

RELION® 615 SERIES

Feeder Protection and Control

REF615 ANSI

Modbus Point List Manual





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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

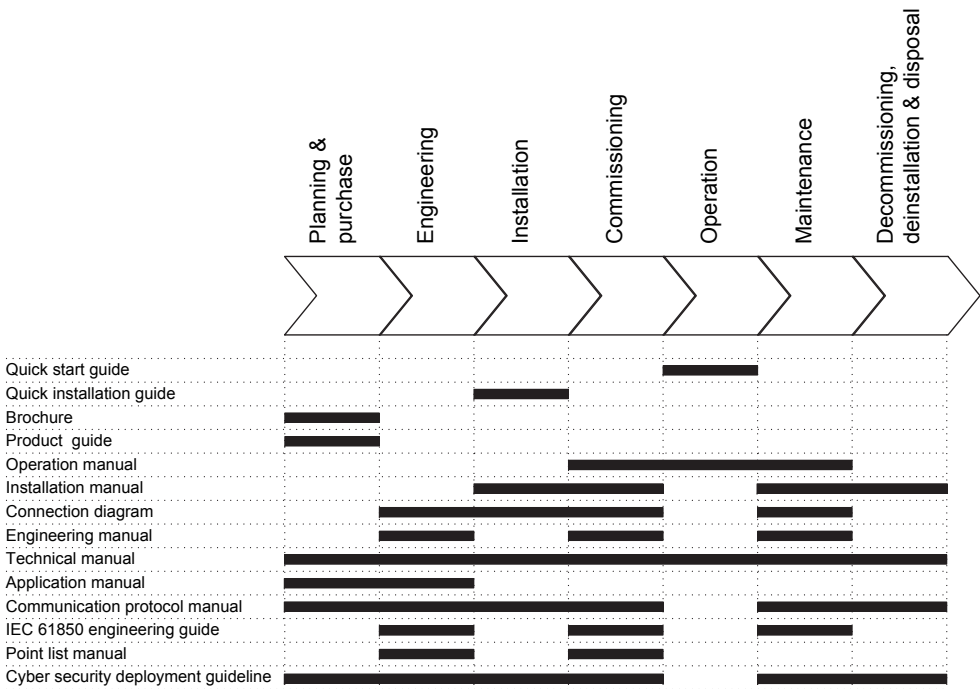


Figure 1: The intended use of documents during the product life cycle



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
Modbus Communication Protocol Manual	1MAC057386-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

Table 1: *Functions included in the relay*

Function	IEC 61850	IEC 60617	ANSI/C37.2-2008
Protection			
Three-phase non-directional overcurrent protection, low stage	PHLPTOC1	3I> (1)	51P-1
	PHLPTOC2	3I> (2)	51P-2
Three-phase non-directional overcurrent protection, high stage	PHHPTOC1	3I>> (1)	50P-1
	PHHPTOC2	3I>> (2)	50P-2
Three-phase non-directional overcurrent protection, instantaneous stage	PHIPTOC1	3I>>> (1)	50P-3
Three-phase directional overcurrent protection, low stage	DPHLPDOC1	3I> -> (1)	67/51P-1
	DPHLPDOC2	3I> -> (2)	67/51P-2
Three-phase directional overcurrent protection, high stage	DPHHPDOC1	3I>> -> (1)	67/50P-1
	DPHHPDOC2	3I>> -> (2)	67/50P-2
Non-directional ground-fault protection, low stage	EFLPTOC1	Io> (1)	51G
	EFLPTOC2	Io> (2)	51N-1
Non-directional ground-fault protection, high stage	EFHPTOC1	Io>> (1)	50G-1
	EFHPTOC2	Io>> (2)	50G-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
	DEFLPDEF2	Io> -> (2)	67/51N-2
Directional ground-fault protection, high stage	DEFHPDEF1	Io>> -> (1)	67/50N-1
	DEFHPDEF2	Io>> -> (2)	67/50N-2
Table continues on next page			

Function	IEC 61850	IEC 60617	ANSI/C37.2-2008
Admittance-based ground-fault protection	EFPADM1	$Y_o > \rightarrow (1)$	21YN-1
	EFPADM2	$Y_o > \rightarrow (2)$	21YN-2
	EFPADM3	$Y_o > \rightarrow (3)$	21YN-3
Wattmetric-based ground-fault protection	WPWDE1	$P_o > \rightarrow (1)$	32N-1
	WPWDE2	$P_o > \rightarrow (2)$	32N-2
	WPWDE3	$P_o > \rightarrow (3)$	32N-3
Transient/intermittent ground-fault protection	INTRPTEF1	$I_o > \rightarrow IEF (1)$	67NIEF
Harmonics-based ground-fault protection	HAEFPTOC1	$I_o > HA (1)$	51NHA
Negative-sequence overcurrent protection	NSPTOC1	$I_2 > (1)$	46-1
	NSPTOC2	$I_2 > (2)$	46-2
Phase discontinuity protection	PDNSPTOC1	$I_2/I_1 > (1)$	46PD
Residual overvoltage protection	ROVPTOV1	$U_o > (1)$	59G
	ROVPTOV2	$U_o > (2)$	59N-1
	ROVPTOV3	$U_o > (3)$	59N-2
Three-phase undervoltage protection	PHPTUV1	$3U < (1)$	27-1
	PHPTUV2	$3U < (2)$	27-2
	PHPTUV3	$3U < (3)$	27-3
Three-phase overvoltage protection	PHPTOV1	$3U > (1)$	59-1
	PHPTOV2	$3U > (2)$	59-2
	PHPTOV3	$3U > (3)$	59-3
Positive-sequence undervoltage protection	PSPTUV1	$U_1 < (1)$	47U-1
	PSPTUV2	$U_1 < (2)$	47U-2
Negative-sequence overvoltage protection	NSPTOV1	$U_2 > (1)$	47-1
	NSPTOV2	$U_2 > (2)$	47-2
Three-phase remnant undervoltage protection	MSVPR1	$3U < (1)$	27R-1
	MSVPR2	$3U < (2)$	27R-2
Frequency protection	FRPFRQ1	$f > / f < , df/dt (1)$	81-1
	FRPFRQ2	$f > / f < , df/dt (2)$	81-2
	FRPFRQ3	$f > / f < , df/dt (3)$	81-3
	FRPFRQ4	$f > / f < , df/dt (4)$	81-4
	FRPFRQ5	$f > / f < , df/dt (5)$	81-5
	FRPFRQ6	$f > / f < , df/dt (6)$	81-6
Three-phase thermal protection for feeders, cables and distribution transformers	T1PTTR1	$3I_{th} > F (1)$	49F-1
High-impedance differential protection for phase A	HIAPDIF1	$dH_i_A > (1)$	87A
Table continues on next page			

Function	IEC 61850	IEC 60617	ANSI/C37.2-2008
High-impedance differential protection for phase B	HIBPDIF1	dHi_B>(1)	87B
High-impedance differential protection for phase C	HICPDIF1	dHi_C>(1)	87C
Circuit breaker failure protection	CCBRBRF1	3I>/lo>BF (1)	50BF-1
	CCBRBRF2	3I>/lo>BF (2)	50BF-2
Three-phase inrush detector	INRPHAR1	3I2f> (1)	INR-1
Switch onto fault	CBPSOF1	SOTF (1)	SOTF-1
Master trip	TRPPTRC1	Master Trip (1)	86/94-1
	TRPPTRC2	Master Trip (2)	86/94-2
	TRPPTRC3	Master Trip (3)	86/94-3
	TRPPTRC4	Master Trip (4)	86/94-4
	TRPPTRC5	Master Trip (5)	86/94-5
Arc protection	ARCSARC1	ARC (1)	AFD-1
	ARCSARC2	ARC (2)	AFD-2
	ARCSARC3	ARC (3)	AFD-3
Multipurpose protection	MAPGAPC1	MAP (1)	MAP-1
	MAPGAPC2	MAP (2)	MAP-2
	MAPGAPC3	MAP (3)	MAP-3
	MAPGAPC4	MAP (4)	MAP-4
	MAPGAPC5	MAP (5)	MAP-5
	MAPGAPC6	MAP (6)	MAP-6
	MAPGAPC7	MAP (7)	MAP-7
	MAPGAPC8	MAP (8)	MAP-8
	MAPGAPC9	MAP (9)	MAP-9
	MAPGAPC10	MAP (10)	MAP-10
	MAPGAPC11	MAP (11)	MAP-11
	MAPGAPC12	MAP (12)	MAP-12
	MAPGAPC13	MAP (13)	MAP-13
	MAPGAPC14	MAP (14)	MAP-14
	MAPGAPC15	MAP (15)	MAP-15
	MAPGAPC16	MAP (16)	MAP-16
	MAPGAPC17	MAP (17)	MAP-17
	MAPGAPC18	MAP (18)	MAP-18
Fault locator	SCEFRFLO1	FLOC (1)	21FL-1
Loss of phase	PHPTUC1	3I< (1)	37-1
High-impedance fault detection	PHIZ1	HIF (1)	HIZ-1
Table continues on next page			

Function	IEC 61850	IEC 60617	ANSI/C37.2-2008
Underpower protection	DUPPDPR1	P< (1)	32U-1
	DUPPDPR2	P< (2)	32U-2
Reverse power/directional overpower protection	DOPPDPR1	P>/Q> (1)	32R/32O-1
	DOPPDPR2	P>/Q> (2)	32R/32O-2
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	VVSPAM1	VS (1)	78V-1
Power quality			
Current total demand distortion	CMHAI1	PQM3I (1)	PQI-1
Voltage total harmonic distortion	VMHAI1	PQM3U (1)	PQVPH-1
	VMHAI2	PQM3U(B)	PQVPH-2
Voltage variation	PHQVVR1	PQMU (1)	PQSS-1
	PHQVVR2	PQ 3U<>(B)	PQSS-2
Voltage unbalance	VSQVUB1	PQUUB (1)	PQVUB-1
Control			
Circuit-breaker control	CBXCBR1	I <-> O CB (1)	52-1
	CBXCBR2	I <-> O CB (2)	52-2
Disconnecter control	DCXSWI1	I <-> O DCC (1)	29DS-1
	DCXSWI2	I <-> O DCC (2)	29DS-2
Grounding switch control	ESXSWI1	I <-> O ESC (1)	29GS-1
Disconnecter position indication	DCSXSXI1	I <-> O DC (1)	52-TOC
	DCSXSXI2	I <-> O DC (2)	29DS-1
	DCSXSXI3	I <-> O DC (3)	29DS-2
Grounding switch indication	ESSXSXI1	I <-> O ES (1)	29GS-1
	ESSXSXI2	I <-> O ES (2)	29GS-2
Autoreclosing	DARREC1	O -> I (1)	79
Synchronism and energizing check	SECRSYN1	SYNC (1)	25
Condition monitoring			
Circuit-breaker condition monitoring	SSCBR1	CBCM (1)	52CM-1
	SSCBR2	CBCM (2)	52CM-2
Table continues on next page			

Function	IEC 61850	IEC 60617	ANSI/C37.2-2008
Trip circuit supervision	TCSSCBR1	TCS (1)	TCM-1
	TCSSCBR2	TCS (2)	TCM-2
Current circuit supervision	CCSPVC1	MCS 3I (1)	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
	SEQSPVC2	FUSEF (2)	60-2
Runtime counter for machines and devices	MDSOPT1	OPTS (1)	OPTM-1
Measurement			
Load profile record	LDPRLRC1	LOADPROF (1)	LoadProf
Three-phase current measurement	CMMXU1	3I (1)	IA, IB, IC
Sequence current measurement	CSMSQI1	I1, I2, I0 (1)	I1, I2, I0
Residual current measurement	RESCMMXU1	Io (1)	IG
Three-phase voltage measurement	VMMXU1	3U (1)	VA, VB, VC
	VMMXU2	3U (2)	VA, VB, VC (2)
Residual voltage measurement	RESVMMXU1	Uo (1)	VG
Sequence voltage measurement	VSMSQI1	U1, U2, U0 (1)	V1, V2, V0
	VSMSQI2	U1, U2, U0(B)	V1, V2, V0 (2)
Single-phase power and energy measurement	SPEMMXU1	SP, SE	SP, SE-1
Three-phase power and energy measurement	PEMMXU1	P, E (1)	P, E-1
RTD/mA measurement	XRGGIO130	X130 (RTD) (1)	X130 (RTD) (1)
Frequency measurement	FMMXU1	f (1)	f
IEC 61850-9-2 LE sampled value sending	SMVSENDER	SMVSENDER	SMVSENDER
IEC 61850-9-2 LE sampled value receiving (voltage sharing)	SMVRECEIVER	SMVRECEIVER	SMVRECEIVER
Other			
Minimum pulse timer	TPGAPC1	TP (1)	62TP-1
	TPGAPC2	TP (2)	62TP-2
	TPGAPC3	TP (3)	62TP-3
	TPGAPC4	TP (4)	62TP-4
Minimum pulse timer (second resolution)	TPSGAPC1	TPS (1)	62TPS-1
Minimum pulse timer (minute resolution)	TPMGAPC1	TPM (1)	62TPM-1
Table continues on next page			

Function	IEC 61850	IEC 60617	ANSI/C37.2-2008
Pulse timer	PTGAPC1	PT (1)	62PT-1
	PTGAPC2	PT (2)	62PT-2
Time delay off	TOFGAPC1	TOF (1)	62TOF-1
	TOFGAPC2	TOF (2)	62TOF-2
	TOFGAPC3	TOF (3)	62TOF-3
	TOFGAPC4	TOF (4)	62TOF-4
Time delay on	TONGAPC1	TON (1)	62TON-1
	TONGAPC2	TON (2)	62TON-2
	TONGAPC3	TON (3)	62TON-3
	TONGAPC4	TON (4)	62TON-4
Set-reset	SRGAPC1	SR (1)	SR-1
	SRGAPC2	SR (2)	SR-2
	SRGAPC3	SR (3)	SR-3
	SRGAPC4	SR (4)	SR-4
Move	MVGAPC1	MV (1)	MV-1
	MVGAPC2	MV (2)	MV-2
Generic control point	SPCGAPC1	SPC (1)	SPC-1
	SPCGAPC2	SPC (2)	SPC-2
Analog value scaling	SCA4GAPC1	SCA4 (1)	SCA4-1
	SCA4GAPC2	SCA4 (2)	SCA4-2
	SCA4GAPC3	SCA4 (3)	SCA4-3
	SCA4GAPC4	SCA4 (4)	SCA4-4
Integer value move	MVI4GAPC1	MVI4 (1)	MVI4-1
Generic up-down counters	UDFCNT1	UDCNT (1)	CTR-1
	UDFCNT2	UDCNT (2)	CTR-2
	UDFCNT3	UDCNT (3)	CTR-3
	UDFCNT4	UDCNT (4)	CTR-4

Section 2 Modbus data mappings

2.1 Overview

This document describes the Modbus data points and structures available in the protection relay. The point lists describe a superset of all data available through the standard configuration/s including the optional functionalities.

2.2 Supported functions

2.2.1 Supported functions in REF615

Table 2: *Supported functions*

Function	IEC 61850	ANSI	D	F	L	N	P
			FA04	FA06	FA11	FA12	FA13
Protection							
Three-phase non-directional overcurrent protection, low stage	PHLPTOC	51P	1		2	2	1
Three-phase non-directional overcurrent protection, high stage	PHHPTOC	50P-1	2		2	2	2
Three-phase non-directional overcurrent protection, instantaneous stage	PHIPTOC	50P-3	1	1	1	1	1
Three-phase directional overcurrent protection, low stage	DPHLPDOC	67/51P		2	2	2	
Three-phase directional overcurrent protection, high stage	DPHHPDOC	67/50P		1	2	2	2
Non-directional ground-fault protection, low stage	EFLPTOC	51G	1		1	1	1
		51N	1		1	1	1
Non-directional ground-fault protection, high stage	EFHPTOC	50G	1	1	2	2	2
		50N			2	2	2
Non-directional ground-fault protection, instantaneous stage	EFIPTOC	50G-3	1		1	1	1
		50N-3			1	1	1
Directional ground-fault protection, low stage	DEFLPDEF	67/51N		2	2	2	
Directional ground-fault protection, high stage	DEFHPDEF	67/50N		1	2	2	2
Table continues on next page							

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Modbus data mappings

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Function	IEC 61850	ANSI	D	F	L	N	P
			FA04	FA06	FA11	FA12	FA13
Admittance-based ground-fault protection ¹⁾	EFPADM	21YN		(3)	(3) ²⁾	(3)	
Wattmetric-based ground-fault protection ¹⁾	WPWDE	32N		(3)	(3) ²⁾	(3)	
Transient/intermittent ground-fault protection	INTRPTEF	67NIEF		1 ³⁾	1 ²⁾³⁾	1 ³⁾	
Harmonics-based ground-fault protection ¹⁾	HAEFPTOC	51NHA	(1) ³⁾	(1) ³⁾	(1) ³⁾	(1) ³⁾	
Negative-sequence overcurrent protection	NSPTOC	46	2	2	2	2	2
Phase discontinuity protection	PDNSPTOC	46PD	1	1	1	1	
Residual overvoltage protection	ROVPTOV	59G		1	1 ²⁾	1	
		59N		2	2 ²⁾	2	2
Three-phase undervoltage protection	PHPTUV	27-1		3	3	3	2
Three-phase overvoltage protection	PHPTOV	59		3	3	3	2
Positive-sequence undervoltage protection	PSPTUV	47U		1	2	2	
Negative-sequence overvoltage protection	NSPTOV	47		1	2	2	2
Three-phase remnant undervoltage protection (source 1)	MSVPR	27R			(1) ⁴⁾	1	2
Frequency protection	FRPFRQ	81			6	6	
Three-phase thermal protection for feeders, cables and distribution transformers	T1PTTR	49F	1	1	1	1	
High-impedance differential protection for phase A	HIAPDIF	87A				1	
High-impedance differential protection for phase B	HIBPDIF	87B				1	
High-impedance differential protection for phase C	HICPDIF	87C				1	
Circuit breaker failure protection	CCBRBRF	50BF	1	1	1	1	2
Three-phase inrush detector	INRPHAR	INR	1	1	1	1	1
Switch onto fault	CBPSOF	SOTF	1	1	1	1	
Master trip	TRPPTRC	86/94	2 (3) ⁵⁾	2 (3) ⁵⁾	2 (3) ⁵⁾	2 (3) ⁵⁾	2 (3) ⁵⁾
Arc protection	ARCSARC	AFD	(3)	(3)	(3)	(3)	(3)
Multipurpose protection	MAPGAPC	MAP	18	18	18	18	18
Fault locator	SCEFRFLO	21FL			(1)	(1)	(1)
Loss of phase	PHPTUC	37					1
High-impedance fault detection	PHIZ	HIZ	1	1		1	
Table continues on next page							

Function	IEC 61850	ANSI	D	F	L	N	P
			FA04	FA06	FA11	FA12	FA13
Underpower protection	DUPDPDR	32U			2	2	
Reverse power/directional overpower protection	DOPDPDR	32R/32O			2	2	
Multifrequency admittance-based ground-fault protection	MFADPSDE	67YN			1	1	
Interconnection functions							
Directional reactive power undervoltage protection	DQPTUV	32Q-27			(1)	(1)	
Low-voltage ride-through protection	LVRTPTUV	27RT			(3)	(3)	
Voltage vector shift protection	VVSPPAM	78V			(1)	(1)	
Power quality							
Current total demand distortion	CMHAI	PQI			(1) ⁶	(1) ⁶	(1) ⁶
Voltage total harmonic distortion	VMHAI	PQVPH			(1) ⁶	(1) ⁶	(2) ⁶
Voltage variation	PHQVVR	PQSS			(1) ⁶	(1) ⁶	(2) ⁶
Voltage unbalance	VSQVUB	PQVUB			(1) ⁶	(1) ⁶	(1) ⁶
Control							
Circuit-breaker control	CBXCBR	52	1	1	1	1	2
Disconnecter control	DCXSWI	29DS	2	2	2	2	2
Grounding switch control	ESXSWI	29GS	1	1	1	1	1
Disconnecter position indication	DCSXSXI	52-TOC	1	1	1	1	1
		29DS	2	2	2	2	2
Grounding switch indication	ESSXSWI	29GS	2	2	2	2	2
Autoreclosing	DARREC	79	(1)	(1)	(1)	(1)	(1)
Synchronism and energizing check	SECRSYN	25			(1) ⁴	1	1
Condition monitoring							
Circuit-breaker condition monitoring	SSCBR	52CM	1	1	1	1	2
Trip circuit supervision	TCSSCBR	TCM	2	2	2	2	2
Current circuit supervision	CCSPVC	CCM		1	1	1	1
Current transformer supervision for high-impedance protection scheme for phase A	HZCCASPVC	MCS-A				1	
Current transformer supervision for high-impedance protection scheme for phase B	HZCCBSPVC	MCS-B				1	
Current transformer supervision for high-impedance protection scheme for phase C	HZCCCSPVC	MCS-C				1	
Fuse failure supervision	SEQSPVC	60		1	1	1	2
Runtime counter for machines and devices	MDSOPT	OPTM	1	1	1	1	1
Measurement							
Table continues on next page							

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Modbus data mappings

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Function	IEC 61850	ANSI	D	F	L	N	P
			FA04	FA06	FA11	FA12	FA13
Load profile record	LDPRLRC	LoadProf	1	1	1	1	1
Three-phase current measurement	CMMXU	IA, IB, IC	1	1	1	1	1
Sequence current measurement	CSMSQI	I1, I2, I0	1	1	1	1	1
Residual current measurement	RESCMMXU	IG	1	1	1	1	1
Three-phase voltage measurement	VMMXU	VA, VB, VC		1	1 (1) ⁴⁾	2	2
Residual voltage measurement	RESVMMXU	VG		1		1	
Sequence voltage measurement	VSMSQI	V1, V2, V0		1	1	1	2
Single-phase power and energy measurement	SPEMMXU	SP, SE		1	1	1	1
Three-phase power and energy measurement	PEMMXU	P, E		1	1	1	1
RTD/mA measurement	XRGGIO130	X130 (RTD)	(1)	(1)		(1)	
Frequency measurement	FMMXU	f		1	1	1	1
IEC 61850-9-2 LE sampled value sending ⁷⁾	SMVSENDER	SMVSENDER		(1)	(1)	(1)	(1)
IEC 61850-9-2 LE sampled value receiving (voltage sharing) ⁷⁾	SMVRECEIVER	SMVRECEIVER		(1)	(1)	(1)	(1)
Other							
Minimum pulse timer (2 pcs)	TPGAPC	62TP	4	4	4	4	4
Minimum pulse timer (2 pcs, second resolution)	TPSGAPC	62TPS	1	1	1	1	1
Minimum pulse timer (2 pcs, minute resolution)	TPMGAPC	62TPM	1	1	1	1	1
Pulse timer (8 pcs)	PTGAPC	62PT	2	2	2	2	2
Time delay off (8 pcs)	TOFGAPC	62TOF	4	4	4	4	4
Time delay on (8 pcs)	TONGAPC	62TON	4	4	4	4	4
Set-reset (8 pcs)	SRGAPC	SR	4	4	4	4	4
Move (8 pcs)	MVGAPC	MV	2	2	2	2	2
Generic control point (16 pcs)	SPCGAPC	SPC	2	2	2	2	2
Analog value scaling	SCA4GAPC	SCA4	3	3	3	3	3
Integer value move	MVI4GAPC	MVI4	1	1	1	1	1
Generic up-down counters	UDFCNT	CTR	4	4	4	4	4
1, 2, ... = Number of included instances. The instances of a protection function represent the number of identical protection function blocks available in the standard configuration. () = Optional							

- 1) One of the following can be ordered as an option; Admittance based E/F, Wattmetric based E/F or Harmonics based E/F. The option is an addition to the existing E/F of the original configuration. The optional ground-fault protection has a predefined configuration in the relay. The optional ground-fault protection can be set on or off.
- 2) "Calculated V0" is always used
- 3) "Measured IG" is always used
- 4) Only available with IEC 61850-9-2

- 5) Master Trip included and connected to corresponding HSO in the configuration only when BIO0007 module is used. If additionally the ARC option is selected, then AFD is connected in the configuration to the corresponding Master Trip input.
- 6) Power quality option includes Current total demand distortion, Voltage total harmonic distortion and Voltage variation.
- 7) Only available with COM0031...0037

2.3 Indications

Table 3: *Explanations of the indications table columns*

Column name	Description
BitA	Default 0X and 1X bit address for the data.
RegA	Default 3X and 4X register.bit (00-15) address for the data.
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 value states.

2.3.1 Premapped indications

2.3.1.1 Common data 1

Table 4: *Common data 1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.LLN0			
2720	170.00	.Loc.stVal	-	Remote/Local state	0/1=Rem/Loc
2721	170.01	.LocKeyHMI.stVal.Station	-	Station state	1=Station
		DR.RDRE1			
2722	170.02	.RcdMade.stVal	-	DR recording made	1=Made
2723	170.03	.mcd			

2.3.1.2 CTRL.CBCILO1 Circuit breaker enable signals (1)

Table 5: *CTRL.CBCILO1 Circuit breaker enable signals (1)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.CBCILO1			
2824	176.08	.EnaOpn.stVal	ENA_OPEN	Open enabled	1=Enabled
2825	176.09	.EnaCls.stVal	ENA_CLOSE	Close enabled	1=Enabled

2.3.1.3 CTRL.CBCSWI1 Circuit breaker (1) mom. position

Table 6: *CTRL.CBCSWI1 Circuit breaker (1) mom. position*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.CBCSWI1	POSITION		
2804	175.04	.Pos.stVal.Close	-	Close bit	1=Close
2805	175.05	.Pos.stVal.Open	-	Open bit	1=Open
2806	175.06	.Pos.stVal.Fault	-	Fault bit	1=Pos(00/11)
2834	177.02	.SynItlBypstVal	ITL_BYPASS	Interlock bypass	1=Bypass
2835	177.03	.mcd			

2.3.1.4 CTRL.CBCSWI1 Circuit breaker (1) mom+mcd position

Table 7: *CTRL.CBCSWI1 Circuit breaker (1) mom+mcd position*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.CBCSWI1	POSITION		
2816	176.00	.Pos.stVal.Close		Close bit	1=Close
2817	176.01	.mcd			
2818	176.02	.Pos.stVal.Open		Open bit	1=Open
2819	176.03	.mcd			
2820	176.04	< reserved >			
2821	176.05	< reserved >			
2822	176.06	.Pos.stSeld	SELECTED	CB selected for control	1=Selected
2823	176.07	.mcd			

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

Table 8: *CTRL.CBXCBR1 Circuit-breaker control (1) – 52-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.CBXCBR1			
2836	177.04	.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked
2837	177.05	.mcd			
2838	177.06	.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
2839	177.07	.mcd			

2.3.1.6 CTRL.DCSXSWI1 Disconnecter position indication (1) – 52-TOC**Table 9:** *CTRL.DCSXSWI1 Disconnecter position indication (1) – 52-TOC*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.DCSXSWI1	POSITION		
2792	174.08	.Pos.stVal.Close	-	Close bit	1=Close
2793	174.09	.Pos.stVal.Open	-	Open bit	1=Open
2794	174.10	.Pos.stVal.Fault	-	Fault bit	1=Pos(00/11)

2.3.1.7 CTRL.DCSXSWI2 Disconnecter position indication (2) – 29DS-1**Table 10:** *CTRL.DCSXSWI2 Disconnecter position indication (2) – 29DS-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.DCSXSWI2	POSITION		
2795	174.11	.Pos.stVal.Close	-	Close bit	1=Close
2796	174.12	.Pos.stVal.Open	-	Open bit	1=Open
2797	174.13	.Pos.stVal.Fault	-	Fault bit	1=Pos(00/11)

2.3.1.8 CTRL.DCSXSWI3 Disconnecter position indication (3) – 29DS-2**Table 11:** *CTRL.DCSXSWI3 Disconnecter position indication (3) – 29DS-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.DCSXSWI3	POSITION		
2798	174.14	.Pos.stVal.Close	-	Close bit	1=Close
2799	174.15	.Pos.stVal.Open	-	Open bit	1=Open
2800	175.00	.Pos.stVal.Fault	-	Fault bit	1=Pos(00/11)

2.3.1.9 CTRL.DCXSWI1 Disconnecter control (1) – 29DS-1**Table 12:** *CTRL.DCXSWI1 Disconnecter control (1) – 29DS-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.DCXSWI1	POSITION		
3472	217.00	.Pos.stVal.Close	-	Close bit	1=Close
3473	217.01	.Pos.stVal.Open	-	Open bit	1=Open
3474	217.02	.Pos.stVal.Fault	-	Fault bit	1=Pos(00/11)
3475	217.03	.Pos.stSeld	-	Control selected	1=Selected
		CTRL.DCCILO1			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3476	217.04	.EnaOpn.stVal	ENA_OPEN	Open enabled	1=Enabled
3477	217.05	.EnaCls.stVal	ENA_CLOSE	Close enabled	1=Enabled
		CTRL.DCXSWI1			
3478	217.06	.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked
3479	217.07	.mcd			
3480	217.08	.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
3481	217.09	.mcd			
		CTRL.DCCILO1			
3482	217.10	.ItlByps.stVal	ITL_BYPASS	Interlock bypass	1=Bypass
3483	217.11	.mcd			

2.3.1.10 CTRL.DCXSWI2 Disconnecter control (2) – 29DS-2

Table 13: CTRL.DCXSWI2 Disconnecter control (2) – 29DS-2

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.DCXSWI2	POSITION		
3484	217.12	.Pos.stVal.Close	-	Close bit	1=Close
3485	217.13	.Pos.stVal.Open	-	Open bit	1=Open
3486	217.14	.Pos.stVal.Fault	-	Fault bit	1=Pos(00/11)
3487	217.15	.Pos.stSeld	-	Control selected	1=Selected
		CTRL.DCCILO2			
3488	218.00	.EnaOpn.stVal	ENA_OPEN	Open enabled	1=Enabled
3489	218.01	.EnaCls.stVal	ENA_CLOSE	Close enabled	1=Enabled
		CTRL.DCXSWI2			
3490	218.02	.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked
3491	218.03	.mcd			
3492	218.04	.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
3493	218.05	.mcd			
		CTRL.DCCILO2			
3494	218.06	.ItlByps.stVal	ITL_BYPASS	Interlock bypass	1=Bypass
3495	218.07	.mcd			

2.3.1.11 CTRL.ESSXSWI1 Grounding switch indication (1) – 29GS-1**Table 14:** *CTRL.ESSXSWI1 Grounding switch indication (1) – 29GS-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.ESSXSWI1	POSITION		
2801	175.01	.Pos.stVal.Close	-	Close bit	1=Close
2802	175.02	.Pos.stVal.Open	-	Open bit	1=Open
2803	175.03	.Pos.stVal.Fault	-	Fault bit	1=Pos(00/11)

2.3.1.12 CTRL.ESSXSWI2 Grounding switch indication (2) – 29GS-2**Table 15:** *CTRL.ESSXSWI2 Grounding switch indication (2) – 29GS-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.ESSXSWI2	POSITION		
2807	175.07	.Pos.stVal.Close	-	Close bit	1=Close
2808	175.08	.Pos.stVal.Open	-	Open bit	1=Open
2809	175.09	.Pos.stVal.Fault	-	Fault bit	1=Pos(00/11)

2.3.1.13 CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1**Table 16:** *CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.ESXSWI1	POSITION		
3496	218.08	.Pos.stVal.Close	-	Close bit	1=Close
3497	218.09	.Pos.stVal.Open	-	Open bit	1=Open
3498	218.10	.Pos.stVal.Fault	-	Fault bit	1=Pos(00/11)
3499	218.11	.Pos.stSeld	-	Control selected	1=Selected
		CTRL.ESCILO1			
3500	218.12	.EnaOpn.stVal	ENA_OPEN	Open enabled	1=Enabled
3501	218.13	.EnaCls.stVal	ENA_CLOSE	Close enabled	1=Enabled
		CTRL.ESXSWI1			
3502	218.14	.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked
3503	218.15	.mcd			
3504	219.00	.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
3505	219.01	.mcd			
		CTRL.ESCILO1			
3506	219.02	.ItlByps.stVal	ITL_BYPASS	Interlock bypass	1=Bypass
3507	219.03	.mcd			

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

Table 17: *LD0.ARCSARC1 Arc protection (1) – AFD-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.ARCSARC11			
2978	186.02	.FADet.stVal	ARC_FLT_DET	Arc detected	1=Detected
2979	186.03	.mcd			
		LD0.ARCPTRC11			
2982	186.06	.Op.general	TRIP	Stage trip	1=Trip
2983	186.07	.mcd			

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

Table 18: *LD0.ARCSARC2 Arc protection (2) – AFD-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.ARCSARC21			
2984	186.08	.FADet.stVal	ARC_FLT_DET	Arc detected	1=Detected
2985	186.09	.mcd			
		LD0.ARCPTRC21			
2988	186.12	.Op.general	TRIP	Stage trip	1=Trip
2989	186.13	.mcd			

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

Table 19: *LD0.ARCSARC3 Arc protection (3) – AFD-3*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.ARCSARC31			
2990	186.14	.FADet.stVal	ARC_FLT_DET	Arc detected	1=Detected
2991	186.15	.mcd			
		LD0.ARCPTRC31			
2994	187.02	.Op.general	TRIP	Stage trip	1=Trip
2995	187.03	.mcd			

2.3.1.17 LD0.CCBRRBF1 Circuit breaker failure protection (1) – 50BF-1**Table 20:** *LD0.CCBRRBF1 Circuit breaker failure protection (1) – 50BF-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.CCBRRBF1			
2828	176.12	.Str.general	CB_FAULT_AL	Timer running	1=Running
2829	176.13	.mcd			
2830	176.14	.OpEx.general	TRBU	Fail, external trip	1=Ext.trip
2831	176.15	.mcd			
2832	177.00	.OpIn.general	TRRET	Internal re-trip	1=Re-trip
2833	177.01	.mcd			

2.3.1.18 LD0.CCSPVC1 Current circuit supervision (1) – CCM-1**Table 21:** *LD0.CCSPVC1 Current circuit supervision (1) – CCM-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.CCSPVC1			
3002	187.10	.SigFailAlm.stVal	ALARM	Alarm	1=Alarm
3003	187.11	.mcd			
3004	187.12	.FailACirc.general	FAIL	Failure trip	1=Trip
3005	187.13	.mcd			

2.3.1.19 LD0.CMHAI1 Current total demand distortion (1) – PQI-1**Table 22:** *LD0.CMHAI1 Current total demand distortion (1) – PQI-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.CMHAI1			
3316	207.04	.Alm.stVal	ALARM		1=Alarm
3317	207.05	.mcd			

2.3.1.20 LD0.CMMXU1 Three-phase current measurement (1) – IA, IB, IC**Table 23:** *LD0.CMMXU1 Three-phase current measurement (1) – IA, IB, IC*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.CMMXU1			
2752	172.00	.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
2753	172.01	.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
2754	172.02	.HiWrn.stVal	HIGH_WARN	High warning	1=Warning
2755	172.03	.mcd			
2756	172.04	.LoWrn.stVal	LOW_WARN	Low warning	1=Warning
2757	172.05	.mcd			
2758	172.06	.LoAlm.stVal	LOW_ALARM	Low alarm	1=Alarm
2759	172.07	.mcd			

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

Table 24: *LD0.DARREC1 Autoreclosing (1) – 79-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DARREC1			
3040	190.00	.PrgRec.stVal	INPRO	AR in progress	1=In progress
3041	190.01	.mcd			
3042	190.02	.PrgRec1.stVal	INPRO_1	1st shot in progress	1=In progress
3043	190.03	.mcd			
3044	190.04	.PrgRec2.stVal	INPRO_2	2nd shot in progress	1=In progress
3045	190.05	.mcd			
3046	190.06	.PrgRec3.stVal	INPRO_3	3rd shot in progress	1=In progress
3047	190.07	.mcd			
3048	190.08	.PrgRec4.stVal	INPRO_4	4th shot in progress	1=In progress
3049	190.09	.mcd			
3050	190.10	.PrgRec5.stVal	INPRO_5	5th shot in progress	1=In progress
3051	190.11	.mcd			
3052	190.12	.SucRec.stVal	SUC_RECL	Successful AR	1=Success
3053	190.13	.mcd			
3054	190.14	.UnsRec.stVal	UNSUC_RECL	Unsuccessful AR	1=Unsuccess
3055	190.15	.mcd			
3056	191.00	< reserved >			
3057	191.01	< reserved >			
3058	191.02	< reserved >			
3059	191.03	< reserved >			
3060	191.04	.LO.stVal	LOCKED	Lockout status	1=Lockout
3061	191.05	.mcd			
3062	191.06	.RdyRec.stVal	READY	Reclose ready	1=Ready
3063	191.07	.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3064	191.08	.ActRec.stVal	ACTIVE	Reclose active	1=Active
3065	191.09	.mcd			
3066	191.10	.PrgDsr.stVal	DISCR_INPRO	Discr.time in progress	1=In progress
3067	191.11	.mcd			
3068	191.12	.PrgCutOut.stVal	CUTOUT_INPRO	Cutout time in progress	1=In progress
3069	191.13	.mcd			
3070	191.14	.FrqOpAlm.stVal	FRQ_OP_ALM	Frequent op. Alarm	1=Alarm
3071	191.15	.mcd			
3072	192.00	.RclTmStr.stVal		Reclaim time started	
3073	192.01	.mcd			
3074	192.02	.ProCrd.stVal		Protection coordination	1=In progress
3075	192.03	.mcd			
3076	192.04	.CBManCls.stVal	MAN_CB_CL	CB manually closed	1=CB closed
3077	192.05	.mcd			
3078	192.06	.OpCls.general	CLOSE_CB	Operate (close XCBR)	1=Close CB
3079	192.07	.mcd			
3080	192.08	.OpOpn.general	OPEN_CB	Operate (open XCBR)	1=Open CB
3081	192.09	.mcd			
3082	192.10	.UnsCBCls.stVal	UNSUC_CB	CB closing failed	1=Failed
3083	192.11	.mcd			
3084	192.12	.WtMstr.stVal	CMD_WAIT	Master signal to follower	1=Signal
3085	192.13	.mcd			

2.3.1.22 LD0.DARREC1 Autoreclosing state (1) – 79-1

Table 25: LD0.DARREC1 Autoreclosing state (1) – 79-1

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DARREC1			
2724	170.04	.AutoRecOn.stVal	AR_ON	AutoRecloser state	0/1=Off/On

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

Table 26: *LD0.DEFHPDEF1 Directional ground-fault protection, high stage (1) – 67/50N-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DEFHPTOC1			
2928	183.00	.Str.general	PICKUP	Stage pickup	1=Pickup
2929	183.01	.mcd			
2930	183.02	.Op.general	TRIP	Stage trip	1=Trip
2931	183.03	.mcd			

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

Table 27: *LD0.DEFHPDEF2 Directional ground-fault protection, high stage (2) – 67/50N-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DEFHPTOC2			
4128	258	.Str.general	PICKUP	Stage pickup	1=Pickup
4129	258.1	.mcd			
4130	258.2	.Op.general	TRIP	Stage trip	1=Trip
4131	258.3	.mcd			

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

Table 28: *LD0.DEFLPDEF1 Directional ground-fault protection, low stage (1) 67/51N-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DEFLPTOC1			
2920	182.08	.Str.general	PICKUP	Stage pickup	1=Pickup
2921	182.09	.mcd			
2922	182.10	.Op.general	TRIP	Stage trip	1=Trip
2923	182.11	.mcd			

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

Table 29: LD0.DEFLPDEF2 Directional ground-fault protection, low stage (2) – 67/51N-2

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DEFLPTOC2			
2924	182.12	.Str.general	PICKUP	Stage pickup	1=Pickup
2925	182.13	.mcd			
2926	182.14	.Op.general	TRIP	Stage trip	1=Trip
2927	182.15	.mcd			

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

Table 30: LD0.DPHHPDOC1 Three-phase directional overcurrent protection, high stage (1) – 67/50P-1

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DPHHPDOC1			
3026	189.02	.Str.general	PICKUP	General pickup	1=Pickup
3027	189.03	.mcd			
3028	189.04	.Str.phsA		Phs A pickup	1=Pickup
3029	189.05	.mcd			
3030	189.06	.Str.phsB		Phs B pickup	1=Pickup
3031	189.07	.mcd			
3032	189.08	.Str.phsC		Phs C pickup	1=Pickup
3033	189.09	.mcd			
3034	189.10	.Op.general	TRIP	General trip	1=Trip
3035	189.11	.mcd			

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

Table 31: LD0.DPHHPDOC2 Three-phase directional overcurrent protection, high stage (2) – 67/50P-2

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DPHHPDOC2			
4108	256.12	.Str.general	PICKUP	General pickup	1=Pickup
4109	256.13	.mcd			
		.Str.phsA		phsA pickup	1=Pickup

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.mcd			
		.Str.phsB		phsB pickup	1=Pickup
		.mcd			
		.Str.phsC		phsC pickup	1=Pickup
		.mcd			
4110	256.14	.Op.general	TRIP	General trip	1=Trip
4111	256.15	.mcd			

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

Table 32: LD0.DPHLPDOC1 Three-phase directional overcurrent protection, low stage (1) – 67/51P-1

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DPHLPDOC1			
3006	187.14	.Str.general	PICKUP	General pickup	1=Pickup
3007	187.15	.mcd			
3008	188.00	.Str.phsA		phsA pickup	1=Pickup
3009	188.01	.mcd			
3010	188.02	.Str.phsB		phsB pickup	1=Pickup
3011	188.03	.mcd			
3012	188.04	.Str.phsC		phsC pickup	1=Pickup
3013	188.05	.mcd			
3014	188.06	.Op.generalTRIP	TRIP	General trip	1=Trip
3015	188.07	.mcd			

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

Table 33: LD0.DPHLPDOC2 Three-phase directional overcurrent protection, low stage (2) – 67/51P-2

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DPHLPDOC2			
3016	188.08	.Str.general	PICKUP	General pickup	1=Pickup
3017	188.09	.mcd			
3018	188.10	.Str.phsA		phsA pickup	1=Pickup
3019	188.11	.mcd			
3020	188.12	.Str.phsB		phsB pickup	1=Pickup

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3021	188.13	.mcd			
3022	188.14	.Str.phsC		phsC pickup	1=Pickup
3023	188.15	.mcd			
3024	189.00	.Op.general	TRIP	General trip	1=Trip
3025	189.01	.mcd			

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

Table 34: LD0.DOPPDPR1 Reverse power/directional overpower protection (1) – 32R/32O-1

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DOPPDPR1			
4186	261.1	.Str.general	PICKUP	Stage pickup	1=Pickup
4187	261.11	.mcd			
4188	261.12	.Op.general	TRIP	Stage trip	1=Trip
4189	261.13	.mcd			

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

Table 35: LD0.DOPPDPR2 Reverse power/directional overpower protection (2) – 32R/32O-2

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DOPPDPR2			
4190	261.14	.Str.general	PICKUP	Stage pickup	1=Pickup
4191	261.15	.mcd			
4192	262	.Op.general	TRIP	Stage trip	1=Trip
4193	262.1	.mcd			

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

Table 36: *LD0.DQPTUV1 Directional reactive power undervoltage protection (1) – 32Q-27*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DQPTUV1			
4202	262.1	.Str.general	PICKUP	Stage pickup	1=Pickup
4203	262.11	.mcd			
4204	262.12	.Op.general	TRIP	Stage trip	1=Trip
4205	262.13	.mcd			

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

Table 37: *LD0.DUPPDPR1 Underpower protection (1) – 32U-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DUPPDPR1			
4178	261.2	.Str.general	PICKUP	Stage pickup	1=Pickup
4179	261.3	.mcd			
4180	261.4	.Op.general	TRIP	Stage trip	1=Trip
4181	261.5	.mcd			

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

Table 38: *LD0.DUPPDPR2 Underpower protection (2) – 32U-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DUPPDPR2			
4182	261.6	.Str.general	PICKUP	Stage pickup	1=Pickup
4183	261.7	.mcd			
4184	261.8	.Op.general	TRIP	Stage trip	1=Trip
4185	261.9	.mcd			

2.3.1.36 LD0.EFHPTOC1 Non-directional ground-fault protection, high stage (1) – 50G-1**Table 39:** *LD0.EFHPTOC1 Non-directional ground-fault protection, high stage (1) – 50G-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFHPTOC1			
2940	183.12	.Str.general	PICKUP	Stage pickup	1=Pickup
2941	183.13	.mcd			
2942	183.14	.Op.general	TRIP	Stage trip	1=Trip
2943	183.15	.mcd			

2.3.1.37 LD0.EFHPTOC2 Non-directional ground-fault protection, high stage (2) – 50G-2**Table 40:** *LD0.EFHPTOC2 Non-directional ground-fault protection, high stage (2) – 50G-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFIPTOC2			
4112	257	.Str.general	PICKUP	Stage pickup	1=Pickup
4113	257.1	.mcd			
4114	257.2	.Op.general	TRIP	Stage trip	1=Trip
4115	257.3	.mcd			

2.3.1.38 LD0.EFHPTOC3 Non-directional ground-fault protection, high stage (3) – 50N-1**Table 41:** *LD0.EFHPTOC3 Non-directional ground-fault protection, high stage (3) – 50N-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFIPTOC3			
4116	257.4	.Str.general	PICKUP	Stage pickup	1=Pickup
4117	257.5	.mcd			
4118	257.6	.Op.general	TRIP	Stage trip	1=Trip
4119	257.7	.mcd			

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

Table 42: *LD0.EFHPTOC4 Non-directional ground-fault protection, high stage (4) – 50N-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFIPTOC4			
4120	257.8	.Str.general	PICKUP	Stage pickup	1=Pickup
4121	257.9	.mcd			
4122	257.1	.Op.general	TRIP	Stage trip	1=Trip
4123	258.11	.mcd			

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

Table 43: *LD0.EFIPTOC1 Non-directional ground-fault protection, instantaneous stage (1) – 50G-3*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFIPTOC1			
2944	184.00	.Str.general	PICKUP	Stage pickup	1=Pickup
2945	184.01	.mcd			
2946	184.02	.Op.general	TRIP	Stage trip	1=Trip
2947	184.03	.mcd			

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

Table 44: *LD0.EFIPTOC2 Non-directional ground-fault protection, instantaneous stage (2) – 50N-3*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFIPTOC2			
4124	257.12	.Str.general	PICKUP	Stage pickup	1=Pickup
4125	257.13	.mcd			
4126	257.14	.Op.general	TRIP	Stage trip	1=Trip
4127	257.15	.mcd			

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

Table 45: *LD0.EFLPTOC1 Non-directional ground-fault protection, low stage (1) – 51G-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFLPTOC1			
2932	183.04	.Str.general	PICKUP	Stage pickup	1=Pickup
2933	183.05	.mcd			
2934	183.06	.Op.general	TRIP	Stage trip	1=Trip
2935	183.07	.mcd			

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

Table 46: *LD0.EFLPTOC2 Non-directional ground-fault protection, low stage (2) – 51N-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFLPTOC2			
2936	183.08	.Str.general	PICKUP	Stage pickup	1=Pickup
2937	183.09	.mcd			
2938	183.10	.Op.general	TRIP	Stage trip	1=Trip
2939	183.11	.mcd			

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

Table 47: *LD0.EFPADM1 Admittance-based ground-fault protection (1) – 21YN-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFPADM1			
2840	177.08	.Str.general	PICKUP	Stage pickup	1=Pickup
2841	177.09	.mcd			
2842	177.10	.Op.general	TRIP	Stage trip	1=Trip
2843	177.11	.mcd			

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

Table 48: *LD0.EFPADM2 Admittance-based ground-fault protection (2) – 21YN-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFPADM2			
2844	177.12	.Str.general	PICKUP	Stage pickup	1=Pickup
2845	177.13	.mcd			
2846	177.14	.Op.general	TRIP	Stage trip	1=Trip
2847	177.15	.mcd			

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

Table 49: *LD0.EFPADM3 Admittance-based ground-fault protection (3) – 21YN-3*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFPADM3			
2860	178.12	.Str.general	PICKUP	Stage pickup	1=Pickup
2861	178.13	.mcd			
2862	178.14	.Op.general	TRIP	Stage trip	1=Trip
2863	178.15	.mcd			

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

Table 50: *LD0.FRPFRQ1 Frequency protection (1) – 81-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.FRPTRC1			
4000	250.00	.Str.general	PICKUP	Stage 1 pickup	1=Pickup
4001	250.01	.mcd			
		LD0.FRPTOF1		Overfrequency	
4002	250.02	.Op.general	OPR_OFRQ	Trip	1=Trip
4003	250.03	.mcd			
		LD0.FRPTUF1		Underfrequency	
4004	250.04	.Op.general	OPR_UFRQ	Trip	1=Trip
4005	250.05	.mcd			
		LD0.FRPFRQ1		Frequency gradient	
4006	250.06	.Op.general	OPR_FRG	Trip	1=Trip
4007	250.07	.mcd			

2.3.1.48 LD0.FRPFRQ2 Frequency protection (2) – 81-2**Table 51:** *LD0.FRPFRQ2 Frequency protection (2) – 81-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.FRPTRC2			
4008	250.08	.Str.general	PICKUP	Stage 2 pickup	1=Pickup
4009	250.09	.mcd			
		LD0.FRPTOF2		Overfrequency	
4010	250.10	.Op.general	OPR_OFRQ	Trip	1=Trip
4011	250.11	.mcd			
		LD0.FRPTUF2		Underfrequency	
4012	250.12	.Op.general	OPR_UFRQ	Trip	1=Trip
4013	250.13	.mcd			
		LD0.FRPFRQ2		Frequency gradient	
4014	250.14	.Op.general	OPR_FRG	Trip	1=Trip
4015	250.15	.mcd			

2.3.1.49 LD0.FRPFRQ3 Frequency protection (3) – 81-3**Table 52:** *LD0.FRPFRQ3 Frequency protection (3) – 81-3*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.FRPTRC3			
4016	251.00	.Str.general	PICKUP	Stage 3 pickup	1=Pickup
4017	251.01	.mcd			
		LD0.FRPTOF3		Overfrequency	
4018	251.02	.Op.general	OPR_OFRQ	Trip	1=Trip
4019	251.03	.mcd			
		LD0.FRPTUF3		Underfrequency	
4020	251.04	.Op.general	OPR_UFRQ	Trip	1=Trip
4021	251.05	.mcd			
		LD0.FRPFRQ3		Frequency gradient	
4022	251.06	.Op.general	OPR_FRG	Trip	1=Trip
4023	251.07	.mcd			

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

Table 53: *LD0.FRPFRQ4 Frequency protection (4) – 81-4*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.FRPTRC4			
4136	258.8	.Str.general	PICKUP	Stage 1 pickup	1=Pickup
4137	258.9	.mcd			
		LD0.FRPTOF4		Overfrequency	
4138	258.1	.Op.general	OPR_OFRQ	Trip	1=Trip
4139	258.11	.mcd			
		LD0.FRPTUF4		Underfrequency	
4140	258.12	.Op.general	OPR_UFRQ	Trip	1=Trip
4141	258.13	.mcd			
		LD0.FRPFRQ4		Frequency gradient	
4142	258.14	.Op.general	OPR_FRG	Trip	1=Trip
4143	258.15	.mcd			

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

Table 54: *LD0.FRPFRQ5 Frequency protection (5) – 81-5*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.FRPTRC5			
4146	259.2	.Str.general	PICKUP	Stage 2 pickup	1=Pickup
4147	259.3	.mcd			
		LD0.FRPTOF5		Overfrequency	
4148	259.4	.Op.general	OPR_OFRQ	Trip	1=Trip
4149	259.5	.mcd			
		LD0.FRPTUF5		Underfrequency	
4150	259.6	.Op.general	OPR_UFRQ	Trip	1=Trip
4151	259.7	.mcd			
		LD0.FRPFRQ5		Frequency gradient	
4152	259.8	.Op.general	OPR_FRG	Trip	1=Trip
4153	259.9	.mcd			

2.3.1.52 LD0.FRPFRQ6 Frequency protection (6) – 81-6**Table 55:** *LD0.FRPFRQ6 Frequency protection (6) – 81-6*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.FRPTRC6			
4154	259.1	.Str.general	PICKUP	Stage 3 pickup	1=Pickup
4154	259.11	.mcd			
		LD0.FRPTOF6		Overfrequency	
4156	259.12	.Op.general	OPR_OFRQ	Trip	1=Trip
4157	259.13	.mcd			
		LD0.FRPTUF6		Underfrequency	
4158	259.14	.Op.general	OPR_UFRQ	Trip	1=Trip
4159	259.15	.mcd			
		LD0.FRPFRQ6		Frequency gradient	
4160	260	.Op.general	OPR_FRG	Trip	1=Trip
4161	260.1	.mcd			

2.3.1.53 LD0.HAEFPTOC1 Harmonics-based ground-fault protection (1) – 51NHA-1**Table 56:** *LD0.HAEFPTOC1 Harmonics-based ground-fault protection (1) – 51NHA-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.HAEFPTOC1			
3312	207.00	.Str.general	PICKUP	Stage pickup	1=Pickup
3313	207.01	.mcd			
3314	207.02	.Op.general	TRIP	Stage trip	1=Trip
3315	207.03	.mcd			

2.3.1.54 LD0.HIAPDIF1 High-impedance differential protection for phase A (1)**Table 57:** *LD0.HIAPDIF1 High-impedance differential protection for phase A (1) – 87A-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.HIAPDIF1			
4162	260.2	.Str.general	PICKUP	Stage pickup	1=Pickup
4163	260.3	.mcd			
4164	260.4	.Op.general	TRIP	Stage trip	1=Trip
4165	260.5	.mcd			

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

Table 58: *LD0.HIAPDIF1 High-impedance differential protection for phase B (1) – 87B-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.HIAPDIF1			
4166	260.6	.Str.general	PICKUP	Stage pickup	1=Pickup
4167	260.7	.mcd			
4168	260.8	.Op.general	TRIP	Stage trip	1=Trip
4169	260.9	.mcd			

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

Table 59: *LD0.HICPDIF1 High-impedance differential protection for phase C (1) – 87C-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.HIAPDIF1			
4170	260.1	.Str.general	PICKUP	Stage pickup	1=Pickup
4171	260.11	.mcd			
4172	260.12	.Op.general	TRIP	Stage trip	1=Trip
4173	260.13	.mcd			

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

Table 60: *LD0.INRPHAR1 Three-phase inrush detector (1) – INR-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.INRPHAR1			
2964	185.04	.Str.general	BLK2H	General pickup	1=Pickup
2965	185.05	.mcd			
2966	185.06	.Str.phsA		Phs A pickup	1=Pickup
2967	185.07	.mcd			
2968	185.08	.Str.phsB		Phs B pickup	1=Pickup
2969	185.09	.mcd			
2970	185.10	.Str.phsC		Phs C pickup	1=Pickup
2971	185.11	.mcd			

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

Table 61: LD0.INTRPTEF1 Transient/intermittent ground-fault protection (1) – 67NIEF-1

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.INTRPTEF1			
2948	184.04	.Str.general	PICKUP	Stage pickup	1=Pickup
2949	184.05	.mcd			
2950	184.06	.Op.general	TRIP	Stage trip	1=Trip
2951	184.07	.mcd			

2.3.1.59 LD0.LEDGGIO1 Indication LED states Color1/Color2 – LED

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 green for OK. Colors can, however, be reconfigured with a setting parameter.

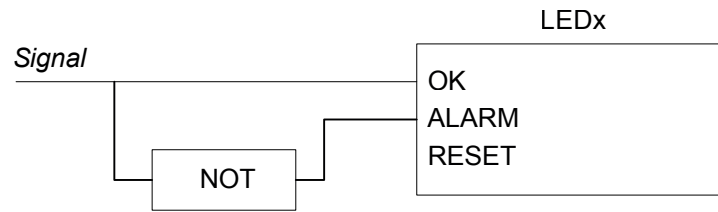


Figure 2: Signal wired to both OK and ALARM inputs – inverted to the other



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.

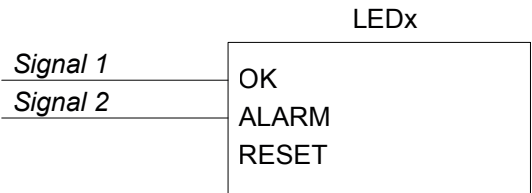


Figure 3: Separate signals wired to OK and ALARM inputs

Table 62: *LD0.LEDGGIO1 Indication LED states Color1/Color2 – LED*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LEDGGIO1			
3520	220.00	.LEDSt1.stVal	-	LED 1 state	0/1=Color1/2
3521	220.01	.LEDSt2.stVal	-	LED 2 state	0/1=Color1/2
3522	220.02	.LEDSt3.stVal	-	LED 3 state	0/1=Color1/2
3523	220.03	.LEDSt4.stVal	-	LED 4 state	0/1=Color1/2
3524	220.04	.LEDSt5.stVal	-	LED 5 state	0/1=Color1/2
3525	220.05	.LEDSt6.stVal	-	LED 6 state	0/1=Color1/2
3526	220.06	.LEDSt7.stVal	-	LED 7 state	0/1=Color1/2
3527	220.07	.LEDSt8.stVal	-	LED 8 state	0/1=Color1/2
3528	220.08	.LEDSt9.stVal	-	LED 9 state	0/1=Color1/2
3529	220.09	.LEDSt10.stVal	-	LED 10 state	0/1=Color1/2
3530	220.10	.LEDSt11.stVal	-	LED 11 state	0/1=Color1/2
3531	220.11	<reserved>			0

2.3.1.60

LD0.LEDGGIO1 Indication LED states OFF/ColorX – LED

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 green for OK. Colors can, however, be reconfigured with a setting parameter.

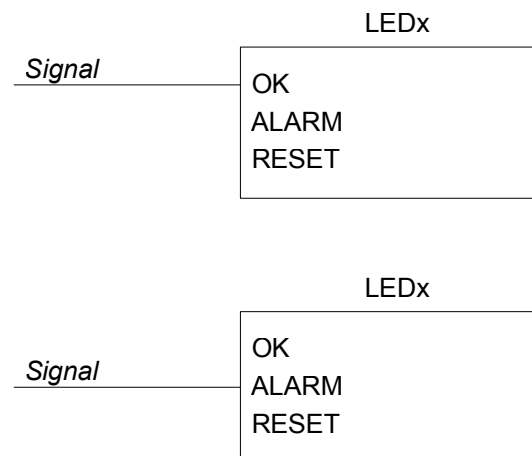


Figure 4: *Signal wired to either OK or Alarm input*

Table 63: *LD0.LEDGGIO1 Indication LED states OFF/ColorX – LED*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LEDGGIO1			
2768	173.00	.LEDSt1.stVal	-	LED 1 state	0/1=Off/Color
2769	173.01	.LEDSt2.stVal	-	LED 2 state	0/1=Off/Color
2770	173.02	.LEDSt3.stVal	-	LED 3 state	0/1=Off/Color
2771	173.03	.LEDSt4.stVal	-	LED 4 state	0/1=Off/Color
2772	173.04	.LEDSt5.stVal	-	LED 5 state	0/1=Off/Color
2773	173.05	.LEDSt6.stVal	-	LED 6 state	0/1=Off/Color
2774	173.06	.LEDSt7.stVal	-	LED 7 state	0/1=Off/Color
2775	173.07	.LEDSt8.stVal	-	LED 8 state	0/1=Off/Color
2776	173.08	.LEDSt9.stVal	-	LED 9 state	0/1=Off/Color
2777	173.09	.LEDSt10.stVal	-	LED 10 state	0/1=Off/Color
2778	173.10	.LEDSt11.stVal	-	LED 11 state	0/1=Off/Color
2779	173.11	<reserved>			0

2.3.1.61 LD0.LEDPTRC1 Global conditioning (1)

Table 64: *LD0.LEDPTRC1 Global conditioning (1)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LEDPTRC1			
2736	171.00	.Str.general	-	Global pickup	1=Pickup
2737	171.01	.mcd			
2738	171.02	.Op.general	-	Global trip	1=Trip
2739	171.03	.mcd			

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

Table 65: *LD0.LVRTPTUV1 Low-voltage ride-through protection (1) – 27RT-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LVRTPTUV1			
4206	262.14	.Str.general	PICKUP	Stage pickup	1=Pickup
4207	262.15	.mcd			
4208	263	.Op.general	TRIP	Stage trip	1=Trip
4209	263.1	.mcd			

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

Table 66: *LD0.LVRTPTUV2 Low-voltage ride-through protection (2) – 27RT-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LVRTPTUV2			
4210	263.2	.Str.general	PICKUP	Stage pickup	1=Pickup
4211	263.3	.mcd			
4212	263.4	.Op.general	TRIP	Stage trip	1=Trip
4213	263.5	.mcd			

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

Table 67: *LD0.LVRTPTUV3 Low-voltage ride-through protection (3) – 27RT-3*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LVRTPTUV3			
4214	263.6	.Str.general	PICKUP	Stage pickup	1=Pickup
4215	263.7	.mcd			
4216	263.8	.Op.general	TRIP	Stage trip	1=Trip
4217	263.9	.mcd			

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

Table 68: *LD0.MFADPSDE1 Multifrequency admittance-based ground-fault protection (1) – 67YN-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MFADPSDE1			
4174	260.14	.Str.general	PICKUP	Stage pickup	1=Pickup
4175	260.15	.mcd			
4176	261	.Op.general	TRIP	Stage trip	1=Trip
4177	261.1	.mcd			

2.3.1.66 LD0.MVGAPC1 Move (8 pcs) (1) – MV-1**Table 69:** *LD0.MVGAPC1 Move (8 pcs) (1) – MV-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MVGAPC1			
3536	221.00	.SPCSO1.stVal		Input 1	0/1=Off/On
3537	221.01	.mcd			
3538	221.02	.SPCSO2.stVal		Input 2	0/1=Off/On
3539	221.03	.mcd			
3540	221.04	.SPCSO3.stVal		Input 3	0/1=Off/On
3541	221.05	.mcd			
3542	221.06	.SPCSO4.stVal		Input 4	0/1=Off/On
3543	221.07	.mcd			
3544	221.08	.SPCSO5.stVal		Input 5	0/1=Off/On
3545	221.09	.mcd			
3546	221.10	.SPCSO6.stVal		Input 6	0/1=Off/On
3547	221.11	.mcd			
3548	221.12	.SPCSO7.stVal		Input 7	0/1=Off/On
3549	221.13	.mcd			
3550	221.14	.SPCSO8.stVal		Input 8	0/1=Off/On
3551	221.15	.mcd			

2.3.1.67 LD0.MVGAPC2 Move (8 pcs) (2) – MV-2**Table 70:** *LD0.MVGAPC2 Move (8 pcs) (2) – MV-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MVGAPC2			
3552	222.00	.SPCSO1.stVal		Input 1	0/1=Off/On
3553	222.01	.mcd			
3554	222.02	.SPCSO2.stVal		Input 2	0/1=Off/On
3555	222.03	.mcd			
3556	222.04	.SPCSO3.stVal		Input 3	0/1=Off/On
3557	222.05	.mcd			
3558	222.06	.SPCSO4.stVal		Input 4	0/1=Off/On
3559	222.07	.mcd			
3560	222.08	.SPCSO5.stVal		Input 5	0/1=Off/On
3561	222.09	.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3562	222.10	.SPCSO6.stVal		Input 6	0/1=Off/On
3563	222.11	.mcd			
3564	222.12	.SPCSO7.stVal		Input 7	0/1=Off/On
3565	222.13	.mcd			
3566	222.14	.SPCSO8.stVal		Input 8	0/1=Off/On
3567	222.15	.mcd			

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

Table 71: *LD0.NSPTOC1 Negative-sequence overcurrent protection (1) – 46-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.NSPTOC1			
2956	184.12	.Str.general	PICKUP	Stage pickup	1=Pickup
2957	184.13	.mcd			
2958	184.14	.Op.general	TRIP	Stage trip	1=Trip
2959	184.15	.mcd			

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

Table 72: *LD0.NSPTOC2 Negative-sequence overcurrent protection (2) – 46-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.NSPTOC2			
2960	185.00	.Str.general	PICKUP	Stage pickup	1=Pickup
2961	185.01	.mcd			
2962	185.02	.Op.general	TRIP	Stage trip	1=Trip
2963	185.03	.mcd			

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

Table 73: *LD0.NSPTOV1 Negative-sequence overvoltage protection (1) – 47-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.NSPTOV1			
3128	195.08	.Str.general	PICKUP	General pickup	1=Pickup
3129	195.09	.mcd			
3130	195.10	.Str.phsA		Phs A pickup	1=Pickup
3131	195.11	.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3132	195.12	.Str.phsB		Phs B pickup	1=Pickup
3133	195.13	.mcd			
3134	195.14	.Str.phsC		Phs C pickup	1=Pickup
3135	195.15	.mcd			
3136	196.00	.Op.general	TRIP	General trip	1=Trip
3137	196.01	.mcd			

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

Table 74: LD0.PDNSPTOC1 Phase discontinuity protection (1) – 46PD-1

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PDNSPTOC1			
2952	184.08	.Str.general	PICKUP	Stage pickup	1=Pickup
2953	184.09	.mcd			
2954	184.10	.Op.general	TRIP	Stage trip	1=Trip
2955	184.11	.mcd			

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

Table 75: LD0.PHHPTOC1 Three-phase non-directional overcurrent protection, high stage (1) – 50P-1

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHHPTOC1			
2890	180.10	.Str.general	PICKUP	General pickup	1=Pickup
2891	180.11	.mcd			
2892	180.12	.Str.phsA		Phs A pickup	1=Pickup
2893	180.13	.mcd			
2894	180.14	.Str.phsB		Phs B pickup	1=Pickup
2895	180.15	.mcd			
2896	181.00	.Str.phsC		Phs C pickup	1=Pickup
2897	181.01	.mcd			
2898	181.02	.Op.general	TRIP	General trip	1=Trip
2899	181.03	.mcd			

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

Table 76: *LD0.PHHPTOC2 Three-phase non-directional overcurrent protection, high stage (2) – 50P-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHHPTOC2			
4104	256.8	.Str.general	PICKUP	General pickup	1=Pickup
4105	256.9	.mcd			
		.Str.phsA		phsA pickup	1=Pickup
		.mcd			
		.Str.phsB		phsB pickup	1=Pickup
		.mcd			
		.Str.phsC		phsC pickup	1=Pickup
		.mcd			
4106	256.1	.Op.general	TRIP	General trip	1=Trip
4107	256.11	.mcd			

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

Table 77: *LD0.PHIPTOC1 Three-phase non-directional overcurrent protection, instantaneous stage (1) – 50P-3*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHIPTOC1			
2910	181.14	.Str.general	PICKUP	General pickup	1=Pickup
2911	181.15	.mcd			
2912	182.00	.Str.phsA		Phs A pickup	1=Pickup
2913	182.01	.mcd			
2914	182.02	.Str.phsB		Phs B pickup	1=Pickup
2915	182.03	.mcd			
2916	182.04	.Str.phsC		Phs C pickup	1=Pickup
2917	182.05	.mcd			
2918	182.06	.Op.general	TRIP	General trip	1=Trip
2919	182.07	.mcd			

2.3.1.75 LD0.PHIZ1 High-impedance fault detection (1) – HIZ-1**Table 78:** *LD0.PHIZ1 High-impedance fault detection (1) – HIZ-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHIZ1			
4198	262.6	.Str.general	PICKUP	Stage pickup	1=Pickup
4199	262.7	.mcd			
4200	262.8	.Op.general	TRIP	Stage trip	1=Trip
4201	262.9	.mcd			

2.3.1.76 LD0.PHLPTOC1 Three-phase non-directional overcurrent protection, low stage (1) – 51P-1**Table 79:** *LD0.PHLPTOC1 Three-phase non-directional overcurrent protection, low stage (1) – 51P-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHLPTOC1			
2880	180.00	.Str.general	PICKUP	General pickup	1=Pickup
2881	180.01	.mcd			
2882	180.02	.Str.phsA		Phs A pickup	1=Pickup
2883	180.03	.mcd			
2884	180.04	.Str.phsB		Phs B pickup	1=Pickup
2885	180.05	.mcd			
2886	180.06	.Str.phsC		Phs C pickup	1=Pickup
2887	180.07	.mcd			
2888	180.08	.Op.general	TRIP	General trip	1=Trip
2889	180.09	.mcd			

2.3.1.77 LD0.PHLPTOC2 Three-phase non-directional overcurrent protection, low stage (2) – 51P-2**Table 80:** *LD0.PHLPTOC2 Three-phase non-directional overcurrent protection, low stage (2) – 51P-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHLPTOC2			
4100	256.4	.Str.general	PICKUP	General pickup	1=Pickup
4101	256.5	.mcd			
		.Str.phsA		phsA pickup	1=Pickup
		.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.Str.phsB		phsB pickup	1=Pickup
		.mcd			
		.Str.phsC		phsC pickup	1=Pickup
		.mcd			
4102	256.6	.Op.general	TRIP	General trip	1=Trip
4103	256.7	.mcd			

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

Table 81: *LD0.PHPTOV1 Three-phase overvoltage protection (1) – 59-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTOV1			
3088	193.00	.Str.general	PICKUP	General pickup	1=Pickup
3089	193.01	.mcd			
3090	193.02	.Str.phsA		phsA pickup	1=Pickup
3091	193.03	.mcd			
3092	193.04	.Str.phsB		phsB pickup	1=Pickup
3093	193.05	.mcd			
3094	193.06	.Str.phsC		phsC pickup	1=Pickup
3095	193.07	.mcd			
3096	193.08	.Op.general	TRIP	General trip	1=Trip
3097	193.09	.mcd			

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

Table 82: *LD0.PHPTOV2 Three-phase overvoltage protection (2) – 59-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTOV2			
3098	193.10	.Str.general	PICKUP	General pickup	1=Pickup
3099	193.11	.mcd			
3100	193.12	.Str.phsA		phsA pickup	1=Pickup
3101	193.13	.mcd			
3102	193.14	.Str.phsB		phsB pickup	1=Pickup
3103	193.15	.mcd			
3104	194.00	.Str.phsC		phsC pickup	1=Pickup

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3105	194.01	.mcd			
3106	194.02	.Op.general	TRIP	General trip	1=Trip
3107	194.03	.mcd			

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

Table 83: *LD0.PHPTOV3 Three-phase overvoltage protection (3) – 59-3*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTOV3			
3108	194.04	.Str.general	PICKUP	General pickup	1=Pickup
3109	194.05	.mcd			
3110	194.06	.Str.phsA		Phs A pickup	1=Pickup
3111	194.07	.mcd			
3112	194.08	.Str.phsB		Phs B pickup	1=Pickup
3113	194.09	.mcd			
3114	194.10	.Str.phsC		Phs C pickup	1=Pickup
3115	194.11	.mcd			
3116	194.12	.Op.general	TRIP	General trip	1=Trip
3117	194.13	.mcd			

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

Table 84: *LD0.PHPTUV1 Three-phase undervoltage protection (1) – 27-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTUV1			
3138	196.02	.Str.general	PICKUP	General pickup	1=Pickup
3139	196.03	.mcd			
3140	196.04	.Str.phsA		Phs A pickup	1=Pickup
3141	196.05	.mcd			
3142	196.06	.Str.phsB		Phs B pickup	1=Pickup
3143	196.07	.mcd			
3144	196.08	.Str.phsC		Phs C pickup	1=Pickup
3145	196.09	.mcd			
3146	196.10	.Op.general	TRIP	General trip	1=Trip
3147	196.11	.mcd			

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

Table 85: *LD0.PHPTUV2 Three-phase undervoltage protection (2) – 27-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTUV2			
3148	196.12	.Str.general	PICKUP	General pickup	1=Pickup
3149	196.13	.mcd			
3150	196.14	.Str.phsA		phsA pickup	1=Pickup
3151	196.15	.mcd			
3152	197.00	.Str.phsB		phsB pickup	1=Pickup
3153	197.01	.mcd			
3154	197.02	.Str.phsC		phsC pickup	1=Pickup
3155	197.03	.mcd			
3156	197.04	.Op.general	TRIP	General trip	1=Trip
3157	197.05	.mcd			

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

Table 86: *LD0.PHPTUV3 Three-phase undervoltage protection (3) – 27-3*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTUV3			
3158	197.06	.Str.general	PICKUP	General pickup	1=Pickup
3159	197.07	.mcd			
3160	197.08	.Str.phsA		Phs A pickup	1=Pickup
3161	197.09	.mcd			
3162	197.10	.Str.phsB		Phs B pickup	1=Pickup
3163	197.11	.mcd			
3164	197.12	.Str.phsC		Phs C pickup	1=Pickup
3165	197.13	.mcd			
3166	197.14	.Op.general	TRIP	General trip	1=Trip
3167	197.15	.mcd			

2.3.1.84 LD0. PHPTUC1 Loss of phase (1) – 37-1**Table 87:** *LD0. PHPTUC1 Loss of phase (1) – 37-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0. PHPTUC1			
4194	262.2	.Str.general	PICKUP	Stage pickup	1=Pickup
4195	262.3	.mcd			
4196	262.4	.Op.general	TRIP	Stage trip	1=Trip
4197	262.5	.mcd			

2.3.1.85 LD0.PHQVVR1 Voltage variation (1) – PQSS-1**Table 88:** *LD0.PHQVVR1 Voltage variation (1) – PQSS-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PH1QVVR1			
3328	208.00	.VarStrGen.stVal	-	Variation event detected	1=Detected
3329	208.01	.mcd			
3330	208.02	.VarEnd.stVal	-	Variation event ended	1=Ended
3331	208.03	.mcd			
3332	208.04	.SwlOp.stVal	-	Swell event detected	1=Detected
3333	208.05	.mcd			
3334	208.06	.DipOp.stVal	-	Dip event detected	1=Detected
3335	208.07	.mcd			
3336	208.08	.IntrOp.stVal	-	Interruption event detected	1=Detected
3337	208.09	.mcd			

2.3.1.86 LD0.PSPTUV1 Positive-sequence undervoltage protection (1) – 47U-1**Table 89:** *LD0.PSPTUV1 Positive-sequence undervoltage protection (1) – 47U-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PSPTUV1			
3118	194.14	.Str.general	PICKUP	General pickup	1=Pickup
3119	194.15	.mcd			
3120	195.00	.Str.phsA		Phs A pickup	1=Pickup
3121	195.01	.mcd			
3122	195.02	.Str.phsB		Phs B pickup	1=Pickup
3123	195.03	.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3124	195.04	.Str.phsC		Phs C pickup	1=Pickup
3125	195.05	.mcd			
3126	195.06	.Op.general	TRIP	General trip	1=Trip
3127	195.07	.mcd			

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

Table 90: *LD0.RESCMMXU1 Residual current measurement (1) – IG-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.RESCMMXU1			
2760	172.08	.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
2761	172.09	.mcd			
2762	172.10	.HiWrn.stVal	HIGH_WARN	High warning	1=Warning
2763	172.11	.mcd			

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

Table 91: *LD0.RESVMMXU1 Residual voltage measurement (1) – VG-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.RESVMMXU1			
2764	172.12	.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
2765	172.13	.mcd			
2766	172.14	.HiWrn.stVal	HIGH_WARN	High warning	1=Warning
2767	172.15	.mcd			

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

Table 92: *LD0.ROVPTOV1 Residual overvoltage protection (1) – 59G-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.ROVPTOV1			
3168	198.00	.Str.general	PICKUP	General pickup	1=Pickup
3169	198.01	.mcd			
3170	198.02	.Op.general	TRIP	General trip	1=Trip
3171	198.03	.mcd			

2.3.1.90 LD0.ROVPTOV2 Residual overvoltage protection (2) – 59N-1**Table 93:** *LD0.ROVPTOV2 Residual overvoltage protection (2) – 59N-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.ROVPTOV2			
3172	198.04	.Str.general	PICKUP	General pickup	1=Pickup
3173	198.05	.mcd			
3174	198.06	.Op.general	TRIP	General trip	1=Trip
3175	198.07	.mcd			

2.3.1.91 LD0.ROVPTOV3 Residual overvoltage protection (3) – 59N-2**Table 94:** *LD0.ROVPTOV3 Residual overvoltage protection (3) – 59N-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.ROVPTOV3			
3176	198.08	.Str.general	PICKUP	General pickup	1=Pickup
3177	198.09	.mcd			
3178	198.10	.Op.general	TRIP	General trip	1=Trip
3179	198.11	.mcd			

2.3.1.92 LD0.SECRSYN1 Synchronism and energizing check (1) – 25-1**Table 95:** *LD0.SECRSYN1 Synchronism and energizing check (1) – 25-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SECRSYN1			
3882	242.10	.SynPrg	SYNC_INPRO	Synch. in progress	1=In progress
3883	242.11	.mcd			
3884	242.12	.FailCmd	CMD_FAIL_AL	Close request fail	1=Failed
3885	242.13	.mcd			
3886	242.14	.FailSyn	CL_FAIL_AL	Close cmd fail	1=Failed
3887	242.15	.mcd			

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

Table 96: *LD0.SEQSPVC1 Fuse failure supervision (1) – 60-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SEQSPVC1			
2996	187.04	.Str.general	FUSEF_U	Pickup	1=Pickup
2997	187.05	.mcd			
2998	187.06	.Str3Ph.general	FUSEF_3PH	3-phase pickup	1=Pickup
2999	187.07	.mcd			

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

Table 97: *LD0.SPCGAPC2 Generic control point (16 pcs) (2) – SPC-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SPCGAPC2			
3632	227.00	.SPCS01.stVal		Ouput state 1	0/1=Off/On
3633	227.01	.mcd			
3634	227.02	.SPCS02.stVal		Ouput state 2	0/1=Off/On
3635	227.03	.mcd			
3636	227.04	.SPCS03.stVal		Ouput state 3	0/1=Off/On
3637	227.05	.mcd			
3638	227.06	.SPCS04.stVal		Ouput state 4	0/1=Off/On
3639	227.07	.mcd			
3640	227.08	.SPCS05.stVal		Ouput state 5	0/1=Off/On
3641	227.09	.mcd			
3642	227.10	.SPCS06.stVal		Ouput state 6	0/1=Off/On
3643	227.11	.mcd			
3644	227.12	.SPCS07.stVal		Ouput state 7	0/1=Off/On
3645	227.13	.mcd			
3646	227.14	.SPCS08.stVal		Ouput state 8	0/1=Off/On
3647	227.15	.mcd			
3648	228.00	.SPCS09.stVal		Ouput state 9	0/1=Off/On
3649	228.01	.mcd			
3650	228.02	.SPCS10.stVal		Ouput state 10	0/1=Off/On
3651	228.03	.mcd			
3652	228.04	.SPCS11.stVal		Ouput state 11	0/1=Off/On
3653	228.05	.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3654	228.06	.SPCS12.stVal		Ouput state 12	0/1=Off/On
3655	228.07	.mcd			
3656	228.08	.SPCS13.stVal		Ouput state 13	0/1=Off/On
3657	228.09	.mcd			
3658	228.10	.SPCS14.stVal		Ouput state 14	0/1=Off/On
3659	228.11	.mcd			
3660	228.12	.SPCS15.stVal		Ouput state 15	0/1=Off/On
3661	228.13	.mcd			
3662	228.14	.SPCS16.stVal		Ouput state 16	0/1=Off/On
3663	228.15	.mcd			

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

Table 98: LD0.SSCBR1 Circuit-breaker condition monitoring (1) – 52CM-1

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SSCBR1			
2848	178.00	.OpnAlm.stVal	TRV_T_OP_ALM	Opn travel time alarm	1=Alarm
2849	178.01	.ClsAlm.stVal	TRV_T_CL_ALM	Cls travel time alarm	1=Alarm
		LD0.SSOPM1			
2850	178.02	.SprChaAlm.stVal	SPR_CHR_ALM	Spring charge alarm	1=Alarm
		LD0.SSCBR1			
2851	178.03	.OpCntAlm.stVal	OPR_ALM	CB operations alarm	1=Alarm
2852	178.04	.OpCntLO.stVal	OPR_LO	CB operations lockout	1=Lockout
2853	178.05	.LonTmAlm.stVal	MON_ALM	CB inactive alarm	1=Alarm
		LD0.SSIGM1			
2854	178.06	.InsAlm.stVal	PRES_ALM	Low pressure alarm	1=Alarm
2855	178.07	.InsBlk.stVal	PRES_LO	Low pressure lockout	1=Lockout
		LD0.SSCBR1			
2856	178.08	.APwrAlm.stVal	IPOW_ALM	Lyt alarm	1=Alarm
2857	178.09	.APwrLO.stVal	IPOW_LO	Lyt lockout	1=Lockout
2858	178.10	.RmnNumOpAlm.stVal	CB_LIFE_ALM	CB lifetime alarm	1=Alarm

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

Table 99: *LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1) – 49F-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.T1PTTR1			
2972	185.12	.Str.general	PICKUP	General pickup	1=Pickup
2973	185.13	.mcd			
2974	185.14	.AlmThm.general	ALARM	Thermal alarm	1=Alarm
2975	185.15	.mcd			
2976	186.00	.Op.general	TRIP	General trip	1=Trip
2977	186.01	.mcd			

2.3.1.97 LD0.TCSCCBR1 Trip circuit supervision (1) – TCM-1

Table 100: *LD0.TCSCCBR1 Trip circuit supervision (1) – TCM-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.TCSCCBR1			
2780	173.12	.CircAlm.stVal	ALARM	Supervision alarm	1=Alarm
2781	173.13	.mcd			

2.3.1.98 LD0.TCSCCBR2 Trip circuit supervision (2) – TCM-2

Table 101: *LD0.TCSCCBR2 Trip circuit supervision (2) – TCM-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.TCSCCBR2			
2782	173.14	.CircAlm.stVal	ALARM	Supervision alarm	1=Alarm
2783	173.15	.mcd			

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

Table 102: *LD0.TRPPTRC1 Master trip (1) – 86/94-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.TRPPTRC1			
2740	171.04	.Op.general	-	Op. input signal	1=Operate
2741	171.05	.mcd			
2742	171.06	.Tr.general	-	Trip output signal	1=Trip
2743	171.07	.mcd			

2.3.1.100 LD0.TRPPTRC2 Master trip (2) – 86/94-2**Table 103:** *LD0.TRPPTRC2 Master trip (2) – 86/94-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.TRPPTRC2			
2744	171.08	.Op.general	-	Op. input signal	1=Operate
2745	171.09	.mcd			
2746	171.10	.Tr.general	-	Trip output signal	1=Trip
2747	171.11	.mcd			

2.3.1.101 LD0.VMHAI1 Voltage total harmonic distortion (1) – PQVPH-1**Table 104:** *LD0.VMHAI1 Voltage total harmonic distortion (1) – PQVPH-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.VMHAI1			
3318	207.06	.Alm.stVal	ALARM		1=Alarm
3319	207.07	.mcd			

2.3.1.102 LD0.VMMXU1 Three-phase voltage measurement (1) – VA, VB, VC**Table 105:** *LD0.VMMXU1 Three-phase voltage measurement (1) – VA, VB, VC*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.VMMXU1			
2784	174.00	.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
2785	174.01	.mcd			
2786	174.02	.HiWrn.stVal	HIGH_WARN	High warning	1=Warning
2787	174.03	.mcd			
2788	174.04	.LoWrn.stVal	LOW_WARN	Low warning	1=Warning
2789	174.05	.mcd			
2790	174.06	.LoAlm.stVal	LOW_ALARM	Low alarm	1=Alarm
2791	174.07	.mcd			

2.3.1.103 LD0.VVSPAM1 Voltage vector shift protection (1) – 78V-1

Table 106: *LD0.VVSPAM1 Voltage vector shift protection (1) – 78V-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.VVSPAM1			
4218	263.1	.Op.general	TRIP	Stage trip	1=Trip
4219	263.11	.mcd			

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

Table 107: *LD0.WPWDE1 Wattmetric-based ground-fault protection (1) – 32N-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.WPSDE1			
3296	206.00	.Str.general	PICKUP	Stage pickup	1=Pickup
3297	206.01	.mcd			
3298	206.02	.Op.general	TRIP	Stage trip	1=Trip
3299	206.03	.mcd			

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

Table 108: *LD0.WPWDE2 Wattmetric-based ground-fault protection (2) – 32N-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.WPSDE2			
3300	206.04	.Str.general	PICKUP	Stage pickup	1=Pickup
3301	206.05	.mcd			
3302	206.06	.Op.general	TRIP	Stage trip	1=Trip
3303	206.07	.mcd			

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

Table 109: *LD0.WPWDE3 Wattmetric-based ground-fault protection (3) – 32N-3*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.WPSDE3			
3304	206.08	.Str.general	PICKUP	Stage pickup	1=Pickup
3305	206.09	.mcd			
3306	206.10	.Op.general	TRIP	Stage trip	1=Trip
3307	206.11	.mcd			

2.3.1.107 LD0.XAGGIO130 Physical I/O states (AIM card XA130)**Table 110:** *LD0.XAGGIO130 Physical I/O states (AIM card XA130)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XAGGIO130			
3280	205.00	.Ind1.stVal		XA130-Input 1 State	0/1=Off/On
3281	205.01	.mcd			
		.mom-only		Mom only alternative	
3282	205.02	.Ind2.stVal		XA130-Input 2 State	0/1=Off/On
3283	205.03	.mcd			
		.mom-only		Mom only alternative	
3284	205.04	.Ind3.stVal		XA130-Input 3 State	0/1=Off/On
3285	205.05	.mcd			
		.mom-only		Mom only alternative	
3286	205.06	.Ind4.stVal		XA130-Input 4 State	0/1=Off/On
3287	205.07	.mcd			
		.mom-only		Mom only alternative	

2.3.1.108 LD0.XBGGIO110 Physical I/O states (BIO card XB110)**Table 111:** *LD0.XBGGIO110 Physical I/O states (BIO card XB110)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XBGGIO110			
3216	201.00	.Ind1.stVal		X110-Input 1 State	0/1=Off/On
3217	201.01	.mcd			
		.mom-only		Mom only alternative	
3218	201.02	.Ind2.stVal		X110-Input 2 State	0/1=Off/On
3219	201.03	.mcd			
		.mom-only		Mom only alternative	
3220	201.04	.Ind3.stVal		X110-Input 3 State	0/1=Off/On
3221	201.05	.mcd			
		.mom-only		Mom only alternative	
3222	201.06	.Ind4.stVal		X110-Input 4 State	0/1=Off/On
3223	201.07	.mcd			
		.mom-only		Mom only alternative	
3224	201.08	.Ind5.stVal		X110-Input 5 State	0/1=Off/On
3225	201.09	.mcd			

Table continues on next page

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BitA	RegA	IEC 61850 name	SA name	Description	Values
		.mom-only		Mom only alternative	
3226	201.10	.Ind6.stVal		X110-Input 6 State	0/1=Off/On
3227	201.11	.mcd			
		.mom-only		Mom only alternative	
3228	201.12	.Ind7.stVal		X110-Input 7 State	0/1=Off/On
3229	201.13	.mcd			
		.mom-only		Mom only alternative	
3230	201.14	.Ind8.stVal		X110-Input 8 State	0/1=Off/On
3231	201.15	.mcd			
		.mom-only		Mom only alternative	
3232	202.00	.SPCSO1.stVal		X110-Output 1 State	0/1=Off/On
3233	202.01	.mcd			
		.mom-only		Mom only alternative	
3234	202.02	.SPCSO2.stVal		X110-Output 2 State	0/1=Off/On
3235	202.03	.mcd			
		.mom-only		Mom only alternative	
3236	202.04	.SPCSO3.stVal		X110-Output 3 State	0/1=Off/On
3237	202.05	.mcd			
		.mom-only		Mom only alternative	

2.3.1.109 LD0.XGGIO100 Physical I/O states (PSM card X100)

Table 112: LD0.XGGIO100 Physical I/O states (PSM card X100)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XGGIO100			
3248	203.00	.SPCSO1.stVal		X100-Output 1 State	0/1=Off/On
3249	203.01	.mcd			
		.mom-only		Mom only alternative	
3250	203.02	.SPCSO2.stVal		X100-Output 2 State	0/1=Off/On
3251	203.03	.mcd			
		.mom-only		Mom only alternative	
3252	203.04	.SPCSO3.stVal		X100-Output 3 State	0/1=Off/On
3253	203.05	.mcd			
		.mom-only		Mom only alternative	
3254	203.06	.SPCSO4.stVal		X100-Output 4 State	0/1=Off/On
3255	203.07	.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.mom-only		Mom only alternative	
3256	203.08	.SPCSO5.stVal		X100-Output 5 State	0/1=Off/On
3257	203.09	.mcd			
		.mom-only		Mom only alternative	
3258	203.10	.SPCSO6.stVal		X100-Output 6 State	0/1=Off/On
3259	203.11	.mcd			
		.mom-only		Mom only alternative	

2.3.1.110 LD0.XGGIO110 Physical I/O states (BIO card X110)

Table 113: LD0.XGGIO110 Physical I/O states (BIO card X110)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XGGIO110			
3216	201.00	.Ind1.stVal		X110-Input 1 State	0/1=Off/On
3217	201.01	.mcd			
		.mom-only		Mom only alternative	
3218	201.02	.Ind2.stVal		X110-Input 2 State	0/1=Off/On
3219	201.03	.mcd			
		.mom-only		Mom only alternative	
3220	201.04	.Ind3.stVal		X110-Input 3 State	0/1=Off/On
3221	201.05	.mcd			
		.mom-only		Mom only alternative	
3222	201.06	.Ind4.stVal		X110-Input 4 State	0/1=Off/On
3223	201.07	.mcd			
		.mom-only		Mom only alternative	
3224	201.08	.Ind5.stVal		X110-Input 5 State	0/1=Off/On
3225	201.09	.mcd			
		.mom-only		Mom only alternative	
3226	201.10	.Ind6.stVal		X110-Input 6 State	0/1=Off/On
3227	201.11	.mcd			
		.mom-only		Mom only alternative	
3228	201.12	.Ind7.stVal		X110-Input 7 State	0/1=Off/On
3229	201.13	.mcd			
		.mom-only		Mom only alternative	
3230	201.14	.Ind8.stVal		X110-Input 8 State	0/1=Off/On
3231	201.15	.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.mom-only		Mom only alternative	
3232	202.00	.SPCSO1.stVal		X110-Output 1 State	0/1=Off/On
3233	202.01	.mcd			
		.mom-only		Mom only alternative	
3234	202.02	.SPCSO2.stVal		X110-Output 2 State	0/1=Off/On
3235	202.03	.mcd			
		.mom-only		Mom only alternative	
3236	202.04	.SPCSO3.stVal		X110-Output 3 State	0/1=Off/On
3237	202.05	.mcd			
		.mom-only		Mom only alternative	
3238	202.06	.SPCSO4.stVal		X110-Output 4 State	0/1=Off/On
3239	202.07	.mcd			
		.mom-only		Mom only alternative	

2.3.1.111 LD0.XGGIO120 Physical I/O states (AIM card X120)

Table 114: LD0.XGGIO120 Physical I/O states (AIM card X120)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XGGIO120			
3200	200.00	.Ind1.stVal		X120-Input 1 State	0/1=Off/On
3201	200.01	.mcd			
		.mom-only		Mom only alternative	
3202	200.02	.Ind2.stVal		X120-Input 2 State	0/1=Off/On
3203	200.03	.mcd			
		.mom-only		Mom only alternative	
3204	200.04	.Ind3.stVal		X120-Input 3 State	0/1=Off/On
3205	200.05	.mcd			
		.mom-only		Mom only alternative	
3206	200.06	.Ind4.stVal		X120-Input 4 State	0/1=Off/On
3207	200.07	.mcd			
		.mom-only		Mom only alternative	

2.3.1.112 LD0.XGGIO130 Physical I/O states (BIO card X130)**Table 115:** *LD0.XGGIO130 Physical I/O states (BIO card X130)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XGGIO130			
3184	199.00	.Ind1.stVal		X130-Input 1 State	0/1=Off/On
3185	199.01	.mcd			
		.mom-only		Mom only alternative	
3186	199.02	.Ind2.stVal		X130-Input 2 State	0/1=Off/On
3187	199.03	.mcd			
		.mom-only		Mom only alternative	
3188	199.04	.Ind3.stVal		X130-Input 3 State	0/1=Off/On
3189	199.05	.mcd			
		.mom-only		Mom only alternative	
3190	199.06	.Ind4.stVal		X130-Input 4 State	0/1=Off/On
3191	199.07	.mcd			
		.mom-only		Mom only alternative	
3192	199.08	.Ind5.stVal		X130-Input 5 State	0/1=Off/On
3193	199.09	.mcd			
		.mom-only		Mom only alternative	
3194	199.10	.Ind6.stVal		X130-Input 6 State	0/1=Off/On
3195	199.11	.mcd			
		.mom-only		Mom only alternative	
3264	204.00	.SPCSO1.stVal		X130-Output 1 State	0/1=Off/On
3265	204.01	.mcd			
		.mom-only		Mom only alternative	
3266	204.02	.SPCSO2.stVal		X130-Output 2 State	0/1=Off/On
3267	204.03	.mcd			
		.mom-only		Mom only alternative	
3268	204.04	.SPCSO3.stVal		X130-Output 3 State	0/1=Off/On
3269	204.05	.mcd			
		.mom-only		Mom only alternative	

2.3.2 Unmapped indications

Unmapped indications are indication data that have no initial Modbus mapping locations, but can be added to the user-definable Modbus area using the Communication

Management tool in PCM600. If Modbus events are enabled for these indication signals, the event identification is the user-definable area address.

2.3.2.1 All premapped three-phase protection function stages, trip/phase-dependent objects added

Table 116: *All premapped three-phase protection function stages, trip/phase-dependent objects added*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.xxxxxxxx (various)			
		.Op.phsA		Phs A trip	1 = Trip
		.mcd			
		.Op.phsB		Phs B trip	1 = Trip
		.mcd			
		.Op.phsC		Phs C trip	1 = Trip
		.mcd			

2.3.2.2 Common data 2

Table 117: *Common data 2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LDEV1			
		.StLstOv.stVal		Internal ind. overflow	1=Overflow
		.mcd			
		.MeasLstOv.stVal		Internal meas. overflow	1=Overflow
		.mcd			
		.ChgFlg.stVal		Configuration changed	1=Changed
		.mcd			
		.FacSet.stVal		Factory settings in use	1=In use
		.mcd			
		LD0.GNRLLTMS1			
		.TmChSt1.stVal		Time synch. status	0/1=Down/Up
		.mcd			
		LD0.SCHLCCH1			
		.ChLiv.stVal	CH1LIV	Ethernet channel 1 live	1=Live
		.mcd			
		LD0.SCHLCCH2			
		.ChLiv.stVal	CH2LIV	Ethernet channel 2 live	1=Live
		.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SCHLCCH3			
		.ChLiv.stVal	CH3LIV	Ethernet channel 3 live	1=Live
		.mcd			

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

Table 118: LD0.CBPSOF1 Switch onto fault (1) – SOTF-1

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.CBPSOF1			
		.Op.general	TRIP	Stage trip	1=Trip
		.mcd			

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

Table 119: LD0.DARREC1 Autoreclosing (1) – 79-1

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DARREC1			
		.InInhRec.stVal	INHIBIT_RECL	Inhibit reclose	1=Inhibit
		.mcd			
		.InBlkThm.stVal	BLK_THERM	Thermal block	1=Block
		.mcd			

2.3.2.5 LD0.DIAGLCCH1 Ethernet supervision (1)

Table 120: LD0.DIAGLCCH1 Ethernet supervision (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DIAGLCCH1			
		.ChLiv.stVal	CHLIV	Ethernet channel live	1=Live
		.mcd			
		.RedChLiv.stVal	REDCHLIV	Red. Ethernet channel live	1=Live
		.mcd			

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

Table 121: *LD0.HZCCASPVC1 Current transformer supervision for high-impedance protection scheme for phase A (1) – MCS-A*

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

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

Table 122: *LD0.HZCCBSPVC1 Current transformer supervision for high-impedance protection scheme for phase B (1) – MCS-B*

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

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

Table 123: *LD0.HZCCCSPVC1 Current transformer supervision for high-impedance protection scheme for phase C (1) – MCS-C*

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

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

Table 124: *LD0.IL1TCTR1 Three-phase CT supervision (1)*

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

2.3.2.10 LD0.LDPRLRC1 Load profile record (1) – LoadProf**Table 125:** *LD0.LDPRLRC1 Load profile record (1) – LoadProf*

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

2.3.2.11 LD0.MAPGAPC1 Multipurpose protection (1) – MAP-1**Table 126:** *LD0.MAPGAPC1 Multipurpose protection (1) – MAP-1*

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

2.3.2.12 LD0.MAPGAPC2 Multipurpose protection (2) – MAP-2**Table 127:** *LD0.MAPGAPC2 Multipurpose protection (2) – MAP-2*

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

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

Table 128: *LD0.MAPGAPC3 Multipurpose protection (3) – MAP-3*

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

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

Table 129: *LD0.MAPGAPC4 Multipurpose protection (4) – MAP-4*

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

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

Table 130: *LD0.MAPGAPC5 Multipurpose protection (5) – MAP-5*

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

2.3.2.16 LD0.MAPGAPC6 Multipurpose protection (6) – MAP-6**Table 131:** *LD0.MAPGAPC6 Multipurpose protection (6) – MAP-6*

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

2.3.2.17 LD0.MAPGAPC7 Multipurpose protection (7) – MAP-7**Table 132:** *LD0.MAPGAPC7 Multipurpose protection (7) – MAP-7*

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

2.3.2.18 LD0.MAPGAPC8 Multipurpose protection (8) – MAP-8**Table 133:** *LD0.MAPGAPC8 Multipurpose protection (8) – MAP-8*

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

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

Table 134: *LD0.MAPGAPC9 Multipurpose protection (9) – MAP-9*

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

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

Table 135: *LD0.MAPGAPC10 Multipurpose protection (10) – MAP-10*

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

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

Table 136: *LD0.MAPGAPC11 Multipurpose protection (11) – MAP-11*

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

2.3.2.22 LD0.MAPGAPC12 Multipurpose protection (12) – MAP-12**Table 137:** *LD0.MAPGAPC12 Multipurpose protection (12) – MAP-12*

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

2.3.2.23 LD0.MAPGAPC13 Multipurpose protection (13) – MAP-13**Table 138:** *LD0.MAPGAPC13 Multipurpose protection (13) – MAP-13*

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

2.3.2.24 LD0.MAPGAPC14 Multipurpose protection (14) – MAP-14**Table 139:** *LD0.MAPGAPC14 Multipurpose protection (14) – MAP-14*

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

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

Table 140: *LD0.MAPGAPC15 Multipurpose protection (15) – MAP-15*

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

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

Table 141: *LD0.MAPGAPC16 Multipurpose protection (16) – MAP-16*

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

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

Table 142: *LD0.MAPGAPC17 Multipurpose protection (17) – MAP-17*

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

2.3.2.28 LD0.MAPGAPC18 Multipurpose protection (18) – MAP-18**Table 143:** *LD0.MAPGAPC18 Multipurpose protection (18) – MAP-18*

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

2.3.2.29 LD0.MDSOPT1 Runtime counter for machines and devices (1) – OPTM-1**Table 144:** *LD0.MDSOPT1 Runtime counter for machines and devices (1) – OPTM-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MDSOPT1			
		OpTmWrn.stVal	PICKUP	Accum.op.time Warn.	1 = Warning
		.mcd			
		OpTmAlm.stVal	TRIP	Accum.op.time Alarm	1 = Alarm
		.mcd			

2.3.2.30 LD0.MSVPR1 Three-phase remnant undervoltage protection (1) – 27R-1**Table 145:** *LD0.MSVPR1 Three-phase remnant undervoltage protection (1) – 27R-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MSVPR1			
		.VLo.stVal	U_LOW	Low remanent voltage	1=U_LOW
		.mcd			

2.3.2.31 LD0.MSVPR2 Three-phase remnant undervoltage protection (2) – 27R-2**Table 146:** *LD0.MSVPR2 Three-phase remnant undervoltage protection (2) – 27R-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MSVPR2			
		.VLo.stVal	U_LOW	Low remanent voltage	1=U_LOW
		.mcd			

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

Table 147: *LD0.NSPTOV2 Negative-sequence overvoltage protection (2) – 47-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.NSPTOV2			
		.Str.general	PICKUP	Stage pickup	1=Pickup
		.mcd			
		.Str.phsA		Phs A pickup	1=Pickup
		.mcd			
		.Str.phsB		Phs B pickup	1=Pickup
		.mcd			
		.Str.phsC		Phs C pickup	1=Pickup
		.mcd			
		.Op.general	TRIP	General trip	1=Trip
		.mcd			
		.Op.phsA		Phs A trip	1=Trip
		.mcd			
		.Op.phsB		Phs B trip	1=Trip
		.mcd			
		.Op.phsC		Phs C trip	1=Trip
		.mcd			

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

Table 148: *LD0.PSPTUV2 Positive-sequence undervoltage protection (2) – 47U-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PSPTUV2			
		.Str.general	PICKUP	General pickup	1=Pickup
		.mcd			
		.Str.phsA		Phs A pickup	1=Pickup
		.mcd			
		.Str.phsB		Phs B pickup	1=Pickup
		.mcd			
		.Str.phsC		Phs C pickup	1=Pickup
		.mcd			
		.Op.general	TRIP	General trip	1=Trip
		.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.Op.phsA		Phs A trip	1=Trip
		.mcd			
		.Op.phsB		Phs B trip	1=Trip
		.mcd			
		.Op.phsC		Phs C trip	1=Trip
		.mcd			

2.3.2.34 LD0.RESTCTR1 IG CT supervision (1)

Table 149: LD0.RESTCTR1 IG CT supervision (1)

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

2.3.2.35 LD0.RESTCTR2 IG CT supervision (2)

Table 150: LD0.RESTCTR2 IG CT supervision (2)

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

2.3.2.36 LD0.RESTVTR1 VG VT supervision (1)

Table 151: LD0.RESTVTR1 VG VT supervision (1)

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

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

Table 152: *LD0.SCEFRFLO1 Fault locator (1) – 21FL-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SCEFRFLO1			
		.Alm.stVal	ALARM	Fault locator alarm	1 = Alarm
		.mcd			
		.TrgSt.stVal	TRIGG	Distance calculation trig	1 = Triggered
		.mcd			

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

Table 153: *LD0.SPCGAPC1 Generic control point (16 pcs) (1) – SPC-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SPCGAPC1			
		.SPCSO1.stVal		Ouput state 1	0/1=Off/On
		.mcd			
		.SPCSO2.stVal		Ouput state 2	0/1=Off/On
		.mcd			
		.SPCSO3.stVal		Ouput state 3	0/1=Off/On
		.mcd			
		.SPCSO4.stVal		Ouput state 4	0/1=Off/On
		.mcd			
		.SPCSO5.stVal		Ouput state 5	0/1=Off/On
		.mcd			
		.SPCSO6.stVal		Ouput state 6	0/1=Off/On
		.mcd			
		.SPCSO7.stVal		Ouput state 7	0/1=Off/On
		.mcd			
		.SPCSO8.stVal		Ouput state 8	0/1=Off/On
		.mcd			
		.SPCSO9.stVal		Ouput state 9	0/1=Off/On
		.mcd			
		.SPCSO10.stVal		Ouput state 10	0/1=Off/On
		.mcd			
		.SPCSO11.stVal		Ouput state 11	0/1=Off/On
		.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.SPCSO12.stVal		Ouput state 12	0/1=Off/On
		.mcd			
		.SPCSO13.stVal		Ouput state 13	0/1=Off/On
		.mcd			
		.SPCSO14.stVal		Ouput state 14	0/1=Off/On
		.mcd			
		.SPCSO15.stVal		Ouput state 15	0/1=Off/On
		.mcd			
		.SPCSO16.stVal		Ouput state 16	0/1=Off/On
		.mcd			

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

Table 154: LD0.TRPPTRC3 Master trip (3) – 86/94-3

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

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

Table 155: LD0.TRPPTRC4 Master trip (4) – 86/94-4

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

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

Table 156: *LD0.TRPPTRC5 Master trip (5) – 86/94-5*

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

2.3.2.42 LD0.UDFCNT1 Multipurpose generic up-down counter (1) – CTR-1

Table 157: *LD0.UDFCNT1 Multipurpose generic up-down counter (1) – CTR-1*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.UDFCNT1			
		.DnCntSt.stVal	DNCNT_STS	Status of the down counting	1= down counting
		.mcd			
		UpCntSt.stVal	UPCNT_STS	Status of the up counting	1= up counting
		.mcd			

2.3.2.43 LD0.UDFCNT2 Multipurpose generic up-down counter (2) – CTR-2

Table 158: *LD0.UDFCNT2 Multipurpose generic up-down counter (2) – CTR-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.UDFCNT2			
		.DnCntSt.stVal	DNCNT_STS	Status of the down counting	1= down counting
		.mcd			
		UpCntSt.stVal	UPCNT_STS	Status of the up counting	1= up counting
		.mcd			

2.3.2.44 LD0.UDFCNT3 Multipurpose generic up-down counter (3) – CTR-3**Table 159:** *LD0.UDFCNT3 Multipurpose generic up-down counter (3) – CTR-3*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.UDFCNT3			
		.DnCntSt.stVal	DNCNT_STS	Status of the down counting	1= down counting
		.mcd			
		UpCntSt.stVal	UPCNT_STS	Status of the up counting	1= up counting
		.mcd			

2.3.2.45 LD0.UDFCNT4 Multipurpose generic up-down counter (4) – CTR-4**Table 160:** *LD0.UDFCNT4 Multipurpose generic up-down counter (4) – CTR-4*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.UDFCNT4			
		.DnCntSt.stVal	DNCNT_STS	Status of the down counting	1= down counting
		.mcd			
		UpCntSt.stVal	UPCNT_STS	Status of the up counting	1= up counting
		.mcd			

2.3.2.46 LD0.UL1TVTR1 Three-phase VT supervision (1)**Table 161:** *LD0.UL1TVTR1 Three-phase VT supervision (1)*

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

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

Table 162: *LD0.UL1TVTR2 Three-phase VT supervision (2)*

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

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

Table 163: *LD0.VMHAI2 Voltage total harmonic distortion (2) – PQVPH-2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.VMHAI2			
		.Alm.stVal	ALARM		1=Alarm
		.mcd			

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

Table 164: *LD0.VMMXU2 Three-phase voltage measurement (2) – VA, VB, VC (2)*

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

2.3.2.50 LD0.VSQVUB1 Voltage unbalance (1) – PQVUB-1**Table 165:** *LD0.VSQVUB1 Voltage unbalance (1) – PQVUB-1*

BitA	RegA	IEC 61850 name	SA name	Description	Value
		LD0.VSQVUB1			
		.VarStr.stVal		Unbalance alarm	1=Alarm
		.mcd			
		.HiPctVUnb.stVal		Percentile Unbalance alarm	1=Alarm
		.mcd			

2.3.2.51 LD0.XARGGIO130 Alarm/warning**Table 166:** *LD0.XARGGIO130 Alarm/warning*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XARGGIO130			
		.Alm.stVal		XARGGIO130 alarm	1 = Alarm
		.mcd			
		.Wrn.stVal		XARGGIO130 warning	1 = Warning
		.mcd			

2.3.2.52 LD0.XRGGIO130 Alarm/warning**Table 167:** *LD0.XRGGIO130 Alarm/warning*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XRGGIO130			
		.Alm.stVal	-	XRGGIO130 alarm	1=Alarm
		.mcd			
		.Wrn.stVal	-	XRGGIO130 warning	1=Warning
		.mcd			

2.4 Registers

Table 168: *Explanations of columns in register tables*

Column name	Description
RegA	Default 3X and 4X register address for the data.
Type	Type of the register. The alternatives are u16, u32 (unsigned 16 and 32 bits integer) or i16, i32 (signed 16 and 32 bit integer).
Scale	Scale factor as default. Also, an adjustable offset value exists that is set to 0 by default.
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. Also, if a register is writable, it is stated here.
Values	The value range of the original IEC 61850 value, that is, before scaling.

2.4.1 Premapped registers

2.4.1.1 Active parameter setting group - read and write

Table 169: *Active parameter setting group - read and write*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
2301	u16	1			Active setting group	1...6

2.4.1.2 Control structure 1

Table 170: *Control structure 1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
8001					Execute register	1
8002					Password reg 1	acc to setting
8003					Password reg 2	acc to setting
8004					Control register	< single bit >
8005					Confirm register	< single bit >

2.4.1.3 Control structure 2**Table 171:** *Control structure 2*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
8006					Execute register	1
8007					Password reg 1	acc to setting
8008					Password reg 2	acc to setting
8009					Control register	< single bit >
8010					Confirm register	< single bit >

2.4.1.4 Control structure 3**Table 172:** *Control structure 3*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
8011					Execute register	1
8012					Password reg 1	acc to setting
8013					Password reg 2	acc to setting
8014					Control register	< single bit >
8015					Confirm register	< single bit >

2.4.1.5 Control structure 4**Table 173:** *Control structure 4*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
8016					Execute register	1
8017					Password reg 1	acc to setting
8018					Password reg 2	acc to setting
8019					Control register	< single bit >
8020					Confirm register	< single bit >

2.4.1.6 Control structure 5

Table 174: *Control structure 5*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
8021					Execute register	1
8022					Password reg 1	acc to setting
8023					Password reg 2	acc to setting
8024					Control register	< single bit >
8025					Confirm register	< single bit >

2.4.1.7 Control structure 6

Table 175: *Control structure 6*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
8026					Execute register	1
8027					Password reg 1	acc to setting
8028					Password reg 2	acc to setting
8029					Control register	< single bit >
8030					Confirm register	< single bit >

2.4.1.8 Control structure 7

Table 176: *Control structure 7*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
8031					Execute register	1
8032					Password reg 1	acc to setting
8033					Password reg 2	acc to setting
8034					Control register	< single bit >
8035					Confirm register	< single bit >

2.4.1.9 Control structure 8**Table 177:** *Control structure 8*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
8036					Execute register	1
8037					Password reg 1	acc to setting
8038					Password reg 2	acc to setting
8039					Control register	< single bit >
8040					Confirm register	< single bit >

2.4.1.10 Device ID string**Table 178:** *Device ID string*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9000	u16				ASCII coded string	1)
...						
9120	u16					

1) See the technical manual.

2.4.1.11 Event record structure**Table 179:** *Event record structure*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
					Selection write:	
9250	u16	1			- Num of multiple records	1...10
9251	i16	1			- Read selection	-499...3
					Record 1 data to read:	
9252	u16	1			- Record sequence num	1...9999
9253	u16	1			- Unread records left	0...499
					Timestamp of record	
9254	u16	1			- Year, Month	Year/Month
9255	u16	1			- Day, Hour	Day/Hour
9256	u16	1			- Minute, Second	Min/Sec
9257	u16	1			- Millisecond	Millisecond
9258	u16	1			Event identification	1)
9259	u16	1			Data object ID1	1)

Table continues on next page

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RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9260	u16	1			Data object ID2	1)
9261	u16	1			Event data value 1	1)
9262	u16	1			Event data value 2	1)
					Record 2 data to read:	If selected
9263	u16	1			- Record sequence num	1..9999
9264	u16	1			- Unread records left	0..499
					Timestamp of record	
9265	u16	1			- Year, Month	Year/Month
9266	u16	1			- Day, Hour	Day/Hour
9267	u16	1			- Minute, Second	Min/Sec
9268	u16	1			- Millisecond	Millisecond
9269	u16	1			Event identification	1)
9270	u16	1			Data object ID1	1)
9271	u16	1			Data object ID2	1)
9272	u16	1			Event data value 1	1)
9273	u16	1			Event data value 2	1)
					Record 3 data to read:	If selected
9274	u16	1			- Record sequence num	1...9999
9275	u16	1			- Unread records left	0...499
					Timestamp of record	
9276	u16	1			- Year, Month	Year/Month
9277	u16	1			- Day, Hour	Day/Hour
9278	u16	1			- Minute, Second	Min/Sec
9279	u16	1			- Millisecond	Millisecond
9280	u16	1			Event identification	1)
9281	u16	1			Data object ID1	1)
9282	u16	1			Data object ID2	1)
9283	u16	1			Event data value 1	1)
9284	u16	1			Event data value 2	1)
					Record 4 data to read:	If selected
9285	u16	1			- Record sequence num	1...9999
9286	u16	1			- Unread records left	0...499
Table continues on next page						

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
					Timestamp of record	
9287	u16	1			- Year, Month	Year/Month
9288	u16	1			- Day, Hour	Day/Hour
9289	u16	1			- Minute, Second	Min/Sec
9290	u16	1			- Millisecond	Millisecond
9291	u16	1			Event identification	1)
9292	u16	1			Data object ID1	1)
9293	u16	1			Data object ID2	1)
9294	u16	1			Event data value 1	1)
9295	u16	1			Event data value 2	1)
					Record 5 data to read:	If selected
9296	u16	1			- Record sequence num	1...9999
9297	u16	1			- Unread records left	0...499
					Timestamp of record	
9298	u16	1			- Year, Month	Year/Month
9299	u16	1			- Day, Hour	Day/Hour
9300	u16	1			- Minute, Second	Min/Sec
9301	u16	1			- Millisecond	Millisecond
9302	u16	1			Event identification	1)
9303	u16	1			Data object ID1	1)
9304	u16	1			Data object ID2	1)
9305	u16	1			Event data value 1	1)
9306	u16	1			Event data value 2	1)
					Record 6 data to read:	If selected
9307	u16	1			- Record sequence num	1...9999
9308	u16	1			- Unread records left	0...499
					Timestamp of record	
9309	u16	1			- Year, Month	Year/Month
9310	u16	1			- Day, Hour	Day/Hour
9311	u16	1			- Minute, Second	Min/Sec
9312	u16	1			- Millisecond	Millisecond
9313	u16	1			Event identification	1)
9314	u16	1			Data object ID1	1)
Table continues on next page						

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RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9315	u16	1			Data object ID2	1)
9316	u16	1			Event data value 1	1)
9317	u16	1			Event data value 2	1)
					Record 7 data to read:	If selected
9318	u16	1			- Record sequence num	1...9999
9319	u16	1			- Unread records left	0...499
					Timestamp of record	
9320	u16	1			- Year, Month	Year/Month
9321	u16	1			- Day, Hour	Day/Hour
9322	u16	1			- Minute, Second	Min/Sec
9323	u16	1			- Millisecond	Millisecond
9324	u16	1			Event identification	1)
9325	u16	1			Data object ID1	1)
9326	u16	1			Data object ID2	1)
9327	u16	1			Event data value 1	1)
9328	u16	1			Event data value 2	1)
					Record 8 data to read:	If selected
9329	u16	1			- Record sequence num	1...9999
9330	u16	1			- Unread records left	0...499
					Timestamp of record	
9331	u16	1			- Year, Month	Year/Month
9332	u16	1			- Day, Hour	Day/Hour
9333	u16	1			- Minute, Second	Min/Sec
9334	u16	1			- Millisecond	Millisecond
9335	u16	1			Event identification	1)
9336	u16	1			Data object ID1	1)
9337	u16	1			Data object ID2	1)
9338	u16	1			Event data value 1	1)
9339	u16	1			Event data value 2	1)
					Record 9 data to read:	If selected
9340	u16	1			- Record sequence num	1...9999

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9341	u16	1			- Unread records left	0...499
					Timestamp of record	
9342	u16	1			- Year, Month	Year/Month
9343	u16	1			- Day, Hour	Day/Hour
9344	u16	1			- Minute, Second	Min/Sec
9345	u16	1			- Millisecond	Millisecond
9346	u16	1			Event identification	1)
9347	u16	1			Data object ID1	1)
9348	u16	1			Data object ID2	1)
9349	u16	1			Event data value 1	1)
9350	u16	1			Event data value 2	1)
					Record 10 data to read:	If selected
9351	u16	1			- Record sequence num	1...9999
9352	u16	1			- Unread records left	0...499
					Timestamp of record	
9353	u16	1			- Year, Month	Year/Month
9354	u16	1			- Day, Hour	Day/Hour
9355	u16	1			- Minute, Second	Min/Sec
9356	u16	1			- Millisecond	Millisecond
9357	u16	1			Event identification	1)
9358	u16	1			Data object ID1	1)
9359	u16	1			Data object ID2	1)
9360	u16	1			Event data value 1	1)
9361	u16	1			Event data value 2	1)

1) See the technical manual.

2.4.1.12 Fault record structure header

Table 180: *Fault record structure header*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
					Selection write	
9401	i16	1			Read selection	-99...3
					Record data header	

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9402	u16	1			Record sequence num	0...65535
9403	u16	1			Unread records left	0...99
					Timestamp of record	
9404	u16	1			Year, month	Year/Month
9405	u16	1			Day, hour	Day/Hour
9406	u16	1			Minute, second	Min/Sec
9407	u16	1			Millisecond	Millisecond
9408	u16	1			Timestamp quality	

2.4.1.13 Fault record data

The table shows all potential data available in the fault record application. Which data is actually recorded depends on the functions available and enabled in the protection relay's configuration.

Table 181: *Fault record data*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.FLTRFRC1		Fault record data	
9409	u32	1	.OpCnt.stVal		Fault record number (high)	0..999999
9410					(Low word)	
9411	i16	1	.ProFnc.stVal		Protection function	-32768...32767
9412	u16	100	.Hz.mag		Frequency	30...80.00 [Hz]
9413	u16	100	.StrDur.mag		Start duration	0...100.00 [%]
9414	u32	1000	.StrOpTm.mag		Operate time [ms] (high)	0...999999.999
9415					(Low word)	
9416	u32	100	.FltPtR.mag		Fault resistance	0.00...1000000.00 ohms
9417					(Low word)	
9418	u32	100	.FltDiskm.mag		Fault distance	0.00...9999.99 pu
9419					(Low word)	
9420	u16	1	.ActSetGr.stVal		Active setting group	1...6
9421	u16	1	.ShotPntr.stVal		AR shot pointer value	0...7
					Captured values during fault	
9422	u16	1000	.Max50DifAA.mag		Max. diff. current phs A	0.000...80.000 [pu]

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9423	u16	1000	.Max50DifAB.mag		Max. diff. current phs B	0.000...80.000 [pu]
9424	u16	1000	.Max50DifAC.mag		Max. diff. current phs C	0.000...80.000 [pu]
9425	u16	1000	.Max50RstAA.mag		Max. bias current phs A	0.000...50.000 [pu]
9426	u16	1000	.Max50RstAB.mag		Max. bias current phs B	0.000...50.000 [pu]
9427	u16	1000	.Max50RstAC.mag		Max. bias current phs C	0.000...50.000 [pu]
9428	u16	1000	.DifAPhsA.mag		Diff. current phs A	0.000...80.000 [pu]
9429	u16	1000	.DifAPhsB.mag		Diff. current phs B	0.000...80.000 [pu]
9430	u16	1000	.DifAPhsC.mag		Diff. current phs C	0.000...80.000 [pu]
9431	u16	1000	.RstAPhsA.mag		Bias current phs A	0.000...50.000 [pu]
9432	u16	1000	.RstAPhsB.mag		Bias current phs B	0.000...50.000 [pu]
9433	u16	1000	.RstAPhsC.mag		Bias current phs C	0.000...50.000 [pu]
9434	u16	1000	.DifARes.mag		Diff. current lo	0.000...80.000 [pu]
9435	u16	1000	.RstARes.mag		Bias current lo	0.000...50.000 [pu]
9436	u16	1000	.Max50APhsA1.mag		Max. current phs A(1)	0.000...50.000 [×In]
9437	u16	1000	.Max50APhsB1.mag		Max. current phs B(1)	0.000...50.000 [×In]
9438	u16	1000	.Max50APhsC1.mag		Max. current phs C(1)	0.000...50.000 [×In]
9439	u16	1000	.Max50ARes1.mag		Max. current lo(1)	0.000...50.000 [×In]
9440	u16	1000	.APhsA1.mag		Current phs A(1)	0.000...50.000 [×In]
9441	u16	1000	.APhsB1.mag		Current phs B(1)	0.000...50.000 [×In]
9442	u16	1000	.APhsC1.mag		Current phs C(1)	0.000...50.000 [×In]
9443	u16	1000	.ARes1.mag		Current lo(1)	0.000...50.000 [×In]
9444	u16	1000	.AResClc1.mag		Current lo-Calc(1)	0.000...50.000 [×In]
Table continues on next page						

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RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9445	u16	1000	.APsSeq1.mag		Current Ps-Seq(1)	0.000... 50.000 [×In]
9446	u16	1000	.ANgSeq1.mag		Current Ng-Seq(1)	0.000... 50.000 [×In]
9447	u16	1000	.PhVPhsA1.mag		Voltage phs A(1)	0.000...4.000 [×Un]
9448	u16	1000	.PhVPhsB1.mag		Voltage phs B(1)	0.000...4.000 [×Un]
9449	u16	1000	.PhVPhsC1.mag		Voltage phs C(1)	0.000...4.000 [×Un]
9450	u16	1000	.PPVPhsAB1.mag		Voltage phs AB(1)	0.000...4.000 [×Un]
9451	u16	1000	.PPVPhsBC1.mag		Voltage phs BC(1)	0.000...4.000 [×Un]
9452	u16	1000	.PPVPhsCA1.mag		Voltage phs CA(1)	0.000...4.000 [×Un]
9453	u16	1000	.VRes1.mag		Voltage Uo(1)	0.000...4.000 [×Un]
9454	u16	1000	.VZro1.mag		Voltage Zro-Seq(1)	0.000...4.000 [×Un]
9455	u16	1000	.VPsSeq1.mag		Voltage Ps-Seq(1)	0.000...4.000 [×Un]
9456	u16	1000	.VNgSeq1.mag		Voltage Ng-Seq(1)	0.000...4.000 [×Un]
9457	u16	100	.MaxTmpRI.mag		PTTR thermal level	0.00...99.99
9458	u16	100	.AMaxNgPs.mag		PDNSPTOC1 ratio I2/I1	0.00...999.99 [%]
9459	i16	100	.HzRteChg.mag		Frequency gradient	-10.00...10.00 [Hz/s]
9460	i16	100	.CondNeut.mag		Conductance Yo	-1000.00...10 00.00 [mS]
9461	i16	100	.SusNeut.mag		Susceptance Yo	-1000.00...10 00.00 [mS]
9462	i32	100	.PPLoopRis.mag		Fault loop resistance	-1000.00...10 00.00 [ohm]
9463	i32				(Low word)	
9464	i32	100	.PPLoopReact.mag		Fault loop reactance	-1000.00...10 00.00 [ohm]
9465	i32				(Low word)	
9466	u16	1000	.CBClrTm.mag		Breaker clear time	0.000...3.000 [s]
9467	u16	1000	.APhsA2.mag		Current phs A(2)	0.000... 50.000 [×In]

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9468	u16	1000	.APhsB2.mag		Current phs B(2)	0.000... 50.000 [×In]
9469	u16	1000	.APhsC2.mag		Current phs C(2)	0.000... 50.000 [×In]
9470	u16	1000	.ARes2.mag		Current Io(2)	0.000... 50.000 [×In]
9471	u16	1000	.AResClc2.mag		Current Io-Calc(2)	0.000... 50.000 [×In]
9472	u16	1000	.APsSeq2.mag		Current Ps-Seq(2)	0.000... 50.000 [×In]
9473	u16	1000	.ANgSeq2.mag		Current Ng-Seq(2)	0.000... 50.000 [×In]
9474	u16	1000	.PhVPhsA2.mag		Voltage phs A(2)	0.000...4.000 [×Un]
9475	u16	1000	.PhVPhsB2.mag		Voltage phs B(2)	0.000...4.000 [×Un]
9476	u16	1000	.PhVPhsC2.mag		Voltage phs C(2)	0.000...4.000 [×Un]
9477	u16	1000	.PPVPhsAB2.mag		Voltage phs AB(2)	0.000...4.000 [×Un]
9478	u16	1000	.PPVPhsBC2.mag		Voltage phs BC(2)	0.000...4.000 [×Un]
9479	u16	1000	.PPVPhsCA2.mag		Voltage phs CA(2)	0.000...4.000 [×Un]
9480	u16	1000	.VRes2.mag		Voltage Uo(2)	0.000...4.000 [×Un]
9481	u16	1000	.VZro2.mag		Voltage Zro-Seq(2)	0.000...4.000 [×Un]
9482	u16	1000	.VPsSeq2.mag		Voltage Ps-Seq(2)	0.000...4.000 [×Un]
9483	u16	1000	.VNgSeq2.mag		Voltage Ng-Seq(2)	0.000...4.000 [×Un]
9484	i16	100	.DifANAngVN1.mag.		Angle Uo-Io(1)	-180.00... 180.00 [deg]
9485	i16	100	.DifAAAngVBC1.mag.		Angle UBC-IA(1)	-180.00... 180.00 [deg]
9486	i16	100	.DifABAngVCA1.mag		Angle UCA-IB(1)	-180.00... 180.00 [deg]
9487	i16	100	.DifACAngVAB1.mag		Angle UAB-IC(1)	-180.00... 180.00 [deg]
9488	i16	100	.DifANAngVN2.mag.		Angle Uo-Io(2)	-180.00... 180.00 [deg]
Table continues on next page						

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9489	i16	100	.DifAAAngVBC2.mag.		Angle UBC-IA(2)	-180.00... 180.00 [deg]
9490	i16	100	.DifABAngVCA2.mag		Angle UCA-IB(2)	-180.00... 180.00 [deg]
9491	i16	100	.DifACAngVAB2.mag		Angle UAB-IC(2)	-180.00... 180.00 [deg]

2.4.1.14 Protection relay's real-time clock (in local time mode) - read and write (synchronize)

Table 182: *Protection relay's real-time clock (in local time mode) - read and write (synchronize)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9201					Control register	0...2 ¹⁾
9202					Year	2000...2999
9203					Month	1...12
9204					Day	1...31
9205					Hour	0...23
9206					Minute	0...59
9207					Second	0...59
9208					Millisecond	0...999

1) See the technical manual.

2.4.1.15 Protection relay's real-time clock (in UTC time mode) - read and write (synchronize)

Table 183: *Protection relay's real-time clock (in UTC time mode) - read and write (synchronize)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9211					Control register	0...2 ¹⁾
9212					Year	2000...2999
9213					Month	1...12
9214					Day	1...31
9215					Hour	0...23
9216					Minute	0...59
9217					Second	0...59
9218					Millisecond	0...999

1) See the technical manual.

2.4.1.16 Indication bits mirrored in registers**Table 184:** *Indication bits mirrored in registers*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
170.00	Bit				Indication bit 2720 (0x1700)	
170.01	Bit				Indication bit 2721 (0x1701)	
:	:				:	
170.14	Bit				Indication bit 2734 (0x170E)	
170.15	Bit				Indication bit 2735 (0x170F)	
171.00	Bit				Indication bit 2736 (0x1710)	

2.4.1.17 SSR1 System status register (1) device health**Table 185:** *SSR1 System status register (1) device health*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
128.00	Bit				Device global error	1=Error
128.01	Bit				Device global warning	1=Warning
128.02	Bit				< reserved >	0
128.03	Bit				< reserved >	0
128.04	Bit				< reserved >	0
128.05	Bit				< reserved >	0
128.06	Bit				< reserved >	0
128.07	Bit				< reserved >	0
128.08	Bit				< reserved >	0
128.09	Bit				< reserved >	0
128.10	Bit				< reserved >	0
128.11	Bit				< reserved >	0
128.12	Bit				< reserved >	0
128.13	Bit				< reserved >	0
128.14	Bit				< reserved >	0
128.15	Bit				< reserved >	0

2.4.1.18 SSR2 System status register (2) protection relay's mode and state

Table 186: *SSR2 System status register (2) protection relay's mode and state*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
129.00	Bit				Device test mode	1=Test mode
129.01	Bit				< reserved >	0
129.02	Bit				Remote/Local state	0/1=Rem/Loc
					Active setting group	SG=1...6
129.03	Bit				- bit 0	
129.04	Bit				- bit 1	
129.05	Bit				- bit 2	
129.06	Bit				Protection relay's timesynch failure	1=Failure
129.07	Bit				< reserved >	0
129.08	Bit				Last reset cause a	1=Cold start
129.09	Bit				Last reset cause b	1=Watchdog
129.10	Bit				Last reset cause c	1=Warm start
129.11	Bit				< reserved >	0
129.12	Bit				< reserved >	0
129.13	Bit				< reserved >	0
129.14	Bit				< reserved >	0
129.15	Bit				< reserved >	0

2.4.1.19 SSR3 System status register (3) data available 1 (client-dependent)

Table 187: *SSR3 System status register (3) data available 1 (client-dependent)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
130.00	Bit				Unread event records available	1=Available
130.01	Bit				Unread fault records available	1=Available
130.02	Bit				< reserved >	0
130.03	Bit				< reserved >	0
130.04	Bit				Any momentary bit updated	1=Updated
130.05	Bit				Any mcd bit set	1=Set
130.06	Bit				Device restart bit	1=IED restart
130.07	Bit				< reserved >	0
130.08	Bit				Event record selected	1=Selected
130.09	Bit				Fault record selected	1=Selected
130.10	Bit				< reserved >	0

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
130.11	Bit				< reserved >	0
130.12	Bit				< reserved >	0
130.13	Bit				< reserved >	0
130.14	Bit				< reserved >	0
130.15	Bit				< reserved >	0

2.4.1.20 SSR4 System status register (4) data available 2 (client-dependent, user-definable)

Table 188: *SSR4 System status register (4) data available 2 (client-dependent, user-definable)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
131.00	Bit				Data category 1 has changed	1=Changed
131.01	Bit				Data category 2 has changed	1=Changed
131.02	Bit				Data category 3 has changed	1=Changed
131.03	Bit				Data category 4 has changed	1=Changed
131.04	Bit				Data category 5 has changed	1=Changed
131.05	Bit				Data category 6 has changed	1=Changed
131.06	Bit				Data category 7 has changed	1=Changed
131.07	Bit				Data category 8 has changed	1=Changed
131.08	Bit				Data category 9 has changed	1=Changed
131.09	Bit				Data category 10 has changed	1=Changed
131.10	Bit				Data category 11 has changed	1=Changed
131.11	Bit				Data category 12 has changed	1=Changed
131.12	Bit				Data category 13 has changed	1=Changed
131.13	Bit				Data category 14 has changed	1=Changed
131.14	Bit				Data category 15 has changed	1=Changed
131.15	Bit				Data category 16 has changed	1=Changed

2.4.1.21 SSR5 System status register (5) device alive register

Table 189: *SSR5 System status register (5) device alive register*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
132	u16	1			Device alive counter	0...65535

2.4.1.22 SSR6 System status register (6) control command status (client-dependent)

Table 190: *SSR6 System status register (6) control command status (client-dependent)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
					Last cmd result code	1)
133.00	Bit				- bit 0	
133.01	Bit				- bit 1	
133.02	Bit				- bit 2	
133.03	Bit				- bit 3	
133.04	Bit				- bit 4	
133.05	Bit				- bit 5	
133.06	Bit				- bit 6	
133.07	Bit				- bit 7	
					Response Type	1)
133.08	Bit				- bit 0	
133.09	Bit				- bit 1	
					Command state	1)
133.10	Bit				- bit 0	
133.11	Bit				- bit 1	
					Cmd sequence number	0...15
133.12	Bit				- bit 0	
133.13	Bit				- bit 1	
133.14	Bit				- bit 2	
133.15	Bit				- bit 3	

1) See the technical manual.

2.4.1.23 System diagnostic values

Table 191: *System diagnostic values*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.LDEV1			
2050	u16	1	.DevWrn.stVal	Warning	Last warning code	1)
2051	u16	1	.DevFail.stVal	Internal fault	Last internal fault code	1)
			DR.RDRE1			
2052	u16	1	.FltNum.stVal		Num. of DR recordings	0...N
2053	u16	1	.MemUsed.stVal		DR memory used	0...100 [%]

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.LPHD1			
2054	u16	1	.NumPwrUp.stVal		Num. of cold starts	0...65535
2055	u16	1	.WrmStr.stVal		Num. of warm starts	0...65535
2056	u16	1	.WacTrg.stVal		Num. of watchdog resets	0...65535
			LD0.LDEV1			
2057	u16	1	.ChgAckCnt.stVal		Num. of conf. changes	0...65535
			LD0.LLN0			
	u16	1	.ParChgCnt.stVal		Num. of setting changes	0...65535

1) See the technical manual.

2.4.1.24 Time and reason for latest protection relay reset

Table 192: *Time and reason for latest protection relay reset*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9221	u16	1			Year	2000...2999
9222	u16	1			Month	1...12
9223	u16	1			Day	1...31
9224	u16	1			Hour	0...23
9225	u16	1			Minute	0...59
9226	u16	1			Second	0...59
9227	u16	1			Millisecond	0...999
9228	u16	1			Reset reason	
9228.0	Bit				- bit 0	1=Cold start
9228.1	Bit				- bit 1	1=Watchdog
9228.2	Bit				- bit 2	1=Warm start

2.4.1.25 User-definable bits [Alt.2], visible on 0x,1x,3x and 4x

Table 193: *User-definable bits [Alt.2], visible on 0x,1x,3x and 4x*

BitA	Type	Scale	IEC 61850 name	SA name	Description	Values
(0)	Bit				< not mappable - not visible >	
1	Bit				Usr reg 1.Bit 01	
2	Bit				Usr reg 1.Bit 02	
3	Bit				Usr reg 1.Bit 03	
:	:				:	
:	:				:	

Table continues on next page

BitA	Type	Scale	IEC 61850 name	SA name	Description	Values
15	Bit				Usr reg 1.Bit 15	
16	Bit				Usr reg 2.Bit 00	
17	Bit				Usr reg 2.Bit 01	
:	:				:	
:	:				:	
2046	Bit				Usr reg 127.Bit 14	
2047	Bit				Usr reg 127.Bit 15	

2.4.1.26 User-definable registers [Alt.1], visible on 3x and 4x

Table 194: *User-definable registers [Alt.1], visible on 3x and 4x*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
(0)	Reg				< not mappable - not visible >	
1	Reg				User register 1	
2	Reg				User register 2	
3	:				:	
:	:				:	
:	:				:	
127	Reg				User register 127	

2.4.1.27 CTRL.CBCSWI1 Circuit breaker operation counter (1)

Table 195: *CTRL.CBCSWI1 Circuit breaker operation counter (1)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			CTRL.CBCSWI1			
2027	u16	1	.OpCntRs.stVal	Operation counter	Operation counter	0...65535

2.4.1.28 LD0.ARCSARCx1 Arc protection (x1) – AFD

Table 196: *LD0.ARCSARCx1 Arc protection (x1) – AFD*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.ARCSARC11			
2028	u16	1	.FACntRs.stVal		Fault arc 1 counter	0...65535
			LD0.ARCSARC21			
2029	u16	1	.FACntRs.stVal		Fault arc 2 counter	0...65535
			LD0.ARCSARC31			
2030	u16	1	.FACntRs.stVal		Fault arc 3 counter	0...65535

2.4.1.29 LD0.CMHAI1 Current total demand distortion (1) – PQI-1**Table 197:** *LD0.CMHAI1 Current total demand distortion (1) – PQI-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.CMHAI1		3-second mean value:	
2150	u16	100	.TddA.phsA.cVal.mag	3SMHTDD_A	- phsA	0...500.00 [%]
2151	u16	100	.TddA.phsB.cVal.mag	3SMHTDD_B	- phsB	0...500.00 [%]
2152	u16	100	.TddA.phsC.cVal.mag	3SMHTDD_C	- phsC	0...500.00 [%]
					Demand value:	
2153	u16	100	.DmdTddA.phsA.cVal.mag	DMD_TDD_A	- phsA	0...500.00 [%]
2154	u16	100	.DmdTddA.phsB.cVal.mag	DMD_TDD_B	- phsB	0...500.00 [%]
2155	u16	100	.DmdTddA.phsC.cVal.mag	DMD_TDD_C	- phsC	0...500.00 [%]
					Max demand value:	
2156	u16	100	.MaxDmdTddA.phsA.cVal.mag	-	- phsA	0...500.00 [%]
2157	u16	100	.MaxDmdTddA.phsB.cVal.mag	-	- phsB	0...500.00 [%]
2158	u16	100	.MaxDmdTddA.phsC.cVal.mag	-	- phsC	0...500.00 [%]

2.4.1.30 LD0.CMMXU1 Phase current demand values (1) – IA, IB, IC**Table 198:** *LD0.CMMXU1 Phase current demand values (1) – IA, IB, IC*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.CAVMMXU1		Demand value	
2001	u16	1000	.A.phsA.cVal.mag	I_DMD_A	Phs A amplitude	0.00...50.0 [xIn]
2002	u16	1000	.A.phsB.cVal.mag	I_DMD_B	Phs B amplitude	0.00...50.0 [xIn]
2003	u16	1000	.A.phsB.cVal.mag	I_DMD_C	Phs C amplitude	0.00...50.0 [xIn]
2004					Year - month	
2005					Day - hour	
2006					Minute - second	
2007					Milliseconds	
2008					Time quality	
			LD0.CMAMMXU1		Max demand values	

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
2009	u16	1000	.A.phsA.cVal.mag	Max demand IL1	Phs A amplitude	0.00...50.0 [xIn]
2010					Year - month	
2011					Day - hour	
2012					Minute - second	
2013					Milliseconds	
2014					Time quality	
2015	u16	1000	.A.phsB.cVal.mag	Max demand IL2	Phs B amplitude	0.00...50.0 [xIn]
2016					Year - month	
2017					Day - hour	
2018					Minute - second	
2019					Milliseconds	
2020					Time quality	
2021	u16	1000	.A.phsC.cVal.mag	Max demand IL2	Phs C amplitude	0.00...50.0 [xIn]
2022					Year - month	
2023					Day - hour	
2024					Minute - second	
2025					Milliseconds	
2026					Time quality	
			LD0.CMIMMXU1		Min demand values	
	u16	1000	.A.phsA.cVal.mag	Max demand IL1	Phs A amplitude	0.00...50.0 [xIn]
	u16	1000	.A.phsB.cVal.mag	Max demand IL2	Phs B amplitude	0.00...50.0 [xIn]
	u16	1000	.A.phsC.cVal.mag	Max demand IL3	Phs C amplitude	0.00...50.0 [xIn]

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

Table 199: LD0.CMMXU1 Three-phase current measurement (1) – IA, IB, IC

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.CMMXU1		Phase current (1)	
138	u16	1000	.A.phsA.instCVal.mag	I_INST_A	Phs A amplitude	0.00...40.0 [xIn]
139	u16	1000	.A.phsB.instCVal.mag	I_INST_B	Phs B amplitude	0.00...40.0 [xIn]
140	u16	1000	.A.phsC.instCVal.mag	I_INST_C	Phs C amplitude	0.00...40.0 [xIn]

2.4.1.32 LD0.CSMSQI1 Sequence current measurement (1) – I1, I2, I0**Table 200:** *LD0.CSMSQI1 Sequence current measurement (1) – I1, I2, I0*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.CSMSQI1		Sequence of currents	
143	u16	1000	.SeqA.c1.instCVal.mag	I1_INST	Positive amplitude	0.00...40.0 [xIn]
144	u16	1000	.SeqA.c2.instCVal.mag	I2_INST	Negative amplitude	0.00...40.0 [xIn]
145	u16	1000	.SeqA.c2.instCVal.mag	I3_INST	Zero amplitude	0.00...40.0 [xIn]

2.4.1.33 LD0.DARREC1 Autoreclosing counters (1) – 79-1**Table 201:** *LD0.DARREC1 Autoreclosing counters (1) – 79-1*

RegA	Typw	Scale	IEC 61850 name	SA name	Description	Values
			LD0.DARREC1			
2031	u16	1	.RecCnt1.stVal	CNT_SHOT1	AR 1st shot counter	0...65535
2032	u16	1	.RecCnt2.stVal	CNT_SHOT2	AR 2nd shot counter	0...65535
2033	u16	1	.RecCnt3.stVal	CNT_SHOT3	AR 3rd shot counter	0...65535
2034	u16	1	.RecCnt4.stVal	CNT_SHOT4	AR 4th shot counter	0...65535
2035	u16	1	.RecCnt5.stVal	CNT_SHOT5	AR 5th shot counter	0...65535
2036	u16	1	.FrqOpCnt.stVal	FRQ_OPR_CNT	AP freq. op. counter	0...65535

2.4.1.34 LD0.DARREC1 Autoreclosing values (1) – 79-1**Table 202:** *LD0.DARREC1 Autoreclosing values (1) – 79-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.DARREC1			
135	i16	1	.AutoRecSt.stVal	STATUS	AR state	-2...4 ¹⁾
136	u16	1	.ShotPntr.stVal	SHOT_PTR	AR shot pointer value	0...6
137	u16	1	.OpCntRs.stVal	COUNTER	AR operation counter	0...65535

1) See the technical manual.

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

Table 203: *LD0.FMMXU1 Frequency measurement (1) – f-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.FMMXU1			
168	u16	100	.Hz.mag	F_DB	Frequency	35.00...75.00 [Hz]

2.4.1.36 LD0.HAEFMHAI1 Current harmonics (1)

Table 204: *LD0.HAEFMHAI1 Current harmonics (1)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.HAEFMHAI1			
151	u16	10	.HRmsA.res.cVal.mag	I_HARM_RES	Current harmonics	0..250.0 [A]

2.4.1.37 LD0.PEMMTR1 Three-phase energy measurements (1)

Table 205: *LD0.PEMMTR1 Three-phase energy measurements (1)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.PEMMTR1			
2037	u32	1	.SupWh.actVal		Reverse active energy (high)	0...1E10 [kWh]
2038			.SupWh.actVal		(low word)	
2039	u32	1	.SupVArh.actVal		Reverse reactive energy (high)	0...1E10 [kVArh]
2040			.SupVArh.actVal		(low word)	
2041	u32	1	.DemWh.actVal		Forward active energy (high)	0...1E10 [kWh]
2042			.DemWh.actVal		(low word)	
2043	u32	1	.DemVArh.actVal		Forward reactive energy (high)	0...1E10 [kVArh]
2044			.DemVArh.actVal		(low word)	

2.4.1.38 LD0.PEMMXU1 Power measurement demand values (1) – P, E-1**Table 206:** *LD0.PEMMXU1 Power measurement demand values (1) – P, E-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.PEAVMMXU1		Demand value	
1939	i32	1	.TotW.mag		Active power P (high)	-/+ 999,999
1940					(Low word)	
1941	i32	1	.TotVAr.mag		Reactive power Q (high)	-/+ 999,999
1942					(Low word)	
1943	i32	1	.TotVA.mag		Apparent power S (high)	-/+ 999,999
1944					(Low word)	
1945	i16	1000	.TotPF.mag		Power factor	-1...1
			LD0.PEMAMMXU1		Max demand value	
	i32	1	.TotW.mag		Active power P	-/+ 999,999
	i32	1	.TotVAr.mag		Reactive power Q	-/+ 999,999
	i32	1	.TotVA.mag		Apparent power S	-/+ 999,999
			LD0.PEMIMMXU1		Min demand value	
	i32	1	.TotW.mag		Active power P	-/+ 999,999
	i32	1	.TotVAr.mag		Reactive power Q	-/+ 999,999
	i32	1	.TotVA.mag		Apparent power S	-/+ 999,999

2.4.1.39 LD0.PEMMXU1 Three-phase power and energy measurement (1) – P, E-1**Table 207:** *LD0.PEMMXU1 Three-phase power and energy measurement (1) – P, E-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.PEMMXU1			
161	i32	1	.TotW.instMag	P_INST	Total active power P (high)	-/+ 999,999
162			.TotW.instMag		(low word)	
163	i32	1	.TotVAr.instMag	Q_INST	Total reactive power Q (high)	-/+ 999,999
164			.TotVAr.instMag		(low word)	
165	i32	1	.TotVA.instMag	S_INST	Total apparent power S (high)	-/+ 999,999
166			.TotVA.instMag		(low word)	
167	i16	1000	.TotPF.instMag	PF_INST	Average power factor	-1...1

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

Table 208: LD0.PHQVVR1 Voltage variation (1) – PQSS-1

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.PH1QVVR1		Voltage swell	
2100	u32	1	.SwlInstCnt.stVal	INSTSWELLCNT	- Inst counter (high)	0...
2101					- (Low word)	2147483647
2102	u32	1	.SwlMomCnt.stVal	MOMSWELLCNT	- Mom counter (high)	0...
2103					- (Low word)	2147483647
2104	u32	1	.SwlTmpCnt.stVal	TEMPSWELLCNT	- Temp counter (high)	0...
2105					- (Low word)	2147483647
2106	u32	1	.SwlMaxCnt.stVal	MAXDURSWELLCNT	- Max. duration.counter (high)	0...
2107					- (Low word)	2147483647
					Voltage dip	
2108	u32	1	.DipInstCnt.stVal	INSTDIPCNT	- Inst counter (high)	0...
2109					- (Low word)	2147483647
2110	u32	1	.DipMomCnt.stVal	MOMDIPCNT	- Mom counter (high)	0...
2111					- (Low word)	2147483647
2112	u32	1	.DipTmpCnt.stVal	TEMPDIPCNT	- Temp counter (high)	0...
2113					- (Low word)	2147483647
2114	u32	1	.DipMaxCnt.stVal	MAXDURDIPCNT	- Max. duration counter (high)	0...
2115					- (Low word)	2147483647
					Voltage interrupts	
2116	u32	1	.IntrMomCnt.stVal	MOMINTCNT	- Mom counter (high)	0...
2117					- (Low word)	2147483647
2118	u32	1	.IntrTmpCnt.stVal	TEMPINTCNT	- Temp counter (high)	0...
2119					- (Low word)	2147483647
2120	u32	1	.IntrSstCnt.stVal	SUSTINTCNT	- Sustain counter (high)	0...
2121					- (Low word)	2147483647
2122	u32	1	.IntrMaxCnt.stVal	MAXDURINTCNT	- Max. duration counter (high)	0...

2.4.1.41 LD0.RESCMMXU1 Residual current demand value (1) – IG-1**Table 209:** *LD0.RESCMMXU1 Residual current demand value (1) – IG-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.RCAVMMXU1		Demand value	
1989	u16	1000	.A.res.cVal.mag	I_DMD_RES	Residual amplitude	0.00...50.0 [xIn]
1990					Year - month	
1991					Day - hour	
1992					Minute - second	
1993					Milliseconds	
1994					Time quality	
			LD0.RCMAMMXU1		Max. demand value	
1995	u16	1000	.A.res.cVal.mag	Max demand Io	Residual amplitude	0.00...50.0 [xIn]
1996					Year - month	
1997					Day - hour	
1998					Minute - second	
1999					Milliseconds	
2000					Time quality	
			LD0.RCMIMMXU1		Min. demand value	
	u16	1000	.A.res.cVal.mag	Min demand Io	Residual amplitude	0.00...50.0 [xIn]

2.4.1.42 LD0.RESCMMXU1 Residual current measurement (1) – IG-1**Table 210:** *LD0.RESCMMXU1 Residual current measurement (1) – IG-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.RESCMMXU1		Residual current (1)	
141	u16	1000	.A.res.instCVal.mag	IO_INST	- amplitude	0.00...40.0 [xIn]

2.4.1.43 LD0.RESVMMXU1 Residual voltage demand value (1) – VG-1

Table 211: *LD0.RESVMMXU1 Residual voltage demand value (1) – VG-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.RVAVMMXU1		Demand value	
1977	u16	1000	.PhV.res.cVal.mag	U_DMD_RES	Residual amplitude	0.00...4.0 [xUn]
1978					Year - month	
1979					Day - hour	
1980					Minute - second	
1981					Milliseconds	
1982					Time quality	
			LD0.RVMAMMXU1		Max. demand value	
1983	u16	1000	.PhV.res.cVal.mag	Max demand Uo	Residual amplitude	0.00...4.0 [xUn]
1984					Year - month	
1985					Day - hour	
1986					Minute - second	
1987					Milliseconds	
1988					Time quality	
			LD0.RVMIMMXU1		Min. demand value	
	u16	1000	.PhV.res.cVal.mag	Min demand Io	Residual amplitude	0.00...4.0 [xUn]

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

Table 212: *LD0.RESVMMXU1 Residual voltage measurement (1) – VG-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.RESVMMXU1		Residual voltage (1)	
142	u16	1000	.A.res.instCVal.mag	U0_INST	- amplitude	0.00...4.00 [xUn]

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

Table 213: *LD0.SECRSYN1 Synchronism and energizing check (1) – 25*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SECRSYN1			
169	u16	1	.EnSt.stVal	ENERG_STATE	Energ. state of line and bus	0...4 ¹⁾

1) See the technical manual.

2.4.1.46 LD0.SSCBR1 Circuit-breaker condition monitoring (1) – 52CM-1**Table 214:** *LD0.SSCBR1 Circuit-breaker condition monitoring (1) – 52CM-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SSCBR1			
2060	u16	1	.InaTmdCnt.stVal	INA_DAYS	CB inactive days	0...65535
2061	u16	1	.OpTmOpn.mag	T_TRV_OP	Open travel time	0...60000 [ms]
2062	u16	1	.OpTmCls.mag	T_TRV_CL	Close travel time	0...60000 [ms]
			LD0.SSOPM1			
2063	u16	100	.TmsSprCha.mag	T_SPR_CHR	Spring charge time	0.00...99.99 [s]
			LD0.SPH1SCBR1			
2064	i16	1	.RmnNumOp.stVal	CB_LIFE_A	Remain.life phs A	-/+ 9999
			LD0.SPH2SCBR1			
2065	i16	1	.RmnNumOp.stVal	CB_LIFE_B	Remain.life phs B	-/+ 9999
			LD0.SPH3SCBR1			
2066	i16	1	.RmnNumOp.stVal	CB_LIFE_C	Remain.life phs C	-/+ 9999
			LD0.SPH1SCBR1			
2067	u16	1	.AccmAPwr.mag	IPOW_A	lyt phs A	0...1E6
			LD0.SPH2SCBR1			
2068	u16	1	.AccmAPwr.mag	IPOW_B	lyt phs B	0...1E6
			LD0.SPH3SCBR1			
2069	u16	1	.AccmAPwr.mag	IPOW_C	lyt phs C	0...1E6

2.4.1.47 LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1) – 49F-1**Table 215:** *LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1) – 49F-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.T1PTTR1			
146	i16	1	.Tmp.mag	TEMP	Object temperature	-100.0...9999.9 [C]
147	u16	1	.TmpRI.mag	TEMP_RL	Relative temperature	0.00...99.99 [C]
148	i16	1	.TmpUsed.mag	TEMP_AMB	Ambient temperature	-99...999.99 [C]
149	u16	1	.OpTm.stVal	T_OPERATE	Time to operate	0...60000 [s]
150	u16	1	.BlkThmRsTm.stVal	T_ENA_CLOSE	Time to deactivate block	0...60000 [s]

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

Table 216: *LD0.VMHAI1 Voltage total harmonic distortion (1) – PQVPH-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.VMHAI1		3-second mean value	
2170	u16	100	.ThdPhV.phsA.cVal.mag	3SMHTHD_A	- Phs A	0...500.00 [%]
2171	u16	100	.ThdPhV.phsB.cVal.mag	3SMHTDD_B	- Phs B	0...500.00 [%]
2172	u16	100	.ThdPhV.phsC.cVal.mag	3SMHTDD_C	- Phs C	0...500.00 [%]
					Demand value:	
2173	u16	100	.DmdThdPhV.phsA.cVal.mag	DMD_TDD_A	- Phs A	0...500.00 [%]
2174	u16	100	.DmdThdPhV.phsB.cVal.mag	DMD_TDD_B	- Phs B	0...500.00 [%]
2175	u16	100	.DmdThdPhV.phsC.cVal.mag	DMD_TDD_C	- Phs C	0...500.00 [%]
					Max demand value	
2176	u16	100	.MaxDmdThdV.phsA.cVal.mag	-	- Phs A	0...500.00 [%]
2177	u16	100	.MaxDmdThdV.phsB.cVal.mag	-	- Phs B	0...500.00 [%]
2178	u16	100	.MaxDmdThdV.phsC.cVal.mag	-	- Phs C	0...500.00 [%]

2.4.1.49 LD0.VMMXU1 Three-phase voltage measurement (1) – VA, VB, VC

Table 217: *LD0.VMMXU1 Three-phase voltage measurement (1) – VA, VB, VC*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.VMMXU1		Phase-ground voltage (1)	
152	u16	1000	.phV.phsA.cVal.mag	U_DB_A	- Phs A amplitude	0.00...4.00 [xUn]
153	u16	1000	.phV.phsB.cVal.mag	U_DB_B	- Phs B amplitude	0.00...4.00 [xUn]
154	u16	1000	.phV.phsC.cVal.mag	U_DB_C	- Phs C amplitude	0.00...4.00 [xUn]
			LD0.VMMXU1		Phase-phase voltage (1)	
155	u16	1000	.PPV.phsAB.cVal.mag	U_DB_AB	- Phs AB amplitude	0.00...4.00 [xUn]
156	u16	1000	.PPV.phsBC.cVal.mag	U_DB_BC	- Phs BC amplitude	0.00...4.00 [xUn]
157	u16	1000	.PPV.phsCA.cVal.mag	U_DB_CA	- Phs CA amplitude	0.00...4.00 [xUn]

2.4.1.50 LD0.VMMXU1 Voltage demand values (1) – VA, VB, VC**Table 218:** *LD0.VMMXU1 Voltage demand values (1) – VA, VB, VC*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.VAVMMXU1		Demand value	
1954	u16	1000	.PhV.phsA.cVal.mag	U_DMD_A	Phs A amplitude	0.00...4.0 [xUn]
1955	u16	1000	.PhV.phsB.cVal.mag	U_DMD_B	Phs B amplitude	0.00...4.0 [xUn]
1956	u16	1000	.PhV.phsC.cVal.mag	U_DMD_C	Phs C amplitude	0.00...4.0 [xUn]
1957	u16	1000	.PPV.phsAB.cVal.mag	U_DMD_AB	Phs AB amplitude	0.00...4.0 [xUn]
1958	u16	1000	.PPV.phsBC.cVal.mag	U_DMD_BC	Phs BC amplitude	0.00...4.0 [xUn]
1959	u16	1000	.PPV.phsCA.cVal.mag	U_DMD_CA	Phs CA amplitude	0.00...4.0 [xUn]

2.4.1.51 LD0.VSMSQI1 Sequence voltage measurement (1) – V1, V2, V0**Table 219:** *LD0.VSMSQI1 Sequence voltage measurement (1) – V1, V2, V0*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.VSMSQI1		Sequence of voltages	
158	u16	1000	.SeqA.c1.instCVal.mag	U1_INST	- Positive amplitude	0.00...4.00 [xUn]
159	u16	1000	.SeqA.c2.instCVal.mag	U2_INST	- Negative amplitude	0.00...4.00 [xUn]
160	u16	1000	.SeqA.c2.instCVal.mag	U3_INST	- Zero amplitude	0.00...4.00 [xUn]

2.4.2 Unmapped registers

Unmapped registers are register data that have no initial Modbus mapping locations, but can be added to the user-definable Modbus area using the Communication Management tool in PCM600. The initial register type settings of these objects have little meaning, since it is always possible to redefine the settings completely for the user-definable register.

2.4.2.1 CTRL.LLN0 Local, Remote, Station, Off and Combinations

Table 220: CTRL.LLN0 Local, Remote, Station, Off and Combinations

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			CTRL.LLN0			
	u16	1	.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

2.4.2.2 LD0.LLN0/LPHD1/LDEV1 System values

Table 221: LD0.LLN0/LPHD1/LDEV1 System values

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.LLN0			
	u16	1	.ParChgCnt.stVal		Num. of setting changes	0...65535

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

Table 222: LD0.MDSOPT1 Runtime counter for machines and devices (1) – OPTM-1

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.MDSOPT1			
	u16	1	.OpTmh.stVal	OPR_TIME	Total operation hours	0...299999

2.4.2.4 LD0.MVI4GAPC1 Integer value move (1) – MVI4-1

Table 223: LD0.MVI4GAPC1 Integer value move (1) – MVI4-1

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.MVI4GAPC1			
	i32	1	.ISCS01.stVal	OUT1	- Integer value 1 (high)	-/ +2147483647
					- Low word	
	i32	1	.ISCS02.stVal	OUT2	- Integer value 2 (high)	-/ +2147483647
					- Low word	
	i32	1	.ISCS03.stVal	OUT3	- Integer value 3 (high)	-/ +2147483647
					- Low word	
	i32	1	.ISCS04.stVal	OUT4	- Integer value 4 (high)	-/ +2147483647
					- Low word	

2.4.2.5 LD0.PHQVVR2 Voltage variation (2) – PQSS-2**Table 224:** *LD0.PHQVVR2 Voltage variation (2) – PQSS-2*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.PHQVVR2		Voltage swell	
	u32	1	.SwlInstCnt.stVal	INSTSWELLCNT	- Inst counter (high)	0... 2147483647
					- (Low word)	
	u32	1	SwlMomCnt.stVal	MOMSWELLCNT	- Mom counter (high)	0... 2147483647
					- (Low word)	
	u32	1	.SwlTmpCnt.stVal	TEMPSWELLCNT	- Temp counter (high)	0... 2147483647
					(Low word)	
	u32	1	.SwlMaxCnt.stVal	MAXDURSWELLCNT	- Max. duration.counter (high)	0... 2147483647
					- (Low word)	
					Voltage dip	
	u32	1	.DipInstCnt.stVal	INSTDIPCNT	- Inst counter (high)	0... 2147483647
					- (Low word)	
	u32	1	.DipMomCnt.stVal	MOMDIPCNT	- Mom counter (high)	0... 2147483647
					- (Low word)	
	u32	1	.DipTmpCnt.stVal	TEMPDIPCNT	- Temp counter (high)	0... 2147483647
					- (Low word)	
	u32	1	.DipMaxCnt.stVal	MAXDURDIPCNT	- Max. duration counter (high)	0... 2147483647
					- (Low word)	
					Voltage dip	
	u32	1	.IntrMomCnt.stVal	MOMINTCNT	- Mom counter (high)	0... 2147483647
					- (Low word)	
	u32	1	.IntrTmpCnt.stVal	TEMPINTCNT	- Temp counter (high)	0... 2147483647
					- (Low word)	
	u32	1	.IntrSstCnt.stVal	SUSTINTCNT	- Sustain counter (high)	0... 2147483647
					- (Low word)	
	u32	1	.IntrMaxCnt.stVal	MAXDURINTCNT	- Max. duration counter (high)	0... 2147483647

2.4.2.6 LD0.SCA4GAPC1 Analog value scaling (1) – SCA4-1

Table 225: *LD0.SCA4GAPC1 Analog value scaling (1) – SCA4-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SCA4GAPC1			
	i16	1000	.AnValOut1.mag	AO1_VALUE	Analog value 1 after scaling	0...N
	i16	1000	.AnValOut2.mag	AO2_VALUE	Analog value 2 after scaling	0...N
	i16	1000	.AnValOut3.mag	AO3_VALUE	Analog value 3 after scaling	0...N
	i16	1000	.AnValOut4.mag	AO4_VALUE	Analog value 4 after scaling	0...N

2.4.2.7 LD0.SCA4GAPC2 Analog value scaling (2) – SCA4-2

Table 226: *LD0.SCA4GAPC2 Analog value scaling (2) – SCA4-2*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SCA4GAPC2			
	i16	1000	.AnValOut1.mag	AO1_VALUE	Analog value 1 after scaling	0...N
	i16	1000	.AnValOut2.mag	AO2_VALUE	Analog value 2 after scaling	0...N
	i16	1000	.AnValOut3.mag	AO3_VALUE	Analog value 3 after scaling	0...N
	i16	1000	.AnValOut4.mag	AO4_VALUE	Analog value 4 after scaling	0...N

2.4.2.8 LD0.SCA4GAPC3 Analog value scaling (3) – SCA4-3

Table 227: *LD0.SCA4GAPC3 Analog value scaling (3) – SCA4-3*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SCA4GAPC3			
	i16	1000	.AnValOut1.mag	AO1_VALUE	Analog value 1 after scaling	0...N
	i16	1000	.AnValOut2.mag	AO2_VALUE	Analog value 2 after scaling	0...N
	i16	1000	.AnValOut3.mag	AO3_VALUE	Analog value 3 after scaling	0...N
	i16	1000	.AnValOut4.mag	AO4_VALUE	Analog value 4 after scaling	0...N

2.4.2.9 LD0.SCA4GAPC4 Analog value scaling (4) – SCA4-4**Table 228:** *LD0.SCA4GAPC4 Analog value scaling (4) – SCA4-4*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SCA4GAPC4			
	i16	1000	.AnValOut1.mag	AO1_VALUE	Analog value 1 after scaling	0...N
	i16	1000	.AnValOut2.mag	AO2_VALUE	Analog value 2 after scaling	0...N
	i16	1000	.AnValOut3.mag	AO3_VALUE	Analog value 3 after scaling	0...N
	i16	1000	.AnValOut4.mag	AO4_VALUE	Analog value 4 after scaling	0...N

2.4.2.10 LD0.SCEFRFLO1 Fault locator (1) – 21FL-1**Table 229:** *LD0.SCEFRFLO1 Fault locator (1) – 21FL-1*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SCEFRFLO1			
	u16	1	.FltDiskm.mag	FLT_DISTANCE	Fault distance in pu	0...3000.0000 [pu]
	u16	1	.FltLoop.stVal	FAULT_LOOP	Fault impedance loop	0...7 (see doc)
	u16	1	.FltPtR.mag	RF	Fault point resistance	0.0...1000000.0 [ohm]
	u16	1	.FltR.mag	RFLOOP	Fault loop resistance	0.0...1000000.0 [ohm]
	u16	1	.FltX.mag	XFLOOP	Fault loop reactance	0.0...1000000.0 [ohm]
	u16	1	.PhReact.mag	XFPHASE	Fault phase reactance	0.0...1000000.0 [ohm]
	u16	1	.RatFltALod.mag	IFLT_PER_ILD	Fault to load current ratio	0...60000.00
	u16	1	.EqDisLod.mag	S_CALC	Est. load distance	0.00...1.00
	u16	1	.PhGndCapac.mag	XC0F_CALC	Est. PhE capacitive reactance	0.0...1000000.0 [ohm]
	u16	1	.FltDisQ.stVal	FLT_DIST_Q	Fault distance quality	0...511

2.4.2.11 LD0.SPEMMTR1 Single-phase power and energy measurement (1)**Table 230:** *LD0.SPEMMTR1 Single-phase power and energy measurement (1)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SPE1MMTR1			
	u32	1	.SupWh.actVal		Accumulated Reverse active energy (high) , phase A	0...1E10 [kWh]

Table continues on next page

Section 2 Modbus data mappings

1MAC105331-MB A

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			.SupWh.actVal		(low word)	
	u32	1	.SupVARh.actVal		Accumulated Reverse reactive energy (high) , phase A	0...1E10 [kWh]
			.SupVARh.actVal		(low word)	
	u32	1	.DmdWh.actVal		Accumulated Forward active energy (high) , phase A	0...1E10 [kWh]
			.DmdWh.actVal		(low word)	
	u32	1	.DmdVARh.actVal		Accumulated Forward reactive energy (high) , phase A	0...1E10 [kWh]
			.DmdVARh.actVal		(low word)	
	u32	1	.EnValRs.Oper.ctlVal		Reset of accumulated energy reading	0...1E10 [kWh]
			.EnValRs.Oper.ctlVal		(low word)	
			LD0.SPE2MMTR1			
	u32	1	.SupWh.actVal		Accumulated Reverse active energy (high) , phase B	0...1E10 [kWh]
			.SupWh.actVal		(low word)	
	u32	1	.SupVARh.actVal		Accumulated Reverse reactive energy (high) , phase B	0...1E10 [kWh]
			.SupVARh.actVal		(low word)	
	u32	1	.DmdWh.actVal		Accumulated Forward active energy (high) , phase B	0...1E10 [kWh]
			.DmdWh.actVal		(low word)	
	u32	1	.DmdVARh.actVal		Accumulated Forward reactive energy (high) , phase B	0...1E10 [kWh]
			.DmdVARh.actVal		(low word)	
			LD0.SPE3MMTR1			
	u32	1	.SupWh.actVal		Accumulated Reverse active energy (high) , phase C	0...1E10 [kWh]
			.SupWh.actVal		(low word)	
	u32	1	.SupVARh.actVal		Accumulated Reverse reactive energy (high) , phase C	0...1E10 [kWh]
			.SupVARh.actVal		(low word)	
	u32	1	.DmdWh.actVal		Accumulated Forward active energy (high) , phase C	0...1E10 [kWh]
			.DmdWh.actVal		(low word)	

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
	u32	1	.DmdVArh.actVal		Accumulated Forward reactive energy (high) , phase C	0...1E10 [kWh]
			.DmdVArh.actVal		(low word)	

2.4.2.12 LD0.SPEMMXU1 Single-phase power and energy measurement demand values (1) – SP, SE-1

Table 231: LD0.SPEMMXU1 Single-phase power and energy measurement demand values (1) – SP, SE-1

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SPEAVMMXU1		Demand value	
	i32	1	.W.phsA.cVal.mag		Active power P (high) , phase A	-/+ 999,999
			.		(low word)	
	i32	1	.W.phsB.cVal.mag		Active power P (high) , phase B	-/+ 999,999
			.		(low word)	
	i32	1	.W.phsC.cVal.mag		Active power P (high) , phase C	-/+ 999,999
			.		(low word)	
	i32	1	.VAr.phsA.cVal.mag		Reactive power Q (high) , phase A	-/+ 999,999
			.		(low word)	
	i32	1	.VAr.phsB.cVal.mag		Reactive power Q (high), phase B	-/+ 999,999
			.		(low word)	
	i32	1	.VAr.phsC.cVal.mag		Reactive power Q (high) , phase C	-/+ 999,999
			.		(low word)	
	i32	1	.VA.phsA.cVal.mag		Apparent power S (high) , phase A	-/+ 999,999
			.		(low word)	
	i32	1	.VA.phsB.cVal.mag		Apparent power S (high), phase B	-/+ 999,999
			.		(low word)	
	i32	1	.VA.phsC.cVal.mag		Apparent power S (high) , phase C	-/+ 999,999
			.		(low word)	
	i16	1000	.PF.phsA.cVal.mag		Power factor , phase A	-1...1
	i16	1000	.PF.phsB.cVal.mag		Power factor, phase B	-1...1
	i16	1000	.PF.phsC.cVal.mag		Power factor , phase C	-1...1
			LD0.SPEMAMMXU1		Max demand value	

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
	i32	1	.W.phsA.cVal.mag		Active power P, phase A	-/+ 999,999
	i32	1	.W.phsB.cVal.mag		Active power P, phase B	-/+ 999,999
	i32	1	.W.phsC.cVal.mag		Active power P, phase C	-/+ 999,999
	i32	1	.VAr.phsA.cVal.mag		Reactive power Q, phase A	-/+ 999,999
	i32	1	.VAr.phsB.cVal.mag		Reactive power Q, phase B	-/+ 999,999
	i32	1	.VAr.phsC.cVal.mag		Reactive power Q, phase C	-/+ 999,999
	i32	1	.VA.phsA.cVal.mag		Apparent power S, phase A	-/+ 999,999
	i32	1	.VA.phsB.cVal.mag		Apparent power S, phase B	-/+ 999,999
	i32	1	.VA.phsC.cVal.mag		Apparent power S, phase C	-/+ 999,999
			LD0.SPEMIMMXU1		Min demand value	
	i32	1	.W.phsA.cVal.mag		Active power P, phase A	-/+ 999,999
	i32	1	.W.phsB.cVal.mag		Active power P, phase B	-/+ 999,999
	i32	1	.W.phsC.cVal.mag		Active power P, phase C	-/+ 999,999
	i32	1	.VAr.phsA.cVal.mag		Reactive power Q, phase A	-/+ 999,999
	i32	1	.VAr.phsB.cVal.mag		Reactive power Q, phase B	-/+ 999,999
	i32	1	.VAr.phsC.cVal.mag		Reactive power Q, phase C	-/+ 999,999
	i32	1	.VA.phsA.cVal.mag		Apparent power S, phase A	-/+ 999,999
	i32	1	.VA.phsB.cVal.mag		Apparent power S, phase B	-/+ 999,999
	i32	1	.VA.phsC.cVal.mag		Apparent power S, phase C	-/+ 999,999

2.4.2.13 LD0.SPEMMXU1 Single-phase power and energy measurement (1) – SP, SE-1

Table 232: LD0.SPEMMXU1 Single-phase power and energy measurement (1) – SP, SE-1

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SPEMMXU1			
	i32	1	.W.phsA.instCVal.mag	PL1-kW:1	Total active power, phase A	-/+ 999,999
			.W.phsA.instCVal.mag		(low word)	
	i32	1	.W.phsB.instCVal.mag	PL2-kW:1	Total active power, phase B	-/+ 999,999
			.W.phsB.instCVal.mag		(low word)	
	i32	1	.W.phsC.instCVal.mag	PL3-kW:1	Total active power, phase C	-/+ 999,999
			.W.phsC.instCVal.mag		(low word)	
	i32	1	.VAr.phsA.instCVal.mag	QL1-VAr:1	Total reactive power , phase A	-/+ 999,999
			.VAr.phsA.instCVal.mag		(low word)	
	i32	1	.VAr.phsB.instCVal.mag	QL2-VAr:1	Total reactive power , phase B	-/+ 999,999
			.VAr.phsB.instCVal.mag		(low word)	

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
	i32	1	.VAr.phsC.instCVal.mag	QL3-VAr:1	Total reactive power , phase C	-/+ 999,999
			.VAr.phsC.instCVal.mag		(low word)	
	i32	1	.VA.phsA.instCVal.mag	SL1-kVA:1	Total apparent power , phase A	-/+ 999,999
			.VA.phsA.instCVal.mag		(low word)	
	i32	1	.VA.phsB.instCVal.mag	SL2-kVA:1	Total apparent power , phase B	-/+ 999,999
			.VA.phsB.instCVal.mag		(low word)	
	i32	1	.VA.phsC.instCVal.mag	SL3-kVA:1	Total apparent power , phase C	-/+ 999,999
			.VA.phsC.instCVal.mag		(low word)	
	i16	1000	.PF.phsA.instCVal.mag	PFL1:1	Average power factor , phase A	-1...1
	i16	1000	.PF.phsB.instCVal.mag	PFL2:1	Average power factor , phase B	-1...1
	i16	1000	.PF.phsC.instCVal.mag	PFL3:1	Average power factor , phase C	-1...1
			.RcdRs.Oper.ctlVal		(Demands)	

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

Table 233: LD0.VMMXU2 Three-phase voltage measurement (2) – VA, VB, VC (2)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.VMMXU2		Phase-ground voltage (2)	
	u16	1000	.phV.phsA.cVal.mag	U_DB_A	Phs A amplitude	0.00..4.00 [xUn]
	u16	1000	.phV.phsB.cVal.mag	U_DB_B	Phs B amplitude	0.00..4.00 [xUn]
	u16	1000	.phV.phsC.cVal.mag	U_DB_C	Phs C amplitude	0.00..4.00 [xUn]
			LD0.VMMXU2		Phase-phase voltage (2)	
	u16	1000	.PPV.phsAB.cVal.mag	U_DB_AB	Phs AB amplitude	0.00..4.00 [xUn]
	u16	1000	.PPV.phsBC.cVal.mag	U_DB_BC	Phs BC amplitude	0.00..4.00 [xUn]
	u16	1000	.PPV.phsCA.cVal.mag	U_DB_CA	Phs CA amplitude	0.00..4.00 [xUn]

2.4.2.15 LD0.VMMXU2 Voltage demand values (2) – VA, VB, VC (2)

Table 234: *LD0.VMMXU2 Voltage demand values (2) – VA, VB, VC (2)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.VAVMMXU2		Demand value	
	u16	1000	.PhV.phsA.cVal.mag	U_DMD_A	Phs A amplitude	0.00...4.0 [×Un]
	u16	1000	.PhV.phsB.cVal.mag	U_DMD_B	Phs B amplitude	0.00...4.0 [×Un]
	u16	1000	.PhV.phsC.cVal.mag	U_DMD_C	Phs C amplitude	0.00...4.0 [×Un]
	u16	1000	.PPV.phsAB.cVal.mag	U_DMD_AB	Phs AB amplitude	0.00...4.0 [×Un]
	u16	1000	.PPV.phsBC.cVal.mag	U_DMD_BC	Phs BC amplitude	0.00...4.0 [×Un]
	u16	1000	.PPV.phsCA.cVal.mag	U_DMD_CA	Phs CA amplitude	0.00...4.0 [×Un]

2.4.2.16 LD0.XARGGIO130 RTD input values

Table 235: *LD0.XARGGIO130 RTD input values*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.XARGGIO130			
	i16	1	.AnIn1.mag	AI_VAL1	RTD input 1 in ohms	-/+ 10000.00
	i16	1	.AnIn2.mag	AI_VAL2	RTD input 2 in ohms	-/+ 10000.00
	i16	1	.AnIn3.mag	AI_VAL3	RTD input 3 in ohms	-/+ 10000.00
	i16	1	.AnIn4.mag	AI_VAL4	RTD input 4 in ohms	-/+ 10000.00

2.4.2.17 LD0.XRGGIO130 RTD input values

Table 236: *LD0.XRGGIO130 RTD input values*

RegA	Type	Scale	IEC 61580 name	SA name	Description	Values
			LD0.XRGGIO130			
	i16	1	.AnIn1.mag	AI_VAL1	RTD input 1 in ohms	-/+ 10000.00
	i16	1	.AnIn2.mag	AI_VAL2	RTD input 2 in ohms	-/+ 10000.00
	i16	1	.AnIn3.mag	AI_VAL3	RTD input 3 in ohms	-/+ 10000.00
	i16	1	.AnIn4.mag	AI_VAL4	RTD input 4 in ohms	-/+ 10000.00
	i16	1	.AnIn5.mag	AI_VAL5	RTD input 5 in ohms	-/+ 10000.00

Table continues on next page

RegA	Type	Scale	IEC 61580 name	SA name	Description	Values
	i16	1	.AnIn6.mag	AI_VAL6	RTD input 6 in ohms	-/+ 10000.00
	i16	1	.AnIn7.mag	AI_VAL7	RTD input 7 in ohms	-/+ 10000.00
	i16	1	.AnIn8.mag	AI_VAL8	RTD input 8 in ohms	-/+ 10000.00

2.5 Controls

Table 237: *Explanations of the controls table columns*

Column name	Description
0xA	Coil (0X) address for control value.
CS	Control structure and bit within the structure for control value.
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 written value.

2.5.1 Reset, acknowledge and trigger points

Table 238: *Reset, acknowledge and trigger points*

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.LLN0			
2060	2.00	.IndLEDRs.Oper.ctIVal		Reset indications and LEDs	1=Reset
2061	2.01	.ProgLEDRs.Oper.ctIVal		Reset Alarm LEDs	1=Reset
		LD0.PEMMXU1			
2062	2.02	.RcdRs.Oper.ctIVal		Reset Power max demands	1=Reset
		LD0.DARREC1			
2063	2.03	.RecRs.Oper.ctIVal		Reset reclosing	1=Reset
2064	2.04	.CntRs.Oper.ctIVal		Reset reclosing counters	1=Reset
		LD0.SSCBR1			
2065	2.05	.RsAccmAPwr.Oper.ctIVal		Reset CB accum. energy	1=Reset
2066	2.06	.RsCBWear.Oper.ctIVal		Reset CB wear data	1=Reset
		DR.RDRE1			
2067	2.07	.RcdTrg.Oper.ctIVal		Trig DR recording	1=Trig

Table continues on next page

0xA	CS	IEC 61850 name	SA name	Description	Values
2068	2.08	.MemClr.Oper.ctIVal		Clear DR memory	1=Clear
		LD0.CMMXU1			
2069	2.09	.RcdRs.Oper.ctIVal		Reset Max current1 demands	1=Reset
		LD0.PEMMTR1			
2070	2.10	.SupDmdRs.Oper.ctIVal		Reset energy values	1=Reset
		LD0.SCCBR1			
2071	2.11	.RsTrvTm.Oper.ctIVal		Reset CB travel time	1=Reset
2072	2.12	.RsSprChaTm.Oper.ctIVal		Reset CB spring charge time	1=Reset
		LD0.RESCMMXU1			
2073	2.13	.RcdRs.Oper.ctIVal		Reset IG (1) max demands	1=Reset
		LD0.RESVMMXU1			
2074	2.14	.RcdRs.Oper.ctIVal		Reset VG (1) max demands	1=Reset

2.5.2 CTRL.CBCSWI1 Circuit breaker control (1)

Table 239: CTRL.CBCSWI1 Circuit breaker control (1)

0xA	CS	IEC 61850 name	SA name	Description	Values
		CTRL.CBCSWI1			
2048	1.00	.Pos.Oper.ctIVal		Select open	1=Select
2049	1.01	.Pos.Oper.ctIVal		Select close	1=Select
2050	1.02	.Pos.Oper.ctIVal		Cancel selection	1=Cancel
2051	1.03	.Pos.Oper.ctIVal		Execute selection	1=Execute
2052	1.04	.Pos.Oper.ctIVal		Direct open	1=Open
2053	1.05	.Pos.Oper.ctIVal		Direct close	1=Close

2.5.3 CTRL.CBCSWI2 Circuit breaker control (2)

Table 240: CTRL.CBCSWI2 Circuit breaker control (2)

0xA	CS	IEC 61850 name	SA name	Description	Values
		CTRL.CBCSWI2			
2156	8	.Pos.Oper.ctIVal		Select open	1=Select
2157	8.01	.Pos.Oper.ctIVal		Select close	1=Select

Table continues on next page

0xA	CS	IEC 61850 name	SA name	Description	Values
2158	8.02	.Pos.Oper.ctIVal		Cancel selection	1=Cancel
2159	8.03	.Pos.Oper.ctIVal		Execute selection	1=Execute
2160	8.04	.Pos.Oper.ctIVal		Direct open	1=Open
2161	8.05	.Pos.Oper.ctIVal		Direct close	1=Close

2.5.4 CTRL.DCXSWI1 Disconnecter control (1) – 29DS-1

Table 241: CTRL.DCXSWI1 Disconnecter control (1) – 29DS-1

0xA	CS	IEC 61850 name	SA name	Description	Values
		CTRL.DCCSWI1			
2144	7.00	.Pos.Oper.ctIVal		Select open	1=Select
2145	7.01	.Pos.Oper.ctIVal		Select close	1=Select
2146	7.02	.Pos.Oper.ctIVal		Cancel selection	1=Cancel
2147	7.03	.Pos.Oper.ctIVal		Execute selection	1=Execute
2148	7.04	.Pos.Oper.ctIVal		Direct open	1=Open
2149	7.05	.Pos.Oper.ctIVal		Direct close	1=Close

2.5.5 CTRL.DCXSWI2 Disconnecter control (2) – 29DS-2

Table 242: CTRL.DCXSWI2 Disconnecter control (2) – 29DS-2

0xA	CS	IEC 61850 name	SA name	Description	Values
		CTRL.DCCSWI2			
2150	7.06	.Pos.Oper.ctIVal		Select open	1=Select
2151	7.07	.Pos.Oper.ctIVal		Select close	1=Select
2152	7.08	.Pos.Oper.ctIVal		Cancel selection	1=Cancel
2153	7.09	.Pos.Oper.ctIVal		Execute selection	1=Execute
2154	7.10	.Pos.Oper.ctIVal		Direct open	1=Open
2155	7.11	.Pos.Oper.ctIVal		Direct close	1=Close

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

Table 243: CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1

0xA	CS	IEC 61850 name	SA name	Description	Values
		CTRL.ESXSWI1			
2054	1.06	.Pos.Oper.ctlVal		Select open	1=Select
2055	1.07	.Pos.Oper.ctlVal		Select close	1=Select
2056	1.08	.Pos.Oper.ctlVal		Cancel selection	1=Cancel
2057	1.09	.Pos.Oper.ctlVal		Execute selection	1=Execute
2058	1.10	.Pos.Oper.ctlVal		Direct open	1=Open
2059	1.11	.Pos.Oper.ctlVal		Direct close	1=Close

2.5.7 LD0.LDEV1 Protection relay's warm reset (1)

Table 244: LD0.LDEV1 Protection relay's warm reset (1)

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.LDEV1			
2080	3.00	.WrmStrCmd.Oper.ctlVal		Warm reboot of protection relay	1=Reboot

2.5.8 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". The setting mode "toggled" for local operation corresponds to "persistent" for remote operation.

Table 245: LD0.SPCGAPC1 Generic control point (16 pcs) (1) – SPC-1

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.SPCGAPC1			
2112	5.00	.SPCS01.ctlVal		Output 1 control	0/1=Off/On
2113	5.01	.SPCS02.ctlVal		Output 2 control	0/1=Off/On
2114	5.02	.SPCS03.ctlVal		Output 3 control	0/1=Off/On
2115	5.03	.SPCS04.ctlVal		Output 4 control	0/1=Off/On
2116	5.04	.SPCS05.ctlVal		Output 5 control	0/1=Off/On
2117	5.05	.SPCS06.ctlVal		Output 6 control	0/1=Off/On
2118	5.06	.SPCS07.ctlVal		Output 7 control	0/1=Off/On
2119	5.07	.SPCS08.ctlVal		Output 8 control	0/1=Off/On
2120	5.08	.SPCS09.ctlVal		Output 9 control	0/1=Off/On

Table continues on next page

0xA	CS	IEC 61850 name	SA name	Description	Values
2121	5.09	.SPCS10.ctIVal		Output 10 control	0/1=Off/On
2122	5.10	.SPCS11.ctIVal		Output 11 control	0/1=Off/On
2123	5.11	.SPCS12.ctIVal		Output 12 control	0/1=Off/On
2124	5.12	.SPCS13.ctIVal		Output 13 control	0/1=Off/On
2125	5.13	.SPCS14.ctIVal		Output 14 control	0/1=Off/On
2126	5.14	.SPCS15.ctIVal		Output 15 control	0/1=Off/On
2127	5.15	.SPCS16.ctIVal		Output 16 control	0/1=Off/On

2.5.9 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 246: *LD0.SPCGAPC2 Generic control point (16 pcs) (2) – SPC-2*

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.SPCGAPC2			
2128	6.00	.SPCS01.ctIVal		Output 1 control	0/1=Off/On
2129	6.01	.SPCS02.ctIVal		Output 2 control	0/1=Off/On
2130	6.02	.SPCS03.ctIVal		Output 3 control	0/1=Off/On
2131	6.03	.SPCS04.ctIVal		Output 4 control	0/1=Off/On
2132	6.04	.SPCS05.ctIVal		Output 5 control	0/1=Off/On
2133	6.05	.SPCS06.ctIVal		Output 6 control	0/1=Off/On
2134	6.06	.SPCS07.ctIVal		Output 7 control	0/1=Off/On
2135	6.07	.SPCS08.ctIVal		Output 8 control	0/1=Off/On
2136	6.08	.SPCS09.ctIVal		Output 9 control	0/1=Off/On
2137	6.09	.SPCS10.ctIVal		Output 10 control	0/1=Off/On
2138	6.10	.SPCS11.ctIVal		Output 11 control	0/1=Off/On
2139	6.11	.SPCS12.ctIVal		Output 12 control	0/1=Off/On
2140	6.12	.SPCS13.ctIVal		Output 13 control	0/1=Off/On
2141	6.13	.SPCS14.ctIVal		Output 14 control	0/1=Off/On
2142	6.14	.SPCS15.ctIVal		Output 15 control	0/1=Off/On
2143	6.15	.SPCS16.ctIVal		Output 16 control	0/1=Off/On

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

Table 247: *LD0.SRGAPC1 Set-reset (8 pcs) (1) – SR-1*

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.SRGAPC1			
2096	4.00	.Rs1.Oper.ctlVal		Reset flip-flop 1	1=Reset
2097	4.01	.Rs2.Oper.ctlVal		Reset flip-flop 2	1=Reset
2098	4.02	.Rs3.Oper.ctlVal		Reset flip-flop 3	1=Reset
2099	4.03	.Rs4.Oper.ctlVal		Reset flip-flop 4	1=Reset
2100	4.04	.Rs5.Oper.ctlVal		Reset flip-flop 5	1=Reset
2101	4.05	.Rs6.Oper.ctlVal		Reset flip-flop 6	1=Reset
2102	4.06	.Rs7.Oper.ctlVal		Reset flip-flop 7	1=Reset
2103	4.07	.Rs8.Oper.ctlVal		Reset flip-flop 8	1=Reset

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

Table 248: *LD0.SRGAPC2 Set-reset (8 pcs) (2) – SR-2*

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.SRGAPC2			
2104	4.08	.Rs1.Oper.ctlVal		Reset flip-flop 1	1=Reset
2105	4.09	.Rs2.Oper.ctlVal		Reset flip-flop 2	1=Reset
2106	4.10	.Rs3.Oper.ctlVal		Reset flip-flop 3	1=Reset
2107	4.11	.Rs4.Oper.ctlVal		Reset flip-flop 4	1=Reset
2108	4.12	.Rs5.Oper.ctlVal		Reset flip-flop 5	1=Reset
2109	4.13	.Rs6.Oper.ctlVal		Reset flip-flop 6	1=Reset
2110	4.14	.Rs7.Oper.ctlVal		Reset flip-flop 7	1=Reset
2111	4.15	.Rs8.Oper.ctlVal		Reset flip-flop 8	1=Reset

2.5.12 Unmapped control points

Table 249: *Unmapped control points*

IEC 61850 name	Description	Value
LD0.LLN0.MeasStatRs.Oper.ctlVal	Reset all min. and max. demands	1=Reset
LD0.LLN0.PQRs.Oper.ctlVal	Reset all power quality data	1=Reset
LD0.FLTRFRC1.RcdRs.Oper.ctlVal	Reset fault record data	1=Reset

2.5.13 Unmapped controls

2.5.13.1 LD0.UDFCNT1 Multipurpose generic up-down counter (1) – CTR-1

Table 250: LD0.UDFCNT1 Multipurpose generic up-down counter (1) – CTR-1

IEC 61850 name	SA name	Description	Values
RsCnt.Oper.ctlVal	Reset counter	Resets counter value	0=Cancel; 1=Reset
LodCnt.Oper.ctlVal	Load counter	Loads the counter to preset value	0=Cancel; 1=Load

2.5.13.2 LD0.UDFCNT2 Multipurpose generic up-down counter (2) – CTR-2

Table 251: LD0.UDFCNT2 Multipurpose generic up-down counter (2) – CTR-2

IEC 61850 name	SA name	Description	Values
RsCnt.Oper.ctlVal	Reset counter	Resets counter value	0=Cancel; 1=Reset
LodCnt.Oper.ctlVal	Load counter	Loads the counter to preset value	0=Cancel; 1=Load

2.5.13.3 LD0.UDFCNT3 Multipurpose generic up-down counter (3) – CTR-3

Table 252: LD0.UDFCNT3 Multipurpose generic up-down counter (3) – CTR-3

IEC 61850 name	SA name	Description	Values
RsCnt.Oper.ctlVal	Reset counter	Resets counter value	0=Cancel; 1=Reset
LodCnt.Oper.ctlVal	Load counter	Loads the counter to preset value	0=Cancel; 1=Load

2.5.13.4 LD0.UDFCNT4 Multipurpose generic up-down counter (4) – CTR-4

Table 253: LD0.UDFCNT4 Multipurpose generic up-down counter (4) – CTR-4

IEC 61850 name	SA name	Description	Values
RsCnt.Oper.ctlVal	Reset counter	Resets counter value	0=Cancel; 1=Reset
LodCnt.Oper.ctlVal	Load counter	Loads the counter to preset value	0=Cancel; 1=Load

Section 3 Glossary

ANSI	American National Standards Institute
EMC	Electromagnetic compatibility
HSO	High-speed output
IEC 61850	International standard for substation communication and modeling
IEC 61850-9-2	A communication protocol based on the IEC 61850 standard series
IED	Intelligent electronic device
LED	Light-emitting diode
LHMI	Local human-machine interface
Modbus	A serial communication protocol developed by the Modicon company in 1979. Originally used for communication in PLCs and RTU devices.
PCM600	Protection and Control IED Manager



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