Relion® 620 series

Advanced Recloser Protection and Control RER620

DNP3 Point List Manual

Power and productivity
for a better world™

Document ID: 1MAC307258-MB
Issued: 07/20/2017
Revision: E
Product version: 1.3

Copyright

Trademarks

Warranty

Please inquire about the terms of warranty from your nearest ABB representative.

ABB Inc.
Distribution Automation
4300 Coral Ridge Drive
Coral Springs, FL 33065, USA
Toll-free: 1 (800) 523-2620
Phone: +1 954-752-6700
Fax: +1 954 345-5329
http://www.abb.com/substationautomation

Disclaimer

The data, examples and diagrams in this manual are included solely for the concept or product description and are not to be deemed as a statement of guaranteed properties. All persons responsible for applying the equipment addressed in this manual must satisfy themselves that each intended application is suitable and acceptable, including that any applicable safety or other operational requirements are complied with. In particular, any risks in applications where a system failure and/or product failure would create a risk for harm to property or persons (including but not limited to personal injuries or death) shall be the sole responsibility of the person or entity applying the equipment, and those so responsible are hereby requested to ensure that all measures are taken to exclude or mitigate such risks.

This document has been carefully checked by ABB but deviations cannot be completely ruled out. In case any errors are detected, the reader is kindly requested to notify the manufacturer. Other than under explicit contractual commitments, in no event shall ABB be responsible or liable for any loss or damage resulting from the use of this manual or the application of the equipment.

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 relay is designed in accordance with the international standards of the IEC 60255 series and ANSI C37.90. The DNP protocol implementation in the relay conforms to “DNP3 Relay Certification Procedure Subset Level 2", available at www.dnp.org .

Section 1 Introduction

1.1 This manual

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

1.2 Intended audience

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

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

1.3 Product documentation

1.3.1 Product documentation set

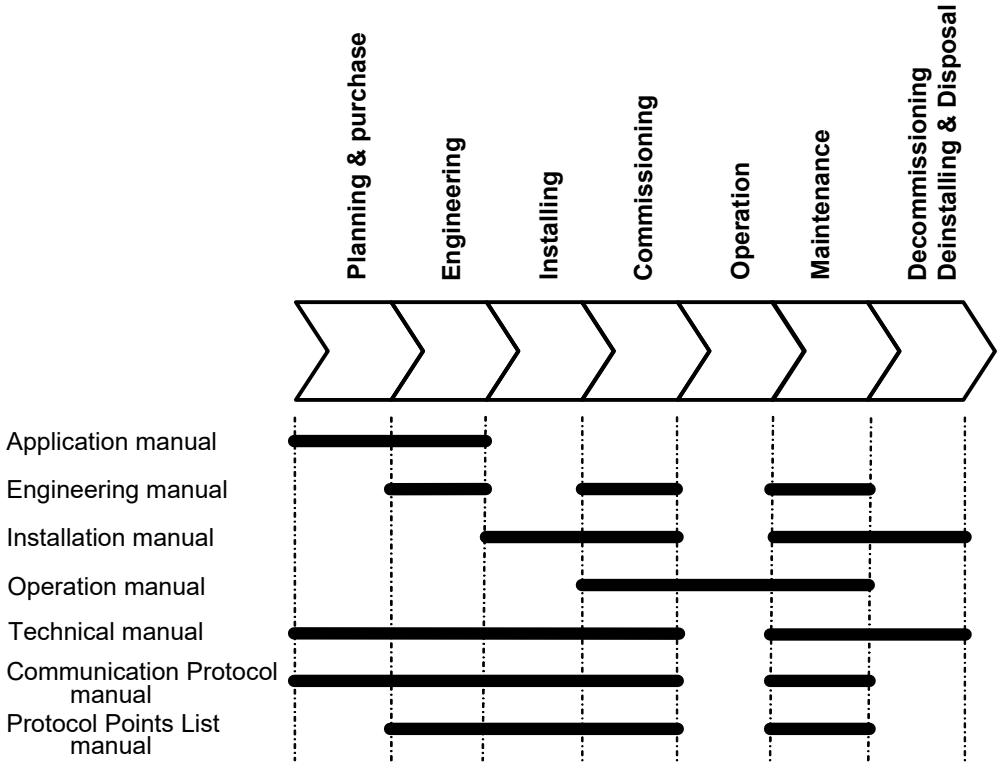

Figure 1: The intended use of manuals in different lifecycles

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

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

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

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

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

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

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

1.3.2 Document revision history

Document revision/date	Product version	History
A/11/23/2010	1.0	First release
B/10/31/2011	1.1	Content updated to correspond to the product series version
C/8/12/2014	1.2	Content updated to correspond to the product series version
D/9/30/2015	1.2	Content updated
E/7/20/2017	1.3	Content updated

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

1.3.3 Related documentation

Name of the document	Document ID
DNP3 Communication Protocol Manual	1MAC052460-MB

1.4 Symbols and conventions

1.4.1 Safety indication symbols

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

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

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

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

1.4.2 Manual conventions

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

- Abbreviations and acronyms in this manual are spelled out in the glossary. The glossary also contains definitions of important terms.
- Push button navigation in the LHMI menu structure is presented by using the push button icons, for example:

  To navigate between the options, use  and  .
- HMI menu paths are presented in bold, for example:

  Select **Main menu > Settings**.
- LHMI messages are shown in Courier font, for example:

  To save the changes in non-volatile memory, select `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".
- Relay input/output messages and monitored data names are shown in Courier font, for example:

  When the function picks up, the `PICKUP` output is set to TRUE.
- Dimensions are provided both in inches and mm. If it is not specifically mentioned then the dimension is in mm.

1.4.3 Functions, codes and symbols

Table 1: RER620 functions, codes and symbols

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

Function	IEC61850	IEC60617	ANSI/C37.2
Zero sequence overvoltage protection, source 2	ROVPTOV2	Uo>(2)	59N-2
Frequency Protection			
Underfrequency, Overfrequency, Frequency rate of change, Source 1, Stage 1	FRPFRQ1	f</f>,df/dt(1)	81-1
Underfrequency, Overfrequency, Frequency rate of change, Source 1, Stage 2	FRPFRQ2	f</f>,df/dt(2)	81-2
Load Shed & Restoration, Source 1, Stage 1	LSHDPFRQ1	UFLS/R(1)	81S-1
Load Shed & Restoration, Source 1, Stage 2	LSHDPFRQ2	UFLS/R(2)	81S-2
Other Protection			
High Impedance Fault Detector	PHIZ1	PHIZ1	HIZ
Circuit breaker failure protection	SCCBRBRF1	3I>/Io>BF	50BFT
Circuit breaker close failure protection	SCCBRBCF1	SCCBRBCF1	50BFC
Directional positive sequence power protection	DPSRDIR1	P>->	32P
Directional negative/zero sequence power protection	DNZSRDIR1	Q>->	32N
Control			
Autoreclosing, 1ph and/or 3ph	SDARREC1	O -> I	79
Synch-check/voltage check (Source 1 is defined as bus, Source 2 as line)	SECRSYN1	SYNC	25
Circuit Breaker 1 (3 state inputs / 3 control outputs)	SCBXCBR1	I<->O CB	52
Loop control	DLCM	LCM	LCM
Supervision and Monitoring			
CB condition monitoring	SPSCBR1	CBCM	52CM
Fuse failure supervision, Source 1	SEQRFUF1	FUSEF	60
Measurement			
Three-phase current	CMMXU1	3I	IA,IB,IC
Demand metering, Max/Min metering	CSMTA1		
Sequence current	CSMSQI1	I1,I2,I0	I1, I2, I0
Ground current	RESCMMXU1	Io	IG
Three-phase voltage, Source 1	VMMXU1	3U	VA,VB,VC
Three-phase voltage, Source 2	VMMXU2	3U(B)	VA,VB,VC(2)
Sequence voltages, Source 1	VSMSQI1	U1,U2,U0	V1,V2,V0
Sequence voltages, Source 2	VSMSQI2	U1,U2,U0(B)	V1,V2,V0(2)
Single and Three-phase power, Power factor and three phase energy, Source 1	APEMMXU1	P,SP,E	P,SP,E
Frequency, Source 1	FMMXU1	f	f
Recorders			
Digital fault recorder (DFR)	RDRE1	DR	DFR
Sequence of Events (SER)	SER	SER	SER
Fault Recorder	FLTMSTA	FLTMSTA	FLTMSTA
Fault Locator (FLOC)	DRFLO1	FLO	FLO
Other Functions			
Battery voltage, current. Test the battery	ZBAT1	UPS	UPS
Universal Power Drive	XGGIO115	X115(UPD)	X115(UPD)
Programmable buttons (16 buttons)	FKEYGGIO1	FKEYGGIO1	FKEYGGIO1
Move function block (8 outputs)	MVGAPC1	MVGAPC1	MVGAPC1

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

Section 2 DNP3 data mappings

2.1 Overview

This document describes the DNP3 data points and structures available in RER620 Ver. 1.3.

The point tables show all the available DNP3 data points in this relay. 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 added, removed, reorganized and reconfigured using the Communication Management Tool (CMT) available in PCM600.

This list represents the superset of DNP3 points. The actual set of available points is determined by the relay's ordercode. A class 0 indication to a point indicates it does not generate event. A “No” in “Enabled” column indicates that the point is not active. Inactive points can be made active through PCM600.

2.2 Point list for RER620 Ver. 1.3

2.2.1 DNP Binary and Analog Inputs

Table 2: General Device Information (LLN0)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	0	Class 1 and 0	Yes	Protection LLN0 Settings Reservation			LD0.LLN0.SetSeld.stVal
BI	1	Class 1 and 0	Yes	Protection LLN0 Settings Change			LD0.LLN0.SetChg.stVal
BI	515	Class 1 and 0	Yes	Local / Remote (1- Local; 0-Remote)			CTRL.LLN0.Loc.stVal
AI	207	Class 2 and 0	Yes	Local / Remote state	0	None	CTRL.LLN0.LocRem.stVal

Table 3: Device Physical Information (LPHD1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	2	Class 0	Yes	Physical Device Reset Device			LD0.LPHD1.RsDev.stVal
AI	0	Class 2 and 0	Yes	General Device State	0	None	LD0.LPHD1.PhyHealth.stVal
AI	1	Class 2 and 0	Yes	Physical Sevice Warning	0	None	LD0.LPHD1.PhyHealth1.stVal
AI	2	Class 0	Yes	Number Of Power Ups	0	None	LD0.LPHD1.NumPwrUp.stVal
AI	3	Class 0	Yes	Number Of Warm Starts	0	None	LD0.LPHD1.WrmStr.stVal
AI	4	Class 0	Yes	Number Of Watchdog Device Resets	0	None	LD0.LPHD1.WacTrg.stVal
AI	184	Class 2 and 0	Yes	Internal Fault	1	Multi plier	LD0.LPHD1.PhyHealth2.stVal

Table 4: LED Condition monitoring (LEDPTRC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	642	Class 1 and 0	Yes	Global Conditioning Start			LD0.LEDPTRC1.Str.general

Table 5: LED Status (LEDGGIO1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	96	Class 1 and 0	Yes	Led 1 On			LD0.LEDGGIO1.SPCSO1.stVal
BI	97	Class 1 and 0	Yes	Led 2 On			LD0.LEDGGIO1.SPCSO2.stVal
BI	98	Class 1 and 0	Yes	Led 3 On			LD0.LEDGGIO1.SPCSO3.stVal
BI	99	Class 1 and 0	Yes	Led 4 On			LD0.LEDGGIO1.SPCSO4.stVal
BI	100	Class 1 and 0	Yes	Led 5 On			LD0.LEDGGIO1.SPCSO5.stVal
BI	101	Class 1 and 0	Yes	Led 6 On			LD0.LEDGGIO1.SPCSO6.stVal
BI	102	Class 1 and 0	Yes	Led 7 On			LD0.LEDGGIO1.SPCSO7.stVal
BI	103	Class 1 and 0	Yes	Led 8 On			LD0.LEDGGIO1.SPCSO8.stVal
BI	104	Class 1 and 0	Yes	Led 9 On			LD0.LEDGGIO1.SPCSO9.stVal
BI	105	Class 1 and 0	Yes	Led 10 On			LD0.LEDGGIO1.SPCSO10.stVal
BI	106	Class 1 and 0	Yes	Led 11 On			LD0.LEDGGIO1.SPCSO11.stVal

Table 6: X100-Binary Inputs/Outputs (XGGIO100)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	90	Class 1 and 0	Yes	X100-Output 1 PSM			LD0.XGGIO100.SPCSO1.stVal
BI	91	Class 1 and 0	Yes	X100-Output 2 PSM			LD0.XGGIO100.SPCSO2.stVal
BI	92	Class 1 and 0	Yes	X100-Output 3 PSM			LD0.XGGIO100.SPCSO3.stVal
BI	93	Class 1 and 0	Yes	X100-Output 4 PSM			LD0.XGGIO100.SPCSO4.stVal
BI	94	Class 1 and 0	Yes	X100-Output 5 PSM			LD0.XGGIO100.SPCSO5.stVal
BI	95	Class 1 and 0	Yes	X100-Output 6 PSM			LD0.XGGIO100.SPCSO6.stVal

Table 7: X110-Binary Inputs/Outputs (XGGIO110)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	78	Class 1 and 0	Yes	X110-Input 1 BIO			LD0.XGGIO110.Ind1.stVal
BI	79	Class 1 and 0	Yes	X110-Input 2 BIO			LD0.XGGIO110.Ind2.stVal
BI	80	Class 1 and 0	Yes	X110-Input 3 BIO			LD0.XGGIO110.Ind3.stVal
BI	81	Class 1 and 0	Yes	X110-Input 4 BIO			LD0.XGGIO110.Ind4.stVal
BI	82	Class 1 and 0	Yes	X110-Input 5 BIO			LD0.XGGIO110.Ind5.stVal
BI	83	Class 1 and 0	Yes	X110-Input 6 BIO			LD0.XGGIO110.Ind6.stVal
BI	84	Class 1 and 0	Yes	X110-Input 7 BIO			LD0.XGGIO110.Ind7.stVal
BI	85	Class 1 and 0	Yes	X110-Input 8 BIO			LD0.XGGIO110.Ind8.stVal
BI	86	Class 1 and 0	Yes	X110-Output 1 BIO			LD0.XGGIO110.SPCSO1.stVal
BI	87	Class 1 and 0	Yes	X110-Output 2 BIO			LD0.XGGIO110.SPCSO2.stVal
BI	88	Class 1 and 0	Yes	X110-Output 3 BIO			LD0.XGGIO110.SPCSO3.stVal
BI	89	Class 1 and 0	Yes	X110-Output 4 BIO			LD0.XGGIO110.SPCSO4.stVal

Table 8: X105-Binary Inputs/Outputs (XGGIO105)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	429	Class 1 and 0	Yes	X105-Input 1 BIO			LD0.XGGIO105.Ind1.stVal
BI	430	Class 1 and 0	Yes	X105-Input 2 BIO			LD0.XGGIO105.Ind2.stVal
BI	431	Class 1 and 0	Yes	X105-Input 3 BIO			LD0.XGGIO105.Ind3.stVal
BI	432	Class 1 and 0	Yes	X105-Input 4 BIO			LD0.XGGIO105.Ind4.stVal
BI	433	Class 1 and 0	Yes	X105-Input 5 BIO			LD0.XGGIO105.Ind5.stVal
BI	434	Class 1 and 0	Yes	X105-Input 6 BIO			LD0.XGGIO105.Ind6.stVal
BI	435	Class 1 and 0	Yes	X105-Input 7 BIO			LD0.XGGIO105.Ind7.stVal
BI	436	Class 1 and 0	Yes	X105-Input 8 BIO			LD0.XGGIO105.Ind8.stVal
BI	437	Class 1 and 0	Yes	X105-Output 1 BIO			LD0.XGGIO105.SPCSO1.stVal
BI	438	Class 1 and 0	Yes	X105-Output 2 BIO			LD0.XGGIO105.SPCSO2.stVal
BI	439	Class 1 and 0	Yes	X105-Output 3 BIO			LD0.XGGIO105.SPCSO3.stVal
BI	440	Class 1 and 0	Yes	X105-Output 4 BIO			LD0.XGGIO105.SPCSO4.stVal

Table 9: X120-Binary Inputs/Outputs (XGGIO120)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	74	Class 1 and 0	Yes	X120-Input 1 AIM			LD0.XGGIO120.Ind1.stVal
BI	75	Class 1 and 0	Yes	X120-Input 2 AIM			LD0.XGGIO120.Ind2.stVal
BI	76	Class 1 and 0	Yes	X120-Input 3 AIM			LD0.XGGIO120.Ind3.stVal
BI	77	Class 1 and 0	Yes	X120-Input 4 AIM			LD0.XGGIO120.Ind4.stVal

Table 10: 51P-Three-phase non-directional time overcurrent protection with 1-ph trip option, low stage (SPHLPTOC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	384	Class 1 and 0	Yes	51P-1 Trip (Operate)			LD0.SPHLPTOC1.Op.general
BI	385	Class 1 and 0	Yes	51P-1 Phase A Trip (Operate)			LD0.SPHLPTOC1.Op.phsA
BI	386	Class 1 and 0	Yes	51P-1 Phase B Trip (Operate)			LD0.SPHLPTOC1.Op.phsB
BI	387	Class 1 and 0	Yes	51P-1 Phase C Trip (Operate)			LD0.SPHLPTOC1.Op.phsC

Table 11: 50P-1:Three-phase non-directional time overcurrent protection with 1-ph trip option, high stage 1 (SPHLPTOC2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	392	Class 1 and 0	Yes	50P-1 Trip (Operate)			LD0.SPHLPTOC2.Op.general
BI	393	Class 1 and 0	Yes	50P-1 Phase A Trip (Operate)			LD0.SPHLPTOC2.Op.phsA
BI	394	Class 1 and 0	Yes	50P-1 Phase B Trip (Operate)			LD0.SPHLPTOC2.Op.phsB
BI	395	Class 1 and 0	Yes	50P-1 Phase C Trip (Operate)			LD0.SPHLPTOC2.Op.phsC

Table 12: 50P-2: Three-phase non-directional overcurrent protection with 1-ph trip option, high stage 2 (SPHHPTOC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	400	Class 1 and 0	Yes	50P-2 Trip (Operate)			LD0.SPHHPTOC1.Op.general
BI	401	Class 1 and 0	Yes	50P-2 Phase A Trip (Operate)			LD0.SPHHPTOC1.Op.phsA
BI	402	Class 1 and 0	Yes	50P-2 Phase B Trip (Operate)			LD0.SPHHPTOC1.Op.phsB
BI	403	Class 1 and 0	Yes	50P-2 Phase C Trip (Operate)			LD0.SPHHPTOC1.Op.phsC

Table 13: 50P-3: Three-phase non-directional instantaneous overcurrent protection with 1-ph trip option (SPHIPTOC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	408	Class 1 and 0	Yes	50P-3 Trip (Operate)			LD0.SPHIPTOC1.Op.general
BI	409	Class 1 and 0	Yes	50P-3 Phase A Trip (Operate)			LD0.SPHIPTOC1.Op.phsA
BI	410	Class 1 and 0	Yes	50P-3 Phase B Trip (Operate)			LD0.SPHIPTOC1.Op.phsB
BI	411	Class 1 and 0	Yes	50P-3 Phase C Trip (Operate)			LD0.SPHIPTOC1.Op.phsC

Table 14: 51N-Non-directional time overcurrent ground-fault protection, low stage (XEFLPTOC2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	442	Class 1 and 0	Yes	51N-1 Trip (Operate)			LD0.XEFLPTOC2.Op.general

Table 15: 50N-1:Non-directional time overcurrent ground-fault protection, high stage 1(XEFLPTOC3)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	444	Class 1 and 0	Yes	50N-1 Trip (Operate)			LD0.XEFLPTOC3.Op.general

Table 16: 50N-2: Non-directional time overcurrent ground-fault protection, high stage 2(XEFHPTOC3)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	446	Class 1 and 0	Yes	50N-2 Trip (Operate)			LD0.XEFHPTOC3.Op.general

Table 17: 50N--3: Non-directional instantaneous ground-fault protection (XEFIPTOC2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	448	Class 1 and 0	Yes	50G-3 Trip (Operate)			LD0.XEFIPTOC2.Op.general

Table 18: 50SEF:Non-directional sensitive earth-fault (EFLPTOC3)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	551	Class 1 and 0	Yes	50SEF Trip (Operate)			LD0.EFLPTOC3.Op.general

Table 19: 46-1:Negative-sequence non-directional time overcurrent protection 1 (XNSPTOC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	470	Class 1 and 0	Yes	46-1 Trip (Operate)			LD0.XNSPTOC1.Op.general

Table 20: 46-2:Negative-sequence non-directional time overcurrent protection 2 (XNSPTOC2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	472	Class 1 and 0	Yes	46-2 Trip (Operate)			LD0.XNSPTOC2.Op.general

Table 21: 46PD:Phase discontinuity protection (PDNSPTOC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	173	Class 1 and 0	Yes	46PD-1 Trip (Operate)			LD0.PDNSPTOC1.Op.general

Table 22: 67/51P-1:Three-phase directional overcurrent protection-low stage 1 (SDPHLPTOC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	453	Class 1 and 0	Yes	67/51P-1 Trip (Operate)			LD0.SDPHLPTOC1.Op.general
BI	454	Class 1 and 0	Yes	67/51P-1 Phase A Trip (Operate)			LD0.SDPHLPTOC1.Op.phsA
BI	455	Class 1 and 0	Yes	67/51P-1 Phase B Trip (Operate)			LD0.SDPHLPTOC1.Op.phsB
BI	456	Class 1 and 0	Yes	67/51P-1 Phase C Trip (Operate)			LD0.SDPHLPTOC1.Op.phsC

Table 23: 67/51P-2:Three-phase directional overcurrent protection, low stage 2(SDPHLPTOC2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	461	Class 1 and 0	Yes	67/51P-2 Trip (Operate)			LD0.SDPHLPTOC2.Op.general
BI	462	Class 1 and 0	Yes	67/51P-2 Phase A Trip (Operate)			LD0.SDPHLPTOC2.Op.phsA
BI	463	Class 1 and 0	Yes	67/51P-2 Phase B Trip (Operate)			LD0.SDPHLPTOC2.Op.phsB
BI	464	Class 1 and 0	Yes	67/51P-2 Phase C Trip (Operate)			LD0.SDPHLPTOC2.Op.phsC

Table 24: 67/51N-1: Directional ground-fault protection, low stage 1 (XDEFLPTOC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	466	Class 1 and 0	Yes	67/51N-1 Trip (Operate)			LD0.XDEFLPTOC1.Op.general

Table 25: 67/51N-2: Directional ground-fault protection, low stage 2 (XDEFLPTOC2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	468	Class 1 and 0	Yes	67/51N-2 Trip (Operate)			LD0.XDEFLPTOC2.Op.general

Table 26: 62CLD-1: Cold load timer 1 phase A (in seconds) (TPSGAPC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	176	Class 0	Yes	Cold Load Seconds Timer Phase A Operation			LD0.TPSGAPC1.Op.general

Table 27: 62CLD-2:: Cold load timer 2 phase A (in minutes) (TPMGAPC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	177	Class 0	Yes	Cold Load Minutes Timer Phase A Operation			LD0.TPMGAPC1.Op.general

Table 28: 62CLD-3 : Cold load timer 1 phase B (in seconds) (TPSGAPC2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	178	Class 0	Yes	Cold Load Seconds Timer Phase B Operation			LD0.TPSGAPC2.Op.general

Table 29: 62CLD-4 : Cold load timer 2 phase B(in minutes) (TPMGAPC2

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	179	Class 0	Yes	Cold Load Minutes Timer Phase B Operation			LD0.TPMGAPC2.Op.general

Table 30: 62CLD-5:Cold load timer 1 phase C (in seconds) (TPSGAPC3)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	180	Class 0	Yes	Cold Load Seconds Timer Phase C Operation			LD0.TPSGAPC3.Op.general

Table 31: 62CLD-6: Cold load timer 2 phase C (in minutes) (TPMGAPC3)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	181	Class 0	Yes	Cold Load Minutes Timer Phase C Operation			LD0.TPMGAPC3.Op.general

Table 32: 59-1:Three-phase overvoltage 1 source 1, low stage (SPHPTOV1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	336	Class 1 and 0	Yes	59-1 Trip (Operate)			LD0.SPHPTOV1.Op.general
BI	337	Class 1 and 0	Yes	59-1 Phase A Trip (Operate)			LD0.SPHPTOV1.Op.phsA
BI	338	Class 1 and 0	Yes	59-1 Phase B Trip (Operate)			LD0.SPHPTOV1.Op.phsB
BI	339	Class 1 and 0	Yes	59-1 Phase C Trip (Operate)			LD0.SPHPTOV1.Op.phsC

Table 33: 59-2:Three-phase overvoltage 2 source 1, high stage (SPHPTOV2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	344	Class 1 and 0	Yes	59-2 Trip (Operate)			LD0.SPHPTOV2.Op.general
BI	345	Class 1 and 0	Yes	59-2 Phase A Trip (Operate)			LD0.SPHPTOV2.Op.phsA
BI	346	Class 1 and 0	Yes	59-2 Phase B Trip (Operate)			LD0.SPHPTOV2.Op.phsB
BI	347	Class 1 and 0	Yes	59-2 Phase C Trip (Operate)			LD0.SPHPTOV2.Op.phsC

Table 34: 59-3:Three-phase overvoltage 3 source 2 low stage (SPHPTOV3)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	352	Class 1 and 0	Yes	59-3 Trip (Operate)			LD0.SPHPTOV3.Op.general
BI	353	Class 1 and 0	Yes	59-3 Phase A Trip (Operate)			LD0.SPHPTOV3.Op.phsA
BI	354	Class 1 and 0	Yes	59-3 Phase B Trip (Operate)			LD0.SPHPTOV3.Op.phsB
BI	355	Class 1 and 0	Yes	59-3 Phase C Trip (Operate)			LD0.SPHPTOV3.Op.phsC

Table 35: 27-1:Three-phase undervoltage 1 source 1, low stage (SPHPTUV1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	360	Class 1 and 0	Yes	27-1 Trip (Operate)			LD0.SPHPTUV1.Op.general
BI	361	Class 1 and 0	Yes	27-1 Phase A Trip (Operate)			LD0.SPHPTUV1.Op.phsA
BI	362	Class 1 and 0	Yes	27-1 Phase B Trip (Operate)			LD0.SPHPTUV1.Op.phsB
BI	363	Class 1 and 0	Yes	27-1 Phase C Trip (Operate)			LD0.SPHPTUV1.Op.phsC

Table 36: 27-2:Three-phase undervoltage 2 source 1, high stage (SPHPTUV2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	368	Class 1 and 0	Yes	27-2 Trip (Operate)			LD0.SPHPTUV2.Op.general
BI	369	Class 1 and 0	Yes	27-2 Phase A Trip (Operate)			LD0.SPHPTUV2.Op.phsA
BI	370	Class 1 and 0	Yes	27-2 Phase B Trip (Operate)			LD0.SPHPTUV2.Op.phsB
BI	371	Class 1 and 0	Yes	27-2 Phase C Trip (Operate)			LD0.SPHPTUV2.Op.phsC

Table 37: 27-3: Three-phase undervoltage 3 source 2, low stage (SPHPTUV3)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	376	Class 1 and 0	Yes	27-3 Trip (Operate)			LD0.SPHPTUV3.Op.general
BI	377	Class 1 and 0	Yes	27-3 Phase A Trip (Operate)			LD0.SPHPTUV3.Op.phsA
BI	378	Class 1 and 0	Yes	27-3 Phase B Trip (Operate)			LD0.SPHPTUV3.Op.phsB
BI	379	Class 1 and 0	Yes	27-3 Phase C Trip (Operate)			LD0.SPHPTUV3.Op.phsC

Table 38: 59PS-1:Positive-sequence overvoltage protection, source1 (PSPTOV1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	165	Class 1 and 0	Yes	59PS-1 Trip (Operate)			LD0.PSPTOV1.Op.general

Table 39: 59PS-2: Positive-sequence overvoltage protection, source 2 (PSPTOV2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	167	Class 1 and 0	Yes	59PS-2 Trip (Operate)			LD0.PSPTOV2.Op.general

Table 40: 47-1:Negative-sequence overvoltage protection, source1 (NSPTOV1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	169	Class 1 and 0	Yes	47-1 Trip (Operate)			LD0.NSPTOV1.Op.general

Table 41: 47-2:Negative-sequence overvoltage protection, source 2 (NSPTOV2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	171	Class 1 and 0	Yes	47-2 Trip (Operate)			LD0.NSPTOV2.Op.general

Table 42: 59N-1:Residual overvoltage protection, source 1(ROVPTOV1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	161	Class 1 and 0	Yes	59N-1 Trip (Operate)			LD0.ROVPTOV1.Op.general

Table 43: 59N-2:Residual overvoltage protection source 2 (ROVPTOV2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	163	Class 1 and 0	Yes	59N-2 Trip (Operate)			LD0.ROVPTOV2.Op.general

Table 44: 81-1:Underfrequency, Overfrequency, Frequency rate of change, source 1(FRPTOF1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	185	Class 1 and 0	Yes	81-1 O Over-Frequency Trip (Operate)			LD0.FRPTOF1.Op.general

Table 45: 81-1:Underfrequency, Overfrequency, Frequency rate of change, source 1 (FRPTUF1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	187	Class 1 and 0	Yes	81-1 U Under-Frequency Trip (Operate)			LD0.FRPTUF1.Op.general

Table 46: 81-1:Underfrequency, Overfrequency, Frequency rate of change, source 1(FRPFRC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	189	Class 1 and 0	Yes	81-1 Frequency Gradient Trip (Operate)			LD0.FRPFRC1.Op.general

Table 47: 81-2:Underfrequency, Overfrequency, Frequency rate of change, source 2 (FRPTOF2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	193	Class 1 and 0	Yes	81-2 O Over-Frequency Trip (Operate)			LD0.FRPTOF2.Op.general

Table 48: 81-2:Underfrequency, Overfrequency, Frequency rate of change, source 2 (FRPTUF2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	195	Class 1 and 0	Yes	81-2 U Under-Frequency Trip (Operate)			LD0.FRPTUF2.Op.general

Table 49: 81-2:Underfrequency, Overfrequency, Frequency rate of change, source 2 (FRPFRC2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	197	Class 1 and 0	Yes	81-2 U Frequency Gradient Trip (Operate)			LD0.FRPFRC2.Op.general

Table 50: 81S-1: Load Shed & Restoration Source 1 (LSHDPTRC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	553	Class 1 and 0	Yes	Load shedding Trip -1			LD0.LSHDPTRC1.Op.general
BI	554	Class 1 and 0	Yes	Restore Signal for Load Restoring Purposes -1			LD0.LSHDPTRC1.RestLodOp.general

Table 51: 81S-2: Load Shed & Restoration Source 2 (LSHDPTRC2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	556	Class 1 and 0	Yes	Load shedding Trip -2			LD0.LSHDPTRC2.Op.general
BI	557	Class 1 and 0	Yes	Restore Signal for Load Restoring Purposes -2			LD0.LSHDPTRC2.RestLodOp.general

Table 52: HIZ: High Impedance Fault detector (PHIZ1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	549	Class 1 and 0	Yes	Downed Conductor Operate			LD0.PHIZ1.Op.general

Table 53: 50BFT:Circuit breaker failure protection-(SCCBRBRF1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	475	Class 1 and 0	Yes	50BFT Delayed recloser Failure Alarm			LD0.SCCBRBRF1.Str.general
BI	476	Class 1 and 0	Yes	50BFT Recloser External Operation Failure			LD0.SCCBRBRF1.OpEx.general
BI	477	Class 1 and 0	Yes	Phase A 50BFT Recloser External Operation Failure			LD0.SCCBRBRF1.OpEx.phsA
BI	478	Class 1 and 0	Yes	Phase B 50BFT Recloser External Operation Failure			LD0.SCCBRBRF1.OpEx.phsB
BI	479	Class 1 and 0	Yes	Phase C 50BFT Recloser External Operation Failure			LD0.SCCBRBRF1.OpEx.phsC
BI	480	Class 1 and 0	Yes	3 Phase Operate Retrip (Internal Trip)			LD0.SCCBRBRF1.OpIn.general
BI	481	Class 1 and 0	Yes	Phase-A Operate Retrip (Internal Trip)			LD0.SCCBRBRF1.OpIn.phsA
BI	482	Class 1 and 0	Yes	Phase-B Operate Retrip (Internal Trip)			LD0.SCCBRBRF1.OpIn.phsB
BI	483	Class 1 and 0	Yes	Phase-C Operate Retrip (Internal Trip)			LD0.SCCBRBRF1.OpIn.phsC
BI	484	Class 0	Yes	50BFT Start Command			LD0.SCCBRBRF1.InStr.stVal
BI	485	Class 0	Yes	50BFT Recloser Faulty And Unable To Trip			LD0.SCCBRBRF1.InCBFlt.stVal
BI	486	Class 0	Yes	50BFT Phase A Start Command			LD0.SCCBRBRF1.InStrA.stVal
BI	487	Class 0	Yes	50BFT Phase B Start Command			LD0.SCCBRBRF1.InStrB.stVal
BI	488	Class 0	Yes	50BFT Phase C Start Command			LD0.SCCBRBRF1.InStrC.stVal
BI	489	Class 0	Yes	Recloser Phase A in Closed Position			LD0.SCCBRBRF1.InPosClsA.stVal
BI	490	Class 0	Yes	Recloser Phase B in Closed Position			LD0.SCCBRBRF1.InPosClsB.stVal
BI	491	Class 0	Yes	Recloser Phase C in Closed Position			LD0.SCCBRBRF1.InPosClsC.stVal

Table 54: 50BFC:Circuit breaker close failure protection (SCCBRBCF1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	492	Class 1 and 0	Yes	3 Phase Operate Retrip (Internal Trip)			LD0.SCCBRBCF1.OpCls.general
BI	493	Class 1 and 0	Yes	Phase-A Operate Retrip (Internal Trip)			LD0.SCCBRBCF1.OpCls.phsA
BI	494	Class 1 and 0	Yes	Phase-B Operate Retrip (Internal Trip)			LD0.SCCBRBCF1.OpCls.phsB
BI	495	Class 1 and 0	Yes	Phase-C Operate Retrip (Internal Trip)			LD0.SCCBRBCF1.OpCls.phsC
BI	496	Class 0	Yes	50BFC Start Command			LD0.SCCBRBCF1.InStr.stVal
BI	497	Class 0	Yes	50BFC Recloser Faulty And Unable To Close			LD0.SCCBRBCF1.InCBFlt.stVal
BI	498	Class 0	Yes	50BFC Phase A Start Command			LD0.SCCBRBCF1.InStrA.stVal
BI	499	Class 0	Yes	50BFC Phase B Start Command			LD0.SCCBRBCF1.InStrB.stVal
BI	500	Class 0	Yes	50BFC Phase C Start Command			LD0.SCCBRBCF1.InStrC.stVal
BI	501	Class 0	Yes	Recloser Phase A in Closed Position			LD0.SCCBRBCF1.InPosClsA.stVal
BI	502	Class 0	Yes	Recloser Phase B in Closed Position			LD0.SCCBRBCF1.InPosClsB.stVal
BI	503	Class 0	Yes	Recloser Phase C in Closed Position			LD0.SCCBRBCF1.InPosClsC.stVal

Table 55: FLO: Fault locator (FLOC)(DRFLO1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	175	Class 2 and 0	Yes	Distance to fault measured in Km / Miles	1	Multiplier	LD0.DRFLO1.FltDisKm.mag.f

Table 56: 32P: Directional Positive sequence power protection (DPSRDIR1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	473	Class 1 and 0	Yes	32P-1 Direction Trip (Operate)			LD0.DPSRDIR1.Dir.general
AI	164	Class 0	Yes	32P-1 Angle Between Operating And Polarizing Quantity	100	Multiplier	LD0.DPSRDIR1.OpChrAng.mag.f

Table 57: 32N: Directional negative / zero sequence power protection (DNZSRDIR1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	474	Class 1 and 0	Yes	32N-1 Direction Trip (Operate)			LD0.DNZSRDIR1.Dir.general
AI	165	Class 0	Yes	32N-1 Angle Between Operating And Polarizing Quantity	100	Multiplier	LD0.DNZSRDIR1.OpChrAng.mag.f

Table 58: LCM: Loop Control (DLCM1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	504	Class 1 and 0	Yes	Loop control Trip			LD0.DLCM1.LCMTrip.general
BI	505	Class 1 and 0	Yes	Loop control Close			LD0.DLCM1.LCMClose.general
BI	506	Class 1 and 0	Yes	Source1 Status			LD0.DLCM1.S1Status.stVal
BI	507	Class 1 and 0	Yes	Source2 Status			LD0.DLCM1.S2Status.stVal
BI	508	Class 0	Yes	Enable Source1			LD0.DLCM1.Src1Enable.stVal
BI	509	Class 0	Yes	Enable Source2			LD0.DLCM1.Src2Enable.stVal
BI	510	Class 1 and 0	Yes	Source1 Enable Output			LD0.DLCM1.Src1EnOut.stVal
BI	511	Class 1 and 0	Yes	Source2 Enable Output			LD0.DLCM1.Src2EnOut.stVal
BI	512	Class 0	Yes	Reset Input			LD0.DLCM1.RstIn.stVal
BI	513	Class 1 and 0	Yes	Reset Output			LD0.DLCM1.RstOut.stVal
BI	514	Class 1 and 0	Yes	Alternate1 settings			LD0.DLCM1.SetGrpSel.stVal

Table 59: 79: Autoreclosing, 1ph and /or 3-ph (SDARREC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	46	Class 1 and 0	Yes	Ready Reclose Status			LD0.SDARREC1.RdyRec.stVal
BI	47	Class 1 and 0	Yes	Active Reclose Status			LD0.SDARREC1.ActRec.stVal
BI	48	Class 1 and 0	Yes	Successful Reclose Status			LD0.SDARREC1.SucRec.stVal
BI	49	Class 1 and 0	Yes	Unsuccessful Reclose Status			LD0.SDARREC1.UnsRec.stVal
BI	50	Class 1 and 0	Yes	In progress Status			LD0.SDARREC1.PrgRec.stVal
BI	51	Class 1 and 0	Yes	Unsuccessful Recloser Closing Status			LD0.SDARREC1.UnsCBCls.stVal
BI	52	Class 1 and 0	Yes	Frequent Operation Counter alarm			LD0.SDARREC1.FrqOpAlm.stVal
BI	53	Class 0	Yes	Recloser Reset			LD0.SDARREC1.RsRec.stVal
BI	54	Class 0	Yes	Recloser Reset Counters			LD0.SDARREC1.RsCnt.stVal
AI	20	Class 2 and 0	Yes	Auto Reclosing Status	1	Multi plier	LD0.SDARREC1.AutoRecSt.stVal
AI	21	Class 0	Yes	Operation Counter (1st shot)	0	None	LD0.SDARREC1.OpCnt1.stVal
AI	22	Class 0	Yes	Operation Counter (2nd shot)	0	None	LD0.SDARREC1.OpCnt2.stVal
AI	23	Class 0	Yes	Operation Counter (3rd shot)	0	None	LD0.SDARREC1.OpCnt3.stVal
AI	24	Class 0	Yes	Operation Counter (4th shot)	0	None	LD0.SDARREC1.OpCnt4.stVal
AI	25	Class 0	Yes	Operation Counter (5th shot)	0	None	LD0.SDARREC1.OpCnt5.stVal
AI	26	Class 0	Yes	Frequent operation counter	0	None	LD0.SDARREC1.FrqOpCnt.stVal

Table 60: 79: Autoreclosing, 1ph and /or 3 ph (SDAOGGIO1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	643	Class 0	Yes	SDAOGGIO1 Phase A Active			LD0.SDAOGGIO1.ActivePhA.stVal
BI	644	Class 0	Yes	SDAOGGIO1 Phase B Active			LD0.SDAOGGIO1.ActivePhB.stVal
BI	645	Class 0	Yes	SDAOGGIO1 Phase C Active			LD0.SDAOGGIO1.ActivePhC.stVal
BI	646	Class 0	Yes	SDAOGGIO1 Three Phase Active			LD0.SDAOGGIO1.ActivePh3P.stVal
BI	647	Class 0	Yes	SDAOGGIO1 Phase A CB Position			LD0.SDAOGGIO1.CbPosA.stVal
BI	648	Class 0	Yes	SDAOGGIO1 Phase B CB Position			LD0.SDAOGGIO1.CbPosB.stVal
BI	649	Class 0	Yes	SDAOGGIO1 Phase C CB Position			LD0.SDAOGGIO1.CbPosC.stVal
BI	650	Class 0	Yes	SDAOGGIO1 Three Phase CB Position			LD0.SDAOGGIO1.CbPos3P.stVal
BI	651	Class 0	Yes	SDAOGGIO1 Reclose Command Input			LD0.SDAOGGIO1.RecloseIn.stVal
BI	652	Class 0	Yes	SDAOGGIO1 Open Command Input			LD0.SDAOGGIO1.OpenIn.stVal
BI	653	Class 0	Yes	SDAOGGIO1 Lockout Input			LD0.SDAOGGIO1.LockoutIn.stVal
BI	654	Class 0	Yes	SDAOGGIO1 Reclose In Progress			LD0.SDAOGGIO1.InPrgIn.stVal
BI	655	Class 1 and 0	Yes	SDAOGGIO1 Open CB			LD0.SDAOGGIO1.OpenCb.general
BI	656	Class 1 and 0	Yes	SDAOGGIO1 Phase A Open CB			LD0.SDAOGGIO1.OpenCb.phsA
BI	657	Class 1 and 0	Yes	SDAOGGIO1 Phase B Open CB			LD0.SDAOGGIO1.OpenCb.phsB
BI	658	Class 1 and 0	Yes	SDAOGGIO1 Phase C Open CB			LD0.SDAOGGIO1.OpenCb.phsC
BI	659	Class 1 and 0	Yes	SDAOGGIO1 Close CB			LD0.SDAOGGIO1.CloseCb.general
BI	660	Class 1 and 0	Yes	SDAOGGIO1 Phase A Close CB			LD0.SDAOGGIO1.CloseCb.phsA
BI	661	Class 1 and 0	Yes	SDAOGGIO1 Phase B Close CB			LD0.SDAOGGIO1.CloseCb.phsB
BI	662	Class 1 and 0	Yes	SDAOGGIO1 Phase C Close CB			LD0.SDAOGGIO1.CloseCb.phsC
BI	663	Class 1 and 0	Yes	SDAOGGIO1 Lockout			LD0.SDAOGGIO1.Locked.general
BI	664	Class 1 and 0	Yes	SDAOGGIO1 Phase A Lockout			LD0.SDAOGGIO1.Locked.phsA
BI	665	Class 1 and 0	Yes	SDAOGGIO1 Phase B Lockout			LD0.SDAOGGIO1.Locked.phsB
BI	666	Class 1 and 0	Yes	SDAOGGIO1 Phase C Lockout			LD0.SDAOGGIO1.Locked.phsC
BI	667	Class 0	Yes	SDAOGGIO1 Auto Recloser CB Position			LD0.SDAOGGIO1.ArCbPos.stVal

Table 61: 25:Synchronism and energizing check (SECRSYN1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	198	Class 0	Yes	25 Voltage Difference Indicator			LD0.SECRSYN1.VInd.stVal
BI	199	Class 0	Yes	25 Angle Difference Indicator			LD0.SECRSYN1.AngInd.stVal
BI	200	Class 0	Yes	25 Frequency Difference Indicator			LD0.SECRSYN1.HzInd.stVal
BI	201	Class 1 and 0	Yes	25 Synchronising In Progress			LD0.SECRSYN1.SynPrg.stVal
BI	202	Class 1 and 0	Yes	25 Recloser Closing Failed			LD0.SECRSYN1.FailSyn.stVal
AI	141	Class 0	Yes	25 Calculated Vdiff	100	Multi plier	LD0.SECRSYN1.DifVClc.mag.f
AI	142	Class 0	Yes	25 Calculated Fdiff	100	Multi plier	LD0.SECRSYN1.DifHzClc.mag.f
AI	143	Class 0	Yes	25 Calculated Angle Diff	100	Multi plier	LD0.SECRSYN1.DifAngClc.mag.f

Table 62: 52-Circuit-breaker 1 (3 state inputs / 3 control outputs) (SCBXCBR1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	528	Class 0	Yes	Recloser Position Phase A Open			CTRL.SCBXCBR1.PosOpn.stVal
BI	529	Class 0	Yes	Recloser Position Phase A Closed			CTRL.SCBXCBR1.PosCls.stVal
BI	530	Class 0	Yes	Reclose Position Phase A OK			CTRL.SCBXCBR1.PosOk.stVal
AI	170	Class 0	Yes	Operation Counter Phase A	0	None	CTRL.SCBXCBR1.OpCnt.stVal

Table 63: 52-Circuit-breaker 1 (3 state inputs / 3 control outputs) (SCBXCBR2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	531	Class 0	Yes	Recloser Position Phase B Open			CTRL.SCBXCBR2.PosOpn.stVal
BI	532	Class 0	Yes	Recloser Position Phase B Closed			CTRL.SCBXCBR2.PosCls.stVal
BI	533	Class 0	Yes	Reclose Position Phase B OK			CTRL.SCBXCBR2.PosOk.stVal
AI	171	Class 0	Yes	Operation Counter Phase B	0	None	CTRL.SCBXCBR2.OpCnt.stVal

Table 64: 52-Circuit-breaker 1 (3 state inputs / 3 control outputs) (SCBXCBR3)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	534	Class 0	Yes	Recloser Position Phase C Open			CTRL.SCBXCBR3.PosOpn.stVal
BI	535	Class 0	Yes	Recloser Position Phase C Closed			CTRL.SCBXCBR3.PosCls.stVal
BI	536	Class 0	Yes	Reclose Position Phase C OK			CTRL.SCBXCBR3.PosOk.stVal
AI	172	Class 0	Yes	Operation Counter Phase C	0	None	CTRL.SCBXCBR3.OpCnt.stVal

Table 65: 52-: Circuit-breaker control (3 state inputs / 3 control outputs)(SCBCSWI1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	166	Class 2 and 0	Yes	3-Phase Recloser Position	0	None	CTRL.SCBCSWI1.Pos.stVal
AI	167	Class 2 and 0	Yes	Recloser Position Phase A	0	None	CTRL.SCBCSWI1.PosA.stVal
AI	168	Class 2 and 0	Yes	Recloser Position Phase B	0	None	CTRL.SCBCSWI1.PosB.stVal
AI	169	Class 2 and 0	Yes	Recloser Position Phase C	0	None	CTRL.SCBCSWI1.PosC.stVal

Table 66: 52CM:Circuit-breaker condition monitoring (SPSCBR1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	3	Class 0	Yes	52CM-1 Recloser Spring Charging Started Input			LD0.SPSCBR1.InSprChStr.stVal
BI	4	Class 0	Yes	52CM-1 Recloser Spring Charged Input			LD0.SPSCBR1.InSprCha.stVal
BI	5	Class 0	Yes	52CM-1 Binary Pressure Input For Alarm			LD0.SPSCBR1.InPresAlm.stVal
BI	6	Class 0	Yes	52CM-1 Binary Pressure Input For Lockout Indication			LD0.SPSCBR1.InPresLO.stVal
BI	7	Class 0	Yes	52CM-1 Phase A Pos open			LD0.SPSCBR1.InPosOpnA.stVal
BI	8	Class 0	Yes	52CM-1 Phase B Pos open			LD0.SPSCBR1.InPosOpnB.stVal
BI	9	Class 0	Yes	52CM-1 Phase C Pos open			LD0.SPSCBR1.InPosOpnC.stVal
BI	10	Class 0	Yes	52CM-1 Phase A Pos close			LD0.SPSCBR1.InPosClsA.stVal
BI	11	Class 0	Yes	52CM-1 Phase B Pos close			LD0.SPSCBR1.InPosClsB.stVal
BI	12	Class 0	Yes	52CM-1 Phase C Pos close			LD0.SPSCBR1.InPosClsC.stVal
BI	13	Class 1 and 0	Yes	52CM-1 Recloser Open travel Time Exceeded set value			LD0.SPSCBR1.OpnAlm.stVal
BI	14	Class 1 and 0	Yes	52CM-1 Recloser Close travel Time Exceeded set value			LD0.SPSCBR1.ClsAlm.stVal
BI	15	Class 1 and 0	Yes	52CM-1 Spring charging Time has crossed the set value			LD0.SPSCBR1.SprChaAlm.stVal
BI	16	Class 1 and 0	Yes	52CM-1 Number of Recloser operations exceeds alarm Limit			LD0.SPSCBR1.OpNumAlm.stVal
BI	17	Class 1 and 0	Yes	52CM-1 Number of Recloser operations exceeds lockout Limit			LD0.SPSCBR1.OpNumLO.stVal
BI	18	Class 1 and 0	Yes	52CM-1 Recloser Not Operated For Long Time Alarm			LD0.SPSCBR1.LonTmAlm.stVal
BI	19	Class 1 and 0	Yes	52CM-1 Pressure Below Alarm Level			LD0.SPSCBR1.PresAlm.stVal
BI	20	Class 1 and 0	Yes	52CM-1 Pressure Below Lockout Level			LD0.SPSCBR1.PresLO.stVal
BI	21	Class 0	Yes	52CM-1 Recloser Position Phase A is Open			LD0.SPSCBR1.PosOpnA.stVal
BI	22	Class 0	Yes	52CM-1 Recloser Position Phase B is Open			LD0.SPSCBR1.PosOpnB.stVal
BI	23	Class 0	Yes	52CM-1 Recloser Position Phase C is Open			LD0.SPSCBR1.PosOpnC.stVal
BI	24	Class 0	Yes	Recloser is in Invalid Position (not Open / Closed) Phase A			LD0.SPSCBR1.PosIvdA.stVal

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	25	Class 0	Yes	Recloser is in Invalid Position (not Open / Closed) Phase B			LD0.SPSCBR1.PoslvdB.stVal
BI	26	Class 0	Yes	Recloser is in Invalid Position (not Open / Closed) Phase C			LD0.SPSCBR1.PoslvdC.stVal
BI	27	Class 0	Yes	52CM-1 Recloser Position Phase A is Closed			LD0.SPSCBR1.PosClsA.stVal
BI	28	Class 0	Yes	52CM-1 Recloser Position Phase B is Closed			LD0.SPSCBR1.PosClsB.stVal
BI	29	Class 0	Yes	52CM-1 Recloser Position Phase C is Closed			LD0.SPSCBR1.PosClsC.stVal
BI	30	Class 0	Yes	52CM-1 Reset Accumulation Energy			LD0.SPSCBR1.RsAccAPwr.stVal
BI	31	Class 0	Yes	52CM-1 Reset Input For Recloser Remaining Life And Operation Counter			LD0.SPSCBR1.RsCBWear.stVal
BI	32	Class 0	Yes	52CM-1 Reset Travel T			LD0.SPSCBR1.RsTrvTm.stVal
BI	33	Class 0	Yes	52CM-1 Reset Spr.Charge T			LD0.SPSCBR1.RsSprChaTm.stVal
BI	34	Class 1 and 0	Yes	52CM-1 Accumulated Currents Power (Iyt) Exceeded Alarm Limit			LD0.SPSCBR1.APwrAlm.stVal
BI	35	Class 1 and 0	Yes	52CM-1 Accumulated Currents Power (Iyt) Exceeded Lockout Limit			LD0.SPSCBR1.APwrLO.stVal
BI	36	Class 1 and 0	Yes	52CM-1 Remaining Life Of Recloser Exceeded Alarm Limit			LD0.SPSCBR1.CBLifAlm.stVal
AI	5	Class 0	Yes	52CM-1 The Number Of Days Recloser Has Been Inactive Phase A	0	None	LD0.SPSCBR1.InaTmdCntA.stVal
AI	6	Class 0	Yes	52CM-1 The Number Of Days Recloser Has Been Inactive Phase B	0	None	LD0.SPSCBR1.InaTmdCntB.stVal
AI	7	Class 0	Yes	52CM-1 The Number Of Days Recloser Has Been Inactive Phase C	0	None	LD0.SPSCBR1.InaTmdCntC.stVal
AI	8	Class 0	Yes	52CM-1 Travel Time Of The Recloser During Opening Operation Phase A	100	Multi plier	LD0.SPSCBR1.TmmsOpnA.mag.f
AI	9	Class 0	Yes	52CM-1 Travel Time Of The Recloser During Opening Operation Phase B	100	Multi plier	LD0.SPSCBR1.TmmsOpnB.mag.f
AI	10	Class 0	Yes	52CM-1 Travel Time Of The Recloser During Opening Operation Phase C	100	Multi plier	LD0.SPSCBR1.TmmsOpnC.mag.f
AI	11	Class 0	Yes	52CM-1 Travel Time Of The Recloser During Closing Operation Phase A	100	Multi plier	LD0.SPSCBR1.TmmsClsA.mag.f
AI	12	Class 0	Yes	52CM-1 Travel Time Of The Recloser During Closing Operation Phase B	100	Multi plier	LD0.SPSCBR1.TmmsClsB.mag.f
AI	13	Class 0	Yes	52CM-1 Travel Time Of The Recloser During Closing Operation Phase C	100	Multi plier	LD0.SPSCBR1.TmmsClsC.mag.f
AI	14	Class 0	Yes	52CM-1 Phase A Recloser Monitoring Remaining Life	0	None	LD0.SPSCBR1.RmnLifPhA.stVal
AI	15	Class 0	Yes	52CM-1 Phase B Recloser Monitoring Remaining Life	0	None	LD0.SPSCBR1.RmnLifPhB.stVal
AI	16	Class 0	Yes	52CM-1 Phase C Recloser Monitoring Remaining Life	0	None	LD0.SPSCBR1.RmnLifPhC.stVal
AI	17	Class 0	Yes	52CM-1 Phase A Accumulated Currents Power (Iyt)	1	Multi plier	LD0.SPSCBR1.AccAPwrPhA.mag.f

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	18	Class 0	Yes	52CM-1 Phase B Accumulated Currents Power (Iyt)	1	Multi plier	LD0.SPSCBR1.AccAPwrPhB.mag.f
AI	19	Class 0	Yes	52CM-1 Phase C Accumulated Currents Power (Iyt)	1	Multi plier	LD0.SPSCBR1.AccAPwrPhC.mag.f

Table 67: IA-IB-IC (1):Three-phase current measurement (CMMXU1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	139	Class 1 and 0	Yes	IA IB IC (1) Current Source High Operate			LD0.CMMXU1.HiAlm.stVal
BI	140	Class 1 and 0	Yes	IA IB IC (1) Current Source High Warning			LD0.CMMXU1.HiWrn.stVal
AI	28	Class 2 and 0	Yes	IA IB IC (1) Phase A Mag (RMS)	100	Multi plier	LD0.CMMXU1.A.phsA.instCVal.mag.f
AI	29	Class 2 and 0	Yes	IA IB IC (1) Phase A Mag (Deadbanded)	100	Multi plier	LD0.CMMXU1.A.phsA.cVal.mag.f
AI	31	Class 2 and 0	Yes	IA IB IC (1) Phase B Mag (RMS)	100	Multi plier	LD0.CMMXU1.A.phsB.instCVal.mag.f
AI	32	Class 2 and 0	Yes	IA IB IC (1) Phase B Mag (Deadbanded)	100	Multi plier	LD0.CMMXU1.A.phsB.cVal.mag.f
AI	34	Class 2 and 0	Yes	IA IB IC (1) Phase C Mag (RMS)	100	Multi plier	LD0.CMMXU1.A.phsC.instCVal.mag.f
AI	35	Class 2 and 0	Yes	IA IB IC (1) Phase C Mag (Deadbanded)	100	Multi plier	LD0.CMMXU1.A.phsC.cVal.mag.f

Table 68: I1-I2-I0 (1):Sequence current measurement-instance 1 (CSMSQI1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	76	Class 2 and 0	Yes	I1-I2-I0 (1) Positive Sequence Magnitude (RMS)	100	Multi plier	LD0.CSMSQI1.SeqA.c1.instCVal.mag.f
AI	77	Class 2 and 0	Yes	I1-I2-I0 (1) Positive Sequence Magnitude (Deadband)	100	Multi plier	LD0.CSMSQI1.SeqA.c1.cVal.mag.f
AI	79	Class 2 and 0	Yes	I1-I2-I0 (1) Negative Sequence Magnitude (RMS)	100	Multi plier	LD0.CSMSQI1.SeqA.c2.instCVal.mag.f
AI	80	Class 2 and 0	Yes	I1-I2-I0 (1) Negative Sequence Magnitude (Deadband)	100	Multi plier	LD0.CSMSQI1.SeqA.c2.cVal.mag.f
AI	82	Class 2 and 0	Yes	I1-I2-I0 (1) Zero Sequence Magnitude (RMS)	100	Multi plier	LD0.CSMSQI1.SeqA.c3.instCVal.mag.f
AI	83	Class 2 and 0	Yes	I1-I2-I0 (1) Zero Sequence Magnitude (Deadband)	100	Multi plier	LD0.CSMSQI1.SeqA.c3.cVal.mag.f

Table 69: IG: Ground Current (RESCMMXU1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	142	Class 1 and 0	Yes	IG High Trip (Operate)			LD0.RESCMMXU1.HiAlm.stVal
BI	143	Class 1 and 0	Yes	IG High Warning			LD0.RESCMMXU1.HiWrn.stVal
AI	43	Class 2 and 0	Yes	IG Magnitude (RMS)	100	Multi plier	LD0.RESCMMXU1.A.res.instCVal.mag.f
AI	44	Class 2 and 0	Yes	IG Magnitude (deadbanded)	100	Multi plier	LD0.RESCMMXU1.A.res.cVal.mag.f

Table 70: VA-VB-VC:Three-phase voltage measurement source1 (VMMXU1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	144	Class 1 and 0	Yes	VA VB VC Source 1- High Trip (Operate)			LD0.VMMXU1.HiAlm.stVal
BI	145	Class 1 and 0	Yes	VA VB VC Source 1- High Warning			LD0.VMMXU1.HiWrn.stVal
BI	146	Class 1 and 0	Yes	VA VB VC Source 1- Low Warning			LD0.VMMXU1.LoWrn.stVal
BI	147	Class 1 and 0	Yes	VA VB VC Source 1- Low Trip (Operate)			LD0.VMMXU1.LoAlm.stVal
AI	46	Class 2 and 0	Yes	VA VB VC Source 1- Phase A Mag	100	Multi plier	LD0.VMMXU1.PhV.phsA.cVal.mag.f
AI	48	Class 2 and 0	Yes	VA VB VC Source 1- Phase B Mag	100	Multi plier	LD0.VMMXU1.PhV.phsB.cVal.mag.f
AI	50	Class 2 and 0	Yes	VA VB VC Source 1- Phase C Mag	100	Multi plier	LD0.VMMXU1.PhV.phsC.cVal.mag.f
AI	52	Class 2 and 0	Yes	VA VB VC Source 1- Phase AB Mag (RMS)	100	Multi plier	LD0.VMMXU1.PPV.phsAB.instCVal.mag.f
AI	53	Class 2 and 0	Yes	VA VB VC Source 1- Phase AB Mag (Deadband)	100	Multi plier	LD0.VMMXU1.PPV.phsAB.cVal.mag.f
AI	55	Class 2 and 0	Yes	VA VB VC Source 1- Phase BC Mag (RMS)	100	Multi plier	LD0.VMMXU1.PPV.phsBC.instCVal.mag.f
AI	56	Class 2 and 0	Yes	VA VB VC Source 1- Phase BC Mag (Deadband)	100	Multi plier	LD0.VMMXU1.PPV.phsBC.cVal.mag.f
AI	58	Class 2 and 0	Yes	VA VB VC Source 1- Phase CA Mag (RMS)	100	Multi plier	LD0.VMMXU1.PPV.phsCA.instCVal.mag.f
AI	59	Class 2 and 0	Yes	VA VB VC Source 1- Phase CA Mag (Deadband)	100	Multi plier	LD0.VMMXU1.PPV.phsCA.cVal.mag.f

Table 71: VA-VB-VC:Three-phase voltage measurement source 2 (VMMXU2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	148	Class 1 and 0	Yes	VA VB VC Source 2- High Trip (Operate)			LD0.VMMXU2.HiAlm.stVal
BI	149	Class 1 and 0	Yes	VA VB VC Source 2- High Warning			LD0.VMMXU2.HiWrn.stVal
BI	150	Class 1 and 0	Yes	VA VB VC Source 2- Low Warning			LD0.VMMXU2.LoWrn.stVal

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	151	Class 1 and 0	Yes	VA VB VC Source 2- Low Trip (Operate)			LD0.VMMXU2.LoAlm.stVal
AI	61	Class 2 and 0	Yes	VA VB VC Source 2- Phase A Mag	100	Multi plier	LD0.VMMXU2.PhV.phsA.cVal.mag.f
AI	63	Class 2 and 0	Yes	VA VB VC Source 2- Phase B Mag	100	Multi plier	LD0.VMMXU2.PhV.phsB.cVal.mag.f
AI	65	Class 2 and 0	Yes	VA VB VC Source 2- Phase C Mag	100	Multi plier	LD0.VMMXU2.PhV.phsC.cVal.mag.f
AI	67	Class 2 and 0	Yes	VA VB VC Source 2- Phase AB Mag (RMS)	100	Multi plier	LD0.VMMXU2.PPV.phsAB.instCVal.mag.f
AI	68	Class 2 and 0	Yes	VA VB VC Source 2- Phase AB Mag (Deadband)	100	Multi plier	LD0.VMMXU2.PPV.phsAB.cVal.mag.f
AI	70	Class 2 and 0	Yes	VA VB VC Source 2- Phase BC Mag (RMS)	100	Multi plier	LD0.VMMXU2.PPV.phsBC.instCVal.mag.f
AI	71	Class 2 and 0	Yes	VA VB VC Source 2- Phase BC Mag (Deadband)	100	Multi plier	LD0.VMMXU2.PPV.phsBC.cVal.mag.f
AI	73	Class 2 and 0	Yes	VA VB VC Source 2- Phase CA Mag (RMS)	100	Multi plier	LD0.VMMXU2.PPV.phsCA.instCVal.mag.f
AI	74	Class 2 and 0	Yes	VA VB VC Source 2- Phase CA Mag (Deadband)	100	Multi plier	LD0.VMMXU2.PPV.phsCA.cVal.mag.f

Table 72: V1-V2-V0:Sequence voltage measurement Source 1 (VSMSQI1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	85	Class 2 and 0	Yes	V1 V2 V0 Source-1 Positive Sequence Mag (RMS)	100	Multi plier	LD0.VSMSQI1.SeqV.c1.instCVal.mag.f
AI	86	Class 2 and 0	Yes	V1 V2 V0 Source-1 Positive Sequence Mag (Deadband)	100	Multi plier	LD0.VSMSQI1.SeqV.c1.cVal.mag.f
AI	88	Class 2 and 0	Yes	V1 V2 V0 Source-1 Negative Sequence Mag (RMS)	100	Multi plier	LD0.VSMSQI1.SeqV.c2.instCVal.mag.f
AI	89	Class 2 and 0	Yes	V1 V2 V0 Source-1 Negative Sequence Mag (Deadband)	100	Multi plier	LD0.VSMSQI1.SeqV.c2.cVal.mag.f
AI	91	Class 2 and 0	Yes	V1 V2 V0 Source-1 Zero Sequence Mag (RMS)	100	Multi plier	LD0.VSMSQI1.SeqV.c3.instCVal.mag.f
AI	92	Class 2 and 0	Yes	V1 V2 V0 Source-1 Zero Sequence Mag (Deadband)	100	Multi plier	LD0.VSMSQI1.SeqV.c3.cVal.mag.f

Table 73: V1-V2-V0:Sequence voltage measurement Source 2 (VSMSQI2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	94	Class 2 and 0	Yes	V1 V2 V0 Source-2 Positive Sequence Mag (RMS)	100	Multi plier	LD0.VSMSQI2.SeqV.c1.instCVal.mag.f
AI	95	Class 2 and 0	Yes	V1 V2 V0 Source-2 Positive Sequence Mag (Deadband)	100	Multi plier	LD0.VSMSQI2.SeqV.c1.cVal.mag.f
AI	97	Class 2 and 0	Yes	V1 V2 V0 Source-2 Negative Sequence Mag (RMS)	100	Multi plier	LD0.VSMSQI2.SeqV.c2.instCVal.mag.f

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	98	Class 2 and 0	Yes	V1 V2 V0 Source-2 Negative Sequence Mag (Deadband)	100	Multi plier	LD0.VSMSQI2.SeqV.c2.cVal.mag.f
AI	100	Class 2 and 0	Yes	V1 V2 V0 Source-2 Zero Sequence Mag (RMS)	100	Multi plier	LD0.VSMSQI2.SeqV.c3.instCVal.mag.f
AI	101	Class 2 and 0	Yes	V1 V2 V0 Source-2 Zero Sequence Mag (Deadband)	100	Multi plier	LD0.VSMSQI2.SeqV.c3.cVal.mag.f

Table 74: P-E-:Single /Three-phase power, power factor and three phase energy measurement (APEMMXU1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	195	Class 2 and 0	Yes	Total Active Power	1	Multi plier	LD0.APEMMXU1.TotW.instMag.f
AI	196	Class 2 and 0	Yes	Total Reactive Power	1	Multi plier	LD0.APEMMXU1.TotVAr.instMag.f
AI	197	Class 2 and 0	Yes	Total Power Factor	100	Multi plier	LD0.APEMMXU1.TotPF.instMag.f
AI	198	Class 0	Yes	Phase A Active Power	1	Multi plier	LD0.APEMMXU1.WA.instMag.f
AI	199	Class 0	Yes	Phase B Active Power	1	Multi plier	LD0.APEMMXU1.WB.instMag.f
AI	200	Class 0	Yes	Phase C Active Power	1	Multi plier	LD0.APEMMXU1.WC.instMag.f
AI	201	Class 0	Yes	Phase A Reactive Power	1	Multi plier	LD0.APEMMXU1.VArA.instMag.f
AI	202	Class 0	Yes	Phase B Reactive Power	1	Multi plier	LD0.APEMMXU1.VArB.instMag.f
AI	203	Class 0	Yes	Phase C Reactive Power	1	Multi plier	LD0.APEMMXU1.VArC.instMag.f
AI	204	Class 0	Yes	Average A Power Factor	100	Multi plier	LD0.APEMMXU1.PFA.instMag.f
AI	205	Class 0	Yes	Average B Power Factor	100	Multi plier	LD0.APEMMXU1.PFB.instMag.f
AI	206	Class 0	Yes	Average C Power Factor	100	Multi plier	LD0.APEMMXU1.PFC.instMag.f
AI	215	Class 2 and 0	Yes	Total Active Power (Total P)	1	Multi plier	LD0.APEMMXU1.TotW.mag.f
AI	216	Class 2 and 0	Yes	Total Reactive Power (Total Q)	1	Multi plier	LD0.APEMMXU1.TotVAr.mag.f
AI	217	Class 2 and 0	Yes	Average Power factor (Total PF)	100	Multi plier	LD0.APEMMXU1.TotPF.mag.f
AI	218	Class 0	Yes	Phase A Active Power	1	Multi plier	LD0.APEMMXU1.WA.mag.f
AI	219	Class 0	Yes	Phase B Active Power	1	Multi plier	LD0.APEMMXU1.WB.mag.f
AI	220	Class 0	Yes	Phase C Active Power	1	Multi plier	LD0.APEMMXU1.WC.mag.f
AI	221	Class 0	Yes	Phase A Reactive Power	1	Multi plier	LD0.APEMMXU1.VArA.mag.f

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	222	Class 0	Yes	Phase B Reactive Power	1	Multi plier	LD0.APEMMXU1.VArB.mag.f
AI	223	Class 0	Yes	Phase C Reactive Power	1	Multi plier	LD0.APEMMXU1.VArC.mag.f
AI	224	Class 0	Yes	Phase A Average Power factor	100	Multi plier	LD0.APEMMXU1.PFA.mag.f
AI	225	Class 0	Yes	Phase B Average Power factor	100	Multi plier	LD0.APEMMXU1.PFB.mag.f
AI	226	Class 0	Yes	Phase C Average Power factor	100	Multi plier	LD0.APEMMXU1.PFC.mag.f

Table 75: f:Frequency measurement (FMMXU1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	102	Class 2 and 0	Yes	Frequency	100	Multi plier	LD0.FMMXU1.Hz.instMag.f

Table 76: DFR:Disturbance recorder (RDRE1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	537	Class 0	Yes	DFR Disturbance Recording Triggered			DR.RDRE1.RcdTrg.stVal
BI	538	Class 0	Yes	DFR Clear Disturbance Recorder Memory			DR.RDRE1.MemClr.stVal
BI	539	Class 1 and 0	Yes	DFR Disturbance Recording Made			DR.RDRE1.RcdMade.stVal
AI	173	Class 0	Yes	DFR Number Of Recordings	0	None	DR.RDRE1.FltNum.stVal
AI	174	Class 0	Yes	DFR Recording Memory Used %	0	None	DR.RDRE1.MemUsed.stVal

Table 77: FLTMSTA: Fault Recorder (FLTMSTA1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	153	Class 0	Yes	Reset Fault Records			LD0.FLTMSTA1.RecRs.stVal
AI	107	Class 2 and 0	Yes	Fault Record Operation Counter	100	Multi plier	LD0.FLTMSTA1.OpCnt.stVal
AI	109	Class 2 and 0	Yes	Last Fault: Max Phase A Current Magnitude	100	Multi plier	LD0.FLTMSTA1.MaxAmpsA.mag.f
AI	110	Class 2 and 0	Yes	Last Fault: Max Phase B Current Magnitude	100	Multi plier	LD0.FLTMSTA1.MaxAmpsB.mag.f
AI	111	Class 2 and 0	Yes	Last Fault: Max Phase C Current Magnitude	100	Multi plier	LD0.FLTMSTA1.MaxAmpsC.mag.f
AI	112	Class 2 and 0	Yes	Last Fault: Max Neutral Current Magnitude	100	Multi plier	LD0.FLTMSTA1.MaxAmpsN.mag.f
AI	113	Class 2 and 0	Yes	Last Fault: Phase A Current Magnitude	100	Multi plier	LD0.FLTMSTA1.AmpsA.mag.f
AI	114	Class 2 and 0	Yes	Last Fault: Phase B Current Magnitude	100	Multi plier	LD0.FLTMSTA1.AmpsB.mag.f

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	115	Class 2 and 0	Yes	Last Fault: Phase C Current Magnitude	100	Multiplier	LD0.FLTMSTA1.AmpsC.mag.f
AI	116	Class 2 and 0	Yes	Last Fault: Neutral Current Magnitude	100	Multiplier	LD0.FLTMSTA1.AmpsN.mag.f
AI	117	Class 2 and 0	Yes	Last Fault: Calculated Residual Current Magnitude	100	Multiplier	LD0.FLTMSTA1.AmpsNClc.mag.f
AI	118	Class 2 and 0	Yes	Last Fault: Positive Sequence Current Mag.	100	Multiplier	LD0.FLTMSTA1.AmpsPsSeq.mag.f
AI	119	Class 2 and 0	Yes	Last Fault: Negative Sequence Current Mag.	100	Multiplier	LD0.FLTMSTA1.AmpsNgSeq.mag.f
AI	120	Class 2 and 0	Yes	Last Fault: Phase A Voltage Magnitude	100	Multiplier	LD0.FLTMSTA1.VoltsA.mag.f
AI	121	Class 2 and 0	Yes	Last Fault: Phase B Voltage Magnitude	100	Multiplier	LD0.FLTMSTA1.VoltsB.mag.f
AI	122	Class 2 and 0	Yes	Last Fault: Phase C Voltage Magnitude	100	Multiplier	LD0.FLTMSTA1.VoltsC.mag.f
AI	123	Class 2 and 0	Yes	Last Fault: Phase AB Voltage Magnitude	100	Multiplier	LD0.FLTMSTA1.VoltsAB.mag.f
AI	124	Class 2 and 0	Yes	Last Fault: Phase BC Voltage Magnitude	100	Multiplier	LD0.FLTMSTA1.VoltsBC.mag.f
AI	125	Class 2 and 0	Yes	Last Fault: Phase CA Voltage Magnitude	100	Multiplier	LD0.FLTMSTA1.VoltsCA.mag.f
AI	126	Class 2 and 0	Yes	Last Fault: Measured Residual Voltage Magnitude	100	Multiplier	LD0.FLTMSTA1.VoltsN.mag.f
AI	127	Class 2 and 0	Yes	Last Fault: Zero Sequence Voltage Magnitude	100	Multiplier	LD0.FLTMSTA1.VZroSeq.mag.f
AI	128	Class 2 and 0	Yes	Last Fault: Positive Sequence Voltage Magnitude	100	Multiplier	LD0.FLTMSTA1.VPsSeq.mag.f
AI	129	Class 2 and 0	Yes	Last Fault: Negative Sequence Voltage Magnitude	100	Multiplier	LD0.FLTMSTA1.VNgSeq.mag.f
AI	130	Class 2 and 0	Yes	Last Fault: I2/I1 Ratio Fault	100	Multiplier	LD0.FLTMSTA1.PDNS1MxRat.mag.f
AI	131	Class 2 and 0	Yes	Last Fault: Frequency at the Time the Fault is Cleared	100	Multiplier	LD0.FLTMSTA1.Hz.mag.f
AI	132	Class 2 and 0	Yes	Last Fault: Frequency Gradient at the Time the Fault is Cleared	100	Multiplier	LD0.FLTMSTA1.HzS.mag.f
AI	189	Class 2 and 0	Yes	Max Start Duration of all Stages During the Fault	1	Multiplier	LD0.FLTMSTA1.StrDur.mag.f

Table 78: UPS: Battery voltage current, Test the battery (ZBAT1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	413	Class 0	Yes	Uninterruptible Power Supply Start Battery Test			LD0.ZBAT1.BatTest.stVal
BI	414	Class 0	Yes	Uninterruptible Power Supply Reset UPS processor			LD0.ZBAT1.ResetUps.stVal
BI	417	Class 0	Yes	Reserved			Reserved
BI	418	Class 0	Yes	Heater Switch			LD0.ZBAT1.SwConnSt.stVal

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	419	Class 0	Yes	Aux Status			LD0.ZBAT1.AuxStat.stVal
BI	420	Class 1 and 0	Yes	Loss of AC			LD0.ZBAT1.ACLoss.stVal
BI	421	Class 0	Yes	Battery Test Result			LD0.ZBAT1.TestRsl.stVal
BI	668	Class 0	Yes	CVD clamping phase A			LD0.ZBAT1.CvdClpSt.phsA.stVal
BI	669	Class 0	Yes	CVD clamping phase B			LD0.ZBAT1.CvdClpSt.phsB.stVal
BI	670	Class 0	Yes	CVD clamping phase C			LD0.ZBAT1.CvdClpSt.phsC.stVal
AI	155	Class 0	Yes	Uninterruptible Power Supply Bat Execution Result	0	None	LD0.ZBAT1.BatTstStat.stVal
AI	156	Class 0	Yes	UPS Firmware Version	100	Multi plier	LD0.ZBAT1.UPSFwVer.mag.f
AI	157	Class 0	Yes	Uninterruptible Power Supply Boost Voltage Value	100	Multi plier	LD0.ZBAT1.BstVolVal.stVal
AI	158	Class 0	Yes	Uninterruptible Power Supply Internal rail 60V	0	None	LD0.ZBAT1.RlVol60V.stVal
AI	159	Class 0	Yes	Aux Voltage	0	None	LD0.ZBAT1.AuxVol.stVal
AI	160	Class 0	Yes	UPS Hw Version	100	Multi plier	LD0.ZBAT1.UPSHwVer.mag.f
AI	161	Class 0	Yes	UPS Bootldr Version	100	Multi plier	LD0.ZBAT1.UPSBldrVer.mag.f
AI	163	Class 0	Yes	Aux Protection	0	None	LD0.ZBAT1.Auxinfo.stVal
AI	176	Class 0	Yes	Battery Voltage	100	Multi plier	LD0.ZBAT1.Vol.mag.f
AI	177	Class 0	Yes	Battery charging current	100	Multi plier	LD0.ZBAT1.Amp.mag.f
AI	178	Class 0	Yes	UPS temperature	100	Multi plier	LD0.ZBAT1.Temp.mag.f
AI	179	Class 0	Yes	AC Input Voltage	100	Multi plier	LD0.ZBAT1.AcInputVol.mag.f
AI	180	Class 0	Yes	Aux Load Current	100	Multi plier	LD0.ZBAT1.AuxLoadI.mag.f
AI	182	Class 0	Yes	Internal rail 12V	100	Multi plier	LD0.ZBAT1.RailVol12V.mag.f
AI	183	Class 0	Yes	Battery Test Voltage	100	Multi plier	LD0.ZBAT1.BatTstVol.mag.f

Table 79: X115(UPD): Universal Power Drive (XGGIO115)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	422	Class 1 and 0	Yes	X115-Input 1 UPD			LD0.XGGIO115.Ind1.stVal
BI	423	Class 1 and 0	Yes	X115-Input 2 UPD			LD0.XGGIO115.Ind2.stVal
BI	424	Class 1 and 0	Yes	X115-Input 3 UPD			LD0.XGGIO115.Ind3.stVal
BI	425	Class 1 and 0	Yes	X115-Input 4 UPD			LD0.XGGIO115.Ind4.stVal
BI	426	Class 1 and 0	Yes	X115-Input 5 UPD			LD0.XGGIO115.Ind5.stVal
BI	427	Class 1 and 0	Yes	X115-Input 6 UPD			LD0.XGGIO115.Ind6.stVal
BI	428	Class 0	Yes	System Health Status			LD0.XGGIO115.Health2.stVal

Table 80: FKEYGGIO1: Programmable buttons (16 buttons) (FKEYGGIO1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	107	Class 1 and 0	Yes	KEY 1 Setting Group 1 Enabled			LD0.FKEYGGIO1.Ind1.stVal
BI	108	Class 1 and 0	Yes	KEY 2 Setting Group 2 Enabled			LD0.FKEYGGIO1.Ind2.stVal
BI	109	Class 1 and 0	Yes	KEY 3 Setting Group 3 Enabled			LD0.FKEYGGIO1.Ind3.stVal
BI	110	Class 1 and 0	Yes	KEY 4 Setting Group 4 Enabled			LD0.FKEYGGIO1.Ind4.stVal
BI	111	Class 1 and 0	Yes	KEY 5 Setting Group 5 Enabled			LD0.FKEYGGIO1.Ind5.stVal
BI	112	Class 1 and 0	Yes	KEY 6 Setting Group 6 Enabled			LD0.FKEYGGIO1.Ind6.stVal
BI	113	Class 1 and 0	Yes	KEY 7 Switch Mode Enabled			LD0.FKEYGGIO1.Ind7.stVal
BI	114	Class 1 and 0	Yes	KEY 8 Hot Line Tag On			LD0.FKEYGGIO1.Ind8.stVal
BI	115	Class 1 and 0	Yes	KEY 9 Ground Block			LD0.FKEYGGIO1.Ind9.stVal
BI	116	Class 1 and 0	Yes	KEY 10 Reclose Blocked			LD0.FKEYGGIO1.Ind10.stVal
BI	117	Class 1 and 0	Yes	KEY 11 Battery Test			LD0.FKEYGGIO1.Ind11.stVal
BI	118	Class 1 and 0	Yes	KEY 12 50SEF Blocked			LD0.FKEYGGIO1.Ind12.stVal
BI	119	Class 1 and 0	Yes	KEY 13 S1 Disabled			LD0.FKEYGGIO1.Ind13.stVal
BI	120	Class 1 and 0	Yes	KEY 14 S2 Disabled			LD0.FKEYGGIO1.Ind14.stVal
BI	121	Class 1 and 0	Yes	KEY 15 Loop Scheme Reset			LD0.FKEYGGIO1.Ind15.stVal
BI	122	Class 1 and 0	Yes	KEY 16 Emergency Open 3 Phase			LD0.FKEYGGIO1.Ind16.stVal
BI	123	Class 0	Yes	LED 1 Setting Group 1 Enabled			LD0.FKEYGGIO1.SPCSO1.stVal
BI	124	Class 0	Yes	LED 2 Setting Group 2 Enabled			LD0.FKEYGGIO1.SPCSO2.stVal
BI	125	Class 0	Yes	LED 3 Setting Group 3 Enabled			LD0.FKEYGGIO1.SPCSO3.stVal
BI	126	Class 0	Yes	LED 4 Setting Group 4 Enabled			LD0.FKEYGGIO1.SPCSO4.stVal
BI	127	Class 0	Yes	LED 5 Setting Group 5 Enabled			LD0.FKEYGGIO1.SPCSO5.stVal
BI	128	Class 0	Yes	LED 6 Setting Group 6 Enabled			LD0.FKEYGGIO1.SPCSO6.stVal
BI	129	Class 0	Yes	LED 7 Switch Mode Enabled			LD0.FKEYGGIO1.SPCSO7.stVal
BI	130	Class 0	Yes	LED 8 Hot Line Tag On			LD0.FKEYGGIO1.SPCSO8.stVal
BI	131	Class 0	Yes	LED 9 Ground Block			LD0.FKEYGGIO1.SPCSO9.stVal
BI	132	Class 0	Yes	LED 10 Reclose Blocked			LD0.FKEYGGIO1.SPCSO10.stVal
BI	133	Class 0	Yes	LED 11 Battery Test			LD0.FKEYGGIO1.SPCSO11.stVal
BI	134	Class 0	Yes	LED 12 50SEF Blocked			LD0.FKEYGGIO1.SPCSO12.stVal
BI	135	Class 0	Yes	LED 13 S1 Disabled			LD0.FKEYGGIO1.SPCSO13.stVal
BI	136	Class 0	Yes	LED 14 S2 Disabled			LD0.FKEYGGIO1.SPCSO14.stVal
BI	137	Class 0	Yes	LED 15 Loop Scheme Reset			LD0.FKEYGGIO1.SPCSO15.stVal
BI	138	Class 0	Yes	LED 16 Emergency Open 3 Phase			LD0.FKEYGGIO1.SPCSO16.stVal

Table 81: MVGAPC1:Move function block(8 outputs) (MVGAPC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	205	Class 1 and 0	Yes	3-Phase Recloser Open (52B)			LD0.MVGAPC1.Q1.stVal
BI	206	Class 1 and 0	Yes	3-Phase Recloser Closed (52A)			LD0.MVGAPC1.Q2.stVal
BI	207	Class 1 and 0	Yes	Phase A Open			LD0.MVGAPC1.Q3.stVal

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	208	Class 1 and 0	Yes	Phase B Open			LD0.MVGAPC1.Q4.stVal
BI	209	Class 1 and 0	Yes	Phase C Open			LD0.MVGAPC1.Q5.stVal
BI	210	Class 1 and 0	Yes	Phase A Close			LD0.MVGAPC1.Q6.stVal
BI	211	Class 1 and 0	Yes	Phase B Close			LD0.MVGAPC1.Q7.stVal
BI	212	Class 1 and 0	Yes	Phase C Close			LD0.MVGAPC1.Q8.stVal

Table 82: PT-1:Pulse timer (8 timers)- (PTGAPC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	283	Class 0	Yes	Generic Pulse Timer 1 Input 1			LD0.PTGAPC1.In1.stVal
BI	284	Class 0	Yes	Generic Pulse Timer 1 Input 2			LD0.PTGAPC1.In2.stVal
BI	285	Class 0	Yes	Generic Pulse Timer 1 Input 3			LD0.PTGAPC1.In3.stVal
BI	286	Class 0	Yes	Generic Pulse Timer 1 Input 4			LD0.PTGAPC1.In4.stVal
BI	287	Class 0	Yes	Generic Pulse Timer 1 Input 5			LD0.PTGAPC1.In5.stVal
BI	288	Class 0	Yes	Generic Pulse Timer 1 Input 6			LD0.PTGAPC1.In6.stVal
BI	289	Class 0	Yes	Generic Pulse Timer 1 Input 7			LD0.PTGAPC1.In7.stVal
BI	290	Class 0	Yes	Generic Pulse Timer 1 Input 8			LD0.PTGAPC1.In8.stVal
BI	291	Class 0	Yes	Generic Pulse Timer 1 Output 1			LD0.PTGAPC1.Q1.stVal
BI	292	Class 0	Yes	Generic Pulse Timer 1 Output 2			LD0.PTGAPC1.Q2.stVal
BI	293	Class 0	Yes	Generic Pulse Timer 1 Output 3			LD0.PTGAPC1.Q3.stVal
BI	294	Class 0	Yes	Generic Pulse Timer 1 Output 4			LD0.PTGAPC1.Q4.stVal
BI	295	Class 0	Yes	Generic Pulse Timer 1 Output 5			LD0.PTGAPC1.Q5.stVal
BI	296	Class 0	Yes	Generic Pulse Timer 1 Output 6			LD0.PTGAPC1.Q6.stVal
BI	297	Class 0	Yes	Generic Pulse Timer 1 Output 7			LD0.PTGAPC1.Q7.stVal
BI	298	Class 0	Yes	Generic Pulse Timer 1 Output 8			LD0.PTGAPC1.Q8.stVal

Table 83: SPCGGIO1: Generic Control points 1 (16 outputs) (SPCGGIO1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	299	Class 1 and 0	Yes	Setting Group 1 Active			LD0.SPCGGIO1. SPCSO1.stVal
BI	300	Class 1 and 0	Yes	Setting Group 2 Active			LD0.SPCGGIO1. SPCSO2.stVal
BI	301	Class 1 and 0	Yes	Setting Group 3 Active			LD0.SPCGGIO1. SPCSO3.stVal
BI	302	Class 1 and 0	Yes	Setting Group 4 Active			LD0.SPCGGIO1. SPCSO4.stVal
BI	303	Class 1 and 0	Yes	Setting Group 5 Active			LD0.SPCGGIO1. SPCSO5.stVal
BI	304	Class 1 and 0	Yes	Setting Group 6 Active			LD0.SPCGGIO1. SPCSO6.stVal
BI	305	Class 1 and 0	Yes	Switch Mode Enabled			LD0.SPCGGIO1. SPCSO7.stVal
BI	306	Class 1 and 0	Yes	Hot Line Tag On			LD0.SPCGGIO1. SPCSO8.stVal
BI	307	Class 1 and 0	Yes	Ground Block Enabled			LD0.SPCGGIO1. SPCSO9.stVal
BI	308	Class 1 and 0	Yes	Reclose Block Enabled			LD0.SPCGGIO1. SPCSO10.stVal
BI	309	Class 1 and 0	Yes	Battery Test Status			LD0.SPCGGIO1. SPCSO11.stVal

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	310	Class 1 and 0	Yes	50SEF Block Enabled			LD0.SPCGGIO1. SPCSO12.stVal
BI	311	Class 1 and 0	Yes	Source1 Enabled			LD0.SPCGGIO1. SPCSO13.stVal
BI	312	Class 1 and 0	Yes	Source2 Enabled			LD0.SPCGGIO1. SPCSO14.stVal
BI	313	Class 1 and 0	Yes	Loop Scheme Reset			LD0.SPCGGIO1. SPCSO15.stVal
BI	314	Class 1 and 0	Yes	Emergency Open 3 Phase			LD0.SPCGGIO1. SPCSO16.stVal

Table 84: SPCGGIO2: Generic Control points 2 (16 outputs) (SPCGGIO2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	315	Class 1 and 0	Yes	General Purpose Binary Output Status 1			LD0.SPCGGIO2. SPCSO1.stVal
BI	316	Class 1 and 0	Yes	General Purpose Binary Output Status 2			LD0.SPCGGIO2. SPCSO2.stVal
BI	317	Class 1 and 0	Yes	General Purpose Binary Output Status 3			LD0.SPCGGIO2. SPCSO3.stVal
BI	318	Class 1 and 0	Yes	General Purpose Binary Output Status 4			LD0.SPCGGIO2. SPCSO4.stVal
BI	319	Class 1 and 0	Yes	General Purpose Binary Output Status 5			LD0.SPCGGIO2. SPCSO5.stVal
BI	320	Class 1 and 0	Yes	General Purpose Binary Output Status 6			LD0.SPCGGIO2. SPCSO6.stVal
BI	321	Class 1 and 0	Yes	General Purpose Binary Output Status 7			LD0.SPCGGIO2. SPCSO7.stVal
BI	322	Class 1 and 0	Yes	General Purpose Binary Output Status 8			LD0.SPCGGIO2. SPCSO8.stVal
BI	323	Class 1 and 0	Yes	General Purpose Binary Output Status 9			LD0.SPCGGIO2. SPCSO9.stVal
BI	324	Class 1 and 0	Yes	General Purpose Binary Output Status 10			LD0.SPCGGIO2. SPCSO10.stVal
BI	325	Class 1 and 0	Yes	General Purpose Binary Output Status 11			LD0.SPCGGIO2. SPCSO11.stVal
BI	326	Class 1 and 0	Yes	General Purpose Binary Output Status 12			LD0.SPCGGIO2. SPCSO12.stVal
BI	327	Class 1 and 0	Yes	General Purpose Binary Output Status 13			LD0.SPCGGIO2. SPCSO13.stVal
BI	328	Class 1 and 0	Yes	General Purpose Binary Output Status 14			LD0.SPCGGIO2. SPCSO14.stVal
BI	329	Class 1 and 0	Yes	General Purpose Binary Output Status 15			LD0.SPCGGIO2. SPCSO15.stVal
BI	330	Class 1 and 0	Yes	General Purpose Binary Output Status 16			LD0.SPCGGIO2. SPCSO16.stVal

Table 85: SRGAPC1: Set reset flipflops (8 outputs) (SRGAPC1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	225	Class 0	Yes	SR-1 Q1 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Q1.stVal
BI	226	Class 0	Yes	SR-1 Q2 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Q2.stVal
BI	227	Class 0	Yes	SR-1 Q3 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Q3.stVal
BI	228	Class 0	Yes	SR-1 Q4 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Q4.stVal
BI	229	Class 0	Yes	SR-1 Q5 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Q5.stVal
BI	230	Class 0	Yes	SR-1 Q6 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Q6.stVal
BI	231	Class 0	Yes	SR-1 Q7 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Q7.stVal
BI	232	Class 0	Yes	SR-1 Q8 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Q8.stVal
BI	233	Class 0	Yes	SR-1 Set 1 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Set1.stVal
BI	234	Class 0	Yes	SR-1 Set 2 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Set2.stVal
BI	235	Class 0	Yes	SR-1 Set 3 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Set3.stVal

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	236	Class 0	Yes	SR-1 Set 4 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Set4.stVal
BI	237	Class 0	Yes	SR-1 Set 5 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Set5.stVal
BI	238	Class 0	Yes	SR-1 Set 6 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Set6.stVal
BI	239	Class 0	Yes	SR-1 Set 7 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Set7.stVal
BI	240	Class 0	Yes	SR-1 Set 8 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Set8.stVal
BI	241	Class 0	Yes	SR-1 Reset 1 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Rs1.stVal
BI	242	Class 0	Yes	SR-1 Reset 2 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Rs2.stVal
BI	243	Class 0	Yes	SR-1 Reset 3 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Rs3.stVal
BI	244	Class 0	Yes	SR-1 Reset 4 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Rs4.stVal
BI	245	Class 0	Yes	SR-1 Reset 5 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Rs5.stVal
BI	246	Class 0	Yes	SR-1 Reset 6 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Rs6.stVal
BI	247	Class 0	Yes	SR-1 Reset 7 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Rs7.stVal
BI	248	Class 0	Yes	SR-1 Reset 8 Set-Reset Flip Flop - 1			LD0.SRGAPC1.Rs8.stVal

Table 86: MVGAPC2:Move function block(8 outputs) (MVGAPC2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	215	Class 1 and 0	Yes	General Purpose Binary Input 9			LD0.MVGAPC2.Q1.stVal
BI	216	Class 1 and 0	Yes	General Purpose Binary Input 10			LD0.MVGAPC2.Q2.stVal
BI	217	Class 1 and 0	Yes	General Purpose Binary Input 11			LD0.MVGAPC2.Q3.stVal
BI	218	Class 1 and 0	Yes	General Purpose Binary Input 12			LD0.MVGAPC2.Q4.stVal
BI	219	Class 1 and 0	Yes	General Purpose Binary Input 13			LD0.MVGAPC2.Q5.stVal
BI	220	Class 1 and 0	Yes	General Purpose Binary Input 14			LD0.MVGAPC2.Q6.stVal
BI	221	Class 1 and 0	Yes	General Purpose Binary Input 15			LD0.MVGAPC2.Q7.stVal
BI	222	Class 1 and 0	Yes	General Purpose Binary Input 16			LD0.MVGAPC2.Q8.stVal

Table 87: PTGAPC2 Pulse timers (8 pcs)- (PTGAPC2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	626	Class 0	Yes	Generic Pulse Timer 2 Input 1			LD0.PTGAPC2.In1.stVal
BI	627	Class 0	Yes	Generic Pulse Timer 2 Input 2			LD0.PTGAPC2.In2.stVal
BI	628	Class 0	Yes	Generic Pulse Timer 2 Input 3			LD0.PTGAPC2.In3.stVal
BI	629	Class 0	Yes	Generic Pulse Timer 2 Input 4			LD0.PTGAPC2.In4.stVal
BI	630	Class 0	Yes	Generic Pulse Timer 2 Input 5			LD0.PTGAPC2.In5.stVal
BI	631	Class 0	Yes	Generic Pulse Timer 2 Input 6			LD0.PTGAPC2.In6.stVal
BI	632	Class 0	Yes	Generic Pulse Timer 2 Input 7			LD0.PTGAPC2.In7.stVal
BI	633	Class 0	Yes	Generic Pulse Timer 2 Input 8			LD0.PTGAPC2.In8.stVal
BI	634	Class 0	Yes	Generic Pulse Timer 2 Output 1			LD0.PTGAPC2.Q1.stVal
BI	635	Class 0	Yes	Generic Pulse Timer 2 Output 2			LD0.PTGAPC2.Q2.stVal
BI	636	Class 0	Yes	Generic Pulse Timer 2 Output 3			LD0.PTGAPC2.Q3.stVal

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	637	Class 0	Yes	Generic Pulse Timer 2 Output 4			LD0.PTGAPC2.Q4.stVal
BI	638	Class 0	Yes	Generic Pulse Timer 2 Output 5			LD0.PTGAPC2.Q5.stVal
BI	639	Class 0	Yes	Generic Pulse Timer 2 Output 6			LD0.PTGAPC2.Q6.stVal
BI	640	Class 0	Yes	Generic Pulse Timer 2 Output 7			LD0.PTGAPC2.Q7.stVal
BI	641	Class 0	Yes	Generic Pulse Timer 2 Output 8			LD0.PTGAPC2.Q8.stVal

Table 88: SRGAPC2: Set reset flipflops (8 outputs) (SRGAPC2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BI	560	Class 0	Yes	SR-2 Q1 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Q1.stVal
BI	561	Class 0	Yes	SR-2 Q2 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Q2.stVal
BI	562	Class 0	Yes	SR-2 Q3 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Q3.stVal
BI	563	Class 0	Yes	SR-2 Q4 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Q4.stVal
BI	564	Class 0	Yes	SR-2 Q5 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Q5.stVal
BI	565	Class 0	Yes	SR-2 Q6 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Q6.stVal
BI	566	Class 0	Yes	SR-2 Q7 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Q7.stVal
BI	567	Class 0	Yes	SR-2 Q8 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Q8.stVal
BI	568	Class 0	Yes	SR-2 Set 1 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Set1.stVal
BI	569	Class 0	Yes	SR-2 Set 2 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Set2.stVal
BI	570	Class 0	Yes	SR-2 Set 3 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Set3.stVal
BI	571	Class 0	Yes	SR-2 Set 4 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Set4.stVal
BI	572	Class 0	Yes	SR-2 Set 5 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Set5.stVal
BI	573	Class 0	Yes	SR-2 Set 6 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Set6.stVal
BI	574	Class 0	Yes	SR-2 Set 7 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Set7.stVal
BI	575	Class 0	Yes	SR-2 Set 8 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Set8.stVal
BI	576	Class 0	Yes	SR-2 Reset 1 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Rs1.stVal
BI	577	Class 0	Yes	SR-2 Reset 2 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Rs2.stVal
BI	578	Class 0	Yes	SR-2 Reset 3 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Rs3.stVal
BI	579	Class 0	Yes	SR-2 Reset 4 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Rs4.stVal
BI	580	Class 0	Yes	SR-2 Reset 5 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Rs5.stVal
BI	581	Class 0	Yes	SR-2 Reset 6 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Rs6.stVal
BI	582	Class 0	Yes	SR-2 Reset 7 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Rs7.stVal
BI	583	Class 0	Yes	SR-2 Reset 8 Set-Reset Flip Flop - 2			LD0.SRGAPC2.Rs8.stVal

Table 89: UDFCNT1: Up/Down Counter 1 (UDFCNT1)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	190	Class 0	Yes	Counter 1	1	Multi plier	LD0.UDFCNT1.CntRs.actVal

Table 90: UDFCNT2: Up/Down Counter 2 (UDFCNT2)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	191	Class 0	Yes	Counter 2	1	Multiplier	LD0.UDFCNT2.CntRs.actVal

Table 91: UDFCNT3: Up/Down Counter 3 (UDFCNT3)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	192	Class 0	Yes	Counter 3	1	Multiplier	LD0.UDFCNT3.CntRs.actVal

Table 92: UDFCNT4: Up/Down Counter 4(UDFCNT4)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	193	Class 0	Yes	Counter 4	1	Multiplier	LD0.UDFCNT4.CntRs.actVal

Table 93: UDFCNT5: Up/Down Counter 5 (UDFCNT5)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	194	Class 0	Yes	Counter 5	1	Multiplier	LD0.UDFCNT5.CntRs.actVal

Table 94: UDFCNT6: Up/Down Counter 6(UDFCNT6)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	208	Class 0	Yes	Counter 6	1	Multiplier	LD0.UDFCNT6.CntRs.actVal

Table 95: UDFCNT7: Up/Down Counter 7(UDFCNT7)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	209	Class 0	Yes	Counter 7	1	Multiplier	LD0.UDFCNT7.CntRs.actVal

Table 96: UDFCNT8: Up/Down Counter 8(UDFCNT8)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	210	Class 0	Yes	Counter 8	1	Multiplier	LD0.UDFCNT8.CntRs.actVal

Table 97: UDFCNT9: Up/Down Counter 9 (UDFCNT9)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name

AI	211	Class 0	Yes	Counter 9	1	Multi plier	LD0.UDFCNT9.CntRs.actVal

Table 98: UDFCNT10: Up/Down Counter 10 (UDFCNT10)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	212	Class 0	Yes	Counter 10	1	Multi plier	LD0.UDFCNT10.CntRs.actVal

Table 99: UDFCNT11: Up/Down Counter 11 (UDFCNT11)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	213	Class 0	Yes	Counter 11	1	Multi plier	LD0.UDFCNT11.CntRs.actVal

Table 100: UDFCNT12: Up/Down Counter 12 (UDFCNT12)

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
AI	214	Class 0	Yes	Counter 12	1	Multi plier	LD0.UDFCNT12.CntRs.actVal

Table 101: Three-phase current measurement 1(CMSTA1)

DNP Object Type	No Event	Point Index	DNP Class	Enabled	Description	Scale Factor	IEC61850 Data Attribute Name
BI	Yes	141	Class 0	Yes	IA IB IC (1) Reset Max Demands		LD0.CMSTA1.RecRs.stVal
AI	Yes	36	Class 0	Yes	IA IB IC (1) Phase A Average Demands	100	LD0.CMSTA1.AvAmpsA.mag.f
AI	Yes	37	Class 0	Yes	IA IB IC (1) Phase A Maximum Demands	100	LD0.CMSTA1.MaxAmpsA.mag.f
AI	Yes	38	Class 0	Yes	IA IB IC (1) Phase B Average Demands	100	LD0.CMSTA1.AvAmpsB.mag.f
AI	Yes	39	Class 0	Yes	IA IB IC (1) Phase B Maximum Demands	100	LD0.CMSTA1.MaxAmpsB.mag.f
AI	Yes	40	Class 0	Yes	IA IB IC (1) Phase C Average Demands	100	LD0.CMSTA1.AvAmpsC.mag.f
AI	Yes	41	Class 0	Yes	IA IB IC (1) Phase C Maximum Demands	100	LD0.CMSTA1.MaxAmpsC.mag.f

2.2.2 DNP Binary Outputs

Table 102: DNP Binary Outputs

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BO	0		Yes	Reset Indications and Leds			LD0.LLN0.LEDRs1.Oper.ctlVal
BO	1		Yes	Reset Programmable Leds			LD0.LLN0.LEDRs2.Oper.ctlVal
BO	2		Yes	Reset Device			LD0.LPHD1.RsDev.Oper.ctlVal
BO	3		Yes	52CM-1 Reset Accumulation Energy			LD0.SPSCBR1.RsAccAPwr.Oper.ctlVal
BO	4		Yes	52CM-1 Reset Input For Cb Remaining Life And Operation Counter			LD0.SPSCBR1.RsCBWear.Oper.ctlVal
BO	5		Yes	52CM-1 Reset Recloser Travel Time 1			LD0.SPSCBR1.RsTrvTm.Oper.ctlVal
BO	6		Yes	52CM-1 Reset Spring Charging Time 1			LD0.SPSCBR1.RsSprChaTm.Oper.ctlVal
BO	7		Yes	79 Reset Recloser			LD0.SDARREC1.RsRec.Oper.ctlVal
BO	8		Yes	79 Reset Recloser Counters			LD0.SDARREC1.RsCnt.Oper.ctlVal
BO	12		Yes	X110-Output 1			LD0.XGGIO110.SPCSO1.Oper.ctlVal
BO	13		Yes	X110-Output 2			LD0.XGGIO110.SPCSO2.Oper.ctlVal
BO	14		Yes	X110-Output 3			LD0.XGGIO110.SPCSO3.Oper.ctlVal
BO	15		Yes	X110-Output 4			LD0.XGGIO110.SPCSO4.Oper.ctlVal
BO	16		Yes	X100-Output 1			LD0.XGGIO100.SPCSO1.Oper.ctlVal
BO	17		Yes	X100-Output 2			LD0.XGGIO100.SPCSO2.Oper.ctlVal
BO	18		Yes	X100-Output 3			LD0.XGGIO100.SPCSO3.Oper.ctlVal
BO	19		Yes	X100-Output 4			LD0.XGGIO100.SPCSO4.Oper.ctlVal
BO	20		Yes	X100-Output 5			LD0.XGGIO100.SPCSO5.Oper.ctlVal
BO	21		Yes	X100-Output 6			LD0.XGGIO100.SPCSO6.Oper.ctlVal
BO	22		Yes	reserved			reserved
BO	23		Yes	reserved			reserved
BO	24		Yes	reserved			reserved
BO	25		Yes	reserved			reserved
BO	26		Yes	reserved			reserved
BO	27		Yes	reserved			reserved
BO	28		Yes	reserved			reserved
BO	29		Yes	reserved			reserved
BO	30		Yes	reserved			reserved
BO	31		Yes	reserved			reserved
BO	32		Yes	reserved			reserved
BO	33		Yes	IA IB IC (1) Reset Max Demands			LD0.CMSTA1.RecRs.Oper.ctlVal
BO	35		Yes	Reset Fault Records			LD0.FLTMSTA1.RecRs.Oper.ctlVal
BO	36		Yes	R1 Reset Q1 - 1			LD0.SRGAPC1.Rs1.Oper.ctlVal
BO	37		Yes	R2 Reset Q2 - 1			LD0.SRGAPC1.Rs2.Oper.ctlVal
BO	38		Yes	R3 Reset Q3 - 1			LD0.SRGAPC1.Rs3.Oper.ctlVal
BO	39		Yes	R4 Reset Q4 - 1			LD0.SRGAPC1.Rs4.Oper.ctlVal
BO	40		Yes	R5 Reset Q5 - 1			LD0.SRGAPC1.Rs5.Oper.ctlVal

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BO	41		Yes	R6 Reset Q6 - 1			LD0.SRGAPC1.Rs6.Oper.ctlVal
BO	42		Yes	R7 Reset Q7 - 1			LD0.SRGAPC1.Rs7.Oper.ctlVal
BO	43		Yes	R8 Reset Q8 - 1			LD0.SRGAPC1.Rs8.Oper.ctlVal
BO	44		Yes	Reset Sp Gen. Purp. 1 Output 1			LD0.SPCGGIO1.SPCSO1.Oper.ctlVal
BO	45		Yes	Reset Sp Gen. Purp. 1 Output 2			LD0.SPCGGIO1.SPCSO2.Oper.ctlVal
BO	46		Yes	Reset Sp Gen. Purp. 1 Output 3			LD0.SPCGGIO1.SPCSO3.Oper.ctlVal
BO	47		Yes	Reset Sp Gen. Purp. 1 Output 4			LD0.SPCGGIO1.SPCSO4.Oper.ctlVal
BO	48		Yes	Reset Sp Gen. Purp. 1 Output 5			LD0.SPCGGIO1.SPCSO5.Oper.ctlVal
BO	49		Yes	Reset Sp Gen. Purp. 1 Output 6			LD0.SPCGGIO1.SPCSO6.Oper.ctlVal
BO	50		Yes	Reset Sp Gen. Purp. 1 Output 7			LD0.SPCGGIO1.SPCSO7.Oper.ctlVal
BO	51		Yes	Reset Sp Gen. Purp. 1 Output 8			LD0.SPCGGIO1.SPCSO8.Oper.ctlVal
BO	52		Yes	Reset Sp Gen. Purp. 1 Output 9			LD0.SPCGGIO1.SPCSO9.Oper.ctlVal
BO	53		Yes	Reset Sp Gen. Purp. 1 Output 10			LD0.SPCGGIO1.SPCSO10.Oper.ctlVal
BO	54		Yes	Reset Sp Gen. Purp. 1 Output 11			LD0.SPCGGIO1.SPCSO11.Oper.ctlVal
BO	55		Yes	Reset Sp Gen. Purp. 1 Output 12			LD0.SPCGGIO1.SPCSO12.Oper.ctlVal
BO	56		Yes	Reset Sp Gen. Purp. 1 Output 13			LD0.SPCGGIO1.SPCSO13.Oper.ctlVal
BO	57		Yes	Reset Sp Gen. Purp. 1 Output 14			LD0.SPCGGIO1.SPCSO14.Oper.ctlVal
BO	58		Yes	Reset Sp Gen. Purp. 1 Output 15			LD0.SPCGGIO1.SPCSO15.Oper.ctlVal
BO	59		Yes	Reset Sp Gen. Purp. 1 Output 16			LD0.SPCGGIO1.SPCSO16.Oper.ctlVal
BO	60		Yes	Reset Sp Gen. Purp. 2 Output 1			LD0.SPCGGIO2.SPCSO1.Oper.ctlVal
BO	61		Yes	Reset Sp Gen. Purp. 2 Output 2			LD0.SPCGGIO2.SPCSO2.Oper.ctlVal
BO	62		Yes	Reset Sp Gen. Purp. 2 Output 3			LD0.SPCGGIO2.SPCSO3.Oper.ctlVal
BO	63		Yes	Reset Sp Gen. Purp. 2 Output 4			LD0.SPCGGIO2.SPCSO4.Oper.ctlVal
BO	64		Yes	Reset Sp Gen. Purp. 2 Output 5			LD0.SPCGGIO2.SPCSO5.Oper.ctlVal
BO	65		Yes	Reset Sp Gen. Purp. 2 Output 6			LD0.SPCGGIO2.SPCSO6.Oper.ctlVal
BO	66		Yes	Reset Sp Gen. Purp. 2 Output 7			LD0.SPCGGIO2.SPCSO7.Oper.ctlVal
BO	67		Yes	Reset Sp Gen. Purp. 2 Output 8			LD0.SPCGGIO2.SPCSO8.Oper.ctlVal
BO	68		Yes	Reset Sp Gen. Purp. 2 Output 9			LD0.SPCGGIO2.SPCSO9.Oper.ctlVal
BO	69		Yes	Reset Sp Gen. Purp. 2 Output 10			LD0.SPCGGIO2.SPCSO10.Oper.ctlVal
BO	70		Yes	Reset Sp Gen. Purp. 2 Output 11			LD0.SPCGGIO2.SPCSO11.Oper.ctlVal
BO	71		Yes	Reset Sp Gen. Purp. 2 Output 12			LD0.SPCGGIO2.SPCSO12.Oper.ctlVal
BO	72		Yes	Reset Sp Gen. Purp. 2 Output 13			LD0.SPCGGIO2.SPCSO13.Oper.ctlVal
BO	73		Yes	Reset Sp Gen. Purp. 2 Output 14			LD0.SPCGGIO2.SPCSO14.Oper.ctlVal
BO	74		Yes	Reset Sp Gen. Purp. 2 Output 15			LD0.SPCGGIO2.SPCSO15.Oper.ctlVal
BO	75		Yes	Reset Sp Gen. Purp. 2 Output 16			LD0.SPCGGIO2.SPCSO16.Oper.ctlVal
BO	76		Yes	Start Battery Test			LD0.ZBAT1.BatTest.Oper.ctlVal
BO	77		Yes	Reset Ups Processor			LD0.ZBAT1.ResetUps.Oper.ctlVal
BO	80		Yes	X105-Output 1			LD0.XGGIO105.SPCSO1.Oper.ctlVal
BO	81		Yes	X105-Output 2			LD0.XGGIO105.SPCSO2.Oper.ctlVal
BO	82		Yes	X105-Output 3			LD0.XGGIO105.SPCSO3.Oper.ctlVal

DNP Object Type	Point Index	DNP Class	Enabled	Description	Scale Factor	Scale Type	IEC61850 Data Attribute Name
BO	83		Yes	X105-Output 4			LD0.XGGIO105.SPCSO4.Oper.ctlVal
BO	84		Yes	Enable Source1			LD0.DLCM1.Src1Enable.Oper.ctlVal
BO	85		Yes	Enable Source2			LD0.DLCM1.Src2Enable.Oper.ctlVal
BO	86		Yes	Reset Input			LD0.DLCM1.RstIn.Oper.ctlVal
BO	87		Yes	Switch General			CTRL.SCBCSWI1.Pos.Oper.ctlVal
BO	88		Yes	Switch Phase A			CTRL.SCBCSWI1.PosA.Oper.ctlVal
BO	89		Yes	Switch Phase B			CTRL.SCBCSWI1.PosB.Oper.ctlVal
BO	90		Yes	Switch Phase C			CTRL.SCBCSWI1.PosC.Oper.ctlVal
BO	91		Yes	Trig Recording			DR.RDRE1.RcdTrg.Oper.ctlVal
BO	92		Yes	Disturbance Records			DR.RDRE1.MemClr.Oper.ctlVal
BO	93		Yes	R1 Reset Q1 - 2			LD0.SRGAPC2.Rs1.Oper.ctlVal
BO	94		Yes	R2 Reset Q2 - 2			LD0.SRGAPC2.Rs2.Oper.ctlVal
BO	95		Yes	R3 Reset Q3 - 2			LD0.SRGAPC2.Rs3.Oper.ctlVal
BO	96		Yes	R4 Reset Q4 - 2			LD0.SRGAPC2.Rs4.Oper.ctlVal
BO	97		Yes	R5 Reset Q5 - 2			LD0.SRGAPC2.Rs5.Oper.ctlVal
BO	98		Yes	R6 Reset Q6 - 2			LD0.SRGAPC2.Rs6.Oper.ctlVal
BO	99		Yes	R7 Reset Q7 - 2			LD0.SRGAPC2.Rs7.Oper.ctlVal
BO	100		Yes	R8 Reset Q8 - 2			LD0.SRGAPC2.Rs8.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 103: Device profile document

DNP3 device profile document	
Vendor name:	ABB Inc.
Device name:	RER620
Highest DNP level supported: For requests: Level 2+ For responses: Level 2+	Device function: ○ Master • Slave
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.	
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: ○ None ○ Fixed • Configurable (0...65535)	Maximum application layer re-tries: • None ○ Configurable
Requires data link layer confirmation: ○ Never ○ Always ○ Sometimes • Configurable as: "Never", "Only for multi-frame messages", or "Always"	
Requires application layer confirmation: ○ Never ○ Always ○ When reporting event data (slave devices only) ○ When sending multi-fragment responses (slave devices only) ○ Sometimes	

DNP3 device profile document								
	•	Configurable as: "Only when reporting event data", or "When reporting event data or multi-fragment messages"						
Timeouts while waiting for:								
Data link confirm:	○	None	○	Fixed at ____	○	Variable	•	Configurable
Complete appl. fragment:	•	None	○	Fixed at ____	○	Variable	○	Configurable
Application confirm:	○	None	○	Fixed at ____	○	Variable	•	Configurable
Complete appl. response:	•	None	○	Fixed at ____	○	Variable	○	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:								
WRITE binary outputs	•	Never	○	Always	○	Sometimes	○	Configurable
SELECT/OPERATE	○	Never	○	Always	○	Sometimes	•	Configurable
DIRECT OPERATE	○	Never	○	Always	○	Sometimes	•	Configurable
DIRECT OPERATE - NO ACK	○	Never	○	Always	○	Sometimes	•	Configurable
Count > 1 (Count > 1 is accepted but ignored)	•	Never	○	Always	○	Sometimes	○	Configurable
Pulse on	•	Never	○	Always	○	Sometimes	○	Configurable
Pulse off	•	Never	○	Always	○	Sometimes	○	Configurable
Latch on	○	Never	•	Always	○	Sometimes	○	Configurable
Latch off	○	Never	•	Always	○	Sometimes	○	Configurable
Queue	•	Never	○	Always	○	Sometimes	○	Configurable
Clear queue	•	Never	○	Always	○	Sometimes	○	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:	
○	Never	○	Never
○	Only when time-tagged	○	Binary input change with time
○	Only non-time-tagged	○	Binary input change with relative time
•	Configurable to send one or the other	•	Configurable
Sends unsolicited responses:		**Sends static data in unsolicited responses:**	
○	Never	•	Never
•	Configurable	○	When device restarts

DNP3 device profile document					
○	Only certain objects	○	When status flags change		
○	Sometimes (attach explanation)				
•	ENABLE/DISABLE UNSOLICITED function codes supported	No other options are permitted.			
Default counter object/variation:		Counters roll over at:			
•	No counters reported	•	No counters reported		
○	Configurable	○	Configurable (attach explanation)		
○	Default object Default variation:	○	16 bits		
○	Point-by-point list attached	○	32 bits		
		○	Other value: _____		
		○	Point-by-point list attached		
Sends multi-fragment responses:					
•	Yes				
○	No				
○	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 relay 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 104: 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 (default) [1]	Binary input change with time	1 (read)	06 (no range, or all) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
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)

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
10	2 (default)	Binary output 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)
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)
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				

OBJECT			REQUEST (Library will parse)		RESPONSE (Library will respond with)	
50	1 (default)	Time and date	1 (read)	00, 01 (start-stop) 06 (no range, or all) 07 (limited qty = 1l) 08 (limited qty)	129 (response)	00, 01 (start-stop) 17, 28 (index)
			2 (write)	07 (limited qty = 1l)		
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	Unsynchronized 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.
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

615/620 series	Series of numerical relays for basic, inexpensive and simple protection and supervision applications of utility substations, and industrial switchgear and equipment
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 modeling
Relay	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 Relay Manager
PSM	Power supply module
SBO	Select-before-operate

stVal	Status value
Val	Value

Contact us

ABB Inc.
Distribution Automation
4300 Coral Ridge Drive
Coral Springs, FL 33065, USA
Phone:+1 (800) 523-2620
Phone:+1 954-752-6700
Fax:+1 954 345-5329
www.abb.com/substationautomation

Power and productivity
for a better world™