7SR210 Non-Directional Relay
7SR220 Directional Relay
IEC 61850 PIXIT
(Protocol Implementation Extra Information for Testing)

(Software Version 2435H85008R7a-7a) (7SR210)
(Software Version 2435H85009R7a-7a) (7SR220)

Description of the IEC61850 conformance test.

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Document Release History

This document is issue 2011/05. The list of revisions up to and including this issue is:

2011/05	First issue

Software Revision History

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1. PROTOCOL IMPLEMENTATION EXTRA INFORMATION FOR TESTING (PIXIT)

1.1 General

The EN100 is widely used within Siprotec 4 and has been chosen as the most cost effective option for adding IEC 61850 functionality to Reyrolle devices. This module offers the following major features:-

1. Peer to peer communications vie GOOSE message

2. A standardized browsable interface for discovery of communication functional capability

3. Abstract Communications Service Interface models including

    a. Association model

    b. Server model

    c. Data set model

    d. Substitution model

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1.2 Asso model

Description	Value / Clarification
Maximum number of clients that can set-up an association simultaneously	6
Lost connection detection time range (default range of TCP_KEEPALIVE is 1-20 seconds	20 seconds
Is authentications supported	N
What called association parameters are necessary for successful association ?	Transport selector Y Session selector Y Presentation selector Y AP Title ANY AE Qualifier ANY where Y means: as defined within the ICD-file ANY means: any value accepted
What is the typical startup time after a power supply interrupt ?	60 SECONDS

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1.3   Server model

Description	Value / Clarification
Which analogue value (MX) quality bits are supported (can be set by server) ?	Validity: Y Good, Y Invalid, N Reserved, Y Questionable Y Overflow Y OutofRange N BadReference N Oscillatory Y Failure Y OldData N Inconsistent Y Inaccurate Source: Y Process N Substituted Y Test Y OperatorBlocked
Which status value (ST) quality bits are supported (can be set by server) ?	Validity: Y Good, Y Invalid, N Reserved, Y Questionable N BadReference Y Oscillatory Y Failure Y OldData N Inconsistent N Inaccurate Source: Y Process Y Substituted Y Test Y OperatorBlocked
What is the maximum number of data values in one GetDataValues request ?	Not restricted; depends on the max. MMS PDU size given above.
What is the maximum number of data values in one SetDataValues request ?	Not restricted; depends on the max. MMS PDU size given above. No Data Attribute within our object directory is writable with the service SetDataValues.

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1.4   Data set model

Description	Value / Clarification
Maximum number of data elements in one data set	Not limited by an internal configuration parameter. It depends on the available memory.
How many persistent data sets can be created by one or more clients ?	64 data sets for each LD. It depends on the available memory.
How many non-persistent data sets can be created by one or more clients ?	10 data sets. It depends on the available memory.
additional items:	
Maximum number of data sets	Could not be defined, it depends on the available memory space. In principle, this information is not necessary from type conformance testing standpoint.

1.5   Substitution model

This service will not be supported (see also *Ethernet Module EN 100 IEC 61850 Electrical Interface 100 MBit, Manual /1/*).

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1.6   Setting group control model

Description	Value / Clarification
What is the number of supported setting groups for each logical device ?	Setting groups available for LLN0 only in LD PROT. The number of supported setting groups is 4..Specified in the ICD-File.
What is the effect of when and how the non-volatile storage is updated ? (compare IEC 61850-8-1 $16.2.4)	Just SelectActiveSG service will be supported according to PICS.

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1.7 Reporting model

Unbuffered Report

Description	Value / Clarification
The supported trigger conditions are	Y Integrity Y Data change Y Quality change Y Data update Y General Interrogation
The supported optional fields are	Y Sequence-number Y Report-time-stamp Y Reason-for-inclusion Y Data-set-name Y Data-reference N Buffer-overflow N EntryID Y Conf-rev Y Segmentation
Can the server send segmented reports ?	Y
Mechanism on second internal data change notification of the same analogue data value within buffer period (Compare IEC 61850-7-2 $14.2.2.9)	Send report immediately
Multi client URCB approach (Compare IEC 61850-7-2 $14.2.1)	All clients can access all URCB's
additional items:	
Interrupt of general interrogation	Running GI could not be interrupted. If a new GI request occurs during a running GI, the current GI will be finished first before the second GI request will be processed.
Integrity period	Configurable >=1 second;
Dynamic URCB reservation after an abort of the client/server association	Reservation of the URCB is lost. After a re-establishment of the association the URCB reservation has to be done by the client before. This behavior is implemented to avoid unnecessary memory residuals if temporarily client associations (e.g. for maintenance) are established.
Configured URCB reservation after an abort of the client/server association	Reservation of the URCB is not lost.

Buffered Report

Description	Value / Clarification
The supported trigger conditions are	Y Integrity Y Data change Y Quality change Y Data update Y General Interrogation
The supported optional fields are	Y Sequence-number Y Report-time-stamp Y Reason-for-inclusion Y Data-set-name Y Data-reference Y Buffer-overflow Y EntryID Y Conf-rev Y Segmentation
Can the server send segmented reports ?	Y

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Description	Value / Clarification
Mechanism on second internal data change notification of the same analogue data value within buffer period (Compare IEC 61850-7-2 $14.2.2.9)	Buffer the Entry Send report if the report is enabled
Multi client BRCB approach (Compare IEC 61850-7-2 $14.2.1)	All clients can access all BRCB's
What is the format of EntryID ?	First 2 Byte : Integer Last 6 Bytes: BTime6 time stamp
What is the buffer size for each BRCB or how many reports can be buffered ?	About 1 MB are available for the buffering. Each BRCB has an extension attribute Memory that display the percentage of those 1 MB that have been reserved/forseen for its own entries. Default amount 1 MB/(2*Number of logical devices)
additional items:	
Interrupt of general interrogation	Running GI could not be interrupted. If a new GI request occurs during a running GI, the current GI will be finished first before the second GI request will be processed.
Integrity period	Configurable >=1 second;
Dynamic BRCB reservation after an abort of the client/server association	Reservation of the BRCB has been fixed with TISSUE 453. The value of the attribute ResvTms delivers the time interval during which the reservation is still active after the connection has been lost. In case a BRCB is still reserved, and a client connects with the same IP address as the one used during the reservation, then the BRCB attribute can be written by this client without prior setting the ResvTms attribute as long as the reservation timer has not expired.
Configured BRCB reservation after an abort of the client/server association	Reservation of the BRCB is not lost for BRCBs that have been pre-associated to a specific client (pre-association defined with means of the ClientLN element with the BRCB instantiation in the SCD file). Reservation of a BRCB is lost for BRCBs, that have not been pre-associated to a specific client, after the expiration of the reservation timer set with the ResvTms attribute. In case ResvTms is not set (backward compatibility), ResvTms will get a default value for all preconfigured BRCBs that are not pre-associated to a specific client.
Optional use of a flow control for transmitting history of a BRCB	As specified in the IEC61850-7-2, transmission of entries may be required some times, depending of the amount of entries that have to be transmitted. Therefore, the device has an optional flow control feature to accelerate the transmission of the entries: each BRCB has an extended attribute MaxOutReports that can be set from the associated-client to change the transmmision strategy of the entries. The number ordered will then be transmitted as long as they exist in the buffer; the server then reset the attribute to 0 and wait for the client to set it again in order to continue the history transmission with MaxOutReports entries. The attribute only influences the flow control of entries while dealing with the history, and not after the history transmission has completed.

1.8   Logging model

This service will not be supported (see also *Ethernet Module EN 100 IEC 61850 Electrical Interface 100 MBit, Manual /1/*).

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1.9 Generic substation model

Description	Value / Clarification
What is the behavior when one subscribed GOOSE message isn't received or syntactically incorrect ?	The telegram will be discarded (i.e not forwarded to the application) since it is corrupt or syntactically incorrect and therefore not readable. The data objects will be declared as invalid after a timeout detection since no telegram have been received by the application.
What is the behavior when a subscribed GOOSE message is out-of-order ?	Error message will be stored into the error buffer (could be accessed by EN100 web-server). All expected data objects will be declared as invalid.
What is the behavior when a subscribed GOOSE message is duplicated ?	The sequence number given in the GOOSE-message is out-of-order. Error message will be stored into the error buffer (could be accessed by EN100 web-server). All expected data objects will be declared as invalid.
additional items:	
Maximum number of GOOSE messages which could be sent	<= 16 ; It depends on the available memory.
Maximum number of GOOSE messages which could be received	<= 128 ; It depends on the available memory.
Interpretation of GOOSE messages at subscriber side	1. Received GOOSE data objects without assigned quality attribute are interpreted as invalid. 2. Received GOOSE data objects which quality attribute are set to questionable are changed to invalid.
GOOSE subscriber behaviour in case of missing GOOSE messages	After a GOOSE multicast application association has been interrupted, the reception of the second consecutive GOOSE telegram is required to validate the state of this GOOSE association again. However, the IED tolerates a missing telegram as long as the next telegram (expected n, received n+1) is received within the time allowed to live time out detection (the time allowed to live timeout detection occurs after 2*TAL).
GOOSE subscriber behaviour in case of multiple GOOSE messages	If a message is received twice or more, the IED already reports an error after the second reception. Therefore, network configuration error can be more easily tracked.
What is the behavior when a GOOSE header parameter is mismatching with the expected one? (datSet, goID, confRev, numDatSetEntries, number of allData)	Error message will be stored into the error buffer (could be accessed by EN100 web-server). All expected data objects will be declared as invalid.
What is the behavior when a timeAllowedToLive is 0?	Error message will be stored into the error buffer (could be accessed by EN100 web-server) since the timeAllowedToLive expired. All expected data objects will be declared as invalid.
What is the behavior when there is an out-of-order entry in the allData?	The confRev attribute in the header guarantees that the allData entries are in the correct order. Therefore, it's necessary to check the confRev attribute. There is no chance to detect such an out-of-order.
What is the behavior when no telegram is received within a TAL timeout?	To avoid an incorrect timeout detection, the subscriber detects a timeout after a period of 2×TAL. The information is then declared as questionable, oldData.
What is the behavior when a GOOSE header parameter goCBRef is mismatching with the expected one?	Since the goCBRef shall be unique station wide, the received telegram with the mismatched goCBRef will be discarded: it has not been published. In that case only the timeout detection will set the data to invalid.
What is the behavior when a GOOSE header parameter APPID is mismatching with the expected one?	The APPID is a link layer parameter. It is used as a filter on link layer. If the APPID is mismatching, the telegram will therefore be discarded on link layer without notifying the application. Only the timeout detection will set the data to invalid.

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Description	Value / Clarification
What is the behavior when a GOOSE header parameter t is not increasing?	The t parameter is not checked. Therefore it doesn't lead to any error detection.
What is the behavior when numDatSetEntries and number of allData are inconsistent?	The telegram is discarded since it is corrupt (not well formed). After the timeout detection (no telegram forwarded to the application) the data objects are declared invalid.

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1.10   Transmission of sample values model

This service will not be supported.

1.11   Control model

Description	Value / Clarification
What control models are supported ?	Y Status-only Y Direct-with-normal-security N Sbo-with-normal-security Y Direct-with-enhanced-security Y Sbo-with-enhanced-security
Is Time activated operate (operTm) supported	N
What is the behavior when the test attribute is set in the SelectWithValue and/or Operate request ?	Will be acknowledged with negative response. The AddCause attribute will be set to "not supported"
What are the conditions for the time (T) attribute in the SelectWithValue and/or Operate request ?	Time attribute is not relevant.
Is "operate-many" supported ?	N
Is pulse configuration supported ?	N
What check conditions are supported ?	N Synchrocheck N Interlock-check "The interlock check is always performed irrespective of the Interlock check bit"
What service error types are supported ?	Y Instance-not-available Y Instance-in-use Y Access-violation Y Access-not-allowed-in-current-state Y Parameter-value-inappropriate Y Parameter-value-inconsistent Y Class-not-supported Y Instance-locked-by-other-client Y Control-must-be-selected Y Type-conflict Y Failed-due-to-communications Y Constraint failed-due-to-server-constraint
What additional cause diagnosis are supported ?	N Blocked-by-switching-hierarchy Y Select-failed Y Invalid-position Y Position-reached Y Parameter-change-in-execution Y Step-limit Y Blocked-by-Mode Y Blocked-by-process Y Blocked-by-interlocking Y Blocked-by-synchrocheck Y Command-already-in-execution N Blocked-by-health Y 1-of-n-control Y Abortion-by-cancel Y Time-limit-over N Abortion-by-trip Y Object-not-selected
additional items:	
What additional cause diagnosis extensions are supported ?	Y Plausibility_error Y Parameter_setting_invalid Y Hardware_error Y System_overload Y Internal_fault Y Command_sequence_error
Changing the control services by configuration	N
Inconsistency between Select and (Oper or cancel)	Operate or cancel will be acknowledged with negative response if inconsistencies to the select request are detected. The following attributes will not be checked in this case: T (Time)
Cancel request could be sent after an operate request.	Y
Format of the control time stamp attribute ?	TimeStamp instead of EntryTime acc. to the 7-2 Errata List.

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Description	Value / Clarification
Negative response for select request could be performed only	If test mode is activated or If the selection is always done.

Description	Value / Clarification

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1.12   Time and time synchronisation model

Description	Value / Clarification
What kind of quality bits are supported ?	N LeapSecondsKnown Y ClockFailure Y ClockNotSynchronized
What kind of quality accuracy bits are supported ?	Y Invalid N Unspecified
What is the behavior when the time synchronization signal/messages are lost ?	The quality attribute "ClockFailure" will be set to TRUE after a configured time period.
What is the behaviour when the time synchronisation messages indicate that the stratum is greater than 3?	A stratum with a value greater than 3 with the SNTP time synchronization messages indicates that the time server has a questionable synchronisation. It might also indicate that no GPS connection are available. Therefore the time quality attribute "ClockNotSynchronized" will be set to TRUE as long as the stratum content is greater than 3.
additional items:	
What is the behavior at start up time when a time synchronization via SNTP is configured ?	The "ClockNotSynchronized" attribute is set to TRUE as long as no time synchronization is established.

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1.13   File transfer model

Description	Value / Clarification
What is structure of files and directories?	Directory name / COMTRADE / *; Directory name / LD / *; Files according to the comtrade standard.
What is the resulting behavior if no file specification is present in the file directory request?	If no file specification is present in the directory request, all files are returned - not only the files in the root directory.
Is the IETF FTP protocol also implemented ?	N
Directory names are separated from the file name by	"/"
The maximum file name size including path (default 64 chars)	64
Are directory/file name case sensitive	Case sensitive
Maximum file size	Not limited by implementation or configuration. Depends on available memory.
additional items:	
Maximum number of clients that can use the FTP service simultaneously	1
Maximum number of files that can be accessed simultaneously	1

1.14   General items

Description	Value / Clarification
additional items:	
GOOSE Proxy object	To be able to subscribe Data over GOOSE, Proxy Objects are added into the object directory. Typically, they are Data of GGIO logical nodes: SPCSOxx, DPCSOxx. The Data Attributes of those Data are ctlVal, q and t. The control model associated to those Data is status-only. They are not controllable from an IEC61850 client, and their function is only to enable the GOOSE subscribing.

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1.15   TISSUES

Topic	TISSUE-No.	Link	Description	Impact of Interoper.
Object Model	120	http://www.tissue.iec61850.com/tissue.mspx?issueid=120	Type - Mod.stVal and Mod.ctlVal	-
	146	http://www.tissue.iec61850.com/tissue.mspx?issueid=146	CtxInt	-
	173	http://www.tissue.iec61850.com/tissue.mspx?issueid=173	Ctl modelling harmonization	-
	234	http://www.tissue.iec61850.com/tissue.mspx?issueid=234	New type CtxInt	x
Services	377	http://www.tissue.iec61850.com/tissue.mspx?issueid=377	DeleteDataSet response-	-
	276	http://www.tissue.iec61850.com/tissue.mspx?issueid=276	File Services Negative Responses	-
	183	http://www.tissue.iec61850.com/tissue.mspx?issueid=183	GetNameList error handling	x
	165	http://www.tissue.iec61850.com/tissue.mspx?issueid=165	Improper Error Response for GetDataSetValues	x
	116	http://www.tissue.iec61850.com/tissue.mspx?issueid=116	GetNameList with empty response?	x
Reporting	474	http://www.tissue.iec61850.com/tissue.mspx?issueid=474	GI for URCB	-
	453	http://www.tissue.iec61850.com/tissue.mspx?issueid=453	Reporting & Logging model revision	x
	438	http://www.tissue.iec61850.com/tissue.mspx?issueid=438	EntryTime base should be GMT	-
	349	http://www.tissue.iec61850.com/tissue.mspx?issueid=349	BRCB TimeOfEntry has two definitions	x
	348	http://www.tissue.iec61850.com/tissue.mspx?issueid=348	URCB class and report	x
	344	http://www.tissue.iec61850.com/tissue.mspx?issueid=344	TimeOfEntry misspelled	x
	335	http://www.tissue.iec61850.com/tissue.mspx?issueid=335	Clearing of Bufovfl	x
	332	http://www.tissue.iec61850.com/tissue.mspx?issueid=332	Ambiguity in use of trigger options	x
	329	http://www.tissue.iec61850.com/tissue.mspx?issueid=329	Reporting and BufOvl	x
	322	http://www.tissue.iec61850.com/tissue.mspx?issueid=322	Write Configuration attribute of BRCBs	
	301	http://www.tissue.iec61850.com/tissue.mspx?issueid=301	SqNum in Buffered Reports	-
	300	http://www.tissue.iec61850.com/tissue.mspx?issueid=300	Attribute Resv in BRCB	x
	298	http://www.tissue.iec61850.com/tissue.mspx?issueid=297	Type of SqNum	x
	297	http://www.tissue.iec61850.com/tissue.mspx?issueid=298	Sequence number	x
	278	http://www.tissue.iec61850.com/tissue.mspx?issueid=278	EntryId not valid for a server	x
	275	http://www.tissue.iec61850.com/tissue.mspx?issueid=275	Confusing statement on GI usage	x
	191	http://www.tissue.iec61850.com/tissue.mspx?issueid=191	BRCB: Integrity and buffering reports	x
	190	http://www.tissue.iec61850.com/tissue.mspx?issueid=190	BRCB: EntryId and TimeOfEntry	x
	177	http://www.tissue.iec61850.com/tissue.mspx?issueid=177	Ignoring OptFlds bits for URCB	-
	52	http://www.tissue.iec61850.com/tissue.mspx?issueid=52	Ambiguity GOOSE SqNum	x

Topic	TISSUE -No.	Link	Description	Impact of Interoper.
	49	http://www.tissue.iec61850.com/tissue.mspx?issueid=49BRCB TimeOfEntry?	Ambiguity GOOSE SqNum	x
Control Model	46	http://www.tissue.iec61850.com/tissue.mspx?issueid=46	Synchro check cancel	x
	44	http://www.tissue.iec61850.com/tissue.mspx?issueid=44	AddCause - Object not sel	x
	30	http://www.tissue.iec61850.com/tissue.mspx?issueid=30	control parameter T	x

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2. FUNCTION PARAMETERS 7SR220

Function	Element	LD	LN	DOI
		PROT	LLN0	
2.1 Phase Overcurrent	51-1	PROT	A51PTOC1	Mod, Beh, Health, NamPlt, Str, Op
	51-2	PROT	A51PTOC2	Mod, Beh, Health, NamPlt, Str, Op
	51-3	PROT	A51PTOC3	Mod, Beh, Health, NamPlt, Str, Op
	51-4	PROT	A51PTOC4	Mod, Beh, Health, NamPlt, Str, Op
	50-1	PROT	A50PTOC1	Mod, Beh, Health, NamPlt, Str, Op
	50-2	PROT	A50PTOC2	Mod, Beh, Health, NamPlt, Str, Op
	50-3	PROT	A50PTOC3	Mod, Beh, Health, NamPlt, Str, Op
	50-4	PROT	A50PTOC4	Mod, Beh, Health, NamPlt, Str, Op
2.2 Derived E/F	51N-1	PROT	A51nPTOC1	Mod, Beh, Health, NamPlt, Str, Op
	51N-2	PROT	A51nPTOC2	Mod, Beh, Health, NamPlt, Str, Op
	51N-3	PROT	A51nPTOC3	Mod, Beh, Health, NamPlt, Str, Op
	51N-4	PROT	A51nPTOC4	Mod, Beh, Health, NamPlt, Str, Op
	50N-1	PROT	A50nPTOC1	Mod, Beh, Health, NamPlt, Str, Op
	50N-2	PROT	A50nPTOC2	Mod, Beh, Health, NamPlt, Str, Op
	50N-3	PROT	A50nPTOC3	Mod, Beh, Health, NamPlt, Str,

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Function	Element	LD	LN	DOI
				Op
	50N-4	PROT	A50nPTOC4	Mod, Beh, Health, NamPlt, Str, Op
2.3 Measured E/F	51G-1	PROT	A51gPTOC1	Mod, Beh, Health, NamPlt, Str, Op
	51G-2	PROT	A51gPTOC2	Mod, Beh, Health, NamPlt, Str, Op
	51G-3	PROT	A51gPTOC3	Mod, Beh, Health, NamPlt, Str, Op
	51G-4	PROT	A51gPTOC4	Mod, Beh, Health, NamPlt, Str, Op
	50G-1	PROT	A50gPTOC1	Mod, Beh, Health, NamPlt, Str, Op
	50G-2	PROT	A50gPTOC2	Mod, Beh, Health, NamPlt, Str, Op
	50G-3	PROT	A50gPTOC3	Mod, Beh, Health, NamPlt, Str, Op
	50G-4	PROT	A50gPTOC4	Mod, Beh, Health, NamPlt, Str, Op
2.4 Sensitive E/F	51SEF-1	PROT	A51SefPTOC1	Mod, Beh, Health, NamPlt, Str, Op
	51SEF-2	PROT	A51SefPTOC2	Mod, Beh, Health, NamPlt, Str, Op
	51SEF-3	PROT	A51SefPTOC3	Mod, Beh, Health, NamPlt, Str, Op
	51SEF-4	PROT	A51SefPTOC4	Mod, Beh, Health, NamPlt, Str, Op
	50SEF-1	PROT	A51SefPTOC1	Mod, Beh, Health, NamPlt, Str, Op
	50SEF-2	PROT	A51SefPTOC2	Mod, Beh, Health, NamPlt, Str, Op
	50SEF-3	PROT	A51SefPTOC3	Mod, Beh,

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Function		Element	LD	LN	DOI
					Health, NamPlt, Str, Op
		50SEF-4	PROT	A51SefPTOC4	Mod, Beh, Health, NamPlt, Str, Op
2.5	**Restrictive E/F**	64H	PROT	A64hPTOC1	Mod, Beh, Health, NamPlt, Str, Op
2.6	**NPS Overcurrent**	46IT	PROT	A46ItPTOC1	Mod, Beh, Health, NamPlt, Str, Op
		46DT	PROT	A46DtPTOC1	Mod, Beh, Health, NamPlt, Str, Op
2.7	**Under Current**	37-1	PROT	A37PTUC1	Mod, Beh, Health, NamPlt, Str, Op
		37-2	PROT	A37PTUC2	Mod, Beh, Health, NamPlt, Str, Op
		37G-1	PROT	A37gPTUC1	Mod, Beh, Health, NamPlt, Str, Op
		37G-2	PROT	A37gPTUC2	Mod, Beh, Health, NamPlt, Str, Op
		37SEF-1	PROT	A37SefPTUC1	Mod, Beh, Health, NamPlt, Str, Op
		37SEF-2	PROT	A37SefPTUC2	Mod, Beh, Health, NamPlt, Str, Op
2.8	**Thermal Overload**	49	PROT	A49PTTR1	Mod, Beh, Health, NamPlt, Str, Op, AlmThm
2.9	**Phase U/O Voltage**	27/59-1	PROT	A2759PTOV1	Mod, Beh, Health, NamPlt, Str, Op
		27/59-2	PROT	A2759PTOV2	Mod, Beh, Health, NamPlt, Str, Op

Function	Element	LD	LN	DOI
	27/59-3	PROT	A2759PTOV3	Mod, Beh, Health, NamPlt, Str, Op
	27/59-4	PROT	A2759PTOV4	Mod, Beh, Health, NamPlt, Str, Op
	27/59-1	PROT	A2759PTUV1	Mod, Beh, Health, NamPlt, Str, Op
	27/59-2	PROT	A2759PTUV2	Mod, Beh, Health, NamPlt, Str, Op
	27/59-3	PROT	A2759PTUV3	Mod, Beh, Health, NamPlt, Str, Op
	27/59-4	PROT	A2759PTUV4	Mod, Beh, Health, NamPlt, Str, Op
2.10 NPS Over Voltage	47-1	PROT	A47PTOV1	Mod, Beh, Health, NamPlt, Str, Op
	47-2	PROT	A47PTOV2	Mod, Beh, Health, NamPlt, Str, Op
2.11 Neutral Over Voltage	59NIT	PROT	A59nItPTOV1	Mod, Beh, Health, NamPlt, Str, Op
	59NDT	PROT	A59nDtPTOV1	Mod, Beh, Health, NamPlt, Str, Op
2.12 U/O Frequency	81-1	PROT	A81PTOF1	Mod, Beh, Health, NamPlt, Str, Op
	81-2	PROT	A81PTOF2	Mod, Beh, Health, NamPlt, Str, Op
	81-3	PROT	A81PTOF3	Mod, Beh, Health, NamPlt, Str, Op
	81-4	PROT	A81PTOF4	Mod, Beh, Health, NamPlt, Str, Op
	81-5	PROT	A81PTOf5	Mod, Beh, Health,

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Function	Element	LD	LN	DOI
				NamPlt, Str, Op
	81-6	PROT	A81PTOF6	Mod, Beh, Health, NamPlt, Str, Op
	81-1	PROT	A81PTUF1	Mod, Beh, Health, NamPlt, Str, Op
	81-2	PROT	A81PTUF2	Mod, Beh, Health, NamPlt, Str, Op
	81-3	PROT	A81PTuF3	Mod, Beh, Health, NamPlt, Str, Op
	81-4	PROT	A81PTUF4	Mod, Beh, Health, NamPlt, Str, Op
	81-5	PROT	A81PTUF5	Mod, Beh, Health, NamPlt, Str, Op
	81-6	PROT	A81PTUF6	Mod, Beh, Health, NamPlt, Str, Op
2.13 Current Measurements				
	Ia	MEAS	MMXU1	A
	Ib	MEAS	MMXU1	A
	Ic	MEAS	MMXU1	A
	In	MEAS	MMXU1	A
	Ig	MEAS	MMXU1	A
	Vab	MEAS	MMXU1	PPV
2.14 Voltage Measurements				
	Vbc	MEAS	MMXU1	PPV
	Vca	MEAS	MMXU1	PPV
	Va	MEAS	MMXU1	PhV
	Vb	MEAS	MMXU1	PhV
	Vc	MEAS	MMXU1	PhV
	Vn	MEAS	MMXU1	PhV
	Frequency	MEAS	MMXU1	Hz
2.15 Frequency Measurement				

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Function		Element	LD	LN	DOI
2.16	**Power Measurements**	W phs A (P)	MEAS	MMXU1	W
		W phs B (P)	MEAS	MMXU1	W
		W phs C (P)	MEAS	MMXU1	W
		Total W (P)	MEAS	MMXU1	TotW
		VAr phs A (Q)	MEAS	MMXU1	VAr
		VAr phs B (Q)	MEAS	MMXU1	VAr
		VAr phs C (Q)	MEAS	MMXU1	VAr
		Total VAr (Q)	MEAS	MMXU1	TotVAr
		VA phs A (S)	MEAS	MMXU1	VA
		VA phs B (S)	MEAS	MMXU1	VA
		VA phs C (S)	MEAS	MMXU1	VA
		Total VA (S)	MEAS	MMXU1	TotVA
		PF phs A	MEAS	MMXU1	PF
		PF phs B	MEAS	MMXU1	PF
		PF phs C	MEAS	MMXU1	PF
		Total PF	MEAS	MMXU1	TotPF

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Function		Element	LD	LN	DOI
2.17	**User Single Point I/P Values**	SPi64GGIO	CTRL	SPi64GGIO1	Mod, Beh, Health, NamPlt, SPCSO1 SPCSO2 SPCSO3 SPCSO4 SPCSO5 SPCSO6 SPCSO7 SPCSO8 SPCSO9 SPCSO10 SPCSO11 SPCSO12 SPCSO13 SPCSO14 SPCSO15 SPCSO16 SPCSO17 SPCSO18 SPCSO19 SPCSO20 SPCSO21 SPCSO22 SPCSO23 SPCSO24 SPCSO25 SPCSO26 SPCSO27 SPCSO28 SPCSO29 SPCSO30 SPCSO31 SPCSO32 SPCSO33 SPCSO34 SPCSO35 SPCSO36 SPCSO37 SPCSO38 SPCSO39 SPCSO40 SPCSO41 SPCSO42 SPCSO43 SPCSO44 SPCSO45 SPCSO46 SPCSO47 SPCSO48 SPCSO49 SPCSO50 SPCSO51 SPCSO52 SPCSO53 SPCSO54 SPCSO55 SPCSO56 SPCSO57 SPCSO58 SPCSO59 SPCSO60 SPCSO61 SPCSO62 SPCSO63
Function		**Element**	**LD**	**LN**	**DOI**

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Function	Element	LD	LN	DOI
				SPCSO64
2.18 **User Single Point O/P Values**	SPo32GGIO	CTRL	SPo32GGIO1	Mod, Beh, Health, NamPlt, Ind1 Ind2 Ind3 Ind4 Ind5 Ind6 Ind7 Ind8 Ind9 Ind10 Ind11 Ind12 Ind13 Ind14 Ind15 Ind16 Ind17 Ind18 Ind19 Ind20 Ind21 Ind22 Ind23 Ind24 Ind25 Ind26 Ind27 Ind28 Ind29 Ind30 Ind31 Ind32
2.19 **User Double Point I/P Values**	DPi8GGIO1	CTRL	DPi8GGIO1	Mod, Beh, Health, NamPlt, DPCSO1 DPCSO2 DPCSO3 DPCSO4 DPCSO5 DPCSO6 DPCSO7 DPCSO8
	DPi8GGIO2	CTRL	DPi8GGIO2	Mod, Beh, Health, NamPlt, DPCSO1 DPCSO2 DPCSO3 DPCSO4 DPCSO5 DPCSO6 DPCSO7 DPCSO8

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Function		Element	LD	LN	DOI
2.20	**User Double Point O/P Values**	DPo8GGIO1	CTRL	DPo8GGIO1	Mod, Beh, Health, NamPlt, DPCSO1 DPCSO2 DPCSO3 DPCSO4 DPCSO5 DPCSO6 DPCSO7 DPCSO8
		DPo8GGIO2	CTRL	DPo8GGIO2	Mod, Beh, Health, NamPlt, DPCSO1 DPCSO2 DPCSO3 DPCSO4 DPCSO5 DPCSO6 DPCSO7 DPCSO8
2.21	**User Single Point Control Values**	SPDOns 1	CTRL	SPDOnsGGIO1	Mod, Beh, Health, NamPlt, SPCSO
		SPDOns 2	CTRL	SPDOnsGGIO2	Mod, Beh, Health, NamPlt, SPCSO
		SPDOns 3	CTRL	SPDOnsGGIO3	Mod, Beh, Health, NamPlt, SPCSO
		SPDOns 4	CTRL	SPDOnsGGIO4	Mod, Beh, Health, NamPlt, SPCSO
		SPDOes 1	CTRL	SPDOesGGIO1	Mod, Beh, Health, NamPlt, SPCSO
		SPDOes 2	CTRL	SPDOesGGIO2	Mod, Beh, Health, NamPlt, SPCSO
		SPDOes 3	CTRL	SPDOesGGIO3	Mod, Beh, Health, NamPlt, SPCSO
		SPDOes 4	CTRL	SPDOesGGIO4	Mod, Beh, Health, NamPlt, SPCSO
2.22	**User Double Point Control Values**	DPDOns 1	CTRL	DPDOnsGGIO1	Mod, Beh, Health, NamPlt, DPCSO
		DPDOns 2	CTRL	DPDOnsGGIO2	Mod, Beh, Health,

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Function	Element	LD	LN	DOI
				NamPlt, DPCSO
	DPDOns 3	CTRL	DPDOnsGGIO3	Mod, Beh, Health, NamPlt, DPCSO
	DPDOns 4	CTRL	DPDOnsGGIO4	Mod, Beh, Health, NamPlt, DPCSO
	DPDOes 1	CTRL	DPDOesGGIO1	Mod, Beh, Health, NamPlt, DPCSO
	DPDOes 2	CTRL	DPDOesGGIO2	Mod, Beh, Health, NamPlt, DPCSO
	DPDOes 3	CTRL	DPDOesGGIO3	Mod, Beh, Health, NamPlt, DPCSO
	DPDOes 4	CTRL	DPDOesGGIO4	Mod, Beh, Health, NamPlt, DPCSO
2.23 Binary I/P Status Values	BI13GGIO	CTRL	BI13GGIO1	Mod, Beh, Health, NamPlt, Ind1 Ind2 Ind3 Ind4 Ind5 Ind6 Ind7 Ind8 Ind9 Ind10 Ind11 Ind12 Ind13
2.24 Binary O/P Status Values	BO14GGIO	CTRL	BI13GGIO1	Mod, Beh, Health, NamPlt, Ind1 Ind2 Ind3 Ind4 Ind5 Ind6 Ind7 Ind8 Ind9 Ind10 Ind11 Ind12 Ind13 Ind14

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Function	Element	LD	LN	DOI
2.25 Quick Logic Equation Status Values	E16GGIO	CTRL	E16GGIO1	Mod, Beh, Health, NamPlt, Ind1 Ind2 Ind3 Ind4 Ind5 Ind6 Ind7 Ind8 Ind9 Ind10 Ind11 Ind12 Ind13 Ind14 Ind15 Ind16
2.26 LED Status Values	L16GGIO	CTRL	L16GGIO1	Mod, Beh, Health, NamPlt, Ind1 Ind2 Ind3 Ind4 Ind5 Ind6 Ind7 Ind8 Ind9 Ind10 Ind11 Ind12 Ind13 Ind14 Ind15 Ind16
2.27 Virtuals Status Values	V16GGIO	CTRL	V16GGIO1	Mod, Beh, Health, NamPlt, Ind1 Ind2 Ind3 Ind4 Ind5 Ind6 Ind7 Ind8 Ind9 Ind10 Ind11 Ind12 Ind13 Ind14 Ind15 Ind16

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3.   MAPPING

This section shows the mapping of the information relevant to the device to the Logical Node of protocol IEC61850. It is structured according to function. General information about IEC61850 mapping can be found in Chapter 2.

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3.1   Device (LPHD1)

LPHD1.Proxy

No	Information		
	Reset Device	0	1
PTOC*.Health.stVal		**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – DEVICE is not a PROXY
                        0 – OFF/FALSE   1 – DEVICE is a PROXY

LPHD1.Health

No	Information		
	Protection Healthy	0	1
PTOC*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                        0 – OFF/FALSE   2 – WARNING
                                                                  3 – ALARM

3.2   Overcurrent Protection 51-1, 51-2, 51-3 & 51-4 (A51PTOC1, A51PTOC2, A51PTOC3, A51PTOC4)

A51PTOC*.Mod

No	Information				
	Phase Overcurrent Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
A51PTOC*.Mod.stVal		**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                             0 – OFF/FALSE   2 – BLOCKED
                             x – Irrelevant   3 – TEST
                                                                         4 - TEST/BLOCKED
                                                                          5 – OFF

A51PTOC*.Health

No	Information		
	Protection Healthy	0	1
A51PTOC*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                             0 – OFF/FALSE   2 – WARNING
                                                                        3 – ALARM

A51PTOC*.Str

No	Information		
	Element Phase A picked up or Element Phase B picked up or Element Phase C picked up	0	1
A51PTOC*.Str.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                             0 – OFF/FALSE   1 - TRUE

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No	Information												
	Element Phase A picked up & Fwd Direction	x	1	1	0	0	0	0	1	0	0	1	0
	Element Phase A picked up & Rev Direction	x	x	x	1	0	0	1	0	0	0	0	0
	Element Phase B picked up & Fwd Direction	x	x	x	0	0	0	0	1	0	1	0	0
	Element Phase B picked up & Rev Direction	1	x	1	1	0	1	0	0	0	0	0	0
	Element Phase C picked up & Fwd Direction	1	x	x	0	0	0	0	1	1	0	0	0
	Element Phase C picked up & Rev Direction	x	1	x	1	1	0	0	0	0	0	0	0
A51PTOC*.Str.dirGeneral		**3**	**3**	**3**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
                      0 – OFF/FALSE   1 – FWD
                                                                2 – REV
                                                                3 – FWD & REV

No	Information		
	Element Phase A picked up	0	1
A51PTOC*.Str.phsA		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 - TRUE

No	Information			
	Element Phase A picked up & Fwd Direction	0	1	0
	Element Phase A picked up & Rev Direction	1	0	0
A51PTOC*.Str.dirPhsA		**2**	**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
                      0 – OFF/FALSE   1 – FWD
                                                                2 – REV

No	Information		
	Element Phase B picked up	0	1
A51PTOC*.Str.phsB		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 - TRUE

No	Information			
	Element Phase B picked up & Fwd Direction	0	1	0
	Element Phase B picked up & Rev Direction	1	0	0
A51PTOC*.Str.dirPhsB		**2**	**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
                      0 – OFF/FALSE   1 – FWD
                                                                2 – REV

No	Information		
	Element Phase C picked up	0	1
A51PTOC*.Str.phsC		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 - TRUE

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No	Information			
	Element Phase C picked up & Fwd Direction	0	1	0
	Element Phase C picked up & Rev Direction	1	0	0
A51PTOC*.Str.dirPhsC		**2**	**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
                              0 – OFF/FALSE   1 – FWD
                                                                       2 – REV

A51PTOC*.Op

No	Information		
	Element Operated	0	1
A51PTOC*.Op.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                              0 – OFF/FALSE   1 - TRUE

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3.3 Overcurrent Protection 50-1, 50-2, 50-3 & 50-4 (A50PTOC1, A50PTOC2, A50PTOC3, A50PTOC4)

A50PTOC*.Mod

No	Information				
	Phase Overcurrent Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
A50PTOC*.Mod.stVal		**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                       0 – OFF/FALSE   2 – BLOCKED
                       x – Irrelevant   3 – TEST
                                                                 4 - TEST/BLOCKED
                                                                 5 – OFF

A50PTOC*.Health

No	Information		
	Protection Healthy	0	1
A50PTOC*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                       0 – OFF/FALSE   2 – WARNING
                                                             3 – ALARM

A50PTOC*.Str

No	Information		
	Element Phase A picked up or Element Phase B picked up or Element Phase C picked up	0	1
A50PTOC*.Str.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                       0 – OFF/FALSE   1 - TRUE

No	Information											
	Element Phase A picked up & Fwd Direction	x	1	1	0	0	0	0	1	0	0	1	0
	Element Phase A picked up & Rev Direction	x	x	x	1	0	0	1	0	0	0	0	0
	Element Phase B picked up & Fwd Direction	x	x	x	0	0	0	0	1	0	1	0	0
	Element Phase B picked up & Rev Direction	1	x	1	1	0	1	0	0	0	0	0	0
	Element Phase C picked up & Fwd Direction	1	x	x	0	0	0	0	1	1	0	0	0
	Element Phase C picked up & Rev Direction	x	1	x	1	1	0	0	0	0	0	0	0
A50PTOC*.Str.dirGeneral		**3**	**3**	**3**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**0**

device annunciation:1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
                    0 – OFF/FALSE   1 – FWD
                                                                   2 – REV
                                                                   3 – FWD & REV

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No	Information		
	Element Phase A picked up	0	1
A50PTOC*.Str.phsA		**0**	**1**

device annunciation:1 – ON/TRUE   IEC61850 Value: 0 – FALSE
            0 – OFF/FALSE   1 - TRUE

No	Information			
	Element Phase A picked up & Fwd Direction	0	1	0
	Element Phase A picked up & Rev Direction	1	0	0
A50PTOC*.Str.dirPhsA		**2**	**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
               0 – OFF/FALSE   1 – FWD
                                                             2 – REV

No	Information		
	Element Phase B picked up	0	1
A50PTOC*.Str.phsB		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
               0 – OFF/FALSE   1 - TRUE

No	Information			
	Element Phase B picked up & Fwd Direction	0	1	0
	Element Phase B picked up & Rev Direction	1	0	0
A50PTOC*.Str.dirPhsB		**2**	**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
               0 – OFF/FALSE   1 – FWD
                                                    2 – REV

No	Information		
	Element Phase C picked up	0	1
A50PTOC*.Str.phsC		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
               0 – OFF/FALSE   1 - TRUE

No	Information			
	Element Phase C picked up & Fwd Direction	0	1	0
	Element Phase C picked up & Rev Direction	1	0	0
A50PTOC*.Str.dirPhsC		**2**	**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
             0 – OFF/FALSE   1 – FWD
                                                2 – REV

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A50PTOC*.Op

No	Information		
	Element Operated	0	1
A50PTOC*.Op.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 - TRUE

A50PTOC*.Op

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3.4 Derived E/F Protection 51N-1, 51N-2, 51N-3 & , 51N-4 (A51nPTOC1, A51nPTOC2, A51nPTOC3, A51nPTOC4)

A51nPTOC*.Mod

No	Information				
	Derived E/F Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
A51nPTOC*.Mod.stVal		**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
0 – OFF/FALSE   2 – BLOCKED
x – Irrelevant   3 – TEST
                                          4 - TEST/BLOCKED
                                          5 - OFF

A51nPTOC*.Health

No	Information		
	Protection Healthy	0	1
A51nPTOC*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
0 – OFF/FALSE   2 – WARNING
                                          3 - ALARM

A51nPTOC*.Str

No	Information		
	Element Picked up	0	1
A51nPTOC*.Str.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
0 – OFF/FALSE   1 – TRUE

No	Information			
	Element picked up & Fwd Direction	0	1	0
	Element picked up & Rev Direction	1	0	0
A51nPTOC*.Str.dirGeneral		**2**	**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
0 – OFF/FALSE   1 – FWD
                                      2 – REV

A51nPTOC*.Op

No	Information		
	Element Operated	0	1
A51nPTOC*.Op.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
0 – OFF/FALSE   1 - TRUE

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3.5 Derived E/F Protection 50N-1, 50N-2, 50N-3 & 50N-4 (A50nPTOC1, A50nPTOC2, A50nPTOC3, A50nPTOC4)

A50nPTOC*.Mod

No	Information				
	Derived E/F Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
A50nPTOC*.Mod.stVal		**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
0 – OFF/FALSE   2 – BLOCKED
x – Irrelevant   3 – TEST
                                                         4 - TEST/BLOCKED
                                                         5 - OFF

A50nPTOC*.Health

No	Information		
	Protection Healthy	0	1
A50nPTOC*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
0 – OFF/FALSE   2 – WARNING
                                                         3 - ALARM

A50nPTOC*.Str

No	Information		
	Element Picked up	0	1
A50nPTOC*.Str.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
0 – OFF/FALSE   1 – TRUE

No	Information			
	Element picked up & Fwd Direction	0	1	0
	Element picked up & Rev Direction	1	0	0
A50nPTOC*.Str.dirGeneral		**2**	**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
0 – OFF/FALSE   1 – FWD
                                                         2 – REV

A50nPTOC*.Op

No	Information		
	Element Operated	0	1
A50nPTOC*.Op.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
0 – OFF/FALSE   1 – TRUE

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3.6 Measured E/F Protection 51G-1, 51G-2, 51G-3 & 51G-4 (A51gPTOC1, A51gPTOC2, A51gPTOC3, A51gPTOC4)

A51gPTOC*.Mod

No	Information				
	Measured E/F Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
A51gPTOC*.Mod.stVal		**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                                0 – OFF/FALSE   2 – BLOCKED
                                x – Irrelevant   3 – TEST
                                                                               4 - TEST/BLOCKED
                                                                                 5 - OFF

A51gPTOC*.Health

No	Information		
	Protection Healthy	0	1
A51gPTOC*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                                0 – OFF/FALSE   2 – WARNING
                                                                             3 - ALARM

A51gPTOC*.Str

No	Information		
	Element Picked up	0	1
A51gPTOC*.Str.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                                0 – OFF/FALSE   1 - TRUE

No	Information			
	Element picked up & Fwd Direction	0	1	0
	Element picked up & Rev Direction	1	0	0
A51gPTOC*.Str.dirGeneral		**2**	**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
                                0 – OFF/FALSE   1 – FWD
                                                                             2 – REV

A51gPTOC*.Op

No	Information		
	Element Operated	0	1
A51gPTOC*.Op.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                                0 – OFF/FALSE   1 - TRUE

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3.7 Measured E/F Protection 50G-1, 50G-2, 50G-3 & 50G-4 (A50gPTOC1, A50gPTOC2, A50gPTOC3, A50gPTOC4)

A50gPTOC*.Mod

No	Information				
	Measured E/F Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
A50gPTOC*.Mod.stVal		**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                            0 – OFF/FALSE   2 – BLOCKED
                            x – Irrelevant   3 – TEST
                                                                                      4 - TEST/BLOCKED
                                                                                      5 - OFF

A50gPTOC*.Health

No	Information		
	Protection Healthy	0	1
A50gPTOC*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                            0 – OFF/FALSE   2 – WARNING
                                                                        3 - ALARM

A50gPTOC*.Str

No	Information		
	Element Picked up	0	1
A50gPTOC*.Str.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                            0 – OFF/FALSE   1 – TRUE

No	Information			
	Element picked up & Fwd Direction	0	1	0
	Element picked up & Rev Direction	1	0	0
A50gPTOC*.Str.dirGeneral		**2**	**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
                            0 – OFF/FALSE   1 – FWD
                                                                          2 – REV

A50gPTOC*.Op

No	Information		
	Element Operated	0	1
A50gPTOC*.Op.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                            0 – OFF/FALSE   1 - TRUE

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3.8   Sensitive E/F Protection 51SEF-1, 51SEF-2, 51SEF-3 & 51SEF-4 (A51SefPTOC1, A51SefPTOC2, A51SefPTOC3, A51SefPTOC4)

A51SefPTOC*.Mod

No	Information				
	Sensitive E/F Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
A51SefPTOC*.Mod.stVal		**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                                     0 – OFF/FALSE   2 – BLOCKED
                                     x – Irrelevant   3 – TEST
                                                                                                                4 - TEST/BLOCKED
                                                                                                                5 - OFF

A51SefPTOC*.Health

No	Information		
	Protection Healthy	0	1
A51SefPTOC*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                                     0 – OFF/FALSE   2 – WARNING
                                                                                                           3 - ALARM

A51SefPTOC*.Str

No	Information		
	Element Picked up	0	1
A51SefPTOC*.Str.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                                     0 – OFF/FALSE   1 – TRUE

No	Information			
	Element picked up & Fwd Direction	0	1	0
	Element picked up & Rev Direction	1	0	0
A51SefPTOC*.Str.dirGeneral		**2**	**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
                                     0 – OFF/FALSE   1 – FWD
                                                                                                                2 – REV

A51SefPTOC*.Op

No	Information		
	Element Operated	0	1
A51SefPTOC*.Op.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                                     0 – OFF/FALSE   1 – TRUE

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3.9 Sensitive E/F Protection 50SEF-1, 50SEF-2, 50SEF-3 & 50SEF-4 (A50SefPTOC1, A50SefPTOC2, A50SefPTOC3, A50SefPTOC4)

A50SefPTOC*.Mod

No	Information				
	Sensitive E/F Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
A50SefPTOC*.Mod.stVal		**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                      0 – OFF/FALSE   2 – BLOCKED
                      x – Irrelevant   3 – TEST
                                                                     4 - TEST/BLOCKED
                                                                     5 - OFF

A50SefPTOC*.Health

No	Information		
	Protection Healthy	0	1
A50SefPTOC*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                      0 – OFF/FALSE   2 – WARNING
                                                                     3 - ALARM

A50SefPTOC*.Str

No	Information		
	Element Picked up	0	1
A50SefPTOC*.Str.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 – TRUE

No	Information			
	Element picked up & Fwd Direction	0	1	0
	Element picked up & Rev Direction	1	0	0
A50SefPTOC*.Str.dirGeneral		**2**	**1**	**0**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – NO-DIR
                      0 – OFF/FALSE   1 – FWD
                                                                2 – REV

A50SefPTOC*.Op

No	Information		
	Element Operated	0	1
A50SefPTOC*.Op.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 – TRUE

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3.10   Restricted E/F Protection 64H (A64hPTOC1)

A64hPTOC1.Mod

No	Information				
	Restricted E/F Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
	A64hPTOC1.Mod.stVal	**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                        0 – OFF/FALSE   2 – BLOCKED
                        x – Irrelevant   3 – TEST
                                                                     4 - TEST/BLOCKED
                                                                     5 - OFF

A64hPTOC1.Health

No	Information		
	Protection Healthy	0	1
	A64hPTOC1.Health.stVal	**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                        0 – OFF/FALSE   2 – WARNING
                                                                 3 - ALARM

A64hPTOC1.Str

No	Information		
	Element Picked up	0	1
	A64hPTOC1.Str.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                        0 – OFF/FALSE   1 - TRUE

A64hPTOC1.Op

No	Information		
	Element Operated	0	1
	A64hPTOC1.Op.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                        0 – OFF/FALSE   1 - TRUE

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3.11 Negative Sequence Protection 46DT, 46IT (A46ItPTOC1, A46DtPTOC1)

PTOC*.Mod

No	Information				
	NPS Overcurrent Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
PTOC*.Mod.stVal		**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
0 – OFF/FALSE   2 – BLOCKED
x – Irrelevant   3 – TEST
                                                      4 - TEST/BLOCKED
                                                      5 - OFF

PTOC*.Health

No	Information		
	Protection Healthy	0	1
PTOC*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
0 – OFF/FALSE   2 – WARNING
                                                 3 - ALARM

PTOC*.Str

No	Information		
	Element Picked up	0	1
PTOC*.Str.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
0 – OFF/FALSE   1 - TRUE

PTOC*.Op

No	Information		
	Element Operated	0	1
PTOC*.Op.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
0 – OFF/FALSE   1 - TRUE

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3.12   Under Current Protection 37-1 & 37-2   (A37PTUC1, A37PTUC2)

A37PTUC*.Mod

No	Information				
	Under Current Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
A37PTUC*.Mod.stVal		**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
    0 – OFF/FALSE   2 – BLOCKED
    x – Irrelevant   3 – TEST
    4 - TEST/BLOCKED
    5 – OFF

A37PTUC*.Health

No	Information		
	Protection Healthy	0	1
A37PTUC*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
    0 – OFF/FALSE   2 – WARNING
    3 – ALARM

A37PTUC*.Str

No	Information		
	Element Phase A picked up or Element Phase B picked up or Element Phase C picked up	0	1
A37PTUC*.Str.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
    0 – OFF/FALSE   1 - TRUE

No	Information		
	Element Phase A picked up	0	1
A37PTUC*.Str.phsA		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
    0 – OFF/FALSE   1 - TRUE

No	Information		
	Element Phase B picked up	0	1
A37PTUC*.Str.phsB		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
    0 – OFF/FALSE   1 - TRUE

No	Information		
	Element Phase C picked up	0	1
A37PTUC*.Str.phsC		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
    0 – OFF/FALSE   1 - TRUE

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A37PTUC*.Op

No	Information		
	Element Operated	0	1
A37PTUC*.Op.general		**0**	**1**

device annunciation: 1 – ON/TRUE IEC61850 Value: 0 – FALSE
0 – OFF/FALSE 1 - TRUE

A37PTUC*.Op

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3.13   Under Current Protection 37G-1 & 37G2 (A37gPTUC1, A37gPTUC2)

A37gPTUC*.Mod

No	Information				
	Under Current Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
	A37gPTUC*.Mod.stVal	**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                         0 – OFF/FALSE   2 – BLOCKED
                         x – Irrelevant   3 – TEST
                                                                       4 - TEST/BLOCKED
                                                                       5 - OFF

A37gPTUC*.Health

No	Information		
	Protection Healthy	0	1
	A37gPTUC*.Health.stVal	**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                         0 – OFF/FALSE   2 – WARNING
                                                                       3 - ALARM

A37gPTUC*.Str

No	Information		
	Element Picked up	0	1
	A37gPTUC*.Str.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                         0 – OFF/FALSE   1 - TRUE

A37gPTUC*.Op

No	Information		
	Element Operated	0	1
	A37gPTUC*.Op.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                         0 – OFF/FALSE   1 - TRUE

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3.14 Under Current Protection 37SEF-1 & 37SEF-2 (A37SefPTUC1, A37SefPTUC2)

A37SefPTUC*.Mod

No	Information				
	Under Current Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
	A37SefPTUC*.Mod.stVal	**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                                0 – OFF/FALSE   2 – BLOCKED
                                x – Irrelevant   3 – TEST
                                                                            4 - TEST/BLOCKED
                                                                             5 - OFF

A37SefPTUC*.Health

No	Information		
	Protection Healthy	0	1
	A37SefPTUC*.Health.stVal	**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                                0 – OFF/FALSE   2 – WARNING
                                                                           3 - ALARM

A37SefPTUC*.Str

No	Information		
	Element Picked up	0	1
	A37SefPTUC*.Str.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                                0 – OFF/FALSE   1 - TRUE

A37SefPTUC*.Op

No	Information		
	Element Operated	0	1
	A37SefPTUC*.Op.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                                0 – OFF/FALSE   1 - TRUE

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3.15   Thermal Overload 49   (A49PTTR1)

A49PTTR1.Mod

No	Information				
	Thermal Overload Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
A49PTTR1.Mod.stVal		**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                         0 – OFF/FALSE   2 – BLOCKED
                         x – Irrelevant   3 – TEST
                                                                   4 - TEST/BLOCKED
                                                                   5 - OFF

A49PTTR1.Health

No	Information		
	Protection Healthy	0	1
A49PTTR1.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                         0 – OFF/FALSE   2 – WARNING
                                                                   3 - ALARM

A49PTTR1.Str

No	Information		
	Element Picked up	0	1
A49PTTR1.Str.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                         0 – OFF/FALSE   1 - TRUE

A49PTTR1.Op

No	Information		
	Element Operated	0	1
A49PTTR1.Op.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                         0 – OFF/FALSE   1 - TRUE

A49PTTR1.AlmThm

No	Information		
	Element Alarm	0	1
A49PTTR1.AlmThm.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                         0 – OFF/FALSE   1 - TRUE

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3.16 Phase Over Voltage Protection 27/59-1, 27/59-2, 27/59-3, 27/59-4 (A2759PTOV1, A2759PTOV2, A2759PTOV3, A2759PTOV4)

A2759PTOV*.Mod

No	Information				
	Phase U/O Voltage Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
A2759PTOV*.Mod.stVal		**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                      0 – OFF/FALSE   2 – BLOCKED
                      x – Irrelevant   3 – TEST
                                                            4 - TEST/BLOCKED
                                                            5 – OFF

A2759PTOV*.Health

No	Information		
	Protection Healthy	0	1
A2759PTOV*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                      0 – OFF/FALSE   2 – WARNING
                                                          3 – ALARM

A2759PTOV*.Str

No	Information		
	Element Phase A picked up or Element Phase B picked up or Element Phase C picked up	0	1
A2759PTOV*.Str.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 - TRUE

No	Information		
	Element Phase A picked up	0	1
A2759PTOV*.Str.phsA		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 - TRUE

No	Information		
	Element Phase B picked up	0	1
A2759PTOV*.Str.phsB		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 - TRUE

No	Information		
	Element Phase C picked up	0	1
A2759PTOV*.Str.phsC		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 - TRUE

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A2759PTOV*.Op

No	Information		
	Element Operated	0	1
A2759PTOV*.Op.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                        0 – OFF/FALSE   1 - TRUE

A2759PTOV*.Op

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3.17 Under Voltage Protection 27/59-1, 27/59-2, 27/59-3 & 27/59-4 (A2759PTUV1, A2759PTUV2, A2759PTUV3, A2759PTUV4)

A2759PTUV*.Mod

No	Information				
	Phase U/O Voltage Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
A2759PTUV*.Mod.stVal		**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                             0 – OFF/FALSE   2 – BLOCKED
                             x – Irrelevant   3 – TEST
                                                             4 - TEST/BLOCKED
                                                             5 – OFF

A2759PTUV*.Health

No	Information		
	Protection Healthy	0	1
A2759PTUV*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                             0 – OFF/FALSE   2 – WARNING
                                                          3 – ALARM

A2759PTUV*.Str

No	Information		
	Element Phase A picked up or Element Phase B picked up or Element Phase C picked up	0	1
A2759PTUV*.Str.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                             0 – OFF/FALSE   1 - TRUE

No	Information		
	Element Phase A picked up	0	1
A2759PTUV*.Str.phsA		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                             0 – OFF/FALSE   1 - TRUE

No	Information		
	Element Phase B picked up	0	1
A2759PTUV*.Str.phsB		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                             0 – OFF/FALSE   1 - TRUE

No	Information		
	Element Phase C picked up	0	1
A2759PTUV*.Str.phsC		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                             0 – OFF/FALSE   1 - TRUE

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A2759PTUV*.Op

No	Information		
	Element Operated	0	1
A2759PTUV*.Op.general		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                                      0 – OFF/FALSE   1 - TRUE

A2759PTUV*.Op

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3.18 Negative Sequence Voltage 47-1 & 47-2 (A47PTOV1, A47PTOV2)

A47PTOV*.Mod

No	Information				
	NPS Over Voltage Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
	A47PTOV*.Mod.stVal	**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                      0 – OFF/FALSE   2 – BLOCKED
                      x – Irrelevant   3 – TEST
                                                                   4 - TEST/BLOCKED
                                                                   5 - OFF

A47PTOV*.Health

No	Information		
	Protection Healthy	0	1
	A47PTOV*.Health.stVal	**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                      0 – OFF/FALSE   2 – WARNING
                                                             3 - ALARM

A47PTOV*.Str

No	Information		
	Element Picked up	0	1
	A37SefPTOV*.Str.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 - TRUE

A47PTOV*.Op

No	Information		
	Element Operated	0	1
	A37SefPTOV*.Op.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 - TRUE

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3.19 Neutral Overvoltage 59NIT & 59NDT (A59nltPTOV1, A59nDtPTOV1)

A59nltPTOV*.Mod

No	Information				
	Neutral Overvoltage Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
	A59nltPTOV*.Mod.stVal	**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                      0 – OFF/FALSE   2 – BLOCKED
                      x – Irrelevant   3 – TEST
                                                                   4 - TEST/BLOCKED
                                                                   5 - OFF

A59nltPTOV*.Health

No	Information		
	Protection Healthy	0	1
	A59nltPTOV*.Health.stVal	**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                      0 – OFF/FALSE   2 – WARNING
                                                            3 - ALARM

A59nltPTOV*.Str

No	Information		
	Element Picked up	0	1
	A59nltPTOV*.Str.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 - TRUE

A59nltPTOV*.Op

No	Information		
	Element Operated	0	1
	A59nltPTOV*.Op.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                      0 – OFF/FALSE   1 - TRUE

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A59nDtPTOV*.Mod

No	Information				
	Neutral Overvoltage Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
	A59nDtPTOV*.Mod.stVal	**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
0 – OFF/FALSE   2 – BLOCKED
x – Irrelevant   3 – TEST
4 - TEST/BLOCKED
5 - OFF

A59nDtPTOV*.Health

No	Information		
	Protection Healthy	0	1
	A59nDtPTOV*.Health.stVal	**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
0 – OFF/FALSE   2 – WARNING
3 - ALARM

A59nDtPTOV*.Str

No	Information		
	Element Picked up	0	1
	A59nDtPTOV*.Str.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
0 – OFF/FALSE   1 - TRUE

A59nDtPTOV*.Op

No	Information		
	Element Operated	0	1
	A59nDtPTOV*.Op.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
0 – OFF/FALSE   1 - TRUE

3.20 Under Frequency 81-1, 81-2, 81-3, 81-4, 81-5 & 81-6 (A81PTUF1, A81PTUF2, A81PTUF3, A81PTUF4, A81PTUF5 & A81PTUF6)

A81PTUF*.Mod

No	Information				
	U/O Frequency Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
	A81PTUF*.Mod.stVal	**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                                     0 – OFF/FALSE   2 – BLOCKED
                                     x – Irrelevant   3 – TEST
                                                                                                   4 - TEST/BLOCKED
                                                                                                   5 - OFF

A81PTUF*.Health

No	Information		
	Protection Healthy	0	1
	A81PTUF*.Health.stVal	**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                                     0 – OFF/FALSE   2 – WARNING
                                                                                                   3 - ALARM

A81PTUF*.Str

No	Information		
	Element Picked up	0	1
	A81PTUF*.Str.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                                     0 – OFF/FALSE   1 - TRUE

A81PTUF*.Op

No	Information		
	Element Operated	0	1
	A81PTUF*.Op.general	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – FALSE
                                     0 – OFF/FALSE   1 - TRUE

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3.21 Over Frequency 81-1, 81-2, 81-3, 81-4, 81-5 & 81-6 (A81PTOF1, A81PTOF2, A81PTOF3, A81PTOF4, A81PTOF5 & A81PTOF6)

A81PTOF*.Mod

No	Information				
	U/O Frequency Enabled (Function Config)	x	0	x	1
	Element Disabled	1	0	0	0
	Element Inhibited	x	x	1	0
	A81PTOF*.Mod.stVal	**5**	**2**	**2**	**1**

device annunciation: 1 – ON/TRUE IEC61850 Value: 1 – ON
0 – OFF/FALSE 2 – BLOCKED
x – Irrelevant 3 – TEST
4 - TEST/BLOCKED
5 - OFF

A81PTOF*.Health

No	Information		
	Protection Healthy	0	1
	A81PTOF*.Health.stVal	**3**	**1**

device annunciation: 1 – ON/TRUE IEC61850 Value: 1 – OK
0 – OFF/FALSE 2 – WARNING
3 - ALARM

A81PTOF*.Str

No	Information		
	Element Picked up	0	1
	A81PTOF*.Str.general	**0**	**1**

device annunciation: 1 – ON/TRUE IEC61850 Value: 0 – FALSE
0 – OFF/FALSE 1 - TRUE

A81PTOF*.Op

No	Information		
	Element Operated	0	1
	A81PTOF*.Op.general	**0**	**1**

device annunciation: 1 – ON/TRUE IEC61850 Value: 0 – FALSE
0 – OFF/FALSE 1 - TRUE

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Measurement (MMXU1)

MMXU1.Mod

No	Information	
	Reset Device	x
MMXU1.Mod.stVal		**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                                        0 – OFF/FALSE   2 – WARNING
                                          x - irrelevant   3 - ALARM

MMXU.Health

No	Information		
	Protection Healthy	0	1
PTOC*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                                          0 – OFF/FALSE   2 – WARNING
                                                                      3 - ALARM

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MMXU1.TotW

No	Information	Value		
	Active Power (P =)	MMXU1.TotW.mag.f	Measured Value	Value
		MMXU1.TotW.units.SIunit	62	W (Watt)
		MMXU1.TotW.units.multiplier	0	1

MMXU1.TotVAr

No	Information	Value		
	Reactive Power (Q =)	MMXU1.TotVAr.mag.f	Measured Value	Value
		MMXU1.TotVAr.units.SIunit	63	VAr
		MMXU1.TotVAr.units.multiplier	0	1

MMXU1.TotVA

No	Information	Value		
	Apparent Power (S =)	MMXU1.TotVA.mag.f	Measured Value	Value
		MMXU1.TotVA.units.SIunit	61	VA
		MMXU1.TotVA.units.multiplier	0	1

MMXU1.TotPF

No	Information	Value		
	Power Factor (PF =)	MMXU1.TotPF.mag.f	Measured Value	Value
		MMXU1.TotPF.units.SIunit	1	none
		MMXU1.TotPF.units.multiplier	0	1

MMXU1.Hz

No	Information	Value		
	Frequency (Freq =)	MMXU1.Hz.mag.f	Measured Value	Value
		MMXU1.Hz.units.SIunit	33	Hz
		MMXU1.Hz.units.multiplier	0	1

MMXU1.PPV

No	Information	Value		
	Va-b (Vab =)	MMXU1.PPV.phsAB.cVal.mag.f	Measured Value	Value
		MMXU1.PPV.phsAB.units.SIunit	29	V
		MMXU1.PPV.phsAB.units.multiplier	0	1

No	Information	Value		
	Vb-c (Vbc =)	MMXU1.PPV.phsBC.cVal.mag.f	Measured Value	Value
		MMXU1.PPV.phsBC.units.SIunit	29	V
		MMXU1.PPV.phsBC.units.multiplier	0	1

No	Information	Value		
	Vc-a (Vca =)	MMXU1.PPV.phsCA.cVal.mag.f	Measured Value	Value
		MMXU1.PPV.phsCA.units.SIunit	29	V
		MMXU1.PPV.phsCA.units.multiplier	0	1

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MMXU1.PhV

No	Information	Value		
	Va (Va =)	MMXU1.PhV.phsA.cVal.mag.f	Measured Value	Value
		MMXU1.PhV.phsA.cVal.ang.f	Measured Value	Value
		MMXU1.PhV.phsA.units.SIunit	29	V
		MMXU1.PhV.phsA.units.multiplier	0	1

No	Information	Value		
	Vb (Vb =)	MMXU1.PhV.phsB.cVal.mag.f	Measured Value	Value
		MMXU1.PhV.phsB.cVal.ang.f	Measured Value	Value
		MMXU1.PhV.phsB.units.SIunit	29	V
		MMXU1.PhV.phsB.units.multiplier	0	1

No	Information	Value		
	Vc (Vc =)	MMXU1.PhV.phsC.cVal.mag.f	Measured Value	Value
		MMXU1.PhV.phsC.cVal.ang.f	Measured Value	Value
		MMXU1.PhV.phsC.units.SIunit	29	V
		MMXU1.PhV.phsC.units.multiplier	0	1

No	Information	Value		
	Vneut (Vneut =)	MMXU1.PhV.neut.cVal.mag.f	Measured Value	Value
		MMXU1.PhV.neut.cVal.ang.f	Measured Value	Value
		MMXU1.PhV.neut.units.SIunit	29	V
		MMXU1.PhV.neut.units.multiplier	0	1

No	Information	Value		
	Vres (Vres =)	MMXU1.PhV.res.cVal.mag.f	Measured Value	Value
		MMXU1.PhV.res.cVal.ang.f	Measured Value	Value
		MMXU1.PhV.res.units.SIunit	29	V
		MMXU1.PhV.res.units.multiplier	0	1

MMXU1.PhV

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MMXU1.A

No	Information	Value		
	Ia (Ia =)	MMXU1.A.phsA.cVal.mag.f	Measured Value	Value
		MMXU1.A.phsA.cVal.ang.f	Measured Value	Value
		MMXU1.A.phsA.units.SIunit	5	A
		MMXU1.A.phsA.units.multiplier	0	1

No	Information	Value		
	Ib (Ib =)	MMXU1.A.phsB.cVal.mag.f	Measured Value	Value
		MMXU1.A.phsB.cVal.ang.f	Measured Value	Value
		MMXU1.A.phsB.units.SIunit	5	A
		MMXU1.A.phsB.units.multiplier	0	1

No	Information	Value		
	Ic (Ic =)	MMXU1.A.phsC.cVal.mag.f	Measured Value	Value
		MMXU1.A.phsC.cVal.ang.f	Measured Value	Value
		MMXU1.A.phsC.units.SIunit	5	A
		MMXU1.A.phsC.units.multiplier	0	1

No	Information	Value		
	Ineut (Ineut =)	MMXU1.A.neut.cVal.mag.f	Measured Value	Value
		MMXU1.A.neut.cVal.ang.f	Measured Value	Value
		MMXU1.A.neut.units.SIunit	5	A
		MMXU1.A.neut.units.multiplier	0	1

No	Information	Value		
	Ires (Ires =)	MMXU1.A.res.cVal.mag.f	Measured Value	Value
		MMXU1.A.res.cVal.ang.f	Measured Value	Value
		MMXU1.A.res.units.SIunit	5	A
		MMXU1.A.res.units.multiplier	0	1

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MMXU1.W

No	Information	Value		
	Active Power (P =) Phase A	MMXU1.W.phsA.cVal.mag.f	Measured Value	Value
		MMXU1.W.phsA.units.SIunit	62	W
		MMXU1.W.phsA.units.multiplier	0	1

No	Information	Value		
	Active Power (P =) Phase B	MMXU1.W.phsB.cVal.mag.f	Measured Value	Value
		MMXU1.W.phsB.units.SIunit	62	W
		MMXU1.W.phsB.units.multiplier	0	1

No	Information	Value		
	Active Power (P =) Phase C	MMXU1.A.phsC.cVal.mag.f	Measured Value	Value
		MMXU1.A.phsC.units.SIunit	62	W
		MMXU1.A.phsC.units.multiplier	0	1

MMXU1.VAr

No	Information	Value		
	Reactive Power (Q =) Phase A	MMXU1.VAr.phsA.cVal.mag.f	Measured Value	Value
		MMXU1.VAr.phsA.units.SIunit	63	VAr
		MMXU1.VAr.phsA.units.multiplier	0	1

No	Information	Value		
	Reactive Power (Q =) Phase B	MMXU1.VAr.phsB.cVal.mag.f	Measured Value	Value
		MMXU1.VAr.phsB.units.SIunit	63	VAr
		MMXU1.Var.phsB.units.multiplier	0	1

No	Information	Value		
	Reactive Power (Q =) Phase C	MMXU1.VAr.phsC.cVal.mag.f	Measured Value	Value
		MMXU1.VAr.phsC.units.SIunit	63	VAr
		MMXU1.VAr.phsC.units.multiplier	0	1

MMXU1.W

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MMXU1.VA

No	Information	Value		
	Apparent Power (S =) Phase A	MMXU1.VA.phsA.cVal.mag.f	Measured Value	Value
		MMXU1.VA.phsA.units.SIunit	61	VAr
		MMXU1.VA.phsA.units.multiplier	0	1

No	Information	Value		
	Apparent Power (S =) Phase B	MMXU1.VA.phsB.cVal.mag.f	Measured Value	Value
		MMXU1.VA.phsB.units.SIunit	61	VAr
		MMXU1.VarphsB.units.multiplier	0	1

No	Information	Value		
	Apparent Power (S =) Phase C	MMXU1.VA.phsC.cVal.mag.f	Measured Value	Value
		MMXU1.VA.phsC.units.SIunit	61	VAr
		MMXU1.VA.phsC.units.multiplier	0	1

MMXU1.PF

No	Information	Value		
	Power Factor (PF =) Phase A	MMXU1.PF.phsA.cVal.mag.f	Measured Value	Value
		MMXU1.PF.phsA.units.SIunit	1	None
		MMXU1.PF.phsA.units.multiplier	0	1

No	Information	Value		
	Power Factor (PF =) Phase B	MMXU1.PF.phsB.cVal.mag.f	Measured Value	Value
		MMXU1.PF.phsB.units.SIunit	1	None
		MMXU1.PF.phsB.units.multiplier	0	1

No	Information	Value		
	Power Factor (PF =) Phase C	MMXU1.PF.phsC.cVal.mag.f	Measured Value	Value
		MMXU1.PF.phsC.units.SIunit	1	none
		MMXU1.PF.phsC.units.multiplier	0	1

3.22   User Single Point GGIO Inputs (SPi64GGIO1)

SPi64GGIO1.Mod

No	Information	
	Reset Device	x
SPi64GGIO1.Mod.stVal		**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                        0 – OFF/FALSE   2 – BLOCKED
                        x – Irrelevant   3 – TEST
                                                                     4 - TEST/BLOCKED
                                                                     5 - OFF

SPi64GGIO1.Health

No	Information		
	Protection Healthy	0	1
SPi64GGIO64.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                        0 – OFF/FALSE   2 – WARNING
                                                                     3 - ALARM

SPi64GGIO1.SPCSO*

No	Information		
	SPi64GGIO1 SPCSO*	0	1
SPi64GGIO64.SPCSO*.ctlVal		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – OFF
                        0 – OFF/FALSE   1 - ON
                            * Values of 1 to 64

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3.23   User Single Point GGIO Outputs (SPo32GGIO1)

SPo32GGIO1.Mod

No	Information	
	Reset Device	x
SPo32GGIO1.Mod.stVal		**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
    0 – OFF/FALSE   2 – BLOCKED
    x – Irrelevant   3 – TEST
    4 - TEST/BLOCKED
    5 - OFF

SPo32GGIO32.Health

No	Information		
	Protection Healthy	0	1
SPo32GGIO1.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
    0 – OFF/FALSE   2 – WARNING
    3 - ALARM

SPo32GGIO1.Ind*

No	Information		
	SPo32GGIO1 Ind*	0	1
SPo32GGIO1.Ind*.stVal		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – OFF
    0 – OFF/FALSE   1 - ON
    Values of 1 to 32

3.24 User Single Point GGIO Control Elements (Normal Security) (SPDOnsGGIO1, SPDOnsGGIO2, SPDOnsGGIO3, SPDOnsGGIO4)

SPDOnsGGIO*.Mod

No	Information	
	Reset Device	x
	SPDOnsGGIO*.Mod.stVal	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                            0 – OFF/FALSE   2 – BLOCKED
                            x – Irrelevant   3 – TEST
                                                                        4 - TEST/BLOCKED
                                                                         5 - OFF

SPDOnsGGIO*.Health

No	Information		
	Protection Healthy	0	1
	SPDOnsGGIO*.Health.stVal	**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                            0 – OFF/FALSE   2 – WARNING
                                                                  3 - ALARM

SPDOnsGGIO*.SPCSO

No	Information		
	SPDOns (OFF/OPEN)	1	-
	SPDOns (ON/CLOSE)	-	1
	SPDOnsGGIO*.SPCSO.ctlVal	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – OFF
                            0 – OFF/FALSE   1 - ON

No	Information		
	SPDOns Status (ON/CLOSED)	0	1
	SPDOnsGGIO*.SPCSO.stVal	**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – OFF
                            0 – OFF/FALSE   1 - ON
                            * Values of 1 to 4

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3.25 User Single Point GGIO Control Elements (Enhanced Security) (SPDOesGGIO1, SPDOesGGIO2, SPDOesGGIO3, SPDOesGGIO4)

SPDOesGGIO*.Mod

No	Information	
	Reset Device	x
SPDOesGGIO*.Mod.stVal		**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                                      0 – OFF/FALSE   2 – BLOCKED
                                      x – Irrelevant   3 – TEST
                                                                                                     4 - TEST/BLOCKED
                                                                                                     5 - OFF

SPDOesGGIO*.Health

No	Information		
	Protection Healthy	0	1
SPDOesGGIO*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                                      0 – OFF/FALSE   2 – WARNING
                                                                                                     3 - ALARM

SPDOesGGIO*.SPCSO

No	Information		
	SPDOes (OFF/OPEN)	1	-
	SPDOes (ON/CLOSE)	-	1
SPDOesGGIO*.SPCSO.ctlVal		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – OFF
                                      0 – OFF/FALSE   1 - ON

No	Information		
	SPDOes Status (ON/CLOSED)	0	1
SPDOesGGIO*.SPCSO.stVal		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – OFF
                                      0 – OFF/FALSE   1 - ON
                                      * Values of 1 to 4

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3.26 User Double Point GGIO Control Elements (Normal Security) (DPDOnsGGIO1, DPDOnsGGIO2, DPDOnsGGIO3, DPDOnsGGIO4)

DPDOnsGGIO*.Mod

No	Information	
	Reset Device	x
DPDOnsGGIO*.Mod.stVal		**1**

device annunciation:
1 – ON/TRUE   IEC61850 Value: 1 – ON
0 – OFF/FALSE   2 – BLOCKED
x – Irrelevant   3 – TEST
                                                   4 - TEST/BLOCKED
                                                   5 - OFF

DPDOnsGGIO*.Health

No	Information		
	Protection Healthy	0	1
DPDOnsGGIO*.Health.stVal		**3**	**1**

device annunciation:
1 – ON/TRUE   IEC61850 Value: 1 – OK
0 – OFF/FALSE   2 – WARNING
                                                   3 - ALARM

DPDOnsGGIO*.DPCSO

No	Information		
	DPDOns (OFF/OPEN)	1	-
	DPDOns (ON/CLOSE)	-	1
DPDOnsGGIO*.DPCSO.ctlVal		**0**	**1**

device annunciation:
1 – ON/TRUE   IEC61850 Value: 0 – OFF
0 – OFF/FALSE   1 - ON

No	Information				
	DPDOns Status (OFF/OPEN)	0	1	0	1
	DPDOns Status (ON/CLOSED)	0	0	1	1
DPDOnsGGIO*.DPCSO.stVal		**00**	**01**	**10**	**11**

device annunciation:
1 – ON/TRUE   IEC61850 Value: 00 - INTERMEDIATE STATE
0 – OFF/FALSE   01 – OFF
                                                   10 – ON
                                                   11 - INVALID STATE (DBI)

* Values of 1 to 4

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3.27 User Double Point GGIO Control Elements (Enhanced Security) (DPDOesGGIO1, DPDOesGGIO2, DPDOesGGIO3, DPDOesGGIO4)

DPDOesGGIO*.Mod

No	Information	
	Reset Device	x
DPDOesGGIO*.Mod.stVal		**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                       0 – OFF/FALSE   2 – BLOCKED
                       x – Irrelevant   3 – TEST
                                                     4 - TEST/BLOCKED
                                                       5 - OFF

DPDOesGGIO*.Health

No	Information		
	Protection Healthy	0	1
DPDOesGGIO*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                       0 – OFF/FALSE   2 – WARNING
                                                      3 - ALARM

DPDOesGGIO*.DPCSO

No	Information		
	DPDOes (OFF/OPEN)	1	-
	DPDOes (ON/CLOSE)	-	1
DPDOesGGIO*.DPCSO.ctlVal		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – OFF
                       0 – OFF/FALSE   1 - ON

No	Information				
	DPDOes Status (OFF/OPEN)	0	1	0	1
	DPDOes Status (ON/CLOSED)	0	0	1	1
DPDOesGGIO*.DPCSO.stVal		**00**	**01**	**10**	**11**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 00 - INTERMEDIATE STATE
                       0 – OFF/FALSE   01 – OFF
                                                     10 – ON
                                                     11 - INVALID STATE (DBI)

* Values of 1 to 4

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3.28   User Double Point GGIO Input (DPi8GGIO1, DPi8GGIO2)

DPi8GGIO1.Mod

No	Information	
	Reset Device	x
DPi8GGIO*.Mod.stVal		**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                         0 – OFF/FALSE   2 – BLOCKED
                         x – Irrelevant   3 – TEST
                                                                      4 - TEST/BLOCKED
                                                                      5 - OFF

DPi8GGIO1.Health

No	Information		
	Protection Healthy	0	1
DPi8GGIO*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                         0 – OFF/FALSE   2 – WARNING
                                                                      3 - ALARM

DPi8GGIO1.DPCSO

	Information		
	DPI8GGIO1 DPCSO* (OFF/OPEN)	1	-
	DPI8GGIO1 DPCSO* (ON/CLOSE)	-	1
DPi8GGIO*.DPCSO.ctlVal		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – OFF
                         0 – OFF/FALSE   1 - ON
                         Values of 1 to 8

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3.29   User Double Point GGIO Output (DPo8GGIO1, DPo8GGIO2)

DPo8GGIO1.Mod

No	Information	
	Reset Device	x
GGIO*.Mod.stVal		**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                       0 – OFF/FALSE   2 – BLOCKED
                       x – Irrelevant   3 – TEST
                                            4 - TEST/BLOCKED
                                            5 - OFF

DPoGGIO1.Health

No	Information		
	Protection Healthy	0	1
GGIO*.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                       0 – OFF/FALSE   2 – WARNING
                                            3 - ALARM

DPoGGIO1.DPCSO

No	Information				
	DPo8GGIO1 DPCSO* (OFF/OPEN)	0	1	0	1
	DPo8GGIO1 DPCSO* (ON/CLOSED)	0	0	1	1
GGIO*.DPCSO.stVal		**00**	**01**	**10**	**11**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 00 - INTERMEDIATE STATE
                       0 – OFF/FALSE   01 – OFF
                                            10 – ON
                                            11 - INVALID STATE (DBI)

Values of 1 to 8

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3.30   Binary Input Status (BI13GGIO1)

BI13GGIO1.Mod

No	Information	
	Reset Device	x
BI13GGIO1.Mod.stVal		1

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
    0 – OFF/FALSE   2 – BLOCKED
    x – Irrelevant   3 – TEST
                                                    4 - TEST/BLOCKED
                                                        5 - OFF

BI13GGIO1.Health

No	Information		
	Protection Healthy	0	1
BI13GGIO1.Health.stVal		3	1

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
    0 – OFF/FALSE   2 – WARNING
                                                      3 - ALARM

BI13GGIO1.Ind*

No	Information		
	Binary I/P* Status	0	1
BI13GGIO1.Ind*.stVal		0	1

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – OFF
    0 – OFF/FALSE   1 - ON
    * Values of 1 to 13

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3.31 Binary Output Status (BO14GGIO1)

BO14GGIO1.Mod

No	Information	
	Reset Device	x
BO14GGIO1.Mod.stVal		**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                               0 – OFF/FALSE   2 – BLOCKED
                               x – Irrelevant   3 – TEST
                                                                                 4 - TEST/BLOCKED
                                                                                        5 - OFF

BO14GGIO1.Health

No	Information		
	Protection Healthy	0	1
BO14GGIO1.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                               0 – OFF/FALSE   2 – WARNING
                                                                                   3 - ALARM

BO14GGIO1.Ind*

No	Information		
	Binary O/P* Status	0	1
BO14GGIO1.Ind*.stVal		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – OFF
                               0 – OFF/FALSE   1 - ON
                               * Values of 1 to 14

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3.32   LED Status (L16GGIO1)

L16GGIO1.Mod

No	Information	
	Reset Device	x
L16GGIO1.Mod.stVal		**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                        0 – OFF/FALSE   2 – BLOCKED
                        x – Irrelevant   3 – TEST
                                                                4 - TEST/BLOCKED
                                                                5 - OFF

L16GGIO1.Health

No	Information		
	Protection Healthy	0	1
L16GGIO1.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                        0 – OFF/FALSE   2 – WARNING
                                                                3 - ALARM

L16GGIO1.Ind*

No	Information		
	LED* Status	0	1
L16GGIO1.Ind*.stVal		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – OFF
                        0 – OFF/FALSE   1 - ON
                        Values of 1 to 16

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3.33 Quick Logic Equation Status (E16GGIO1)

E16GGIO1.Mod

No	Information	
	Reset Device	x
E16GGIO1.Mod.stVal		**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                                 0 – OFF/FALSE   2 – BLOCKED
                                 x – Irrelevant   3 – TEST
                                                                           4 - TEST/BLOCKED
                                                                              5 - OFF

E16GGIO1.Health

No	Information		
	Protection Healthy	0	1
E16GGIO1.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                                   0 – OFF/FALSE   2 – WARNING
                                                                         3 - ALARM

E16GGIO1.Ind*

No	Information		
	Equation* Status	0	1
E16GGIO1.Ind*.stVal		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – OFF
                                   0 – OFF/FALSE   1 - ON
                                   * Values of 1 to 16

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3.34   Virtuals Status (V16GGIO1)

V16GGIO1.Mod

No	Information	
	Reset Device	x
V16GGIO1.Mod.stVal		**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – ON
                        0 – OFF/FALSE   2 – BLOCKED
                        x – Irrelevant   3 – TEST
                                                                     4 - TEST/BLOCKED
                                                                     5 - OFF

V16GGIO1.Health

No	Information		
	Protection Healthy	0	1
V16GGIO1.Health.stVal		**3**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 1 – OK
                        0 – OFF/FALSE   2 – WARNING
                                                                     3 - ALARM

V16GGIO1.Ind*

No	Information		
	Virtual* Status	0	1
V16GGIO1.Ind*.stVal		**0**	**1**

device annunciation: 1 – ON/TRUE   IEC61850 Value: 0 – OFF
                        0 – OFF/FALSE   1 - ON
                        Values of 1 to 16

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