

Easergy MiCOM P643

Transformer Protection Relay

P643/EN MC/Gb3 - Ed. 2

Software Version	B6
Hardware Suffix	M
IEC61850 Edition	2
Issue Date	09/2020

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.

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**MODEL IMPLEMENTATION
CONFORMANCE STATEMENT
(MICS)**

Date (month/year):	09/2020
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:	B6
Connection diagrams:	This includes a list of the Connection Diagrams for the Products covered by this document. 10P642xx (xx = 01 to 10) 10P643xx (xx = 01 to 06) 10P645xx (xx = 01 to 09)

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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 P643 with the firmware B6A. The MICS is conformant to the devices associated ICD (Substation Configuration Language) file:

P643_____B6A.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 LLNO 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
Control	P643 Controls Domain
Measurements	P643 Measurements
Protection	P643 Protection
Records	P643 Records
System	P643 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
Control				
	CILO1	CILO_INTERLOCK	CILO	Circuit Breaker(1) Interlocking
	CILO2	CILO_INTERLOCK	CILO	Circuit Breaker(2) Interlocking
	CILO3	CILO_INTERLOCK	CILO	Circuit Breaker(3) Interlocking
	LLN0	LLN0_STANDARD	LLN0	Controls Logical Device
	LPHD1	LPHD_STANDARD	LPHD	Physical Device Information
	XCBR1	XCBR_BASIC	XCBR	Circuit Breaker(1) Monitoring (3 Pole)
	XCBR2	XCBR_BASIC	XCBR	Circuit Breaker(2) Monitoring (3 Pole)
	XCBR3	XCBR_BASIC	XCBR	Circuit Breaker(3) Monitoring (3 Pole)
Measurements				
	ClIMsiGGIO1	GGIO_ANAL_4	GGIO	CLIO measurements
	LLN0	LLN0_STANDARD	LLN0	Measurements Logical Device
	LoIMMTR1	MMTR_LOL	MMTR	Loss of Life (Transformer) Meter values
	LoIMMXU1	MMXU_LOL	MMXU	Loss of life (transformer) measurements
	LPHD1	LPHD_STANDARD	LPHD	Physical Device Information
	PriEflMMTR1	MMTR_EFL	MMTR	Primary Energy Flow Metering
	PriFouMMXU1	MMXU_FOURIER	MMXU	Primary fourier derived measurements
	PriFouMMXU2	MMXU_FOURIER_WINDING	MMXU	Primary HV Winding Fourier Measurements
	PriFouMMXU3	MMXU_FOURIER_WINDING	MMXU	Primary LV Winding Fourier Measurements
	PriFouMMXU4	MMXU_FOURIER_WINDING	MMXU	Primary TV Winding Fourier Measurements
	PriFxdMSTA1	MSTA_DEMAND	MSTA	Primary Fixed Demand Values
	PriHzdMMXU1	MMXU_HZD	MMXU	HV winding high impedance primary values
	PriHzdMMXU2	MMXU_HZD	MMXU	LV winding high impedance primary values
	PriHzdMMXU3	MMXU_HZD	MMXU	TV winding high impedance primary values
	PriHzdMMXU4	MMXU_HZD	MMXU	Auto transformer high impedance primary values
	PriLzdMMXU1	MMXU_DIF_LZD	MMXU	HV winding low impedance primary differential values

LD	LN Instance	LN Type	LN Class	Description
	PriLzdMMXU2	MMXU_DIF_LZD	MMXU	LV winding low impedance primary differential values
	PriLzdMMXU3	MMXU_DIF_LZD	MMXU	TV winding low impedance primary differential values
	PriLzdMMXU4	MMXU_DIF_LZD	MMXU	Auto transformer low impedance primary differential values
	PriMsiMMXU1	MMXU_MSI	MMXU	Primary measured input values for CT1
	PriMsiMMXU2	MMXU_MSI	MMXU	Primary measured input values for CT2
	PriMsiMMXU3	MMXU_MSI	MMXU	Primary measured input values for CT3
	PriPkdMSTA1	MSTA_DEMAND	MSTA	Primary Peak Demand Values
	PriPwrMMXU1	MMXU_POWER_WINDING	MMXU	Primary power measurements for HV
	PriPwrMMXU2	MMXU_POWER_WINDING	MMXU	Primary power measurements for LV
	PriPwrMMXU3	MMXU_POWER_WINDING	MMXU	Primary power measurements for TV
	PriRmsMMXU1	MMXU_RMS_PHV	MMXU	Primary phase to ground voltage measurements
	PriRmsMMXU2	MMXU_RMS	MMXU	Primary RMS measurements for HV
	PriRmsMMXU3	MMXU_RMS	MMXU	Primary RMS measurements for LV
	PriRmsMMXU4	MMXU_RMS	MMXU	Primary RMS measurements for TV
	PriRodMSTA1	MSTA_DEMAND	MSTA	Primary Rolling Demand Values
	PriVhzMMXU1	MMXU_VHZ	MMXU	Primary volts-per-hertz measurements - winding 1
	PriVhzMMXU2	MMXU_VHZ	MMXU	Primary volts-per-hertz measurements - winding 2
	PwrFctMMXU1	MMXU_POWER_FACTOR	MMXU	Power factor measurements
	RtdGGIO1	GGIO_ANAL_10	GGIO	RTD Analogue values
	SecEflMMTR1	MMTR_EFL	MMTR	Secondary Energy Flow Metering
	SecFouMMXU1	MMXU_FOURIER	MMXU	Secondary fourier derived measurements
	SecFouMMXU2	MMXU_FOURIER_WINDING	MMXU	Secondary HV Winding Fourier Measurements
	SecFouMMXU3	MMXU_FOURIER_WINDING	MMXU	Secondary LV Winding Fourier Measurements
	SecFouMMXU4	MMXU_FOURIER_WINDING	MMXU	Secondary TV Winding Fourier Measurements
	SecFxdMSTA1	MSTA_DEMAND	MSTA	Secondary Fixed Demand Values
	SecHzdMMXU1	MMXU_HZD	MMXU	HV winding high impedance secondary values
	SecHzdMMXU2	MMXU_HZD	MMXU	LV winding high impedance secondary values

LD	LN Instance	LN Type	LN Class	Description
	SecHzdMMXU3	MMXU_HZD	MMXU	TV winding high impedance secondary values
	SecHzdMMXU4	MMXU_HZD	MMXU	Auto transformer high impedance secondary values
	SecLzdMMXU1	MMXU_DIF_LZD	MMXU	HV winding low impedance secondary differential values
	SecLzdMMXU2	MMXU_DIF_LZD	MMXU	LV winding low impedance secondary differential values
	SecLzdMMXU3	MMXU_DIF_LZD	MMXU	TV winding low impedance secondary differential values
	SecLzdMMXU4	MMXU_DIF_LZD	MMXU	Auto transformer low impedance secondary differential values
	SecMsiMMXU1	MMXU_MSI	MMXU	Secondary measured input values for CT1
	SecMsiMMXU2	MMXU_MSI	MMXU	Secondary measured input values for CT2
	SecMsiMMXU3	MMXU_MSI	MMXU	Secondary measured input values for CT3
	SecPkdMSTA1	MSTA_DEMAND	MSTA	Secondary Peak Demand Values
	SecPwrMMXU1	MMXU_POWER_WINDING	MMXU	Secondary power measurements for HV
	SecPwrMMXU2	MMXU_POWER_WINDING	MMXU	Secondary power measurements for LV
	SecPwrMMXU3	MMXU_POWER_WINDING	MMXU	Secondary power measurements for TV
	SecRmsMMXU1	MMXU_RMS_PHV	MMXU	Secondary phase to ground voltage measurements
	SecRmsMMXU2	MMXU_RMS	MMXU	Secondary RMS measurements for HV
	SecRmsMMXU3	MMXU_RMS	MMXU	Secondary RMS measurements for LV
	SecRmsMMXU4	MMXU_RMS	MMXU	Secondary RMS measurements for TV
	SecRodMSTA1	MSTA_DEMAND	MSTA	Secondary Rolling Demand Values
	SecVhzMMXU1	MMXU_VHZ	MMXU	Secondary volts-per-hertz measurements - winding 1
	SecVhzMMXU2	MMXU_VHZ	MMXU	Secondary volts-per-hertz measurements - winding 2
	ThmMMXU1	MMXU_THM	MMXU	Thermal Measurements
	XfrDifMMXU1	MMXU_DIF_XFR_1	MMXU	Transformer Differential Values
	XfrDifMMXU2	MMXU_DIF_XFR_2	MMXU	Transformer Differential values - 2nd Harmonic
	XfrDifMMXU3	MMXU_DIF_XFR_2	MMXU	Transformer Differential values -5th Harmonic
Protection				
	Cbf1RBRF1	RBRF_INTTRIP	RBRF	CT1 CB Fail 1
	Cbf1RBRF2	RBRF_EXTTRIP	RBRF	CT1 CB Fail 2
	Cbf2RBRF1	RBRF_INTTRIP	RBRF	CT2 CB Fail 1

LD	LN Instance	LN Type	LN Class	Description
	Cbf2RBRF2	RBRF_EXTTRIP	RBRF	CT2 CB Fail 2
	Cbf3RBRF1	RBRF_INTTRIP	RBRF	CT3 CB Fail 1 - P643/P645
	Cbf3RBRF2	RBRF_EXTTRIP	RBRF	CT3 CB Fail 2 - P643/P645
	CliAlmPTUC1	PTUC_NEU	PTUC	CLIO Input 1 Alarm
	CliAlmPTUC2	PTUC_NEU	PTUC	CLIO Input 2 Alarm
	CliAlmPTUC3	PTUC_NEU	PTUC	CLIO Input 3 Alarm
	CliAlmPTUC4	PTUC_NEU	PTUC	CLIO Input 4 Alarm
	CliBlkGGIO1	GGIO_IND_4	GGIO	Current Loop blocked signals
	CliTrpPTUC1	PTUC_NEU	PTUC	Current Loop Input 1 Trip
	CliTrpPTUC2	PTUC_NEU	PTUC	Current Loop Input 2 Trip
	CliTrpPTUC3	PTUC_NEU	PTUC	Current Loop Input 3 Trip
	CliTrpPTUC4	PTUC_NEU	PTUC	Current Loop Input 4 Trip
	DifPDIF1	PDIF_NEU_NO_STR	PDIF	differential protection
	EfmE11PTOC1	PTOC_NO_SEG	PTOC	Earth fault element 1 - stage 1
	EfmE11PTOC2	PTOC_NO_SEG	PTOC	Earth fault element 1 - stage 2
	EfmE11PTOC3	PTOC_NO_SEG	PTOC	Earth fault element 1 - stage 3
	EfmE11PTOC4	PTOC_NO_SEG	PTOC	Earth fault element 1 - stage 4
	EfmE12PTOC1	PTOC_NO_SEG	PTOC	Earth fault element 2 - stage 1
	EfmE12PTOC2	PTOC_NO_SEG	PTOC	Earth fault element 2 - stage 2
	EfmE12PTOC3	PTOC_NO_SEG	PTOC	Earth fault element 2 - stage 3
	EfmE12PTOC4	PTOC_NO_SEG	PTOC	Earth fault element 2 - stage 4
	EfmE13PTOC1	PTOC_NO_SEG	PTOC	Earth fault element 3 - stage 1
	EfmE13PTOC2	PTOC_NO_SEG	PTOC	Earth fault element 3 - stage 2
	EfmE13PTOC3	PTOC_NO_SEG	PTOC	Earth fault element 3 - stage 3
	EfmE13PTOC4	PTOC_NO_SEG	PTOC	Earth fault element 3 - stage 4
	FrqPTOF1	PTOF_NO_SEG	PTOF	F > 1 Over Frequency
	FrqPTOF2	PTOF_NO_SEG	PTOF	F > 2 Over Frequency
	FrqPTUF1	PTUF_NO_SEG	PTUF	F < 1 Under Frequency
	FrqPTUF2	PTUF_NO_SEG	PTUF	F < 2 Under Frequency
	FrqPTUF3	PTUF_NO_SEG	PTUF	F < 3 Under Frequency
	FrqPTUF4	PTUF_NO_SEG	PTUF	F < 4 Under Frequency
	HotPTTR1	PTTR_NO_SEG	PTTR	Hot Oil Thermal Overload stage 1
	HotPTTR2	PTTR_NO_SEG	PTTR	Hot Oil Thermal Overload stage 2
	HotPTTR3	PTTR_NO_SEG	PTTR	Hot Oil Thermal Overload stage 3
	LLN0	LLN0_P643_P645	LLN0	LLN0
	LPHD1	LPHD_STANDARD	LPHD	Physical Device Information
	NgcE11PTOC1	PTOC_NO_SEG	PTOC	I > 1 element 1 NPS Overcurrent
	NgcE11PTOC2	PTOC_NO_SEG	PTOC	I > 2 element 1 NPS Overcurrent
	NgcE11PTOC3	PTOC_NO_SEG	PTOC	I > 3 element 1 NPS Overcurrent
	NgcE11PTOC4	PTOC_NO_SEG	PTOC	I > 4 element 1 NPS Overcurrent
	NgcE12PTOC1	PTOC_NO_SEG	PTOC	I > 1 element 2 NPS Overcurrent
	NgcE12PTOC2	PTOC_NO_SEG	PTOC	I > 2 element 2 NPS Overcurrent

LD	LN Instance	LN Type	LN Class	Description
	NgcEI2PTOC3	PTOC_NO_SEG	PTOC	I>3 element 2 NPS Overcurrent
	NgcEI2PTOC4	PTOC_NO_SEG	PTOC	I>4 element 2 NPS Overcurrent
	NgcEI3PTOC1	PTOC_NO_SEG	PTOC	I>1 element 3 NPS Overcurrent
	NgcEI3PTOC2	PTOC_NO_SEG	PTOC	I>2 element 3 NPS Overcurrent
	NgcEI3PTOC3	PTOC_NO_SEG	PTOC	I>3 element 3 NPS Overcurrent
	NgcEI3PTOC4	PTOC_NO_SEG	PTOC	I>4 element 3 NPS Overcurrent
	NgvPTOV1	PTOV_NO_SEG	PTOV	Negative Sequence Overvoltage
	OcpEI1PTOC1	PTOC_NO_SEG	PTOC	I>1 element 1 Protection
	OcpEI1PTOC2	PTOC_NO_SEG	PTOC	I>2 element 1 Protection
	OcpEI1PTOC3	PTOC_NO_SEG	PTOC	I>3 element 1 Protection
	OcpEI1PTOC4	PTOC_NO_SEG	PTOC	I>4 element 1 Protection
	OcpEI2PTOC1	PTOC_NO_SEG	PTOC	I>1 element 2 Protection
	OcpEI2PTOC2	PTOC_NO_SEG	PTOC	I>2 element 2 Protection
	OcpEI2PTOC3	PTOC_NO_SEG	PTOC	I>3 element 2 Protection
	OcpEI2PTOC4	PTOC_NO_SEG	PTOC	I>4 element 2 Protection
	OcpEI3PTOC1	PTOC_NO_SEG	PTOC	I>1 element 3 Protection
	OcpEI3PTOC2	PTOC_NO_SEG	PTOC	I>2 element 3 Protection
	OcpEI3PTOC3	PTOC_NO_SEG	PTOC	I>3 element 3 Protection
	OcpEI3PTOC4	PTOC_NO_SEG	PTOC	I>4 element 3 Protection
	OcpPVOC1	PVOC_NO_SEG	PVOC	Voltage Controlled Overcurrent - stage 1
	OcpPVOC2	PVOC_NO_SEG	PVOC	Voltage Controlled Overcurrent - stage 2
	PTRC1	PTRC_NO_SEG	PTRC	Trip Conditioning
	RefAtrPDIF1	PDIF_NEU	PDIF	Auto Transformer Restricted Earth Fault
	RefHvwPDIF1	PDIF_NEU	PDIF	HV Winding Restricted Earth Fault
	RefLvwPDIF1	PDIF_NEU	PDIF	LV Winding Restricted Earth Fault
	RefTvwPDIF1	PDIF_NEU	PDIF	TV Winding Restricted Earth Fault
	RtdDerGGIO1	GGIO_IND_10	GGIO	RTD Data Error indications
	RtdOpcGGIO1	GGIO_IND_10	GGIO	RTD Open Cct indications
	RtdPTTR1	PTTR_NEU	PTTR	RTD Channel 1
	RtdPTTR10	PTTR_NEU	PTTR	RTD Channel 10
	RtdPTTR2	PTTR_NEU	PTTR	RTD Channel 2
	RtdPTTR3	PTTR_NEU	PTTR	RTD Channel 3
	RtdPTTR4	PTTR_NEU	PTTR	RTD Channel 4
	RtdPTTR5	PTTR_NEU	PTTR	RTD Channel 5
	RtdPTTR6	PTTR_NEU	PTTR	RTD Channel 6
	RtdPTTR7	PTTR_NEU	PTTR	RTD Channel 7
	RtdPTTR8	PTTR_NEU	PTTR	RTD Channel 8
	RtdPTTR9	PTTR_NEU	PTTR	RTD Channel 9
	RtdShcGGIO1	GGIO_IND_10	GGIO	RTD Short Cct indications

LD	LN Instance	LN Type	LN Class	Description
	TopPTTR1	PTTR_NO_SEG	PTTR	Top Oil Thermal Overload stage 1
	TopPTTR2	PTTR_NO_SEG	PTTR	Top Oil Thermal Overload stage 2
	TopPTTR3	PTTR_NO_SEG	PTTR	Top Oil Thermal Overload stage 3
	VhzWg1PVPH1	PVPH_STANDARD	PVPH	Over fluxing - winding 1
	VhzWg1PVPH2	PVPH_STANDARD	PVPH	Over fluxing winding 1
	VhzWg1PVPH3	PVPH_STANDARD	PVPH	Over fluxing winding 1
	VhzWg1PVPH4	PVPH_STANDARD	PVPH	Over fluxing winding 1
	VhzWg2PVPH1	PVPH_STANDARD	PVPH	Over fluxing - winding 2
	VhzWg2PVPH2	PVPH_STANDARD	PVPH	Over fluxing - winding 2
	VhzWg2PVPH3	PVPH_STANDARD	PVPH	Over fluxing - winding 2
	VhzWg2PVPH4	PVPH_STANDARD	PVPH	Over fluxing - winding 2
	VtpPhsPTOV1	PTOV_NO_SEG	PTOV	Phase Overvoltage - stage 1
	VtpPhsPTOV2	PTOV_NO_SEG	PTOV	Phase Overvoltage - stage 2
	VtpPhsPTUV1	PTUV_NO_SEG	PTUV	Phase Undervoltage -stage 1
	VtpPhsPTUV2	PTUV_NO_SEG	PTUV	Phase Undervoltage -stage 2
	VtpResPTOV1	PTOV_NO_SEG	PTOV	Residual Overvoltage - stage 1
	VtpResPTOV2	PTOV_NO_SEG	PTOV	Residual Overvoltage - stage 2
	XfrDifPDIF1	PDIF_NEU_SEG	PDIF	Xformer Differential
	XfrDifPHAR1	PHAR_BASIC	PHAR	XFormer Harmonic Restraint - 2nd harmonic
	XfrDifPHAR2	PHAR_BASIC	PHAR	XFormer Harmonic Restraint - 5th harmonic
Records				
	LLN0	LLN0_STANDARD	LLN0	Records Logical Device
	LPHD1	LPHD_STANDARD	LPHD	Physical Device Information
	RDRE1	RDRE_BASIC	RDRE	Disturbance Recorder
	RFLO1	RFLO_P643	RFLO	Fault Record
System				
	AlmGGIO1	GGIO_ALM_96	GGIO	Alarms
	AlmGGIO2	GGIO_ALM_32	GGIO	User Alarms
	FnkGGIO1	GGIO_IND_10	GGIO	Function Keys
	GosGGIO1	GGIO_IND_64_INREF	GGIO	GOOSE Input Signals for edition 2
	GosGGIO2	GGIO_IND_32	GGIO	GOOSE Output Signals
	LedGGIO1	GGIO_IND_18	GGIO	Red LED Signals
	LedGGIO2	GGIO_IND_18	GGIO	Green LED Signals
	LinkGGIO1	GGIO_IND_6	GGIO	Link Status
	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_24	GGIO	Opto Inputs (24 off)

LD	LN Instance	LN Type	LN Class	Description
	OrdRunGGIO1	GGIO_IND_64_INREF	GGIO	Uniqueness of control "Order Running" indications for control operations for edition 2
	PlGGIO1	GGIO_IND_32_CTRL	GGIO	Controllable Inputs
	RlyGGIO1	GGIO_IND_24	GGIO	Output Contacts (24 off)
	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: CILO_INTERLOCK

Description: Control Interlocking
LN Class: CILO

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	
EnaOpn	SPS_WD	Enable OPEN Commands		M	
EnaCls	SPS_WD	Enable CLOSE Commands		M	

3.2 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	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
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	

3.3 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	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
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	
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	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
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	
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	

3.4 LN: GGIO_ANAL_10

Description: Generic process I/O w.r.t. 10 analogue inputs

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	
AnIn1	MV_FLOAT_D	Analogue input point 1		O	
AnIn2	MV_FLOAT_D	Analogue input point 2		O	
AnIn3	MV_FLOAT_D	Analogue input point 3		O	
AnIn4	MV_FLOAT_D	Analogue input point 4		O	
AnIn5	MV_FLOAT_D	Analogue input point 5		O	
AnIn6	MV_FLOAT_D	Analogue input point 6		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
AnIn7	MV_FLOAT_D	Analogue input point 7		O	
AnIn8	MV_FLOAT_D	Analogue input point 8		O	
AnIn9	MV_FLOAT_D	Analogue input point 9		O	
AnIn10	MV_FLOAT_D	Analogue input point 10		O	

3.5 LN: GGIO_ANAL_4

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	
AnIn1	MV_FLOAT_D	Analogue Input		O	
AnIn2	MV_FLOAT_D	Analogue Input		O	
AnIn3	MV_FLOAT_D	Analogue Input		O	
AnIn4	MV_FLOAT_D	Analogue Input		O	

3.6 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	

3.7 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	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
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	
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	

3.8 LN: GGIO_IND_24

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	
Ind1	SPS_D	General Indication		O	
Ind2	SPS_D	General Indication		O	
Ind3	SPS_D	General Indication		O	
Ind4	SPS_D	General Indication		O	
Ind5	SPS_D	General Indication		O	
Ind6	SPS_D	General Indication		O	
Ind7	SPS_D	General Indication		O	
Ind8	SPS_D	General Indication		O	
Ind9	SPS_D	General Indication		O	
Ind10	SPS_D	General Indication		O	
Ind11	SPS_D	General Indication		O	
Ind12	SPS_D	General Indication		O	
Ind13	SPS_D	General Indication		O	
Ind14	SPS_D	General Indication		O	
Ind15	SPS_D	General Indication		O	
Ind16	SPS_D	General Indication		O	
Ind17	SPS_D	General Indication		O	
Ind18	SPS_D	General Indication		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Ind19	SPS_D	General Indication		O	
Ind20	SPS_D	General Indication		O	
Ind21	SPS_D	General Indication		O	
Ind22	SPS_D	General Indication		O	
Ind23	SPS_D	General Indication		O	
Ind24	SPS_D	General Indication		O	

3.9 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	
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	
Ind30	SPS_D	General indication (binary input)		O	

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

3.10 LN: GGIO_IND_32_CTRL

Description: Generic process I/O (w.r.t 32 Indications 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	
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	

3.11 LN: GGIO_IND_4

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	
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	

3.12 LN: GGIO_IND_6

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	
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	

3.13 LN: GGIO_IND_64_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		O	
Ind1	SPS_D	General indication (binary input)		O	
InRef2	ORG_SRC	General input reference		O	
Ind2	SPS_D	General indication (binary input)		O	
InRef3	ORG_SRC	General input reference		O	
Ind3	SPS_D	General indication (binary input)		O	
InRef4	ORG_SRC	General input reference		O	
Ind4	SPS_D	General indication (binary input)		O	
InRef5	ORG_SRC	General input reference		O	
Ind5	SPS_D	General indication (binary input)		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
InRef6	ORG_SRC	General input reference		O	
Ind6	SPS_D	General indication (binary input)		O	
InRef7	ORG_SRC	General input reference		O	
Ind7	SPS_D	General indication (binary input)		O	
InRef8	ORG_SRC	General input reference		O	
Ind8	SPS_D	General indication (binary input)		O	
InRef9	ORG_SRC	General input reference		O	
Ind9	SPS_D	General indication (binary input)		O	
InRef10	ORG_SRC	General input reference		O	
Ind10	SPS_D	General indication (binary input)		O	
InRef11	ORG_SRC	General input reference		O	
Ind11	SPS_D	General indication (binary input)		O	
InRef12	ORG_SRC	General input reference		O	
Ind12	SPS_D	General indication (binary input)		O	
InRef13	ORG_SRC	General input reference		O	
Ind13	SPS_D	General indication (binary input)		O	
InRef14	ORG_SRC	General input reference		O	
Ind14	SPS_D	General indication (binary input)		O	
InRef15	ORG_SRC	General input reference		O	
Ind15	SPS_D	General indication (binary input)		O	
InRef16	ORG_SRC	General input reference		O	
Ind16	SPS_D	General indication (binary input)		O	
InRef17	ORG_SRC	General input reference		O	
Ind17	SPS_D	General indication (binary input)		O	
InRef18	ORG_SRC	General input reference		O	
Ind18	SPS_D	General indication (binary input)		O	
InRef19	ORG_SRC	General input reference		O	
Ind19	SPS_D	General indication (binary input)		O	
InRef20	ORG_SRC	General input reference		O	
Ind20	SPS_D	General indication (binary input)		O	
InRef21	ORG_SRC	General input reference		O	
Ind21	SPS_D	General indication (binary input)		O	
InRef22	ORG_SRC	General input reference		O	
Ind22	SPS_D	General indication (binary input)		O	
InRef23	ORG_SRC	General input reference		O	
Ind23	SPS_D	General indication (binary input)		O	
InRef24	ORG_SRC	General input reference		O	
Ind24	SPS_D	General indication (binary input)		O	
InRef25	ORG_SRC	General input reference		O	
Ind25	SPS_D	General indication (binary input)		O	
InRef26	ORG_SRC	General input reference		O	
Ind26	SPS_D	General indication (binary input)		O	
InRef27	ORG_SRC	General input reference		O	
Ind27	SPS_D	General indication (binary input)		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
InRef28	ORG_SRC	General input reference		O	
Ind28	SPS_D	General indication (binary input)		O	
InRef29	ORG_SRC	General input reference		O	
Ind29	SPS_D	General indication (binary input)		O	
InRef30	ORG_SRC	General input reference		O	
Ind30	SPS_D	General indication (binary input)		O	
InRef31	ORG_SRC	General input reference		O	
Ind31	SPS_D	General indication (binary input)		O	
InRef32	ORG_SRC	General input reference		O	
Ind32	SPS_D	General indication (binary input)		O	
InRef33	ORG_SRC	General input reference		O	
Ind33	SPS_D	General indication (binary input)		O	
InRef34	ORG_SRC	General input reference		O	
Ind34	SPS_D	General indication (binary input)		O	
InRef35	ORG_SRC	General input reference		O	
Ind35	SPS_D	General indication (binary input)		O	
InRef36	ORG_SRC	General input reference		O	
Ind36	SPS_D	General indication (binary input)		O	
InRef37	ORG_SRC	General input reference		O	
Ind37	SPS_D	General indication (binary input)		O	
InRef38	ORG_SRC	General input reference		O	
Ind38	SPS_D	General indication (binary input)		O	
InRef39	ORG_SRC	General input reference		O	
Ind39	SPS_D	General indication (binary input)		O	
InRef40	ORG_SRC	General input reference		O	
Ind40	SPS_D	General indication (binary input)		O	
InRef41	ORG_SRC	General input reference		O	
Ind41	SPS_D	General indication (binary input)		O	
InRef42	ORG_SRC	General input reference		O	
Ind42	SPS_D	General indication (binary input)		O	
InRef43	ORG_SRC	General input reference		O	
Ind43	SPS_D	General indication (binary input)		O	
InRef44	ORG_SRC	General input reference		O	
Ind44	SPS_D	General indication (binary input)		O	
InRef45	ORG_SRC	General input reference		O	
Ind45	SPS_D	General indication (binary input)		O	
InRef46	ORG_SRC	General input reference		O	
Ind46	SPS_D	General indication (binary input)		O	
InRef47	ORG_SRC	General input reference		O	
Ind47	SPS_D	General indication (binary input)		O	
InRef48	ORG_SRC	General input reference		O	
Ind48	SPS_D	General indication (binary input)		O	
InRef49	ORG_SRC	General input reference		O	
Ind49	SPS_D	General indication (binary input)		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
InRef50	ORG_SRC	General input reference		O	
Ind50	SPS_D	General indication (binary input)		O	
InRef51	ORG_SRC	General input reference		O	
Ind51	SPS_D	General indication (binary input)		O	
InRef52	ORG_SRC	General input reference		O	
Ind52	SPS_D	General indication (binary input)		O	
InRef53	ORG_SRC	General input reference		O	
Ind53	SPS_D	General indication (binary input)		O	
InRef54	ORG_SRC	General input reference		O	
Ind54	SPS_D	General indication (binary input)		O	
InRef55	ORG_SRC	General input reference		O	
Ind55	SPS_D	General indication (binary input)		O	
InRef56	ORG_SRC	General input reference		O	
Ind56	SPS_D	General indication (binary input)		O	
InRef57	ORG_SRC	General input reference		O	
Ind57	SPS_D	General indication (binary input)		O	
InRef58	ORG_SRC	General input reference		O	
Ind58	SPS_D	General indication (binary input)		O	
InRef59	ORG_SRC	General input reference		O	
Ind59	SPS_D	General indication (binary input)		O	
InRef60	ORG_SRC	General input reference		O	
Ind60	SPS_D	General indication (binary input)		O	
InRef61	ORG_SRC	General input reference		O	
Ind61	SPS_D	General indication (binary input)		O	
InRef62	ORG_SRC	General input reference		O	
Ind62	SPS_D	General indication (binary input)		O	
InRef63	ORG_SRC	General input reference		O	
Ind63	SPS_D	General indication (binary input)		O	
InRef64	ORG_SRC	General input reference		O	
Ind64	SPS_D	General indication (binary input)		O	

3.14 LN: LLN0_P643_P645

Description: Logical Node 0

LN Class: LLN0

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LLNO	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
CbfBeh	ENS_BEH_D_PRIV	Circuit Breaker Fail Behaviour		E	
CbfMod	ENC_MOD_D_PRIV	CB Fail Mode		E	
CliBeh	ENS_BEH_D_PRIV	Clio Inputs Behaviour		E	
CliMod	ENC_MOD_D_PRIV	Clio Inputs Protection Mode		E	
DifBeh	ENS_BEH_D_PRIV	Differential Behaviour		E	
DifMod	ENC_MOD_D_PRIV	Differential Mode		E	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
EfmBeh	ENS_BEH_D_PRIV	Earth Fault 1 (Measured) Behaviour		E	
EfmMod	ENC_MOD_D_PRIV	Earth Fault 1 (Measured) Mode		E	
FrqBeh	ENS_BEH_D_PRIV	Overfrequency/Underfrequency Behaviour		E	
FrqMod	ENC_MOD_D_PRIV	Overfrequency/Underfrequency Mode		E	
NpsBeh	ENS_BEH_D_PRIV	NPS Overcurrent Behaviour		E	
NpsMod	ENC_MOD_D_PRIV	NPS Overcurrent Mode		E	
NvdBeh	ENS_BEH_D_PRIV	NVD Overvoltage Behaviour		E	
NvdMod	ENC_MOD_D_PRIV	NVD Overvoltage Mode		E	
OcpBeh	ENS_BEH_D_PRIV	Overcurrent Behaviour		E	
OcpMod	ENC_MOD_D_PRIV	Overcurrent Mode		E	
RefBeh	ENS_BEH_D_PRIV	REF Behaviour		E	
RefMod	ENC_MOD_D_PRIV	REF Mode		E	
RtdBeh	ENS_BEH_D_PRIV	RTD Behaviour		E	
RtdMod	ENC_MOD_D_PRIV	RTD Mode		E	
ThmBeh	ENS_BEH_D_PRIV	Thermal Overload Behaviour		E	
ThmMod	ENC_MOD_D_PRIV	Thermal Overload Mode		E	
VhzBeh	ENS_BEH_D_PRIV	Volts per Hz Behaviour		E	
VhzMod	ENC_MOD_D_PRIV	Volts/Hz Mode		E	
VtpBeh	ENS_BEH_D_PRIV	Voltage Protection Behaviour		E	
VtpMod	ENC_MOD_D_PRIV	Voltage Protection Mode		E	

3.15 LN: LLN0_STANDARD

Description: General Logical Node 0
LN Class: LLN0

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

3.16 LN: LLN0_SYSTEM

Description: Logical Node 0
LN Class: LLN0

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LLNO	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(IEC61850 phase 2.0 and 2.1)		E	
SyncSt	SPS_WD_NS	Time Synchronisation Indication(IEC61850 phase 2.0 and 2.1)		E	

3.17 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	

3.18 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	
Sim	SPC_CONTROL	Receive simulated GOOSE or simulated SV		O	

3.19 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	

3.20 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	

3.21 LN: MMTR_EFL

Description: Metering

LN Class: MMTR

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	
SupWh	BCR_MMTR	Real energy supply (Energy flow towards bus bar)		O	
SupVARh	BCR_MMTR	Reactive energy supply (Energy flow towards bus bar)		O	
DmdWh	BCR_MMTR	Real energy demand (Energy flow from bus bar)		O	
DmdVARh	BCR_MMTR	Reactive energy demand (Energy flow from bus bar)		O	
MMTRs	SPC_CTRL_PRIV	Reset thermal state		E	

3.22 LN: MMTR_LOL

Description: Metering

LN Class: MMTR

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	
FAALres	MV_FLOAT_NS	Loss of Life FAA LRes		E	
LOLLres	MV_FLOAT_NS	Loss of Life LRes		E	
LOLSts	MV_FLOAT_NS	Loss of Life Status		E	
LOLRate	MV_FLOAT_NS	Loss of Life Rate		E	

3.23 LN: MMXU_DIF_LZD

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	
IDiff	MV_FLOAT_NS	IREF low impedance Diff		E	
IBias	MV_FLOAT_NS	IREF low impedance Bias		E	

3.24 LN: MMXU_DIF_XFR_1

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	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Mod	ENC_MOD	Mode		C	
IDiff	WYE_SEG_NS	Current Diff - 3 phase		E	
IBias	WYE_SEG_NS	Current Bias - 3 phase		E	

3.25 LN: MMXU_DIF_XFR_2

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	
IDiff	WYE_SEG_NS	Harmonic Differential		E	

3.26 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 Magnitude		E	
V1	MV_FLOAT_NS	V1 Magnitude		E	
V2	MV_FLOAT_NS	V2 Magnitude		E	
Vx	WYE_RES_ANG_D_NS	Vx		E	
VNd	WYE_RES_ANG_D_NS	VNd		E	

3.27 LN: MMXU_FOURIER_WINDING

Description: Fourier winding 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	
A	WYE_SEG_ANG	Phase currents		O	
IN	WYE_RES_ANG_D_NS	IN measured		E	
INd	WYE_RES_ANG_D_NS	IN derived		E	
INTN	WYE_RES_ANG_D_NS	IN TN measured		E	

3.28 LN: MMXU_HZD

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	
IN	WYE_RES_MAG_NS	IN measured		E	

3.29 LN: MMXU_LOL

Description: Loss-of-Life (Transformer) 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	
FAA	MV_FLOAT_NS	Loss of Life FAA		E	
LOL	MV_FLOAT_NS	Loss of Life Aging Factor		E	

3.30 LN: MMXU_MSI

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	
A	WYE_SEG_ANG	Phase currents		O	
I0	MV_FLOAT_NS	I0 Magnitude		E	
I1	MV_FLOAT_NS	I1 Magnitude		E	
I2	MV_FLOAT_NS	I2 Magnitude		E	
INd	WYE_RES_ANG_D_NS	IN derived		O	

3.31 LN: MMXU_POWER_FACTOR

Description: Power factor 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	
TotPF	MV_FLOAT	Average power factor (Total PF)		O	
PF	WYE_SEG	Phase power factor		O	

3.32 LN: MMXU_POWER_WINDING

Description: Power 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	
TotW	MV_FLOAT	Total active power (Total P)		O	
TotVAr	MV_FLOAT	Total reactive power (Total Q)		O	
TotVA	MV_FLOAT	Total apparent power (Total S)		O	
W	WYE_SEG	Phase active power (P)		O	
VAr	WYE_SEG	Phase reactive power (Q)		O	
VA	WYE_SEG	Phase apparent power (S)		O	

3.33 LN: MMXU_RMS

Description: RMS 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	
A	WYE_SEG	Phase currents		O	

3.34 LN: MMXU_RMS_PHV

Description: RMS Voltage 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	

3.35 LN: MMXU_THM

Description: Thermal 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	
HotT	MV_FLOAT_NS	Hot Spot Temperature		E	
TopT	MV_FLOAT_NS	Top Oil Temperature		E	
AmbT	MV_FLOAT_NS	Ambient Temperature		E	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
TopPreLft	MV_FLOAT_NS	Top Oil Pretrip Left		E	

3.36 LN: MMXU_VHZ**Description:** Volts per Herz 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	
VHz	MV_FLOAT_NS	Volts/Hz		E	
VHzt	MV_FLOAT_NS	Volts/Hz t Pretrip		E	
VHzThrm	MV_FLOAT_NS	Volts/Hz Thermal		E	

3.37 LN: MSTA_DEMAND**Description:** Metering Statistics

LN Class: MSTA

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN_PRIV	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
MaxW	MV_FLOAT	Maximum real power		O	
MaxVAr	MV_FLOAT	Maximum reactive power		O	

3.38 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	
Str	ACD_NO_SEG	Start		O	
Op	ACT_NO_SEG	Operate	T	M	

3.39 LN: PDIF_NEU_NO_STR**Description:** Differential

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_SEG	Operate	T	M	

3.40 LN: PDIF_NEU_SEG

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	
Str	ACD_SEG	Start		O	
Op	ACT_SEG	Operate	T	M	

3.41 LN: PHAR_BASIC

Description: Harmonic Restraint

LN Class: PHAR

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_SEG	Start		M	

3.42 LN: PTOC_NO_SEG

Description: Timed Overcurrent (w.r.t No Phase Segregation)

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	

3.43 LN: PTOF_NO_SEG

Description: Over frequency (w.r.t No Phase Segregation)

LN Class: PTOF

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	

3.44 LN: PTOV_NO_SEG

Description: Overvoltage (w.r.t Phase Segregation)

LN Class: PTOV

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	O	

3.45 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_SEG	Trip		C	
Str	ACD_NO_SEG	Sum of all starts of all connected Logical Nodes		O	

3.46 LN: PTTR_NEU

Description: Thermal overload (Including alarm)
LN Class: PTTR

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	
AlmThm	SPS_WD	Thermal alarm		O	
MTRRs	SPC_CTRL_PRIV	Reset thermal state		E	

3.47 LN: PTTR_NO_SEG

Description: Thermal overload (w.r.t No Phase Segregation)
LN Class: PTTR

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	
MTRRs	SPC_CTRL_PRIV	Reset thermal state		E	

3.48 LN: PTUC_NEU

Description: Models timed under-current protection
LN Class: PTUC

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	Started		M	
Op	ACT_NO_SEG	Operate	T	M	
ModOvA	SPS_WD_NS	Overcurrent Mode Indication		E	

3.49 LN: PTUF_NO_SEG

Description: Under frequency (w.r.t No Phase Segregation)

LN Class: PTUF

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	

3.50 LN: PTUV_NO_SEG

Description: Undervoltage (w.r.t No Phase Segregation)

LN Class: PTUV

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	

3.51 LN: PVOC_NO_SEG

Description: Voltage controlled time overcurrent (w.r.t No Phase Segregation)

LN Class: PVOC

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	

3.52 LN: PVPH_STANDARD

Description: Volts per Hz protection

LN Class: PVPH

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	

3.53 LN: RBRF_EXTTRIP

Description: Breaker Failure (w.r.t External Trip)

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	

3.54 LN: RBRF_INTTRIP

Description: Breaker Failure (w.r.t Internal Trip)

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	
OpIn	ACT_NO_SEG	Operate, retrip ("Internal trip")	T	C	

3.55 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	

3.56 LN: RFLO_P643

Description: Fault record values

LN Class: RFLO

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
NamPlt	LPL_LN	Name Plate		C	
Beh	ENS_BEH	Behaviour		M	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Health	ENS_HEALTH	Health		C	
Mod	ENC_MOD	Mode		C	
FltZ	CMV_FLOAT_FAULT	Fault impedance		M	
FltNum	INS_D_NS	Fault record number		E	
FltPhs	INS_D_NS	Fault Phases		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	
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	
FltAlmU	INS_D_NS	Fault alarm up		E	
FltAlmL	INS_D_NS	Fault alarm low		E	
FltTU	INS_D_NS	Fault time up		E	
FltTL	INS_D_NS	Fault time low		E	
FltTms	INS_D_NS	Fault time ms		E	
FltType	INS_D_NS	Fault Type		E	
ActGp	INS_D_NS	Fault Active group		E	
Freq	MV_FLOAT_FAULT	Fault frequency		E	
FltDur	MV_FLOAT_FAULT	Fault duration		E	
CBOpTm	MV_FLOAT_FAULT	Fault CB Operation time		E	
RlyOpTm	MV_FLOAT_FAULT	Fault Rly Operation time		E	
FltA1	WYE_SEG_FAULT	Fault phase current of CT1		E	
FltA2	WYE_SEG_FAULT	Fault phase current of CT2		E	
FltA3	WYE_SEG_FAULT	Fault phase current of CT3		E	
AHV	WYE_SEG_FAULT	Fault phase current for HV Winding		E	
ALV	WYE_SEG_FAULT	Fault phase current for LV Winding		E	
ATV	WYE_SEG_FAULT	Fault phase current for TV Winding		E	
I2LV	MV_FLOAT_FAULT	Fault current I2 for LV Winding		E	
I2HV	MV_FLOAT_FAULT	Fault current I2 for HV Winding		E	
I2TV	MV_FLOAT_FAULT	Fault current I2 for TV Winding		E	
INHV	MV_FLOAT_FAULT	Fault current IN for HV Winding		E	
INLV	MV_FLOAT_FAULT	Fault current IN for LV Winding		E	
INTV	MV_FLOAT_FAULT	Fault current IN for TV Winding		E	
FltPhV	WYE_SEG_FAULT	Fault record phase voltage		E	
FltVx	MV_FLOAT_FAULT	Fault voltage Vx measured		E	
FltV1	MV_FLOAT_FAULT	Fault voltage V1 measured		E	
FltV2	MV_FLOAT_FAULT	Fault voltage V2 measured		E	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
FitVN	MV_FLOAT_FAULT	Fault voltage VN measured		E	
FitPPV	DEL_SEG_FAULT	Fault record phase-phase voltage		E	
IDiff	WYE_SEG_FAULT	Fault current Idiff		E	
IBias	WYE_SEG_FAULT	Fault current Ibias		E	
IDiffLZHV	MV_FLOAT_FAULT	Fault IREF HV LoZ Diff		E	
IBiasLZHV	MV_FLOAT_FAULT	Fault IREF HV LoZ Bias		E	
IDiffLZLV	MV_FLOAT_FAULT	Fault IREF LV LoZ Diff		E	
IBiasLZLV	MV_FLOAT_FAULT	Fault IREF LV LoZ Bias		E	
IDiffLZTV	MV_FLOAT_FAULT	Fault IREF TV LoZ Diff		E	
IBiasLZTV	MV_FLOAT_FAULT	Fault IREF TV LoZ Bias		E	
IDiffLZAt	MV_FLOAT_FAULT	Fault IREF Auto LoZ Diff		E	
IBiasLZAt	MV_FLOAT_FAULT	Fault IREF Auto LoZ Bias		E	
IOPHZHV	MV_FLOAT_FAULT	Fault IREF HV HighZ Op		E	
IOPHZLV	MV_FLOAT_FAULT	Fault IREF LV HighZ Op		E	
IOPHZTV	MV_FLOAT_FAULT	Fault IREF TV HighZ Op		E	
IOPHZAt	MV_FLOAT_FAULT	Fault IREF Auto HighZ Op		E	
Ipeak	WYE_SEG_FAULT	Fault phase current Ipeak		E	
I2t	WYE_SEG_FAULT	Fault phase I2t		E	
RTD1	MV_FLOAT_FAULT	Fault RTD1		E	
RTD2	MV_FLOAT_FAULT	Fault RTD2		E	
RTD3	MV_FLOAT_FAULT	Fault RTD3		E	
RTD4	MV_FLOAT_FAULT	Fault RTD4		E	
RTD5	MV_FLOAT_FAULT	Fault RTD5		E	
RTD6	MV_FLOAT_FAULT	Fault RTD6		E	
RTD7	MV_FLOAT_FAULT	Fault RTD7		E	
RTD8	MV_FLOAT_FAULT	Fault RTD8		E	
RTD9	MV_FLOAT_FAULT	Fault RTD9		E	
RTD10	MV_FLOAT_FAULT	Fault RTD10		E	
CLIO1	MV_FLOAT_FAULT	Fault CLIO1		E	
CLIO2	MV_FLOAT_FAULT	Fault CLIO2		E	
CLIO3	MV_FLOAT_FAULT	Fault CLIO3		E	
CLIO4	MV_FLOAT_FAULT	Fault CLIO4		E	
INTN1	MV_FLOAT_FAULT	Fault current IN for TN1		E	
INTN2	MV_FLOAT_FAULT	Fault current IN for TN2		E	
INTN3	MV_FLOAT_FAULT	Fault current IN for TN3		E	

3.57

LN: XCBR_BASIC

Description: Circuit Breaker (w.r.t Mandatory Attributes Only)

LN Class: XCBR

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	
EEHealth	ENS_HEALTH	External equipment health		O	

Attribute	Attr. Type	Explanation	T	M/O/E	Remarks
Lock	SPC_CTRL_PRIV	Circuit Breaker(w.r.t Mandatory Attributes Only)		E	
Loc	SPS_WD	Local operation		M	
Pos	DPC_CONTROL	Switch position		M	
BlkOpn	SPC_STATUS	Block opening		M	
BlkCls	SPC_STATUS	Block closing		M	
OpCnt	INS_BASIC	Operation counter		M	
CBOpCap	ENS_CB_OPCAP	Circuit Breaker operating capability		O	

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	dchg	--	Trip or start has happened	M
dirGeneral	ENUMERATED8	ST	dchg	FaultDirectionKind	General direction (unknown, forward, backward or both)	M
q	Quality	ST	qchg	--	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: ACD_SEG

Description: Directional Protection Activation Information (w.r.t Phase Segregation)
CDC Class: ACD

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
general	BOOLEAN	ST	dchg	--	Trip or start has happened	M
dirGeneral	ENUMERATED8	ST	dchg	FaultDirectionKind	General direction (unknown, forward, backward or both)	M
phsA	BOOLEAN	ST	dchg	--	Trip or start event of Phase A has happened	GC_2
dirPhsA	ENUMERATED8	ST	dchg	FaultDirectionKind	Phase A direction (unknown, forward or backward)	GC_2
phsB	BOOLEAN	ST	dchg	--	Trip or start event of Phase B has happened	GC_2
dirPhsB	ENUMERATED8	ST	dchg	FaultDirectionKind	Phase B direction (unknown, forward or backward)	GC_2
phsC	BOOLEAN	ST	dchg	--	Trip or start event of Phase C has happened	GC_2
dirPhsC	ENUMERATED8	ST	dchg	FaultDirectionKind	Phase C direction (unknown, forward or backward)	GC_2
q	Quality	ST	qchg	--	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: 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	dchg	--	Trip or start has happened	M
q	Quality	ST	qchg	--	Quality of the protection activation information	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state of protection activation information	M

4.4 CDC: ACT_SEG

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

CDC Class: ACT

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
general	BOOLEAN	ST	dchg	--	Trip or start has happened	M
phsA	BOOLEAN	ST	dchg	--	Trip or start event of Phase A has happened	O
phsB	BOOLEAN	ST	dchg	--	Trip or start event of Phase B has happened	O
phsC	BOOLEAN	ST	dchg	--	Trip or start event of Phase C has happened	O
q	Quality	ST	qchg	--	Quality of the protection activation information	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state of protection activation information	M

4.5 CDC: BCR_MMTR

Description: Binary Counter Reading

CDC Class: BCR

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
actVal	INT64	ST	dchg	--	Binary counter status represented as an integer	M
q	Quality	ST	qchg	--	Quality of counter value	M
t	TimeStamp	ST	--	--	Time of last counter change	M
pulsQty	FLOAT32	CF	dchg	--	Magnitude of the counted value 'per count' (value = actVal x pulsQty)	M

4.6 CDC: CMV_FLOAT_FAULT

Description: Complex Measured value in fault record

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
db	INT32U	CF	dchg	--	Measurement deadband	O
rangeC	RangeConfig_Deadband	CF	dchg	--	Measurement range configuration attributes	GC_CON

4.7 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	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
db	INT32U	CF	dchg	--	Measurement deadband	O
rangeC	RangeConfig_Deadband	CF	dchg	--	Measurement range configuration attributes	GC_CON

4.8 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	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
db	INT32U	CF	dchg	--	Measurement deadband	O
rangeC	RangeConfig_Deadband	CF	dchg	--	Measurement range configuration attributes	GC_CON

4.9 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

4.10 CDC: DEL_SEG_FAULT

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

CDC Class: DEL

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
phsAB	CMV_FLOAT_FAULT	--	--	--	Measurement values for Phase A to Phase B	GC_1
phsBC	CMV_FLOAT_FAULT	--	--	--	Measurement values for Phase B to Phase C	GC_1
phsCA	CMV_FLOAT_FAULT	--	--	--	Measurement values for Phase C to Phase A	GC_1
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.11 CDC: DPC_CONTROL

Description: Controllable Double Point

CDC Class: DPC

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	Dbpos	ST	dchg	--	Status value of the data (Intermediate state, Off, On or Bad-state)	M
q	Quality	ST	qchg	--	Quality of the status value	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state of status value	M
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 (Off - FALSE, On - TRUE)	AC_CO_M

4.12 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

4.13 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	M

4.14 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	M
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

4.15 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

4.16 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

4.17 CDC: ENS_CB_OPCAP

Description: Enumerated status

CDC Class: ENS

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
stVal	ENUMERATED8	ST	dchg, dupd	CBOpCapKind	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

4.18 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

4.19 CDC: ING_BASIC

Description: Integer Status Setting

CDC Class: ING

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

4.20 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	dchg,dupd	--	The element status	M
q	Quality	ST	qchg	--	The quality of the status value	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M

4.21 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
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

4.22 CDC: LPL_LLNO

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

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

4.23 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

4.24 CDC: LPL_LN_PRIV

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

4.25 CDC: MV_FLOAT

Description: Measured value (w.r.t. Floating Point 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
db	INT32U	CF	dchg	--	Measurement deadband	O
rangeC	RangeConfig_Deadband	CF	dchg	--	Measurement range configuration attributes	GC_CON

4.26 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	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
db	INT32U	CF	dchg	--	Measurement deadband	O
rangeC	RangeConfig_Deadband	CF	dchg	--	Measurement range configuration attributes	GC_CON
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O

4.27 CDC: MV_FLOAT_FAULT

Description: Measured value in fault record
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
db	INT32U	CF	dchg	--	Measurement deadband	O
rangeC	RangeConfig_Deadband	CF	dchg	--	Measurement range configuration attributes	GC_CON
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.28 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	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
db	INT32U	CF	dchg	--	Measurement deadband	O
rangeC	RangeConfig_Deadband	CF	dchg	--	Measurement range configuration attributes	GC_CON
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.29 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

4.30 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	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
stSeld	BOOLEAN	ST	dchg	--	The controllable data is in the status "Selected"	O

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
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 (Off - FALSE, On - TRUE)	AC_CO_M
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O

4.31 CDC: SPC_CTRL_PRIV

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	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
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 (Off - FALSE, On - TRUE)	AC_CO_M
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.32 CDC: SPC_STATUS

Description: Controllable Single Point (w.r.t Status Only)
CDC Class: SPC

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
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
ctlModel	ENUMERATED8	CF	dchg	CtlModelKind	Control model (Corresponding to the behaviour of the data)	M

4.33 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_NS_G_M
d	VISIBLE_STRING255	DC	--	--	Description of the status element	O

4.34 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	dchg	--	The element status (TRUE or FALSE)	M
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

4.35 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	dchg	--	The element status (TRUE or FALSE)	M
q	Quality	ST	qchg	--	The quality of the status value	M
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M

4.36 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	dchg	--	The element status (TRUE or FALSE)	M
q	Quality	ST	qchg	--	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

4.37 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
t	TimeStamp	ST	--	--	Timestamp of the last change in state	M

4.38 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

4.39 CDC: WYE_RES_MAG_NS

Description: Phase to ground measurements for a 1-Phase system, magnitude only

CDC Class: WYE

Attribute	Type	FC	TrgOp	Value/Value Range	Comment	M/O/E
res	CMV_MAG_FLOAT	--	--	--	Measurement values for the residual system current	GC_1
dataNs	VISIBLE_STRING255	EX	--	--	Data name space	AC_DLN_M

4.40 CDC: WYE_SEG

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

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

4.41 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

4.42 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_FLOAT_FAULT	--	--	--	Measurement values for Phase A	GC_1
phsB	CMV_FLOAT_FAULT	--	--	--	Measurement values for Phase B	GC_1
phsC	CMV_FLOAT_FAULT	--	--	--	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

4.43 CDC: WYE_SEG_NS

Description: WYE_SEG with dataNs DO

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
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: IEC61850 phase 2.0 and 2.1

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	
4	test/blocked	
5	off	

5.3 Enumerated type: CBOpCapKind

Description: Circuit Breaker Operating Capacity

Value	Description	Remarks
1	None	
2	Open	
3	Close-Open	
4	Open-Close-Open	
5	Close-Open-Close-Open	
6	Open-Close-Open-Close-Open	
7	more	

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	
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: IEC61850 phase 2.0 and 2.1

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: SIUnitKind**

Description: SI Units derived from ISO/IEC 1000

Value	Description	Remarks
-16	years	
-15	months	
-14	weeks	
-13	V/s	
-10	days	
-9	°F	
-8	ratio	

Value	Description	Remarks
-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	
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	

Value	Description	Remarks
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 ² t	
71	VAh	
72	Wh	
73	VArh	
74	V/Hz	
75	Hz/s	
76	char	
77	char/s	
78	kgm ²	
79	dB	
80	J/Wh	
81	W/s	
82	l/s	
83	dBm	
84	h	
85	min	

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
Dbpos	Bstring2	Switch positions
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	64 bit 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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