



Relion® 620 series

Advanced Recloser Protection and Control

RER620

Modbus Point List Manual

Power and productivity
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ABB



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This product complies with the directive of the Council of the European Communities on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive 2004/108/EC) and concerning electrical equipment for use within specified voltage limits (Low-voltage directive 2006/95/EC). This conformity is the result of tests conducted by ABB in accordance with the product standards EN 50263 and EN 60255-26 for the EMC directive, and with the product standards EN 60255-6 and EN 60255-27 for the low voltage directive. The relay is designed in accordance with the international standards of the IEC 60255 series and ANSI C37.90.

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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 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 a 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

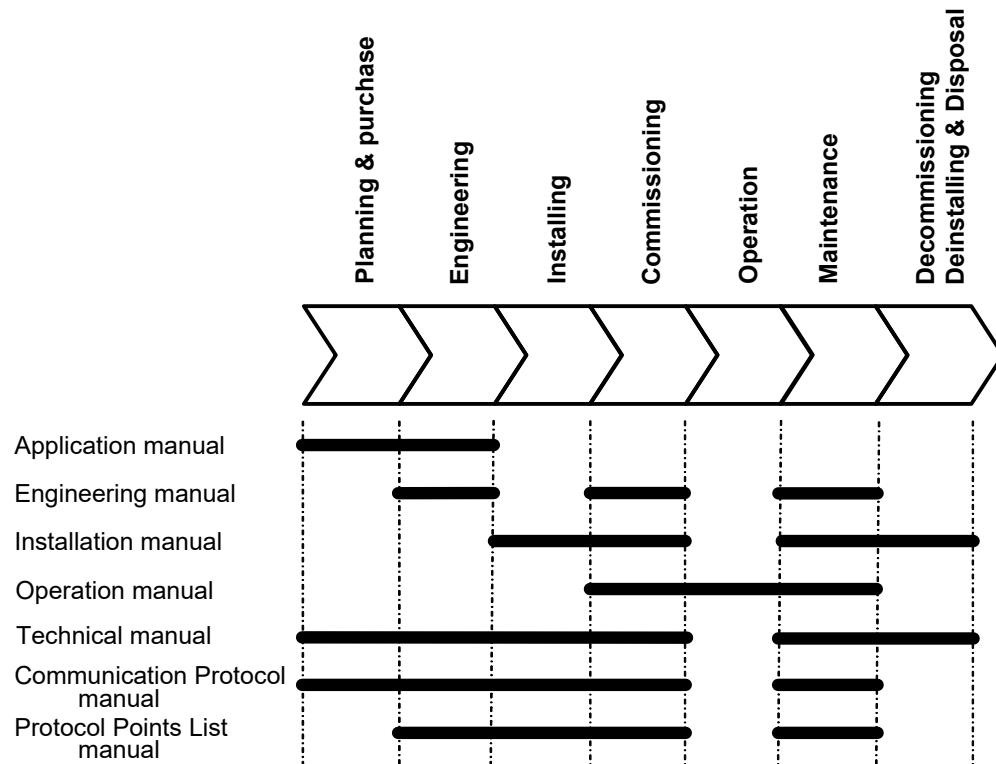


Figure 1: The intended use of manuals in different lifecycles

The engineering manual contains instructions on how to engineer the relays using the different tools in PCM600. The manual provides instructions on how to set up a PCM600 project and insert relays to the project structure. The manual also recommends a sequence for engineering of protection and control functions, LHMI functions as well as communication engineering for IEC 61850 and DNP3.

The installation manual contains instructions on how to install the relay. The manual provides procedures for mechanical and electrical installation. The chapters are organized in chronological order in which the relay should be installed.

The operation manual contains instructions on how to operate the relay once it has been commissioned. The manual provides instructions for monitoring, controlling and setting the relay. The manual also describes how to identify disturbances and how to view calculated and measured power grid data to determine the cause of a fault.

The application manual contains application descriptions and setting guidelines sorted per function. The manual can be used to find out when and for what purpose a typical protection function can be used. The manual can also be used when calculating settings.

The technical manual contains application and functionality descriptions and lists function blocks, logic diagrams, input and output signals, setting parameters and technical data

sorted per function. The manual can be used as a technical reference during the engineering phase, installation and commissioning phase, and during normal service.

The communication protocol manual describes a communication protocol supported by the relay. The manual concentrates on vendor-specific implementations. The point list manual describes the outlook and properties of the data points specific to the relay. The manual should be used in conjunction with the corresponding communication protocol manual.

1.3.2 Document revision history

Document revision/date	Product version	History
A/11/23/2010	1.0	First release
B/30/09/2011	1.1	Content updated to correspond to the product series version
C/12/08/2014	1.2	Content updated to correspond to the product series version
D/09/30/2015	1.2	Content updated
E/07/20/2017	1.3	Content updated



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1.3.3 Related documentation

Name of the document	Document ID
Modbus Communication Protocol Manual	1MAC052634-MB

1.4 Symbols and conventions

1.4.1 Safety indication 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 to 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 should be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to personal injury or death. Therefore, comply fully with all warning and caution notices.

1.4.2

Manual conventions

Conventions used in relay manuals. A particular convention may not be used in this manual.

- Abbreviations and acronyms in this manual 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, for example:
To navigate between the options, use and .
- HMI menu paths are presented in bold, for example:
Select **Main menu > Settings**.
- LHMI messages are shown in Courier font, for example:
To save the changes in non-volatile memory, select **Y**es and press .
- Parameter names are shown in italics, for example:
The function can be enabled and disabled with the *Operation* setting.
- Parameter values are indicated with quotation marks, for example:
The corresponding parameter values are "Enabled" and "Disabled".
- Relay input/output messages and monitored data names are shown in Courier font, for example:
When the function picks up, the **PICKUP** output is set to TRUE.
- Dimensions are provided both in inches and mm. If it is not specifically mentioned then the dimension is in mm.

1.4.3**Functions, codes and symbols****Table 1:** *RER620 functions, codes and symbols*

Function	IEC61850	IEC60617	ANSI/C37.2
<i>Current Protection</i>			
Single-phase non-directional time overcurrent protection with 1-ph trip option, low stage	SPHLPTOC1	3I>(1)	51P
Single-phase non-directional time overcurrent protection with 1-ph trip option, high stage 1	SPHLPTOC2	3I>(2)	50P-1
Single-phase non-directional time overcurrent protection with 1-ph trip option, high stage 2	SPHHPTOC1	3I>>(1)	50P-2
Single-phase non-directional instantaneous overcurrent protection with 1-ph trip option	SPHIPTOC1	3I>>>(1)	50P-3
Non-directional time overcurrent ground-fault protection, low stage	XEFLPTOC2	Io>(2)	51N
Non-directional time overcurrent ground-fault protection, high stage 1	XEFLPTOC3	Io>(3)	50N-1
Non-directional time overcurrent ground-fault protection, high stage 2	XEFHPTOC3	Io>>(3)	50N-2
Non-directional instantaneous time overcurrent ground-fault protection	XEFIPTOC2	Io>>>(2)	50N-3
Non-directional sensitive earth-fault	EFLPTOC3	Io>(3)	50SEF
Negative sequence non-directional time overcurrent protection 1	XNSPTOC1	I2 >(1)	46-1
Negative sequence non-directional time overcurrent protection 2	XNSPTOC2	I2 >(2)	46-2
Phase discontinuity protection	PDNSPTOC1	I2/I1>	46PD
Three-phase inrush detector	INPHAR	3I2f >	INR
<i>Directional Protection</i>			
Single-phase directional overcurrent protection, low stage 1	SDPHLPDOC1	3I >->(1)	67/51P-1
Single-phase directional overcurrent protection, low stage 2	SDPHLPDOC2	3I >->(2)	67/51P-2
Directional ground-fault protection, low stage 1	XDEFLPDEF1	Io>->(1)	67/51N-1
Directional ground-fault protection, low stage 2	XDEFLPDEF2	Io>->(2)	67/51N-2
<i>Cold Load Timers</i>			
Cold load timer 1 Phase A (in seconds)	TPSGAPC1	TPS(1)	62CLD-1
Cold load timer 2 Phase A (in minutes)	TPMGAPC1	TPM(1)	62CLD-2
Cold load timer 1 Phase B (in seconds)	TPSGAPC2	TPS(2)	62CLD-3
Cold load timer 2 Phase B (in minutes)	TPMGAPC2	TPM(2)	62CLD-4
Cold load timer 1 Phase C (in seconds)	TPSGAPC3	TPS(3)	62CLD-5
Cold load timer 2 Phase C (in minutes)	TPMGAPC3	TPM(3)	62CLD-6
<i>Voltage Protection</i>			
Single-phase overvoltage 1, source 1 low stage	SPHPTOV1	3U >(1)	59-1
Single-phase overvoltage 2, source 1 high stage	SPHPTOV2	3U >(2)	59-2
Single-phase overvoltage 3, source 2 low stage	SPHPTOV3	3U >(3)	59-3
Single-phase undervoltage 1, source 1 low stage	SPHPTUV1	3U <(1)	27-1
Single-phase undervoltage 2, source 1 high stage	SPHPTUV2	3U <(2)	27-2
Single-phase undervoltage 3, source 2 low stage	SPHPTUV3	3U <(3)	27-3
Positive sequence overvoltage protection, source1	PSPTOV1	U1>(1)	59PS-1
Positive sequence overvoltage protection, source 2	PSPTOV2	U1>(2)	59PS-2
Negative sequence overvoltage protection, source1	NSPTOV1	U2>(1)	47
Negative sequence overvoltage protection, source 2	NSPTOV2	U2>(2)	47-2
Zero sequence overvoltage protection, source1	ROVPTOV1	Uo>(1)	59N-1

Section 1

Introduction

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Function	IEC61850	IEC60617	ANSI/C37.2
Zero sequence overvoltage protection, source 2	ROVPTOV2	Uo>(2)	59N-2
Frequency Protection			
Underfrequency, Overfrequency, Frequency rate of change, Source 1, Stage 1	FRPFRQ1	f</f>,df/dt(1)	81-1
Underfrequency, Overfrequency, Frequency rate of change, Source 1, Stage 2	FRPFRQ2	f</f>,df/dt(2)	81-2
Load Shed & Restoration, Source 1, Stage 1	LSDHPFRQ1	UFLS/R(1)	81S-1
Load Shed & Restoration, Source 1, Stage 2	LSDHPFRQ2	UFLS/R(2)	81S-2
Other Protection			
High Impedance Fault Detector	PHIZ1	PHIZ1	HIZ
Circuit breaker failure protection	SCCBRBRF1	3I>/Io>BF	50BFT
Circuit breaker close failure protection	SCCBRBCF1	SCCBRBCF1	50BFC
Directional positive sequence power protection	DPSRDIR1	P>->	32P
Directional negative/zero sequence power protection	DNZSRDIR1	Q>->	32N
Control			
Autoreclosing, 1ph and/or 3ph	SDARREC1	O -> I	79
Synch-check/voltage check (Source 1 is defined as bus, Source 2 as line)	SECRSYN1	SYNC	25
Circuit Breaker 1 (3 state inputs / 3 control outputs)	SCBXCBR1	I<->O CB	52
Loop control	DLCM	LCM	LCM
Supervision and Monitoring			
CB condition monitoring	SPSCBR1	CBCM	52CM
Fuse failure supervision, Source 1	SEQRFUF1	FUSEF	60
Measurement			
Three-phase current	CMMXU1	3I	IA,IB,IC
Demand metering, Max/Min metering	CSMTA1		
Sequence current	CSMSQI1	I1,I2,I0	I1, I2, I0
Ground current	RESCMMXU1	Io	IG
Three-phase voltage, Source 1	VMMXU1	3U	VA,VB,VC
Three-phase voltage, Source 2	VMMXU2	3U(B)	VA,VB,VC(2)
Sequence voltages, Source 1	VSMSQI1	U1,U2,U0	V1,V2,V0
Sequence voltages, Source 2	VSMSQI2	U1,U2,U0(B)	V1,V2,V0(2)
Single and Three-phase power, Power factor and three phase energy, Source 1	APEMMXU1	P,SP,E	P,SP,E
Frequency, Source 1	FMMXU1	f	f
Recorders			
Digital fault recorder (DFR)	RDRE1	DR	DFR
Sequence of Events (SER)	SER	SER	SER
Fault Recorder	FLTMSTA	FLTMSTA	FLTMSTA
Fault Locator (FLOC)	DRFLO1	FLO	FLO
Other Functions			
Battery voltage, current. Test the battery	ZBAT1	UPS	UPS
Universal Power Drive	XGGIO115	X115(UPD)	X115(UPD)
Programmable buttons (16 buttons)	FKEYGGIO1	FKEYGGIO1	FKEYGGIO1
Move function block (8 outputs)	MVGAPC1	MVGAPC1	MVGAPC1

Function	IEC61850	IEC60617	ANSI/C37.2
Move function block (8 outputs)	MVGAPC2	MVGAPC2	MVGAPC2
Pulse timer (8 timers)	PTGAPC1	PTGAPC1	PTGAPC1
Pulse timer (8 timers)	PTGAPC2	PTGAPC2	PTGAPC2
Generic control points (16 outputs)	SPCGGIO1	SPCGGIO1	SPCGGIO1
Generic control points (16 outputs)	SPCGGIO2	SPCGGIO2	SPCGGIO2
Set reset flip flops (8 outputs)	SRGAPC1	SRGAPC1	SRGAPC1
Set reset flip flops (8 outputs)	SRGAPC2	SRGAPC2	SRGAPC2
Time delay off timers (8 timers)	TOFGAPC1	TOFGAPC1	TOFGAPC1
Time delay off timers (8 timers)	TOFGAPC2	TOFGAPC2	TOFGAPC2
Time delay on timers (8 timers)	TONGAPC1	TONGAPC1	TONGAPC1
Time delay on timers (8 timers)	TONGAPC2	TONGAPC2	TONGAPC2
Multipurpose generic up-down counter	UDFCNT1	UDFCNT1	UDFCNT1
Multipurpose generic up-down counter	UDFCNT2	UDFCNT2	UDFCNT2
Multipurpose generic up-down counter	UDFCNT3	UDFCNT3	UDFCNT3
Multipurpose generic up-down counter	UDFCNT4	UDFCNT4	UDFCNT4
Multipurpose generic up-down counter	UDFCNT5	UDFCNT5	UDFCNT5
Multipurpose generic up-down counter	UDFCNT6	UDFCNT6	UDFCNT6
Multipurpose generic up-down counter	UDFCNT7	UDFCNT7	UDFCNT7
Multipurpose generic up-down counter	UDFCNT8	UDFCNT8	UDFCNT8
Multipurpose generic up-down counter	UDFCNT9	UDFCNT9	UDFCNT9
Multipurpose generic up-down counter	UDFCNT10	UDFCNT10	UDFCNT10
Multipurpose generic up-down counter	UDFCNT11	UDFCNT11	UDFCNT11
Multipurpose generic up-down counter	UDFCNT12	UDFCNT12	UDFCNT12

Section 2 Modbus data mappings

2.1 Overview

This document describes the Modbus data points and structures available in RER620 Ver. 1.3.

Point list table columns

0x addr	Coil (0X) PLC address, base address = 1
AFL-Common SA name	AFL name of the corresponding data signal
Bit addr	Bit (1X and 0X) PLC address, base address = 1
Ctrl bit	Control bit (0..15) within control structure
Ctrl struct	Control structure number
Dc	Data category
DS	Object resides as default in some IEC 61850 data set (Y = yes, N = no)
FD Num	Unique number of the platform SW component
Identification	Relay's internal IEC 61850 signal name
Item	Unique number of an data item within the data object
Mode	Control object mode: unsecured or secured
Object	Unique number of a data object within the SW component
Offset	Offset factor, default setting
Reg addr	Modbus register address (3X or 4X). PLC address, base address = 1
Reg.bit addr	Register PLC address (3X and 4X) and bit within register (0..15)
Scale	Scale factor, default setting
Signal name	IEC 61850 signal description
Type	Register type and value interpretation: signed or unsigned
UID	Unique ID combination of FD Num, Object and Item
W	Writable register

2.2 Point list for RER620 v1.3

Table 2: System Status Registers

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	Type	Scale	OffSet	Description	IEC61850 Data Attribute Name
	129	0	u16			System Status Register, 1	
	130	0	u16			System Status Register, 2	
	131	0	u16			System Status Register, 3	
	132	0	u16			System Status Register, 4	
	133	0	u16			System Status Register, 5	
	134	0	u16			System Status Register, 6	
	135	0	u16			Device Information	
..		0	u16				
	225	0	u16				
	245		u16			Parameter Setting Group in Use	

Table 3: Time Stamp of Last Device Reset

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	Type	Scale	OffSet	Description	IEC61850 Data Attribute Name
	226	0	u16			Year(High Byte)/Month(Low Byte)	
	227	0	u16			Day(High Byte)/Hour(Low Byte)	
	228	0	u16			Min(High Byte)/Sec(Low Byte)	
	229	0	u16			MilliSecond	
	230	0	u16			Time Quality	
	231	0	u16			Cause of Reset (1-Power Reset, 2-Watchdog Reset, 3-Warm Reset)	

Table 4: Device Real-Time clock in local Time

Coil Addr(0x)	Register(:Bit) Addr(4x)	W	Type	Scale	OffSet	Description	IEC61850 Data Attribute Name
	497	x	u16			Real-time struct - Control register(0..2)	
	498	x	u16			Real-time struct - Year (2000-2999)	
	499	x	u16			Real-time struct - Month (1..12)	
	500	x	u16			Real-time struct - Day (1..31)	
	501	x	u16			Real-time struct - Hour (0..23)	
	502	x	u16			Real-time struct - Minute (0..59)	
	503	x	u16			Real-time struct - Seconds (0..59)	
	504	x	u16			Real-time struct - Milliseconds (0..999)	

Table 5: Device Real-Time clock in UTC Time

Coil Addr(0x)	Register(:Bit) Addr(4x)	W	Type	Scale	OffSet	Description	IEC61850 Data Attribute Name
	516	x	u16			Real-time struct - Control register(0..2)	
	517	x	u16			Real-time struct - Year (2000-2999)	
	518	x	u16			Real-time struct - Month (1..12)	
	519	x	u16			Real-time struct - Day (1..31)	
	520	x	u16			Real-time struct - Hour (0..23)	
	521	x	u16			Real-time struct - Minute (0..59)	
	522	x	u16			Real-time struct - Seconds (0..59)	
	523	x	u16			Real-time struct - Milliseconds (0..999)	

Table 6: Event Records

Coil Addr(0x)	Register(:Bit) Addr(4x)	W	Type	Scale	OffSet	Description	IEC61850 Data Attribute Name
	1561	x	u16			Number of Events to Read	
	1562	x	u16	1		Event Selection	
	1563		u16	1		Sequence Number	
	1564		u16	1		Number of Unread Records	
	1565		u16	1		Year(High Byte)/Month(Low Byte)	
	1566		u16	1		Day(High Byte)/Hour(Low Byte)	
	1567		u16	1		Min(High Byte)/Sec(Low Byte)	
	1568		u16	1		Millisecond	
	1569		u16	1		Event Type	
	1570		u16	1		Data Object ID 1 ¹⁾	
	1571		u16	1		Data Object ID 2 ¹⁾	
	1572		u16	1		Event Data Value	
	1573		u16	1		Event Data Value	

1) See Decoding of Data Object ID1 and 1

Decoding of Data Object ID1 and Data Object ID2

The base 4x Modbus address is Data Object ID2/16. Bit offset is the remainder of DataObject ID2/16.

For Instance, Bit 10 in register of 2500 would appear in Data Object ID2 as $0x9C4A = 40010$. The base address is $40010/16 = 2500$. The bit is $0.625 \times 16 = 10$.

Data Object ID1 is the most significant 16 bits. If Data Object ID1 is non-zero then a 32 bit number is composed of Data Object ID1 as bits 31-16 and Data Object ID2 are bits 15-0.

Section 2

Modbus data mappings

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Table 7: Fault records

Coil Addr(0x)	Register(Bit) Addr(4x)	W	Dc	Type	Scale	Description	IEC61850 Data Attribute Name
	1712	x		u16	1	Fault Record Selection	
	1713			u16	1	Sequence Number	
	1714			u16	1	Number of Unread Records	
	1715			u16	1	Year(High Byte)/Month(Low Byte)	
	1716			u16	1	Day(High Byte)/Hour(Low Byte)	
	1717			u16	1	Min(High Byte)/Sec(Low Byte)	
	1718			u16	1	Millisecond	
	1719			u16	1	Time Quality	
	1720		100	u16	100	Last Fault: Max Phase A Current Magnitude	LD0.FLTMSTA1.MaxAmpsA.mag.f
	1721		100	u16	100	Last Fault: Max Phase B Current Magnitude	LD0.FLTMSTA1.MaxAmpsB.mag.f
	1722		100	u16	100	Last Fault: Max Phase C Current Magnitude	LD0.FLTMSTA1.MaxAmpsC.mag.f
	1723		100	u16	100	Last Fault: Max Neutral Current Magnitude	LD0.FLTMSTA1.MaxAmpsN.mag.f
	1724		100	u16	100	Last Fault: Phase A Current Magnitude	LD0.FLTMSTA1.AmpsA.mag.f
	1725		100	u16	100	Last Fault: Phase B Current Magnitude	LD0.FLTMSTA1.AmpsB.mag.f
	1726		100	u16	100	Last Fault: Phase C Current Magnitude	LD0.FLTMSTA1.AmpsC.mag.f
	1727		100	u16	100	Last Fault: Neutral Current Magnitude	LD0.FLTMSTA1.AmpsN.mag.f
	1728		100	u16	100	Last Fault: Calculated Residual Current Magnitude	LD0.FLTMSTA1.AmpsNCIC.mag.f
	1729		100	u16	100	Last Fault: Negative Sequence Current Mag.	LD0.FLTMSTA1.AmpsNgSeq.mag.f
	1730		100	u16	100	Last Fault: Positive Sequence Current Mag.	LD0.FLTMSTA1.AmpsPsSeq.mag.f
	1732		100	u16	100	Last Fault: Phase A Voltage Magnitude	LD0.FLTMSTA1.VoltsA.mag.f
	1733		100	u16	100	Last Fault: Phase B Voltage Magnitude	LD0.FLTMSTA1.VoltsB.mag.f
	1734		100	u16	100	Last Fault: Phase C Voltage Magnitude	LD0.FLTMSTA1.VoltsC.mag.f
	1735		100	u16	100	Last Fault: Measured Residual Voltage Magnitude	LD0.FLTMSTA1.VoltsN.mag.f
	1736		100	u16	100	Last Fault: Negative Sequence Voltage Magnitude	LD0.FLTMSTA1.VNgSeq.mag.f
	1737		100	u16	100	Last Fault: Positive Sequence Voltage Magnitude	LD0.FLTMSTA1.VPsSeq.mag.f
	1738		100	u16	100	Last Fault: Zero Sequence Voltage Magnitude	LD0.FLTMSTA1.VZroSeq.mag.f

Coil Addr(0x)	Register(:Bit) Addr(4x)	W	Dc	Type	Scale	Description	IEC61850 Data Attribute Name
	1739		100	u16	100	Last Fault: Phase AB Voltage Magnitude	LD0.FLTMSTA1.VoltsAB.mag.f
	1740		100	u16	100	Last Fault: Phase BC Voltage Magnitude	LD0.FLTMSTA1.VoltsBC.mag.f
	1741		100	u16	100	Last Fault: Phase CA Voltage Magnitude	LD0.FLTMSTA1.VoltsCA.mag.f
	1780		100	u16	100	Last Fault: I2/I1 Ratio Fault	LD0.FLTMSTA1.PDNS1MxRat.mag.f
	1782		100	u16	100	Last Fault: Fault Record Operation Counter	LD0.FLTMSTA1.OpCnt.stVal
	1783		100	u16	100	Last Fault: Frequency At The Time The Fault Is Cleared	LD0.FLTMSTA1.Hz.mag.f
	1784		100	u16	100	Last Fault: Frequency Gradient At The Time The Fault Is Cleared	LD0.FLTMSTA1.HzS.mag.f
	1785		100	u16	100	Last Fault: Max Start Duration Of All Stages During The Fault	LD0.FLTMSTA1.StrDur.mag.f

Table 8: General Device Information (LLN0)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	235:0	0					Local / Remote (1- Local; 0-Remote)	CTRL.LLN0.Loc.stVal
	235:1	0	Yes					
	244:0	0					Protection LLN0 Settings Reservation	LD0.LLN0.SetSel.stVal
	244:1	0	Yes					
	245:0	0					Protection LLN0 Settings Change	LD0.LLN0.SetChg.stVal
	245:1	0	Yes					
	236	0		u16	1	0	Local / Remote state	CTRL.LLN0.LocRem.stVal

Table 9: Device Physical Information (LPHD1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	232	0		u16	1	0	Number Of Power Ups	LD0.LPHD1.NumPwrUp.stVal
	233	0		u16	1	0	Number Of Warm Starts	LD0.LPHD1.WrmStr.stVal
	234	0		u16	1	0	Number Of Watchdog Device Resets	LD0.LPHD1.WacTrg.stVal
	237	0		u16	1	0	General Device State	LD0.LPHD1.PhyHealth.stVal
	238	0		u16	1	0	Physical Sevice Warning	LD0.LPHD1.PhyHealth1.stVal
	239	0		u16	1	0	Internal Fault	LD0.LPHD1.PhyHealth2.stVal

Table 10: LED Condition monitoring (LEDPTRC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3844	2246:12	0					Global Conditioning Pickup	LD0.LEDPTRC1.Str.general
3845	2246:13	0	Yes					

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Table 11: LED Status (LEDGGIO1)

Coil Addr(0x)	Register(Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
5020		0					Led 1 On	LD0.LEDGGIO1.SPCSO1.stVal
5021		0	Yes					
5022		0					Led 2 On	LD0.LEDGGIO1.SPCSO2.stVal
5023		0	Yes					
5024		0					Led 3 On	LD0.LEDGGIO1.SPCSO3.stVal
5025		0	Yes					
5026		0					Led 4 On	LD0.LEDGGIO1.SPCSO4.stVal
5027		0	Yes					
5028		0					Led 5 On	LD0.LEDGGIO1.SPCSO5.stVal
5029		0	Yes					
5030		0					Led 6 On	LD0.LEDGGIO1.SPCSO6.stVal
5031		0	Yes					
5032		0					Led 7 On	LD0.LEDGGIO1.SPCSO7.stVal
5033		0	Yes					
5034		0					Led 8 On	LD0.LEDGGIO1.SPCSO8.stVal
5035		0	Yes					
5036		0					Led 9 On	LD0.LEDGGIO1.SPCSO9.stVal
5037		0	Yes					
5038		0					Led 10 On	LD0.LEDGGIO1.SPCSO10.stVal
5039		0	Yes					
5040		0					Led 11 On	LD0.LEDGGIO1.SPCSO11.stVal
5041		0	Yes					

Table 12: X100-Binary Inputs/Outputs (XGGIO100)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2148		2					X100-Output 1 PSM	LD0.XGGIO100.SPCSO1.stVal
2149		2	Yes					
2150		2					X100-Output 2 PSM	LD0.XGGIO100.SPCSO2.stVal
2151		2	Yes					
2152		2					X100-Output 3 PSM	LD0.XGGIO100.SPCSO3.stVal
2153		2	Yes					
2154		2					X100-Output 4 PSM	LD0.XGGIO100.SPCSO4.stVal
2155		2	Yes					
2156		2					X100-Output 5 PSM	LD0.XGGIO100.SPCSO5.stVal
2157		2	Yes					
2158		2					X100-Output 6 PSM	LD0.XGGIO100.SPCSO6.stVal
2159		2	Yes					

Table 13: X110-Binary Inputs/Outputs (XGGIO110)

Coil Addr(0x)	Input Addr (1x)	Register (:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2132			2					X110-Output 1 BIO	LD0.XGGIO110.SPCSO1.stVal
2133			2	Yes					
2134			2					X110-Output 2 BIO	LD0.XGGIO110.SPCSO2.stVal
2135			2	Yes					
2136			2					X110-Output 3 BIO	LD0.XGGIO110.SPCSO3.stVal
2137			2	Yes					
2138			2					X110-Output 4 BIO	LD0.XGGIO110.SPCSO4.stVal
2139			2	Yes					
	2164	2320:0	1					X110-Input 1 BIO	LD0.XGGIO110.Ind1.stVal
	2165	2320:1	1	Yes					
	2166	2320:2	1					X110-Input 2 BIO	LD0.XGGIO110.Ind2.stVal
	2167	2320:3	1	Yes					
	2168	2320:4	1					X110-Input 3 BIO	LD0.XGGIO110.Ind3.stVal
	2169	2320:5	1	Yes					
	2170	2320:6	1					X110-Input 4 BIO	LD0.XGGIO110.Ind4.stVal
	2171	2320:7	1	Yes					
	2172	2320:8	1					X110-Input 5 BIO	LD0.XGGIO110.Ind5.stVal
	2173	2320:9	1	Yes					
	2174	2320:10	1					X110-Input 6 BIO	LD0.XGGIO110.Ind6.stVal
	2175	2320:11	1	Yes					
	2176	2320:12	1					X110-Input 7 BIO	LD0.XGGIO110.Ind7.stVal
	2177	2320:13	1	Yes					
	2178	2320:14	1					X110-Input 8 BIO	LD0.XGGIO110.Ind8.stVal
	2179	2320:15	1	Yes					

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Table 14: X105-Binary Inputs/Outputs (XGGIO105)

Coil Addr(0x)	Input Addr (1x)	Register (:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2164			2					X105-Output 1 BIO	LD0.XGGIO105.SPCSO1.stVal
2165			2	Yes					
2166			2					X105-Output 2 BIO	LD0.XGGIO105.SPCSO2.stVal
2167			2	Yes					
2168			2					X105-Output 3 BIO	LD0.XGGIO105.SPCSO3.stVal
2169			2	Yes					
2170			2					X105-Output 4 BIO	LD0.XGGIO105.SPCSO4.stVal
2171			2	Yes					
2180	2321:0	1						X105-Input 1 BIO	LD0.XGGIO105.Ind1.stVal
2181	2321:1	1	Yes						
2182	2321:2	1						X105-Input 2 BIO	LD0.XGGIO105.Ind2.stVal
2183	2321:3	1	Yes						
2184	2321:4	1						X105-Input 3 BIO	LD0.XGGIO105.Ind3.stVal
2185	2321:5	1	Yes						
2186	2321:6	1						X105-Input 4 BIO	LD0.XGGIO105.Ind4.stVal
2187	2321:7	1	Yes						
2188	2321:8	1						X105-Input 5 BIO	LD0.XGGIO105.Ind5.stVal
2189	2321:9	1	Yes						
2190	2321:10	1						X105-Input 6 BIO	LD0.XGGIO105.Ind6.stVal
2191	2321:11	1	Yes						
2192	2321:12	1						X105-Input 7 BIO	LD0.XGGIO105.Ind7.stVal
2193	2321:13	1	Yes						
2194	2321:14	1						X105-Input 8 BIO	LD0.XGGIO105.Ind8.stVal
2195	2321:15	1	Yes						

Table 15: X120-Binary Inputs/Outputs (XGGIO120)

Coil Addr(0x)	Input Addr (1x)	Register (:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2132	2318:0	1						X120-Input 1 BIO	LD0.XGGIO120.Ind1.stVal
2133	2318:1	1	Yes						
2134	2318:2	1						X120-Input 2 BIO	LD0.XGGIO120.Ind2.stVal
2135	2318:3	1	Yes						
2136	2318:4	1						X120-Input 3 BIO	LD0.XGGIO120.Ind3.stVal
2137	2318:5	1	Yes						
2138	2318:6	1						X120-Input 4 BIO	LD0.XGGIO120.Ind4.stVal
2139	2318:7	1	Yes						

Table 16: 51P: Three-phase non-directional time overcurrent protection with 1-ph trip option, low stage (SPHLPTOC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3134	2210:0	0					51P-1 Trip (Operate)	LD0.SPHLPTOC1.Op.general
3135	2210:1	0	Yes					
3800	2244:0	0					51P-1 Phase A Trip (Operate)	LD0.SPHLPTOC1.Op.phsA
3801	2244:1	0	Yes					
3802	2244:2	0					51P-1 Phase B Trip (Operate)	LD0.SPHLPTOC1.Op.phsB
3803	2244:3	0	Yes					
3804	2244:4	0					51P-1 Phase C Trip (Operate)	LD0.SPHLPTOC1.Op.phsC
3805	2244:5	0	Yes					

Table 17: 50P-1: Three-phase non-directional time overcurrent protection with 1-ph trip option, high stage 1 (SPHLPTOC2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3198	2214:0	0					50P-1 Trip (Operate)	LD0.SPHLPTOC2.Op.general
3199	2214:1	0	Yes					
3866	2248:2	0					50P-1 Phase A Trip (Operate)	LD0.SPHLPTOC2.Op.phsA
3867	2248:3	0	Yes					
3868	2248:4	0					50P-1 Phase B Trip (Operate)	LD0.SPHLPTOC2.Op.phsB
3869	2248:5	0	Yes					
3870	2248:6	0					50P-1 Phase C Trip (Operate)	LD0.SPHLPTOC2.Op.phsC
3871	2248:7	0	Yes					

Table 18: 50P-2: Three-phase non-directional time overcurrent protection with 1-ph trip option, high stage 2 (SPHHPTOC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3136	2210:2	0					50P-2 Trip (Operate)	LD0.SPHHPTOC1.Op.general
3137	2210:3	0	Yes					
3806	2244:6	0					50P-2 Phase A Trip (Operate)	LD0.SPHHPTOC1.Op.phsA
3807	2244:7	0	Yes					
3808	2244:8	0					50P-2 Phase B Trip (Operate)	LD0.SPHHPTOC1.Op.phsB
3809	2244:9	0	Yes					
3810	2244:10	0					50P-2 Phase C Trip (Operate)	LD0.SPHHPTOC1.Op.phsC
3811	2244:11	0	Yes					

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Table 19: 50P-3:Three-phase non-directional instantaneous overcurrent protection with 1-ph trip option (SPHIPTOC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3140	2210:6	0					50P-3 Trip (Operate)	LD0.SPHIPTOC1.Op.general
3141	2210:7	0	Yes					
3818	2245:2	0					50P-3 Phase A Trip (Operate)	LD0.SPHIPTOC1.Op.phsA
3819	2245:3	0	Yes					
3820	2245:4	0					50P-3 Phase B Trip (Operate)	LD0.SPHIPTOC1.Op.phsB
3821	2245:5	0	Yes					
3822	2245:6	0					50P-3 Phase C Trip (Operate)	LD0.SPHIPTOC1.Op.phsC
3823	2245:7	0	Yes					

Table 20: 51N: Non-directional time overcurrent ground-fault protection, low stage (XEFLPTOC2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3186	2213:4	0					51N-1 Trip (Operate)	LD0.XEFLPTOC2.Op.general
3187	2213:5	0	Yes					

Table 21: 50N-1:Non-directional time overcurrent ground-fault protection, high stage 1 (XEFLPTOC3)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3200	2214:2	0					50N-1 Trip (Operate)	LD0.XEFLPTOC3.Op.general
3201	2214:3	0	Yes					

Table 22: 50N-2: Non-directional time overcurrent ground-fault protection, high stage 2 (XFHPTOC3)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3188	2213:6	0					50N-2 Trip (Operate)	LD0.XFHPTOC3.Op.general
3189	2213:7	0	Yes					

Table 23: 50N-3:Non-directional instantaneous ground-fault protection (XEFIPTOC2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3192	2213:10	0					50G-3 Trip (Operate)	LD0.XEFIPTOC2.Op.general
3193	2213:11	0	Yes					

Table 24: 50SEF:Non-directional sensitive earth-fault protection (EFLPTOC3)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2602	2184:8	0					50SEF Trip (Operate)	LD0.EFLPTOC3.Op.general
2603	2184:9	0	Yes					

Table 25: 46-1:Negative-sequence non-directional time overcurrent protection-1 (XNSPTOC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3202	2214:4	0					46-1 Trip (Operate)	LD0.XNSPTOC1.Op.general
3203	2214:5	0	Yes					

Table 26: 46-2:Negative-sequence non-directional time overcurrent protection-2 (XNSPTOC2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3204	2214:6	0					46-2 Trip (Operate)	LD0.XNSPTOC2.Op.general
3205	2214:7	0	Yes					

Table 27: 46PD: Phase Discontinuity protection (PDNSPTOC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2254	2168:8	0					46PD Trip (Operate)	LD0.PDNSPTOC1.Op.general
2255	2168:9	0	Yes					

Table 28: 67/51P-1:Three-phase directional overcurrent protection, low stage 1 (SDPHLPTOC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3206	2214:8	0					67/51P-1 Trip (Operate)	LD0.SDPHLPTOC1.Op.general
3207	2214:9	0	Yes					
3872	2248:8	0					67/51P-1 Phase A Trip (Operate)	LD0.SDPHLPTOC1.Op.phsA
3873	2248:9	0	Yes					
3874	2248:10	0					67/51P-1 Phase B Trip (Operate)	LD0.SDPHLPTOC1.Op.phsB
3875	2248:11	0	Yes					
3876	2248:12	0					67/51P-1 Phase C Trip (Operate)	LD0.SDPHLPTOC1.Op.phsC
3877	2248:13	0	Yes					

Table 29: 67/51P-2: Three-phase directional overcurrent protection, low stage 2 (SDPHLPTOC2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3208	2214:10	0					67/51P-2 Trip (Operate)	LD0.SDPHLPTOC2.Op.general
3209	2214:11	0	Yes					
3878	2249:14	0					67/51P-2 Phase A Trip (Operate)	LD0.SDPHLPTOC2.Op.phsA
3879	2249:15	0	Yes					
3880	2249:0	0					67/51P-2 Phase B Trip (Operate)	LD0.SDPHLPTOC2.Op.phsB
3881	2249:1	0	Yes					
3882	2249:2	0					67/51P-2 Phase C Trip (Operate)	LD0.SDPHLPTOC2.Op.phsC
3883	2249:3	0	Yes					

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Table 30: 67/51N-1: Directional ground-fault protection, low stage 1 (XDEFLPTOC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3210	2214:12	0					67/51N-1 Trip (Operate)	LD0.XDEFLPTOC1.Op.general
3211	2214:13	0	Yes					

Table 31: 67/51N-2: Directional ground-fault protection, low stage 2 (XDEFLPTOC2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3212	2214:14	0					67/51N-2 Trip (Operate)	LD0.XDEFLPTOC2.Op.general
3213	2214:15	0	Yes					

Table 32: 62CLD-1: Cold load timer 1 Phase A (in seconds) (TPSGAPC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2880	2198:4	0					Cold Load Seconds Timer Phase A Operation	LD0.TPSGAPC1.Op.general
2881	2198:5	0	Yes					

Table 33: 62CLD-2: Cold load timer 2 Phase A (in minutes) (TPMGAPC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2882	2198:6	0					Cold Load Minutes Timer Phase A Operation	LD0.TPMGAPC1.Op.general
2883	2198:7	0	Yes					

Table 34: 62CLD-3: Cold load timer 1 Phase B (in seconds) (TPSGAPC2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2924		0					Cold Load Seconds Timer Phase B Operation	LD0.TPSGAPC2.Op.general
2925		0	Yes					

Table 35: 62CLD-4: Cold load timer 2 Phase B (in minutes) (TPMGAPC2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2926		0					Cold Load Minutes Timer Phase B Operation	LD0.TPMGAPC2.Op.general
2927		0	Yes					

Table 36: 62CLD-5: Cold load timer 1 Phase C (in seconds) (TPSGAPC3)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2928		0					Cold Load Seconds Timer Phase C Operation	LD0.TPSGAPC3.Op.general
2929		0	Yes					

Table 37: 62CLD-6: Cold load timer 2 Phase C (in minutes) (TPMGAPC3)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2930		0					Cold Load Minutes Timer Phase C Operation	LD0.TPMGAPC3.Op.general
2931		0	Yes					

Table 38: 59-1:Three-phase overvoltage 1 source 1, low stage(SPHPTOV1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2302	2171:8	0					59-1 Trip (Operate)	LD0.SPHPTOV1.Op.general
2303	2171:9	0	Yes					
3884	2249:4	0					59-1 Phase A Trip (Operate)	LD0.SPHPTOV1.Op.phsA
3885	2249:5	0	Yes					
3886	2249:6	0					59-1 Phase B Trip (Operate)	LD0.SPHPTOV1.Op.phsB
3887	2249:7	0	Yes					
3888	2249:8	0					59-1 Phase C Trip (Operate)	LD0.SPHPTOV1.Op.phsC
3889	2249:9	0	Yes					

Table 39: 59-2:Three-phase overvoltage 2 source 1, high stage(SPHPTOV2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2304	2171:10	0					59-2 Trip (Operate)	LD0.SPHPTOV2.Op.general
2305	2171:11	0	Yes					
3890	2249:10	0					59-2 Phase A Trip (Operate)	LD0.SPHPTOV2.Op.phsA
3891	2249:11	0	Yes					
3892	2249:12	0					59-2 Phase B Trip (Operate)	LD0.SPHPTOV2.Op.phsB
3893	2249:13	0	Yes					
3894	2249:14	0					59-2 Phase C Trip (Operate)	LD0.SPHPTOV2.Op.phsC
3895	2249:15	0	Yes					

Table 40: 59-3:Three-phase overvoltage 3 source 2, low stage(SPHPTOV3)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2306	2171:12	0					59-3 Trip (Operate)	LD0.SPHPTOV3.Op.general
2307	2171:13	0	Yes					
3896	2250:0	0					59-3 Phase A Trip (Operate)	LD0.SPHPTOV3.Op.phsA
3897	2250:1	0	Yes					
3898	2250:2	0					59-3 Phase B Trip (Operate)	LD0.SPHPTOV3.Op.phsB
3899	2250:3	0	Yes					
3900	2250:4	0					59-3 Phase C Trip (Operate)	LD0.SPHPTOV3.Op.phsC
3901	2250:5	0	Yes					

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Table 41: 27-1:Three-phase undervoltage 1 source 1, low stage (SPHPTUV1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2616	2185:6	0					27-1 Trip (Operate)	LD0.SPHPTUV1.Op.general
2617	2185:7	0	Yes					
3902	2250:6	0					27-1 Phase A Trip (Operate)	LD0.SPHPTUV1.Op.phsA
3903	2250:7	0	Yes					
3904	2250:8	0					27-1 Phase B Trip (Operate)	LD0.SPHPTUV1.Op.phsB
3905	2250:9	0	Yes					
3906	2250:10	0					27-1 Phase C Trip (Operate)	LD0.SPHPTUV1.Op.phsC
3907	2250:11	0	Yes					

Table 42: 27-2: Three-phase undervoltage 2 source 1, high stage (SPHPTUV2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2618	2185:8	0					27-2 Trip (Operate)	LD0.SPHPTUV2.Op.general
2619	2185:9	0	Yes					
3908	2250:12	0					27-2 Phase A Trip (Operate)	LD0.SPHPTUV2.Op.phsA
3909	2250:13	0	Yes					
3910	2250:14	0					27-2 Phase B Trip (Operate)	LD0.SPHPTUV2.Op.phsB
3911	2250:15	0	Yes					
3912	2251:0	0					27-2 Phase C Trip (Operate)	LD0.SPHPTUV2.Op.phsC
3913	2251:1	0	Yes					

Table 43: 27-3:Three-phase undervoltage 3 source 2, low stage (SPHPTUV3)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2620	2185:10	0					27-3 Trip (Operate)	LD0.SPHPTUV3.Op.general
2621	2185:11	0	Yes					
3914	2251:2	0					27-3 Phase A Trip (Operate)	LD0.SPHPTUV3.Op.phsA
3915	2251:3	0	Yes					
3916	2251:4	0					27-3 Phase B Trip (Operate)	LD0.SPHPTUV3.Op.phsB
3917	2251:5	0	Yes					
3918	2251:6	0					27-3 Phase C Trip (Operate)	LD0.SPHPTUV3.Op.phsC
3919	2251:7	0	Yes					

Table 44: 59PS-1: Positive sequence overvoltage protection, source 1 (PSPTOV1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3148	2210:14	0					59PS-1 Trip (Operate)	LD0.PSPTOV1.Op.general
3149	2210:15	0	Yes					

Table 45: 59PS-2: Positive sequence overvoltage protection, source 2 (PSPTOV2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3150	2211:0	0					59PS-2 Trip (Operate)	LD0.PSPTOV2.Op.general
3151	2211:1	0	Yes					

Table 46: 47-1:Negative-sequence overvoltage protection, source1 (NSPTOV1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2342	2174:0	0					47-1 Trip (Operate)	LD0.NSPTOV1.Op.general
2343	2174:1	0	Yes					

Table 47: 47-2:Negative-sequence overvoltage protection, source 2 (NSPTOV2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3152	2211:2	0					47-2 Trip (Operate)	LD0.NSPTOV2.Op.general
3153	2211:3	0	Yes					

Table 48: 59N-1: Residual overvoltage protection, source1 (ROVPTOV1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2308	2171:14	0					59N-1 Trip (Operate)	LD0.ROVPTOV1.Op.general
2309	2171:15	0	Yes					

Table 49: 59N-2:Residual overvoltage protection, source 2 (ROVPTOV2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3146	2210:12	0					59N-2 Trip (Operate)	LD0.ROVPTOV2.Op.general
3147	2210:13	0	Yes					

Table 50: 81-1: Underfrequency, Overfrequency, Frequency rate of change, source 1 (FRPTOF1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3158	2211:8	0					81-1 Over-Frequency Trip (Operate)	LD0.FRPTOF1.Op.general
3159	2211:9	0	Yes					

Table 51: 81-1:Underfrequency, Overfrequency, Frequency rate of change, source 1 (FRPTUF1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3162	2211:12	0					81-1 Under-Frequency Trip (Operate)	LD0.FRPTUF1.Op.general
3163	2211:13	0	Yes					

Table 52: 81-1:Underfrequency, Overfrequency, Frequency rate of change, source 1 (FRPFRC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3166	2212:0	0					81-1 Frequency Gradient Trip (Operate)	LD0.FRPFRC1.Op.general
3167	2212:1	0	Yes					

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Table 53: 81-2:Underfrequency, Overfrequency, Frequency rate of change, source 2 (FRPTOF2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3160	2211:10	0					81-2 Over-Frequency Trip (Operate)	LD0.FRPTOF2.Op.general
3161	2211:11	0	Yes					

Table 54: 81-2:Underfrequency, Overfrequency, Frequency rate of change, source 2 (FRPTUF2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3164	2211:14	0					81-2 Under-Frequency Trip (Operate)	LD0.FRPTUF2.Op.general
3165	2211:15	0	Yes					

Table 55: 81-2:Underfrequency, Overfrequency, Frequency rate of change, source 2 (FRPFRC2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3168	2212:2	0					81-2 Frequency Gradient Trip (Operate)	LD0.FRPFRC2.Op.general
3169	2212:3	0	Yes					

Table 56: 81S-1:Load shedding and restoration source 1 (LSHDPTRC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3170	2212:4	0					81S-1 Load Shedding Trip - 1	LD0.LSHDPTRC1.Op.general
3171	2212:5	0	Yes					
3172	2212:6	0					81S-1 LSH Restore Signal For Load Restoring Purposes - 1	LD0.LSHDPTRC1.RestLodOp.g eneral
3173	2212:7	0	Yes					

Table 57: 81S-2:Load shedding and restoration source 2 (LSHDPTRC2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
3174	2212:8	0					81S-2 Load Shedding Trip - 2	LD0.LSHDPTRC2.Op.general
3175	2212:9	0	Yes					
3176	2212:10	0					81S-2 Restore Signal For Load Restoring Purposes - 2	LD0.LSHDPTRC2.RestLodOp.g eneral
3177	2212:11	0	Yes					

Table 58: HIZ:High impedance fault detection (PHIZ1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2604	2184:10	0					HIZ Downed Conductor Trip (Operate)	LD0.PHIZ1.Op.general
2605	2184:11	0	Yes					

Table 59: 50BFT:Circuit breaker failure protection-instance 1 (SCCBRBRF1)

Coil Addr(0x)	Register(Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6488	3030:8	0					50BFT Start Command	LD0.SCCBRBRF1.InStr.stVal
6489	3030:9	0	Yes					
6490	3030:10	0					50BFT Phase A Start Command	LD0.SCCBRBRF1.InStrA.stVal
6491	3030:11	0	Yes					
6492	3030:12	0					50BFT Phase B Start Command	LD0.SCCBRBRF1.InStrB.stVal
6493	3030:13	0	Yes					
6494	3030:14	0					50BFT Phase C Start Command	LD0.SCCBRBRF1.InStrC.stVal
6495	3030:15	0	Yes					
6496	3031:0	0					Recloser Phase A in Closed Position	LD0.SCCBRBRF1.InPosClsA.stVal
6497	3031:1	0	Yes					
6498	3031:2	0					Recloser Phase B in Closed Position	LD0.SCCBRBRF1.InPosClsB.stVal
6499	3031:3	0	Yes					
6500	3031:4	0					Recloser Phase C in Closed Position	LD0.SCCBRBRF1.InPosClsC.stVal
6501	3031:5	0	Yes					
6502	3031:6	0					50BFT Recloser faulty and unable to Trip	LD0.SCCBRBRF1.InCBFlt.stVal
6503	3031:7	0	Yes					
6504	3031:8	0					50BF Delayed Recloser failure alarm	LD0.SCCBRBRF1.Str.general
6505	3031:9	0	Yes					
6506	3031:10	0					3 Phase Recloser Failure Trip (External Trip)	LD0.SCCBRBRF1.OpEx.general
6507	3031:11	0	Yes					
6508	3031:12	0					Reserved	Reserved
6509	3031:13	0	Yes					
6510	3031:14	0					Reserved	Reserved
6511	3031:15	0	Yes					
6512	3032:0	0					Reserved	Reserved
6513	3032:1	0	Yes					
6514	3032:2	0					3 Phase Operate Retrip (Internal Trip)	LD0.SCCBRBRF1.Opln.general
6515	3032:3	0	Yes					
6516	3032:4	0					Reserved	Reserved
6517	3032:5	0	Yes					
6518	3032:6	0					Reserved	Reserved
6519	3032:7	0	Yes					
6520	3032:8	0					Reserved	Reserved
6521	3032:9	0	Yes					

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Table 60: 50BFC:Circuit breaker close failure protection (SCCBRBCF1)

Coil Addr(0x)	Register(Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6522	3032:10	0					Recloser Phase A in Closed Position	LD0.SCCBRBCF1.InPosClsA.stVal
6523	3032:11	0	Yes					
6524	3032:12	0					Recloser Phase B in Closed Position	LD0.SCCBRBCF1.InPosClsB.stVal
6525	3032:13	0	Yes					
6526	3032:14	0					Recloser Phase C in Closed Position	LD0.SCCBRBCF1.InPosClsC.stVal
6527	3032:15	0	Yes					
6528	3033:0	0					50BFC Start Command	LD0.SCCBRBCF1.InStr.stVal
6529	3033:1	0	Yes					
6530	3033:2	0					50BFC Phase A Start Command	LD0.SCCBRBCF1.InStrA.stVal
6531	3033:3	0	Yes					
6532	3033:4	0					50BFC Phase B Start Command	LD0.SCCBRBCF1.InStrB.stVal
6533	3033:5	0	Yes					
6534	3033:6	0					50BFC Phase C Start Command	LD0.SCCBRBCF1.InStrC.stVal
6535	3033:7	0	Yes					
6536	3033:8	0					Reserved	Reserved
6537	3033:9	0	Yes					
6538	3033:10	0					3 Phase Close	LD0.SCCBRBCF1.OpCls.general
6539	3033:11	0	Yes					
6540	3033:12	0					Reserved	Reserved
6541	3033:13	0	Yes					
6542	3033:14	0					Reserved	Reserved
6543	3033:15	0	Yes					
6544	3034:0	0					Reserved	Reserved
6545	3034:1	0	Yes					

Table 61: FLO:Fault location (DRFLO1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	862	0		u16	100	0	FLO Distance To Fault Measured In Km/Miles	LD0.DRFLO1.FltDisKm.mag.f

Table 62: 32P: Directional Positive sequence power protection (DPSRDIR1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2934	2201:10	0					32P-1 Direction Operate	LD0.DPSRDIR1.Dir.general
2935	2201:11	0	Yes					

Table 63: 32N: Directional negative / zero sequence power protection (DNZSRDIR1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2936	2201:12	0					32N-1 Direction Operate	LD0.DNZSRDIR1.Dir.general
2937	2201:13	0	Yes					

Table 64: LCM: Loop control (DLCM1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
5572	2509:2	0					Loop Control trip	LD0.DLCM1.LCMTrip.general
5573	2509:3	0	Yes					
5574	2509:4	0					Loop Control Close	LD0.DLCM1.LCMClose.general
5575	2509:5	0	Yes					
5576	2509:6	0					Source1 Status	LD0.DLCM1.S1Status.stVal
5577	2509:7	0	Yes					
5578	2509:8	0					Source2 Status	LD0.DLCM1.S2Status.stVal
5579	2509:9	0	Yes					
5582	2509:12	0					Source1 Enable Output	LD0.DLCM1.Src1EnOut.stVal
5583	2509:13	0	Yes					
5584	2509:14	0					Source2 Enable Output	LD0.DLCM1.Src2EnOut.stVal
5585	2509:15	0	Yes					
5586	2510:0	0					Reset Output	LD0.DLCM1.RstOut.stVal
5587	2510:1	0	Yes					
5588	2510:2	0					Alternate1 settings	LD0.DLCM1.SetGrpSel.stVal
5589	2510:3	0	Yes					

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Table 65: 79:Auto-reclosing , 1ph and / or 3-ph (SDARREC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
5548	2507:10	0					Frequent Operation Counter alarm	LD0.SDARREC1.FrqOpAlm.stVal
5549		0	Yes					
5550	2507:12	0					Ready Reclose Status	LD0.SDARREC1.RdyRec.stVal
5551		0	Yes					
5552	2507:14	0					Active Reclose Status	LD0.SDARREC1.ActRec.stVal
5553		0	Yes					
5554	2508:0	0					Successful Reclose Status	LD0.SDARREC1.SucRec.stVal
5555		0	Yes					
5556	2508:2	0					Unsuccessful Reclose Status	LD0.SDARREC1.UnsRec.stVal
5557		0	Yes					
5558	2508:4	0					In progress Status	LD0.SDARREC1.PrgRec.stVal
5559		0	Yes					
5560	2508:6	0					Unsuccessful Recloser Closing Status	LD0.SDARREC1.UnsCBCls.stVal
5561		0	Yes					
	837	0		u16	1	0	79 Auto Reclosing Status	LD0.SDARREC1.AutoRecSt.stVal
	2112	0		u16	1	0	79 Operation Counter (1st Shot)	LD0.SDARREC1.OpCnt1.stVal
	2113	0		u16	1	0	79 Operation Counter (2nd Shot)	LD0.SDARREC1.OpCnt2.stVal
	2114	0		u16	1	0	79 Operation Counter (3rd Shot)	LD0.SDARREC1.OpCnt3.stVal
	2115	0		u16	1	0	79 Operation Counter (4th Shot)	LD0.SDARREC1.OpCnt4.stVal
	2116	0		u16	1	0	79 Operation Counter (5th Shot)	LD0.SDARREC1.OpCnt5.stVal

Table 66: 79: Autoreclosing, 1ph and / or 3-ph (SDAOGGIO1)

Coil Addr(0x)	Input Addr (1x)	Register (:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6618		3038:10	0					SDAOGGIO1 Phase A Active	LD0.SDAOGGIO1.ActivePhA.stVal
6619		3038:11	0	Yes					
6620		3038:12	0					SDAOGGIO1 Phase B Active	LD0.SDAOGGIO1.ActivePhB.stVal
6621		3038:13	0	Yes					
6622		3038:14	0					SDAOGGIO1 Phase C Active	LD0.SDAOGGIO1.ActivePhC.stVal
6623		3038:15	0	Yes					
6624		3039:0	0					SDAOGGIO1 Three Phase Active	LD0.SDAOGGIO1.ActivePh3P.stVal
6625		3039:1	0	Yes					
6626		3039:2	0					SDAOGGIO1 Phase A CB Position	LD0.SDAOGGIO1.CbPosA.stVal
6627		3039:3	0	Yes					
6628		3039:4	0					SDAOGGIO1 Phase B CB Position	LD0.SDAOGGIO1.CbPosB.stVal
6629		3039:5	0	Yes					
6630		3039:6	0					SDAOGGIO1 Phase C CB Position	LD0.SDAOGGIO1.CbPosC.stVal
6631		3039:7	0	Yes					
6632		3039:8	0					SDAOGGIO1 Three Phase CB Position	LD0.SDAOGGIO1.CbPos3P.stVal
6633		3039:9	0	Yes					
6634		3039:10	0					SDAOGGIO1 Reclose Command Input	LD0.SDAOGGIO1.ReccloseIn.stVal
6635		3039:11	0	Yes					
6636		3039:12	0					SDAOGGIO1 Open Command Input	LD0.SDAOGGIO1.OpenIn.stVal
6637		3039:13	0	Yes					
6638		3039:14	0					SDAOGGIO1 Lockout Input	LD0.SDAOGGIO1.LockoutIn.stVal
6639		3039:15	0	Yes					
6640		3040:0	0					SDAOGGIO1 Reclose In Progress	LD0.SDAOGGIO1.InPrgIn.stVal
6641		3040:1	0	Yes					
6642		3040:2	0					Reserved	Reserved
6643		3040:3	0	Yes					
6646		3040:6	0					Reserved	Reserved
6647		3040:7	0	Yes					

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Coil Addr(0x)	Input Addr (1x)	Register (:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6648		3040:8	0					Reserved	Reserved
6649		3040:9	0	Yes					
6650		3040:10	0					Reserved	Reserved
6651		3040:11	0	Yes					
6654		3040:14	0					Reserved	Reserved
6655		3040:15	0	Yes					
6656		3041:0	0					Reserved	Reserved
6657		3041:1	0	Yes					
6658		3041:2	0					Reserved	Reserved
6659		3041:3	0	Yes					
6660		3041:4	0					SDAOGGIO1 Lockout	LD0.SDAOGGIO1.Locked.general
6661		3041:5	0	Yes					
6662		3041:6	0					SDAOGGIO1 Phase A Lockout	LD0.SDAOGGIO1.Locked.phsA
6663		3041:7	0	Yes					
6664		3041:8	0					SDAOGGIO1 Phase B Lockout	LD0.SDAOGGIO1.Locked.phsB
6665		3041:9	0	Yes					
6666		3041:10	0					SDAOGGIO1 Phase C Lockout	LD0.SDAOGGIO1.Locked.phsC
6667		3041:11	0	Yes					

Table 67: 25:Synchronism and energizing check (SECRSYN1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
5562	2508:8	0					25 Voltage Difference Indicator	LD0.SECRSYN1.VInd.stVal
5563	2508:9	0	Yes					
5564	2508:10	0					25 Angle Difference Indicator	LD0.SECRSYN1.AngInd.stVal
5565	2508:11	0	Yes					
5566	2508:12	0					25 Frequency Difference Indicator	LD0.SECRSYN1.HzInd.stVal
5567	2508:13	0	Yes					
5568	2508:14	0					25 Synchronising In Progress	LD0.SECRSYN1.SynPrg.stVal
5569	2508:15	0	Yes					
5570	2509:0	0					25 Recloser Closing Failed	LD0.SECRSYN1.FailSyn.stVal
5571	2509:1	0	Yes					
	838	0		u16	100	0	25 Calculated Vdiff	LD0.SECRSYN1.DifVClc.mag.f
	839	0		u16	100	0	25 Calculated Fdiff	LD0.SECRSYN1.DifHzClc.mag.f
	840	0		u16	100	0	25 Calculated Angle Diff	LD0.SECRSYN1.DifAngClc.mag.f

Table 68: 52: Circuit Breaker 1 (3 state inputs / 3 control outputs) (SCBXCBR1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2132	0		u16	1	0	Operation Counter Phase A	CTRL.SCBXCBR1.OpCnt.stVal

Table 69: 52: Circuit Breaker 1 (3 state inputs / 3 control outputs) (SCBXCBR2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2133	0		u16	1	0	Operation Counter Phase B	CTRL.SCBXCBR2.OpCnt.stVal

Table 70: 52: Circuit Breaker 1 (3 state inputs / 3 control outputs) (SCBXCBR3)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2134	0		u16	1	0	Operation Counter Phase C	CTRL.SCBXCBR3.OpCnt.stVal

Table 71: 52: Circuit Breaker 1 (3 state inputs / 3 control outputs) (SCBCSWI1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
5118		0					52 Breaker Phase A Position Open	CTRL.SCBCSWI1.PosA.stVal
5119		0	Yes					
5120		0					52 Breaker Phase A Position Closed	CTRL.SCBCSWI1.PosA.stVal
5121		0	Yes					
5122		0					52 Breaker Phase A Position Valid	CTRL.SCBCSWI1.PosA.stVal
5123		0	Yes					
5124		0					52 Breaker Phase B Position Open	CTRL.SCBCSWI1.PosB.stVal
5125		0	Yes					
5126		0					52 Breaker Phase B Position Closed	CTRL.SCBCSWI1.PosB.stVal
5127		0	Yes					

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Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
5128		0					52 Breaker Phase B Position Valid	CTRL.SCBCSWI1.PosB.stVal
5129		0	Yes					
5130		0					52 Breaker Phase C Position Open	CTRL.SCBCSWI1.PosC.stVal
5131		0	Yes					
5132		0					52 Breaker Phase C Position Closed	CTRL.SCBCSWI1.PosC.stVal
5133		0	Yes					
5134		0					52 Breaker Phase C Position Valid	CTRL.SCBCSWI1.PosC.stVal
5135		0	Yes					
5136		0					52 Breaker Three Phase Position Open	CTRL.SCBCSWI1.Pos.stVal
5137		0	Yes					

Table 72: 52CM: Circuit-breaker condition monitoring (SPSCBR1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2117	0		u16	1	0	Number of days Recloser has been inactive Phase A	LD0.SPSCBR1.InaTmdCntA.stVal
	2118	0		u16	1	0	Number of days Recloser has been inactive Phase B	LD0.SPSCBR1.InaTmdCntB.stVal
	2119	0		u16	1	0	Number of days Recloser has been inactive Phase C	LD0.SPSCBR1.InaTmdCntC.stVal
	2120	0		u16	1	0	Recloser Remaining Life Phase A	LD0.SPSCBR1.RmnLifPhA.stVal
	2121	0		u16	1	0	Recloser Remaining Life Phase B	LD0.SPSCBR1.RmnLifPhB.stVal
	2122	0		u16	1	0	Recloser Remaining Life Phase C	LD0.SPSCBR1.RmnLifPhC.stVal
	2123	0		u16	100	0	Travel Time of Recloser during Opening Operation Phase A	LD0.SPSCBR1.TmmsOpnA.mag.f
	2124	0		u16	100	0	Travel Time of Recloser during Opening Operation Phase B	LD0.SPSCBR1.TmmsOpnB.mag.f
	2125	0		u16	100	0	Travel Time of Recloser during Opening Operation Phase C	LD0.SPSCBR1.TmmsOpnC.mag.f
	2126	0		u16	100	0	Travel Time of Recloser during Closing Operation Phase A	LD0.SPSCBR1.TmmsClsA.mag.f
	2127	0		u16	100	0	Travel Time of Recloser during Closing Operation Phase B	LD0.SPSCBR1.TmmsClsB.mag.f
	2128	0		u16	100	0	Travel Time of Recloser during Closing Operation Phase C	LD0.SPSCBR1.TmmsClsC.mag.f
	2129	0		u16	1	0	Accumulated Currents Power (lyt) Phase A	LD0.SPSCBR1.AccAPwrPhA.mag.f
	2130	0		u16	1	0	Accumulated Currents Power (lyt) Phase B	LD0.SPSCBR1.AccAPwrPhB.mag.f
	2131	0		u16	1	0	Accumulated Currents Power (lyt) Phase C	LD0.SPSCBR1.AccAPwrPhC.mag.f

Table 73: IA-IB-IC (1):Three-phase current measurement (CMMXU1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
5446	2501:4	0					IA IB IC (1) High Alarm	LD0.CMMXU1.HiAlm.stVal
5447	2501:5	0	Yes					
5448	2501:6	0					IA IB IC (1) High Warning	LD0.CMMXU1.HiWrn.stVal
5449	2501:7	0	Yes					
	536	0		u32	100	0	IA IB IC (1) Phase A Mag (RMS)	LD0.CMMXU1.A.phsA.instCVal.mag.f
	537	0						
	538	0		u32	100	0	IA IB IC (1) Phase B Mag (RMS)	LD0.CMMXU1.A.phsB.instCVal.mag.f
	539	0						
	540	0		u32	100	0	IA IB IC (1) Phase C Mag (RMS)	LD0.CMMXU1.A.phsC.instCVal.mag.f
	541	0						

Table 74: IA-IB-IC (1):Three-phase current measurement (CMSTA1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	899	5		u32	100	0	IA IB IC (1) Phase A Average Demand	LD0.CMSTA1.AvAmpsA.mag.f
	900	5						
	901	5		u32	100	0	IA IB IC (1) Phase B Average Demand	LD0.CMSTA1.AvAmpsB.mag.f
	902	5						
	903	5		u32	100	0	IA IB IC (1) Phase C Average Demand	LD0.CMSTA1.AvAmpsC.mag.f
	904	5						
	1000	5		u32	100	0	IA IB IC (1) Phase A Maximum Demand	LD0.CMSTA1.MaxAmpsA.mag.f
	1001	5						
	1002						IA IB IC (1) Phase A Maximum Demand Timestamp Year(High Byte)/Month(Low Byte)	
	1003						Day(High Byte)/Hour(Low Byte)	
	1004						Min(High Byte)/Sec(Low Byte)	
	1005						Millisecond	
	1006						Time Quality	
	1010	5		u32	100	0	IA IB IC (1) Phase B Maximum Demand	LD0.CMSTA1.MaxAmpsB.mag.f
	1011	5						
	1012						IA IB IC (1) Phase B Maximum Demand Timestamp Year(High Byte)/Month(Low Byte)	
	1013						Day(High Byte)/Hour(Low Byte)	
	1014						Min(High Byte)/Sec(Low Byte)	
	1015						Millisecond	

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Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	1016						Time Quality	
	1020	5		u32	100	0	IA IB IC (1) Phase C Maximum Demand	LD0.CMSTA1.MaxAmpsC.mag.f
	1021	5						
	1022						IA IB IC (1) Phase C Maximum Demand Timestamp Year(High Byte)/Month(Low Byte)	
	1023						Day(High Byte)/Hour(Low Byte)	
	1024						Min(High Byte)/Sec(Low Byte)	
	1025						Millisecond	
	1026						Time Quality	

Table 75: I1-I2-I0:Sequence current measurement (CSMSQI1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	614	0		u32	100	0	I1-I2-I0 (1) Positive Sequence Mag (RMS)	LD0.CSMSQI1.SeqA.c1.instCVal.mag.f
	615	0						
	616	0		u32	100	0	I1-I2-I0 (1) Negative Sequence Mag (RMS)	LD0.CSMSQI1.SeqA.c2.instCVal.mag.f
	617	0						
	618	0		u32	100	0	I1-I2-I0 (1) Zero Sequence Mag (RMS)	LD0.CSMSQI1.SeqA.c3.instCVal.mag.f
	619	0						

Table 76: IG:Residual current measurement (RESCMMXU1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
5454	2501:12	0					IN High Trip (Operate)	LD0.RESCMMXU1.HiAlm.stVal
5455	2501:13	0	Yes					
5456	2501:14	0					IN High Warning	LD0.RESCMMXU1.HiWrn.stVal
5457	2501:15	0	Yes					
	542	6		u16	100	0	IN -Mag (RMS)	LD0.RESCMMXU1.A.res.instCVal.mag.f

Table 77: VA-VB-VC (1):Three-phase voltage measurement Source 1 (VMMXU1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
5460	2502:2	0					VA VB VC (1) High Trip (Operate)	LD0.VMMXU1.HiAlm.stVal
5461	2502:3	0	Yes					
5462	2502:4	0					VA VB VC (1) High Warning	LD0.VMMXU1.HiWrn.stVal
5463	2502:5	0	Yes					
5464	2502:6	0					VA VB VC (1) Low Warning	LD0.VMMXU1.LoWrn.stVal
5465	2502:7	0	Yes					
5466	2502:8	0					VA VB VC (1) Low Trip (Operate)	LD0.VMMXU1.LoAlm.stVal
5467	2502:9	0	Yes					

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	590	0		u16	100	0	VA VB VC (1) Phase A Mag	LD0.VMMXU1.PhV.phsA.cVal.mag.f
	591	0		u16	100	0	VA VB VC (1) Phase B Mag	LD0.VMMXU1.PhV.phsB.cVal.mag.f
	592	0		u16	100	0	VA VB VC (1) Phase C Mag	LD0.VMMXU1.PhV.phsC.cVal.mag.f
	596	0		u16	100	0	VA VB VC (1) Phase AB Mag (RMS)	LD0.VMMXU1.PPV.phsAB.instCVal.mag.f
	597	0		u16	100	0	VA VB VC (1) Phase BC Mag (RMS)	LD0.VMMXU1.PPV.phsBC.instCVal.mag.f
	598	0		u16	100	0	VA VB VC (1) Phase CA Mag (RMS)	LD0.VMMXU1.PPV.phsCA.instCVal.mag.f

Table 78: VA-VB-VC (2):Three-phase voltage measurement Source 2 (VMMXU2)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
5498	2504:8	0					VA VB VC (2) High Trip (Operate)	LD0.VMMXU2.HiAlm.stVal
5499	2504:9	0	Yes					
5500	2504:10	0					VA VB VC (2) High Warning	LD0.VMMXU2.HiWrn.stVal
5501	2504:11	0	Yes					
5502	2504:12	0					VA VB VC (2) Low Warning	LD0.VMMXU2.LoWrn.stVal
5503	2504:13	0	Yes					
5504	2504:14	0					VA VB VC (2) Low Trip (Operate)	LD0.VMMXU2.LoAlm.stVal
5505	2504:15	0	Yes					
	602	0		u16	100	0	VA VB VC (2) Phase A Mag	LD0.VMMXU2.PhV.phsA.cVal.mag.f
	603	0		u16	100	0	VA VB VC (2) Phase B Mag	LD0.VMMXU2.PhV.phsB.cVal.mag.f
	604	0		u16	100	0	VA VB VC (2) Phase C Mag	LD0.VMMXU2.PhV.phsC.cVal.mag.f
	608	0		u16	100	0	VA VB VC (2) Phase AB Mag (RMS)	LD0.VMMXU2.PPV.phsAB.instCVal.mag.f
	609	0		u16	100	0	VA VB VC (2) Phase BC Mag (RMS)	LD0.VMMXU2.PPV.phsBC.instCVal.mag.f
	610	0		u16	100	0	VA VB VC (2) Phase CA Mag (RMS)	LD0.VMMXU2.PPV.phsCA.instCVal.mag.f

Table 79: V1-V2-V0 (1):Sequence voltage measurement source 1 (VSMSQI1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	650	0		u16	100	0	V1 V2 V0 (1) Positive Sequence Mag (RMS)	LD0.VSMSQI1.SeqV.c1.instCVal.mag.f
	651	0		u16	100	0	V1 V2 V0 (1) Negative Sequence Mag (RMS)	LD0.VSMSQI1.SeqV.c2.instCVal.mag.f
	652	0		u16	100	0	V1 V2 V0 (1) Zero Sequence Mag (RMS)	LD0.VSMSQI1.SeqV.c3.instCVal.mag.f

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Table 80: V1-V2-V0 (2):Sequence voltage measurement source 2 (VSMSQI2)

Coil Addr(0x)	Register(Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	656	0		u16	100	0	V1 V2 V0 (2) Positive Sequence Mag (RMS)	LD0.VSMSQI2.SeqV.c1.instCVal.mag.f
	657	0		u16	100	0	V1 V2 V0 (2) Negative Sequence Mag (RMS)	LD0.VSMSQI2.SeqV.c2.instCVal.mag.f
	658	0		u16	100	0	V1 V2 V0 (2) Zero Sequence Mag (RMS)	LD0.VSMSQI2.SeqV.c3.instCVal.mag.f

Table 81: P-E: Single / Three-phase power, Three phase energy and PF measurement(APEMMXU1)

Coil Addr(0x)	Register(Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	722	0		s32	1	0	Total Active Power	LD0.APEMMXU1.TotW.instMag.f
	723	0						
	724	0		s32	1	0	Phase A Active Power	LD0.APEMMXU1.WA.instMag.f
	725	0						
	726	0		s32	1	0	Phase B Active Power	LD0.APEMMXU1.WB.instMag.f
	727	0						
	728	0		s32	1	0	Phase C Active Power	LD0.APEMMXU1.WC.instMag.f
	729	0						
	730	0		s32	1	0	Total Reactive Power	LD0.APEMMXU1.TotVar.instMag.f
	731	0						
	732	0		s32	1	0	Phase A Reactive Power	LD0.APEMMXU1.VarA.instMag.f
	733	0						
	734	0		s32	1	0	Phase B Reactive Power	LD0.APEMMXU1.VarB.instMag.f
	735	0						
	736	0		s32	1	0	Phase C Reactive Power	LD0.APEMMXU1.VarC.instMag.f
	737	0						
	738	0		s16	100	0	Total Power Factor	LD0.APEMMXU1.TotPF.instMag.f
	739	0		s16	100	0	Average A Power Factor	LD0.APEMMXU1.TotPFA.instMag.f
	740	0		s16	100	0	Average B Power Factor	LD0.APEMMXU1.TotPFB.instMag.f
	741	0		s16	100	0	Average C Power Factor	LD0.APEMMXU1.TotPFC.instMag.f

Table 82: f:Frequency measurement-instance 1 (FMMXU1)

Coil Addr(0x)	Register(Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	786	0		u16	100	0	Frequency	LD0.FMMXU1.Hz.instMag.f

Table 83: DFR:Disturbance recorder (RDRE1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
5458	2502:0	0					DFR Disturbance Recording Made	DR.RDRE1.RcdMade.stVal
5459	2502:1	0	Yes					
	241	0		u16	1	0	DFR Recording Memory Used %	DR.RDRE1.MemUsed.stVal
	2108	0		u16	1	0	DFR Number Of Recordings	DR.RDRE1.FltNum.stVal

Table 84: UPS: Battery voltage, current. Test the battery (ZBAT1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
2944	2202:4	0					CVD clamping phase A	LD0.ZBAT1.CvdClpSt.phsA.stVal
2945	2202:5	0	Yes					
2946	2202:6	0					CVD clamping phase B	LD0.ZBAT1.CvdClpSt.phsB.stVal
2947	2202:7	0	Yes					
2948	2202:8	0					CVD clamping phase C	LD0.ZBAT1.CvdClpSt.phsC.stVal
2949	2202:9	0	Yes					
6004	3000:4	0					Reserved	Reserved
6005		0	Yes					
6006	3000:6	0					Aux Status	LD0.ZBAT1.AuxStat.stVal
6007		0	Yes					
6008	3000:8	0					Heater Switch	LD0.ZBAT1.SwConnSt.stVal
6009		0	Yes					
6010	3000:10	0					Loss of AC	LD0.ZBAT1.ACloss.stVal
6011		0	Yes					
	175:1	0						LD0.ZBAT1.TestRsl.stVal
	246	0		u16	100	0	UPS Hw Version	LD0.ZBAT1.UPSHwVer.mag.f
	247	0		u16	100	0	UPS Bootldr Version	LD0.ZBAT1.UPSBlDrVer.mag.f
	248	0		u16	100	0	UPS Firmware Version	LD0.ZBAT1.UPSFwVer.mag.f
	853	0		u16	1	0	Uninterruptible Power Supply Bat Execution Result	LD0.ZBAT1.BatTstStat.stVal
	854	0		u16	100	0	Battery Voltage	LD0.ZBAT1.Vol.mag.f
	855	0		u16	100	0	Battery charging current	LD0.ZBAT1.Amp.mag.f
	856	0		u16	100	0	UPS temperature	LD0.ZBAT1.Temp.mag.f
	857	0		u16	100	0	AC Input Voltage	LD0.ZBAT1.AcInputVol.mag.f
	858	0		u16	100	0	Aux Load Current	LD0.ZBAT1.AuxLoadI.mag.f
	860	0		u16	100	0	Battery Test Voltage	LD0.ZBAT1.BatTstVol.mag.f
	861	0		u16	100	0	Internal rail 12V	LD0.ZBAT1.RailVol12V.mag.f
	2802	0		u16	1	0	Uninterruptible Power Supply Boost Voltage Value	LD0.ZBAT1.BstVolVal.stVal
	2803	0		u16	1	0	Uninterruptible Power Supply Internal rail 60V	LD0.ZBAT1.RIVol60V.stVal
	2804	0		u16	1	0	Aux Protection	LD0.ZBAT1.Auxinfo.stVal
	2805	0		u16	1	0	Aux Voltage	LD0.ZBAT1.AuxVol.stVal

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Table 85: X115(UPD) : Universal Power Drive (XGGIO115)

Coil Addr(0x)	Input Addr (1x)	Register (:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6546		3034:2	0					X115(UPD: System Health Status	LD0.XGGIO115.Health2.stVal
6547		3034:3	0	Yes					
	2196	2322:0	1					X115(UPD: Input 1	LD0.XGGIO115.Ind1.stVal
	2197	2322:1	1	Yes					
	2198	2322:2	1					X115(UPD: Input 2	LD0.XGGIO115.Ind2.stVal
	2199	2322:3	1	Yes					
	2200	2322:4	1					X115(UPD: Input 3	LD0.XGGIO115.Ind3.stVal
	2201	2322:5	1	Yes					
	2202	2322:6	1					X115(UPD: Input 4	LD0.XGGIO115.Ind4.stVal
	2203	2322:7	1	Yes					
	2204	2322:8	1					X115(UPD: Input 5	LD0.XGGIO115.Ind5.stVal
	2205	2322:9	1	Yes					
	2206	2322:10	1					X115(UPD: Input 6	LD0.XGGIO115.Ind6.stVal
	2207	2322:11	1	Yes					

Table 86: FKEYGGIO1: Programmable buttons (16 buttons) (FKEYGGIO1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6074	3004:10	4					KEY 1 Setting Group 1 Enabled	LD0.FKEYGGIO1.Ind1.stVal
6075	3004:11	4	Yes					
6076	3004:12	4					KEY 2 Setting Group 2 Enabled	LD0.FKEYGGIO1.Ind2.stVal
6077	3004:13	4	Yes					
6078	3004:14	4					KEY 3 Setting Group 3 Enabled	LD0.FKEYGGIO1.Ind3.stVal
6079	3004:15	4	Yes					
6080	3005:0	4					KEY 4 Setting Group 4 Enabled	LD0.FKEYGGIO1.Ind4.stVal
6081	3005:1	4	Yes					
6082	3005:2	4					KEY 5 Setting Group 5 Enabled	LD0.FKEYGGIO1.Ind5.stVal
6083	3005:3	4	Yes					
6084	3005:4	4					KEY 6 Setting Group 6 Enabled	LD0.FKEYGGIO1.Ind6.stVal
6085	3005:5	4	Yes					
6086	3005:6	4					KEY 7 Switch Mode Enabled	LD0.FKEYGGIO1.Ind7.stVal
6087	3005:7	4	Yes					
6088	3005:8	4					KEY 8 Hot Line Tag On	LD0.FKEYGGIO1.Ind8.stVal
6089	3005:9	4	Yes					
6090	3005:10	4					KEY 9 Ground Block	LD0.FKEYGGIO1.Ind9.stVal
6091	3005:11	4	Yes					
6092	3005:12	4					KEY 10 Reclose Blocked	LD0.FKEYGGIO1.Ind10.stVal
6093	3005:13	4	Yes					
6094	3005:14	4					KEY 11 Battery Test	LD0.FKEYGGIO1.Ind11.stVal

Coil Addr(0x)	Register(Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6095	3005:15	4	Yes					
6096	3006:0	4					KEY 12 50SEF Blocked	LD0.FKEYGGIO1.Ind12.stVal
6097	3006:1	4	Yes					
6098	3006:2	4					KEY 13 S1 Disabled	LD0.FKEYGGIO1.Ind13.stVal
6099	3006:3	4	Yes					
6100	3006:4	4					KEY 14 S2 Disabled	LD0.FKEYGGIO1.Ind14.stVal
6101	3006:5	4	Yes					
6102	3006:6	4					KEY 15 Loop Scheme Reset	LD0.FKEYGGIO1.Ind15.stVal
6103	3006:7	4	Yes					
6104	3006:8	4					KEY 16 Emergency Open 3 Phase	LD0.FKEYGGIO1.Ind16.stVal
6105	3006:9	4	Yes					
6106		0					LED 1 Setting Group 1 Enabled	LD0.FKEYGGIO1.SPCSO1.stVal
6107		0	Yes					
6108		0					LED 2 Setting Group 2 Enabled	LD0.FKEYGGIO1.SPCSO2.stVal
6109		0	Yes					
6110		0					LED 3 Setting Group 3 Enabled	LD0.FKEYGGIO1.SPCSO3.stVal
6111		0	Yes					
6112		0					LED 4 Setting Group 4 Enabled	LD0.FKEYGGIO1.SPCSO4.stVal
6113		0	Yes					
6114		0					LED 5 Setting Group 5 Enabled	LD0.FKEYGGIO1.SPCSO5.stVal
6115		0	Yes					
6116		0					LED 6 Setting Group 6 Enabled	LD0.FKEYGGIO1.SPCSO6.stVal
6117		0	Yes					
6118		0					LED 7 Switch Mode Enabled	LD0.FKEYGGIO1.SPCSO7.stVal
6119		0	Yes					
6120		0					LED 8 Hot Line Tag On	LD0.FKEYGGIO1.SPCSO8.stVal
6121		0	Yes					
6122		0					LED 9 Ground Block	LD0.FKEYGGIO1.SPCSO9.stVal
6123		0	Yes					
6124		0					LED 10 Reclose Blocked	LD0.FKEYGGIO1.SPCSO10.stVal
6125		0	Yes					
6126		0					LED 11 Battery Test	LD0.FKEYGGIO1.SPCSO11.stVal
6127		0	Yes					
6128		0					LED 12 50SEF Blocked	LD0.FKEYGGIO1.SPCSO12.stVal
6129		0	Yes					
6130		0					LED 13 S1 Disabled	LD0.FKEYGGIO1.SPCSO13.stVal
6131		0	Yes					
6132		0					LED 14 S2 Disabled	LD0.FKEYGGIO1.SPCSO14.stVal
6133		0	Yes					
6134		0					LED 15 Loop Scheme Reset	LD0.FKEYGGIO1.SPCSO15.stVal

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Coil Addr(0x)	Register(Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6135		0	Yes					
6136		0					LED 16 Emergency Open 3 Phase	LD0.FKEYGGIO1.SPCSO16.stVal
6137		0	Yes					

Table 87: MVGAPC1: Move function block (8 outputs) (MVGAPC1)

Coil Addr(0x)	Register(Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6142	3008:14	4					3-Phase Recloser Open (52B)	LD0.MVGAPC1.Q1.stVal
6143	3008:15	4	Yes					
6144	3009:0	4					3-Phase Recloser Closed (52A)	LD0.MVGAPC1.Q2.stVal
6145	3009:1	4	Yes					
6146	3009:2	4					Phase A Open	LD0.MVGAPC1.Q3.stVal
6147	3009:3	4	Yes					
6148	3009:4	4					Phase B Open	LD0.MVGAPC1.Q4.stVal
6149	3009:5	4	Yes					
6150	3009:6	4					Phase C Open	LD0.MVGAPC1.Q5.stVal
6151	3009:7	4	Yes					
6152	3009:8	4					Phase A Close	LD0.MVGAPC1.Q6.stVal
6153	3009:9	4	Yes					
6154	3009:10	4					Phase B Close	LD0.MVGAPC1.Q7.stVal
6155	3009:11	4	Yes					
6156	3009:12	4					Phase C Close	LD0.MVGAPC1.Q8.stVal
6157	3009:13	4	Yes					

Table 88: PTGAPC1: Pulse Timer (8 timers) (PTGAPC1)

Coil Addr(0x)	Register(Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6158	3009:14	4					Generic Pulse Timer 1 Input 1	LD0.PTGAPC1.In1.stVal
6159	3009:15	4	Yes					
6160	3010:0	4					Generic Pulse Timer 1 Input 2	LD0.PTGAPC1.In2.stVal
6161	3010:1	4	Yes					
6162	3010:2	4					Generic Pulse Timer 1 Input 3	LD0.PTGAPC1.In3.stVal
6163	3010:3	4	Yes					
6164	3010:4	4					Generic Pulse Timer 1 Input 4	LD0.PTGAPC1.In4.stVal
6165	3010:5	4	Yes					
6166	3010:6	4					Generic Pulse Timer 1 Input 5	LD0.PTGAPC1.In5.stVal
6167	3010:7	4	Yes					
6168	3010:8	4					Generic Pulse Timer 1 Input 6	LD0.PTGAPC1.In6.stVal
6169	3010:9	4	Yes					
6170	3010:10	4					Generic Pulse Timer 1 Input 7	LD0.PTGAPC1.In7.stVal
6171	3010:11	4	Yes					

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6172	3010:12	4					Generic Pulse Timer 1 Input 8	LD0.PTGAPC1.In8.stVal
6173	3010:13	4	Yes					
6174	3010:14	4					Generic Pulse Timer 1 output 1	LD0.PTGAPC1.Q1.stVal
6175	3010:15	4	Yes					
6176	3011:0	4					Generic Pulse Timer 1 output 2	LD0.PTGAPC1.Q2.stVal
6177	3011:1	4	Yes					
6178	3011:2	4					Generic Pulse Timer 1 output 3	LD0.PTGAPC1.Q3.stVal
6179	3011:3	4	Yes					
6180	3011:4	4					Generic Pulse Timer 1 output 4	LD0.PTGAPC1.Q4.stVal
6181	3011:5	4	Yes					
6182	3011:6	4					Generic Pulse Timer 1 output 5	LD0.PTGAPC1.Q5.stVal
6183	3011:7	4	Yes					
6184	3011:8	4					Generic Pulse Timer 1 output 6	LD0.PTGAPC1.Q6.stVal
6185	3011:9	4	Yes					
6186	3011:10	4					Generic Pulse Timer 1 output 7	LD0.PTGAPC1.Q7.stVal
6187	3011:11	4	Yes					
6188	3011:12	4					Generic Pulse Timer 1 output 8	LD0.PTGAPC1.Q8.stVal
6189	3011:13	4	Yes					

Table 89: SRGAPC1: Set reset flip flops 8 outputs (SRGAPC1)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6272	3017:0	4					Q1 Set-Reset Flip Flop-1	LD0.SRGAPC1.Q1.stVal
6273	3017:1	4	Yes					
6274	3017:2	4					Q2 Set-Reset Flip Flop-1	LD0.SRGAPC1.Q2.stVal
6275	3017:3	4	Yes					
6276	3017:4	4					Q3 Set-Reset Flip Flop-1	LD0.SRGAPC1.Q3.stVal
6277	3017:5	4	Yes					
6278	3017:6	4					Q4 Set-Reset Flip Flop-1	LD0.SRGAPC1.Q4.stVal
6279	3017:7	4	Yes					
6280	3017:8	4					Q5 Set-Reset Flip Flop-1	LD0.SRGAPC1.Q5.stVal
6281	3017:9	4	Yes					
6282	3017:10	4					Q6 Set-Reset Flip Flop-1	LD0.SRGAPC1.Q6.stVal
6283	3017:11	4	Yes					
6284	3017:12	4					Q7 Set-Reset Flip Flop-1	LD0.SRGAPC1.Q7.stVal
6285	3017:13	4	Yes					
6286	3017:14	4					Q8 Set-Reset Flip Flop-1	LD0.SRGAPC1.Q8.stVal
6287	3017:15	4	Yes					
6288	3018:0	4					Set 1 Set-Reset Flip Flop-1	LD0.SRGAPC1.Set1.stVal
6289	3018:1	4	Yes					
6290	3018:2	4					Set 2 Set-Reset Flip Flop-1	LD0.SRGAPC1.Set2.stVal

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Coil Addr(0x)	Register(Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6291	3018:3	4	Yes					
6292	3018:4	4					Set 3 Set-Reset Flip Flop-1	LD0.SRGAPC1.Set3.stVal
6293	3018:5	4	Yes					
6294	3018:6	4					Set 4 Set-Reset Flip Flop-1	LD0.SRGAPC1.Set4.stVal
6295	3018:7	4	Yes					
6296	3018:8	4					Set 5 Set-Reset Flip Flop-1	LD0.SRGAPC1.Set5.stVal
6297	3018:9	4	Yes					
6298	3018:10	4					Set 6 Set-Reset Flip Flop-1	LD0.SRGAPC1.Set6.stVal
6299	3018:11	4	Yes					
6300	3018:12	4					Set 7 Set-Reset Flip Flop-1	LD0.SRGAPC1.Set7.stVal
6301	3018:13	4	Yes					
6302	3018:14	4					Set 8 Set-Reset Flip Flop-1	LD0.SRGAPC1.Set8.stVal
6303	3018:15	4	Yes					

Table 90: MVGAPC2: Move function block (8 outputs) (MVGAPC2)

Coil Addr(0x)	Register(Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
6308	3019:4	4					General Purpose Binary input 9	LD0.MVGAPC2.Q1.stVal
6309	3019:5	4	Yes					
6310	3019:6	4					General Purpose Binary input 10	LD0.MVGAPC2.Q2.stVal
6311	3019:7	4	Yes					
6312	3019:8	4					General Purpose Binary input 11	LD0.MVGAPC2.Q3.stVal
6313	3019:9	4	Yes					
6314	3019:10	4					General Purpose Binary input 12	LD0.MVGAPC2.Q4.stVal
6315	3019:11	4	Yes					
6316	3019:12	4					General Purpose Binary input 13	LD0.MVGAPC2.Q5.stVal
6317	3019:13	4	Yes					
6318	3019:14	4					General Purpose Binary input 14	LD0.MVGAPC2.Q6.stVal
6319	3019:15	4	Yes					
6320	3020:0	4					General Purpose Binary input 15	LD0.MVGAPC2.Q7.stVal
6321	3020:1	4	Yes					
6322	3020:2	4					General Purpose Binary input 16	LD0.MVGAPC2.Q8.stVal
6323	3020:3	4	Yes					

Table 91: UDFCNT1: Up/Down Counter-1 (UDFCNT1)

Coil Addr(0x)	Register(Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2064	0		s32	1	0	Counter 1	LD0.UDFCNT1.CntRs.actVal
	2065	0						

Table 92: *UDFCNT2: Up/Down Counter-2 (UDFCNT2)*

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2066	0		s32	1	0	Counter 2	LD0.UDFCNT2.CntRs.actVal
	2067	0						

Table 93: *UDFCNT3: Up/Down Counter-3 (UDFCNT3)*

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2068	0		s32	1	0	Counter 3	LD0.UDFCNT3.CntRs.actVal
	2069	0						

Table 94: *UDFCNT4: Up/Down Counter-4 (UDFCNT4)*

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2070	0		s32	1	0	Counter 4	LD0.UDFCNT4.CntRs.actVal
	2071	0						

Table 95: *UDFCNT5: Up/Down Counter-5 (UDFCNT5)*

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2072	0		s32	1	0	Counter 5	LD0.UDFCNT5.CntRs.actVal
	2073	0						

Table 96: *UDFCNT6: Up/Down Counter-6 (UDFCNT6)*

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2074	0		s32	1	0	Counter 6	LD0.UDFCNT6.CntRs.actVal
	2075	0						

Table 97: *UDFCNT7: Up/Down Counter-7 (UDFCNT7)*

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2076	0		s32	1	0	Counter 7	LD0.UDFCNT7.CntRs.actVal
	2077	0						

Table 98: *UDFCNT8: Up/Down Counter-8 (UDFCNT8)*

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2078	0		s32	1	0	Counter 8	LD0.UDFCNT8.CntRs.actVal
	2079	0						

Table 99: *UDFCNT9: Up/Down Counter (UDFCNT9)*

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2080	0		s32	1	0	Counter 9	LD0.UDFCNT9.CntRs.actVal
	2081	0						

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Table 100: UDFCNT10: Up/Down Counter (UDFCNT10)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2082	0		s32	1	0	Counter 10	LD0.UDFCNT10.CntRs.actVal
	2083	0						

Table 101: UDFCNT11: Up/Down Counter (UDFCNT11)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2084	0		s32	1	0	Counter 11	LD0.UDFCNT11.CntRs.actVal
	2085	0						

Table 102: UDFCNT12: Up/Down Counter (UDFCNT12)

Coil Addr(0x)	Register(:Bit) Addr(4x)	Dc	MCD	Type	Scale	Offset	Description	IEC61850 Data Attribute Name
	2086	0		s32	1	0	Counter 12	LD0.UDFCNT12.CntRs.actVal
	2087	0						

Table 103: Control Structures

Control Structure	Control Register Addr(4x)	Control bit number	Description	IEC61850 Data Attribute Name
1	2513		Control Structure 1 Execute Register	
	2514		Control Structure 1 Password 1	
	2515		Control Structure 1 Password 2	
	2516	0	Turn Off Trip LEDs	LD0.LLN0.LEDRs1.Oper.ctlVal
	2516	1	Turn Off Alarm Indication LEDs	LD0.LLN0.LEDRs2.Oper.ctlVal
	2516	2	Reserved	
	2516	3	Reserved	
	2516	4	Reserved	
	2516	5	Reserved	
	2516	6	Reserved	
	2516	7	Reserved	
	2516	8	Reserved	
	2516	9	Reserved	
	2516	10	Reserved	
	2516	11	Reserved	
	2516	12	Reserved	
	2516	13	Reserved	
2516	14	Reserved		
2516	15	Reserved		
2517		Control Structure 1 Confirmation Register		
2	2518		Control Structure 2 Execute Register	
	2519		Control Structure 2 Password 1	
	2520		Control Structure 2 Password 2	
	2521	0	FLO Reset Fault Record Counter	LD0.FLTMSTA1.RecRs.Oper.ctlVal
	2521	1	DFR Trigger Disturbance Recording	DR.RDRE1.RcdTrg.Oper.ctlVal
	2521	2	DFR Clear Disturbance Records	DR.RDRE1.MemClr.Oper.ctlVal
	2521	3	Reserved	
	2521	4	Reserved	
	2521	5	Clear Current Demand Metering Source 1	LD0.CMSTA1.RecRs.Oper.ctlVal
	2521	6	Reserved	
	2521	7	Reserved	
	2521	8	Reserved	
	2521	9	Reserved	
	2521	10	Reserved	
2521	11	Reserved		
2521	12	Reserved		

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Control Structure	Control Register Addr(4x)	Control bit number	Description	IEC61850 Data Attribute Name
2	2521	13	Reserved	
	2521	14	Reserved	
	2521	15	Reserved	
	2522		Control Structure 2 Confirmation Register	
3	2523		Control Structure 3 Execute Register	
	2524		Control Structure 3 Password 1	
	2525		Control Structure 3 Password 2	
	2526	0	Reserved	
	2526	1	Reserved	
	2526	2	Reserved	
	2526	3	Reset Device	LD0.LPHD1.RsDev.Oper.ctlVal
	2526	4	Reserved	
	2526	5	Reserved	
	2526	6	Reserved	
	2526	7	Reserved	
	2526	8	Reserved	
	2526	9	Reserved	
	2526	10	Reserved	
	2526	11	Reserved	
	2526	12	Reserved	
	2526	13	Reserved	
	2526	14	Reserved	
	2526	15	Reserved	
	2527		Control Structure 3 Confirmation Register	

Control Structure	Control Register Addr(4x)	Control bit number	Description	IEC61850 Data Attribute Name
4	2528		Control Structure 4 Execute Register	
	2529		Control Structure 4 Password 1	
	2530		Control Structure 4 Password 2	
	2531	0	52 Phase A Select Open Recloser	CTRL.SCBCSWI1.PosA.Oper.ctlVal
	2531	1	52 Phase A Select Close Recloser	CTRL.SCBCSWI1.PosA.Oper.ctlVal
	2531	2	52 Phase A Cancel Select Recloser	CTRL.SCBCSWI1.PosA.Oper.ctlVal
	2531	3	52 Phase A Operate Select Recloser	CTRL.SCBCSWI1.PosA.Oper.ctlVal
	2531	4	52 Phase A Direct Open Recloser	CTRL.SCBCSWI1.PosA.Oper.ctlVal
	2531	5	52 Phase A Direct Close Recloser	CTRL.SCBCSWI1.PosA.Oper.ctlVal
	2531	6	79 Reset Recloser	LD0.SDARREC1.RsRec.Oper.ctlVal
	2531	7	79 Reset Recloser Operation Counter	LD0.SDARREC1.RsCnt.Oper.ctlVal
	2531	8	Reserved	
	2531	9	Reserved	
	2531	10	Reserved	
	2531	11	Reserved	
	2531	12	Reserved	
	2531	13	Reserved	
	2531	14	Reserved	
	2531	15	Reserved	
	2532		Control Structure 4 Confirmation Register	

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Control Structure	Control Register Addr(4x)	Control bit number	Description	IEC61850 Data Attribute Name
5	2533		Control Structure 5 Execute Register	
	2534		Control Structure 5 Password 1	
	2535		Control Structure 5 Password 2	
	2536	0	52 Phase B Select Open Recloser	CTRL.SCBCSWI1.PosB.Oper.ctlVal
	2536	1	52 Phase B Select Close Recloser	CTRL.SCBCSWI1.PosB.Oper.ctlVal
	2536	2	52 Phase B Cancel Select Recloser	CTRL.SCBCSWI1.PosB.Oper.ctlVal
	2536	3	52 Phase B Operate Select Recloser	CTRL.SCBCSWI1.PosB.Oper.ctlVal
	2536	4	52 Phase B Direct Open Recloser	CTRL.SCBCSWI1.PosB.Oper.ctlVal
	2536	5	52 Phase B Direct Close Recloser	CTRL.SCBCSWI1.PosB.Oper.ctlVal
	2536	6	Reserved	
	2536	7	Reserved	
	2536	8	Reserved	
	2536	9	Reserved	
	2536	10	Reserved	
	2536	11	Reserved	
	2536	12	Reserved	
	2536	13	Reserved	
	2536	14	Reserved	
	2536	15	Reserved	
	2537		Control Structure 5 Confirmation Register	

Control Structure	Control Register Addr(4x)	Control bit number	Description	IEC61850 Data Attribute Name
6	2538		Control Structure 6 Execute Register	
	2539		Control Structure 6 Password 1	
	2540		Control Structure 6 Password 2	
	2541	0	52 Phase C Select Open Recloser	CTRL.SCBCSWI1.PosC.Oper.ctlVal
	2541	1	52 Phase C Select Close Recloser	CTRL.SCBCSWI1.PosC.Oper.ctlVal
	2541	2	52 Phase C Cancel Select Recloser	CTRL.SCBCSWI1.PosC.Oper.ctlVal
	2541	3	52 Phase C Operate Select Recloser	CTRL.SCBCSWI1.PosC.Oper.ctlVal
	2541	4	52 Phase C Direct Open Recloser	CTRL.SCBCSWI1.PosC.Oper.ctlVal
	2541	5	52 Phase C Direct Close Recloser	CTRL.SCBCSWI1.PosC.Oper.ctlVal
	2541	6	Reserved	
	2541	7	Reserved	
	2541	8	Reserved	
	2541	9	Reserved	
	2541	10	Reserved	
	2541	11	Reserved	
	2541	12	Reserved	
	2541	13	Reserved	
	2541	14	Reserved	
	2541	15	Reserved	
	2542		Control Structure 6 Confirmation Register	

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Control Structure	Control Register Addr(4x)	Control bit number	Description	IEC61850 Data Attribute Name
7	2543		Control Structure 7 Execute Register	
	2544		Control Structure 7 Password 1	
	2545		Control Structure 7 Password 2	
	2546	0	52 All Phases Select Open Recloser	CTRL.SCBCSWI1.Pos.Oper.ctlVal
	2546	1	52 All Phases Select Close Recloser	CTRL.SCBCSWI1.Pos.Oper.ctlVal
	2546	2	52 All Phases Cancel Select Recloser	CTRL.SCBCSWI1.Pos.Oper.ctlVal
	2546	3	52 All Phases Operate Select Recloser	CTRL.SCBCSWI1.Pos.Oper.ctlVal
	2546	4	52 All Phases Direct Open Recloser	CTRL.SCBCSWI1.Pos.Oper.ctlVal
	2546	5	52 All Phases Direct Close Recloser	CTRL.SCBCSWI1.Pos.Oper.ctlVal
	2546	6	Reserved	
	2546	7	Reserved	
	2546	8	Reserved	
	2546	9	Reserved	
	2546	10	Reserved	
	2546	11	Reserved	
	2546	12	Reserved	
	2546	13	Reserved	
	2546	14	Reserved	
	2546	15	Reserved	
	2547		Control Structure 7 Confirmation Register	

Control Structure	Control Register Addr(4x)	Control bit number	Description	IEC61850 Data Attribute Name
8	2548		Control Structure 8 Execute Register	
	2549		Control Structure 8 Password 1	
	2550		Control Structure 8 Password 2	
	2551	0	Start Battery Test	LD0.ZBAT1.BatTest.Oper.ctlVal
	2551	1	Reset UPS processor	LD0.ZBAT1.ResetUps.Oper.ctlVal
	2551	2	Reserved	
	2551	3	Reserved	
	2551	4	52CM Reset Breaker Accumulated Power	LD0.SPSCBR1.RsAccAPwr.Oper.ctlVal
	2551	5	52CM Reset Breaker remaining life	LD0.SPSCBR1.RsCBWear.Oper.ctlVal
	2551	6	52CM Reset Breaker Travel Time	LD0.SPSCBR1.RsTrvTm.Oper.ctlVal
	2551	7	52CM Reset Breaker Spring Charging time	LD0.SPSCBR1.RsSprChaTm.Oper.ctlVal
	2551	8	Reserved	
	2551	9	Reserved	
	2551	10	Reserved	
	2551	11	Reserved	
	2551	12	Reserved	
	2551	13	SPCGGIO2 Control 1	LD0.SPCGGIO2.SPCSO1.Oper.ctlVal
	2551	14	SPCGGIO2 Control 2	LD0.SPCGGIO2.SPCSO2.Oper.ctlVal
	2551	15	SPCGGIO2 Control 3	LD0.SPCGGIO2.SPCSO3.Oper.ctlVal
	2552		Control Structure 8 Confirmation Register	

Section 3 Glossary

AFL	Application function block library
ANSI	American National Standards Institute
AR	Autoreclosing
CB	Circuit breaker
CT	Current transformer
CTRL	Control logical device
DFR	Digital fault recorder
DNP3	A distributed network protocol originally developed by Westronic. The DNP3 Users Group has the ownership of the protocol and assumes responsibility for its evolution.
DR	Disturbance recorder
EMC	Electromagnetic compatibility
HMI	Human-machine interface
I/O	Input/output
ID	Identifier or identification
IEC 61850	International standard for substation communication and modelling
Relay	Intelligent electronic device
LD0	Logical device zero (0)
LED	Light-emitting diode
LHMI	Local human-machine interface
LLN0	Logical node zero (0)
MCD	Momentary change detect
Modbus	A serial communication protocol developed by the Modicon company in 1979. Originally used for communication in PLCs and RTU devices.
MOM	Momentary position
PCM600	Protection and Control Relay Manager
PLC	Programmable logic controller
SBO	Select-before-operate

stVal	Status value
SW	Software
UTC	Coordinated universal time
Val	Value

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