RELION® PROTECTION AND CONTROL

615 series ANSI

DNP3 Point List Manual

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This product has been designed to be connected and communicate data and information via a network interface which should be connected to a secure network. It is the sole responsibility of the person or entity responsible for network administration to ensure a secure connection to the network and to take the necessary measures (such as, but not limited to, installation of firewalls, application of authentication measures, encryption of data, installation of anti virus programs, etc.) to protect the product and the network, its system and interface included, against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB is not liable for any such damages and/or losses.

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Conformity

This product complies with the directive of the Council of the European Communities on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive 2004/108/EC) and concerning electrical equipment for use within specified voltage limits (Low-voltage directive 2006/95/EC). This conformity is the result of tests conducted by ABB in accordance with the product standards EN 50263 and EN 60255-26 for the EMC directive, and with the product standards EN 60255-1 and EN 60255-27 for the low voltage directive. The product is designed in accordance with the international standards of the IEC 60255 series and ANSI C37.90. The DNP3 protocol implementation in this product conforms to "DNP3 Intelligent Electronic Device (IED) Certification Procedure Subset Level 2", available at www.dnp.org. This product complies with the UL 508 certification.

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Section 1 Introduction

1.1 This manual

The point list manual describes the outlook and properties of the data points specific to the protection relay. The manual should be used in conjunction with the corresponding communication protocol manual.

1.2 Intended audience

This manual addresses the communication system engineer or system integrator responsible for pre-engineering and engineering for communication setup in a substation from an protection relay perspective.

The system engineer or system integrator must have a basic knowledge of communication in protection and control systems and thorough knowledge of the specific communication protocol.

1.3 Product documentation

1.3.1 Product documentation set

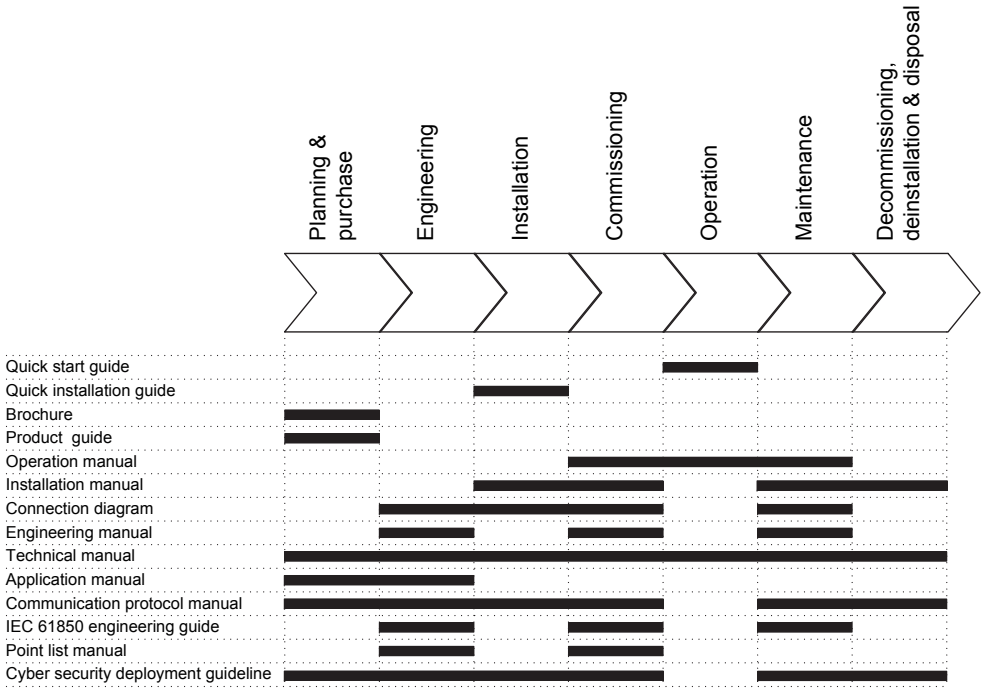

Figure 1: The intended use of documents during the product life cycle

Product series- and product-specific manuals can be downloaded from the ABB Web site http://www.abb.com/relion.

1.3.2 Document revision history

Document revision/date	Product version	History
A/2018-02-26	5.0 FP1	First release

Download the latest documents from the ABB Web site http://www.abb.com/substationautomation.

1.3.3 Related documentation

Name of the document	Document ID
DNP3 Communication Protocol Manual	1MAC052479-MB

1.4 Symbols and conventions

1.4.1 Symbols

The caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in corruption of software or damage to equipment or property.

The information icon alerts the reader of important facts and conditions.

The tip icon indicates advice on, for example, how to design your project or how to use a certain function.

Although warning hazards are related to personal injury, it is necessary to understand that under certain operational conditions, operation of damaged equipment may result in degraded process performance leading to personal injury or death. Therefore, comply fully with all warning and caution notices.

1.4.2 Document conventions

A particular convention may not be used in this manual.

- Abbreviations and acronyms are spelled out in the glossary. The glossary also contains definitions of important terms.
- Push button navigation in the LHMI menu structure is presented by using the push button icons.
  To navigate between the options, use  and  .
- Menu paths are presented in bold.
  Select **Main menu/Settings**.
- LHMI messages are shown in Courier font.
  To save the changes in nonvolatile memory, select `Yes` and press  .

- Parameter names are shown in italics.
  The function can be enabled and disabled with the *Operation* setting.
- Parameter values are indicated with quotation marks.
  The corresponding parameter values are "Enabled" and "Disabled".
- Input/output messages and monitored data names are shown in Courier font.
  When the function picks up, the `PICKUP` output is set to TRUE.
- Dimensions are provided both in inches and mm. If it is not specifically mentioned, the dimension is in mm.
- This document assumes that the parameter setting visibility is "Advanced".

1.4.3 Functions, codes and symbols

All available functions are listed in the table. All of them may not be applicable to all products.

Table 1: Functions included in the relays

Function	IEC 61850	IEC 60617	ANSI/C37.2-2008				
			RED615	REF615	REG615	REM615	RET615
Protection							
Three-phase non-directional overcurrent protection, low stage	PHLPTOC1	3I> (1)		51P-1	51P-1	51P	51P (1)
	PHLPTOC2	3I> (2)		51P-2			51P (2)
Three-phase non-directional overcurrent protection, high stage	PHHPTOC1	3I>> (1)		50P-1	50P-1	50P-1	50P-1 (1)
	PHHPTOC2	3I>> (2)		50P-2		50P-2	50P-1 (2)
Three-phase non-directional overcurrent protection, instantaneous stage	PHIPTOC1	3I>>> (1)	50P-3	50P-3	50P-3	50P-3	50P-3 (1)
	PHIPTOC2	3I>>> (2)					50P-3 (2)
Three-phase directional overcurrent protection, low stage	DPHLPDOC1	3I> -> (1)	67/51P-1	67/51P-1	67/51P-1		67/51P-1(2)
	DPHLPDOC2	3I> -> (2)	67/51P-2	67/51P-2			67/51P-2(2)
Three-phase directional overcurrent protection, high stage	DPHHPDOC1	3I>> -> (1)	67/50P-1	67/50P-1	67/50P-1		
	DPHHPDOC2	3I>> -> (2)		67/50P-2			
Three-phase voltage-dependent overcurrent protection	PHPVOC1	3I(U)> (1)			51V		
Non-directional ground-fault protection, low stage	EFLPTOC1	Io> (1)		51G		51G	
	EFLPTOC2	Io> (2)		51N-1			51N (2)
Non-directional ground-fault protection, high stage	EFHPTOC1	Io>> (1)	50G-1	50G-1	50G-1	50G-1	
	EFHPTOC2	Io>> (2)		50G-2		50G-2	50G-2 (2)
	EFHPTOC3	Io>> (3)		50N-1			
	EFHPTOC4	Io>> (4)		50N-2			
Non-directional ground-fault protection, instantaneous stage	EFIPTOC1	Io>>> (1)		50G-3			
	EFIPTOC2	Io>>> (2)		50N-3			
Directional ground-fault protection, low stage	DEFLPDEF1	Io> -> (1)	67/51N-1	67/51N-1	67/51N-1	67/51N	67/51N-1 (2)
	DEFLPDEF2	Io> -> (2)	67/51N-2	67/51N-2	67/51N-2		67/51N-2 (2)
Directional ground-fault protection, high stage	DEFHPDEF1	Io>> -> (1)	67/50N-1	67/50N-1	67/50N-1		
	DEFHPDEF2	Io>> -> (2)		67/50N-2			

Table continues on next page

Function	IEC 61850	IEC 60617	ANSI/C37.2-2008				
			RED615	REF615	REG615	REM615	RET615
Admittance-based ground-fault protection	EFPADM1	Yo> -> (1)	21YN-1	21YN-1			
	EFPADM2	Yo> -> (2)	21YN-2	21YN-2			
	EFPADM3	Yo> -> (3)	21YN-3	21YN-3			
Wattmetric-based ground-fault protection	WPWDE1	Po> -> (1)	32N-1	32N-1			
	WPWDE2	Po> -> (2)	32N-2	32N-2			
	WPWDE3	Po> -> (3)	32N-3	32N-3			
Transient/intermittent ground-fault protection	INTRPTEF1	Io> -> IEF (1)	67NIEF	67NIEF			
Harmonics-based ground-fault protection	HAEFPTOC1	Io>HA (1)	51NHA	51NHA			
Negative-sequence overcurrent protection	NSPTOC1	I2> (1)	46-1	46-1			46 (1)
	NSPTOC2	I2> (2)	46-2	46-2			46 (2)
Phase discontinuity protection	PDNSPTOC1	I2/I1> (1)	46PD	46PD			
Residual overvoltage protection	ROVPTOV1	Uo> (1)	59G	59G	59G	59G-1	59G (1)
	ROVPTOV2	Uo> (2)	59N-1	59N-1	59N-1	59N-1	59N (1)
	ROVPTOV3	Uo> (3)	59N-2	59N-2			59N (2)
Three-phase undervoltage protection	PHPTUV1	3U< (1)	27-1	27-1	27-1	27-1	27-1 (2)
	PHPTUV2	3U< (2)	27-2	27-2	27-2	27-2	27-2 (2)
	PHPTUV3	3U< (3)	27-3	27-3			
Three-phase overvoltage protection	PHPTOV1	3U> (1)	59-1	59-1	59-1	59-1	59-1 (2)
	PHPTOV2	3U> (2)	59-2	59-2	59-2	59-2	59-2 (2)
	PHPTOV3	3U> (3)	59-3	59-3			
Positive-sequence undervoltage protection	PSPTUV1	U1< (1)	47U-1	47U-1	47U-1	27PS	
	PSPTUV2	U1< (2)		47U-2	47U-2		
Negative-sequence overvoltage protection	NSPTOV1	U2> (1)	47-1	47-1	47-1	47-1	
	NSPTOV2	U2> (2)		47-2	47-2	47-2	
Three-phase remnant undervoltage protection	MSVPR1	3U< (1)		27R-1		27R	
	MSVPR2	3U< (2)		27R-2			
Frequency protection	FRPFRQ1	f>/f<,df/dt (1)	81-1	81-1	81-1	81-1	81-1 (2)
	FRPFRQ2	f>/f<,df/dt (2)	81-2	81-2	81-2	81-2	81-2 (2)
	FRPFRQ3	f>/f<,df/dt (3)	81-3	81-3	81-3		
	FRPFRQ4	f>/f<,df/dt (4)	81-4	81-4	81-4		
	FRPFRQ5	f>/f<,df/dt (5)		81-5	81-5		
	FRPFRQ6	f>/f<,df/dt (6)		81-6	81-6		
Overexcitation protection	OEPVPH1	U/f> (1)			24	24-1	24-1 (2)
	OEPVPH2	U/f> (2)				24-2	24-2 (2)
Three-phase thermal protection for feeders, cables and distribution transformers	T1PTTR1	3Ith>F (1)	49F-1	49F-1			
Three-phase thermal overload protection, two time constants	T2PTTR1	3Ith>T/G/C (1)	49T-1		49T-1		49T (1)
Negative-sequence overcurrent protection for machines	MNSPTOC1	I2>M (1)			46M-1	46M-1	
	MNSPTOC2	I2>M (2)			46M-2	46M-2	
Loss of load supervision	LOFLPTUC1	3I< (1)				37M-1	
	LOFLPTUC2	3I< (2)				37M-2	
Motor load jam protection	JAMPTOC1	Ist> (1)				51LR-1	

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Function	IEC 61850	IEC 60617	ANSI/C37.2-2008				
			RED615	REF615	REG615	REM615	RET615
	JAMPTOC2	Ist> (2)				51LR-2	
Motor start-up supervision	STTPMSU1	Is2t n< (1)				66/51LRS	
Phase reversal protection	PREVPTOC1	I2>> (1)				46R	
Thermal overload protection for motors	MPTTR1	3Ith>M (1)				49M	
Binary signal transfer	BSTGGIO1	BST (1)	BST-1				
Motor differential protection	MPDIF1	3dI>M			87G-1	87M	
High-impedance differential protection for phase A	HIAPDIF1	dHi_A>(1)		87A		87A	
High-impedance differential protection for phase B	HIBPDIF1	dHi_B>(1)		87B		87B	
High-impedance differential protection for phase C	HICPDIF1	dHi_C>(1)		87C		87C	
Stabilized and instantaneous differential protection for two-winding transformers	TR2PTDF1	3dI>T (1)					87T
Numerically stabilized low-impedance restricted ground-fault protection	LREFPNDF1	dIoLo> (1)			87LOZREF		87LOZREF (2)
Circuit breaker failure protection	CCBRBRF1	3I>/Io>BF (1)	50BF-1	50BF-1	50BF-1	50BF	50BF (1)
	CCBRBRF2	3I>/Io>BF (2)		50BF-2			50BF (2)
Three-phase inrush detector	INRPHAR1	3I2f> (1)	INR-1	INR-1	INR-1		
Switch onto fault	CBPSOF1	SOTF (1)	SOTF-1	SOTF-1			
Master trip	TRPPTRC1	Master Trip (1)	86/94-1	86/94-1	86/94-1	86/94-1	86/94-1
	TRPPTRC2	Master Trip (2)	86/94-2	86/94-2	86/94-2	86/94-2	86/94-2
	TRPPTRC3	Master Trip (3)		86/94-3	86/94-3	86/94-3	86/94-3
	TRPPTRC4	Master Trip (4)		86/94-4	86/94-4	86/94-4	86/94-4
	TRPPTRC5	Master Trip (5)		86/94-5	86/94-5	86/94-5	86/94-5
	TRPPTRC6	Master Trip (6)			86/94-6		
Arc protection	ARCSARC1	ARC (1)		AFD-1	AFD-1	AFD-1	AFD-1 (2)
	ARCSARC2	ARC (2)		AFD-2	AFD-2	AFD-2	AFD-2 (2)
	ARCSARC3	ARC (3)		AFD-3	AFD-3	AFD-3	AFD-3 (2)
Multipurpose protection	MAPGAPC1	MAP (1)	MAP-1	MAP-1	MAP-1	MAP-1	MAP-1
	MAPGAPC2	MAP (2)	MAP-2	MAP-2	MAP-2	MAP-2	MAP-2
	MAPGAPC3	MAP (3)	MAP-3	MAP-3	MAP-3	MAP-3	MAP-3
	MAPGAPC4	MAP (4)	MAP-4	MAP-4	MAP-4	MAP-4	MAP-4
	MAPGAPC5	MAP (5)	MAP-5	MAP-5	MAP-5	MAP-5	MAP-5
	MAPGAPC6	MAP (6)	MAP-6	MAP-6	MAP-6	MAP-6	MAP-6
	MAPGAPC7	MAP (7)	MAP-7	MAP-7	MAP-7	MAP-7	MAP-7
	MAPGAPC8	MAP (8)	MAP-8	MAP-8	MAP-8	MAP-8	MAP-8
	MAPGAPC9	MAP (9)	MAP-9	MAP-9	MAP-9	MAP-9	MAP-9
	MAPGAPC10	MAP (10)	MAP-10	MAP-10	MAP-10	MAP-10	MAP-10
	MAPGAPC11	MAP (11)	MAP-11	MAP-11	MAP-11	MAP-11	MAP-11
	MAPGAPC12	MAP (12)	MAP-12	MAP-12	MAP-12	MAP-12	MAP-12
	MAPGAPC13	MAP (13)	MAP-13	MAP-13	MAP-13	MAP-13	MAP-13
	MAPGAPC14	MAP (14)	MAP-14	MAP-14	MAP-14	MAP-14	MAP-14

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Function	IEC 61850	IEC 60617	ANSI/C37.2-2008				
			RED615	REF615	REG615	REM615	RET615
	MAPGAPC15	MAP (15)	MAP-15	MAP-15	MAP-15	MAP-15	MAP-15
	MAPGAPC16	MAP (16)	MAP-16	MAP-16	MAP-16	MAP-16	MAP-16
	MAPGAPC17	MAP (17)	MAP-17	MAP-17	MAP-17	MAP-17	MAP-17
	MAPGAPC18	MAP (18)	MAP-18	MAP-18	MAP-18	MAP-18	MAP-18
Fault locator	SCEFRFLO1	FLOC (1)	21FL-1	21FL-1			
Loss of phase	PHPTUC1	3I< (1)		37-1			
Line differential protection with in-zone power transformer	LNPLDF1	3Id/I> (1)	87L-1				
High-impedance fault detection	PHIZ1	HIF (1)	HIZ-1	HIZ-1			
Third harmonic-based stator ground-fault protection	H3EFPSEF1	dUo>/Uo3H (1)			27/59THN		
Underpower protection	DUPPDPR1	P< (1)		32U-1	32U-1	32U-1	
	DUPPDPR2	P< (2)		32U-2	32U-2	32U-2	
Reverse power/directional overpower protection	DOPPDPR1	P>/Q> (1)		32R/32O-1	32R-32	32O-1	
	DOPPDPR2	P>/Q> (2)		32R/32O-2	32R-32	32O-2	
	DOPPDPR3	P>/Q> (3)			32R-32	32O-3	
Three-phase underexcitation protection	UEXPDIS1	X< (1)			40-1		
Three-phase underimpedance protection	UZPDIS1	Z<G (1)			21G-1		
Out-of-step protection	OOSRPSB1	OOS (1)			78-1		
Multifrequency admittance-based ground-fault protection	MFADPSDE1	Io> ->Y (1)		67YN-1			
Interconnection functions							
Directional reactive power undervoltage protection	DQPTUV1	Q> ->,3U< (1)		32Q-27			
Low-voltage ride-through protection	LVRTPTUV1	U<RT (1)		27RT-1			
	LVRTPTUV2	U<RT (2)		27RT-2			
	LVRTPTUV3	U<RT (3)		27RT-3			
Voltage vector shift protection	VVSPPAM1	VS (1)		78V-1			
Power quality							
Current total demand distortion	CMHAI1	PQM3I (1)	PQI-1	PQI-1	PQI-1		
	CMHAI2	PQM3I(B)					
Voltage total harmonic distortion	VMHAI1	PQM3U (1)	PQVPH-1	PQVPH-1	PQVPH-1		
	VMHAI2	PQM3U(B)		PQVPH-2			
Voltage variation	PHQVVR1	PQMU (1)	PQSS-1	PQSS-1	PQSS-1		
	PHQVVR2	PQ 3U<>(B)		PQSS-2			
Voltage unbalance	VSQVUB1	PQUUB (1)	PQVUB-1	PQVUB-1	PQVUB-1		
Control							
Circuit-breaker control	CBXCBR1	I <-> O CB (1)	52-1	52-1	52-1	52	52 (1)
	CBXCBR2	I <-> O CB (2)		52-2			52 (2)
Disconnector control	DCXSWI1	I <-> O DCC (1)	29DS-1	29DS-1	29DS-1	29DS-1	29DS-1
	DCXSWI2	I <-> O DCC (2)	29DS-2	29DS-2	29DS-2	29DS-2	29DS-2
Grounding switch control	ESXSWI1	I <-> O ESC (1)	29GS-1	29GS-1	29GS-1	29GS-1	29GS-1

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Function	IEC 61850	IEC 60617	ANSI/C37.2-2008				
			RED615	REF615	REG615	REM615	RET615
Disconnector position indication	DCSXSWI1	I <-> O DC (1)	52-TOC	52-TOC	52-TOC	52-TOC	52-TOC
	DCSXSWI2	I <-> O DC (2)	29DS-1	29DS-1	29DS-1	29DS-1	29DS-1
	DCSXSWI3	I <-> O DC (3)	29DS-2	29DS-2	29DS-2	29DS-2	29DS-2
Grounding switch indication	ESSXSWI1	I <-> O ES (1)	29GS-1	29GS-1	29GS-1	29GS-1	29GS-1
	ESSXSWI2	I <-> O ES (2)	29GS-2	29GS-2	29GS-2	29GS-2	29GS-2
Emergency startup	ESMGAPC1	ESTART (1)				62EST	
Autoreclosing	DARREC1	O -> I (1)	79	79			
Tap changer position indication	TPOSYLTC1	TPOSM (1)					84T
Synchronism and energizing check	SECRSYN1	SYNC (1)	25	25	25		25 (2)
Condition monitoring							
Circuit-breaker condition monitoring	SSCBR1	CBCM (1)	52CM-1	52CM-1	52CM-1	52CM	52CM (1)
	SSCBR2	CBCM (2)		52CM-2			52CM (2)
Trip circuit supervision	TCSSCBR1	TCS (1)	TCM-1	TCM-1	TCM-1	TCM-1	TCM-1
	TCSSCBR2	TCS (2)	TCM-2	TCM-2	TCM-2	TCM-2	TCM-2
Current circuit supervision	CCSPVC1	MCS 3I (1)	CCM	CCM		CCM	
Current transformer supervision for high-impedance protection scheme for phase A	HZCCASPVC1	MCS I_A(1)		MCS-A			
Current transformer supervision for high-impedance protection scheme for phase B	HZCCBSPVC1	MCS I_B(1)		MCS-B			
Current transformer supervision for high-impedance protection scheme for phase C	HZCCCSPVC1	MCS I_C(1)		MCS-C			
Fuse failure supervision	SEQSPVC1	FUSEF (1)	60-1	60-1	60-1	60	60 (1)
	SEQSPVC2	FUSEF (2)		60-2			
Protection communication supervision	PCSITPC1	PCS (1)	PCS-1				
Runtime counter for machines and devices	MDSOPT1	OPTS (1)	OPTM-1	OPTM-1	OPTM-1	OPTM-1	OPTM-1
Measurement							
Load profile record	LDPRLRC1	LOADPROF (1)	LoadProf	LoadProf	LoadProf	LoadProf	LoadProf
Three-phase current measurement	CMMXU1	3I (1)	IA, IB, IC	IA, IB, IC	IA, IB, IC	IA, IB, IC	IA, IB, IC (1)
	CMMXU2	3I (2)			IA, IB, IC (2)	IA, IB, IC (2)	IA, IB, IC (2)
Sequence current measurement	CSMSQI1	I1, I2, I0 (1)	I1, I2, I0	I1, I2, I0	I1, I2, I0	I1, I2, I0	I1, I2, I0 (1)
Residual current measurement	RESCMMXU1	Io (1)	IG	IG	IG	IG	
	RESCMMXU2	Io (2)					IG (2)
Three-phase voltage measurement	VMMXU1	3U (1)	VA, VB, VC	VA, VB, VC	VA, VB, VC	VA, VB, VC	VA, VB, VC (2)
	VMMXU2	3U (2)	VA, VB, VC (2)	VA, VB, VC (2)	VA, VB, VC (2)		
Residual voltage measurement	RESVMMXU1	Uo (1)	VG-1	VG	VG-1	VG	VG (2)
	RESVMMXU2	Uo (2)			VG-2		
Sequence voltage measurement	VSMSQI1	U1, U2, U0 (1)	V1, V2, V0	V1, V2, V0	V1, V2, V0	V1, V2, V0	V1, V2, V0 (2)
	VSMSQI2	U1, U2, U0(B)		V1, V2, V0 (2)			
Single-phase power and energy measurement	SPEMMXU1	SP, SE	SP, SE-1	SP, SE-1	SP, SE-1	SP, SE-1	SP, SE (2)

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Function	IEC 61850	IEC 60617	ANSI/C37.2-2008				
			RED615	REF615	REG615	REM615	RET615
Three-phase power and energy measurement	PEMMXU1	P, E (1)	P, E-1	P, E-1	P, E-1	P, E-1	P, E (2)
RTD/mA measurement	XRGGIO130	X130 (RTD) (1)	X130 (RTD) (1)	X130 (RTD) (1)	X130 (RTD) (1)	X130 (RTD) (1)	X130 (RTD) (1)
Frequency measurement	FMMXU1	f (1)	f	f	f	f	f
IEC 61850-9-2 LE sampled value sending	SMVSENDER	SMVSENDER	SMVSENDER	SMVSENDER	SMVSENDER	SMVSENDER	SMVSENDER
IEC 61850-9-2 LE sampled value receiving (voltage sharing)	SMVRECEIVER	SMVRECEIVER	SMVRECEIVER	SMVRECEIVER	SMVRECEIVER	SMVRECEIVER	SMVRECEIVER
Other							
Minimum pulse timer (2 pcs)	TPGAPC1	TP (1)	62TP-1	62TP-1	62TP-1	62TP-1	62TP-1
	TPGAPC2	TP (2)	62TP-2	62TP-2	62TP-2	62TP-2	62TP-2
	TPGAPC3	TP (3)	62TP-3	62TP-3	62TP-3	62TP-3	62TP-3
	TPGAPC4	TP (4)	62TP-4	62TP-4	62TP-4	62TP-4	62TP-4
Minimum pulse timer (2 pcs, second resolution)	TPSGAPC1	TPS (1)	62TPS-1	62TPS-1	62TPS-1	62TPS-1	62TPS-1
Minimum pulse timer (2 pcs, minute resolution)	TPMGAPC1	TPM (1)	62TPM-1	62TPM-1	62TPM-1	62TPM-1	62TPM-1
Pulse timer (8 pcs)	PTGAPC1	PT (1)	62PT-1	62PT-1	62PT-1	62PT-1	62PT-1
	PTGAPC2	PT (2)	62PT-2	62PT-2	62PT-2	62PT-2	62PT-2
Time delay off (8 pcs)	TOFGAPC1	TOF (1)	62TOF-1	62TOF-1	62TOF-1	62TOF-1	62TOF-1
	TOFGAPC2	TOF (2)	62TOF-2	62TOF-2	62TOF-2	62TOF-2	62TOF-2
	TOFGAPC3	TOF (3)	62TOF-3	62TOF-3	62TOF-3	62TOF-3	62TOF-3
	TOFGAPC4	TOF (4)	62TOF-4	62TOF-4	62TOF-4	62TOF-4	62TOF-4
Time delay on (8 pcs)	TONGAPC1	TON (1)	62TON-1	62TON-1	62TON-1	62TON-1	62TON-1
	TONGAPC2	TON (2)	62TON-2	62TON-2	62TON-2	62TON-2	62TON-2
	TONGAPC3	TON (3)	62TON-3	62TON-3	62TON-3	62TON-3	62TON-3
	TONGAPC4	TON (4)	62TON-4	62TON-4	62TON-4	62TON-4	62TON-4
Set-reset (8 pcs)	SRGAPC1	SR (1)	SR-1	SR-1	SR-1	SR-1	SR-1
	SRGAPC2	SR (2)	SR-2	SR-2	SR-2	SR-2	SR-2
	SRGAPC3	SR (3)	SR-3	SR-3	SR-3	SR-3	SR-3
	SRGAPC4	SR (4)	SR-4	SR-4	SR-4	SR-4	SR-4
Move (8 pcs)	MVGAPC1	MV (1)	MV-1	MV-1	MV-1	MV-1	MV-1
	MVGAPC2	MV (2)	MV-2	MV-2	MV-2	MV-2	MV-2
Generic control point (16 pcs)	SPCGAPC1	SPC (1)	SPC-1	SPC-1	SPC-1	SPC-1	SPC-1
	SPCGAPC2	SPC (2)	SPC-2	SPC-2	SPC-2	SPC-2	SPC-2
Analog value scaling	SCA4GAPC1	SCA4 (1)	SCA4-1	SCA4-1	SCA4-1	SCA4-1	SCA4-1
	SCA4GAPC2	SCA4 (2)	SCA4-2	SCA4-2	SCA4-2	SCA4-2	SCA4-2
	SCA4GAPC3	SCA4 (3)	SCA4-3	SCA4-3	SCA4-3	SCA4-3	SCA4-3
	SCA4GAPC4	SCA4 (4)	SCA4-4	SCA4-4	SCA4-4	SCA4-4	SCA4-4
Integer value move	MVI4GAPC1	MVI4 (1)	MVI4-1	MVI4-1	MVI4-1	MVI4-1	MVI4-1
Generic up-down counters	UDFCNT1	UDCNT (1)	CTR-1	CTR-1	CTR-1	CTR-1	CTR-1
	UDFCNT2	UDCNT (2)	CTR-2	CTR-2	CTR-2	CTR-2	CTR-2
	UDFCNT3	UDCNT (3)	CTR-3	CTR-3	CTR-3	CTR-3	CTR-3
	UDFCNT4	UDCNT (4)	CTR-4	CTR-4	CTR-4	CTR-4	CTR-4

Section 2 DNP3 data mappings

2.1 Overview

This document describes the DNP3 data points and structures available in the protection relay.

The point tables show all the available DNP3 data points in this protection relay. The data objects in the point tables are listed in alphabetical order based on the objects' IEC 61850 names. Also the default point indexes, class assignments and scaling configurations are shown. The DNP3 points can be freely added, removed, reorganized and reconfigured using PCM600.

This list represents the superset of DNP3 points. The actual set of available points is determined by the protection relay's ordercode. An asterisk (*) in a No Events column indicates that no events can be generated for that point regardless of class assignment. An asterisk (*) in Disabled column indicates that the point is not active. Inactive points can be made active through PCM600.

2.2 DNP3 default mapping

Table 2: Analog inputs

Index	Name	Class	Description	IEC 61850 name
0	CMMXU1: 1.IA-A.AI-EvUpd	0;2	Three-phase current measurement, Measured current amplitude phase A - AI-EvUpd	LD0.CMMXU1.A.phsA.instCVal.mag.f
1	CMMXU1: 1.IB-A.AI-EvUpd	0;2	Three-phase current measurement, Measured current amplitude phase B - AI-EvUpd	LD0.CMMXU1.A.phsB.instCVal.mag.f
2	CMMXU1: 1.IC-A.AI-EvUpd	0;2	Three-phase current measurement, Measured current amplitude phase C - AI-EvUpd	LD0.CMMXU1.A.phsC.instCVal.mag.f
3	RESCMMXU1: 1.IG-A.AI-EvUpd	0;2	Ground current measurement, Measured residual current - AI-EvUpd	LD0.RESCMMXU1.A.res.instCVal.mag.f
4	VMMXU1: 1.V_DB_AB.AI-EvUpd	0;2	Three-phase voltage measurement, VAB Amplitude, magnitude of reported value - AI-EvUpd	LD0.VMMXU1.PPV.phsAB.cVal.mag.f
5	VMMXU1: 1.V_DB_BC.AI-EvUpd	0;2	Three-phase voltage measurement, VBC Amplitude, magnitude of reported value - AI-EvUpd	LD0.VMMXU1.PPV.phsBC.cVal.mag.f
6	VMMXU1: 1.V_DB_CA.AI-EvUpd	0;2	Three-phase voltage measurement, VCA Amplitude, magnitude of reported value - AI-EvUpd	LD0.VMMXU1.PPV.phsCA.cVal.mag.f

Table continues on next page

Index	Name	Class	Description	IEC 61850 name
7	RESVMMXU1: 1.VG-kV.AI-EvUpd	0;2	Residual voltage measurement, Measured residual voltage - AI-EvUpd	LD0.RESVMMXU1.PhV.res.instCVal.mag.f
8	CSMSQI1: 1.PsSeq-A.AI-EvUpd	0;2	Sequence current measurement, Measured positive sequence current - AI-EvUpd	LD0.CSMSQI1.SeqA.c1.instCVal.mag.f
9	CSMSQI1: 1.NgSeq-A.AI-EvUpd	0;2	Sequence current measurement, Measured negative sequence current - AI-EvUpd	LD0.CSMSQI1.SeqA.c2.instCVal.mag.f
10	CSMSQI1: 1.ZroSeq-A.AI-EvUpd	0;2	Sequence current measurement, Measured zero sequence current - AI-EvUpd	LD0.CSMSQI1.SeqA.c3.instCVal.mag.f
11	VSMSQI1: 1.PsSeq-kV.AI-EvUpd	0;2	Sequence voltage measurement, Measured positive sequence voltage - AI-EvUpd	LD0.VSMSQI1.SeqV.c1.instCVal.mag.f
12	VSMSQI1: 1.NgSeq-kV.AI-EvUpd	0;2	Sequence voltage measurement, Measured negative sequence voltage - AI-EvUpd	LD0.VSMSQI1.SeqV.c2.instCVal.mag.f
13	VSMSQI1: 1.ZroSeq-kV.AI-EvUpd	0;2	Sequence voltage measurement, Measured zero sequence voltage - AI-EvUpd	LD0.VSMSQI1.SeqV.c3.instCVal.mag.f
14	PEMMXU1: 1.P-kW.AI-EvUpd	0;2	Three-phase power and energy measurement, Total Active Power - AI-EvUpd	LD0.PEMMXU1.TotW.instMag.f
15	PEMMXU1: 1.Q-kVAr.AI-EvUpd	0;2	Three-phase power and energy measurement, Total Reactive Power - AI-EvUpd	LD0.PEMMXU1.TotVAr.instMag.f
16	PEMMXU1: 1.S-kVA.AI-EvUpd	0;2	Three-phase power and energy measurement, Total Apparent Power - AI-EvUpd	LD0.PEMMXU1.TotVA.instMag.f
17	PEMMXU1: 1.PF.AI-EvUpd	0;2	Three-phase power and energy measurement, Average Power factor - AI-EvUpd	LD0.PEMMXU1.TotPF.instMag.f
18	FMMXU1: 1.f-Hz.AI-EvUpd	0;2	Frequency measurement, Measured frequency - AI-EvUpd	LD0.FMMXU1.Hz.instMag.f
19	CMMXU2: 1.IA-A.AI-EvUpd	0;2	Three-phase current measurement, Measured current amplitude phase A - AI-EvUpd	LD0.CMMXU2.A.phsA.instCVal.mag.f
20	CMMXU2: 1.IB-A.AI-EvUpd	0;2	Three-phase current measurement, Measured current amplitude phase B - AI-EvUpd	LD0.CMMXU2.A.phsB.instCVal.mag.f
21	CMMXU2: 1.IC-A.AI-EvUpd	0;2	Three-phase current measurement, Measured current amplitude phase C - AI-EvUpd	LD0.CMMXU2.A.phsC.instCVal.mag.f
22	VMMXU2: 2.V_INST_A.AI-EvUpd	0;2	Three-phase voltage measurement, VAB Amplitude, magnitude of instantaneous value - AI-EvUpd	LD0.VMMXU2.PPV.phsAB.cVal.mag.f
23	VMMXU2: 2.V_INST_B.AI-EvUpd	0;2	Three-phase voltage measurement, VAB Amplitude, magnitude of instantaneous value - AI-EvUpd	LD0.VMMXU2.PPV.phsBC.cVal.mag.f
24	VMMXU2: 2.V_INST_C.AI-EvUpd	0;2	Three-phase voltage measurement, VAB Amplitude, magnitude of instantaneous value - AI-EvUpd	LD0.VMMXU2.PPV.phsCA.cVal.mag.f
25	RESCMMXU2: 2.IG-A.AI-EvUpd	0;2	Ground current measurement, Measured residual current - AI-EvUpd	LD0.RESCMMXU2.A.res.instCVal.mag.f
26	RESVMMXU2: 2.VG-kV.AI-EvUpd	0;2	Ground voltage measurement, Measured residual voltage - AI-EvUpd	LD0.RESVMMXU2.PhV.res.instCVal.mag.f

Table continues on next page

Index	Name	Class	Description	IEC 61850 name
27	CSMSQI2: 2.PsSeq-A.AI-EvUpd	0;2	Sequence current measurement, Measured positive sequence current - AI-EvUpd	LD0.CSMSQI2.SeqA.c1.instCVal.mag.f
28	CSMSQI2: 2.NgSeq-A.AI-EvUpd	0;2	Sequence current measurement, Measured negative sequence current - AI-EvUpd	LD0.CSMSQI2.SeqA.c3.instCVal.mag.f
29	CSMSQI2: 2.ZroSeq-A.AI-EvUpd	0;2	Sequence current measurement, Measured zero sequence current - AI-EvUpd	LD0.CSMSQI2.SeqA.c2.instCVal.mag.f

Table 3: Binary inputs

Index	Name	Class	Description	IEC 61850 name
0	X100 (PSM): 100.X100-PO1.BI-EvUpd	0;1	X100 (PSM) hardware module, Connectors 6-7 - BI-EvUpd	LD0.XGGIO100.SPCSO1.stVal
1	X100 (PSM): 100.X100-PO2.BI-EvUpd	0;1	X100 (PSM) hardware module, Connectors 8-9 - BI-EvUpd	LD0.XGGIO100.SPCSO2.stVal
2	X100 (PSM): 100.X100-SO1.BI-EvUpd	0;1	X100 (PSM) hardware module, Connectors 10c-11nc-12no - BI-EvUpd	LD0.XGGIO100.SPCSO3.stVal
3	X100 (PSM): 100.X100-SO2.BI-EvUpd	0;1	X100 (PSM) hardware module, Connectors 13c-14no - BI-EvUpd	LD0.XGGIO100.SPCSO4.stVal
4	X100 (PSM): 100.X100-PO3.BI-EvUpd	0;1	X100 (PSM) hardware module, Connectors 15-17/18-19 - BI-EvUpd	LD0.XGGIO100.SPCSO5.stVal
5	X100 (PSM): 100.X100-PO4.BI-EvUpd	0;1	X100 (PSM) hardware module, Connectors 20-22/23-24 - BI-EvUpd	LD0.XGGIO100.SPCSO6.stVal
6	X110 (BIO): 110.X110-Input 1.BI-EvUpd	0;1	X110 (BIO), Connectors 1-2 - BI-EvUpd	LD0.XGGIO110.Ind1.stVal
7	X110 (BIO): 110.X110-Input 2.BI-EvUpd	0;1	X110 (BIO), Connectors 3-4 - BI-EvUpd	LD0.XGGIO110.Ind2.stVal
8	X110 (BIO): 110.X110-Input 3.BI-EvUpd	0;1	X110 (BIO), Connectors 5-6c - BI-EvUpd	LD0.XGGIO110.Ind3.stVal
9	X110 (BIO): 110.X110-Input 4.BI-EvUpd	0;1	X110 (BIO), Connectors 7-6c - BI-EvUpd	LD0.XGGIO110.Ind4.stVal
10	X110 (BIO): 110.X110-Input 5.BI-EvUpd	0;1	X110 (BIO), Connectors 8-9c - BI-EvUpd	LD0.XGGIO110.Ind5.stVal
11	X110 (BIO): 110.X110-Input 6.BI-EvUpd	0;1	X110 (BIO), Connectors 10-9c - BI-EvUpd	LD0.XGGIO110.Ind6.stVal
12	X110 (BIO): 110.X110-Input 7.BI-EvUpd	0;1	X110 (BIO), Connectors 11-12c - BI-EvUpd	LD0.XGGIO110.Ind7.stVal
13	X110 (BIO): 110.X110-Input 8.BI-EvUpd	0;1	X110 (BIO), Connectors 13-12c - BI-EvUpd	LD0.XGGIO110.Ind8.stVal
14	X110 (BIO): 110.X110-SO1.BI-EvUpd	0;1	X110 (BIO) hardware module, Connectors 14c-15no-16nc - BI-EvUpd	LD0.XGGIO110.SPCSO1.stVal
15	X110 (BIO): 110.X110-SO2.BI-EvUpd	0;1	X110 (BIO) hardware module, Connectors 17c-18no-19nc - BI-EvUpd	LD0.XGGIO110.SPCSO2.stVal
16	X110 (BIO): 110.X110-SO3.BI-EvUpd	0;1	X110 (BIO) hardware module, Connectors 20c-21no-22nc - BI-EvUpd	LD0.XGGIO110.SPCSO3.stVal

Table continues on next page

Index	Name	Class	Description	IEC 61850 name
17	X110 (BIO): 110.X110-SO4.BI-EvUpd	0;1	X110 (BIO) hardware module, Connectors 23-24 - BI-EvUpd	LD0.XGGIO110.SPCSO4.stVal
18	X110 (BIO-H): 110.X110-Input 1.BI-EvUpd	0;1	X110 (BIO-H), Connectors 1-5c - BI-EvUpd	LD0.XBGGIO110.Ind1.stVal
19	X110 (BIO-H): 110.X110-Input 2.BI-EvUpd	0;1	X110 (BIO-H), Connectors 2-5c - BI-EvUpd	LD0.XBGGIO110.Ind2.stVal
20	X110 (BIO-H): 110.X110-Input 3.BI-EvUpd	0;1	X110 (BIO-H), Connectors 3-5c - BI-EvUpd	LD0.XBGGIO110.Ind3.stVal
21	X110 (BIO-H): 110.X110-Input 4.BI-EvUpd	0;1	X110 (BIO-H), Connectors 4-5c - BI-EvUpd	LD0.XBGGIO110.Ind4.stVal
22	X110 (BIO-H): 110.X110-Input 5.BI-EvUpd	0;1	X110 (BIO-H), Connectors 6-10c - BI-EvUpd	LD0.XBGGIO110.Ind5.stVal
23	X110 (BIO-H): 110.X110-Input 6.BI-EvUpd	0;1	X110 (BIO-H), Connectors 7-10c - BI-EvUpd	LD0.XBGGIO110.Ind6.stVal
24	X110 (BIO-H): 110.X110-Input 7.BI-EvUpd	0;1	X110 (BIO-H), Connectors 8-10c - BI-EvUpd	LD0.XBGGIO110.Ind7.stVal
25	X110 (BIO-H): 110.X110-Input 8.BI-EvUpd	0;1	X110 (BIO-H), Connectors 9-10c - BI-EvUpd	LD0.XBGGIO110.Ind8.stVal
26	X110 (BIO-H): 110.X110-HSO1.BI-EvUpd	0;1	X110 (BIO) hardware module, Connectors 15no-16no - BI-EvUpd	LD0.XBGGIO110.SPCSO1.stVal
27	X110 (BIO-H): 110.X110-HSO2.BI-EvUpd	0;1	X110 (BIO) hardware module, Connectors 19no-20no - BI-EvUpd	LD0.XBGGIO110.SPCSO2.stVal
28	X110 (BIO-H): 110.X110-HSO3.BI-EvUpd	0;1	X110 (BIO) hardware module, Connectors 23no-24no - BI-EvUpd	LD0.XBGGIO110.SPCSO3.stVal
29	X120 (AIM): 120.X120-Input 1.BI-EvUpd	0;1	X120 (AIM), Connectors 1-2c - BI-EvUpd	LD0.XGGIO120.Ind1.stVal
30	X120 (AIM): 120.X120-Input 2.BI-EvUpd	0;1	X120 (AIM), Connectors 3-2c - BI-EvUpd	LD0.XGGIO120.Ind2.stVal
31	X120 (AIM): 120.X120-Input 3.BI-EvUpd	0;1	X120 (AIM), Connectors 4-2c - BI-EvUpd	LD0.XGGIO120.Ind3.stVal
32	X120 (AIM): 120.X120-Input 4.BI-EvUpd	0;1	X120 (AIM), Connectors 5-6 - BI-EvUpd	LD0.XGGIO120.Ind4.stVal
33	X130 (AIM): 130.X130-Input 1.BI-EvUpd	0;1	X130 (AIM), Connectors 1-2 - BI-EvUpd	LD0.XAGGIO130.Ind1.stVal
34	X130 (AIM): 130.X130-Input 2.BI-EvUpd	0;1	X130 (AIM), Connectors 3-4 - BI-EvUpd	LD0.XAGGIO130.Ind2.stVal
35	X130 (AIM): 130.X130-Input 3.BI-EvUpd	0;1	X130 (AIM), Connectors 5-6 - BI-EvUpd	LD0.XAGGIO130.Ind3.stVal
36	X130 (AIM): 130.X130-Input 4.BI-EvUpd	0;1	X130 (AIM), Connectors 7-8 - BI-EvUpd	LD0.XAGGIO130.Ind4.stVal
37	X130 (BIO): 130.X130-Input 1.BI-EvUpd	0;1	X130 (BIO), Connectors 1-2c - BI-EvUpd	LD0.XGGIO130.Ind1.stVal
38	X130 (BIO): 130.X130-Input 2.BI-EvUpd	0;1	X130 (BIO), Connectors 3-2c - BI-EvUpd	LD0.XGGIO130.Ind2.stVal

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Index	Name	Class	Description	IEC 61850 name
39	X130 (BIO): 130.X130-Input 3.BI-EvUpd	0;1	X130 (BIO), Connectors 4-5c - BI-EvUpd	LD0.XGGIO130.Ind3.stVal
40	X130 (BIO): 130.X130-Input 4.BI-EvUpd	0;1	X130 (BIO), Connectors 6-5c - BI-EvUpd	LD0.XGGIO130.Ind4.stVal
41	X130 (BIO): 130.X130-Input 5.BI-EvUpd	0;1	X130 (BIO), Connectors 7-8c - BI-EvUpd	LD0.XGGIO130.Ind5.stVal
42	X130 (BIO): 130.X130-Input 6.BI-EvUpd	0;1	X130 (BIO), Connectors 9-8c - BI-EvUpd	LD0.XGGIO130.Ind6.stVal
43	X130 (BIO): 130.X130-SO1.BI-EvUpd	0;1	X130 (BIO) hardware module, Connectors 10c-11no-12nc - BI-EvUpd	LD0.XGGIO130.SPCSO1.stVal
44	X130 (BIO): 130.X130-SO2.BI-EvUpd	0;1	X130 (BIO) hardware module, Connectors 13c-14no-15nc - BI-EvUpd	LD0.XGGIO130.SPCSO2.stVal
45	X130 (BIO): 130.X130-SO3.BI-EvUpd	0;1	X130 (BIO) hardware module, Connectors 16c-17no-18nc - BI-EvUpd	LD0.XGGIO130.SPCSO3.stVal
50	CBXCBR1: 1.POSITION.PosOpen	0;1	Circuit breaker control, Apparatus position indication - PosOpen	CTRL.CBCSWI1.Pos.stVal
51	CBXCBR1: 1.POSITION.PosClose	0;1	Circuit breaker control, Apparatus position indication - PosClose	CTRL.CBCSWI1.Pos.stVal
52	CBXCBR1: 1.POSITION.PosError	0;1	Circuit breaker control, Apparatus position indication - PosError	CTRL.CBCSWI1.Pos.stVal
53	CBXCBR1: 1.POSITION.PosOK	0;1	Circuit breaker control, Apparatus position indication - PosOK	CTRL.CBCSWI1.Pos.stVal
55	CBXCBR2: 2.POSITION.PosOpen	0;1	Circuit breaker control, Apparatus position indication - PosOpen	CTRL.CBCSWI2.Pos.stVal
56	CBXCBR2: 2.POSITION.PosClose	0;1	Circuit breaker control, Apparatus position indication - PosClose	CTRL.CBCSWI2.Pos.stVal
57	CBXCBR2: 2.POSITION.PosError	0;1	Circuit breaker control, Apparatus position indication - PosError	CTRL.CBCSWI2.Pos.stVal
58	CBXCBR2: 2.POSITION.PosOK	0;1	Circuit breaker control, Apparatus position indication - PosOK	CTRL.CBCSWI2.Pos.stVal
100	PHLPTOC1: 1.PICKUP.BI-EvUpd	0;1	51P-1(1), Pickup - BI-EvUpd	LD0.PHLPTOC1.Str.general
101	PHLPTOC1: 1.TRIP.BI-EvUpd	0;1	51P-1(1), Trip - BI-EvUpd	LD0.PHLPTOC1.Op.general
102	PHLPTOC2: 2.PICKUP.BI-EvUpd	0;1	51P-1(2), Pickup - BI-EvUpd	LD0.PHLPTOC2.Str.general
103	PHLPTOC2: 2.TRIP.BI-EvUpd	0;1	51P-1(2), Trip - BI-EvUpd	LD0.PHLPTOC2.Op.general
104	PHHPTOC1: 1.PICKUP.BI-EvUpd	0;1	51P-2(1), Pickup - BI-EvUpd	LD0.PHHPTOC1.Str.general
105	PHHPTOC1: 1.TRIP.BI-EvUpd	0;1	51P-2(1), Trip - BI-EvUpd	LD0.PHHPTOC1.Op.general

Table continues on next page

Index	Name	Class	Description	IEC 61850 name
106	PHHPTOC2: 2.PICKUP.BI-EvUpd	0;1	51P-2(2), Pickup - BI-EvUpd	LD0.PHHPTOC2.Str.general
107	PHHPTOC2: 2.TRIP.BI-EvUpd	0;1	51P-2(2), Trip - BI-EvUpd	LD0.PHHPTOC2.Op.general
108	PHIPTOC1: 1.PICKUP.BI-EvUpd	0;1	50P/51P(1), Pickup - BI-EvUpd	LD0.PHIPTOC1.Str.general
109	PHIPTOC1: 1.TRIP.BI-EvUpd	0;1	50P/51P(1), Trip - BI-EvUpd	LD0.PHIPTOC1.Op.general
110	PHIPTOC2: 2.PICKUP.BI-EvUpd	0;1	50P/51P(2), Pickup - BI-EvUpd	LD0.PHIPTOC2.Str.general
111	PHIPTOC2: 2.TRIP.BI-EvUpd	0;1	50P/51P(2), Trip - BI-EvUpd	LD0.PHIPTOC2.Op.general
112	DPHLPDOC1: 1.PICKUP.BI-EvUpd	0;1	67-1(1), Pickup - BI-EvUpd	LD0.DPHLPTOC1.Str.general
113	DPHLPDOC1: 1.TRIP.BI-EvUpd	0;1	67-1(1), Trip - BI-EvUpd	LD0.DPHLPTOC1.Op.general
114	DPHLPDOC2: 2.PICKUP.BI-EvUpd	0;1	67-1(2), Pickup - BI-EvUpd	LD0.DPHLPTOC2.Str.general
115	DPHLPDOC2: 2.TRIP.BI-EvUpd	0;1	67-1(2), Trip - BI-EvUpd	LD0.DPHLPTOC2.Op.general
116	DPHHPDOC1: 1.PICKUP.BI-EvUpd	0;1	67-2(1), Pickup - BI-EvUpd	LD0.DPHHPTOC1.Str.general
117	DPHHPDOC1: 1.TRIP.BI-EvUpd	0;1	67-2(1), Trip - BI-EvUpd	LD0.DPHHPTOC1.Op.general
118	DPHHPDOC2: 2.PICKUP.BI-EvUpd	0;1	67-2(2), Pickup - BI-EvUpd	LD0.DPHHPTOC2.Str.general
119	DPHHPDOC2: 2.TRIP.BI-EvUpd	0;1	67-2(2), Trip - BI-EvUpd	LD0.DPHHPTOC2.Op.general
120	EFLPTOC1: 1.PICKUP.BI-EvUpd	0;1	51N-1(1), Pickup - BI-EvUpd	LD0.EFLPTOC1.Str.general
121	EFLPTOC1: 1.TRIP.BI-EvUpd	0;1	51N-1(1), Trip - BI-EvUpd	LD0.EFLPTOC1.Op.general
122	EFLPTOC2: 2.PICKUP.BI-EvUpd	0;1	51N-1(2), Pickup - BI-EvUpd	LD0.EFLPTOC2.Str.general
123	EFLPTOC2: 2.TRIP.BI-EvUpd	0;1	51N-1(2), Trip - BI-EvUpd	LD0.EFLPTOC2.Op.general
124	EFHPTOC1: 1.PICKUP.BI-EvUpd	0;1	51N-2(1), Pickup - BI-EvUpd	LD0.EFHPTOC1.Str.general
125	EFHPTOC1: 1.TRIP.BI-EvUpd	0;1	51N-2(1), Trip - BI-EvUpd	LD0.EFHPTOC1.Op.general
126	EFHPTOC2: 2.PICKUP.BI-EvUpd	0;1	51N-2(2), Pickup - BI-EvUpd	LD0.EFHPTOC2.Str.general
127	EFHPTOC2: 2.TRIP.BI-EvUpd	0;1	51N-2(2), Trip - BI-EvUpd	LD0.EFHPTOC2.Op.general

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Index	Name	Class	Description	IEC 61850 name
128	EFHPTOC3: 3.PICKUP.BI-EvUpd	0;1	51N-2(3), Pickup - BI-EvUpd	LD0.EFHPTOC3.Str.general
129	EFHPTOC3: 3.TRIP.BI-EvUpd	0;1	51N-2(3), Trip - BI-EvUpd	LD0.EFHPTOC3.Op.general
130	EFHPTOC4: 4.PICKUP.BI-EvUpd	0;1	51N-2(4), Pickup - BI-EvUpd	LD0.EFHPTOC4.Str.general
131	EFHPTOC4: 4.TRIP.BI-EvUpd	0;1	51N-2(4), Trip - BI-EvUpd	LD0.EFHPTOC4.Op.general
132	EFIPTOC1: 1.PICKUP.BI-EvUpd	0;1	50N/51N(1), Pickup - BI-EvUpd	LD0.EFIPTOC1.Str.general
133	EFIPTOC1: 1.TRIP.BI-EvUpd	0;1	50N/51N(1), Trip - BI-EvUpd	LD0.EFIPTOC1.Op.general
134	EFIPTOC2: 2.PICKUP.BI-EvUpd	0;1	50N/51N(2), Pickup - BI-EvUpd	LD0.EFIPTOC2.Str.general
135	EFIPTOC2: 2.TRIP.BI-EvUpd	0;1	50N/51N(2), Trip - BI-EvUpd	LD0.EFIPTOC2.Op.general
136	DEFLPDEF1: 1.PICKUP.BI-EvUpd	0;1	67N-1(1), Pickup - BI-EvUpd	LD0.DEFLPTOC1.Str.general
137	DEFLPDEF1: 1.TRIP.BI-EvUpd	0;1	67N-1(1), Trip - BI-EvUpd	LD0.DEFLPTOC1.Op.general
138	DEFLPDEF2: 2.PICKUP.BI-EvUpd	0;1	67N-1(2), Pickup - BI-EvUpd	LD0.DEFLPTOC2.Str.general
139	DEFLPDEF2: 2.TRIP.BI-EvUpd	0;1	67N-1(2), Trip - BI-EvUpd	LD0.DEFLPTOC2.Op.general
140	DEFHPDEF1: 1.PICKUP.BI-EvUpd	0;1	67N-2(1), Pickup - BI-EvUpd	LD0.DEFHPTOC1.Str.general
141	DEFHPDEF1: 1.TRIP.BI-EvUpd	0;1	67N-2(1), Trip - BI-EvUpd	LD0.DEFHPTOC1.Op.general
142	DEFHPDEF2: 2.PICKUP.BI-EvUpd	0;1	67N-2(2), Pickup - BI-EvUpd	LD0.DEFHPTOC2.Str.general
143	DEFHPDEF2: 2.TRIP.BI-EvUpd	0;1	67N-2(2), Trip - BI-EvUpd	LD0.DEFHPTOC2.Op.general
144	MFADPSDE1: 1.PICKUP.BI-EvUpd	0;1	67YN-1, Pickup - BI-EvUpd	LD0.MFADPSDE1.Str.general
145	MFADPSDE1: 1.TRIP.BI-EvUpd	0;1	67YN-1, Trip - BI-EvUpd	LD0.MFADPSDE1.Op.general
146	EFPADM1: 1.PICKUP.BI-EvUpd	0;1	21YN(1), Pickup - BI-EvUpd	LD0.EFPADM1.Str.general
147	EFPADM1: 1.TRIP.BI-EvUpd	0;1	21YN(1), Trip - BI-EvUpd	LD0.EFPADM1.Op.general
148	EFPADM2: 2.PICKUP.BI-EvUpd	0;1	21YN(2), Pickup - BI-EvUpd	LD0.EFPADM2.Str.general
149	EFPADM2: 2.TRIP.BI-EvUpd	0;1	21YN(2), Trip - BI-EvUpd	LD0.EFPADM2.Op.general

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150	EFPADM3: 3.PICKUP.BI-EvUpd	0;1	21YN(3), Pickup - BI-EvUpd	LD0.EFPADM3.Str.general
151	EFPADM3: 3.TRIP.BI-EvUpd	0;1	21YN(3), Trip - BI-EvUpd	LD0.EFPADM3.Op.general
152	WPWDE1: 1.PICKUP.BI-EvUpd	0;1	32N-1, Pickup - BI-EvUpd	LD0.WPSDE1.Str.general
153	WPWDE1: 1.TRIP.BI-EvUpd	0;1	32N-1, Trip - BI-EvUpd	LD0.WPSDE1.Op.general
154	WPWDE2: 2.PICKUP.BI-EvUpd	0;1	32N-2, Pickup - BI-EvUpd	LD0.WPSDE2.Str.general
155	WPWDE2: 2.TRIP.BI-EvUpd	0;1	32N-2, Trip - BI-EvUpd	LD0.WPSDE2.Op.general
156	WPWDE3: 3.PICKUP.BI-EvUpd	0;1	32N-3, Pickup - BI-EvUpd	LD0.WPSDE3.Str.general
157	WPWDE3: 3.TRIP.BI-EvUpd	0;1	32N-3, Trip - BI-EvUpd	LD0.WPSDE3.Op.general
158	INTRPTEF1: 1.PICKUP.BI-EvUpd	0;1	67NIEF(1), Pickup - BI-EvUpd	LD0.INTRPTEF1.Str.general
159	INTRPTEF1: 1.TRIP.BI-EvUpd	0;1	67NIEF(1), Trip - BI-EvUpd	LD0.INTRPTEF1.Op.general
160	HAEFPTOC1: 1.PICKUP.BI-EvUpd	0;1	51NHA(1), Pickup - BI-EvUpd	LD0.HAEFPTOC1.Str.general
161	HAEFPTOC1: 1.TRIP.BI-EvUpd	0;1	51NHA(1), Trip - BI-EvUpd	LD0.HAEFPTOC1.Op.general
162	NSPTOC1: 1.PICKUP.BI-EvUpd	0;1	46(1), Pickup - BI-EvUpd	LD0.NSPTOC1.Str.general
163	NSPTOC1: 1.TRIP.BI-EvUpd	0;1	46(1), Trip - BI-EvUpd	LD0.NSPTOC1.Op.general
164	NSPTOC2: 2.PICKUP.BI-EvUpd	0;1	46(2), Pickup - BI-EvUpd	LD0.NSPTOC2.Str.general
165	NSPTOC2: 2.TRIP.BI-EvUpd	0;1	46(2), Trip - BI-EvUpd	LD0.NSPTOC2.Op.general
166	PDNSPTOC1: 1.PICKUP.BI-EvUpd	0;1	46PD(1), Pickup - BI-EvUpd	LD0.PDNSPTOC1.Str.general
167	PDNSPTOC1: 1.TRIP.BI-EvUpd	0;1	46PD(1), Trip - BI-EvUpd	LD0.PDNSPTOC1.Op.general
168	ROVPTOV1: 1.PICKUP.BI-EvUpd	0;1	59G(1), Pickup - BI-EvUpd	LD0.ROVPTOV1.Str.general
169	ROVPTOV1: 1.TRIP.BI-EvUpd	0;1	59G(1), Trip - BI-EvUpd	LD0.ROVPTOV1.Op.general
170	ROVPTOV2: 2.PICKUP.BI-EvUpd	0;1	59G(2), Pickup - BI-EvUpd	LD0.ROVPTOV2.Str.general
171	ROVPTOV2: 2.TRIP.BI-EvUpd	0;1	59G(2), Trip - BI-EvUpd	LD0.ROVPTOV2.Op.general

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Index	Name	Class	Description	IEC 61850 name
172	ROVPTOV3: 3.PICKUP.BI-EvUpd	0;1	59G(3), Pickup - BI-EvUpd	LD0.ROVPTOV3.Str.general
173	ROVPTOV3: 3.TRIP.BI-EvUpd	0;1	59G(3), Trip - BI-EvUpd	LD0.ROVPTOV3.Op.general
174	PHPTUV1: 1.PICKUP.BI-EvUpd	0;1	27(1), Pickup - BI-EvUpd	LD0.PHPTUV1.Str.general
175	PHPTUV1: 1.TRIP.BI-EvUpd	0;1	27(1), Trip - BI-EvUpd	LD0.PHPTUV1.Op.general
176	PHPTUV2: 2.PICKUP.BI-EvUpd	0;1	27(2), Pickup - BI-EvUpd	LD0.PHPTUV2.Str.general
177	PHPTUV2: 2.TRIP.BI-EvUpd	0;1	27(2), Trip - BI-EvUpd	LD0.PHPTUV2.Op.general
178	PHPTUV3: 3.PICKUP.BI-EvUpd	0;1	27(3), Pickup - BI-EvUpd	LD0.PHPTUV3.Str.general
179	PHPTUV3: 3.TRIP.BI-EvUpd	0;1	27(3), Trip - BI-EvUpd	LD0.PHPTUV3.Op.general
180	PHPTOV1: 1.PICKUP.BI-EvUpd	0;1	59(1), Pickup - BI-EvUpd	LD0.PHPTOV1.Str.general
181	PHPTOV1: 1.TRIP.BI-EvUpd	0;1	59(1), Trip - BI-EvUpd	LD0.PHPTOV1.Op.general
182	PHPTOV2: 2.PICKUP.BI-EvUpd	0;1	59(2), Pickup - BI-EvUpd	LD0.PHPTOV2.Str.general
183	PHPTOV2: 2.TRIP.BI-EvUpd	0;1	59(2), Trip - BI-EvUpd	LD0.PHPTOV2.Op.general
184	PHPTOV3: 3.PICKUP.BI-EvUpd	0;1	59(3), Pickup - BI-EvUpd	LD0.PHPTOV3.Str.general
185	PHPTOV3: 3.TRIP.BI-EvUpd	0;1	59(3), Trip - BI-EvUpd	LD0.PHPTOV3.Op.general
186	PSPTUV1: 1.PICKUP.BI-EvUpd	0;1	47U+(1), Pickup - BI-EvUpd	LD0.PSPTUV1.Str.general
187	PSPTUV1: 1.TRIP.BI-EvUpd	0;1	47U+(1), Trip - BI-EvUpd	LD0.PSPTUV1.Op.general
188	PSPTUV2: 2.PICKUP.BI-EvUpd	0;1	47U+(2), Pickup - BI-EvUpd	LD0.PSPTUV2.Str.general
189	PSPTUV2: 2.TRIP.BI-EvUpd	0;1	47U+(2), Trip - BI-EvUpd	LD0.PSPTUV2.Op.general
190	NSPTOV1: 1.PICKUP.BI-EvUpd	0;1	47O-(1), Pickup - BI-EvUpd	LD0.NSPTOV1.Str.general
191	NSPTOV1: 1.TRIP.BI-EvUpd	0;1	47O-(1), Trip - BI-EvUpd	LD0.NSPTOV1.Op.general
192	NSPTOV2: 2.PICKUP.BI-EvUpd	0;1	47O-(2), Pickup - BI-EvUpd	LD0.NSPTOV2.Str.general
193	NSPTOV2: 2.TRIP.BI-EvUpd	0;1	47O-(2), Trip - BI-EvUpd	LD0.NSPTOV2.Op.general

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194	FRPFRQ1: 1.PICKUP.BI-EvUpd	0;1	81(1), Pickup - BI-EvUpd	LD0.FRPTRC1.Str.general
195	FRPFRQ1: 1.OPR_UFRQ.BI-EvUpd	0;1	81(1), Trip signal for underfrequency - BI-EvUpd	LD0.FRPTUF1.Op.general
196	FRPFRQ1: 1.OPR_OFRQ.BI-EvUpd	0;1	81(1), Trip signal for overfrequency - BI-EvUpd	LD0.FRPTOF1.Op.general
197	FRPFRQ1: 1.OPR_FRG.BI-EvUpd	0;1	81(1), Trip signal for frequency gradient - BI-EvUpd	LD0.FRPFRC1.Op.general
198	FRPFRQ2: 2.PICKUP.BI-EvUpd	0;1	81(2), Pickup - BI-EvUpd	LD0.FRPTRC2.Str.general
199	FRPFRQ2: 2.OPR_UFRQ.BI-EvUpd	0;1	81(2), Trip signal for underfrequency - BI-EvUpd	LD0.FRPTUF2.Op.general
200	FRPFRQ2: 2.OPR_OFRQ.BI-EvUpd	0;1	81(2), Trip signal for overfrequency - BI-EvUpd	LD0.FRPTOF2.Op.general
201	FRPFRQ2: 2.OPR_FRG.BI-EvUpd	0;1	81(2), Trip signal for frequency gradient - BI-EvUpd	LD0.FRPFRC2.Op.general
202	FRPFRQ3: 3.PICKUP.BI-EvUpd	0;1	81(3), Pickup - BI-EvUpd	LD0.FRPTRC3.Str.general
203	FRPFRQ3: 3.OPR_UFRQ.BI-EvUpd	0;1	81(3), Trip signal for underfrequency - BI-EvUpd	LD0.FRPTUF3.Op.general
204	FRPFRQ3: 3.OPR_OFRQ.BI-EvUpd	0;1	81(3), Trip signal for overfrequency - BI-EvUpd	LD0.FRPTOF3.Op.general
205	FRPFRQ3: 3.OPR_FRG.BI-EvUpd	0;1	81(3), Trip signal for frequency gradient - BI-EvUpd	LD0.FRPFRC3.Op.general
206	FRPFRQ4: 4.PICKUP.BI-EvUpd	0;1	81(4), Pickup - BI-EvUpd	LD0.FRPTRC4.Str.general
207	FRPFRQ4: 4.OPR_UFRQ.BI-EvUpd	0;1	81(4), Trip signal for underfrequency - BI-EvUpd	LD0.FRPTUF4.Op.general
208	FRPFRQ4: 4.OPR_OFRQ.BI-EvUpd	0;1	81(4), Trip signal for overfrequency - BI-EvUpd	LD0.FRPTOF4.Op.general
209	FRPFRQ4: 4.OPR_FRG.BI-EvUpd	0;1	81(4), Trip signal for frequency gradient - BI-EvUpd	LD0.FRPFRC4.Op.general
210	FRPFRQ5: 5.PICKUP.BI-EvUpd	0;1	81(5), Pickup - BI-EvUpd	LD0.FRPTRC5.Str.general
211	FRPFRQ5: 5.OPR_UFRQ.BI-EvUpd	0;1	81(5), Trip signal for underfrequency - BI-EvUpd	LD0.FRPTUF5.Op.general
212	FRPFRQ5: 5.OPR_OFRQ.BI-EvUpd	0;1	81(5), Trip signal for overfrequency - BI-EvUpd	LD0.FRPTOF5.Op.general
213	FRPFRQ5: 5.OPR_FRG.BI-EvUpd	0;1	81(5), Trip signal for frequency gradient - BI-EvUpd	LD0.FRPFRC5.Op.general
214	FRPFRQ6: 6.PICKUP.BI-EvUpd	0;1	81(6), Pickup - BI-EvUpd	LD0.FRPTRC6.Str.general
215	FRPFRQ6: 6.OPR_UFRQ.BI-EvUpd	0;1	81(6), Trip signal for underfrequency - BI-EvUpd	LD0.FRPTUF6.Op.general

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216	FRPFRQ6: 6.OPR_OFRQ.BI-EvUpd	0;1	81(6), Trip signal for overfrequency - BI-EvUpd	LD0.FRPTOF6.Op.general
217	FRPFRQ6: 6.OPR_FRG.BI-EvUpd	0;1	81(6), Trip signal for frequency gradient - BI-EvUpd	LD0.FRPFRC6.Op.general
218	T1PTTR1: 1.PICKUP.BI-EvUpd	0;1	49F(1), Pickup - BI-EvUpd	LD0.T1PTTR1.Str.general
219	T1PTTR1: 1.TRIP.BI-EvUpd	0;1	49F(1), Trip - BI-EvUpd	LD0.T1PTTR1.Op.general
220	ARCSARC1: 11.ARC_FLT_DET.BI-EvUpd	0;1	50L/50NL(1), Fault arc detected=light signal output - BI-EvUpd	LD0.ARCSARC11.FADet.stVal
221	ARCSARC1: 11.TRIP.BI-EvUpd	0;1	50L/50NL(1), Trip - BI-EvUpd	LD0.ARCPTRC11.Op.general
222	ARCSARC2: 21.ARC_FLT_DET.BI-EvUpd	0;1	50L/50NL(2), Fault arc detected=light signal output - BI-EvUpd	LD0.ARCSARC21.FADet.stVal
223	ARCSARC2: 21.TRIP.BI-EvUpd	0;1	50L/50NL(2), Trip - BI-EvUpd	LD0.ARCPTRC21.Op.general
224	ARCSARC3: 31.ARC_FLT_DET.BI-EvUpd	0;1	50L/50NL(3), Fault arc detected=light signal output - BI-EvUpd	LD0.ARCSARC31.FADet.stVal
225	ARCSARC3: 31.TRIP.BI-EvUpd	0;1	50L/50NL(3), Trip - BI-EvUpd	LD0.ARCPTRC31.Op.general
226	HIAPDIF1: 1.PICKUP.BI-EvUpd	0;1	87A(1), Pickup - BI-EvUpd	LD0.HIAPDIF1.Str.general
227	HIAPDIF1: 1.TRIP.BI-EvUpd	0;1	87A(1), Trip - BI-EvUpd	LD0.HIAPDIF1.Op.general
228	HIBPDIF1: 1.PICKUP.BI-EvUpd	0;1	87B(1), Pickup - BI-EvUpd	LD0.HIBPDIF1.Str.general
229	HIBPDIF1: 1.TRIP.BI-EvUpd	0;1	87B(1), Trip - BI-EvUpd	LD0.HIBPDIF1.Op.general
230	HICPDIF1: 1.PICKUP.BI-EvUpd	0;1	87C(1), Pickup - BI-EvUpd	LD0.HICPDIF1.Str.general
231	HICPDIF1: 1.TRIP.BI-EvUpd	0;1	87C(1), Trip - BI-EvUpd	LD0.HICPDIF1.Op.general
232	PHIZ1: 1.Pickup.BI-EvUpd	0;1	HIZ-1, Pickup - BI-EvUpd	LD0.PHIZ1.Str.general
233	PHIZ1: 1.TRIP.BI-EvUpd	0;1	HIZ-1, Trip - BI-EvUpd	LD0.PHIZ1.Op.general
234	MNSPTOC1: 1.PICKUP.BI-EvUpd	0;1	46M(1), Pickup - BI-EvUpd	LD0.MNSPTOC1.Str.general
235	MNSPTOC1: 1.TRIP.BI-EvUpd	0;1	46M(1), Trip - BI-EvUpd	LD0.MNSPTOC1.Op.general
236	MNSPTOC2: 2.PICKUP.BI-EvUpd	0;1	46M(2), Pickup - BI-EvUpd	LD0.MNSPTOC2.Str.general
237	MNSPTOC2: 2.TRIP.BI-EvUpd	0;1	46M(2), Trip - BI-EvUpd	LD0.MNSPTOC2.Op.general

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238	LOFLPTUC1: 1.PICKUP.BI-EvUpd	0;1	37(1), Pickup - BI-EvUpd	LD0.LOFLPTUC1.Str.general
239	LOFLPTUC1: 1.TRIP.BI-EvUpd	0;1	37(1), Trip - BI-EvUpd	LD0.LOFLPTUC1.Op.general
240	LOFLPTUC2: 2.PICKUP.BI-EvUpd	0;1	37(2), Pickup - BI-EvUpd	LD0.LOFLPTUC2.Str.general
241	LOFLPTUC2: 2.TRIP.BI-EvUpd	0;1	37(2), Trip - BI-EvUpd	LD0.LOFLPTUC2.Op.general
242	JAMPTOC1: 1.TRIP.BI-EvUpd	0;1	51LR(1), Trip - BI-EvUpd	LD0.JAMPTOC1.Op.general
243	JAMPTOC2: 1.TRIP.BI-EvUpd	0;1	51LR(2), Trip - BI-EvUpd	LD0.JAMPTOC2.Op.general
244	STTPMSU1: 1.LOCK_PICKUP.BI-EvUpd	0;1	49,66,48,51LR(1), Lock out condition for rePickup of motor. - BI-EvUpd	LD0.STTPMRI1.StrInh.stVal
245	STTPMSU1: 1.MOT_PICKUP.BI-EvUpd	0;1	49,66,48,51LR(1), Signal to show that motor Pickupup is in progress - BI-EvUpd	LD0.STTPMSS1.Str.general
246	STTPMSU1: 1.OPR_IIT.BI-EvUpd	0;1	49,66,48,51LR(1), Trip/Trip signal for thermal stress. - BI-EvUpd	LD0.STTPMRI1.Op.general
247	STTPMSU1: 1.OPR_STALL.BI-EvUpd	0;1	49,66,48,51LR(1), Trip/Trip signal for stalling protection. - BI-EvUpd	LD0.STTPMSS1.Op.general
248	PREVPTOC1: 1.PICKUP.BI-EvUpd	0;1	46R(1), Pickup - BI-EvUpd	LD0.PREVPTOC1.Str.general
249	PREVPTOC1: 1.TRIP.BI-EvUpd	0;1	46R(1), Trip - BI-EvUpd	LD0.PREVPTOC1.Op.general
250	MPTTR1: 1.ALARM.BI-EvUpd	0;1	49M(1), Thermal Alarm - BI-EvUpd	LD0.MPTTR1.AlmThm.stVal
251	MPTTR1: 1.BLK_REPICKUP.BI-EvUpd	0;1	49M(1), Thermal overload indicator, to inhibit rePickup - BI-EvUpd	LD0.MPTTR1.BlkThm.stVal
252	MPTTR1: 1.TRIP.BI-EvUpd	0;1	49M(1), Trip - BI-EvUpd	LD0.MPTTR1.Op.general
253	MPDIF1: 1.TRIP.BI-EvUpd	0;1	87M/G(1), Trip - BI-EvUpd	LD0.MPTRC1.Op.general
254	OEPVPH1: 1.PICKUP.BI-EvUpd	0;1	24(1), Pickuped - BI-EvUpd	LD0.OEPVPH1.Str.general
255	OEPVPH1: 1.TRIP.BI-EvUpd	0;1	24(1), Tripd - BI-EvUpd	LD0.OEPVPH1.Op.general
256	OEPVPH2: 2.PICKUP.BI-EvUpd	0;1	24(2), Pickuped - BI-EvUpd	LD0.OEPVPH2.Str.general
257	OEPVPH2: 2.TRIP.BI-EvUpd	0;1	24(2), Tripd - BI-EvUpd	LD0.OEPVPH2.Op.general
258	T2PTTR1: 1.PICKUP.BI-EvUpd	0;1	49T(1), Pickup - BI-EvUpd	LD0.T2PTTR1.Str.general
259	T2PTTR1: 1.TRIP.BI-EvUpd	0;1	49T(1), Trip - BI-EvUpd	LD0.T2PTTR1.Op.general

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260	TR2PTDF1: 1.TRIP.BI-EvUpd	0;1	87T, Trip combined - BI-EvUpd	LD0.TR2PTRC1.Op.general
261	LREFPNDF1: 1.PICKUP.BI-EvUpd	0;1	87LOZREF(2), Pickup - BI-EvUpd	LD0.LREFPDIF1.Str.general
262	LREFPNDF1: 1.TRIP.BI-EvUpd	0;1	87LOZREF(2), Trip - BI-EvUpd	LD0.LREFPDIF1.Op.general
263	CCBRBRF1: 1.TRRET.BI-EvUpd	0;1	50BF(1), ReTrip - BI-EvUpd	LD0.CCBRBRF1.OpIn.general
264	CCBRBRF1: 1.TRBU.BI-EvUpd	0;1	50BF(1), Backup Trip - BI-EvUpd	LD0.CCBRBRF1.OpEx.general
265	CCBRBRF2: 2.TRRET.BI-EvUpd	0;1	50BF(2), ReTrip - BI-EvUpd	LD0.CCBRBRF2.OpIn.general
266	CCBRBRF2: 2.TRBU.BI-EvUpd	0;1	50BF(2), Backup Trip - BI-EvUpd	LD0.CCBRBRF2.OpEx.general
267	LNPLDF1: 1.PICKUP.BI-EvUpd	0;1	87L-1, Pickup - BI-EvUpd	LD0.LNPTRC1.Str.general
268	LNPLDF1: 1.TRIP.BI-EvUpd	0;1	87L-1, Trip - BI-EvUpd	LD0.LNPTRC1.Op.general
269	H3EFPSEF1: 1.PICKUP.BI-EvUpd	0;1	27/59THN, Pickup (LD0.H3EFPTRC1.Str.general) - BI-EvUpd	LD0.H3EFPTRC1.Str.general
270	H3EFPSEF1: 1.TRIP.BI-EvUpd	0;1	27/59THN, Trip (LD0.H3EFPTRC1.Op.general) - BI-EvUpd	LD0.H3EFPTRC1.Op.general
271	DUPPDPR1: 1.PICKUP.BI-EvUpd	0;1	32U-1, Pickup (LD0.DPPDUP1.Str.general) - BI-EvUpd	LD0.DPPDUP1.Str.general
272	DUPPDPR1: 1.TRIP.BI-EvUpd	0;1	32U-1, Trip (LD0.DPPDUP1.Op.general) - BI-EvUpd	LD0.DPPDUP1.Op.general
273	DUPPDPR2: 2.PICKUP.BI-EvUpd	0;1	32U-2, Pickup (LD0.DPPDUP2.Str.general) - BI-EvUpd	LD0.DPPDUP2.Str.general
274	DUPPDPR2: 2.TRIP.BI-EvUpd	0;1	32U-2, Trip (LD0.DPPDUP2.Op.general) - BI-EvUpd	LD0.DPPDUP2.Op.general
275	DOPPDPR1: 1.PICKUP.BI-EvUpd	0;1	32R-32, Pickup (LD0.DPPDOP1.Str.general) - BI-EvUpd	LD0.DPPDOP1.Str.general
276	DOPPDPR1: 1.TRIP.BI-EvUpd	0;1	32R-32, Trip (LD0.DPPDOP1.Op.general) - BI-EvUpd	LD0.DPPDOP1.Op.general
277	DOPPDPR2: 2.PICKUP.BI-EvUpd	0;1	32R-32, Pickup (LD0.DPPDOP2.Str.general) - BI-EvUpd	LD0.DPPDOP2.Str.general
278	DOPPDPR2: 2.TRIP.BI-EvUpd	0;1	32R-32, Trip (LD0.DPPDOP2.Op.general) - BI-EvUpd	LD0.DPPDOP2.Op.general
279	DOPPDPR3: 3.PICKUP.BI-EvUpd	0;1	32R-32, Pickup (LD0.DPPDOP3.Str.general) - BI-EvUpd	LD0.DPPDOP3.Str.general
280	DOPPDPR3: 3.TRIP.BI-EvUpd	0;1	32R-32, Trip (LD0.DPPDOP3.Op.general) - BI-EvUpd	LD0.DPPDOP3.Op.general
281	UEXPDIS1: 1.PICKUP.BI-EvUpd	0;1	40-1, Pickup (LD0.UEXPDIS1.Str.general) - BI-EvUpd	LD0.UEXPDIS1.Str.general

Table continues on next page

Index	Name	Class	Description	IEC 61850 name
282	UEXPDIS1: 1.TRIP.BI-EvUpd	0;1	40-1, Trip (LD0.UEXPDIS1.Op.general) - BI-EvUpd	LD0.UEXPDIS1.Op.general
283	UZPDIS1: 1.PICKUP.BI-EvUpd	0;1	21G-1, Pickup (LD0.UZPDIS1.Str.general) - BI-EvUpd	LD0.UZPDIS1.Str.general
284	UZPDIS1: 1.TRIP.BI-EvUpd	0;1	21G-1, Trip (LD0.UZPDIS1.Op.general) - BI-EvUpd	LD0.UZPDIS1.Op.general
285	OOSRPSB1: 1.RPSB_Op_general.BI-EvUpd	0;1	78-1, RPSB_Op_general_DESC - BI-EvUpd	LD0.OOSRPSB1.Op.general
286	CBPSOF1: 1.TRIP.BI-EvUpd	0;1	SOTF-1, Trip - BI-EvUpd	LD0.CBPSOF1.Op.general
287	PHPVOC1: 1.PICKUP.BI-EvUpd	0;1	51V, Pickup - BI-EvUpd	LD0.PHPVOC1.Str.general
288	PHPVOC1: 1.TRIP.BI-EvUpd	0;1	51V, Trip - BI-EvUpd	LD0.PHPVOC1.Op.general
289	PHPTUC1: 1.PICKUP.BI-EvUpd	0;1	37-1, Pickup - BI-EvUpd	LD0.PHPTUC1.Str.general
290	PHPTUC1: 1.TRIP.BI-EvUpd	0;1	37-1, Trip - BI-EvUpd	LD0.PHPTUC1.Op.general
291	DQPTUV1: 1.PICKUP.BI-EvUpd	0;1	32Q-27, Pickup - BI-EvUpd	LD0.DQPTUV1.Str.general
292	DQPTUV1: 1.TRIP.BI-EvUpd	0;1	32Q-27, Trip - BI-EvUpd	LD0.DQPTUV1.Op.general
293	LVRTPTUV1: 1.PICKUP.BI-EvUpd	0;1	27RT-1, Pickup - BI-EvUpd	LD0.LVRTPTUV1.Str.general
294	LVRTPTUV1: 1.TRIP.BI-EvUpd	0;1	27RT-1, Trip - BI-EvUpd	LD0.LVRTPTUV1.Op.general
295	LVRTPTUV2: 2.PICKUP.BI-EvUpd	0;1	27RT-2, Pickup - BI-EvUpd	LD0.LVRTPTUV2.Str.general
296	LVRTPTUV2: 2.TRIP.BI-EvUpd	0;1	27RT-2, Trip - BI-EvUpd	LD0.LVRTPTUV2.Op.general
297	LVRTPTUV3: 3.PICKUP.BI-EvUpd	0;1	27RT-3, Pickup - BI-EvUpd	LD0.LVRTPTUV3.Str.general
298	LVRTPTUV3: 3.TRIP.BI-EvUpd	0;1	27RT-3, Trip - BI-EvUpd	LD0.LVRTPTUV3.Op.general
299	VVSPPAM1: 1.TRIP.BI-EvUpd	0;1	78V-1, Trip - BI-EvUpd	LD0.VVSPPAM1.Op.general
300	MAPGAPC1: 1.PICKUP.BI-EvUpd	0;1	MAP-1, Pickup - BI-EvUpd	LD0.MAPGAPC1.Str.general
301	MAPGAPC1: 1.TRIP.BI-EvUpd	0;1	MAP-1, Trip - BI-EvUpd	LD0.MAPGAPC1.Op.general
302	MAPGAPC2: 2.PICKUP.BI-EvUpd	0;1	MAP-2, Pickup - BI-EvUpd	LD0.MAPGAPC2.Str.general
303	MAPGAPC2: 2.TRIP.BI-EvUpd	0;1	MAP-2, Trip - BI-EvUpd	LD0.MAPGAPC2.Op.general

Table continues on next page

Index	Name	Class	Description	IEC 61850 name
304	MAPGAPC3: 3.PICKUP.BI-EvUpd	0;1	MAP-3, Pickup - BI-EvUpd	LD0.MAPGAPC3.Str.general
305	MAPGAPC3: 3.TRIP.BI-EvUpd	0;1	MAP-3, Trip - BI-EvUpd	LD0.MAPGAPC3.Op.general
306	MAPGAPC4: 4.PICKUP.BI-EvUpd	0;1	MAP-4, Pickup - BI-EvUpd	LD0.MAPGAPC4.Str.general
307	MAPGAPC4: 4.TRIP.BI-EvUpd	0;1	MAP-4, Trip - BI-EvUpd	LD0.MAPGAPC4.Op.general
308	MAPGAPC5: 5.PICKUP.BI-EvUpd	0;1	MAP-5, Pickup - BI-EvUpd	LD0.MAPGAPC5.Str.general
309	MAPGAPC5: 5.TRIP.BI-EvUpd	0;1	MAP-5, Trip - BI-EvUpd	LD0.MAPGAPC5.Op.general
310	MAPGAPC6: 6.PICKUP.BI-EvUpd	0;1	MAP-6, Pickup - BI-EvUpd	LD0.MAPGAPC6.Str.general
311	MAPGAPC6: 6.TRIP.BI-EvUpd	0;1	MAP-6, Trip - BI-EvUpd	LD0.MAPGAPC6.Op.general
312	MAPGAPC7: 7.PICKUP.BI-EvUpd	0;1	MAP-7, Pickup - BI-EvUpd	LD0.MAPGAPC7.Str.general
313	MAPGAPC7: 7.TRIP.BI-EvUpd	0;1	MAP-7, Trip - BI-EvUpd	LD0.MAPGAPC7.Op.general
314	MAPGAPC8: 8.PICKUP.BI-EvUpd	0;1	MAP-8, Pickup - BI-EvUpd	LD0.MAPGAPC8.Str.general
315	MAPGAPC8: 8.TRIP.BI-EvUpd	0;1	MAP-8, Trip - BI-EvUpd	LD0.MAPGAPC8.Op.general
316	MAPGAPC9: 9.PICKUP.BI-EvUpd	0;1	MAP-9, Pickup - BI-EvUpd	LD0.MAPGAPC9.Str.general
317	MAPGAPC9: 9.TRIP.BI-EvUpd	0;1	MAP-9, Trip - BI-EvUpd	LD0.MAPGAPC9.Op.general
318	MAPGAPC10: 10.PICKUP.BI-EvUpd	0;1	MAP-10, Pickup - BI-EvUpd	LD0.MAPGAPC10.Str.general
319	MAPGAPC10: 10.TRIP.BI-EvUpd	0;1	MAP-10, Trip - BI-EvUpd	LD0.MAPGAPC10.Op.general
320	MAPGAPC11: 11.PICKUP.BI-EvUpd	0;1	MAP-11, Pickup - BI-EvUpd	LD0.MAPGAPC11.Str.general
321	MAPGAPC11: 11.TRIP.BI-EvUpd	0;1	MAP-11, Trip - BI-EvUpd	LD0.MAPGAPC11.Op.general
322	MAPGAPC12: 12.PICKUP.BI-EvUpd	0;1	MAP-12, Pickup - BI-EvUpd	LD0.MAPGAPC12.Str.general
323	MAPGAPC12: 12.TRIP.BI-EvUpd	0;1	MAP-12, Trip - BI-EvUpd	LD0.MAPGAPC12.Op.general
324	MAPGAPC13: 13.PICKUP.BI-EvUpd	0;1	MAP-13, Pickup - BI-EvUpd	LD0.MAPGAPC13.Str.general
325	MAPGAPC13: 13.TRIP.BI-EvUpd	0;1	MAP-13, Trip - BI-EvUpd	LD0.MAPGAPC13.Op.general

Table continues on next page

Index	Name	Class	Description	IEC 61850 name
326	MAPGAPC14: 14.PICKUP.BI-EvUpd	0;1	MAP-14, Pickup - BI-EvUpd	LD0.MAPGAPC14.Str.general
327	MAPGAPC14: 14.TRIP.BI-EvUpd	0;1	MAP-14, Trip - BI-EvUpd	LD0.MAPGAPC14.Op.general
328	MAPGAPC15: 15.PICKUP.BI-EvUpd	0;1	MAP-15, Pickup - BI-EvUpd	LD0.MAPGAPC15.Str.general
329	MAPGAPC15: 15.TRIP.BI-EvUpd	0;1	MAP-15, Trip - BI-EvUpd	LD0.MAPGAPC15.Op.general
330	MAPGAPC16: 16.PICKUP.BI-EvUpd	0;1	MAP-16, Pickup - BI-EvUpd	LD0.MAPGAPC16.Str.general
331	MAPGAPC16: 16.TRIP.BI-EvUpd	0;1	MAP-16, Trip - BI-EvUpd	LD0.MAPGAPC16.Op.general
332	MAPGAPC17: 17.PICKUP.BI-EvUpd	0;1	MAP-17, Pickup - BI-EvUpd	LD0.MAPGAPC17.Str.general
333	MAPGAPC17: 17.TRIP.BI-EvUpd	0;1	MAP-17, Trip - BI-EvUpd	LD0.MAPGAPC17.Op.general
334	MAPGAPC18: 18.PICKUP.BI-EvUpd	0;1	MAP-18, Pickup - BI-EvUpd	LD0.MAPGAPC18.Str.general
335	MAPGAPC18: 18.TRIP.BI-EvUpd	0;1	MAP-18, Trip - BI-EvUpd	LD0.MAPGAPC18.Op.general

Table 4: Binary outputs

Index	Name	Description	IEC 61850 name
0	CTRL.CBCSWI1 : 1.Switch, general.BO-Double	52(1), Switch, general - BO-Double	CTRL.CBCSWI1.Pos.Oper.ctlVal
1	CTRL.CBCSWI2 : 2.Switch, general.BO-Double	52(2), Switch, general - BO-Double	CTRL.CBCSWI2.Pos.Oper.ctlVal

Table 5: Double input points

Index	Name	Class	Description	IEC61850 name
0	CBXCBR1: 1.POSITION.DP-EvUpd	0;2	Circuit breaker control, Apparatus position indication - DP-EvUpd	CTRL.CBCSWI1.Pos.stVal
1	CBXCBR2: 2.POSITION.DP-EvUpd	0;2	Circuit breaker control, Apparatus position indication - DP-EvUpd	CTRL.CBCSWI2.Pos.stVal

2.3 Binary inputs

Table 6: Explanations of the binary input table columns

Column name	Description
IEC 61850 name	Original IED data object identification. Described in the IEC 61850 format as Logical Device.Logical Node and thereafter .Data Object.Data Attribute. Logical Node is the same as the application function block name.
SA name	The signal may have a defined label that is visible, for example, in the Application Configuration tool in PCM600.
Description	Short description of the signal. See the technical manual for more information.
Value	Meaning of the input states.

2.3.1 System functions

2.3.1.1 CTRL.LLN0 Local/remote state (also present in DNP IIN-bits)

Boolean object CTRL.LLN0.Loc is True (“1”) in states Local and Off. In all other states, including multistates, the object is False (“0”). DNP3 control should be possible when the object is “0”.

Table 7: CTRL.LLN0 Local/remote state (also present in DNP IIN-bits)

IEC 61850 name	SA name	Description	Values
CTRL.LLN0			
.Loc.stVal		Remote/Local state	0/1=Rem/Loc
.LocKeyHMI.stVal		Station state	1=Station

2.3.1.2 LD0.GNRLLTMS1 Time synchronization (1)

Table 8: LD0.GNRLLTMS1 Time synchronization (1)

IEC 61850 name	SA name	Description	Value
LD0.GNRLLTMS1			
.TmChSt1.stVal		Time channel status	0=Up; 1=Down

2.3.1.3 LD0.GSELPRT1 Goose supervision (1)

Table 9: LD0.GSELPRT1 Goose supervision (1)

IEC 61850 name	SA name	Description	Value
LD0.GSELPRT1			
.Alm.stVal	ALARM	Goose alarm	1=Alarm

2.3.1.4 LD0.LDEV1 System values (1)

Table 10: LD0.LDEV1 System values (1)

IEC 61850 name	SA name	Description	Value
LD0.LDEV1			
.StLstOv.stVal		Internal overflow	1=Overflow
.MeasLstOv.stVal		Internal meas overflow	1=Overflow
.ChgFlg.stVal		Configuration changed	1=Changed
.DevFail.stVal		Internal Relay Fault	1=Fault

2.3.1.5 LD0.LEDGGIO1 Indication LED states OFF/ColorX

These LED indication points interpret the case when an indication signal is wired to either the OK or ALARM input of the LED function block. The default color for ALARM is red and for OK green. Colors can, however, be reconfigured with a setting parameter.

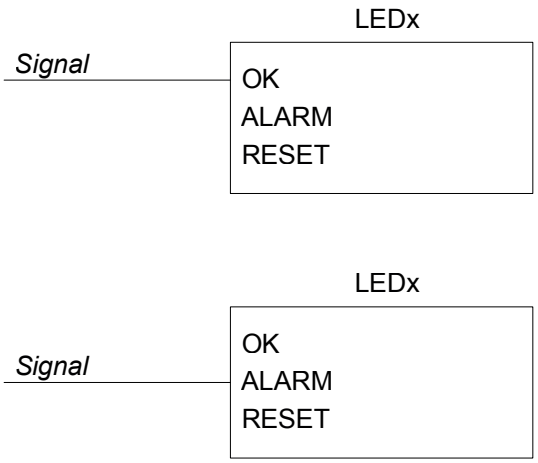

Figure 2: Signal wired to either OK or Alarm input

Table 11: LD0.LEDGGIO1 LHMI LED indications OFF/ColorX

IEC 61850 name	SA name	Description	Values
LD0.LEDGGIO1			
.LEDSt1.stVal		LED State 1 - Off/Color	0/1=Off/Color
.LEDSt2.stVal		LED State 2 - Off/Color	0/1=Off/Color
.LEDSt3.stVal		LED State 3 - Off/Color	0/1=Off/Color
.LEDSt4.stVal		LED State 4 - Off/Color	0/1=Off/Color
.LEDSt5.stVal		LED State 5 - Off/Color	0/1=Off/Color

Table continues on next page

IEC 61850 name	SA name	Description	Values
.LEDSt6.stVal		LED State 6 - Off/Color	0/1=Off/Color
.LEDSt7.stVal		LED State 7 - Off/Color	0/1=Off/Color
.LEDSt8.stVal		LED State 8 - Off/Color	0/1=Off/Color
.LEDSt9.stVal		LED State 9 - Off/Color	0/1=Off/Color
.LEDSt10.stVal		LED State 10 - Off/Color	0/1=Off/Color
.LEDSt11.stVal		LED State 11 - Off/Color	0/1=Off/Color

2.3.1.6 LD0.LEDGGIO1 Indication LED states Color1/Color2

These LED indication points interpret the case when a signal is wired to both the OK and ALARM inputs, but inverted to the other. This means that the LED toggles between red and green colors. The default color for ALARM is red and for OK green. Colors can, however, be reconfigured with a setting parameter.

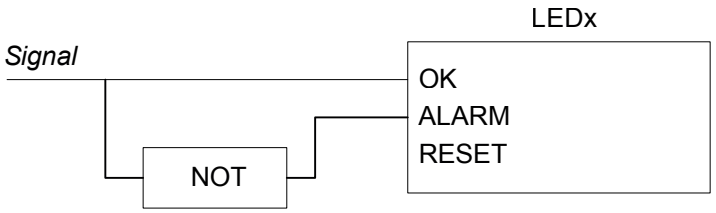

Figure 3: Signal wired to both OK and ALARM inputs – inverted to the other

If the OK and ALARM inputs are wired to separate indication signals, the LED will have three legal states and cannot be expressed with one bit only. In this case, it is possible to combine this LED bit interpretation with the corresponding value from the other LED state interpretation.

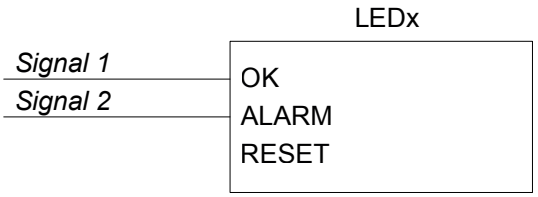

Figure 4: Separate signals wired to OK and ALARM inputs

Table 12: LD0.LEDGGIO1 LHMI LED indications - two state cases (1)

IEC 61850 name	SA name	Description	Values
LD0.LEDGGIO1			
.LEDSt1.stVal		LED State 1 - Color 1/Color 2	0/1=Color 1/Color 2
.LEDSt2.stVal		LED State 2 - Color 1/Color 2	0/1=Color 1/Color 2
.LEDSt3.stVal		LED State 3 - Color 1/Color 2	0/1=Color 1/Color 2
.LEDSt4.stVal		LED State 4 - Color 1/Color 2	0/1=Color 1/Color 2
.LEDSt5.stVal		LED State 5 - Color 1/Color 2	0/1=Color 1/Color 2
.LEDSt6.stVal		LED State 6 - Color 1/Color 2	0/1=Color 1/Color 2
.LEDSt7.stVal		LED State 7 - Color 1/Color 2	0/1=Color 1/Color 2
.LEDSt8.stVal		LED State 8 - Color 1/Color 2	0/1=Color 1/Color 2
.LEDSt9.stVal		LED State 9 - Color 1/Color 2	0/1=Color 1/Color 2
.LEDSt10.stVal		LED State 10 - Color 1/Color 2	0/1=Color 1/Color 2
.LEDSt11.stVal		LED State 11 - Color 1/Color 2	0/1=Color 1/Color 2

2.3.1.7 LD0.PCSITPC1 Protection communication supervision (1) – PCS-1

Table 13: LD0.PCSITPC1 Protection communication supervision (1) – PCS-1

IEC 61850 name	SA name	Description	Value
LD0.PCSITPC1			
.HealthAlm.stVal	ALARM	Protection communication alarm	1=Alarm

2.3.1.8 LD0.RCHLCCH1 Redundant Ethernet supervision (1)

Table 14: LD0.RCHLCCH1 Redundant Ethernet supervision (1)

IEC 61850 name	SA name	Description	Value
LD0.RCHLCCH1			
.ChLiv.stVal	CHLIV	Ethernet channel live	1=Live
.RedChLiv.stVal	REDCHLIV	Redundant Ethernet channel live	1=Live

2.3.1.9 LD0.SCHLCCHx Ethernet channel supervision (1...3)

Table 15: LD0.SCHLCCHx Ethernet channel supervision (1...3)

IEC 61850 name	SA name	Description	Value
LD0.SCHLCCH1			
.ChLiv.stVal	CH1LIV	Ethernet channel 1 live	1=Live
LD0.SCHLCCH2			
.ChLiv.stVal	CH2LIV	Ethernet channel 2 live	1=Live
LD0.SCHLCCH3			
.ChLiv.stVal	CH3LIV	Ethernet channel 2 live	1=Live

2.3.2 Switchgear functions

2.3.2.1 CTRL.CBXCBR1 Circuit breaker control (1) – 52-1

Table 16: CTRL.CBXCBR1 Circuit breaker control (1) – 52-1

IEC 61850 name	SA name	Description	Values
CTRL.CBCILO1			
.EnaCls.stVal	ENA_CLOSE	Close enabled	1=Enabled
.EnaOpn.stVal	ENA_OPEN	Open enabled	1=Enabled
CTRL.CBCSWI1			
.SynItlByps.stVal	ITL_BYPASS	Interlocking bypass	1=Bypassed
.Pos.stSeld	SELECTED	CB selected	1=Selected
CTRL.CBXCBR1			
.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked
LD0.CCBRBRF1			
.OpEx.general	TRBU	Failure ext.trip	1=Failure
.OpIn.general	TRRET	Trip, re-trip	1=Trip
.Str.general	CB_FAULT_AL	Pickup, timer running	1=Pickup

2.3.2.2 CTRL.CBXCBR2 Circuit breaker control (2) – 52-2

Table 17: CTRL.CBXCBR2 Circuit breaker control (2) – 52-2

IEC 61850 name	SA name	Description	Value
CTRL.CBCILO2			
.EnaCls.stVal	ENA_CLOSE	Close enabled	1=Enabled
.EnaOpn.stVal	ENA_OPEN	Open enabled	1=Enabled
.ItlByPss.stVal	ITL_BYPASS	Interlocking bypass	1=Bypassed
CTRL.CBCSWI2			
.Pos.stSeld	SELECTED	CB selected	1=Selected
CTRL.CBXCBR2			
.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked
LD0.CCBRBRF2			
.OpEx.general	TRBU	Failure ext.trip	1=Failure
.OpIn.general	TRRET	Trip, re-trip	1=Trip
.Str.general	CB_FAULT_AL	Pickup, timer running	1=Pickup

2.3.2.3 CTRL.DCXSWI1 Disconnector control (1) – 29DS-1

Table 18: CTRL.DCXSWI1 Disconnector control (1) – 29DS-1

IEC 61850 name	SA name	Description	Values
CTRL.DCCILO1			
.EnaCls.stVal	ENA_CLOSE	Close enabled	1=Enabled
.EnaOpn.stVal	ENA_OPEN	Open enabled	1=Enabled
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	1=Bypassed
CTRL.DCCSWI1			
.Pos.stSeld	SELECTED	CB selected	1=Selected
CTRL.DCXSWI1			
.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked

2.3.2.4 CTRL.DCXSWI2 Disconnector control (2) – 29DS-2

Table 19: CTRL.DCXSWI2 Disconnector control (2) – 29DS-2

IEC 61850 name	SA name	Description	Values
CTRL.DCCILO2			
.EnaCls.stVal	ENA_CLOSE	Close enabled	1=Enabled
.EnaOpn.stVal	ENA_OPEN	Open enabled	1=Enabled
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	1=Bypassed
CTRL.DCCSWI2			
.Pos.stSeld	SELECTED	CB selected	1=Selected
CTRL.DCXSWI2			
.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked

2.3.2.5 CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1

Table 20: CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1

IEC 61850 name	SA name	Description	Values
CTRL.ESCILO1			
.EnaCls.stVal	ENA_CLOSE	Close enabled	1=Enabled
.EnaOpn.stVal	ENA_OPEN	Open enabled	1=Enabled
.ItlByps.stVal	ITL_BYPASS	Interlocking bypass	1=Bypassed
CTRL.ESCSWI1			
.Pos.stSeld	SELECTED	CB selected	1=Selected
CTRL.ESXSWI1			
.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked

2.3.3 Sensors and monitoring functions

2.3.3.1 LD0.ARCSARC1 Arc protection (1) – AFD-1

Table 21: LD0.ARCSARC1 Arc protection (1) – AFD-1

IEC 61850 name	SA name	Description	Values
LD0.ARCSARC11			
.FADet.stVal	ARC_FLT_DET	Arc detected	1=Detected
LD0.ARCPTRC11			
.Op.general	TRIP	Trip	1=Trip

2.3.3.2 LD0.ARCSARC2 Arc protection (2) – AFD-2

Table 22: LD0.ARCSARC2 Arc protection (2) – AFD-2

IEC 61850 name	SA name	Description	Values
LD0.ARCSARC21			
.FADet.stVal	ARC_FLT_DET	Arc detected	1=Detected
LD0.ARCPTRC21			
.Op.general	TRIP	Trip	1=Trip

2.3.3.3 LD0.ARCSARC3 Arc protection (3) – AFD-3

Table 23: LD0.ARCSARC3 Arc protection (3) – AFD-3

IEC 61850 name	SA name	Description	Values
LD0.ARCSARC31			
.FADet.stVal	ARC_FLT_DET	Arc detected	1=Detected
LD0.ARCPTRC31			
.Op.general	TRIP	Trip	1=Trip

2.3.3.4 LD0.BSTGGIO1 Binary signal transfer (1) – BST-1

Table 24: LD0.BSTGGIO1 Binary signal transfer (1) – BST-1

IEC 61850 name	SA name	Description	Values
LD0.BSTGGIO1			
.Alm1.stVal	SEND_SIG_A	Send alarm	1=Alarm
.Alm2.stVal	RECV_SIG_A	Receive alarm	1=Alarm

2.3.3.5 LD0.HZCCASPVC1 Current transformer supervision for high-impedance protection scheme for phase A (1) – MCS-A

Table 25: LD0.HZCCASPVC1 Current transformer supervision for high-impedance protection scheme for phase A (1) – MCS-A

IEC 61850 name	SA name	Description	Value
LD0.HZCCASPVC1			
.Alm.stVal	ALARM	Phase A alarm	1=Alarm

2.3.3.6 LD0.HZCCBSPVC1 Current transformer supervision for high-impedance protection scheme for phase B (1) – MCS-B

Table 26: LD0.HZCCBSPVC1 Current transformer supervision for high-impedance protection scheme for phase B (1) – MCS-B

IEC 61850 name	SA name	Description	Value
LD0.HZCCBSPVC1			
.Alm.stVal	ALARM	Phase A alarm	1=Alarm

2.3.3.7 LD0.HZCCCSPVC1 Current transformer supervision for high-impedance protection scheme for phase C (1) – MCS-C

Table 27: LD0.HZCCCSPVC1 Current transformer supervision for high-impedance protection scheme for phase C (1) – MCS-C

IEC 61850 name	SA name	Description	Value
LD0.HZCCCSPVC1			
.Alm.stVal	ALARM	Phase A alarm	1=Alarm

2.3.3.8 LD0.IL1TCTR1 Three-phase CT supervision (1)

Table 28: LD0.IL1TCTR1 Three-phase CT supervision (1)

IEC 61850 name	SA name	Description	Values
LD0.IL1TCTR1			
.Alm.stVal	ALARM	Alarm	1=Alarm
.Wrn.stVal	WARNING	Warning	1=Warning

2.3.3.9 LD0.IL1TCTR2 Three-phase CT supervision (2)

Table 29: LD0.IL1TCTR2 Three-phase CT supervision (2)

IEC 61850 name	SA name	Description	Values
LD0.IL1TCTR2			
.Alm.stVal	ALARM	Alarm	1=Alarm
.Wrn.stVal	WARNING	Warning	1=Warning

2.3.3.10 LD0.MDSOPT1 Runtime counter for machines and devices (1) – OPTM-1

Table 30: LD0.MDSOPT1 Runtime counter for machines and devices (1) – OPTM-1

IEC 61850 name	SA name	Description	Values
LD0.MDSOPT1			
.OpTmAlm.stVal	ALARM	Accum. op. time alarm	1=Alarm
.OpTmWrn.stVal	WARNING	Accum. op. time warning	1=Warning

2.3.3.11 LD0.RESTCTR1 Io CT supervision (1)

Table 31: LD0.RESTCTR1 Io CT supervision (1)

IEC 61850 name	SA name	Description	Values
LD0.RESTCTR1			
.Alm.stVal	ALARM	Alarm	1=Alarm
.Wrn.stVal	WARNING	Warning	1=Warning

2.3.3.12 LD0.RESTCTR2 Io CT supervision (2)

Table 32: LD0.RESTCTR2 Io CT supervision (2)

IEC 61850 name	SA name	Description	Values
LD0.RESTCTR2			
.Alm.stVal	ALARM	Alarm	1=Alarm
.Wrn.stVal	WARNING	Warning	1=Warning

2.3.3.13 LD0.RESTVTR1 Uo VT supervision (1)

Table 33: LD0.RESTVTR1 Uo VT supervision (1)

IEC 61850 name	SA name	Description	Values
LD0.RESTVTR1			
.Alm.stVal	ALARM	Alarm	1=Alarm
.Wrn.stVal	WARNING	Warning	1=Warning

2.3.3.14 LD0.RESTVTR2 Uo VT supervision (2)

Table 34: LD0.RESTVTR2 Uo VT supervision (2)

IEC 61850 name	SA name	Description	Values
LD0.RESTVTR2			
.Alm.stVal	ALARM	Alarm	1=Alarm
.Wrn.stVal	WARNING	Warning	1=Warning

2.3.3.15 LD0.SSCBR1 Circuit-breaker condition monitoring (1) – 52CM-1

Table 35: LD0.SSCBR1 Circuit-breaker condition monitoring (1) – 52CM-1

IEC 61850 name	SA name	Description	Values
LD0.SSCBR1			
.OpCntAlm.stVal	OPR_ALM	CB operations alarm	1=Alarm
.OpnAlm.stVal	TRV_T_OP_ALM	Cls travel time alarm	1=Alarm
.ClsAlm.stVal	TRV_T_CL_ALM	Cls travel time alarm	1=Alarm
.OpCntLO.stVal	OPR_LO	CB operations lockout	1=Lockout
.LonTmAlm.stVal	MON_ALM	CB inactive alarm	1=Alarm
.APwrAlm.stVal	IPOW_ALM	Iyt alarm	1=Alarm
.APwrLO.stVal	IPOW_LO	Iyt lockout	1=Lockout
.RmnNumOpAlm.stVal	CB_LIFE_ALM	CB lifetime alarm	1=Alarm
LD0.SSIMG1			
.InsAlm.stVal	PRES_ALM	Low pressure alarm	1=Alarm
.InsBlk.stVal	PRES_LO	Low pressure lockout	1=Lockout
LD0.SSOPM1			
.SprChaAlm.stVal	SPR_CHR_ALM	Spring charge time alarm	1=Alarm

2.3.3.16 LD0.SSCBR2 Circuit-breaker condition monitoring (2) – 52CM-2

Table 36: LD0.SSCBR2 Circuit-breaker condition monitoring (2) – 52CM-2

IEC 61850 name	SA name	Description	Value
LD0.SSCBR2			
.OpCntAlm.stVal	OPR_ALM	CB operations alarm	1=Alarm
.OpnAlm.stVal	TRV_T_OP_ALM	Cls travel time alarm	1=Alarm
.ClsAlm.stVal	TRV_T_CL_ALM	Cls travel time alarm	1=Alarm
.OpCntLO.stVal	OPR_LO	CB operations lockout	1=Lockout
.LonTmAlm.stVal	MON_ALM	CB inactive alarm	1=Alarm
Table continues on next page			

IEC 61850 name	SA name	Description	Value
.APwrAlm.stVal	IPOW_ALM	Iyt alarm	1=Alarm
.APwrLO.stVal	IPOW_LO	Iyt lockout	1=Lockout
.RmnNumOpAlm.stVal	CB_LIFE_ALM	CB lifetime alarm	1=Alarm
LD0.SSIMG2			
.InsAlm.stVal	PRES_ALM	Low pressure alarm	1=Alarm
.InsBlk.stVal	PRES_LO	Low pressure lockout	1=Lockout
LD0.SSOPM2			
SprChaAlm.stVal	SPR_CHR_ALM	Spring charge time alarm	1=Alarm
LD0.SSCBR2			
.OpCntAlm.stVal	OPR_ALM	CB operations alarm	1=Alarm
.OpnAlm.stVal	TRV_T_OP_ALM	Cls travel time alarm	1=Alarm
.ClsAlm.stVal	TRV_T_CL_ALM	Cls travel time alarm	1=Alarm
.OpCntLO.stVal	OPR_LO	CB operations lockout	1=Lockout
.LonTmAlm.stVal	MON_ALM	CB inactive alarm	1=Alarm
.APwrAlm.stVal	IPOW_ALM	Iyt alarm	1=Alarm
.APwrLO.stVal	IPOW_LO	Iyt lockout	1=Lockout
.RmnNumOpAlm.stVal	CB_LIFE_ALM	CB lifetime alarm	1=Alarm
LD0.SSIMG1			
.InsAlm.stVal	PRES_ALM	Low pressure alarm	1=Alarm
.InsBlk.stVal	PRES_LO	Low pressure lockout	1=Lockout
LD0.SSOPM1			
SprChaAlm.stVal	SPR_CHR_ALM	Spring charge time alarm	1=Alarm

2.3.3.17 LD0.TCSSCBR1 Trip circuit supervision (1) – TCM-1

Table 37: LD0.TCSSCBR1 Trip circuit supervision (1) – TCM-1

IEC 61850 name	SA name	Description	Values
LD0.TCSSCBR1			
.CircAlm.stVal	ALARM	Supervision alarm	1=Alarm

2.3.3.18 LD0.TCSSCBR2 Trip circuit supervision (2) – TCM-2

Table 38: LD0.TCSSCBR2 Trip circuit supervision (2) – TCM-2

IEC 61850 name	SA name	Description	Values
LD0.TCSSCBR2			
.CircAlm.stVal	ALARM	Supervision alarm	1=Alarm

2.3.3.19 LD0.UL1TVTR1 Three-phase VT supervision (1)

Table 39: LD0.UL1TVTR1 Three-phase VT supervision (1)

IEC 61850 name	SA name	Description	Values
LD0.UL1TVTR1			
.Alm.stVal	ALARM	Alarm	1=Alarm
.Wrn.stVal	WARNING	Warning	1=Warning

2.3.3.20 LD0.UL1TVTR2 Three-phase VT supervision (2)

Table 40: LD0.UL1TVTR2 Three-phase VT supervision (2)

IEC 61850 name	SA name	Description	Values
LD0.UL1TVTR2			
.Alm.stVal	ALARM	Alarm	1=Alarm
.Wrn.stVal	WARNING	Warning	1=Warning

2.3.3.21 LD0.XARGGI0130 Alarm/warning

Table 41: LD0.XARGGI0130 Alarm/warning

IEC 61850 name	SA name	Description	Values
LD0.XARGGIO130			
.Alm.stVal		XARGGIO130 Alarm	1=Alarm
.Wrn.stVal		XARGGIO130 Warning	1=Warning

2.3.3.22 LD0.XRGGIO130 Alarm/warning

Table 42: LD0.XRGGIO130 Alarm/warning

IEC 61850 name	SA name	Description	Values
LD0.XRGGIO130			
.Alm.stVal	-	XRGGIO130 Alarm	1=Alarm
.Wrn.stVal	-	XRGGIO130 Warning	1=Warning

2.3.4 Metering and measurand functions

2.3.4.1 LD0.CMMXU1 Three-phase current measurement (1) – IA, IB, IC-1

Table 43: LD0.CMMXU1 Three-phase current measurement (1) – IA, IB, IC-1

IEC 61850 name	SA name	Description	Values
LD0.CMMXU1			
.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
.HiWrn.stVal	HIGH_WARN	High warning	1=Warning
.LoAlm.stVal	LOW_ALARM	Low alarm	1=Alarm
.LoWrn.stVal	LOW_WARN	Low warning	1=Warning

2.3.4.2 LD0.CMMXU2 Three-phase current measurement (2) – IA, IB, IC-2

Table 44: LD0.CMMXU2 Three-phase current measurement (2) – IA, IB, IC-2

IEC 61850 name	SA name	Description	Values
LD0.CMMXU2			
.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
.HiWrn.stVal	HIGH_WARN	High warning	1=Warning
.LoAlm.stVal	LOW_ALARM	Low alarm	1=Alarm
.LoWrn.stVal	LOW_WARN	Low warning	1=Warning

2.3.4.3 LD0.RESCMMXU1 Residual current measurement (1) – IG-1

Table 45: LD0.RESCMMXU1 Residual current measurement (1) – IG-1

IEC 61850 name	SA name	Description	Values
LD0.RESCMMXU1			
.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
.HiWrn.stVal	HIGH_WARN	High warning	1=Warning

2.3.4.4 LD0.RESCMMXU2 Residual current measurement (2) – IG-2

Table 46: LD0.RESCMMXU2 Residual current measurement (2) – IG-2

IEC 61850 name	SA name	Description	Values
LD0.RESCMMXU2			
.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
.HiWrn.stVal	HIGH_WARN	High warning	1=Warning

2.3.4.5 LD0.RESVMMXU1 Residual voltage measurement (1) – VG-1

Table 47: LD0.RESVMMXU1 Residual voltage measurement (1) – VG-1

IEC 61850 name	SA name	Description	Values
LD0.RESVMMXU1			
.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
.HiWrn.stVal	HIGH_WARN	High warning	1=Warning

2.3.4.6 LD0.RESVMMXU2 Residual voltage measurement (2) – VG-2

Table 48: LD0.RESVMMXU2 Residual voltage measurement (2) – VG-2

IEC 61850 name	SA name	Description	Values
LD0.RESVMMXU2			
.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
.HiWrn.stVal	HIGH_WARNING	High warning	1=Warning

2.3.4.7 LD0.VMMXU1 Three-phase voltage measurement (1) – VA, VB, BC

Table 49: LD0.VMMXU1 Three-phase voltage measurement (1) – VA, VB, BC

IEC 61850 name	SA name	Description	Values
LD0.VMMXU1			
.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
.HiWrn.stVal	HIGH_WARN	High warning	1=Warning
.LoAlm.stVal	LOW_ALARM	Low alarm	1=Alarm
.LoWrn.stVal	LOW_WARN	Low warning	1=Warning

2.3.4.8 LD0.VMMXU2 Three-phase voltage measurement (2) – VA, VB, VC (2)

Table 50: LD0.VMMXU2 Three-phase voltage measurement (2) – VA, VB, VC (2)

IEC 61850 name	SA name	Description	Values
LD0.VMMXU2			
.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
.HiWrn.stVal	HIGH_WARN	High warning	1=Warning
.LoAlm.stVal	LOW_ALARM	Low alarm	1=Alarm
.LoWrn.stVal	LOW_WARN	Low warning	1=Warning

2.3.5 Power quality functions

2.3.5.1 LD0.CMHAI1 Current total demand distortion (1) – PQI-1

Table 51: LD0.CMHAI1 Current total demand distortion (1) – PQI-1

IEC 61850 name	SA name	Description	Values
LD0.CMHAI1			
.Alm.stVal	ALARM	Distortion alarm	10=Alarm

2.3.5.2 LD0.CMHAI2 Current total demand distortion (2) – PQI-2

Table 52: LD0.CMHAI2 Current total demand distortion (2) – PQI-2

IEC 61850 name	SA name	Description	Values
LD0.CMHAI2			
.Alm.stVal	ALARM	Distortion alarm	1=Alarm

2.3.5.3 LD0.PHQVVR1 Voltage variation (1) – PQSS-1

Table 53: LD0.PHQVVR1 Voltage variation (1) – PQSS-1

IEC 61850 name	SA name	Description	Values
LD0.PH1QVVR1			
.VarStrGen.stVal	-	Variation event detected	1=Detected
.VarEnd.stVal	-	Variation event ended	1=Ended
.SwlOp.stVal	-	Swell event detected	1=Detected
.DipOp.stVal	-	Dip event detected	1=Detected
.IntrOp.stVal	-	Interruption event detected	1=Detected

2.3.5.4 LD0.PHQVVR2 Voltage variation (2) – PQSS-2

Table 54: LD0.PHQVVR2 Voltage variation (2) – PQSS-2

IEC 61850 name	SA name	Description	Value
LD0.PH1QVVR2			
.VarStrGen.stVal	-	Variation event detected	1=Detected
.VarEnd.stVal	-	Variation event ended	1=Ended
.SwlOp.stVal	-	Swell event detected	1=Detected
.DipOp.stVal	-	Dip event detected	1=Detected
.IntrOp.stVal	-	Interruption event detected	1=Detected

2.3.5.5 LD0.VMHAI1 Voltage total harmonic distortion (1) – PQVPH-1

Table 55: LD0.VMHAI1 Voltage total harmonic distortion (1) – PQVPH-1

IEC 61850 name	SA name	Description	Values
LD0.VMHAI1			
.Alm.stVal	-	Distortion alarm	1=Alarm

2.3.5.6 LD0.VMHAI2 Voltage total harmonic distortion (2) – PQVPH-2

Table 56: LD0.VMHAI2 Voltage total harmonic distortion (2) – PQVPH-2

IEC 61850 name	SA name	Description	Values
LD0.VMHAI2			
.Alm.stVal	ALARM	Distortion alarm	1=Alarm

2.3.5.7 LD0.VSQVUB1 Voltage unbalance (1) – PQVUB-1

Table 57: LD0.VSQVUB1 Voltage unbalance (1) – PQVUB-1

IEC 61850 name	SA name	Description	Value
LD0.VSQVUB1			
.VarStr.stVal	MN_UNB_AL	Unbalance alarm	1=Alarm
.HiPctVUnb.stVal	PCT_UNB_AL	Percentile unbalance alarm	1=Alarm

2.3.6 Protection functions

2.3.6.1 LD0.CBPSOF1 Switch onto fault (1) – SOTF-1

Table 58: LD0.CBPSOF1 Switch onto fault (1) – SOTF-1

IEC 61850 name	SA name	Description	Value
LD0.CBPSOF1			
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.2 LD0.DEFHPDEF1 Directional ground-fault protection, high stage (1) – 67/50N-1

Table 59: LD0.DEFHPDEF1 Directional ground-fault protection, high stage (1) – 67/50N-1

IEC 61850 name	SA name	Description	Values
LD0.DEFHPTOC1		High stage (1)	
.Op.general	TRIP	-Trip	1=Trip
.Str.general	PICKUP	-Pickup	1=Pickup

2.3.6.3 LD0.DEFHPDEF2 Directional ground-fault protection, high stage (2) – 67/50N-2

Table 60: LD0.DEFHPDEF2 Directional ground-fault protection, high stage (2) – 67/50N-2

IEC 61850 name	SA name	Description	Value
LD0.DEFHPTOC2		High stage (2)	
.Op.general	TRIP	Trip	1=Trip
.Str.general	PICKUP	Pickup	1=Pickup

2.3.6.4 LD0.DEFLPDEF1 Directional ground-fault protection, low stage (1) – 67/51N-1

Table 61: LD0.DEFLPDEF1 Directional ground-fault protection, low stage (1) – 67/51N-1

IEC 61850 name	SA name	Description	Values
LD0.DEFLPTOC1		Low stage (1)	
.Op.general	TRIP	-Trip	1=Trip
.Str.general	PICKUP	-Pickup	1=Pickup

2.3.6.5 LD0.DEFLPDEF2 Directional ground-fault protection, low stage (2) – 67/51N-2

Table 62: LD0.DEFLPDEF2 Directional ground-fault protection, low stage (2) – 67/51N-2

IEC 61850 name	SA name	Description	Values
LD0.DEFLPTOC2		Low stage (2)	
.Op.general	TRIP	-Trip	1=Trip
.Str.general	PICKUP	-Pickup	1=Pickup

2.3.6.6 LD0.DOPPDPR1 Reverse power/directional overpower protection (1) – 32R/32O-1, 32O-1, 32R-32

Table 63: LD0.DOPPDPR1 Reverse power/directional overpower protection (1) – 32R/32O-1, 32O-1, 32R-32

IEC 61850 name	SA name	Description	Value
LD0.DPPDOP1			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.7 LD0.DOPPDPR2 Reverse power/directional overpower protection (2) – 32R/32O-2, 32O-2, 32R-32

Table 64: LD0.DOPPDPR2 Reverse power/directional overpower protection (2) – 32R/32O-2, 32O-2, 32R-32

IEC 61850 name	SA name	Description	Value
LD0.DPPDOP2			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.8 LD0.DOPPDPR3 Reverse power/directional overpower protection (3) – 32O-3, 32R-32

Table 65: LD0.DOPPDPR3 Reverse power/directional overpower protection (3) – 32O-3, 32R-32

IEC 61850 name	SA name	Description	Value
LD0.DPPDOP3			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.9 LD0.DPHHPDOC1 Three-phase directional overcurrent protection, high stage (1) – 67/50P-1

Table 66: LD0.DPHHPDOC1 Three-phase directional overcurrent protection, high stage (1) – 67/50P-1

IEC 61850 name	SA name	Description	Values
LD0.DPHHPTOC1		High stage (1)	
.Op.general	TRIP	-Trip	1=Trip
.Str.general	PICKUP	-Pickup	1=Pickup

2.3.6.10 LD0.DPHHPDOC2 Three-phase directional overcurrent protection, high stage (2) – 67/50P-2

Table 67: LD0.DPHHPDOC2 Three-phase directional overcurrent protection, high stage (2) – 67/50P-2

IEC 61850 name	SA name	Description	Value
LD0.DPHHPTOC2		High stage (2)	
.Op.general	TRIP	Trip	1=Trip
.Str.general	PICKUP	Pickup	1=Pickup

2.3.6.11 LD0.DPHLPDOC1 Three-phase directional overcurrent protection, low stage (1) – 67/51P-1

Table 68: LD0.DPHLPDOC1 Three-phase directional overcurrent protection, low stage (1) – 67/51P-1

IEC 61850 name	SA name	Description	Values
LD0.DPHLPTOC1		Low stage (1)	
.Op.general	TRIP	-Trip	1=Trip
.Str.general	PICKUP	-Pickup	1=Pickup

2.3.6.12 LD0.DPHLPDOC2 Three-phase directional overcurrent protection, low stage (2) – 67/51P-2

Table 69: LD0.DPHLPDOC2 Three-phase directional overcurrent protection, low stage (2) – 67/51P-2

IEC 61850 name	SA name	Description	Values
LD0.DPHLPTOC2		Low stage (2)	
.Op.general	TRIP	-Trip	1=Trip
.Str.general	PICKUP	-Pickup	1=Pickup

2.3.6.13 LD0.DQPTUV1 Directional reactive power undervoltage protection (1) – 32Q-27

Table 70: LD0.DQPTUV1 Directional reactive power undervoltage protection (1) – 32Q-27

IEC 61850 name	SA name	Description	Value
LD0.DQPTUV1			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.14 LD0.DUPPDPR1 Underpower protection (1) – 32U-1

Table 71: LD0.DUPPDPR1 Underpower protection (1) – 32U-1

IEC 61850 name	SA name	Description	Value
LD0.DPPDUP1			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.15 LD0.DUPPDPR2 Underpower protection (2) – 32U-2

Table 72: LD0.DUPPDPR2 Underpower protection (2) – 32U-2

IEC 61850 name	SA name	Description	Value
LD0.DPPDUP2			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.16 LD0.EFHPTOC1 Non-directional ground-fault protection, high stage (1) – 50G-1

Table 73: LD0.EFHPTOC1 Non-directional ground-fault protection, high stage (1) – 50G-1

IEC 61850 name	SA name	Description	Values
LD0.EFHPTOC1		High stage (1)	
.Op.general	TRIP	Trip	1=Trip
.Str.general	PICKUP	Pickup	1=Pickup

2.3.6.17 LD0.EFHPTOC2 Non-directional ground-fault protection, high stage (2) – 50G-2

Table 74: LD0.EFHPTOC2 Non-directional ground-fault protection, high stage (2) – 50G-2

IEC 61850 name	SA name	Description	Values
LD0.EFHPTOC2		High stage (2)	
.Op.general	TRIP	Trip	1=Trip
.Str.general	PICKUP	Pickup	1=Pickup

2.3.6.18 LD0.EFHPTOC3 Non-directional ground-fault protection, high stage (3) – 50N-1

Table 75: LD0.EFHPTOC3 Non-directional ground-fault protection, high stage (3) – 50N-1

IEC 61850 name	SA name	Description	Value
LD0.EFHPTOC3		High stage (3)	
.Op.general	TRIP	Trip	1=Trip
.Str.general	PICKUP	Pickup	1=Pickup

2.3.6.19 LD0.EFHPTOC4 Non-directional ground-fault protection, high stage (4) – 50N-2

Table 76: LD0.EFHPTOC4 Non-directional ground-fault protection, high stage (4) – 50N-2

IEC 61850 name	SA name	Description	Value
LD0.EFHPTOC4		High stage (3)	
.Op.general	TRIP	Trip	1=Trip
.Str.general	PICKUP	Pickup	1=Pickup

2.3.6.20 LD0.EFIPTOC1 Non-directional ground-fault protection, instantaneous stage (1) – 50G-3

Table 77: LD0.EFIPTOC1 Non-directional ground-fault protection, instantaneous stage (1) – 50G-3

IEC 61850 name	SA name	Description	Values
LD0.EFIPTOC1		Instant. stage (1)	
.Op.general	TRIP	Trip	1=Trip
.Str.general	PICKUP	Pickup	1=Pickup

2.3.6.21 LD0.EFIPTOC2 Non-directional ground-fault protection, instantaneous stage (2) – 50N-3

Table 78: LD0.EFIPTOC2 Non-directional ground-fault protection, instantaneous stage (2) – 50N-3

IEC 61850 name	SA name	Description	Value
LD0.EFIPTOC2		Instant. stage (2)	
.Op.general	TRIP	Trip	1=Trip
.Str.general	PICKUP	Pickup	1=Pickup

2.3.6.22 LD0.EFLPTOC1 Non-directional ground-fault protection, low stage (1) – 51G

Table 79: LD0.EFLPTOC1 Non-directional ground-fault protection, low stage (1) – 51G

IEC 61850 name	SA name	Description	Values
LD0.EFLPTOC1		Low stage (1)	
.Op.general	TRIP	Trip	1=Trip
.Str.general	PICKUP	Pickup	1=Pickup

2.3.6.23 LD0.EFLPTOC2 Non-directional ground-fault protection, low stage (2) – 51N-1

Table 80: LD0.EFLPTOC2 Non-directional ground-fault protection, low stage (2) – 51N-1

IEC 61850 name	SA name	Description	Values
LD0.EFLPTOC2		Low stage (2)	
.Op.general	TRIP	Trip	1=Trip
.Str.general	PICKUP	Pickup	1=Pickup

2.3.6.24 LD0.EFPADM1 Admittance-based ground-fault protection (1) – 21YN-1

Table 81: LD0.EFPADM1 Admittance-based ground-fault protection (1) – 21YN-1

IEC 61850 name	SA name	Description	Values
LD0.EFPADM1			
.Str.general	PICKUP	Stage1 pickup	1=Pickup
.Op.general	TRIP	Stage1 trip	1=Trip

2.3.6.25 LD0.EFPADM2 Admittance-based ground-fault protection (2) – 21YN-2

Table 82: LD0.EFPADM2 Admittance-based ground-fault protection (2) – 21YN-2

IEC 61850 name	SA name	Description	Values
LD0.EFPADM2			
.Str.general	PICKUP	Stage2 pickup	1=Pickup
.Op.general	TRIP	Stage2 trip	1=Trip

2.3.6.26 LD0.EFPADM3 Admittance-based ground-fault protection (3) – 21YN-3

Table 83: LD0.EFPADM3 Admittance-based ground-fault protection (3) – 21YN-3

IEC 61850 name	SA name	Description	Values
LD0.EFPADM3			
.Str.general	PICKUP	Stage3 pickup	1=Pickup
.Op.general	TRIP	Stage3 trip	1=Trip

2.3.6.27 LD0.FRPFRQ1 Frequency protection (1) – 81-1

Table 84: LD0.FRPFRQ1 Frequency protection (1) – 81-1

IEC 61850 name	SA name	Description	Values
LD0.FRPTRC1			
.Str.general	PICKUP	Stage pickup	1=Pickup
LD0.FRPTOF1		Overfrequency	
.Op.general	OPR_OFRQ	-Trip	1=Trip
LD0.FRPTUF1		Underfrequency	
.Op.general	OPR_UFRQ	-Trip	1=Trip
LD0.FRPFRC1		Frequency gradient	
.Op.general	OPR_FRG	-Trip	1=Trip

2.3.6.28 LD0.FRPFRQ2 Frequency protection (2) – 81-2

Table 85: LD0.FRPFRQ2 Frequency protection (2) – 81-2

IEC 61850 name	SA name	Description	Values
LD0.FRPTRC2			
.Str.general	PICKUP	Stage pickup	1=Pickup
LD0.FRPTOF2		Overfrequency	
.Op.general	OPR_OFRQ	-Trip	1=Trip
LD0.FRPTUF2		Underfrequency	
.Op.general	OPR_UFRQ	-Trip	1=Trip
LD0.FRPFRC2		Frequency gradient	
.Op.general	OPR_FRG	-Trip	1=Trip

2.3.6.29 LD0.FRPFRQ3 Frequency protection (3) – 81-3

Table 86: LD0.FRPFRQ3 Frequency protection (3) – 81-3

IEC 61850 name	SA name	Description	Values
LD0.FRPTRC3			
.Str.general	PICKUP	Stage pickup	1=Pickup
LD0.FRPTOF3		Overfrequency	
.Op.general	OPR_OFRQ	-Trip	1=Trip
LD0.FRPTUF3		Underfrequency	
.Op.general	OPR_UFRQ	-Trip	1=Trip
LD0.FRPFRC3		Frequency gradient	
.Op.general	OPR_FRG	-Trip	1=Trip

2.3.6.30 LD0.FRPFRQ4 Frequency protection (4) – 81-4

Table 87: LD0.FRPFRQ4 Frequency protection (4) – 81-4

IEC 61850 name	SA name	Description	Values
LD0.FRPTRC4			
.Str.general	PICKUP	Stage pickup	1=Pickup
LD0.FRPTOF4		Overfrequency	
.Op.general	OPR_OFRQ	-Trip	1=Trip
LD0.FRPTUF4		Underfrequency	
.Op.general	OPR_UFRQ	-Trip	1=Trip
LD0.FRPFRC4		Frequency gradient	
.Op.general	OPR_FRG	-Trip	1=Trip

2.3.6.31 LD0.FRPFRQ5 Frequency protection (5) – 81-5

Table 88: LD0.FRPFRQ5 Frequency protection (5) – 81-5

IEC 61850 name	SA name	Description	Values
LD0.FRPTRC5			
.Str.general	PICKUP	Stage pickup	1=Pickup
LD0.FRPTOF5		Overfrequency	
.Op.general	OPR_OFRQ	-Trip	1=Trip
LD0.FRPTUF5		Underfrequency	
.Op.general	OPR_UFRQ	-Trip	1=Trip
LD0.FRPFRC5		Frequency gradient	
.Op.general	OPR_FRG	-Trip	1=Trip

2.3.6.32 LD0.FRPFRQ6 Frequency protection (6) – 81-6

Table 89: LD0.FRPFRQ6 Frequency protection (6) – 81-6

IEC 61850 name	SA name	Description	Values
LD0.FRPTRC6			
.Str.general	PICKUP	Stage pickup	1=Pickup
LD0.FRPTOF6		Overfrequency	
.Op.general	OPR_OFRQ	-Trip	1=Trip
LD0.FRPTUF6		Underfrequency	
.Op.general	OPR_UFRQ	-Trip	1=Trip
LD0.FRPFRC6		Frequency gradient	
.Op.general	OPR_FRG	-Trip	1=Trip

2.3.6.33 LD0.H3EFPSEF1 Third harmonic-based stator ground-fault protection (1) – 27/59THN

Table 90: LD0.H3EFPSEF1 Third harmonic-based stator ground-fault protection (1) – 27/59THN

IEC 61850 name	SA name	Description	Value
LD0.H3EFPTRC1			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip
LD0.H3EFPTOV1			
.BlkIntnSt.general	INT_BLKD	Internally blocked	1=Blocked

2.3.6.34 LD0.HAEFPTOC1 Harmonics-based ground-fault protection (1) – 51NHA

Table 91: LD0.HAEFPTOC1 Harmonics-based ground-fault protection (1) – 51NHA

IEC 61850 name	SA name	Description	Values
LD0.HAEFPTOC1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.35 LD0.HIAPDIF1 High-impedance differential protection for phase A (1) – 87A

Table 92: LD0.HIAPDIF1 High-impedance differential protection for phase A (1) – 87A

IEC 61850 name	SA name	Description	Value
LD0.HIAPDIF1			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.36 LD0.HIBPDIF1 High-impedance differential protection for phase B (1) – 87B

Table 93: LD0.HIBPDIF1 High-impedance differential protection for phase B (1) – 87B

IEC 61850 name	SA name	Description	Value
LD0.HIBPDIF1			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.37 LD0.HICPDIF1 High-impedance differential protection for phase C (1) – 87C

Table 94: LD0.HICPDIF1 High-impedance differential protection for phase C (1) – 87C

IEC 61850 name	SA name	Description	Value
LD0.HICPDIF1			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.38 LD0.INRPHAR1 Three-phase inrush detector (1) – INR-1

Table 95: LD0.INRPHAR1 Three-phase inrush detector (1) – INR-1

IEC 61850 name	SA name	Description	Values
LD0.INRPHAR1			
.Str.general	-	General pickup	1=Pickup
.Str.phsA		Phs A pickup	1=Pickup
.Str.phsB		Phs B pickup	1=Pickup
.Str.phsC		Phs C pickup	1=Pickup

2.3.6.39 LD0.INTRPTEF1 Transient/intermittent ground-fault protection (1) – 67NIEF

Table 96: LD0.INTRPTEF1 Transient/intermittent ground-fault protection (1) – 67NIEF

IEC 61850 name	SA name	Description	Values
LD0.INTRPTEF1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.40 LD0.JAMPTOC1 Motor load jam protection (1) – 51LR-1

Table 97: LD0.JAMPTOC1 Motor load jam protection (1) – 51LR-1

IEC 61850 name	SA name	Description	Values
LD0.JAMPTOC1			
.Op.general	TRIP	Stage trip	1=Trip
.Op.phsA		Phs A trip	1=Trip
.Op.phsB		Phs B trip	1=Trip
.Op.phsC		Phs C trip	1=Trip

2.3.6.41 LD0.JAMPTOC2 Motor load jam protection (2) – 51LR-2

Table 98: LD0.JAMPTOC2 Motor load jam protection (2) – 51LR-2

IEC 61850 name	SA name	Description	Value
LD0.JAMPTOC2			
.Op.general	TRIP	Stage trip	1=Trip
.Op.phsA		Phs A trip	1=Trip
.Op.phsB		Phs B trip	1=Trip
.Op.phsC		Phs C trip	1=Trip

2.3.6.42 LD0.LEDPTRC1 Global protection signals (1)

Table 99: LD0.LEDPTRC1 Global protection signals (1)

IEC 61850 name	SA name	Description	Values
LD0.LEDPTRC1		Global protection signals	
.Op.general	-	-General Trip	1=Trip
.Op.phsA	-	-phsA Trip	1=Trip
.Op.phsB	-	-phsB Trip	1=Trip

Table continues on next page

IEC 61850 name	SA name	Description	Values
.Op.phsC	-	-phsC Trip	1=Trip
.Str.general	-	-General Pickup	1=Pickup
.Str.phsA	-	-phsA Pickup	1=Pickup
.Str.phsB	-	-phsB Pickup	1=Pickup
.Str.phsC	-	-phsC Pickup	1=Pickup

2.3.6.43 LD0.LNPLDF1 Line differential protection with in-zone power transformer (1) – 87L-1

Table 100: LD0.LNPLDF1 Line differential protection with in-zone power transformer (1) – 87L-1

IEC 61850 name	SA name	Description	Values
LD0.LNPTRC1			
.Op.general	TRIP	Trip (Local or remote)	1=Trip
.Str.general	PICKUP	Pickup (Local or remote)	1=Pickup
.Op.phsA		Phs A trip	1=Trip
.Op.phsB		Phs B trip	1=Trip
.Op.phsC		Phs C trip	1=Trip
.Str.phsA		Phs A pickup	1=Pickup
.Str.phsB		Phs B pickup	1=Pickup
.Str.phsC		Phs C pickup	1=Pickup

2.3.6.44 LD0.LOFLPTUC1 Loss of load supervision (1) – 37M-1

Table 101: LD0.LOFLPTUC1 Loss of load supervision (1) – 37M-1

IEC 61850 name	SA name	Description	Values
LD0.LOFLPTUC1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.45 LD0.LOFLPTUC2 Loss of load supervision (2) – 37M-2

Table 102: LD0.LOFLPTUC2 Loss of load supervision (2) – 37M-2

IEC 61850 name	SA name	Description	Value
LD0.LOFLPTUC2			
.Op.general	TRIP	Stage Trip	1=Trip
.Str.general	PICKUP	Stage Pickup	1=Pickup

2.3.6.46 LD0.LREFPNDF1 Numerically stabilized low-impedance restricted ground-fault protection (1) – 87LOZREF

Table 103: LD0.LREFPNDF1 Numerically stabilized low-impedance restricted ground-fault protection (1) – 87LOZREF

IEC 61850 name	SA name	Description	Values
LD0.LREFPNDF1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.47 LD0.LVRTPTUV1 Low-voltage ride-through protection (1) – 27RT-1

Table 104: LD0.LVRTPTUV1 Low-voltage ride-through protection (1) – 27RT-1

IEC 61850 name	SA name	Description	Value
LD0.LVRTPTUV1			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.48 LD0.LVRTPTUV2 Low-voltage ride-through protection (2) – 27RT-2

Table 105: LD0.LVRTPTUV2 Low-voltage ride-through protection (2) – 27RT-2

IEC 61850 name	SA name	Description	Value
LD0.LVRTPTUV2			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.49 LD0.LVRTPTUV3 Low voltage ride through protection (3) – 27RT-3

Table 106: LD0.LVRTPTUV3 Low voltage ride through protection (3) – 27RT-3

IEC 61850 name	SA name	Description	Value
LD0.LVRTPTUV3			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.50 LD0.MFADPSDE1 Multifrequency admittance-based ground-fault protection (1) – 67YN-1

Table 107: LD0.MFADPSDE1 Multifrequency admittance-based ground-fault protection (1) – 67YN-1

IEC 61850 name	SA name	Description	Value
LD0.MFADPSDE1			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.51 LD0.MNSPTOC1 Negative-sequence overcurrent protection for machines (1) – 46M-1

Table 108: LD0.MNSPTOC1 Negative-sequence overcurrent protection for machines (1) – 46M-1

IEC 61850 name	SA name	Description	Values
LD0.MNSPTOC1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.52 LD0.MNSPTOC2 Negative-sequence overcurrent protection for machines (2) – 46M-2

Table 109: LD0.MNSPTOC2 Negative-sequence overcurrent protection for machines (2) – 46M-2

IEC 61850 name	SA name	Description	Values
LD0.MNSPTOC2			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.53 LD0.MPDIF1 Stabilized and instantaneous differential protection for machines (1) – 87M, 87G-1

Table 110: LD0.MPDIF1 Stabilized and instantaneous differential protection for machines (1) – 87M, 87G-1

IEC 61850 name	SA name	Description	Value
LD0.MPTRC1			
.Op.general	TRIP	General trip	1=Trip
.Op.phsA		Phs A trip	1=Trip
.Op.phsB		Phs B trip	1=Trip
.Op.phsC		Phs C trip	1=Trip

Table continues on next page

IEC 61850 name	SA name	Description	Value
LD0.MLPDIF1			
.BlkIntnSt.general	INT_BLKD	Internal block	1=Blocked
.BlkIntnSt.phsA	INT_BLKD_A	Internal block phs A	1=Blocked
.BlkIntnSt.phsB	INT_BLKD_B	Internal block phs B	1=Blocked
.BlkIntnSt.phsC	INT_BLKD_C	Internal block phs C	1=Blocked

2.3.6.54 LD0.MPTTR1 Thermal overload protection for motors (1) – 49M-1

Table 111: LD0.MPTTR1 Thermal overload protection for motors (1) – 49M-1

IEC 61850 name	SA name	Description	Values
LD0.MPTTR1			
.AlmThm.general	ALARM	Thermal alarm	1=Alarm
.Op.general	TRIP	Thermal trip	1=Trip
.StrInh.general	BLK_RESTART	Block restart	1=Restart

2.3.6.55 LD0.MSVPR1 Remanent voltage supervision (1) – 27R-1

Table 112: LD0.MSVPR1 Remanent voltage supervision (1) – 27R-1

IEC 61850 name	SA Name	Description	Value
LD0.MSVPR1			
.VLo.stVal	U_LOW	Low remanent voltage	1=Detected

2.3.6.56 LD0.MSVPR2 Remanent voltage supervision (2) – 27R-2

Table 113: LD0.MSVPR2 Remanent voltage supervision (2) – 27R-2

IEC 61850 name	SA Name	Description	Value
LD0.MSVPR2			
.VLo.stVal	U_LOW	Low remanent voltage	1=Detected

2.3.6.57 LD0.NSPTOC1 Negative-sequence overcurrent protection (1) – 46-1

Table 114: LD0.NSPTOC1 Negative-sequence overcurrent protection (1) – 46-1

IEC 61850 name	SA name	Description	Values
LD0.NSPTOC1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.58 LD0.NSPTOC2 Negative-sequence overcurrent protection (2) – 46-2

Table 115: LD0.NSPTOC2 Negative-sequence overcurrent protection (2) – 46-2

IEC 61850 name	SA name	Description	Values
LD0.NSPTOC2			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.59 LD0.NSPTOV1 Negative-sequence overvoltage protection (1) – 47-1

Table 116: LD0.NSPTOV1 Negative-sequence overvoltage protection (1) – 47-1

IEC 61850 name	SA name	Description	Values
LD0.NSPTOV1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.60 LD0.NSPTOV2 Negative-sequence overvoltage protection (2) – 47-2

Table 117: LD0.NSPTOV2 Negative-sequence overvoltage protection (2) – 47-2

IEC 61850 name	SA name	Description	Values
LD0.NSPTOV2			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.61 LD0.OEPVPH1 Overexcitation protection (1) – 24-1

Table 118: LD0.OEPVPH1 Overexcitation protection (1) – 24-1

IEC 61850 name	SA name	Description	Values
LD0.OEPVPH1			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.62 LD0.OEPVPH2 Overexcitation protection (2) – 24-2

Table 119: LD0.OEPVPH2 Overexcitation protection (2) – 24-2

IEC 61850 name	SA name	Description	Value
LD0.OEPVPH2			
.Op.general	TRIP	Stage Trip	1=Trip
.Str.general	PICKUP	Stage Pickup	1=Pickup

2.3.6.63 LD0.PDNSPTOC1 Phase discontinuity protection (1) – 46PD-1

Table 120: LD0.PDNSPTOC1 Phase discontinuity protection (1) – 46PD-1

IEC 61850 name	SA name	Description	Values
LD0.PDNSPTOC1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.64 LD0.PHHPTOC1 Three-phase non-directional overcurrent protection, high stage (1) – 50P-1

Table 121: LD0.PHHPTOC1 Three-phase non-directional overcurrent protection, high stage (1) – 50P-1

IEC 61850 name	SA name	Description	Values
LD0.PHHPTOC1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.65 LD0.PHHPTOC2 Three-phase non-directional overcurrent protection, high stage (2) – 50P-2

Table 122: LD0.PHHPTOC2 Three-phase non-directional overcurrent protection, high stage (2) – 50P-2

IEC 61850 name	SA name	Description	Values
LD0.PHHPTOC2			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.66 LD0.PHIPTOC1 Three-phase non-directional overcurrent protection, instantaneous stage (1) – 50P-3 (1)

Table 123: LD0.PHIPTOC1 Three-phase non-directional overcurrent protection, instantaneous stage (1) – 50P-3 (1)

IEC 61850 name	SA name	Description	Values
LD0.PHIPTOC1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.67 LD0.PHIPTOC2 Three-phase non-directional overcurrent protection, instantaneous stage (2) – 50P-3 (2)

Table 124: LD0.PHIPTOC2 Three-phase non-directional overcurrent protection, instantaneous stage (2) – 50P-3 (2)

IEC 61850 name	SA name	Description	Values
LD0.PHIPTOC2			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.68 LD0.PHIZ1 High-impedance fault detection (1) – HIZ-1

Table 125: LD0.PHIZ1 High-impedance fault detection (1) – HIZ-1

IEC 61850 name	SA name	Description	Values
LD0.PHIZ1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.69 LD0.PHLPTOC1 Three-phase non-directional overcurrent protection, low stage (1) – 51P-1

Table 126: LD0.PHLPTOC1 Three-phase non-directional overcurrent protection, low stage (1) – 51P-1

IEC 61850 name	SA name	Description	Values
LD0.PHLPTOC1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.70 LD0.PHLPTOC2 Three-phase non-directional overcurrent protection, low stage (2) – 51P-2

Table 127: LD0.PHLPTOC2 Three-phase non-directional overcurrent protection, low stage (2) – 51P-2

IEC 61850 name	SA name	Description	Values
LD0.PHLPTOC2			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.71 LD0.PHPTOV1 Three-phase overvoltage protection (1) – 59-1

Table 128: LD0.PHPTOV1 Three-phase overvoltage protection (1) – 59-1

IEC 61850 name	SA name	Description	Values
LD0.PHPTOV1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.72 LD0.PHPTOV2 Three-phase overvoltage protection (2) – 59-2

Table 129: LD0.PHPTOV2 Three-phase overvoltage protection (2) – 59-2

IEC 61850 name	SA name	Description	Values
LD0.PHPTOV2			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.73 LD0.PHPTOV3 Three-phase overvoltage protection (3) – 59-3

Table 130: LD0.PHPTOV3 Three-phase overvoltage protection (3) – 59-3

IEC 61850 name	SA name	Description	Values
LD0.PHPTOV3			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.74 LD0.PHPTUC1 Loss of phase (1) – 37-1

Table 131: LD0.PHPTUC1 Loss of phase (1) – 37-1

IEC 61850 name	SA name	Description	Value
LD0.PHPTUC1			
.Op.general	TRIP	Trip	1=Trip
.Str.general	PICKUP	Pickup	1=Pickup

2.3.6.75 LD0.PHPTUV1 Three-phase undervoltage protection (1) – 27-1

Table 132: LD0.PHPTUV1 Three-phase undervoltage protection (1) – 27-1

IEC 61850 name	SA name	Description	Values
LD0.PHPTUV1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.76 LD0.PHPTUV2 Three-phase undervoltage protection (2) – 27-2

Table 133: LD0.PHPTUV2 Three-phase undervoltage protection (2) – 27-2

IEC 61850 name	SA name	Description	Values
LD0.PHPTUV2			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.77 LD0.PHPTUV3 Three-phase undervoltage protection (3) – 27-3

Table 134: LD0.PHPTUV3 Three-phase undervoltage protection (3) – 27-3

IEC 61850 name	SA name	Description	Values
LD0.PHPTUV3			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.78 LD0.PHPVOC1 Three-phase voltage-dependent overcurrent protection (1) – 51V-1

Table 135: LD0.PHPVOC1 Three-phase voltage-dependent overcurrent protection (1) – 51V-1

IEC 61850 name	SA name	Description	Value
LD0.PHPVOC1			
.Str.general	PICKUP	General pickup	1=Pickup
.Str.phsA		Phs A pickup	1=Pickup
.Str.phsB		Phs B pickup	1=Pickup
.Str.phsC		Phs C pickup	1=Pickup
.Op.general	TRIP	General trip	1=Trip
.Op.phsA		Phs A trip	1=Trip
.Op.phsB		Phs B trip	1=Trip
.Op.phsC		Phs C trip	1=Trip

2.3.6.79 LD0.PREVPTOC1 Phase reversal protection (1) – 46R-1

Table 136: LD0.PREVPTOC1 Phase reversal protection (1) – 46R-1

IEC 61850 name	SA name	Description	Values
LD0.PREVPTOC1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.80 LD0.PSPTUV1 Positive-sequence undervoltage protection (1) – 47U-1, 27PS

Table 137: LD0.PSPTUV1 Positive-sequence undervoltage protection (1) – 47U-1, 27PS

IEC 61850 name	SA name	Description	Values
LD0.PSPTUV1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.81 LD0.PSPTUV2 Positive-sequence undervoltage protection (2) – 47U-2

Table 138: LD0.PSPTUV2 Positive-sequence undervoltage protection (2) – 47U-2

IEC 61850 name	SA name	Description	Values
LD0.PSPTUV2			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.82 LD0.ROVPTOV1 Residual overvoltage protection (1) – 59G-1

Table 139: LD0.ROVPTOV1 Residual overvoltage protection (1) – 59G-1

IEC 61850 name	SA name	Description	Values
LD0.ROVPTOV1			
.Op.general	TRIP	Stage trip	1=Trip
.Str.general	PICKUP	Stage pickup	1=Pickup

2.3.6.83 LD0.ROVPTOV2 Residual overvoltage protection (2) – 59N-1

Table 140: LD0.ROVPTOV2 Residual overvoltage protection (2) – 59N-1

IEC 61850 name	SA name	Description	Values
LD0.ROVPTOV2			
.Op.general	TRIP	Stage 2 trip	1=Trip
.Str.general	PICKUP	Stage 2 pickup	1=Pickup

2.3.6.84 LD0.ROVPTOV3 Residual overvoltage protection (3) – 59N-2

Table 141: LD0.ROVPTOV3 Residual overvoltage protection (3) – 59N-2

IEC 61850 name	SA name	Description	Values
LD0.ROVPTOV3			
.Op.general	TRIP	Stage 3 trip	1=Trip
.Str.general	PICKUP	Stage 3 pickup	1=Pickup

2.3.6.85 LD0.STTPMSU1 Motor start-up supervision (1) – 66/51LRS

Table 142: LD0.STTPMSU1 Motor start-up supervision (1) – 66/51LRS

IEC 61850 name	SA name	Description	Values
LD0.STTPMRI1			
.Op.general	OPR_STALL	Thermal stress operate	1=Operate
.StrInh.stVal	LOCK_START	Restart lockout	1=Lockout
LD0.STTPMSS1			
.Op.general	OPR_IIT	Stalling operate	1=Operate
.Str.general	MOT_START	Startup in progress	1=In progress

2.3.6.86 LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1) – 49F-1

Table 143: LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1) – 49F-1

IEC 61850 name	SA name	Description	Values
LD0.T1PTTR1			
.AlmThm.general	ALARM	Thermal alarm	1=Alarm
.Op.general	TRIP	General trip	1=Trip
.Str.general	PICKUP	General pickup	1=Pickup

2.3.6.87 LD0.T2PTTR1 Three-phase thermal overload protection, two time constants (1) – 49T-1

Table 144: LD0.T2PTTR1 Three-phase thermal overload protection, two time constants (1) – 49T-1

IEC 61850 name	SA name	Description	Values
LD0.T2PTTR1			
.AlmThm.general	ALARM	Thermal alarm	1=Alarm
.Op.general	TRIP	General trip	1=Trip
.Str.general	PICKUP	General pickup	1=Pickup

2.3.6.88 LD0.TR2PTDF1 Stabilized and instantaneous differential protection for two-winding transformers (1) – 87T-1

Table 145: LD0.TR2PTDF1 Stabilized and instantaneous differential protection for two-winding transformers (1) – 87T-1

IEC 61850 name	SA name	Description	Value
LD0.TR2PTRC1			
.Op.general	TRIP	General trip	1=Trip
.Op.phsA	OPR_A	Phs A trip	1=Trip
.Op.phsB	OPR_B	Phs B trip	1=Trip
.Op.phsC	OPR_C	Phs C trip	1=Trip
LD0.TR2LPDIF1			
.BlkWavSt.general	BLKDWAV	Waveform block, general	1=Blocking
.BlkWavSt.phsA	BLKDWAV_A	Waveform block, phs A	1=Blocking
.BlkWavSt.phsB	BLKDWAV_B	Waveform block, phs B	1=Blocking
.BlkWavSt.phsC	BLKDWAV_C	Waveform block, phs C	1=Blocking
.Blk2HSt.general	BLKD2H	2nd harmonic res. block, general	1=Blocking
.Blk2HSt.phsA	BLKD2H_A	2nd harmonic res. block, Phs A	1=Blocking
.Blk2HSt.phsB	BLKD2H_B	2nd harmonic res. block, Phs B	1=Blocking
.Blk2HSt.phsC	BLKD2H_C	2nd harmonic res. block, phs C	1=Blocking
.Blk5HSt.general	BLKD5H	5th harmonic res. block, general	1=Blocking
.Blk5HSt.phsA	BLKD5H_A	5th harmonic res. block, phs A	1=Blocking
.Blk5HSt.phsB	BLKD5H_B	5th harmonic res. block, phs B	1=Blocking
.Blk5HSt.phsC	BLKD5H_C	5th harmonic res. block, phs C	1=Blocking

2.3.6.89 LD0.TRPPTRC1 Master trip (1) – 86/94-1

Table 146: LD0.TRPPTRC1 Master trip (1) – 86/94-1

IEC 61850 name	SA name	Description	Values
LD0.TRPPTRC1			
.Op.general	-	Trip input signal	1=Trip
.Tr.general	-	Trip output signal	1=Trip

2.3.6.90 LD0.TRPPTRC2 Master trip (2) – 86/94-2

Table 147: LD0.TRPPTRC2 Master trip (2) – 86/94-2

IEC 61850 name	SA name	Description	Values
LD0.TRPPTRC2			
.Op.general	-	Trip input signal	1=Trip
.Tr.general	-	Trip output signal	1=Trip

2.3.6.91 LD0.TRPPTRC3 Master trip (3) – 86/94-3

Table 148: LD0.TRPPTRC3 Master trip (3) – 86/94-3

IEC 61850 name	SA name	Description	Values
LD0.TRPPTRC3			
.Op.general		Trip input signal	1=Trip
.Tr.general		Trip output signal	1=Trip

2.3.6.92 LD0.TRPPTRC4 Master trip (4) – 86/94-4

Table 149: LD0.TRPPTRC4 Master trip (4) – 86/94-4

IEC 61850 name	SA name	Description	Values
LD0.TRPPTRC4			
.Op.general		Trip input signal	1=Trip
.Tr.general		Trip output signal	1=Trip

2.3.6.93 LD0.TRPPTRC5 Master trip (5) – 86/94-5

Table 150: LD0.TRPPTRC5 Master trip (5) – 86/94-5

IEC 61850 name	SA name	Description	Values
LD0.TRPPTRC5			
.Op.general		Trip input signal	1=Trip
.Tr.general		Trip output signal	1=Trip

2.3.6.94 LD0.TRPPTRC6 Master trip (6) – 86/94-6

Table 151: LD0.TRPPTRC6 Master trip (6) – 86/94-6

IEC 61850 name	SA name	Description	Values
LD0.TRPPTRC6			
.Op.general		Trip input signal	1=Trip
.Tr.general		Trip output signal	1=Trip

2.3.6.95 LD0.UEXPDIS1 Three-phase underexcitation protection (1) – 40-1

Table 152: LD0.UEXPDIS1 Three-phase underexcitation protection (1) – 40-1

IEC 61850 name	SA name	Description	Value
LD0.UEXPDIS1			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.96 LD0.UZPDIS1 Three-phase underimpedance protection (1) – 21G-1

Table 153: LD0.UZPDIS1 Three-phase underimpedance protection (1) – 21G-1

IEC 61850 name	SA name	Description	Value
LD0.UZPDIS1			
.Str.general	PICKUP	Stage pickup	1=Pickup
.Op.general	TRIP	Stage trip	1=Trip

2.3.6.97 LD0.VVSPPAM1 Voltage vector shift protection (1) – 78V-1

Table 154: LD0.VVSPPAM1 Voltage vector shift protection (1) – 78V-1

IEC 61850 name	SA name	Description	Value
LD0.VVSPPAM1			
.Op.general	TRIP	Stage trip	1=Trip
.BlkIntnSt.general	INT_BLKD	Internal block	1=Blocked

2.3.6.98 LD0.WPWDE1 Wattmetric-based ground-fault protection (1) – 32N-1

Table 155: LD0.WPWDE1 Wattmetric-based ground-fault protection (1) – 32N-1

IEC 61850 name	SA name	Description	Values
LD0.WPDSE1			
.Str.general	PICKUP	Stage 1 pickup	1=Pickup
.Op.general	TRIP	Stage 1 trip	1=Trip

2.3.6.99 LD0.WPWDE2 Wattmetric-based ground-fault protection (2) – 32N-2

Table 156: LD0.WPWDE2 Wattmetric-based ground-fault protection (2) – 32N-2

IEC 61850 name	SA name	Description	Values
LD0.WPDSE2			
.Str.general	PICKUP	Stage 2 pickup	1=Pickup
.Op.general	TRIP	Stage 2 trip	1=Trip

2.3.6.100 LD0.WPWDE3 Wattmetric-based ground-fault protection (3) – 32N-3

Table 157: LD0.WPWDE3 Wattmetric-based ground-fault protection (3) – 32N-3

IEC 61850 name	SA name	Description	Values
LD0.WPDSE3			
.Str.general	PICKUP	Stage 3 pickup	1=Pickup
.Op.general	TRIP	Stage 3 trip	1=Trip

2.3.7 Protection-related functions

2.3.7.1 DR.RDRE1 Disturbance recorder (1)

Table 158: DR.RDRE1 Disturbance recorder (1)

IEC 61850 name	SA name	Description	Values
DR.RDRE1			
.RcdMade.stVal		DR recording made	1=Made
.RcdStr.stVal		Recording started	1=Started
.RcdDltInd.stVal		Recording deleted	1=Deleted
.MemFullSt.stVal		Memory full	1=Full
.OvWrRcdInd.stVal		Recording overwritten	1=Overwritten
.PerTrgInd.stVal		Periodic triggering	1=Periodic
.ManTrgInd.stVal		Manual triggering	1=Manual

2.3.7.2 LD0.CCSPVC1 Current circuit supervision (1) – CCM

Table 159: LD0.CCSPVC1 Current circuit supervision (1) – CCM

IEC 61850 name	SA name	Description	Value
LD0.CCSPVC1			
.FailACirc.general	FAIL	Failure	1=Failure
.SigFailAlm.stVal	ALARM	Alarm	1=Alarm

2.3.7.3 LD0.DARREC1 Autoreclosing (1) – 79

Table 160: LD0.DARREC1 Autoreclosing (1) – 79

IEC 61850 name	SA name	Description	Values
LD0.DARREC1			
.PrgRec1.stVal	INPRO_1	AR 1st reclose	1=In progress
.PrgRec2.stVal	INPRO_2	AR 2nd reclose	1=In progress
.PrgRec3.stVal	INPRO_3	AR 3rd reclose	1=In progress
.PrgRec4.stVal	INPRO_4	AR 4th reclose	1=In progress
.PrgRec5.stVal	INPRO_5	AR 5th reclose	1=In progress
.PrgRec.stVal	INPRO	AR in progress	1=In progress
.CBManCls.stVal	MAN_CB_CL	CB manually closed	1=CB closed
.AutoRecOn.stVal	AR_ON	Autoreclose ON/OFF	1=ON
.LO.stVal	LOCKED	Lockout status	1=Lockout
.UnsRec.stVal	UNSUC_RECL	Reclose fail status	1=Failed
.InInhRec.stVal	INHIBIT_RECL	Inhibit reclose	1=Inhibit
.InBlkThm.stVal	-	Thermal block (status)	1=Block
.RdyRec.stVal	READY	Ready reclose status	1=Ready
.ActRec.stVal	ACTIVE	Active reclose status	1=Active
.SucRec.stVal	SUC_RECL	Successful reclose	1=Successful
.PrgDsr.stVal	DISCR_INPRO	Discrimination time in p.	1=In progress
.PrgCutOut.stVal	CUTOUT_INPRO	Cutout time in progress	1=In progress
.FrqOpAlm.stVal	FRQ_OP_ALM	Frequent operation alarm	1=Alarm
.RclTmStr.stVal	-	Reclaim time started	1=Started
.ProCrd.stVal	-	Protection coordination	1=In progress
.OpCls.general	CLOSE_CB	Operate (close XCBR)	1=Close CB
.OpOpn.general	OPEN_CB	Operate (open XCBR)	1=Open CB
.UnsCBCls.stVal	UNSUC_CB	CB closing failed	1=Failed
.WtMstr.stVal	CMD_WAIT	Master signal to follower	1=Signal

2.3.7.4 LD0.LDPRLRC1 Load profile record (1) – LoadProf

Table 161: LD0.LDPRLRC1 Load profile record (1) – LoadProf

IEC 61850 name	SA name	Description	Value
LD0.LDPRLRC1			
.MemWrn.stVal		Recording memory warning	1=Warning
.MemAlm.stVal		Recording memory alarm	1=Alarm

2.3.7.5 LD0.OOSRPSB1 Out-of-step protection (1) – 78-1

Table 162: LD0.OOSRPSB1 Out-of-step protection (1) – 78-1

IEC 61850 name	SA name	Description	Values
LD0.OOSRPSB1			
.Op.general	TRIP	Out-of-step trip, zone 1 or 2	1=Trip
.BlkZn.stVal	OSB	Out-of-step block, zone 1	1=Block
.Blk2Zn.stVal	OSB_Z2	Out-of-step block, zone 2	1=Block
.SwgOp.general	SWING_OP	Out-of-step trip, zone 3	1=Trip

2.3.7.6 LD0.SCEFRFLO1 Fault locator (1) – 21FL-1

Table 163: LD0.SCEFRFLO1 Fault locator (1) – 21FL-1

IEC 61850 name	SA name	Description	Values
LD0.SCEFRFLO1			
.Alm.stVal	ALARM	Alarm signal	1=Alarm
.TrgSt.stVal	TRIGG	Calculation triggered	1=Triggered

2.3.7.7 LD0.SECRSYN1 Synchronism and energizing check (1) – 25

Table 164: LD0.SECRSYN1 Synchronism and energizing check (1) – 25

IEC 61850 name	SA name	Description	Values
LD0.SECRSYN1			
.SynPrg.stVal	SYNC_INPRO	Synch in progress	1=In progress
.FailCmd.stVal	CMD_FAIL_AL	CB close request failed	1=Failed
.FailSyn.stVal	CL_FAIL_AL	CB close command failed	1=Failed

2.3.7.8 LD0.SEQSPVC1 Fuse failure supervision (1) – 60-1

Table 165: LD0.SEQSPVC1 Fuse failure supervision (1) – 60-1

IEC 61850 name	SA name	Description	Values
LD0.SEQSPVC1			
.Str.general	FUSEF_U	General pickup	1=Pickup
.Str3Ph.general	FUSEF_3PH	Three-phase pivkup	1=Pickup

2.3.7.9 LD0.SEQSPVC2 Fuse failure supervision (2) – 60-2

Table 166: LD0.SEQSPVC2 Fuse failure supervision (2) – 60-2

IEC 61850 name	SA name	Description	Value
LD0.SEQSPVC2			
.Str.general	FUSEF_U	General pickup	1=Pickup
.Str3Ph.general	FUSEF_3PH	Three-phase pickup	1=Pickup

2.3.8 Generic functions

2.3.8.1 LD0.ESMGAPC1 Emergency start-up (1) – 62EST-1

Table 167: LD0.ESMGAPC1 Emergency start-up (1) – 62EST-1

IEC 61850 name	SA name	Description	Values
LD0.ESMGAPC1			
.Str.general	ST_EMERG_ENA	Emergency start	1=Start

2.3.8.2 LD0.MAPGAPC1 Multipurpose protection (1) – MAP-1

Table 168: LD0.MAPGAPC1 Multipurpose protection (1) – MAP-1

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC1			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.3 LD0.MAPGAPC2 Multipurpose protection (2) – MAP-2

Table 169: LD0.MAPGAPC2 Multipurpose protection (2) – MAP-2

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC2			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.4 LD0.MAPGAPC3 Multipurpose protection (3) – MAP-3

Table 170: LD0.MAPGAPC3 Multipurpose protection (3) – MAP-3

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC3			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.5 LD0.MAPGAPC4 Multipurpose protection (4) – MAP-4

Table 171: LD0.MAPGAPC4 Multipurpose protection (4) – MAP-4

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC4			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.6 LD0.MAPGAPC5 Multipurpose protection (5) – MAP-5

Table 172: LD0.MAPGAPC5 Multipurpose protection (5) – MAP-5

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC5			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.7 LD0.MAPGAPC6 Multipurpose protection (6) – MAP-6

Table 173: LD0.MAPGAPC6 Multipurpose protection (6) – MAP-6

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC6			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.8 LD0.MAPGAPC7 Multipurpose protection (7) – MAP-7

Table 174: LD0.MAPGAPC7 Multipurpose protection (7) – MAP-7

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC7			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.9 LD0.MAPGAPC8 Multipurpose protection (8) – MAP-8

Table 175: LD0.MAPGAPC8 Multipurpose protection (8) – MAP-8

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC8			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.10 LD0.MAPGAPC9 Multipurpose protection (9) – MAP-9

Table 176: LD0.MAPGAPC9 Multipurpose protection (9) – MAP-9

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC9			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.11 LD0.MAPGAPC10 Multipurpose protection (10) – MAP-10

Table 177: LD0.MAPGAPC10 Multipurpose protection (10) – MAP-10

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC10			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.12 LD0.MAPGAPC11 Multipurpose protection (11) – MAP-11

Table 178: LD0.MAPGAPC11 Multipurpose protection (11) – MAP-11

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC11			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.13 LD0.MAPGAPC12 Multipurpose protection (12) – MAP-12

Table 179: LD0.MAPGAPC12 Multipurpose protection (12) – MAP-12

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC12			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.14 LD0.MAPGAPC13 Multipurpose protection (13) – MAP-13

Table 180: LD0.MAPGAPC13 Multipurpose protection (13) – MAP-13

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC13			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.15 LD0.MAPGAPC14 Multipurpose protection (14) – MAP-14

Table 181: LD0.MAPGAPC14 Multipurpose protection (14) – MAP-14

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC14			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.16 LD0.MAPGAPC15 Multipurpose protection (15) – MAP-15

Table 182: LD0.MAPGAPC15 Multipurpose protection (15) – MAP-15

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC15			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.17 LD0.MAPGAPC16 Multipurpose protection (16) – MAP-16

Table 183: LD0.MAPGAPC16 Multipurpose protection (16) – MAP-16

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC16			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.18 LD0.MAPGAPC17 Multipurpose protection (17) – MAP-17

Table 184: LD0.MAPGAPC17 Multipurpose protection (17) – MAP-17

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC17			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.19 LD0.MAPGAPC18 Multipurpose protection (18) – MAP-18

Table 185: LD0.MAPGAPC18 Multipurpose protection (18) – MAP-18

IEC 61850 name	SA name	Description	Values
LD0.MAPGAPC18			
.Op.general	TRIP	Stage trip	1 = Trip
.Str.general	Pickup	Stage pickup	1 = Pickup

2.3.8.20 LD0.MVGAPC1 Move (8 pcs) (1) – MV-1

Table 186: LD0.MVGAPC1 Move (8 pcs) (1) – MV-1

IEC 61850 name	SA name	Description	Values
LD0.MVGAPC1			
.SPCSO1.stVal	-	Input 1 signal	0/1=Off/On
.SPCSO2.stVal	-	Input 2 signal	0/1=Off/On
.SPCSO3.stVal	-	Input 3 signal	0/1=Off/On
.SPCSO4.stVal	-	Input 4 signal	0/1=Off/On
.SPCSO5.stVal	-	Input 5 signal	0/1=Off/On
.SPCSO6.stVal	-	Input 6 signal	0/1=Off/On
.SPCSO7.stVal	-	Input 7 signal	0/1=Off/On
.SPCSO8.stVal	-	Input 8 signal	0/1=Off/On

2.3.8.21 LD0.MVGAPC2 Move (8 pcs) (2) – MV-2

Table 187: LD0.MVGAPC2 Move (8 pcs) (2) – MV-2

IEC 61850 name	SA name	Description	Values
LD0.MVGAPC2			
.SPCSO1.stVal	-	Input 1 signal	0/1=Off/On
.SPCSO2.stVal	-	Input 2 signal	0/1=Off/On
.SPCSO3.stVal	-	Input 3 signal	0/1=Off/On
.SPCSO4.stVal	-	Input 4 signal	0/1=Off/On
.SPCSO5.stVal	-	Input 5 signal	0/1=Off/On
.SPCSO6.stVal	-	Input 6 signal	0/1=Off/On
.SPCSO7.stVal	-	Input 7 signal	0/1=Off/On
.SPCSO8.stVal	-	Input 8 signal	0/1=Off/On

2.3.8.22 LD0.SPCGAPC1 Generic control point (16 pcs) (1) – SPC-1

Table 188: LD0.SPCGAPC1 Generic control point (16 pcs) (1) – SPC-1

IEC 61850 name	SA name	Description	Values
LD0.SPCGAPC1			
.SPCS01.stVal	-	Output 1 state	0/1=Off/On
.SPCS02.stVal	-	Output 2 state	0/1=Off/On
.SPCS03.stVal	-	Output 3 state	0/1=Off/On
.SPCS04.stVal	-	Output 4 state	0/1=Off/On
.SPCS05.stVal	-	Output 5 state	0/1=Off/On
.SPCS06.stVal	-	Output 6 state	0/1=Off/On
.SPCS07.stVal	-	Output 7 state	0/1=Off/On
.SPCS08.stVal	-	Output 8 state	0/1=Off/On
.SPCS09.stVal	-	Output 9 state	0/1=Off/On
.SPCS10.stVal	-	Output 10 state	0/1=Off/On
.SPCS11.stVal	-	Output 11 state	0/1=Off/On
.SPCS12.stVal	-	Output 12 state	0/1=Off/On
.SPCS13.stVal	-	Output 13 state	0/1=Off/On
.SPCS14.stVal	-	Output 14 state	0/1=Off/On
.SPCS15.stVal	-	Output 15 state	0/1=Off/On
.SPCS16.stVal	-	Output 16 state	0/1=Off/On

2.3.8.23 LD0.SPCGAPC2 Generic control point (16 pcs) (2) – SPC-2

Table 189: LD0.SPCGAPC2 Generic control point (16 pcs) (2) – SPC-2

IEC 61850 name	SA name	Description	Values
LD0.SPCGAPC2			
.SPCS01.stVal	-	Output 1 state	0/1=Off/On
.SPCS02.stVal	-	Output 2 state	0/1=Off/On
.SPCS03.stVal	-	Output 3 state	0/1=Off/On
.SPCS04.stVal	-	Output 4 state	0/1=Off/On
.SPCS05.stVal	-	Output 5 state	0/1=Off/On
.SPCS06.stVal	-	Output 6 state	0/1=Off/On
.SPCS07.stVal	-	Output 7 state	0/1=Off/On
.SPCS08.stVal	-	Output 8 state	0/1=Off/On
.SPCS09.stVal	-	Output 9 state	0/1=Off/On
.SPCS10.stVal	-	Output 10 state	0/1=Off/On
Table continues on next page			

IEC 61850 name	SA name	Description	Values
.SPCS11.stVal	-	Output 11 state	0/1=Off/On
.SPCS12.stVal	-	Output 12 state	0/1=Off/On
.SPCS13.stVal	-	Output 13 state	0/1=Off/On
.SPCS14.stVal	-	Output 14 state	0/1=Off/On
.SPCS15.stVal	-	Output 15 state	0/1=Off/On
.SPCS16.stVal	-	Output 16 state	0/1=Off/On

2.3.8.24 LD0.UDFCNT1 Generic up-down counter (1) – CTR-1

Table 190: LD0.UDFCNT1 Generic up-down counter (1) – CTR-1

IEC 61850 name	SA name	Description	Value
LD0.UDFCNT1			
.DnCntSt.stVal	DNCNT_STS	Status of the down counting	0/1=Off/On
.UpCntSt.stVal	UPCNT_STS	Status of the up counting	0/1=Off/On

2.3.8.25 LD0.UDFCNT2 Generic up-down counter (1) – CTR-2

Table 191: LD0.UDFCNT2 Generic up-down counter (1) – CTR-2

IEC 61850 name	SA name	Description	Value
LD0.UDFCNT2			
.DnCntSt.stVal	DNCNT_STS	Status of the down counting	0/1=Off/On
.UpCntSt.stVal	UPCNT_STS	Status of the up counting	0/1=Off/On

2.3.8.26 LD0.UDFCNT3 Generic up-down counter (1) – CTR-3

Table 192: LD0.UDFCNT3 Generic up-down counter (1) – CTR-3

IEC 61850 name	SA name	Description	Value
LD0.UDFCNT3			
.DnCntSt.stVal	DNCNT_STS	Status of the down counting	0/1=Off/On
.UpCntSt.stVal	UPCNT_STS	Status of the up counting	0/1=Off/On

2.3.8.27 LD0.UDFCNT4 Generic up-down counter (1) – CTR-4

Table 193: LD0.UDFCNT4 Generic up-down counter (1) – CTR-4

IEC 61850 name	SA name	Description	Value
LD0.UDFCNT4			
.DnCntSt.stVal	DNCNT_STS	Status of the down counting	0/1=Off/On
.UpCntSt.stVal	UPCNT_STS	Status of the up counting	0/1=Off/On

2.3.9 Physical and raw I/O data

2.3.9.1 LD0.BSTGGIO1 Binary signal transfer (1) – BST-1

Table 194: LD0.BSTGGIO1 Binary signal transfer (1) – BST-1

IEC 61850 name	SA name	Description	Values
LD0.BSTGGIO1			
.SPCSO1.stVal	RECV_SIG_1	Output 1 state	0/1=Off/On
.SPCSO2.stVal	RECV_SIG_2	Output 2 state	0/1=Off/On
.SPCSO3.stVal	RECV_SIG_3	Output 3 state	0/1=Off/On
.SPCSO4.stVal	RECV_SIG_4	Output 4 state	0/1=Off/On
.SPCSO5.stVal	RECV_SIG_5	Output 5 state	0/1=Off/On
.SPCSO6.stVal	RECV_SIG_6	Output 6 state	0/1=Off/On
.SPCSO7.stVal	RECV_SIG_7	Output 7 state	0/1=Off/On
.SPCSO8.stVal	RECV_SIG_8	Output 8 state	0/1=Off/On
.Ind1.stVal	SEND_SIG_1	Input 1 state	0/1=Off/On
.Ind2.stVal	SEND_SIG_2	Input 2 state	0/1=Off/On
.Ind3.stVal	SEND_SIG_3	Input 3 state	0/1=Off/On
.Ind4.stVal	SEND_SIG_4	Input 4 state	0/1=Off/On
.Ind5.stVal	SEND_SIG_5	Input 5 state	0/1=Off/On
.Ind6.stVal	SEND_SIG_6	Input 6 state	0/1=Off/On
.Ind7.stVal	SEND_SIG_7	Input 7 state	0/1=Off/On
.Ind8.stVal	SEND_SIG_8	Input 8 state	0/1=Off/On

2.3.9.2 LD0.XAGGIO130 Physical I/O

Table 195: LD0.XAGGIO130 Physical I/O

IEC 61850 name	SA name	Description	Values
LD0.XAGGIO130			
.Ind1.stVal	-	X130-Input 1	1/0=ON/OFF
.Ind2.stVal	-	X130-Input 2	1/0=ON/OFF
.Ind3.stVal	-	X130-Input 3	1/0=ON/OFF
.Ind4.stVal	-	X130-Input 4	1/0=ON/OFF

2.3.9.3 LD0.XBGGIO110 Physical I/O

Table 196: LD0.XBGGIO110 Physical I/O

IEC 61850 name	SA name	Description	Values
LD0.XBGGIO110			
.Ind1.stVal		XB110-Input 1	1/0=ON/OFF
.Ind2.stVal		XB110-Input 2	1/0=ON/OFF
.Ind3.stVal		XB110-Input 3	1/0=ON/OFF
.Ind4.stVal		XB110-Input 4	1/0=ON/OFF
.Ind5.stVal		XB110-Input 5	1/0=ON/OFF
.Ind6.stVal		XB110-Input 6	1/0=ON/OFF
.Ind7.stVal		XB110-Input 7	1/0=ON/OFF
.Ind8.stVal		XB110-Input 8	1/0=ON/OFF
.SPCSO1.stVal		XB110-Output 1	1/0=ON/OFF
.SPCSO2.stVal		XB110-Output 1	1/0=ON/OFF
.SPCSO3.stVal		XB110-Output 1	1/0=ON/OFF
.SPCSO4.stVal		XB110-Output 1	1/0=ON/OFF

2.3.9.4 LD0.XGGIO100 Physical I/O

Table 197: LD0.XGGIO100 Physical I/O

IEC 61850 name	SA name	Description	Values
LD0.XGGIO100			
.SPCSO1.stVal	-	X100-Output 1	1/0=ON/OFF
.SPCSO2.stVal	-	X100-Output 2	1/0=ON/OFF
.SPCSO3.stVal	-	X100-Output 3	1/0=ON/OFF
Table continues on next page			

IEC 61850 name	SA name	Description	Values
.SPCSO4.stVal	-	X100-Output 4	1/0=ON/OFF
.SPCSO5.stVal	-	X100-Output 5	1/0=ON/OFF
.SPCSO6.stVal	-	X100-Output 6	1/0=ON/OFF

2.3.9.5 LD0.XGGIO110 Physical I/O

Table 198: LD0.XGGIO110 Physical I/O

IEC 61850 name	SA name	Description	Values
LD0.XGGIO110			
.Ind1.stVal	-	X110-Input 1	1/0=ON/OFF
.Ind2.stVal	-	X110-Input 2	1/0=ON/OFF
.Ind3.stVal	-	X110-Input 3	1/0=ON/OFF
.Ind4.stVal	-	X110-Input 4	1/0=ON/OFF
.Ind5.stVal	-	X110-Input 5	1/0=ON/OFF
.Ind6.stVal	-	X110-Input 6	1/0=ON/OFF
.Ind7.stVal	-	X110-Input 7	1/0=ON/OFF
.Ind8.stVal	-	X110-Input 8	1/0=ON/OFF
.SPCSO1.stVal	-	X110-Output 1	1/0=ON/OFF
.SPCSO2.stVal	-	X110-Output 2	1/0=ON/OFF
.SPCSO3.stVal	-	X110-Output 3	1/0=ON/OFF
.SPCSO4.stVal	-	X110-Output 4	1/0=ON/OFF

2.3.9.6 LD0.XGGIO120 Physical I/O

Table 199: LD0.XGGIO120 Physical I/O

IEC 61850 name	SA name	Description	Values
LD0.XGGIO120			
.Ind1.stVal	-	X120-Input 1	1/0=ON/OFF
.Ind2.stVal	-	X120-Input 2	1/0=ON/OFF
.Ind3.stVal	-	X120-Input 3	1/0=ON/OFF
.Ind4.stVal	-	X120-Input 4	1/0=ON/OFF

2.3.9.7 LD0.XGGIO130 Physical I/O

Table 200: LD0.XGGIO130 Physical I/O

IEC 61850 name	SA name	Description	Values
LD0.XGGIO130			
.Ind1.stVal	-	X130-Input 1	1/0=ON/OFF
.Ind2.stVal	-	X130-Input 2	1/0=ON/OFF
.Ind3.stVal	-	X130-Input 3	1/0=ON/OFF
.Ind4.stVal	-	X130-Input 4	1/0=ON/OFF
.Ind5.stVal	-	X130-Input 5	1/0=ON/OFF
.Ind6.stVal	-	X130-Input 6	1/0=ON/OFF
.SPCSO1.stVal	-	X130-Output 1	1/0=ON/OFF
.SPCSO2.stVal	-	X130-Output 2	1/0=ON/OFF
.SPCSO3.stVal	-	X130-Output 3	1/0=ON/OFF

2.4 Binary outputs

Table 201: Explanations of the binary output table columns

Column name	Description
IEC 61850 name	Original IED data object identification. Described in the IEC 61850 format as Logical Device.Logical Node and thereafter .Data Object.Data Attribute. Logical Node is the same as the application function block name.
SA name	The signal may have a defined label that is visible, for example, in the Application Configuration tool in PCM600.
Description	Short description of the signal. See the technical manual for more information.
Type	Output type. Some outputs can only be controlled with value “On”. Writing “Off” to these points does not affect the function of the output. See the DNP3 control relay output block parameters.

2.4.1 System functions

2.4.1.1 LD0.LLN0/LDEV1 Reset indications and LEDs, reset device (1)

Table 202: LD0.LLN0/LDEV1 Reset indications and LEDs, reset device (1)

IEC 61850 name	SA name	Description	Type
LD0.LLN0			
.IndLEDRs.Oper.ctlVal		Reset indications and LEDs	On
.ProgLEDRs.Oper.ctlVal		Reset programmable LEDs	On

Table continues on next page

IEC 61850 name	SA name	Description	Type
.MeasStatRs.Oper.ctlVal		Reset metering records	On
.PQRs.Oper.ctlVal		Reset power quality data	On
LD0.LDEV1			
.WrmStrCmd.Oper.ctlVal		Reset device (warm start)	On

2.4.2 Switchgear functions

2.4.2.1 CTRL.CBXCBR1 Circuit-breaker control (1) – 52-1

Table 203: CTRL.CBXCBR1 Circuit-breaker control (1) – 52-1

IEC 61850 name	SA name	Description	Type
CTRL.CBCSWI1			
.Pos.Oper.ctlVal	-	Circuit breaker control	On/Off

2.4.2.2 CTRL.CBXCBR2 Circuit-breaker control (2) – 52-2

Table 204: CTRL.CBXCBR2 Circuit-breaker control (2) – 52-2

IEC 61850 name	SA name	Description	Type
CTRL.CBCSWI2			
.Pos.Oper.ctlVal	-	Circuit breaker control	On/Off

2.4.2.3 CTRL.DCXSWI1 Disconnector control (1) – 29DS-1

Table 205: CTRL.DCXSWI1 Disconnector control (1) – 29DS-1

IEC 61850 name	SA name	Description	Type
CTRL.DCCSWI1			
.Pos.Oper.ctlVal	-	Disconnector control	On/Off

2.4.2.4 CTRL.DCXSWI2 Disconnector control (2) – 29DS-2

Table 206: CTRL.DCXSWI2 Disconnector control (2) – 29DS-2

IEC 61850 name	SA name	Description	Type
CTRL.DCCSWI2			
.Pos.Oper.ctlVal	-	Disconnector control	On/Off

2.4.2.5 CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1

Table 207: CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1

IEC 61850 name	SA name	Description	Type
CTRL.ESCSWI1			
.Pos.Oper.ctlVal	-	Ground switch control	On/Off

2.4.3 Sensors and monitoring functions

2.4.3.1 LD0.SSCBR1 Circuit-breaker condition monitoring (1) – 52CM-1

Table 208: LD0.SSCBR1 Circuit-breaker condition monitoring (1) – 52CM-1

IEC 61850 name	SA name	Description	Type
LD0.SSCBR1			
.RsAccmAPwr.Oper.ctlVal	RST_IPOW	Reset accum. energy	On
.RsCBWear.Oper.ctlVal	RST_CB_WEAR	Reset CB life and op. counter	On
.RsTrvTm.Oper.ctlVal	RST_TRV_T	Reset travel time alarm	On
LD0.SSOPM1			
.RsSprChaTm.Oper.ctlVal	RST_SPR_T	Reset spring charge alarm	On

2.4.3.2 LD0.SSCBR2 Circuit-breaker condition monitoring (2) – 52CM-2

Table 209: LD0.SSCBR2 Circuit-breaker condition monitoring (2) – 52CM-2

IEC 61850 name	SA name	Description	Type
LD0.SSCBR2			
.RsAccmAPwr.Oper.ctlVal	RST_IPOW	Reset accum. energy	On
.RsCBWear.Oper.ctlVal	RST_CB_WEAR	Reset CB life and op. counter	On
.RsTrvTm.Oper.ctlVal	RST_TRV_T	Reset travel time alarm	On
LD0.SSOPM2			
.RsSprChaTm.Oper.ctlVal	RST_SPR_T	Reset spring charge alarm	On

2.4.4 Metering and measurand functions

2.4.4.1 LD0.CMMXU1 Three-phase current measurement (1) – IA, IB, IC-1

Table 210: LD0.CMMXU1 Three-phase current measurement (1) – IA, IB, IC-1

IEC 61850 name	SA name	Description	Values
LD0.CMMXU1			
.RcdRs.Oper.ctlVal		Reset min./max. demands	On

2.4.4.2 LD0.CMMXU2 Three-phase current measurement (2) – IA, IB, IC-2

Table 211: LD0.CMMXU2 Three-phase current measurement (2) – IA, IB, IC-2

IEC 61850 name	SA name	Description	Values
LD0.CMMXU2			
.RcdRs.Oper.ctlVal		Reset min./max. demands	On

2.4.4.3 LD0.FLTRFRC1 Fault record (1) – FLR-1

Table 212: LD0.FLTRFRC1 Fault record (1) – FLR-1

IEC 61850 name	SA name	Description	Values
LD0.FLTRFRC1			
.RcdRs.Oper.ctlVal		Reset fault records	On

2.4.4.4 LD0.PEMMTR1 Reset accumulated energy values (1)

Table 213: LD0.PEMMTR1 Reset accumulated energy values (1)

IEC 61850 name	SA name	Description	Type
LD0.PEMMTR1			
.SupDmdRs.Oper.ctlVal	RSTACM	Reset accum. energy	On

2.4.4.5 LD0.PEMMXU1 Three-phase power and energy measurement (1) – P, E-1

Table 214: LD0.PEMMXU1 Three-phase power and energy measurement (1) – P, E-1

IEC 61850 name	SA name	Description	Value
LD0.PEMMXU1			
.RcdRs.Oper.ctlVal		Reset power demands	On

2.4.4.6 LD0.SPEMMXU1 Single-phase power and energy measurement – Sp, SE-1

Table 215: LD0.SPEMMXU1 Single-phase power and energy measurement – Sp, SE-1

IEC 61850 name	SA name	Description	Type
LD0.SPEMMXU1			
.RcdRs.Oper.ctlVal	-	Reset power demands	1=Reset

2.4.4.7 LD0.RESCMMXU1 Residual current measurement (1) – IG-1

Table 216: LD0.RESCMMXU1 Residual current measurement (1) – IG-1

IEC 61850 name	SA name	Description	Values
LD0.RESCMMXU1			
.RcdRs.Oper.ctlVal		Reset min./max. demands	On

2.4.4.8 LD0.RESCMMXU2 Residual current measurement (2) – IG-2

Table 217: LD0.RESCMMXU2 Residual current measurement (2) – IG-2

IEC 61850 name	SA name	Description	Values
LD0.RESCMMXU2			
.RcdRs.Oper.ctlVal		Reset min./max. demands	On

2.4.4.9 LD0.RESVMMXU1 Residual voltage measurement (1) – VG-1

Table 218: LD0.RESVMMXU1 Residual voltage measurement (1) – VG-1

IEC 61850 name	SA name	Description	Value
LD0.RESVMMXU1			
.RcdRs.Oper.ctlVal		Reset min./max. demands	On

2.4.4.10 LD0.RESVMMXU2 Residual voltage measurement (2) – VG-2

Table 219: LD0.RESVMMXU2 Residual voltage measurement (2) – VG-2

IEC 61850 name	SA name	Description	Value
LD0.RESVMMXU2			
.RcdRs.Oper.ctlVal		Reset min./max. demands	On

2.4.5 Power quality functions

2.4.5.1 LD0.CMHAI1 Current total demand distortion (1) – PQI-1

Table 220: LD0.CMHAI1 Current total demand distortion (1) – PQI-1

IEC 61850 name	SA name	Description	Type
LD0.CMHAI1			
.RcdRs.Oper.ctlVal		Reset max. demands	1=Reset

2.4.5.2 LD0.PHQVVR1 Voltage variation (1) – PQSS-1

Table 221: LD0.PHQVVR1 Voltage variation (1) – PQSS-1

IEC 61850 name	SA name	Description	Type
LD0.PH1QVVR1			
.CntRs.Oper.ctlVal		Reset counters	1=Reset

2.4.5.3 LD0.PHQVVR2 Voltage variation (2)

Table 222: LD0.PHQVVR2 Voltage variation (2)

IEC 61850 name	SA name	Description	Type
LD0.PH1QVVR2			
.CntRs.Oper.ctlVal	-	Reset counters	1=Reset

2.4.5.4 LD0.VMHAI1 Voltage total harmonic distortion (1) – PQVPH-1

Table 223: LD0.VMHAI1 Voltage total harmonic distortion (1) – PQVPH-1

IEC 61850 name	SA name	Description	Type
LD0.VMHAI1			
.RcdRs.Oper.ctlVal		Reset max. demands	1=Reset

2.4.5.5 LD0.VMHAI2 Voltage total harmonic distortion (2) – PQVPH-2

Table 224: LD0.VMHAI2 Voltage total harmonic distortion (2) – PQVPH-2

IEC 61850 name	SA name	Description	Type
LD0.VMHAI2			
.RcdRs.Oper.ctlVal	-	Reset max. demands	1=Reset

2.4.6 Protection-related functions

2.4.6.1 DR.RDRE1 Disturbance recorder (1)

Table 225: DR.RDRE1 Disturbance recorder (1)

IEC 61850 name	SA name	Description	Type
DR.RDRE1			
.MemClr.Oper.ctlVal	-	Clear all records	On
.RcdTrg.Oper.ctlVal	-	Trig recording	On

2.4.6.2 LD0.DARREC1 Autoreclosing (1) –79-1

Table 226: LD0.DARREC1 Autoreclosing (1) –79-1

IEC 61850 name	SA name	Description	Type
LD0.DARREC1			
.CntRs.Oper.ctlVal	-	AR reset all counters	On
.RecRs.Oper.ctlVal	-	AR reset	On

2.4.6.3 LD0.LDPRLRC1 Load profile record (1) – LoadProf

Table 227: LD0.LDPRLRC1 Load profile record (1) – LoadProf

IEC 61850 name	SA name	Description	Value
LD0.LDPRLRC1			
.RcdRs.Oper.ctlVal		Reset record	On

2.4.7 Generic functions

2.4.7.1 LD0.BSTGGIO1 Binary signal transfer (1) – BST-1

Table 228: LD0.BSTGGIO1 Binary signal transfer (1) – BST-1

IEC 61850 name	SA name	Description	Type
LD0.BSTGGIO1			
.SPCSO1.Oper.ctlVal		Output 1	0/1=Off/On
.SPCSO2.Oper.ctlVal		Output 2	0/1=Off/On
.SPCSO3.Oper.ctlVal		Output 3	0/1=Off/On
.SPCSO4.Oper.ctlVal		Output 4	0/1=Off/On
.SPCSO5.Oper.ctlVal		Output 5	0/1=Off/On

Table continues on next page

IEC 61850 name	SA name	Description	Type
.SPCSO6.Oper.ctlVal		Output 6	0/1=Off/On
.SPCSO7.Oper.ctlVal		Output 7	0/1=Off/On
.SPCSO8.Oper.ctlVal		Output 8	0/1=Off/On

2.4.7.2 LD0.SPCGAPC1 Generic control point (16 pcs) (1) – SPC-1

The binary outputs can be configured either as pulse- or persistent-type outputs. Pulse-type outputs are triggered with the write value "1". Persistent-type outputs can be written with both values "1" and "0" values. The setting mode "toggled" for local operation corresponds to "persistent" for remote operation.

Table 229: LD0.SPCGAPC1 Generic control point (16 pcs) (1) – SPC-1

IEC 61850 name	SA name	Description	Type
LD0.SPCGAPC1			
.SPCSO1.Oper.ctlVal	-	Output 1 control	On/Off
.SPCSO2.Oper.ctlVal	-	Output 2 control	On/Off
.SPCSO3.Oper.ctlVal	-	Output 3 control	On/Off
.SPCSO4.Oper.ctlVal	-	Output 4 control	On/Off
.SPCSO5.Oper.ctlVal	-	Output 5 control	On/Off
.SPCSO6.Oper.ctlVal	-	Output 6 control	On/Off
.SPCSO7.Oper.ctlVal	-	Output 7 control	On/Off
.SPCSO8.Oper.ctlVal	-	Output 8 control	On/Off
.SPCSO9.Oper.ctlVal	-	Output 9 control	On/Off
.SPCSO10.Oper.ctlVal	-	Output 10 control	On/Off
.SPCSO11.Oper.ctlVal	-	Output 11 control	On/Off
.SPCSO12.Oper.ctlVal	-	Output 12 control	On/Off
.SPCSO13.Oper.ctlVal	-	Output 13 control	On/Off
.SPCSO14.Oper.ctlVal	-	Output 14 control	On/Off
.SPCSO15.Oper.ctlVal	-	Output 15 control	On/Off
.SPCSO16.Oper.ctlVal	-	Output 16 control	On/Off

2.4.7.3 LD0.SPCGAPC2 Generic control point (16 pcs) (2) – SPC-2

The binary outputs can be configured either as pulse- or persistent-type outputs. Pulse-type outputs are triggered with the write value "1". Persistent-type outputs can be written with both values "1" and "0". The setting mode "toggled" for local operation corresponds to "persistent" for remote operation.

Table 230: LD0.SPCGAPC2 Generic control point (16 pcs) (2) – SPC-2

IEC 61850 name	SA name	Description	Type
LD0.SPCGAPC2			
.SPCSO1.Oper.ctlVal	-	Output 1 control	On/Off
.SPCSO2.Oper.ctlVal	-	Output 2 control	On/Off
.SPCSO3.Oper.ctlVal	-	Output 3 control	On/Off
.SPCSO4.Oper.ctlVal	-	Output 4 control	On/Off
.SPCSO5.Oper.ctlVal	-	Output 5 control	On/Off
.SPCSO6.Oper.ctlVal	-	Output 6 control	On/Off
.SPCSO7.Oper.ctlVal	-	Output 7 control	On/Off
.SPCSO8.Oper.ctlVal	-	Output 8 control	On/Off
.SPCSO9.Oper.ctlVal	-	Output 9 control	On/Off
.SPCSO10.Oper.ctlVal	-	Output 10 control	On/Off
.SPCSO11.Oper.ctlVal	-	Output 11 control	On/Off
.SPCSO12.Oper.ctlVal	-	Output 12 control	On/Off
.SPCSO13.Oper.ctlVal	-	Output 13 control	On/Off
.SPCSO14.Oper.ctlVal	-	Output 14 control	On/Off
.SPCSO15.Oper.ctlVal	-	Output 15 control	On/Off
.SPCSO16.Oper.ctlVal	-	Output 16 control	On/Off

2.4.7.4 LD0.SRGAPC1 Set-reset (8 pcs) (1) – SR-1

Table 231: LD0.SRGAPC1 Set-reset (8 pcs) (1) – SR-1

IEC 61850 name	SA name	Description	Type
LD0.SRGAPC1			
.Rs1.Oper.ctlVal	-	Reset flip-flop 1	On
.Rs2.Oper.ctlVal	-	Reset flip-flop 2	On
.Rs3.Oper.ctlVal	-	Reset flip-flop 3	On
.Rs4.Oper.ctlVal	-	Reset flip-flop 4	On
.Rs5.Oper.ctlVal	-	Reset flip-flop 5	On
.Rs6.Oper.ctlVal	-	Reset flip-flop 6	On
.Rs7.Oper.ctlVal	-	Reset flip-flop 7	On
.Rs8.Oper.ctlVal	-	Reset flip-flop 8	On

2.4.7.5 LD0.SRGAPC2 Set-reset (8 pcs) (2) – SR-2

Table 232: LD0.SRGAPC2 Set-reset (8 pcs) (2) – SR-2

IEC 61850 name	SA name	Description	Type
LD0.SRGAPC2			
.Rs1.Oper.ctlVal	-	Reset flip-flop 1	On
.Rs2.Oper.ctlVal	-	Reset flip-flop 2	On
.Rs3.Oper.ctlVal	-	Reset flip-flop 3	On
.Rs4.Oper.ctlVal	-	Reset flip-flop 4	On
.Rs5.Oper.ctlVal	-	Reset flip-flop 5	On
.Rs6.Oper.ctlVal	-	Reset flip-flop 6	On
.Rs7.Oper.ctlVal	-	Reset flip-flop 7	On
.Rs8.Oper.ctlVal	-	Reset flip-flop 8	On

2.4.7.6 LD0.SRGAPC3 Set-reset (8 pcs) (3) – SR-3

Table 233: LD0.SRGAPC3 Set-reset (8 pcs) (3) – SR-3

IEC 61850 name	SA name	Description	Type
LD0.SRGAPC3			
.Rs1.Oper.ctlVal	-	Reset flip-flop 1	On
.Rs2.Oper.ctlVal	-	Reset flip-flop 2	On
.Rs3.Oper.ctlVal	-	Reset flip-flop 3	On
.Rs4.Oper.ctlVal	-	Reset flip-flop 4	On
.Rs5.Oper.ctlVal	-	Reset flip-flop 5	On
.Rs6.Oper.ctlVal	-	Reset flip-flop 6	On
.Rs7.Oper.ctlVal	-	Reset flip-flop 7	On
.Rs8.Oper.ctlVal	-	Reset flip-flop 8	On

2.4.7.7 LD0.SRGAPC4 Set-reset (8 pcs) (4) – SR-4

Table 234: LD0.SRGAPC4 Set-reset (8 pcs) (4) – SR-4

IEC 61850 name	SA name	Description	Type
LD0.SRGAPC4			
.Rs1.Oper.ctlVal	-	Reset flip-flop 1	On
.Rs2.Oper.ctlVal	-	Reset flip-flop 2	On
.Rs3.Oper.ctlVal	-	Reset flip-flop 3	On
.Rs4.Oper.ctlVal	-	Reset flip-flop 4	On
Table continues on next page			

IEC 61850 name	SA name	Description	Type
.Rs5.Oper.ctlVal	-	Reset flip-flop 5	On
.Rs6.Oper.ctlVal	-	Reset flip-flop 6	On
.Rs7.Oper.ctlVal	-	Reset flip-flop 7	On
.Rs8.Oper.ctlVal	-	Reset flip-flop 8	On

2.4.7.8 LD0.UDFCNT1 Generic up-down counter (1) – CTR-1

Table 235: LD0.UDFCNT1 Generic up-down counter (1) – CTR-1

IEC 61850 name	SA name	Description	Type
LD0.UDFCNT1			
.CntRs.Oper.ctlVal	-	Resets counter value	1=Reset
.LodCnt.Oper.ctlVal	-	Loads the counter to preset value	1=Load

2.4.7.9 LD0.UDFCNT2 Generic up-down counter (1) – CTR-2

Table 236: LD0.UDFCNT2 Generic up-down counter (1) – CTR-2

IEC 61850 name	SA name	Description	Type
LD0.UDFCNT2			
.CntRs.Oper.ctlVal	-	Resets counter value	1=Reset
.LodCnt.Oper.ctlVal	-	Loads the counter to preset value	1=Load

2.4.7.10 LD0.UDFCNT3 Generic up-down counter (1) – CTR-3

Table 237: LD0.UDFCNT3 Generic up-down counter (1) – CTR-3

IEC 61850 name	SA name	Description	Type
LD0.UDFCNT3			
.CntRs.Oper.ctlVal	-	Resets counter value	1=Reset
.LodCnt.Oper.ctlVal	-	Loads the counter to preset value	1=Load

2.4.7.11 LD0.UDFCNT4 Generic up-down counter (1) – CTR-4

Table 238: LD0.UDFCNT4 Generic up-down counter (1) – CTR-4

IEC 61850 name	SA name	Description	Type
LD0.UDFCNT4			
.CntRs.Oper.ctlVal	-	Resets counter value	1=Reset
.LodCnt.Oper.ctlVal	-	Loads the counter to preset value	1=Load

2.5 Analog inputs

Table 239: Explanations of the analog input table columns

Column name	Description
IEC 61850 name	Original IED data object identification. Described in the IEC 61850 format as Logical Device.Logical Node and thereafter .Data Object.Data Attribute. Logical Node is the same as the application function block name.
SA name	The signal may have a defined label that is visible, for example, in the Application Configuration tool in PCM600.
Description	Short description of the signal. See the technical manual for more information.
Values	The value range of the original IEC 61850 data. Scaling is needed to convert floating point data into DNP3 integer values.
S	Scaling type selected as default. Default “R” means ratio scaling. See the DNP3 communication protocol manual for details.
Arg 1, 2, 3, 4	Scaling argument values as default. When ratio scaling is selected, the four values correspond to min value in, max value in, min value out, and max value out. See the DNP3 communication protocol manual for details.

2.5.1 System functions

2.5.1.1 CTRL.LLN0 Local/remote/station/off and combinations

Table 240: CTRL.LLN0 Local/remote/station/off and combinations

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
CTRL.LLN0					
.LocKeyHMI.stVal		0=Off; 1=Loc; 2=Rem; 3=Stat; 4=L+R; 5=L+S; 6=L+S+R; 7=S+R	0…7	R	0,65535,0,65535

2.5.1.2 LD0.GNRLLTMS1 Time synchronization (1)

Table 241: LD0.GNRLLTMS1 Time synchronization (1)

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.GNRLLTMS1					
.TmSyn.stVal	SMV Synch accuracy	IEC 61850-9-2 status	0=No sync; 1=Local; 2=Global	R	0,65535,0,65535
.TmSrcSt.stVal	Synch source	Current synch. source	0...99[1)]	R	0,65535,0,65535

1) See the technical manual.

2.5.1.3 LD0.LEDGGIO1 LHMI LED indications, 3 states (1) – LED-1

Table 242: LD0.LEDGGIO1 LHMI LED indications, 3 states (1) – LED-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.LEDGGIO1					
.LEDSt1.stVal	-	LED 1 state	0/1/3=Off/Ok/ Alarm	R	0,3,0,3
.LEDSt2.stVal	-	LED 2 state	0/1/3=Off/Ok/ Alarm	R	0,3,0,3
.LEDSt3.stVal	-	LED 3 state	0/1/3=Off/Ok/ Alarm	R	0,3,0,3
.LEDSt4.stVal	-	LED 4 state	0/1/3=Off/Ok/ Alarm	R	0,3,0,3
.LEDSt5.stVal	-	LED 5 state	0/1/3=Off/Ok/ Alarm	R	0,3,0,3
.LEDSt6.stVal	-	LED 6 state	0/1/3=Off/Ok/ Alarm	R	0,3,0,3
.LEDSt7.stVal	-	LED 7 state	0/1/3=Off/Ok/ Alarm	R	0,3,0,3
.LEDSt8.stVal	-	LED 8 state	0/1/3=Off/Ok/ Alarm	R	0,3,0,3
.LEDSt9.stVal	-	LED 9 state	0/1/3=Off/Ok/ Alarm	R	0,3,0,3
.LEDSt10.stVal	-	LED 10 state	0/1/3=Off/Ok/ Alarm	R	0,3,0,3
.LEDSt11.stVal	-	LED 11 state	0/1/3=Off/Ok/ Alarm	R	0,3,0,3

2.5.1.4 LD0.LLN0 Active parameter setting group

Table 243: LD0.LLN0 Active parameter setting group

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.LLN0					
.ActSetGr.stVal		Active setting group	1…6	R	1,6,1,6

2.5.1.5 LD0.LLN0/LPHD1/LDEV1 System values (1)

Table 244: LD0.LLN0/LPHD1/LDEV1 System values (1)

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.LLN0					
.ParChgCnt.stVal		Num. of setting changes	0…65535	R	0,65535,0,65535
LD0.LDEV1					
.DevWrn.stVal	Warning	Warning code	0…65535	R	0,65535,0,65535
.DevFail.stVal	Internal Fault	Internal fault code	0…65535	R	0,65535,0,65535
.ChgAckCnt.stVal		Num. of comp. changes	0…65535	R	0,65535,0,65535
LD0.LPHD1					
.PhyHealth.stVal		Global health code	0…10	R	0,10,0,10
.NumPwrUp.stVal		Num. of power ups	0…65535	R	0,65535,0,65535
.WacTrg.stVal		Num. of watchdog resets	0…65535	R	0,65535,0,65535
.WrmStr.stVal		Num. of warm starts	0…65535	R	0,65535,0,65535

2.5.2 Switchgear functions

2.5.2.1 CTRL.CBXCBR1 Circuit-breaker control (1) – 52-1

Table 245: CTRL.CBXCBR1 Circuit-breaker control (1) – 52-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
CTRL.CBCSWI1					
.Pos.stVal	POSITION	Intermediate=0; Off=1; On=2; Bad=3	0…3	R	0,3,0,3

2.5.2.2 CTRL.CBXCBR2 Circuit-breaker control (2) – 52-2

Table 246: CTRL.CBXCBR2 Circuit-breaker control (2) – 52-2

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
CTRL.CBCSWI2					
.Pos.stVal	POSITION	Intermediate=0; Off=1; On=2; Bad=3	0…3	R	0,3,0,3

2.5.2.3 CTRL.DCSXSWI1 Disconnector position indication (1) – 52-TOC

Table 247: CTRL.DCSXSWI1 Disconnector position indication (1) – 52-TOC

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
CTRL.DCSXSWI1					
.Pos.stVal	POSITION	Intermediate=0; Off=1; On=2; Bad=3	0…3	R	0,3,0,3

2.5.2.4 CTRL.DCSXSWI2 Disconnector position indication (2) – 29DS-1

Table 248: CTRL.DCSXSWI2 Disconnector position indication (2) – 29DS-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
CTRL.DCSXSWI2					
.Pos.stVal	POSITION	Intermediate=0; Off=1; On=2; Bad=3	0…3	R	0,3,0,3

2.5.2.5 CTRL.DCSXSWI3 Disconnector position indication (3) – 29DS-2

Table 249: CTRL.DCSXSWI3 Disconnector position indication (3) – 29DS-2

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
CTRL.DCSXSWI3					
.Pos.stVal	POSITION	Intermediate=0; Off=1; On=2; Bad=3	0…3	R	0,3,0,3

2.5.2.6 CTRL.DCXSWI1 Disconnector control (1) – 29DS-1

Table 250: CTRL.DCXSWI1 Disconnector control (1) – 29DS-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
CTRL.DCXSWI1					
.Pos.stVal	POSITION	Intermediate=0; Off=1; On=2; Bad=3	0…3	R	0,3,0,3

2.5.2.7 CTRL.DCXSWI2 Disconnector control (2) – 29DS-2

Table 251: CTRL.DCXSWI2 Disconnector control (2) – 29DS-2

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
CTRL.DCXSWI2					
.Pos.stVal	POSITION	Intermediate=0; Off=1; On=2; Bad=3	0…3	R	0,3,0,3

2.5.2.8 CTRL.ESSXSWI1 Grounding switch indication (1) – 29GS-1

Table 252: CTRL.ESSXSWI1 Grounding switch indication (1) – 29GS-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
CTRL.ESSXSWI1					
.Pos.stVal	POSITION	Intermediate=0; Off=1; On=2; Bad=3	0…3	R	0,3,0,3

2.5.2.9 CTRL.ESSXSWI2 Grounding switch indication (2) – 29GS-2

Table 253: CTRL.ESSXSWI2 Grounding switch indication (2) – 29GS-2

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
CTRL.ESSXSWI2					
.Pos.stVal	POSITION	Intermediate=0; Off=1; On=2; Bad=3	0…3	R	0,3,0,3

2.5.2.10 CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1

Table 254: CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
CTRL.ESXSWI1					
.Pos.stVal	POSITION	Intermediate=0; Off=1; On=2; Bad=3	0…3	R	0,3,0,3

2.5.3 Sensors and monitoring functions

2.5.3.1 LD0.ARCSARC11 Arc protection (1) – AFD-1

Table 255: LD0.ARCSARC11 Arc protection (1) – AFD-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.ARCSARC11					
.FACntRs.stVal		Arc 1 operation counter	0…65535	R	0,65535,0,65535

2.5.3.2 LD0.ARCSARC21 Arc protection (2) – AFD-2

Table 256: LD0.ARCSARC21 Arc protection (2) – AFD-2

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.ARCSARC21					
.FACntRs.stVal		Arc 2 operation counter	0…65535	R	0,65535,0,65535

2.5.3.3 LD0.ARCSARC31 Arc protection (3) – AFD-3

Table 257: LD0.ARCSARC31 Arc protection (3) – AFD-3

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.ARCSARC31					
.FACntRs.stVal		Arc 3 operation counter	0…65535	R	0,65535,0,65535

2.5.3.4 LD0.MDSOPT1 Runtime counter for machines and devices (1) – OPTM-1

Table 258: LD0.MDSOPT1 Runtime counter for machines and devices (1) – OPTM-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.MDSOPT1					
.OpTmh.stVal		Operation time	0…300000 [h]	R	0,300000,0,300000

2.5.3.5 LD0.SSCBR1 Circuit-breaker condition monitoring (1) – 52CM-1

Table 259: LD0.SSCBR1 Circuit-breaker condition monitoring (1) – 52CM-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.SSCBR1					
.OpCntRs.stVal	NO_OPR	Number of CB operations	0...99999	R	0,99999,0,99999
.InaTmdCnt.stVal	INA_DAYS	CB inactive days	0...9999	R	0,9999,0,9999
.OpTmOpn.mag	T_TRV_OP	Opening travel time	0…60000 [ms]	R	0,60000,0,60000
.OpTmCls.mag	T_TRV_CL	Closing travel time	0…60000 [ms]	R	0,60000,0,60000
LD0.SSOPM1					
.TmsSprCha.mag	T_SPR_CHR	Spring charging time	0...99.99 [s]	R	0,100,0,10000
LD0.SPH1SCBR1					
.AccmAPwr.mag	IPOW_A	Phs A acc. currents power	0…30000	R	0,30000,0,30000
.RmnNumOp.stVal	CB_LIFE_A	Phs A remaining life	-99999...99999	R	-99999,99999,-99999,99999
LD0.SPH2SCBR1					
.AccmAPwr.mag	IPOW_B	Phs B acc. currents power	0…30000	R	0,30000,0,30000
.RmnNumOp.stVal	CB_LIFE_B	Phs B remaining life	-99999...99999	R	-99999,99999,-99999,99999
LD0.SPH3SCBR1					
.AccmAPwr.mag	IPOW_C	Phs C acc. currents power	0…30000	R	0,30000,0,30000
.RmnNumOp.stVal	CB_LIFE_C	Phs C remaining life	-99999...99999	R	-99999,99999,-99999,99999

2.5.3.6 LD0.SSCBR2 Circuit-breaker condition monitoring (2) – 52CM-2

Table 260: LD0.SSCBR2 Circuit-breaker condition monitoring (2) – 52CM-2

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.SSCBR2					
.OpCntRs.stVal	NO_OPR	Number of CB operations	0...99999	R	0,99999,0,99999
.InaTmdCnt.stVal	INA_DAYS	CB inactive days	0...9999	R	0,9999,0,9999
.OpTmOpn.mag	T_TRV_OP	Opening travel time	0…60000 [ms]	R	0,60000,0,60000
.OpTmCls.mag	T_TRV_CL	Closing travel time	0…60000 [ms]	R	0,60000,0,60000
LD0.SSOPM2					
.TmsSprCha.mag	T_SPR_CHR	Spring charging time	0...99.99 [s]	R	0,100,0,10000
LD0.SPH1SCBR2					
.AccmAPwr.mag	IPOW_A	Phs A acc. currents power	0…30000	R	0,30000,0,30000
.RmnNumOp.stVal	CB_LIFE_A	Phs A remaining life	-99999...99999	R	-99999,99999,-99999,99999
LD0.SPH2SCBR2					
.AccmAPwr.mag	IPOW_B	Phs B acc. currents power	0…30000	R	0,30000,0,30000
.RmnNumOp.stVal	CB_LIFE_B	Phs B remaining life	-99999...99999	R	-99999,99999,-99999,99999
LD0.SPH3SCBR2					
.AccmAPwr.mag	IPOW_C	Phs C acc. currents power	0…30000	R	0,30000,0,30000
.RmnNumOp.stVal	CB_LIFE_C	Phs C remaining life	-99999...99999	R	-99999,99999,-99999,99999

2.5.3.7 LD0.TPOSYLTC1 Tap changer position indication (1) – 87T-1

Table 261: LD0.TPOSYLTC1 Tap changer position indication (1) – 87T-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.TPOSYLTC1					
.TapPos.valWTr.posVal	TAP_POS	Tap changer position	-64…63	R	-64,63,-64,63

2.5.4 Metering and measurand functions

2.5.4.1 LD0.CMMXU1 Three-phase current measurement (1) – IA, IB, IC-1

Table 262: LD0.CMMXU1 Three-phase current measurement (1) – IA, IB, IC-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.CMMXU1		Phase-to-ground current			
.A.phsA.instCVal.mag	IL1-A	Phs A magnitude	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsB.instCVal.mag	IL2-A	Phs B magnitude	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsC.instCVal.mag	IL3-A	Phs C magnitude	0.00...50.00 [xIn]	R	0,50,0,5000
LD0.CAVMMXU1					
.A.phsA.cVal.mag	I_DMD_A	Phs A demand value	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsB.cVal.mag	I_DMD_B	Phs B demand value	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsC.cVal.mag	I_DMD_C	Phs C demand value	0.00...50.00 [xIn]	R	0,50,0,5000
LD0.CMAMMXU1					
.A.phsA.cVal.mag	Max demand IL1	Phs A max. demand value	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsB.cVal.mag	Max demand IL2	Phs B max. demand value	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsC.cVal.mag	Max demand IL3	Phs C max. demand value	0.00...50.00 [xIn]	R	0,50,0,5000
LD0.CMIMMXU1					
.A.phsA.cVal.mag	Min demand IL1	Phs A min. demand value	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsB.cVal.mag	Min demand IL2	Phs B. min demand value	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsC.cVal.mag	Min demand IL3	Phs C min. demand value	0.00...50.00 [xIn]	R	0,50,0,5000

2.5.4.2 LD0.CMMXU2 Three-phase current measurement (2) – IA, IB, IC-2

Table 263: LD0.CMMXU2 Three-phase current measurement (2) – IA, IB, IC-2

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.CMMXU2		Phase-to-ground current			
.A.phsA.instCVal.mag	IL1-A	Phs A magnitude	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsB.instCVal.mag	IL2-A	Phs B magnitude	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsC.instCVal.mag	IL3-A	Phs C magnitude	0.00...50.00 [xIn]	R	0,50,0,5000
LD0.CAVMMXU2					
.A.phsA.cVal.mag	I_DMD_A	Phs A demand value	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsB.cVal.mag	I_DMD_B	Phs B demand value	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsC.cVal.mag	I_DMD_C	Phs C demand value	0.00...50.00 [xIn]	R	0,50,0,5000
LD0.CMAMMXU2					
.A.phsA.cVal.mag	Max demand IL1	Phs A max. demand value	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsB.cVal.mag	Max demand IL2	Phs B max. demand value	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsC.cVal.mag	Max demand IL3	Phs C max. demand value	0.00...50.00 [xIn]	R	0,50,0,5000
LD0.CMIMMXU2					
.A.phsA.cVal.mag	Min demand IL1	Phs A min. demand value	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsB.cVal.mag	Min demand IL2	Phs B min. demand value	0.00...50.00 [xIn]	R	0,50,0,5000
.A.phsC.cVal.mag	Min demand IL3	Phs C min. demand value	0.00...50.00 [xIn]	R	0,50,0,5000

2.5.4.3 LD0.CSMSQI1 Sequence current measurement (1) – I1, I2, I0-1

Table 264: LD0.CSMSQI1 Sequence current measurement (1) – I1, I2, I0-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.CSMSQI1		Sequence of currents			
.SeqA.c1.instCVal.mag	I1_INST	Positive magnitude	0.00...50.0 [×In]	R	0,50,0,5000
.SeqA.c2.instCVal.mag	I2_INST	Negative magnitude	0.00...50.0 [×In]	R	0,50,0,5000
.SeqA.c3.instCVal.mag	I3_INST	Zero magnitude	0.00...50.0 [×In]	R	0,50,0,5000

2.5.4.4 LD0.FLTRFRC1 Fault record (1) – FLR-1

Table 265: LD0.FLTRFRC1 Fault record (1) – FLR-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.FLTRFRC1					
		Values only for reading[1)]			
.OpTm.t		Captured time (year)	0...3000		0,3000,0,3000
.OpTm.t		Captured time (month)	1...12		1,12,1,12
.OpTm.t		Captured time (day)	1…31		1,31,1,31
.OpTm.t		Captured time (hour)	0…23		0,23,2,23
.OpTm.t		Captured time (minute)	0…59		0,59,0,59
.OpTm.t		Captured time (second)	0…59		0,59,0,59
.OpTm.t		Captured time (msec)	0…999		0,999,0,999
		Event updated values[2)]			
.OpCnt.stVal		Fault record number	0...999999		0,999999,0,999999
.ProFcn.stVal		Protection function	-32767...32768		-32768,32767,-32768,32767
.Hz.mag		Frequency	30.00...80.00 [Hz]		30,80,3000,8000
.StrDur.mag		Start duration	0…100.00 [%]		0,100,0,10000
.StrOpTm.mag		Operate time	0.000...999999.999 [s]		0,10000000,0,10000000
.FltPtR.mag		Fault reactance	0...1000000.00 [ohm]		0,1000000,0,1000000
.FltDiskm.mag		Fault distance	0.00...3000.00 [pu]		0,3000,0,300000
.ActSetGr.stVal		Active setting group	1...6		1,6,1,6
.ShotPntr.stVal		AR Shot pointer	1...7		1,7,1,7
.Max50DifAA.mag		Max. diff. current phs A	0.000...80.000 [pu]		0,80,0,8000
.Max50DifAB.mag		Max. diff. current phs B	0.000...80.000 [pu]		0,80,0,8000
.Max50DifAC.mag		Max. diff. current phs C	0.000...80.000 [pu]		0,80,0,8000
.Max50RstAA.mag		Max. bias current phs A	0.000...50.000 [pu]		0,50,0,5000
.Max50RstAB.mag		Max. bias current phs B	0.000...50.000 [pu]		0,50,0,5000
.Max50RstAC.mag		Max. bias current phs C	0.000...50.000 [pu]		0,50,0,5000
.DifAPhsA.mag		Diff. current phs A	0.000...80.000 [pu]		0,80,0,8000

Table continues on next page

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
.DifAPhsB.mag		Diff. current phs B	0.000...80.000 [pu]		0,80,0,8000
.DifAPhsC.mag		Diff. current phs C	0.000...80.000 [pu]		0,80,0,8000
.RstAPhsA.mag		Bias current phs A	0.000...50.000 [pu]		0,50,0,5000
.RstAPhsB.mag		Bias current phs B	0.000...50.000 [pu]		0,50,0,5000
.RstAPhsC.mag		Bias current phsC	0.000...50.000 [pu]		0,50,0,5000
.DifARes.mag		Diff. current Io	0.000...80.000 [pu]		0,80,0,8000
.RstARes.mag		Bias current Io	0.000...50.000 [pu]		0,50,0,5000
.Max50APhsA1.mag		Max. current phs A(1)	0.000...50.000 [xIn]		0,50,0,5000
.Max50APhsB1.mag		Max. current phs B(1)	0.000...50.000 [xIn]		0,50,0,5000
.Max50APhsC1.mag		Max. current phs C(1)	0.000...50.000 [xIn]		0,50,0,5000
.Max50ARes1.mag		Max. current Io(1)	0.000...50.000 [xIn]		0,50,0,5000
.APhsA1.mag		Current phs A(1)	0.000...50.000 [xIn]		0,50,0,5000
.APhsB1.mag		Current phs B(1)	0.000...50.000 [xIn]		0,50,0,5000
.APhsC1.mag		Current phs C(1)	0.000...50.000 [xIn]		0,50,0,5000
.ARes1.mag		Current Io(1)	0.000...50.000 [xIn]		0,50,0,5000
.AResClc1.mag		Current Io-Calc(1)	0.000...50.000 [xIn]		0,50,0,5000
.APsSeq1.mag		Current Ps-Seq(1)	0.000...50.000 [xIn]		0,50,0,5000
.ANgSeq1.mag		Current Ng-Seq(1)	0.000...50.000 [xIn]		0,50,0,5000
.APhsA2.mag		Current phs A(2)	0.000...50.000 [xIn]		0,50,0,5000
.APhsB2.mag		Current phs B(2)	0.000...50.000 [xIn]		0,50,0,5000
.APhsC2.mag		Current phs C(2)	0.000...50.000 [xIn]		0,50,0,5000
.ARes2.mag		Current Io(2)	0.000...50.000 [xIn]		0,50,0,5000

Table continues on next page

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
.AResClc2.mag		Current Io-Calc(2)	0.000...50.000 [xIn]		0,50,0,5000
.APsSeq2.mag		Current Ps-Seq(2)	0.000...50.000 [xIn]		0,50,0,5000
.ANgSeq2.mag		Current Ng-Seq(2)	0.000...50.000 [xIn]		0,50,0,5000
.PhVPhsA1.mag		Voltage phs A(1)	0.000...4.000 [xUn]		0,4,0,4000
.PhVPhsB1.mag		Voltage phs B(1)	0.000...4.000 [xUn]		0,4,0,4000
.PhVPhsC1.mag		Voltage phs C(1)	0.000...4.000 [xUn]		0,4,0,4000
.PPVPhsAB1.mag		Voltage phs AB(1)	0.000...4.000 [xUn]		0,4,0,4000
.PPVPhsBC1.mag		Voltage phs BC(1)	0.000...4.000 [xUn]		0,4,0,4000
.PPVPhsCA1.mag		Voltage phs CA(1)	0.000...4.000 [xUn]		0,4,0,4000
.VRes1.mag		Voltage Uo(1)	0.000...4.000 [xUn]		0,4,0,4000
.VZro1.mag		Voltage Zro-Seq(1)	0.000...4.000 [xUn]		0,4,0,4000
.VPsSeq1.mag		Voltage Ps-Seq(1)	0.000...4.000 [xUn]		0,4,0,4000
.VNgSeq1.mag		Voltage Ng-Seq(1)	0.000...4.000 [xUn]		0,4,0,4000
.PhVPhsA2.mag		Voltage phs A(2)	0.000...4.000 [xUn]		0,4,0,4000
.PhVPhsB2.mag		Voltage phs B(2)	0.000...4.000 [xUn]		0,4,0,4000
.PhVPhsC2.mag		Voltage phs C(2)	0.000...4.000 [xUn]		0,4,0,4000
.PPVPhsAB2.mag		Voltage phs AB(2)	0.000...4.000 [xUn]		0,4,0,4000
.PPVPhsBC2.mag		Voltage phs BC(2)	0.000...4.000 [xUn]		0,4,0,4000
.PPVPhsCA2.mag		Voltage phs CA(2)	0.000...4.000 [xUn]		0,4,0,4000
.VRes2.mag		Voltage Uo(2)	0.000...4.000 [xUn]		0,4,0,4000
.VZro2.mag		Voltage Zro-Seq(2)	0.000...4.000 [xUn]		0,4,0,4000
.VPsSeq2.mag		Voltage Ps-Seq(2)	0.000...4.000 [xUn]		0,4,0,4000

Table continues on next page

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
.VNgSeq2.mag		Voltage Ng-Seq(2)	0.000...4.000 [xUn]		0,4,0,4000
.MaxTmpRl.mag		PTTR thermal level	0.00...99.99		0,99.99,0,9999
.AMaxNgPs.mag		PDNSPTOC1 ratio I2/I1	0.00...999.99 [%]		0,999.99,0,99999
.DifANAngVN1.mag.		Angle Uo-Io(1)	-180.00...180.00 deg		-180,180,-18000,18000
.DifAAAngVBC1.mag.		Angle UBC-IA(1)	-180.00...180.00 deg		-180,180,-18000,18000
.DifABAngVCA1.mag		Angle UCA-IB(1)	-180.00...180.00 deg		-180,180,-18000,18000
.DifACAngVAB1.mag		Angle UAB-IC(1)	-180.00...180.00 deg		-180,180,-18000,18000
.DifANAngVN2.mag.		Angle Uo-Io(2)	-180.00...180.00 deg		-180,180,-18000,18000
.DifAAAngVBC2.mag.		Angle UBC-IA(2)	-180.00...180.00 deg		-180,180,-18000,18000
.DifABAngVCA2.mag		Angle UCA-IB(2)	-180.00...180.00 deg		-180,180,-18000,18000
.DifACAngVAB2.mag		Angle UAB-IC(2)	-180.00...180.00 deg		-180,180,-18000,18000
.HzRteChg.mag		Frequency gradient	-10.00...10.00 [Hz/s]		-10,10,-1000,1000
.CondNeut.mag		Conductance Yo	-1000.00...1000.00 [mS]		-1000,1000,-100000,100000
.SusNeut.mag		Susceptance Yo	-1000.00...1000.00 [mS]		-1000,1000,-100000,100000
.PPLoopRis.mag		Fault loop resistance	-1000.00...1000.00 [ohm]		-1000.00,1000.00,-100000,100000
.PPLoopReact.mag		Fault loop reactance	-1000.00...1000.00 [ohm]		-1000.00,1000.00,-100000,100000
.CBClrTm.mag		Breaker clear time	0.000...3.000 [s]		0,3,0,3000

1) When reading out fault record values on demand, DNP3 cannot give timestamps for data objects, meaning the timestamps for the moment the objects were recorded. Instead, the timetag of the fault record is available for reading in seven regular DNP3 analog objects.
2) If fault record values are received as DNP3 events when they are recorded, the object timestamps, that is, the fault record timestamps, are given in the DNP3 event messages.

2.5.4.5 LD0.FMMXU1 Frequency measurement (1) – f-1

Table 266: LD0.FMMXU1 Frequency measurement (1) – f-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.FMMXU1					
.Hz.mag	-	Frequency value	35…75 [Hz]	R	35,75,3500,7500

2.5.4.6 LD0.HAEFMHAI1 Current harmonics (1)

Table 267: LD0.HAEFMHAI1 Current harmonics (1)

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.HAEFMHAI					
.HRmsA.res.cVal.mag	-	Current harmonics	0…250 [A]	R	0,250,0,250

2.5.4.7 LD0.PEMMXU1 Three-phase power and energy measurement (1) – P,E-1

Table 268: LD0.PEMMXU1 Three-phase power and energy measurement (1) – P,E-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.PEMMXU1					
.TotW.instMag	P-kW	Total active power	-/+999999.9	R	multiplied by 10
.TotVA.instMag	S-kVA	Total apparent power	-/+999999.9	R	multiplied by 10
.TotVAr.instMag	Q-kVAr	Total reactive power	-/+999999.9	R	multiplied by 10
.TotPF.instMag	PF	Average power factor	-1.00…1.00	R	-1,1,-100,100
LD0.PEAVMMXU1					
.TotW.mag		Total active power demand	-/+999999.9	R	multiplied by 10
.TotVAr.mag		Total apparent power demand	-/+999999.9	R	multiplied by 10
.TotVA.mag		Total reactive power demand	-/+999999.9	R	multiplied by 10
.TotPF.mag		Average power factor demand	-1.00…1.00	R	-1,1,-100,100
LD0.PEMAMMXU1					
.TotW.mag		Total active power demand max.	-/+999999.9	R	multiplied by 10
.TotVAr.mag		Total apparent power demand max.	-/+999999.9	R	multiplied by 10
.TotVA.mag		Total reactive power demand max.	-/+999999.9	R	multiplied by 10
.TotPF.mag		Average power factor demand max.	-1.00…1.00	R	-1,1,-100,100
LD0.PEMIMMXU1					
.TotW.mag		Total active power demand min.	-/+999999.9	R	multiplied by 10
.TotVAr.mag		Total apparent power demand min.	-/+999999.9	R	multiplied by 10
.TotVA.mag		Total reactive power demand min.	-/+999999.9	R	multiplied by 10
.TotPF.mag		Average power factor demand min.	-1.00…1.00	R	-1,1,-100,100

2.5.4.8 LD0.SPEMMXU1 Single-phase power and energy measurement – SP, SE-1

Table 269: LD0.SPEMMXU1 Single-phase power and energy measurement – SP, SE-1

IEC 61850 Name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.SPEMMXU1					
.W.phsA.instCVal.mag.f	PL1-kW	Total active power, phase A	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.W.phsB.instCVal.mag.f	PL2-kW	Total active power, phase B	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.W.phsC.instCVal.mag.f	PL3-kW	Total active power, phase C	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VAr.phsA.instCVal.mag.f	QL1-kVAr	Total reactive power, phase A	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VAr.phsB.instCVal.mag.f	QL2-kVAr	Total reactive power, phase B	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VAr.phsC.instCVal.mag.f	QL3-kVAr	Total reactive power, phase C	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsA.instCVal.mag.f	SL1-kVA	Total apparent power, phase A	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsB.instCVal.mag.f	SL2-kVA	Total apparent power, phase B	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsC.instCVal.mag.f	SL3-kVA	Total reactive power, phase C	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.PF.phsA.instCVal.mag.f	PFL1	Average power factor, phase A	-1.00…1.00	R	-1,1,-100,100
.PF.phsB.instCVal.mag.f	PFL2	Average power factor, phase B	-1.00…1.00	R	-1,1,-100,100
.PF.phsC.instCVal.mag.f	PFL3	Average power factor, phase C	-1.00…1.00	R	-1,1,-100,100
LD0.SPEAVMMXU1					
.W.phsA.cVal.mag.f		Demand value of active power, phase A	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.W.phsB.cVal.mag.f		Demand value of active power, phase B	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.W.phsC.cVal.mag.f		Demand value of active power, phase C	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsA.cVal.mag.f		Demand value of apparent power, phase A	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsB.cVal.mag.f		Demand value of apparent power, phase B	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsC.cVal.mag.f		Demand value of apparent power, phase C	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VAr.phsA.cVal.mag.f		Demand value of reactive power, phase A	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VAr.phsB.cVal.mag.f		Demand value of reactive power, phase B	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999

Table continues on next page

IEC 61850 Name	SA name	Description	Values	S	Arg 1,2,3,4
.VAr.phsC.cVal.mag.f		Demand value of reactive power, phase C	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.PF.phsA.cVal.mag.f		Demand value of power factor, phase A	-1.00…1.00	R	-1,1,-100,100
.PF.phsB.cVal.mag.f		Demand value of power factor, phase B	-1.00…1.00	R	-1,1,-100,100
.PF.phsC.cVal.mag.f		Demand value of power factor, phase C	-1.00…1.00	R	-1,1,-100,100
LD0.SPEMAMMXU1					
.VA.phsA.cVal.mag.f		Maximum demand of active power, phase A	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsB.cVal.mag.f		Maximum demand of active power, phase B	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsC.cVal.mag.f		Maximum demand of active power, phase C	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsA.cVal.mag.f		Maximum demand of apparent power, phase A	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsB.cVal.mag.f		Maximum demand of apparent power, phase B	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsC.cVal.mag.f		Maximum demand of apparent power, phase C	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VAr.phsA.cVal.mag.f		Maximum demand of reactive power, phase A	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VAr.phsB.cVal.mag.f		Maximum demand of reactive power, phase B	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VAr.phsC.cVal.mag.f		Maximum demand of reactive power, phase C	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.PF.phsA.cVal.mag.f		Maximum demand of power factor, phase A	-1.00…1.00	R	-1,1,-100,100
.PF.phsB.cVal.mag.f		Maximum demand of power factor, phase B	-1.00…1.00	R	-1,1,-100,100
.PF.phsC.cVal.mag.f		Maximum demand of power factor, phase C	-1.00…1.00	R	-1,1,-100,100
LD0.SPEMIMMXU1					
.VA.phsA.cVal.mag.f		Minimum demand of active power, phase A	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsB.cVal.mag.f		Minimum demand of active power, phase B	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsC.cVal.mag.f		Minimum demand of active power, phase C	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsA.cVal.mag.f		Minimum demand of apparent power, phase A	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VA.phsB.cVal.mag.f		Minimum demand of apparent power, phase B	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999

Table continues on next page

IEC 61850 Name	SA name	Description	Values	S	Arg 1,2,3,4
.VA.phsC.cVal.mag.f		Minimum demand of apparent power, phase C	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VAr.phsA.cVal.mag.f		Minimum demand of reactive power, phase A	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VAr.phsB.cVal.mag.f		Minimum demand of reactive power, phase B	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.VAr.phsC.cVal.mag.f		Minimum demand of reactive power, phase C	-/+999999.9	R	-999999.9,999999.9,-9999999,9999999
.PF.phsA.cVal.mag.f		Minimum demand of power factor, phase A	-1.00…1.00	R	-1,1,-100,100
.PF.phsB.cVal.mag.f		Minimum demand of power factor, phase B	-1.00…1.00	R	-1,1,-100,100
.PF.phsC.cVal.mag.f		Minimum demand of power factor, phase C	-1.00…1.00	R	-1,1,-100,100

2.5.4.9 LD0.RESCMMXU1 Residual current measurement (1) – IG-1

Table 270: LD0.RESCMMXU1 Residual current measurement (1) – IG-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.RESCMMXU1					
.A.res.instCVal.mag	Io-A	Residual current	0.00...50.00 [xIn]	R	0,50,0,5000
LD0.RCAVMMXU1					
.A.res.cVal.mag	I_DMD_RES	Residual current demand	0.00...50.00 [xIn]	R	0,50,0,5000
LD0.RCMAMMXU1					
.A.res.cVal.mag	Max demand Io	Residual current max. demand	0.00...50.00 [xIn]	R	0,50,0,5000
LD0.RCMIMMXU1					
.A.res.cVal.mag	Min demand Io	Residual current min. demand	0.00...50.00 [xIn]	R	0,50,0,5000

2.5.4.10 LD0.RESCMMXU2 Residual current measurement (2) – IG-2

Table 271: LD0.RESCMMXU2 Residual current measurement (2) – IG-2

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.RESCMMXU2					
.A.res.instCVal.mag	Io-A	Residual current	0.00...50.00 [xIn]	R	0,50,0,5000
LD0.RCAVMMXU2					

Table continues on next page

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
.A.res.cVal.mag	I_DMD_RES	Residual current demand	0.00...50.00 [xIn]	R	0,50,0,5000
LD0.RCMAMMXU2					
.A.res.cVal.mag	Max demand Io	Residual current max. demand	0.00...50.00 [xIn]	R	0,50,0,5000
LD0.RCMIMMXU2					
.A.res.cVal.mag	Min demand Io	Residual current min. demand	0.00...50.00 [xIn]	R	0,50,0,5000

2.5.4.11 LD0.RESVMMXU1 Residual voltage measurement (1) – VG-1

Table 272: LD0.RESVMMXU1 Residual voltage measurement (1) – VG-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.RESVMMXU1					
.PhV.res.instCVal.mag.f	Uo-A	Residual voltage	0.00…4.00 [xUn]	R	0,4,0,400
LD0.RVAVMMXU1					
.PhV.res.cVal.mag.f	U_DMD_RES	Residual voltage demand	0.00…4.00 [xUn]	R	0,4,0,400
LD0.RVMAMMXU1					
.PhV.res.cVal.mag.f	Max demand Uo	Residual voltage max. demand	0.00…4.00 [xUn]	R	0,4,0,400
LD0.RVMIMMXU1					
.PhV.res.cVal.mag.f	Min demand Uo	Residual volatge min. demand	0.00…4.00 [xUn]	R	0,4,0,400

2.5.4.12 LD0.RESVMMXU2 Residual voltage measurement (2) – VG-2

Table 273: LD0.RESVMMXU2 Residual voltage measurement (2) – VG-2

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.RESVMMXU2					
.PhV.res.instCVal.mag	Uo-A	Residual voltage	0.00…4.00 [xUn]	R	0,4,0,400
LD0.RVAVMMXU2					
.PhV.res.cVal.mag	U_DMD_RES	Residual voltage demand	0.00…4.00 [xUn]	R	0,4,0,400
LD0.RVMAMMXU2					

Table continues on next page

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
.PhV.res.cVal.mag	Max demand Uo	Residual voltage max. demand	0.00…4.00 [xUn]	R	0,4,0,400
LD0.RVMIMMXU2					
.PhV.res.cVal.mag	Min demand Uo	Residual volatge min. demand	0.00…4.00 [xUn]	R	0,4,0,400

2.5.4.13 LD0.VMMXU1 Three-phase voltage measurement (1) – VA, VB, VC-1

Table 274: LD0.VMMXU1 Three-phase voltage measurement (1) – VA, VB, VC-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.VMMXU1.PhV		Phase-to-ground voltage			
.phsA.cVal.mag	U_INST_A	Phs A magnitude	0.00…4.00 [xUn]	R	0,4,0,400
.phsB.cVal.mag	U_INST_B	Phs B magnitude	0.00…4.00 [xUn]	R	0,4,0,400
.phsC.cVal.mag	U_INST_C	Phs C magnitude	0.00…4.00 [xUn]	R	0,4,0,400
LD0.VMMXU1.PPV		Phase-to-phase voltage			
.phsAB.cVal.mag	U_DB_AB	Phs AB magnitude	0.00…4.00 [xUn]	R	0,4,0,400
.phsBC.cVal.mag	U_DB_BA	Phs BC magnitude	0.00…4.00 [xUn]	R	0,4,0,400
.phsCA.cVal.mag	U_DB_CA	Phs CA magnitude	0.00…4.00 [xUn]	R	0,4,0,400
LD0.VAVMMXU1.PhV		Phase-to-ground voltage			
.phsA.cVal.mag	U_DMD_A	Phs A demand value	0.00…4.00 [xUn]	R	0,4,0,400
.phsB.cVal.mag	U_DMD_B	Phs B demand value	0.00…4.00 [xUn]	R	0,4,0,400
.phsC.cVal.mag	U_DMD_C	Phs C demand value	0.00…4.00 [xUn]	R	0,4,0,400
LD0.VAVMMXU1.PPV		Phase-to-phase voltage			
.phsAB.cVal.mag	U_DMD_AB	Phs AB demand value	0.00…4.00 [xUn]	R	0,4,0,400
.phsBC.cVal.mag	U_DMD_BC	Phs BC demand value	0.00…4.00 [xUn]	R	0,4,0,400
.phsCA.cVal.mag	U_DMD_CA	Phs CA demand value	0.00…4.00 [xUn]	R	0,4,0,400

2.5.4.14 LD0.VMMXU2 Three-phase voltage measurement (2) – VA, VB, VC-2

Table 275: LD0.VMMXU2 Three-phase voltage measurement (2) – VA, VB, VC-2

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.VMMXU2.PhV		Phase-to-ground voltage			
.phsA.cVal.mag	U_INST_A	Phs A magnitude	0.00…4.00 [xUn]	R	0,4,0,400
.phsB.cVal.mag	U_INST_B	Phs B magnitude	0.00…4.00 [xUn]	R	0,4,0,400
.phsC.cVal.mag	U_INST_C	Phs C magnitude	0.00…4.00 [xUn]	R	0,4,0,400
LD0.VMMXU2.PPV		Phase-to-phase voltage			
.phsAB.cVal.mag	U_DB_AB	Phs AB magnitude	0.00…4.00 [xUn]	R	0,4,0,400
.phsBC.cVal.mag	U_DB_BA	Phs BC magnitude	0.00…4.00 [xUn]	R	0,4,0,400
.phsCA.cVal.mag	U_DB_CA	Phs CA magnitude	0.00…4.00 [xUn]	R	0,4,0,400
LD0.VAVMMXU2.PhV		Phase-to-ground voltage			
.phsA.cVal.mag	U_DMD_A	Phs A demand value	0.00…4.00 [xUn]	R	0,4,0,400
.phsB.cVal.mag	U_DMD_B	Phs B demand value	0.00…4.00 [xUn]	R	0,4,0,400
.phsC.cVal.mag	U_DMD_C	Phs C demand value	0.00…4.00 [xUn]	R	0,4,0,400
LD0.VAVMMXU2.PPV		Phase-to-phase voltage			
.phsAB.cVal.mag	U_DMD_AB	Phs AB demand value	0.00…4.00 [xUn]	R	0,4,0,400
.phsBC.cVal.mag	U_DMD_BC	Phs BC demand value	0.00…4.00 [xUn]	R	0,4,0,400
.phsCA.cVal.mag	U_DMD_CA	Phs CA demand value	0.00…4.00 [xUn]	R	0,4,0,400

2.5.4.15 LD0.VSMSQI1 Sequence voltage measurement (1) – V1, V2, V0-1

Table 276: LD0.VSMSQI1 Sequence voltage measurement (1) – V1, V2, V0-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.VSMSQI1		Sequence of voltages			
.SeqV.c1.cVal.mag	I1_DB	-Positive magnitude	0.00…4.00 [xUn]	R	0,4,0,400
.SeqV.c2.cVal.mag	I2_DB	-Negative magnitude	0.00…4.00 [xUn]	R	0,4,0,400
.SeqV.c3.cVal.mag	I3_DB	-Zero magnitude	0.00…4.00 [xUn]	R	0,4,0,400

2.5.4.16 LD0.VSMSQI2 Sequence voltage measurement (2) – V1, V2, V0-2

Table 277: LD0.VSMSQI2 Sequence voltage measurement (2) – V1, V2, V0-2

IEC 61850 name	SA name	Description	Value	S	Arg 1,2,3,4
LD0.VSMSQI2		Sequence of voltages			
.SeqV.c1.cVal.mag	I1_DB	-Positive magnitude	0.00…4.00 [xUn]	R	0,4,0,400
.SeqV.c2.cVal.mag	I2_DB	-Negative magnitude	0.00…4.00 [xUn]	R	0,4,0,400
.SeqV.c3.cVal.mag	I3_DB	-Zero magnitude	0.00…4.00 [xUn]	R	0,4,0,400

2.5.5 Power quality functions

2.5.5.1 LD0.CMHAI1 Current total demand distortion (1) – PQI-1

Table 278: LD0.CMHAI1 Current total demand distortion (1) – PQI-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.CMHAI1					
.TddA.phsA.cVal.mag	3SMHTDD_A	3 sec mean TDD value phs A	0.00...500.00 [%]	R	0,500,0,500
.TddA.phsB.cVal.mag	3SMHTDD_B	3 sec mean TDD value phs B	0.00...500.00 [%]	R	0,500,0,500
.TddA.phsC.cVal.mag	3SMHTDD_C	3 sec mean TDD value phs C	0.00...500.00 [%]	R	0,500,0,500
.DmdTddA.phsA.cVal	DMD_TDD_A	Demand TDD value phs A	0.00...500.00 [%]	R	0,500,0,500
.DmdTddA.phsB.cVal	DMD_TDD_B	Demand TDD value phs B	0.00...500.00 [%]	R	0,500,0,500
.DmdTddA.phsC.cVal	DMD_TDD_C	Demand TDD value phs C	0.00...500.00 [%]	R	0,500,0,500
.MaxDmdTddA.phsA.cVal .mag	Max demand TDD IL1	Maximum demand TDD for phase A	0.00...500.00 [%]	R	0,500,0,500
.MaxDmdTddA.phsB.cVal .mag	Max demand TDD IL2	Maximum demand TDD for phase B	0.00...500.00 [%]	R	0,500,0,500
.MaxDmdTddA.phsC.cVal .mag	Max demand TDD IL3	Maximum demand TDD for phase C	0.00...500.00 [%]	R	0,500,0,500

2.5.5.2 LD0.PHQVVR1 Voltage variation (1) – PQSS-1

Table 279: LD0.PHQVVR1 Voltage variation (1) – PQSS-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.PH1QVVR1					
.SwlInstCnt.stVal	INSTSWELLCNT	Inst. swell counter	0...2147483647	R	0,2147483647,0,2147483647
.SwlMomCnt.stVal	MOMSWELLCNT	Mom. swell counter	0...2147483647	R	0,2147483647,0,2147483647
.SwlTmpCnt.stVal	TEMPSWELLCNT	Temp. swell counter	0...2147483647	R	0,2147483647,0,2147483647
.SwlMaxCnt.stVal	MAXDURSWELLCN	Max duration swell counter	0...2147483647	R	0,2147483647,0,2147483647
.DipInstCnt.stVal	INSTDIPCNT	Inst. dip counter	0...2147483647	R	0,2147483647,0,2147483647
.DipMomCnt.stVal	TEMPDIPCNT	Mom. dip counter	0...2147483647	R	0,2147483647,0,2147483647
.DipTmpCnt.stVal	MOMDIPCNT	Temp. dip counter	0...2147483647	R	0,2147483647,0,2147483647
.DipMaxCnt.stVal	MAXDURDIPCNT	Max duration dip counter	0...2147483647	R	0,2147483647,0,2147483647
.IntrMomCnt.stVal	MOMINTCNT	Mom. interruption counter	0...2147483647	R	0,2147483647,0,2147483647
.IntrTmpCnt.stVal	TEMPINTCNT	Temp. interruption counter	0...2147483647	R	0,2147483647,0,2147483647
.IntrSstCnt.stVal	SUSTINTCNT	Sustained Interr. counter	0...2147483647	R	0,2147483647,0,2147483647
.IntrMaxCnt.stVal	MAXDURINTCNT	Max duration interr. counter	0...2147483647	R	0,2147483647,0,2147483647

2.5.5.3 LD0.PHQVVR2 Voltage variation (2) – PQSS-2

Table 280: LD0.PHQVVR2 Voltage variation (2) – PQSS-2

IEC 61850 Name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.PH1QVVR2					
.SwlInstCnt.stVal	INSTSWELLCNT	Inst. swell counter	0...2147483647	R	0,2147483647,0,2147483647
.SwlMomCnt.stVal	MOMSWELLCNT	Mom. swell counter	0...2147483647	R	0,2147483647,0,2147483648
.SwlTmpCnt.stVal	TEMPSWELLCNT	Temp. swell counter	0...2147483647	R	0,2147483647,0,2147483649
.SwlMaxCnt.stVal	MAXDURSWELLCN	Max duration swell counter	0...2147483647	R	0,2147483647,0,2147483650
.DipInstCnt.stVal	INSTDIPCNT	Inst. dip counter	0...2147483647	R	0,2147483647,0,2147483651
.DipMomCnt.stVal	TEMPDIPCNT	Mom. dip counter	0...2147483647	R	0,2147483647,0,2147483652
.DipTmpCnt.stVal	MOMDIPCNT	Temp. dip counter	0...2147483647	R	0,2147483647,0,2147483653
.DipMaxCnt.stVal	MAXDURDIPCNT	Max duration dip counter	0...2147483647	R	0,2147483647,0,2147483654
.IntrMomCnt.stVal	MOMINTCNT	Mom. interruption counter	0...2147483647	R	0,2147483647,0,2147483655
.IntrTmpCnt.stVal	TEMPINTCNT	Temp. interruption counter	0...2147483647	R	0,2147483647,0,2147483656
.IntrSstCnt.stVal	SUSTINTCNT	Sustained Interr. counter	0...2147483647	R	0,2147483647,0,2147483657
.IntrMaxCnt.stVal	MAXDURINTCNT	Max duration interr. counter	0...2147483647	R	0,2147483647,0,2147483658

2.5.5.4 LD0.VMHAI1 Voltage total harmonic distortion (1) – PQVPH-1

Table 281: LD0.VMHAI1 Voltage total harmonic distortion (1) – PQVPH-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.VMHAI1					
.ThdPhV.phsA.cVal.mag	3SMHTHD_A	3 sec mean THD value phs A	0.00...500.00 [%]	R	0,500,0,500
.ThdPhV.phsB.cVal.mag	3SMHTHD_B	3 sec mean THD value phs B	0.00...500.00 [%]	R	0,500,0,500
.ThdPhV.phsC.cVal.mag	3SMHTHD_C	3 sec mean THD value phs C	0.00...500.00 [%]	R	0,500,0,500
.DmdThdPhV.phsA.cVal.mag	DMD_THD_A	Demand THD value phs A	0.00...500.00 [%]	R	0,500,0,500
.DmdThdPhV.phsB.cVal.mag	DMD_THD_B	Demand THD value phs B	0.00...500.00 [%]	R	0,500,0,500
.DmdThdPhV.phsC.cVal.mag	DMD_THD_C	Demand THD value phs C	0.00...500.00 [%]	R	0,500,0,500
.MaxDmdThdV.phsA.cVal.mag	Max demand THD IL1	Maximum demand THD for phase A	0.00...500.00 [%]	R	0,500,0,500
.MaxDmdThdV.phsB.cVal.mag	Max demand THD IL2	Maximum demand THD for phase B	0.00...500.00 [%]	R	0,500,0,500
.MaxDmdThdV.phsC.cVal.mag	Max demand THD IL3	Maximum demand THD for phase C	0.00...500.00 [%]	R	0,500,0,500

2.5.5.5 LD0.VMHAI2 Voltage total harmonic distortion (2) – PQVPH-2

Table 282: LD0.VMHAI2 Voltage total harmonic distortion (2) – PQVPH-2

IEC 61850 Name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.VMHAI2					
.ThdPhV.phsA.cVal.mag	3SMHTHD_A	3 sec mean THD value phs A	0.00...500.00[%]	R	0,500,0,500
.ThdPhV.phsB.cVal.mag	3SMHTHD_B	3 sec mean THD value phs B	0.00...500.00[%]	R	0,500,0,500
.ThdPhV.phsC.cVal.mag	3SMHTHD_C	3 sec mean THD value phs C	0.00...500.00[%]	R	0,500,0,500
.DmdThdPhV.phsA.cVal.mag	DMD_THD_A	Demand THD value phs A	0.00...500.00[%]	R	0,500,0,500
.DmdThdPhV.phsB.cVal.mag	DMD_THD_B	Demand THD value phs B	0.00...500.00[%]	R	0,500,0,500
.DmdThdPhV.phsC.cVal.mag	DMD_THD_C	Demand THD value phs C	0.00...500.00[%]	R	0,500,0,500

Table continues on next page

IEC 61850 Name	SA name	Description	Values	S	Arg 1,2,3,4
.MaxDmdThdV.phsA.cVal.mag	Max demand THD IL1	Maximum demand THD for phase A	0.00...500.00[%]	R	0,500,0,500
.MaxDmdThdV.phsB.cVal.mag	Max demand THD IL2	Maximum demand THD for phase B	0.00...500.00[%]	R	0,500,0,500
.MaxDmdThdV.phsC.cVal.mag	Max demand THD IL3	Maximum demand THD for phase C	0.00...500.00[%]	R	0,500,0,500

2.5.6 Protection functions

2.5.6.1 LD0.LNPDEF1 Line differential protection (1) – 87L-1

Table 283: LD0.LNPDEF1 Line differential protection (1) – 87L-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.LNPDIF1					
.DifAClc.phsA.cVal.mag		Phase A diff. Current	0.00…80.0 [xIn]	R	0,80,0,8000
.DifAClc.phsB.cVal.mag		Phase B diff. Current	0.00…80.0 [xIn]	R	0,80,0,8000
.DifAClc.phsC.cVal.mag		Phase C diff. Current	0.00…80.0 [xIn]	R	0,80,0,8000
.RstA.phsA.cVal.mag		Phase A stab. Current	0.00…80.0 [xIn]	R	0,80,0,8000
.RstA.phsB.cVal.mag		Phase B stab. Current	0.00…80.0 [xIn]	R	0,80,0,8000
.RstA.phsC.cVal.mag		Phase C stab. Current	0.00…80.0 [xIn]	R	0,80,0,8000

2.5.6.2 LD0.MPTTR1 Thermal overload protection for motors (1) – 49M-1

Table 284: LD0.MPTTR1 Thermal overload protection for motors (1) – 49M-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.MPTTR1					
.TmpRl	THERM_LEVEL	Thermal level	-99...999	R	-99,999,-99,999

2.5.6.3 LD0.PHIZ1 High-impedance fault detection (1) – HIZ-1

Table 285: LD0.PHIZ1 High-impedance fault detection (1) – HIZ-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.PHIZ1					
.Str.dirGeneral		Start direction	0…10	R	0,10,0,10

2.5.6.4 LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1) – 49F-1

Table 286: LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1) – 49F-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.T1PTTR1					
.Tmp.mag	-	Object temperature	-100…9999.9	R	-100,9999.9.0,-1000,99999
.TmpRl.mag	-	Relative temperature	0…99.9	R	0,99.9,0,999

2.5.6.5 LD0.T2PTTR1 Three-phase thermal overload protection, two time constants (1) – 49T-1

Table 287: LD0.T2PTTR1 Three-phase thermal overload protection, two time constants (1) – 49T-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.T2PTTR1					
.Tmp.mag	-	Object temperature	-100…9999.9	R	-100,9999.9.0,-1000,99999
.TmpRl.mag	-	Relative temperature	0…99.9	R	0,99.9,0,999

2.5.7 Protection-related functions

2.5.7.1 DR.RDRE1 Disturbance recorder (1)

Table 288: DR.RDRE1 Disturbance recorder (1)

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
DR.RDRE1					
.FltNum.stVal	-	Number of recordings	0…65535	R	0,65535,0,65535
.MemUsed.stVal	-	Rec. memory used	0…100 [%]	R	0,100,0,100

2.5.7.2 LD0.DARREC1 Autoreclosing (1) – 79-1

Table 289: LD0.DARREC1 Autoreclosing (1) – 79-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.DARREC1					
.AutoRecSt.stVal	STATUS	Autorec. status	-2…4		-2,4,-2,4
.ShotPntr.stVal	SHOT_PTR	Shot pointer value	1…7		1,7,1,7
.OpCntRs.stVal		Operation counter	0...2147483647		0,2147483647,0,2147483647
.RecCnt1.stVal		Shot 1 counter	0...2147483647		0,2147483647,0,2147483647

Table continues on next page

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
.RecCnt2.stVal		Shot 2 counter	0...2147483647		0,2147483647,0,2147483647
.RecCnt3.stVal		Shot 3 counter	0...2147483647		0,2147483647,0,2147483647
.RecCnt4.stVal		Shot 4 counter	0...2147483647		0,2147483647,0,2147483647
.RecCnt5.stVal		Shot 5 counter	0...2147483647		0,2147483647,0,2147483647
.FrqOpCnt.stVal		Shot 6 counter	0...2147483647		0,2147483647,0,2147483647

2.5.7.3 LD0.SCEFRFLO1 Fault locator (1) – 21FL-1

Table 290: LD0.SCEFRFLO1 Fault locator (1) – 21FL-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.FLO1RFRC1					
.FltDiskm.mag		Fault distance	0…3000.000 [km]		0,3000,0,3000000
.FltLoop.stVal		Fault loop	0…7		0,7,0,7
.FltPtR.mag		Fault point resistance	0...1000000.0 [ohm]		0,1000000,0,10000000
.FltR.mag		Fault loop resistance	0...1000000.0 [ohm]		0,1000000,0,10000000
.FltX.mag		Fault loop reactance	0...1000000.0 [ohm]		0,1000000,0,10000000
.PhReact.mag		Fault phase reactance	0...1000000.0 [ohm]		0,1000000,0,10000000
.RatFltALod.mag		Fault to load current ratio	0...60000.00		0,60000,0,6000000
.EqDisLod.mag		Estim. equivalent load distance	0.00...1.00		0,1,0,100
.PhGndCapac.mag		Estim. PE line capacitive reactance	0.0...1000000.0 [ohm]		0,1000000,0,10000000
.FltDisQ.stVal		Fault distance quality	0...511		0,512,0,512

2.5.7.4 LD0.SECRSYN1 Synchronism and energizing check (1) – 25-1

Table 291: LD0.SECRSYN1 Synchronism and energizing check (1) – 25-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.SECRSYN1					
.EnSt.stVal	-	Energization state	0…4	R	0,4,0,4

2.5.8 Generic functions

2.5.8.1 LD0.MVI4GAPC1 Integer value move (1) – MVI4-1

Table 292: LD0.MVI4GAPC1 Integer value move (1) – MVI4-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.MVI4GAPC1					
.ISCSO1.stVal	OUT1	Analog value 1	0…N	R	0,1,0,1
.ISCSO1.stVal	OUT2	Analog value 2	0…N	R	0,1,0,1
.ISCSO1.stVal	OUT3	Analog value 3	0…N	R	0,1,0,1
.ISCSO1.stVal	OUT4	Analog value 4	0…N	R	0,1,0,1

2.5.8.2 LD0.SCA4GAPC1 Analog value scaling (1) – SCA4-1

Table 293: LD0.SCA4GAPC1 Analog value scaling (1) – SCA4-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.SCA4GAPC1					
.AnValOut1.mag	AO1_VALUE	Analog value 1 after scaling	0…N	R	0,1,0,1
.AnValOut2.mag	AO2_VALUE	Analog value 2 after scaling	0…N	R	0,1,0,1
.AnValOut3.mag	AO3_VALUE	Analog value 3 after scaling	0…N	R	0,1,0,1
.AnValOut4.mag	AO4_VALUE	Analog value 4 after scaling	0…N	R	0,1,0,1

2.5.8.3 LD0.SCA4GAPC2 Analog value scaling (2) – SCA4-2

Table 294: LD0.SCA4GAPC2 Analog value scaling (2) – SCA4-2

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.SCA4GAPC2					
.AnValOut1.mag	AO1_VALUE	Analog value 1 after scaling	0…N	R	0,1,0,1
.AnValOut2.mag	AO2_VALUE	Analog value 2 after scaling	0…N	R	0,1,0,1
.AnValOut3.mag	AO3_VALUE	Analog value 3 after scaling	0…N	R	0,1,0,1
.AnValOut4.mag	AO4_VALUE	Analog value 4 after scaling	0…N	R	0,1,0,1

2.5.8.4 LD0.SCA4GAPC3 Analog value scaling (3) – SCA4-3

Table 295: LD0.SCA4GAPC3 Analog value scaling (3) – SCA4-3

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.SCA4GAPC3					
.AnValOut1.mag	AO1_VALUE	Analog value 1 after scaling	0…N	R	0,1,0,1
.AnValOut2.mag	AO2_VALUE	Analog value 2 after scaling	0…N	R	0,1,0,1
.AnValOut3.mag	AO3_VALUE	Analog value 3 after scaling	0…N	R	0,1,0,1
.AnValOut4.mag	AO4_VALUE	Analog value 4 after scaling	0…N	R	0,1,0,1

2.5.8.5 LD0.SCA4GAPC4 Analog value scaling (4) – SCA4-4

Table 296: LD0.SCA4GAPC4 Analog value scaling (4) – SCA4-4

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.SCA4GAPC4					
.AnValOut1.mag	AO1_VALUE	Analog value 1 after scaling	0…N	R	0,1,0,1
.AnValOut2.mag	AO2_VALUE	Analog value 2 after scaling	0…N	R	0,1,0,1
.AnValOut3.mag	AO3_VALUE	Analog value 3 after scaling	0…N	R	0,1,0,1
.AnValOut4.mag	AO4_VALUE	Analog value 4 after scaling	0…N	R	0,1,0,1

2.5.8.6 LD0.XARGGIO130 RTD inputs

Table 297: LD0.XARGGIO130 RTD inputs

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
LD0.XARGGIO130					
.AnIn1.instMag	AI_VAL1	RTD input 1	-10000…10000	R	-1E4,1E4,-1E4,1E4
.AnIn2.instMag	AI_VAL2	RTD input 2	-10000…10000	R	-1E4,1E4,-1E4,1E4
.AnIn3.instMag	AI_VAL3	RTD input 3	-10000…10000	R	-1E4,1E4,-1E4,1E4

2.5.8.7 LD0.XRGGIO130 RTD inputs – X130 RTD-1

Table 298: LD0.XRGGIO130 RTD inputs – X130 RTD-1

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
.AnIn1.instMag	AI_VAL1	RTD input 1	-10000…10000	R	-1E4,1E4,-1E4,1E4
.AnIn2.instMag	AI_VAL2	RTD input 2	-10000…10000	R	-1E4,1E4,-1E4,1E4
.AnIn3.instMag	AI_VAL3	RTD input 3	-10000…10000	R	-1E4,1E4,-1E4,1E4
.AnIn4.instMag	AI_VAL4	RTD input 4	-10000…10000	R	-1E4,1E4,-1E4,1E4

Table continues on next page

IEC 61850 name	SA name	Description	Values	S	Arg 1,2,3,4
.AnIn5.instMag	AI_VAL5	RTD input 5	-10000…10000	R	-1E4,1E4,-1E4,1E4
.AnIn6.instMag	AI_VAL6	RTD input 6	-10000…10000	R	-1E4,1E4,-1E4,1E4
.AnIn7.instMag	AI_VAL7	RTD input 7	-10000…10000	R	-1E4,1E4,-1E4,1E4
.AnIn8.instMag	AI_VAL8	RTD input 8	-10000…10000	R	-1E4,1E4,-1E4,1E4

2.6 Double-bit binary inputs

Table 299: Explanations of the double-bit binary input table columns

Column name	Description
IEC 61850 name	Original IED data object identification. Described in the IEC 61850 format as Logical Device.Logical Node and thereafter .Data Object.Data Attribute. Logical Node is the same as the application function block name.
SA name	The signal may have a defined label that is visible, for example, in the Application Configuration tool in PCM600.
Description	Short description of the signal. See the technical manual for more information.
Values	4-pole states.

2.6.1 Switchgear functions

2.6.1.1 CTRL.CBXCBR1 Circuit-breaker control (1) – 52-1

Table 300: CTRL.CBXCBR1 Circuit-breaker control (1) – 52-1

IEC 61850 name	SA name	Description	Values
CTRL.CBCSWI1			
.pos.stVal		CB1 position	00, 01, 10, 11

2.6.1.2 CTRL.CBXCBR2 Circuit-breaker control (2) – 52-2

Table 301: CTRL.CBXCBR2 Circuit-breaker control (2) – 52-2

IEC 61850 name	SA name	Description	Values
CTRL.CBCSWI2			
.pos.stVal		CB2 position	00, 01, 10, 11

2.6.1.3 CTRL.DCXSWI1 Disconnector control (1) – 29DS-1

Table 302: CTRL.DCXSWI1 Disconnector control (1) – 29DS-1

IEC 61850 name	SA name	Description	Values
CTRL.DCCSWI1			
.pos.stVal		DC1 position	00 ,01, 10, 11

2.6.1.4 CTRL.DCXSWI2 Disconnector control (2) – 29DS-2

Table 303: CTRL.DCXSWI2 Disconnector control (2) – 29DS-2

IEC 61850 name	SA name	Description	Values
CTRL.DCCSWI2			
.pos.stVal		DC2 position	00, 01, 10 ,11

2.6.1.5 CTRL.DCSXSWI1 Disconnector position indication (1) – 52-TOC

Table 304: CTRL.DCSXSWI1 Disconnector position indication (1) – 52-TOC

IEC 61850 name	SA name	Description	Values
CTRL.DCSXSWI1			
.pos.stVal		DC1 position	00, 01, 10, 11

2.6.1.6 CTRL.DCSXSWI2 Disconnector position indication (2) – 29DS-1

Table 305: CTRL.DCSXSWI2 Disconnector position indication (2) – 29DS-1

IEC 61850 name	SA name	Description	Values
CTRL.DCSXSWI2			
.pos.stVal		DC2 position	00, 01, 10, 11

2.6.1.7 CTRL.DCSXSWI3 Disconnector position indication (3) – 29DS-2

Table 306: CTRL.DCSXSWI3 Disconnector position indication (3) – 29DS-2

IEC 61850 name	SA name	Description	Values
CTRL.DCSXSWI3			
.pos.stVal		DC3 position	00, 01, 10, 11

2.6.1.8 CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1

Table 307: CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1

IEC 61850 name	SA name	Description	Values
CTRL.ESCSWI1			
.pos.stVal		ES1 position	00, 01, 10, 11

2.6.1.9 CTRL.ESSXSWI1 Grounding switch indication (1) – 29GS-1

Table 308: CTRL.ESSXSWI1 Grounding switch indication (1) – 29GS-1

IEC 61850 name	SA name	Description	Values
CTRL.ESSXSWI1			
.pos.stVal		ES1 position	00, 01, 10, 11

2.6.1.10 CTRL.ESSXSWI2 Grounding switch indication (2) – 29GS-2

Table 309: CTRL.ESSXSWI2 Grounding switch indication (2) – 29GS-2

IEC 61850 name	SA name	Description	Values
CTRL.ESSXSWI2			
.pos.stVal		ES2 position	00, 01, 10, 11

2.7 Counters

Table 310: Explanations of the counter table columns

Column name	Description
IEC 61850 name	Original IED data object identification. Described in the IEC 61850 format as Logical Device.Logical Node and thereafter .Data Object.Data Attribute. Logical Node is the same as the application function block name.
SA name	The signal may have a defined label that is visible, for example, in the Application Configuration tool in PCM600.
Description	Short description of the signal. See the technical manual for more information.
Values	Original IEC 61850 counters range.

2.7.1 Metering and measurand functions

2.7.1.1 LD0.PEMMXU1 Three-phase power and energy measurement (1) – P, E-1

Table 311: LD0.PEMMXU1 Three-phase power and energy measurement (1) – P, E-1

IEC 61850 name	SA name	Description	Values
LD0.PEMMTR1			
.SupWh.actVal	EA_RV_ACM	Accumulated reverse active energy value	0...999999999 [kWh]
.SupVArh.actVal	ER_RV_ACM	Accumulated reverse reactive energy value	0...999999999 [kVArh]
.DmdWh.actVal	EA_FWD_ACM	Accumulated forward active energy value	0...999999999 [kWh]
.DmdVArh.actVal	ER_FWD_ACM	Accumulated forward reactive energy value	0...999999999 [kVArh]

2.7.1.2 LD0.SPEMMXU1 Single-phase power and energy measurement – SP, SE-1

Table 312: LD0.SPEMMXU1 Single-phase power and energy measurement – SP, SE-1

IEC 61850 Name	SA Name	Description	Value
LD0.SPE1MMTR1			
.SupWh.actVal	EA_RV_ACM_A	Accumulated reverse active energy value, phase A	0...999999999 [kWh]
.SupVArh.actVal	ER_RV_ACM_A	Accumulated reverse reactive energy value, phase A	0...999999999 [kVArh]
.DmdWh.actVal	EA_FWD_ACM_A	Accumulated forward active energy value, phase A	0...999999999 [kWh]
.DmdVArh.actVal	ER_FWD_ACM_A	Accumulated forward reactive energy value, phase A	0...999999999 [kVArh]
LD0.SPE2MMTR1			
.SupWh.actVal	EA_RV_ACM_B	Accumulated reverse active energy value, phase B	0...999999999 [kWh]
.SupVArh.actVal	ER_RV_ACM_B	Accumulated reverse reactive energy value, phase B	0...999999999 [kVArh]
.DmdWh.actVal	EA_FWD_ACM_B	Accumulated forward active energy value, phase B	0...999999999 [kWh]
.DmdVArh.actVal	ER_FWD_ACM_B	Accumulated forward reactive energy value, phase B	0...999999999 [kVArh]
LD0.SPE3MMTR1			
.SupWh.actVal	EA_RV_ACM_C	Accumulated reverse active energy value, phase C	0...999999999 [kWh]

Table continues on next page

IEC 61850 Name	SA Name	Description	Value
.SupVArh.actVal	ER_RV_ACM_C	Accumulated reverse reactive energy value, phase C	0...999999999 [kVArh]
.DmdWh.actVal	EA_FWD_ACM_C	Accumulated forward active energy value, phase C	0...999999999 [kWh]
.DmdVArh.actVal	ER_FWD_ACM_C	Accumulated forward reactive energy value, phase C	0...999999999 [kVArh]

2.7.2 Generic functions

2.7.2.1 LD0.MVI4GAPC1 Integer value move (1) – MVI4-1

Table 313: LD0.MVI4GAPC1 Integer value move (1) – MVI4-1

IEC 61850 name	SA name	Description	Values
LD0.MVI4GAPC1			
.ISCSO1.stVal		Generic integer value 1 (counter usage)	0…N
.ISCSO2.stVal		Generic integer value 2 (counter usage)	0…N
.ISCSO3.stVal		Generic integer value 3 (counter usage)	0…N
.ISCSO4.stVal		Generic integer value 4 (counter usage)	0…N

2.8 Analog ouputs

Table 314: Explanations of the double-bit binary input table columns

Column name	Description
IEC 61850 name	Original IED data object identification. Described in the IEC 61850 format as Logical Device.Logical Node and thereafter .Data Object.Data Attribute. Logical Node is the same as the application function block name.
SA name	The signal may have a defined label that is visible, for example, in the Application Configuration tool in PCM600.
Description	Short description of the signal. See the technical manual for more information.
Values	The value range of the original IEC 61850 data. Scaling is needed to convert floating point data into DNP3 integer values.

2.8.1 System functions

2.8.1.1 LD0.LLN0 Active setting group

Table 315: LD0.LLN0 Active setting group

IEC 61850 name	SA name	Description	Values
LD0.LLN0			
.ActSetGr.Oper.ctlVal		Change setting group	1…6

2.8.2 Metering and measurand fucntions

2.8.2.1 LD0.FLTRFRC1 Fault record (1) – FLR-1

Table 316: LD0.FLTRFRC1 Fault record (1) – FLR-1

IEC 61850 name	SA name	Description	Values
LD0.FLTRFRC1			
.SelRow.Oper.ctlVal		Select record for reading	1…N

Section 3 DNP3 protocol implementation

3.1 DNP3 device profile

The following table provides a device profile document in the standard format defined in the DNP3 Subset Definitions Document. In the DNP3 Subset Definitions Document it is referred to as a document, although it is in fact a table and only a component of a total interoperability guide. The table, in combination with the Implementation table and the point list tables, provides a complete configuration/interoperability guide for communicating with a device.

Table 317: Device profile document

DNP3 device profile document	
Vendor name:	ABB Inc.
Device name:	RED615, REF615, REG615, REM615, RET615
Highest DNP level supported: For requests: Level 2+ For responses: Level 2+	Device function: ○ Master • Slave
Notable objects, functions, and/or qualifiers supported in addition to the highest DNP levels supported (the complete list is described in the attached table): For static (non-change-event) object requests, request qualifier codes 07 and 08 (limited quantity), and 17 and 28 (index) are supported. Static object requests sent with qualifiers 07, or 08, will be responded with qualifiers 00 or 01. 16-bit and 32-bit Analog Change Events with Time may be requested.	
Maximum data link frame size (octets): Transmitted: 292 Received: 292	Maximum application fragment size (octets): Transmitted: Configurable (256...2048) Received: 2048
Maximum data link re-tries: ○ None ○ Fixed • Configurable (0...65535)	Maximum application layer re-tries: • None ○ Configurable
Requires data link layer confirmation: ○ Never ○ Always ○ Sometimes • Configurable as: "Never", "Only for multi-frame messages", or "Always"	
Requires application layer confirmation: ○ Never	

Table continues on next page

DNP3 device profile document								
	○	Always						
	○	When reporting event data (slave devices only)						
	○	When sending multi-fragment responses (slave devices only)						
	○	Sometimes						
	•	Configurable as: "Only when reporting event data", or "When reporting event data or multi-fragment messages"						
Timeouts while waiting for:								
Data link confirm:	○	None	○	Fixed at ____	○	Variable	•	Configurable
Complete appl. fragment:	•	None	○	Fixed at ____	○	Variable	○	Configurable
Application confirm:	○	None	○	Fixed at ____	○	Variable	•	Configurable
Complete appl. response:	•	None	○	Fixed at ____	○	Variable	○	Configurable
Others:	Select/Operate Arm timeout, configurable in DNP setting parameters. Regrdless of the select timeout in the HMI. Need time interval, configurable Unsolicited notification delay, configurable Unsolicited response retry delay, configurable Unsolicited offline Interval, configurable							
Sends/Executes Control Operations:								
WRITE binary outputs	•	Never	○	Always	○	Sometimes	○	Configurable
SELECT/ OPERATE	○	Never	○	Always	○	Sometimes	•	Configurable
DIRECT OPERATE	○	Never	○	Always	○	Sometimes	•	Configurable
DIRECT OPERATE - NO ACK	○	Never	○	Always	○	Sometimes	•	Configurable
Count > 1 (Count > 1 is accepted but ignored)	•	Never	○	Always	○	Sometimes	○	Configurable
Pulse on	•	Never	○	Always	○	Sometimes	○	Configurable
Pulse off	•	Never	○	Always	○	Sometimes	○	Configurable
Latch on	○	Never	•	Always	○	Sometimes	○	Configurable
Latch off	○	Never	•	Always	○	Sometimes	○	Configurable
Queue	•	Never	○	Always	○	Sometimes	○	Configurable
Clear queue	•	Never	○	Always	○	Sometimes	○	Configurable
The circuit breaker control model is configurable for either direct or SBO mode in the circuit breaker settings. If the operation mode does not match the CROB, the returned CROB status is hardware error (4). All other control points may be controlled by either direct or SBO controls.								
Reports binary input change events when no specific variation requested:					Reports time-tagged binary input change events when no specific variation requested:			
	○	Never				○	Never	

Table continues on next page

DNP3 device profile document			
	○ Only when time-tagged ○ Only non-time-tagged • Configurable to send one or the other	○ Binary input change with time ○ Binary input change with relative time • Configurable	
Sends unsolicited responses: ○ Never • Configurable ○ Only certain objects ○ Sometimes • ENABLE/DISABLE UNSOLICITED function codes supported		Sends static data in unsolicited responses: • Never ○ When device restarts ○ When status flags change No other options are permitted.	
Default counter object/variation: ○ No counters reported • Configurable ○ Default object Default variation: ○ Point-by-point list attached		Counters roll over at: ○ No counters reported • Configurable (Counter roll-over depends on the source-data object) ○ 16 bits ○ 32 bits ○ Other value: _____ ○ Point-by-point list attached	
Sends multi-fragment responses: • Yes ○ No ○ Configurable			
Sequential file transfer support:			
Append file mode	○ Yes	• No	
Custom status code strings	○ Yes	• No	
Permissions field	○ Yes	• No	
File events assigned to class	○ Yes	• No	
File events send immediately	○ Yes	• No	
Multiple blocks in a fragment	○ Yes	• No	
Max number of files open	0		
• = Selected,○ = Not selected			

3.2 DNP3 implementation table

The following table identifies which object variations, function codes and qualifiers the protection relay supports in both request messages and response messages. For static (non-change-event) objects, requests sent with qualifiers 00, 01, 06, 07 or 08 are

responded with qualifiers 00 or 01. Requests sent with qualifiers 17 or 28 are responded with qualifiers 17 or 28. For change-event objects, qualifiers 17 or 28 are always responded.

Table 318: Implementation table

OBJECT			REQUEST (Slave will parse)		RESPONSE (Slave will respond with)	
Object number	Variation number	Description	Function codes (dec)	Qualifier codes (hex)	Function codes (dec)	Qualifier codes (hex)
1	0	Binary input – any variation	1 (read) 22 (assign class)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)		
1	1 (default) [1)]	Binary input	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index) [2)]
1	2	Binary input with status	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index) [2)]
2	1	Binary input change without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
2	2	Binary input change with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
3	0	Double bit input – any variation	1 (read) 22 (assign class)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)		
3	1 [1)]	Double bit output	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index) [2)]
3	2	Double bit input with status	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)[2)]
4	0	Double bit input change - any variation	1 (read)	06 (no range, or all) 07, 08 (limited qty)		
4	1	Double bit input change without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
4	2	Double bit input change with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
10	0	Binary output status — any variation	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)		
10	1	Binary output	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index) [2)]

Table continues on next page

OBJECT			REQUEST (Slave will parse)		RESPONSE (Slave will respond with)	
10	2[1)]	Binary output status	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)[2)]
12	1	Control relay output block	3 (select) 4 (operate) 5 (direct op) 6 (dir.op. noack)	17, 28 (index)	129 (response)	echo of request
20	0	Binary counter — any variation	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)		
20	1	32–bit binary counter (with flag)	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index) [2)]
20	2	16–bit binary counter (with flag)	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index) [2)]
20	5[1)]	32–bit binary counter without flag	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index) [2)]
20	6	16–bit binary counter without flag	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index) [2)]
21	0	Frozen counter — any variation	1 (read) 22 (assign class)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)		
21	1	32-bit frozen counter (with flag)	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index)
21	2	16-bit frozen counter (with flag)	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index)
21	5	32-bit frozen counter with time of freeze	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index)
21	6	16-bit frozen counter with time of freeze	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index)

Table continues on next page

OBJECT			REQUEST (Slave will parse)		RESPONSE (Slave will respond with)	
21	9	32-bit frozen counter without flag	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index)
21	10	16-bit frozen counter without flag	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index)
22	0	Counter change event — any variation	1 (read)	06 (no range, or all) 07, 08 (limited qty)		
22	1 [1)]	32–bit counter change event without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
22	2	16–bit counter change event without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
22	5	32–bit counter change event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
22	6	16–bit counter change event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
23	0	Frozen counter event — any variation	1 (read)	06 (no range, or all) 07, 08 (limited qty)		
23	1	32-bit frozen counter event	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
23	2	16-bit frozen counter event	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
23	5	32-bit frozen counter event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
23	6	16-bit frozen counter event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
30	0	Analog input — any variation	1 (read) 22 (assign class)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)		
30	1	32–bit analog input	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index) [2)]
30	2	16–bit analog input	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index) [2)]
30	3 [1)]	32–bit analog input without flag	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index) [2)]
30	4	16–bit analog input without flag	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index) [2)]

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OBJECT			REQUEST (Slave will parse)		RESPONSE (Slave will respond with)	
30	5	Short floating point	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index) [2]
30	6	Long floating point	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index) [2]
32	0	Analog change event — any variation	1 (read)	06 (no range, or all) 07, 08 (limited qty)		
32	1[1]	32–bit analog change event without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
32	2	16–bit analog change event without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
32	3	32–bit analog change event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
32	4	16–bit analog change event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
32	5	Short floating point analog change event without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
32	6	Long floating point analog change event without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
32	7	Short floating point analog change event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
32	8	Long floating point analog change event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
40	0	Analog output status	1 (read) 22 (assign class)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)		
40	1	32-bit analog output status	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index)
40	2	16-bit analog output status	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index)
40	3	Short floating point analog output status	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index)

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OBJECT			REQUEST (Slave will parse)		RESPONSE (Slave will respond with)	
40	4	Long floating point analog output status	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 27, 28 (index)	129 (response)	00,01 (start-stop) 17, 28 (index)
41	1	32-bit analog output block	3 (select) 4 (operate) 5 (direct op) 6 (dir.op. noack)	17, 28 (index)	129 (response)	Echo of request
41	2	16-bit analog output block	3 (select) 4 (operate) 5 (direct op) 6 (dir.op. noack)	17, 28 (index)	129 (response)	Echo of request
41	3	Short floating point analog output block	3 (select) 4 (operate) 5 (direct op) 6 (dir.op. noack)	17, 28 (index)	129 (response)	Echo of request
41	4	Long floating point analog output block	3 (select) 4 (operate) 5 (direct op) 6 (dir.op. noack)	17, 28 (index)	129 (response)	Echo of request
42	0	Analog output event — any variation	1 (read)	06 (no range, or all) 07, 08 (limited qty)		
42	1	32-bit analog output event without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
42	2	16-bit analog output event without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
42	3	32-bit analog output event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
42	4	16-bit analog output event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
42	5	Short floating point analog output event without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
42	6	Long floating point analog output event without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
42	7	Short floating point analog output event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
42	8	Long floating point analog output event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
50	0	Time and date				
50	1[1)]	Time and date	1 (read)	07, (limited qty = 1)	129 (response)	07 (limited qty = 1)
			2 (write)	07, (limited qty = 1)		
50	3	Time and date last recorded time	2 (write)	07 (limited qty)		

Table continues on next page

OBJECT			REQUEST (Slave will parse)		RESPONSE (Slave will respond with)	
51	1	Time and date CTO			129 (response) 130 (unsol. resp)	07 (limited qty) (qty = 1)
51	2	Unsynchronized time and date CTO			129 (response) 130 (unsol. resp)	07 (limited qty) (qty = 1)
52	1	Time delay coarse			129 (response)	07 (limited qty) (qty = 1)
52	2	Time delay fine			129 (response)	07 (limited qty) (qty = 1)
60	0	Not defined				
60	1	Class 0 data	1 (read)	06 (no range, or all)		
60	2	Class 1 data	1 (read)	06 (no range, or all) 07, 08 (limited qty)		
			20 (enbl. unsol.) 21 (dab.unsol.) 22 (assign class)	06 (no range, or all)		
60	3	Class 2 data	1 (read)	06 (no range, or all) 07, 08 (limited qty)		
			20 (enbl. unsol.) 21 (dab.unsol.) 22 (assign class)	06 (no range, or all)		
60	4	Class 3 data	1 (read) 20 (enbl. unsol.) 21 (dab.unsol.) 22 (assign class)	06 (no range, or all) 06 (no range, or all) 07, 08 (limited qty)		
80	1	Internal indications	1 (read)	00, 01 (start-stop)	129 (response)	00,01 (start-stop)
			2 (write) 3)	00 (start-stop) index=7		
No object (function code only)			13 (cold restart)			
No object (function code only)			14 (warm restart)			
No object (function code only)			23 (delay meas.)			
No object (function code only)			24 (record current time)			

1) A default variation refers to the variation responded when variation 0 is requested and/or in class 0, 1, 2 or 3 scans. Default variations are configurable; however, default settings for the configuration parameters are indicated in the table above.
2) For static (non-change event) objects, qualifiers 17 or 28 are only responded when a request is sent with qualifiers 17 or 28. Otherwise, static object requests sent with qualifiers 00, 01, 06, 07 or 08 are responded with qualifiers 00 or 01. (For change event objects, qualifiers 17 or 28 are always responded.)
3) Writings of internal indications are only supported for index 7 (Restart IIn1–7).

Section 4 Glossary

ANSI	American National Standards Institute
CROB	Control relay output block
DNP3	A distributed network protocol originally developed by Westronic. The DNP3 Users Group has the ownership of the protocol and assumes responsibility for its evolution.
EMC	Electromagnetic compatibility
HMI	Human-machine interface
IEC 61850	International standard for substation communication and modeling
IED	Intelligent electronic device
LHMI	Local human-machine interface
PCM600	Protection and Control IED Manager
SBO	Select-before-operate

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