Relion® 615 series

Feeder Protection and Control
REF615
Modbus Point List Manual

Power and productivity
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ABB

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Conformity

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

Table of contents

Section 1 Introduction

1.1 This manual

Point List Manual describes the outlook and properties of the data points specific to the IED. The manual should be used in conjunction with the corresponding Communication Protocol Manual.

1.2 Intended audience

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

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

1.3 Product documentation

1.3.1 Product documentation set

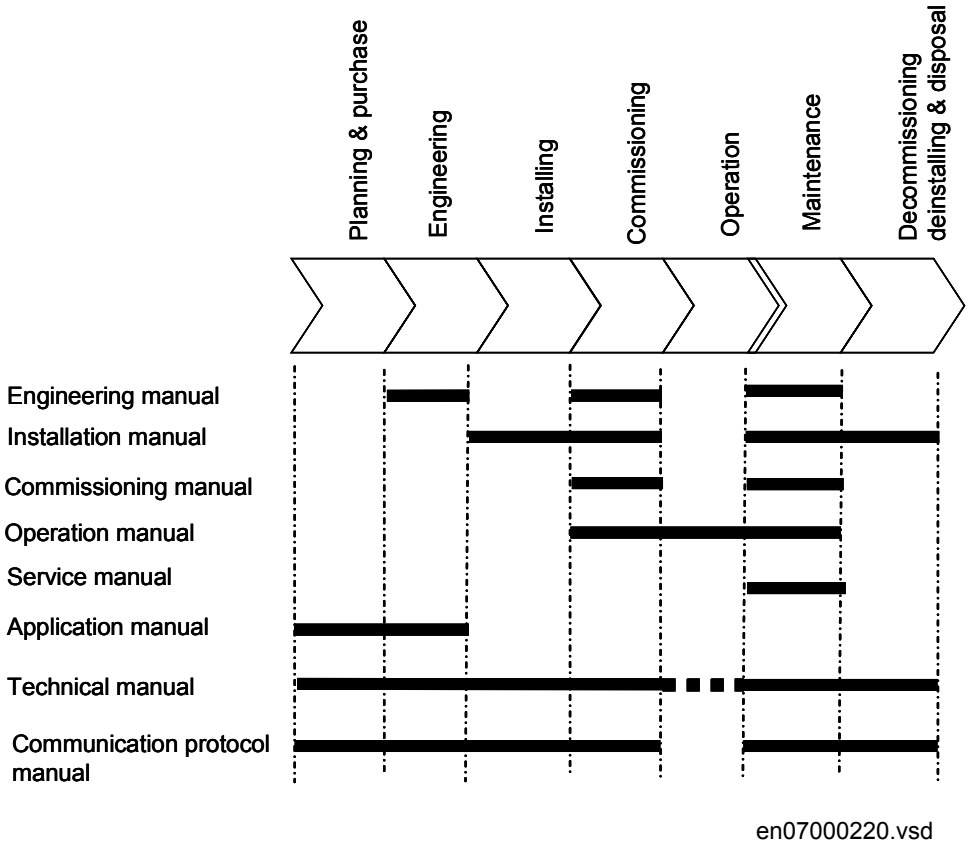

Figure 1: The intended use of manuals in different lifecycles

Engineering Manual contains instructions on how to engineer the IEDs. The manual provides instructions on how to use the different tools for IED engineering. It also includes instructions on how to handle the tool component available to read disturbance files from the IEDs on the basis of the IEC 61850 definitions. It further introduces the diagnostic tool components available for IEDs and the PCM600 tool.

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

Commissioning Manual contains instructions on how to commission the IED. The manual can also be used as a reference during periodic testing. The manual provides procedures for energizing and checking of external circuitry, setting and configuration as well as verifying settings and performing directional tests. The

chapters are organized in chronological order in which the IED should be commissioned.

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

Service Manual contains instructions on how to service and maintain the IED. The manual also provides procedures for de-energizing, de-commissioning and disposal of the IED.

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.

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.

Communication Protocol Manual describes a communication protocol supported by the IED. The manual concentrates on vendor-specific implementations.

Point List Manual describes the outlook and properties of the data points specific to the IED. The manual should be used in conjunction with the corresponding Communication Protocol Manual.

Some of the manuals are not available yet.

1.3.2 Document revision history

Document revision/date	Product version	History
A/02.07.2008	1.1	First release
B/04.03.2009	2.0	Content updated to correspond to the product version
C/03.07.2009	2.0	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	1MRS756468

1.4 Document symbols and conventions

1.4.1 Safety indication symbols

This publication includes icons that point out safety-related conditions or other important information.

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 Document conventions

- Abbreviations and acronyms in this manual are spelled out in Glossary. Glossary also contains definitions of important terms.
- HMI menu paths are presented in bold, for example:
  Select **Main menu/Information**.
- 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 "On" and "Off".
- IED input/output messages and monitored data names are shown in Courier font, for example:
  When the function starts, the `START` output is set to TRUE.

1.4.3 Functions, codes and symbols

Table 1: REF615 Functions, codes and symbols

Function	IEC 61850	IEC 60617	IEC-ANSI
Protection			
Three-phase non-directional overcurrent protection, low stage, instance 1	PHLPTOC1	3I> (1)	51P-1 (1)
Three-phase non-directional overcurrent protection, high stage, instance 1	PHHPTOC1	3I>> (1)	51P-2 (1)
Three-phase non-directional overcurrent protection, high stage, instance 2	PHHPTOC2	3I>> (2)	51P-2 (2)
Three-phase non-directional overcurrent protection, instantaneous stage, instance 1	PHIPTOC1	3I>>> (1)	50P/51P (1)
Three-phase directional overcurrent protection, low stage, instance 1	DPHLPDOC1	3I> → (1)	67-1 (1)
Three-phase directional overcurrent protection, low stage, instance 2	DPHLPDOC2	3I> → (2)	67-1 (2)
Three-phase directional overcurrent protection, high stage	DPHHPDOC1	3I>> →	67-2
Non-directional earth-fault protection, low stage, instance 1	EFLPTOC1	I_0> (1)	51N-1 (1)
Non-directional earth-fault protection, low stage, instance 2	EFLPTOC2	I_0> (2)	51N-1 (2)
Non-directional earth-fault protection, high stage, instance 1	EFHPTOC1	I_0>> (1)	51N-2 (1)
Non-directional earth-fault protection, instantaneous stage	EFIPTOC1	I_0>>>	50N/51N
Directional earth-fault protection, low stage, instance 1	DEFLPDEF1	I_0> → (1)	67N-1 (1)
Directional earth-fault protection, low stage, instance 2	DEFLPDEF2	I_0> → (2)	67N-1 (2)
Directional earth-fault protection, high stage	DEFHPDEF1	I_0>> →	67N-2
Transient / intermittent earth-fault protection	INTRPTEF1	I_0> → IEF	67NIEF
Non-directional (cross-country) earth fault protection, using calculated I0	EFHPTOC1	I_0>>	51N-2
Negative-sequence overcurrent protection, instance 1	NSPTOC1	I_2> (1)	46 (1)
Negative-sequence overcurrent protection, instance 2	NSPTOC2	I_2> (2)	46 (2)
Phase discontinuity protection	PDNSPTOC1	I_2/I_1>	46PD
Residual overvoltage protection, instance 1	ROVPTOV1	U_0> (1)	59G (1)
Residual overvoltage protection, instance 2	ROVPTOV2	U_0> (2)	59G (2)

Table continues on next page

Function	IEC 61850	IEC 60617	IEC-ANSI
Residual overvoltage protection, instance 3	ROVPTOV3	U_0> (3)	59G (3)
Three-phase undervoltage protection, instance 1	PHPTUV1	3U< (1)	27 (1)
Three-phase undervoltage protection, instance 2	PHPTUV2	3U< (2)	27 (2)
Three-phase undervoltage protection, instance 3	PHPTUV3	3U< (3)	27 (3)
Three-phase overvoltage protection, instance 1	PHPTOV1	3U> (1)	59 (1)
Three-phase overvoltage protection, instance 2	PHPTOV2	3U> (2)	59 (2)
Three-phase overvoltage protection, instance 3	PHPTOV3	3U> (3)	59 (3)
Positive-sequence undervoltage protection	PSPTUV1	U1<	47U+
Negative-sequence overvoltage protection	NSPTOV1	U2>	47O-
Three-phase thermal protection for feeders, cables and distribution transformers	T1PTTR1	3Ith>F	49F
Circuit breaker failure protection	CCBRBRF1	3I>/I_0>BF	51BF/51NBF
Three-phase inrush detector	INRPHAR1	3I2f>	68
Master trip, instance 1	TRPPTRC1	Master Trip (1)	94/86 (1)
Master trip, instance 2	TRPPTRC2	Master Trip (2)	94/86 (2)
Arc protection, instance 1	ARCSARC1	ARC (1)	50L/50NL (1)
Arc protection, instance 2	ARCSARC2	ARC (2)	50L/50NL (2)
Arc protection, instance 3	ARCSARC3	ARC (3)	50L/50NL (3)
Control			
Circuit-breaker control	CBXCBR1	I ↔ O CB	I ↔ O CB
Disconnector position indication, instance 1	DCSXSWI1	I ↔ O DC (1)	I ↔ O DC (1)
Disconnector position indication, instance 2	DCSXSWI2	I ↔ O DC (2)	I ↔ O DC (2)
Disconnector position indication, instance 3	DCSXSWI3	I ↔ O DC (3)	I ↔ O DC (3)
Earthing switch indication	ESSXSWI1	I ↔ O ES	I ↔ O ES
Auto-reclosing	DARREC1	O → I	79
Condition Monitoring			
Circuit-breaker condition monitoring	SSCBR1	CBCM	CBCM
Trip circuit supervision, instance 1	TCSSCBR1	TCS (1)	TCM (1)
Trip circuit supervision, instance 2	TCSSCBR2	TCS (2)	TCM (2)
Current circuit supervision	CCRDIF1	MCS 3I	MCS 3I
Fuse failure supervision	SEQRFUF1	FUSEF	60
Measurement			

Table continues on next page

Function	IEC 61850	IEC 60617	IEC-ANSI
Disturbance recorder	RDRE1	-	-
Three-phase current measurement, instance 1	CMMXU1	3I	3I
Sequence current measurement	CSMSQI1	I_1, I_2, I_0	I_1, I_2, I_0
Residual current measurement, instance 1	RESCMMXU1	I_0	I_n
Three-phase voltage measurement	VMMXU1	3U	3U
Residual voltage measurement	RESVMMXU1	U_0	V_n
Sequence voltage measurement	VSMSQI1	U_1, U_2, U_0	U_1, U_2, U_0
Three-phase power and energy measurement	PEMMXU1	P, E	P, E

Section 2 Modbus data mappings

2.1 Overview

This document describes the Modbus data points and structures available in REF615 Ver. 2.0. The point lists describe a superset of all data available through the standard configurations A, B, C, D, E and F including the optional functionalities. The names of the standard configurations are FE01, FE02, FE03, FE04, FE05 and FE06 respectively.

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

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	IED'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 REF615 Ver. 2.0 FE01-06

Table 2: Registers

Reg addr	Dc	W	Type	Scale	IEC 61850 name	Description	Value range
128						System status register 1	See Modbus CPM
129						System status register 2	See Modbus CPM
130						System status register 3	See Modbus CPM
131						System status register 4	See Modbus CPM
132						System status register 5	See Modbus CPM
133						System status register 6	See Modbus CPM
134						(reserved)	0
Frequently updated registers, all variants							
135	0		i16	1	LD0.DARREC1.AutoRecSt.stVal	Autoreclosing status[.stVal] -	-2…4 (See documentation)
136	0		u16	1	LD0.DARREC1.ShotPntr.stVal	AR shot pointer value[.stVal] -	0…6
137	0		u16	1	LD0.DARREC1.OpCntRs.stVal	AR resettable operation counter (all shots)[.stVal] -	0...2147483647
138	0		u16	1000	LD0.CMMXU1.A.phsA.instCVal.mag	Phase current A amplitude [.phsA.instCVal.mag] -	0…40.00 [xIn]
139	0		u16	1000	LD0.CMMXU1.A.phsB.instCVal.mag	Phase current B amplitude [.phsB.instCVal.mag] -	0…40.00 [xIn]
140	0		u16	1000	LD0.CMMXU1.A.phsC.instCVal.mag	Phase current C amplitude [.phsC.instCVal.mag] -	0…40.00 [xIn]
141	0		u16	1000	LD0.RESCMMXU1.A.res.instCVal.mag	Residual current amplitude [.res.instCVal.mag] -	0…40.00 [xIn]
142	0		u16	1000	LD0.RESVMMXU1.PhV.res.instCVal.mag	Residual voltage amplitude [.res.instCVal.mag] -	0…4.00 [xUn]
143	0		u16	1000	LD0.CSMSQI1.SeqA.c1.instCVal.mag	Positive sequence current amplitude [.c1.instCVal.mag] -	0…40.00 [xIn]
144	0		u16	1000	LD0.CSMSQI1.SeqA.c2.instCVal.mag	Negative sequence current amplitude [.c2.instCVal.mag] -	0…40.00 [xIn]
145	0		u16	1000	LD0.CSMSQI1.SeqA.c3.instCVal.mag	Zero sequence current amplitude [.c3.instCVal.mag] -	0…40.00 [xIn]
146	0		i16	1	LD0.T1PTTR1.Tmp.mag	Protected object temperature [.mag] -	-100.0…9999.9 [Celsius]
147	0		i16	1	LD0.T1PTTR1.TmpRl.mag	Relative temperature [.mag] -	0.00…99.99 [Celcius]
148	0		i16	1	LD0.T1PTTR1.TmpUsed.mag	Ambient temperature used in calculations [.mag] -	-99…999.99 [Celsius]
149	0		i16	0.001	LD0.T1PTTR1.TmmsOp.stVal	Estimated time to operate[.stVal] -	0…600000 [ms]
150	0		i16	0.001	LD0.T1PTTR1.TmmsRecEna.stVal	Estimated time to deactivate BLK_CLOSE[.stVal] -	0…600000 [ms]
151						(reserved)	0
Frequently updated registers, variants FE05,06							
152	0		u16	1000	LD0.VMMXU1.phV.phsA.cVal.mag	Phase-to-ground voltage A amplitude [.phsA.cVal.mag] -	0…4.00 [xUn]
153	0		u16	1000	LD0.VMMXU1.phV.phsB.cVal.mag	Phase-to-ground voltage B amplitude [.phsB.cVal.mag] -	0…4.00 [xUn]
154	0		u16	1000	LD0.VMMXU1.phV.phsC.cVal.mag	Phase-to-ground voltage C amplitude [.phsC.cVal.mag] -	0…4.00 [xUn]
155	0		u16	1000	LD0.VMMXU1.PPV.phsAB.cVal.mag	Phase-to-phase voltage AB amplitude [.phsAB.cVal.mag] -	0…4.00 [xUn]
156	0		u16	1000	LD0.VMMXU1.PPV.phsBC.cVal.mag	Phase-to-phase voltage BC amplitude [.phsBC.cVal.mag] -	0…4.00 [xUn]
157	0		u16	1000	LD0.VMMXU1.PPV.phsCA.cVal.mag	Phase-to-phase voltage CA amplitude [.phsCA.cVal.mag] -	0…4.00 [xUn]
158	0		u16	1000	LD0.VSMSQI1.SeqA.c1.cVal.mag	Positive sequence voltage amplitude [.c1.instCVal.mag] -	0…4.00 [xUn]
159	0		u16	1000	LD0.VSMSQI1.SeqA.c2.cVal.mag	Negative sequence voltage amplitude [.c2.instCVal.mag] -	0…4.00 [xUn]
160	0		u16	1000	LD0.VSMSQI1.SeqA.c3.cVal.mag	Zero sequence voltage amplitude [.c3.instCVal.mag] -	0…4.00 [xUn]

Table continues on next page

Reg addr	Dc	W	Type	Scale	IEC 61850 name	Description	Value range
161	0		i32	1	LD0.PEMMXU1.TotW.instMag	Total active power P [.instMag] - High word	-999999...999999 (units = see documentation)
162					LD0.PEMMXU1.TotW.instMag	Total active power P [.instMag] - Low word	
163	0		i32	1	LD0.PEMMXU1.TotVAr.instMag	Total reactive power Q [.instMag] - High word	-999999...999999 (units = see documentation)
164					LD0.PEMMXU1.TotVAr.instMag	Total reactive power Q [.instMag] - Low word	
165	0		i32	1	LD0.PEMMXU1.TotVA.instMag	Total apparent power S [.instMag] - High word	-999999...999999 (units = see documentation)
166					LD0.PEMMXU1.TotVA.instMag	Total apparent power S [.instMag] - Low word	
167	0		i16	1000	LD0.PEMMXU1.TotPF.instMag	Average power factor [.instMag] -	-1...1
168							
169						(reserved)	0
170						Indication bits mirrored and packed in registers 170 onwards	See 'Indications' table
...							
2000							
					Phase current demand values (latest values), all variants		
2001	5		u16	1000	LD0.CMSTA1.AvAmps1.mag	Demand value of phase A current[.mag] -	0...40.00 [xIn]
2002	5		u16	1000	LD0.CMSTA1.AvAmps2.mag	Demand value of phase B current[.mag] -	0...40.00 [xIn]
2003	5		u16	1000	LD0.CMSTA1.AvAmps3.mag	Demand value of phase C current[.mag] -	0...40.00 [xIn]
2004	5				Time structure	Update time of demand values phase A..C current -reg 1	Time structure (See Modbus CPM)
2005						Update time of demand values phase A..C current -reg 2	
2006						Update time of demand values phase A..C current -reg 3	
2007						Update time of demand values phase A..C current -reg 4	
2008						Update time of demand values phase A..C current -reg 5	
					Maximum phase current demand values, all variants		
2009	6		u16	1000	LD0.CMSTA1.MaxAmps1.mag	Maximum demand value for phase A[.mag] -	0...40.00 [xIn]
2010	6				Time structure	Update time of phase A max value -reg 1	Time structure (See Modbus CPM)
2011						Update time of phase A max value -reg 2	
2012						Update time of phase A max value -reg 3	
2013						Update time of phase A max value -reg 4	
2014						Update time of phase A max value -reg 5	
2015	6		u16	1000	LD0.CMSTA1.MaxAmps2.mag	Maximum demand value for phase B[.mag] -	0...40.00 [xIn]
2016	6				Time structure	Update time of phase A max value -reg 1	Time structure (See Modbus CPM)
2017						Update time of phase A max value -reg 2	
2018						Update time of phase A max value -reg 3	
2019						Update time of phase A max value -reg 4	
2020						Update time of phase A max value -reg 5	

Table continues on next page

Reg addr	Dc	W	Type	Scale	IEC 61850 name	Description	Value range
2021	6		u16	1000	LD0.CMSTA1.MaxAmps3.mag	Maximum demand value for phase C[.mag] -	0...40.00 [xIn]
2022	6				Time structure	Update time of phase A max value -reg 1	Time structure (See Modbus CPM)
2023						Update time of phase A max value -reg 2	
2024						Update time of phase A max value -reg 3	
2025						Update time of phase A max value -reg 4	
2026						Update time of phase A max value -reg 5	
Counters - Circuit breaker, autorecloser							
2027	0	x	u16	1	CTRL.CBCSWI1.OpCntRs.stVal	Circuit breaker operation counter[.stVal] -	0...65535
2028	0	x	u16	1	LD0.ARCSARC11.FACntRs.stVal	Fault arc1 counter[.stVal] -	0...65535
2029	0	x	u16	1	LD0.ARCSARC21.FACntRs.stVal	Fault arc2 counter[.stVal] -	0...65535
2030	0	x	u16	1	LD0.ARCSARC31.FACntRs.stVal	Fault arc3 counter[.stVal] -	0...65535
2031	0		u16	1	LD0.DARREC1.OpCnt1.stVal	Auto recloser operation counter (1st shot)[.stVal] -	0...65535
2032	0		u16	1	LD0.DARREC1.OpCnt2.stVal	Autorecloser operation counter (2nd shot)[.stVal] -	0...65535
2033	0		u16	1	LD0.DARREC1.OpCnt3.stVal	Autorecloser operation counter (3rd shot)[.stVal] -	0...65535
2034	0		u16	1	LD0.DARREC1.OpCnt4.stVal	Autorecloser operation counter (4th shot)[.stVal] -	0...65335
2035	0		u16	1	LD0.DARREC1.OpCnt5.stVal	Autorecloser operation counter (5th shot)[.stVal] -	0...65535
2036	0		u16	1	LD0.DARREC1.FrqOpCnt.stVal	Autorecloser frequent operation counter[.stVal] -	0...65535
2037						(reserved)	0
2038						(reserved)	0
2039						(reserved)	0
Energy counters, FE05,06							
2040	0		u32	1	LD0.PEMMTR1.SupWh.actVal	Reverse active energy Wh [.actVal] - high word	0...999999999 (units = see docs.)
2041					LD0.PEMMTR1.SupWh.actVal	Reverse active energy [.actVal] - low word	
2042	0		u32	1	LD0.PEMMTR1.SupVArh.actVal	Reverse reactive energy [.actVal] - high word	0...999999999 (units = see docs.)
2043					LD0.PEMMTR1.SupVArh.actVal	Reverse reactive energy [.actVal] - low word	
2044	0		u32	1	LD0.PEMMTR1.DemWh.actVal	Forward active energy Wh [.actVal] - high word	0...999999999 (units = see docs.)
2045					LD0.PEMMTR1.DemWh.actVal	Forward active energy Wh [.actVal] - low word	
2046	0		u32	1	LD0.PEMMTR1.DemVArh.actVal	Forward reactive energy VAr [.actVal] - high word	0...999999999 (units = see docs.)
2047					LD0.PEMMTR1.DemVArh.actVal	Forward reactive energy VAr [.actVal] - low word	
2048						(reserved)	0
2049						(reserved)	0
Diagnostics, all variants							
2050	0		u16	1	LD0.LPHD1.PhyHealth1.stVal	Physical device - Warning[.stVal] -	See documentation
2051	0		u16	1	LD0.LPHD1.PhyHealth2.stVal	Physical device - Internal Fault[.stVal] -	See documentation
2052	0		u16	1	DR.RDRE1.FltNum.stVal	Disturbance recorder - Number of recordings[.stVal] -	0...N
2053	0		u16	1	DR.RDRE1.MemUsed.stVal	Disturbance recorder - Rec. memory used[.stVal] -	0...100 [%]

Table continues on next page

Reg addr	Dc	W	Type	Scale	IEC 61850 name	Description	Value range
2054	0		u16	1	LD0.LPHD1.NumPwrUp.stVal	Physical device - Number of Power ups[.stVal] -	0…65535
2055	0		u16	1	LD0.LPHD1.WrmStr.stVal	Physical device - Number of Warm starts[.stVal] -	0…65535
2056	0		u16	1	LD0.LPHD1.WacTrg.stVal	Physical device - Number of watchdog device resets detected[.stVal] -	0…65535
2057						(reserved)	0
2058						(reserved)	0
2059						(reserved)	0
Circuit breaker condition monitoring							
2060	0		u16	1	LD0.SSCBR1.InaTmdCnt.stVal	SSCBR1 - The number of days CB has been inactive[.stVal] -	0…9999
2061	0		u16	1	LD0.SSCBR1.TmmsOpn.mag	SSCBR1 - Travel time of the CB during opening operation[.mag] -	0…60000 [ms]
2062	0		u16	1	LD0.SSCBR1.TmmsCls.mag	SSCBR1 - Travel time of the CB during closing operation[.mag] -	0…60000 [ms]
2063	0		u16	100	LD0.SSCBR1.TmsSprCha.mag	SSCBR1 - The charging time of the CB spring[.mag] -	0.00…99.99 [sec]
2064	0		i16	1	LD0.SSCBR1.RmnLifPhA.stVal	SSCBR1 - CB remaining life phase A[.stVal] -	-9999…9999
2065	0		i16	1	LD0.SSCBR1.RmnLifPhB.stVal	SSCBR1 - CB remaining life phase B[.stVal] -	-9999…9999
2066	0		i16	1	LD0.SSCBR1.RmnLifPhC.stVal	SSCBR1 - CB remaining life phase C[.stVal] -	-9999…9999
2067	0		u16	1	LD0.SSCBR1.AccAPwrPhA.mag	SSCBR1 - Accumulated currents power (Iyt), phase A[.mag] -	0.00…1000000.00
2068	0		u16	1	LD0.SSCBR1.AccAPwrPhB.mag	SSCBR1 - Accumulated currents power (Iyt), phase B[.mag] -	0.00…1000000.00
2069	0		u16	1	LD0.SSCBR1.AccAPwrPhC.mag	SSCBR1 - Accumulated currents power (Iyt), phase C[.mag] -	0.00…1000000.00
2070						(reserved)	0
...							
8000							
Control structure 1							
8001		x	u16			Control Struct 1 - Execute register	Control structure (See Modbus CPM)
8002		x	u16			Control Struct 1 - Password 1	
8003		x	u16			Control Struct 1 - Password 2	
8004		x	u16		Control structure 1 bit definitions are found in Modbus Controls table	Control Struct 1 - Control register	
8005		x	u16			Control Struct 1 - Confirm register	
Control structure 2							
8006		x	u16			Control Struct 2 - Execute register	Control structure (See Modbus CPM)
8007		x	u16			Control Struct 2 - Password 1	
8008		x	u16			Control Struct 2 - Password 2	
8009		x	u16		Control structure 2 bit definitions are found in Modbus Controls table	Control Struct 2 - Control register	
8010		x	u16			Control Struct 2 - Confirm register	

Table continues on next page

Reg addr	Dc	W	Type	Scale	IEC 61850 name	Description	Value range
Control structure 3							
8011		x	u16			Control Struct 3 - Execute register	Control structure (See Modbus CPM)
8012		x	u16			Control Struct 3 - Password 1	
8013		x	u16			Control Struct 3 - Password 2	
8014		x	u16		Control structure 3 bit definitions are found in Modbus Controls table	Control Struct 3 - Control register	
8015		x	u16			Control Struct 3 - Confirm register	
Control structure 4							
8016		x	u16			Control Struct 4 - Execute register	Control structure (See Modbus CPM)
8017		x	u16			Control Struct 4 - Password 1	
8018		x	u16			Control Struct 4 - Password 2	
8019		x	u16		Control structure 4 bit definitions are found in Modbus Controls table	Control Struct 4 - Control register	
8020		x	u16			Control Struct 4 - Confirm register	
Control structure 5							
8021		x	u16			Control Struct 5 - Execute register	Control structure (See Modbus CPM)
8022		x	u16			Control Struct 5 - Password 1	
8023		x	u16			Control Struct 5 - Password 2	
8024		x	u16		Control structure 5 bit definitions are found in Modbus Controls table	Control Struct 5 - Control register	
8025		x	u16			Control Struct 5 - Confirm register	
8026						(reserved)	0
...							
9000							
Device ID string							
9001						Max length of device ID string may be 128 registers	Device Id string (See Modbus CPM)
9002						(reserved)	0
...							
9128							
Device real-time clock in local time							
9201		x	u16			Real-time struct - Control register (0..2)	
9202		x	u16			Real-time struct - Year (2000..2999)	
9203		x	u16			Real-time struct - Month (1..12)	
9204		x	u16			Real-time struct - Day (1..31)	
9205		x	u16			Real-time struct - Hour (0..23)	
9206		x	u16			Real-time struct - Minute (0..59)	
9207		x	u16			Real-time struct - Seconds (0..59)	

Table continues on next page

Reg addr	Dc	W	Type	Scale	IEC 61850 name	Description	Value range
9208		x	u16			Real-time struct - Milliseconds (0..999)	
9209						(reserved)	0
9210						(reserved)	0
Device real-time clock in UTC time							
9211		x	u16			Real-time struct UTC - Control register (0..2)	
9212		x	u16			Real-time struct UTC - Year (2000..2999)	
9213		x	u16			Real-time struct UTC - Month (1..12)	
9214		x	u16			Real-time struct UTC - Day (1..31)	
9215		x	u16			Real-time struct UTC - Hour (0..23)	
9216		x	u16			Real-time struct UTC - Minute (0..59)	
9217		x	u16			Real-time struct UTC - Seconds (0..59)	
9218		x	u16			Real-time struct UTC - Milliseconds (0..999)	
9219						(reserved)	0
9220						(reserved)	0
Timestamp of last device reset							
9221			u16			Reset time struct - Year (2000..2999)	
9222			u16			Reset time struct - Month (1..12)	
9223			u16			Reset time struct - Day (1..31)	
9224			u16			Reset time struct - Hour (0..23)	
9225			u16			Reset time struct - Minute (0..59)	
9226			u16			Reset time struct - Seconds (0..59)	
9227			u16			Reset time struct - Milliseconds (0..999)	
9228			u16			Reset time struct - Reason	1 = Cold reset 2 = Watchdog reset 4 = Warm reset
9229						(reserved)	0
...							
9249							
Event record structure							
9250		x	u16	0	Event read selection	Number of events records in multiple event reading	1...10
9251		x	i16	0		Event read operation selection	-499...3
9252			u16	0	Event record 1 (11 registers)	Event record struct - Sequence number	Event record structure (See Modbus CPM)
9253			u16	0		Event record struct - Unread records left	
9254			u16	0		Event record struct - TimeStamp (Year,Month)	
9255			u16	0		Event record struct - TimeStamp (Day, Hour)	
9256			u16	0		Event record struct - TimeStamp (Min, Sec)	
9257			u16	0		Event record struct - TimeStamp (Milliseconds)	
9258			u16	0		Event record struct - Event identification	
9259			u16	0		Event record struct - Data object ID 1	

Table continues on next page

Reg addr	Dc	W	Type	Scale	IEC 61850 name	Description	Value range
9260			u16	0		Event record struct - Data object ID 2	
9261			u16	0		Event record struct - Data value	
9262			u16	0		Event record struct - Data value	
9263...9273					Event record 2 (11 registers)	Event record structure	Event record structure (See Modbus CPM)
9274...9284					Event record 3 (11 registers)	Event record structure	Event record structure (See Modbus CPM)
9285...9295					Event record 4 (11 registers)	Event record structure	Event record structure (See Modbus CPM)
9296...9306					Event record 5 (11 registers)	Event record structure	Event record structure (See Modbus CPM)
9307...9317					Event record 6 (11 registers)	Event record structure	Event record structure (See Modbus CPM)
9318...9328					Event record 7 (11 registers)	Event record structure	Event record structure (See Modbus CPM)
9329...9339					Event record 8 (11 registers)	Event record structure	Event record structure (See Modbus CPM)
9340...9350					Event record 9 (11 registers)	Event record structure	Event record structure (See Modbus CPM)
9351...9361					Event record 10 (11 registers)	Event record structure	Event record structure (See Modbus CPM)
9362						(reserved)	0
...							
9400							
Fault record structure							
9401		x	i16	0	Fault record read selection	Fault record read operation selection	-99...3
9402			u16	0		Fault record struct - Sequence number	Header
9403			u16	0		Fault record struct - Unread records left	
9404			u16	0		Fault record struct - TimeStamp (Year,Month)	
9405			u16	0		Fault record struct - TimeStamp (Day, Hour)	
9406			u16	0		Fault record struct - TimeStamp (Min, Sec)	
9407			u16	0		Fault record struct - TimeStamp (Milliseconds)	
9408			u16	0		Fault record struct - TimeStamp (Time quality)	
Fault record data, all variants							
9409			u16	1000	LD0.FLTMSTA1.MaxAmpsA.mag	Maximum phase A current during fault	0...40.00 [xIn]
9410			u16	1000	LD0.FLTMSTA1.MaxAmpsB.mag	Maximum phase B current during fault	0...40.00 [xIn]
9411			u16	1000	LD0.FLTMSTA1.MaxAmpsC.mag	Maximum phase C current during fault	0...40.00 [xIn]
9412			u16	1000	LD0.FLTMSTA1.MaxAmpsN.mag	Maximum residual current during fault	0...40.00 [xIn]
9413			u16	1000	LD0.FLTMSTA1.AmpsA.mag	Phase A current at moment of trip	0...40.00 [xIn]
9414			u16	1000	LD0.FLTMSTA1.AmpsB.mag	Phase B current at moment of trip	0...40.00 [xIn]
9415			u16	1000	LD0.FLTMSTA1.AmpsC.mag	Phase C current at moment of trip	0...40.00 [xIn]
9416			u16	1000	LD0.FLTMSTA1.AmpsN.mag	Residual current at moment of trip	0...40.00 [xIn]

Table continues on next page

Reg addr	Dc	W	Type	Scale	IEC 61850 name	Description	Value range
9417			u16	1000	LD0.FLTMSTA1.AmpsNClc.mag	Residual Clc current at moment of trip	0...40.00 [xIn]
9418			u16	1000	LD0.FLTMSTA1.AmpsNgSeq.mag	Negative sequence current at moment of trip	0...40.00 [xIn]
9419			u16	1000	LD0.FLTMSTA1.MaxTmpRl.mag	Max relative temperature	0.00...99.99 [degrees Celcius]
9420			u16	10	LD0.FLTMSTA1.PHI1MxDur.mag	Start duration of PHIPTOC1 stage	0.0...100.0 [%]
9421			u16	10	LD0.FLTMSTA1.EFH1MxDur.mag	Start duration of EFHPTOC1 stage	0.0...100.0 [%]
9422			u16	10	LD0.FLTMSTA1.NSOC1MxDur.mag	Start duration of NSPTOC1 stage	0.0...100.0 [%]
9423			u16	10	LD0.FLTMSTA1.NSOC2MxDur.mag	Start duration of NSPTOC2 stage	0.0...100.0 [%]
9424			u16	10	LD0.FLTMSTA1.PDNS1MxDur.mag	Start duration of PDNSPTOC1 stage	0.0...100.0 [%]
9425			u16	10	LD0.FLTMSTA1.PDNS1MxRat.mag	PS/NS Ratio of PDNSPTOC1 stage	0.0...100.0 [%]
Fault record data, variants FE01,02,03,04							
9426			u16	10	LD0.FLTMSTA1.PHL1MxDur.mag	Start duration of PHLPTOC1 stage	0.0...100.0 [%]
9427			u16	10	LD0.FLTMSTA1.PHH1MxDur.mag	Start duration of PHHPTOC1 stage	0.0...100.0 [%]
9428			u16	10	LD0.FLTMSTA1.PHH2MxDur.mag	Start duration of PHHPTOC2 stage	0.0...100.0 [%]
Fault record data, variants FE03,04							
9429			u16	10	LD0.FLTMSTA1.EFL1MxDur.mag	Start duration of EFLPTOC1 stage	0.0...100.0 [%]
9430			u16	10	LD0.FLTMSTA1.EFL2MxDur.mag	Start duration of EFLPTOC2 stage	0.0...100.0 [%]
9431			u16	10	LD0.FLTMSTA1.EFI1MxDur.mag	Start duration of EFIPTOC1 stage	0.0...100.0 [%]
Fault record data, variants FE01,02,05,06							
9432			u16	10	LD0.FLTMSTA1.DEFL1MxDur.mag	Start duration of DEFLPDEF1 stage	0.0...100.0 [%]
9433			u16	10	LD0.FLTMSTA1.DEFL2MxDur.mag	Start duration of DEFLPDEF2 stage	0.0...100.0 [%]
9434			u16	10	LD0.FLTMSTA1.DEFH1MxDur.mag	Start duration of DEFHPDEF1 stage	0.0...100.0 [%]
9435			u16	10	LD0.FLTMSTA1.INTR1MxDur.mag	Start duration of INTRPTEF1 stage	0.0...100.0 [%]
Fault record data, variants FE05,06							
9436			u16	1000	LD0.FLTMSTA1.VoltsA.mag	Phase A voltage at moment of trip	0...4.00 [xUn]
9437			u16	1000	LD0.FLTMSTA1.VoltsB.mag	Phase B voltage at moment of trip	0...4.00 [xUn]
9438			u16	1000	LD0.FLTMSTA1.VoltsC.mag	Phase C voltage at moment of trip	0...4.00 [xUn]
9439			u16	1000	LD0.FLTMSTA1.VoltsAB.mag	Phase-to-phase voltage AB at moment of trip	0...4.00 [xUn]
9440			u16	1000	LD0.FLTMSTA1.VoltsBC.mag	Phase-to-phase voltage BC at moment of trip	0...4.00 [xUn]
9441			u16	1000	LD0.FLTMSTA1.VoltsCA.mag	Phase-to-phase voltage CA at moment of trip	0...4.00 [xUn]
9442			u16	1000	LD0.FLTMSTA1.VoltsN.mag	Residual voltage at moment of trip	0...4.00 [xUn]
9443			u16	1000	LD0.FLTMSTA1.VPsSeq.mag	Positive sequence voltage at moment of trip	0...4.00 [xUn]
9444			u16	1000	LD0.FLTMSTA1.VNgSeq.mag	Negative sequence voltage at moment of trip	0...4.00 [xUn]
Fault record data, variant FE06							
9445			u16	10	LD0.FLTMSTA1.ROV1MxDur.mag	Start duration of ROVPTOV1 stage	0.0...100.0 [%]
9446			u16	10	LD0.FLTMSTA1.ROV2MxDur.mag	Start duration of ROVPTOV2 stage	0.0...100.0 [%]
9447			u16	10	LD0.FLTMSTA1.ROV3MxDur.mag	Start duration of ROVPTOV3 stage	0.0...100.0 [%]
9448			u16	10	LD0.FLTMSTA1.PHOV1MxDur.mag	Start duration of PHPTOV1 stage	0.0...100.0 [%]
9449			u16	10	LD0.FLTMSTA1.PHOV2MxDur.mag	Start duration of PHPTOV2 stage	0.0...100.0 [%]
9450			u16	10	LD0.FLTMSTA1.PHOV3MxDur.mag	Start duration of PHPTOV3 stage	0.0...100.0 [%]

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Reg addr	Dc	W	Type	Scale	IEC 61850 name	Description	Value range
9451			u16	10	LD0.FLTMSTA1.PHUV1MxDur.mag	Start duration of PHPTUV1 stage	0.0…100.0 [%]
9452			u16	10	LD0.FLTMSTA1.PHUV2MxDur.mag	Start duration of PHPTUV2 stage	0.0…100.0 [%]
9453			u16	10	LD0.FLTMSTA1.PHUV3MxDur.mag	Start duration of PHPTUV3 stage	0.0…100.0 [%]
9454			u16	10	LD0.FLTMSTA1.PSUV1MxDur.mag	Start duration of PSPTUV1 stage	0.0…100.0 [%]
9455			u16	10	LD0.FLTMSTA1.NSOV1MxDur.mag	Start duration of NSPTOV1 stage	0.0…100.0 [%]
9456			u16	10	LD0.FLTMSTA1.DPHL1MxDur.mag	Start duration of DPHLPDOC1 stage	0.0…100.0 [%]
9457			u16	10	LD0.FLTMSTA1.DPHL2MxDur.mag	Start duration of DPHLPDOC2 stage	0.0…100.0 [%]
9458			u16	10	LD0.FLTMSTA1.DPHH1MxDur.mag	Start duration of DPHHPDOC1 stage	0.0…100.0 [%]

Table 3: Indications

Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
2720	170.00	0	CTRL.LLN0.Loc.stVal	Local/Remote state - mom	0=Local, 1=Remote
2721	170.01	0	CTRL.LLN0.Loc1.stVal	Local/Remote Off - mom	0=ON, 1=OFF
2722	170.02	4	DR.RDRE1.RcdMade.stVal	Disturbance recorder file ready	1=DR file captured
2723	170.03	4	DR.RDRE1.RcdMade.stVal	Disturbance recorder file ready - MCD	
2724	170.04	0	LD0.DARREC1.AROn.stVal	Autorecloser state	0=AR Off, 1=AR On
2725	170.05			(reserved)	0
...	...				
2735	170.15				
Global conditioning, all variants					
2736	171.00	2	LD0.LEDPTRC1.Str.general	Start (.general)- mom	1=Start (LEDPTRC)
2737	171.01	2	LD0.LEDPTRC1.Str.general	Start (.general) - MCD	
2738	171.02	2	LD0.LEDPTRC1.Op.general	Operate (.general) - mom	1=Operate (LEDPTRC)
2739	171.03	2	LD0.LEDPTRC1.Op.general	Operate(.general) - MCD	
Protection trip conditioning (1), all variants					
2740	171.04	2	LD0.TRPPTRC1.Op.general	Input signal (.general)- mom	1=Input signal ON
2741	171.05	2	LD0.TRPPTRC1.Op.general	Input signal (.general) - MCD	
2742	171.06	2	LD0.TRPPTRC1.Tr.general	Trip output signal (.general) - mom	1=Trip output signal ON
2743	171.07	2	LD0.TRPPTRC1.Tr.general	Trip output signal (.general) - MCD	
Protection trip conditioning (2), all variants					
2744	171.08	2	LD0.TRPPTRC2.Op.general	Input signal (.general) - mom	1=Input signal ON
2745	171.09	2	LD0.TRPPTRC2.Op.general	Input signal (.general) - MCD	
2746	171.10	2	LD0.TRPPTRC2.Tr.general	Trip output signal [.general] - mom	1=Trip output signal ON
2747	171.11	2	LD0.TRPPTRC2.Tr.general	Trip output signal [.general] - MCD	
2748	171.12			(reserved)	0
2749	171.13			(reserved)	0
2750	171.14			(reserved)	0
2751	171.15			(reserved)	0
Phase current value limit supervision, all variants					
2752	172.00	0	LD0.CMMXU1.HiAlm.stVal	High alarm[.stVal] - mom	1=High alarm
2753	172.01	0	LD0.CMMXU1.HiAlm.stVal	High alarm[.stVal] - MCD	
2754	172.02	0	LD0.CMMXU1.HiWrn.stVal	High warning[.stVal] - mom	1=High warning
2755	172.03	0	LD0.CMMXU1.HiWrn.stVal	High warning[.stVal] - MCD	
2756	172.04	0	LD0.CMMXU1.LoWrn.stVal	Low warning[.stVal] - mom	1=Low warning
2757	172.05	0	LD0.CMMXU1.LoWrn.stVal	Low warning[.stVal] - MCD	
2758	172.06	0	LD0.CMMXU1.LoAlm.stVal	Low alarm[.stVal] - mom	1=Low alarm
2759	172.07	0	LD0.CMMXU1.LoAlm.stVal	Low alarm[.stVal] - MCD	
Residual current value limit supervision, all variants					
2760	172.08	0	LD0.RESCMMXU1.HiAlm.stVal	High alarm[.stVal] - mom	1= High alarm

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Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
2761	172.09	0	LD0.RESCMMXU1.HiAlm.stVal	High alarm[.stVal] - MCD	
2762	172.10	0	LD0.RESCMMXU1.HiWrn.stVal	High warning[.stVal] - mom	1=High warning
2763	172.11	0	LD0.RESCMMXU1.HiWrn.stVal	High warning[.stVal] - MCD	
Residual voltage value limit supervision, FE01,02,05,06					
2764	172.12	0	LD0.RESVMMXU1.HiAlm.stVal	High alarm[.stVal] - mom	1=High alarm
2765	172.13	0	LD0.RESVMMXU1.HiAlm.stVal	High alarm[.stVal] - MCD	
2766	172.14	0	LD0.RESVMMXU1.HiWrn.stVal	High warning[.stVal] - mom	1=High warning
2767	172.15	0	LD0.RESVMMXU1.HiWrn.stVal	High warning[.stVal] - MCD	
Indication LED states, all variants					
2768	173.00	3	LD0.LEDGGIO1.SPCSO1.stVal	LED 1[.stVal] - mom	1=LED ON
2769	173.01	3	LD0.LEDGGIO1.SPCSO2.stVal	LED 2[.stVal] - mom	1=LED ON
2770	173.02	3	LD0.LEDGGIO1.SPCSO3.stVal	LED 3[.stVal] - mom	1=LED ON
2771	173.03	3	LD0.LEDGGIO1.SPCSO4.stVal	LED 4[.stVal] - mom	1=LED ON
2772	173.04	3	LD0.LEDGGIO1.SPCSO5.stVal	LED 5[.stVal] - mom	1=LED ON
2773	173.05	3	LD0.LEDGGIO1.SPCSO6.stVal	LED 6[.stVal] - mom	1=LED ON
2774	173.06	3	LD0.LEDGGIO1.SPCSO7.stVal	LED 7[.stVal] - mom	1=LED ON
2775	173.07	3	LD0.LEDGGIO1.SPCSO8.stVal	LED 8[.stVal] - mom	1=LED ON
2776	173.08	3	LD0.LEDGGIO1.SPCSO9.stVal	LED 9[.stVal] - mom	1=LED ON
2777	173.09	3	LD0.LEDGGIO1.SPCSO10.stVal	LED 10[.stVal] - mom	1=LED ON
2778	173.10	3	LD0.LEDGGIO1.SPCSO11.stVal	LED 11[.stVal] - mom	1=LED ON
2779	173.11			(reserved)	0
Trip circuit supervision (1), all variants					
2780	173.12	0	LD0.TCSSCBR1.CirAlm.stVal	Alarm[.stVal] - mom	1=TCS1 Alarm
2781	173.13	0	LD0.TCSSCBR1.CirAlm.stVal	Alarm[.stVal] - MCD	
Trip circuit supervision (2), all variants					
2782	173.14	0	LD0.TCSSCBR2.CirAlm.stVal	Alarm[.stVal] - mom	1=TCS2 Alarm
2783	173.15	0	LD0.TCSSCBR2.CirAlm.stVal	Alarm[.stVal] - MCD	
Phase-to-phase voltage limit supervision, FE05.06					
2784	174.00	0	LD0.VMMXU1.HiAlm.stVal	High alarm[.stVal] - mom	1=High alarm
2785	174.01	0	LD0.VMMXU1.HiAlm.stVal	High alarm[.stVal] - MCD	
2786	174.02	0	LD0.VMMXU1.HiWrn.stVal	High warning[.stVal] - mom	1=High warning
2787	174.03	0	LD0.VMMXU1.HiWrn.stVal	High warning[.stVal] - MCD	
2788	174.04	0	LD0.VMMXU1.LoWrn.stVal	Low warning[.stVal] - mom	1=Low warning
2789	174.05	0	LD0.VMMXU1.LoWrn.stVal	Low warning[.stVal] - MCD	
2790	174.06	0	LD0.VMMXU1.LoAlm.stVal	Low alarm[.stVal] - mom	1=Low alarm
2791	174.07	0	LD0.VMMXU1.LoAlm.stVal	Low alarm[.stVal] - MCD	
Disconnector (1) position, FE02,04,05,06					
2792	174.08	0	CTRL.DCSXSWI1.Pos.stVal	close mom	1=Close
2793	174.09	0	CTRL.DCSXSWI1.Pos.stVal	open mom	1=Open

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Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
2794	174.10	0	CTRL.DCSXSWI1.Pos.stVal	error position	1=Faulty or Intermediate
Disconnector (2) position, FE02,04,05,06					
2795	174.11	0	CTRL.DCSXSWI2.Pos.stVal	close mom	1=Close
2796	174.12	0	CTRL.DCSXSWI2.Pos.stVal	open mom	1=Open
2797	174.13	0	CTRL.DCSXSWI2.Pos.stVal	error position	1=Faulty or Intermediate
Disconnector (3) position, FE02,04,05,06					
2798	174.14	0	CTRL.DCSXSWI3.Pos.stVal	close mom	1=Close
2799	174.15	0	CTRL.DCSXSWI3.Pos.stVal	open mom	1=Open
2800	175.00	0	CTRL.DCSXSWI3.Pos.stVal	error position	1=Faulty or Intermediate
Earth disconnector position, FE02,04,05,06					
2801	175.01	0	CTRL.ESSXSWI1.Pos.stVal	close mom	1=Close
2802	175.02	0	CTRL.ESSXSWI1.Pos.stVal	open mom	1=Open
2803	175.03	0	CTRL.ESSXSWI1.Pos.stVal	error position	1=Faulty or Intermediate
Circuit breaker position, all variants					
2804	175.04	0	CTRL.CBCSWI1.Pos.stVal	close mom	1=Close
2805	175.05	0	CTRL.CBCSWI1.Pos.stVal	open mom	1=Open
2806	175.06	0	CTRL.CBCSWI1.Pos.stVal	error position	1=Faulty or Intermediate
2807	175.07			(reserved)	0
2808	175.08			(reserved)	0
2809	175.09			(reserved)	0
2810	175.10			(reserved)	0
2811	175.11			(reserved)	0
2812	175.12			(reserved)	0
2813	175.13			(reserved)	0
2814	175.14			(reserved)	0
2815	175.15			(reserved)	0
Circuit breaker position + momentary change detect, all variants					
2816	176.00	0	CTRL.CBCSWI1.Pos.stVal	close mom	1=Close
2817	176.01	0	CTRL.CBCSWI1.Pos.stVal	close MCD	
2818	176.02	0	CTRL.CBCSWI1.Pos.stVal	open mom	1=Open
2819	176.03	0	CTRL.CBCSWI1.Pos.stVal	open MCD	
2820	176.04			(reserved)	0
2821	176.05			(reserved)	0
Circuit breaker selected for control operation, all variants					
2822	176.06	0	CTRL.CBCSWI1.Pos.stSeld	Selected (.stSeld) - mom	1=Selected
2823	176.07	0	CTRL.CBCSWI1.Pos.stSeld	Selected [.stSeld] - MCD	
Circuit breaker control enable signals, all variants					
2824	176.08	0	CTRL.CBCILO1.EnaOpn.stVal	Open enabled (.stVal) - mom	1=Open enabled
2825	176.09	0	CTRL.CBCILO1.EnaCls.stVal	Close enabled (.stVal) - mom	1=Close enabled

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Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
Circuit breaker failure detection and -protection, all variants					
2826	176.10	0	LD0.CCBRBRF1.InStr.stVal	Start command[.stVal] - mom	1=Start command
2827	176.11	0	LD0.CCBRBRF1.InStr.stVal	Start command[.stVal] - MCD	
2828	176.12	0	LD0.CCBRBRF1.Str.general	Start, timer running[.general] - mom	1=Start,timer running
2829	176.13	0	LD0.CCBRBRF1.Str.general	Start, timer running[.general] - MCD	
2830	176.14	0	LD0.CCBRBRF1.OpEx.general	Failure, external trip [.general] - mom	1=Failure,external trip
2831	176.15	0	LD0.CCBRBRF1.OpEx.general	Failure, external trip [.general] - MCD	
2832	177.00	0	LD0.CCBRBRF1.OpIn.general	Operate, internal retrip (.general) - mom	1=Operate, internal re-trip
2833	177.01	0	LD0.CCBRBRF1.OpIn.general	Operate, internal retrip (.general) - MCD	
2834	177.02	0	LD0.CCBRBRF1.InPosCls.stVal	CB in closed position[.stVal] - mom	1=CB Closed
2835	177.03	0	LD0.CCBRBRF1.InCBFlt.stVal	CB faulty and unable to trip[.stVal] - mom	1=CB faulty, trip unable
2836	177.04	0	CTRL.CBXCBR1.BlkOpn.stVal	Open blocked [.stVal] - mom	1 = Open blocked
2837	177.05	0	CTRL.CBXCBR1.BlkOpn.stVal	Open blocked [.stVal] - MCD	
2838	177.06	0	CTRL.CBXCBR1.BlkCls.stVal	Close blocked [.stVal] - mom	1 = Close blocked
2839	177.07	0	CTRL.CBXCBR1.BlkCls.stVal	Close blocked [.stVal] - MCD	
2840	177.08			(reserved)	0
...	...				
2847	177.15				
Circuit breaker condition monitoring, FE02,04,05,06					
2848	178.00	0	LD0.SSCBR1.OpnAlm.stVal	Open travel time exceeded (.stVal) - mom	1=Open travel time alarm
2849	178.01	0	LD0.SSCBR1.ClsAlm.stVal	Close travel time exceeded (.stVal) - mom	1=Close travel time alarm
2850	178.02	0	LD0.SSCBR1.SprChaAlm.stVal	Spring charging time exceeded (.stVal)- mom	1=Spring charging time alarm
2851	178.03	0	LD0.SSCBR1.OpNumAlm.stVal	Num of CB operations alarm (.stVal)- mom	1=CB operations alarm
2852	178.04	0	LD0.SSCBR1.OpNumLO.stVal	Num of CB operations lockout limit (.stVal) - mom	1=CB operations lockout alarm
2853	178.05	0	LD0.SSCBR1.LonTmAlm.stVal	CB "not operated for long time"alarm (.stVal)- mom	1=CB unactive alarm
2854	178.06	0	LD0.SSCBR1.PresAlm.stVal	Pressure below alarm level[.stVal] - mom	1=Low pressure alarm
2855	178.07	0	LD0.SSCBR1.PresLO.stVal	Pressure below lockout level[.stVal] - mom	1=Low pressure lockout alarm
2856	178.08	0	LD0.SSCBR1.APwrAlm.stVal	Acc. currents power (lyt),alarm limit[.stVal] - mom	1=lyt alarm
2857	178.09	0	LD0.SSCBR1.APwrLO.stVal	Acc. currents power (lyt),lockout limit[.stVal] - mom	1=lyt lockout alarm
2858	178.10	0	LD0.SSCBR1.CBLifAlm.stVal	Remaining life of CB exceeded alarm limit[.stVal] - mom	1=CB life alarm
2859	178.11			(reserved)	0
...	...				
2879	179.15				
Phase overcurrent protection signals (3 stages), FE01,02,03,04,05					
2880	180.00	0	LD0.PHLPTOC1.Str.general	Low stage Start[.general] - mom	1=Low stage start
2881	180.01	0	LD0.PHLPTOC1.Str.general	Low stage Start[.general] - MCD	
2882	180.02	0	LD0.PHLPTOC1.Str.phsA	Low stage Start[.phsA] - mom	1=Low stage phsA start
2883	180.03	0	LD0.PHLPTOC1.Str.phsA	Low stage Start[.phsA] - MCD	
2884	180.04	0	LD0.PHLPTOC1.Str.phsB	Low stage Start[.phsB] - mom	1=Low stage phsB start

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Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
2885	180.05	0	LD0.PHLPTOC1.Str.phsB	Low stage Start[.phsB] - MCD	
2886	180.06	0	LD0.PHLPTOC1.Str.phsC	Low stage Start[.phsC] - mom	1=Low stage phsC start
2887	180.07	0	LD0.PHLPTOC1.Str.phsC	Low stage Start[.phsC] - MCD	
2888	180.08	0	LD0.PHLPTOC1.Op.general	Low stage Operate[.general] - mom	1=Low stage operate
2889	180.09	0	LD0.PHLPTOC1.Op.general	Low stage Operate[.general] - MCD	
2890	180.10	0	LD0.PHHPTOC1.Str.general	High(1) stage Start[.general] - mom	1=High(1) stage start
2891	180.11	0	LD0.PHHPTOC1.Str.general	High(1) stage Start[.general] - MCD	
2892	180.12	0	LD0.PHHPTOC1.Str.phsA	High(1) stage Start[.phsA] - mom	1=High(1) stage phsA start
2893	180.13	0	LD0.PHHPTOC1.Str.phsA	High(1) stage Start[.phsA] - MCD	
2894	180.14	0	LD0.PHHPTOC1.Str.phsB	High(1) stage Start[.phsB] - mom	1=High(1) stage phsB start
2895	180.15	0	LD0.PHHPTOC1.Str.phsB	High(1) stage Start[.phsB] - MCD	
2896	181.00	0	LD0.PHHPTOC1.Str.phsC	High(1) stage Start[.phsC] - mom	1=High(1) stage phsC start
2897	181.01	0	LD0.PHHPTOC1.Str.phsC	High(1) stage Start[.phsC] - MCD	
2898	181.02	0	LD0.PHHPTOC1.Op.general	High(1) stage Operate[.general] - mom	1=High(1) stage operate
2899	181.03	0	LD0.PHHPTOC1.Op.general	High(1) stage Operate[.general] - MCD	
2900	181.04	0	LD0.PHHPTOC2.Str.general	High(2) stage Start[.general] - mom	1=High(2) stage start
2901	181.05	0	LD0.PHHPTOC2.Str.general	High(2) stage Start[.general] - MCD	
2902	181.06	0	LD0.PHHPTOC2.Str.phsA	High(2) stage Start[.phsA] - mom	1=High(2) stage phsA start
2903	181.07	0	LD0.PHHPTOC2.Str.phsA	High(2) stage Start[.phsA] - MCD	
2904	181.08	0	LD0.PHHPTOC2.Str.phsB	High(2) stage Start[.phsB] - mom	1=High(2) stage phsB start
2905	181.09	0	LD0.PHHPTOC2.Str.phsB	High(2) stage Start[.phsB] - MCD	
2906	181.10	0	LD0.PHHPTOC2.Str.phsC	High(2) stage Start[.phsC] - mom	1=High(2) stage phsC start
2907	181.11	0	LD0.PHHPTOC2.Str.phsC	High(2) stage Start[.phsC] - MCD	
2908	181.12	0	LD0.PHHPTOC2.Op.general	High(2) stage Operate[.general] - mom	1=High(2) stage operate
2909	181.13	0	LD0.PHHPTOC2.Op.general	High(2) stage Operate[.general] - MCD	
Phase overcurrent protection signals (1 stage)					
2910	181.14	0	LD0.PHIPTOC1.Str.general	Instantaneous stage Start[.general] - mom	1=Instantaneous stage start
2911	181.15	0	LD0.PHIPTOC1.Str.general	Instantaneous stage Start[.general] - MCD	
2912	182.00	0	LD0.PHIPTOC1.Str.phsA	Instantaneous stage Start[.phsA] - mom	1=Inst. stage phsA start
2913	182.01	0	LD0.PHIPTOC1.Str.phsA	Instantaneous stage Start[.phsA] - MCD	
2914	182.02	0	LD0.PHIPTOC1.Str.phsB	Instantaneous stage Start[.phsB] - mom	1=Inst. stage phsB start
2915	182.03	0	LD0.PHIPTOC1.Str.phsB	Instantaneous stage Start[.phsB] - MCD	
2916	182.04	0	LD0.PHIPTOC1.Str.phsC	Instantaneous stage Start[.phsC] - mom	1=Inst. stage phsC start
2917	182.05	0	LD0.PHIPTOC1.Str.phsC	Instantaneous stage Start[.phsC] - MCD	
2918	182.06	0	LD0.PHIPTOC1.Op.general	Instantaneous stage Operate[.general] - mom	1=Instantaneous stage operate
2919	182.07	0	LD0.PHIPTOC1.Op.general	Instantaneous stage Operate[.general] - MCD	
Directional earth-fault protection signals (3 stages), FE01,02,05,06					
2920	182.08	0	LD0.DEFLPTOC1.Str.general	Low(1) stage Start[.general] - mom	1=Low(1) stage start
2921	182.09	0	LD0.DEFLPTOC1.Str.general	Low(1) stage Start[.general] - MCD	

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Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
2922	182.10	0	LD0.DEFLPTOC1.Op.general	Low(1) stage Operate[.general] - mom	1=Low(1) stage operate
2923	182.11	0	LD0.DEFLPTOC1.Op.general	Low(1) stage Operate[.general] - MCD	
2924	182.12	0	LD0.DEFLPTOC2.Str.general	Low(2) stage Start[.general] - mom	1=Low(2) stage start
2925	182.13	0	LD0.DEFLPTOC2.Str.general	Low(2) stage Start[.general] - MCD	
2926	182.14	0	LD0.DEFLPTOC2.Op.general	Low(2) stage Operate[.general] - mom	1=Low(2) stage operate
2927	182.15	0	LD0.DEFLPTOC2.Op.general	Low(2) stage Operate[.general] - MCD	
2928	183.00	0	LD0.DEFHPTOC1.Str.general	High stage Start[.general] - mom	1=High stage start
2929	183.01	0	LD0.DEFHPTOC1.Str.general	High stage Start[.general] - MCD	
2930	183.02	0	LD0.DEFHPTOC1.Op.general	High stage Operate[.general] - mom	1=High stage operate
2931	183.03	0	LD0.DEFHPTOC1.Op.general	High stage Operate[.general] - MCD	
Non-directional earth-fault and sensitive earth-fault protection signals (4 stages), FE03,04 (EFHPTOC1 in all variants)					
2932	183.04	2	LD0.EFLPTOC1.Str.general	Low(1) stage Start[.general] - mom	1=Low(1) stage start
2933	183.05	2	LD0.EFLPTOC1.Str.general	Low(1) stage Start[.general] - MCD	
2934	183.06	2	LD0.EFLPTOC1.Op.general	Low(1) stage Operate[.general] - mom	1=Low(1) stage operate
2935	183.07	2	LD0.EFLPTOC1.Op.general	Low(1) stage Operate[.general] - MCD	
2936	183.08	2	LD0.EFLPTOC2.Str.general	Low(2) stage Start[.general] - mom	1=Low(2) stage start
2937	183.09	2	LD0.EFLPTOC2.Str.general	Low(2) stage Start[.general] - MCD	
2938	183.10	2	LD0.EFLPTOC2.Op.general	Low(2) stage Operate[.general] - mom	1=Low(2) stage operate
2939	183.11	2	LD0.EFLPTOC2.Op.general	Low(2) stage Operate[.general] - MCD	
2940	183.12	0	LD0.EFHPTOC1.Str.general	High stage Start[.general] - mom	1=High stage start
2941	183.13	0	LD0.EFHPTOC1.Str.general	High stage Start[.general] - MCD	
2942	183.14	0	LD0.EFHPTOC1.Op.general	High stage Operate[.general] - mom	1=High stage operate
2943	183.15	0	LD0.EFHPTOC1.Op.general	High stage Operate[.general] - MCD	
2944	184.00	2	LD0.EFIPTOC1.Str.general	Instantaneous stage Start[.general] - mom	1=Instantaneous stage start
2945	184.01	2	LD0.EFIPTOC1.Str.general	Instantaneous stage Start[.general] - MCD	
2946	184.02	2	LD0.EFIPTOC1.Op.general	Instantaneous stage Operate[.general] - mom	1=Instantaneous stage operate
2947	184.03	2	LD0.EFIPTOC1.Op.general	Instantaneous stage Operate[.general] - MCD	
Transient/Intermittent earth-fault protection signals (1 stage), FE01,02,05,06					
2948	184.04	0	LD0.INTRPTEF1.Str.general	Start[.general] - mom	1=Stage start
2949	184.05	0	LD0.INTRPTEF1.Str.general	Start[.general] - MCD	
2950	184.06	0	LD0.INTRPTEF1.Op.general	Operate[.general] - mom	1=Stage operate
2951	184.07	0	LD0.INTRPTEF1.Op.general	Operate[.general] - MCD	
Phase discontinuity protection signals (1 stage), all variants					
2952	184.08	0	LD0.PDNSPTOC1.Str.general	Start[.general] - mom	1=Stage start
2953	184.09	0	LD0.PDNSPTOC1.Str.general	Start[.general] - MCD	
2954	184.10	0	LD0.PDNSPTOC1.Op.general	Operate[.general] - mom	1=Stage operate
2955	184.11	0	LD0.PDNSPTOC1.Op.general	Operate[.general] - MCD	
Negative sequence overcurrent protection signals (2 stages), all variants					
2956	184.12	0	LD0.NSPTOC1.Str.general	Stage1 Start[.general] - mom	1=Stage1 start

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Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
2957	184.13	0	LD0.NSPTOC1.Str.general	Stage1 Start[.general] - MCD	
2958	184.14	0	LD0.NSPTOC1.Op.general	Stage1 Operate[.general] - mom	1=Stage1 operate
2959	184.15	0	LD0.NSPTOC1.Op.general	Stage1 Operate[.general] - MCD	
2960	185.00	0	LD0.NSPTOC2.Str.general	Stage2 Start[.general] - mom	1=Stage2 start
2961	185.01	0	LD0.NSPTOC2.Str.general	Stage2 Start[.general] - MCD	
2962	185.02	0	LD0.NSPTOC2.Op.general	Stage2 Operate[.general] - mom	1=Stage2 operate
2963	185.03	0	LD0.NSPTOC2.Op.general	Stage2 Operate[.general] - MCD	
			Three-phase inrush detection signals, all variants		
2964	185.04	0	LD0.INRPHAR1.Str.general	Start[.general] - mom	1=Start general
2965	185.05	0	LD0.INRPHAR1.Str.general	Start[.general] - MCD	
2966	185.06	0	LD0.INRPHAR1.Str.phsA	Start[.phsA] - mom	1=Start phsA
2967	185.07	0	LD0.INRPHAR1.Str.phsA	Start[.phsA] - MCD	
2968	185.08	0	LD0.INRPHAR1.Str.phsB	Start[.phsB] - mom	1=Start phsB
2969	185.09	0	LD0.INRPHAR1.Str.phsB	Start[.phsB] - MCD	
2970	185.10	0	LD0.INRPHAR1.Str.phsC	Start[.phsC] - mom	1=Start phsC
2971	185.11	0	LD0.INRPHAR1.Str.phsC	Start[.phsC] - MCD	
			Thermal overload protection signals (1 stage), all variants		
2972	185.12	0	LD0.T1PTTR1.Str.general	Start[.general] - mom	1=Start
2973	185.13	0	LD0.T1PTTR1.Str.general	Start[.general] - MCD	
2974	185.14	0	LD0.T1PTTR1.AlmThm.general	Thermal Alarm[.general] - mom	1=Thermal alarm
2975	185.15	0	LD0.T1PTTR1.AlmThm.general	Thermal Alarm[.general] - MCD	
2976	186.00	0	LD0.T1PTTR1.Op.general	Operate[.general] - mom	1=Operate
2977	186.01	0	LD0.T1PTTR1.Op.general	Operate[.general] - MCD	
			ARC protection signals (3 stages), optional in all variants		
2978	186.02	0	LD0.ARCSARC11.FADet.stVal	Stage1 Fault arc detected[.stVal] - mom	1=Stage1 arc detected
2979	186.03	0	LD0.ARCSARC11.FADet.stVal	Stage1 Fault arc detected[.stVal] - MCD	
2980	186.04	0	LD0.ARCSARC11.InRemFA.stVal	Stage1 Remote Fault arc detected[.stVal] - mom	1=Stage1 remote arc detected
2981	186.05	0	LD0.ARCSARC11.InRemFA.stVal	Stage1 Remote Fault arc detected[.stVal] - MCD	
2982	186.06	0	LD0.ARCPTRC11.Op.general	Stage1 Operate[.general] - mom	1=Stage1 operate
2983	186.07	0	LD0.ARCPTRC11.Op.general	Stage1 Operate[.general] - MCD	
2984	186.08	0	LD0.ARCSARC21.FADet.stVal	Stage2 Fault arc detected[.stVal] - mom	1=Stage2 arc detected
2985	186.09	0	LD0.ARCSARC21.FADet.stVal	Stage2 Fault arc detected[.stVal] - MCD	
2986	186.10	0	LD0.ARCSARC21.InRemFA.stVal	Stage2 Remote Fault arc detected[.stVal] - mom	1=Stage2 remote arc detected
2987	186.11	0	LD0.ARCSARC21.InRemFA.stVal	Stage2 Remote Fault arc detected[.stVal] - MCD	
2988	186.12	0	LD0.ARCPTRC21.Op.general	Stage2 Operate[.general] - mom	1=Stage2 operate
2989	186.13	0	LD0.ARCPTRC21.Op.general	Stage2 Operate[.general] - MCD	
2990	186.14	0	LD0.ARCSARC31.FADet.stVal	Stage3 Fault arc detected[.stVal] - mom	1=Stage3 arc detected
2991	186.15	0	LD0.ARCSARC31.FADet.stVal	Stage3 Fault arc detected[.stVal] - MCD	
2992	187.00	0	LD0.ARCSARC31.InRemFA.stVal	Stage3 Remote Fault arc detected[.stVal] - mom	1=Stage3 remote arc detected

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Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
2993	187.01	0	LD0.ARCSARC31.InRemFA.stVal	Stage3 Remote Fault arc detected[.stVal] - MCD	
2994	187.02	0	LD0.ARCPTRC31.Op.general	Stage3 Operate[.general] - mom	1=Stage3 operate
2995	187.03	0	LD0.ARCPTRC31.Op.general	Stage3 Operate[.general] - MCD	
Fuse failure protection (1 stage), FE05,06					
2996	187.04	0	LD0.SEQRFUF1.Str.general	Start[.general] - mom	1=Start general
2997	187.05	0	LD0.SEQRFUF1.Str.phsA	Start[.general] - MCD	
2998	187.06	0	LD0.SEQRFUF1.Str3Ph.general	Start[.general] - mom	1=Start 3phase general
2999	187.07	0	LD0.SEQRFUF1.Str3Ph.phsB	Start[.general] - MCD	
3000	187.08			(reserved)	0
3001	187.09			(reserved)	0
Current circuit failure detection (1 stage), FE05,06					
3002	187.10	0	LD0.CCRDIF1.Alm.stVal	Alarm[.general] - mom	1=Alarm
3003	187.11	0	LD0.CCRDIF1.Alm.stVal	Alarm[.general] - MCD	
3004	187.12	0	LD0.CCRDIF1.Op.general	Operate[.general] - mom	1=Operate
3005	187.13	0	LD0.CCRDIF1.Op.general	Operate[.general] - MCD	
Three-phase directional overcurrent protection (3 stages), FE06					
3006	187.14	0	LD0.DPHLPTOC1.Str.general	Low stage 1 Start[.general] - mom	1=Low stage1 start
3007	187.15	0	LD0.DPHLPTOC1.Str.general	Low stage 1 Start[.general] - MCD	
3008	188.00	0	LD0.DPHLPTOC1.Str.phsA	Low stage 1 Start[.phsA] - mom	1=Low stage1 phsA start
3009	188.01	0	LD0.DPHLPTOC1.Str.phsA	Low stage 1 Start[.phsA] - MCD	
3010	188.02	0	LD0.DPHLPTOC1.Str.phsB	Low stage 1 Start[.phsB] - mom	1=Low stage1 phsB start
3011	188.03	0	LD0.DPHLPTOC1.Str.phsB	Low stage 1 Start[.phsB] - MCD	
3012	188.04	0	LD0.DPHLPTOC1.Str.phsC	Low stage 1 Start[.phsC] - mom	1=Low stage1 phsC start
3013	188.05	0	LD0.DPHLPTOC1.Str.phsC	Low stage 1 Start[.phsC] - MCD	
3014	188.06	0	LD0.DPHLPTOC1.Op.general	Low stage 1 Operate[.general] - mom	1=Low stage1 operate
3015	188.07	0	LD0.DPHLPTOC1.Op.general	Low stage 1 Operate[.general] - MCD	
3016	188.08	0	LD0.DPHLPTOC2.Str.general	Low stage 2 Start[.general] - mom	1=Low stage2 start
3017	188.09	0	LD0.DPHLPTOC2.Str.general	Low stage 2 Start[.general] - MCD	
3018	188.10	0	LD0.DPHLPTOC2.Str.phsA	Low stage 2 Start[.phsA] - mom	1=Low stage2 phsA start
3019	188.11	0	LD0.DPHLPTOC2.Str.phsA	Low stage 2 Start[.phsA] - MCD	
3020	188.12	0	LD0.DPHLPTOC2.Str.phsB	Low stage 2 Start[.phsB] - mom	1=Low stage2 phsB start
3021	188.13	0	LD0.DPHLPTOC2.Str.phsB	Low stage 2 Start[.phsB] - MCD	
3022	188.14	0	LD0.DPHLPTOC2.Str.phsC	Low stage 2 Start[.phsC] - mom	1=Low stage2 phsC start
3023	188.15	0	LD0.DPHLPTOC2.Str.phsC	Low stage 2 Start[.phsC] - MCD	
3024	189.00	0	LD0.DPHLPTOC2.Op.general	Low stage 2 Operate[.general] - mom	1=Low stage2 operate
3025	189.01	0	LD0.DPHLPTOC2.Op.general	Low stage 2 Operate[.general] - MCD	
3026	189.02	0	LD0.DPHHPTOC1.Str.general	High stage 1 Start[.general] - mom	1=High stage1 start
3027	189.03	0	LD0.DPHHPTOC1.Str.general	High stage 1 Start[.general] - MCD	
3028	189.04	0	LD0.DPHHPTOC1.Str.phsA	High stage 1 Start[.phsA] - mom	1=High stage1 phsA start

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Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
3029	189.05	0	LD0.DPHHPTOC1.Str.phsA	High stage 1 Start[.phsA] - MCD	
3030	189.06	0	LD0.DPHHPTOC1.Str.phsB	High stage 1 Start[.phsB] - mom	1=High stage1 phsB start
3031	189.07	0	LD0.DPHHPTOC1.Str.phsB	High stage 1 Start[.phsB] - MCD	
3032	189.08	0	LD0.DPHHPTOC1.Str.phsC	High stage 1 Start[.phsC] - mom	1=High stage1 phsC start
3033	189.09	0	LD0.DPHHPTOC1.Str.phsC	High stage 1 Start[.phsC] - MCD	
3034	189.10	0	LD0.DPHHPTOC1.Op.general	High stage 1 Operate[.general] - mom	1=High stage1 operate
3035	189.11	0	LD0.DPHHPTOC1.Op.general	High stage 1 Operate[.general] - MCD	
3036	189.12			(reserved)	0
3037	189.13			(reserved)	0
3038	189.14			(reserved)	0
3039	189.15			(reserved)	0
			Autorecloser detailed signals, optional in all variants		
3040	190.00	0	LD0.DARREC1.PrgRec.stVal	AR in progress [.stVal] - mom	1=In progress
3041	190.01	0	LD0.DARREC1.PrgRec.stVal	AR in progress [.stVal] - MCD	
3042	190.02	0	LD0.DARREC1.PrgRec1.stVal	AR in progress 1st reclose[.stVal] - mom	1=In progress
3043	190.03	0	LD0.DARREC1.PrgRec1.stVal	AR in progress 1st reclose[.stVal] - MCD	
3044	190.04	0	LD0.DARREC1.PrgRec2.stVal	AR in progress 2nd reclose[.stVal] - mom	1=In progress
3045	190.05	0	LD0.DARREC1.PrgRec2.stVal	AR in progress 2nd reclose[.stVal] - MCD	
3046	190.06	0	LD0.DARREC1.PrgRec3.stVal	AR in progress 3rd reclose[.stVal] - mom	1=In progress
3047	190.07	0	LD0.DARREC1.PrgRec3.stVal	AR in progress 3rd reclose[.stVal] - MCD	
3048	190.08	0	LD0.DARREC1.PrgRec4.stVal	AR in progress 4th reclose[.stVal] - mom	1=In progress
3049	190.09	0	LD0.DARREC1.PrgRec4.stVal	AR in progress 4th reclose[.stVal] - MCD	
3050	190.10	0	LD0.DARREC1.PrgRec5.stVal	AR in progress 5th reclose[.stVal] - mom	1=In progress
3051	190.11	0	LD0.DARREC1.PrgRec5.stVal	AR in progress 5th reclose[.stVal] - MCD	
3052	190.12	0	LD0.DARREC1.SucRec.stVal	Successful reclose status[.stVal] - mom	1=Successful reclose
3053	190.13	0	LD0.DARREC1.SucRec.stVal	Successful reclose status[.stVal] - MCD	
3054	190.14	0	LD0.DARREC1.UnsRec.stVal	Unsuccessful reclose status[.stVal] - mom	1=Unsuccessful reclose
3055	190.15	0	LD0.DARREC1.UnsRec.stVal	Unsuccessful reclose status[.stVal] - MCD	
3056	191.00	0	LD0.DARREC1.InInhRec.stVal	Inhibit reclose (status)[.stVal] - mom	1=Reclose inhibit
3057	191.01	0	LD0.DARREC1.InInhRec.stVal	Inhibit reclose (status)[.stVal] - MCD	
3058	191.02	0	LD0.DARREC1.InBlkThm.stVal	Thermal block (status)[.stVal] - mom	1=Thermal block
3059	191.03	0	LD0.DARREC1.InBlkThm.stVal	Thermal block (status)[.stVal] - MCD	
3060	191.04	0	LD0.DARREC1.LO.stVal	Lockout status[.stVal] - mom	1=Lockout
3061	191.05	0	LD0.DARREC1.LO.stVal	Lockout status[.stVal] - MCD	
3062	191.06	0	LD0.DARREC1.RdyRec.stVal	Ready reclose status[.stVal] - mom	1=Reclose ready
3063	191.07	0	LD0.DARREC1.RdyRec.stVal	Ready reclose status[.stVal] - MCD	
3064	191.08	0	LD0.DARREC1.ActRec.stVal	Active reclose status[.stVal] - mom	1=Reclose active
3065	191.09	0	LD0.DARREC1.ActRec.stVal	Active reclose status[.stVal] - MCD	
3066	191.10	0	LD0.DARREC1.PrgDsr.stVal	Discrimination time in progress[.stVal] - mom	1=Discrimination time in progress

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Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
3067	191.11	0	LD0.DARREC1.PrgDsr.stVal	Discrimination time in progress[.stVal] - MCD	
3068	191.12	0	LD0.DARREC1.PrgCutOut.stVal	Cutout time in progress[.stVal] - mom	1=Cutout time in progress
3069	191.13	0	LD0.DARREC1.PrgCutOut.stVal	Cutout time in progress[.stVal] - MCD	
3070	191.14	0	LD0.DARREC1.FrqOpAlm.stVal	Frequent operation counter alarm[.stVal] - mom	1=Frequent operation alarm
3071	191.15	0	LD0.DARREC1.FrqOpAlm.stVal	Frequent operation counter alarm[.stVal] - MCD	
3072	192.00	0	LD0.DARREC1.RclTmStr.stVal	Reclaim time started[.stVal] - mom	1=Reclaim time started
3073	192.01	0	LD0.DARREC1.RclTmStr.stVal	Reclaim time started[.stVal] - MCD	
3074	192.02	0	LD0.DARREC1.ProCrd.stVal	Protection coordination[.stVal] - mom	1=Protection coordination
3075	192.03	0	LD0.DARREC1.ProCrd.stVal	Protection coordination[.stVal] - MCD	
3076	192.04	0	LD0.DARREC1.CBManCls.stVal	CB manually closed[.stVal] - mom	1=CB manually closed
3077	192.05	0	LD0.DARREC1.CBManCls.stVal	CB manually closed[.stVal] - MCD	
3078	192.06	0	LD0.DARREC1.Op.general	Operate (close command to XCBR)[.general] - mom	1=Close command to CB
3079	192.07	0	LD0.DARREC1.Op.general	Operate (close command to XCBR)[.general] - MCD	
3080	192.08	0	LD0.DARREC1.OpOpn.general	Operate (open command to XCBR)[.general] - mom	1=Open command to CB
3081	192.09	0	LD0.DARREC1.OpOpn.general	Operate (open command to XCBR)[.general] - MCD	
3082	192.10	0	LD0.DARREC1.UnsCBCls.stVal	Unsuccessful CB closing status[.stVal] - mom	1=Unsuccessful CB closing
3083	192.11	0	LD0.DARREC1.UnsCBCls.stVal	Unsuccessful CB closing status[.stVal] - MCD	
3084	192.12	0	LD0.DARREC1.WfMstr.stVal	Master signal to follower[.stVal] - mom	1=Master signal to follower
3085	192.13	0	LD0.DARREC1.WfMstr.stVal	Master signal to follower[.stVal] - MCD	
3086	192.14			(reserved)	0
3087	192.15			(reserved)	0
Phase overvoltage protection (3 stages), FE06					
3088	193.00	0	LD0.PHPTOV1.Str.general	Stage 1 Start[.general] - mom	1=Stage1 start
3089	193.01	0	LD0.PHPTOV1.Str.general	Stage 1 Start[.general] - MCD	
3090	193.02	0	LD0.PHPTOV1.Str.phsA	Stage 1 Start[.phsA] - mom	1=Stage1 phsA start
3091	193.03	0	LD0.PHPTOV1.Str.phsA	Stage 1 Start[.phsA] - MCD	
3092	193.04	0	LD0.PHPTOV1.Str.phsB	Stage 1 Start[.phsB] - mom	1=Stage1 phsB start
3093	193.05	0	LD0.PHPTOV1.Str.phsB	Stage 1 Start[.phsB] - MCD	
3094	193.06	0	LD0.PHPTOV1.Str.phsC	Stage 1 Start[.phsC] - mom	1=Stage1 phsC start
3095	193.07	0	LD0.PHPTOV1.Str.phsC	Stage 1 Start[.phsC] - MCD	
3096	193.08	0	LD0.PHPTOV1.Op.general	Stage 1 Operate[.general] - mom	1=Stage1 operate
3097	193.09	0	LD0.PHPTOV1.Op.general	Stage 1 Operate[.general] - MCD	
3098	193.10	0	LD0.PHPTOV2.Str.general	Stage 2 Start[.general] - mom	1=Stage2 start
3099	193.11	0	LD0.PHPTOV2.Str.general	Stage 2 Start[.general] - MCD	
3100	193.12	0	LD0.PHPTOV2.Str.phsA	Stage 2 Start[.phsA] - mom	1=Stage2 phsA start
3101	193.13	0	LD0.PHPTOV2.Str.phsA	Stage 2 Start[.phsA] - MCD	
3102	193.14	0	LD0.PHPTOV2.Str.phsB	Stage 2 Start[.phsB] - mom	1=Stage2 phsB start
3103	193.15	0	LD0.PHPTOV2.Str.phsB	Stage 2 Start[.phsB] - MCD	
3104	194.00	0	LD0.PHPTOV2.Str.phsC	Stage 2 Start[.phsC] - mom	1=Stage2 phsC start

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Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
3105	194.01	0	LD0.PHPTOV2.Str.phsC	Stage 2 Start[.phsC] - MCD	
3106	194.02	0	LD0.PHPTOV2.Op.general	Stage 2 Operate[.general] - mom	1=Stage2 operate
3107	194.03	0	LD0.PHPTOV2.Op.general	Stage 2 Operate[.general] - MCD	
3108	194.04	0	LD0.PHPTOV3.Str.general	Stage 3 Start[.general] - mom	1=Stage3 start
3109	194.05	0	LD0.PHPTOV3.Str.general	Stage 3 Start[.general] - MCD	
3110	194.06	0	LD0.PHPTOV3.Str.phsA	Stage 3 Start[.phsA] - mom	1=Stage3 phsA start
3111	194.07	0	LD0.PHPTOV3.Str.phsA	Stage 3 Start[.phsA] - MCD	
3112	194.08	0	LD0.PHPTOV3.Str.phsB	Stage 3 Start[.phsB] - mom	1=Stage3 phsB start
3113	194.09	0	LD0.PHPTOV3.Str.phsB	Stage 3 Start[.phsB] - MCD	
3114	194.10	0	LD0.PHPTOV3.Str.phsC	Stage 3 Start[.phsC] - mom	1=Stage3 phsC start
3115	194.11	0	LD0.PHPTOV3.Str.phsC	Stage 3 Start[.phsC] - MCD	
3116	194.12	0	LD0.PHPTOV3.Op.general	Stage 3 Operate[.general] - mom	1=Stage3 operate
3117	194.13	0	LD0.PHPTOV3.Op.general	Stage 3 Operate[.general] - MCD	
			Positive sequence undervoltage protection (1 stage), FE06		
3118	194.14	0	LD0.PSPTUV1.Str.general	Stage 1 Start[.general] - mom	1=Stage1 start
3119	194.15	0	LD0.PSPTUV1.Str.general	Stage 1 Start[.general] - MCD	
3120	195.00	0	LD0.PSPTUV1.Str.phsA	Stage 1 Start[.phsA] - mom	1=Stage1 phsA start
3121	195.01	0	LD0.PSPTUV1.Str.phsA	Stage 1 Start[.phsA] - MCD	
3122	195.02	0	LD0.PSPTUV1.Str.phsB	Stage 1 Start[.phsB] - mom	1=Stage1 phsB start
3123	195.03	0	LD0.PSPTUV1.Str.phsB	Stage 1 Start[.phsB] - MCD	
3124	195.04	0	LD0.PSPTUV1.Str.phsC	Stage 1 Start[.phsC] - mom	1=Stage1 phsC start
3125	195.05	0	LD0.PSPTUV1.Str.phsC	Stage 1 Start[.phsC] - MCD	
3126	195.06	0	LD0.PSPTUV1.Op.general	Stage 1 Operate[.general] - mom	1=Stage1 operate
3127	195.07	0	LD0.PSPTUV1.Op.general	Stage 1 Operate[.general] - MCD	
			Negative sequence overvoltage (1 stage), FE06		
3128	195.08	0	LD0.NSPTOV1.Str.general	Stage 1 Start[.general] - mom	1=Stage1 start
3129	195.09	0	LD0.NSPTOV1.Str.general	Stage 1 Start[.general] - MCD	
3130	195.10	0	LD0.NSPTOV1.Str.phsA	Stage 1 Start[.phsA] - mom	1=Stage1 phsA start
3131	195.11	0	LD0.NSPTOV1.Str.phsA	Stage 1 Start[.phsA] - MCD	
3132	195.12	0	LD0.NSPTOV1.Str.phsB	Stage 1 Start[.phsB] - mom	1=Stage1 phsB start
3133	195.13	0	LD0.NSPTOV1.Str.phsB	Stage 1 Start[.phsB] - MCD	
3134	195.14	0	LD0.NSPTOV1.Str.phsC	Stage 1 Start[.phsC] - mom	1=Stage1 phsC start
3135	195.15	0	LD0.NSPTOV1.Str.phsC	Stage 1 Start[.phsC] - MCD	
3136	196.00	0	LD0.NSPTOV1.Op.general	Stage 1 Operate[.general] - mom	1=Stage1 operate
3137	196.01	0	LD0.NSPTOV1.Op.general	Stage 1 Operate[.general] - MCD	
			Phase undervoltage protection (3 stages), FE06		
3138	196.02	0	LD0.PHPTUV1.Str.general	Stage 1 Start[.general] - mom	1=Stage1 start
3139	196.03	0	LD0.PHPTUV1.Str.general	Stage 1 Start[.general] - MCD	
3140	196.04	0	LD0.PHPTUV1.Str.phsA	Stage 1 Start[.phsA] - mom	1=Stage1 phsA start

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Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
3141	196.05	0	LD0.PHPTUV1.Str.phsA	Stage 1 Start[.phsA] - MCD	
3142	196.06	0	LD0.PHPTUV1.Str.phsB	Stage 1 Start[.phsB] - mom	1=Stage1 phsB start
3143	196.07	0	LD0.PHPTUV1.Str.phsB	Stage 1 Start[.phsB] - MCD	
3144	196.08	0	LD0.PHPTUV1.Str.phsC	Stage 1 Start[.phsC] - mom	1=Stage1 phsC start
3145	196.09	0	LD0.PHPTUV1.Str.phsC	Stage 1 Start[.phsC] - MCD	
3146	196.10	0	LD0.PHPTUV1.Op.general	Stage 1 Operate[.general] - mom	1=Stage1 operate
3147	196.11	0	LD0.PHPTUV1.Op.general	Stage 1 Operate[.general] - MCD	
3148	196.12	0	LD0.PHPTUV2.Str.general	Stage 2 Start[.general] - mom	1=Stage2 start
3149	196.13	0	LD0.PHPTUV2.Str.general	Stage 2 Start[.general] - MCD	
3150	196.14	0	LD0.PHPTUV2.Str.phsA	Stage 2 Start[.phsA] - mom	1=Stage2 phsA start
3151	196.15	0	LD0.PHPTUV2.Str.phsA	Stage 2 Start[.phsA] - MCD	
3152	197.00	0	LD0.PHPTUV2.Str.phsB	Stage 2 Start[.phsB] - mom	1=Stage2 phsB start
3153	197.01	0	LD0.PHPTUV2.Str.phsB	Stage 2 Start[.phsB] - MCD	
3154	197.02	0	LD0.PHPTUV2.Str.phsC	Stage 2 Start[.phsC] - mom	1=Stage2 phsC start
3155	197.03	0	LD0.PHPTUV2.Str.phsC	Stage 2 Start[.phsC] - MCD	
3156	197.04	0	LD0.PHPTUV2.Op.general	Stage 2 Operate[.general] - mom	1=Stage2 operate
3157	197.05	0	LD0.PHPTUV2.Op.general	Stage 2 Operate[.general] - MCD	
3158	197.06	0	LD0.PHPTUV3.Str.general	Stage 3 Start[.general] - mom	1=Stage3 start
3159	197.07	0	LD0.PHPTUV3.Str.general	Stage 3 Start[.general] - MCD	
3160	197.08	0	LD0.PHPTUV3.Str.phsA	Stage 3 Start[.phsA] - mom	1=Stage3 phsA start
3161	197.09	0	LD0.PHPTUV3.Str.phsA	Stage 3 Start[.phsA] - MCD	
3162	197.10	0	LD0.PHPTUV3.Str.phsB	Stage 3 Start[.phsB] - mom	1=Stage3 phsB start
3163	197.11	0	LD0.PHPTUV3.Str.phsB	Stage 3 Start[.phsB] - MCD	
3164	197.12	0	LD0.PHPTUV3.Str.phsC	Stage 3 Start[.phsC] - mom	1=Stage3 phsC start
3165	197.13	0	LD0.PHPTUV3.Str.phsC	Stage 3 Start[.phsC] - MCD	
3166	197.14	0	LD0.PHPTUV3.Op.general	Stage 3 Operate[.general] - mom	1=Stage3 operate
3167	197.15	0	LD0.PHPTUV3.Op.general	Stage 3 Operate[.general] - MCD	
				Residual overvoltage protection (3 stages) FE06	
3168	198.00	0	LD0.ROVPTOV1.Str.general	Stage 1 Start[.general] - mom	1=Stage1 start
3169	198.01	0	LD0.ROVPTOV1.Str.general	Stage 1 Start[.general] - MCD	
3170	198.02	0	LD0.ROVPTOV1.Op.general	Stage 1 Operate[.general] - mom	1=Stage1 operate
3171	198.03	0	LD0.ROVPTOV1.Op.general	Stage 1 Operate[.general] - MCD	
3172	198.04	0	LD0.ROVPTOV2.Str.general	Stage 2 Start[.general] - mom	1=Stage2 start
3173	198.05	0	LD0.ROVPTOV2.Str.general	Stage 2 Start[.general] - MCD	
3174	198.06	0	LD0.ROVPTOV2.Op.general	Stage 2 Operate[.general] - mom	1=Stage2 operate
3175	198.07	0	LD0.ROVPTOV2.Op.general	Stage 2 Operate[.general] - MCD	
3176	198.08	0	LD0.ROVPTOV3.Str.general	Stage 3 Start[.general] - mom	1=Stage3 start
3177	198.09	0	LD0.ROVPTOV3.Str.general	Stage 3 Start[.general] - MCD	
3178	198.10	0	LD0.ROVPTOV3.Op.general	Stage 3 Operate[.general] - mom	1=Stage3 operate

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Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
3179	198.11	0	LD0.ROVPTOV3.Op.general	Stage 3 Operate[.general] - MCD	
3180	198.12			(reserved)	0
3181	198.13			(reserved)	0
3182	198.14			(reserved)	0
3183	198.15			(reserved)	0
			Physical I/O signal states (BIO-card X130)		
3184	199.00	1	LD0.XGGIO130.Ind1.stVal	X130-Input 1[.stVal] - mom	1=ON, 0=OFF
3185	199.01	1	LD0.XGGIO130.Ind1.stVal	X130-Input 1[.stVal] - MCD	
3186	199.02	1	LD0.XGGIO130.Ind2.stVal	X130-Input 2[.stVal] - mom	1=ON, 0=OFF
3187	199.03	1	LD0.XGGIO130.Ind2.stVal	X130-Input 2[.stVal] - MCD	
3188	199.04	1	LD0.XGGIO130.Ind3.stVal	X130-Input 3[.stVal] - mom	1=ON, 0=OFF
3189	199.05	1	LD0.XGGIO130.Ind3.stVal	X130-Input 3[.stVal] - MCD	
3190	199.06	1	LD0.XGGIO130.Ind4.stVal	X130-Input 4[.stVal] - mom	1=ON, 0=OFF
3191	199.07	1	LD0.XGGIO130.Ind4.stVal	X130-Input 4[.stVal] - MCD	
3192	199.08	1	LD0.XGGIO130.Ind5.stVal	X130-Input 5[.stVal] - mom	1=ON, 0=OFF
3193	199.09	1	LD0.XGGIO130.Ind5.stVal	X130-Input 5[.stVal] - MCD	
3194	199.10	1	LD0.XGGIO130.Ind6.stVal	X130-Input 6[.stVal] - mom	1=ON, 0=OFF
3195	199.11	1	LD0.XGGIO130.Ind6.stVal	X130-Input 6[.stVal] - MCD	
3196	199.12			(reserved)	0
3197	199.13			(reserved)	0
3198	199.14			(reserved)	0
3199	199.15			(reserved)	0
			Physical I/O signal states (AIM-card X120)		
3200	200.00	1	LD0.XGGIO120.Ind1.stVal	X120-Input 1[.stVal] - mom	1=ON, 0=OFF
3201	200.01	1	LD0.XGGIO120.Ind1.stVal	X120-Input 1[.stVal] - MCD	
3202	200.02	1	LD0.XGGIO120.Ind2.stVal	X120-Input 2[.stVal] - mom	1=ON, 0=OFF
3203	200.03	1	LD0.XGGIO120.Ind2.stVal	X120-Input 2[.stVal] - MCD	
3204	200.04	1	LD0.XGGIO120.Ind3.stVal	X120-Input 3[.stVal] - mom	1=ON, 0=OFF
3205	200.05	1	LD0.XGGIO120.Ind3.stVal	X120-Input 3[.stVal] - MCD	
3206	200.06	1	LD0.XGGIO120.Ind4.stVal	X120-Input 4[.stVal] - mom	1=ON, 0=OFF
3207	200.07	1	LD0.XGGIO120.Ind4.stVal	X120-Input 4[.stVal] - MCD	
3208	200.08			(reserved)	0
3209	200.09			(reserved)	0
3210	200.10			(reserved)	0
3211	200.11			(reserved)	0
3212	200.12			(reserved)	0
3213	200.13			(reserved)	0
3214	200.14			(reserved)	0
3215	200.15			(reserved)	0

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Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
Physical I/O signal states (BIO-card X110)					
3216	201.00	1	LD0.XGGIO110.Ind1.stVal	X110-Input 1[.stVal] - mom	1=ON, 0=OFF
3217	201.01	1	LD0.XGGIO110.Ind1.stVal	X110-Input 1[.stVal] - MCD	
3218	201.02	1	LD0.XGGIO110.Ind2.stVal	X110-Input 2[.stVal] - mom	1=ON, 0=OFF
3219	201.03	1	LD0.XGGIO110.Ind2.stVal	X110-Input 2[.stVal] - MCD	
3220	201.04	1	LD0.XGGIO110.Ind3.stVal	X110-Input 3[.stVal] - mom	1=ON, 0=OFF
3221	201.05	1	LD0.XGGIO110.Ind3.stVal	X110-Input 3[.stVal] - MCD	
3222	201.06	1	LD0.XGGIO110.Ind4.stVal	X110-Input 4[.stVal] - mom	1=ON, 0=OFF
3223	201.07	1	LD0.XGGIO110.Ind4.stVal	X110-Input 4[.stVal] - MCD	
3224	201.08	1	LD0.XGGIO110.Ind5.stVal	X110-Input 5[.stVal] - mom	1=ON, 0=OFF
3225	201.09	1	LD0.XGGIO110.Ind5.stVal	X110-Input 5[.stVal] - MCD	
3226	201.10	1	LD0.XGGIO110.Ind6.stVal	X110-Input 6[.stVal] - mom	1=ON, 0=OFF
3227	201.11	1	LD0.XGGIO110.Ind6.stVal	X110-Input 6[.stVal] - MCD	
3228	201.12	1	LD0.XGGIO110.Ind7.stVal	X110-Input 7[.stVal] - mom	1=ON, 0=OFF
3229	201.13	1	LD0.XGGIO110.Ind7.stVal	X110-Input 7[.stVal] - MCD	
3230	201.14	1	LD0.XGGIO110.Ind8.stVal	X110-Input 8[.stVal] - mom	1=ON, 0=OFF
3231	201.15	1	LD0.XGGIO110.Ind8.stVal	X110-Input 8[.stVal] - MCD	
3232	202.00	0	LD0.XGGIO110.SPCSO1.stVal	X110-Output 1[.stVal] - mom	1=ON, 0=OFF
3233	202.01	0	LD0.XGGIO110.SPCSO1.stVal	X110-Output 1[.stVal] - MCD	
3234	202.02	0	LD0.XGGIO110.SPCSO2.stVal	X110-Output 2[.stVal] - mom	1=ON, 0=OFF
3235	202.03	0	LD0.XGGIO110.SPCSO2.stVal	X110-Output 2[.stVal] - MCD	
3236	202.04	0	LD0.XGGIO110.SPCSO3.stVal	X110-Output 3[.stVal] - mom	1=ON, 0=OFF
3237	202.05	0	LD0.XGGIO110.SPCSO3.stVal	X110-Output 3[.stVal] - MCD	
3238	202.06	0	LD0.XGGIO110.SPCSO4.stVal	X110-Output 4[.stVal] - mom	1=ON, 0=OFF
3239	202.07	0	LD0.XGGIO110.SPCSO4.stVal	X110-Output 4[.stVal] - MCD	
3240	202.08			(reserved)	0
3241	202.09			(reserved)	0
3242	202.10			(reserved)	0
3243	202.11			(reserved)	0
3244	202.12			(reserved)	0
3245	202.13			(reserved)	0
3246	202.14			(reserved)	0
3247	202.15			(reserved)	0
Physical I/O signal states (PSM-card X100)					
3248	203.00	0	LD0.XGGIO100.SPCSO1.stVal	X100-Output 1[.stVal] - mom	1=ON, 0=OFF
3249	203.01	0	LD0.XGGIO100.SPCSO1.stVal	X100-Output 1[.stVal] - MCD	
3250	203.02	0	LD0.XGGIO100.SPCSO2.stVal	X100-Output 2[.stVal] - mom	1=ON, 0=OFF
3251	203.03	0	LD0.XGGIO100.SPCSO2.stVal	X100-Output 2[.stVal] - MCD	
3252	203.04	0	LD0.XGGIO100.SPCSO3.stVal	X100-Output 3[.stVal] - mom	1=ON, 0=OFF

Table continues on next page

Bit addr	Reg.bit	Dc	IEC 61850 name	Description	Value range
3253	203.05	0	LD0.XGGIO100.SPCSO3.stVal	X100-Output 3[.stVal] - MCD	
3254	203.06	0	LD0.XGGIO100.SPCSO4.stVal	X100-Output 4[.stVal] - mom	1=ON, 0=OFF
3255	203.07	0	LD0.XGGIO100.SPCSO4.stVal	X100-Output 4[.stVal] - MCD	
3256	203.08	0	LD0.XGGIO100.SPCSO5.stVal	X100-Output 5[.stVal] - mom	1=ON, 0=OFF
3257	203.09	0	LD0.XGGIO100.SPCSO5.stVal	X100-Output 5[.stVal] - MCD	
3258	203.10	0	LD0.XGGIO100.SPCSO6.stVal	X100-Output 6[.stVal] - mom	1=ON, 0=OFF
3259	203.11	0	LD0.XGGIO100.SPCSO6.stVal	X100-Output 6[.stVal] - MCD	
3260	203.12			(reserved)	0
3261	203.13			(reserved)	0
3262	203.14			(reserved)	0
3263	203.15			(reserved)	0
Physical I/O signal states (BIO-card X130)					
3264	204.00	0	LD0.XGGIO130.SPCSO1.stVal	X130-Output 1[.stVal] - mom	1=ON, 0=OFF
3265	204.01	0	LD0.XGGIO130.SPCSO1.stVal	X130-Output 1[.stVal] - MCD	
3266	204.02	0	LD0.XGGIO130.SPCSO2.stVal	X130-Output 2[.stVal] - mom	1=ON, 0=OFF
3267	204.03	0	LD0.XGGIO130.SPCSO2.stVal	X130-Output 2[.stVal] - MCD	
3268	204.04	0	LD0.XGGIO130.SPCSO3.stVal	X130-Output 3[.stVal] - mom	1=ON, 0=OFF
3269	204.05	0	LD0.XGGIO130.SPCSO3.stVal	X130-Output 3[.stVal] - MCD	
Physical I/O signal states (AIM-card XA130)					
3280	205.00		LD0.XAGGIO130.Ind1.stVal	XA130-Input 1 - mom	1=ON, 0=OFF
3281	205.01		LD0.XAGGIO130.Ind1.stVal	XA130-Input 1[.stVal] - MCD	
3282	205.02		LD0.XAGGIO130.Ind2.stVal	XA130-Input 2 - mom	1=ON, 0=OFF
3283	205.03		LD0.XAGGIO130.Ind2.stVal	XA130-Input 2[.stVal] - MCD	
3284	205.04		LD0.XAGGIO130.Ind3.stVal	XA130-Input 3 - mom	1=ON, 0=OFF
3285	205.05		LD0.XAGGIO130.Ind3.stVal	XA130-Input 3[.stVal] - MCD	
3286	205.06		LD0.XAGGIO130.Ind4.stVal	XA130-Input 4 - mom	1=ON, 0=OFF
3287	205.07		LD0.XAGGIO130.Ind4.stVal	XA130-Input 4[.stVal] - MCD	

Table 4: ***Controls***

0x addr	Ctrl struct	Ctrl bit	Mode	Identification	Description
2048	1	0	Uns	CTRL.CBCSWI1.Pos.ctlVal	CBXCBR1 - Switch, general - Open
2049	1	1	Uns	CTRL.CBCSWI1.Pos.ctlVal	CBXCBR1 - Switch, general - Close
2050	1	2	Uns	CTRL.CBCSWI1.Pos.ctlVal	CBXCBR1 - Switch, general - Cancel
2051	1	3	Uns	CTRL.CBCSWI1.Pos.ctlVal	CBXCBR1 - Switch, general - Operate
2052	1	4	Uns	CTRL.CBCSWI1.Pos.ctlVal	CBXCBR1 - Switch, general - Direct open
2053	1	5	Uns	CTRL.CBCSWI1.Pos.ctlVal	CBXCBR1 - Switch, general - Direct close
2060	2	0	Uns	LD0.LLN0.LEDRs1.ctlVal	General - Indications and LEDs - 1=Activate
2061	2	1	Uns	LD0.LLN0.LEDRs2.ctlVal	General - Alarm LEDs - 1=Activate
2062	2	2	Uns	LD0.LLN0.RecRs.ctlVal	General - All data - 1=Activate
2063	2	3	Uns	LD0.DARREC1.RsRec.ctlVal	Reset reclosing - 1=Activate
2064	2	4	Uns	LD0.DARREC1.RsCnt.ctlVal	Reset reclosing counters - 1=Activate
2065	2	5	Uns	LD0.SSCBR1.RsAccAPwr.ctlVal	Reset accumulation energy - 1=Activate
2066	2	6	Uns	LD0.SSCBR1.RsCBWear.ctlVal	Reset input for CB remaining life and operation counter - 1=Activate
2067	2	7	Uns	DR.RDRE1.RcdTrg.ctlVal	Disturbance recorder - Trig recording - 1=Activate
2068	2	8	Uns	DR.RDRE1.MemClr.ctlVal	Disturbance recorder - Disturbance records - 1=Activate
2069	2	9	Uns	LD0.CMSTA1.RecRs.ctlVal	CMMXU1 - CMMXU1 max.demands - 1=Reset
2070	2	10	Uns	LD0.PEMMXU1.SupDmdRs.ctlVal	Reset accumulated energy - 1=Reset
2071	2	11	Uns	LD0.SCCBR1.RsTrvTm.ctlVal	Reset travelling time alarm - 1=Reset
2072	2	12	Uns	LD0.SCCBR1.RsSprChaTm.ctlVal	Reset spring charge time alarm - 1=Reset
2073					(reserved)
2074					(reserved)
2075					(reserved)
2076					(reserved)
2077					(reserved)
2078					(reserved)
2079					(reserved)
2080	3	0	Uns	LD0.LPHD1.RsDev.ctlVal	Physical device - Reset device - 1=Activate

Section 3 Glossary

AFL	Application function block library
AIM	Analog input module
AR	Autoreclosure
BIO	Binary input and output
CB	Circuit breaker
CPM	Communication protocol manual
DR	Disturbance recorder
EMC	Electromagnetic compatibility
HMI	Human-machine interface
I/O	Input/output
ID	Identifier or identification
IEC	International Electrotechnical Commission
IEC 61850	International standard for substation communication and modelling
IED	Intelligent electronic device
LED	Light-emitting diode
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.
PLC	Programmable logic controller
PSM	Power supply module
SW	Software
TCS	Trip-circuit supervision
UTC	Coordinated universal time

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