



Relion® 615 series

Capacitor Bank Protection and Control REV615 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 IED. 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 IED 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

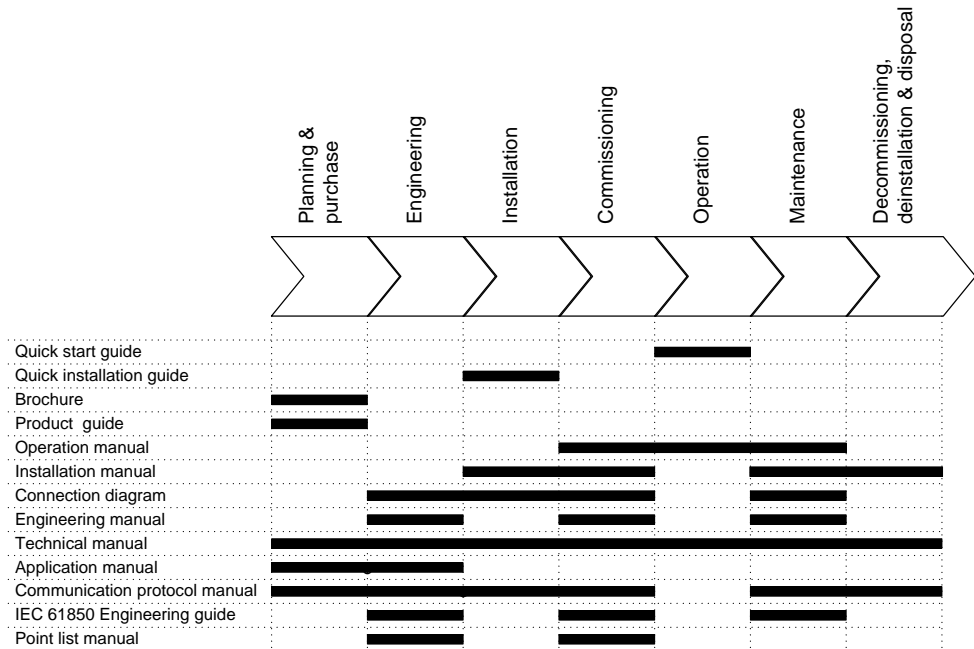


Figure 1: The intended use of documents during the product life cycle



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

1.3.2 Document revision history

Document revision/date	Product version	History
A/2014-01-24	5.0	First release



Download the latest documents from the ABB Website <http://www.abb.com/substationautomation>.

1.3.3 Related documentation

Name of the document	Document ID
Modbus Communication Protocol Manual	1MRS756468

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 non-volatile 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 "On" and "Off".
- IED input/output messages and monitored data names are shown in Courier font.
When the function starts, the START output is set to TRUE.
- This document assumes that the parameter setting visibility is "Advanced".

1.4.3

Functions, codes and symbols

Table 1: Functions included in the IED

Function	IEC 61850	IEC 60617	IEC-ANSI
Protection			
Three-phase non-directional overcurrent protection, low stage	PHLPTOC1	3I> (1)	51P-1 (1)
Three-phase non-directional overcurrent protection, high stage	PHHPTOC1	3I>> (1)	51P-2 (1)
	PHHPTOC2	3I>> (2)	51P-2 (2)
Three-phase non-directional overcurrent protection, instantaneous stage	PHIPTOC1	3I>>> (1)	50P/51P (1)
Non-directional earth-fault protection, low stage	EFLPTOC1	Io> (1)	51N-1 (1)
	EFLPTOC2	Io> (2)	51N-1 (2)
Non-directional earth-fault protection, high stage	EFHPTOC1	Io>> (1)	51N-2 (1)
Non-directional earth-fault protection, instantaneous stage	EFIPTOC1	Io>>> (1)	50N/51N (1)
Directional earth-fault protection, low stage	DEFLPDEF1	Io> -> (1)	67N-1 (1)
	DEFLPDEF2	Io> -> (2)	67N-1 (2)
Directional earth-fault protection, high stage	DEFHPDEF1	Io>> -> (1)	67N-2 (1)
Negative-sequence overcurrent protection	NSPTOC1	I2> (1)	46 (1)
	NSPTOC2	I2> (2)	46 (2)
Residual overvoltage protection	ROVPTOV1	Uo> (1)	59G (1)
	ROVPTOV2	Uo> (2)	59G (2)
	ROVPTOV3	Uo> (3)	59G (3)
Three-phase undervoltage protection	PHPTUV1	3U< (1)	27 (1)
	PHPTUV2	3U< (2)	27 (2)
Three-phase overvoltage protection	PHPTOV1	3U> (1)	59 (1)
	PHPTOV2	3U> (2)	59 (2)
Positive-sequence undervoltage protection	PSPTUV1	U1< (1)	47U+ (1)
Negative-sequence overvoltage protection	NSPTOV1	U2> (1)	47O- (1)
Three-phase thermal overload protection for power transformers, two time constants	T2PTTR1	3Ith>T (1)	49T (1)
Circuit breaker failure protection	CCBRBRF1	3I>/Io>BF (1)	51BF/51NBF (1)
Master trip	TRPPTRC1	Master Trip (1)	94/86 (1)
	TRPPTRC2	Master Trip (2)	94/86 (2)
	TRPPTRC3	Master Trip (3)	94/86 (3)
	TRPPTRC4	Master Trip (4)	94/86 (4)
	TRPPTRC5	Master Trip (5)	94/86 (5)
Arc protection	ARCSARC1	ARC (1)	50L/50NL (1)
	ARCSARC2	ARC (2)	50L/50NL (2)
	ARCSARC3	ARC (3)	50L/50NL (3)

Table continues on next page

Function	IEC 61850	IEC 60617	IEC-ANSI
Multi-purpose protection ¹⁾	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)
Three phase overload protection for shunt capacitor banks	COLPTOC1	3I> 3I< (1)	51C/37 (1)
Current unbalance protection for SCB	CUBPTOC1	dI>C (1)	51NC-1 (1)
Three-phase current unbalance protection for H-bridge SCB	HCUBPTOC1	3dI>C (1)	51NC-2 (1)
Capacitor bank switching resonance protection, current based	SRCPTOC1	TD> (1)	55TD (1)
Power quality			
Current total demand distortion	CMHAI1	PQM3I (1)	PQM3I (1)
Voltage total harmonic distortion	VMHAI1	PQM3U (1)	PQM3V (1)
Voltage variation	PHQVVR1	PQMU (1)	PQMV (1)
Control			
Circuit-breaker control	CBXCBR1	I <-> O CB (1)	I <-> O CB (1)
Disconnecter control	DCXSWI1	I <-> O DCC (1)	I <-> O DCC (1)
	DCXSWI2	I <-> O DCC (2)	I <-> O DCC (2)
Earthing switch control	ESXSWI1	I <-> O ESC (1)	I <-> O ESC (1)
Disconnecter position indication	DCSXSWI1	I <-> O DC (1)	I <-> O DC (1)
	DCSXSWI2	I <-> O DC (2)	I <-> O DC (2)
	DCSXSWI3	I <-> O DC (3)	I <-> O DC (3)
Earthing switch indication	ESSXSWI1	I <-> O ES (1)	I <-> O ES (1)
	ESSXSWI2	I <-> O ES (2)	I <-> O ES (2)
Condition monitoring			
Circuit-breaker condition monitoring	SSCBR1	CBCM (1)	CBCM (1)
Table continues on next page			

Function	IEC 61850	IEC 60617	IEC-ANSI
Trip circuit supervision	TCSSCBR1	TCS (1)	TCM (1)
	TCSSCBR2	TCS (2)	TCM (2)
Current circuit supervision	CCRDIF1	MCS 3I (1)	MCS 3I (1)
Fuse failure supervision	SEQRFUF1	FUSEF (1)	60 (1)
Runtime counter for machines and devices	MDSOPT1	OPTS (1)	OPTM (1)
Measurement			
Disturbance recorder	RDRE1	DR (1)	DFR (1)
Load profile record	LDPMSTA1	LOADPROF (1)	LOADPROF (1)
Three-phase current measurement	CMMXU1	3I (1)	3I (1)
Sequence current measurement	CSMSQI1	I1, I2, I0 (1)	I1, I2, I0 (1)
Residual current measurement	RESCMMXU1	Io (1)	In (1)
Three-phase voltage measurement	VMMXU1	3U (1)	3V (1)
Residual voltage measurement	RESVMMXU1	Uo (1)	Vn (1)
	RESVMMXU2	Uo (2)	Vn (2)
Sequence voltage measurement	VSMSQI1	U1, U2, U0 (1)	V1, V2, V0 (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 (1)
IEC 61850-9-2 LE (Voltage sharing) ²⁾	SMVSENDER	SMVSENDER	SMVSENDER

- 1) For example, used for RTD/mA based protection or analog GOOSE
2) Only available with redundant Ethernet communication modules

Section 2 Modbus data mappings

2.1 Overview

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

The majority of the Modbus data points are valid for all standard configurations. Some data points are standard configuration-dependent or optional application-dependent and thus not available in each IED. The unavailable, that means, unused, data points always return value 0 when they are read. The configuration-dependent and optional data do not overlap.

2.2 Supported functions in REV615

Table 2: *Supported functions*

Function	IEC 61850	A	B
		VE01	VE02
Protection¹⁾			
Three-phase non-directional overcurrent protection, low stage	PHLPTOC	1	1
Three-phase non-directional overcurrent protection, high stage	PHHPTOC	2	2
Three-phase non-directional overcurrent protection, instantaneous stage	PHIPTOC	1	1
Non-directional earth-fault protection, low stage	EFLPTOC	2 ²⁾	
Non-directional earth-fault protection, high stage	EFHPTOC	1 ²⁾	1 ²⁾
Non-directional earth-fault protection, instantaneous stage	EFIPTOC	1 ²⁾	
Directional earth-fault protection, low stage	DEFLPDEF		2 ²⁾³⁾
Directional earth-fault protection, high stage	DEFHPDEF		1 ²⁾³⁾
Negative-sequence overcurrent protection	NSPTOC	2	2
Residual overvoltage protection	ROVPTOV		3 ³⁾⁴⁾⁵⁾
Three-phase undervoltage protection	PHPTUV		2
Three-phase overvoltage protection	PHPTOV		2
Positive-sequence undervoltage protection	PSPTUV		1
Negative-sequence overvoltage protection	NSPTOV		1
Three-phase thermal overload protection for power transformers, two time constants	T2PTTR	1	1
Circuit breaker failure protection	CCBRBRF	1	1
Master trip ⁶⁾	TRPPTRC	2 ⁽⁵⁾	2 ⁽⁵⁾
Arc protection	ARCSARC	(3)	(3)
Multi-purpose protection ⁴⁾⁷⁾	MAPGAPC	18	18
Three phase overload protection for shunt capacitor banks	COLPTOC	1	1
Current unbalance protection for SCB ⁸⁾	CUBPTOC	1 ⁴⁾	1
Three-phase current unbalance protection for H-bridge SCB ⁸⁾	HCUBPTOC	1	1 ⁴⁾
Table continues on next page			

Section 2 Modbus data mappings

1MRS757947 A

Function	IEC 61850	A	B
		VE01	VE02
Capacitor bank switching resonance protection, current based	SRCPTOC	1	1
Power quality			
Current total demand distortion	CMHAI	(1) ⁹⁾	(1) ¹⁰⁾
Voltage total harmonic distortion	VMHAI		(1) ¹⁰⁾
Voltage variation	PHQVVR		(1) ¹⁰⁾
Control			
Circuit-breaker control	CBXCBR	1	1
Disconnecter control ⁴⁾	DCXSWI	2	2
Earthing switch control ⁴⁾	ESXSWI	1	1
Disconnecter position indication ⁴⁾	DCSXSXI	3	3
Earthing switch indication ⁴⁾	ESSXSXI	2	2
Condition monitoring			
Circuit-breaker condition monitoring	SSCBBR	1	1
Trip circuit supervision	TCSSCBBR	2	2
Current circuit supervision	CCRDIF	1	1
Fuse failure supervision	SEQRFUF		1
Runtime counter for machines and devices ⁴⁾	MDSOPT	1	1
Measurement			
Disturbance recorder	RDRE	1	1
Load profile record	LDPMSTA	1	1
Three-phase current measurement	CMMXU	1	1
Sequence current measurement	CSMSQI	1	1
Residual current measurement	RESCMMXU	1	1
Three-phase voltage measurement	VMMXU		1
Residual voltage measurement ¹¹⁾	RESVMMXU		2
Sequence voltage measurement	VSMSQI		1 ⁴⁾
Three-phase power and energy measurement	PEMMXU		1
RTD/mA measurement	XRGGIO130	(1)	(1)
Frequency measurement	FMMXU		1
IEC 61850-9-2 LE (Voltage sharing) ¹²⁾	SMVSENDER		(1)
1, 2, ... = number of included instances () = optional			

- 1) The instances of a protection function represent the number of identical protection function blocks available in the standard configuration.
- 2) Io selectable by parameter, "Io measured" as default
- 3) Uo selectable by parameter, "Uo measured" as default
- 4) Must be added with Application Configuration to be available in Signal Matrix and in IED
- 5) "Uob measured" is always used for unbalance protection with unearthed single Y-connected capacitor bank.
- 6) Master trip included and connected to the corresponding HSO in the configuration only when the BIO0007 module is used. If the ARC option is selected additionally, ARCSARC is connected to the corresponding master trip input in the configuration.
- 7) Multi-purpose protection is used, for example, for RTD/mA-based protection or analog GOOSE.
- 8) The Iunb measurement values are taken from this block and put in the Measurement view.
- 9) Power quality option includes only current total demand distortion.
- 10) Power quality option includes current total demand distortion, voltage total harmonic distortion and voltage variation.
- 11) Unbalance voltage measurement for capacitor bank
- 12) Only available with COM0031-COM0034

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	.LocRem.stVal.Station	-	Station state	1=Station
		DR.RDRE1			
2722	170.02	.RcdMade.stVal	-	DR recording made	1=Made
2723	170.03	.mcd			
		LD0.LLN0			
2726	170.06	.SetSeld.stVal		Settings reserved	1=Reserved
2727	170.07	.mcd			
2728	170.08	.SetChg.stVal		Settings changed	1=Changed
2729	170.09	.mcd			

2.3.1.2 LD0.LEDPTRC1 Global conditioning (1)

Table 5: *LD0.LEDPTRC1 Global conditioning (1)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LEDPTRC1			
2736	171.00	.Str.general	-	Global start	1=Start
2737	171.01	.mcd			
2738	171.02	.Op.general	-	Global operate	1=Operate
2739	171.03	.mcd			

2.3.1.3 LD0.TRPPTRC1 Protection trip conditioning (1)

Table 6: LD0.TRPPTRC1 Protection trip conditioning (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			

2.3.1.4 LD0.TRPPTRC2 Protection trip conditioning (2)

Table 7: LD0.TRPPTRC2 Protection trip conditioning (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			

2.3.1.5 LD0.CMMXU1 Phase current limit supervision (1)

Table 8: LD0.CMMXU1 Phase current limit supervision (1)

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			
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			

2.3.1.6 LD0.RESCMMXU1 Residual current limit supervision (1)

Table 9: LD0.RESCMMXU1 Residual current limit supervision (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			

2.3.1.7 LD0.RESVMMXU1 Residual voltage limit supervision (1)

Table 10: LD0.RESVMMXU1 Residual voltage limit supervision (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			

2.3.1.8 LD0.LEDGGIO1 Indication LED states OFF/ColorX

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

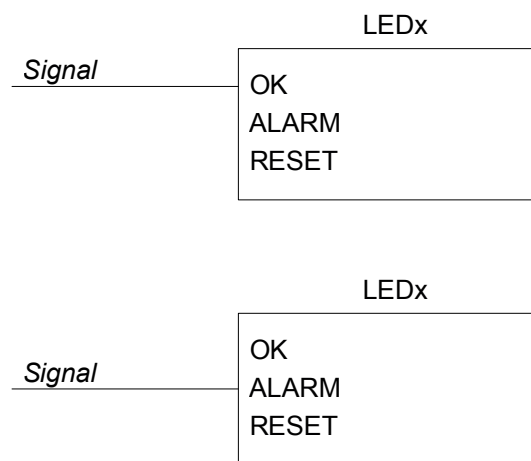


Figure 2: Signal wired to either OK or Alarm input

Table 11: LD0.LEDGGIO1 Indication LED states OFF/ColorX

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LEDGGIO1			
2768	173.00	.ISCSO1.stVal	-	LED 1 state	0/1=Off/Color
2769	173.01	.ISCSO2.stVal	-	LED 2 state	0/1=Off/Color
2770	173.02	.ISCSO3.stVal	-	LED 3 state	0/1=Off/Color
2771	173.03	.ISCSO4.stVal	-	LED 4 state	0/1=Off/Color
2772	173.04	.ISCSO5.stVal	-	LED 5 state	0/1=Off/Color
2773	173.05	.ISCSO6.stVal	-	LED 6 state	0/1=Off/Color
2774	173.06	.ISCSO7.stVal	-	LED 7 state	0/1=Off/Color
2775	173.07	.ISCSO8.stVal	-	LED 8 state	0/1=Off/Color
2776	173.08	.ISCSO9.stVal	-	LED 9 state	0/1=Off/Color
2777	173.09	.ISCSO10.stVal	-	LED 10 state	0/1=Off/Color
2778	173.10	.ISCSO11.stVal	-	LED 11 state	0/1=Off/Color
2779	173.11	<reserved>			0

2.3.1.9

LD0.LEDGGIO1 Indication LED states Color1/Color2

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

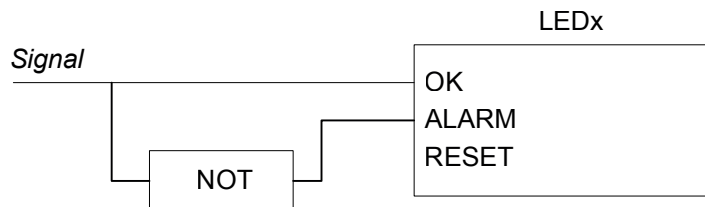


Figure 3: Signal wired to both OK and ALARM inputs – inverted to the other



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

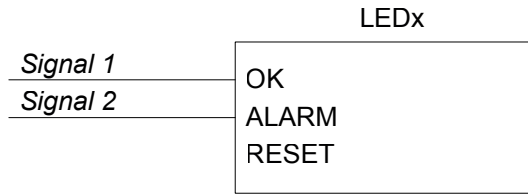


Figure 4: Separate signals wired to OK and ALARM inputs

Table 12: LD0.LEDGGIO1 Indication LED states Color1/Color2

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LEDGGIO1			
3520	220.00	.ISCSO1.stVal	-	LED 1 state	0/1=Color1/2
3521	220.01	.ISCSO2.stVal	-	LED 2 state	0/1=Color1/2
3522	220.02	.ISCSO3.stVal	-	LED 3 state	0/1=Color1/2
3523	220.03	.ISCSO4.stVal	-	LED 4 state	0/1=Color1/2
3524	220.04	.ISCSO5.stVal	-	LED 5 state	0/1=Color1/2
3525	220.05	.ISCSO6.stVal	-	LED 6 state	0/1=Color1/2
3526	220.06	.ISCSO7.stVal	-	LED 7 state	0/1=Color1/2
3527	220.07	.ISCSO8.stVal	-	LED 8 state	0/1=Color1/2
3528	220.08	.ISCSO9.stVal	-	LED 9 state	0/1=Color1/2
3529	220.09	.ISCSO10.stVal	-	LED 10 state	0/1=Color1/2
3530	220.10	.ISCSO11.stVal	-	LED 11 state	0/1=Color1/2
3531	220.11	<reserved>			0

2.3.1.10 LD0.TCSSCBR1 Trip circuit supervision (1)

Table 13: LD0.TCSSCBR1 Trip circuit supervision (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.TCSSCBR1			
2780	173.12	.CirAlm.stVal	ALARM	Supervision alarm	1=Alarm
2781	173.13	.mcd			

2.3.1.11 LD0.TCSSCBR2 Trip circuit supervision (2)

Table 14: LD0.TCSSCBR2 Trip circuit supervision (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.TCSSCBR2			
2782	173.14	.CirAlm.stVal	ALARM	Supervision alarm	1=Alarm
2783	173.15	.mcd			

2.3.1.12 LD0.VMMXU1 Phase voltage limit supervision (1)

Table 15: LD0.VMMXU1 Phase voltage limit supervision (1)

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			

2.3.1.13 CTRL.DCSXSWI1 Disconnecter (1) mom. position

Table 16: CTRL.DCSXSWI1 Disconnecter (1) mom. position

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)

2.3.1.14 CTRL.DCSXSWI2 Disconnecter (2) mom. position

Table 17: CTRL.DCSXSWI2 Disconnecter (2) mom. position

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)

2.3.1.15 CTRL.DCSXSWI3 Disconnecter (3) mom. position

Table 18: CTRL.DCSXSWI3 Disconnecter (3) mom. position

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)

2.3.1.16 CTRL.ESSXSWI1 Earth switch (1) mom. position**Table 19:** CTRL.ESSXSWI1 Earth switch (1) mom. position

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)

2.3.1.17 CTRL.CBCSWI1 Circuit breaker (1) mom. position**Table 20:** 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)

2.3.1.18 CTRL.ESSXSWI2 Earth switch (2) mom. position**Table 21:** CTRL.ESSXSWI2 Earth switch (2) mom. position

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)

2.3.1.19 CTRL.CBCSWI1 Circuit breaker (1) mom+mcd position**Table 22:** 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			

2.3.1.20 CTRL.CBCILO1 Circuit breaker (1) enable signals

Table 23: CTRL.CBCILO1 Circuit breaker (1) enable signals

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

2.3.1.21 CTRL.CCBRBRF1 Circuit breaker (1) failure protection

Table 24: CTRL.CCBRBRF1 Circuit breaker (1) failure protection

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.CCBRBRF1			
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			

2.3.1.22 CTRL.CBXCBR1 Circuit breaker (1) blocking signals

Table 25: CTRL.CBXCBR1 Circuit breaker (1) blocking signals

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.CBXCBR1			
2834	177.02	.ItlByPss.stVal	ITL_BYPASS	Interlock bypass	1=Bypass
2835	177.03	.mcd			
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			

2.3.1.23 LD0.SSCBR1 Circuit breaker (1) condition monitoring

Table 26: LD0.SSCBR1 Circuit breaker (1) condition monitoring

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
2850	178.02	.SprChaAlm.stVal	SPR_CHR_ALM	Spring charge alarm	1=Alarm

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
2851	178.03	.OpNumAlm.stVal	OPR_ALM	CB operations alarm	1=Alarm
2852	178.04	.OpNumLO.stVal	OPR_LO	CB operations lockout	1=Lockout
2853	178.05	.LonTmAlm.stVal	MON_ALM	CB inactive alarm	1=Alarm
2854	178.06	.PresAlm.stVal	PRES_ALM	Low pressure alarm	1=Alarm
2855	178.07	.PresLO.stVal	PRES_LO	Low pressure lockout	1=Lockout
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	.CBLifAlm.stVal	CB_LIFE_ALM	CB lifetime alarm	1=Alarm

2.3.1.24 LD0.PHLPTOC1 Phase overcurrent protection low stage (1)

Table 27: LD0.PHLPTOC1 Phase overcurrent protection low stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHLPTOC1			
2880	180.00	.Str.general	START	General start	1=Start
2881	180.01	.mcd			
2882	180.02	.Str.phsA		phsA start	1=Start
2883	180.03	.mcd			
2884	180.04	.Str.phsB		phsB start	1=Start
2885	180.05	.mcd			
2886	180.06	.Str.phsC		phsC start	1=Start
2887	180.07	.mcd			
2888	180.08	.Op.general	OPERATE	General operate	1=Operate
2889	180.09	.mcd			

2.3.1.25 LD0.PHHPTOC1 Phase overcurrent protection high stage (1)

Table 28: LD0.PHHPTOC1 Phase overcurrent protection high stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHHPTOC1			
2890	180.10	.Str.general	START	General start	1=Start
2891	180.11	.mcd			
2892	180.12	.Str.phsA		phsA start	1=Start
2893	180.13	.mcd			
2894	180.14	.Str.phsB		phsB start	1=Start
2895	180.15	.mcd			
2896	181.00	.Str.phsC		phsC start	1=Start
2897	181.01	.mcd			
2898	181.02	.Op.general	OPERATE	General operate	1=Operate
2899	181.03	.mcd			

2.3.1.26 LD0.PHHPTOC2 Phase overcurrent protection high stage (2)

Table 29: LD0.PHHPTOC2 Phase overcurrent protection high stage (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHHPTOC2			
2900	181.04	.Str.general	START	General start	1=Start
2901	181.05	.mcd			
2902	181.06	.Str.phsA		phsA start	1=Start
2903	181.07	.mcd			
2904	181.08	.Str.phsB		phsB start	1=Start
2905	181.09	.mcd			
2906	181.10	.Str.phsC		phsC start	1=Start
2907	181.11	.mcd			
2908	181.12	.Op.general	OPERATE	General operate	1=Operate
2909	181.13	.mcd			

2.3.1.27 LD0.PHIPTOC1 Phase overcurrent protection instantaneous stage (1)

Table 30: LD0.PHIPTOC1 Phase overcurrent protection instantaneous stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHIPTOC1			
2910	181.14	.Str.general	START	General start	1=Start
2911	181.15	.mcd			
2912	182.00	.Str.phsA		phsA start	1=Start
2913	182.01	.mcd			
2914	182.02	.Str.phsB		phsB start	1=Start
2915	182.03	.mcd			
2916	182.04	.Str.phsC		phsC start	1=Start
2917	182.05	.mcd			
2918	182.06	.Op.general	OPERATE	General operate	1=Operate
2919	182.07	.mcd			

2.3.1.28 LD0.DEFLPDEF1 Directional earth-fault protection low stage (1)

Table 31: LD0.DEFLPDEF1 Directional earth-fault protection low stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DEFLPTOC1			
2920	182.08	.Str.general	START	Stage start	1=Start
2921	182.09	.mcd			
2922	182.10	.Op.general	OPERATE	Stage operate	1=Operate
2923	182.11	.mcd			

2.3.1.29 LD0.DEFLPDEF2 Directional earth-fault protection low stage (2)**Table 32:** *LD0.DEFLPDEF2 Directional earth-fault protection low stage (2)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DEFLPTOC2			
2924	182.12	.Str.general	START	Stage start	1=Start
2925	182.13	.mcd			
2926	182.14	.Op.general	OPERATE	Stage operate	1=Operate
2927	182.15	.mcd			

2.3.1.30 LD0.DEFHPDEF1 Directional earth-fault protection high stage (1)**Table 33:** *LD0.DEFHPDEF1 Directional earth-fault protection high stage (1)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DEFHPTOC1			
2928	183.00	.Str.general	START	Stage start	1=Start
2929	183.01	.mcd			
2930	183.02	.Op.general	OPERATE	Stage operate	1=Operate
2931	183.03	.mcd			

2.3.1.31 LD0.EFLPTOC1 Non-directional earth-fault protection low stage (1)**Table 34:** *LD0.EFLPTOC1 Non-directional earth-fault protection low stage (1)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFLPTOC1			
2932	183.04	.Str.general	START	Stage start	1=Start
2933	183.05	.mcd			
2934	183.06	.Op.general	OPERATE	Stage operate	1=Operate
2935	183.07	.mcd			

2.3.1.32 LD0.EFLPTOC2 Non-directional earth-fault protection low stage (2)**Table 35:** *LD0.EFLPTOC2 Non-directional earth-fault protection low stage (2)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFLPTOC2			
2936	183.08	.Str.general	START	Stage start	1=Start
2937	183.09	.mcd			
2938	183.10	.Op.general	OPERATE	Stage operate	1=Operate
2939	183.11	.mcd			

2.3.1.33 LD0.EFHPTOC1 Non-directional earth-fault protection high stage (1)

Table 36: LD0.EFHPTOC1 Non-directional earth-fault protection high stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFHPTOC1			
2940	183.12	.Str.general	START	Stage start	1=Start
2941	183.13	.mcd			
2942	183.14	.Op.general	OPERATE	Stage operate	1=Operate
2943	183.15	.mcd			

2.3.1.34 LD0.EFIPTOC1 Non-directional earth-fault protection instantaneous stage (1)

Table 37: LD0.EFIPTOC1 Non-directional earth-fault protection instantaneous stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFIPTOC1			
2944	184.00	.Str.general	START	Stage start	1=Start
2945	184.01	.mcd			
2946	184.02	.Op.general	OPERATE	Stage operate	1=Operate
2947	184.03	.mcd			

2.3.1.35 LD0.NSPTOC1 Negative-sequence overcurrent protection (1)

Table 38: LD0.NSPTOC1 Negative-sequence overcurrent protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.NSPTOC1			
2956	184.12	.Str.general	START	Stage start	1=Start
2957	184.13	.mcd			
2958	184.14	.Op.general	OPERATE	Stage operate	1=Operate
2959	184.15	.mcd			

2.3.1.36 LD0.NSPTOC2 Negative-sequence overcurrent protection (2)

Table 39: LD0.NSPTOC2 Negative-sequence overcurrent protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.NSPTOC2			
2960	185.00	.Str.general	START	Stage start	1=Start
2961	185.01	.mcd			
2962	185.02	.Op.general	OPERATE	Stage operate	1=Operate
2963	185.03	.mcd			

2.3.1.37 LD0.ARCSARC1 Fault arc protection (1)**Table 40:** *LD0.ARCSARC1 Fault arc protection (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	OPERATE	Stage operate	1=Operate
2983	186.07	.mcd			

2.3.1.38 LD0.ARCSARC2 Fault arc protection (2)**Table 41:** *LD0.ARCSARC2 Fault arc protection (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	OPERATE	Stage operate	1=Operate
2989	186.13	.mcd			

2.3.1.39 LD0.ARCSARC3 Fault arc protection (3)**Table 42:** *LD0.ARCSARC3 Fault arc protection (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	OPERATE	Stage operate	1=Operate
2995	187.03	.mcd			

2.3.1.40 LD0.SEQRFUF1 Fuse failure protection (1)

Table 43: LD0.SEQRFUF1 Fuse failure protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SEQRFUF1			
2996	187.04	.Str.general	FUSEF_U	Start	1=Start
2997	187.05	.mcd			
2998	187.06	.Str3Ph.general	FUSEF_3PH	3-phase start	1=Start
2999	187.07	.mcd			

2.3.1.41 CTRL.CCRDIF1 Current circuit failure detection (1)

Table 44: CTRL.CCRDIF1 Current circuit failure detection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.CCRDIF1			
3002	187.10	.Alm.stVal	ALARM	Alarm	1=Alarm
3003	187.11	.mcd			
3004	187.12	.Op.general	FAIL	Failure operate	1=Operate
3005	187.13	.mcd			

2.3.1.42 LD0.PHPTOV1 Phase overvoltage protection (1)

Table 45: LD0.PHPTOV1 Phase overvoltage protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTOV1			
3088	193.00	.Str.general	START	General start	1=Start
3089	193.01	.mcd			
3090	193.02	.Str.phsA		phsA start	1=Start
3091	193.03	.mcd			
3092	193.04	.Str.phsB		phsB start	1=Start
3093	193.05	.mcd			
3094	193.06	.Str.phsC		phsC start	1=Start
3095	193.07	.mcd			
3096	193.08	.Op.general	OPERATE	General operate	1=Operate
3097	193.09	.mcd			

2.3.1.43 LD0.PHPTOV2 Phase overvoltage protection (2)**Table 46:** *LD0.PHPTOV2 Phase overvoltage protection (2)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTOV2			
3098	193.10	.Str.general	START	General start	1=Start
3099	193.11	.mcd			
3100	193.12	.Str.phsA		phsA start	1=Start
3101	193.13	.mcd			
3102	193.14	.Str.phsB		phsB start	1=Start
3103	193.15	.mcd			
3104	194.00	.Str.phsC		phsC start	1=Start
3105	194.01	.mcd			
3106	194.02	.Op.general	OPERATE	General operate	1=Operate
3107	194.03	.mcd			

2.3.1.44 LD0.PSPTUV1 Positive-sequence undervoltage protection (1)**Table 47:** *LD0.PSPTUV1 Positive-sequence undervoltage protection (1)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PSPTUV1			
3118	194.14	.Str.general	START	General start	1=Start
3119	194.15	.mcd			
3120	195.00	.Str.phsA		phsA start	1=Start
3121	195.01	.mcd			
3122	195.02	.Str.phsB		phsB start	1=Start
3123	195.03	.mcd			
3124	195.04	.Str.phsC		phsC start	1=Start
3125	195.05	.mcd			
3126	195.06	.Op.general	OPERATE	General operate	1=Operate
3127	195.07	.mcd			

2.3.1.45 LD0.NSPTOV1 Negative-sequence overvoltage protection (1)**Table 48:** *LD0.NSPTOV1 Negative-sequence overvoltage protection (1)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.NSPTOV1			
3128	195.08	.Str.general	START	General start	1=Start
3129	195.09	.mcd			
3130	195.10	.Str.phsA		phsA start	1=Start

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3131	195.11	.mcd			
3132	195.12	.Str.phsB		phsB start	1=Start
3133	195.13	.mcd			
3134	195.14	.Str.phsC		phsC start	1=Start
3135	195.15	.mcd			
3136	196.00	.Op.general	OPERATE	General operate	1=Operate
3137	196.01	.mcd			

2.3.1.46 LD0.PHPTUV1 Phase undervoltage protection (1)

Table 49: LD0.PHPTUV1 Phase undervoltage protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTUV1			
3138	196.02	.Str.general	START	General start	1=Start
3139	196.03	.mcd			
3140	196.04	.Str.phsA		phsA start	1=Start
3141	196.05	.mcd			
3142	196.06	.Str.phsB		phsB start	1=Start
3143	196.07	.mcd			
3144	196.08	.Str.phsC		phsC start	1=Start
3145	196.09	.mcd			
3146	196.10	.Op.general	OPERATE	General operate	1=Operate
3147	196.11	.mcd			

2.3.1.47 LD0.PHPTUV2 Phase undervoltage protection (2)

Table 50: LD0.PHPTUV2 Phase undervoltage protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTUV2			
3148	196.12	.Str.general	START	General start	1=Start
3149	196.13	.mcd			
3150	196.14	.Str.phsA		phsA start	1=Start
3151	196.15	.mcd			
3152	197.00	.Str.phsB		phsB start	1=Start
3153	197.01	.mcd			
3154	197.02	.Str.phsC		phsC start	1=Start
3155	197.03	.mcd			
3156	197.04	.Op.general	OPERATE	General operate	1=Operate
3157	197.05	.mcd			

2.3.1.48 LD0.ROVPTOV1 Residual overvoltage protection (1)**Table 51:** *LD0.ROVPTOV1 Residual overvoltage protection (1)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.ROVPTOV1			
3168	198.00	.Str.general	START	General start	1=Start
3169	198.01	.mcd			
3170	198.02	.Op.general	OPERATE	General operate	1=Operate
3171	198.03	.mcd			

2.3.1.49 LD0.ROVPTOV2 Residual overvoltage protection (2)**Table 52:** *LD0.ROVPTOV2 Residual overvoltage protection (2)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.ROVPTOV2			
3172	198.04	.Str.general	START	General start	1=Start
3173	198.05	.mcd			
3174	198.06	.Op.general	OPERATE	General operate	1=Operate
3175	198.07	.mcd			

2.3.1.50 LD0.ROVPTOV3 Residual overvoltage protection (3)**Table 53:** *LD0.ROVPTOV3 Residual overvoltage protection (3)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.ROVPTOV3			
3176	198.08	.Str.general	START	General start	1=Start
3177	198.09	.mcd			
3178	198.10	.Op.general	OPERATE	General operate	1=Operate
3179	198.11	.mcd			

2.3.1.51 LD0.CMHAI1 Current total demand distortion (1)**Table 54:** *LD0.CMHAI1 Current total demand distortion (1)*

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

2.3.1.52 LD0.VMHA11 Voltage total demand distortion (1)

Table 55: LD0.VMHA11 Voltage total demand distortion (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.VMHA11			
3318	207.06	.Alm.stVal	ALARM		1=Alarm
3319	207.07	.mcd			

2.3.1.53 LD0.PH1QVVR1 PQ - Voltage variation signals (1)

Table 56: LD0.PH1QVVR1 PQ - Voltage variation signals (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			

2.3.1.54 CTRL.DCXSWI1 Controllable discon. (1) mom. position data

Table 57: CTRL.DCXSWI1 Controllable discon. (1) mom. position data

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			
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

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3481	217.09	.mcd			
3482	217.10	.ItlByPss.stVal	ITL_BYPASS	Interlock bypass	1=Bypass
3483	217.11	.mcd			

2.3.1.55 CTRL.DCXSWI2 Controllable discon. (2) mom. position data

Table 58: CTRL.DCXSWI2 Controllable discon. (2) mom. position data

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			
3494	218.06	.ItlByPss.stVal	ITL_BYPASS	Interlock bypass	1=Bypass
3495	218.07	.mcd			

2.3.1.56 CTRL.ESXSWI1 Controllable earth switch (1) mom. position

Table 59: CTRL.ESXSWI1 Controllable earth switch (1) mom. position

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			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3504	219.00	.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
3505	219.01	.mcd			
3506	219.02	.ItlByPss.stVal	ITL_BYPASS	Interlock bypass	1=Bypass
3507	219.03	.mcd			

2.3.1.57 LD0.XGGIO130 Physical I/O states (BIO card X130)

Table 60: 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			
3186	199.02	.Ind2.stVal		X130-Input 2 State	0/1=Off/On
3187	199.03	.mcd			
3188	199.04	.Ind3.stVal		X130-Input 3 State	0/1=Off/On
3189	199.05	.mcd			
3190	199.06	.Ind4.stVal		X130-Input 4 State	0/1=Off/On
3191	199.07	.mcd			
3192	199.08	.Ind5.stVal		X130-Input 5 State	0/1=Off/On
3193	199.09	.mcd			
3194	199.10	.Ind6.stVal		X130-Input 6 State	0/1=Off/On
3195	199.11	.mcd			
3264	204.00	.SPCSO1.stVal		X130-Output 1 State	0/1=Off/On
3265	204.01	.mcd			
3266	204.02	.SPCSO2.stVal		X130-Output 2 State	0/1=Off/On
3267	204.03	.mcd			
3268	204.04	.SPCSO3.stVal		X130-Output 3 State	0/1=Off/On
3269	204.05	.mcd			

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

Table 61: 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			
3202	200.02	.Ind2.stVal		X120-Input 2 State	0/1=Off/On
3203	200.03	.mcd			
3204	200.04	.Ind3.stVal		X120-Input 3 State	0/1=Off/On

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3205	200.05	.mcd			
3206	200.06	.Ind4.stVal		X120-Input 4 State	0/1=Off/On
3207	200.07	.mcd			

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

Table 62: 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			
3218	201.02	.Ind2.stVal		X110-Input 2 State	0/1=Off/On
3219	201.03	.mcd			
3220	201.04	.Ind3.stVal		X110-Input 3 State	0/1=Off/On
3221	201.05	.mcd			
3222	201.06	.Ind4.stVal		X110-Input 4 State	0/1=Off/On
3223	201.07	.mcd			
3224	201.08	.Ind5.stVal		X110-Input 5 State	0/1=Off/On
3225	201.09	.mcd			
3226	201.10	.Ind6.stVal		X110-Input 6 State	0/1=Off/On
3227	201.11	.mcd			
3228	201.12	.Ind7.stVal		X110-Input 7 State	0/1=Off/On
3229	201.13	.mcd			
3230	201.14	.Ind8.stVal		X110-Input 8 State	0/1=Off/On
3231	201.15	.mcd			
3232	202.00	.SPCSO1.stVal		X110-Output 1 State	0/1=Off/On
3233	202.01	.mcd			
3234	202.02	.SPCSO2.stVal		X110-Output 2 State	0/1=Off/On
3235	202.03	.mcd			
3236	202.04	.SPCSO3.stVal		X110-Output 3 State	0/1=Off/On
3237	202.05	.mcd			
3238	202.06	.SPCSO4.stVal		X110-Output 4 State	0/1=Off/On
3239	202.07	.mcd			

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

Table 63: 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			
3250	203.02	.SPCSO2.stVal		X100-Output 2 State	0/1=Off/On
3251	203.03	.mcd			
3252	203.04	.SPCSO3.stVal		X100-Output 3 State	0/1=Off/On
3253	203.05	.mcd			
3254	203.06	.SPCSO4.stVal		X100-Output 4 State	0/1=Off/On
3255	203.07	.mcd			
3256	203.08	.SPCSO5.stVal		X100-Output 5 State	0/1=Off/On
3257	203.09	.mcd			
3258	203.10	.SPCSO6.stVal		X100-Output 6 State	0/1=Off/On
3259	203.11	.mcd			

2.3.1.61 LD0.XAGGIO130 Physical I/O states (AIM card XA130)

Table 64: 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			
3282	205.02	.Ind2.stVal		XA130-Input 2 State	0/1=Off/On
3283	205.03	.mcd			
3284	205.04	.Ind3.stVal		XA130-Input 3 State	0/1=Off/On
3285	205.05	.mcd			
3286	205.06	.Ind4.stVal		XA130-Input 4 State	0/1=Off/On
3287	205.07	.mcd			

2.3.1.62 LD0.MVGAPC1 Multipurpose binary inputs (1)

Table 65: LD0.MVGAPC1 Multipurpose binary inputs (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MVGAPC1			
3536	221.00	.Q1.stVal		Input 1	0/1=Off/On
3537	221.01	.mcd			
3538	221.02	.Q2.stVal		Input 2	0/1=Off/On

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3539	221.03	.mcd			
3540	221.04	.Q3.stVal		Input 3	0/1=Off/On
3541	221.05	.mcd			
3542	221.06	.Q4.stVal		Input 4	0/1=Off/On
3543	221.07	.mcd			
3544	221.08	.Q5.stVal		Input 5	0/1=Off/On
3545	221.09	.mcd			
3546	221.10	.Q6.stVal		Input 6	0/1=Off/On
3547	221.11	.mcd			
3548	221.12	.Q7.stVal		Input 7	0/1=Off/On
3549	221.13	.mcd			
3550	221.14	.Q8.stVal		Input 8	0/1=Off/On
3551	221.15	.mcd			

2.3.1.63 LD0.MVGAPC2 Multipurpose binary inputs (2)

Table 66: LD0.MVGAPC2 Multipurpose binary inputs (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MVGAPC2			
3552	222.00	.Q1.stVal		Input 1	0/1=Off/On
3553	222.01	.mcd			
3554	222.02	.Q2.stVal		Input 2	0/1=Off/On
3555	222.03	.mcd			
3556	222.04	.Q3.stVal		Input 3	0/1=Off/On
3557	222.05	.mcd			
3558	222.06	.Q4.stVal		Input 4	0/1=Off/On
3559	222.07	.mcd			
3560	222.08	.Q5.stVal		Input 5	0/1=Off/On
3561	222.09	.mcd			
3562	222.10	.Q6.stVal		Input 6	0/1=Off/On
3563	222.11	.mcd			
3564	222.12	.Q7.stVal		Input 7	0/1=Off/On
3565	222.13	.mcd			
3566	222.14	.Q8.stVal		Input 8	0/1=Off/On
3567	222.15	.mcd			

2.3.1.64 LD0.SPCGGIO2 Multipurpose binary output states (2)

Table 67: LD0.SPCGGIO2 Multipurpose binary output states (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SPCGGIO2			
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			
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			

2.3.2 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 3-phase protection function stages - operate/phase-dependent objects added

Table 68: *All premapped 3-phase protection function stages - operate/phase-dependent objects added*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.xxxxxxxx (various)			
		.Op.phsA		phsA operate	1 = Operate
		.mcd			
		.Op.phsB		phsB operate	1 = Operate
		.mcd			
		.Op.phsC		phsC operate	1 = Operate
		.mcd			

2.3.2.2 Common data 2

Table 69: *Common data 2*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LPHD1			
		.OutOv.stVal		Internal ind. overflow	1=Overflow
		.mcd			
		.OutOv1.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.GNRLTMS1			
		.TmChSt1.stVal		Time synch. status	0/1=Down/Up
		.mcd			
		LD0.IHMI1			
		.LocClk.stVal		Local time	1=Local time
		.mcd			
		LD0.DIAGLCCH1.ChLiv			
		.ChLiv.stVal		Ethernet chn live	1=Live

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.mcd			
		.RedChLiv.stVal		Redundant ethernet chn live	1=Live
		.mcd			
		LD0.GSAL1			
		.AuthAccsA.stVal		Viewer accesses IED	1=Accesses
		.mcd			
		.AuthAccsB.stVal		Operator accesses IED	1=Accesses
		.mcd			
		.AuthAccsC.stVal		Engineer accesses IED	1=Accesses
		.mcd			
		.AuthAccsD.stVal		Admin accesses IED	1=Accesses
		.mcd			

2.3.2.3 CTRL.DCSXSWI2 Disconnecter (2) mom. position

Table 70: CTRL.DCSXSWI2 Disconnecter (2) mom. position

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.DCSXSWI2	POSITION		
		.Pos.stVal.Close		Close bit	1=Close
		.Pos.stVal.Open		Open bit	1=Open
		.Pos.stVal.Fault		Fault bit	1=Pos(00/11)

2.3.2.4 CTRL.DCSXSWI3 Disconnecter (3) mom. position

Table 71: CTRL.DCSXSWI3 Disconnecter (3) mom. position

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.DCSXSWI3	POSITION		
		.Pos.stVal.Close		Close bit	1 = Close
		.Pos.stVal.Open		Open bit	1 = Open
		.Pos.stVal.Fault		Fault bit	1 = Pos(00/11)

2.3.2.5 CTRL.DCXSWI1 Controllable discon. (1) mom. position data

Table 72: CTRL.DCXSWI1 Controllable discon. (1) mom. position data

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.DCXSWI1	POSITION		
		.Pos.stVal.Close		Close bit	1 = Close
		.Pos.stVal.Open		Open bit	1 = Open
		.Pos.stVal.Fault		Fault bit	1 = Pos(00/11)

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.Pos.stSeld		Control selected	1 = Selected
		CTRL.DCCILO1			
		.EnaOpn.stVal	ENA_OPEN	Open enabled	1 = Enabled
		.EnaCls.stVal	ENA_CLOSE	Close enabled	1 = Enabled
		CTRL.DCXSWI1			
		.BlkOpn.stVal	BLK_OPEN	Open blocked	1 = Blocked
		.mcd			
		.BlkCls.stVal	BLK_CLOSE	Close blocked	1 = Blocked
		.mcd			
		.ItlByPss.stVal	ITL_BYPASS	Interlock bypass	1 = Bypass
		.mcd			

2.3.2.6 CTRL.DCXSWI2 Controllable discon. (2) mom. position data

Table 73: CTRL.DCXSWI2 Controllable discon. (2) mom. position data

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.DCXSWI2	POSITION		
		.Pos.stVal.Close		Close bit	1 = Close
		.Pos.stVal.Open		Open bit	1 = Open
		.Pos.stVal.Fault		Fault bit	1 = Pos(00/11)
		.Pos.stSeld		Control selected	1 = Selected
		CTRL.DCCILO2			
		.EnaOpn.stVal	ENA_OPEN	Open enabled	1 = Enabled
		.EnaCls.stVal	ENA_CLOSE	Close enabled	1 = Enabled
		CTRL.DCXSWI2			
		.BlkOpn.stVal	BLK_OPEN	Open blocked	1 = Blocked
		.mcd			
		.BlkCls.stVal	BLK_CLOSE	Close blocked	1 = Blocked
		.mcd			
		.ItlByPss.stVal	ITL_BYPASS	Interlock bypass	1 = Bypass
		.mcd			

2.3.2.7 CTRL.ESSXSWI2 Earth switch (2) mom. position

Table 74: CTRL.ESSXSWI2 Earth switch (2) mom. position

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.ESSXSWI3	POSITION		
		.Pos.stVal.Close		Close bit	1 = Close
		.Pos.stVal.Open		Open bit	1 = Open
		.Pos.stVal.Fault		Fault bit	1 = Pos(00/11)

2.3.2.8 CTRL.ESXSWI1 Controllable earth switch (1) mom. position data

Table 75: CTRL.ESXSWI1 Controllable earth switch (1) mom. position data

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.ESXSWI1	POSITION		
		.Pos.stVal.Close		Close bit	1 = Close
		.Pos.stVal.Open		Open bit	1 = Open
		.Pos.stVal.Fault		Fault bit	1 = Pos(00/11)
		.Pos.stSeld		Control selected	1 = Selected
		CTRL.ESCILO1			
		.EnaOpn.stVal	ENA_OPEN	Open enabled	1 = Enabled
		.EnaCls.stVal	ENA_CLOSE	Close enabled	1 = Enabled
		CTRL.ESXSWI1			
		.BlkOpn.stVal	BLK_OPEN	Open blocked	1 = Blocked
		.mcd			
		.BlkCls.stVal	BLK_CLOSE	Close blocked	1 = Blocked
		.mcd			
		.ItlByPss.stVal	ITL_BYPASS	Interlock bypass	1 = Bypass
		.mcd			

2.3.2.9 LD0.COLPTOC1 Capacitor bank overload protection (1)

Table 76: LD0.COLPTOC1 Capacitor bank overload protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.COL1PTOC1			
		.Str.general	ST_OVL0D	Overload start	1=Start
		.mcd			
		.Op.stVal	OPR_OVL0D	Overload operate	1=Operate
		.mcd			
		LD0.COL2PTOC1			
		.Op.stVal	ALARM	Alarm	1=Alarm
		.mcd			
		LD0.COLPTUC1			
		.Str.general	ST_UN_I	Under current start	1=Start
		.mcd			
		.Op.stVal	OPR_UN_I	Under current operate	1=Operate
		.mcd			

2.3.2.10 LD0.CUBPTOC1 Capacitor bank unbalance current, double Y bridge (1)

Table 77: LD0.CUBPTOC1 Capacitor bank unbalance current, double Y bridge (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.CUB1PTOC1			
		.Op.stVal	ALARM	Alarm	1=Alarm
		.mcd			
		LD0.CUB2PTOC1			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.stVal	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.11 LD0.DIAGLCCH1 Ethernet supervision (1)

Table 78: 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			

2.3.2.12 LD0.HCUBPTOC1 Capacitor bank unbalance current, H bridge (1)

Table 79: LD0.HCUBPTOC1 Capacitor bank unbalance current, H bridge (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.HCUB1PTOC1			
		.Op.stVal	ALARM	Alarm	1=Alarm
		.mcd			
		LD0.HCUB2PTOC1			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.stVal	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.13 LD0.IL1TCTR1 3-phase CT supervision (1)

Table 80: LD0.IL1TCTR1 3-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			

2.3.2.14 LD0.IL1TCTR2 3-phase CT supervision (2)

Table 81: LD0.IL1TCTR2 3-phase CT supervision (2)

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

2.3.2.15 LD0.MAPGAPC1 Multipurpose analog protection function (1)

Table 82: LD0.MAPGAPC1 Multipurpose analog protection function (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC1			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.16 LD0.MAPGAPC2 Multipurpose analog protection function (2)

Table 83: LD0.MAPGAPC2 Multipurpose analog protection function (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC2			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.17 LD0.MAPGAPC3 Multipurpose analog protection function (3)**Table 84:** *LD0.MAPGAPC3 Multipurpose analog protection function (3)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC3			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.18 LD0.MAPGAPC4 Multipurpose analog protection function (4)**Table 85:** *LD0.MAPGAPC4 Multipurpose analog protection function (4)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC4			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.19 LD0.MAPGAPC5 Multipurpose analog protection function (5)**Table 86:** *LD0.MAPGAPC5 Multipurpose analog protection function (5)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC5			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.20 LD0.MAPGAPC6 Multipurpose analog protection function (6)**Table 87:** *LD0.MAPGAPC6 Multipurpose analog protection function (6)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC6			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.21 LD0.MAPGAPC7 Multipurpose analog protection function (7)

Table 88: LD0.MAPGAPC7 Multipurpose analog protection function (7)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC7			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.22 LD0.MAPGAPC8 Multipurpose analog protection function (8)

Table 89: LD0.MAPGAPC8 Multipurpose analog protection function (8)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC8			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.23 LD0.MAPGAPC9 Multipurpose analog protection function (9)

Table 90: LD0.MAPGAPC9 Multipurpose analog protection function (9)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC9			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.24 LD0.MAPGAPC10 Multipurpose analog protection function (10)

Table 91: LD0.MAPGAPC10 Multipurpose analog protection function (10)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC10			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.25 LD0.MAPGAPC11 Multipurpose analog protection function (11)**Table 92:** *LD0.MAPGAPC11 Multipurpose analog protection function (11)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC11			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.26 LD0.MAPGAPC12 Multipurpose analog protection function (12)**Table 93:** *LD0.MAPGAPC12 Multipurpose analog protection function (12)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC12			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.27 LD0.MAPGAPC13 Multipurpose analog protection function (13)**Table 94:** *LD0.MAPGAPC13 Multipurpose analog protection function (13)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC13			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.28 LD0.MAPGAPC14 Multipurpose analog protection function (14)**Table 95:** *LD0.MAPGAPC14 Multipurpose analog protection function (14)*

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC14			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.29 LD0.MAPGAPC15 Multipurpose analog protection function (15)

Table 96: LD0.MAPGAPC15 Multipurpose analog protection function (15)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC15			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.30 LD0.MAPGAPC16 Multipurpose analog protection function (16)

Table 97: LD0.MAPGAPC16 Multipurpose analog protection function (16)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC16			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.31 LD0.MAPGAPC17 Multipurpose analog protection function (17)

Table 98: LD0.MAPGAPC17 Multipurpose analog protection function (17)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC17			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.32 LD0.MAPGAPC18 Multipurpose analog protection function (18)

Table 99: LD0.MAPGAPC18 Multipurpose analog protection function (18)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC18			
		.Str.general	START	Stage start	1 = Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1 = Operate
		.mcd			

2.3.2.33 LD0.MVGAPC1 Multipurpose binary inputs, MOM-only or latch use (1)

Table 100: LD0.MVGAPC1 Multipurpose binary inputs, MOM-only or latch use (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MVGAPC1			
		.Q1.stVal (Mom-only)		Input 1 momentary value	1 = On
		.Q1.stVal (Latch)		Input 1 latched value	1 = On (latched)
		.Q2.stVal (Mom-only)		Input 2 momentary value	1 = On
		.Q2.stVal (Latch)		Input 2 latched value	1 = On (latched)
		.Q3.stVal (Mom-only)		Input 3 momentary value	1 = On
		.Q3.stVal (Latch)		Input 3 latched value	1 = On (latched)
		.Q4.stVal (Mom-only)		Input 4 momentary value	1 = On
		.Q4.stVal (Latch)		Input 4 latched value	1 = On (latched)
		.Q5.stVal (Mom-only)		Input 5 momentary value	1 = On
		.Q5.stVal (Latch)		Input 5 latched value	1 = On (latched)
		.Q6.stVal (Mom-only)		Input 6 momentary value	1 = On
		.Q6.stVal (Latch)		Input 6 latched value	1 = On (latched)
		.Q7.stVal (Mom-only)		Input 7 momentary value	1 = On
		.Q7.stVal (Latch)		Input 7 latched value	1 = On (latched)
		.Q8.stVal (Mom-only)		Input 8 momentary value	1 = On
		.Q8.stVal (Latch)		Input 8 latched value	1 = On (latched)

2.3.2.34 LD0.MVGAPC2 Multipurpose binary inputs, MOM-only or latch use (2)

Table 101: LD0.MVGAPC2 Multipurpose binary inputs, MOM-only or latch use (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MVGAPC2			
		.Q1.stVal (Mom-only)		Input 1 momentary value	1 = On
		.Q1.stVal (Latch)		Input 1 latched value	1 = On (latched)
		.Q2.stVal (Mom-only)		Input 2 momentary value	1 = On
		.Q2.stVal (Latch)		Input 2 latched value	1 = On (latched)
		.Q3.stVal (Mom-only)		Input 3 momentary value	1 = On
		.Q3.stVal (Latch)		Input 3 latched value	1 = On (latched)
		.Q4.stVal (Mom-only)		Input 4 momentary value	1 = On
		.Q4.stVal (Latch)		Input 4 latched value	1 = On (latched)
		.Q5.stVal (Mom-only)		Input 5 momentary value	1 = On
		.Q5.stVal (Latch)		Input 5 latched value	1 = On (latched)
		.Q6.stVal (Mom-only)		Input 6 momentary value	1 = On
		.Q6.stVal (Latch)		Input 6 latched value	1 = On (latched)
		.Q7.stVal (Mom-only)		Input 7 momentary value	1 = On

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.Q7.stVal (Latch)		Input 7 latched value	1 = On (latched)
		.Q8.stVal (Mom-only)		Input 8 momentary value	1 = On
		.Q8.stVal (Latch)		Input 8 latched value	1 = On (latched)

2.3.2.35 LD0.RESTCTR1 Io CT supervision (1)

Table 102: LD0.RESTCTR1 Io 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			

2.3.2.36 LD0.RESTVTR1 Uo VT supervision (1)

Table 103: LD0.RESTVTR1 Uo 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.RESTVTR2 Uo VT supervision (2)

Table 104: LD0.RESTVTR2 Uo VT supervision (2)

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

2.3.2.38 LD0.RESVMMXU2 Residual voltage limit supervision (2)

Table 105: LD0.RESVMMXU2 Residual voltage limit supervision (2)

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

2.3.2.39 LD0.SPCGGIO1 Multipurpose binary output states (1)

Table 106: LD0.SPCGGIO1 Multipurpose binary output states (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SPCGGIO1			
		.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			
		.SPCSO12.stVal		Ouput state 12	0/1=Off/On
		.mcd			
		.SPCSO13.stVal		Ouput state 13	0/1=Off/On

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.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			

2.3.2.40 LD0.SRCPTOC1 Capacitor resonance protection (1)

Table 107: LD0.SRCPTOC1 Capacitor resonance protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SRC1PTOC1			
		.Op.stVal	ALARM	Alarm	1=Alarm
		.mcd			
		LD0.SRC2PTOC1			
		.Op.stVal	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.41 LD0.T2PTTR1 Thermal overload protection (1)

Table 108: LD0.T2PTTR1 Thermal overload protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.T2PTTR1			
		.Str.general	START	General start	1=Start
		.mcd			
		.AlmThm.general	ALARM	Thermal alarm	1=Alarm
		.mcd			
		.Op.general	OPERATE	General operate	1=Operate
		.mcd			

2.3.2.42 LD0.TRPPTRC3 Protection trip conditioning (3)

Table 109: LD0.TRPPTRC3 Protection trip conditioning (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			

2.3.2.43 LD0.TRPPTRC4 Protection trip conditioning (4)**Table 110:** *LD0.TRPPTRC4 Protection trip conditioning (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			

2.3.2.44 LD0.TRPPTRC5 Protection trip conditioning (5)**Table 111:** *LD0.TRPPTRC5 Protection trip conditioning (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			

2.3.2.45 LD0.UL1TVTR1 3-phase VT supervision (1)**Table 112:** *LD0.UL1TVTR1 3-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			

2.3.2.46 LD0.XARGGIO130 Alarm/warning**Table 113:** *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			

2.3.2.47 LD0.XRGGIO130 Alarm/warning

Table 114: 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 115: 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 User definable registers [Alt.1], visible on 3x and 4x

Table 116: 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	

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

Table 117: *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	
:	:				:	
:	:				:	
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	

2.4.1.3 SSR1 System status register (1) device health

Table 118: *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

2.4.1.4 SSR2 System status register (2) IED mode and state

Table 119: SSR2 System status register (2) IED 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				IED 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

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

Table 120: 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
130.11	Bit				< reserved >	0
130.12	Bit				< reserved >	0

Table continues on next page

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

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

Table 121: 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

2.4.1.7 SSR5 System status register (5) device alive register

Table 122: 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

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

Table 123: SSR6 System status register (6) control command status (client-dependent)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
					Last cmd result code	See doc.
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	See doc.
133.08	Bit				- bit 0	
133.09	Bit				- bit 1	
					Command state	See doc.
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	

2.4.1.9 LD0.CMMXU1 Phase current measurements (1)

Table 124: LD0.CMMXU1 Phase current measurements (1)

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	- phsA amplitude	0.00..40.0 [xIn]
139	u16	1000	.A.phsB.instCVal.mag	I_INST_B	- phsB amplitude	0.00..40.0 [xIn]
140	u16	1000	.A.phsC.instCVal.mag	I_INST_C	- phsC amplitude	0.00..40.0 [xIn]

2.4.1.10 LD0.RESCMMXU1 Residual current measurement (1)**Table 125:** *LD0.RESCMMXU1 Residual current measurement (1)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.RESCMMXU1		Residual current (1)	
141	u16	1000	.A.res.instCVal.mag	I0_INST	- amplitude	0.00..40.0 [xIn]

2.4.1.11 LD0.RESVMMXU1 Residual voltage measurement (1)**Table 126:** *LD0.RESVMMXU1 Residual voltage measurement (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]

2.4.1.12 LD0.CMSQI1 Sequence of current measurements (1)**Table 127:** *LD0.CMSQI1 Sequence of current measurements (1)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.CMSQI1		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]

2.4.1.13 LD0.VMMXU1 Voltage measurements (1)**Table 128:** *LD0.VMMXU1 Voltage measurements (1)*

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	- phsA amplitude	0.00..4.00 [xUn]
153	u16	1000	.phV.phsB.cVal.mag	U_DB_B	- phsB amplitude	0.00..4.00 [xUn]
154	u16	1000	.phV.phsC.cVal.mag	U_DB_C	- phsC amplitude	0.00..4.00 [xUn]
			LD0.VMMXU1		Phase-phase voltage (1)	

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
155	u16	1000	.PPV.phsAB.cVal.mag	U_DB_AB	- phsAB amplitude	0.00..4.00 [xUn]
156	u16	1000	.PPV.phsBC.cVal.mag	U_DB_BC	- phsBC amplitude	0.00..4.00 [xUn]
157	u16	1000	.PPV.phsCA.cVal.mag	U_DB_CA	- phsCA amplitude	0.00..4.00 [xUn]

2.4.1.14 LD0.VMSQI1 Sequence of voltage measurements (1)

Table 129: LD0.VMSQI1 Sequence of voltage measurements (1)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.VMSQI1		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]

2.4.1.15 LD0.PEMMXU1 Three-phase power measurements (1)

Table 130: LD0.PEMMXU1 Three-phase power measurements (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

2.4.1.16 LD0.FMMXU1 Frequency measurement (1)

Table 131: LD0.FMMXU1 Frequency measurement (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]

2.4.1.17 Indication bits mirrored in registers**Table 132:** *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)	

2.4.1.18 LD0.PEMSTA1 Power measurement demand values (1)**Table 133:** *LD0.PEMSTA1 Power measurement demand values (1)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.PEMSTA1		Demand	
1939	i32	1	.AvW.mag		- Active power P (high)	-/+ 999,999
1940					- (low word)	
1941	i32	1	.AvVAr.mag		- Reactive power Q (high)	-/+ 999,999
1942					- (low word)	
1943	i32	1	.AvVA.mag		- Apparent power S (high)	-/+ 999,999
1944					- (low word)	
1945	i16	1000	.AvPF.mag		- Power factor	-1..1
1946					< reserved >	0
					Max values:	
1947	i32	1	.MaxW.mag		- Active power P (high)	-/+ 999,999
1948					- (low word)	
1949	i32	1	.MaxVAr.mag		- Reactive power Q (high)	-/+ 999,999
1950					- (low word)	
1951	i32	1	.MaxVA.mag		- Apparent power S (high)	-/+ 999,999
1952					- (low word)	
1953					< reserved >	0

2.4.1.19 LD0.VMSTA1 Voltage demand values (1)**Table 134:** *LD0.VMSTA1 Voltage demand values (1)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.VMSTA1		Demand phase-to-ground	
1954	u16	1000	.AvVPhsA.mag	U_DMD_A	- phsA amplitude	0..4.0 [xUn]
1955	u16	1000	.AvVPhsB.mag	U_DMD_B	- phsB amplitude	0..4.0 [xUn]

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
1956	u16	1000	.AvVPhsC.mag	U_DMD_C	- phsC amplitude	0..4.0 [xUn]
					Demand phase-to-phase	
1957	u16	1000	.AvVPhsAB.mag	U_DMD_AB	- phsAB amplitude	0..4.0 [xUn]
1958	u16	1000	.AvVPhsBC.mag	U_DMD_BC	- phsBC amplitude	0..4.0 [xUn]
1959	u16	1000	.AvVPhsCA.mag	U_DMD_CA	- phsCA amplitude	0..4.0 [xUn]
					Update time stamp	See doc.
1960	u16	-			- Year - month	
1961	u16	-			- Day - hour	
1962	u16	-			- Minute - second	
1963	u16	-			- Milliseconds	
1964	u16	-			- Time quality	

2.4.1.20 LD0.RESVMSTA1 Residual voltage demand value (1)

Table 135: LD0.RESVMSTA1 Residual voltage demand value (1)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.RESVMSTA1		Demand value	
1977	u16	1000	.AvVolts.mag	U_DMD_RES	- residual amplitude	0.00..4.0 [xUn]
					Update time stamp	See doc.
1978	u16	-			- Year - month	
1979	u16	-			- Day - hour	
1980	u16	-			- Minute - second	
1981	u16	-			- Milliseconds	
1982	u16	-			- Time quality	
1983	u16	1000	.MaxVolts.mag	Max demand Uo	- Max Uo demand	0.00..4.0 [xUn]
					Update time stamp	See doc.
1984	u16	-			- Year - month	
1985	u16	-			- Day - hour	
1986	u16	-			- Minute - second	
1987	u16	-			- Milliseconds	
1988	u16	-			- Time quality	

2.4.1.21 LD0.RESCMSTA1 Residual current demand value (1)**Table 136:** *LD0.RESCMSTA1 Residual current demand value (1)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.RESCMSTA1		Demand value	
1989	u16	1000	.AvAmps.mag	I_DMD_RES	- residual amplitude	0.00..40.0 [xIn]
					Update time stamp	See doc.
1990	u16	-			- Year - month	
1991	u16	-			- Day - hour	
1992	u16	-			- Minute - second	
1993	u16	-			- Milliseconds	
1994	u16	-			- Time quality	
1995	u16	1000	.MaxAmps.mag	Max demand lo	- Max lo demand	0.00..40.0 [xIn]
					Update time stamp	See doc.
1996	u16	-			- Year - month	
1997	u16	-			- Day - hour	
1998	u16	-			- Minute - second	
1999	u16	-			- Milliseconds	
2000	u16	-			- Time quality	

2.4.1.22 LD0.CMSTA1 Phase current demand values (1)**Table 137:** *LD0.CMSTA1 Phase current demand values (1)*

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.CMSTA1		Demand value	
2001	u16	1000	.AvAmpsA.mag	I_DMD_A	- phsA amplitude	0.00..40.0 [xIn]
2002	u16	1000	.AvAmpsB.mag	I_DMD_B	- phsB amplitude	0.00..40.0 [xIn]
2003	u16	1000	.AvAmpsC.mag	I_DMD_C	- phsC amplitude	0.00..40.0 [xIn]
					Update time stamp	See doc.
2004	u16	-			- Year - month	
2005	u16	-			- Day - hour	
2006	u16	-			- Minute - second	
2007	u16	-			- Milliseconds	
2008	u16	-			- Time quality	
2009	u16	1000	.MaxAmpsA.mag	Max demand IL1	- Max phsA demand	0.00..40.0 [xIn]

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
					Update time stamp	See doc.
2010	u16	-			- Year - month	
2011	u16	-			- Day - hour	
2012	u16	-			- Minute - second	
2013	u16	-			- Milliseconds	
2014	u16	-			- Time quality	
2015	u16	1000	.MaxAmpsB.mag	Max demand IL2	- Max phsB demand	0.00..40.0 [xIn]
					Update time stamp	See doc.
2016	u16	-			- Year - month	
2017	u16	-			- Day - hour	
2018	u16	-			- Minute - second	
2019	u16	-			- Milliseconds	
2020	u16	-			- Time quality	
2021	u16	1000	.MaxAmpsC.mag	Max demand IL3	- Max phsC demand	0.00..40.0 [xIn]
					Update time stamp	see doc.
2022	u16	-			- Year - month	
2023	u16	-			- Day - hour	
2024	u16	-			- Minute - second	
2025	u16	-			- Milliseconds	
2026	u16	-			- Time quality	

2.4.1.23 CTRL.CBCSWI1 Circuit breaker operation counter (1)

Table 138: 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

2.4.1.24 LD0.ARCSARCx1 Fault arc counters

Table 139: LD0.ARCSARCx1 Fault arc counters

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			

Table continues on next page

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

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

Table 140: 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 [kVAr]
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 [kVAr]
2044			.DemVArh.actVal		(low word)	

2.4.1.26 System diagnostic values

Table 141: System diagnostic values

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.LPHD1			
2050	u16	1	.PhyHealth1.stVal	Warning	Last warning code	see doc.
2051	u16	1	.PhyHealth2.stVal	Internal fault	Last internal fault code	see doc.
			DR.RDRE1			
2052	u16	1	.FitNum.stVal		Num.of DR recordings	0..N
2053	u16	1	.MemUsed.stVal		DR memory used	0..100 [%]
			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
2057	u16	1	.NumCmpChg.stVal		Num of conf. changes	0..65535

2.4.1.27 LD0.SSCBR1 Circuit-breaker condition monitoring values (1)

Table 142: LD0.SSCBR1 Circuit-breaker condition monitoring values (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	.TmmsOpn.mag	T_TRV_OP	Open travel time	0..60000 [ms]
2062	u16	1	.TmmsCls.mag	T_TRV_CL	Close travel time	0..60000 [ms]
2063	u16	100	.TmsSprCha.mag	T_SPR_CHR	Spring charge time	0.00...99.99 [s]
2064	i16	1	.RmnLifPhA.stVal	CB_LIFE_A	Remain.life phsA	-/+ 9999
2065	i16	1	.RmnLifPhB.stVal	CB_LIFE_B	Remain.life phsB	-/+ 9999
2066	i16	1	.RmnLifPhC.stVal	CB_LIFE_C	Remain.life phsC	-/+ 9999
2067	u16	1	.AccAPwrPhA.mag	IPOW_A	lyt phsA	0..1E6
2068	u16	1	.AccAPwrPhB.mag	IPOW_B	lyt phsB	0..1E6
2069	u16	1	.AccAPwrPhC.mag	IPOW_C	lyt phsC	0..1E6

2.4.1.28 LD0.PH1QVVR1 Short duration voltage variations (1)

Table 143: LD0.PH1QVVR1 Short duration voltage variations (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:	

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
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...

2.4.1.29 LD0.CMHAI1 Current total demand distortion (1)

Table 144: LD0.CMHAI1 Current total demand distortion (1)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.CMHAI1		3 2nd 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.VMHAI1 Voltage total demand distortion (1)

Table 145: LD0.VMHAI1 Voltage total demand distortion (1)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.VMHAI1		3 2nd mean value:	
2170	u16	100	.ThdPhV.phsA.cVal.mag	3SMHTDD_A	- phsA	0..500.00 [%]
2171	u16	100	.ThdPhV.phsB.cVal.mag	3SMHTDD_B	- phsB	0..500.00 [%]
2172	u16	100	.ThdPhV.phsC.cVal.mag	3SMHTDD_C	- phsC	0..500.00 [%]
					Demand value:	
2173	u16	100	.DmdThdPhV.phsA.cVal.mag	DMD_TDD_A	- phsA	0..500.00 [%]

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
2174	u16	100	.DmdThdPhV.phsB.cVal.mag	DMD_TDD_B	- phsB	0..500.00 [%]
2175	u16	100	.DmdThdPhV.phsC.cVal.mag	DMD_TDD_C	- phsC	0..500.00 [%]
					Max demand value:	
2176	u16	100	.MaxDmdThdV.phsA.cVal.mag	-	- phsA	0..500.00 [%]
2177	u16	100	.MaxDmdThdV.phsB.cVal.mag	-	- phsB	0..500.00 [%]
2178	u16	100	.MaxDmdThdV.phsC.cVal.mag	-	- phsC	0..500.00 [%]

2.4.1.31 Control structure 1

Table 146: 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 >

2.4.1.32 Control structure 2

Table 147: 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 >

2.4.1.33 Control structure 3

Table 148: 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 >

2.4.1.34 Control structure 4*Table 149: 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 >

2.4.1.35 Control structure 5*Table 150: 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 >

2.4.1.36 Control structure 6*Table 151: 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 >

2.4.1.37 Control structure 7*Table 152: 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 >

2.4.1.38 Control structure 8

Table 153: 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 >

2.4.1.39 Device ID string

Table 154: Device ID string

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

2.4.1.40 IED Real-time clock (in local time mode) - read and write (synchronize)

Table 155: IED 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 (see doc.)
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

2.4.1.41 IED real-time clock (in UTC time mode) - read and write (synchronize)

Table 156: IED 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 (see doc.)
9212					Year	2000..2999
9213					Month	1..12
9214					Day	1..31

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9215					Hour	0..23
9216					Minute	0..59
9217					Second	0..59
9218					Millisecond	0..999

2.4.1.42 Time and reason for latest IED reset

Table 157: Time and reason for latest IED 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

2.4.1.43 Event record structure

Table 158: 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	see doc.
9259	u16	1			Data object ID1	see doc.

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	see doc.
9261	u16	1			Event data value 1	see doc.
9262	u16	1			Event data value 2	see doc.
					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	see doc.
9270	u16	1			Data object ID1	see doc.
9271	u16	1			Data object ID2	see doc.
9272	u16	1			Event data value 1	see doc.
9273	u16	1			Event data value 2	see doc.
					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	see doc.
9281	u16	1			Data object ID1	see doc.
9282	u16	1			Data object ID2	see doc.
9283	u16	1			Event data value 1	see doc.
9284	u16	1			Event data value 2	see doc.
					Record 4 data to read:	If selected
9285	u16	1			- Record sequence num	1..9999
9286	u16	1			- Unread records left	0..499
					Timestamp of record	
9287	u16	1			- Year, Month	Year/Month
9288	u16	1			- Day, Hour	Day/Hour
9289	u16	1			- Minute, Second	Min/Sec

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9290	u16	1			- Millisecond	Millisecond
9291	u16	1			Event identification	see doc.
9292	u16	1			Data object ID1	see doc.
9293	u16	1			Data object ID2	see doc.
9294	u16	1			Event data value 1	see doc.
9295	u16	1			Event data value 2	see doc.
					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	see doc.
9303	u16	1			Data object ID1	see doc.
9304	u16	1			Data object ID2	see doc.
9305	u16	1			Event data value 1	see doc.
9306	u16	1			Event data value 2	see doc.
					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	see doc.
9314	u16	1			Data object ID1	see doc.
9315	u16	1			Data object ID2	see doc.
9316	u16	1			Event data value 1	see doc.
9317	u16	1			Event data value 2	see doc.
					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	

Table continues on next page

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RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
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	see doc.
9325	u16	1			Data object ID1	see doc.
9326	u16	1			Data object ID2	see doc.
9327	u16	1			Event data value 1	see doc.
9328	u16	1			Event data value 2	see doc.
					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	see doc.
9336	u16	1			Data object ID1	see doc.
9337	u16	1			Data object ID2	see doc.
9338	u16	1			Event data value 1	see doc.
9339	u16	1			Event data value 2	see doc.
					Record 9 data to read:	If selected
9340	u16	1			- Record sequence num	1..9999
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	see doc.
9347	u16	1			Data object ID1	see doc.
9348	u16	1			Data object ID2	see doc.
9349	u16	1			Event data value 1	see doc.
9350	u16	1			Event data value 2	see doc.

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RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
					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	see doc.
9358	u16	1			Data object ID1	see doc.
9359	u16	1			Data object ID2	see doc.
9360	u16	1			Event data value 1	see doc.
9361	u16	1			Event data value 2	see doc.

2.4.1.44 Fault record structure header

Table 159: 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:	
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	see doc.
			LD0.FLTMSTA1		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	.StrDur.mag		- Start duration	0..100.00 [%]
9413	u32	1000	.OpTm.mag		- Operate time [ms] (high)	0..999999.999
9414					- (low word)	

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9415	u16	1	.ActSG.stVal		- Active setting group	1..6
9416	u16	1	.ShotPntr.stVal		- AR shot pointer value	0..7
9417	u16				< reserved >	0
9418	u16				< reserved >	0
9419	u16				< reserved >	0
9420	u16				< reserved >	0
9421	u16				< reserved >	0

2.4.1.45 Fault record data

Table 160: Fault record data

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.FLTMTSTA1			
9422	u16	1000	.MaxAmpsA.mag		Max phsA current	0..50.0 [xIn]
9423	u16	1000	.MaxAmpsB.mag		Max phsB current	0..50.0 [xIn]
9424	u16	1000	.MaxAmpsC.mag		Max phsC current	0..50.0 [xIn]
9425	u16	1000	.MaxAmpsN.mag		Max residual current	0..50.0 [xIn]
9426	u16	1000	.AmpsA.mag		PhsA current	0..50.0 [xIn]
9427	u16	1000	.AmpsB.mag		PhsB current	0..50.0 [xIn]
9428	u16	1000	.AmpsC.mag		PhsC current	0..50.0 [xIn]
9429	u16	1000	.AmpsN.mag		Residual current	0..50.0 [xIn]
9430	u16	1000	.AmpsNCIc.mag		Residual current (calc)	0..50.0 [xIn]
9431	u16	1000	.AmpsPsSeq.mag		Positive seq. current	0..50.0 [xIn]
9432	u16	1000	.AmpsNgSeq.mag		Negative seq. current	0..50.0 [xIn]
9433	u16	100	.MxDifACIcA.mag		Max phsA diff. current	0..80.00 [pu]
9434	u16	100	.MxDifACIcB.mag		Max phsB diff. current	0..80.00 [pu]
9435	u16	100	.MxDifACIcC.mag		Max phsC diff. current	0..80.00 [pu]
9436	u16	100	.MxRstACIcA.mag		Max phsA bias current	0..50.00 [pu]
9437	u16	100	.MxRstACIcB.mag		Max phsB bias current	0..50.00 [pu]
9438	u16	100	.MxRstACIcC.mag		Max phsC bias current	0..50.00 [pu]
9439	u16	100	.DifAmpsA.mag		PhsA diff. current	0..80.00 [pu]
9440	u16	100	.DifAmpsB.mag		PhsB diff. current	0..80.00 [pu]
9441	u16	100	.DifAmpsC.mag		PhsC diff. current	0..80.00 [pu]
9442	u16	100	.RstAmpsA.mag		PhsA bias current	0..50.00 [pu]
9443	u16	100	.RstAmpsB.mag		PhsB bias current	0..50.00 [pu]
9444	u16	100	.RstAmpsC.mag		PhsC bias current	0..50.00 [pu]
9445	u16	1000	.VoltsA.mag		PhsA voltage	0..4.00 [xUn]
9446	u16	1000	.VoltsB.mag		PhsB voltage	0..4.00 [xUn]
9447	u16	1000	.VoltsC.mag		PhsC voltage	0..4.00 [xUn]

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	
9448	u16	1000	.VoltsAB.mag		PhsAB voltage	0..4.00 [xUn]
9449	u16	1000	.VoltsBC.mag		PhsBC voltage	0..4.00 [xUn]
9450	u16	1000	.VoltsCA.mag		PhsCA voltage	0..4.00 [xUn]
9451	u16	1000	.VoltsN.mag		Residual voltage	0..4.00 [xUn]
9452	u16	1000	.VZroSeq.mag		Zero seq. voltage	0..4.00 [xUn]
9453	u16	1000	.VPsSeq.mag		Positive seq. voltage	0..4.00 [xUn]
9454	u16	1000	.VNgSeq.mag		Negative seq. voltage	0..4.00 [xUn]
9455	i16	10	.DifNAngN.mag		Uo-lo angle	-/+ 180.0 [Deg]
9456	i16	10	.DifAAngBC.mag		PhsB-C angle	-/+ 180.0 [Deg]
9457	i16	10	.DifBAngCA.mag		PhsC-A angle	-/+ 180.0 [Deg]
9458	i16	10	.DifCAngAB.mag		PhsA-B angle	-/+ 180.0 [Deg]
9459	u16	100	.MaxTmpRI.mag		Relative temperature	0..99.99
9460	u16	1000	.MaxAmpsAb.mag		Max phsAb current	0...50.0 [xIn]
9461	u16	1000	.MaxAmpsBb.mag		Max phsBb current	0...50.0 [xIn]
9462	u16	1000	.MaxAmpsCb.mag		Max phsCb current	0...50.0 [xIn]
9463	u16	1000	.AmpsAb.mag		PhsAb current	0...50.0 [xIn]
9464	u16	1000	.AmpsBb.mag		PhsBb current	0...50.0 [xIn]
9465	u16	1000	.AmpsCb.mag		PhsCb current	0...50.0 [xIn]
9466	u16	1000	.AmpsNCIcb.mag		NCIcb current	0...50.0 [xIn]
9467	u16	1000	.AmpsPsSeqb.mag		Positive seq. current b	0...50.0 [xIn]
9468	u16	1000	.AmpsNgSeqb.mag		Negative seq. current b	0...50.0 [xIn]
9469	u16	100	.Hz.mag		Frequency	30..80.00 [Hz]
9470	i16	100	.HzS.mag		Frequency gradient	-/+10.00 [Hz/s]
9471	u16	1000	.CBClrTm.mag		Breaker clear time	0.00...3.000 [s]

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 LD0.MVI4GAPC1 Multipurpose analog values (1)

Table 161: LD0.MVI4GAPC1 Multipurpose analog values (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	

2.4.2.2 LD0.SCA4GAPC1 Multipurpose analog values (1)

Table 162: LD0.SCA4GAPC1 Multipurpose analog values (1)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SCA4GAPC1			
	i16	1000	.AnOut1.mag	AO1_VALUE	Analog value 1	-/+ 10000.00
	i16	1000	.AnOut2.mag	AO2_VALUE	Analog value 2	-/+ 10000.00
	i16	1000	.AnOut3.mag	AO3_VALUE	Analog value 3	-/+ 10000.00
	i16	1000	.AnOut4.mag	AO4_VALUE	Analog value 4	-/+ 10000.00

2.4.2.3 LD0.T2PTTR1 Thermal protection values (2)

Table 163: LD0.T2PTTR1 Thermal protection values (2)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.T2PTTR1			
		1	.Tmp.mag	TEMP	Object temperature	-100.0... 9999.9 [C]
		1	.TmpRI.mag	TEMP_RL	Relative temperature	0.00...99.99 [C]
		1	.TmsOp.stVal	THERMLEV_ST	Est. time to operate	0...60000 [s]
		1	.TmsRecEna.stVal	THERMLEV_END	Est. time to deactivate block	0...60000 [s]

2.5 Controls

Table 164: 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 CTRL.CBCSWI1 Circuit breaker (1) control

Table 165: CTRL.CBCSWI1 Circuit breaker (1) control

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

2.5.2 Reset, acknowledge and trigger points (A)

Table 166: Reset, acknowledge and trigger points (A)

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.LLN0			
2060	2.00	.LEDRs1.Oper.ctlVal		Reset indications and LEDs	1=Reset
2061	2.01	.LEDRs2.Oper.ctlVal		Reset Alarm LEDs	1=Reset
		LD0.PEMSTA1			
2062	2.02	.RecRs.Oper.ctlVal		Reset Power max demands	1=Reset
		LD0.DARREC1			
2063	2.03	.RsRec.Oper.ctlVal		Reset reclosing	1=Reset
2064	2.04	.RsCnt.ctlVal		Reset reclosing counters	1=Reset
		LD0.SSCBR1			
2065	2.05	.RsAccAPwr.Oper.ctlVal		Reset CB accum. energy	1=Reset

Table continues on next page

0xA	CS	IEC 61850 name	SA name	Description	Values
2066	2.06	.RsCBWear.Oper.ctlVal		Reset CB wear data	1=Reset
		DR.RDRE1			
2067	2.07	.RcdTrg.Oper.ctlVal		Trig DR recording	1=Trig
2068	2.08	.MemClr.Oper.ctlVal		Clear DR memory	1=Clear
		LD0.CMSTA1			
2069	2.09	.RecRs.Oper.ctlVal		Reset Max current1 demands	1=Reset
		LD0.PEMMXU1			
2070	2.10	.SupDmdRs.Oper.ctlVal		Reset energy values	1=Reset
		LD0.SCCBR1			
2071	2.11	.RsTrvTm.Oper.ctlVal		Reset CB travel time	1=Reset
2072	2.12	.RsSprChaTm.Oper.ctlVal		Reset CB spring charge time	1=Reset
		LD0.RESCMSTA1			
2073	2.13	.RecRs.Oper.ctlVal		Reset lo (1) max demands	1=Reset
		LD0.RESVMSTA1			
2074	2.14	.RecRs.Oper.ctlVal		Reset Uo (1) max demands	1=Reset

2.5.3 LD0.LPHD1 IED warm reset (1)

Table 167: LD0.LPHD1 IED warm reset (1)

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.LPHD1			
2080	3.00	.RsDev.Oper.ctlVal		Warm reboot of IED	1=Reboot

2.5.4 LD0.SRGAPC1 Reset SRGAPC1 generic flip-flops

Table 168: LD0.SRGAPC1 Reset SRGAPC1 generic flip-flops

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

2.5.5 LD0.SRGAPC2 Reset SRGAPC2 generic flip-flops

Table 169: *LD0.SRGAPC2 Reset SRGAPC2 generic flip-flops*

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

2.5.6 LD0.SPCGGIO1 Multipurpose binary outputs (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 170: *LD0.SPCGGIO1 Multipurpose binary outputs (1)*

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.SPCGGIO1			
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
2121	5.09	.SPCS10.ctlVal		Output 10 control	0/1=Off/On
2122	5.10	.SPCS11.ctlVal		Output 11 control	0/1=Off/On
2123	5.11	.SPCS12.ctlVal		Output 12 control	0/1=Off/On
2124	5.12	.SPCS13.ctlVal		Output 13 control	0/1=Off/On
2125	5.13	.SPCS14.ctlVal		Output 14 control	0/1=Off/On
2126	5.14	.SPCS15.ctlVal		Output 15 control	0/1=Off/On
2127	5.15	.SPCS16.ctlVal		Output 16 control	0/1=Off/On

2.5.7 LD0.SPCGGIO2 Multipurpose binary outputs (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 171: LD0.SPCGGIO2 Multipurpose binary outputs (2)

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.SPCGGIO2			
2128	6.00	.SPCS01.ctlVal		Output 1 control	0/1=Off/On
2129	6.01	.SPCS02.ctlVal		Output 2 control	0/1=Off/On
2130	6.02	.SPCS03.ctlVal		Output 3 control	0/1=Off/On
2131	6.03	.SPCS04.ctlVal		Output 4 control	0/1=Off/On
2132	6.04	.SPCS05.ctlVal		Output 5 control	0/1=Off/On
2133	6.05	.SPCS06.ctlVal		Output 6 control	0/1=Off/On
2134	6.06	.SPCS07.ctlVal		Output 7 control	0/1=Off/On
2135	6.07	.SPCS08.ctlVal		Output 8 control	0/1=Off/On
2136	6.08	.SPCS09.ctlVal		Output 9 control	0/1=Off/On
2137	6.09	.SPCS10.ctlVal		Output 10 control	0/1=Off/On
2138	6.10	.SPCS11.ctlVal		Output 11 control	0/1=Off/On
2139	6.11	.SPCS12.ctlVal		Output 12 control	0/1=Off/On
2140	6.12	.SPCS13.ctlVal		Output 13 control	0/1=Off/On
2141	6.13	.SPCS14.ctlVal		Output 14 control	0/1=Off/On
2142	6.14	.SPCS15.ctlVal		Output 15 control	0/1=Off/On
2143	6.15	.SPCS16.ctlVal		Output 16 control	0/1=Off/On

2.5.8 CTRL.DCCSWI1 Disconnecter (1) control

Table 172: CTRL.DCCSWI1 Disconnecter (1) control

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

2.5.9 CTRL.DCCSWI2 Disconnecter (2) control

Table 173: *CTRL.DCCSWI2 Disconnecter (2) control*

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

2.5.10 CTRL.ESCSWI1 Earth switch (1) control

Table 174: *CTRL.ESCSWI1 Earth switch (1) control*

0xA	CS	IEC 61850 name	SA name	Description	Values
		CTRL.ESCXSWI1			
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

Section 3 Glossary

BIO	Binary input and output
EMC	Electromagnetic compatibility
Ethernet	A standard for connecting a family of frame-based computer networking technologies into a LAN
GOOSE	Generic Object-Oriented Substation Event
HSO	High-speed output
IEC	International Electrotechnical Commission
IEC 61850	International standard for substation communication and modeling
IED	Intelligent electronic device
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
RTD	Resistance temperature detector

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