordinal	Semantic
0	Unknown
1	Not-supported
2	Blocked-by-switching-hierarchy
3	Select-failed
4	Invalid-position
5	Position-reached
6	Parameter-change-in-execution
7	Step-limit
8	Blocked-by-Mode
9	Blocked-by-process
10	Blocked-by-interlocking
11	Blocked-by-synchrocheck
12	Command-already-in-execution
13	Blocked-by-health
14	1-of-n-control
15	Abortion-by-cancel
16	Time-limit-over
17	Abortion-by-trip
18	Object-not-selected
19	Object-already-selected
20	No-access-authority
21	Ended-with-overshoot
22	Abortion-due-to-deviation
23	Abortion-by-communication-loss
24	Blocked-by-command
25	None
26	Inconsistent-parameters
27	Locked-by-other-client

1.7.2 ENUMERATED TYPE: BEH

Description: Behaviour

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

1.7.3 ENUMERATED TYPE: BEH_3

Description: Behaviour Including 3 States

Ordinal	Semantic
1	on
3	test
4	test/blocked

1.7.4 ENUMERATED TYPE: BEH_4

Description: Behaviour Including 4 States

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

1.7.5 ENUMERATED TYPE: CTLMODEL

Description: Control Model

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

1.7.6 ENUMERATED TYPE: FAULTDIRECTIONKIND

Description: Directional for General Fault Direction

Ordinal	Semantic
0	unknown
1	forward
2	backward
3	both

1.7.7 ENUMERATED TYPE: HEALTH

Description: Health

Ordinal	Semantic
1	Ok
2	Warning
3	Alarm

1.7.8 ENUMERATED TYPE: MOD

Description: Mode

Ordinal	Semantic
1	on
2	blocked
3	test

Ordinal	Semantic
4	test/blocked
5	off

1.7.9 ENUMERATED TYPE: MOD_2

Description: Mode Including 2 States

Ordinal	Semantic
1	on
5	off

1.7.10 ENUMERATED TYPE: MOD_3

Description: Mode Including 3 States

Ordinal	Semantic
1	on
3	test
4	test/blocked

1.7.11 ENUMERATED TYPE: MULTIPLIER

Description: Exponents of the Multiplier Value in Base 10

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

1.7.12 ENUMERATED TYPE: ORCATEGORY

Description: IEC 61850 Phase 2.0 and 2.1

Ordinal	Semantic
0	not-supported
1	bay-control

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

1.7.13 ENUMERATED TYPE: PHASEFAULTDIRECTIONKIND

Description: Directional for Phase and Neutral Direction

Ordinal	Semantic
0	unknown
1	forward
2	backward

1.7.14 ENUMERATED TYPE: SIUNIT

Description: SI Units Derived from ISO/IEC 1000

Ordinal	Semantic
-16	years
-15	months
-14	weeks
-13	V/s
-12	mins
-11	hours
-10	days
-9	°F
-8	ratio
-7	miles
-6	inches
-5	feet
-4	df/dt
-3	hz/s
-2	%
-1	pu
1	
2	m
3	kg
4	s
5	A
6	K
7	mol
8	cd
9	deg
10	rad
11	sr
21	Gy
22	Bq
23	°C
24	Sv

Ordinal	Semantic
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	m²
42	m³
43	m/s
44	m/s²
45	m³/s
46	m/m³
47	M
48	kg/m³
49	m²/s
50	W/m K
51	J/K
52	ppm
53	1/s
54	rad/s
61	VA
62	Watts
63	VAr
64	phi
65	cos(phi)
66	Vs
67	V²
68	As
69	A²
70	A²t
71	VAh
72	Wh
73	VArh
74	V/Hz
75	Hz/s
76	char
77	char/s
78	kgm²
79	dB
80	J/Wh
81	W/s

Ordinal	Semantic
82	l/s
83	dBm
84	h
85	min

1.8 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
BSTR16	Bstring16	Bit string 16
BVstring13	BVstring13	Variable bit string (up to 13 bits)
Check	BVstring2	Control Object check flags
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
ENUMERATED32	Long	32 bit enumerated value
ENUMERATED8	Byte	8 bit enumerated value
FLOAT32	Float	32 bit floating point value
FLOAT64	Double	64 bit floating point value
INT128	Int64	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
INT64	Int64	64 bit signed integer value
INT8	Byte	8 bit signed integer value
INT8U	Ubyte	8 bit unsigned integer value
ObjectReference	Vstring129	Object Reference (129 character string)
OCTET_STRING6	Ostring6	6 character string (8 bits per character)
OCTET_STRING64	OVstring64	64 character string (8 bits per character)
OCTET_STRING8	OVstring8	8 character string (8 bits per character)
Quality	BVstring13	IEC61850 Quality
TimeStamp	Utctime	IEC61850 Time stamp
UNICODE_STRING255	UTF8Vstring255	255 character string (16 bits per unicode character)
UTC_TM	Utctime	UTC Timestamp
VISIBLE_STRING129	Vstring129	129 character string
VISIBLE_STRING255	Vstring255	255 character string
VISIBLE_STRING64	Vstring64	64 character string
VISIBLE_STRING65	Vstring65	65 character string
VISIBLE_STRING97	Vstring97	97 character string