RELION® 620 SERIES

Motor Protection and Control REM620

Modbus Point List Manual

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Section 1 Introduction

1.1 This manual

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

1.2 Intended audience

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

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

1.3 Product documentation

1.3.1 Product documentation set

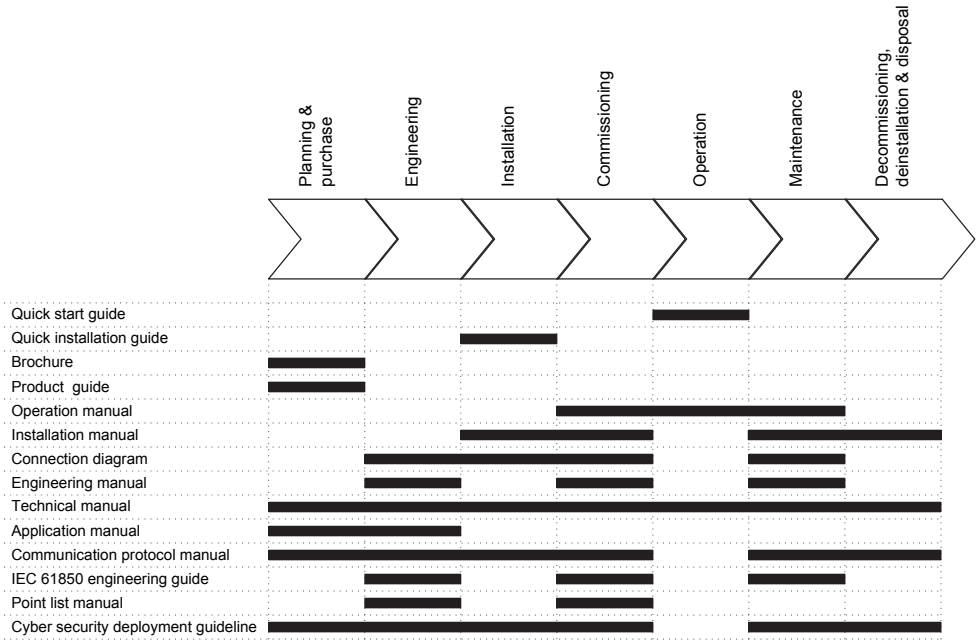

Figure 1: The intended use of documents during the product life cycle

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

1.3.2 Document revision history

Document revision/date	Product version	History
A/2013-05-07	2.0	First release
B/2015-12-11	2.0 FP1	Content updated to correspond to the product version
C/2019-06-19	2.0 FP1	Content updated

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

1.3.3 Related documentation

Name of the document	Document ID
Modbus Communication Protocol Manual	1MRS757645

1.4 Symbols and conventions

1.4.1 Symbols

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

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

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

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

1.4.2 Document conventions

A particular convention may not be used in this manual.

- Abbreviations and acronyms are spelled out in the glossary. The glossary also contains definitions of important terms.
- Push button navigation in the LHMI menu structure is presented by using the push button icons.
  To navigate between the options, use  and  .
- Menu paths are presented in bold.
  Select **Main menu/Settings**.
- LHMI messages are shown in Courier font.
  To save the changes in nonvolatile memory, select `Yes` and press  .
- Parameter names are shown in italics.
  The function can be enabled and disabled with the *Operation* setting.
- Parameter values are indicated with quotation marks.

The corresponding parameter values are "On" and "Off".

- 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 relay

Function	IEC 61850	IEC 60617	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)
Three-phase directional overcurrent protection, low stage	DPHLPDOC1	3I> -> (1)	67-1 (1)
Three-phase directional overcurrent protection, high stage	DPHHPDOC1	3I>> -> (1)	67-2 (1)
	DPHHPDOC2	3I>> -> (2)	67-2 (2)
Three-phase voltage-dependent overcurrent protection	PHPVOC1	3I(U)> (1)	51V (1)
	PHPVOC2	3I(U)> (2)	51V (2)
Non-directional earth-fault protection, low stage	EFLPTOC1	Io> (1)	51N-1 (1)
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)
Directional earth-fault protection, high stage	DEFHPDEF1	Io>> -> (1)	67N-2 (1)
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)
	PHPTUV3	3U< (3)	27 (3)
	PHPTUV4	3U< (4)	27 (4)
Single-phase undervoltage protection, secondary side	PHAPTUV1	U_A< (1)	27_A (1)

Table continues on next page

Function	IEC 61850	IEC 60617	ANSI
Three-phase overvoltage protection	PHPTOV1	3U> (1)	59 (1)
	PHPTOV2	3U> (2)	59 (2)
	PHPTOV3	3U> (3)	59 (3)
Single-phase overvoltage protection, secondary side	PHAPTOV1	U_A> (1)	59_A (1)
Positive-sequence undervoltage protection	PSPTUV1	U1< (1)	47U+ (1)
	PSPTUV2	U1< (2)	47U+ (2)
Negative-sequence overvoltage protection	NSPTOV1	U2> (1)	47O- (1)
	NSPTOV2	U2> (2)	47O- (2)
Frequency protection	FRPFRQ1	f>/f<,df/dt (1)	81 (1)
	FRPFRQ2	f>/f<,df/dt (2)	81 (2)
	FRPFRQ3	f>/f<,df/dt (3)	81 (3)
	FRPFRQ4	f>/f<,df/dt (4)	81 (4)
	FRPFRQ5	f>/f<,df/dt (5)	81 (5)
	FRPFRQ6	f>/f<,df/dt (6)	81 (6)
Negative-sequence overcurrent protection for machines	MNSPTOC1	I2>M (1)	46M (1)
	MNSPTOC2	I2>M (2)	46M (2)
Loss of load supervision	LOFLPTUC1	3I< (1)	37 (1)
	LOFLPTUC2	3I< (2)	37 (2)
Motor load jam protection	JAMPTOC1	Ist> (1)	51LR (1)
Motor start-up supervision	STTPMSU1	Is2t n< (1)	49,66,48,51LR (1)
Phase reversal protection	PREVPTOC1	I2>> (1)	46R (1)
Thermal overload protection for motors	MPTTR1	3Ith>M (1)	49M (1)
Stabilized and instantaneous differential protection for machines	MPDIF1	3dI>M/G (1)	87M/G (1)
High-impedance/flux-balance based differential protection for motors	MHZPDIF1	3dIHi>M (1)	87MH (1)
High-impedance based restricted earth-fault protection	HREFPDIF1	dIoHi> (1)	87NH (1)
Circuit breaker failure protection	CCBRBRF1	3I>/Io>BF (1)	51BF/51NBF (1)
	CCBRBRF2	3I>/Io>BF (2)	51BF/51NBF (2)
	CCBRBRF3	3I>/Io>BF (3)	51BF/51NBF (3)
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)
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	ANSI
Multipurpose protection	MAPGAPC1	MAP (1)	MAP (1)
	MAPGAPC2	MAP (2)	MAP (2)
	MAPGAPC3	MAP (3)	MAP (3)
	MAPGAPC4	MAP (4)	MAP (4)
	MAPGAPC5	MAP (5)	MAP (5)
	MAPGAPC6	MAP (6)	MAP (6)
	MAPGAPC7	MAP (7)	MAP (7)
	MAPGAPC8	MAP (8)	MAP (8)
	MAPGAPC9	MAP (9)	MAP (9)
	MAPGAPC10	MAP (10)	MAP (10)
	MAPGAPC11	MAP (11)	MAP (11)
	MAPGAPC12	MAP (12)	MAP (12)
	MAPGAPC13	MAP (13)	MAP (13)
	MAPGAPC14	MAP (14)	MAP (14)
	MAPGAPC15	MAP (15)	MAP (15)
	MAPGAPC16	MAP (16)	MAP (16)
	MAPGAPC17	MAP (17)	MAP (17)
	MAPGAPC18	MAP (18)	MAP (18)
Automatic switch-onto-fault logic (SOF)	CVPSOF1	CVPSOF (1)	SOFT/21/50 (1)
Directional reactive power undervoltage protection	DQPTUV1	Q> -> ,3U< (1)	32Q,27 (1)
	DQPTUV2	Q> -> ,3U< (2)	32Q,27 (2)
Underpower protection	DUPPDPR1	P< (1)	32U (1)
	DUPPDPR2	P< (2)	32U (2)
Reverse power/directional overpower protection	DOPPDPR1	P>/Q> (1)	32R/32O (1)
	DOPPDPR2	P>/Q> (2)	32R/32O (2)
	DOPPDPR3	P>/Q> (3)	32R/32O (3)
Three-phase underexcitation protection	UEXPDIS1	X< (1)	40 (1)
	UEXPDIS2	X< (2)	40 (2)
Low-voltage ride-through protection	LVRTPTUV1	U<RT (1)	27RT (1)
	LVRTPTUV2	U<RT (2)	27RT (2)
	LVRTPTUV3	U<RT (3)	27RT (3)
Rotor earth-fault protection	MREFPTOC1	Io>R (1)	64R (1)
Control			
Circuit-breaker control	CBXCBR1	I <-> O CB (1)	I <-> O CB (1)
	CBXCBR2	I <-> O CB (2)	I <-> O CB (2)
	CBXCBR3	I <-> O CB (3)	I <-> O CB (3)

Table continues on next page

Function	IEC 61850	IEC 60617	ANSI
Disconnector control	DCXSWI1	I <-> O DCC (1)	I <-> O DCC (1)
	DCXSWI2	I <-> O DCC (2)	I <-> O DCC (2)
	DCXSWI3	I <-> O DCC (3)	I <-> O DCC (3)
	DCXSWI4	I <-> O DCC (4)	I <-> O DCC (4)
Earthing switch control	ESXSWI1	I <-> O ESC (1)	I <-> O ESC (1)
	ESXSWI2	I <-> O ESC (2)	I <-> O ESC (2)
	ESXSWI3	I <-> O ESC (3)	I <-> O ESC (3)
Disconnector 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)
	DCSXSWI4	I <-> O DC (4)	I <-> O DC (4)
Earthing switch indication	ESSXSWI1	I <-> O ES (1)	I <-> O ES (1)
	ESSXSWI2	I <-> O ES (2)	I <-> O ES (2)
	ESSXSWI3	I <-> O ES (3)	I <-> O ES (3)
Emergency start-up	ESMGAPC1	ESTART (1)	ESTART (1)
Synchronism and energizing check	SECRSYN1	SYNC (1)	25 (1)
Condition monitoring and supervision			
Circuit-breaker condition monitoring	SSCBR1	CBCM (1)	CBCM (1)
	SSCBR2	CBCM (2)	CBCM (2)
	SSCBR3	CBCM (3)	CBCM (3)
Trip circuit supervision	TCSSCBR1	TCS (1)	TCM (1)
	TCSSCBR2	TCS (2)	TCM (2)
Current circuit supervision	CCSPVC1	MCS 3I (1)	MCS 3I (1)
Fuse failure supervision	SEQSPVC1	FUSEF (1)	60 (1)
Runtime counter for machines and devices	MDSOPT1	OPTS (1)	OPTM (1)
	MDSOPT2	OPTS (2)	OPTM (2)
Measurement			
Three-phase current measurement	CMMXU1	3I (1)	3I (1)
	CMMXU2	3I (2)	3I (2)
Sequence current measurement	CSMSQI1	I1, I2, I0 (1)	I1, I2, I0 (1)
	CSMSQI2	I1, I2, I0 (B) (1)	I1, I2, I0 (B) (1)
Residual current measurement	RESCMMXU1	Io (1)	In (1)
Three-phase voltage measurement	VMMXU1	3U (1)	3V (1)
Single-phase voltage measurement	VAMMXU2	U_A (2)	V_A (2)
Residual voltage measurement	RESVMMXU1	Uo (1)	Vn (1)
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)
Load profile record	LDPRLRC1	LOADPROF (1)	LOADPROF (1)
Frequency measurement	FMMXU1	f (1)	f (1)

Table continues on next page

Function	IEC 61850	IEC 60617	ANSI
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)
Voltage unbalance	VSQVUB1	PQUUB (1)	PQVUB (1)
Other			
Minimum pulse timer (2 pcs)	TPGAPC1	TP (1)	TP (1)
	TPGAPC2	TP (2)	TP (2)
	TPGAPC3	TP (3)	TP (3)
	TPGAPC4	TP (4)	TP (4)
Minimum pulse timer (2 pcs, second resolution)	TPSGAPC1	TPS (1)	TPS (1)
	TPSGAPC2	TPS (2)	TPS (2)
Minimum pulse timer (2 pcs, minute resolution)	TPMGAPC1	TPM (1)	TPM (1)
	TPMGAPC2	TPM (2)	TPM (2)
Pulse timer (8 pcs)	PTGAPC1	PT (1)	PT (1)
	PTGAPC2	PT (2)	PT (2)
Time delay off (8 pcs)	TOFGAPC1	TOF (1)	TOF (1)
	TOFGAPC2	TOF (2)	TOF (2)
	TOFGAPC3	TOF (3)	TOF (3)
	TOFGAPC4	TOF (4)	TOF (4)
Time delay on (8 pcs)	TONGAPC1	TON (1)	TON (1)
	TONGAPC2	TON (2)	TON (2)
	TONGAPC3	TON (3)	TON (3)
	TONGAPC4	TON (4)	TON (4)
Set-reset (8 pcs)	SRGAPC1	SR (1)	SR (1)
	SRGAPC2	SR (2)	SR (2)
	SRGAPC3	SR (3)	SR (3)
	SRGAPC4	SR (4)	SR (4)
Move (8 pcs)	MVGAPC1	MV (1)	MV (1)
	MVGAPC2	MV (2)	MV (2)
	MVGAPC3	MV (3)	MV (3)
	MVGAPC4	MV (4)	MV (4)
Integer value move	MVI4GAPC1	MVI4 (1)	MVI4 (1)
	MVI4GAPC2	MVI4 (2)	MVI4 (2)
	MVI4GAPC3	MVI4 (3)	MVI4 (3)
	MVI4GAPC4	MVI4 (4)	MVI4 (4)

Table continues on next page

Function	IEC 61850	IEC 60617	ANSI
Analog value scaling	SCA4GAPC1	SCA4 (1)	SCA4 (1)
	SCA4GAPC2	SCA4 (2)	SCA4 (2)
	SCA4GAPC3	SCA4 (3)	SCA4 (3)
	SCA4GAPC4	SCA4 (4)	SCA4 (4)
Generic control point (16 pcs)	SPCGAPC1	SPC (1)	SPC (1)
	SPCGAPC2	SPC (2)	SPC (2)
	SPCGAPC3	SPC (3)	SPC (3)
Remote generic control points	SPCRGAPC1	SPCR (1)	SPCR (1)
Local generic control points	SPCLGAPC1	SPCL (1)	SPCL (1)
Generic up-down counters	UDFCNT1	UDCNT (1)	UDCNT (1)
	UDFCNT2	UDCNT (2)	UDCNT (2)
	UDFCNT3	UDCNT (3)	UDCNT (3)
	UDFCNT4	UDCNT (4)	UDCNT (4)
	UDFCNT5	UDCNT (5)	UDCNT (5)
	UDFCNT6	UDCNT (6)	UDCNT (6)
	UDFCNT7	UDCNT (7)	UDCNT (7)
	UDFCNT8	UDCNT (8)	UDCNT (8)
	UDFCNT9	UDCNT (9)	UDCNT (9)
	UDFCNT10	UDCNT (10)	UDCNT (10)
	UDFCNT11	UDCNT (11)	UDCNT (11)
	UDFCNT12	UDCNT (12)	UDCNT (12)
Programmable buttons (16 buttons)	FKEYGGIO1	FKEY (1)	FKEY (1)
Logging functions			
Disturbance recorder	RDRE1	DR (1)	DFR (1)
Fault recorder	FLTRFRC1	FAULTREC (1)	FAULTREC (1)
Sequence event recorder	SER1	SER (1)	SER (1)

Section 2 Modbus data mappings

2.1 Overview

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

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 protection relay. 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 REM620

Table 2: Supported functions

Function	IEC 61850	A (CTs/VTs)	B (Sensors)
		ME201	ME202
Protection			
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
Three-phase directional overcurrent protection, low stage	DPHLPDOC	1	1
Three-phase directional overcurrent protection, high stage	DPHHPDOC	2	2
Three-phase voltage-dependent overcurrent protection	PHPVOC	2	2
Non-directional earth-fault protection, low stage	EFLPTOC	1[1)2)]	1[2)]
Non-directional earth-fault protection, high stage	EFHPTOC	1[1)2)]	1[2)]
Non-directional earth-fault protection, instantaneous stage	EFIPTOC1	1[1)2)]	1[2)]
Directional earth-fault protection, low stage	DEFLPDEF	1[1)2)]	1[2)3)]
Directional earth-fault protection, high stage	DEFHPDEF	1[1)2)]	1[2)3)]
Residual overvoltage protection	ROVPTOV	3	3[3)]

Table continues on next page

Function	IEC 61850	A (CTs/VTs)	B (Sensors)
		ME201	ME202
Three-phase undervoltage protection	PHPTUV	4	4
Single-phase undervoltage protection, secondary side	PHAPTUV	1	
Three-phase overvoltage protection	PHPTOV	3	3
Single-phase overvoltage protection, secondary side	PHAPTOV	1	
Positive-sequence undervoltage protection	PSPTUV	2	2
Negative-sequence overvoltage protection	NSPTOV	2	2
Frequency protection	FRPFRQ	6	6
Negative-sequence overcurrent protection for machines	MNSPTOC	2	2
Loss of load supervision	LOFLPTUC	2	2
Motor load jam protection	JAMPTOC	1	1
Motor start-up supervision	STTPMSU	1	1
Phase reversal protection	PREVPTOC	1	1
Thermal overload protection for motors	MPTTR	1	1
Stabilized and instantaneous differential protection for machines	MPDIF	1	
High-impedance/flux-balance based differential protection for motors	MHZPDIF	1	
High-impedance based restricted earth-fault protection	HREFPDIF	1	
Circuit breaker failure protection	CCBRBRF	3	3
Master trip	TRPPTRC	4	4
Arc protection	ARCSARC	(3)[4)]	(3)[4)]
Multipurpose protection	MAPGAPC	18	18
Automatic switch-onto-fault logic (SOF)	CVPSOF	1	1
Directional reactive power undervoltage protection	DQPTUV	(2)	(2)
Underpower protection	DUPPDPR	(2)	(2)
Reverse power/directional overpower protection	DOPPDPR	(3)	(3)
Three-phase underexcitation protection	UEXPDIS	(2)	(2)
Low-voltage ride-through protection	LVRTPTUV	(3)	(3)
Rotor earth-fault protection	MREFPTOC	1	1
Control			
Circuit-breaker control	CBXCBR	3	3
Disconnector control	DCXSWI	4	4
Earthing switch control	ESXSWI	3	3
Disconnector position indication	DCSXSWI	4	4
Earthing switch indication	ESSXSWI	3	3
Emergency start-up	ESMGAPC	1	1

Table continues on next page

Function	IEC 61850	A (CTs/VTs)	B (Sensors)
		ME201	ME202
Synchronism and energizing check	SECRSYN	1	(1)[5)]
Condition monitoring and supervision			
Circuit-breaker condition monitoring	SSCBR	3	3
Trip circuit supervision	TCSSCBR	2	2
Current circuit supervision	CCSPVC	1	1
Fuse failure supervision	SEQSPVC	1	1
Runtime counter for machines and devices	MDSOPT	2	2
Measurement			
Three-phase current measurement	CMMXU	2	1
Sequence current measurement	CSMSQI	2	1
Residual current measurement	RESCMMXU	1	1
Three-phase voltage measurement	VMMXU	1	1
Single-phase voltage measurement	VAMMXU	1	(1)[5)]
Residual voltage measurement	RESVMMXU	1	
Sequence voltage measurement	VSMSQI	1	1
Three-phase power and energy measurement	PEMMXU	1	1
Load profile record	LDPRLRC	1	1
Frequency measurement	FMMXU	1	1
Power quality			
Current total demand distortion	CMHAI	1	1
Voltage total harmonic distortion	VMHAI	1	1
Voltage variation	PHQVVR	1	1
Voltage unbalance	VSQVUB	1	1
Other			
Minimum pulse timer (2 pcs)	TPGAPC	4	4
Minimum pulse timer (2 pcs, second resolution)	TPSGAPC	2	2
Minimum pulse timer (2 pcs, minute resolution)	TPMGAPC	2	2
Pulse timer (8 pcs)	PTGAPC	2	2
Time delay off (8 pcs)	TOFGAPC	4	4
Time delay on (8 pcs)	TONGAPC	4	4
Set-reset (8 pcs)	SRGAPC	4	4
Move (8 pcs)	MVGAPC	4	4
Integer value move	MVI4GAPC	4	4
Analog value scaling	SCA4GAPC	4	4
Generic control point (16 pcs)	SPCGAPC	3	3
Remote generic control points	SPCRGAPC	1	1
Local generic control points	SPCLGAPC	1	1
Generic up-down counters	UDFCNT	12	12

Table continues on next page

Function	IEC 61850	A (CTs/VTs)	B (Sensors)
		ME201	ME202
Programmable buttons (16 buttons)	FKEYGGIO	1	1
Logging functions			
Disturbance recorder	RDRE	1	1
Fault recorder	FLTRFRC	1	1
Sequence event recorder	SER	1	1
1, 2, ... = Number of included instances. The instances of a protection function represent the number of identical protection function blocks available in the standard configuration. () = optional			

1) Function uses calculated value when the high-impedance based restricted earth-fault protection is used
2) Function uses calculated value when the rotor earth-fault protection is used
3) Uo is calculated from the measured phase voltages
4) Io is calculated from the measured phase currents
5) Available only with IEC 61850-9-2 LE

2.3 Indications

Table 3: Explanations of the indications table columns

Column name	Description
BitA	Default 0X and 1X bit address for the data.
RegA	Default 3X and 4X register.bit (00-15) address for the data.
IEC 61850 name	Original IED data object identification. Described in the IEC 61850 format as Logical Device.Logical Node and thereafter .Data Object.Data Attribute. Logical Node is the same as the application function block name.
SA name	The signal may have a defined label that is visible, for example, in the Application Configuration tool in PCM600.
Description	Short description of the signal. See the technical manual for more information.
Value	Meaning of the value states.

2.3.1 Premapped indications

2.3.1.1 Common data 1

Table 4: Common data 1

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

2.3.1.2 CTRL.CBCILO1 Circuit breaker enable signals (1)

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

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

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

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

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

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

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

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

2.3.1.5 CTRL.CBXCBR1 Circuit-breaker control (1)

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

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.CBXCBR1			
2836	177.04	.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked
2837	177.05	.mcd			
Table continues on next page					

BitA	RegA	IEC 61850 name	SA name	Description	Values
2838	177.06	.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
2839	177.07	.mcd			
2840	177.08	.ItlByPss.stVal	ITL_BYPASS	Interlock bypass	1=Bypass
2841	177.09	.mcd			

2.3.1.6 CTRL.DCSXSWI1 Disconnector position indication (1)

Table 9: CTRL.DCSXSWI1 Disconnector position indication (1)

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

2.3.1.7 CTRL.DCSXSWI2 Disconnector position indication (2)

Table 10: CTRL.DCSXSWI2 Disconnector position indication (2)

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

2.3.1.8 CTRL.DCSXSWI3 Disconnector position indication (3)

Table 11: CTRL.DCSXSWI3 Disconnector position indication (3)

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

2.3.1.9 CTRL.DCXSWI1 Disconnector control (1)

Table 12: CTRL.DCXSWI1 Disconnector control (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.DCXSWI1	POSITION		
3472	217.00	.Pos.stVal.Close	-	Close bit	1=Close
3473	217.01	.Pos.stVal.Open	-	Open bit	1=Open

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
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
3481	217.09	.mcd			
		CTRL.DCCILO1			
3482	217.10	.ItlByps.stVal	ITL_BYPASS	Interlock bypass	1=Bypass
3483	217.11	.mcd			

2.3.1.10 CTRL.DCXSWI2 Disconnector control (2)

Table 13: CTRL.DCXSWI2 Disconnector control (2)

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

2.3.1.11 CTRL.ESSXSWI1 Earthing switch indication (1)

Table 14: CTRL.ESSXSWI1 Earthing switch indication (1)

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

2.3.1.12 CTRL.ESSXSWI2 Earthing switch indication (2)

Table 15: CTRL.ESSXSWI2 Earthing switch indication (2)

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

2.3.1.13 CTRL.ESXSWI1 Earthing switch control (1)

Table 16: CTRL.ESXSWI1 Earthing switch control (1)

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

2.3.1.14 LD0.ARCSARC1 Arc protection (1)

Table 17: LD0.ARCSARC1 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			

2.3.1.15 LD0.ARCSARC2 Arc protection (2)

Table 18: LD0.ARCSARC2 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			

2.3.1.16 LD0.ARCSARC3 Arc protection (3)

Table 19: LD0.ARCSARC3 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			

2.3.1.17 LD0.CCBRBRF1 Circuit breaker failure protection (1)

Table 20: LD0.CCBRBRF1 Circuit breaker failure protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.CCBRBRF1			
2828	176.12	.Str.general	CB_FAULT_AL	Timer running	1=Running
2829	176.13	.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
2830	176.14	.OpEx.general	TRBU	Fail, external trip	1=Ext.trip
2831	176.15	.mcd			
2832	177.00	.OpIn.general	TRRET	Internal re-trip	1=Re-trip
2833	177.01	.mcd			

2.3.1.18 LD0.CCBRBRF2 Circuit breaker failure protection (2)

Table 21: LD0.CCBRBRF2 Circuit breaker failure protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.CCBRBRF2			
4428	276.12	.Str.general	CB_FAULT_AL	Timer running	1=Running
4429	276.13	.mcd			
4430	276.14	.OpEx.general	TRBU	Fail, external trip	1=Ext.trip
4431	276.15	.mcd			
4432	277.00	.OpIn.general	TRRET	Internal re-trip	1=Re-trip
4433	277.01	.mcd			

2.3.1.19 LD0.CCSPVC1 Current circuit supervision (1)

Table 22: LD0.CCSPVC1 Current circuit supervision (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.CCSPVC1			
2936	183.08	.SigFailAlm.stVal	ALARM	Alarm	1=Alarm
2937	183.09	.mcd			
2938	183.10	.FailACirc.general	FAIL	Failure operate	1=Operate
2939	183.11	.mcd			

2.3.1.20 LD0.CMMXU1 Three-phase current measurement (1)

Table 23: LD0.CMMXU1 Three-phase current measurement (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			

2.3.1.21 LD0.CMMXU2 Three-phase current measurement (2)

Table 24: LD0.CMMXU2 Three-phase current measurement (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.CMMXU2			
3130	195.10	.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
3131	195.11	.mcd			
3132	195.12	.HiWrn.stVal	HIGH_WARN	High warning	1=Warning
3133	195.13	.mcd			
3134	195.14	.LoWrn.stVal	LOW_WARN	Low warning	1=Warning
3135	195.15	.mcd			
3136	196.00	.LoAlm.stVal	LOW_ALARM	Low alarm	1=Alarm
3137	196.01	.mcd			

2.3.1.22 LD0.DEFHPDEF1 Directional earth-fault protection, high stage (1)

Table 25: LD0.DEFHPDEF1 Directional earth-fault protection, high stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DEFHPTOC1			
3088	193.00	.Str.general	START	Stage start	1=Start
3089	193.01	.mcd			
3090	193.02	.Op.general	OPERATE	Stage operate	1=Operate
3091	193.03	.mcd			

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

Table 26: LD0.DEFLPDEF1 Directional earth-fault protection, low stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DEFLPTOC1			
2900	181.04	.Str.general	START	Stage start	1=Start
2901	181.05	.mcd			
2902	181.06	.Op.general	OPERATE	Stage operate	1=Operate
2903	181.07	.mcd			

2.3.1.24 LD0.DPHHPDOC1 Three-phase directional overcurrent protection, high stage (1)

Table 27: LD0.DPHHPDOC1 Three-phase directional overcurrent protection, high stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DPHHPTOC1			
3850	240.10	.Str.general	START	General start	1=Start
3851	240.11	.mcd			
3852	240.12	.Str.phsA		Phs A start	1=Start
3853	240.13	.mcd			
3854	240.14	.Str.phsB		Phs B start	1=Start
3855	240.15	.mcd			
3856	241.00	.Str.phsC		Phs C start	1=Start
3857	241.01	.mcd			
3858	241.02	.Op.general	OPERATE	General operate	1=Operate
3859	241.03	.mcd			

2.3.1.25 LD0.DPHHPDOC2 Three-phase directional overcurrent protection, high stage (2)

Table 28: LD0.DPHHPDOC2 Three-phase directional overcurrent protection, high stage (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DPHHPTOC2			
3860	241.04	.Str.general	START	General start	1=Start
3861	241.05	.mcd			
3862	241.06	.Str.phsA		Phs A start	1=Start
3863	241.07	.mcd			
3864	241.08	.Str.phsB		Phs B start	1=Start
3865	241.09	.mcd			
3866	241.10	.Str.phsC		Phs C start	1=Start
3867	241.11	.mcd			
3868	241.12	.Op.general	OPERATE	General operate	1=Operate
3869	241.13	.mcd			

2.3.1.26 LD0.DPHLPDOC1 Three-phase directional overcurrent protection, low stage (1)

Table 29: LD0.DPHLPDOC1 Three-phase directional overcurrent protection, low stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.DPHLPTOC1			
3840	240.00	.Str.general	START	General start	1=Start
3841	240.01	.mcd			
3842	240.02	.Str.phsA		Phs A start	1=Start
3843	240.03	.mcd			
3844	240.04	.Str.phsB		Phs B start	1=Start
3845	240.05	.mcd			
3846	240.06	.Str.phsC		Phs C start	1=Start
3847	240.07	.mcd			
3848	240.08	.Op.general	OPERATE	General operate	1=Operate
3849	240.09	.mcd			

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

Table 30: LD0.EFHPTOC1 Non-directional earth-fault protection, high stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFHPTOC1			
3012	188.04	.Str.general	START	Stage start	1=Start
3013	188.05	.mcd			
3014	188.06	.Op.general	OPERATE	Stage operate	1=Operate
3015	188.07	.mcd			

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

Table 31: LD0.EFIPTOC1 Non-directional earth-fault protection, instantaneous stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFIPTOC1			
3016	188.08	.Str.general	START	Stage start	1=Start
3017	188.09	.mcd			
3018	188.10	.Op.general	OPERATE	Stage operate	1=Operate
3019	188.11	.mcd			

2.3.1.29 LD0.EFLPTOC1 Non-directional earth-fault protection low stage (1)

Table 32: LD0.EFLPTOC1 Non-directional earth-fault protection low stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.EFLPTOC1			
3008	188.00	.Str.general	START	Stage start	1=Start
3009	188.01	.mcd			
3010	188.02	.Op.general	OPERATE	Stage operate	1=Operate
3011	188.03	.mcd			

2.3.1.30 LD0.ESMGAPC1 Emergency start-up (1)

Table 33: LD0.ESMGAPC1 Emergency start-up (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.ESMGAPC1			
2934	183.06	.Str.general	ST_EMERG_ENA	Emergency start	1=Start
2935	183.07	.mcd			

2.3.1.31 LD0.FRPFRQ1 Frequency protection (1)

Table 34: LD0.FRPFRQ1 Frequency protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.FRPTRC1			
3024	189.00	.Str.general	START	Stage 1 start	1=Start
3025	189.01	.mcd			
		LD0.FRPTOF1		Overfrequency	
3026	189.02	.Op.general	OPR_OFRQ	Operate	1=Operate
3027	189.03	.mcd			
		LD0.FRPTUF1		Underfrequency	
3028	189.04	.Op.general	OPR_UFRQ	Operate	1=Operate
3029	189.05	.mcd			
		LD0.FRPFRC1		Frequency gradient	
3030	189.06	.Op.general	OPR_FRG	Operate	1=Operate
3031	189.07	.mcd			

2.3.1.32 LD0.FRPFRQ2 Frequency protection (2)

Table 35: LD0.FRPFRQ2 Frequency protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.FRPTRC2			
3032	189.08	.Str.general	START	Stage 2 start	1=Start
3033	189.09	.mcd			
		LD0.FRPTOF2		Overfrequency	
3034	189.10	.Op.general	OPR_OFRQ	Operate	1=Operate
3035	189.11	.mcd			
		LD0.FRPTUF2		Underfrequency	
3036	189.12	.Op.general	OPR_UFRQ	Operate	1=Operate
3037	189.13	.mcd			
		LD0.FRPFRC2		Frequency gradient	
3038	189.14	.Op.general	OPR_FRG	Operate	1=Operate
3039	189.15	.mcd			

2.3.1.33 LD0.FRPFRQ3 Frequency protection (3)

Table 36: LD0.FRPFRQ3 Frequency protection (3)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.FRPTRC3			
4016	251.00	.Str.general	START	Stage 3 start	1=Start
4017	251.01	.mcd			
		LD0.FRPTOF3		Overfrequency	
4018	251.02	.Op.general	OPR_OFRQ	Operate	1=Operate
4019	251.03	.mcd			
		LD0.FRPTUF3		Underfrequency	
4020	251.04	.Op.general	OPR_UFRQ	Operate	1=Operate
4021	251.05	.mcd			
		LD0.FRPFRC3		Frequency gradient	
4022	251.06	.Op.general	OPR_FRG	Operate	1=Operate
4023	251.07	.mcd			

2.3.1.34 LD0.FRPFRQ4 Frequency protection (4)

Table 37: LD0.FRPFRQ4 Frequency protection (4)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.FRPTRC4			
4024	251.08	.Str.general	START	Stage 4 start	1=Start
4025	251.09	.mcd			
		LD0.FRPTOF4		Overfrequency	
4026	251.10	.Op.general	OPR_OFRQ	Operate	1=Operate
4027	251.11	.mcd			
		LD0.FRPTUF4		Underfrequency	
4028	251.12	.Op.general	OPR_UFRQ	Operate	1=Operate
4029	251.13	.mcd			
		LD0.FRPFRC4		Frequency gradient	
4030	251.14	.Op.general	OPR_FRG	Operate	1=Operate
4031	251.15	.mcd			

2.3.1.35 LD0.FRPFRQ5 Frequency protection (5)

Table 38: LD0.FRPFRQ5 Frequency protection (5)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.FRPTRC5			
4032	252.00	.Str.general	START	Stage 5 start	1=Start
4033	252.01	.mcd			
		LD0.FRPTOF5		Overfrequency	
4034	252.02	.Op.general	OPR_OFRQ	Operate	1=Operate
4035	252.03	.mcd			
		LD0.FRPTUF5		Underfrequency	
4036	252.04	.Op.general	OPR_UFRQ	Operate	1=Operate
4037	252.05	.mcd			
		LD0.FRPFRC5		Frequency gradient	
4038	252.06	.Op.general	OPR_FRG	Operate	1=Operate
4039	252.07	.mcd			

2.3.1.36 LD0.FRPFRQ6 Frequency protection (6)

Table 39: LD0.FRPFRQ6 Frequency protection (6)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.FRPTRC6			
4040	252.08	.Str.general	START	Stage 6 start	1=Start
4041	252.09	.mcd			
		LD0.FRPTOF6		Overfrequency	
4042	252.10	.Op.general	OPR_OFRQ	Operate	1=Operate
4043	252.11	.mcd			
		LD0.FRPTUF6		Underfrequency	
4044	252.12	.Op.general	OPR_UFRQ	Operate	1=Operate
4045	252.13	.mcd			
		LD0.FRPFRC6		Frequency gradient	
4046	252.14	.Op.general	OPR_FRG	Operate	1=Operate
4047	252.15	.mcd			

2.3.1.37 LD0.JAMPTOC1 Motor load jam protection (1)

Table 40: LD0.JAMPTOC1 Motor load jam protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.JAMPTOC1			
2918	182.06	.Op.general	OPERATE	Stage operate	1=Operate
2919	182.07	.mcd			

2.3.1.38 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.

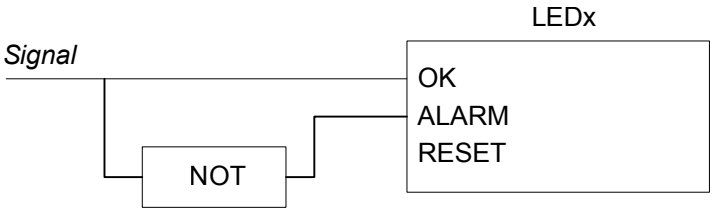

Figure 2: Signal wired to both OK and ALARM inputs – inverted to the other

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

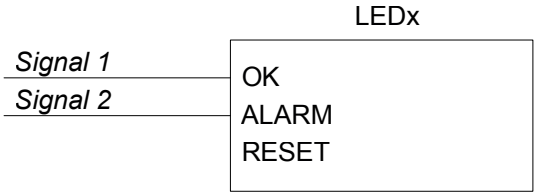

Figure 3: Separate signals wired to OK and ALARM inputs

Table 41: LD0.LEDGGIO1 Indication LED states Color1/Color2

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

2.3.1.39 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.

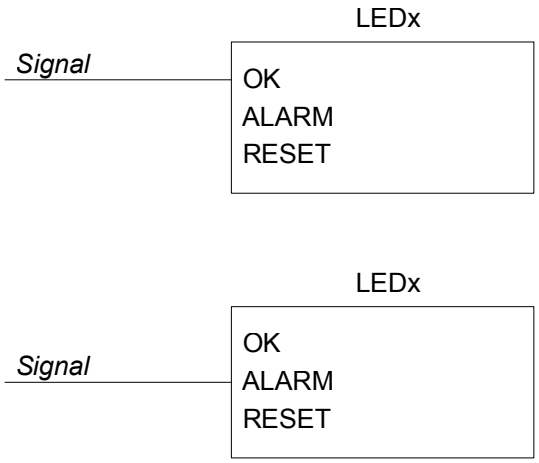

Figure 4: Signal wired to either OK or Alarm input

Table 42: LD0.LEDGGIO1 Indication LED states OFF/ColorX

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

2.3.1.40 LD0.LEDPTRC1 Global conditioning (1)

Table 43: 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			

2.3.1.41 LD0.LEDPTRC1 Global conditioning - phase information (1)

Table 44: LD0.LEDPTRC1 Global conditioning - phase information (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LEDPTRC1			
2864	179.00	.Str.phsA		Start phsA	1=Start
2865	179.01	.mcd			
2866	179.02	.Str.phsB		Start phsB	1=Start
2867	179.03	.mcd			
2868	179.04	.Str.phsC		Start phsC	1=Start
2869	179.05	.mcd			
2870	179.06	.Op.phsA		Operate phsA	1=Operate
2871	179.07	.mcd			
2872	179.08	.Op.phsB		Operate phsB	1=Operate
2873	179.09	.mcd			
2874	179.10	.Op.phsC		Operate phsC	1=Operate
2875	179.11	.mcd			

2.3.1.42 LD0.LOFLPTUC1 Loss of load supervision (1)

Table 45: LD0.LOFLPTUC1 Loss of load supervision (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LOFLPTUC1			
2912	182.00	.Str.general	START	Stage start	1=Start
2913	182.01	.mcd			
2914	182.02	.Op.general	OPERATE	Stage operate	1=Operate
2915	182.03	.mcd			

2.3.1.43 LD0.LOFLPTUC2 Loss of load supervision (2)

Table 46: LD0.LOFLPTUC2 Loss of load supervision (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LOFLPTUC2			
3122	195.02	.Str.general	START	Stage start	1=Start
3123	195.03	.mcd			
3124	195.04	.Op.general	OPERATE	Stage operate	1=Operate
3125	195.05	.mcd			

2.3.1.44 LD0.MAPGAPC1 Multipurpose protection (1)

Table 47: LD0.MAPGAPC1 Multipurpose protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC1			
3056	191.00	.Op.general	OPERATE	Stage operate	1 = Operate
3057	191.01	.mcd			
3058	191.02	.Str.general	START	Stage start	1 = Start
3059	191.03	.mcd			

2.3.1.45 LD0.MAPGAPC2 Multipurpose protection (2)

Table 48: LD0.MAPGAPC2 Multipurpose protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC2			
3060	191.04	.Op.general	OPERATE	Stage operate	1 = Operate
3061	191.05	.mcd			
3062	191.06	.Str.general	START	Stage start	1 = Start
3063	191.07	.mcd			

2.3.1.46 LD0.MAPGAPC3 Multipurpose protection (3)

Table 49: LD0.MAPGAPC3 Multipurpose protection (3)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC3			
3064	191.08	.Op.general	OPERATE	Stage operate	1 = Operate
3065	191.09	.mcd			
3066	191.10	.Str.general	START	Stage start	1 = Start
3067	191.11	.mcd			

2.3.1.47 LD0.MAPGAPC4 Multipurpose protection (4)

Table 50: LD0.MAPGAPC4 Multipurpose protection (4)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC4			
3068	191.12	.Op.general	OPERATE	Stage operate	1 = Operate
3069	191.13	.mcd			
3070	191.14	.Str.general	START	Stage start	1 = Start
3071	191.15	.mcd			

2.3.1.48 LD0.MAPGAPC5 Multipurpose protection (5)

Table 51: LD0.MAPGAPC5 Multipurpose protection (5)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC5			
3040	190.00	.Op.general	OPERATE	Stage operate	1 = Operate
3041	190.01	.mcd			
3042	190.02	.Str.general	START	Stage start	1 = Start
3043	190.03	.mcd			

2.3.1.49 LD0.MAPGAPC6 Multipurpose protection (6)

Table 52: LD0.MAPGAPC6 Multipurpose protection (6)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC6			
3044	190.04	.Op.general	OPERATE	Stage operate	1 = Operate
3045	190.05	.mcd			
3046	190.06	.Str.general	START	Stage start	1 = Start
3047	190.07	.mcd			

2.3.1.50 LD0.MAPGAPC7 Multipurpose protection (7)

Table 53: LD0.MAPGAPC7 Multipurpose protection (7)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC7			
3720	232.08	.Str.general	START	Stage start	1 = Start
3721	232.09	.mcd			
3722	232.10	.Op.general	OPERATE	Stage operate	1 = Operate
3723	232.11	.mcd			

2.3.1.51 LD0.MAPGAPC8 Multipurpose protection (8)

Table 54: LD0.MAPGAPC8 Multipurpose protection (8)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC8			
3724	232.12	.Str.general	START	Stage start	1 = Start
3725	232.13	.mcd			
3726	232.14	.Op.general	OPERATE	Stage operate	1 = Operate
3727	232.15	.mcd			

2.3.1.52 LD0.MAPGAPC9 Multipurpose protection (9)

Table 55: LD0.MAPGAPC9 Multipurpose protection (9)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC9			
3728	233.00	.Str.general	START	Stage start	1 = Start
3729	233.01	.mcd			
3730	233.02	.Op.general	OPERATE	Stage operate	1 = Operate
3731	233.03	.mcd			

2.3.1.53 LD0.MAPGAPC10 Multipurpose protection (10)

Table 56: LD0.MAPGAPC10 Multipurpose protection (10)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC10			
3732	233.04	.Str.general	START	Stage start	1 = Start
3733	233.05	.mcd			
3734	233.06	.Op.general	OPERATE	Stage operate	1 = Operate
3735	233.07	.mcd			

2.3.1.54 LD0.MAPGAPC11 Multipurpose protection (11)

Table 57: LD0.MAPGAPC11 Multipurpose protection (11)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC11			
3736	233.08	.Str.general	START	Stage start	1 = Start
3737	233.09	.mcd			
3738	233.10	.Op.general	OPERATE	Stage operate	1 = Operate
3739	233.11	.mcd			

2.3.1.55 LD0.MAPGAPC12 Multipurpose protection (12)

Table 58: LD0.MAPGAPC12 Multipurpose protection (12)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MAPGAPC12			
3740	233.12	.Str.general	START	Stage start	1 = Start
3741	233.13	.mcd			
3742	233.14	.Op.general	OPERATE	Stage operate	1 = Operate
3743	233.15	.mcd			

2.3.1.56 LD0.MDSOPT1 Runtime counter for machines and devices (1)

Table 59: LD0.MDSOPT1 Runtime counter for machines and devices (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MDSOPT1			
2876	179.12	.OpTmWrn.stVal		Accum.op.time Warn.	1=Warning
2877	179.13	.mcd			
2878	179.14	.OpTmAlm.stVal		Accum.op.time Alarm	1=Alarm
2879	179.15	.mcd			

2.3.1.57 LD0.MDSOPT2 Runtime counter for machines and devices (2)

Table 60: LD0.MDSOPT2 Runtime counter for machines and devices (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MDSOPT2			
3126	195.06	OpTmWrn.stVal	START	Accum.op.time Warn.	1 = Warning
3127	195.07	.mcd			
3128	195.08	OpTmAlm.stVal	OPERATE	Accum.op.time Alarm	1 = Alarm
3129	195.09	.mcd			

2.3.1.58 LD0.MNSPTOC1 Negative-sequence overcurrent protection for machines (1)

Table 61: LD0.MNSPTOC1 Negative-sequence overcurrent protection for machines (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MNSPTOC1			
2904	181.08	.Str.general	START	Stage start	1=Start
2905	181.09	.mcd			
2906	181.10	.Op.general	OPERATE	Stage operate	1=Operate
2907	181.11	.mcd			

2.3.1.59 LD0.MNSPTOC2 Negative-sequence overcurrent protection for machines (2)

Table 62: LD0.MNSPTOC2 Negative-sequence overcurrent protection for machines (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MNSPTOC2			
2908	181.12	.Str.general	START	Stage start	1=Start
2909	181.13	.mcd			
2910	181.14	.Op.general	OPERATE	Stage operate	1=Operate
2911	181.15	.mcd			

2.3.1.60 LD0.MPTTR1 Thermal overload protection for motors (1)

Table 63: LD0.MPTTR1 Thermal overload protection for motors (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MPTTR1			
2916	182.04	.StrInh.stVal	BLK_RESTART	Block restart	1=Restart
2917	182.05	.mcd			
2930	183.02	.AlmThm.general	ALARM	Thermal alarm	1=Alarm
2931	183.03	.mcd			
2932	183.04	.Op.general	OPERATE	Thermal operate	1=Operate
2933	183.05	.mcd			

2.3.1.61 LD0.MVGAPC1 Move (8 pcs) (1)

Table 64: LD0.MVGAPC1 Move (8 pcs) (1)

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

2.3.1.62 LD0.MVGAPC2 Move (8 pcs) (2)

Table 65: LD0.MVGAPC2 Move (8 pcs) (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MVGAPC2			
3552	222.00	.SPCSO1.stVal		Input 1	0/1=Off/On
3553	222.01	.mcd			
3554	222.02	.SPCSO2.stVal		Input 2	0/1=Off/On
3555	222.03	.mcd			
3556	222.04	.SPCSO3.stVal		Input 3	0/1=Off/On
3557	222.05	.mcd			
3558	222.06	.SPCSO4.stVal		Input 4	0/1=Off/On
3559	222.07	.mcd			
3560	222.08	.SPCSO5.stVal		Input 5	0/1=Off/On
3561	222.09	.mcd			
3562	222.10	.SPCSO6.stVal		Input 6	0/1=Off/On
3563	222.11	.mcd			
3564	222.12	.SPCSO7.stVal		Input 7	0/1=Off/On
3565	222.13	.mcd			
3566	222.14	.SPCSO8.stVal		Input 8	0/1=Off/On
3567	222.15	.mcd			

2.3.1.63 LD0.NSPTOV1 Negative-sequence overvoltage protection (1)

Table 66: LD0.NSPTOV1 Negative-sequence overvoltage protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.NSPTOV1			
2968	185.08	.Str.general	START	General start	1=Start
2969	185.09	.mcd			
2970	185.10	.Str.phsA		phsA start	1=Start
2971	185.11	.mcd			
2972	185.12	.Str.phsB		phsB start	1=Start
2973	185.13	.mcd			
2974	185.14	.Str.phsC		phsC start	1=Start
2975	185.15	.mcd			
2976	186.00	.Op.general	OPERATE	General operate	1=Operate
2977	186.01	.mcd			

2.3.1.64 LD0.NSPTOV2 Negative-sequence overvoltage protection (2)

Table 67: LD0.NSPTOV2 Negative-sequence overvoltage protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.NSPTOV2			
2998	187.06	.Str.general	START	General start	1=Start
2999	187.07	.mcd			
3006	187.14	.Op.general	OPERATE	General operate	1=Operate
3007	187.15	.mcd			

2.3.1.65 LD0.PHIPTOC1 Three-phase non-directional overcurrent protection, instantaneous stage (1)

Table 68: LD0.PHIPTOC1 Three-phase non-directional overcurrent protection, instantaneous stage (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHIPTOC1			
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			

2.3.1.66 LD0.PHLPTOC1 Three-phase non-directional overcurrent protection, low stage (1)

Table 69: LD0.PHLPTOC1 Three-phase non-directional 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		Phs A start	1=Start
2883	180.03	.mcd			
2884	180.04	.Str.phsB		Phs B start	1=Start
2885	180.05	.mcd			
2886	180.06	.Str.phsC		Phs C start	1=Start

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
2887	180.07	.mcd			
2888	180.08	.Op.general	OPERATE	General operate	1=Operate
2889	180.09	.mcd			

2.3.1.67 LD0.PHPTOV1 Three-phase overvoltage protection (1)

Table 70: LD0.PHPTOV1 Three-phase overvoltage protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTOV1			
3888	243.00	.Str.general	START	General start	1=Start
3889	243.01	.mcd			
3890	243.02	.Str.phsA		Phs A start	1=Start
3891	243.03	.mcd			
3892	243.04	.Str.phsB		Phs B start	1=Start
3893	243.05	.mcd			
3894	243.06	.Str.phsC		Phs C start	1=Start
3895	243.07	.mcd			
3896	243.08	.Op.general	OPERATE	General operate	1=Operate
3897	243.09	.mcd			

2.3.1.68 LD0.PHPTOV2 Three-phase overvoltage protection (2)

Table 71: LD0.PHPTOV2 Three-phase overvoltage protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTOV2			
3898	243.10	.Str.general	START	General start	1=Start
3899	243.11	.mcd			
3900	243.12	.Str.phsA		Phs A start	1=Start
3901	243.13	.mcd			
3902	243.14	.Str.phsB		Phs B start	1=Start
3903	243.15	.mcd			
3904	244.00	.Str.phsC		Phs C start	1=Start
3905	244.01	.mcd			
3906	244.02	.Op.general	OPERATE	General operate	1=Operate
3907	244.03	.mcd			

2.3.1.69 LD0.PHPTOV3 Three-phase overvoltage protection (3)

Table 72: LD0.PHPTOV3 Three-phase overvoltage protection (3)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTOV3			
3908	244.04	.Str.general	START	General start	1=Start
3909	244.05	.mcd			
3910	244.06	.Str.phsA		Phs A start	1=Start
3911	244.07	.mcd			
3912	244.08	.Str.phsB		Phs B start	1=Start
3913	244.09	.mcd			
3914	244.10	.Str.phsC		Phs C start	1=Start
3915	244.11	.mcd			
3916	244.12	.Op.general	OPERATE	General operate	1=Operate
3917	244.13	.mcd			

2.3.1.70 LD0.PHPTUV1 Three-phase undervoltage protection (1)

Table 73: LD0.PHPTUV1 Three-phase undervoltage protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTUV1			
2958	184.14	.Str.general	START	General start	1=Start
2959	184.15	.mcd			
2960	185.00	.Str.phsA		phsA start	1=Start
2961	185.01	.mcd			
2962	185.02	.Str.phsB		phsB start	1=Start
2963	185.03	.mcd			
2964	185.04	.Str.phsC		phsC start	1=Start
2965	185.05	.mcd			
2966	185.06	.Op.general	OPERATE	General operate	1=Operate
2967	185.07	.mcd			

2.3.1.71 LD0.PHPTUV2 Three-phase undervoltage protection (2)

Table 74: LD0.PHPTUV2 Three-phase undervoltage protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTUV2			
3092	193.04	.Str.general	START	General start	1=Start
3093	193.05	.mcd			
3094	193.06	.Str.phsA		Phs A start	1=Start

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3095	193.07	.mcd			
3096	193.08	.Str.phsB		Phs B start	1=Start
3097	193.09	.mcd			
3098	193.10	.Str.phsC		Phs C start	1=Start
3099	193.11	.mcd			
3100	193.12	.Op.general	OPERATE	General operate	1=Operate
3101	193.13	.mcd			

2.3.1.72 LD0.PHPTUV3 Three-phase undervoltage protection (3)

Table 75: LD0.PHPTUV3 Three-phase undervoltage protection (3)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTUV3			
3102	193.14	.Str.general	START	General start	1=Start
3103	193.15	.mcd			
3104	194.00	.Str.phsA		Phs A start	1=Start
3105	194.01	.mcd			
3106	194.02	.Str.phsB		Phs B start	1=Start
3107	194.03	.mcd			
3108	194.04	.Str.phsC		Phs C start	1=Start
3109	194.05	.mcd			
3110	194.06	.Op.general	OPERATE	General operate	1=Operate
3111	194.07	.mcd			

2.3.1.73 LD0.PREVPTOC1 Phase reversal protection (1)

Table 76: LD0.PREVPTOC1 Phase reversal protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PREVPTOC1			
2926	182.14	.Str.general	START	Stage start	1=Start
2927	182.15	.mcd			
2928	183.00	.Op.general	OPERATE	Stage operate	1=Operate
2929	183.01	.mcd			

2.3.1.74 LD0.PSPTUV1 Positive-sequence undervoltage protection (1)

Table 77: LD0.PSPTUV1 Positive-sequence undervoltage protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PSPTUV1			
2948	184.04	.Str.general	START	General start	1=Start
2949	184.05	.mcd			
2950	184.06	.Str.phsA		phsA start	1=Start
2951	184.07	.mcd			
2952	184.08	.Str.phsB		phsB start	1=Start
2953	184.09	.mcd			
2954	184.10	.Str.phsC		phsC start	1=Start
2955	184.11	.mcd			
2956	184.12	.Op.general	OPERATE	General operate	1=Operate
2957	184.13	.mcd			

2.3.1.75 LD0.PSPTUV2 Positive-sequence undervoltage protection (2)

Table 78: LD0.PSPTUV2 Positive-sequence undervoltage protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PSPTUV2			
3112	194.08	.Str.general	START	General start	1=Start
3113	194.09	.mcd			
3120	195.00	.Op.general	OPERATE	General operate	1=Operate
3121	195.01	.mcd			

2.3.1.76 LD0.RESCMMXU1 Residual current measurement (1)

Table 79: LD0.RESCMMXU1 Residual current measurement (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			

2.3.1.77 LD0.RESVMMXU1 Residual voltage measurement (1)

Table 80: LD0.RESVMMXU1 Residual voltage measurement (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			

2.3.1.78 LD0.ROVPTOV1 Residual overvoltage protection (1)

Table 81: LD0.ROVPTOV1 Residual overvoltage protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.ROVPTOV1			
3870	241.14	.Str.general	START	General start	1=Start
3871	241.15	.mcd			
3872	242.00	.Op.general	OPERATE	General operate	1=Operate
3873	242.01	.mcd			

2.3.1.79 LD0.ROVPTOV2 Residual overvoltage protection (2)

Table 82: LD0.ROVPTOV2 Residual overvoltage protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.ROVPTOV2			
3874	242.02	.Str.general	START	General start	1=Start
3875	242.03	.mcd			
3876	242.04	.Op.general	OPERATE	General operate	1=Operate
3877	242.05	.mcd			

2.3.1.80 LD0.ROVPTOV3 Residual overvoltage protection (3)

Table 83: LD0.ROVPTOV3 Residual overvoltage protection (3)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.ROVPTOV3			
3878	242.06	.Str.general	START	General start	1=Start
3879	242.07	.mcd			
3880	242.08	.Op.general	OPERATE	General operate	1=Operate
3881	242.09	.mcd			

2.3.1.81 LD0.SECRSYN1 Synchronism and energizing check (1)

Table 84: LD0.SECRSYN1 Synchronism and energizing check (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SECRSYN1			
3992	249.08	.SynPrg	SYNC_INPRO	Synch. in progress	1=In progress
3993	249.09	.mcd			
3994	249.10	.FailCmd	CMD_FAIL_AL	Close request fail	1=Failed
3995	249.11	.mcd			
3996	249.12	.FailSyn	CL_FAIL_AL	Close cmd fail	1=Failed
3997	249.13	.mcd			

2.3.1.82 LD0.SEQSPVC1 Fuse failure protection (1)

Table 85: LD0.SEQSPVC1 Fuse failure protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SEQSPVC1			
2940	183.12	.Str.general	FUSEF_U	Start	1=Start
2941	183.13	.mcd			
2942	183.14	.Str3Ph.general	FUSEF_3PH	3-phase start	1=Start
2943	183.15	.mcd			

2.3.1.83 LD0.SPCGAPC2 Generic control point (16 pcs) (2)

Table 86: LD0.SPCGAPC2 Generic control point (16 pcs) (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SPCGAPC2			
3632	227.00	.SPCS01.stVal		Ouput state 1	0/1=Off/On
3633	227.01	.mcd			
3634	227.02	.SPCS02.stVal		Ouput state 2	0/1=Off/On
3635	227.03	.mcd			
3636	227.04	.SPCS03.stVal		Ouput state 3	0/1=Off/On
3637	227.05	.mcd			
3638	227.06	.SPCS04.stVal		Ouput state 4	0/1=Off/On
3639	227.07	.mcd			
3640	227.08	.SPCS05.stVal		Ouput state 5	0/1=Off/On
3641	227.09	.mcd			
3642	227.10	.SPCS06.stVal		Ouput state 6	0/1=Off/On
3643	227.11	.mcd			
3644	227.12	.SPCS07.stVal		Ouput state 7	0/1=Off/On

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
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			

2.3.1.84 LD0.SPCGAPC3 Generic control point (16 pcs) (3)

Table 87: LD0.SPCGAPC3 Generic control point (16 pcs) (3)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SPCGAPC3			
3664	229.00	.SPCSO1.stVal		Ouput state 1	0/1=Off/On
3665	229.01	.mcd			
3666	229.02	.SPCSO2.stVal		Ouput state 2	0/1=Off/On
3667	229.03	.mcd			
3668	229.04	.SPCSO3.stVal		Ouput state 3	0/1=Off/On
3669	229.05	.mcd			
3670	229.06	.SPCSO4.stVal		Ouput state 4	0/1=Off/On
3671	229.07	.mcd			
3672	229.08	.SPCSO5.stVal		Ouput state 5	0/1=Off/On
3673	229.09	.mcd			
3674	229.10	.SPCSO6.stVal		Ouput state 6	0/1=Off/On
3675	229.11	.mcd			
3676	229.12	.SPCSO7.stVal		Ouput state 7	0/1=Off/On
3677	229.13	.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
3678	229.14	.SPCSO8.stVal		Ouput state 8	0/1=Off/On
3679	229.15	.mcd			
3680	230.00	.SPCSO9.stVal		Ouput state 9	0/1=Off/On
3681	230.01	.mcd			
3682	230.02	.SPCSO10.stVal		Ouput state 10	0/1=Off/On
3683	230.03	.mcd			
3684	230.04	.SPCSO11.stVal		Ouput state 11	0/1=Off/On
3685	230.05	.mcd			
3686	230.06	.SPCSO12.stVal		Ouput state 12	0/1=Off/On
3687	230.07	.mcd			
3688	230.08	.SPCSO13.stVal		Ouput state 13	0/1=Off/On
3689	230.09	.mcd			
3790	230.10	.SPCSO14.stVal		Ouput state 14	0/1=Off/On
3791	230.11	.mcd			
3792	230.12	.SPCSO15.stVal		Ouput state 15	0/1=Off/On
3793	230.13	.mcd			
3794	230.14	.SPCSO16.stVal		Ouput state 16	0/1=Off/On
3795	230.15	.mcd			

2.3.1.85 LD0.SPCRGAPC1 Remote generic control points (1)

Table 88: LD0.SPCRGAPC1 Remote generic control points (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SPCRGAPC1			
4080	255.00	.SPCSO1.stVal		Output state 1	0/1=Off/On
4081	255.01	.mcd			
4082	255.02	.SPCSO2.stVal		Output state 2	0/1=Off/On
4083	255.03	.mcd			
4084	255.04	.SPCSO3.stVal		Output state 3	0/1=Off/On
4085	255.05	.mcd			
4086	255.06	.SPCSO4.stVal		Output state 4	0/1=Off/On
4087	255.07	.mcd			
4088	255.08	.SPCSO5.stVal		Output state 5	0/1=Off/On
4089	255.09	.mcd			
4090	255.10	.SPCSO6.stVal		Output state 6	0/1=Off/On
4091	255.11	.mcd			
4092	255.12	.SPCSO7.stVal		Output state 7	0/1=Off/On
4093	255.13	.mcd			
4094	255.14	.SPCSO8.stVal		Output state 8	0/1=Off/On

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
4095	255.15	.mcd			
4096	256.00	.SPCSO9.stVal		Output state 9	0/1=Off/On
4097	256.01	.mcd			
4098	256.02	.SPCSO10.stVal		Output state 10	0/1=Off/On
4099	256.03	.mcd			
4100	256.04	.SPCSO11.stVal		Output state 11	0/1=Off/On
4101	256.05	.mcd			
4102	256.06	.SPCSO12.stVal		Output state 12	0/1=Off/On
4103	256.07	.mcd			
4104	256.08	.SPCSO13.stVal		Output state 13	0/1=Off/On
4105	256.09	.mcd			
4106	256.10	.SPCSO14.stVal		Output state 14	0/1=Off/On
4107	256.11	.mcd			
4108	256.12	.SPCSO15.stVal		Output state 15	0/1=Off/On
4109	256.13	.mcd			
4110	256.14	.SPCSO16.stVal		Output state 16	0/1=Off/On
4111	256.15	.mcd			

2.3.1.86 LD0.SSCBR1 Circuit-breaker condition monitoring (1)

Table 89: LD0.SSCBR1 Circuit-breaker condition monitoring (1)

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

2.3.1.87 LD0.STTPMSU1 Motor start-up supervision (1)

Table 90: LD0.STTPMSU1 Motor start-up supervision (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.STTPMSS1			
2920	182.08	.Str.general	MOT_START	Startup in progress	1=In progress
2921	182.09	.mcd			
2922	182.10	.Op.general	OPR_IIT	Thermal stress operate	1=Operate
2923	182.11	.mcd			
		LD0.STTPMRI1			
2924	182.12	.Op.general	OPR_STALL	Stalling operate	1=Operate
2925	182.13	.mcd			

2.3.1.88 LD0.TCSSCBR1 Trip circuit supervision (1)

Table 91: LD0.TCSSCBR1 Trip circuit supervision (1)

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

2.3.1.89 LD0.TCSSCBR2 Trip circuit supervision (2)

Table 92: LD0.TCSSCBR2 Trip circuit supervision (2)

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

2.3.1.90 LD0.TRPPTRC1 Master trip (1)

Table 93: LD0.TRPPTRC1 Master trip (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			

2.3.1.91 LD0.TRPPTRC2 Master trip (2)

Table 94: LD0.TRPPTRC2 Master trip (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			

2.3.1.92 LD0.VMMXU1 Three-phase voltage measurement (1)

Table 95: LD0.VMMXU1 Three-phase voltage measurement (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			

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

Table 96: LD0.XAGGIO130 Physical I/O states (AIM card XA130)

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

2.3.1.94 LD0.XBGGIO115 Physical I/O states (BIO card X115)

Table 97: LD0.XBGGIO115 Physical I/O states (BIO card X115)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XBGGIO115			
3184	199.00	.Ind1.stVal		XB105-Input 1 State	0/1=Off/On
3185	199.01	.mcd			
3186	199.02	.Ind2.stVal		XB105-Input 2 State	0/1=Off/On
3187	199.03	.mcd			
3188	199.04	.Ind3.stVal		XB105-Input 3 State	0/1=Off/On
3189	199.05	.mcd			
3190	199.06	.Ind4.stVal		XB105-Input 4 State	0/1=Off/On
3191	199.07	.mcd			
3192	199.08	.Ind5.stVal		XB105-Input 5 State	0/1=Off/On
3193	199.09	.mcd			
3194	199.10	.Ind6.stVal		XB105-Input 6 State	0/1=Off/On
3195	199.11	.mcd			
3196	199.12	.Ind7.stVal		XB105-Input 7 State	0/1=Off/On
3197	199.13	.mcd			
3198	199.14	.Ind8.stVal		XB105-Input 8 State	0/1=Off/On
3199	199.15	.mcd			
3208	201.00	.SPCSO1.stVal		XB105-Output 1 State	0/1=Off/On
3209	201.01	.mcd			
3210	201.02	.SPCSO2.stVal		XB105-Output 2 State	0/1=Off/On
3211	201.03	.mcd			
3212	201.04	.SPCSO3.stVal		XB105-Output 3 State	0/1=Off/On
3213	201.05	.mcd			
3214	201.06	.SPCSO4.stVal		XB105-Output 4 State	0/1=Off/On
3215	201.07	.mcd			

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

Table 98: LD0.XGGIO100 Physical I/O states (PSM card X100)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XGGIO100			
3248	203.00	.SPCSO1.stVal		X100-Output 1 State	0/1=Off/On
3249	203.01	.mcd			
		.mom-only		Mom only alternative	
3250	203.02	.SPCSO2.stVal		X100-Output 2 State	0/1=Off/On
3251	203.03	.mcd			

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BitA	RegA	IEC 61850 name	SA name	Description	Values
		.mom-only		Mom only alternative	
3252	203.04	.SPCSO3.stVal		X100-Output 3 State	0/1=Off/On
3253	203.05	.mcd			
		.mom-only		Mom only alternative	
3254	203.06	.SPCSO4.stVal		X100-Output 4 State	0/1=Off/On
3255	203.07	.mcd			
		.mom-only		Mom only alternative	
3256	203.08	.SPCSO5.stVal		X100-Output 5 State	0/1=Off/On
3257	203.09	.mcd			
		.mom-only		Mom only alternative	
3258	203.10	.SPCSO6.stVal		X100-Output 6 State	0/1=Off/On
3259	203.11	.mcd			
		.mom-only		Mom only alternative	

2.3.1.96 LD0.XGGIO105 Physical I/O states (BIO card X105)

Table 99: LD0.XGGIO105 Physical I/O states (BIO card X105)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XGGIO105			
3264	204.00	.Ind1.stVal		X105-Input 1 State	0/1=Off/On
3265	204.01	.mcd			
3266	204.02	.Ind2.stVal		X105-Input 2 State	0/1=Off/On
3267	204.03	.mcd			
3268	204.04	.Ind3.stVal		X105-Input 3 State	0/1=Off/On
3269	204.05	.mcd			
3270	204.06	.Ind4.stVal		X105-Input 4 State	0/1=Off/On
3271	204.07	.mcd			
3272	204.08	.Ind5.stVal		X105-Input 5 State	0/1=Off/On
3273	204.09	.mcd			
3274	204.10	.Ind6.stVal		X105-Input 6 State	0/1=Off/On
3275	204.11	.mcd			
3276	204.12	.Ind7.stVal		X105-Input 7 State	0/1=Off/On
3277	204.13	.mcd			
3278	204.14	.Ind8.stVal		X105-Input 8 State	0/1=Off/On
3279	204.15	.mcd			
3240	202.08	.SPCSO1.stVal		X105-Output 1 State	0/1=Off/On
3241	202.09	.mcd			
3242	202.10	.SPCSO2.stVal		X105-Output 2 State	0/1=Off/On
3243	202.11	.mcd			

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BitA	RegA	IEC 61850 name	SA name	Description	Values
3244	202.12	.SPCSO3.stVal		X105-Output 3 State	0/1=Off/On
3245	202.13	.mcd			
3246	202.14	.SPCSO4.stVal		X105-Output 4 State	0/1=Off/On
3247	202.15	.mcd			

2.3.1.97 LD0.XHBGGIO105 Physical I/O states (BIO card XHB105)

Table 100: LD0.XHBGGIO105 Physical I/O states (BIO card XHB105)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XHBGGIO105			
3344	209.00	.Ind1.stVal		XHB105-Input 1 State	0/1=Off/On
3345	209.01	.mcd			
3346	209.02	.Ind2.stVal		XHB105-Input 2 State	0/1=Off/On
3347	209.03	.mcd			
3348	209.04	.Ind3.stVal		XHB105-Input 3 State	0/1=Off/On
3349	209.05	.mcd			
3350	209.06	.Ind4.stVal		XHB105-Input 4 State	0/1=Off/On
3351	209.07	.mcd			
3352	209.08	.Ind5.stVal		XHB105-Input 5 State	0/1=Off/On
3353	209.09	.mcd			
3354	209.10	.Ind6.stVal		XHB105-Input 6 State	0/1=Off/On
3355	209.11	.mcd			
3356	209.12	.Ind7.stVal		XHB105-Input 7 State	0/1=Off/On
3357	209.13	.mcd			
3358	209.14	.Ind8.stVal		XHB105-Input 8 State	0/1=Off/On
3359	209.15	.mcd			
3288	205.08	.SPCSO1.stVal		XHB105-Output 1 State	0/1=Off/On
3289	205.09	.mcd			
3290	205.10	.SPCSO2.stVal		XHB105-Output 2 State	0/1=Off/On
3291	205.11	.mcd			
3292	205.12	.SPCSO3.stVal		XHB105-Output 3 State	0/1=Off/On
3293	205.13	.mcd			

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

Table 101: LD0.XGGIO110 Physical I/O states (BIO card X110)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XGGIO110			
3216	201.00	.Ind1.stVal		X110-Input 1 State	0/1=Off/On
3217	201.01	.mcd			
		.mom-only		Mom only alternative	
3218	201.02	.Ind2.stVal		X110-Input 2 State	0/1=Off/On
3219	201.03	.mcd			
		.mom-only		Mom only alternative	
3220	201.04	.Ind3.stVal		X110-Input 3 State	0/1=Off/On
3221	201.05	.mcd			
		.mom-only		Mom only alternative	
3222	201.06	.Ind4.stVal		X110-Input 4 State	0/1=Off/On
3223	201.07	.mcd			
		.mom-only		Mom only alternative	
3224	201.08	.Ind5.stVal		X110-Input 5 State	0/1=Off/On
3225	201.09	.mcd			
		.mom-only		Mom only alternative	
3226	201.10	.Ind6.stVal		X110-Input 6 State	0/1=Off/On
3227	201.11	.mcd			
		.mom-only		Mom only alternative	
3228	201.12	.Ind7.stVal		X110-Input 7 State	0/1=Off/On
3229	201.13	.mcd			
		.mom-only		Mom only alternative	
3230	201.14	.Ind8.stVal		X110-Input 8 State	0/1=Off/On
3231	201.15	.mcd			
		.mom-only		Mom only alternative	
3232	202.00	.SPCSO1.stVal		X110-Output 1 State	0/1=Off/On
3233	202.01	.mcd			
		.mom-only		Mom only alternative	
3234	202.02	.SPCSO2.stVal		X110-Output 2 State	0/1=Off/On
3235	202.03	.mcd			
		.mom-only		Mom only alternative	
3236	202.04	.SPCSO3.stVal		X110-Output 3 State	0/1=Off/On
3237	202.05	.mcd			
		.mom-only		Mom only alternative	
3238	202.06	.SPCSO4.stVal		X110-Output 4 State	0/1=Off/On
3239	202.07	.mcd			
		.mom-only		Mom only alternative	

2.3.1.99 LD0.XRGGIO105 Alarm/warning

Table 102: LD0.XRGGIO105 Alarm/warning

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XRGGIO105			
3200	200.00	.Alm1.stVal	-	XRGGIO105 Alarm	1=Alarm
3201	200.01	.mcd			
3202	200.02	.Wrn1.stVal	-	XRGGIO105 Warning	1=Warning
3203	200.03	.mcd			

2.3.1.100 LD0.XRGGIO110 Alarm/warning

Table 103: LD0.XRGGIO110 Alarm/warning

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.XRGGIO110			
3204	200.04	.Alm1.stVal	-	XRGGIO110 Alarm	1=Alarm
3205	200.05	.mcd			
3206	200.06	.Wrn1.stVal	-	XRGGIO110 Warning	1=Warning
3207	200.07	.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 three-phase protection function stages, operate/phase-dependent objects added

Table 104: All premapped three-phase protection function stages, operate/phase-dependent objects added

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

2.3.2.2 Common data 2

Table 105: Common data 2

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.LDEV1			
		.StLstOv.stVal		Internal ind. overflow	1=Overflow
		.mcd			
		.MeasLstOv.stVal		Internal meas. overflow	1=Overflow
		.mcd			
		.ChgFlg.stVal		Configuration changed	1=Changed
		.mcd			
		.FacSet.stVal		Factory settings in use	1=In use
		.mcd			
		LD0.GNRLLTMS1			
		.TmChSt1.stVal		Time synch. status	0/1=Down/Up
		.mcd			
		LD0.SCHLCCH1			
		.ChLiv.stVal	CH1LIV	Ethernet channel 1 live	1=Live
		.mcd			
		LD0.SCHLCCH2			
		.ChLiv.stVal	CH2LIV	Ethernet channel 2 live	1=Live
		.mcd			
		LD0.SCHLCCH3			
		.ChLiv.stVal	CH3LIV	Ethernet channel 3 live	1=Live
		.mcd			

2.3.2.3 CTRL.CBXCBR2 Circuit-breaker control (2)

Table 106: CTRL.CBXCBR2 Circuit-breaker control (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.CBXCBR2			
		.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			

2.3.2.4 CTRL.CBXCBR3 Circuit-breaker control (3)

Table 107: CTRL.CBXCBR3 Circuit-breaker control (3)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.CBXCBR3			
		.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			

2.3.2.5 CTRL.DCSXSWI4 Disconnector position indication (4)

Table 108: CTRL.DCSXSWI4 Disconnector position indication (4)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.DCSXSWI4	POSITION		
		.Pos.stVal.Close	-	Close bit	1=Close
		.Pos.stVal.Open	-	Open bit	1=Open
		.Pos.stVal.Fault	-	Fault bit	1=Pos(00/11)

2.3.2.6 CTRL.DCXSWI3 Disconnector control (3)

Table 109: CTRL.DCXSWI3 Disconnector control (3)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.DCXSWI3	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.DCCILO3			
		.EnaOpn.stVal	ENA_OPEN	Open enabled	1=Enabled
		.EnaCls.stVal	ENA_CLOSE	Close enabled	1=Enabled
		CTRL.DCXSWI3			
		.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked
		.mcd			
		.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
		.mcd			
		CTRL.DCCILO3			
		.ItlByps.stVal	ITL_BYPASS	Interlock bypass	1=Bypass
		.mcd			

2.3.2.7 CTRL.DCXSWI4 Disconnector control (4)

Table 110: CTRL.DCXSWI4 Disconnector control (4)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.DCXSWI4	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.DCCILO4			
		.EnaOpn.stVal	ENA_OPEN	Open enabled	1=Enabled
		.EnaCls.stVal	ENA_CLOSE	Close enabled	1=Enabled
		CTRL.DCXSWI4			
		.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked
		.mcd			
		.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
		.mcd			
		CTRL.DCCILO4			
		.ItlByps.stVal	ITL_BYPASS	Interlock bypass	1=Bypass
		.mcd			

2.3.2.8 CTRL.ESSXSWI3 Earthing switch indication (3)

Table 111: CTRL.ESSXSWI3 Earthing switch indication (3)

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)

2.3.2.9 CTRL.ESXSWI2 Earthing switch control (2)

Table 112: CTRL.ESXSWI2 Earthing switch control (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.ESXSWI2	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.ESCILO2			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.EnaOpn.stVal	ENA_OPEN	Open enabled	1=Enabled
		.EnaCls.stVal	ENA_CLOSE	Close enabled	1=Enabled
		CTRL.ESXSWI2			
		.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked
		.mcd			
		.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
		.mcd			
		CTRL.ESCILO2			
		.ItlByps.stVal	ITL_BYPASS	Interlock bypass	1=Bypass
		.mcd			

2.3.2.10 CTRL.ESXSWI3 Earthing switch control (3)

Table 113: CTRL.ESXSWI3 Earthing switch control (3)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		CTRL.ESXSWI3	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.ESCILO3			
		.EnaOpn.stVal	ENA_OPEN	Open enabled	1=Enabled
		.EnaCls.stVal	ENA_CLOSE	Close enabled	1=Enabled
		CTRL.ESXSWI3			
		.BlkOpn.stVal	BLK_OPEN	Open blocked	1=Blocked
		.mcd			
		.BlkCls.stVal	BLK_CLOSE	Close blocked	1=Blocked
		.mcd			
		CTRL.ESCILO3			
		.ItlByps.stVal	ITL_BYPASS	Interlock bypass	1=Bypass
		.mcd			

2.3.2.11 LD0.CCBRBRF3 Circuit breaker failure protection (3)

Table 114: LD0.CCBRBRF3 Circuit breaker failure protection (3)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.CCBRBRF3			
		.Str.general	CB_FAULT_AL	Timer running	1=Running
		.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.OpEx.general	TRBU	Fail, external trip	1=Ext.trip
		.mcd			
		.OpIn.general	TRRET	Internal re-trip	1=Re-trip
		.mcd			

2.3.2.12 LD0.CMHAI1 Current total demand distortion (1)

Table 115: LD0.CMHAI1 Current total demand distortion (1)

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

2.3.2.13 LD0.CVPSOF1 Automatic switch-onto-fault logic (SOF) (1)

Table 116: LD0.CVPSOF1 Automatic switch-onto-fault logic (SOF) (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.CVPSOF1			
		.TrFltSt.stVal	OPERATE	Operate	1=Operate
		.mcd			

2.3.2.14 LD0.DIAGLCCH1 Ethernet supervision (1)

Table 117: 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			

2.3.2.15 LD0.DOPPDPR1 Reverse power/directional overpower protection (1)

Table 118: LD0.DOPPDPR1 Reverse power/directional overpower protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Value
		LD0.DPPDOP1			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.16 LD0.DOPPDPR2 Reverse power/directional overpower protection (2)

Table 119: LD0.DOPPDPR2 Reverse power/directional overpower protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Value
		LD0.DPPDOP2			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.17 LD0.DOPPDPR3 Reverse power/directional overpower protection (3)

Table 120: LD0.DOPPDPR3 Reverse power/directional overpower protection (3)

BitA	RegA	IEC 61850 name	SA name	Description	Value
		LD0.DPPDOP3			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.18 LD0.DQPTUV1 Directional reactive power undervoltage protection (1)

Table 121: LD0.DQPTUV1 Directional reactive power undervoltage protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Value
		LD0.DQPTUV1			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.19 LD0.DQPTUV2 Directional reactive power undervoltage protection (2)

Table 122: LD0.DQPTUV2 Directional reactive power undervoltage protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Value
		LD0.DQPTUV2			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.20 LD0.DUPPDPR1 Underpower protection (1)

Table 123: LD0.DUPPDPR1 Underpower protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Value
		LD0.DPPDUP1			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.21 LD0.DUPPDPR2 Underpower protection (2)

Table 124: LD0.DUPPDPR2 Underpower protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Value
		LD0.DPPDUP2			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.22 LD0.FKEYGGIO1 Programmable buttons (16 buttons) (1)

Table 125: LD0.FKEYGGIO1 Programmable buttons (16 buttons) (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.FKEYGGIO1			
		.SPCSO1.stVal		LED state 1	0/1=Off/On
		.SPCSO2.stVal		LED state 2	0/1=Off/On
		.SPCSO3.stVal		LED state 3	0/1=Off/On
		.SPCSO4.stVal		LED state 4	0/1=Off/On
		.SPCSO5.stVal		LED state 5	0/1=Off/On
		.SPCSO6.stVal		LED state 6	0/1=Off/On
		.SPCSO7.stVal		LED state 7	0/1=Off/On
		.SPCSO8.stVal		LED state 8	0/1=Off/On
		.SPCSO9.stVal		LED state 9	0/1=Off/On
		.SPCSO10.stVal		LED state 10	0/1=Off/On
		.SPCSO11.stVal		LED state 11	0/1=Off/On
		.SPCSO12.stVal		LED state 12	0/1=Off/On
		.SPCSO13.stVal		LED state 13	0/1=Off/On
		.SPCSO14.stVal		LED state 14	0/1=Off/On
		.SPCSO15.stVal		LED state 15	0/1=Off/On
		.SPCSO16.stVal		LED state 16	0/1=Off/On

2.3.2.23 LD0.HREFPDIF1 High-impedance based restricted earth-fault protection (1)

Table 126: LD0.HREFPDIF1 High-impedance based restricted earth-fault protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.HREFPDIF1			
		.Str.general	START	General start	1 = Start
		.mcd			
		.Op.general	OPERATE	General operate	1 = Operate
		.mcd			

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

Table 127: LD0.IL1TCTR1 Three-phase CT supervision (1)

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

2.3.2.25 LD0.LDPRLRC1 Load profile record (1)

Table 128: LD0.LDPRLRC1 Load profile record (1)

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

2.3.2.26 LD0.LVRTPTUV1 Low-voltage ride-through protection (1)

Table 129: LD0.LVRTPTUV1 Low-voltage ride-through protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Value
		LD0.LVRTPTUV1			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.27 LD0.LVRTPTUV2 Low-voltage ride-through protection (2)

Table 130: LD0.LVRTPTUV2 Low-voltage ride-through protection (2)

BitA	RegA	IEC 61850 name	SA name	Description	Value
		LD0.LVRTPTUV2			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.28 LD0.LVRTPTUV3 Low-voltage ride-through protection (3)

Table 131: LD0.LVRTPTUV3 Low-voltage ride-through protection (3)

BitA	RegA	IEC 61850 name	SA name	Description	Value
		LD0.LVRTPTUV3			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.29 LD0.MAPGAPC13 Multipurpose protection (13)

Table 132: LD0.MAPGAPC13 Multipurpose protection (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			

2.3.2.30 LD0.MAPGAPC14 Multipurpose protection (14)

Table 133: LD0.MAPGAPC14 Multipurpose protection (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			

2.3.2.31 LD0.MAPGAPC15 Multipurpose protection (15)

Table 134: LD0.MAPGAPC15 Multipurpose protection (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			

2.3.2.32 LD0.MAPGAPC16 Multipurpose protection (16)

Table 135: LD0.MAPGAPC16 Multipurpose protection (16)

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			

2.3.2.33 LD0.MAPGAPC17 Multipurpose protection (17)

Table 136: LD0.MAPGAPC17 Multipurpose protection (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			

2.3.2.34 LD0.MAPGAPC18 Multipurpose protection (18)

Table 137: LD0.MAPGAPC18 Multipurpose protection (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			

2.3.2.35 LD0.MHZPDIF1 High-impedance/flux-balance based differential protection for motors (1)

Table 138: LD0.MHZPDIF1 High-impedance/flux-balance based differential protection for motors (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MHZPDIF1			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.36 LD0.MPDIF1 Stabilized and instantaneous differential protection for machines (1)

Table 139: LD0.MPDIF1 Stabilized and instantaneous differential protection for machines (1)

BitA	RegA	IEC 61850 name	SA name	Description	Value
		LD0.MPTRC1			
		.Op.general	OPERATE	General operate	1=Operate
		.mcd			
		.Op.phsA		Phs A operate	1=Operate
		.mcd			
		.Op.phsB		Phs B operate	1=Operate
		.mcd			
		.Op.phsC		Phs C operate	1=Operate
		.mcd			
		LD0.MLPDIF1			
		.BlkIntnSt.general	INT_BLKD	Internal block status	1=Block
		.mcd			
		.BlkIntnSt.phsA	INT_BLKD_A	Internal block phase A	1=Block
		.mcd			
		.BlkIntnSt.phsB	INT_BLKD_B	Internal block phase B	1=Block
		.mcd			
		.BlkIntnSt.phsC	INT_BLKD_C	Internal block phase C	1=Block
		.mcd			

2.3.2.37 LD0.MREFPTOC1 Rotor earth-fault protection (1)

Table 140: LD0.MREFPTOC1 Rotor earth-fault protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MRE1PTOC1			
		.Op.general	ALARM	Alarm	1=Alarm
		LD0.MRE2PTOC1			
		.mcd			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.38 LD0.MVGAPC3 Move (8 pcs) (3)

Table 141: LD0.MVGAPC3 Move (8 pcs) (3)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MVGAPC3			
		.SPCSO1.stVal		Input 1	0/1=Off/On
		.mcd			
		.SPCSO2.stVal		Input 2	0/1=Off/On
		.mcd			
		.SPCSO3.stVal		Input 3	0/1=Off/On
		.mcd			
		.SPCSO4.stVal		Input 4	0/1=Off/On
		.mcd			
		.SPCSO5.stVal		Input 5	0/1=Off/On
		.mcd			
		.SPCSO6.stVal		Input 6	0/1=Off/On
		.mcd			
		.SPCSO7.stVal		Input 7	0/1=Off/On
		.mcd			
		.SPCSO8.stVal		Input 8	0/1=Off/On
		.mcd			

2.3.2.39 LD0.MVGAPC4 Move (8 pcs) (4)

Table 142: LD0.MVGAPC4 Move (8 pcs) (4)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.MVGAPC4			
		.SPCSO1.stVal		Input 1	0/1=Off/On
		.mcd			
		.SPCSO2.stVal		Input 2	0/1=Off/On
		.mcd			
		.SPCSO3.stVal		Input 3	0/1=Off/On
		.mcd			
		.SPCSO4.stVal		Input 4	0/1=Off/On
		.mcd			
		.SPCSO5.stVal		Input 5	0/1=Off/On
		.mcd			
		.SPCSO6.stVal		Input 6	0/1=Off/On
		.mcd			
		.SPCSO7.stVal		Input 7	0/1=Off/On
		.mcd			
		.SPCSO8.stVal		Input 8	0/1=Off/On
		.mcd			

2.3.2.40 LD0.PHAPTOV1 Single-phase overvoltage protection (1)

Table 143: LD0.PHAPTOV1 Single-phase overvoltage protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHAPTOV1			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.41 LD0.PHAPTUV1 Single-phase undervoltage protection (1)

Table 144: LD0.PHAPTUV1 Single-phase undervoltage protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHAPTUV1			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.42 LD0.PHHPTOC1 Three-phase non-directional overcurrent protection, high stage (1)

Table 145: LD0.PHHPTOC1 Three-phase non-directional overcurrent protection, high stage (1)

RegA	BitA	IEC 61850 name	SA name	Description	Values
		LD0.PHHPTOC1			
		.Str.general	START	General start	1=Start
		.mcd			
		.Str.phsA		Phs A start	1=Start
		.mcd			
		.Str.phsB		Phs B start	1=Start
		.mcd			
		.Str.phsC		Phs C start	1=Start
		.mcd			
		.Op.general	OPERATE	General operate	1=Operate
		.mcd			
		.Op.phsA		Phs A operate	1=Operate
		.mcd			
		.Op.phsB		Phs B operate	1=Operate
		.mcd			
		.Op.phsC		Phs C operate	1=Operate
		.mcd			

2.3.2.43 LD0.PHHPTOC2 Three-phase non-directional overcurrent protection, high stage (2)

Table 146: LD0.PHHPTOC2 Three-phase non-directional overcurrent protection, high stage (2)

RegA	BitA	IEC 61850 name	SA name	Description	Values
		LD0.PHHPTOC2			
		.Str.general	START	General start	1=Start
		.mcd			
		.Str.phsA		Phs A start	1=Start
		.mcd			
		.Str.phsB		Phs B start	1=Start
		.mcd			
		.Str.phsC		Phs C start	1=Start
		.mcd			
		.Op.general	OPERATE	General operate	1=Operate
		.mcd			
		.Op.phsA		Phs A operate	1=Operate
		.mcd			

Table continues on next page

RegA	BitA	IEC 61850 name	SA name	Description	Values
		.Op.phsB		Phs B operate	1=Operate
		.mcd			
		.Op.phsC		Phs C operate	1=Operate
		.mcd			

2.3.2.44 LD0.PHPTUV4 Three-phase undervoltage protection (4)

Table 147: LD0.PHPTUV4 Three-phase undervoltage protection (4)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPTUV4			
		.Str.general	START	General start	1=Start
		.mcd			
		.Str.phsA		Phs A start	1=Start
		.mcd			
		.Str.phsB		Phs B start	1=Start
		.mcd			
		.Str.phsC		Phs C start	1=Start
		.mcd			
		.Op.general	OPERATE	General operate	1=Operate
		.mcd			

2.3.2.45 LD0.PHPVOC1 Three-phase voltage-dependent overcurrent protection (1)

Table 148: LD0.PHPVOC1 Three-phase voltage-dependent overcurrent protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PHPVOC1			
		.Str.general	START	General start	1=Start
		.mcd			
		.Str.phsA		Phs A start	1=Start
		.mcd			
		.Str.phsB		Phs B start	1=Start
		.mcd			
		.Str.phsC		Phs C start	1=Start
		.mcd			
		.Op.general	OPERATE	General operate	1=Operate
		.mcd			
		.Op.phsA		Phs A operate	1=Operate
		.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.Op.phsB		Phs B operate	1=Operate
		.mcd			
		.Op.phsC		Phs C operate	1=Operate
		.mcd			

2.3.2.46 LD0.PHPVOC2 Three-phase voltage-dependent overcurrent protection (2)

Table 149: LD0.PHPVOC2 Three-phase voltage-dependent overcurrent protection (2)

RegA	BitA	IEC 61850 name	SA name	Description	Values
		LD0.PHPVOC2			
		.Str.general	START	General start	1=Start
		.mcd			
		.Str.phsA		Phs A start	1=Start
		.mcd			
		.Str.phsB		Phs B start	1=Start
		.mcd			
		.Str.phsC		Phs C start	1=Start
		.mcd			
		.Op.general	OPERATE	General operate	1=Operate
		.mcd			
		.Op.phsA		Phs A operate	1=Operate
		.mcd			
		.Op.phsB		Phs B operate	1=Operate
		.mcd			
		.Op.phsC		Phs C operate	1=Operate
		.mcd			

2.3.2.47 LD0.PHQVVR1 Voltage variation (1)

Table 150: LD0.PHQVVR1 Voltage variation (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.PH1QVVR1			
		.VarStrGen.stVal	-	Variation event detected	1=Detected
		.mcd			
		.VarEnd.stVal	-	Variation event ended	1=Ended
		.mcd			
		.SwlOp.stVal	-	Swell event detected	1=Detected
		.mcd			

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.DipOp.stVal	-	Dip event detected	1=Detected
		.mcd			
		.IntrOp.stVal	-	Interruption event detected	1=Detected
		.mcd			

2.3.2.48 LD0.RESTCTR1 Io CT supervision (1)

Table 151: 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			

2.3.2.49 LD0.RESTVTR1 Uo VT supervision (1)

Table 152: 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			

2.3.2.50 LD0.SPCGAPC1 Generic control point (16 pcs) (1)

Table 153: LD0.SPCGAPC1 Generic control point (16 pcs) (1)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SPCGAPC1			
		.SPCSO1.stVal		Ouput state 1	0/1=Off/On
		.mcd			
		.SPCSO2.stVal		Ouput state 2	0/1=Off/On
		.mcd			
		.SPCSO3.stVal		Ouput state 3	0/1=Off/On
		.mcd			
		.SPCSO4.stVal		Ouput state 4	0/1=Off/On
		.mcd			
		.SPCSO5.stVal		Ouput state 5	0/1=Off/On

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		.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
		.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			

2.3.2.51 LD0.SPCLGAPC1 Local generic control points (1)

Table 154: LD0.SPCLGAPC1 Local generic control points (1)

BitA	RegA	IEC 61850	SA name	Description	Values
		LD0.SPCLGAPC1			
		.SPCSO1.stVal		Output state 1	0/1=Off/On
		.mcd			
		.SPCSO2.stVal		Output state 2	0/1=Off/On
		.mcd			
		.SPCSO3.stVal		Output state 3	0/1=Off/On
		.mcd			
		.SPCSO4.stVal		Output state 4	0/1=Off/On
		.mcd			
		.SPCSO5.stVal		Output state 5	0/1=Off/On
		.mcd			

Table continues on next page

BitA	RegA	IEC 61850	SA name	Description	Values
		.SPCSO6.stVal		Output state 6	0/1=Off/On
		.mcd			
		.SPCSO7.stVal		Output state 7	0/1=Off/On
		.mcd			
		.SPCSO8.stVal		Output state 8	0/1=Off/On
		.mcd			
		.SPCSO9.stVal		Output state 9	0/1=Off/On
		.mcd			
		.SPCSO10.stVal		Output state 10	0/1=Off/On
		.mcd			
		.SPCSO11.stVal		Output state 11	0/1=Off/On
		.mcd			
		.SPCSO12.stVal		Output state 12	0/1=Off/On
		.mcd			
		.SPCSO13.stVal		Output state 13	0/1=Off/On
		.mcd			
		.SPCSO14.stVal		Output state 14	0/1=Off/On
		.mcd			
		.SPCSO15.stVal		Output state 15	0/1=Off/On
		.mcd			
		.SPCSO16.stVal		Output state 16	0/1=Off/On
		.mcd			

2.3.2.52 LD0.SSCBR2 Circuit-breaker condition monitoring (2)

Table 155: LD0.SSCBR2 Circuit-breaker condition monitoring (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SSCBR2			
		.OpnAlm.stVal	TRV_T_OP_ALM	Opn travel time alarm	1=Alarm
		.ClsAlm.stVal	TRV_T_CL_ALM	Cls travel time alarm	1=Alarm
		LD0.SSOPM2			
		.SprChaAlm.stVal	SPR_CHR_ALM	Spring charge alarm	1=Alarm
		LD0.SSCBR2			
		.OpCntAlm.stVal	OPR_ALM	CB operations alarm	1=Alarm
		.OpCntLO.stVal	OPR_LO	CB operations lockout	1=Lockout
		.LonTmAlm.stVal	MON_ALM	CB inactive alarm	1=Alarm
		LD0.SSIGM2			
		.InsAlm.stVal	PRES_ALM	Low pressure alarm	1=Alarm
		.InsBlk.stVal	PRES_LO	Low pressure lockout	1=Lockout

Table continues on next page

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SSCBR2			
		.APwrAlm.stVal	IPOW_ALM	Lyt alarm	1=Alarm
		.APwrLO.stVal	IPOW_LO	Lyt lockout	1=Lockout
		.RmnNumOpAlm.stVal	CB_LIFE_ALM	CB lifetime alarm	1=Alarm

2.3.2.53 LD0.SSCBR3 Circuit-breaker condition monitoring (3)

Table 156: LD0.SSCBR3 Circuit-breaker condition monitoring (3)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.SSCBR3			
		.OpnAlm.stVal	TRV_T_OP_ALM	Opn travel time alarm	1=Alarm
		.ClsAlm.stVal	TRV_T_CL_ALM	Cls travel time alarm	1=Alarm
		LD0.SSOPM3			
		.SprChaAlm.stVal	SPR_CHR_ALM	Spring charge alarm	1=Alarm
		LD0.SSCBR3			
		.OpCntAlm.stVal	OPR_ALM	CB operations alarm	1=Alarm
		.OpCntLO.stVal	OPR_LO	CB operations lockout	1=Lockout
		.LonTmAlm.stVal	MON_ALM	CB inactive alarm	1=Alarm
		LD0.SSIGM3			
		.InsAlm.stVal	PRES_ALM	Low pressure alarm	1=Alarm
		.InsBlk.stVal	PRES_LO	Low pressure lockout	1=Lockout
		LD0.SSCBR3			
		.APwrAlm.stVal	IPOW_ALM	Lyt alarm	1=Alarm
		.APwrLO.stVal	IPOW_LO	Lyt lockout	1=Lockout
		.RmnNumOpAlm.stVal	CB_LIFE_ALM	CB lifetime alarm	1=Alarm

2.3.2.54 LD0.TRPPTRC3 Master trip (3)

Table 157: LD0.TRPPTRC3 Master trip (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			

2.3.2.55 LD0.TRPPTRC4 Master trip (4)

Table 158: LD0.TRPPTRC4 Master trip (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			

2.3.2.56 LD0.UEXPDIS1 Three-phase underexcitation protection (1)

Table 159: LD0.UEXPDIS1 Three-phase underexcitation protection (1)

BitA	RegA	IEC 61850 name	SA name	Description	Value
		LD0.UEXPDIS1			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

2.3.2.57 LD0.UEXPDIS2 Three-phase underexcitation protection (2)

Table 160: LD0.UEXPDIS2 Three-phase underexcitation protection (2)

RegA	BitA	IEC61850 name	SA name	Description	Value
		LD0.UEXPDIS2			
		.Str.general	START	Stage start	1=Start
		.mcd			
		.Op.general	OPERATE	Stage operate	1=Operate
		.mcd			

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

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

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

2.3.2.59 LD0.VAMMXU2 Single-phase voltage measurement (2)

Table 162: LD0.VAMMXU2 Single-phase voltage measurement (2)

BitA	RegA	IEC 61850 name	SA name	Description	Values
		LD0.VAMMXU2			
		.HiAlm.stVal	HIGH_ALARM	High alarm	1=Alarm
		.mcd			
		.HiWrn.stVal	HIGH_WARN	High warning	1=Warning
		.mcd			
		.LoWrn.stVal	LOW_WARN	Low warning	1=Warning
		.mcd			
		.LoAlm.stVal	LOW_ALARM	Low alarm	1=Alarm
		.mcd			

2.3.2.60 LD0.VMHAI1 Voltage total harmonic distortion (1)

Table 163: LD0.VMHAI1 Voltage total harmonic distortion (1)

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

2.3.2.61 LD0.VSQVUB1 Voltage unbalance (1)

Table 164: LD0.VSQVUB1 Voltage unbalance (1)

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

2.4 Registers

Table 165: Explanations of columns in register tables

Column name	Description
RegA	Default 3X and 4X register address for the data.
Type	Type of the register. The alternatives are u16, u32 (unsigned 16 and 32 bits integer) or i16, i32 (signed 16 and 32 bit integer).
Scale	Scale factor as default. Also, an adjustable offset value exists that is set to 0 by default.
IEC 61850 name	Original IED data object identification. Described in the IEC 61850 format as Logical Device.Logical Node and thereafter .Data Object.Data Attribute. Logical Node is the same as the application function block name.
SA name	The signal may have a defined label that is visible, for example, in the Application Configuration tool in PCM600.
Description	Short description of the signal. See the technical manual for more information. Also, if a register is writable, it is stated here.
Values	The value range of the original IEC 61850 value, that is, before scaling.

2.4.1 Premapped registers

2.4.1.1 Active parameter setting group - read and write

Table 166: Active parameter setting group - read and write

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9231	u16	1			Active setting group	1...6

2.4.1.2 Control structure 1

Table 167: Control structure 1

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

2.4.1.3 Control structure 2

Table 168: Control structure 2

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

2.4.1.4 Control structure 3

Table 169: Control structure 3

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

2.4.1.5 Control structure 4

Table 170: Control structure 4

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

2.4.1.6 Control structure 5

Table 171: Control structure 5

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

2.4.1.7 Control structure 6

Table 172: Control structure 6

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

2.4.1.8 Control structure 7

Table 173: Control structure 7

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

2.4.1.9 Control structure 8

Table 174: Control structure 8

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

2.4.1.10 Device ID string

Table 175: Device ID string

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

1) See the technical manual.

2.4.1.11 Event record structure

Table 176: Event record structure

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
					Selection write:	
9250	u16	1			- Num of multiple records	1...10
9251	i16	1			- Read selection	-499…3
					Record 1 data to read:	
9252	u16	1			- Record sequence num	1...9999
9253	u16	1			- Unread records left	0...499
					Timestamp of record	
9254	u16	1			- Year, Month	Year/Month
9255	u16	1			- Day, Hour	Day/Hour
9256	u16	1			- Minute, Second	Min/Sec
9257	u16	1			- Millisecond	Millisecond
9258	u16	1			Event identification	1)
9259	u16	1			Data object ID1	1)
9260	u16	1			Data object ID2	1)
9261	u16	1			Event data value 1	1)
9262	u16	1			Event data value 2	1)
					Record 2 data to read:	If selected
9263	u16	1			- Record sequence num	1..9999
9264	u16	1			- Unread records left	0..499
					Timestamp of record	
9265	u16	1			- Year, Month	Year/Month
9266	u16	1			- Day, Hour	Day/Hour
9267	u16	1			- Minute, Second	Min/Sec
9268	u16	1			- Millisecond	Millisecond
9269	u16	1			Event identification	1)
9270	u16	1			Data object ID1	1)
9271	u16	1			Data object ID2	1)
9272	u16	1			Event data value 1	1)
9273	u16	1			Event data value 2	1)
					Record 3 data to read:	If selected
9274	u16	1			- Record sequence num	1...9999
9275	u16	1			- Unread records left	0...499
					Timestamp of record	

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9276	u16	1			- Year, Month	Year/Month
9277	u16	1			- Day, Hour	Day/Hour
9278	u16	1			- Minute, Second	Min/Sec
9279	u16	1			- Millisecond	Millisecond
9280	u16	1			Event identification	1)
9281	u16	1			Data object ID1	1)
9282	u16	1			Data object ID2	1)
9283	u16	1			Event data value 1	1)
9284	u16	1			Event data value 2	1)
					Record 4 data to read:	If selected
9285	u16	1			- Record sequence num	1...9999
9286	u16	1			- Unread records left	0...499
					Timestamp of record	
9287	u16	1			- Year, Month	Year/Month
9288	u16	1			- Day, Hour	Day/Hour
9289	u16	1			- Minute, Second	Min/Sec
9290	u16	1			- Millisecond	Millisecond
9291	u16	1			Event identification	1)
9292	u16	1			Data object ID1	1)
9293	u16	1			Data object ID2	1)
9294	u16	1			Event data value 1	1)
9295	u16	1			Event data value 2	1)
					Record 5 data to read:	If selected
9296	u16	1			- Record sequence num	1...9999
9297	u16	1			- Unread records left	0...499
					Timestamp of record	
9298	u16	1			- Year, Month	Year/Month
9299	u16	1			- Day, Hour	Day/Hour
9300	u16	1			- Minute, Second	Min/Sec
9301	u16	1			- Millisecond	Millisecond
9302	u16	1			Event identification	1)
9303	u16	1			Data object ID1	1)
9304	u16	1			Data object ID2	1)
9305	u16	1			Event data value 1	1)
9306	u16	1			Event data value 2	1)

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
					Record 6 data to read:	If selected
9307	u16	1			- Record sequence num	1...9999
9308	u16	1			- Unread records left	0...499
					Timestamp of record	
9309	u16	1			- Year, Month	Year/Month
9310	u16	1			- Day, Hour	Day/Hour
9311	u16	1			- Minute, Second	Min/Sec
9312	u16	1			- Millisecond	Millisecond
9313	u16	1			Event identification	1)
9314	u16	1			Data object ID1	1)
9315	u16	1			Data object ID2	1)
9316	u16	1			Event data value 1	1)
9317	u16	1			Event data value 2	1)
					Record 7 data to read:	If selected
9318	u16	1			- Record sequence num	1...9999
9319	u16	1			- Unread records left	0...499
					Timestamp of record	
9320	u16	1			- Year, Month	Year/Month
9321	u16	1			- Day, Hour	Day/Hour
9322	u16	1			- Minute, Second	Min/Sec
9323	u16	1			- Millisecond	Millisecond
9324	u16	1			Event identification	1)
9325	u16	1			Data object ID1	1)
9326	u16	1			Data object ID2	1)
9327	u16	1			Event data value 1	1)
9328	u16	1			Event data value 2	1)
					Record 8 data to read:	If selected
9329	u16	1			- Record sequence num	1...9999
9330	u16	1			- Unread records left	0...499
					Timestamp of record	
9331	u16	1			- Year, Month	Year/Month
9332	u16	1			- Day, Hour	Day/Hour
9333	u16	1			- Minute, Second	Min/Sec
9334	u16	1			- Millisecond	Millisecond
9335	u16	1			Event identification	1)
9336	u16	1			Data object ID1	1)

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9337	u16	1			Data object ID2	1)
9338	u16	1			Event data value 1	1)
9339	u16	1			Event data value 2	1)
					Record 9 data to read:	If selected
9340	u16	1			- Record sequence num	1...9999
9341	u16	1			- Unread records left	0...499
					Timestamp of record	
9342	u16	1			- Year, Month	Year/Month
9343	u16	1			- Day, Hour	Day/Hour
9344	u16	1			- Minute, Second	Min/Sec
9345	u16	1			- Millisecond	Millisecond
9346	u16	1			Event identification	1)
9347	u16	1			Data object ID1	1)
9348	u16	1			Data object ID2	1)
9349	u16	1			Event data value 1	1)
9350	u16	1			Event data value 2	1)
					Record 10 data to read:	If selected
9351	u16	1			- Record sequence num	1...9999
9352	u16	1			- Unread records left	0...499
					Timestamp of record	
9353	u16	1			- Year, Month	Year/Month
9354	u16	1			- Day, Hour	Day/Hour
9355	u16	1			- Minute, Second	Min/Sec
9356	u16	1			- Millisecond	Millisecond
9357	u16	1			Event identification	1)
9358	u16	1			Data object ID1	1)
9359	u16	1			Data object ID2	1)
9360	u16	1			Event data value 1	1)
9361	u16	1			Event data value 2	1)

1) See the technical manual.

2.4.1.12 Fault record structure header

Table 177: 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	

2.4.1.13 Fault record data

Table 178: Fault record data

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.FLTMSTA1			
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	.AmpsNClc.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	1000	.VoltsA.mag		PhsA voltage	0...4.00 [xUn]
9434	u16	1000	.VoltsB.mag		PhsB voltage	0...4.00 [xUn]
9435	u16	1000	.VoltsC.mag		PhsC voltage	0...4.00 [xUn]
9436	u16	1000	.VoltsAB.mag		PhsAB voltage	0...4.00 [xUn]
9437	u16	1000	.VoltsBC.mag		PhsBC voltage	0...4.00 [xUn]
9438	u16	1000	.VoltsCA.mag		PhsCA voltage	0...4.00 [xUn]
9439	u16	1000	.VoltsN.mag		Residual voltage	0...4.00 [xUn]

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
9440	u16	1000	.VZroSeq.mag		Zero seq. voltage	0...4.00 [xUn]
9441	u16	1000	.VPsSeq.mag		Positive seq. voltage	0...4.00 [xUn]
9442	u16	1000	.VNgSeq.mag		Negative seq. voltage	0...4.00 [xUn]
9443	u16	1000	.VoltsAb.mag		PhsAb voltage	0...4.00 [xUn]
9444	u16	1000	.VoltsABb.mag		PhsABb voltage	0...4.00 [xUn]
9445	i16	10	.DifNAngN.mag		Uo-Io angle	-/+ 180.0 [Deg]
9446	i16	10	.DifAAngBC.mag		PhsB-C angle	-/+ 180.0 [Deg]
9447	i16	10	.DifBAngCA.mag		PhsC-A angle	-/+ 180.0 [Deg]
9448	i16	10	.DifCAngAB.mag		PhsA-B angle	-/+ 180.0 [Deg]
9449	u16	100	.Hz.mag		Frequency	30...80.00 [Hz]
9450	i16	100	.HzS.mag		Frequency gradient	-/+10.00 [Hz/s]
9451	u16	100	.PDNS1MxRat.mag		PDNSPTOC1 ratio I2/I1	0...999.99 [%]
9452	u16	100	.MaxTmpRl.mag		Relative temperature	0...99.99

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

Table 179: Protection relay's real-time clock (in local time mode) - read and write (synchronize)

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

1) See the technical manual.

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

Table 180: Protection relay's real-time clock (in UTC time mode) - read and write (synchronize)

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

1) See the technical manual.

2.4.1.16 Indication bits mirrored in registers

The pre-mapped indication bit data has been mapped from indication bit address 2720 onwards. The bit data is mirrored in registers starting from register address 170 onwards.

Table 181: Indication bits mirrored in registers

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

2.4.1.17 SSR1 System status register (1) device health

Table 182: 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

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
128.06	Bit				< reserved >	0
128.07	Bit				< reserved >	0
128.08	Bit				< reserved >	0
128.09	Bit				< reserved >	0
128.10	Bit				< reserved >	0
128.11	Bit				< reserved >	0
128.12	Bit				< reserved >	0
128.13	Bit				< reserved >	0
128.14	Bit				< reserved >	0
128.15	Bit				< reserved >	0

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

Table 183: SSR2 System status register (2) protection relay's mode and state

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

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

Table 184: 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
130.13	Bit				< reserved >	0
130.14	Bit				< reserved >	0
130.15	Bit				< reserved >	0

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

Table 185: SSR4 System status register (4) data available 2 (client-dependent, user-definable)

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

2.4.1.21 SSR5 System status register (5) device alive register

Table 186: SSR5 System status register (5) device alive register

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

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

Table 187: SSR6 System status register (6) control command status (client-dependent)

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

1) See the technical manual.

2.4.1.23 System diagnostic values

Table 188: System diagnostic values

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.LDEV1			
2050	u16	1	.DevWrn.stVal	Warning	Last warning code	1)
2051	u16	1	.DevFail.stVal	Internal fault	Last internal fault code	1)
Table continues on next page						

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			DR.RDRE1			
2052	u16	1	.FltNum.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
			LD0.LDEV1			
2057	u16	1	.ChgAckCnt.stVal		Num. of conf. changes	0...65535
			LD0.LLN0			
	u16	1	.ParChgCnt.stVal		Num. of setting changes	0…65535

1) See the technical manual.

2.4.1.24 Time and reason for latest protection relay reset

Table 189: Time and reason for latest protection relay reset

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

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

Table 190: User-definable bits [Alt.2], visible on 0x,1x,3x and 4x

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

Table continues on next page

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

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

Table 191: User-definable registers [Alt.1], visible on 3x and 4x

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

2.4.1.27 CTRL.CBCSWI1 Circuit breaker operation counter (1)

Table 192: CTRL.CBCSWI1 Circuit breaker operation counter (1)

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

2.4.1.28 LD0.ARCSARC1 Arc protection (1)

Table 193: LD0.ARCSARC1 Arc protection (1)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.ARCSARC11			
2028	u16	1	.FACntRs.stVal		Fault arc 1 counter	0…65535

2.4.1.29 LD0.ARCSARC2 Arc protection (2)

Table 194: LD0.ARCSARC2 Arc protection (2)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.ARCSARC21			
2029	u16	1	.FACntRs.stVal		Fault arc 2 counter	0…65535

2.4.1.30 LD0.ARCSARC3 Arc protection (3)

Table 195: LD0.ARCSARC3 Arc protection (3)

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

2.4.1.31 LD0.CMMXU1 Phase current demand values (1)

Table 196: LD0.CMMXU1 Phase current demand values (1)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.CAVMMXU1		Demand value	
2001	u16	1000	.A.phsA.cVal.mag	I_DMD_A	Phs A amplitude	0.00…50.0 [xIn]
2002	u16	1000	.A.phsB.cVal.mag	I_DMD_B	Phs B amplitude	0.00…50.0 [xIn]
2003	u16	1000	.A.phsB.cVal.mag	I_DMD_C	Phs C amplitude	0.00…50.0 [xIn]
2004					Year - month	
2005					Day - hour	
2006					Minute - second	
2007					Milliseconds	
2008					Time quality	
			LD0.CMAMMXU1		Max demand values	
2009	u16	1000	.A.phsA.cVal.mag	Max demand IL1	Phs A amplitude	0.00…50.0 [xIn]
2010					Year - month	
2011					Day - hour	
2012					Minute - second	
2013					Milliseconds	
2014					Time quality	
2015	u16	1000	.A.phsB.cVal.mag	Max demand IL2	Phs B amplitude	0.00…50.0 [xIn]
2016					Year - month	
2017					Day - hour	
2018					Minute - second	
2019					Milliseconds	
2020					Time quality	
2021	u16	1000	.A.phsC.cVal.mag	Max demand IL2	Phs C amplitude	0.00…50.0 [xIn]
2022					Year - month	
2023					Day - hour	
2024					Minute - second	

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
2025					Milliseconds	
2026					Time quality	
			LD0.CMIMMXU1		Min demand values	
	u16	1000	.A.phsA.cVal.mag	Max demand IL1	Phs A amplitude	0.00…50.0 [xIn]
	u16	1000	.A.phsB.cVal.mag	Max demand IL2	Phs B amplitude	0.00…50.0 [xIn]
	u16	1000	.A.phsC.cVal.mag	Max demand IL3	Phs C amplitude	0.00…50.0 [xIn]

2.4.1.32 LD0.CMMXU1 Three-phase current measurement (1)

Table 197: LD0.CMMXU1 Three-phase current measurement (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	Phs A amplitude	0.00...40.0 [xIn]
139	u16	1000	.A.phsB.instCVal.mag	I_INST_B	Phs B amplitude	0.00...40.0 [xIn]
140	u16	1000	.A.phsC.instCVal.mag	I_INST_C	Phs C amplitude	0.00...40.0 [xIn]

2.4.1.33 LD0.CMMXU2 Phase current demand values (2)

Table 198: LD0.CMMXU2 Phase current demand values (2)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.CMMXU2		Demand value	
2027	u16	1000	.AvAmpsA.mag	I_DMD_A	Phs A amplitude	0.00...40.0 [xIn]
2028	u16	1000	.AvAmpsB.mag	I_DMD_B	Phs B amplitude	0.00...40.0 [xIn]
2029	u16	1000	.AvAmpsC.mag	I_DMD_C	Phs C amplitude	0.00...40.0 [xIn]
					Update time stamp	See doc.
2030	u16	-			Year - month	
2031	u16	-			Day - hour	
2032	u16	-			Minute - second	
2033	u16	-			Milliseconds	
2034	u16	-			Time quality	
2035	u16	1000	.MaxAmpsA.mag	Max demand IL1	Max. phs A demand	0.00...40.0 [xIn]
					Update time stamp	See doc.

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
2036	u16	-			Year - month	
2037	u16	-			Day - hour	
2038	u16	-			Minute - second	
2039	u16	-			Milliseconds	
2040	u16	-			Time quality	
2041	u16	1000	.MaxAmpsB.mag	Max demand IL2	Max. phs B demand	0.00...40.0 [xIn]
					Update time stamp	See doc.
2042	u16	-			Year - month	
2043	u16	-			Day - hour	
2044	u16	-			Minute - second	
2045	u16	-			Milliseconds	
2046	u16	-			Time quality	
2047	u16	1000	.MaxAmpsC.mag	Max demand IL3	Max. phsC demand	0.00...40.0 [xIn]
					Update time stamp	see doc.
2048	u16	-			Year - month	
2049	u16	-			Day - hour	
2050	u16	-			Minute - second	
2051	u16	-			Milliseconds	
2052	u16	-			Time quality	

2.4.1.34 LD0.CMMXU2 Three-phase current measurement (2)

Table 199: LD0.CMMXU2 Three-phase current measurement (2)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.CMMXU2		Phase current (2)	
135	u16	1000	.A.phsA.instCVal.mag	I_INST_A	PhsA amplitude	0.00..40.0 [xIn]
136	u16	1000	.A.phsB.instCVal.mag	I_INST_B	PhsB amplitude	0.00..40.0 [xIn]
137	u16	1000	.A.phsC.instCVal.mag	I_INST_C	PhsC amplitude	0.00..40.0 [xIn]

2.4.1.35 LD0.CSMSQI1 Sequence current measurement (1)

Table 200: LD0.CSMSQI1 Sequence current measurement (1)

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

2.4.1.36 LD0.FMMXU1 Frequency measurement (1)

Table 201: LD0.FMMXU1 Frequency measurement (1)

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

2.4.1.37 LD0.MDSOPT1 Runtime counter for machines and devices (1)

Since the register size is 16 bits, the value saturates at 65535 hours (approximately 7.5 years). Alternatively, a 32-bit user-definable register can be made of this data to cover the whole 300 000 hours (34 years) range. The value can also, for example, be rescaled to show “total operation days” instead by changing the scale factor from 1 to 1/24 = 0.0417.

Table 202: LD0.MDSOPT1 Runtime counter for machines and devices (1)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.MDSOPT1			
2048	u16	1	.OpTmh.stVal	OPR_TIME	Total operation hours	0..299999

2.4.1.38 LD0.MDSOPT2 Runtime counter for machines and devices (2)

Table 203: LD0.MDSOPT2 Runtime counter for machines and devices (2)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.MDSOPT2			
2049	u16	1	.OpTmh.stVal	OPR_TIME	Total operation hours	0…299999

2.4.1.39 LD0.MPTTR1 Thermal overload protection for motors (1)

Table 204: LD0.MPTTR1 Thermal overload protection for motors (1)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.MPTTR1			
147	u16	1	.TmpRl.mag	Therm-lev	Thermal level	0.00...9.99
148	i16	1	.TmpUsed.mag	TEMP_AMB	Ambient temperature	-99...999 [C]
149	u16	10	.ThmLevSt	THERMLEV_ST	Start therm.level	0.00...9.99
150	u16	10	.ThmLevEnd	THERMLEV_END	End therm.level	0.00...9.99
151	u16	1	.StrInhTms.stVal	T_ENARESTART	Est. time to reset block restart	0...99999 [s]

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

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

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.PEMMTR1			
2040	u32	1	.SupWh.actVal		Reverse active energy (high)	0..1E10 [kWh]
2041			.SupWh.actVal		(low word)	
2042	u32	1	.SupVArh.actVal		Reverse reactive energy (high)	0..1E10 [kVArh]
2043			.SupVArh.actVal		(low word)	
2044	u32	1	.DemWh.actVal		Forward active energy (high)	0..1E10 [kWh]
2045			.DemWh.actVal		(low word)	
2046	u32	1	.DemVArh.actVal		Forward reactive energy (high)	0..1E10 [kVArh]
2047			.DemVArh.actVal		(low word)	

2.4.1.41 LD0.PEMMXU1 Three-phase power and energy measurement (1)

Table 206: LD0.PEMMXU1 Three-phase power and energy measurement (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

2.4.1.42 LD0.RESCMMXU1 Residual current demand value (1)

Table 207: LD0.RESCMMXU1 Residual current demand value (1)

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

2.4.1.43 LD0.RESCMMXU1 Residual current measurement (1)

Table 208: 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]

2.4.1.44 LD0.RESVMMXU1 Residual voltage demand value (1)

Table 209: LD0.RESVMMXU1 Residual voltage demand value (1)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.RVAVMMXU1		Demand value	
1977	u16	1000	.PhV.res.cVal.mag	U_DMD_RES	Residual amplitude	0.00…4.0 [xUn]
1978					Year - month	
1979					Day - hour	
1980					Minute - second	

Table continues on next page

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

2.4.1.45 LD0.RESVMMXU1 Residual voltage measurement (1)

Table 210: 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]

2.4.1.46 LD0.SSCBR1 Circuit-breaker condition monitoring (1)

Table 211: LD0.SSCBR1 Circuit-breaker condition monitoring (1)

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

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SPH1SCBR1			
2067	u16	1	.AccmAPwr.mag	IPOW_A	Iyt phs A	0...1E6
			LD0.SPH2SCBR1			
2068	u16	1	.AccmAPwr.mag	IPOW_B	Iyt phs B	0...1E6
			LD0.SPH3SCBR1			
2069	u16	1	.AccmAPwr.mag	IPOW_C	Iyt phs C	0...1E6

2.4.1.47 LD0.VMMXU1 Three-phase voltage measurement (1)

Table 212: LD0.VMMXU1 Three-phase voltage measurement (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	- Phs A amplitude	0.00...4.00 [xUn]
153	u16	1000	.phV.phsB.cVal.mag	U_DB_B	- Phs B amplitude	0.00...4.00 [xUn]
154	u16	1000	.phV.phsC.cVal.mag	U_DB_C	- Phs C amplitude	0.00...4.00 [xUn]
			LD0.VMMXU1		Phase-phase voltage (1)	
155	u16	1000	.PPV.phsAB.cVal.mag	U_DB_AB	- Phs AB amplitude	0.00...4.00 [xUn]
156	u16	1000	.PPV.phsBC.cVal.mag	U_DB_BC	- Phs BC amplitude	0.00...4.00 [xUn]
157	u16	1000	.PPV.phsCA.cVal.mag	U_DB_CA	- Phs CA amplitude	0.00...4.00 [xUn]

2.4.1.48 LD0.VMMXU1 Voltage demand values (1)

Table 213: LD0.VMMXU1 Voltage demand values (1)

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

2.4.1.49 LD0.VSMSQI1 Sequence voltage measurement (1)

Table 214: LD0.VSMSQI1 Sequence voltage measurement (1)

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

2.4.1.50 LD0.XRGGIO105 RTD input values

Table 215: LD0.XRGGIO105 RTD input values

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.XRGGIO105			
2031	i16	1	.AnIn1.mag	AI_VAL1	RTD input 1 in ohms	-/+ 10000.00
2032	i16	1	.AnIn2.mag	AI_VAL2	RTD input 2 in ohms	-/+ 10000.00
2033	i16	1	.AnIn3.mag	AI_VAL3	RTD input 3 in ohms	-/+ 10000.00
2034	i16	1	.AnIn4.mag	AI_VAL4	RTD input 4 in ohms	-/+ 10000.00
2035	i16	1	.AnIn5.mag	AI_VAL5	RTD input 5 in ohms	-/+ 10000.00
2036	i16	1	.AnIn6.mag	AI_VAL6	RTD input 6 in ohms	-/+ 10000.00
2037	i16	1	.AnIn7.mag	AI_VAL7	RTD input 7 in ohms	-/+ 10000.00
2038	i16	1	.AnIn8.mag	AI_VAL8	RTD input 8 in ohms	-/+ 10000.00

2.4.1.51 LD0.XRGGIO110 RTD input values

Table 216: LD0.XRGGIO110 RTD input values

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.XRGGIO110			
2121	i16	1	.AnIn1.mag	AI_VAL1	RTD input 1 in ohms	-/+ 10000.00
2122	i16	1	.AnIn2.mag	AI_VAL2	RTD input 2 in ohms	-/+ 10000.00
2123	i16	1	.AnIn3.mag	AI_VAL3	RTD input 3 in ohms	-/+ 10000.00
2124	i16	1	.AnIn4.mag	AI_VAL4	RTD input 4 in ohms	-/+ 10000.00
2125	i16	1	.AnIn5.mag	AI_VAL5	RTD input 5 in ohms	-/+ 10000.00
2126	i16	1	.AnIn6.mag	AI_VAL6	RTD input 6 in ohms	-/+ 10000.00
2127	i16	1	.AnIn7.mag	AI_VAL7	RTD input 7 in ohms	-/+ 10000.00
2128	i16	1	.AnIn8.mag	AI_VAL8	RTD input 8 in ohms	-/+ 10000.00

2.4.2 Unmapped registers

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

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

Table 217: CTRL.LLN0 Local, Remote, Station, Off and Combinations

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			CTRL.LLN0			
	u16	1	.LocKeyHMI.stVal		0=Off; 1=Loc; 2=Rem; 3=Stat; 4=L+R; 5=L+S; 6=L+S+R; 7=S+R	0…7

2.4.2.2 LD0.CMHAI1 Current total demand distortion (1)

Table 218: LD0.CMHAI1 Current total demand distortion (1)

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

2.4.2.3 LD0.CSMSQI2 Sequence current measurement (2)

Table 219: LD0.CSMSQI2 Sequence current measurement (2)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.CSMSQI2		Sequence of currents	
	u16	1000	.SeqA.c1.instCVal.mag	I1_INST	Positive amplitude	0.00...40.0 [xIn]
	u16	1000	.SeqA.c2.instCVal.mag	I2_INST	Negative amplitude	0.00...40.0 [xIn]
	u16	1000	.SeqA.c2.instCVal.mag	I3_INST	Zero amplitude	0.00...40.0 [xIn]

2.4.2.4 LD0.MVI4GAPC1 Integer value move (1)

Table 220: LD0.MVI4GAPC1 Integer value move (1)

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

2.4.2.5 LD0.MVI4GAPC2 Integer value move (2)

Table 221: LD0.MVI4GAPC2 Integer value move (2)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.MVI4GAPC2			
	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

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
					- Low word	
	i32	1	.ISCS04.stVal	OUT4	- Integer value 4 (high)	-/ +2147483647
					- Low word	

2.4.2.6 LD0.MVI4GAPC3 Integer value move (3)

Table 222: LD0.MVI4GAPC3 Integer value move (3)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.MVI4GAPC3			
	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	

2.4.2.7 LD0.MVI4GAPC4 Integer value move (4)

Table 223: LD0.MVI4GAPC4 Integer value move (4)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.MVI4GAPC4			
	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	

2.4.2.8 LD0.PHQVVR1 Voltage variation (1)

Table 224: LD0.PHQVVR1 Voltage variation (1)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.PH1QVVR1		Voltage swell	
	u32	1	.SwlInstCnt.stVal	INSTSWELLCNT	- Inst counter (high)	0…
					- (Low word)	2147483647
	u32	1	.SwlMomCnt.stVal	MOMSWELLCNT	- Mom counter (high)	0…
					- (Low word)	2147483647
	u32	1	.SwlTmpCnt.stVal	TEMPSWELLCNT	- Temp counter (high)	0…
					- (Low word)	2147483647
	u32	1	.SwlMaxCnt.stVal	MAXDURSWELLCNT	- Max. duration.counter (high)	0…
					- (Low word)	2147483647
					Voltage dip	
	u32	1	.DipInstCnt.stVal	INSTDIPCNT	- Inst counter (high)	0…
					- (Low word)	2147483647
	u32	1	.DipMomCnt.stVal	MOMDIPCNT	- Mom counter (high)	0…
					- (Low word)	2147483647
	u32	1	.DipTmpCnt.stVal	TEMPDIPCNT	- Temp counter (high)	0…
					- (Low word)	2147483647
	u32	1	.DipMaxCnt.stVal	MAXDURDIPCNT	- Max. duration counter (high)	0…
					- (Low word)	2147483647
					Voltage interrupts	
	u32	1	.IntrMomCnt.stVal	MOMINTCNT	- Mom counter (high)	0…
					- (Low word)	2147483647
	u32	1	.IntrTmpCnt.stVal	TEMPINTCNT	- Temp counter (high)	0…
					- (Low word)	2147483647
	u32	1	.IntrSstCnt.stVal	SUSTINTCNT	- Sustain counter (high)	0…
					- (Low word)	2147483647
	u32	1	.IntrMaxCnt.stVal	MAXDURINTCNT	- Max. duration counter (high)	0…

2.4.2.9 LD0.SCA4GAPC1 Analog value scaling (1)

Table 225: LD0.SCA4GAPC1 Analog value scaling (1)

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

2.4.2.10 LD0.SCA4GAPC2 Analog value scaling (2)

Table 226: LD0.SCA4GAPC2 Analog value scaling (2)

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

2.4.2.11 LD0.SCA4GAPC3 Analog value scaling (3)

Table 227: LD0.SCA4GAPC3 Analog value scaling (3)

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

2.4.2.12 LD0.SCA4GAPC4 Analog value scaling (4)

Table 228: LD0.SCA4GAPC4 Analog value scaling (4)

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

2.4.2.13 LD0.SSCBR2 Circuit-breaker condition monitoring (2)

Table 229: LD0.SSCBR2 Circuit-breaker condition monitoring (2)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SSCBR2			
	u16	1	.InaTmdCnt.stVal	INA_DAYS	CB inactive days	0...65535
	u16	1	.OpTmOpn.mag	T_TRV_OP	Open travel time	0...60000 [ms]
	u16	1	.OpTmCls.mag	T_TRV_CL	Close travel time	0...60000 [ms]
			LD0.SSOPM2			

Table continues on next page

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
	u16	100	.TmsSprCha.mag	T_SPR_CHR	Spring charge time	0.00…99.99 [s]
			LD0.SPH1SCBR2			
	i16	1	.RmnNumOp.stVal	CB_LIFE_A	Remain.life phs A	-/+ 9999
			LD0.SPH2SCBR2			
	i16	1	.RmnNumOp.stVal	CB_LIFE_B	Remain.life phs B	-/+ 9999
			LD0.SPH3SCBR2			
	i16	1	.RmnNumOp.stVal	CB_LIFE_C	Remain.life phs C	-/+ 9999
			LD0.SPH1SCBR2			
	u16	1	.AccmAPwr.mag	IPOW_A	Iyt phs A	0...1E6
			LD0.SPH2SCBR2			
	u16	1	.AccmAPwr.mag	IPOW_B	Iyt phs B	0...1E6
			LD0.SPH3SCBR2			
	u16	1	.AccmAPwr.mag	IPOW_C	Iyt phs C	0...1E6

2.4.2.14 LD0.SSCBR3 Circuit-breaker condition monitoring (3)

Table 230: LD0.SSCBR3 Circuit-breaker condition monitoring (3)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.SSCBR3			
	u16	1	.InaTmdCnt.stVal	INA_DAYS	CB inactive days	0...65535
	u16	1	.OpTmOpn.mag	T_TRV_OP	Open travel time	0...60000 [ms]
	u16	1	.OpTmCls.mag	T_TRV_CL	Close travel time	0...60000 [ms]
			LD0.SSOPM3			
	u16	100	.TmsSprCha.mag	T_SPR_CHR	Spring charge time	0.00…99.99 [s]
			LD0.SPH1SCBR3			
	i16	1	.RmnNumOp.stVal	CB_LIFE_A	Remain.life phs A	-/+ 9999
			LD0.SPH2SCBR3			
	i16	1	.RmnNumOp.stVal	CB_LIFE_B	Remain.life phs B	-/+ 9999
			LD0.SPH3SCBR3			
	i16	1	.RmnNumOp.stVal	CB_LIFE_C	Remain.life phs C	-/+ 9999
			LD0.SPH1SCBR3			
	u16	1	.AccmAPwr.mag	IPOW_A	Iyt phs A	0...1E6
			LD0.SPH2SCBR3			
	u16	1	.AccmAPwr.mag	IPOW_B	Iyt phs B	0...1E6
			LD0.SPH3SCBR3			
	u16	1	.AccmAPwr.mag	IPOW_C	Iyt phs C	0...1E6

2.4.2.15 LD0.VAMMXU2 Single-phase voltage measurement (2)

Table 231: LD0.VAMMXU2 Single-phase voltage measurement (2)

RegA	Type	Scale	IEC 61850 name	SA name	Description	Values
			LD0.VAMMXU2			
			.PhV.phsA.cVal.mag	U_DB_A	Phs A amplitude	0.00…4.00 [xUn]
			.PPV.phsAB.cVal.mag	U_DB_AB	Phs AB amplitude	0.00…4.00 [xUn]
			LD0.VAAVMMXU2			
			.PhV.phsA.cVal.mag	U_DMD_A	Phs A demand amplitude	0.00…4.00 [xUn]
			.phsAB.cVal.mag	U_DMD_AB	Phs AB demand amplitude	0.00…4.00 [xUn]

2.4.2.16 LD0.VMHAI1 Voltage total harmonic distortion (1)

Table 232: LD0.VMHAI1 Voltage total harmonic distortion (1)

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

2.5 Controls

Table 233: Explanations of the controls table columns

Column name	Description
0xA	Coil (0X) address for control value.
CS	Control structure and bit within the structure for control value.
IEC 61850 name	Original IED data object identification. Described in the IEC 61850 format as Logical Device.Logical Node and thereafter .Data Object.Data Attribute. Logical Node is the same as the application function block name.
SA name	The signal may have a defined label that is visible, for example, in the Application Configuration tool in PCM600.
Description	Short description of the signal. See the technical manual for more information.
Value	Meaning of the written value.

2.5.1 Reset, acknowledge and trigger points

Table 234: Reset, acknowledge and trigger points

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.PEMMXU1			
2062	2.02	.RecRs.Oper.ctlVal		Reset power max demands	1=Reset
2063	2.03	< reserved >			
2064	2.04	< reserved >			
		LD0.SSCBR1			
2065	2.05	.RsAccAPwr.Oper.ctlVal		Reset CB accum. energy	1=Reset
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.CMMXU1			
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.RESCMMXU1			

Table continues on next page

0xA	CS	IEC 61850 name	SA name	Description	Values
2073	2.13	.RecRs.Oper.ctlVal		Reset Io (1) max demands	1=Reset
		LD0.RESVMMXU1			
2074	2.14	.RecRs.Oper.ctlVal		Reset Uo (1) max demands	1=Reset

2.5.2 CTRL.CBCSWI1 Circuit breaker control (1)

Table 235: CTRL.CBCSWI1 Circuit breaker control (1)

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

2.5.3 CTRL.DCXSWI1 Disconnector control (1)

Table 236: CTRL.DCXSWI1 Disconnector control (1)

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

2.5.4 CTRL.DCXSWI2 Disconnector control (2)

Table 237: CTRL.DCXSWI2 Disconnector control (2)

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

2.5.5 CTRL.DCXSWI3 Disconnector control (3)

Table 238: CTRL.DCXSWI3 Disconnector control (3)

0xA	CS	IEC 61850 name	SA name	Description	Values
		CTRL.DCCSWI3			
		.Pos.Oper.ctlVal		Select open	1=Select
		.Pos.Oper.ctlVal		Select close	1=Select
		.Pos.Oper.ctlVal		Cancel selection	1=Cancel
		.Pos.Oper.ctlVal		Execute selection	1=Execute
		.Pos.Oper.ctlVal		Direct open	1=Open
		.Pos.Oper.ctlVal		Direct close	1=Close

2.5.6 CTRL.DCXSWI4 Disconnector control (4)

Table 239: CTRL.DCXSWI4 Disconnector control (4)

0xA	CS	IEC 61850 name	SA name	Description	Values
		CTRL.DCCSWI4			
		.Pos.Oper.ctlVal		Select open	1=Select
		.Pos.Oper.ctlVal		Select close	1=Select
		.Pos.Oper.ctlVal		Cancel selection	1=Cancel
		.Pos.Oper.ctlVal		Execute selection	1=Execute
		.Pos.Oper.ctlVal		Direct open	1=Open
		.Pos.Oper.ctlVal		Direct close	1=Close

2.5.7 CTRL.ESXSWI1 Earthing switch control (1)

Table 240: CTRL.ESXSWI1 Earthing switch control (1)

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

2.5.8 CTRL.ESXSWI2 Earthing switch control (2)

Table 241: CTRL.ESXSWI2 Earthing switch control (2)

0xA	CS	IEC 61850 name	SA name	Description	Values
		CTRL.ESXSWI2			
		.Pos.Oper.ctlVal		Select open	1=Select
		.Pos.Oper.ctlVal		Select close	1=Select
		.Pos.Oper.ctlVal		Cancel selection	1=Cancel
		.Pos.Oper.ctlVal		Execute selection	1=Execute
		.Pos.Oper.ctlVal		Direct open	1=Open
		.Pos.Oper.ctlVal		Direct close	1=Close

2.5.9 CTRL.ESXSWI3 Earthing switch control (3)

Table 242: CTRL.ESXSWI3 Earthing switch control (3)

0xA	CS	IEC 61850 name	SA name	Description	Values
		CTRL.ESXSWI3			
		.Pos.Oper.ctlVal		Select open	1=Select
		.Pos.Oper.ctlVal		Select close	1=Select
		.Pos.Oper.ctlVal		Cancel selection	1=Cancel
		.Pos.Oper.ctlVal		Execute selection	1=Execute
		.Pos.Oper.ctlVal		Direct open	1=Open
		.Pos.Oper.ctlVal		Direct close	1=Close

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

Table 243: LD0.LDEV1 Protection relay's warm reset (1)

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

2.5.11 LD0.SPCGAPC1 Generic control point (16 pcs) (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 244: LD0.SPCGAPC1 Generic control point (16 pcs) (1)

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

2.5.12 LD0.SPCGAPC2 Generic control point (16 pcs) (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 245: LD0.SPCGAPC2 Generic control point (16 pcs) (2)

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.SPCGAPC2			
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

Table continues on next page

0xA	CS	IEC 61850 name	SA name	Description	Values
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

2.5.13 LD0.SPCGAPC3 Generic control point (16 pcs) (3)

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

Table 246: LD0.SPCGAPC3 Generic control point (16 pcs) (3)

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.SPCGAPC3			
2400		.SPCS01.ctlVal		Output 1 control	0/1=Off/On
2401		.SPCS02.ctlVal		Output 2 control	0/1=Off/On
2402		.SPCS03.ctlVal		Output 3 control	0/1=Off/On
2403		.SPCS04.ctlVal		Output 4 control	0/1=Off/On
2404		.SPCS05.ctlVal		Output 5 control	0/1=Off/On
2405		.SPCS06.ctlVal		Output 6 control	0/1=Off/On
2406		.SPCS07.ctlVal		Output 7 control	0/1=Off/On
2407		.SPCS08.ctlVal		Output 8 control	0/1=Off/On
2408		.SPCS09.ctlVal		Output 9 control	0/1=Off/On
2409		.SPCS10.ctlVal		Output 10 control	0/1=Off/On
2410		.SPCS11.ctlVal		Output 11 control	0/1=Off/On
2411		.SPCS12.ctlVal		Output 12 control	0/1=Off/On
2412		.SPCS13.ctlVal		Output 13 control	0/1=Off/On
2413		.SPCS14.ctlVal		Output 14 control	0/1=Off/On
2414		.SPCS15.ctlVal		Output 15 control	0/1=Off/On
2415		.SPCS16.ctlVal		Output 16 control	0/1=Off/On

2.5.14 LD0.SPCRGAPC1 Remote generic control points (1)

Table 247: LD0.SPCRGAPC1 Remote generic control points (1)

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.SPCRGAPC1			
2416		.SPCSO1.Oper.ctlVal		Output 1 control	0/1=Off/On
2417		.SPCSO2.Oper.ctlVal		Output 2 control	0/1=Off/On
Table continues on next page					

0xA	CS	IEC 61850 name	SA name	Description	Values
2418		.SPCSO3.Oper.ctlVal		Output 3 control	0/1=Off/On
2419		.SPCSO4.Oper.ctlVal		Output 4 control	0/1=Off/On
2420		.SPCSO5.Oper.ctlVal		Output 5 control	0/1=Off/On
2421		.SPCSO6.Oper.ctlVal		Output 6 control	0/1=Off/On
2422		.SPCSO7.Oper.ctlVal		Output 7 control	0/1=Off/On
2423		.SPCSO8.Oper.ctlVal		Output 8 control	0/1=Off/On
2424		.SPCSO9.Oper.ctlVal		Output 9 control	0/1=Off/On
2425		.SPCSO10.Oper.ctlVal		Output 10 control	0/1=Off/On
2426		.SPCSO11.Oper.ctlVal		Output 11 control	0/1=Off/On
2427		.SPCSO12.Oper.ctlVal		Output 12 control	0/1=Off/On
2428		.SPCSO13.Oper.ctlVal		Output 13 control	0/1=Off/On
2429		.SPCSO14.Oper.ctlVal		Output 14 control	0/1=Off/On
2430		.SPCSO15.Oper.ctlVal		Output 15 control	0/1=Off/On
2431		.SPCSO16.Oper.ctlVal		Output 16 control	0/1=Off/On

2.5.15 LD0.SRGAPC1 Set-reset (8 pcs) (1)

Table 248: LD0.SRGAPC1 Set-reset (8 pcs) (1)

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

2.5.16 LD0.SRGAPC2 Set-reset (8 pcs) (2)

Table 249: LD0.SRGAPC2 Set-reset (8 pcs) (2)

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.SRGAPC2			
2104	4.08	.Rs1.Oper.ctlVal		Reset flip-flop 1	1=Reset
2105	4.09	.Rs2.Oper.ctlVal		Reset flip-flop 2	1=Reset
2106	4.10	.Rs3.Oper.ctlVal		Reset flip-flop 3	1=Reset
2107	4.11	.Rs4.Oper.ctlVal		Reset flip-flop 4	1=Reset
2108	4.12	.Rs5.Oper.ctlVal		Reset flip-flop 5	1=Reset

Table continues on next page

0xA	CS	IEC 61850 name	SA name	Description	Values
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

2.5.17 LD0.SRGAPC3 Set-reset (8 pcs) (3)

Table 250: LD0.SRGAPC3 Set-reset (8 pcs) (3)

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.SRGAPC3			
2432	-	.Rs1.Oper.ctlVal		Reset flip-flop 1	1=Reset
2433	-	.Rs2.Oper.ctlVal		Reset flip-flop 2	1=Reset
2434	-	.Rs3.Oper.ctlVal		Reset flip-flop 3	1=Reset
2435	-	.Rs4.Oper.ctlVal		Reset flip-flop 4	1=Reset
2436	-	.Rs5.Oper.ctlVal		Reset flip-flop 5	1=Reset
2437	-	.Rs6.Oper.ctlVal		Reset flip-flop 6	1=Reset
2438	-	.Rs7.Oper.ctlVal		Reset flip-flop 7	1=Reset
2439	-	.Rs8.Oper.ctlVal		Reset flip-flop 8	1=Reset

2.5.18 LD0.SRGAPC4 Set-reset (8 pcs) (4)

Table 251: LD0.SRGAPC4 Set-reset (8 pcs) (4)

0xA	CS	IEC 61850 name	SA name	Description	Values
		LD0.SRGAPC4			
2440	-	.Rs1.Oper.ctlVal		Reset flip-flop 1	1=Reset
2441	-	.Rs2.Oper.ctlVal		Reset flip-flop 2	1=Reset
2442	-	.Rs3.Oper.ctlVal		Reset flip-flop 3	1=Reset
2443	-	.Rs4.Oper.ctlVal		Reset flip-flop 4	1=Reset
2444	-	.Rs5.Oper.ctlVal		Reset flip-flop 5	1=Reset
2445	-	.Rs6.Oper.ctlVal		Reset flip-flop 6	1=Reset
2446	-	.Rs7.Oper.ctlVal		Reset flip-flop 7	1=Reset
2447	-	.Rs8.Oper.ctlVal		Reset flip-flop 8	1=Reset

2.5.19 Unmapped control points

Table 252: Unmapped control points

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

Section 3 Glossary

EMC	Electromagnetic compatibility
IEC	International Electrotechnical Commission
IEC 61850	International standard for substation communication and modeling
IED	Intelligent electronic device
LED	Light-emitting diode
LHMI	Local human-machine interface
Modbus	A serial communication protocol developed by the Modicon company in 1979. Originally used for communication in PLCs and RTU devices.
PCM600	Protection and Control IED Manager

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