Easergy MiCOM P746

Numerical Busbar Protection Relay

P746/EN MC/L72

Software Version	B3
Hardware Suffix	M
IEC61850	Edition 2

Model Implementation Conformance Statement (MICS)

Note The technical manual for this device gives instructions for its installation, commissioning, and operation. However, the manual cannot cover all conceivable circumstances or include detailed information on all topics. In the event of questions or specific problems, do not take any action without proper authorization. Contact the appropriate Schneider Electric technical sales office and request the necessary information.

Any agreements, commitments, and legal relationships and any obligations on the part of Schneider Electric including settlements of warranties, result solely from the applicable purchase contract, which is not affected by the contents of the technical manual.

This device MUST NOT be modified. If any modification is made without the express permission of Schneider Electric, it will invalidate the warranty, and may render the product unsafe.

MODEL IMPLEMENTATION CONFORMANCE STATEMENT (MICS)

Date (month/year):	10/2016
Products covered by this chapter:	This chapter covers the specific versions of the MiCOM products listed below. This includes ***only*** the following combinations of Software Version and Hardware Suffix.
Hardware suffix:	M
Software version:	B3
IEC61850 Edition:	2
Connection diagrams:	This includes a list of the Connection Diagrams for the Products covered by this document. 10P746xx (xx = 00 to 21)

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1 INTRODUCTION

This specification is the Model Implementation Conformance Statement (MICS) and presents the top-level IEC61850 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 IEC61850 part 6 and part 7 series of specifications.

This document is applicable for P746 with the firmware B3A. The MICS is conformant to the devices associated ICD (Substation Configuration Language) file: P746_____B3A.ICD, version V3.0, according to part 6 and part 7 of the IEC61850 standards.

2 LOGICAL DEVICES

The MiCOM relay implements an IEC61850 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 IEC61850 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	P746 Measurements
Protection	P746 Protection
Records	P746 Records
System	P746 System

3 LOGICAL NODES

The IEC61850 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).

The following table presents a summary of the Logical Node templates used across the Logical Devices within the overall IEC61850 product data model:

LD	LN Instance	LN Type	LN Class	Description
Measurements				
	LLN0	LLN0_STANDARD	LLN0	Measurements Logical Device
	LPHD1	LPHD_STANDARD	LPHD	Physical Device Information
	PriBbpMDIF1	MDIF_BBP_7	MDIF	Primary Busbar Differential measurements for base values - zone 1
	PriBbpMDIF2	MDIF_BBP_7	MDIF	Primary Busbar Differential measurements for bias values - zone 1
	PriBbpMDIF3	MDIF_BBP_7	MDIF	Primary Busbar Differential measurements for base values - zone 2
	PriBbpMDIF4	MDIF_BBP_7	MDIF	Primary Busbar Differential measurements for bias values - zone 2
	PriBbpMDIF5	MDIF_BBP_7	MDIF	Primary Busbar Differential measurements for base values - zone 3
	PriBbpMDIF6	MDIF_BBP_7	MDIF	Primary Busbar Differential measurements for bias values - zone 3
	PriBbpMDIF7	MDIF_BBP_7	MDIF	Primary Busbar Differential measurements for base values - zone 4
	PriBbpMDIF8	MDIF_BBP_7	MDIF	Primary Busbar Differential measurements for bias values - zone 4
	PriCznMDIF1	MDIF_CZ_7	MDIF	Primary Check zone differential measurements for base values-fundamentals

LD	LN Instance	LN Type	LN Class	Description
	PriCznMDIF2	MDIF_CZ_7	MDIF	Primary Check zone differential measurements for bias values- fundamentals
	PriDvdMMXU1	MMXU_A_6	MMXU	Primary Derived one-box measurements
	PriFouMMXU1	MMXU_FOURIER	MMXU	Primary Fourier based measurements
	PriMsiMMXU1	MMXU_DERIVED_A_6	MMXU	Primary measured values for One-box measurements
	PriMsiMMXU2	MMXU_A_18	MMXU	Primary measured values for Three-box measurements
	PriRmsMMXU1	MMXU_RMS	MMXU	Primary RMS measuerments
	PriSeqMSQI1	MSQI_SEQ_6	MSQI	Primary one-box sequence measurements
	SecBbpMDIF1	MDIF_BBP_7	MDIF	Secondary Busbar Differential measurements for base values - zone 1
	SecBbpMDIF2	MDIF_BBP_7	MDIF	Secondary Busbar Differential measurements for bias values - zone 1
	SecBbpMDIF3	MDIF_BBP_7	MDIF	Secondary Busbar Differential measurements for base values - zone 2
	SecBbpMDIF4	MDIF_BBP_7	MDIF	Secondary Busbar Differential measurements for bias values - zone 2
	SecBbpMDIF5	MDIF_BBP_7	MDIF	Secondary Busbar Differential measurements for base values - zone 3
	SecBbpMDIF6	MDIF_BBP_7	MDIF	Secondary Busbar Differential measurements for bias values - zone 3
	SecBbpMDIF7	MDIF_BBP_7	MDIF	Secondary Busbar Differential measurements for base values - zone 4
	SecBbpMDIF8	MDIF_BBP_7	MDIF	Secondary Busbar Differential measurements for bias values - zone 4
	SecCznMDIF1	MDIF_CZ_7	MDIF	Secondary Check Zone Differential measurements for base values

LD	LN Instance	LN Type	LN Class	Description
	SecCznMDIF2	MDIF_CZ_7	MDIF	Secondary Check Zone Differential measurements for bias values
	SecDvdMMXU1	MMXU_A_6	MMXU	Secondary Derived one-box measurements
	SecFouMMXU1	MMXU_FOURIER	MMXU	Secondary Fourier based measuerments
	SecMsiMMXU1	MMXU_DERIVED_A_6	MMXU	Secondary measured values for One-box measurements
	SecMsiMMXU2	MMXU_A_18	MMXU	Secondary measured values for Three-box measurements
	SecRmsMMXU1	MMXU_RMS	MMXU	Secondary RMS measuerments
	SecSeqMSQI1	MSQI_SEQ_6	MSQI	Secondary one-box sequence measurements
Protection				
	BbpT01PDIF1	PDIF_NEU	PDIF	Busbar Differential - T1
	BbpT02PDIF1	PDIF_NEU	PDIF	Busbar Differential - T2
	BbpT03PDIF1	PDIF_NEU	PDIF	Busbar Differential - T3
	BbpT04PDIF1	PDIF_NEU	PDIF	Busbar Differential - T4
	BbpT05PDIF1	PDIF_NEU	PDIF	Busbar Differential - T5
	BbpT06PDIF1	PDIF_NEU	PDIF	Busbar Differential - T6
	BbpT07PDIF1	PDIF_NEU	PDIF	Busbar Differential - T7
	BbpT08PDIF1	PDIF_NEU	PDIF	Busbar Differential - T8
	BbpT09PDIF1	PDIF_NEU	PDIF	Busbar Differential - T9
	BbpT10PDIF1	PDIF_NEU	PDIF	Busbar Differential - T10
	BbpT11PDIF1	PDIF_NEU	PDIF	Busbar Differential - T11
	BbpT12PDIF1	PDIF_NEU	PDIF	Busbar Differential - T12
	BbpT13PDIF1	PDIF_NEU	PDIF	Busbar Differential - T13
	BbpT14PDIF1	PDIF_NEU	PDIF	Busbar Differential - T14
	BbpT15PDIF1	PDIF_NEU	PDIF	Busbar Differential - T15
	BbpT16PDIF1	PDIF_NEU	PDIF	Busbar Differential - T16

LD	LN Instance	LN Type	LN Class	Description
	BbpT17PDIF1	PDIF_NEU	PDIF	Busbar Differential - T17
	BbpT18PDIF1	PDIF_NEU	PDIF	Busbar Differential - T18
	BbpZonPDIF1	PDIF_NEU	PDIF	Busbar Differential - Zone 1
	BbpZonPDIF2	PDIF_NEU	PDIF	Busbar Differential - Zone 2
	BbpZonPDIF3	PDIF_NEU	PDIF	Busbar Differential - Zone 3
	BbpZonPDIF4	PDIF_NEU	PDIF	Busbar Differential - Zone 4
	CbfT01RBRF1	RBRF_STANDARD	RBRF	CB Fail - T1
	CbfT02RBRF1	RBRF_STANDARD	RBRF	CB Fail - T2
	CbfT03RBRF1	RBRF_STANDARD	RBRF	CB Fail - T3
	CbfT04RBRF1	RBRF_STANDARD	RBRF	CB Fail - T4
	CbfT05RBRF1	RBRF_STANDARD	RBRF	CB Fail - T5
	CbfT06RBRF1	RBRF_STANDARD	RBRF	CB Fail - T6
	CbfT07RBRF1	RBRF_STANDARD	RBRF	CB Fail - T7
	CbfT08RBRF1	RBRF_STANDARD	RBRF	CB Fail - T8
	CbfT09RBRF1	RBRF_STANDARD	RBRF	CB Fail - T9
	CbfT10RBRF1	RBRF_STANDARD	RBRF	CB Fail - T10
	CbfT11RBRF1	RBRF_STANDARD	RBRF	CB Fail - T11
	CbfT12RBRF1	RBRF_STANDARD	RBRF	CB Fail - T12
	CbfT13RBRF1	RBRF_STANDARD	RBRF	CB Fail - T13
	CbfT14RBRF1	RBRF_STANDARD	RBRF	CB Fail - T14
	CbfT15RBRF1	RBRF_STANDARD	RBRF	CB Fail - T15
	CbfT16RBRF1	RBRF_STANDARD	RBRF	CB Fail - T16
	CbfT17RBRF1	RBRF_STANDARD	RBRF	CB Fail - T17
	CbfT18RBRF1	RBRF_STANDARD	RBRF	CB Fail - T18
	CznPDIF1	PDIF_NEU	PDIF	Check zone differential protection
	DznT01PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T1 - Stage 1
	DznT02PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T2 - Stage 1
	DznT03PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T3 - Stage 1
	DznT04PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T4 - Stage 1
	DznT05PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T5 - Stage 1
	DznT06PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T6 - Stage 1
	DznT07PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T7 - Stage 1
	DznT08PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T8 - Stage 1

LD	LN Instance	LN Type	LN Class	Description
	DznT09PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T9 - Stage 1
	DznT10PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T10 - Stage 1
	DznT11PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T11 - Stage 1
	DznT12PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T12 - Stage 1
	DznT13PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T13 - Stage 1
	DznT14PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T14 - Stage 1
	DznT15PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T15 - Stage 1
	DznT16PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T16 - Stage 1
	DznT17PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T17 - Stage 1
	DznT18PTOC1	PTOC_NEU	PTOC	Deadzone Overcurrent - T18 - Stage 1
	EfdT01PTOC1	PTOC_NEU	PTOC	Earth Fault Protection - T1 - Stage 1
	EfdT01PTOC2	PTOC_NEU	PTOC	Earth Fault Protection - T1- Stage 2
	EfdT02PTOC1	PTOC_NEU	PTOC	Earth Fault Protection - T2 - Stage 1
	EfdT02PTOC2	PTOC_NEU	PTOC	Earth Fault Protection - T2- Stage 2
	EfdT03PTOC1	PTOC_NEU	PTOC	Earth Fault Protection - T3 - Stage 1
	EfdT03PTOC2	PTOC_NEU	PTOC	Earth Fault Protection - T3- Stage 2
	EfdT04PTOC1	PTOC_NEU	PTOC	Earth Fault Protection - T4 - Stage 1
	EfdT04PTOC2	PTOC_NEU	PTOC	Earth Fault Protection - T4- Stage 2
	EfdT05PTOC1	PTOC_NEU	PTOC	Earth Fault Protection - T5 - Stage 1
	EfdT05PTOC2	PTOC_NEU	PTOC	Earth Fault Protection - T5- Stage 2
	EfdT06PTOC1	PTOC_NEU	PTOC	Earth Fault Protection - T6 - Stage 1
	EfdT06PTOC2	PTOC_NEU	PTOC	Earth Fault Protection - T6- Stage 2
	LLN0	LLN0_PROT	LLN0	Protection LLN0
	LPHD1	LPHD_STANDARD	LPHD	Physical Device Information
	OcpT01PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T1 - Stage 1
	OcpT01PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T1 - Stage 2

LD	LN Instance	LN Type	LN Class	Description
	OcpT02PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T2 - Stage 1
	OcpT02PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T2 - Stage 2
	OcpT03PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T3 - Stage 1
	OcpT03PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T3 - Stage 2
	OcpT04PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T4 - Stage 1
	OcpT04PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T4 - Stage 2
	OcpT05PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T5 - Stage 1
	OcpT05PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T5 - Stage 2
	OcpT06PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T6 - Stage 1
	OcpT06PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T6 - Stage 2
	OcpT07PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T7 - Stage 1
	OcpT07PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T7 - Stage 2
	OcpT08PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T8 - Stage 1
	OcpT08PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T8 - Stage 2
	OcpT09PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T9 - Stage 1
	OcpT09PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T9 - Stage 2
	OcpT10PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T10 - Stage 1
	OcpT10PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T10 - Stage 2
	OcpT11PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T11 - Stage 1
	OcpT11PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T11- Stage 2
	OcpT12PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T12 - Stage 1
	OcpT12PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T12 - Stage 2
	OcpT13PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T13 - Stage 1
	OcpT13PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T13 - Stage 2
	OcpT14PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T14 - Stage 1
	OcpT14PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T14 - Stage 2

LD	LN Instance	LN Type	LN Class	Description
	OcpT15PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T15 - Stage 1
	OcpT15PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T15 - Stage 2
	OcpT16PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T16 - Stage 1
	OcpT16PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T16 - Stage 2
	OcpT17PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T17 - Stage 1
	OcpT17PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T17 - Stage 2
	OcpT18PTOC1	PTOC_NEU	PTOC	Overcurrent Protection - T18 - Stage 1
	OcpT18PTOC2	PTOC_NEU	PTOC	Overcurrent Protection - T18 - Stage 2
	PTRC1	PTRC_NO_SEG	PTRC	Trip Conditioning
Records				
	LLN0	LLN0_STANDARD	LLN0	Records Logical Device
	LPHD1	LPHD_STANDARD	LPHD	Physical Device Information
	RDRE1	RDRE_BASIC	RDRE	Disturbance Recorder
	RFLO1	RFLO_PRIV_P746	RFLO	Fault record
System				
	AlmGGIO1	GGIO_ALM_96	GGIO	Alarms
	AlmGGIO2	GGIO_ALM_32	GGIO	User Alarms
	FnkGGIO1	GGIO_IND_10	GGIO	Function Key Indications
	GosGGIO1	GGIO_IND_64_INREF	GGIO	GOOSE Input Signals for edition 2
	GosGGIO2	GGIO_IND_32	GGIO	GOOSE Output Signals
	GosGGIO3	GGIO_ANAL_8_INREF	GGIO	Analogue GOOSE Input Signals for edition 2.
	LedGGIO1	GGIO_IND_18	GGIO	Red LED Signals
	LedGGIO2	GGIO_IND_18	GGIO	Green LED Signals
	LLN0	LLN0_SYSTEM	LLN0	System Logical Device
	LocLTIM1	LTIM_LOCAL	LTIM	Time management
	LPHD1	LPHD_SYSTEM	LPHD	Px40 physical device information in system
	OptGGIO1	GGIO_IND_40	GGIO	Opto Inputs
	OrdRunGGIO1	GGIO_IND_64_INREF	GGIO	Uniqueness of control "Order Running" indications for control operations for edition 2
	PloGGIO1	GGIO_IND_32_CTRL	GGIO	PSL Control Inputs
	RlyGGIO1	GGIO_IND_32	GGIO	Relay outputs

LD	LN Instance	LN Type	LN Class	Description
	SynLTMS1	LTMS_SYNC	LTMS	Time master supervision

The definition tables for each of the Logical Nodes in the top-level data model are presented in the following sub-sections and the column "T" means transient attribute.

3.1 LN: GGIO_ALM_32

Description: Generic process I/O

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
Alm1	SPS_D	General single alarm		O	
Alm2	SPS_D	General single alarm		O	
Alm3	SPS_D	General single alarm		O	
Alm4	SPS_D	General single alarm		O	
Alm5	SPS_D	General single alarm		O	
Alm6	SPS_D	General single alarm		O	
Alm7	SPS_D	General single alarm		O	
Alm8	SPS_D	General single alarm		O	
Alm9	SPS_D	General single alarm		O	
Alm10	SPS_D	General single alarm		O	
Alm11	SPS_D	General single alarm		O	
Alm12	SPS_D	General single alarm		O	
Alm13	SPS_D	General single alarm		O	
Alm14	SPS_D	General single alarm		O	
Alm15	SPS_D	General single alarm		O	
Alm16	SPS_D	General single alarm		O	
Alm17	SPS_D	General single alarm		O	
Alm18	SPS_D	General single alarm		O	
Alm19	SPS_D	General single alarm		O	
Alm20	SPS_D	General single alarm		O	
Alm21	SPS_D	General single alarm		O	
Alm22	SPS_D	General single alarm		O	
Alm23	SPS_D	General single alarm		O	
Alm24	SPS_D	General single alarm		O	
Alm25	SPS_D	General single alarm		O	
Alm26	SPS_D	General single alarm		O	
Alm27	SPS_D	General single alarm		O	
Alm28	SPS_D	General single alarm		O	
Alm29	SPS_D	General single alarm		O	
Alm30	SPS_D	General single alarm		O	
Alm31	SPS_D	General single alarm		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Alm32	SPS_D	General single alarm		O	

3.2 LN: GGIO_ALM_96

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

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
Alm1	SPS_D	General single alarm		O	
Alm2	SPS_D	General single alarm		O	
Alm3	SPS_D	General single alarm		O	
Alm4	SPS_D	General single alarm		O	
Alm5	SPS_D	General single alarm		O	
Alm6	SPS_D	General single alarm		O	
Alm7	SPS_D	General single alarm		O	
Alm8	SPS_D	General single alarm		O	
Alm9	SPS_D	General single alarm		O	
Alm10	SPS_D	General single alarm		O	
Alm11	SPS_D	General single alarm		O	
Alm12	SPS_D	General single alarm		O	
Alm13	SPS_D	General single alarm		O	
Alm14	SPS_D	General single alarm		O	
Alm15	SPS_D	General single alarm		O	
Alm16	SPS_D	General single alarm		O	
Alm17	SPS_D	General single alarm		O	
Alm18	SPS_D	General single alarm		O	
Alm19	SPS_D	General single alarm		O	
Alm20	SPS_D	General single alarm		O	
Alm21	SPS_D	General single alarm		O	
Alm22	SPS_D	General single alarm		O	
Alm23	SPS_D	General single alarm		O	
Alm24	SPS_D	General single alarm		O	
Alm25	SPS_D	General single alarm		O	
Alm26	SPS_D	General single alarm		O	
Alm27	SPS_D	General single alarm		O	
Alm28	SPS_D	General single alarm		O	
Alm29	SPS_D	General single alarm		O	
Alm30	SPS_D	General single alarm		O	
Alm31	SPS_D	General single alarm		O	
Alm32	SPS_D	General single alarm		O	
Alm33	SPS_D	General single alarm		O	
Alm34	SPS_D	General single alarm		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Alm35	SPS_D	General single alarm		O	
Alm36	SPS_D	General single alarm		O	
Alm37	SPS_D	General single alarm		O	
Alm38	SPS_D	General single alarm		O	
Alm39	SPS_D	General single alarm		O	
Alm40	SPS_D	General single alarm		O	
Alm41	SPS_D	General single alarm		O	
Alm42	SPS_D	General single alarm		O	
Alm43	SPS_D	General single alarm		O	
Alm44	SPS_D	General single alarm		O	
Alm45	SPS_D	General single alarm		O	
Alm46	SPS_D	General single alarm		O	
Alm47	SPS_D	General single alarm		O	
Alm48	SPS_D	General single alarm		O	
Alm49	SPS_D	General single alarm		O	
Alm50	SPS_D	General single alarm		O	
Alm51	SPS_D	General single alarm		O	
Alm52	SPS_D	General single alarm		O	
Alm53	SPS_D	General single alarm		O	
Alm54	SPS_D	General single alarm		O	
Alm55	SPS_D	General single alarm		O	
Alm56	SPS_D	General single alarm		O	
Alm57	SPS_D	General single alarm		O	
Alm58	SPS_D	General single alarm		O	
Alm59	SPS_D	General single alarm		O	
Alm60	SPS_D	General single alarm		O	
Alm61	SPS_D	General single alarm		O	
Alm62	SPS_D	General single alarm		O	
Alm63	SPS_D	General single alarm		O	
Alm64	SPS_D	General single alarm		O	
Alm65	SPS_D	General single alarm		O	
Alm66	SPS_D	General single alarm		O	
Alm67	SPS_D	General single alarm		O	
Alm68	SPS_D	General single alarm		O	
Alm69	SPS_D	General single alarm		O	
Alm70	SPS_D	General single alarm		O	
Alm71	SPS_D	General single alarm		O	
Alm72	SPS_D	General single alarm		O	
Alm73	SPS_D	General single alarm		O	
Alm74	SPS_D	General single alarm		O	
Alm75	SPS_D	General single alarm		O	
Alm76	SPS_D	General single alarm		O	
Alm77	SPS_D	General single alarm		O	
Alm78	SPS_D	General single alarm		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Alm79	SPS_D	General single alarm		O	
Alm80	SPS_D	General single alarm		O	
Alm81	SPS_D	General single alarm		O	
Alm82	SPS_D	General single alarm		O	
Alm83	SPS_D	General single alarm		O	
Alm84	SPS_D	General single alarm		O	
Alm85	SPS_D	General single alarm		O	
Alm86	SPS_D	General single alarm		O	
Alm87	SPS_D	General single alarm		O	
Alm88	SPS_D	General single alarm		O	
Alm89	SPS_D	General single alarm		O	
Alm90	SPS_D	General single alarm		O	
Alm91	SPS_D	General single alarm		O	
Alm92	SPS_D	General single alarm		O	
Alm93	SPS_D	General single alarm		O	
Alm94	SPS_D	General single alarm		O	
Alm95	SPS_D	General single alarm		O	
Alm96	SPS_D	General single alarm		O	

3.3 LN: GGIO_ANAL_8_INREF

Description: Generic process I/O

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
InRef1	ORG_SRC	General input reference 1		O	
AnIn1	MV_FLOAT_GSE	Analogue Input 1		O	
InRef2	ORG_SRC	General input reference 2		O	
AnIn2	MV_FLOAT_GSE	Analogue Input 2		O	
InRef3	ORG_SRC	General input reference 3		O	
AnIn3	MV_FLOAT_GSE	Analogue Input 3		O	
InRef4	ORG_SRC	General input reference 4		O	
AnIn4	MV_FLOAT_GSE	Analogue Input 4		O	
InRef5	ORG_SRC	General input reference 5		O	
AnIn5	MV_FLOAT_GSE	Analogue Input 5		O	
InRef6	ORG_SRC	General input reference 6		O	
AnIn6	MV_FLOAT_GSE	Analogue Input 6		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
InRef7	ORG_SRC	General input reference 7		O	
AnIn7	MV_FLOAT_GSE	Analogue Input 7		O	
InRef8	ORG_SRC	General input reference 8		O	
AnIn8	MV_FLOAT_GSE	Analogue Input 8		O	

3.4 LN: GGIO_IND_10

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

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
Ind1	SPS_D	General indication (binary input)		O	
Ind2	SPS_D	General indication (binary input)		O	
Ind3	SPS_D	General indication (binary input)		O	
Ind4	SPS_D	General indication (binary input)		O	
Ind5	SPS_D	General indication (binary input)		O	
Ind6	SPS_D	General indication (binary input)		O	
Ind7	SPS_D	General indication (binary input)		O	
Ind8	SPS_D	General indication (binary input)		O	
Ind9	SPS_D	General indication (binary input)		O	
Ind10	SPS_D	General indication (binary input)		O	

3.5 LN: GGIO_IND_18

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

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
Ind1	SPS_D	General indication (binary input)		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Ind2	SPS_D	General indication (binary input)		O	
Ind3	SPS_D	General indication (binary input)		O	
Ind4	SPS_D	General indication (binary input)		O	
Ind5	SPS_D	General indication (binary input)		O	
Ind6	SPS_D	General indication (binary input)		O	
Ind7	SPS_D	General indication (binary input)		O	
Ind8	SPS_D	General indication (binary input)		O	
Ind9	SPS_D	General indication (binary input)		O	
Ind10	SPS_D	General indication (binary input)		O	
Ind11	SPS_D	General indication (binary input)		O	
Ind12	SPS_D	General indication (binary input)		O	
Ind13	SPS_D	General indication (binary input)		O	
Ind14	SPS_D	General indication (binary input)		O	
Ind15	SPS_D	General indication (binary input)		O	
Ind16	SPS_D	General indication (binary input)		O	
Ind17	SPS_D	General indication (binary input)		O	
Ind18	SPS_D	General indication (binary input)		O	

3.6 LN: GGIO_IND_32

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

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
Ind1	SPS_D	General indication (binary input)		O	
Ind2	SPS_D	General indication (binary input)		O	
Ind3	SPS_D	General indication (binary input)		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Ind4	SPS_D	General indication (binary input)		O	
Ind5	SPS_D	General indication (binary input)		O	
Ind6	SPS_D	General indication (binary input)		O	
Ind7	SPS_D	General indication (binary input)		O	
Ind8	SPS_D	General indication (binary input)		O	
Ind9	SPS_D	General indication (binary input)		O	
Ind10	SPS_D	General indication (binary input)		O	
Ind11	SPS_D	General indication (binary input)		O	
Ind12	SPS_D	General indication (binary input)		O	
Ind13	SPS_D	General indication (binary input)		O	
Ind14	SPS_D	General indication (binary input)		O	
Ind15	SPS_D	General indication (binary input)		O	
Ind16	SPS_D	General indication (binary input)		O	
Ind17	SPS_D	General indication (binary input)		O	
Ind18	SPS_D	General indication (binary input)		O	
Ind19	SPS_D	General indication (binary input)		O	
Ind20	SPS_D	General indication (binary input)		O	
Ind21	SPS_D	General indication (binary input)		O	
Ind22	SPS_D	General indication (binary input)		O	
Ind23	SPS_D	General indication (binary input)		O	
Ind24	SPS_D	General indication (binary input)		O	
Ind25	SPS_D	General indication (binary input)		O	
Ind26	SPS_D	General indication (binary input)		O	
Ind27	SPS_D	General indication (binary input)		O	
Ind28	SPS_D	General indication (binary input)		O	
Ind29	SPS_D	General indication (binary input)		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Ind30	SPS_D	General indication (binary input)		O	
Ind31	SPS_D	General indication (binary input)		O	
Ind32	SPS_D	General indication (binary input)		O	

3.7 LN: GGIO_IND_32_CTRL

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

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
SPCSO1	SPC_CONTROL	Single point controllable status output		O	
SPCSO2	SPC_CONTROL	Single point controllable status output		O	
SPCSO3	SPC_CONTROL	Single point controllable status output		O	
SPCSO4	SPC_CONTROL	Single point controllable status output		O	
SPCSO5	SPC_CONTROL	Single point controllable status output		O	
SPCSO6	SPC_CONTROL	Single point controllable status output		O	
SPCSO7	SPC_CONTROL	Single point controllable status output		O	
SPCSO8	SPC_CONTROL	Single point controllable status output		O	
SPCSO9	SPC_CONTROL	Single point controllable status output		O	
SPCSO10	SPC_CONTROL	Single point controllable status output		O	
SPCSO11	SPC_CONTROL	Single point controllable status output		O	
SPCSO12	SPC_CONTROL	Single point controllable status output		O	
SPCSO13	SPC_CONTROL	Single point controllable status output		O	
SPCSO14	SPC_CONTROL	Single point controllable status output		O	
SPCSO15	SPC_CONTROL	Single point controllable status output		O	
SPCSO16	SPC_CONTROL	Single point controllable status output		O	
SPCSO17	SPC_CONTROL	Single point controllable status output		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
SPCSO18	SPC_CONTROL	Single point controllable status output		O	
SPCSO19	SPC_CONTROL	Single point controllable status output		O	
SPCSO20	SPC_CONTROL	Single point controllable status output		O	
SPCSO21	SPC_CONTROL	Single point controllable status output		O	
SPCSO22	SPC_CONTROL	Single point controllable status output		O	
SPCSO23	SPC_CONTROL	Single point controllable status output		O	
SPCSO24	SPC_CONTROL	Single point controllable status output		O	
SPCSO25	SPC_CONTROL	Single point controllable status output		O	
SPCSO26	SPC_CONTROL	Single point controllable status output		O	
SPCSO27	SPC_CONTROL	Single point controllable status output		O	
SPCSO28	SPC_CONTROL	Single point controllable status output		O	
SPCSO29	SPC_CONTROL	Single point controllable status output		O	
SPCSO30	SPC_CONTROL	Single point controllable status output		O	
SPCSO31	SPC_CONTROL	Single point controllable status output		O	
SPCSO32	SPC_CONTROL	Single point controllable status output		O	

3.8 LN: GGIO_IND_40

Description: Generic Process I/O (w.r.t 40 Indication Elements)

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
Ind1	SPS_D	General indication (binary input)		O	
Ind2	SPS_D	General indication (binary input)		O	
Ind3	SPS_D	General indication (binary input)		O	
Ind4	SPS_D	General indication (binary input)		O	
Ind5	SPS_D	General indication (binary input)		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Ind6	SPS_D	General indication (binary input)		O	
Ind7	SPS_D	General indication (binary input)		O	
Ind8	SPS_D	General indication (binary input)		O	
Ind9	SPS_D	General indication (binary input)		O	
Ind10	SPS_D	General indication (binary input)		O	
Ind11	SPS_D	General indication (binary input)		O	
Ind12	SPS_D	General indication (binary input)		O	
Ind13	SPS_D	General indication (binary input)		O	
Ind14	SPS_D	General indication (binary input)		O	
Ind15	SPS_D	General indication (binary input)		O	
Ind16	SPS_D	General indication (binary input)		O	
Ind17	SPS_D	General indication (binary input)		O	
Ind18	SPS_D	General indication (binary input)		O	
Ind19	SPS_D	General indication (binary input)		O	
Ind20	SPS_D	General indication (binary input)		O	
Ind21	SPS_D	General indication (binary input)		O	
Ind22	SPS_D	General indication (binary input)		O	
Ind23	SPS_D	General indication (binary input)		O	
Ind24	SPS_D	General indication (binary input)		O	
Ind25	SPS_D	General indication (binary input)		O	
Ind26	SPS_D	General indication (binary input)		O	
Ind27	SPS_D	General indication (binary input)		O	
Ind28	SPS_D	General indication (binary input)		O	
Ind29	SPS_D	General indication (binary input)		O	
Ind30	SPS_D	General indication (binary input)		O	
Ind31	SPS_D	General indication (binary input)		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Ind32	SPS_D	General indication (binary input)		O	
Ind33	SPS_D	General indication (binary input)		O	
Ind34	SPS_D	General indication (binary input)		O	
Ind35	SPS_D	General indication (binary input)		O	
Ind36	SPS_D	General indication (binary input)		O	
Ind37	SPS_D	General indication (binary input)		O	
Ind38	SPS_D	General indication (binary input)		O	
Ind39	SPS_D	General indication (binary input)		O	
Ind40	SPS_D	General indication (binary input)		O	

3.9 LN: GGIO_IND_64_INREF

Description: Generic process I/O(w.r.t 64 Indication Elements with inref)

LN Class: GGIO

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
InRef1	ORG_SRC	General input reference 1		O	
Ind1	SPS_D	General indication (binary input)		O	
InRef2	ORG_SRC	General input reference 2		O	
Ind2	SPS_D	General indication (binary input)		O	
InRef3	ORG_SRC	General input reference 3		O	
Ind3	SPS_D	General indication (binary input)		O	
InRef4	ORG_SRC	General input reference 4		O	
Ind4	SPS_D	General indication (binary input)		O	
InRef5	ORG_SRC	General input reference 5		O	
Ind5	SPS_D	General indication (binary input)		O	
InRef6	ORG_SRC	General input reference 6		O	
Ind6	SPS_D	General indication (binary input)		O	
InRef7	ORG_SRC	General input reference 7		O	
Ind7	SPS_D	General indication (binary input)		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
InRef8	ORG_SRC	General input reference 8		O	
Ind8	SPS_D	General indication (binary input)		O	
InRef9	ORG_SRC	General input reference 9		O	
Ind9	SPS_D	General indication (binary input)		O	
InRef10	ORG_SRC	General input reference 10		O	
Ind10	SPS_D	General indication (binary input)		O	
InRef11	ORG_SRC	General input reference 11		O	
Ind11	SPS_D	General indication (binary input)		O	
InRef12	ORG_SRC	General input reference 12		O	
Ind12	SPS_D	General indication (binary input)		O	
InRef13	ORG_SRC	General input reference 13		O	
Ind13	SPS_D	General indication (binary input)		O	
InRef14	ORG_SRC	General input reference 14		O	
Ind14	SPS_D	General indication (binary input)		O	
InRef15	ORG_SRC	General input reference 15		O	
Ind15	SPS_D	General indication (binary input)		O	
InRef16	ORG_SRC	General input reference 16		O	
Ind16	SPS_D	General indication (binary input)		O	
InRef17	ORG_SRC	General input reference 17		O	
Ind17	SPS_D	General indication (binary input)		O	
InRef18	ORG_SRC	General input reference 18		O	
Ind18	SPS_D	General indication (binary input)		O	
InRef19	ORG_SRC	General input reference 19		O	
Ind19	SPS_D	General indication (binary input)		O	
InRef20	ORG_SRC	General input reference 20		O	
Ind20	SPS_D	General indication (binary input)		O	
InRef21	ORG_SRC	General input reference 21		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Ind21	SPS_D	General indication (binary input)		O	
InRef22	ORG_SRC	General input reference 22		O	
Ind22	SPS_D	General indication (binary input)		O	
InRef23	ORG_SRC	General input reference 23		O	
Ind23	SPS_D	General indication (binary input)		O	
InRef24	ORG_SRC	General input reference 24		O	
Ind24	SPS_D	General indication (binary input)		O	
InRef25	ORG_SRC	General input reference 25		O	
Ind25	SPS_D	General indication (binary input)		O	
InRef26	ORG_SRC	General input reference 26		O	
Ind26	SPS_D	General indication (binary input)		O	
InRef27	ORG_SRC	General input reference 27		O	
Ind27	SPS_D	General indication (binary input)		O	
InRef28	ORG_SRC	General input reference 28		O	
Ind28	SPS_D	General indication (binary input)		O	
InRef29	ORG_SRC	General input reference 29		O	
Ind29	SPS_D	General indication (binary input)		O	
InRef30	ORG_SRC	General input reference 30		O	
Ind30	SPS_D	General indication (binary input)		O	
InRef31	ORG_SRC	General input reference 31		O	
Ind31	SPS_D	General indication (binary input)		O	
InRef32	ORG_SRC	General input reference 32		O	
Ind32	SPS_D	General indication (binary input)		O	
InRef33	ORG_SRC	General input reference 33		O	
Ind33	SPS_D	General indication (binary input)		O	
InRef34	ORG_SRC	General input reference 34		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Ind34	SPS_D	General indication (binary input)		O	
InRef35	ORG_SRC	General input reference 35		O	
Ind35	SPS_D	General indication (binary input)		O	
InRef36	ORG_SRC	General input reference 36		O	
Ind36	SPS_D	General indication (binary input)		O	
InRef37	ORG_SRC	General input reference 37		O	
Ind37	SPS_D	General indication (binary input)		O	
InRef38	ORG_SRC	General input reference 38		O	
Ind38	SPS_D	General indication (binary input)		O	
InRef39	ORG_SRC	General input reference 39		O	
Ind39	SPS_D	General indication (binary input)		O	
InRef40	ORG_SRC	General input reference 40		O	
Ind40	SPS_D	General indication (binary input)		O	
InRef41	ORG_SRC	General input reference 41		O	
Ind41	SPS_D	General indication (binary input)		O	
InRef42	ORG_SRC	General input reference 42		O	
Ind42	SPS_D	General indication (binary input)		O	
InRef43	ORG_SRC	General input reference 43		O	
Ind43	SPS_D	General indication (binary input)		O	
InRef44	ORG_SRC	General input reference 44		O	
Ind44	SPS_D	General indication (binary input)		O	
InRef45	ORG_SRC	General input reference 45		O	
Ind45	SPS_D	General indication (binary input)		O	
InRef46	ORG_SRC	General input reference 46		O	
Ind46	SPS_D	General indication (binary input)		O	
InRef47	ORG_SRC	General input reference 47		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Ind47	SPS_D	General indication (binary input)		O	
InRef48	ORG_SRC	General input reference 48		O	
Ind48	SPS_D	General indication (binary input)		O	
InRef49	ORG_SRC	General input reference 49		O	
Ind49	SPS_D	General indication (binary input)		O	
InRef50	ORG_SRC	General input reference 50		O	
Ind50	SPS_D	General indication (binary input)		O	
InRef51	ORG_SRC	General input reference 51		O	
Ind51	SPS_D	General indication (binary input)		O	
InRef52	ORG_SRC	General input reference 52		O	
Ind52	SPS_D	General indication (binary input)		O	
InRef53	ORG_SRC	General input reference 53		O	
Ind53	SPS_D	General indication (binary input)		O	
InRef54	ORG_SRC	General input reference 54		O	
Ind54	SPS_D	General indication (binary input)		O	
InRef55	ORG_SRC	General input reference 55		O	
Ind55	SPS_D	General indication (binary input)		O	
InRef56	ORG_SRC	General input reference 56		O	
Ind56	SPS_D	General indication (binary input)		O	
InRef57	ORG_SRC	General input reference 57		O	
Ind57	SPS_D	General indication (binary input)		O	
InRef58	ORG_SRC	General input reference 58		O	
Ind58	SPS_D	General indication (binary input)		O	
InRef59	ORG_SRC	General input reference 59		O	
Ind59	SPS_D	General indication (binary input)		O	
InRef60	ORG_SRC	General input reference 60		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Ind60	SPS_D	General indication (binary input)		O	
InRef61	ORG_SRC	General input reference 61		O	
Ind61	SPS_D	General indication (binary input)		O	
InRef62	ORG_SRC	General input reference 62		O	
Ind62	SPS_D	General indication (binary input)		O	
InRef63	ORG_SRC	General input reference 63		O	
Ind63	SPS_D	General indication (binary input)		O	
InRef64	ORG_SRC	General input reference 64		O	
Ind64	SPS_D	General indication (binary input)		O	

3.10 LN: LLN0_PROT

Description: Protection Domain Logical Node 0

LN Class: LLN0

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LLN0	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
DifBeh	ENS_BEH_D_PRIV	Differential Behaviour		E	
DifMod	ENC_MOD_D_PRIV	Differential Mode		E	
DznBeh	ENS_BEH_D_PRIV	Deadzone Overcurrent Behaviour		E	
DznMod	ENC_MOD_D_PRIV	Deadzone Overcurrent Mode		E	
OcpBeh	ENS_BEH_D_PRIV	Overcurrent Behaviour		E	
OcpMod	ENC_MOD_D_PRIV	Overcurrent Mode		E	
EfmBeh	ENS_BEH_D_PRIV	Earth Fault 1 (Measured) Behaviour		E	
EfmMod	ENC_MOD_D_PRIV	Earth Fault 1 (Measured) Mode		E	
CbfBeh	ENS_BEH_D_PRIV	Circuit Breaker Fail Behaviour		E	
CbfMod	ENC_MOD_D_PRIV	CB Fail Mode		E	
SvnBeh	ENS_BEH_D_PRIV	System backup Behaviour		E	
SvnMod	ENC_MOD_D_PRIV	System Backup Mode		E	

3.11 LN: LLN0_STANDARD

Description: General Logical Node 0

LN Class: LLN0

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LLN0	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	

3.12 LN: LLN0_SYSTEM

Description: System Domain Logical Node 0

LN Class: LLN0

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LLN0	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
LEDRs	SPC_CONTROL	LED reset	T	O	
OrdRun	SPS_WD_NS	Order Running(IEC 61850 phase 2.0 and 2.1)		E	
SyncSt	SPS_WD_NS	Time Synchronisation Indication(IEC 61850 phase 2.0 and 2.1)		E	

3.13 LN: LPHD_STANDARD

Description: Px40 Physical Device Information

LN Class: LPHD

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

3.14 LN: LPHD_SYSTEM

Description: Px40 Physical device information in System

LN Class: LPHD

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

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Sim	SPC_CONTROL_NS	Receive simulated GOOSE or simulated SV		O	

3.15 LN: LTIM_LOCAL

Description: Time management

LN Class: LTIM

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
TmDT	SPS_D	Indicating if for this location daylight saving time is in effect now		M	
TmOfsTmm	ING_BASIC	Offset of local time from UTC in minutes		M	
TmUseDT	SPG_BASIC	Flag indicating if this location is using daylight saving time		M	

3.16 LN: LTMS_SYNC

Description: Time master supervision (with time source only)

LN Class: LTMS

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
TmSrc	VSS_BASIC	Current time source		M	

3.17 LN: MDIF_BBP_7

Description: Differential measurements for busbar

LN Class: MDIF

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN_P	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
OpARem	WYE_SEG_D	Remote current measurement value		O	

3.18 LN: MDIF_CZ_7

Description: Differential measurements for checkzone

LN Class: MDIF

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN_P	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
OpARem	WYE_SEG_D	Remote current measurement value		O	

3.19 LN: MMXU_A_18

Description: Standard measurements for P746 three-box mode

LN Class: MMXU

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
Ase1	WYE_SEG_ANONYMOU	Single anonymous phase terminal 1		E	
Ase2	WYE_SEG_ANONYMOU	Single anonymous phase terminal 2		E	
Ase3	WYE_SEG_ANONYMOU	Single anonymous phase terminal 3		E	
Ase4	WYE_SEG_ANONYMOU	Single anonymous phase terminal 4		E	
Ase5	WYE_SEG_ANONYMOU	Single anonymous phase terminal 5		E	
Ase6	WYE_SEG_ANONYMOU	Single anonymous phase terminal 6		E	
Ase7	WYE_SEG_ANONYMOU	Single anonymous phase terminal 7		E	
Ase8	WYE_SEG_ANONYMOU	Single anonymous phase terminal 8		E	
Ase9	WYE_SEG_ANONYMOU	Single anonymous phase terminal 9		E	
Ase10	WYE_SEG_ANONYMOU	Single anonymous phase terminal 10		E	
Ase11	WYE_SEG_ANONYMOU	Single anonymous phase terminal 11		E	
Ase12	WYE_SEG_ANONYMOU	Single anonymous phase terminal 12		E	
Ase13	WYE_SEG_ANONYMOU	Single anonymous phase terminal 13		E	
Ase14	WYE_SEG_ANONYMOU	Single anonymous phase terminal 14		E	
Ase15	WYE_SEG_ANONYMOU	Single anonymous phase terminal 15		E	
Ase16	WYE_SEG_ANONYMOU	Single anonymous phase terminal 16		E	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Ase17	WYE_SEG_ANONYMOU	Single anonymous phase terminal 17		E	
Ase18	WYE_SEG_ANONYMOU	Single anonymous phase terminal 18		E	

3.20 LN: MMXU_A_6

Description: Standard measurements for P746 one-box mode

LN Class: MMXU

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
Ase1	WYE_SEG_ANONYMOU	Single anonymous phase terminal 1		E	
Ase2	WYE_SEG_ANONYMOU	Single anonymous phase terminal 2		E	
Ase3	WYE_SEG_ANONYMOU	Single anonymous phase terminal 3		E	
Ase4	WYE_SEG_ANONYMOU	Single anonymous phase terminal 4		E	
Ase5	WYE_SEG_ANONYMOU	Single anonymous phase terminal 5		E	
Ase6	WYE_SEG_ANONYMOU	Single anonymous phase terminal 6		E	

3.21 LN: MMXU_DERIVED_A_6

Description: Standard measurements

LN Class: MMXU

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
Ase1	WYE_SEG_ANG_NS	Phase currents, derived - T1		E	
Ase2	WYE_SEG_ANG_NS	Phase currents, derived - T2		E	
Ase3	WYE_SEG_ANG_NS	Phase currents, derived - T3		E	
Ase4	WYE_SEG_ANG_NS	Phase currents, derived - T4		E	
Ase5	WYE_SEG_ANG_NS	Phase currents, derived - T5		E	
Ase6	WYE_SEG_ANG_NS	Phase currents, derived - T6		E	

3.22 LN: MMXU_FOURIER

Description: Fourier standard measurements

LN Class: MMXU

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
Hz	MV_FLOAT_D	Frequency		O	
PPV	DEL_SEG_ANG	Phase to Phase voltages		O	
PhV	WYE_SEG_ANG	Phase to Ground voltages		O	
V0	MV_FLOAT_NS	V0 Magnitutde		E	
V1	MV_FLOAT_NS	V1 Magnitutde		E	
V2	MV_FLOAT_NS	V2 Magnitutde		E	
VNd	WYE_RES_ANG_D_NS	VNd		E	

3.23 LN: MMXU_RMS

Description: Standard measurements

LN Class: MMXU

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
PhV	WYE_SEG	Phase to Ground voltages		O	

3.24 LN: MSQI_SEQ_6

Description: Sequence and imbalance

LN Class: MSQI

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
SeqA	SEQ_MAG_DN	Positive, Negative and Zero sequence current for T1		C	
SeqAse1	SEQ_MAG	Positive, Negative and Zero sequence current for T2		E	
SeqAse2	SEQ_MAG	Positive, Negative and Zero sequence current for T3		E	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
SeqAse3	SEQ_MAG	Positive, Negative and Zero sequence current for T4		E	
SeqAse4	SEQ_MAG	Positive, Negative and Zero sequence current for T5		E	
SeqAse5	SEQ_MAG	Positive, Negative and Zero sequence current for T6		E	

3.25 LN: PDIF_NEU

Description: Differential (w.r.t Neutral)

LN Class: PDIF

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
Op	ACT_NO_SEG	Operate	T	M	

3.26 LN: PTOC_NEU

Description: Timed Overcurrent (w.r.t Neutral)

LN Class: PTOC

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
Str	ACD_NO_SEG	Start		M	
Op	ACT_NO_SEG	Operate	T	M	

3.27 LN: PTRC_NO_SEG

Description: Protection trip conditioning (w.r.t No Phase Segregation)

LN Class: PTRC

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
Tr	ACT_NO_SEG	Trip		C	
Str	ACD_NO_SEG	Sum of all starts of all connected Logical Nodes		O	

3.28 LN: RBRF_STANDARD

Description: Breaker Failure

LN Class: RBRF

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
OpEx	ACT_NO_SEG	Breaker failure trip ("External trip")	T	C	
OpIn	ACT_NO_SEG	Operate, retrip ("Internal trip")	T	C	

3.29 LN: RDRE_BASIC

Description: Disturbance Recorder function (w.r.t Mandatory Attributes only)

LN Class: RDRE

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
RcdMade	SPS_WD	Recording made		M	
FltNum	INS_BASIC	Fault number		M	
GriFltNum	INS_BASIC	Grid fault number		O	

3.30 LN: RFLO_PRIV_P746

Description: Fault reocrd

LN Class: RFLO

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
FltZ	CMV_MAG	Fault impedance		M	
FltPhs	INS_D_NS	Fault phase		E	
FltSt1U	INS_D_NS	Fault start element 1 up		E	
FltSt1L	INS_D_NS	Fault start element 1 low		E	
FltSt2U	INS_D_NS	Fault start element 2 up		E	
FltSt2L	INS_D_NS	Fault start element 2 low		E	
FltSt3U	INS_D_NS	Fault start element 3 up		E	
FltSt3L	INS_D_NS	Fault start element 3 low		E	
FltOp1U	INS_D_NS	Fault trip element 1 up		E	
FltOp1L	INS_D_NS	Fault trip element 1 low		E	
FltOp2U	INS_D_NS	Fault trip element 2 up		E	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
FltOp2L	INS_D_NS	Fault trip element 2 low		E	
FltOp3U	INS_D_NS	Fault trip element 3 up		E	
FltOp3L	INS_D_NS	Fault trip element 3 low		E	
FltAlm1U	INS_D_NS	Fault alarm 1 up		E	
FltAlm1L	INS_D_NS	Fault alarm 1 low		E	
FltTL	INS_D_NS	Fault time low		E	
FltTU	INS_D_NS	Fault time up		E	
FltTms	INS_D_NS	Fault time ms		E	
FltTye	INS_D_NS	Fault type		E	
FltNum	INS_D_NS	Fault record number		E	
ActiveSG	INS_D_NS	Fault Record Active group		E	
FltHz	MV_FLOAT_FAULT	Fault frequency		E	
FltDur	MV_FLOAT_FAULT	Fault duration		E	
CBOpTm	MV_FLOAT_FAULT	CB Operation time		E	
RlyOpTm	MV_FLOAT_FAULT	Relay Operation time		E	
TestMod	INS_D_NS	Test mode		E	
FltA1	WYE_SEG_FAULT	Fault phase current--T1		E	
FltA2	WYE_SEG_FAULT	Fault phase current--T2		E	
FltA3	WYE_SEG_FAULT	Fault phase current--T3		E	
FltA4	WYE_SEG_FAULT	Fault phase current--T4		E	
FltA5	WYE_SEG_FAULT	Fault phase current--T5		E	
FltA6	WYE_SEG_FAULT	Fault phase current--T6		E	
AX1	MV_FLOAT_FAULT	Single anonymous phase terminal 1		E	
AX2	MV_FLOAT_FAULT	Single anonymous phase terminal 2		E	
AX3	MV_FLOAT_FAULT	Single anonymous phase terminal 3		E	
AX5	MV_FLOAT_FAULT	Single anonymous phase terminal 5		E	
AX4	MV_FLOAT_FAULT	Single anonymous phase terminal 4		E	
AX6	MV_FLOAT_FAULT	Single anonymous phase terminal 6		E	
AX7	MV_FLOAT_FAULT	Single anonymous phase terminal 7		E	
AX8	MV_FLOAT_FAULT	Single anonymous phase terminal 8		E	
AX9	MV_FLOAT_FAULT	Single anonymous phase terminal 9		E	
AX10	MV_FLOAT_FAULT	Single anonymous phase terminal 10		E	
AX11	MV_FLOAT_FAULT	Single anonymous phase terminal 11		E	
AX12	MV_FLOAT_FAULT	Single anonymous phase terminal 12		E	
AX13	MV_FLOAT_FAULT	Single anonymous phase terminal 13		E	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
AX14	MV_FLOAT_FAULT	Single anonymous phase terminal 14		E	
AX15	MV_FLOAT_FAULT	Single anonymous phase terminal 15		E	
AX16	MV_FLOAT_FAULT	Single anonymous phase terminal 16		E	
AX17	MV_FLOAT_FAULT	Single anonymous phase terminal 17		E	
AX18	MV_FLOAT_FAULT	Single anonymous phase terminal 18		E	
FltPhV	WYE_SEG_FAULT	Fault record phase to ground voltage		E	
FltV1	MV_FLOAT_FAULT	Fault record V1 voltage		E	
FltV2	MV_FLOAT_FAULT	Fault record V2 voltage		E	
FltVN	MV_FLOAT_FAULT	Fault record VN voltage		E	
FltPPV	WYE_SEG_FAULT	Fault record phase to phase voltage		E	
Z1IDiff	WYE_SEG_FAULT	Fault differential current--Z1		E	
Z1IBias	WYE_SEG_FAULT	Fault bias current--Z1		E	
Z2IDiff	WYE_SEG_FAULT	Fault differential current--Z2		E	
Z2IBias	WYE_SEG_FAULT	Fault bias current--Z2		E	
Z3IDiff	WYE_SEG_FAULT	Fault differential current--Z3		E	
Z3IBias	WYE_SEG_FAULT	Fault bias current--Z3		E	
Z4IDiff	WYE_SEG_FAULT	Fault differential current--Z4		E	
Z4IBias	WYE_SEG_FAULT	Fault bias current--Z4		E	
CZIDiff	WYE_SEG_FAULT	Fault differential current--CZ		E	
CZIBias	WYE_SEG_FAULT	Fault bias current--CZ		E	

4 COMMON DATA CLASSES

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

4.1 CDC: ACD_NO_SEG

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

CDC Class: ACD

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
general	BOOLEAN	ST	--	--	Trip or start has happened	M
dirGeneral	ENUMERATED8	ST	--	FaultDirectionKind	General direction (unknown, forward, backward or both)	M
q	Quality	ST	--	--	Quality of the protection activation information	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state of protection activation information	M

4.2 CDC: ACT_NO_SEG

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

CDC Class: ACT

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
general	BOOLEAN	ST	--	--	Trip or start has happened	M
q	Quality	ST	--	--	Quality of the protection activation information	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state of protection activation information	M

4.3 CDC: CMV_MAG

Description: Complex Measured value(without db and rangeC)

CDC Class: CMV

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
cVal	Vector_Magnitude_Float	MX	dchg, dupd	--	Deadbanded complex measured vector. Updated to the current value of instCVal when the value has changed according to the configuration parameter db.	M
q	Quality	MX	qchg	--	Quality of the measurement value	M
t	TimeStamp	MX	--	--	Time deadbanded magnitude last exceeded its db configuration parameter	M
units	Unit_Multiplier	CF	dchg	--	Unit of the attribute representing the data	O

4.4 CDC: CMV_MAG_ANG_FLOAT

Description: Complex Measured value (w.r.t Floating Point Magnitude and Angle)

CDC Class: CMV

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
cVal	Vector_MagnitudeAngle_Float	MX	--	--	Deadbanded complex measured vector. Updated to the current value of instCVal when the value has changed according to the configuration parameter db.	M

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
q	Quality	MX	--	--	Quality of the measurement value	M
t	TimeStamp	MX	--	--	Time deadbanded magnitude last exceeded its db configuration parameter	M
units	Unit_Multiplier	CF	--	--	Unit of the attribute representing the data	O
db	INT32U	CF	--	--	Measurement deadband	O
rangeC	RangeConfig_Deadband	CF	--	--	Measurement range configuration attributes	GC_CON

4.5 CDC: CMV_MAG_FLOAT

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

CDC Class: CMV

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
cVal	Vector_Magnitude_Float	MX	--	--	Deadbanded complex measured vector. Updated to the current value of instCVal when the value has changed according to the configuration parameter db.	M
q	Quality	MX	--	--	Quality of the measurement value	M
t	TimeStamp	MX	--	--	Time deadbanded magnitude last exceeded its db configuration parameter	M
units	Unit_Multiplier	CF	--	--	Unit of the attribute representing the data	O

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
db	INT32U	CF	--	--	Measurement deadband	O
rangeC	RangeConfig_Deadband	CF	--	--	Measurement range configuration attributes	GC_CON

4.6 CDC: DEL_SEG_ANG

Description: Phase to phase measurements for a 3-Phase system (w.r.t Phase Seggregation + Angle)

CDC Class: DEL

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
phsAB	CMV_MAG_ANG_FLOAT	--	--	--	Measurement values for Phase A to Phase B	GC_1
phsBC	CMV_MAG_ANG_FLOAT	--	--	--	Measurement values for Phase B to Phase C	GC_1
phsCA	CMV_MAG_ANG_FLOAT	--	--	--	Measurement values for Phase C to Phase A	GC_1

4.7 CDC: DPL_STANDARD

Description: Standard Device Name Plate

CDC Class: DPL

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
vendor	VISIBLE_STRING255	DC	--	--	Name of the vendor	M
hwRev	VISIBLE_STRING255	DC	--	--	Hardware revision	O
swRev	VISIBLE_STRING255	DC	--	--	Software revision	O
serNum	VISIBLE_STRING255	DC	--	--	Serial Number	O
model	VISIBLE_STRING255	DC	--	--	Model Number	O
location	VISIBLE_STRING255	DC	--	--	Physical location of device	O

4.8 CDC: ENC_MOD

Description: Controllable enumerated status(w.r.t Mode)

CDC Class: ENC

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
stVal	ENUMERATED8	ST	dchg	ModKind	Status value of the data.	M
q	Quality	ST	qchg	--	Quality of the status value	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M
ctlModel	ENUMERATED8	CF	dchg	CtlModelKind	Specifies the control model[status-only,direct-with-normal-security,sbo-with-normal-security,direct-with-enhanced-security,sbo-with-enhanced-security].	M

4.9 CDC: ENC_MOD_D_PRIV

Description: Controllable enumerated status (w.r.t Mode, with description (Private DO))

CDC Class: ENC

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
stVal	ENUMERATED8	ST	dchg	ModKind	Status value of the data.	M
q	Quality	ST	qchg	--	Quality of the status value	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M
stSeld	BOOLEAN	ST	dchg	--	The controllable data is in the status "selected".	O
ctlModel	ENUMERATED8	CF	dchg	CtlModelKind	Specifies the control model[status-only,direct-with-normal-security,sbo-with-normal-security,direct-with-enhanced-security,sbo-with-enhanced-security].	M

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O
ctlVal	ENUMERATED8	CO	--	--	Control value	AC_CO_M
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.10 CDC: ENS_BEH

Description: Enumerated status (w.r.t Behaviour)

CDC Class: ENS

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
stVal	ENUMERATED8	ST	dchg, dupd	BehKind	Status value of the data.	M
q	Quality	ST	qchg	--	Quality of the status value	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M

4.11 CDC: ENS_BEH_D_PRIV

Description: Enumerated status (w.r.t Behaviour, with Description (Private DO))

CDC Class: ENS

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
stVal	ENUMERATED8	ST	dchg,dupd	BehKind	Status value of the data.	M
q	Quality	ST	qchg	--	Quality of the status value	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M
d	VISIBLE_STRING255	DC	--	--	Textual description of the data.	O
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.12 CDC: ENS_HEALTH

Description: Enumerated status(w.r.t health)

CDC Class: ENS

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
stVal	ENUMERATED8	ST	dchg, dupd	HealthKind	Status value of the data.	M
q	Quality	ST	qchg	--	Quality of the status value	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M

4.13 CDC: ING_BASIC

Description: Integer Status Setting

CDC Class: ING

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
setVal	INT32	SP	--	--	Setting value	AC_NSG_M
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O

4.14 CDC: INS_BASIC

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

CDC Class: INS

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
stVal	INT32	ST	--	--	The element status	M
q	Quality	ST	--	--	The quality of the status value	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M

4.15 CDC: INS_D_NS

Description: Integer Status with description

CDC Class: INS

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
stVal	INT32	ST	dchg,dupd	--	The element status	M

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
q	Quality	ST	qchg	--	The quality of the status value	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.16 CDC: LPL_LLN0

Description: Logical Node 0 Name Plate

CDC Class: LPL

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
vendor	VISIBLE_STRING255	DC	--	--	Name of the vendor	M
swRev	VISIBLE_STRING255	DC	--	--	Software revision	M
d	VISIBLE_STRING255	DC	--	--	Description	O
configRev	VISIBLE_STRING255	DC	--	--	Uniquely identifies the configuration of a local device instance	AC_LN0_M
ldNs	VISIBLE_STRING255	EX	--	--	Logical Device name space	AC_LN0_EX

4.17 CDC: LPL_LN

Description: Standard Logical Node Name Plate

CDC Class: LPL

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
vendor	VISIBLE_STRING255	DC	--	--	Name of the vendor	M
swRev	VISIBLE_STRING255	DC	--	--	Software revision	M
d	VISIBLE_STRING255	DC	--	--	Description	O

4.18 CDC: LPL_LN_P

Description: Logical Node Name Plate for Propriety LN

CDC Class: LPL

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
vendor	VISIBLE_STRING255	DC	--	--	Name of the vendor	M
swRev	VISIBLE_STRING255	DC	--	--	Software revision	M
d	VISIBLE_STRING255	DC	--	--	Description	O
lnNs	VISIBLE_STRING255	EX	--	--	Logical Node name space	AC_DLD_M

4.19 CDC: MV_FLOAT_D

Description: Measured value (w.r.t Floating Point Value with Description)

CDC Class: MV

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
mag	AnalogueValue_Float	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	M
the configuration parameter db.q	Quality	MX	--	--	Quality of the measurement value	M
t	TimeStamp	MX	--	--	Time deadbanded magnitude last exceeded its db configuration parameter	M
units	Unit_Multiplier	CF	--	--	Unit of the attribute representing the data	O
db	INT32U	CF	--	--	Measurement deadband	O
rangeC	RangeConfig_Deadband	CF	--	--	Measurement range configuration attributes	GC_CON
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O

4.20 CDC: MV_FLOAT_FAULT

Description: Measured value(without db and rangC but namespace)

CDC Class: MV

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
mag	AnalogueValue_Float	MX	dchg, dupd	--	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	M
the configuration parameter db.q	Quality	MX	qchg	--	Quality of the measurement value	M
t	TimeStamp	MX	--	--	Time deadbanded magnitude last exceeded its db configuration parameter	M
units	Unit	CF	dchg	--	Unit of the attribute representing the data	O
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.21 CDC: MV_FLOAT_GSE

Description: Measured value

CDC Class: MV

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
mag	AnalogueValue_Float	MX	dchg, dupd	--	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	M
the configuration parameter db.q	Quality	MX	qchg	--	Quality of the measurement value	M
t	TimeStamp	MX	--	--	Time deadbanded magnitude last exceeded its db configuration parameter	M
units	Unit_Multiplier	CF	dchg	--	Unit of the attribute representing the data	O
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O

4.22 CDC: MV_FLOAT_NS

Description: MV_FLOAT with dataNs for extra Dos

CDC Class: MV

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
mag	AnalogueValue_Float	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	M

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
the configuration parameter db.q	Quality	MX	--	--	Quality of the measurement value	M
t	TimeStamp	MX	--	--	Time deadbanded magnitude last exceeded its db configuration parameter	M
units	Unit_Multiplier	CF	--	--	Unit of the attribute representing the data	O
db	INT32U	CF	--	--	Measurement deadband	O
rangeC	RangeConfig_Deadband	CF	--	--	Measurement range configuration attributes	GC_CON
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.23 CDC: ORG_SRC

Description: Object reference setting

CDC Class: ORG

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
setSrcRef	ObjectReference	SP	dchg	--	The value of the object reference setting.	M
setSrcCB	ObjectReference	SP	dchg	--	The value of the object reference to the control block	O

4.24 CDC: SEQ_MAG

Description: Sequence components of a measurement value

CDC Class: SEQ

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
c1	CMV_MAG_FLOAT	--	--	--	Sequence component 1 (For semantic meaning see seqT)	M

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
c2	CMV_MAG_FLOAT	--	--	--	Sequence component 2 (For semantic meaning see seqT)	M
c3	CMV_MAG_FLOAT	--	--	--	Sequence component 3 (For semantic meaning see seqT)	M
seqT	ENUMERATED8	MX	--	SequenceKind	Sequence quantity measurement type (Pos-Neg-Zero or Dir-Quad-Zero)	M
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.25 CDC: SEQ_MAG_DN

Description: Sequence components of a measurement value

CDC Class: SEQ

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
c1	CMV_MAG_FLOAT	--	--	--	Sequence component 1 (For semantic meaning see seqT)	M
c2	CMV_MAG_FLOAT	--	--	--	Sequence component 2 (For semantic meaning see seqT)	M
c3	CMV_MAG_FLOAT	--	--	--	Sequence component 3 (For semantic meaning see seqT)	M
seqT	ENUMERATED8	MX	--	SequenceKind	Sequence quantity measurement type (Pos-Neg-Zero or Dir-Quad-Zero)	M

4.26 CDC: SPC_CONTROL

Description: Controllable Single Point

CDC Class: SPC

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
origin	Originator	ST	--	--	Originator of the last change of the controllable data	AC_CO_O
stVal	BOOLEAN	ST	--	--	Status value of the data	AC_ST
q	Quality	ST	--	--	Quality of the status value	AC_ST
t	TimeStamp	ST	--	--	Timestamp of the last change in state of status value	AC_ST
stSeld	BOOLEAN	ST	dchg	--	The controllable data is in the status "Selected"	O
ctlModel	ENUMERATED8	CF	--	CtlModelKind	Control model (Corresponding to the behaviour of the data)	M
sboTimeout	INT32U	CF	--	--	Select Before Operate timeout period (in milliseconds)	AC_CO_O
ctlVal	BOOLEAN	CO	--	--	Control value (Off - FALSE, On - TRUE)	AC_CO_M
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O

4.27 CDC: SPC_CONTROL_NS

Description: Controllable Single Point (NAME SPACE)

CDC Class: SPC

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
origin	Originator	ST	--	--	Originator of the last change of the controllable data	AC_CO_O
stVal	BOOLEAN	ST	dchg	--	Status value of the data	AC_ST
q	Quality	ST	qchg	--	Quality of the status value	AC_ST
t	TimeStamp	ST	--	--	Timestamp of the last change in state of status value	AC_ST

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
stSeld	BOOLEAN	ST	dchg	--	The controllable data is in the status "Selected"	O
ctlModel	ENUMERATED8	CF	dchg	CtlModelKind	Control model (Corresponding to the behaviour of the data)	M
sboTimeout	INT32U	CF	dchg	--	Select Before Operate timeout period (in milliseconds)	AC_CO_O
ctlVal	BOOLEAN	CO	--	--	Control value	AC_CO_M

4.28 CDC: SPG_BASIC

Description: Single Point Setting

CDC Class: SPG

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
setVal	BOOLEAN	SP	dchg	--	Setting value (Off - FALSE, On - TRUE)	AC_NSG_M
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O

4.29 CDC: SPS_D

Description: Standard Single Point Status (with Description)

CDC Class: SPS

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
stVal	BOOLEAN	ST	--	--	The element status (TRUE or FALSE)	M
q	Quality	ST	--	--	The quality of the status value	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O

4.30 CDC: SPS_WD

Description: Single Point Status (without Description)

CDC Class: SPS

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
stVal	BOOLEAN	ST	--	--	The element status (TRUE or FALSE)	M
q	Quality	ST	--	--	The quality of the status value	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M

4.31 CDC: SPS_WD_NS

Description: Single Point Status (without Description, with namespace)

CDC Class: SPS

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
stVal	BOOLEAN	ST	--	--	The element status (TRUE or FALSE)	M
q	Quality	ST	--	--	The quality of the status value	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.32 CDC: VSS_BASIC

Description: Visible string status

CDC Class: VSS

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
stVal	VISIBLE_STRING255	ST	dchg	--	Status value of the data.	M
q	Quality	ST	qchg	--	Quality of the status value	M

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M

4.33 CDC: WYE_RES_ANG_D_NS

Description: Phase to ground measurements for a 3-Phase system (w.r.t Residual + Description + Angle)

CDC Class: WYE

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
res	CMV_MAG_ANG_FLOAT	--	--	--	Measurement values for the residual system current	GC_1
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.34 CDC: WYE_SEG

Description: Phase to ground measurements for a 3-Phase system (w.r.t Phase Seggregation)

CDC Class: WYE

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
phsA	CMV_MAG_FLOAT	--	--	--	Measurement values for Phase A	GC_1
phsB	CMV_MAG_FLOAT	--	--	--	Measurement values for Phase B	GC_1
phsC	CMV_MAG_FLOAT	--	--	--	Measurement values for Phase C	GC_1

4.35 CDC: WYE_SEG_ANG

Description: Phase to ground measurements for a 3-Phase system

CDC Class: WYE

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
phsA	CMV_MAG_ANG_FLOAT	--	--	--	Measurement values for Phase A	GC_1
phsB	CMV_MAG_ANG_FLOAT	--	--	--	Measurement values for Phase B	GC_1

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
phsC	CMV_MAG_ANG_FLOAT	--	--	--	Measurement values for Phase C	GC_1

4.36 CDC: WYE_SEG_ANG_NS

Description: Phase to ground measurements for a 3-Phase system

CDC Class: WYE

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
phsA	CMV_MAG_ANG_FLOAT	--	--	--	Measurement values for Phase A	GC_1
phsB	CMV_MAG_ANG_FLOAT	--	--	--	Measurement values for Phase B	GC_1
phsC	CMV_MAG_ANG_FLOAT	--	--	--	Measurement values for Phase C	GC_1
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.37 CDC: WYE_SEG_ANONYMOUS

Description: Phase to ground measurements for anonymous phase of a 3-Phase system

CDC Class: WYE

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
neut	CMV_MAG_ANG_FLOAT	--	--	--	Measurement values for neutral input	GC_1
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.38 CDC: WYE_SEG_D

Description: Phase to ground measurements for a 3-Phase system (w.r.t Phase Seggregation + Description)

CDC Class: WYE

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
phsA	CMV_MAG_FLOAT	--	--	--	Measurement values for Phase A	GC_1
phsB	CMV_MAG_FLOAT	--	--	--	Measurement values for Phase B	GC_1
phsC	CMV_MAG_FLOAT	--	--	--	Measurement values for Phase C	GC_1

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O

4.39 CDC: WYE_SEG_FAULT

Description: Phase to ground measurements for a 3-Phase system

CDC Class: WYE

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
phsA	CMV_MAG	--	--	--	Measurement values for Phase A	GC_1
phsB	CMV_MAG	--	--	--	Measurement values for Phase B	GC_1
phsC	CMV_MAG	--	--	--	Measurement values for Phase C	GC_1
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

5 ENUMERATED TYPES

The following sub-sections specify the enumerations that are associated to some Common Data Class attributes. The definition of the enumerations are according to IEC61850-7-3 and IEC61850-7-4 unless otherwise stated.

5.1 Enumerated Type: AddCause

Description: AddCause

Value	Description	Remarks
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	

5.2 Enumerated Type: BehKind

Description: Behaviour

Value	Description	Remarks
1	on	
2	blocked	
3	test	

Value	Description	Remarks
4	test/blocked	
5	off	

5.3 Enumerated Type: Bypass

Description: Bypass

Value	Description	Remarks
0	locking-bypass	
1	mode-bypass	
2	automation-bypass	
3	uniqueness-bypass	
4	select-bypass	
5	status-bypass	

5.4 Enumerated Type: CtlModelKind

Description: Control Model

Value	Description	Remarks
0	status-only	
1	direct-with-normal-security	
2	sbo-with-normal-security	
3	direct-with-enhanced-security	
4	sbo-with-enhanced-security	

5.5 Enumerated Type: FaultDirectionKind

Description: Direction

Value	Description	Remarks
0	unknown	
1	forward	
2	backward	
3	both	

5.6 Enumerated Type: HealthKind

Description: Health

Value	Description	Remarks
1	Ok	
2	Warning	
3	Alarm	

5.7 Enumerated Type: ModKind

Description: Mode

Value	Description	Remarks
1	on	
2	blocked	

Value	Description	Remarks
3	test	
4	test/blocked	
5	off	

5.8 Enumerated Type: MultiplierKind

Description: Exponents of the multiplier value in base 10.

Value	Description	Remarks
-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	

5.9 Enumerated Type: OriginatorCategoryKind

Description: orCategory

Value	Description	Remarks
0	not-supported	
1	bay-control	
2	station-control	
3	remote-control	
4	automatic-bay	
5	automatic-station	
6	automatic-remote	
7	maintenance	
8	process	

5.10 Enumerated Type: SequenceKind

Description: Sequence Measurement Type

Value	Description	Remarks
0	pos-neg-zero	
1	dir-quad-zero	

5.11 Enumerated Type: SIUnitKind

Description: SI Units derived from ISO/IEC 1000

Value	Description	Remarks
-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	
-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	
25	F	
26	C	
27	S	
28	H	
29	V	

Value	Description	Remarks
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	
55	W/m^2	
56	J/m^2	
57	S/m	
58	K/s	
59	Pa/s	
60	J/kg K	
61	VA	
62	Watts	
63	VAr	
64	phi	
65	cos(phi)	
66	Vs	
67	V^2	
68	As	
69	A^2	
70	A^2t	
71	VAh	
72	Wh	
73	VArh	
74	V/Hz	

Value	Description	Remarks
75	Hz/s	
76	char	
77	char/s	
78	kgm²	
79	dB	
80	J/Wh	
81	W/s	
82	l/s	
83	dBm	

6 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 (upto 13 bits)
Check	BVstring2	Control Object check flags
CODED_ENUM	Byte	Coded enumeration
CODED_ENUM2	Byte	Coded enumeration (2)
Currency	Vstring3	3-character currency
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
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	64bit signed integer value
INT8	Byte	8 bit signed integer value
INT8U	Ubyte	8 bit unsigned integer value
ObjectReference	Vstring129	Object Reference
OCTET_STRING6	OVstring6	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

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Publisher: Schneider Electric

Publication: Easergy MiCOM P746/EN MC/L72 Numerical Busbar Protection Relay Software Version: B3 Hardware Suffix: M IEC61850 Edition: 2

10/2016