



Relion® 620 series

Feeder Protection and Control REF620 ANSI DNP3 Point List Manual



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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 and ANSI C37.90. The DNP protocol implementation in the IED conforms to "DNP3 Intelligent Electronic Device (IED) Certification Procedure Subset Level 2", available at www.dnp.org.

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Section 1 Introduction

1.1 This manual

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

1.2 Intended audience

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

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

1.3 Product documentation

1.3.1 Product documentation set

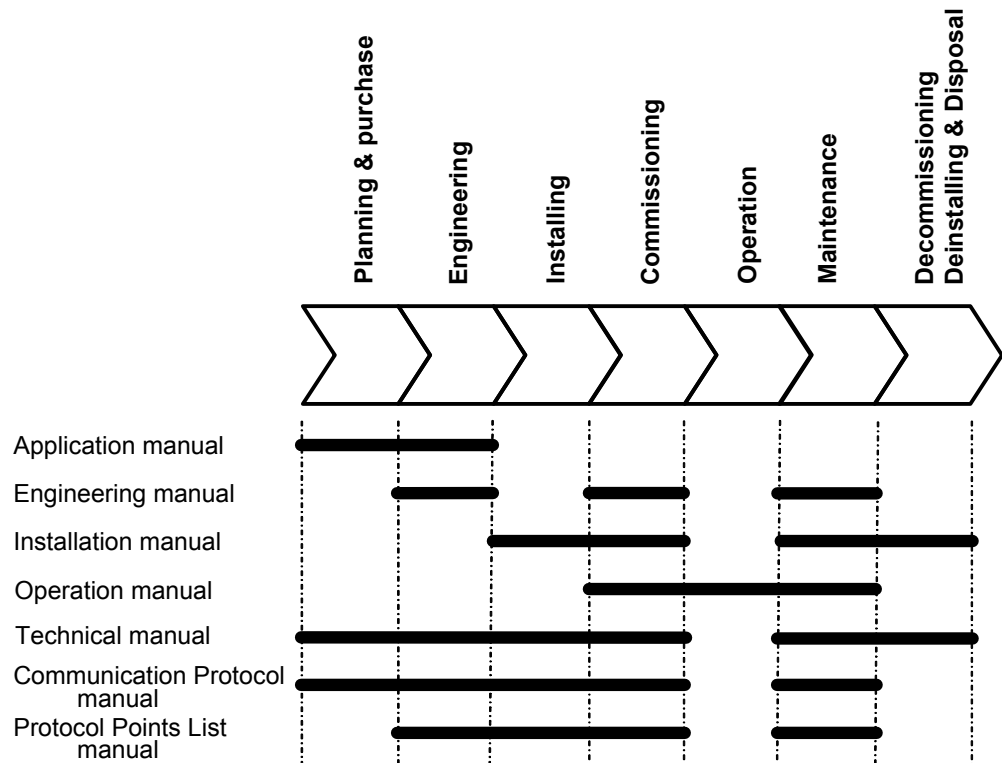


Figure 1: The intended use of manuals in different life cycles

The engineering manual contains instructions on how to engineer the IEDs using the different tools in PCM600. The manual provides instructions on how to set up a PCM600 project and insert IEDs 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 IED. The manual provides procedures for mechanical and electrical installation. The chapters are organized in chronological order in which the IED should be installed.

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

1.3.2 Document revision history

Document revision/date	Product version	History
A/10/26/2012	2.0	First release



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

1.3.3 Related documentation

Name of the document	Document ID
DNP3 Communication Protocol Manual	1MAC505978-IB

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 IED 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 `Yes` 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".
- IED 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: REF620 functions, codes and symbols

Function	IEC61850	ANSI/C37.2	IEC60617
Protection			
Three-phase non-directional overcurrent protection, low stage, instance 1	PHLPTOC1	51P	3I> (1)
Three-phase non-directional overcurrent protection, high stage, instance 1	PHHPTOC1	50P-1	3I>> (1)
Three-phase non-directional overcurrent protection, high stage, instance 2	PHHPTOC2	50P-2	3I>> (2)
Three-phase non-directional overcurrent protection, instantaneous stage, instance 1	PHIPTOC1	50P-3	3I>>> (1)
Three-phase non-directional long time overcurrent protection, low stage, instance 1	PHLTPTOC1	51LT	3I> (3)
Three-phase directional overcurrent protection, low stage, instance 1	DPHLPDOC1	67/51P	3I> -> (1)
Three-phase directional overcurrent protection, high stage, instance 1	DPHHPDOC1	67/50P-1	3I>> -> (1)
Three-phase directional overcurrent protection, high stage, instance 2	DPHHPDOC2	67/50P-2	3I>> -> (2)
Non-directional ground-fault protection, low stage, instance 1	EFLPTOC1	51G	Io> (1)

Function	IEC61850	ANSI/C37.2	IEC60617
Non-directional ground-fault protection, low stage, instance 2	EFLPTOC2	51N-1	lo> (2)
Non-directional ground-fault protection, low stage, instance 4	EFLPTOC4	50SEF	lo> (4)
Non-directional ground-fault protection, high stage, instance 1	EFHPTOC1	50G-1	lo>> (1)
Non-directional ground-fault protection, high stage, instance 2	EFHPTOC2	50G-2	lo>> (2)
Non-directional ground-fault protection, high stage, instance 3	EFHPTOC3	50N-1	lo>> (3)
Non-directional ground-fault protection, high stage, instance 4	EFHPTOC4	50N-2	lo>> (4)
Non-directional ground-fault protection, instantaneous stage, instance 1	EFIPTOC1	50G-3	lo>>> (1)
Non-directional ground-fault protection, instantaneous stage, instance 2	EFIPTOC2	50N-3	lo>>> (2)
Directional ground-fault protection, low stage, instance 1	DEFLPDEF1	67/51N	lo> -> (1)
Directional ground-fault protection, high stage, instance 1	DEFHPDEF1	67/50N-1	lo>> -> (1)
Directional ground-fault protection, high stage, instance 2	DEFHPDEF2	67/50N-2	lo>> -> (2)
Three phase directional power protection, instance 1	DPSRDIR1	32P-1	I1-> (1)
Ground directional power protection, instance 1	DNZSRDIR1	32N-1	I2 ->, lo-> (1)
Phase distance protection, instance 1	PHDSTPDIS1	21P	Z<
Negative-sequence overcurrent protection, instance 1	NSPTOC1	46-1	I2> (1)
Negative-sequence overcurrent protection, instance 2	NSPTOC2	46-2	I2> (2)
Phase discontinuity protection	PDNSPTOC1	46PD	I2/I1>
Residual overvoltage protection, instance 1	ROVPTOV1	59G	Uo> (1)
Residual overvoltage protection, instance 2	ROVPTOV2	59N-1(1)	Uo> (2)
Residual overvoltage protection, instance 3	ROVPTOV3	59N-1(2)	Uo> (3)
Three-phase undervoltage protection, instance 1	PHPTUV1	27-1(1)	3U< (1)
Three-phase undervoltage protection, instance 2	PHPTUV2	27-2(1)	3U< (2)
Three-phase undervoltage protection, instance 3	PHPTUV3	27-1(2)	3U< (3)
Three-phase undervoltage protection, instance 4	PHPTUV4	27-2(2)	3U< (4)
Three-phase overvoltage protection, instance 1	PHPTOV1	59-1(1)	3U> (1)
Three-phase overvoltage protection, instance 2	PHPTOV2	59-2(1)	3U> (2)
Three-phase overvoltage protection, instance 3	PHPTOV3	59-1(2)	3U> (3)
Three-phase overvoltage protection, instance 4	PHPTOV4	59-2(2)	3U> (4)
Negative-sequence overvoltage protection, instance 1	NSPTOV1	47-1(1)	U2> (1)
Negative-sequence overvoltage protection, instance 2	NSPTOV2	47-2(1)	U2> (2)
Negative-sequence overvoltage protection, instance 3	NSPTOV3	47-1(2)	U2> (3)
Negative-sequence overvoltage protection, instance 4	NSPTOV4	47-2(2)	U2> (4)
Frequency protection, instance 1	FRPFRQ1	81-1	f>/f<,df/dt (1)
Frequency protection, instance 2	FRPFRQ2	81-2	f>/f<,df/dt (2)
Voltage per hertz protection, instance 1	OEPVPH1	24	U/f> (1)
Three-phase thermal protection for feeders, cables and distribution transformers, Instance 1	T1PTTR1	49F	3Ith>F (1)

Function	IEC61850	ANSI/C37.2	IEC60617
Phase current sets summing function	CMSUM1	CSUM	CSUM
Three phase measurement switching	VMSWI1	VSWI	VSWI
Numerical stabilized low impedance restricted ground-fault protection	LREFPND1	87LOZREF	dIoLo>
Circuit breaker failure protection, instance 1	CCBRBRF1	50BF-1	3I>/Io>BF (1)
Circuit breaker failure protection, instance 2	CCBRBRF2	50BF-2	3I>/Io>BF (2)
Three-phase inrush detector, instance 1	INRPHAR1	INR	3I2f> (1)
Master trip, instance 1	TRPPTRC1	86/94-1	Master Trip (1)
Master trip, instance 2	TRPPTRC2	86/94-2	Master Trip (2)
Arc protection, instance 1	ARCSARC1	AFD-1	ARC (1)
Arc protection, instance 2	ARCSARC2	AFD-2	ARC (2)
Arc protection, instance 3	ARCSARC3	AFD-3	ARC (3)
High impedance fault detection	PHIZ1	HIZ	PHIZ1
Load shedding and restoration, instance 1	LSHDPFRQ1	81LSH-1	UFLS/R (1)
Load shedding and restoration, instance 2	LSHDPFRQ2	81LSH-2	UFLS/R (2)
Loss of phase, instance 1	PHPTUC1	37-1	3I< (1)
Control			
Circuit-breaker control, instance 1	CBXCBR1	52-1	I <-> O CB (1)
Circuit-breaker control, instance 2	CBXCBR2	52-2	I <-> O CB (2)
Auto-reclosing, instance 1	DARREC1	79-1	O -> I(1)
Auto-reclosing, instance 2	DARREC2	79-2	O -> I(2)
Synchronism and energizing check, instance 1	SECRSYN1	25-1	SYNC(1)
Synchronism and energizing check, instance 2	SECRSYN2	25-2	SYNC(2)
Synchronism and energizing check, instance 3	SECRSYN3	25-3	SYNC(3)
Condition Monitoring			
Circuit-breaker condition monitoring, instance 1	SSCBR1	52CM-1	CBCM (1)
Circuit-breaker condition monitoring, instance 2	SSCBR2	52CM-2	CBCM (2)
Trip circuit supervision, instance 1	TCSSCBR1	TCM-1	TCS (1)
Trip circuit supervision, instance 2	TCSSCBR2	TCM-2	TCS (2)
Current circuit supervision	CCRDIF1	CCM	MCS 3I
Fuse failure supervision, instance 1	SEQRUF1	60-1	FUSEF (1)
Fuse failure supervision, instance 2	SEQRUF2	60-2	FUSEF (2)
Cable fault detection	RCFD1	CFD	CFD
Measurement			
Three-phase current measurement, instance 1	CMMXU1	IA, IB, IC	3I
Sequence current measurement, instance 1	CSMSQI1	I1, I2, I0	I1, I2, I0
Residual current measurement, instance 1	RESCMMXU1	IG	Io
Three-phase voltage measurement, instance 1	VMMXU1	VA, VB, VC	3U
Three-phase voltage measurement, instance 2	VMMXU2	VA, VB, VC (2)	3U(B)
Residual voltage measurement	RESVMMXU1	VG	Uo

Function	IEC61850	ANSI/C37.2	IEC60617
Sequence voltage measurement, instance 1	VSMSQI1	V1, V2, V0	U1, U2, U0
Sequence voltage measurement, instance 2	VSMSQI2	V1, V2, V0 (2)	U1, U2, U0(B)
Single-phase power and energy measurement, instance 1	SPEMMXU1	SP, SE	SP, SE
Three-phase power and energy measurement, instance 1	PEMMXU1	P, E	P, E
Current total demand distortion, instance 1	CMHAI1	PQI-1	PQM3I
Voltage total harmonic distortion, instance 1	VMHAI1	PQVPH-1	PQM3U(1)
Voltage total harmonic distortion, instance 2	VMHAI2	PQVPH-2	PQM3U(2)
Voltage variation, instance 1	PHQVVR1	PQSS-1	PQ 3U<>(1)
Voltage unbalance, instance 1	VSQVUB1	PQVUB-1	PQMUBU(1)
Voltage unbalance, instance 2	VSQVUB2	PQVUB-2	PQMUBU(2)
Load profile	LDPMSTA1	LoadProf	LoadProf
Frequency measurement	FMMXU1	f	f
Recorder			
Disturbance recorder	RDRE1	DFR	DR
Fault recorder	FLTMSTA1	FR	FR
Sequence event recorder	SER	SER	SER
Fault location	DRFLO	FLO	DRFLO
Other Functions			
Minimum pulse timer (2 pcs), instance 1	TPGAPC1	TP-1	TP (1)
Minimum pulse timer (2 pcs), instance 2	TPGAPC2	TP-2	TP (2)
Minimum pulse timer (2 pcs), instance 3	TPGAPC3	TP-3	TP (3)
Minimum pulse timer (2 pcs), instance 4	TPGAPC4	TP-4	TP (4)
Minimum pulse timer (2 pcs, second resolution), instance 1	TPSGAPC1	62CLD-1	TPS (1)
Minimum pulse timer (2 pcs, second resolution), instance 2	TPSGAPC2	62CLD-3	TPS (2)
Minimum pulse timer (2 pcs, minute resolution), instance 1	TPMGAPC1	62CLD-2	TPM (1)
Minimum pulse timer (2 pcs, minute resolution), instance 2	TPMGAPC2	62CLD-4	TPM (2)
Pulse timer (8 pcs), instance 1	PTGAPC1	PT-1	PT (1)
Pulse timer (8 pcs), instance 2	PTGAPC2	PT-2	PT (2)
Time delay off (8 pcs), instance 1	TOFGAPC1	TOF-1	TOF (1)
Time delay off (8 pcs), instance 2	TOFGAPC2	TOF-2	TOF (2)
Time delay off (8 pcs), instance 3	TOFGAPC3	TOF-3	TOF (3)
Time delay off (8 pcs), instance 4	TOFGAPC4	TOF-4	TOF (4)
Time delay on (8 pcs), instance 1	TONGAPC1	TON-1	TON (1)
Time delay on (8 pcs), instance 2	TONGAPC2	TON-2	TON (2)
Time delay on (8 pcs), instance 3	TONGAPC3	TON-3	TON (3)
Time delay on (8 pcs), instance 4	TONGAPC4	TON-4	TON (4)
Set reset (8 pcs), instance 1	SRGAPC1	SR-1	SR (1)
Set reset (8 pcs), instance 2	SRGAPC2	SR-2	SR (2)
Set reset (8 pcs), instance 3	SRGAPC3	SR-3	SR (3)

Function	IEC61850	ANSI/C37.2	IEC60617
Set reset (8 pcs), instance 4	SRGAPC4	SR-4	SR (4)
Move (8 pcs), instance 1	MVGAPC1	MV-1	MV (1)
Move (8 pcs), instance 2	MVGAPC2	MV-2	MV (2)
Move (8 pcs), instance 3	MVGAPC3	MV-3	MV (3)
Move (8 pcs), instance 4	MVGAPC4	MV-4	MV (4)
Move (8 pcs), instance 5	MVGAPC5	MV-5	MV (5)
Move (8 pcs), instance 6	MVGAPC6	MV-6	MV (6)
Move (8 pcs), instance 7	MVGAPC7	MV-7	MV (7)
Move (8 pcs), instance 8	MVGAPC8	MV-8	MV (8)
Generic control points, instance 1	SPCGGIO1	CNTRL-1	SPC(1)
Generic control points, instance 2	SPCGGIO2	CNTRL-2	SPC(2)
Generic control points, instance 3	SPCGGIO3	CNTRL-3	SPC(3)
Remote Generic control points, instance 1	SPCRGGIO1	RCNTRL-1	SPCR(1)
Local Generic control points, instance 1	SPCLGGIO1	LCNTRL-1	SPCL(1)
Generic Up-Down Counters, instance 1	UDFCNT1	CTR-1	CTR(1)
Generic Up-Down Counters, instance 2	UDFCNT2	CTR-2	CTR(2)
Generic Up-Down Counters, instance 3	UDFCNT3	CTR-3	CTR(3)
Generic Up-Down Counters, instance 4	UDFCNT4	CTR-4	CTR(4)
Generic Up-Down Counters, instance 5	UDFCNT5	CTR-5	CTR(5)
Generic Up-Down Counters, instance 6	UDFCNT6	CTR-6	CTR(6)
Generic Up-Down Counters, instance 7	UDFCNT7	CTR-7	CTR(7)
Generic Up-Down Counters, instance 8	UDFCNT8	CTR-8	CTR(8)
Generic Up-Down Counters, instance 9	UDFCNT9	CTR-9	CTR(9)
Generic Up-Down Counters, instance 10	UDFCNT10	CTR-10	CTR(10)
Generic Up-Down Counters, instance 11	UDFCNT11	CTR-11	CTR(11)
Generic Up-Down Counters, instance 12	UDFCNT12	CTR-12	CTR(12)
Programmable buttons (16 buttons), instance 1	FKEYGGIO1	FKEY	FKEY

Section 2 DNP3 data mappings

2.1 Overview

This document describes the DNP3 data points and structures available in REF620 Ver. 2.0 ANSI.

The point tables show all the available DNP3 data points in this IED. The data objects in the point tables are listed based on the IEC61850 logical node name. Also the default point indexes, class assignments and scaling configurations are shown. The DNP3 points can be freely inserted, removed, reorganized and reconfigured using PCM600.

This list represents the superset of DNP3 points. The actual set of available points is determined by the IED's ordercode. A "Yes" in a "No Events" column indicates that no events can be generated for that point regardless of class assignment. A "No" in "Enabled" column indicates that the point is not active. Inactive points can be made active through PCM600.

Since only integer values are supported in DNP analog inputs, to keep two decimals of a floating point analog input (i.e. current, voltage, power), the multiplicative scaling mode is selected with default scale factor 100. For integer analog input, (i.e., counter, multiple state status), the scale factor 0 hints no scaling is taken.

2.2 Binary/Analog Inputs

Table 2: LED Status (LEDGGIO1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI		356	Class 2 and 0	Yes	Programmable LEDs Status of programmable LED 1	0	LD0.LEDGGIO1.ISCSO1.stVal
AI		357	Class 2 and 0	Yes	Programmable LEDs Status of programmable LED 2	0	LD0.LEDGGIO1.ISCSO2.stVal
AI		358	Class 2 and 0	Yes	Programmable LEDs Status of programmable LED 3	0	LD0.LEDGGIO1.ISCSO3.stVal
AI		359	Class 2 and 0	Yes	Programmable LEDs Status of programmable LED 4	0	LD0.LEDGGIO1.ISCSO4.stVal
AI		360	Class 2 and 0	Yes	Programmable LEDs Status of programmable LED 5	0	LD0.LEDGGIO1.ISCSO5.stVal
AI		361	Class 2 and 0	Yes	Programmable LEDs Status of programmable LED 6	0	LD0.LEDGGIO1.ISCSO6.stVal
AI		362	Class 2 and 0	Yes	Programmable LEDs Status of programmable LED 7	0	LD0.LEDGGIO1.ISCSO7.stVal

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DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI		363	Class 2 and 0	Yes	Programmable LEDs Status of programmable LED 8	0	LD0.LEDGGIO1.ISCSO8.stVal
AI		364	Class 2 and 0	Yes	Programmable LEDs Status of programmable LED 9	0	LD0.LEDGGIO1.ISCSO9.stVal
AI		365	Class 2 and 0	Yes	Programmable LEDs Status of programmable LED 10	0	LD0.LEDGGIO1.ISCSO10.stVal
AI		366	Class 2 and 0	Yes	Programmable LEDs Status of programmable LED 11	0	LD0.LEDGGIO1.ISCSO11.stVal

Table 3: LED Condition monitoring (LEDPTRC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		520	Class 1 and 0	Yes	Global conditioning Trip general		LD0.LEDPTRC1.Op.general
BI		521	Class 1 and 0	Yes	Global conditioning Trip phsA		LD0.LEDPTRC1.Op.phsA
BI		522	Class 1 and 0	Yes	Global conditioning Trip phsB		LD0.LEDPTRC1.Op.phsB
BI		523	Class 1 and 0	Yes	Global conditioning Trip phsC		LD0.LEDPTRC1.Op.phsC

Table 4: General Device Information (LPHD1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI	Yes	335	Class 0	Yes	Physical device Number of composition changes	0	LD0.LPHD1.NumCmpChg.stVal
AI		336	Class 2 and 0	Yes	Physical device General state	0	LD0.LPHD1.PhyHealth.stVal
AI		337	Class 2 and 0	Yes	Physical device IED warning	0	LD0.LPHD1.PhyHealth1.stVal
AI		338	Class 2 and 0	Yes	Physical device IED internal fault	0	LD0.LPHD1.PhyHealth2.stVal

Table 5: General Device Information (LLN0)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		167	Class 1 and 0	Yes	Control LLN0 Local / Remote		CTRL.LLN0.Loc.stVal
BI		524	Class 1 and 0	Yes	Protection LLN0 Settings change		LD0.LLN0.SetChg.stVal
BI		525	Class 1 and 0	Yes	Protection LLN0 Settings reservation		LD0.LLN0.SetSeld.stVal
AI		315	Class 2 and 0	Yes	Control LLN0 LR state monitoring for PCM	0	CTRL.LLN0.LocRem.stVal
AI	Yes	334	Class 0	Yes	Protection LLN0 Phase rotation order	0	LD0.LLN0.PhRotSet.setVal

Table 6: DNP Setting Group (DNPGGIO1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1110	Class 0	Yes	DNP 3.0 Activate setting group 1		LD0.DNPGGIO1.ActSG1.stVal
BI	Yes	1111	Class 0	Yes	DNP 3.0 Activate setting group 2		LD0.DNPGGIO1.ActSG2.stVal
BI	Yes	1112	Class 0	Yes	DNP 3.0 Activate setting group 3		LD0.DNPGGIO1.ActSG3.stVal
BI	Yes	1113	Class 0	Yes	DNP 3.0 Activate setting group 4		LD0.DNPGGIO1.ActSG4.stVal

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1114	Class 0	Yes	DNP 3.0 Activate setting group 5		LD0.DNPGGIO1.ActSG5.stVal
BI	Yes	1115	Class 0	Yes	DNP 3.0 Activate setting group 6		LD0.DNPGGIO1.ActSG6.stVal

Table 7: 51P : Three-phase non-directional overcurrent protection low stage instance 1 (PHLPTOC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	444	Class 0	Yes	51P Enable signal for current multiplier		LD0.PHLPTOC1.InEnaMult.stVal
BI		445	Class 1 and 0	Yes	51P Trip		LD0.PHLPTOC1.Op.general
BI		446	Class 1 and 0	Yes	51P Trip phsA		LD0.PHLPTOC1.Op.phsA
BI		447	Class 1 and 0	Yes	51P Trip phsB		LD0.PHLPTOC1.Op.phsB
BI		448	Class 1 and 0	Yes	51P Trip phsC		LD0.PHLPTOC1.Op.phsC

Table 8: 50P-1 : Three-phase non-directional overcurrent protection high stage instance 1 (PHHPTOC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	409	Class 0	Yes	50P-1 Enable signal for current multiplier		LD0.PHHPTOC1.InEnaMult.stVal
BI		410	Class 1 and 0	Yes	50P-1 Trip		LD0.PHHPTOC1.Op.general
BI		411	Class 1 and 0	Yes	50P-1 Trip phsA		LD0.PHHPTOC1.Op.phsA
BI		412	Class 1 and 0	Yes	50P-1 Trip phsB		LD0.PHHPTOC1.Op.phsB
BI		413	Class 1 and 0	Yes	50P-1 Trip phsC		LD0.PHHPTOC1.Op.phsC

Table 9: 50P-2 : Three-phase non-directional overcurrent protection high stage instance 2 (PHHPTOC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	414	Class 0	Yes	50P-2 Enable signal for current multiplier		LD0.PHHPTOC2.InEnaMult.stVal
BI		415	Class 1 and 0	Yes	50P-2 Trip		LD0.PHHPTOC2.Op.general
BI		416	Class 1 and 0	Yes	50P-2 Trip phsA		LD0.PHHPTOC2.Op.phsA
BI		417	Class 1 and 0	Yes	50P-2 Trip phsB		LD0.PHHPTOC2.Op.phsB
BI		418	Class 1 and 0	Yes	50P-2 Trip phsC		LD0.PHHPTOC2.Op.phsC

Table 10: 50P-3 : Three-phase non-directional overcurrent protection instantaneous stage instance 1 (PHIPTOC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	439	Class 0	Yes	50P-3 Enable signal for current multiplier		LD0.PHIPTOC1.InEnaMult.stVal
BI		440	Class 1 and 0	Yes	50P-3 Trip		LD0.PHIPTOC1.Op.general
BI		441	Class 1 and 0	Yes	50P-3 Trip phsA		LD0.PHIPTOC1.Op.phsA
BI		442	Class 1 and 0	Yes	50P-3 Trip phsB		LD0.PHIPTOC1.Op.phsB
BI		443	Class 1 and 0	Yes	50P-3 Trip phsC		LD0.PHIPTOC1.Op.phsC

Table 11: 51LT : Three-phase non-directional long time overcurrent protection lower stage instance 1 (PHLTPTOC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	459	Class 0	Yes	51LT Enable signal for current multiplier		LD0.PHLTPTOC1.InEnaMult.stVal
BI		460	Class 1 and 0	Yes	51LT Trip		LD0.PHLTPTOC1.Op.general
BI		461	Class 1 and 0	Yes	51LT Trip phsA		LD0.PHLTPTOC1.Op.phsA
BI		462	Class 1 and 0	Yes	51LT Trip phsB		LD0.PHLTPTOC1.Op.phsB
BI		463	Class 1 and 0	Yes	51LT Trip phsC		LD0.PHLTPTOC1.Op.phsC

Table 12: 67/51P : Three-phase directional overcurrent protection low stage instance 1 (DPHLPTOC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	371	Class 0	Yes	67/51P Enable signal for current multiplier		LD0.DPHLPTOC1.InEnaMult.stVal
BI		372	Class 1 and 0	Yes	67/51P Trip		LD0.DPHLPTOC1.Op.general
BI		373	Class 1 and 0	Yes	67/51P Trip phsA		LD0.DPHLPTOC1.Op.phsA
BI		374	Class 1 and 0	Yes	67/51P Trip phsB		LD0.DPHLPTOC1.Op.phsB
BI		375	Class 1 and 0	Yes	67/51P Trip phsC		LD0.DPHLPTOC1.Op.phsC

Table 13: 67/50P-1 : Three-phase directional overcurrent protection high stage instance 1 (DPHHPTOC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	361	Class 0	Yes	67/50P-1 Enable signal for current multiplier		LD0.DPHHPTOC1.InEnaMult.stVal
BI		362	Class 1 and 0	Yes	67/50P-1 Trip		LD0.DPHHPTOC1.Op.general
BI		363	Class 1 and 0	Yes	67/50P-1 Trip phsA		LD0.DPHHPTOC1.Op.phsA
BI		364	Class 1 and 0	Yes	67/50P-1 Trip phsB		LD0.DPHHPTOC1.Op.phsB
BI		365	Class 1 and 0	Yes	67/50P-1 Trip phsC		LD0.DPHHPTOC1.Op.phsC

Table 14: 67/50P-2 : Three-phase directional overcurrent protection high stage instance 2 (DPHHPTOC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	366	Class 0	Yes	67/50P-2 Enable signal for current multiplier		LD0.DPHHPTOC2.InEnaMult.stVal
BI		367	Class 1 and 0	Yes	67/50P-2 Trip		LD0.DPHHPTOC2.Op.general
BI		368	Class 1 and 0	Yes	67/50P-2 Trip phsA		LD0.DPHHPTOC2.Op.phsA
BI		369	Class 1 and 0	Yes	67/50P-2 Trip phsB		LD0.DPHHPTOC2.Op.phsB
BI		370	Class 1 and 0	Yes	67/50P-2 Trip phsC		LD0.DPHHPTOC2.Op.phsC

Table 15: 51G : Non-directional earth-fault protection low stage instance 1 (EFLPTOC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	395	Class 0	Yes	51G Enable signal for current multiplier		LD0.EFLPTOC1.InEnaMult.stVal

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		396	Class 1 and 0	Yes	51G Trip		LD0.EFLPTOC1.Op.general

Table 16: 51N-1 : Non-directional earth-fault protection low stage instance 2 (EFLPTOC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	397	Class 0	Yes	51N-1 Enable signal for current multiplier		LD0.EFLPTOC2.InEnaMult.stVal
BI		398	Class 1 and 0	Yes	51N-1 Trip		LD0.EFLPTOC2.Op.general

Table 17: 50SEF : Non-directional earth-fault protection low stage instance 4 (EFLPTOC4)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	401	Class 0	Yes	50SEF Enable signal for current multiplier		LD0.EFLPTOC4.InEnaMult.stVal
BI		402	Class 1 and 0	Yes	50SEF Trip		LD0.EFLPTOC4.Op.general

Table 18: 50G-1 : Non-directional earth-fault protection high stage instance 1 (EFHPTOC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	381	Class 0	Yes	50G-1 Enable signal for current multiplier		LD0.EFHPTOC1.InEnaMult.stVal
BI		382	Class 1 and 0	Yes	50G-1 Trip		LD0.EFHPTOC1.Op.general

Table 19: 50G-2 : Non-directional earth-fault protection high stage instance 2 (EFHPTOC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	383	Class 0	Yes	50G-2 Enable signal for current multiplier		LD0.EFHPTOC2.InEnaMult.stVal
BI		384	Class 1 and 0	Yes	50G-2 Trip		LD0.EFHPTOC2.Op.general

Table 20: 50N-1 : Non-directional earth-fault protection high stage instance 3 (EFHPTOC3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	385	Class 0	Yes	50N-1 Enable signal for current multiplier		LD0.EFHPTOC3.InEnaMult.stVal
BI		386	Class 1 and 0	Yes	50N-1 Trip		LD0.EFHPTOC3.Op.general

Table 21: 50N-2 : Non-directional earth-fault protection high stage instance 4 (EFHPTOC4)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	387	Class 0	Yes	50N-2 Enable signal for current multiplier		LD0.EFHPTOC4.InEnaMult.stVal
BI		388	Class 1 and 0	Yes	50N-2 Trip		LD0.EFHPTOC4.Op.general

Table 22: 50G-3 : Non-directional earth-fault protection instantaneous stage instance 1 (EFIPTOC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	391	Class 0	Yes	50G-3 Enable signal for current multiplier		LD0.EFIPTOC1.InEnaMult.stVal
BI		392	Class 1 and 0	Yes	50G-3 Trip		LD0.EFIPTOC1.Op.general

Table 23: 50N-3 : Non-directional earth-fault protection instantaneous stage instance 2 (EFIPTOC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	393	Class 0	Yes	50N-3 Enable signal for current multiplier		LD0.EFIPTOC2.InEnaMult.stVal
BI		394	Class 1 and 0	Yes	50N-3 Trip		LD0.EFIPTOC2.Op.general

Table 24: 67/51N : Directional earth-fault protection low stage instance 1 (DEFLPTOC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	359	Class 0	Yes	67/51N Enable signal for current multiplier		LD0.DEFLPTOC2.InEnaMult.stVal
BI		360	Class 1 and 0	Yes	67/51N Trip		LD0.DEFLPTOC2.Op.general

Table 25: 67/51N : Directional earth-fault protection low stage instance 1 (DEFLLRDIR2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	494	Class 0	Yes	67/51N Relay characteristic angle control		LD0.DEFLRDIR2.InRcaCtl.stVal

Table 26: 67/50N-1 : Directional earth-fault protection high stage instance 1 (DEFHPTOC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	353	Class 0	Yes	67/50N-1 Enable signal for current multiplier		LD0.DEFHPTOC1.InEnaMult.stVal
BI		354	Class 1 and 0	Yes	67/50N-1 Trip		LD0.DEFHPTOC1.Op.general

Table 27: 67/50N-1 : Directional earth-fault protection high stag instance 1 (DEFHRDIR1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	491	Class 0	Yes	67/50N-1 Relay characteristic angle control		LD0.DEFHRDIR1.InRcaCtl.stVal

Table 28: 67/50N-2 : Directional earth-fault protection high stage instance 2 (DEFHPTOC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	355	Class 0	Yes	67/50N-2 Enable signal for current multiplier		LD0.DEFHPTOC2.InEnaMult.stVal
BI		356	Class 1 and 0	Yes	67/50N-2 Trip		LD0.DEFHPTOC2.Op.general

Table 29: 67/50N-2 : Directional earth-fault protection high stage instance 2 (DEFHRDIR2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	492	Class 0	Yes	67/50N-2 Relay characteristic angle control		LD0.DEFHRDIR2.InRcaCtl.stVal

Table 30: 32P-1 : Three phase directional power protection instance 1 (DPSRDIR1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		499	Class 1 and 0	Yes	32P-1 direction signal		LD0.DPSRDIR1.Dir.general
AI	Yes	332	Class 0	Yes	32P-1 Angle between polarizing and operating quantity	100	LD0.DPSRDIR1.OpChrAng.mag.f

Table 31: 21P : Phase distance protection instance 1 (PHDSTPDIS1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		619	Class 1 and 0	Yes	21P Trip Z1		LD0.PHDSTPDIS1.Op.general

Table 32: 21P : Phase distance protection instance 1 (PHDSTPDIS2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		620	Class 1 and 0	Yes	21P Trip Z2		LD0.PHDSTPDIS2.Op.general

Table 33: 21P : Phase distance protection instance 1 (PHDSTPDIS3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		621	Class 1 and 0	Yes	21P Trip Z3		LD0.PHDSTPDIS3.Op.general

Table 34: 21P : Phase distance protection instance 1 (PHDSTPDIS4)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		622	Class 1 and 0	Yes	21P Trip Z4		LD0.PHDSTPDIS4.Op.general

Table 35: 21P : Phase distance protection instance 1 (PHDSTPDIS5)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		623	Class 1 and 0	Yes	21P Trip Z5		LD0.PHDSTPDIS5.Op.general

Table 36: 21P : Phase distance protection instance 1 (PHGFCPDIS1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		624	Class 1 and 0	Yes	21P Start signal for load discrimination logic		LD0.PHGFCPDIS1.LodDsrDet.stVal
BI		625	Class 1 and 0	Yes	21P Pickup GFC		LD0.PHGFCPDIS1.Str.general

Table 37: 46-1 : Negative-sequence overcurrent protection instance 1 (NSPTOC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	403	Class 0	Yes	46-1 Enable signal for current multiplier		LD0.NSPTOC1.InEnaMult.stVal
BI		404	Class 1 and 0	Yes	46-1 Trip		LD0.NSPTOC1.Op.general

Table 38: 46-2 : Negative-sequence overcurrent protection instance 2 (NSPTOC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	405	Class 0	Yes	46-2 Enable signal for current multiplier		LD0.NSPTOC2.InEnaMult.stVal
BI		406	Class 1 and 0	Yes	46-2 Trip		LD0.NSPTOC2.Op.general

Table 39: 46PD : Phase discontinuity protection (PDNSPTOC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		469	Class 1 and 0	Yes	46PD Trip		LD0.PDNSPTOC1.Op.general

Table 40: 59G : Residual overvoltage protection instance 1 (ROVPTOV1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		484	Class 1 and 0	Yes	59G Trip		LD0.ROVPTOV1.Op.general

Table 41: 59N-1 (1) : Residual overvoltage protection instance 2 (ROVPTOV2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		485	Class 1 and 0	Yes	59N-1(1) Trip		LD0.ROVPTOV2.Op.general

Table 42: 59N-1 (2) : Residual overvoltage protection instance 3 (ROVPTOV3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		486	Class 1 and 0	Yes	59N-1(2) Trip		LD0.ROVPTOV3.Op.general

Table 43: 27-1 (1) : Three-phase undervoltage protection instance 1 (PHPTUV1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		639	Class 1 and 0	Yes	27-1(1) Trip		LD0.PHPTUV1.Op.general
BI		640	Class 1 and 0	Yes	27-1(1) Trip phsA		LD0.PHPTUV1.Op.phsA
BI		641	Class 1 and 0	Yes	27-1(1) Trip phsB		LD0.PHPTUV1.Op.phsB
BI		642	Class 1 and 0	Yes	27-1(1) Trip phsC		LD0.PHPTUV1.Op.phsC

Table 44: 27-2 (1) : Three-phase undervoltage protection instance 2 (PHPTUV2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		643	Class 1 and 0	Yes	27-2(1) Trip		LD0.PHPTUV2.Op.general
BI		644	Class 1 and 0	Yes	27-2(1) Trip phsA		LD0.PHPTUV2.Op.phsA
BI		645	Class 1 and 0	Yes	27-2(1) Trip phsB		LD0.PHPTUV2.Op.phsB
BI		646	Class 1 and 0	Yes	27-2(1) Trip phsC		LD0.PHPTUV2.Op.phsC

Table 45: 27-1 (2) : Three-phase undervoltage protection instance 3 (PHPTUV3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		647	Class 1 and 0	Yes	27-1(2) Trip		LD0.PHPTUV3.Op.general

Table 46: 27-2 (2) : Three-phase undervoltage protection instance 4 (PHPTUV4)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		648	Class 1 and 0	Yes	27-2(2) Trip		LD0.PHPTUV4.Op.general

Table 47: 59-1 (1) : Three-phase overvoltage protection instance 1 (PHPTOV1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		471	Class 1 and 0	Yes	59-1(1) Trip		LD0.PHPTOV1.Op.general
BI		472	Class 1 and 0	Yes	59-1(1) Trip phsA		LD0.PHPTOV1.Op.phsA
BI		473	Class 1 and 0	Yes	59-1(1) Trip phsB		LD0.PHPTOV1.Op.phsB
BI		474	Class 1 and 0	Yes	59-1(1) Trip phsC		LD0.PHPTOV1.Op.phsC

Table 48: 59-2 (1) : Three-phase overvoltage protection instance 2 (PHPTOV2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		475	Class 1 and 0	Yes	59-2(1) Trip		LD0.PHPTOV2.Op.general
BI		476	Class 1 and 0	Yes	59-2(1) Trip phsA		LD0.PHPTOV2.Op.phsA
BI		477	Class 1 and 0	Yes	59-2(1) Trip phsB		LD0.PHPTOV2.Op.phsB
BI		478	Class 1 and 0	Yes	59-2(1) Trip phsC		LD0.PHPTOV2.Op.phsC

Table 49: 59-1 (2) : Three-phase overvoltage protection instance 3 (PHPTOV3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		479	Class 1 and 0	Yes	59-1(2) Trip		LD0.PHPTOV3.Op.general
BI		480	Class 1 and 0	Yes	59-1(2) Trip phsA		LD0.PHPTOV3.Op.phsA
BI		481	Class 1 and 0	Yes	59-1(2) Trip phsB		LD0.PHPTOV3.Op.phsB
BI		482	Class 1 and 0	Yes	59-1(2) Trip phsC		LD0.PHPTOV3.Op.phsC

Table 50: 59-2 (2) : Three-phase overvoltage protection instance 4 (PHPTOV4)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		483	Class 1 and 0	Yes	59-2(2) Trip		LD0.PHPTOV4.Op.general

Table 51: 47-1 (1) : Negative-sequence overvoltage protection instance 1 (NSPTOV1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		487	Class 1 and 0	Yes	47-1(1) Trip		LD0.NSPTOV1.Op.general

Table 52: 47-2 (1) : Negative-sequence overvoltage protection instance 2 (NSPTOV2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		488	Class 1 and 0	Yes	47-2(1) Trip		LD0.NSPTOV2.Op.general

Table 53: 47-1 (2) : Negative-sequence overvoltage protection instance 3 (NSPTOV3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		489	Class 1 and 0	Yes	47-1(2) Trip		LD0.NSPTOV3.Op.general

Table 54: 47-2 (2) : Negative-sequence overvoltage protection instance 4 (NSPTOV4)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		490	Class 1 and 0	Yes	47-2(2) Trip		LD0.NSPTOV4.Op.general

Table 55: Frequency protection instance 1 (FRPTRC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	510	Class 0	Yes	81-1 Trip		LD0.FRPTRC1.Op.general
AI	Yes	347	Class 0	Yes	81-1 Pickup duration	100	LD0.FRPTRC1.StrDur.mag.f

Table 56: 81-1 : Frequency protection instance 1 (FRPTOF1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		506	Class 1 and 0	Yes	81-1 Trip signal for overfrequency		LD0.FRPTOF1.Op.general
AI	Yes	343	Class 0	Yes	81-1 Pickup duration	100	LD0.FRPTOF1.StrDur.mag.f

Table 57: 81-1 : Frequency protection instance 1 (FRPTUF1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		514	Class 1 and 0	Yes	81-1 Trip signal for underfrequency		LD0.FRPTUF1.Op.general
AI	Yes	351	Class 0	Yes	81-1 Pickup duration	100	LD0.FRPTUF1.StrDur.mag.f

Table 58: 81-1 : Frequency protection instance 1 (FRPFRC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		502	Class 1 and 0	Yes	81-1 Trip signal for frequency gradient		LD0.FRPFRC1.Op.general
AI	Yes	339	Class 0	Yes	81-1 Pickup duration	100	LD0.FRPFRC1.StrDur.mag.f

Table 59: 81-2 : Frequency protection instance 2 (FRPTRC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	511	Class 0	Yes	81-2 Trip		LD0.FRPTRC2.Op.general
AI	Yes	348	Class 0	Yes	81-2 Pickup duration	100	LD0.FRPTRC2.StrDur.mag.f

Table 60: 81-2 : Frequency protection instance 2 (FRPTOF2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		507	Class 1 and 0	Yes	81-2 Trip signal for overfrequency		LD0.FRPTOF2.Op.general
AI	Yes	344	Class 0	Yes	81-2 Pickup duration	100	LD0.FRPTOF2.StrDur.mag.f

Table 61: 81-2 : Frequency protection instance 2 (FRPTUF2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		515	Class 1 and 0	Yes	81-2 Trip signal for underfrequency		LD0.FRPTUF2.Op.general
AI	Yes	352	Class 0	Yes	81-2 Pickup duration	100	LD0.FRPTUF2.StrDur.mag.f

Table 62: 81-2 : Frequency protection instance 2 (FRPFRC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		503	Class 1 and 0	Yes	81-2 Trip signal for frequency gradient		LD0.FRPFRC2.Op.general
AI	Yes	340	Class 0	Yes	81-2 Pickup duration	100	LD0.FRPFRC2.StrDur.mag.f

Table 63: 24 : Voltage per hertz protection instance 1 (OEPVPH1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	598	Class 0	Yes	24 Signal to indicate machine is in cooling process		LD0.OEPVPH1.CoolAct.stVal
BI		599	Class 1 and 0	Yes	24 Trip		LD0.OEPVPH1.Op.general
BI	Yes	600	Class 0	Yes	24 Signal for blocking reconnection of an overheated machine		LD0.OEPVPH1.StrInh.stVal

Table 64: 49F : Three-phase thermal protection for feeders cables and distribution transformers (T1PTTR1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		782	Class 1 and 0	Yes	49F Thermal Alarm		LD0.T1PTTR1.AlmThm.general
BI	Yes	783	Class 0	Yes	49F Enable Current multiplier		LD0.T1PTTR1.InEnaMult.stVal

Section 2 DNP3 data mappings

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	784	Class 0	Yes	49F Thermal overload indicator. To inhibit rec lose.		LD0.T1PTTR1.InhRec.stVal
BI		785	Class 1 and 0	Yes	49F Trip		LD0.T1PTTR1.Op.general
AI		210	Class 2 and 0	Yes	49F The calculated temperature of the protected object	100	LD0.T1PTTR1.Tmp.mag.f
AI		211	Class 2 and 0	Yes	49F The calculated temperature of the protected object relative to the trip level	100	LD0.T1PTTR1.TmpRl.mag.f
AI	Yes	212	Class 0	Yes	49F The ambient temperature used in the calculation	100	LD0.T1PTTR1.TmpUsed.mag.f

Table 65: 37-1 : Loss of phase instance 1 (PHPTUC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		627	Class 1 and 0	Yes	37-1 Trip		LD0.PHPTUC1.Op.general
BI		628	Class 1 and 0	Yes	37-1 Trip phase A		LD0.PHPTUC1.Op.phsA
BI		629	Class 1 and 0	Yes	37-1 Trip phase B		LD0.PHPTUC1.Op.phsB
BI		630	Class 1 and 0	Yes	37-1 Trip phase C		LD0.PHPTUC1.Op.phsC

Table 66: VSWI : Three phase measurement switching (VMSWI1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	286	Class 0	Yes	VSWI Selected voltage source is bus 1		LD0.VMSWI1.VSelStBus1.stVal
BI	Yes	287	Class 0	Yes	VSWI Selected voltage source is bus 2		LD0.VMSWI1.VSelStBus2.stVal

Table 67: 87LOZREF : Numerical stabilized low impedance restricted earth-fault protection (LREFPDIF1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	528	Class 0	Yes	87LOZREF 2nd harmonic block		LD0.LREFPDIF1.BIk2Hst.general
BI		529	Class 1 and 0	Yes	87LOZREF Trip		LD0.LREFPDIF1.Op.general

Table 68: 50BF-1 : Circuit breaker failure protection instance 1 (CCBRBRF1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	224	Class 0	Yes	50BF-1 CB faulty and unable to trip		LD0.CCBRBRF1.InCBFlt.stVal
BI	Yes	225	Class 0	Yes	50BF-1 CB in closed position		LD0.CCBRBRF1.InPosCls.stVal
BI	Yes	226	Class 0	Yes	50BF-1 CBFP pickup command		LD0.CCBRBRF1.InStr.stVal
BI		227	Class 1 and 0	Yes	50BF-1 Backup trip		LD0.CCBRBRF1.OpEx.general
BI		228	Class 1 and 0	Yes	50BF-1 Retrip		LD0.CCBRBRF1.OpIn.general
BI		229	Class 1 and 0	Yes	50BF-1 Delayed CB failure alarm		LD0.CCBRBRF1.Str.general

Table 69: 50BF-2 : Circuit breaker failure protection instance 2 (CCBRBRF2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	230	Class 0	Yes	50BF-2 CB faulty and unable to trip		LD0.CCBRBRF2.InCBFIt.stVal
BI	Yes	231	Class 0	Yes	50BF-2 CB in closed position		LD0.CCBRBRF2.InPosCls.stVal
BI	Yes	232	Class 0	Yes	50BF-2 CBFP pickup command		LD0.CCBRBRF2.InStr.stVal
BI		233	Class 1 and 0	Yes	50BF-2 Backup trip		LD0.CCBRBRF2.OpEx.general
BI		234	Class 1 and 0	Yes	50BF-2 Retrip		LD0.CCBRBRF2.Opln.general
BI		235	Class 1 and 0	Yes	50BF-2 Delayed CB failure alarm		LD0.CCBRBRF2.Str.general

Table 70: 86/94-1 : Master trip instance 1 (TRPPTRC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1033	Class 0	Yes	86/94-1 Circuit breaker lockout output (set until reset)		LD0.TRPPTRC1.ClsLO.stVal
BI	Yes	1034	Class 0	Yes	86/94-1 Input for resetting the circuit breaker lockout function		LD0.TRPPTRC1.LORs.stVal
BI		1035	Class 1 and 0	Yes	86/94-1 Trip		LD0.TRPPTRC1.Op.general
BI		1036	Class 1 and 0	Yes	86/94-1 General trip output signal		LD0.TRPPTRC1.Tr.general

Table 71: 86/94-2 : Master trip instance 2 (TRPPTRC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1037	Class 0	Yes	86/94-2 Circuit breaker lockout output (set until reset)		LD0.TRPPTRC2.ClsLO.stVal
BI	Yes	1038	Class 0	Yes	86/94-2 Input for resetting the circuit breaker lockout function		LD0.TRPPTRC2.LORs.stVal
BI		1039	Class 1 and 0	Yes	86/94-2 Trip		LD0.TRPPTRC2.Op.general
BI		1040	Class 1 and 0	Yes	86/94-2 General trip output signal		LD0.TRPPTRC2.Tr.general

Table 72: 86/94-3 : Master trip instance 3 (TRPPTRC3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1041	Class 0	Yes	86/94-3 Circuit breaker lockout output (set until reset)		LD0.TRPPTRC3.ClsLO.stVal
BI	Yes	1042	Class 0	Yes	86/94-3 Input for resetting the circuit breaker lockout function		LD0.TRPPTRC3.LORs.stVal
BI		1043	Class 1 and 0	Yes	86/94-3 Trip		LD0.TRPPTRC3.Op.general
BI		1044	Class 1 and 0	Yes	86/94-3 General trip output signal		LD0.TRPPTRC3.Tr.general

Table 73: AFD-1 : Arc protection instance 1 (ARCSARC11)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		249	Class 1 and 0	Yes	AFD-1 Fault arc detected=light signal output		LD0.ARCSARC11.FADet.stVal

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DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	250	Class 0	Yes	AFD-1 Remote Fault arc detected		LD0.ARCSCARC11.InRemFA.stVal

Table 74: *AFD-1 : Arc protection instance 1 (ARCPTRC11)*

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	243	Class 0	Yes	AFD-1 Operation mode input		LD0.ARCPTRC11.InOpMod.stVal
BI		244	Class 1 and 0	Yes	AFD-1 Trip		LD0.ARCPTRC11.Op.general

Table 75: *AFD-2 : Arc protection instance 2 (ARCSARC21)*

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		251	Class 1 and 0	Yes	AFD-2 Fault arc detected=light signal output		LD0.ARCSCARC21.FADet.stVal
BI	Yes	252	Class 0	Yes	AFD-2 Remote Fault arc detected		LD0.ARCSCARC21.InRemFA.stVal

Table 76: *AFD-2 : Arc protection instance 2 (ARCPTRC21)*

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	245	Class 0	Yes	AFD-2 Operation mode input		LD0.ARCPTRC21.InOpMod.stVal
BI		246	Class 1 and 0	Yes	AFD-2 Trip		LD0.ARCPTRC21.Op.general

Table 77: *AFD-3 : Arc protection instance 3 (ARCSARC31)*

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		253	Class 1 and 0	Yes	AFD-3 Fault arc detected=light signal output		LD0.ARCSCARC31.FADet.stVal
BI	Yes	254	Class 0	Yes	AFD-3 Remote Fault arc detected		LD0.ARCSCARC31.InRemFA.stVal

Table 78: *AFD-3 : Arc protection instance 3 (ARCPTRC31)*

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	247	Class 0	Yes	AFD-3 Operation mode input		LD0.ARCPTRC31.InOpMod.stVal
BI		248	Class 1 and 0	Yes	AFD-3 Trip		LD0.ARCPTRC31.Op.general

Table 79: *HIZ : High impedance fault detection (PHIZ1)*

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		626	Class 1 and 0	Yes	HIZ Trip		LD0.PHIZ1.Op.general

Table 80: 81LSH-1 : Load shedding and restoration instance 1 (LSHDPTRC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	538	Class 0	Yes	81LSH-1 Block restore		LD0.LSHDPTRC1.BlkRest.stVal
BI	Yes	539	Class 0	Yes	81LSH-1 Manual restore signal		LD0.LSHDPTRC1.ManRest.stVal
BI		540	Class 1 and 0	Yes	81LSH-1 Trip of load shedding		LD0.LSHDPTRC1.Op.general
BI		541	Class 1 and 0	Yes	81LSH-1 Restore signal for load restoring purposes		LD0.LSHDPTRC1.RestLodOp.general
BI		542	Class 1 and 0	Yes	81LSH-1 Restore frequency attained and restore timer started		LD0.LSHDPTRC1.RestLodStr.general
AI	Yes	367	Class 0	Yes	81LSH-1 Pickup duration	100	LD0.LSHDPTRC1.StrDur.mag.f

Table 81: 81LSH-1 : Load shedding and restoration instance 1 (LSHDPTUF1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	578	Class 0	Yes	81LSH-1 Trip signal for under frequency		LD0.LSHDPTUF1.Op.general

Table 82: 81LSH-1 : Load shedding and restoration instance 1 (LSHDPFRC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	530	Class 0	Yes	81LSH-1 Trip signal for high df/dt		LD0.LSHDPFRC1.Op.general

Table 83: 81LSH-2 : Load shedding and restoration instance 2 (LSHDPTRC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	543	Class 0	Yes	81LSH-2 Block restore		LD0.LSHDPTRC2.BlkRest.stVal
BI	Yes	544	Class 0	Yes	81LSH-2 Manual restore signal		LD0.LSHDPTRC2.ManRest.stVal
BI		545	Class 1 and 0	Yes	81LSH-2 Trip of load shedding		LD0.LSHDPTRC2.Op.general
BI		546	Class 1 and 0	Yes	81LSH-2 Restore signal for load restoring purposes		LD0.LSHDPTRC2.RestLodOp.general
BI		547	Class 1 and 0	Yes	81LSH-2 Restore frequency attained and restore timer started		LD0.LSHDPTRC2.RestLodStr.general
AI	Yes	368	Class 0	Yes	81LSH-2 Pickup duration	100	LD0.LSHDPTRC2.StrDur.mag.f

Table 84: 81LSH-2 : Load shedding and restoration instance 2 (LSHDPTUF2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	579	Class 0	Yes	81LSH-2 Trip signal for under frequency		LD0.LSHDPTUF2.Op.general

Table 85: 81LSH-2 : Load shedding and restoration instance 2 (LSHDPFRC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	531	Class 0	Yes	81LSH-2 Trip signal for high df/dt		LD0.LSHDPFRC2.Op.general

Table 86: 52-1 : Circuit-breaker control instance 1 (CBCILO1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		128	Class 1 and 0	Yes	52-1 Enables closing		CTRL.CBCILO1.EnaCls.stVal
BI		129	Class 1 and 0	Yes	52-1 Enables opening		CTRL.CBCILO1.EnaOpn.stVal
BI		130	Class 1 and 0	Yes	52-1 Discards ENA_OPEN and ENA_CLOSE interlocking when TRUE		CTRL.CBCILO1.ItlByPss.stVal

Table 87: 52-1 : Circuit-breaker control instance 1 (CBCSWI1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	137	Class 0	Yes	52-1 Closing is enabled based on the input status		CTRL.CBCSWI1.ClsEna.stVal
BI	Yes	138	Class 0	Yes	52-1 Executes the command for close direction		CTRL.CBCSWI1.OpCls.general
BI	Yes	139	Class 0	Yes	52-1 Opening is enabled based on the input status		CTRL.CBCSWI1.OpnEna.stVal
BI	Yes	140	Class 0	Yes	52-1 Executes the command for open direction		CTRL.CBCSWI1.OpOpn.general
BI		141	Class 1 and 0	Yes	52-1 Object selected		CTRL.CBCSWI1.Pos.stSeld
BI	Yes	142	Class 0	Yes	52-1 Apparatus closed position		CTRL.CBCSWI1.PosCls.stVal
BI	Yes	143	Class 0	Yes	52-1 Apparatus position is ok		CTRL.CBCSWI1.PosOk.stVal
BI	Yes	144	Class 0	Yes	52-1 Apparatus open position		CTRL.CBCSWI1.PosOpn.stVal
AI		374	Class 2 and 0	Yes	52-1 Apparatus position indication	0	CTRL.CBCSWI1.Pos.stVal

Table 88: 52-1 : Circuit-breaker control instance 1 (CBXCBR1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		161	Class 1 and 0	Yes	52-1 Blocks closing		CTRL.CBXCBR1.BlkCls.stVal
BI		162	Class 1 and 0	Yes	52-1 Blocks opening		CTRL.CBXCBR1.BlkOpn.stVal

Table 89: 52-2 : Circuit-breaker control instance 2 (CBCILO2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		131	Class 1 and 0	Yes	52-2 Enables closing		CTRL.CBCILO2.EnaCls.stVal
BI		132	Class 1 and 0	Yes	52-2 Enables opening		CTRL.CBCILO2.EnaOpn.stVal
BI		133	Class 1 and 0	Yes	52-2 Discards ENA_OPEN and ENA_CLOSE interlocking when TRUE		CTRL.CBCILO2.ItlByPss.stVal

Table 90: 52-2 : Circuit-breaker control instance 2 (CBCSWI2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	145	Class 0	Yes	52-2 Closing is enabled based on the input status		CTRL.CBCSWI2.ClsEna.stVal
BI	Yes	146	Class 0	Yes	52-2 Executes the command for close direction		CTRL.CBCSWI2.OpCls.general

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	147	Class 0	Yes	52-2 Opening is enabled based on the input status		CTRL.CBCSWI2.OpnEna.stVal
BI	Yes	148	Class 0	Yes	52-2 Executes the command for open direction		CTRL.CBCSWI2.OpOpn.general
BI		149	Class 1 and 0	Yes	52-2 Object selected		CTRL.CBCSWI2.Pos.stSeld
BI	Yes	150	Class 0	Yes	52-2 Apparatus closed position		CTRL.CBCSWI2.PosCls.stVal
BI	Yes	151	Class 0	Yes	52-2 Apparatus position is ok		CTRL.CBCSWI2.PosOk.stVal
BI	Yes	152	Class 0	Yes	52-2 Apparatus open position		CTRL.CBCSWI2.PosOpn.stVal
AI		375	Class 2 and 0	Yes	52-2 Apparatus position indication	0	CTRL.CBCSWI2.Pos.stVal

Table 91: 52-2 : Circuit-breaker control instance 2 (CBXCBR2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		163	Class 1 and 0	Yes	52-2 Blocks closing		CTRL.CBXCBR2.BlkCls.stVal
BI		164	Class 1 and 0	Yes	52-2 Blocks opening		CTRL.CBXCBR2.BlkOpn.stVal

Table 92: 79-1 : Auto-reclosing instance 1 (DARREC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		299	Class 1 and 0	Yes	79-1 Autoreclosing allowed		LD0.DARREC1.AROn.stVal
BI	Yes	300	Class 0	Yes	79-1 Blocks and resets reclaim time		LD0.DARREC1.InBlkRcITm.stVal
BI	Yes	301	Class 0	Yes	79-1 Blocks and resets reclose time		LD0.DARREC1.InBlkRecTm.stVal
BI	Yes	302	Class 0	Yes	79-1 Blocks and holds the reclose shot from the thermal overload		LD0.DARREC1.InBlkThm.stVal
BI	Yes	303	Class 0	Yes	79-1 Circuit breaker position input		LD0.DARREC1.InCBPos.stVal
BI	Yes	304	Class 0	Yes	79-1 Circuit breaker status signal		LD0.DARREC1.InCBRdy.stVal
BI	Yes	305	Class 0	Yes	79-1 Delayed AR initialization / blocking signal 2		LD0.DARREC1.InDIIni2.stVal
BI	Yes	306	Class 0	Yes	79-1 Delayed AR initialization / blocking signal 3		LD0.DARREC1.InDIIni3.stVal
BI	Yes	307	Class 0	Yes	79-1 Delayed AR initialization / blocking signal 4		LD0.DARREC1.InDIIni4.stVal
BI	Yes	308	Class 0	Yes	79-1 A zone sequence coordination signal		LD0.DARREC1.InIncrPntr.stVal
BI	Yes	309	Class 0	Yes	79-1 Interrupts and inhibits reclosing sequence		LD0.DARREC1.InInhRec.stVal
BI	Yes	310	Class 0	Yes	79-1 AR initialization / blocking signal 1		LD0.DARREC1.InIni1.stVal
BI	Yes	311	Class 0	Yes	79-1 AR initialization / blocking signal 2		LD0.DARREC1.InIni2.stVal
BI	Yes	312	Class 0	Yes	79-1 AR initialization / blocking signal 3		LD0.DARREC1.InIni3.stVal
BI	Yes	313	Class 0	Yes	79-1 AR initialization / blocking signal 4		LD0.DARREC1.InIni4.stVal
BI	Yes	314	Class 0	Yes	79-1 AR initialization / blocking signal 5		LD0.DARREC1.InIni5.stVal
BI	Yes	315	Class 0	Yes	79-1 AR initialization / blocking signal 6		LD0.DARREC1.InIni6.stVal
BI	Yes	316	Class 0	Yes	79-1 Level sensitive signal for allowing (high) / not allowing (low) reclosing		LD0.DARREC1.InReClsOn.stVal

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DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	317	Class 0	Yes	79-1 Synchronizing check fulfilled		LD0.DARREC1.InSynChk.stVal
BI		318	Class 1 and 0	Yes	79-1 Signal indicating that AR is locked out		LD0.DARREC1.LO.stVal
BI		319	Class 1 and 0	Yes	79-1 Close (reclose) command for circuit breaker		LD0.DARREC1.Op.general
BI		320	Class 1 and 0	Yes	79-1 Open command for circuit breaker		LD0.DARREC1.OpOpn.general
BI		321	Class 1 and 0	Yes	79-1 Reclosing shot in progress activated during dead time		LD0.DARREC1.PrgRec.stVal
BI	Yes	322	Class 0	Yes	79-1 A signal for coordination between the AR and the protection		LD0.DARREC1.ProCrd.stVal
BI		323	Class 1 and 0	Yes	79-1 Indicates that the AR is ready for a new sequence		LD0.DARREC1.RdyRec.stVal
BI		324	Class 1 and 0	Yes	79-1 Indicates an unsuccessful reclosing sequence		LD0.DARREC1.UnsRec.stVal
BI		325	Class 1 and 0	Yes	79-1 Wait for master command		LD0.DARREC1.WtMstr.stVal
AI		316	Class 2 and 0	Yes	79-1 AR status signal for IEC61850	0	LD0.DARREC1.AutoRecSt.stVal
AI	Yes	317	Class 0	Yes	79-1 Frequent operation counter	0	LD0.DARREC1.FrqOpCnt.stVal
AI	Yes	318	Class 0	Yes	79-1 Resetable operation counter shot 1	0	LD0.DARREC1.OpCnt1.stVal
AI	Yes	319	Class 0	Yes	79-1 Resetable operation counter shot 2	0	LD0.DARREC1.OpCnt2.stVal
AI	Yes	320	Class 0	Yes	79-1 Resetable operation counter shot 3	0	LD0.DARREC1.OpCnt3.stVal
AI	Yes	321	Class 0	Yes	79-1 Resetable operation counter shot 4	0	LD0.DARREC1.OpCnt4.stVal
AI	Yes	322	Class 0	Yes	79-1 Resetable operation counter shot 5	0	LD0.DARREC1.OpCnt5.stVal

Table 93: 79-2 : Auto-reclosing instance 2 (DARREC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		326	Class 1 and 0	Yes	79-2 Autoreclosing allowed		LD0.DARREC2.AROn.stVal
BI	Yes	327	Class 0	Yes	79-2 Blocks and resets reclaim time		LD0.DARREC2.InBlkRclTm.stVal
BI	Yes	328	Class 0	Yes	79-2 Blocks and resets reclose time		LD0.DARREC2.InBlkRecTm.stVal
BI	Yes	329	Class 0	Yes	79-2 Blocks and holds the reclose shot from the thermal overload		LD0.DARREC2.InBlkThm.stVal
BI	Yes	330	Class 0	Yes	79-2 Circuit breaker position input		LD0.DARREC2.InCBPos.stVal
BI	Yes	331	Class 0	Yes	79-2 Circuit breaker status signal		LD0.DARREC2.InCBRdy.stVal
BI	Yes	332	Class 0	Yes	79-2 Delayed AR initialization / blocking signal 2		LD0.DARREC2.InDIIni2.stVal
BI	Yes	333	Class 0	Yes	79-2 Delayed AR initialization / blocking signal 3		LD0.DARREC2.InDIIni3.stVal
BI	Yes	334	Class 0	Yes	79-2 Delayed AR initialization / blocking signal 4		LD0.DARREC2.InDIIni4.stVal
BI	Yes	335	Class 0	Yes	79-2 A zone sequence coordination signal		LD0.DARREC2.InIncrPntr.stVal
BI	Yes	336	Class 0	Yes	79-2 Interrupts and inhibits reclosing sequence		LD0.DARREC2.InInhRec.stVal
BI	Yes	337	Class 0	Yes	79-2 AR initialization / blocking signal 1		LD0.DARREC2.InIni1.stVal
BI	Yes	338	Class 0	Yes	79-2 AR initialization / blocking signal 2		LD0.DARREC2.InIni2.stVal

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	339	Class 0	Yes	79-2 AR initialization / blocking signal 3		LD0.DARREC2.InIni3.stVal
BI	Yes	340	Class 0	Yes	79-2 AR initialization / blocking signal 4		LD0.DARREC2.InIni4.stVal
BI	Yes	341	Class 0	Yes	79-2 AR initialization / blocking signal 5		LD0.DARREC2.InIni5.stVal
BI	Yes	342	Class 0	Yes	79-2 AR initialization / blocking signal 6		LD0.DARREC2.InIni6.stVal
BI	Yes	343	Class 0	Yes	79-2 Level sensitive signal for allowing (high) / not allowing (low) reclosing		LD0.DARREC2.InReClsOn.stVal
BI	Yes	344	Class 0	Yes	79-2 Synchronizing check fulfilled		LD0.DARREC2.InSynChk.stVal
BI		345	Class 1 and 0	Yes	79-2 Signal indicating that AR is locked out		LD0.DARREC2.LO.stVal
BI		346	Class 1 and 0	Yes	79-2 Close (reclose) command for circuit breaker		LD0.DARREC2.Op.general
BI		347	Class 1 and 0	Yes	79-2 Open command for circuit breaker		LD0.DARREC2.OpOpn.general
BI		348	Class 1 and 0	Yes	79-2 Reclosing shot in progress activated during dead time		LD0.DARREC2.PrgRec.stVal
BI	Yes	349	Class 0	Yes	79-2 A signal for coordination between the AR and the protection		LD0.DARREC2.ProCrd.stVal
BI		350	Class 1 and 0	Yes	79-2 Indicates that the AR is ready for a new sequence		LD0.DARREC2.RdyRec.stVal
BI		351	Class 1 and 0	Yes	79-2 Indicates an unsuccessful reclosing sequence		LD0.DARREC2.UnsRec.stVal
BI		352	Class 1 and 0	Yes	79-2 Wait for master command		LD0.DARREC2.WtMstr.stVal
AI		323	Class 2 and 0	Yes	79-2 AR status signal for IEC61850	0	LD0.DARREC2.AutoRecSt.stVal
AI	Yes	324	Class 0	Yes	79-2 Frequent operation counter	0	LD0.DARREC2.FrqOpCnt.stVal
AI	Yes	325	Class 0	Yes	79-2 Resetable operation counter shot 1	0	LD0.DARREC2.OpCnt1.stVal
AI	Yes	326	Class 0	Yes	79-2 Resetable operation counter shot 2	0	LD0.DARREC2.OpCnt2.stVal
AI	Yes	327	Class 0	Yes	79-2 Resetable operation counter shot 3	0	LD0.DARREC2.OpCnt3.stVal
AI	Yes	328	Class 0	Yes	79-2 Resetable operation counter shot 4	0	LD0.DARREC2.OpCnt4.stVal
AI	Yes	329	Class 0	Yes	79-2 Resetable operation counter shot 5	0	LD0.DARREC2.OpCnt5.stVal

Table 94: 25-1 : Synchronism and energizing check instance 1 (SECRSYN1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	654	Class 0	Yes	25-1 Phase angle difference out of limit for synchronizing		LD0.SECRSYN1.AngInd.stVal
BI	Yes	655	Class 0	Yes	25-1 Request to bypass synchronism check and voltage check		LD0.SECRSYN1.ByPss.stVal
BI	Yes	656	Class 0	Yes	25-1 Dead Line Dead Bus		LD0.SECRSYN1.DLDBInd.stVal
BI	Yes	657	Class 0	Yes	25-1 Dead Line Live Bus		LD0.SECRSYN1.DLLBInd.stVal
BI		658	Class 1 and 0	Yes	25-1 CB closing request failed		LD0.SECRSYN1.FailCmd.stVal
BI		659	Class 1 and 0	Yes	25-1 CB closing failed		LD0.SECRSYN1.FailSyn.stVal
BI	Yes	660	Class 0	Yes	25-1 Frequency difference out of limit for synchronizing		LD0.SECRSYN1.HzInd.stVal
BI	Yes	661	Class 0	Yes	25-1 Live Line Dead Bus		LD0.SECRSYN1.LLDBInd.stVal
BI	Yes	662	Class 0	Yes	25-1 Live Line Live Bus		LD0.SECRSYN1.LLLBInd.stVal

Section 2 DNP3 data mappings

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	663	Class 0	Yes	25-1 Systems in synchronism		LD0.SECRSYN1.Rel.stVal
BI		664	Class 1 and 0	Yes	25-1 Synchronizing in progress		LD0.SECRSYN1.SynPrg.stVal
BI	Yes	665	Class 0	Yes	25-1 Voltage difference out of limit for synchronizing		LD0.SECRSYN1.VInd.stVal
AI	Yes	172	Class 0	Yes	25-1 Calculated voltage phase angle difference	100	LD0.SECRSYN1.DifAngClc.mag.f
AI	Yes	173	Class 0	Yes	25-1 Calculated voltage frequency difference	100	LD0.SECRSYN1.DifHzClc.mag.f
AI	Yes	174	Class 0	Yes	25-1 Calculated voltage amplitude difference	100	LD0.SECRSYN1.DifVClc.mag.f

Table 95: 25-2 : Synchronism and energizing check instance 2 (SECRSYN2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	666	Class 0	Yes	25-2 Phase angle difference out of limit for synchronizing		LD0.SECRSYN2.AngInd.stVal
BI	Yes	667	Class 0	Yes	25-2 Request to bypass synchronism check and voltage check		LD0.SECRSYN2.ByPss.stVal
BI	Yes	668	Class 0	Yes	25-2 Dead Line Dead Bus		LD0.SECRSYN2.DLDBInd.stVal
BI	Yes	669	Class 0	Yes	25-2 Dead Line Live Bus		LD0.SECRSYN2.DLLBInd.stVal
BI		670	Class 1 and 0	Yes	25-2 CB closing request failed		LD0.SECRSYN2.FailCmd.stVal
BI		671	Class 1 and 0	Yes	25-2 CB closing failed		LD0.SECRSYN2.FailSyn.stVal
BI	Yes	672	Class 0	Yes	25-2 Frequency difference out of limit for synchronizing		LD0.SECRSYN2.HzInd.stVal
BI	Yes	673	Class 0	Yes	25-2 Live Line Dead Bus		LD0.SECRSYN2.LLDBInd.stVal
BI	Yes	674	Class 0	Yes	25-2 Live Line Live Bus		LD0.SECRSYN2.LLLBInd.stVal
BI	Yes	675	Class 0	Yes	25-2 Systems in synchronism		LD0.SECRSYN2.Rel.stVal
BI		676	Class 1 and 0	Yes	25-2 Synchronizing in progress		LD0.SECRSYN2.SynPrg.stVal
BI	Yes	677	Class 0	Yes	25-2 Voltage difference out of limit for synchronizing		LD0.SECRSYN2.VInd.stVal
AI	Yes	175	Class 0	Yes	25-2 Calculated voltage phase angle difference	100	LD0.SECRSYN2.DifAngClc.mag.f
AI	Yes	176	Class 0	Yes	25-2 Calculated voltage frequency difference	100	LD0.SECRSYN2.DifHzClc.mag.f
AI	Yes	177	Class 0	Yes	25-2 Calculated voltage amplitude difference	100	LD0.SECRSYN2.DifVClc.mag.f

Table 96: 25-3 : Synchronism and energizing check instance 3 (SECRSYN3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	678	Class 0	Yes	25-3 Phase angle difference out of limit for synchronizing		LD0.SECRSYN3.AngInd.stVal
BI	Yes	679	Class 0	Yes	25-3 Request to bypass synchronism check and voltage check		LD0.SECRSYN3.ByPss.stVal
BI	Yes	680	Class 0	Yes	25-3 Dead Line Dead Bus		LD0.SECRSYN3.DLDBInd.stVal

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	681	Class 0	Yes	25-3 Dead Line Live Bus		LD0.SECRSYN3.DLLBInd.stVal
BI		682	Class 1 and 0	Yes	25-3 CB closing request failed		LD0.SECRSYN3.FailCmd.stVal
BI		683	Class 1 and 0	Yes	25-3 CB closing failed		LD0.SECRSYN3.FailSyn.stVal
BI	Yes	684	Class 0	Yes	25-3 Frequency difference out of limit for synchronizing		LD0.SECRSYN3.HzInd.stVal
BI	Yes	685	Class 0	Yes	25-3 Live Line Dead Bus		LD0.SECRSYN3.LLDBInd.stVal
BI	Yes	686	Class 0	Yes	25-3 Live Line Live Bus		LD0.SECRSYN3.LLLBInd.stVal
BI	Yes	687	Class 0	Yes	25-3 Systems in synchronism		LD0.SECRSYN3.Rel.stVal
BI		688	Class 1 and 0	Yes	25-3 Synchronizing in progress		LD0.SECRSYN3.SynPrg.stVal
BI	Yes	689	Class 0	Yes	25-3 Voltage difference out of limit for synchronizing		LD0.SECRSYN3.VInd.stVal
AI	Yes	178	Class 0	Yes	25-3 Calculated voltage phase angle difference	100	LD0.SECRSYN3.DifAngClc.mag.f
AI	Yes	179	Class 0	Yes	25-3 Calculated voltage frequency difference	100	LD0.SECRSYN3.DifHzClc.mag.f
AI	Yes	180	Class 0	Yes	25-3 Calculated voltage amplitude difference	100	LD0.SECRSYN3.DifVClc.mag.f

Table 97: 52CM-1 : Circuit-breaker condition monitoring instance 1 (SSCBR1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		168	Class 1 and 0	Yes	52CM-1 Accumulated currents power (lyt) exceeded alarm limit		LD0.SSCBR1.APwrAlm.stVal
BI		169	Class 1 and 0	Yes	52CM-1 Accumulated currents power (lyt) exceeded lockout limit		LD0.SSCBR1.APwrLO.stVal
BI		170	Class 1 and 0	Yes	52CM-1 Remaining life of CB exceeded alarm limit		LD0.SSCBR1.CBLifAlm.stVal
BI		171	Class 1 and 0	Yes	52CM-1 CB close travel time exceeded set value		LD0.SSCBR1.ClsAlm.stVal
BI	Yes	172	Class 0	Yes	52CM-1 Signal for close position of apparatus from I/O		LD0.SSCBR1.InPosCls.stVal
BI	Yes	173	Class 0	Yes	52CM-1 Signal for open position of apparatus from I/O		LD0.SSCBR1.InPosOpn.stVal
BI	Yes	174	Class 0	Yes	52CM-1 Binary pressure alarm input		LD0.SSCBR1.InPresAlm.stVal
BI	Yes	175	Class 0	Yes	52CM-1 Binary pressure input for lockout indication		LD0.SSCBR1.InPresLO.stVal
BI	Yes	176	Class 0	Yes	52CM-1 CB spring charged input		LD0.SSCBR1.InSprCha.stVal
BI	Yes	177	Class 0	Yes	52CM-1 CB spring charging started input		LD0.SSCBR1.InSprChStr.stVal
BI		178	Class 1 and 0	Yes	52CM-1 CB 'not tripped for long time' alarm		LD0.SSCBR1.LonTmAlm.stVal
BI		179	Class 1 and 0	Yes	52CM-1 CB open travel time exceeded set value		LD0.SSCBR1.OpnAlm.stVal
BI		180	Class 1 and 0	Yes	52CM-1 Number of CB operations exceeds alarm limit		LD0.SSCBR1.OpNumAlm.stVal
BI		181	Class 1 and 0	Yes	52CM-1 Number of CB operations exceeds lockout limit		LD0.SSCBR1.OpNumAlm.stVal

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DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	182	Class 0	Yes	52CM-1 CB is in closed position		LD0.SSCBR1.PosCls.stVal
BI	Yes	183	Class 0	Yes	52CM-1 CB is in invalid position (not positively open or closed)		LD0.SSCBR1.PosIvd.stVal
BI	Yes	184	Class 0	Yes	52CM-1 CB is in open position		LD0.SSCBR1.PosOpn.stVal
BI		185	Class 1 and 0	Yes	52CM-1 Pressure below alarm level		LD0.SSCBR1.PresAlm.stVal
BI		186	Class 1 and 0	Yes	52CM-1 Pressure below lockout level		LD0.SSCBR1.PresLO.stVal
BI	Yes	187	Class 0	Yes	52CM-1 Reset accumulation energy		LD0.SSCBR1.RsAccAPwr.stVal
BI	Yes	188	Class 0	Yes	52CM-1 Reset input for CB remaining life and operation counter		LD0.SSCBR1.RsCBWear.stVal
BI	Yes	189	Class 0	Yes	52CM-1 Reset input for the charging time of the CB spring		LD0.SSCBR1.RsSprChaTm.stVal
BI	Yes	190	Class 0	Yes	52CM-1 Reset input for CB closing and opening travel times		LD0.SSCBR1.RsTrvTm.stVal
BI		191	Class 1 and 0	Yes	52CM-1 Spring charging time has crossed the set value		LD0.SSCBR1.SprChaAlm.stVal
AI	Yes	181	Class 0	Yes	52CM-1 Accumulated currents power (lyt) phase A	100	LD0.SSCBR1.AccAPwrPhA.mag.f
AI	Yes	182	Class 0	Yes	52CM-1 Accumulated currents power (lyt) phase B	100	LD0.SSCBR1.AccAPwrPhB.mag.f
AI	Yes	183	Class 0	Yes	52CM-1 Accumulated currents power (lyt) phase C	100	LD0.SSCBR1.AccAPwrPhC.mag.f
AI	Yes	184	Class 0	Yes	52CM-1 The number of days CB has been inactive	0	LD0.SSCBR1.InaTmdCnt.stVal
AI	Yes	185	Class 0	Yes	52CM-1 CB Remaining life phase A	0	LD0.SSCBR1.RmnLifPhA.stVal
AI	Yes	186	Class 0	Yes	52CM-1 CB Remaining life phase B	0	LD0.SSCBR1.RmnLifPhB.stVal
AI	Yes	187	Class 0	Yes	52CM-1 CB Remaining life phase C	0	LD0.SSCBR1.RmnLifPhC.stVal
AI	Yes	188	Class 0	Yes	52CM-1 Travel time of the CB during closing operation	100	LD0.SSCBR1.TmmsCls.mag.f
AI	Yes	189	Class 0	Yes	52CM-1 Travel time of the CB during opening operation	100	LD0.SSCBR1.TmmsOpn.mag.f
AI	Yes	190	Class 0	Yes	52CM-1 The charging time of the CB spring	100	LD0.SSCBR1.TmsSprCha.mag.f

Table 98: 52CM-2 : Circuit-breaker condition monitoring instance 2 (SSCBR2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		192	Class 1 and 0	Yes	52CM-2 Accumulated currents power (lyt) exceeded alarm limit		LD0.SSCBR2.APwrAlm.stVal
BI		193	Class 1 and 0	Yes	52CM-2 Accumulated currents power (lyt) exceeded lockout limit		LD0.SSCBR2.APwrLO.stVal
BI		194	Class 1 and 0	Yes	52CM-2 Remaining life of CB exceeded alarm limit		LD0.SSCBR2.CBLifAlm.stVal
BI		195	Class 1 and 0	Yes	52CM-2 CB close travel time exceeded set value		LD0.SSCBR2.ClsAlm.stVal
BI	Yes	196	Class 0	Yes	52CM-2 Signal for closeposition of apparatus from I/O		LD0.SSCBR2.InPosCls.stVal

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	197	Class 0	Yes	52CM-2 Signal for open position of apparatus from I/O		LD0.SSCBR2.InPosOpn.stVal
BI	Yes	198	Class 0	Yes	52CM-2 Binary pressure alarm input		LD0.SSCBR2.InPresAlm.stVal
BI	Yes	199	Class 0	Yes	52CM-2 Binary pressure input for lockout indication		LD0.SSCBR2.InPresLO.stVal
BI	Yes	200	Class 0	Yes	52CM-2 CB spring charged input		LD0.SSCBR2.InSprCha.stVal
BI	Yes	201	Class 0	Yes	52CM-2 CB spring charging started input		LD0.SSCBR2.InSprChStr.stVal
BI		202	Class 1 and 0	Yes	52CM-2 CB 'not tripped for long time' alarm		LD0.SSCBR2.LonTmAlm.stVal
BI		203	Class 1 and 0	Yes	52CM-2 CB open travel time exceeded set value		LD0.SSCBR2.OpnAlm.stVal
BI		204	Class 1 and 0	Yes	52CM-2 Number of CB operations exceeds alarm limit		LD0.SSCBR2.OpNumAlm.stVal
BI		205	Class 1 and 0	Yes	52CM-2 Number of CB operations exceeds lockout limit		LD0.SSCBR2.OpNumLO.stVal
BI	Yes	206	Class 0	Yes	52CM-2 CB is in closed position		LD0.SSCBR2.PosCls.stVal
BI	Yes	207	Class 0	Yes	52CM-2 CB is in invalid position (not positively open or closed)		LD0.SSCBR2.PosIvd.stVal
BI	Yes	208	Class 0	Yes	52CM-2 CB is in open position		LD0.SSCBR2.PosOpn.stVal
BI		209	Class 1 and 0	Yes	52CM-2 Pressure below alarm level		LD0.SSCBR2.PresAlm.stVal
BI		210	Class 1 and 0	Yes	52CM-2 Pressure below lockout level		LD0.SSCBR2.PresLO.stVal
BI	Yes	211	Class 0	Yes	52CM-2 Reset accumulation energy		LD0.SSCBR2.RsAccAPwr.stVal
BI	Yes	212	Class 0	Yes	52CM-2 Reset input for CB remaining life and operation counter		LD0.SSCBR2.RsCBWear.stVal
BI	Yes	213	Class 0	Yes	52CM-2 Reset input for the charging time of the CB spring		LD0.SSCBR2.RsSprChaTm.stVal
BI	Yes	214	Class 0	Yes	52CM-2 Reset input for CB closing and opening travel times		LD0.SSCBR2.RsTrvTm.stVal
BI		215	Class 1 and 0	Yes	52CM-2 Spring charging time has crossed the set value		LD0.SSCBR2.SprChaAlm.stVal
AI	Yes	191	Class 0	Yes	52CM-2 Accumulated currents power (lyt) phase A	100	LD0.SSCBR2.AccAPwrPhA.mag.f
AI	Yes	192	Class 0	Yes	52CM-2 Accumulated currents power (lyt) phase B	100	LD0.SSCBR2.AccAPwrPhB.mag.f
AI	Yes	193	Class 0	Yes	52CM-2 Accumulated currents power (lyt) phase C	100	LD0.SSCBR2.AccAPwrPhC.mag.f
AI	Yes	194	Class 0	Yes	52CM-2 CB Remaining life phase A	0	LD0.SSCBR2.RmnLifPhA.stVal
AI	Yes	195	Class 0	Yes	52CM-2 CB Remaining life phase B	0	LD0.SSCBR2.RmnLifPhB.stVal
AI	Yes	196	Class 0	Yes	52CM-2 CB Remaining life phase C	0	LD0.SSCBR2.RmnLifPhC.stVal
AI	Yes	197	Class 0	Yes	52CM-2 Travel time of the CB during closing operation	100	LD0.SSCBR2.TmmsCls.mag.f
AI	Yes	198	Class 0	Yes	52CM-2 Travel time of the CB during opening operation	100	LD0.SSCBR2.TmmsOpn.mag.f
AI	Yes	199	Class 0	Yes	52CM-2 The charging time of the CB spring	100	LD0.SSCBR2.TmsSprCha.mag.f

Table 99: TCM-1 : Trip circuit supervision instance 1 (TCSSCBR1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		239	Class 1 and 0	Yes	TCM-1 Alarm output		LD0.TCSSCBR1.CirAlm.stVal

Table 100: TCM-2 : Trip circuit supervision instance 2 (TCSSCBR2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		240	Class 1 and 0	Yes	TCM-2 Alarm output		LD0.TCSSCBR2.CirAlm.stVal

Table 101: CCM : Current circuit supervision (CCRDIF1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		255	Class 1 and 0	Yes	CCM Alarm output		LD0.CCRDIF1.Alm.stVal
BI		256	Class 1 and 0	Yes	CCM Fail output		LD0.CCRDIF1.Op.general

Table 102: 60-1 : Fuse failure supervision instance 1 (SEQRFUF1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		690	Class 1 and 0	Yes	60-1 General pickup of function		LD0.SEQRFUF1.Str.general
BI		691	Class 1 and 0	Yes	60-1 Three-phase pickup of function		LD0.SEQRFUF1.Str3Ph.general

Table 103: 60-2 : Fuse failure supervision instance 2 (SEQRFUF2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		692	Class 1 and 0	Yes	60-2 General pickup of function		LD0.SEQRFUF2.Str.general
BI		693	Class 1 and 0	Yes	60-2 Three-phase pickup of function		LD0.SEQRFUF2.Str3Ph.general

Table 104: CFD : Cable fault detection (RCFD1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		650	Class 1 and 0	Yes	CFD Trip		LD0.RCFD1.Op.general
BI		651	Class 1 and 0	Yes	CFD Trip phsA		LD0.RCFD1.Op.phsA
BI		652	Class 1 and 0	Yes	CFD Trip phsB		LD0.RCFD1.Op.phsB
BI		653	Class 1 and 0	Yes	CFD Trip phsC		LD0.RCFD1.Op.phsC

Table 105: IA IB IC : Three-phase current measurement instance 1 (CMMXU1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		258	Class 1 and 0	Yes	IA IB IC High alarm		LD0.CMMXU1.HiAlm.stVal
BI		259	Class 1 and 0	Yes	IA IB IC High warning		LD0.CMMXU1.HiWrn.stVal
BI		260	Class 1 and 0	Yes	IA IB IC Low alarm		LD0.CMMXU1.LoAlm.stVal
BI		261	Class 1 and 0	Yes	IA IB IC Low warning		LD0.CMMXU1.LoWrn.stVal

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI		0	Class 2 and 0	Yes	IA IB IC IA Amplitude magnitude of instantaneous value	100	LD0.CMMXU1.A.phsA.instCVal.mag.f
AI		1	Class 2 and 0	Yes	IA IB IC IB Amplitude magnitude of instantaneous value	100	LD0.CMMXU1.A.phsB.instCVal.mag.f
AI		2	Class 2 and 0	Yes	IA IB IC IC Amplitude magnitude of instantaneous value	100	LD0.CMMXU1.A.phsC.instCVal.mag.f

Table 106: IA IB IC : Three-phase current measurement instance 1 (CMSTA1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI	Yes	9	Class 0	Yes	IA IB IC Demand value of IA current	100	LD0.CMSTA1.AvAmpsA.mag.f
AI	Yes	10	Class 0	Yes	IA IB IC Demand value of IB current	100	LD0.CMSTA1.AvAmpsB.mag.f
AI	Yes	11	Class 0	Yes	IA IB IC Demand value of IC current	100	LD0.CMSTA1.AvAmpsC.mag.f
AI	Yes	12	Class 0	Yes	IA IB IC Maximum demand for Phase A	100	LD0.CMSTA1.MaxAmpsA.mag.f
AI	Yes	13	Class 0	Yes	IA IB IC Maximum demand for Phase B	100	LD0.CMSTA1.MaxAmpsB.mag.f
AI	Yes	14	Class 0	Yes	IA IB IC Maximum demand for Phase C	100	LD0.CMSTA1.MaxAmpsC.mag.f

Table 107: I1 I2 I0 : Sequence current measurement instance 1 (CSMSQI1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI		27	Class 2 and 0	Yes	I1 I2 I0 Positive sequence current amplitude instantaneous value	100	LD0.CSMSQI1.SeqA.c1.instCVal.mag.f
AI		28	Class 2 and 0	Yes	I1 I2 I0 Negative sequence current amplitude instantaneous value	100	LD0.CSMSQI1.SeqA.c2.instCVal.mag.f
AI		29	Class 2 and 0	Yes	I1 I2 I0 Zero sequence current amplitude instantaneous value	100	LD0.CSMSQI1.SeqA.c3.instCVal.mag.f

Table 108: IG : Residual current measurement instance 1 (RESCMMXU1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		270	Class 1 and 0	Yes	IG High alarm		LD0.RESCMMXU1.HiAlm.stVal
BI		271	Class 1 and 0	Yes	IG High warning		LD0.RESCMMXU1.HiWrn.stVal
AI		36	Class 2 and 0	Yes	IG Ground current Amplitude magnitude of instantaneous value	100	LD0.RESCMMXU1.A.res.instCVal.mag.f

Table 109: VA VB VC : Three-phase voltage measurement instance 1 (VMMXU1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		274	Class 1 and 0	Yes	VA VB VC High alarm		LD0.VMMXU1.HiAlm.stVal
BI		275	Class 1 and 0	Yes	VA VB VC High warning		LD0.VMMXU1.HiWrn.stVal
BI		276	Class 1 and 0	Yes	VA VB VC Low alarm		LD0.VMMXU1.LoAlm.stVal

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DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		277	Class 1 and 0	Yes	VA VB VC Low warning		LD0.VMMXU1.LoWrn.stVal
AI		48	Class 2 and 0	Yes	VA VB VC VA Amplitude magnitude of instantaneous value	100	LD0.VMMXU1.PhV.phsA.cVal.mag.f
AI		49	Class 2 and 0	Yes	VA VB VC VB Amplitude magnitude of instantaneous value	100	LD0.VMMXU1.PhV.phsB.cVal.mag.f
AI		50	Class 2 and 0	Yes	VA VB VC VC Amplitude magnitude of instantaneous value	100	LD0.VMMXU1.PhV.phsC.cVal.mag.f
AI		51	Class 2 and 0	Yes	VA VB VC VAB Amplitude magnitude of instantaneous value	100	LD0.VMMXU1.PPV.phsAB.instCVal.mag.f
AI		52	Class 2 and 0	Yes	VA VB VC VBC Amplitude magnitude of instantaneous value	100	LD0.VMMXU1.PPV.phsBC.instCVal.mag.f
AI		53	Class 2 and 0	Yes	VA VB VC VCA Amplitude magnitude of instantaneous value	100	LD0.VMMXU1.PPV.phsCA.instCVal.mag.f

Table 110: VA VB VC (2) : Three-phase voltage measurement instance 2 (VMMXU2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		278	Class 1 and 0	Yes	VA VB VC(2) High alarm		LD0.VMMXU2.HiAlm.stVal
BI		279	Class 1 and 0	Yes	VA VB VC(2) High warning		LD0.VMMXU2.HiWrn.stVal
BI		280	Class 1 and 0	Yes	VA VB VC(2) Low alarm		LD0.VMMXU2.LoAlm.stVal
BI		281	Class 1 and 0	Yes	VA VB VC(2) Low warning		LD0.VMMXU2.LoWrn.stVal
AI		54	Class 2 and 0	Yes	VA VB VC(2) VA Amplitude magnitude of instantaneous value	100	LD0.VMMXU2.PhV.phsA.cVal.mag.f
AI		55	Class 2 and 0	Yes	VA VB VC(2) VB Amplitude magnitude of instantaneous value	100	LD0.VMMXU2.PhV.phsB.cVal.mag.f
AI		56	Class 2 and 0	Yes	VA VB VC(2) VC Amplitude magnitude of instantaneous value	100	LD0.VMMXU2.PhV.phsC.cVal.mag.f
AI		57	Class 2 and 0	Yes	VA VB VC(2) VAB Amplitude magnitude of instantaneous value	100	LD0.VMMXU2.PPV.phsAB.instCVal.mag.f
AI		58	Class 2 and 0	Yes	VA VB VC(2) VBC Amplitude magnitude of instantaneous value	100	LD0.VMMXU2.PPV.phsBC.instCVal.mag.f
AI		59	Class 2 and 0	Yes	VA VB VC(2) VCA Amplitude magnitude of instantaneous value	100	LD0.VMMXU2.PPV.phsCA.instCVal.mag.f

Table 111: VG : Residual voltage measurement instance 1 (RESVMMXU1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		282	Class 1 and 0	Yes	VG High alarm		LD0.RESVMMXU1.HiAlm.stVal
BI		283	Class 1 and 0	Yes	VG High warning		LD0.RESVMMXU1.HiWrn.stVal
AI		46	Class 2 and 0	Yes	VG Ground voltage Amplitude magnitude of instantaneous value	100	LD0.RESVMMXU1.PhV.res.instCVal.mag.f

Table 112: V1 V2 V0 : Sequence voltage measurement instance 1 (VSMSQI1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI		60	Class 2 and 0	Yes	V1 V2 V0 Positive sequence voltage amplitude instantaneous value	100	LD0.VSMSQI1.SeqV.c1.instCVal.mag.f
AI		61	Class 2 and 0	Yes	V1 V2 V0 Negative sequence voltage amplitude instantaneous value	100	LD0.VSMSQI1.SeqV.c2.instCVal.mag.f
AI		62	Class 2 and 0	Yes	V1 V2 V0 Zero sequence voltage amplitude instantaneous value	100	LD0.VSMSQI1.SeqV.c3.instCVal.mag.f

Table 113: V1 V2 V0 (2) : Sequence voltage measurement instance 2 (VSMSQI2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI		63	Class 2 and 0	Yes	V1 V2 V0(2) Positive sequence voltage amplitude instantaneous value	100	LD0.VSMSQI2.SeqV.c1.instCVal.mag.f
AI		64	Class 2 and 0	Yes	V1 V2 V0(2) Negative sequence voltage amplitude instantaneous value	100	LD0.VSMSQI2.SeqV.c2.instCVal.mag.f
AI		65	Class 2 and 0	Yes	V1 V2 V0(2) Zero sequence voltage amplitude instantaneous value	100	LD0.VSMSQI2.SeqV.c3.instCVal.mag.f

Table 114: P E : Three-phase power and energy measurement instance 1 (PEMMXU1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI		90	Class 2 and 0	Yes	P E Average Power factor	100	LD0.PEMMXU1.TotPF.instMag.f
AI		91	Class 2 and 0	Yes	P E Total Apparent Power	100	LD0.PEMMXU1.TotVA.instMag.f
AI		92	Class 2 and 0	Yes	P E Total Reactive Power	100	LD0.PEMMXU1.TotVAr.instMag.f
AI		93	Class 2 and 0	Yes	P E Active power magnitude of instantaneous value	100	LD0.PEMMXU1.TotW.instMag.f

Table 115: P E : Three-phase power and energy measurement instance 1 (PEMMTR1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	610	Class 0	Yes	P E Reset of accumulated energy reading		LD0.PEMMTR1.SupDmdRs.stVal
AI	Yes	86	Class 0	Yes	P E Accumulated forward reactive energy value	0	LD0.PEMMTR1.DmdVArh.actVal
AI	Yes	87	Class 0	Yes	P E Accumulated forward active energy value	0	LD0.PEMMTR1.DmdWh.actVal
AI	Yes	88	Class 0	Yes	P E Accumulated reverse reactive energy value	0	LD0.PEMMTR1.SupVArh.actVal
AI	Yes	89	Class 0	Yes	P E Accumulated reverse active energy value	0	LD0.PEMMTR1.SupWh.actVal

Table 116: PQI-1 : Current total demand distortion instance 1 (CMHAI1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		257	Class 1 and 0	Yes	PQI-1 Alarm signal for TDD		LD0.CMHAI1.Alm.stVal
AI	Yes	37	Class 0	Yes	PQI-1 Demand value for TDD for phase A	100	LD0.CMHAI1.DmdTddA.phsA.cVal.mag.f
AI	Yes	38	Class 0	Yes	PQI-1 Demand value for TDD for phase B	100	LD0.CMHAI1.DmdTddA.phsB.cVal.mag.f
AI	Yes	39	Class 0	Yes	PQI-1 Demand value for TDD for phase C	100	LD0.CMHAI1.DmdTddA.phsC.cVal.mag.f
AI	Yes	40	Class 0	Yes	PQI-1 Maximum demand TDD for phase A	100	LD0.CMHAI1.MaxDmdTddA.phsA.cVal.mag.f
AI	Yes	41	Class 0	Yes	PQI-1 Maximum demand TDD for phase B	100	LD0.CMHAI1.MaxDmdTddA.phsB.cVal.mag.f
AI	Yes	42	Class 0	Yes	PQI-1 Maximum demand TDD for phase C	100	LD0.CMHAI1.MaxDmdTddA.phsC.cVal.mag.f
AI	Yes	43	Class 0	Yes	PQI-1 3 second mean value of TDD for phase A	100	LD0.CMHAI1.TddA.phsA.cVal.mag.f
AI	Yes	44	Class 0	Yes	PQI-1 3 second mean value of TDD for phase B	100	LD0.CMHAI1.TddA.phsB.cVal.mag.f
AI	Yes	45	Class 0	Yes	PQI-1 3 second mean value of TDD for phase C	100	LD0.CMHAI1.TddA.phsC.cVal.mag.f

Table 117: PQVPH-1 : Voltage total harmonic distortion instance 1 (VMHAI1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		272	Class 1 and 0	Yes	PQVPH-1 Alarm signal for THD		LD0.VMHAI1.Alm.stVal
AI	Yes	66	Class 0	Yes	PQVPH-1 Demand value for THD for phase A	100	LD0.VMHAI1.DmdThdPhV.phsA.cVal.mag.f
AI	Yes	67	Class 0	Yes	PQVPH-1 Demand value for THD for phase B	100	LD0.VMHAI1.DmdThdPhV.phsB.cVal.mag.f
AI	Yes	68	Class 0	Yes	PQVPH-1 Demand value for THD for phase C	100	LD0.VMHAI1.DmdThdPhV.phsC.cVal.mag.f
AI	Yes	69	Class 0	Yes	PQVPH-1 Maximum demand THD for phase A	100	LD0.VMHAI1.MaxDmdThdV.phsA.cVal.mag.f
AI	Yes	70	Class 0	Yes	PQVPH-1 Maximum demand THD for phase B	100	LD0.VMHAI1.MaxDmdThdV.phsB.cVal.mag.f
AI	Yes	71	Class 0	Yes	PQVPH-1 Maximum demand THD for phase C	100	LD0.VMHAI1.MaxDmdThdV.phsC.cVal.mag.f
AI	Yes	72	Class 0	Yes	PQVPH-1 3 second mean value of THD for phase A	100	LD0.VMHAI1.ThdPhV.phsA.cVal.mag.f
AI	Yes	73	Class 0	Yes	PQVPH-1 3 second mean value of THD for phase B	100	LD0.VMHAI1.ThdPhV.phsB.cVal.mag.f
AI	Yes	74	Class 0	Yes	PQVPH-1 3 second mean value of THD for phase C	100	LD0.VMHAI1.ThdPhV.phsC.cVal.mag.f

Table 118: PQVPH-2 : Voltage total harmonic distortion instance 2 (VMHAI2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		273	Class 1 and 0	Yes	PQVPH-2 Alarm signal for THD		LD0.VMHAI2.Alm.stVal
AI	Yes	75	Class 0	Yes	PQVPH-2 Demand value for THD for phase A	100	LD0.VMHAI2.DmdThdPhV.phsA.cVal.mag.f
AI	Yes	76	Class 0	Yes	PQVPH-2 Demand value for THD for phase B	100	LD0.VMHAI2.DmdThdPhV.phsB.cVal.mag.f
AI	Yes	77	Class 0	Yes	PQVPH-2 Demand value for THD for phase C	100	LD0.VMHAI2.DmdThdPhV.phsC.cVal.mag.f
AI	Yes	78	Class 0	Yes	PQVPH-2 Maximum demand THD for phase A	100	LD0.VMHAI2.MaxDmdThdV.phsA.cVal.mag.f
AI	Yes	79	Class 0	Yes	PQVPH-2 Maximum demand THD for phase B	100	LD0.VMHAI2.MaxDmdThdV.phsB.cVal.mag.f
AI	Yes	80	Class 0	Yes	PQVPH-2 Maximum demand THD for phase C	100	LD0.VMHAI2.MaxDmdThdV.phsC.cVal.mag.f
AI	Yes	81	Class 0	Yes	PQVPH-2 3 second mean value of THD for phase A	100	LD0.VMHAI2.ThdPhV.phsA.cVal.mag.f
AI	Yes	82	Class 0	Yes	PQVPH-2 3 second mean value of THD for phase B	100	LD0.VMHAI2.ThdPhV.phsB.cVal.mag.f
AI	Yes	83	Class 0	Yes	PQVPH-2 3 second mean value of THD for phase C	100	LD0.VMHAI2.ThdPhV.phsC.cVal.mag.f

Table 119: PQSS-1 : Voltage variation instance 1 (PH1QVVR1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		612	Class 1 and 0	Yes	PQSS-1 Voltage dip detected		LD0.PH1QVVR1.DipOp.stVal
BI	Yes	613	Class 0	Yes	PQSS-1 Voltage dip active		LD0.PH1QVVR1.DipStr.stVal
BI		614	Class 1 and 0	Yes	PQSS-1 Voltage interruption detected		LD0.PH1QVVR1.IntrOp.stVal
BI	Yes	615	Class 0	Yes	PQSS-1 Voltage interruption active		LD0.PH1QVVR1.IntrStr.stVal
BI	Yes	616	Class 0	Yes	PQSS-1 Voltage variation detected		LD0.PH1QVVR1.VarOp.stVal
BI		617	Class 1 and 0	Yes	PQSS-1 Voltage swell detected		LD0.PH1QVVR1.SwOp.stVal
BI	Yes	618	Class 0	Yes	PQSS-1 Voltage swell active		LD0.PH1QVVR1.SwStr.stVal
AI	Yes	134	Class 0	Yes	PQSS-1 Instantaneous dip operation counter	0	LD0.PH1QVVR1.DipInstCnt.stVal
AI	Yes	135	Class 0	Yes	PQSS-1 Maximum duration dip operation counter	0	LD0.PH1QVVR1.DipMaxCnt.stVal
AI	Yes	136	Class 0	Yes	PQSS-1 Momentary dip operation counter	0	LD0.PH1QVVR1.DipMomCnt.stVal
AI	Yes	137	Class 0	Yes	PQSS-1 Temporary dip operation counter	0	LD0.PH1QVVR1.DipTmpCnt.stVal
AI	Yes	138	Class 0	Yes	PQSS-1 Maximum duration interruption operation counter	0	LD0.PH1QVVR1.IntrMaxCnt.stVal
AI	Yes	139	Class 0	Yes	PQSS-1 Momentary interruption operation counter	0	LD0.PH1QVVR1.IntrMomCnt.stVal

Section 2 DNP3 data mappings

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI	Yes	140	Class 0	Yes	PQSS-1 Sustained interruption operation counter	0	LD0.PH1QVVR1.IntrSstCnt.stVal
AI	Yes	141	Class 0	Yes	PQSS-1 Temporary interruption operation counter	0	LD0.PH1QVVR1.IntrTmpCnt.stVal
AI	Yes	142	Class 0	Yes	PQSS-1 Instantaneous swell operation counter	0	LD0.PH1QVVR1.SwlInstCnt.stVal
AI	Yes	143	Class 0	Yes	PQSS-1 Maximum duration swell operation counter	0	LD0.PH1QVVR1.SwlMaxCnt.stVal
AI	Yes	144	Class 0	Yes	PQSS-1 Momentary swell operation counter	0	LD0.PH1QVVR1.SwlMomCnt.stVal
AI	Yes	145	Class 0	Yes	PQSS-1 Temporary swell operation counter	0	LD0.PH1QVVR1.SwlTmpCnt.stVal

Table 120: PQVUB-1 : Voltage unbalance instance 1 (VSQVUB1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		288	Class 1 and 0	Yes	PQVUB-1 Alarm active when percentile unbalance exceeds the limit		LD0.VSQVUB1.HiPctVUnb.stVal
BI	Yes	289	Class 0	Yes	PQVUB-1 Observation period is active		LD0.VSQVUB1.ObsPerAct.stVal
BI		290	Class 1 and 0	Yes	PQVUB-1 Alarm active when 3 sec voltage unbalance exceeds the limit		LD0.VSQVUB1.VarStr.stVal

Table 121: PQVUB-2 : Voltage unbalance instance 2 (VSQVUB2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		291	Class 1 and 0	Yes	PQVUB-2 Alarm active when percentile unbalance exceeds the limit		LD0.VSQVUB2.HiPctVUnb.stVal
BI	Yes	292	Class 0	Yes	PQVUB-2 Observation period is active		LD0.VSQVUB2.ObsPerAct.stVal
BI		293	Class 1 and 0	Yes	PQVUB-2 Alarm active when 3 sec voltage unbalance exceeds the limit		LD0.VSQVUB2.VarStr.stVal

Table 122: LoadProf : Load profile instance 1 (LDPMSTA1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		518	Class 1 and 0	Yes	LoadProf Recording memory alarm status		LD0.LDPMSTA1.MemAlm.stVal
BI		519	Class 1 and 0	Yes	LoadProf Recording memory warning status		LD0.LDPMSTA1.MemWrn.stVal
AI	Yes	355	Class 0	Yes	LoadProf How much recording memory is currently used	0	LD0.LDPMSTA1.MemUsed.stVal

Table 123: *f*: Frequency measurement instance 1 (FMMXU1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI		84	Class 2 and 0	Yes	f Frequency instantaneous value	100	LD0.FMMXU1.Hz.instMag.f

Table 124: *SP SE*: Single-phase power and energy measurement instance 1 (SPEMMXU1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI		110	Class 2 and 0	Yes	SP SE Power factor magnitude of reported value Phase A	100	LD0.SPEMMXU1.PF.phsA.cVal.mag.f
AI		111	Class 2 and 0	Yes	SP SE Power factor magnitude of reported value Phase B	100	LD0.SPEMMXU1.PF.phsB.cVal.mag.f
AI		112	Class 2 and 0	Yes	SP SE Power factor magnitude of reported value Phase C	100	LD0.SPEMMXU1.PF.phsC.cVal.mag.f
AI		113	Class 2 and 0	Yes	SP SE Apparent power magnitude of reported value Phase A	100	LD0.SPEMMXU1.VA.phsA.cVal.mag.f
AI		114	Class 2 and 0	Yes	SP SE Apparent power magnitude of reported value Phase B	100	LD0.SPEMMXU1.VA.phsB.cVal.mag.f
AI		115	Class 2 and 0	Yes	SP SE Apparent power magnitude of reported value Phase C	100	LD0.SPEMMXU1.VA.phsC.cVal.mag.f
AI		116	Class 2 and 0	Yes	SP SE Reactive power magnitude of reported value Phase A	100	LD0.SPEMMXU1.VAr.phsA.cVal.mag.f
AI		117	Class 2 and 0	Yes	SP SE Reactive power magnitude of reported value Phase B	100	LD0.SPEMMXU1.VAr.phsB.cVal.mag.f
AI		118	Class 2 and 0	Yes	SP SE Reactive power magnitude of reported value Phase C	100	LD0.SPEMMXU1.VAr.phsC.cVal.mag.f
AI		119	Class 2 and 0	Yes	SP SE Active power magnitude of reported value Phase A	100	LD0.SPEMMXU1.W.phsA.cVal.mag.f
AI		120	Class 2 and 0	Yes	SP SE Active power magnitude of reported value Phase B	100	LD0.SPEMMXU1.W.phsB.cVal.mag.f
AI		121	Class 2 and 0	Yes	SP SE Active power magnitude of reported value Phase C	100	LD0.SPEMMXU1.W.phsC.cVal.mag.f

Table 125: *SP SE*: Single-phase power and energy measurement instance 1 (SPEMMTR1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	774	Class 0	Yes	SP SE Reset of accumulated energy reading		LD0.SPEMMTR1.SuDmdRs.stVal
AI	Yes	98	Class 0	Yes	SP SE Accumulated forward reactive energy value Phase A	0	LD0.SPEMMTR1.DmdVArhA.actVal
AI	Yes	99	Class 0	Yes	SP SE Accumulated forward reactive energy value Phase B	0	LD0.SPEMMTR1.DmdVArhB.actVal
AI	Yes	100	Class 0	Yes	SP SE Accumulated forward reactive energy value Phase C	0	LD0.SPEMMTR1.DmdVArhC.actVal
AI	Yes	101	Class 0	Yes	SP SE Accumulated forward active energy value Phase A	0	LD0.SPEMMTR1.DmdWhA.actVal
AI	Yes	102	Class 0	Yes	SP SE Accumulated forward active energy value Phase B	0	LD0.SPEMMTR1.DmdWhB.actVal
AI	Yes	103	Class 0	Yes	SP SE Accumulated forward active energy value Phase C	0	LD0.SPEMMTR1.DmdWhC.actVal

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DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI	Yes	104	Class 0	Yes	SP SE Accumulated reverse reactive energy value Phase A	0	LD0.SPEMMTR1.SupVArhA.actVal
AI	Yes	105	Class 0	Yes	SP SE Accumulated reverse reactive energy value Phase B	0	LD0.SPEMMTR1.SupVArhB.actVal
AI	Yes	106	Class 0	Yes	SP SE Accumulated reverse reactive energy value Phase C	0	LD0.SPEMMTR1.SupVArhC.actVal
AI	Yes	107	Class 0	Yes	SP SE Accumulated reverse active energy value Phase A	0	LD0.SPEMMTR1.SupWhA.actVal
AI	Yes	108	Class 0	Yes	SP SE Accumulated reverse active energy value Phase B	0	LD0.SPEMMTR1.SupWhB.actVal
AI	Yes	109	Class 0	Yes	SP SE Accumulated reverse active energy value Phase C	0	LD0.SPEMMTR1.SupWhC.actVal

Table 126: TP-1 : Minimum pulse timer (2 pcs) instance 1 (TPGAPC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1013	Class 0	Yes	TP-1 Output 2 status		LD0.TPGAPC1.Op.general
BI	Yes	1014	Class 0	Yes	TP-1 Output 1 status		LD0.TPGAPC1.Str.general

Table 127: TP-2 : Minimum pulse timer (2 pcs) instance 2 (TPGAPC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1015	Class 0	Yes	TP-2 Output 2 status		LD0.TPGAPC2.Op.general
BI	Yes	1016	Class 0	Yes	TP-2 Output 1 status		LD0.TPGAPC2.Str.general

Table 128: TP-3 : Minimum pulse timer (2 pcs) instance 3 (TPGAPC3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1017	Class 0	Yes	TP-3 Output 2 status		LD0.TPGAPC3.Op.general
BI	Yes	1018	Class 0	Yes	TP-3 Output 1 status		LD0.TPGAPC3.Str.general

Table 129: TP-4 : Minimum pulse timer (2 pcs) instance 4 (TPGAPC4)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1019	Class 0	Yes	TP-4 Output 2 status		LD0.TPGAPC4.Op.general
BI	Yes	1020	Class 0	Yes	TP-4 Output 1 status		LD0.TPGAPC4.Str.general

Table 130: 62CLD-1 : Minimum pulse timer (2 pcs second resolution) instance 1 (TPSGAPC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1025	Class 0	Yes	62CLD-1 Output 2 status		LD0.TPSGAPC1.Op.general
BI	Yes	1026	Class 0	Yes	62CLD-1 Output 1 status		LD0.TPSGAPC1.Str.general

Table 131: 62CLD-3 : Minimum pulse timer (2 pcs second resolution) instance 2 (TPSGAPC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1027	Class 0	Yes	62CLD-3 Output 2 status		LD0.TPSGAPC2.Op.general
BI	Yes	1028	Class 0	Yes	62CLD-3 Output 1 status		LD0.TPSGAPC2.Str.general

Table 132: 62CLD-2 : Minimum pulse timer (2 pcs minute resolution) instance 1 (TPMGAPC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1021	Class 0	Yes	62CLD-2 Output 2 status		LD0.TPMGAPC1.Op.general
BI	Yes	1022	Class 0	Yes	62CLD-2 Output 1 status		LD0.TPMGAPC1.Str.general

Table 133: 62CLD-4 : Minimum pulse timer (2 pcs minute resolution) instance 2 (TPMGAPC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1023	Class 0	Yes	62CLD-4 Output 2 status		LD0.TPMGAPC2.Op.general
BI	Yes	1024	Class 0	Yes	62CLD-4 Output 1 status		LD0.TPMGAPC2.Str.general

Table 134: PT-1 : Pulse timer (8 pcs) instance 1 (PTGAPC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	837	Class 0	Yes	PT-1 Input 1 status		LD0.PTGAPC1.In1.stVal
BI	Yes	838	Class 0	Yes	PT-1 Input 2 status		LD0.PTGAPC1.In2.stVal
BI	Yes	839	Class 0	Yes	PT-1 Input 3 status		LD0.PTGAPC1.In3.stVal
BI	Yes	840	Class 0	Yes	PT-1 Input 4 status		LD0.PTGAPC1.In4.stVal
BI	Yes	841	Class 0	Yes	PT-1 Input 5 status		LD0.PTGAPC1.In5.stVal
BI	Yes	842	Class 0	Yes	PT-1 Input 6 status		LD0.PTGAPC1.In6.stVal
BI	Yes	843	Class 0	Yes	PT-1 Input 7 status		LD0.PTGAPC1.In7.stVal
BI	Yes	844	Class 0	Yes	PT-1 Input 8 status		LD0.PTGAPC1.In8.stVal
BI	Yes	845	Class 0	Yes	PT-1 Output 1 status		LD0.PTGAPC1.Q1.stVal
BI	Yes	846	Class 0	Yes	PT-1 Output 2 status		LD0.PTGAPC1.Q2.stVal
BI	Yes	847	Class 0	Yes	PT-1 Output 3 status		LD0.PTGAPC1.Q3.stVal
BI	Yes	848	Class 0	Yes	PT-1 Output 4 status		LD0.PTGAPC1.Q4.stVal
BI	Yes	849	Class 0	Yes	PT-1 Output 5 status		LD0.PTGAPC1.Q5.stVal
BI	Yes	850	Class 0	Yes	PT-1 Output 6 status		LD0.PTGAPC1.Q6.stVal
BI	Yes	851	Class 0	Yes	PT-1 Output 7 status		LD0.PTGAPC1.Q7.stVal
BI	Yes	852	Class 0	Yes	PT-1 Output 8 status		LD0.PTGAPC1.Q8.stVal

Table 135: PT-2 : Pulse timer (8 pcs) instance 2 (PTGAPC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	853	Class 0	Yes	PT-2 Input 1 status		LD0.PTGAPC2.In1.stVal
BI	Yes	854	Class 0	Yes	PT-2 Input 2 status		LD0.PTGAPC2.In2.stVal

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DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	855	Class 0	Yes	PT-2 Input 3 status		LD0.PTGAPC2.In3.stVal
BI	Yes	856	Class 0	Yes	PT-2 Input 4 status		LD0.PTGAPC2.In4.stVal
BI	Yes	857	Class 0	Yes	PT-2 Input 5 status		LD0.PTGAPC2.In5.stVal
BI	Yes	858	Class 0	Yes	PT-2 Input 6 status		LD0.PTGAPC2.In6.stVal
BI	Yes	859	Class 0	Yes	PT-2 Input 7 status		LD0.PTGAPC2.In7.stVal
BI	Yes	860	Class 0	Yes	PT-2 Input 8 status		LD0.PTGAPC2.In8.stVal
BI	Yes	861	Class 0	Yes	PT-2 Output 1 status		LD0.PTGAPC2.Q1.stVal
BI	Yes	862	Class 0	Yes	PT-2 Output 2 status		LD0.PTGAPC2.Q2.stVal
BI	Yes	863	Class 0	Yes	PT-2 Output 3 status		LD0.PTGAPC2.Q3.stVal
BI	Yes	864	Class 0	Yes	PT-2 Output 4 status		LD0.PTGAPC2.Q4.stVal
BI	Yes	865	Class 0	Yes	PT-2 Output 5 status		LD0.PTGAPC2.Q5.stVal
BI	Yes	866	Class 0	Yes	PT-2 Output 6 status		LD0.PTGAPC2.Q6.stVal
BI	Yes	867	Class 0	Yes	PT-2 Output 7 status		LD0.PTGAPC2.Q7.stVal
BI	Yes	868	Class 0	Yes	PT-2 Output 8 status		LD0.PTGAPC2.Q8.stVal

Table 136: TOF-1 : Time delay off (8 pcs) instance 1 (TOFGAPC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	917	Class 0	Yes	TOF-1 Input 1 status		LD0.TOFGAPC1.In1.stVal
BI	Yes	918	Class 0	Yes	TOF-1 Input 2 status		LD0.TOFGAPC1.In2.stVal
BI	Yes	919	Class 0	Yes	TOF-1 Input 3 status		LD0.TOFGAPC1.In3.stVal
BI	Yes	920	Class 0	Yes	TOF-1 Input 4 status		LD0.TOFGAPC1.In4.stVal
BI	Yes	921	Class 0	Yes	TOF-1 Input 5 status		LD0.TOFGAPC1.In5.stVal
BI	Yes	922	Class 0	Yes	TOF-1 Input 6 status		LD0.TOFGAPC1.In6.stVal
BI	Yes	923	Class 0	Yes	TOF-1 Input 7 status		LD0.TOFGAPC1.In7.stVal
BI	Yes	924	Class 0	Yes	TOF-1 Input 8 status		LD0.TOFGAPC1.In8.stVal
BI	Yes	925	Class 0	Yes	TOF-1 Output 1 status		LD0.TOFGAPC1.Q1.stVal
BI	Yes	926	Class 0	Yes	TOF-1 Output 2 status		LD0.TOFGAPC1.Q2.stVal
BI	Yes	927	Class 0	Yes	TOF-1 Output 3 status		LD0.TOFGAPC1.Q3.stVal
BI	Yes	928	Class 0	Yes	TOF-1 Output 4 status		LD0.TOFGAPC1.Q4.stVal
BI	Yes	929	Class 0	Yes	TOF-1 Output 5 status		LD0.TOFGAPC1.Q5.stVal
BI	Yes	930	Class 0	Yes	TOF-1 Output 6 status		LD0.TOFGAPC1.Q6.stVal
BI	Yes	931	Class 0	Yes	TOF-1 Output 7 status		LD0.TOFGAPC1.Q7.stVal
BI	Yes	932	Class 0	Yes	TOF-1 Output 8 status		LD0.TOFGAPC1.Q8.stVal

Table 137: TOF-2 : Time delay off (8 pcs) instance 2 (TOFGAPC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	933	Class 0	Yes	TOF-2 Input 1 status		LD0.TOFGAPC2.In1.stVal
BI	Yes	934	Class 0	Yes	TOF-2 Input 2 status		LD0.TOFGAPC2.In2.stVal

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	935	Class 0	Yes	TOF-2 Input 3 status		LD0.TOFGAPC2.In3.stVal
BI	Yes	936	Class 0	Yes	TOF-2 Input 4 status		LD0.TOFGAPC2.In4.stVal
BI	Yes	937	Class 0	Yes	TOF-2 Input 5 status		LD0.TOFGAPC2.In5.stVal
BI	Yes	938	Class 0	Yes	TOF-2 Input 6 status		LD0.TOFGAPC2.In6.stVal
BI	Yes	939	Class 0	Yes	TOF-2 Input 7 status		LD0.TOFGAPC2.In7.stVal
BI	Yes	940	Class 0	Yes	TOF-2 Input 8 status		LD0.TOFGAPC2.In8.stVal
BI	Yes	941	Class 0	Yes	TOF-2 Output 1 status		LD0.TOFGAPC2.Q1.stVal
BI	Yes	942	Class 0	Yes	TOF-2 Output 2 status		LD0.TOFGAPC2.Q2.stVal
BI	Yes	943	Class 0	Yes	TOF-2 Output 3 status		LD0.TOFGAPC2.Q3.stVal
BI	Yes	944	Class 0	Yes	TOF-2 Output 4 status		LD0.TOFGAPC2.Q4.stVal
BI	Yes	945	Class 0	Yes	TOF-2 Output 5 status		LD0.TOFGAPC2.Q5.stVal
BI	Yes	946	Class 0	Yes	TOF-2 Output 6 status		LD0.TOFGAPC2.Q6.stVal
BI	Yes	947	Class 0	Yes	TOF-2 Output 7 status		LD0.TOFGAPC2.Q7.stVal
BI	Yes	948	Class 0	Yes	TOF-2 Output 8 status		LD0.TOFGAPC2.Q8.stVal

Table 138: TOF-3 : Time delay off (8 pcs) instance 3 (TOFGAPC3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	949	Class 0	Yes	TOF-3 Output 1 status		LD0.TOFGAPC3.Q1.stVal
BI	Yes	950	Class 0	Yes	TOF-3 Output 2 status		LD0.TOFGAPC3.Q2.stVal
BI	Yes	951	Class 0	Yes	TOF-3 Output 3 status		LD0.TOFGAPC3.Q3.stVal
BI	Yes	952	Class 0	Yes	TOF-3 Output 4 status		LD0.TOFGAPC3.Q4.stVal
BI	Yes	953	Class 0	Yes	TOF-3 Output 5 status		LD0.TOFGAPC3.Q5.stVal
BI	Yes	954	Class 0	Yes	TOF-3 Output 6 status		LD0.TOFGAPC3.Q6.stVal
BI	Yes	955	Class 0	Yes	TOF-3 Output 7 status		LD0.TOFGAPC3.Q7.stVal
BI	Yes	956	Class 0	Yes	TOF-3 Output 8 status		LD0.TOFGAPC3.Q8.stVal

Table 139: TOF-4 : Time delay off (8 pcs) instance 4 (TOFGAPC4)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	957	Class 0	Yes	TOF-4 Output 1 status		LD0.TOFGAPC4.Q1.stVal
BI	Yes	958	Class 0	Yes	TOF-4 Output 2 status		LD0.TOFGAPC4.Q2.stVal
BI	Yes	959	Class 0	Yes	TOF-4 Output 3 status		LD0.TOFGAPC4.Q3.stVal
BI	Yes	960	Class 0	Yes	TOF-4 Output 4 status		LD0.TOFGAPC4.Q4.stVal
BI	Yes	961	Class 0	Yes	TOF-4 Output 5 status		LD0.TOFGAPC4.Q5.stVal
BI	Yes	962	Class 0	Yes	TOF-4 Output 6 status		LD0.TOFGAPC4.Q6.stVal
BI	Yes	963	Class 0	Yes	TOF-4 Output 7 status		LD0.TOFGAPC4.Q7.stVal
BI	Yes	964	Class 0	Yes	TOF-4 Output 8 status		LD0.TOFGAPC4.Q8.stVal

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Table 140: TON -1 : Time delay on (8 pcs) instance 1 (TONGAPC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	965	Class 0	Yes	TON -1 Input 1		LD0.TONGAPC1.In1.stVal
BI	Yes	966	Class 0	Yes	TON -1 Input 2		LD0.TONGAPC1.In2.stVal
BI	Yes	967	Class 0	Yes	TON -1 Input 3		LD0.TONGAPC1.In3.stVal
BI	Yes	968	Class 0	Yes	TON -1 Input 4		LD0.TONGAPC1.In4.stVal
BI	Yes	969	Class 0	Yes	TON -1 Input 5		LD0.TONGAPC1.In5.stVal
BI	Yes	970	Class 0	Yes	TON -1 Input 6		LD0.TONGAPC1.In6.stVal
BI	Yes	971	Class 0	Yes	TON -1 Input 7		LD0.TONGAPC1.In7.stVal
BI	Yes	972	Class 0	Yes	TON -1 Input 8		LD0.TONGAPC1.In8.stVal
BI	Yes	973	Class 0	Yes	TON -1 Output 1		LD0.TONGAPC1.Q1.stVal
BI	Yes	974	Class 0	Yes	TON -1 Output 2		LD0.TONGAPC1.Q2.stVal
BI	Yes	975	Class 0	Yes	TON -1 Output 3		LD0.TONGAPC1.Q3.stVal
BI	Yes	976	Class 0	Yes	TON -1 Output 4		LD0.TONGAPC1.Q4.stVal
BI	Yes	977	Class 0	Yes	TON -1 Output 5		LD0.TONGAPC1.Q5.stVal
BI	Yes	978	Class 0	Yes	TON -1 Output 6		LD0.TONGAPC1.Q6.stVal
BI	Yes	979	Class 0	Yes	TON -1 Output 7		LD0.TONGAPC1.Q7.stVal
BI	Yes	980	Class 0	Yes	TON -1 Output 8		LD0.TONGAPC1.Q8.stVal

Table 141: TON -2 : Time delay on (8 pcs) instance 2 (TONGAPC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	981	Class 0	Yes	TON -2 Input 1		LD0.TONGAPC2.In1.stVal
BI	Yes	982	Class 0	Yes	TON -2 Input 2		LD0.TONGAPC2.In2.stVal
BI	Yes	983	Class 0	Yes	TON -2 Input 3		LD0.TONGAPC2.In3.stVal
BI	Yes	984	Class 0	Yes	TON -2 Input 4		LD0.TONGAPC2.In4.stVal
BI	Yes	985	Class 0	Yes	TON -2 Input 5		LD0.TONGAPC2.In5.stVal
BI	Yes	986	Class 0	Yes	TON -2 Input 6		LD0.TONGAPC2.In6.stVal
BI	Yes	987	Class 0	Yes	TON -2 Input 7		LD0.TONGAPC2.In7.stVal
BI	Yes	988	Class 0	Yes	TON -2 Input 8		LD0.TONGAPC2.In8.stVal
BI	Yes	989	Class 0	Yes	TON -2 Output 1		LD0.TONGAPC2.Q1.stVal
BI	Yes	990	Class 0	Yes	TON -2 Output 2		LD0.TONGAPC2.Q2.stVal
BI	Yes	991	Class 0	Yes	TON -2 Output 3		LD0.TONGAPC2.Q3.stVal
BI	Yes	992	Class 0	Yes	TON -2 Output 4		LD0.TONGAPC2.Q4.stVal
BI	Yes	993	Class 0	Yes	TON -2 Output 5		LD0.TONGAPC2.Q5.stVal
BI	Yes	994	Class 0	Yes	TON -2 Output 6		LD0.TONGAPC2.Q6.stVal
BI	Yes	995	Class 0	Yes	TON -2 Output 7		LD0.TONGAPC2.Q7.stVal
BI	Yes	996	Class 0	Yes	TON -2 Output 8		LD0.TONGAPC2.Q8.stVal

Table 142: TON -3 : Time delay on (8 pcs) instance 3 (TONGAPC3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	997	Class 0	Yes	TON -3 Output 1		LD0.TONGAPC3.Q1.stVal
BI	Yes	998	Class 0	Yes	TON -3 Output 2		LD0.TONGAPC3.Q2.stVal
BI	Yes	999	Class 0	Yes	TON -3 Output 3		LD0.TONGAPC3.Q3.stVal
BI	Yes	1000	Class 0	Yes	TON -3 Output 4		LD0.TONGAPC3.Q4.stVal
BI	Yes	1001	Class 0	Yes	TON -3 Output 5		LD0.TONGAPC3.Q5.stVal
BI	Yes	1002	Class 0	Yes	TON -3 Output 6		LD0.TONGAPC3.Q6.stVal
BI	Yes	1003	Class 0	Yes	TON -3 Output 7		LD0.TONGAPC3.Q7.stVal
BI	Yes	1004	Class 0	Yes	TON -3 Output 8		LD0.TONGAPC3.Q8.stVal

Table 143: TON -4 : Time delay on (8 pcs) instance 4 (TONGAPC4)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1005	Class 0	Yes	TON -4 Output 1		LD0.TONGAPC4.Q1.stVal
BI	Yes	1006	Class 0	Yes	TON -4 Output 2		LD0.TONGAPC4.Q2.stVal
BI	Yes	1007	Class 0	Yes	TON -4 Output 3		LD0.TONGAPC4.Q3.stVal
BI	Yes	1008	Class 0	Yes	TON -4 Output 4		LD0.TONGAPC4.Q4.stVal
BI	Yes	1009	Class 0	Yes	TON -4 Output 5		LD0.TONGAPC4.Q5.stVal
BI	Yes	1010	Class 0	Yes	TON -4 Output 6		LD0.TONGAPC4.Q6.stVal
BI	Yes	1011	Class 0	Yes	TON -4 Output 7		LD0.TONGAPC4.Q7.stVal
BI	Yes	1012	Class 0	Yes	TON -4 Output 8		LD0.TONGAPC4.Q8.stVal

Table 144: SR-1 : Set reset (8 pcs) instance 1 (SRGAPC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	869	Class 0	Yes	SR-1 Q1 status		LD0.SRGAPC1.Q1.stVal
BI	Yes	870	Class 0	Yes	SR-1 Q2 status		LD0.SRGAPC1.Q2.stVal
BI	Yes	871	Class 0	Yes	SR-1 Q3 status		LD0.SRGAPC1.Q3.stVal
BI	Yes	872	Class 0	Yes	SR-1 Q4 status		LD0.SRGAPC1.Q4.stVal
BI	Yes	873	Class 0	Yes	SR-1 Q5 status		LD0.SRGAPC1.Q5.stVal
BI	Yes	874	Class 0	Yes	SR-1 Q6 status		LD0.SRGAPC1.Q6.stVal
BI	Yes	875	Class 0	Yes	SR-1 Q7 status		LD0.SRGAPC1.Q7.stVal
BI	Yes	876	Class 0	Yes	SR-1 Q8 status		LD0.SRGAPC1.Q8.stVal
BI	Yes	877	Class 0	Yes	SR-1 Set Q1 output when set		LD0.SRGAPC1.Set1.stVal
BI	Yes	878	Class 0	Yes	SR-1 Set Q2 output when set		LD0.SRGAPC1.Set2.stVal
BI	Yes	879	Class 0	Yes	SR-1 Set Q3 output when set		LD0.SRGAPC1.Set3.stVal
BI	Yes	880	Class 0	Yes	SR-1 Set Q4 output when set		LD0.SRGAPC1.Set4.stVal
BI	Yes	881	Class 0	Yes	SR-1 Set Q5 output when set		LD0.SRGAPC1.Set5.stVal
BI	Yes	882	Class 0	Yes	SR-1 Set Q6 output when set		LD0.SRGAPC1.Set6.stVal
BI	Yes	883	Class 0	Yes	SR-1 Set Q7 output when set		LD0.SRGAPC1.Set7.stVal

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DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	884	Class 0	Yes	SR-1 Set Q8 output when set		LD0.SRGAPC1.Set8.stVal

Table 145: SR-2 : Set reset (8 pcs) instance 2 (SRGAPC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	885	Class 0	Yes	SR-2 Q1 status		LD0.SRGAPC2.Q1.stVal
BI	Yes	886	Class 0	Yes	SR-2 Q2 status		LD0.SRGAPC2.Q2.stVal
BI	Yes	887	Class 0	Yes	SR-2 Q3 status		LD0.SRGAPC2.Q3.stVal
BI	Yes	888	Class 0	Yes	SR-2 Q4 status		LD0.SRGAPC2.Q4.stVal
BI	Yes	889	Class 0	Yes	SR-2 Q5 status		LD0.SRGAPC2.Q5.stVal
BI	Yes	890	Class 0	Yes	SR-2 Q6 status		LD0.SRGAPC2.Q6.stVal
BI	Yes	891	Class 0	Yes	SR-2 Q7 status		LD0.SRGAPC2.Q7.stVal
BI	Yes	892	Class 0	Yes	SR-2 Q8 status		LD0.SRGAPC2.Q8.stVal
BI	Yes	893	Class 0	Yes	SR-2 Set Q1 output when set		LD0.SRGAPC2.Set1.stVal
BI	Yes	894	Class 0	Yes	SR-2 Set Q2 output when set		LD0.SRGAPC2.Set2.stVal
BI	Yes	895	Class 0	Yes	SR-2 Set Q3 output when set		LD0.SRGAPC2.Set3.stVal
BI	Yes	896	Class 0	Yes	SR-2 Set Q4 output when set		LD0.SRGAPC2.Set4.stVal
BI	Yes	897	Class 0	Yes	SR-2 Set Q5 output when set		LD0.SRGAPC2.Set5.stVal
BI	Yes	898	Class 0	Yes	SR-2 Set Q6 output when set		LD0.SRGAPC2.Set6.stVal
BI	Yes	899	Class 0	Yes	SR-2 Set Q7 output when set		LD0.SRGAPC2.Set7.stVal
BI	Yes	900	Class 0	Yes	SR-2 Set Q8 output when set		LD0.SRGAPC2.Set8.stVal

Table 146: SR-3 : Set reset (8 pcs) instance 3 (SRGAPC3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	901	Class 0	Yes	SR-3 Q1 status		LD0.SRGAPC3.Q1.stVal
BI	Yes	902	Class 0	Yes	SR-3 Q2 status		LD0.SRGAPC3.Q2.stVal
BI	Yes	903	Class 0	Yes	SR-3 Q3 status		LD0.SRGAPC3.Q3.stVal
BI	Yes	904	Class 0	Yes	SR-3 Q4 status		LD0.SRGAPC3.Q4.stVal
BI	Yes	905	Class 0	Yes	SR-3 Q5 status		LD0.SRGAPC3.Q5.stVal
BI	Yes	906	Class 0	Yes	SR-3 Q6 status		LD0.SRGAPC3.Q6.stVal
BI	Yes	907	Class 0	Yes	SR-3 Q7 status		LD0.SRGAPC3.Q7.stVal
BI	Yes	908	Class 0	Yes	SR-3 Q8 status		LD0.SRGAPC3.Q8.stVal

Table 147: SR-4 : Set reset (8 pcs) instance 4 (SRGAPC4)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	909	Class 0	Yes	SR-4 Q1 status		LD0.SRGAPC4.Q1.stVal
BI	Yes	910	Class 0	Yes	SR-4 Q2 status		LD0.SRGAPC4.Q2.stVal
BI	Yes	911	Class 0	Yes	SR-4 Q3 status		LD0.SRGAPC4.Q3.stVal

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	912	Class 0	Yes	SR-4 Q4 status		LD0.SRGAPC4.Q4.stVal
BI	Yes	913	Class 0	Yes	SR-4 Q5 status		LD0.SRGAPC4.Q5.stVal
BI	Yes	914	Class 0	Yes	SR-4 Q6 status		LD0.SRGAPC4.Q6.stVal
BI	Yes	915	Class 0	Yes	SR-4 Q7 status		LD0.SRGAPC4.Q7.stVal
BI	Yes	916	Class 0	Yes	SR-4 Q8 status		LD0.SRGAPC4.Q8.stVal

Table 148: MV-1 : Move (8 pcs) instance 1 (MVGAPC1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		805	Class 1 and 0	Yes	MV-1 Q1 status		LD0.MVGAPC1.Q1.stVal
BI		806	Class 1 and 0	Yes	MV-1 Q2 status		LD0.MVGAPC1.Q2.stVal
BI		807	Class 1 and 0	Yes	MV-1 Q3 status		LD0.MVGAPC1.Q3.stVal
BI		808	Class 1 and 0	Yes	MV-1 Q4 status		LD0.MVGAPC1.Q4.stVal
BI		809	Class 1 and 0	Yes	MV-1 Q5 status		LD0.MVGAPC1.Q5.stVal
BI		810	Class 1 and 0	Yes	MV-1 Q6 status		LD0.MVGAPC1.Q6.stVal
BI		811	Class 1 and 0	Yes	MV-1 Q7 status		LD0.MVGAPC1.Q7.stVal
BI		812	Class 1 and 0	Yes	MV-1 Q8 status		LD0.MVGAPC1.Q8.stVal

Table 149: MV-2 : Move (8 pcs) instance 2 (MVGAPC2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		813	Class 1 and 0	Yes	MV-2 Q1 status		LD0.MVGAPC2.Q1.stVal
BI		814	Class 1 and 0	Yes	MV-2 Q2 status		LD0.MVGAPC2.Q2.stVal
BI		815	Class 1 and 0	Yes	MV-2 Q3 status		LD0.MVGAPC2.Q3.stVal
BI		816	Class 1 and 0	Yes	MV-2 Q4 status		LD0.MVGAPC2.Q4.stVal
BI		817	Class 1 and 0	Yes	MV-2 Q5 status		LD0.MVGAPC2.Q5.stVal
BI		818	Class 1 and 0	Yes	MV-2 Q6 status		LD0.MVGAPC2.Q6.stVal
BI		819	Class 1 and 0	Yes	MV-2 Q7 status		LD0.MVGAPC2.Q7.stVal
BI		820	Class 1 and 0	Yes	MV-2 Q8 status		LD0.MVGAPC2.Q8.stVal

Table 150: MV-3 : Move (8 pcs) instance 3 (MVGAPC3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		821	Class 1 and 0	Yes	MV-3 Q1 status		LD0.MVGAPC3.Q1.stVal
BI		822	Class 1 and 0	Yes	MV-3 Q2 status		LD0.MVGAPC3.Q2.stVal
BI		823	Class 1 and 0	Yes	MV-3 Q3 status		LD0.MVGAPC3.Q3.stVal
BI		824	Class 1 and 0	Yes	MV-3 Q4 status		LD0.MVGAPC3.Q4.stVal
BI		825	Class 1 and 0	Yes	MV-3 Q5 status		LD0.MVGAPC3.Q5.stVal
BI		826	Class 1 and 0	Yes	MV-3 Q6 status		LD0.MVGAPC3.Q6.stVal
BI		827	Class 1 and 0	Yes	MV-3 Q7 status		LD0.MVGAPC3.Q7.stVal

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DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		828	Class 1 and 0	Yes	MV-3 Q8 status		LD0.MVGAPC3.Q8.stVal

Table 151: MV-4 : Move (8 pcs) instance 4 (MVGAPC4)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		829	Class 1 and 0	Yes	MV-4 Q1 status		LD0.MVGAPC4.Q1.stVal
BI		830	Class 1 and 0	Yes	MV-4 Q2 status		LD0.MVGAPC4.Q2.stVal
BI		831	Class 1 and 0	Yes	MV-4 Q3 status		LD0.MVGAPC4.Q3.stVal
BI		832	Class 1 and 0	Yes	MV-4 Q4 status		LD0.MVGAPC4.Q4.stVal
BI		833	Class 1 and 0	Yes	MV-4 Q5 status		LD0.MVGAPC4.Q5.stVal
BI		834	Class 1 and 0	Yes	MV-4 Q6 status		LD0.MVGAPC4.Q6.stVal
BI		835	Class 1 and 0	Yes	MV-4 Q7 status		LD0.MVGAPC4.Q7.stVal
BI		836	Class 1 and 0	Yes	MV-4 Q8 status		LD0.MVGAPC4.Q8.stVal

Table 152: MV-5 : Move (8 pcs) instance 5 (MVGAPC5)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		1072	Class 1 and 0	Yes	MV-5 Q1 status		LD0.MVGAPC5.Q1.stVal
BI		1073	Class 1 and 0	Yes	MV-5 Q2 status		LD0.MVGAPC5.Q2.stVal
BI		1074	Class 1 and 0	Yes	MV-5 Q3 status		LD0.MVGAPC5.Q3.stVal
BI		1075	Class 1 and 0	Yes	MV-5 Q4 status		LD0.MVGAPC5.Q4.stVal
BI		1076	Class 1 and 0	Yes	MV-5 Q5 status		LD0.MVGAPC5.Q5.stVal
BI		1077	Class 1 and 0	Yes	MV-5 Q6 status		LD0.MVGAPC5.Q6.stVal
BI		1078	Class 1 and 0	Yes	MV-5 Q7 status		LD0.MVGAPC5.Q7.stVal
BI		1079	Class 1 and 0	Yes	MV-5 Q8 status		LD0.MVGAPC5.Q8.stVal

Table 153: MV-6 : Move (8 pcs) instance 6 (MVGAPC6)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		1080	Class 1 and 0	Yes	MV-6 Q1 status		LD0.MVGAPC6.Q1.stVal
BI		1081	Class 1 and 0	Yes	MV-6 Q2 status		LD0.MVGAPC6.Q2.stVal
BI		1082	Class 1 and 0	Yes	MV-6 Q3 status		LD0.MVGAPC6.Q3.stVal
BI		1083	Class 1 and 0	Yes	MV-6 Q4 status		LD0.MVGAPC6.Q4.stVal
BI		1084	Class 1 and 0	Yes	MV-6 Q5 status		LD0.MVGAPC6.Q5.stVal
BI		1085	Class 1 and 0	Yes	MV-6 Q6 status		LD0.MVGAPC6.Q6.stVal
BI		1086	Class 1 and 0	Yes	MV-6 Q7 status		LD0.MVGAPC6.Q7.stVal
BI		1087	Class 1 and 0	Yes	MV-6 Q8 status		LD0.MVGAPC6.Q8.stVal

Table 154: MV-7 : Move (8 pcs) instance 7 (MVGAPC7)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		1088	Class 1 and 0	Yes	MV-7 Q1 status		LD0.MVGAPC7.Q1.stVal
BI		1089	Class 1 and 0	Yes	MV-7 Q2 status		LD0.MVGAPC7.Q2.stVal
BI		1090	Class 1 and 0	Yes	MV-7 Q3 status		LD0.MVGAPC7.Q3.stVal
BI		1091	Class 1 and 0	Yes	MV-7 Q4 status		LD0.MVGAPC7.Q4.stVal
BI		1092	Class 1 and 0	Yes	MV-7 Q5 status		LD0.MVGAPC7.Q5.stVal
BI		1093	Class 1 and 0	Yes	MV-7 Q6 status		LD0.MVGAPC7.Q6.stVal
BI		1094	Class 1 and 0	Yes	MV-7 Q7 status		LD0.MVGAPC7.Q7.stVal
BI		1095	Class 1 and 0	Yes	MV-7 Q8 status		LD0.MVGAPC7.Q8.stVal

Table 155: MV-8 : Move (8 pcs) instance 8 (MVGAPC8)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		1096	Class 1 and 0	Yes	MV-8 Q1 status		LD0.MVGAPC8.Q1.stVal
BI		1097	Class 1 and 0	Yes	MV-8 Q2 status		LD0.MVGAPC8.Q2.stVal
BI		1098	Class 1 and 0	Yes	MV-8 Q3 status		LD0.MVGAPC8.Q3.stVal
BI		1099	Class 1 and 0	Yes	MV-8 Q4 status		LD0.MVGAPC8.Q4.stVal
BI		1100	Class 1 and 0	Yes	MV-8 Q5 status		LD0.MVGAPC8.Q5.stVal
BI		1101	Class 1 and 0	Yes	MV-8 Q6 status		LD0.MVGAPC8.Q6.stVal
BI		1102	Class 1 and 0	Yes	MV-8 Q7 status		LD0.MVGAPC8.Q7.stVal
BI		1103	Class 1 and 0	Yes	MV-8 Q8 status		LD0.MVGAPC8.Q8.stVal

Table 156: CNTRL-1 : Generic control points instance 1 (SPCGGIO1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		694	Class 1 and 0	Yes	CNTRL-1 Output 1 status		LD0.SPCGGIO1.SPCSO1.stVal
BI		695	Class 1 and 0	Yes	CNTRL-1 Output 2 status		LD0.SPCGGIO1.SPCSO2.stVal
BI		696	Class 1 and 0	Yes	CNTRL-1 Output 3 status		LD0.SPCGGIO1.SPCSO3.stVal
BI		697	Class 1 and 0	Yes	CNTRL-1 Output 4 status		LD0.SPCGGIO1.SPCSO4.stVal
BI		698	Class 1 and 0	Yes	CNTRL-1 Output 5 status		LD0.SPCGGIO1.SPCSO5.stVal
BI		699	Class 1 and 0	Yes	CNTRL-1 Output 6 status		LD0.SPCGGIO1.SPCSO6.stVal
BI		700	Class 1 and 0	Yes	CNTRL-1 Output 7 status		LD0.SPCGGIO1.SPCSO7.stVal
BI		701	Class 1 and 0	Yes	CNTRL-1 Output 8 status		LD0.SPCGGIO1.SPCSO8.stVal
BI		702	Class 1 and 0	Yes	CNTRL-1 Output 9 status		LD0.SPCGGIO1.SPCSO9.stVal
BI		703	Class 1 and 0	Yes	CNTRL-1 Output 10 status		LD0.SPCGGIO1.SPCSO10.stVal
BI		704	Class 1 and 0	Yes	CNTRL-1 Output 11 status		LD0.SPCGGIO1.SPCSO11.stVal
BI		705	Class 1 and 0	Yes	CNTRL-1 Output 12 status		LD0.SPCGGIO1.SPCSO12.stVal
BI		706	Class 1 and 0	Yes	CNTRL-1 Output 13 status		LD0.SPCGGIO1.SPCSO13.stVal
BI		707	Class 1 and 0	Yes	CNTRL-1 Output 14 status		LD0.SPCGGIO1.SPCSO14.stVal
BI		708	Class 1 and 0	Yes	CNTRL-1 Output 15 status		LD0.SPCGGIO1.SPCSO15.stVal

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DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		709	Class 1 and 0	Yes	CNTRL-1 Output 16 status		LD0.SPCGGIO1.SPCSO16.stVal

Table 157: CNTRL-2 : Generic control points instance 2 (SPCGGIO2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		710	Class 1 and 0	Yes	CNTRL-2 Output 1 status		LD0.SPCGGIO2.SPCSO1.stVal
BI		711	Class 1 and 0	Yes	CNTRL-2 Output 2 status		LD0.SPCGGIO2.SPCSO2.stVal
BI		712	Class 1 and 0	Yes	CNTRL-2 Output 3 status		LD0.SPCGGIO2.SPCSO3.stVal
BI		713	Class 1 and 0	Yes	CNTRL-2 Output 4 status		LD0.SPCGGIO2.SPCSO4.stVal
BI		714	Class 1 and 0	Yes	CNTRL-2 Output 5 status		LD0.SPCGGIO2.SPCSO5.stVal
BI		715	Class 1 and 0	Yes	CNTRL-2 Output 6 status		LD0.SPCGGIO2.SPCSO6.stVal
BI		716	Class 1 and 0	Yes	CNTRL-2 Output 7 status		LD0.SPCGGIO2.SPCSO7.stVal
BI		717	Class 1 and 0	Yes	CNTRL-2 Output 8 status		LD0.SPCGGIO2.SPCSO8.stVal
BI		718	Class 1 and 0	Yes	CNTRL-2 Output 9 status		LD0.SPCGGIO2.SPCSO9.stVal
BI		719	Class 1 and 0	Yes	CNTRL-2 Output 10 status		LD0.SPCGGIO2.SPCSO10.stVal
BI		720	Class 1 and 0	Yes	CNTRL-2 Output 11 status		LD0.SPCGGIO2.SPCSO11.stVal
BI		721	Class 1 and 0	Yes	CNTRL-2 Output 12 status		LD0.SPCGGIO2.SPCSO12.stVal
BI		722	Class 1 and 0	Yes	CNTRL-2 Output 13 status		LD0.SPCGGIO2.SPCSO13.stVal
BI		723	Class 1 and 0	Yes	CNTRL-2 Output 14 status		LD0.SPCGGIO2.SPCSO14.stVal
BI		724	Class 1 and 0	Yes	CNTRL-2 Output 15 status		LD0.SPCGGIO2.SPCSO15.stVal
BI		725	Class 1 and 0	Yes	CNTRL-2 Output 16 status		LD0.SPCGGIO2.SPCSO16.stVal

Table 158: CNTRL-2 : Generic control points instance 2 (SPCGGIO2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		726	Class 1 and 0	Yes	CNTRL-3 Output 1 status		LD0.SPCGGIO3.SPCSO1.stVal
BI		727	Class 1 and 0	Yes	CNTRL-3 Output 2 status		LD0.SPCGGIO3.SPCSO2.stVal
BI		728	Class 1 and 0	Yes	CNTRL-3 Output 3 status		LD0.SPCGGIO3.SPCSO3.stVal
BI		729	Class 1 and 0	Yes	CNTRL-3 Output 4 status		LD0.SPCGGIO3.SPCSO4.stVal
BI		730	Class 1 and 0	Yes	CNTRL-3 Output 5 status		LD0.SPCGGIO3.SPCSO5.stVal
BI		731	Class 1 and 0	Yes	CNTRL-3 Output 6 status		LD0.SPCGGIO3.SPCSO6.stVal
BI		732	Class 1 and 0	Yes	CNTRL-3 Output 7 status		LD0.SPCGGIO3.SPCSO7.stVal
BI		733	Class 1 and 0	Yes	CNTRL-3 Output 8 status		LD0.SPCGGIO3.SPCSO8.stVal
BI		734	Class 1 and 0	Yes	CNTRL-3 Output 9 status		LD0.SPCGGIO3.SPCSO9.stVal
BI		735	Class 1 and 0	Yes	CNTRL-3 Output 10 status		LD0.SPCGGIO3.SPCSO10.stVal
BI		736	Class 1 and 0	Yes	CNTRL-3 Output 11 status		LD0.SPCGGIO3.SPCSO11.stVal
BI		737	Class 1 and 0	Yes	CNTRL-3 Output 12 status		LD0.SPCGGIO3.SPCSO12.stVal
BI		738	Class 1 and 0	Yes	CNTRL-3 Output 13 status		LD0.SPCGGIO3.SPCSO13.stVal
BI		739	Class 1 and 0	Yes	CNTRL-3 Output 14 status		LD0.SPCGGIO3.SPCSO14.stVal
BI		740	Class 1 and 0	Yes	CNTRL-3 Output 15 status		LD0.SPCGGIO3.SPCSO15.stVal

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		741	Class 1 and 0	Yes	CNTRL-3 Output 16 status		LD0.SPCGGIO3.SPCSO16.stVal

Table 159: RCNTRL-1 : Remote Generic control points instance 1 (SPCRGGIO1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		758	Class 1 and 0	Yes	RCNTRL-1 Output 1 status		LD0.SPCRGGIO1.SPCSO1.stVal
BI		759	Class 1 and 0	Yes	RCNTRL-1 Output 2 status		LD0.SPCRGGIO1.SPCSO2.stVal
BI		760	Class 1 and 0	Yes	RCNTRL-1 Output 3 status		LD0.SPCRGGIO1.SPCSO3.stVal
BI		761	Class 1 and 0	Yes	RCNTRL-1 Output 4 status		LD0.SPCRGGIO1.SPCSO4.stVal
BI		762	Class 1 and 0	Yes	RCNTRL-1 Output 5 status		LD0.SPCRGGIO1.SPCSO5.stVal
BI		763	Class 1 and 0	Yes	RCNTRL-1 Output 6 status		LD0.SPCRGGIO1.SPCSO6.stVal
BI		764	Class 1 and 0	Yes	RCNTRL-1 Output 7 status		LD0.SPCRGGIO1.SPCSO7.stVal
BI		765	Class 1 and 0	Yes	RCNTRL-1 Output 8 status		LD0.SPCRGGIO1.SPCSO8.stVal
BI		766	Class 1 and 0	Yes	RCNTRL-1 Output 9 status		LD0.SPCRGGIO1.SPCSO9.stVal
BI		767	Class 1 and 0	Yes	RCNTRL-1 Output 10 status		LD0.SPCRGGIO1.SPCSO10.stVal
BI		768	Class 1 and 0	Yes	RCNTRL-1 Output 11 status		LD0.SPCRGGIO1.SPCSO11.stVal
BI		769	Class 1 and 0	Yes	RCNTRL-1 Output 12 status		LD0.SPCRGGIO1.SPCSO12.stVal
BI		770	Class 1 and 0	Yes	RCNTRL-1 Output 13 status		LD0.SPCRGGIO1.SPCSO13.stVal
BI		771	Class 1 and 0	Yes	RCNTRL-1 Output 14 status		LD0.SPCRGGIO1.SPCSO14.stVal
BI		772	Class 1 and 0	Yes	RCNTRL-1 Output 15 status		LD0.SPCRGGIO1.SPCSO15.stVal
BI		773	Class 1 and 0	Yes	RCNTRL-1 Output 16 status		LD0.SPCRGGIO1.SPCSO16.stVal

Table 160: LCNTRL-1 : Local Generic control points instance 1 (SPCLGGIO1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		742	Class 1 and 0	Yes	LCNTRL-1 Output 1 status		LD0.SPCLGGIO1.SPCSO1.stVal
BI		743	Class 1 and 0	Yes	LCNTRL-1 Output 2 status		LD0.SPCLGGIO1.SPCSO2.stVal
BI		744	Class 1 and 0	Yes	LCNTRL-1 Output 3 status		LD0.SPCLGGIO1.SPCSO3.stVal
BI		745	Class 1 and 0	Yes	LCNTRL-1 Output 4 status		LD0.SPCLGGIO1.SPCSO4.stVal
BI		746	Class 1 and 0	Yes	LCNTRL-1 Output 5 status		LD0.SPCLGGIO1.SPCSO5.stVal
BI		747	Class 1 and 0	Yes	LCNTRL-1 Output 6 status		LD0.SPCLGGIO1.SPCSO6.stVal
BI		748	Class 1 and 0	Yes	LCNTRL-1 Output 7 status		LD0.SPCLGGIO1.SPCSO7.stVal
BI		749	Class 1 and 0	Yes	LCNTRL-1 Output 8 status		LD0.SPCLGGIO1.SPCSO8.stVal
BI		750	Class 1 and 0	Yes	LCNTRL-1 Output 9 status		LD0.SPCLGGIO1.SPCSO9.stVal
BI		751	Class 1 and 0	Yes	LCNTRL-1 Output 10 status		LD0.SPCLGGIO1.SPCSO10.stVal
BI		752	Class 1 and 0	Yes	LCNTRL-1 Output 11 status		LD0.SPCLGGIO1.SPCSO11.stVal
BI		753	Class 1 and 0	Yes	LCNTRL-1 Output 12 status		LD0.SPCLGGIO1.SPCSO12.stVal
BI		754	Class 1 and 0	Yes	LCNTRL-1 Output 13 status		LD0.SPCLGGIO1.SPCSO13.stVal
BI		755	Class 1 and 0	Yes	LCNTRL-1 Output 14 status		LD0.SPCLGGIO1.SPCSO14.stVal
BI		756	Class 1 and 0	Yes	LCNTRL-1 Output 15 status		LD0.SPCLGGIO1.SPCSO15.stVal

Section 2 DNP3 data mappings

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		757	Class 1 and 0	Yes	LCNTRL-1 Output 16 status		LD0.SPCLGGIO1.SPCSO16.stVal

Table 161: CTR-1 : Generic Up-Down Counters instance 1 (UDFCNT1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1045	Class 0	Yes	CTR-1 Status of the down counting		LD0.UDFCNT1.DnCntSt.stVal
BI	Yes	1046	Class 0	Yes	CTR-1 Status of the up counting		LD0.UDFCNT1.UpCntSt.stVal

Table 162: CTR-2 : Generic Up-Down Counters instance 2 (UDFCNT2)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1047	Class 0	Yes	CTR-2 Status of the down counting		LD0.UDFCNT2.DnCntSt.stVal
BI	Yes	1048	Class 0	Yes	CTR-2 Status of the up counting		LD0.UDFCNT2.UpCntSt.stVal

Table 163: CTR-3 : Generic Up-Down Counters instance 3 (UDFCNT3)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1049	Class 0	Yes	CTR-3 Status of the down counting		LD0.UDFCNT3.DnCntSt.stVal
BI	Yes	1050	Class 0	Yes	CTR-3 Status of the up counting		LD0.UDFCNT3.UpCntSt.stVal

Table 164: CTR-4 : Generic Up-Down Counters instance 4 (UDFCNT4)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1051	Class 0	Yes	CTR-4 Status of the down counting		LD0.UDFCNT4.DnCntSt.stVal
BI	Yes	1052	Class 0	Yes	CTR-4 Status of the up counting		LD0.UDFCNT4.UpCntSt.stVal

Table 165: CTR-5 : Generic Up-Down Counters instance 5 (UDFCNT5)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1053	Class 0	Yes	CTR-5 Status of the down counting		LD0.UDFCNT5.DnCntSt.stVal
BI	Yes	1054	Class 0	Yes	CTR-5 Status of the up counting		LD0.UDFCNT5.UpCntSt.stVal

Table 166: CTR-6 : Generic Up-Down Counters instance 6 (UDFCNT6)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1055	Class 0	Yes	CTR-6 Status of the down counting		LD0.UDFCNT6.DnCntSt.stVal
BI	Yes	1056	Class 0	Yes	CTR-6 Status of the up counting		LD0.UDFCNT6.UpCntSt.stVal

Table 167: CTR-7 : Generic Up-Down Counters instance 7 (UDFCNT7)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1057	Class 0	Yes	CTR-7 Status of the down counting		LD0.UDFCNT7.DnCntSt.stVal
BI	Yes	1058	Class 0	Yes	CTR-7 Status of the up counting		LD0.UDFCNT7.UpCntSt.stVal

Table 168: CTR-8 : Generic Up-Down Counters instance 8 (UDFCNT8)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1059	Class 0	Yes	CTR-8 Status of the down counting		LD0.UDFCNT8.DnCntSt.stVal
BI	Yes	1060	Class 0	Yes	CTR-8 Status of the up counting		LD0.UDFCNT8.UpCntSt.stVal

Table 169: CTR-9 : Generic Up-Down Counters instance 9 (UDFCNT9)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1061	Class 0	Yes	CTR-9 Status of the down counting		LD0.UDFCNT9.DnCntSt.stVal
BI	Yes	1062	Class 0	Yes	CTR-9 Status of the up counting		LD0.UDFCNT9.UpCntSt.stVal

Table 170: CTR-10 : Generic Up-Down Counters instance 10 (UDFCNT10)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1063	Class 0	Yes	CTR-10 Status of the down counting		LD0.UDFCNT10.DnCntSt.stVal
BI	Yes	1064	Class 0	Yes	CTR-10 Status of the up counting		LD0.UDFCNT10.UpCntSt.stVal

Table 171: CTR-11 : Generic Up-Down Counters instance 11 (UDFCNT11)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1065	Class 0	Yes	CTR-11 Status of the down counting		LD0.UDFCNT11.DnCntSt.stVal
BI	Yes	1066	Class 0	Yes	CTR-11 Status of the up counting		LD0.UDFCNT11.UpCntSt.stVal

Table 172: CTR-12 : Generic Up-Down Counters instance 12 (UDFCNT12)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	1067	Class 0	Yes	CTR-12 Status of the down counting		LD0.UDFCNT12.DnCntSt.stVal
BI	Yes	1068	Class 0	Yes	CTR-12 Status of the up counting		LD0.UDFCNT12.UpCntSt.stVal

Table 173: FKEY : Programmable buttons (16 buttons) instance 1 (FKEYGGIO1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		96	Class 1 and 0	Yes	FKEY KEY 1		LD0.FKEYGGIO1.Ind1.stVal
BI		97	Class 1 and 0	Yes	FKEY KEY 2		LD0.FKEYGGIO1.Ind2.stVal
BI		98	Class 1 and 0	Yes	FKEY KEY 3		LD0.FKEYGGIO1.Ind3.stVal
BI		99	Class 1 and 0	Yes	FKEY KEY 4		LD0.FKEYGGIO1.Ind4.stVal

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DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		100	Class 1 and 0	Yes	FKEY KEY 5		LD0.FKEYGGIO1.lnd5.stVal
BI		101	Class 1 and 0	Yes	FKEY KEY 6		LD0.FKEYGGIO1.lnd6.stVal
BI		102	Class 1 and 0	Yes	FKEY KEY 7		LD0.FKEYGGIO1.lnd7.stVal
BI		103	Class 1 and 0	Yes	FKEY KEY 8		LD0.FKEYGGIO1.lnd8.stVal
BI		104	Class 1 and 0	Yes	FKEY KEY 9		LD0.FKEYGGIO1.lnd9.stVal
BI		105	Class 1 and 0	Yes	FKEY KEY 10		LD0.FKEYGGIO1.lnd10.stVal
BI		106	Class 1 and 0	Yes	FKEY KEY 11		LD0.FKEYGGIO1.lnd11.stVal
BI		107	Class 1 and 0	Yes	FKEY KEY 12		LD0.FKEYGGIO1.lnd12.stVal
BI		108	Class 1 and 0	Yes	FKEY KEY 13		LD0.FKEYGGIO1.lnd13.stVal
BI		109	Class 1 and 0	Yes	FKEY KEY 14		LD0.FKEYGGIO1.lnd14.stVal
BI		110	Class 1 and 0	Yes	FKEY KEY 15		LD0.FKEYGGIO1.lnd15.stVal
BI		111	Class 1 and 0	Yes	FKEY KEY 16		LD0.FKEYGGIO1.lnd16.stVal
BI		112	Class 1 and 0	Yes	FKEY LED 1		LD0.FKEYGGIO1.SPCSO1.stVal
BI		113	Class 1 and 0	Yes	FKEY LED 2		LD0.FKEYGGIO1.SPCSO2.stVal
BI		114	Class 1 and 0	Yes	FKEY LED 3		LD0.FKEYGGIO1.SPCSO3.stVal
BI		115	Class 1 and 0	Yes	FKEY LED 4		LD0.FKEYGGIO1.SPCSO4.stVal
BI		116	Class 1 and 0	Yes	FKEY LED 5		LD0.FKEYGGIO1.SPCSO5.stVal
BI		117	Class 1 and 0	Yes	FKEY LED 6		LD0.FKEYGGIO1.SPCSO6.stVal
BI		118	Class 1 and 0	Yes	FKEY LED 7		LD0.FKEYGGIO1.SPCSO7.stVal
BI		119	Class 1 and 0	Yes	FKEY LED 8		LD0.FKEYGGIO1.SPCSO8.stVal
BI		120	Class 1 and 0	Yes	FKEY LED 9		LD0.FKEYGGIO1.SPCSO9.stVal
BI		121	Class 1 and 0	Yes	FKEY LED 10		LD0.FKEYGGIO1.SPCSO10.stVal
BI		122	Class 1 and 0	Yes	FKEY LED 11		LD0.FKEYGGIO1.SPCSO11.stVal
BI		123	Class 1 and 0	Yes	FKEY LED 12		LD0.FKEYGGIO1.SPCSO12.stVal
BI		124	Class 1 and 0	Yes	FKEY LED 13		LD0.FKEYGGIO1.SPCSO13.stVal
BI		125	Class 1 and 0	Yes	FKEY LED 14		LD0.FKEYGGIO1.SPCSO14.stVal
BI		126	Class 1 and 0	Yes	FKEY LED 15		LD0.FKEYGGIO1.SPCSO15.stVal
BI		127	Class 1 and 0	Yes	FKEY LED 16		LD0.FKEYGGIO1.SPCSO16.stVal

Table 174: DFR : Disturbance recorder (RDRE1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		242	Class 1 and 0	Yes	Disturbance recorder Recording made		DR.RDRE1.RcdMade.stVal
AI	Yes	168	Class 0	Yes	Disturbance recorder Remaining amount of recordings that fit into the available recording memory when present settings are used	0	DR.RDRE1.EMaxNumRcd.stVal
AI	Yes	169	Class 0	Yes	Disturbance recorder Time remaining to the next periodic triggering	0	DR.RDRE1.EPerTRem.stVal
AI	Yes	170	Class 0	Yes	Disturbance recorder Number of recordings in the memory	0	DR.RDRE1.FitNum.stVal

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI	Yes	171	Class 0	Yes	Disturbance recorder How much recording memory is currently used	0	DR.RDRE1.MemUsed.stVal

Table 175: FR : Fault recorder (FLTMSTA1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI		219	Class 2 and 0	Yes	FLTMSTA1 Active setting group	0	LD0.FLTMSTA1.ActSG.stVal
AI		220	Class 2 and 0	Yes	FLTMSTA1 Phase A current	100	LD0.FLTMSTA1.AmpsA.mag.f
AI		221	Class 2 and 0	Yes	FLTMSTA1 Maximum phase A current (b)	100	LD0.FLTMSTA1.AmpsAb.mag.f
AI		222	Class 2 and 0	Yes	FLTMSTA1 Phase A current (c)	100	LD0.FLTMSTA1.AmpsAc.mag.f
AI		223	Class 2 and 0	Yes	FLTMSTA1 Phase B current	100	LD0.FLTMSTA1.AmpsB.mag.f
AI		224	Class 2 and 0	Yes	FLTMSTA1 Maximum phase B current (b)	100	LD0.FLTMSTA1.AmpsBb.mag.f
AI		225	Class 2 and 0	Yes	FLTMSTA1 Phase B current (c)	100	LD0.FLTMSTA1.AmpsBc.mag.f
AI		226	Class 2 and 0	Yes	FLTMSTA1 Phase C current	100	LD0.FLTMSTA1.AmpsC.mag.f
AI		227	Class 2 and 0	Yes	FLTMSTA1 Maximum phase C current (b)	100	LD0.FLTMSTA1.AmpsCb.mag.f
AI		228	Class 2 and 0	Yes	FLTMSTA1 Phase C current (c)	100	LD0.FLTMSTA1.AmpsCc.mag.f
AI		229	Class 2 and 0	Yes	FLTMSTA1 Residual current	100	LD0.FLTMSTA1.AmpsN.mag.f
AI		230	Class 2 and 0	Yes	FLTMSTA1 Residual current (b)	100	LD0.FLTMSTA1.AmpsNb.mag.f
AI		231	Class 2 and 0	Yes	FLTMSTA1 Residual current (c)	100	LD0.FLTMSTA1.AmpsNc.mag.f
AI		232	Class 2 and 0	Yes	FLTMSTA1 Calculated residual current	100	LD0.FLTMSTA1.AmpsNClc.mag.f
AI		233	Class 2 and 0	Yes	FLTMSTA1 Calculated residual current (b)	100	LD0.FLTMSTA1.AmpsNClcb.mag.f
AI		234	Class 2 and 0	Yes	FLTMSTA1 Calculated residual current (c)	100	LD0.FLTMSTA1.AmpsNClcc.mag.f
AI		235	Class 2 and 0	Yes	FLTMSTA1 Negative sequence current	100	LD0.FLTMSTA1.AmpsNgSeq.mag.f
AI		236	Class 2 and 0	Yes	FLTMSTA1 Negative sequence current (b)	100	LD0.FLTMSTA1.AmpsNgSeqb.mag.f
AI		237	Class 2 and 0	Yes	FLTMSTA1 Negative sequence current (c)	100	LD0.FLTMSTA1.AmpsNgSeqc.mag.f
AI		238	Class 2 and 0	Yes	FLTMSTA1 Positive sequence current	100	LD0.FLTMSTA1.AmpsPsSeq.mag.f
AI		239	Class 2 and 0	Yes	FLTMSTA1 Positive sequence current (b)	100	LD0.FLTMSTA1.AmpsPsSeqb.mag.f
AI		240	Class 2 and 0	Yes	FLTMSTA1 Positive sequence current (c)	100	LD0.FLTMSTA1.AmpsPsSeqc.mag.f
AI		241	Class 2 and 0	Yes	FLTMSTA1 Breaker clear time	100	LD0.FLTMSTA1.CBClrTm.mag.f
AI		242	Class 2 and 0	Yes	FLTMSTA1 Conductance Yo	100	LD0.FLTMSTA1.CondN.mag.f
AI		243	Class 2 and 0	Yes	FLTMSTA1 Angle phase B to phase C voltage - phase A current	100	LD0.FLTMSTA1.DifAAngBC.mag.f
AI		244	Class 2 and 0	Yes	FLTMSTA1 Angle phase B to phase C voltage - phase A current (b)	100	LD0.FLTMSTA1.DifAAngBCb.mag.f

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DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI		245	Class 2 and 0	Yes	FLTMSTA1 Differential current phase A	100	LD0.FLTMSTA1.DifAmpsA.mag.f
AI		246	Class 2 and 0	Yes	FLTMSTA1 Differential current phase B	100	LD0.FLTMSTA1.DifAmpsB.mag.f
AI		247	Class 2 and 0	Yes	FLTMSTA1 Differential current phase C	100	LD0.FLTMSTA1.DifAmpsC.mag.f
AI		248	Class 2 and 0	Yes	FLTMSTA1 Differential current residual	100	LD0.FLTMSTA1.DifAmpsN.mag.f
AI		249	Class 2 and 0	Yes	FLTMSTA1 Angle phase C to phase A voltage - phase B current	100	LD0.FLTMSTA1.DifBAngCA.mag.f
AI		250	Class 2 and 0	Yes	FLTMSTA1 Angle phase C to phase A voltage - phase B current (b)	100	LD0.FLTMSTA1.DifBAngCAb.mag.f
AI		251	Class 2 and 0	Yes	FLTMSTA1 Angle phase A to phase B voltage - phase C current	100	LD0.FLTMSTA1.DifCAngAB.mag.f
AI		252	Class 2 and 0	Yes	FLTMSTA1 Angle phase A to phase B voltage - phase C current (b)	100	LD0.FLTMSTA1.DifCAngABb.mag.f
AI		253	Class 2 and 0	Yes	FLTMSTA1 Angle residual voltage - residual current	100	LD0.FLTMSTA1.DifNAngN.mag.f
AI		254	Class 2 and 0	Yes	FLTMSTA1 Angle residual voltage - residual current (b)	100	LD0.FLTMSTA1.DifNAngNb.mag.f
AI		255	Class 2 and 0	Yes	FLTMSTA1 Distance to fault measured in pu	100	LD0.FLTMSTA1.FltDiskm.mag.f
AI		256	Class 2 and 0	Yes	FLTMSTA1 Fault resistance	100	LD0.FLTMSTA1.FltZ.cVal.mag.f
AI		257	Class 2 and 0	Yes	FLTMSTA1 Frequency	100	LD0.FLTMSTA1.Hz.mag.f
AI		258	Class 2 and 0	Yes	FLTMSTA1 Frequency gradient	100	LD0.FLTMSTA1.HzS.mag.f
AI		259	Class 2 and 0	Yes	FLTMSTA1 Maximum phase A current	100	LD0.FLTMSTA1.MaxAmpsA.mag.f
AI		260	Class 2 and 0	Yes	FLTMSTA1 Maximum phase A current (b)	100	LD0.FLTMSTA1.MaxAmpsAb.mag.f
AI		261	Class 2 and 0	Yes	FLTMSTA1 Maximum phase A current (c)	100	LD0.FLTMSTA1.MaxAmpsAc.mag.f
AI		262	Class 2 and 0	Yes	FLTMSTA1 Maximum phase B current	100	LD0.FLTMSTA1.MaxAmpsB.mag.f
AI		263	Class 2 and 0	Yes	FLTMSTA1 Maximum phase B current (b)	100	LD0.FLTMSTA1.MaxAmpsBb.mag.f
AI		264	Class 2 and 0	Yes	FLTMSTA1 Maximum phase B current (c)	100	LD0.FLTMSTA1.MaxAmpsBc.mag.f
AI		265	Class 2 and 0	Yes	FLTMSTA1 Maximum phase C current	100	LD0.FLTMSTA1.MaxAmpsC.mag.f
AI		266	Class 2 and 0	Yes	FLTMSTA1 Maximum phase C current (b)	100	LD0.FLTMSTA1.MaxAmpsCb.mag.f
AI		267	Class 2 and 0	Yes	FLTMSTA1 Maximum phase C current (c)	100	LD0.FLTMSTA1.MaxAmpsCc.mag.f
AI		268	Class 2 and 0	Yes	FLTMSTA1 Maximum residual current	100	LD0.FLTMSTA1.MaxAmpsN.mag.f
AI		269	Class 2 and 0	Yes	FLTMSTA1 Maximum residual current (b)	100	LD0.FLTMSTA1.MaxAmpsNb.mag.f
AI		270	Class 2 and 0	Yes	FLTMSTA1 Maximum residual current (c)	100	LD0.FLTMSTA1.MaxAmpsNc.mag.f

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI		271	Class 2 and 0	Yes	FLTMSTA1 49 calculated temperature of the protected object relative to the trip level	100	LD0.FLTMSTA1.MaxTmpRI.mag.f
AI		272	Class 2 and 0	Yes	FLTMSTA1 Maximum phase A differential current	100	LD0.FLTMSTA1.MxDifAClCA.mag.f
AI		273	Class 2 and 0	Yes	FLTMSTA1 Maximum phase B differential current	100	LD0.FLTMSTA1.MxDifAClCB.mag.f
AI		274	Class 2 and 0	Yes	FLTMSTA1 Maximum phase C differential current	100	LD0.FLTMSTA1.MxDifAClCC.mag.f
AI		275	Class 2 and 0	Yes	FLTMSTA1 Maximum phase A bias current	100	LD0.FLTMSTA1.MxRstAClCA.mag.f
AI		276	Class 2 and 0	Yes	FLTMSTA1 Maximum phase B bias current	100	LD0.FLTMSTA1.MxRstAClCB.mag.f
AI		277	Class 2 and 0	Yes	FLTMSTA1 Maximum phase C bias current	100	LD0.FLTMSTA1.MxRstAClCC.mag.f
AI		278	Class 2 and 0	Yes	FLTMSTA1 Fault record number	0	LD0.FLTMSTA1.OpCnt.stVal
AI		279	Class 2 and 0	Yes	FLTMSTA1 Trip time	100	LD0.FLTMSTA1.OpTm.mag.f
AI		280	Class 2 and 0	Yes	FLTMSTA1 46PD ratio I2/I1	100	LD0.FLTMSTA1.PDNS1MxRat.mag.f
AI		281	Class 2 and 0	Yes	FLTMSTA1 Reactance of fault loop	100	LD0.FLTMSTA1.PPLoopReac.mag.f
AI		282	Class 2 and 0	Yes	FLTMSTA1 Resistance of fault loop	100	LD0.FLTMSTA1.PPLoopRis.mag.f
AI		283	Class 2 and 0	Yes	FLTMSTA1 Protection function	0	LD0.FLTMSTA1.ProFcn.stVal
AI		284	Class 2 and 0	Yes	FLTMSTA1 Bias current phase A	100	LD0.FLTMSTA1.RstAmpsA.mag.f
AI		285	Class 2 and 0	Yes	FLTMSTA1 Bias current phase B	100	LD0.FLTMSTA1.RstAmpsB.mag.f
AI		286	Class 2 and 0	Yes	FLTMSTA1 Bias current phase C	100	LD0.FLTMSTA1.RstAmpsC.mag.f
AI		287	Class 2 and 0	Yes	FLTMSTA1 Bias current residual	100	LD0.FLTMSTA1.RstAmpsN.mag.f
AI		288	Class 2 and 0	Yes	FLTMSTA1 Autoreclosing shot pointer value	0	LD0.FLTMSTA1.ShotPntr.stVal
AI		289	Class 2 and 0	Yes	FLTMSTA1 Maximum pickup duration of all stages during the fault	100	LD0.FLTMSTA1.StrDur.mag.f
AI		290	Class 2 and 0	Yes	FLTMSTA1 Susceptance Yo	100	LD0.FLTMSTA1.SusN.mag.f
AI		291	Class 2 and 0	Yes	FLTMSTA1 Negative sequence voltage	100	LD0.FLTMSTA1.VNgSeq.mag.f
AI		292	Class 2 and 0	Yes	FLTMSTA1 Negative sequence voltage (b)	100	LD0.FLTMSTA1.VNgSeqb.mag.f
AI		293	Class 2 and 0	Yes	FLTMSTA1 Phase A voltage	100	LD0.FLTMSTA1.VoltsA.mag.f
AI		294	Class 2 and 0	Yes	FLTMSTA1 Phase A to phase B voltage	100	LD0.FLTMSTA1.VoltsAB.mag.f
AI		295	Class 2 and 0	Yes	FLTMSTA1 Phase A voltage (b)	100	LD0.FLTMSTA1.VoltsAb.mag.f
AI		296	Class 2 and 0	Yes	FLTMSTA1 Phase A to phase B voltage (b)	100	LD0.FLTMSTA1.VoltsABb.mag.f
AI		297	Class 2 and 0	Yes	FLTMSTA1 Phase B voltage	100	LD0.FLTMSTA1.VoltsB.mag.f
AI		298	Class 2 and 0	Yes	FLTMSTA1 Phase B voltage (b)	100	LD0.FLTMSTA1.VoltsBb.mag.f
AI		299	Class 2 and 0	Yes	FLTMSTA1 Phase B to phase C voltage	100	LD0.FLTMSTA1.VoltsBC.mag.f
AI		300	Class 2 and 0	Yes	FLTMSTA1 Phase B to phase C voltage (b)	100	LD0.FLTMSTA1.VoltsBCb.mag.f

Section 2 DNP3 data mappings

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
AI		301	Class 2 and 0	Yes	FLTMSTA1 Phase C voltage	100	LD0.FLTMSTA1.VoltsC.mag.f
AI		302	Class 2 and 0	Yes	FLTMSTA1 Phase C to phase A voltage	100	LD0.FLTMSTA1.VoltsCA.mag.f
AI		303	Class 2 and 0	Yes	FLTMSTA1 Phase C to phase A voltage (b)	100	LD0.FLTMSTA1.VoltsCAb.mag.f
AI		304	Class 2 and 0	Yes	FLTMSTA1 Phase B voltage (b)	100	LD0.FLTMSTA1.VoltsCb.mag.f
AI		305	Class 2 and 0	Yes	FLTMSTA1 Residual voltage	100	LD0.FLTMSTA1.VoltsN.mag.f
AI		306	Class 2 and 0	Yes	FLTMSTA1 Residual voltage (b)	100	LD0.FLTMSTA1.VoltsNb.mag.f
AI		307	Class 2 and 0	Yes	FLTMSTA1 Positive sequence voltage	100	LD0.FLTMSTA1.VPsSeq.mag.f
AI		308	Class 2 and 0	Yes	FLTMSTA1 Positive sequence voltage (b)	100	LD0.FLTMSTA1.VPsSeqb.mag.f
AI		309	Class 2 and 0	Yes	FLTMSTA1 Zero sequence voltage	100	LD0.FLTMSTA1.VZroSeq.mag.f
AI		310	Class 2 and 0	Yes	FLTMSTA1 Zero sequence voltage (b)	100	LD0.FLTMSTA1.VZroSeqb.mag.f

Table 176: FLO : Fault location (DRFLO1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	501	Class 0	Yes	DRFLO1 Relay Trip		LD0.DRFLO1.Tr.general
AI		311	Class 2 and 0	Yes	DRFLO1 Fault Distance	100	LD0.DRFLO1.FltDisKm.mag.f
AI		312	Class 2 and 0	Yes	DRFLO1 Fault Loop	0	LD0.DRFLO1.FltLoop.stVal
AI		313	Class 2 and 0	Yes	DRFLO1 Loop Reactance	100	LD0.DRFLO1.FltLoopX.mag.f
AI		314	Class 2 and 0	Yes	DRFLO1 Fault Resistance	100	LD0.DRFLO1.FltZ.mag.f

Table 177: FLO : Fault location (DRFLO1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		27	Class 1 and 0	Yes	X100 (PSM) Connectors 6-7		LD0.XGGIO100.SPCSO1.stVal
BI		28	Class 1 and 0	Yes	X100 (PSM) Connectors 8-9		LD0.XGGIO100.SPCSO2.stVal
BI		29	Class 1 and 0	Yes	X100 (PSM) Connectors 10c-11nc-12no		LD0.XGGIO100.SPCSO3.stVal
BI		30	Class 1 and 0	Yes	X100 (PSM) Connectors 13c-14no		LD0.XGGIO100.SPCSO4.stVal
BI		31	Class 1 and 0	Yes	X100 (PSM) Connectors 15-17/18-19		LD0.XGGIO100.SPCSO5.stVal
BI		32	Class 1 and 0	Yes	X100 (PSM) Connectors 20-22/23-24		LD0.XGGIO100.SPCSO6.stVal

Table 178: XGGIO105 : BIO (X105) standard BO card (XGGIO105)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		33	Class 1 and 0	Yes	X105 (BIO) Connectors 1-2		LD0.XGGIO105.Ind1.stVal
BI		34	Class 1 and 0	Yes	X105 (BIO) Connectors 3-4		LD0.XGGIO105.Ind2.stVal
BI		35	Class 1 and 0	Yes	X105 (BIO) Connectors 5-6c		LD0.XGGIO105.Ind3.stVal
BI		36	Class 1 and 0	Yes	X105 (BIO) Connectors 7-6c		LD0.XGGIO105.Ind4.stVal

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		37	Class 1 and 0	Yes	X105 (BIO) Connectors 8-9c		LD0.XGGIO105.Ind5.stVal
BI		38	Class 1 and 0	Yes	X105 (BIO) Connectors 10-9c		LD0.XGGIO105.Ind6.stVal
BI		39	Class 1 and 0	Yes	X105 (BIO) Connectors 11-12c		LD0.XGGIO105.Ind7.stVal
BI		40	Class 1 and 0	Yes	X105 (BIO) Connectors 13-12c		LD0.XGGIO105.Ind8.stVal
BI		41	Class 1 and 0	Yes	X105 (BIO) Connectors 14c-15no-16nc		LD0.XGGIO105.SPCSO1.stVal
BI		42	Class 1 and 0	Yes	X105 (BIO) Connectors 17c-18no-19nc		LD0.XGGIO105.SPCSO2.stVal
BI		43	Class 1 and 0	Yes	X105 (BIO) Connectors 20c-21no-22nc		LD0.XGGIO105.SPCSO3.stVal
BI		44	Class 1 and 0	Yes	X105 (BIO) Connectors 23-24		LD0.XGGIO105.SPCSO4.stVal

Table 179: XGGIO110 : BIO (X110) standard BO card (XGGIO110)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		45	Class 1 and 0	Yes	X110 (BIO) Connectors 1-2		LD0.XGGIO110.Ind1.stVal
BI		46	Class 1 and 0	Yes	X110 (BIO) Connectors 3-4		LD0.XGGIO110.Ind2.stVal
BI		47	Class 1 and 0	Yes	X110 (BIO) Connectors 5-6c		LD0.XGGIO110.Ind3.stVal
BI		48	Class 1 and 0	Yes	X110 (BIO) Connectors 7-6c		LD0.XGGIO110.Ind4.stVal
BI		49	Class 1 and 0	Yes	X110 (BIO) Connectors 8-9c		LD0.XGGIO110.Ind5.stVal
BI		50	Class 1 and 0	Yes	X110 (BIO) Connectors 10-9c		LD0.XGGIO110.Ind6.stVal
BI		51	Class 1 and 0	Yes	X110 (BIO) Connectors 11-12c		LD0.XGGIO110.Ind7.stVal
BI		52	Class 1 and 0	Yes	X110 (BIO) Connectors 13-12c		LD0.XGGIO110.Ind8.stVal
BI		53	Class 1 and 0	Yes	X110 (BIO) Connectors 14c-15no-16nc		LD0.XGGIO110.SPCSO1.stVal
BI		54	Class 1 and 0	Yes	X110 (BIO) Connectors 17c-18no-19nc		LD0.XGGIO110.SPCSO2.stVal
BI		55	Class 1 and 0	Yes	X110 (BIO) Connectors 20c-21no-22nc		LD0.XGGIO110.SPCSO3.stVal
BI		56	Class 1 and 0	Yes	X110 (BIO) Connectors 23-24		LD0.XGGIO110.SPCSO4.stVal

Table 180: XBGIO110 : BIO (X110) HSO card (XBGIO110)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		4	Class 1 and 0	Yes	X110 (BIO-H) Connectors 1-5c		LD0.XBGIO110.Ind1.stVal
BI		5	Class 1 and 0	Yes	X110 (BIO-H) Connectors 2-5c		LD0.XBGIO110.Ind2.stVal
BI		6	Class 1 and 0	Yes	X110 (BIO-H) Connectors 3-5c		LD0.XBGIO110.Ind3.stVal
BI		7	Class 1 and 0	Yes	X110 (BIO-H) Connectors 4-5c		LD0.XBGIO110.Ind4.stVal
BI		8	Class 1 and 0	Yes	X110 (BIO-H) Connectors 6-10c		LD0.XBGIO110.Ind5.stVal
BI		9	Class 1 and 0	Yes	X110 (BIO-H) Connectors 7-10c		LD0.XBGIO110.Ind6.stVal
BI		10	Class 1 and 0	Yes	X110 (BIO-H) Connectors 8-10c		LD0.XBGIO110.Ind7.stVal
BI		11	Class 1 and 0	Yes	X110 (BIO-H) Connectors 9-10c		LD0.XBGIO110.Ind8.stVal
BI		12	Class 1 and 0	Yes	X110 (BIO-H) Connectors 15no-16no		LD0.XBGIO110.SPCSO1.stVal
BI		13	Class 1 and 0	Yes	X110 (BIO-H) Connectors 19no-20no		LD0.XBGIO110.SPCSO2.stVal
BI		14	Class 1 and 0	Yes	X110 (BIO-H) Connectors 23no-24no		LD0.XBGIO110.SPCSO3.stVal

Table 181: XBGGIO115 : BIO (X115) standard BO card (XBGGIO115)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		15	Class 1 and 0	Yes	X115 (BIO) Connectors 1-2		LD0.XBGGIO115.Ind1.stVal
BI		16	Class 1 and 0	Yes	X115 (BIO) Connectors 3-4		LD0.XBGGIO115.Ind2.stVal
BI		17	Class 1 and 0	Yes	X115 (BIO) Connectors 5-6c		LD0.XBGGIO115.Ind3.stVal
BI		18	Class 1 and 0	Yes	X115 (BIO) Connectors 7-6c		LD0.XBGGIO115.Ind4.stVal
BI		19	Class 1 and 0	Yes	X115 (BIO) Connectors 8-9c		LD0.XBGGIO115.Ind5.stVal
BI		20	Class 1 and 0	Yes	X115 (BIO) Connectors 10-9c		LD0.XBGGIO115.Ind6.stVal
BI		21	Class 1 and 0	Yes	X115 (BIO) Connectors 11-12c		LD0.XBGGIO115.Ind7.stVal
BI		22	Class 1 and 0	Yes	X115 (BIO) Connectors 13-12c		LD0.XBGGIO115.Ind8.stVal
BI		23	Class 1 and 0	Yes	X115 (BIO) Connectors 14c-15no-16nc		LD0.XBGGIO115.SPSCO1.stVal
BI		24	Class 1 and 0	Yes	X115 (BIO) Connectors 17c-18no-19nc		LD0.XBGGIO115.SPSCO2.stVal
BI		25	Class 1 and 0	Yes	X115 (BIO) Connectors 20c-21no-22nc		LD0.XBGGIO115.SPSCO3.stVal
BI		26	Class 1 and 0	Yes	X115 (BIO) Connectors 23-24		LD0.XBGGIO115.SPSCO4.stVal

Table 182: XHBGGIO115 : BIO (X115) HSO card (XHBGGIO115)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		81	Class 1 and 0	Yes	X115 (BIO-H) Connectors 1-5c		LD0.XHBGGIO115.Ind1.stVal
BI		82	Class 1 and 0	Yes	X115 (BIO-H) Connectors 2-5c		LD0.XHBGGIO115.Ind2.stVal
BI		83	Class 1 and 0	Yes	X115 (BIO-H) Connectors 3-5c		LD0.XHBGGIO115.Ind3.stVal
BI		84	Class 1 and 0	Yes	X115 (BIO-H) Connectors 4-5c		LD0.XHBGGIO115.Ind4.stVal
BI		85	Class 1 and 0	Yes	X115 (BIO-H) Connectors 6-10c		LD0.XHBGGIO115.Ind5.stVal
BI		86	Class 1 and 0	Yes	X115 (BIO-H) Connectors 7-10c		LD0.XHBGGIO115.Ind6.stVal
BI		87	Class 1 and 0	Yes	X115 (BIO-H) Connectors 8-10c		LD0.XHBGGIO115.Ind7.stVal
BI		88	Class 1 and 0	Yes	X115 (BIO-H) Connectors 9-10c		LD0.XHBGGIO115.Ind8.stVal
BI		89	Class 1 and 0	Yes	X115 (BIO-H) Connectors 15no-16no		LD0.XHBGGIO115.SPSCO1.stVal
BI		90	Class 1 and 0	Yes	X115 (BIO-H) Connectors 19no-20no		LD0.XHBGGIO115.SPSCO2.stVal
BI		91	Class 1 and 0	Yes	X115 (BIO-H) Connectors 23no-24no		LD0.XHBGGIO115.SPSCO3.stVal

Table 183: XGGIO120 : AIM (X120) 4CT+4BI (XGGIO120)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		57	Class 1 and 0	Yes	X120 (AIM) Connectors 1-2c		LD0.XGGIO120.Ind1.stVal
BI		58	Class 1 and 0	Yes	X120 (AIM) Connectors 3-2c		LD0.XGGIO120.Ind2.stVal
BI		59	Class 1 and 0	Yes	X120 (AIM) Connectors 4-2c		LD0.XGGIO120.Ind3.stVal
BI		60	Class 1 and 0	Yes	X120 (AIM) Connectors 5-6		LD0.XGGIO120.Ind4.stVal

Table 184: XGGIO120 : AIM (X120) 4CT+4BI with sensitive IO (XGGIO120)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		57	Class 1 and 0	Yes	X120 (AIM) Connectors 1-2c		LD0.XGGIO120.Ind1.stVal
BI		58	Class 1 and 0	Yes	X120 (AIM) Connectors 3-2c		LD0.XGGIO120.Ind2.stVal
BI		59	Class 1 and 0	Yes	X120 (AIM) Connectors 4-2c		LD0.XGGIO120.Ind3.stVal
BI		60	Class 1 and 0	Yes	X120 (AIM) Connectors 5-6		LD0.XGGIO120.Ind4.stVal

Table 185: XAGGIO130 : AIM (X130) 8VT (XAGGIO130)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		0	Class 1 and 0	Yes	X130 (AIM) Connectors 1-2		LD0.XAGGIO130.Ind1.stVal
BI		1	Class 1 and 0	Yes	X130 (AIM) Connectors 3-4		LD0.XAGGIO130.Ind2.stVal
BI		2	Class 1 and 0	Yes	X130 (AIM) Connectors 5-6		LD0.XAGGIO130.Ind3.stVal
BI		3	Class 1 and 0	Yes	X130 (AIM) Connectors 7-8		LD0.XAGGIO130.Ind4.stVal

Table 186: XGGIO130 : BIO (X130) card (XGGIO130)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI		61	Class 1 and 0	Yes	X130 (BIO) Connectors 1-2c		LD0.XGGIO130.Ind1.stVal
BI		62	Class 1 and 0	Yes	X130 (BIO) Connectors 3-2c		LD0.XGGIO130.Ind2.stVal
BI		63	Class 1 and 0	Yes	X130 (BIO) Connectors 4-5c		LD0.XGGIO130.Ind3.stVal
BI		64	Class 1 and 0	Yes	X130 (BIO) Connectors 6-5c		LD0.XGGIO130.Ind4.stVal
BI		65	Class 1 and 0	Yes	X130 (BIO) Connectors 7-8c		LD0.XGGIO130.Ind5.stVal
BI		66	Class 1 and 0	Yes	X130 (BIO) Connectors 9-8c		LD0.XGGIO130.Ind6.stVal
BI		67	Class 1 and 0	Yes	X130 (BIO) Connectors 10c-11no-12nc		LD0.XGGIO130.SPCSO1.stVal
BI		68	Class 1 and 0	Yes	X130 (BIO) Connectors 13c-14no-15nc		LD0.XGGIO130.SPCSO2.stVal
BI		69	Class 1 and 0	Yes	X130 (BIO) Connectors 16c-17no-18nc		LD0.XGGIO130.SPCSO3.stVal

2.3 DNP Binary Outputs

Table 187: DNP Binary Outputs

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BO		0		Yes	Protection LLN0 Clear indication LEDs and texts		LD0.LLN0.LEDRs1.Oper.ctlVal
BO		1		Yes	Protection LLN0 Clear alarm LEDs		LD0.LLN0.LEDRs2.Oper.ctlVal
BO		2		Yes	Protection LLN0 Reset all power quality data		LD0.LLN0.PQRs.Oper.ctlVal
BO		3		Yes	52-1 Switch general		CTRL.CBCSWI1.Pos.Oper.ctlVal
BO		4		Yes	52-2 Switch general		CTRL.CBCSWI2.Pos.Oper.ctlVal
BO		5		Yes	FLTMSTA1 Reset fault records		LD0.FLTMSTA1.RecRs.Oper.ctlVal
BO		6		Yes	Disturbance recorder Manual trigger for the disturbance recorder		DR.RDRE1.RcdTrg.Oper.ctlVal
BO		7		Yes	Disturbance recorder Clear all DFR recordings in the memory		DR.RDRE1.MemClr.Oper.ctlVal
BO		9		Yes	PQI-1 CMHAI1 max.demands		LD0.CMHAI1.RecRs.Oper.ctlVal
BO		10		Yes	IA IB IC CMMXU1 demands		LD0.CMSTA1.RecRs.Oper.ctlVal
BO		11		Yes	IA IB IC(2) CMMXU2 demands		LD0.CMSTA2.RecRs.Oper.ctlVal
BO		13		Yes	PQSS-1 Recorded data reset		LD0.PH1QVVR1.RecRs.Oper.ctlVal
BO		14		Yes	PQSS-1 Counters reset		LD0.PH1QVVR1.RsCnt.Oper.ctlVal
BO		15		Yes	CFD CFD Reset		LD0.RCFD1.Rst.Oper.ctlVal
BO		16		Yes	Physical device Reset of IED		LD0.LPHD1.RsDev.Oper.ctlVal
BO		17		Yes	79-1 79 all counters reset		LD0.DARREC1.RsCnt.Oper.ctlVal
BO		18		Yes	79-1 79 reset to initial condition		LD0.DARREC1.RsRec.Oper.ctlVal
BO		19		Yes	79-2 79-2 all counters reset		LD0.DARREC2.RsCnt.Oper.ctlVal
BO		20		Yes	79-2 79-2 reset		LD0.DARREC2.RsRec.Oper.ctlVal
BO		21		Yes	LoadProf Reset load profile record		LD0.LDPMSTA1.RecRs.Oper.ctlVal
BO		25		Yes	P E Reset of accumulated energy reading		LD0.PEMMTR1.SupDmdRs.Oper.ctlVal
BO		27		Yes	SP SE Reset of accumulated energy reading		LD0.SPEMMTR1.SupDmdRs.Oper.ctlVal
BO		29		Yes	PQVPH-1 CMHAI1 max.demands		LD0.VMHAI1.RecRs.Oper.ctlVal
BO		30		Yes	PQVPH-2 CMHAI1 max.demands		LD0.VMHAI2.RecRs.Oper.ctlVal
BO		31		Yes	49F Reset 49F temperature		LD0.T1PTTR1.RsTmp.Oper.ctlVal
BO		32		Yes	CNTRL-1 Trig output 1		LD0.SPCGGIO1.SPCSO1.Oper.ctlVal
BO		33		Yes	CNTRL-1 Trig output 2		LD0.SPCGGIO1.SPCSO2.Oper.ctlVal
BO		34		Yes	CNTRL-1 Trig output 3		LD0.SPCGGIO1.SPCSO3.Oper.ctlVal
BO		35		Yes	CNTRL-1 Trig output 4		LD0.SPCGGIO1.SPCSO4.Oper.ctlVal
BO		36		Yes	CNTRL-1 Trig output 5		LD0.SPCGGIO1.SPCSO5.Oper.ctlVal
BO		37		Yes	CNTRL-1 Trig output 6		LD0.SPCGGIO1.SPCSO6.Oper.ctlVal
BO		38		Yes	CNTRL-1 Trig output 7		LD0.SPCGGIO1.SPCSO7.Oper.ctlVal

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BO		39		Yes	CNTRL-1 Trig output 8		LD0.SPCGGIO1.SPCSO8.Oper.ctlVal
BO		40		Yes	CNTRL-1 Trig output 9		LD0.SPCGGIO1.SPCSO9.Oper.ctlVal
BO		41		Yes	CNTRL-1 Trig output 10		LD0.SPCGGIO1.SPCSO10.Oper.ctlVal
BO		42		Yes	CNTRL-1 Trig output 11		LD0.SPCGGIO1.SPCSO11.Oper.ctlVal
BO		43		Yes	CNTRL-1 Trig output 12		LD0.SPCGGIO1.SPCSO12.Oper.ctlVal
BO		44		Yes	CNTRL-1 Trig output 13		LD0.SPCGGIO1.SPCSO13.Oper.ctlVal
BO		45		Yes	CNTRL-1 Trig output 14		LD0.SPCGGIO1.SPCSO14.Oper.ctlVal
BO		46		Yes	CNTRL-1 Trig output 15		LD0.SPCGGIO1.SPCSO15.Oper.ctlVal
BO		47		Yes	CNTRL-1 Trig output 16		LD0.SPCGGIO1.SPCSO16.Oper.ctlVal
BO		48		Yes	CNTRL-2 Trig output 1		LD0.SPCGGIO2.SPCSO1.Oper.ctlVal
BO		49		Yes	CNTRL-2 Trig output 2		LD0.SPCGGIO2.SPCSO2.Oper.ctlVal
BO		50		Yes	CNTRL-2 Trig output 3		LD0.SPCGGIO2.SPCSO3.Oper.ctlVal
BO		51		Yes	CNTRL-2 Trig output 4		LD0.SPCGGIO2.SPCSO4.Oper.ctlVal
BO		52		Yes	CNTRL-2 Trig output 5		LD0.SPCGGIO2.SPCSO5.Oper.ctlVal
BO		53		Yes	CNTRL-2 Trig output 6		LD0.SPCGGIO2.SPCSO6.Oper.ctlVal
BO		54		Yes	CNTRL-2 Trig output 7		LD0.SPCGGIO2.SPCSO7.Oper.ctlVal
BO		55		Yes	CNTRL-2 Trig output 8		LD0.SPCGGIO2.SPCSO8.Oper.ctlVal
BO		56		Yes	CNTRL-2 Trig output 9		LD0.SPCGGIO2.SPCSO9.Oper.ctlVal
BO		57		Yes	CNTRL-2 Trig output 10		LD0.SPCGGIO2.SPCSO10.Oper.ctlVal
BO		58		Yes	CNTRL-2 Trig output 11		LD0.SPCGGIO2.SPCSO11.Oper.ctlVal
BO		59		Yes	CNTRL-2 Trig output 12		LD0.SPCGGIO2.SPCSO12.Oper.ctlVal
BO		60		Yes	CNTRL-2 Trig output 13		LD0.SPCGGIO2.SPCSO13.Oper.ctlVal
BO		61		Yes	CNTRL-2 Trig output 14		LD0.SPCGGIO2.SPCSO14.Oper.ctlVal
BO		62		Yes	CNTRL-2 Trig output 15		LD0.SPCGGIO2.SPCSO15.Oper.ctlVal
BO		63		Yes	CNTRL-2 Trig output 16		LD0.SPCGGIO2.SPCSO16.Oper.ctlVal
BO		64		Yes	CNTRL-3 Trig output 1		LD0.SPCGGIO3.SPCSO1.Oper.ctlVal
BO		65		Yes	CNTRL-3 Trig output 2		LD0.SPCGGIO3.SPCSO2.Oper.ctlVal
BO		66		Yes	CNTRL-3 Trig output 3		LD0.SPCGGIO3.SPCSO3.Oper.ctlVal
BO		67		Yes	CNTRL-3 Trig output 4		LD0.SPCGGIO3.SPCSO4.Oper.ctlVal
BO		68		Yes	CNTRL-3 Trig output 5		LD0.SPCGGIO3.SPCSO5.Oper.ctlVal
BO		69		Yes	CNTRL-3 Trig output 6		LD0.SPCGGIO3.SPCSO6.Oper.ctlVal
BO		70		Yes	CNTRL-3 Trig output 7		LD0.SPCGGIO3.SPCSO7.Oper.ctlVal
BO		71		Yes	CNTRL-3 Trig output 8		LD0.SPCGGIO3.SPCSO8.Oper.ctlVal
BO		72		Yes	CNTRL-3 Trig output 9		LD0.SPCGGIO3.SPCSO9.Oper.ctlVal
BO		73		Yes	CNTRL-3 Trig output 10		LD0.SPCGGIO3.SPCSO10.Oper.ctlVal
BO		74		Yes	CNTRL-3 Trig output 11		LD0.SPCGGIO3.SPCSO11.Oper.ctlVal
BO		75		Yes	CNTRL-3 Trig output 12		LD0.SPCGGIO3.SPCSO12.Oper.ctlVal
BO		76		Yes	CNTRL-3 Trig output 13		LD0.SPCGGIO3.SPCSO13.Oper.ctlVal
BO		77		Yes	CNTRL-3 Trig output 14		LD0.SPCGGIO3.SPCSO14.Oper.ctlVal
BO		78		Yes	CNTRL-3 Trig output 15		LD0.SPCGGIO3.SPCSO15.Oper.ctlVal

Section 2 DNP3 data mappings

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BO		79		Yes	CNTRL-3 Trig output 16		LD0.SPCGGIO3.SPCSO16.Oper.ctlVal
BO		80		Yes	RCNTRL-1 Output 1		LD0.SPCRGGIO1.SPCSO1.Oper.ctlVal
BO		81		Yes	RCNTRL-1 Output 2		LD0.SPCRGGIO1.SPCSO2.Oper.ctlVal
BO		82		Yes	RCNTRL-1 Output 3		LD0.SPCRGGIO1.SPCSO3.Oper.ctlVal
BO		83		Yes	RCNTRL-1 Output 4		LD0.SPCRGGIO1.SPCSO4.Oper.ctlVal
BO		84		Yes	RCNTRL-1 Output 5		LD0.SPCRGGIO1.SPCSO5.Oper.ctlVal
BO		85		Yes	RCNTRL-1 Output 6		LD0.SPCRGGIO1.SPCSO6.Oper.ctlVal
BO		86		Yes	RCNTRL-1 Output 7		LD0.SPCRGGIO1.SPCSO7.Oper.ctlVal
BO		87		Yes	RCNTRL-1 Output 8		LD0.SPCRGGIO1.SPCSO8.Oper.ctlVal
BO		88		Yes	RCNTRL-1 Output 9		LD0.SPCRGGIO1.SPCSO9.Oper.ctlVal
BO		89		Yes	RCNTRL-1 Output 10		LD0.SPCRGGIO1.SPCSO10.Oper.ctlVal
BO		90		Yes	RCNTRL-1 Output 11		LD0.SPCRGGIO1.SPCSO11.Oper.ctlVal
BO		91		Yes	RCNTRL-1 Output 12		LD0.SPCRGGIO1.SPCSO12.Oper.ctlVal
BO		92		Yes	RCNTRL-1 Output 13		LD0.SPCRGGIO1.SPCSO13.Oper.ctlVal
BO		93		Yes	RCNTRL-1 Output 14		LD0.SPCRGGIO1.SPCSO14.Oper.ctlVal
BO		94		Yes	RCNTRL-1 Output 15		LD0.SPCRGGIO1.SPCSO15.Oper.ctlVal
BO		95		Yes	RCNTRL-1 Output 16		LD0.SPCRGGIO1.SPCSO16.Oper.ctlVal
BO		96		Yes	SR-1 Resets Q1 output when set		LD0.SRGAPC1.Rs1.Oper.ctlVal
BO		97		Yes	SR-1 Resets Q2 output when set		LD0.SRGAPC1.Rs2.Oper.ctlVal
BO		98		Yes	SR-1 Resets Q3 output when set		LD0.SRGAPC1.Rs3.Oper.ctlVal
BO		99		Yes	SR-1 Resets Q4 output when set		LD0.SRGAPC1.Rs4.Oper.ctlVal
BO		100		Yes	SR-1 Resets Q5 output when set		LD0.SRGAPC1.Rs5.Oper.ctlVal
BO		101		Yes	SR-1 Resets Q6 output when set		LD0.SRGAPC1.Rs6.Oper.ctlVal
BO		102		Yes	SR-1 Resets Q7 output when set		LD0.SRGAPC1.Rs7.Oper.ctlVal
BO		103		Yes	SR-1 Resets Q8 output when set		LD0.SRGAPC1.Rs8.Oper.ctlVal
BO		104		Yes	SR-2 Resets Q1 output when set		LD0.SRGAPC2.Rs1.Oper.ctlVal
BO		105		Yes	SR-2 Resets Q2 output when set		LD0.SRGAPC2.Rs2.Oper.ctlVal
BO		106		Yes	SR-2 Resets Q3 output when set		LD0.SRGAPC2.Rs3.Oper.ctlVal
BO		107		Yes	SR-2 Resets Q4 output when set		LD0.SRGAPC2.Rs4.Oper.ctlVal
BO		108		Yes	SR-2 Resets Q5 output when set		LD0.SRGAPC2.Rs5.Oper.ctlVal
BO		109		Yes	SR-2 Resets Q6 output when set		LD0.SRGAPC2.Rs6.Oper.ctlVal
BO		110		Yes	SR-2 Resets Q7 output when set		LD0.SRGAPC2.Rs7.Oper.ctlVal
BO		111		Yes	SR-2 Resets Q8 output when set		LD0.SRGAPC2.Rs8.Oper.ctlVal
BO		112		Yes	SR-3 Resets Q1 output when set		LD0.SRGAPC3.Rs1.Oper.ctlVal
BO		113		Yes	SR-3 Resets Q2 output when set		LD0.SRGAPC3.Rs2.Oper.ctlVal
BO		114		Yes	SR-3 Resets Q3 output when set		LD0.SRGAPC3.Rs3.Oper.ctlVal
BO		115		Yes	SR-3 Resets Q4 output when set		LD0.SRGAPC3.Rs4.Oper.ctlVal
BO		116		Yes	SR-3 Resets Q5 output when set		LD0.SRGAPC3.Rs5.Oper.ctlVal
BO		117		Yes	SR-3 Resets Q6 output when set		LD0.SRGAPC3.Rs6.Oper.ctlVal
BO		118		Yes	SR-3 Resets Q7 output when set		LD0.SRGAPC3.Rs7.Oper.ctlVal

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BO		119		Yes	SR-3 Resets Q8 output when set		LD0.SRGAPC3.Rs8.Oper.ctlVal
BO		120		Yes	SR-4 Resets Q1 output when set		LD0.SRGAPC4.Rs1.Oper.ctlVal
BO		121		Yes	SR-4 Resets Q2 output when set		LD0.SRGAPC4.Rs2.Oper.ctlVal
BO		122		Yes	SR-4 Resets Q3 output when set		LD0.SRGAPC4.Rs3.Oper.ctlVal
BO		123		Yes	SR-4 Resets Q4 output when set		LD0.SRGAPC4.Rs4.Oper.ctlVal
BO		124		Yes	SR-4 Resets Q5 output when set		LD0.SRGAPC4.Rs5.Oper.ctlVal
BO		125		Yes	SR-4 Resets Q6 output when set		LD0.SRGAPC4.Rs6.Oper.ctlVal
BO		126		Yes	SR-4 Resets Q7 output when set		LD0.SRGAPC4.Rs7.Oper.ctlVal
BO		127		Yes	SR-4 Resets Q8 output when set		LD0.SRGAPC4.Rs8.Oper.ctlVal
BO		128		Yes	52CM-1 Resets accumulation energy		LD0.SSCBR1.RsAccAPwr.Oper.ctlVal
BO		129		Yes	52CM-1 Reset CB remaining life and operation counter		LD0.SSCBR1.RsCBWear.Oper.ctlVal
BO		130		Yes	52CM-1 Reset the charging time of the CB spring		LD0.SSCBR1.RsSprChaTm.Oper.ctlVal
BO		131		Yes	52CM-1 Reset CB closing and opening travel times		LD0.SSCBR1.RsTrvTm.Oper.ctlVal
BO		132		Yes	52CM-2 Resets accumulation energy		LD0.SSCBR2.RsAccAPwr.Oper.ctlVal
BO		133		Yes	52CM-2 Reset CB remaining life and operation counter		LD0.SSCBR2.RsCBWear.Oper.ctlVal
BO		134		Yes	52CM-2 Reset the charging time of the CB spring		LD0.SSCBR2.RsSprChaTm.Oper.ctlVal
BO		135		Yes	52CM-2 Reset CB closing and opening travel times		LD0.SSCBR2.RsTrvTm.Oper.ctlVal
BO		140		Yes	86/94-1 Reset 86/94-1 lockout and latch		LD0.TRPPTRC1.LORs.Oper.ctlVal
BO		141		Yes	86/94-1 Reset latched trip		LD0.TRPPTRC1.TrRs.Oper.ctlVal
BO		142		Yes	86/94-2 Reset 86/94-2 lockout and latch		LD0.TRPPTRC2.LORs.Oper.ctlVal
BO		143		Yes	86/94-2 Reset latched trip		LD0.TRPPTRC2.TrRs.Oper.ctlVal
BO		144		Yes	86/94-3 Reset 86/94-3 lockout and latch		LD0.TRPPTRC3.LORs.Oper.ctlVal
BO		145		Yes	86/94-3 Reset latched trip		LD0.TRPPTRC3.TrRs.Oper.ctlVal
BO		146		Yes	CTR-1 Loads the counter to preset value		LD0.UDFCNT1.LodCnt.Oper.ctlVal
BO		147		Yes	CTR-1 Resets counter value		LD0.UDFCNT1.RsCnt.Oper.ctlVal
BO		148		Yes	CTR-2 Loads the counter to preset value		LD0.UDFCNT2.LodCnt.Oper.ctlVal
BO		149		Yes	CTR-2 Resets counter value		LD0.UDFCNT2.RsCnt.Oper.ctlVal
BO		150		Yes	CTR-3 Loads the counter to preset value		LD0.UDFCNT3.LodCnt.Oper.ctlVal
BO		151		Yes	CTR-3 Resets counter value		LD0.UDFCNT3.RsCnt.Oper.ctlVal
BO		152		Yes	CTR-4 Loads the counter to preset value		LD0.UDFCNT4.LodCnt.Oper.ctlVal
BO		153		Yes	CTR-4 Resets counter value		LD0.UDFCNT4.RsCnt.Oper.ctlVal

Section 2 DNP3 data mappings

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BO		154		Yes	CTR-5 Loads the counter to preset value		LD0.UDFCNT5.LodCnt.Oper.ctlVal
BO		155		Yes	CTR-5 Resets counter value		LD0.UDFCNT5.RsCnt.Oper.ctlVal
BO		156		Yes	CTR-6 Loads the counter to preset value		LD0.UDFCNT6.LodCnt.Oper.ctlVal
BO		157		Yes	CTR-6 Resets counter value		LD0.UDFCNT6.RsCnt.Oper.ctlVal
BO		158		Yes	CTR-7 Loads the counter to preset value		LD0.UDFCNT7.LodCnt.Oper.ctlVal
BO		159		Yes	CTR-7 Resets counter value		LD0.UDFCNT7.RsCnt.Oper.ctlVal
BO		160		Yes	CTR-8 Loads the counter to preset value		LD0.UDFCNT8.LodCnt.Oper.ctlVal
BO		161		Yes	CTR-8 Resets counter value		LD0.UDFCNT8.RsCnt.Oper.ctlVal
BO		162		Yes	CTR-9 Loads the counter to preset value		LD0.UDFCNT9.LodCnt.Oper.ctlVal
BO		163		Yes	CTR-9 Resets counter value		LD0.UDFCNT9.RsCnt.Oper.ctlVal
BO		164		Yes	CTR-10 Loads the counter to preset value		LD0.UDFCNT10.LodCnt.Oper.ctlVal
BO		165		Yes	CTR-10 Resets counter value		LD0.UDFCNT10.RsCnt.Oper.ctlVal
BO		166		Yes	CTR-11 Loads the counter to preset value		LD0.UDFCNT11.LodCnt.Oper.ctlVal
BO		167		Yes	CTR-11 Resets counter value		LD0.UDFCNT11.RsCnt.Oper.ctlVal
BO		168		Yes	CTR-12 Loads the counter to preset value		LD0.UDFCNT12.LodCnt.Oper.ctlVal
BO		169		Yes	CTR-12 Resets counter value		LD0.UDFCNT12.RsCnt.Oper.ctlVal
BO		171		Yes	DNP 3.0 Activate setting group 1		LD0.DNPGGIO1.ActSG1.Oper.ctlVal
BO		172		Yes	DNP 3.0 Activate setting group 2		LD0.DNPGGIO1.ActSG2.Oper.ctlVal
BO		173		Yes	DNP 3.0 Activate setting group 3		LD0.DNPGGIO1.ActSG3.Oper.ctlVal
BO		174		Yes	DNP 3.0 Activate setting group 4		LD0.DNPGGIO1.ActSG4.Oper.ctlVal
BO		175		Yes	DNP 3.0 Activate setting group 5		LD0.DNPGGIO1.ActSG5.Oper.ctlVal
BO		176		Yes	DNP 3.0 Activate setting group 6		LD0.DNPGGIO1.ActSG6.Oper.ctlVal

Section 3 DNP3 protocol implementation

3.1 DNP3 device profile

The following table provides a device profile document in the standard format defined in the DNP3 Subset Definitions Document. While it is referred to in the DNP3 Subset Definitions as a document, it is in fact a table, and only a component of a total interoperability guide. The table, in combination with the Implementation table and the point list tables provides a complete configuration/interoperability guide for communicating with a device.

Table 188: Device profile document

DNP3 device profile document	
Vendor name:	ABB Inc.
Device name:	REF620
Highest DNP level supported: For requests: Level 2+ For responses: Level 2+	Device function: <input type="radio"/> Master <input checked="" type="radio"/> Slave
<p>Notable objects, functions, and/or qualifiers supported in addition to the highest DNP levels supported (the complete list is described in the attached table): For static (non-change-event) object requests, request qualifier codes 07 and 08 (limited quantity), and 17 and 28 (index) are supported. Static object requests sent with qualifiers 07, or 08, will be responded with qualifiers 00 or 01. 16-bit and 32-bit Analog Change Events with Time may be requested.</p>	
Maximum data link frame size (octets): Transmitted: 292 Received: 292	Maximum application fragment size (octets): Transmitted: Configurable (256...2048) Received: 2048
Maximum data link re-tries: <input type="radio"/> None <input type="radio"/> Fixed <input checked="" type="radio"/> Configurable (0...65535)	Maximum application layer re-tries: <input checked="" type="radio"/> None <input type="radio"/> Configurable
Requires data link layer confirmation: <input type="radio"/> Never <input type="radio"/> Always <input type="radio"/> Sometimes <input checked="" type="radio"/> Configurable as: "Never", "Only for multi-frame messages", or "Always"	
Requires application layer confirmation: <input type="radio"/> Never <input type="radio"/> Always <input type="radio"/> When reporting event data (slave devices only) <input type="radio"/> When sending multi-fragment responses (slave devices only) <input type="radio"/> Sometimes <input checked="" type="radio"/> Configurable as: "Only when reporting event data", or "When reporting event data or multi-fragment messages"	
Timeouts while waiting for:	
Data link confirm:	<input type="radio"/> None <input type="radio"/> Fixed at ____ <input type="radio"/> Variable <input checked="" type="radio"/> Configurable
Complete appl. fragment:	<input checked="" type="radio"/> None <input type="radio"/> Fixed at ____ <input type="radio"/> Variable <input type="radio"/> Configurable
Application confirm:	<input type="radio"/> None <input type="radio"/> Fixed at ____ <input type="radio"/> Variable <input checked="" type="radio"/> Configurable
Complete appl. response:	<input checked="" type="radio"/> None <input type="radio"/> Fixed at ____ <input type="radio"/> Variable <input type="radio"/> Configurable
Others:	Select/Operate Arm Timeout, not configurable; fixed at 10s, regardless of select timeout in the HMI. Need time interval, configurable Unsolicited notification delay, configurable Unsolicited response retry delay, configurable Unsolicited offline Interval, configurable
Sends/Executes Control Operations:	

DNP3 device profile document								
WRITE binary outputs	<input checked="" type="radio"/>	Never	<input type="radio"/>	Always	<input type="radio"/>	Sometimes	<input type="radio"/>	Configurable
SELECT/OPERATE	<input type="radio"/>	Never	<input type="radio"/>	Always	<input type="radio"/>	Sometimes	<input checked="" type="radio"/>	Configurable
DIRECT OPERATE	<input type="radio"/>	Never	<input type="radio"/>	Always	<input type="radio"/>	Sometimes	<input checked="" type="radio"/>	Configurable
DIRECT OPERATE - NO ACK	<input type="radio"/>	Never	<input type="radio"/>	Always	<input type="radio"/>	Sometimes	<input checked="" type="radio"/>	Configurable
Count > 1 (Count > 1 is accepted but ignored)	<input checked="" type="radio"/>	Never	<input type="radio"/>	Always	<input type="radio"/>	Sometimes	<input type="radio"/>	Configurable
Pulse on	<input checked="" type="radio"/>	Never	<input type="radio"/>	Always	<input type="radio"/>	Sometimes	<input type="radio"/>	Configurable
Pulse off	<input checked="" type="radio"/>	Never	<input type="radio"/>	Always	<input type="radio"/>	Sometimes	<input type="radio"/>	Configurable
Latch on	<input type="radio"/>	Never	<input checked="" type="radio"/>	Always	<input type="radio"/>	Sometimes	<input type="radio"/>	Configurable
Latch off	<input type="radio"/>	Never	<input checked="" type="radio"/>	Always	<input type="radio"/>	Sometimes	<input type="radio"/>	Configurable
Queue	<input checked="" type="radio"/>	Never	<input type="radio"/>	Always	<input type="radio"/>	Sometimes	<input type="radio"/>	Configurable
Clear queue	<input checked="" type="radio"/>	Never	<input type="radio"/>	Always	<input type="radio"/>	Sometimes	<input type="radio"/>	Configurable
The circuit breaker control model is configurable for either direct or SBO mode in the circuit breaker settings. If the operation mode does not match the CROB, the returned CROB status is hardware error (4). All other control points may be controlled by either direct or SBO controls.								
Reports binary input change events when no specific variation requested:				Reports time-tagged binary input change events when no specific variation requested:				
<input type="radio"/> Never				<input type="radio"/> Never				
<input type="radio"/> Only when time-tagged				<input type="radio"/> Binary input change with time				
<input type="radio"/> Only non-time-tagged				<input type="radio"/> Binary input change with relative time				
<input checked="" type="radio"/> Configurable to send one or the other				<input checked="" type="radio"/> Configurable				
Sends unsolicited responses:				Sends static data in unsolicited responses:				
<input type="radio"/> Never				<input checked="" type="radio"/> Never				
<input checked="" type="radio"/> Configurable				<input type="radio"/> When device restarts				
<input type="radio"/> Only certain objects				<input type="radio"/> When status flags change				
<input type="radio"/> Sometimes (attach explanation)				No other options are permitted.				
<input checked="" type="radio"/> ENABLE/DISABLE UNSOLICITED function codes supported								
Default counter object/variation:				Counters roll over at:				
<input checked="" type="radio"/> No counters reported				<input checked="" type="radio"/> No counters reported				
<input type="radio"/> Configurable				<input type="radio"/> Configurable (attach explanation)				
<input type="radio"/> Default object				<input type="radio"/> 16 bits				
Default variation:				<input type="radio"/> 32 bits				
<input type="radio"/> Point-by-point list attached				<input type="radio"/> Other value: _____				
<input type="radio"/> Point-by-point list attached				<input type="radio"/> Point-by-point list attached				
Sends multi-fragment responses:								
<input checked="" type="radio"/> Yes								
<input type="radio"/> No								

DNP3 device profile document			
○ Configurable			
Sequential file transfer support:			
Append file mode	○ Yes	● No	
Custom status code strings	○ Yes	● No	
Permissions field	○ Yes	● No	
File events assigned to class	○ Yes	● No	
File events send immediately	○ Yes	● No	
Multiple blocks in a fragment	○ Yes	● No	
Max number of files open	0		
● = Selected, ○ = Not selected			

3.2 DNP3 implementation table

The following table identifies which object variations, function codes, and qualifiers the IED supports in both request messages and response messages. For static (non-change-event) objects, requests sent with qualifiers 00, 01, 06, 07, or 08, will be responded with qualifiers 00 or 01. Requests sent with qualifiers 17 or 28 will be responded with qualifiers 17 or 28. For change-event objects, qualifiers 17 or 28 are always responded.

Table 189: Implementation table

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
Object number	Variation number	Description	Function codes (dec)	Qualifier codes (hex)	Function codes (dec)	Qualifier codes (hex)
1	0	Binary input – any variation	1 (read) 22 (assign class)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 28 (index)		
1	1 (default) ¹	Binary input	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index) ²
1	2	Binary input with status	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)
2	0	Binary input change – any variation	1 (read)	06 (no range, or all) 07, 08 (limited qty)		
2	1	Binary input change without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
2	2	Binary input change with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
2	3	Binary input change with relative time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
10	0	Binary output status – any variation	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 28 (index)		
10	1	Binary output	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)
12	1	Control relay output block	3 (select) 4 (operate) 5 (direct op) 6 (dir. op, noack)	17, 28 (index)	129 (response)	echo of request
30	0	Analog input - any variation	1 (read) 22 (assign class)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 28 (index)		
30	1	32-bit analog input	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)
30	2 (default)	16-bit analog input	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)
30	3	32-bit analog input without flag	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)
30	4	16-bit analog input without flag	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07, 08 (limited qty) 17, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)
32	0	Analog change event – any variation	1 (read)	06 (no range, or all) 07, 08 (limited qty)		
32	1	32-bit analog change event without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
32	2	16-bit analog change event without time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
32	3	32-bit analog change event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)

Section 3

DNP3 protocol implementation

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
32	4 (default)	16-bit analog change event with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
50	0	Time and date				
50	1 (default)	Time and date	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07 (limited qty = 1) 08 (limited qty)	129 (response)	00, 01 (start-stop) 17, 28 (index)
			2 (write)	07 (limited qty = 1)		
50	3	Time and date last recorded time	2 (write)	07 (limited qty)		
51	1	Time and date CTO			129 (response) 130 (unsol. resp)	07 (limited qty) (qty = 1)
51	2	Unsynchro nized time and date CTO			129 (response) 130 (unsol. resp)	07 (limited qty) (qty = 1)
52	2	Time delay fine			129 (response)	07 (limited qty) (qty = 1)
60	0	Not defined				
60	1	Class 0 data	1 (read)	06 (no range, or all)		
60	2	Class 1 data	1 (read)	06 (no range, or all)		
			20 (enbl. unsol.) 21 (dab. unsol.) 22 (assign class)	07, 08 (limited qty) 06 (no range, or all)		
60	3	Class 2 data	1 (read)	06 (no range, or all) 07, 08 (limited qty)		
			20 (enbl. unsol.) 21 (dab. unsol.) 22 (assign class)	06 (no range, or all)		
60	4	Class 3 data	1 (read)	06 (no range, or all) 07, 08 (limited qty)		
			20 (enbl. unsol.) 21 (dab. unsol.) 22 (assign class)	06 (no range, or all)		
80	1	Internal indications	1 (read)	00, 01 (start-stop)		
			2 (write) ³	00 (start-stop) index=7		
No object (function code only)			13 (cold restart)		4	
No object (function code only)			14 (warm restart)			
No object (function code only)			23 (delay meas.)			
No object (function code only)			24 (record current time)			

1. A default variation refers to the variation responded when variation 0 is requested and/or in class 0, 1, 2, or 3 scans. Default variations are configurable; however, default settings for the configuration parameters are indicated in the table above.

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2. For static (non-change-event) objects, qualifiers 17 or 28 are only responded when a request is sent with qualifiers 17 or 28, respectively. Otherwise, static object requests sent with qualifiers 00, 01, 06, 07, or 08, will be responded with qualifiers 00 or 01. (For change-event objects, qualifiers 17 or 28 are always responded.)
 3. Writes of internal indications are only supported for index 7 (Restart IIN1-7)
 4. Cold and warm restarts return an application layer acknowledge, but no restart action is taken.

Section 4 Glossary

AIM	Analog input module
ANSI	American National Standards Institute
AR	Autoreclosing
BIO	Binary input and output
CB	Circuit breaker
CBB	Cycle building block
CBFP	Circuit-breaker failure protection
CROB	Control relay output block
CTO	Common time of occurrence. The time and date CTO object is an information object that represents the absolute time of day.
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
IEC 61850	International standard for substation communication and modelling
IED	Intelligent electronic device
LD0	Logical device zero (0)
LED	Light-emitting diode
LHMI	Local human-machine interface
LLN0	Logical node zero (0)
PCM600	Protection and Control IED Manager
PhsA	Phase A
PhsB	Phase B
PhsC	Phase C

PSM	Power supply module
SBO	Select-before-operate
stVal	Status value
Val	Value

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