

SIPROTEC

Multifunctional Generator,
Motor and Transformer
Protection
7UM62

V4.6

IEC 61850

PIXIT

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Preface

Purpose of this manual

In this Manual, you will find the

- ❑ Specification of the applications of the IEC 61850 interface
- ❑ General information about the effects of configuration of your device to the different Logical Nodes and DOIs
- ❑ Mapping of device relevant information to Logical Nodes as part of protocol IEC61850

Target audience

This manual is intended mainly for all persons who configure, parameterize and operate a SIPROTEC Device 7UM62.

Scope of validity of this Manual

SIPROTEC 7UM62, Version 4.60.

Standards

This document has been created according to the ISO 9001 quality standards.

Further Support

If you have questions about SIPROTEC IEC 61850 interface, please contact your Siemens sales representative.

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Applications

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1.1 General

This chapter specifies the protocol implementation extra information for testing (PIXIT) of the IEC 61850 interface in SIPROTEC 7UM62 V4.6.

It is based on the service subset definition given in the protocol implementation conformance statement (PICS), which is specified within the user manual *SIPROTEC 4 Ethernet Module EN 100 IEC 61850 Electrical Interface 100 MBit, Manual /1/*.

The following applicable ACSI service models are specified:

- Association model
- Server model
- Data set model
- Substitution model
- Setting group control model
- Reporting model
- Logging model
- Generic substitution model
- Transmission of sample values model
- Control model
- Time and time synchronisation model
- File transfer model
- General items

Together with the PICS and the MICS the PIXIT forms the basis for a conformance test according to IEC 61850-10.

The mapping between the IEC 61850 server data model and the SIPROTEC specific data is specified in Chapter 3.

1.2 Association model

Description	Value / Clarification
Maximum number of clients that can set-up an association simultaneously	5
Lost connection detection time range (default range of TCP_KEEPALIVE is 1 – 20 seconds)	3 seconds
Is authentication 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 maximum and minimum MMS PDU size ?	Max MMS PDU size 32768 Min MMS PDU size
What is the typical startup time after a power supply interrupt ?	15 SECONDS
<additional items>	

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.
<additional items>	

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 it not necessary from type conformance testing standpoint.

1.5 Substitution model

This service will not be supported (see also *SIPROTEC 4 Ethernet Module EN 100 IEC 61850 Electrical Interface 100 MBit, Manual /1/*).

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 1 or 4, it depends on the given configuration. 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 supported according to PICS.
<additional items>	

1.7 Reporting model

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
What is the format of EntryID ?	EntryID is an attribute of BRCB. Buffered report will not supported acc. to PICS.
What is the buffer size for each BRCB or how many reports can be buffered ?	Not supported.
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.

1.8 Logging model

This service will not be supported (see also *SIPROTEC 4 Ethernet Module EN 100 IEC 61850 Electrical Interface 100 MBit, Manual /1/*).

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	<ol style="list-style-type: none"> 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 behavior in case of missing GOOSE messages	<p>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.</p> <p>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).</p>
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 stationwide, 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.
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.

1.10 Transmission of sample values model

Compare the "Implementation Guidelines for Electrical Current and Voltage Transducers according to IEC 60044-7/8 with Digital Output according to IEC 61850-9-2; Version 1.0; as specified by ABB, Areva, Landis+Gyr, OMICRON and SIEMENS

This service will not be supported (see also *SIPROTEC 4 Ethernet Module EN 100 IEC 61850 Electrical Interface 100 MBit, Manual /1/*).

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 ?	Y Synchrocheck Y Interlock-check
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 ?	<p>N Blocked-by-switching-hierarchy Y Select-failed Y Invalid-position Y Position-reached Y Parameter-change-in-execution N 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</p>
additional items:	
What additional cause diagnosis extensions are supported ?	<p>Y Plausibility_error Y Parameter_setting_invalid Y Hardware_error Y System_overload Y Internal_fault Y Command_sequence_error</p>
Changing the control services by configuration	N
Inconsistency between Select and (Oper or cancel)	<p>Oper 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)</p>
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.
Negative response for select request could be performed only	<p>If test mode is activated or If the selection is always done.</p>

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.
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.

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
IED behavior when the Logical Device is blocked : LLN0.Mod.stVal = blocked	Unlike the definition of the Data Objects "Mod/Beh" in IEC 61850-7-4, outputs to the process will be generated. Details to this behavior are specified in <i>SIPROTEC 4 Ethernet Module EN 100 IEC 61850 Electrical Interface 100 MBit, Manual /1/</i>
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, ISCSOxx. 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.

Basics

2

Contents

This chapter contains general information about the effects of device configuration on Logical Nodes and DOIs.

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2.1 General

The protocol IEC 61850 was developed to define a standard that can be internationally employed for the transmission of power automation system data.

This cross national standard enables an interoperability between automation systems and devices made by different manufacturers.

The devices and high voltage bay control units of the SIPROTEC 4 series can be equipped with an Ethernet module EN100 via which the protocol IEC 61850 is interpreted.

The configuration of the protocol and the integration of the device with redundant IEC 61850 interfaces in your network are performed via the configuration system DIGSI.

For details please refer to the manuals:

- ❑ *SIPROTEC 4 Ethernet Module EN 100 IEC 61850 Electrical Interface 100 MBit, Manual /1/ und*
- ❑ *SIPROTEC 4 System Description /2/.*

**Note:**

The following definitions are taken mainly from standard IEC 61850, Technical Specification IEC TS 61850-2.

Logical Devices

LD Logical Devices represent a functional structuring of the LN Logical Nodes of a SIPROTEC device.

The following Logical Devices are present:

- ❑ Logical Device Protection PROT
- ❑ Logical Device Measurement MEAS
- ❑ Logical Device Disturbance Recorder DR
- ❑ Logical Device Control CTRL
- ❑ Logical Device Extended EXT

Each LD contains LN LLN0 and LN LPHD1.

The allocation of the Logical Nodes to the Logical Devices is listed in Chapter 2.3.

Logical Node LN	Smallest part of a function that exchanges data. A logical node is an object defined by its data and methods.
Data object instance DOI	A Data object is part of a logical node object representing specific information for example status of measurement. From an object-oriented point of view, a data object is an instance of a data class. Specific data classes carry the semantic within a logical node.
Data attribute instance DAI	A Data attribute defines the name (semantic), format, range of possible values, and representation of values while being communicated.
Annunciation types via GOOSE	<p>Generic Object Oriented Substation Event</p> <p>A GOOSE report enables high speed trip signals to be issued with a high probability of delivery.</p> <p>The following types of information can be configured via GOOSE.</p> <ul style="list-style-type: none"><input type="checkbox"/> External single point indication O/O<input type="checkbox"/> External single point indication I/O<input type="checkbox"/> External double point indication<input type="checkbox"/> External double point indication, fast<input type="checkbox"/> External operational measured values<input type="checkbox"/> External metered values

2.2 Effects of Configuration on the Logical Nodes

2.2.1 Function parameters

Depending on the configuration of the function parameters the functions of the SIPROTEC are enabled or disabled. If a function is disabled, the corresponding Logical Node is not available.

The following Logical Nodes are always available:

Logical Device Protection:	LLN0, LPHD1, PTRC1
Logical Device Measurement:	LLN0, LPHD1, MMXU1, MMXU2, MMXU3, MSQ11
Logical Device Disturbance Recorder:	LLN0, LPHD1, RDRE1
Logical Device Control:	LLN0, LPHD1, CALH1
Logical Device Extended:	LLN0, LPHD1

The following table shows which Logical Nodes are available when setting the corresponding function parameter.

The setting (-) implies that no corresponding LN is available. .

Table 2-1 Effects of Function parameters to the Logical Nodes

No.	Function	Setting	Logical Nodes
103	Setting Group Change Option		No effect
104	Fault Records	Disabled	-
		Instant. values	RDRE1
		RMS values	RDRE1
112	Overcurrent Protection I>	Disabled	-
		Side 1	PTOC1
		Side 2	PTOC1

Table 2-1 Effects of Function parameters to the Logical Nodes (Forts.)

No.	Function	Setting	Logical Nodes
113	Overcurrent Protection I>>	Disabled	-
		Non-directional Side1, Non-directional Side2	PTOC3
		Directional Side1, Directional Side2	PTOC2, PTOC3
114	Inverse O/C Time Protection	Disabled	-
		IEC SIDE 1, IEC SIDE 2, ANSI SIDE 1, ANSI SIDE 2	PTOC4, PVOC1
116	Thermal Overload Protection	Disabled	-
		Enabled	PTTR1
117	Unbalance Load (Negative Sequence)	Disabled	-
		Enabled	PTOC10, PTOC11
118	Startup O/C protection	Disabled	-
		Side 1, Side 2	PTOC8
120	Differential Protection	Disabled	-
		Generator/Motor 3 phase transformer	PDIF1, PDIF2
121	Restricted earth fault protection	Disabled	-
		Generator with IEE2	PDIF3
		Generator with 3I0-S2	PDIF3
		Transformer S1 Transformer S2	PDIF3

Table 2-1 Effects of Function parameters to the Logical Nodes (Forts.)

No.	Function	Setting	Logical Nodes
130	Underexcitation Protection	Disabled	-
		Enabled	PDUP1 - PDUP4
131	Reverse Power Protection	Disabled	-
		Enabled	PDOP1, PDOP2
132	Forward Power Supervision	Disabled	-
		Enabled	PDOP3, PDUP5
133	Impedance Protection	Disabled	-
		Enabled	PDIS1 - PDIS4, RPSB1, RPSB2
135	Out-of-Step Protection	Disabled	-
		Enabled	PPAM1, PPAM2
140	Undervoltage Protection	Disabled	-
		Enabled	PTUV1, PTUV2
141	Overvoltage Protection	Disabled	-
		Enabled	PTOV1, PTOV2
142	Over- / Underfrequency Protection	Disabled	-
		Enabled	PTOF1 - PTOF4 PTUF1 - PTUF4
143	Overexcitation Protection (U/f)	Disabled	-
		Enabled	PVPH1, PVPH2
144	Inverse Undervoltage Protection $U_{p<}$	Disabled	-
		Enabled	PTUV3

Table 2-1 Effects of Function parameters to the Logical Nodes (Forts.)

No.	Function	Setting	Logical Nodes
145	Rate-of-frequency-change protection	Disabled	-
		2 df/dt stages	PFRC1, PFRC2
		4 df/dt stages	PFRC1 - PFRC4
146	Jump of Voltage Vector	Disabled	-
		Enabled	GAPC5
150	Stator Earth Fault Protection	Disabled	-
		Non-directional U0	PTOV3
		Non-directional U0&I0	PTOV3, PSDE1
		Directional	PTOV3,PSDE1
151	Sensitive Earth Current Protection	Disabled	-
		With IEE1 With IEE2	PTOC6, PTOC7
152	Stator Earth Fault Prot. 3rd Harmonic	Disabled	-
		Enabled	PHIZ2
153	100% Stator-Earth-Fault Protection	Disabled	-
		Enabled	PHIZ4
154	Sensitive Earth Current Protection B	Disabled	-
		With IEE1 With IEE2	PTOC9, PTUC2
155	Interturn Protection	Disabled	-
		Enabled	PTOV5

Table 2-1 Effects of Function parameters to the Logical Nodes (Forts.)

No.	Function	Setting	Logical Nodes
160	Rotor Earth Fault Protection (R, fn)	Disabled	-
		Enabled	PHIZ1
161	Rotor Earth Fault Protection (1-3Hz)	Disabled	-
		Enabled	PHIZ3
165	Motor Starting Time Supervision	Disabled	-
		Enabled	PMSS1
166	Restart Inhibit for Motors	Disabled	-
		Enabled	PMR11
170	Breaker Failure Protection	Disabled	-
		Side 1, Side 2	RBRF1
171	Inadvertent Energisation	Disabled	-
		Enabled	PVOC2
172	DC Voltage/Current Protection	Disabled	-
		Enabled	PTOC5, PTUC1, PTOV4, PTUV4
180	Fuse Failure Monitor		No effect
181	Measured Values Supervision		No effect
182	Trip Circuit Supervision		No effect
185	Threshold Supervision		No effect
186	External Trip Function 1	Disabled	-
		Enabled	GAPC1

Table 2-1 Effects of Function parameters to the Logical Nodes (Forts.)

No.	Function	Setting	Logical Nodes
187	External Trip Function 2	Disabled	-
		Enabled	GAPC2
188	External Trip Function 3	Disabled	-
		Enabled	GAPC3
189	External Trip Function 4	Disabled	-
		Enabled	GAPC4

2.3 Allocation of Logical Nodes to Logical Devices

All Logical Nodes (LN) are allocated to Logical Devices (LD). The following tables show this allocation and the DOIs available for each LN.

LD PROT

The Logical Device PROT (Protection) contains the following LNs:

Table 2-2 LD PROT - Logical Nodes

LN	Function	DOI
LLN0	General	Mod, Beh, Health, NamPlt, OpTmh
PTRC1	General device pickup Total OFF	Mod, Beh, Health, NamPlt, Str, Tr
PTOF1 PTOF2 PTOF3 PTOF4	Overfrequency Protection	Mod, Beh, Health, NamPlt, Str, Op, BlkV
PTUF1 PTUF2 PTUF3 PTUF4	Underfrequency Protection	Mod, Beh, Health, NamPlt, Str, Op, BlkV
PTOC1	Overcurrent Protection I>	Mod, Beh, Health, NamPlt, Str, Op
PTOC2 PTOC3	Overcurrent Protection I>>	Mod, Beh, Health, NamPlt, Str, Op
PVOC1 PTOC4	Inverse O/C Time Protection	Mod, Beh, Health, NamPlt, Str, Op
PTOV1 PTOV2	Overvoltage Protection	Mod, Beh, Health, NamPlt, Str, Op
PTUV1 PTUV2	Undervoltage Protection	Mod, Beh, Health, NamPlt, Str, Op
PTTR1	Thermal Overload Protection	Mod, Beh, Health, NamPlt, Str, Op, AlmThm
PTOC10 PTOC11	Unbalance Load (Negative Sequence)	Mod, Beh, Health, NamPlt, Str, Op

Table 2-2 LD PROT - Logical Nodes (Forts.)

LN	Function	DOI
PMSS1	Motor Starting Time Supervision	Mod, Beh, Health, NamPlt, Str, Op
PMRI1	Restart Inhibit for Motors	Mod, Beh, Health, NamPlt, Op, StrInhTmm
PTOV3 PSDE1	Stator Earth Fault Protection	Mod, Beh, Health, NamPlt, Str, Op
PDIF1 PDIF2	Differential Protection	Mod, Beh, Health, NamPlt, Str, Op (DifAClc, RstA nur PDIF1)
PTUV3	Inverse Undervoltage Protection Up<	Mod, Beh, Health, NamPlt, Str, Op
PPAM1 PPAM2	Out-of-Step Protection	Mod, Beh, Health, NamPlt, Str, Op
GAPC1 GAPC2 GAPC3 GAPC4	External Trip Function	Mod, Beh, Health, NamPlt, Str, Op
PDIS1 PDIS2 PDIS3 PDIS4 RPSB1 RPSB2	Impedance Protection	Mod, Beh, Health, NamPlt, Str, Op Mod, Beh, Health, NamPlt, BlkZn
PTOV4 PTUV4 PTOC5 PTUC1	DC Voltage/Current Protection	Mod, Beh, Health, NamPlt, Str, Op
PTOC6 PTOC7	Sensitive Earth Current Protection	Mod, Beh, Health, NamPlt, Str, Op
PHIZ1	Rotor Earth Fault Protection (R, fn)	Mod, Beh, Health, NamPlt, Str, Op
PDOP1 PDOP2	Reverse Power Protection	Mod, Beh, Health, NamPlt, Str, Op

Table 2-2 LD PROT - Logical Nodes (Forts.)

LN	Function	DOI
PHIZ2	Stator Earth Fault Protection 3rd Harmonic	Mod, Beh, Health, NamPlt, Str, Op
RBRF1	Breaker Failure Protection	Mod, Beh, Health, NamPlt, Str, OpIn, OpEx
PVPH1 PVPH2	Overexcitation Protection (U/f)	Mod, Beh, Health, NamPlt, Str, Op
PDUP1 PDUP2 PDUP3 PDUP4	Underexcitation Protection	Mod, Beh, Health, NamPlt, Str, Op
PDOP3 PDUP5	Forward Power Supervision	Mod, Beh, Health, NamPlt, Str, Op
PVOC2	Inadvertent Energisation	Mod, Beh, Health, NamPlt, Str, Op
PTOC8	Startup O/C Protection	Mod, Beh, Health, NamPlt, Str, Op
PFRC1 PFRC2 PFRC3 PFRC4	Rate-of-frequency-change Protection	Mod, Beh, Health, NamPlt, Str, Op, BlkV
GAPC5	Jump of Voltage Vector	Mod, Beh, Health, NamPlt, Str, Op
PDIF3	Restricted earth fault Protection	Mod, Beh, Health, NamPlt, Str, Op, CurED1, CurED2, DifACIc, RstA
PHIZ3	Rotor Earth Fault Protection (1-3Hz)	Mod, Beh, Health, NamPlt, Str, Op
PHIZ4	100% Stator-Earth-Fault Protection	Mod, Beh, Health, NamPlt, Str, Op

Table 2-2 LD PROT - Logical Nodes (Forts.)

LN	Function	DOI
PTOC9 PTUC2	Sensitive Earth Current Protection B	Mod, Beh, Health, NamPlt, Str, Op
PTOV5	Interturn Protection	Mod, Beh, Health, NamPlt, Str, Op
LPHD1	Device	PhyNam, PhyHealth, Proxy

LD MEAS

The Logical Device MEAS (Measurement) contains the following LNs:

Table 2-3 LD MEAS - Logical Nodes

LN	Function	DOIs
LLN0	General	Mod, Beh, Health, NamPlt
MMXU1	Operational measured values Current Side 1	Mod, Beh, Health, NamPlt, A
MMXU2	Operational measured values Current Side 2	Mod, Beh, Health, NamPlt, A
MMXU3	Operational measured values	Mod, Beh, Health, NamPlt, ToTW, TotVAr, TotVA, TotPF, Hz, PPV, PhV
MMTR1	Power Metering	Mod, Beh, Health, NamPlt, SupWh, SupVArh, DmdWh, DmdVArh
MSQI1	Measured values, symmetrical components	Mod, Beh, Health, NamPlt, SeqA, SeqV
M1_GGIO1	General measured values	Mod, Beh, Health, NamPlt, AnIn1, AnIn2, AnIn3, AnIn4, AnIn5, AnIn6
M2_GGIO2	DC-Measured values	Mod, Beh, Health, NamPlt, AnIn1, AnIn2
M3_GGIO3	REF (1-3 Hz)-Measured values	Mod, Beh, Health, NamPlt, AnIn1, AnIn2, AnIn3, AnIn4, AnIn5

Table 2-3 LD MEAS - Logical Nodes

M4_GGIO4	SEF 100 %-Measured values	Mod, Beh, Health, NamPlt, AnIn1, AnIn2, AnIn3, AnIn4, AnIn5
M5_GGIO5	REF (R, fn)-Measured values	Mod, Beh, Health, NamPlt, AnIn1, AnIn2, AnIn3, AnIn4, AnIn5, AnIn6
M6_GGIO6	Thermal Overload-Measured values	Mod, Beh, Health, NamPlt, AnIn1, AnIn2, AnIn3, AnIn4, AnIn5
M7_GGIO7	Thermal measured values	Mod, Beh, Health, NamPlt, AnIn1, AnIn2, AnIn3, AnIn4
LPHD1	Device	PhyNam, PhyHealth Proxy

LD DR

The Logical Device DR (Disturbance Recorder) contains the following LNs:

Table 2-4 LD DR - Logical Nodes

LN	Function	DOIs
LLN0	General	Mod, Beh, Health, NamPlt
RDRE1	Fault Records	Mod, Beh, Health, NamPlt, RcdMade, FltNum, GriFltNum, RcdStr
LPHD1	Device	PhyNam, PhyHealth Proxy

LD CTRL

The Logical Device CTRL (Control) contains the following LNs:

Table 2-5 LD CTRL - Logical Nodes

LN	Function	DOIs
LLN0	General	Mod, Beh, Health, NamPlt
CALH1	Alarms, warning messages and group alarms	Mod, Beh, Health, NamPlt, GrAlm, GrWrn
LPHD1	Device	PhyNam, PhyHealth Proxy, CtlNum, DevStr

The Logical Nodes of the switching (and userdefined) objects will be created by DIGSI during the parameterization of your SIPROTEC device.

MICS, Model Implementation Conformance Statement, shows the assignment of the DOIs; you can use DIGSI to print the MICS.

LD EXT

The Logical Device EXT (Extended) contains the following LNs:

Table 2-6 LD EXT - Logical Nodes

LN	Function	DOIs
LLN0	General	Mod, Beh, Health, NamPlt
LPHD1	Device	PhyNam, PhyHealth Proxy, CtlNum

2.5 DOI Behavior

2.5.1 Logical Device PROT

For the Logical Nodes of the PROT Logical Device, **LNx.Beh.stVal** is formed from **LNx.Mod.stVal** of the Logical Node and the status of the following device messages:

- Test mode (Test mode),
- Stop data transmission.

No.	Information								
	Test mode (Test mode)	x	0	1	0	1	0	1	x
	Stop data transmission (DataStop)	x	0	0	1	1	x	x	x
	LNx .Mod.stVal	5	1	1	1	1	2	2	4
	LNx.Beh.stVal	5	1	3	2	4	2	4	4

device annunciation:
 1 - ON
 0 - OFF
 x - irrelevant

IEC Status stVal:
 1 - ON
 2 - BLOCKED
 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

2.5.2 Logical Devices MEAS, CTRL, DR und EXT

For the Logical Nodes of the MEAS, CTRL, DR and EXT Logical Devices, **LNx.Beh.stVal** is formed from **LNx.Mod.stVal** of the Logical Node and the status of the following device messages:

- Test mode (Test mode),
- Stop data transmission.

No.	Information									
	Test mode (Test mode)	x	0	1	0	1	0	1	x	
	Stop data transmission (DataStop)	x	0	0	1	1	x	x	x	
	LNx .Mod.stVal	5	1	1	1	1	2	2	4	
	LNx.Beh.stVal	5	1	3	2	4	2	4	4	

device annunciation:	1 - ON	IEC Status stVal:	1 - ON
	0 - OFF		2 - BLOCKED
	x - irrelevant		3 - TEST
			4 - TEST/BLOCKED
			5 - OFF

Mapping

3

Contents

This chapter shows the mapping of the information relevant to the device on the Logical Node of protocol IEC61850. It is structured according to function. In Chapter 2 you can find what consequences non-configured functions have on the Logical Nodes as well as general information about IEC 61850 mapping of information.

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3.1.1 Error with a summary alarm and Alarm summary event

CALH1.Mod

No.	Information		
55	Reset Device (Reset Device)	1	0
CALH1.Mod.stVal		1	5

device annunciation: 1 - ON IEC Status Mod.stVal: 1 - ON
 0 - OFF 2 - BLOCKED
 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

CALH1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
CALH1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

CALH1.GrAlm

No.	Information		
140	Error with a summary alarm (Error Sum Alarm)	1	0
CALH1.GrAlm.stVal		1	0

device annunciation: 1 - ON IEC Status GrAlm.stVal: 0 - FALSE
 0 - OFF 1 - TRUE

CALH1.GrWrn

No.	Information		
160	Alarm Summary Event (Alarm Sum Event)	1	0
CALH1.GrWrn.stVal		1	0

device annunciation: 1 - ON IEC Status GrWrn.stVal: 0 - FALSE
 0 - OFF 1 - TRUE

3.2 Definite-Time Overcurrent Protection I> (PTOC1)

PTOC1.Mod

No.	Information				
1967	O/C prot. stage I> is ACTIVE (I> ACTIVE)	x	x	0	1
1965	O/C prot. stage I> is switched OFF (I> OFF)	1	0	0	0
	O/C Prot. I> (P1201) = Block relay	x	1	0	0
PTOC1.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTOC1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTOC1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTOC1.Str

No.	Information				
1811	O/C fault detection stage I> phase L1 (I> Fault L1)	1	x	x	0
1812	O/C fault detection stage I> phase L2 (I> Fault L2)	x	1	x	0
1813	O/C fault detection stage I> phase L3 (I> Fault L3)	x	x	1	0
PTOC1.Str.general		1	1	1	0

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE
 x - irrelevant

PTOC1.Str.phsA

No.	Information		
1811	O/C fault detection stage l> phase L1 (l> Fault L1)	0	1
PTOC1.Str.phsA		0	1

device annunciation: 1 - ON IEC Status Str.phsA: 0 - FALSE
0 - OFF 1 - TRUE

PTOC1.Str.phsB

No.	Information		
1812	O/C fault detection stage l> phase L2 (l> Fault L2)	0	1
PTOC1.Str.phsB		0	1

device annunciation: 1 - ON IEC Status Str.phsB: 0 - FALSE
0 - OFF 1 - TRUE

PTOC1.Str.phsC

No.	Information		
1813	O/C fault detection stage l> phase L3 (l> Fault L3)	0	1
PTOC1.Str.phsC		0	1

device annunciation: 1 - ON IEC Status Str.phsC: 0 - FALSE
0 - OFF 1 - TRUE

PTOC1.Op

No.	Information		
1815	O/C l> TRIP (l> TRIP)	0	1
PTOC1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
0 - OFF 1 - TRUE

3.3 Definite-Time Overcurrent Protection I>>

3.3.1 Non-directional Side 1 / Side 2 (PTOC3)

PTOC3.Mod

No.	Information				
1957	O/C prot. stage I>> is ACTIVE (I>> ACTIVE)	x	x	0	1
1955	O/C prot. stage I>> is switched OFF (I>> OFF)	1	0	0	0
	O/C Prot. I>> (P1301) = Block relay	x	1	0	0
PTOC3.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTOC3.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTOC3.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTOC3.Str

No.	Information				
1801	O/C fault detection stage I>> phase L1 (I>> Fault L1)	1	x	x	0
1802	O/C fault detection stage I>> phase L2 (I>> Fault L2)	x	1	x	0
1803	O/C fault detection stage I>> phase L3 (I>> Fault L3)	x	x	1	0
PTOC3.Str.general		1	1	1	0

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE
 x - irrelevant

PTOC3.Str.phsA

No.	Information		
1801	O/C fault detection stage l>> phase L1 (l>> Fault L1)	0	1
PTOC3.Str.phsA		0	1

device annunciation: 1 - ON IEC Status Str.phsA: 0 - FALSE
0 - OFF 1 - TRUE

PTOC3.Str.phsB

No.	Information		
1802	O/C fault detection stage l>> phase L2 (l>> Fault L2)	0	1
PTOC3.Str.phsB		0	1

device annunciation: 1 - ON IEC Status Str.phsB: 0 - FALSE
0 - OFF 1 - TRUE

PTOC3.Str.phsC

No.	Information		
1803	O/C fault detection stage l>> phase L3 (l>> Fault L3)	0	1
PTOC3.Str.phsC		0	1

device annunciation: 1 - ON IEC Status Str.phsC: 0 - FALSE
0 - OFF 1 - TRUE

PTOC3.Op

No.	Information		
1809	O/C l>> TRIP (l>> TRIP)	0	1
PTOC3.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
0 - OFF 1 - TRUE

PTOC2.Str.dirGeneral

No.	Information				
1807	O/C I>> direction backward (I>> backward)	0	0	1	1
1806	O/C I>> direction forward (I>> forward)	0	1	0	1
PTOC2.Str.dirGeneral		0	1	2	3

device annunciation: 1 - ON
0 - OFF

IEC Status Str.dirGeneral: 0 - UNKNOWN
1 - FORWARD
2 - BACKWARD
3 - BOTH

PTOC2.Op

No.	Information		
1809	O/C I>> TRIP (I>> TRIP)	0	1
PTOC2.Op.general		0	1

device annunciation: 1 - ON
0 - OFF

IEC Status Op.general: 0 - FALSE
1 - TRUE

3.4 Inverse Overcurrent Time Protection (PVOC1, PTOC4)

PVOC1.Mod

No.	Information					
1893	O/C protection Ip is ACTIVE (O/C Ip ACTIVE)	x	x	x	0	1
1891	O/C protection Ip is switched OFF (O/C Ip OFF)	x	1	0	0	0
	O/C Ip (P1401) = Block relay	x	x	1	0	0
	VOLT. INFLUENCE (P1407) = Volt. controll. or Volt. restraint	0	x	1	1	1
PVOC1.Mod.stVal		5	5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PVOC1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PVOC1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PVOC1.Str

No.	Information				
1899	O/C Ip picked up (O/C Ip pick.up)	0	0	1	1
	VOLT. INFLUENCE (P1407) = Volt. controll. or Volt. restraint	0	1	0	1
PVOC1.Str.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PVOC1.Str.phsA

No.	Information				
1896	O/C fault detection Ip phase L1 (O/C Ip Fault L1)	0	0	1	1
	VOLT. INFLUENCE (P1407) = Volt. controll. or Volt. restraint	0	1	0	1
PVOC1.Str.phsA		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.phsA: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PVOC1.Str.phsB

No.	Information				
1897	O/C fault detection Ip phase L2 (O/C Ip Fault L2)	0	0	1	1
	VOLT. INFLUENCE (P1407) = Volt. controll. or Volt. restraint	0	1	0	1
PVOC1.Str.phsB		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.phsB: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PVOC1.Str.phsC

No.	Information				
1898	O/C fault detection Ip phase L3 (O/C Ip Fault L3)	0	0	1	1
	VOLT. INFLUENCE (P1407) = Volt. controll. or Volt. restraint	0	1	0	1
PVOC1.Str.phsC		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.phsC: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PVOC1.Op

No.	Information				
1900	O/C Ip TRIP (O/C Ip TRIP)	0	0	1	1
	VOLT. INFLUENCE (P1407) = Volt. controll. or Volt. restraint	0	1	0	1
PVOC1.Op.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Op.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PTOC4.Mod

No.	Information					
1893	O/C protection Ip is ACTIVE (O/C Ip ACTIVE)	x	x	x	0	1
1891	O/C protection Ip is switched OFF (O/C Ip OFF)	x	1	0	0	0
	O/C Ip (P1401) = Block relay	x	x	1	0	0
	VOLT. INFLUENCE (P1407) = Volt. controll. or Volt. restraint	1	x	0	0	0
PTOC4.Mod.stVal		5	5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

PTOC4.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTOC4.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

PTOC4.Str

No.	Information				
1899	O/C Ip picked up (O/C Ip pick.up)	0	0	1	1
	VOLT. INFLUENCE (P1407) = Volt. controll. or Volt. restraint	0	1	1	0
PTOC4.Str.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
0 - OFF / FALSE 1 - TRUE

PTOC4.Str.phsA

No.	Information				
1896	O/C fault detection Ip phase L1 (O/C Ip Fault L1)	0	0	1	1
	VOLT. INFLUENCE (P1407) = Volt. controll. or Volt. restraint	0	1	1	0
PTOC4.Str.phsA		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.phsA: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PTOC4.Str.phsB

No.	Information				
1897	O/C fault detection Ip phase L2 (O/C Ip Fault L2)	0	0	1	1
	VOLT. INFLUENCE (P1407) = Volt. controll. or Volt. restraint	0	1	1	0
PTOC4.Str.phsB		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.phsB: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PTOC4.Str.phsC

No.	Information				
1898	O/C fault detection Ip phase L3 (O/C Ip Fault L3)	0	0	1	1
	VOLT. INFLUENCE (P1407) = Volt. controll. or Volt. restraint	0	1	1	0
PTOC4.Str.phsC		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.phsC: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PTOC4.Op

No.	Information				
1900	O/C Ip TRIP (O/C Ip TRIP)	0	0	1	1
	VOLT. INFLUENCE (P1407) = Volt. controll. or Volt. restraint	0	1	1	0
PTOC4.Op.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Op.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

3.5 Thermal Overload Protection (PTTR1)

PTTR1.Mod

No.	Information				
1513	Overload Protection ACTIVE (Overload ACT)	x	x	0	1
1511	Thermal Overload Protection OFF (Th.Overload OFF)	1	0	0	0
	Ther. OVER LOAD (P1601) = Block relay	x	1	0	0
PTTR1.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

PTTR1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTTR1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

PTTR1.Str

No.	Information		
1517	Thermal Overload picked up (O/L Th. pick.up)	0	1
PTTR1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
0 - OFF 1 - TRUE

PTTR1.Op

No.	Information		
1521	Thermal Overload TRIP (ThOverload TRIP)	0	1
PTTR1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
0 - OFF 1 - TRUE

PTTR1.AlmThm

No.	Information		
1516	Thermal Overload Alarm (O/L ⊖ Alarm)	0	1
PTTR1.AlmThm.general		0	1

device annunciation:
1 - ON
0 - OFF

IEC Status AlmThm.general:
0 - FALSE
1 - TRUE

PTOC10.Str

No.	Information		
5159	I2>> picked up (I2>> picked up)	0	1
PTOC10.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PTOC10.Op

No.	Information		
5160	Unbalanced load: TRIP of current stage (I2>> TRIP)	0	1
PTOC10.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.6.2 Unbalanced Load I2 ⊖ (PTOC11)

PTOC11.Mod

No.	Information					
5153	I2 is ACTIVE (I2 ACTIVE)	x	x	x	0	1
5151	I2 is switched OFF (I2 OFF)	x	1	0	0	0
	UNBALANCE LOAD (P1701) = Block relay	x	x	1	0	0
	FACTOR K (P1704) = ∞	1	x	0	0	0
PTOC11.Mod.stVal		5	5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

PTOC11.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTOC11.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

PTOC11.Op

No.	Information		
5161	Unbalanced load: TRIP of thermal stage (I2 ⊖ TRIP)	0	1
PTOC11.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
0 - OFF 1 - TRUE

PTOC8.Str.phsA

No.	Information		
5575	Startup O/C phase L1 picked up (O/C Start L1 PU)	0	1
PTOC8.Str.phsA		0	1

device annunciation: 1 - ON IEC Status Str.phsA: 0 - FALSE
 0 - OFF 1 - TRUE

PTOC8.Str.phsB

No.	Information		
5576	Startup O/C phase L2 picked up (O/C Start L2 PU)	0	1
PTOC8.Str.phsB		0	1

device annunciation: 1 - ON IEC Status Str.phsB: 0 - FALSE
 0 - OFF 1 - TRUE

PTOC8.Str.phsC

No.	Information		
5577	Startup O/C phase L3 picked up (O/C Start L3 PU)	0	1
PTOC8.Str.phsC		0	1

device annunciation: 1 - ON IEC Status Str.phsC: 0 - FALSE
 0 - OFF 1 - TRUE

PTOC8.Op

No.	Information		
5578	Startup O/C protection TRIP (O/C Start TRIP)	0	1
PTOC8.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.8 Differential Protection (PDIF1, PDIF2)

PDIF1.Mod

No.	Information				
5617	Differential protection is ACTIVE (Diff ACTIVE)	x	x	0	1
5615	Differential protection is switched OFF (Diff OFF)	1	0	0	0
	DIFF. PROT. (P2001) = Block relay	x	1	0	0
PDIF1.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PDIF1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDIF1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PDIF1.Str

No.	Information		
5631	Differential protection picked up (Diff picked up)	0	1
PDIF1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PDIF1.Op

No.	Information		
5691	Differential prot.: TRIP by IDIFF> (Diff> TRIP)	0	1
PDIF1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PDIF1.DifAClc

No.	Information	Value		
7742	IDiffL1(I/Inominal object [%]) (IDiffL1=)	PDIF1.DifAClc.phsA.cVal.mag.f	Measured value	Absolute value
		PDIF1.DifAClc.phsA.units.SIUnit	1	none
		PDIF1.DifAClc.phsA.units.multiplier	0	1

No.	Information	Value		
7743	IDiffL2(I/Inominal object [%]) (IDiffL2=)	PDIF1.DifAClc.phsB.cVal.mag.f	Measured value	Absolute value
		PDIF1.DifAClc.phsB.units.SIUnit	1	none
		PDIF1.DifAClc.phsB.units.multiplier	0	1

No.	Information	Value		
7744	IDiffL3(I/Inominal object [%]) (IDiffL3=)	PDIF1.DifAClc.phsC.cVal.mag.f	Measured value	Absolute value
		PDIF1.DifAClc.phsC.units.SIUnit	1	none
		PDIF1.DifAClc.phsC.units.multiplier	0	1

PDIF1.RstA

No.	Information	Value		
7745	IRestL1(I/Nominal object [%]) (IRestL1=)	PDIF1.RstA.phsA.cVal.mag.f	Measured value	Absolute value
		PDIF1.RstA.phsA.units.SIUnit	1	none
		PDIF1.RstA.phsA.units.multiplier	0	1

No.	Information	Value		
7746	IRestL2(I/Nominal object [%]) (IRestL2=)	PDIF1.RstA.phsB.cVal.mag.f	Measured value	Absolute value
		PDIF1.RstA.phsB.units.SIUnit	1	none
		PDIF1.RstA.phsB.units.multiplier	0	1

No.	Information	Value		
7747	IRestL3(I/Nominal object [%]) (IRestL3=)	PDIF1.RstA.phsC.cVal.mag.f	Measured value	Absolute value
		PDIF1.RstA.phsC.units.SIUnit	1	none
		PDIF1.RstA.phsC.units.multiplier	0	1

PDIF2.Mod

No.	Information					
5617	Differential protection is ACTIVE (Diff ACTIVE)	x	x	x	0	1
5615	Differential protection is switched OFF (Diff OFF)	x	1	0	0	0
	DIFF. PROT. (P2001) = Block relay	x	x	1	0	0
	I-DIFF>> (P2031) = ∞	1	x	0	0	0
PDIF2.Mod.stVal		5	5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PDIF2.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDIF2.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PDIF2.Str

No.	Information		
5631	Differential protection picked up (Diff picked up)	0	1
PDIF2.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PDIF2.Op

No.	Information		
5692	Differential prot.: TRIP by IDIFF>> (Diff>> TRIP)	0	1
PDIF2.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.9 Earth Current Differential Protection (PDIF3)

PDIF3.Mod

No.	Information				
5813	Restricted earth fault is ACTIVE (REF ACTIVE)	x	x	0	1
5811	Restricted earth fault is switched OFF (REF OFF)	1	0	0	0
	REF PROT. (P2101) = Block relay	x	1	0	0
PDIF3.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PDIF3.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDIF3.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PDIF3.Str

No.	Information		
5817	REF protection picked up (REF picked up)	0	1
PDIF3.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PDIF3.Op

No.	Information		
5821	REF protection TRIP (REF TRIP)	0	1
PDIF3.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PDIF3.DifAClc

No.	Information	Value		
30654	I0-Diff REF (I/Inominal object [%]) (I0-Diff=)	PDIF3.DifAClc.neut.cVal.mag.f	Measured value	Absolute value
		PDIF3.DifAClc.neut.units.SIUnit	1	none
		PDIF3.DifAClc.neut.units.multiplier	0	1

PDIF3.RstA

No.	Information	Value		
30655	I0-Rest REF (I/Inominal object [%]) (I0-Rest=)	PDIF3.RstA.neut.cVal.mag.f	Measured value	Absolute value
		PDIF3.RstA.neut.units.SIUnit	1	none
		PDIF3.RstA.neut.units.multiplier	0	1

PDIF3.CurED1

No.	Information	Value		
30659	3I0-1 REF (I/Inominal object [%]) (3I0-1 =)	PDIF3.CurED1.mag.f	Measured value	Absolute value
		PDIF3.CurED1.units.SIUnit	1	none
		PDIF3.CurED1.multiplier	0	1

PDIF3.CurED2

No.	Information	Value		
30660	3I0-2 REF (I/Inominal object [%]) (3I0-2 =)	PDIF3.CurED2.mag.f	Measured value	Absolute value
		PDIF3.CurED2.units.SIUnit	1	none
		PDIF3.CurED2.units.multiplier	0	1

3.10 Underexcitation (Loss-of-Field) Protection

3.10.1 Exc<1, Exc<2, Exc<3, (PDUP1, PDUP2, PDUP3)

PDUP1.Mod

No.	Information					
5333	Underexc. prot. is ACTIVE (Excit.ACTIVE)	x	x	x	0	1
5329	>BLOCK underexc. prot. char. 1 (>Char. 1 BLK.)	x	x	1	x	0
5331	Underexc. prot. is switched OFF (Excit. OFF)	1	0	0	0	0
	UNDEREXCIT. (P3001) = Block relay	x	1	0	0	0
PDUP1.Mod.stVal		5	4	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PDUP1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDUP1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PDUP1.Str

No.	Information		
	Underexcitation Protection Exc<1 picked up	0	1
PDUP1.Str.general		0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PDUP1.Op

No.	Information		
5344	Underexc. prot. char. 1 TRIP (Exc<1 TRIP)	0	1
PDUP1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PDUP2.Mod

No.	Information					
5333	Underexc. prot. is ACTIVE (Excit.ACTIVE)	x	x	x	0	1
5330	>BLOCK underexc. prot. char. 2 (>Char. 2 BLK.)	x	x	1	x	0
5331	Underexc. prot. is switched OFF (Excit. OFF)	1	0	0	0	0
	UNDEREXCIT. (P3001) = Block relay	x	1	0	0	0
PDUP2.Mod.stVal		5	4	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PDUP2.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDUP2.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PDUP2.Str

No.	Information		
	Underexcitation Protection Exc<2 picked up	0	1
PDUP2.Str.general		0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PDUP2.Op

No.	Information		
5345	Underexc. prot. char. 2 TRIP (Exc<2 TRIP)	0	1
PDUP2.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PDUP3.Mod

No.	Information					
5333	Underexc. prot. is ACTIVE (Excit.ACTIVE)	x	x	x	0	1
5327	>BLOCK underexc. prot. char. 3 (>Char. 3 BLK.)	x	x	1	x	0
5331	Underexc. prot. is switched OFF (Excit. OFF)	1	0	0	0	0
	UNDEREXCIT. (P3001) = Block relay	x	1	0	0	0
PDUP3.Mod.stVal		5	4	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PDUP3.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDUP3.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PDUP3.Str

No.	Information		
	Underexcitation Protection Exc<3 picked up	0	1
PDUP3.Str.general		0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PDUP3.Op

No.	Information		
5343	Underexc. prot. char. 3 TRIP (Exc<3 TRIP)	0	1
PDUP3.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.10.2 Exc<U< (PDUP4)

PDUP4.Mod

No.	Information				
5333	Underexc. prot. is ACTIVE (Excit.ACTIVE)	x	x	0	1
5331	Underexc. prot. is switched OFF (Excit. OFF)	1	0	0	0
	UNDEREXCIT. (P3001) = Block relay	x	1	0	0
PDUP4.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PDUP4.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDUP4.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PDUP4.Str

No.	Information		
	Underexcitation Protection Exc<U< picked up	0	1
PDUP4.Str.general		0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PDUP4.Op

No.	Information		
5346	Underexc. prot. char.+Uexc< TRIP (Exc<U<TRIP)	0	1
PDUP4.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.11 Reverse Power Protection (PDOP1, PDOP2)

PDOP1.Mod

No.	Information				
5093	Reverse power protection is ACTIVE (Pr ACTIVE)	x	x	0	1
5091	Reverse power prot. is switched OFF (Pr OFF)	1	0	0	0
	REVERSE POWER (P3101) = Block relay	x	1	0	0
PDOP1.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

PDOP1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDOP1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

PDOP1.Str

No.	Information		
5096	Reverse power: picked up (Pr picked up)	0	1
PDOP1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PDOP1.Op

No.	Information		
5097	Reverse power: TRIP (Pr TRIP)	0	1
PDOP1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PDOP2.Mod

No.	Information				
5093	Reverse power protection is ACTIVE (Pr ACTIVE)	x	x	0	1
5091	Reverse power prot. is switched OFF (Pr OFF)	1	0	0	0
	REVERSE POWER (P3101) = Block relay	x	1	0	0
PDOP2.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PDOP2.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDOP2.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

3.12 Forward Active Power Supervision

3.12.1 Pf> Stage (PDOP3)

PDOP3.Mod

No.	Information					
5123	Forward power supervision is ACTIVE (Pf ACTIVE)	x	x	x	0	1
5117	>BLOCK forw. power superv. Pf> stage (>Pf> BLOCK)	x	x	1	x	0
5121	Forward power supervis. is switched OFF (Pf OFF)	1	0	0	0	0
	FORWARD POWER (P3201) = Block relay	x	1	0	0	0
PDOP3.Mod.stVal		5	4	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PDOP3.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDOP3.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PDOP3.Str

No.	Information		
5127	Forward power: Pf> stage picked up (Pf> picked up)	0	1
PDOP3.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PDOP3.Op

No.	Information		
5129	Forward power: Pf> stage TRIP (Pf> TRIP)	0	1
PDOP3.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.12.2 Pf< Stage (PDUP5)

PDUP5.Mod

No.	Information					
5123	Forward power supervision is ACTIVE (Pf ACTIVE)	x	x	x	0	1
5116	>BLOCK forw. power superv. Pf< stage (>Pf< BLOCK)	x	x	1	x	0
5121	Forward power supervis. is switched OFF (Pf OFF)	1	0	0	0	0
	FORWARD POWER (P3201) = Block relay	x	1	0	0	0
PDUP5.Mod.stVal		5	4	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

PDUP5.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDUP5.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

3.13 Impedance Protection

3.13.1 Impedance Protection Zone 1 and Zone 2 (PDIS1, PDIS2)

PDIS1.Mod

No.	Information						
3963	Impedance protection is ACTIVE (Imp. ACTIVE)	x	x	x	x	0	1
6575	Voltage Transformer Fuse Failure (VT Fuse Failure)	x	x	x	1	x	0
361	>Failure: Feeder VT (MCB tripped) (>FAIL:Feeder VT)	x	x	1	x	x	0
3961	Impedance protection is switched OFF (Imp. OFF)	1	0	0	0	0	0
	IMPEDANCE PROT. (P3301) = Block relay	x	1	0	0	0	0
PDIS1.Mod.stVal		5	4	2	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PDIS1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDIS1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PDIS1.Str

No.	Information		
	Impedance protection zone Z1< picked up	0	1
PDIS1.Str.general		0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
0 - OFF / FALSE 1 - TRUE

PDIS1.Op

No.	Information		
3977	Imp.: Z1< TRIP (Imp.Z1< TRIP)	0	1
PDIS1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
0 - OFF 1 - TRUE

PDIS2.Mod

No.	Information						
3963	Impedance protection is ACTIVE (Imp. ACTIVE)	x	x	x	x	0	1
6575	Voltage Transformer Fuse Failure (VT Fuse Failure)	x	x	x	1	x	0
361	>Failure: Feeder VT (MCB tripped) (>FAIL:Feeder VT)	x	x	1	x	x	0
3961	Impedance protection is switched OFF (Imp. OFF)	1	0	0	0	0	0
	IMPEDANCE PROT. (P3301) = Block relay	x	1	0	0	0	0
PDIS2.Mod.stVal		5	4	2	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

3.13.2 Impedance Protection Zone 1B (PDIS3)

PDIS3.Mod

No.	Information								
3963	Impedance protection is ACTIVE (Imp. ACTIVE)	x	x	x	x	x	0	1	
6575	Voltage Transformer Fuse Failure (VT Fuse Failure)	x	x	x	x	1	x	0	
361	>Failure: Feeder VT (MCB tripped) (>FAIL:Feeder VT)	x	x	x	1	x	x	0	
3961	Impedance protection is switched OFF (Imp. OFF)	x	1	0	0	0	0	0	
3956	>Zone 1B extension for impedance prot. (>Extens. Z1B)	0	x	1	1	1	1	1	
	IMPEDANCE PROT. (P3301) = Block relay	x	x	1	0	0	0	0	
PDIS3.Mod.stVal		5	5	4	2	2	2	1	

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PDIS3.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDIS3.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

3.13.3 Impedance Protection general (PDIS4)

PDIS4.Mod

No.	Information				
3963	Impedance protection is ACTIVE (Imp. ACTIVE)	x	x	0	1
3961	Impedance protection is switched OFF (Imp. OFF)	1	0	0	0
	IMPEDANCE PROT. (P3301) = Block relay	x	1	0	0
PDIS4.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PDIS4.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PDIS4.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PDIS4.Str

No.	Information		
3966	Impedance protection picked up (Imp. picked up)	0	1
PDIS4.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
0 - OFF 1 - TRUE

PDIS4.Str.phsA

No.	Information		
3967	Imp.: Fault detection , phase L1 (Imp. Fault L1)	0	1
PDIS4.Str.phsA		0	1

device annunciation: 1 - ON IEC Status Str.phsA: 0 - FALSE
0 - OFF 1 - TRUE

PDIS4.Str.phsB

No.	Information		
3968	Imp.: Fault detection , phase L2 (Imp. Fault L2)	0	1
PDIS4.Str.phsB		0	1

device annunciation: 1 - ON IEC Status Str.phsB: 0 - FALSE
0 - OFF 1 - TRUE

PDIS4.Str.phsC

No.	Information		
3969	Imp.: Fault detection , phase L3 (Imp. Fault L3)	0	1
PDIS4.Str.phsC		0	1

device annunciation: 1 - ON IEC Status Str.phsC: 0 - FALSE
0 - OFF 1 - TRUE

PDIS4.Op

No.	Information		
3980	Imp.: T3> TRIP (Imp.T3> TRIP)	0	1
PDIS4.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
0 - OFF 1 - TRUE

3.13.4 Impedance Protection Power Swing Detection (RPSB1, RPSB2)

RPSB1.Mod

No.	Information				
3963	Impedance protection is ACTIVE (Imp. ACTIVE)	x	x	0	1
3961	Impedance protection is switched OFF (Imp. OFF)	1	0	0	0
	IMPEDANCE PROT. (P3301) = Block relay	x	1	0	0
RPSB1.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

RPSB1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
RPSB1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

RPSB1.BlkZn

No.	Information		
3976	Power swing detection (Power Swing)	0	1
RPSB1.BlkZn.stVal		0	1

device annunciation: 1 - ON IEC Status BlkZn.stVal: 0 - FALSE
0 - OFF 1 - TRUE

RPSB2.Mod

No.	Information				
3963	Impedance protection is ACTIVE (Imp. ACTIVE)	x	x	0	1
3961	Impedance protection is switched OFF (Imp. OFF)	1	0	0	0
	IMPEDANCE PROT. (P3301) = Block relay	x	1	0	0
RPSB2.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

RPSB2.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
RPSB2.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

RPSB2.BIkZn

No.	Information				
3976	Power swing detection (Power Swing)	0	1	0	1
	BLOCKING OF (P3316) = Z1 and Z2	0	0	1	1
RPSB2.BIkZn.stVal		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status BlkZn.stVal: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

3.14 Out-of-Step Protection (PPAM1, PPAM2)

PPAM1.Mod

No.	Information				
5063	Out-of-step protection is ACTIVE (O/S ACTIVE)	x	x	0	1
5061	Out-of-step protection is switched OFF (O/S OFF)	1	0	0	0
	OUT-OF-STEP (P3501) = Block relay	x	1	0	0
PPAM1.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

PPAM1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PPAM1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

PPAM1.Str

No.	Information		
5069	Out-of-step characteristic 1 picked up (O/S det. char.1)	0	1
PPAM1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PPAM1.Op

No.	Information		
5071	Out-of-step TRIP characteristic 1 (O/S TRIP char.1)	0	1
PPAM1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PPAM2.Mod

No.	Information				
5063	Out-of-step protection is ACTIVE (O/S ACTIVE)	x	x	0	1
5061	Out-of-step protection is switched OFF (O/S OFF)	1	0	0	0
	OUT-OF-STEP (P3501) = Block relay	x	1	0	0
PPAM2.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PPAM2.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PPAM2.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PPAM2.Str

No.	Information		
5070	Out-of-step characteristic 2 picked up (O/S det. char.2)	0	1
PPAM2.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PPAM2.Op

No.	Information		
5072	Out-of-step TRIP characteristic 2 (O/S TRIP char.2)	0	1
PPAM2.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.15 Undervoltage Protection (PTUV1, PTUV2)

PTUV1.Mod

No.	Information								
6532	Undervoltage protection is ACTIVE (Undervolt. ACT)	x	x	0	x	x	x	1	
6506	>BLOCK undervoltage protection U< (>BLOCK U<)	x	x	x	1	x	x	0	
361	>Failure: Feeder VT (MCB tripped) (>FAIL:Feeder VT)	x	x	x	x	1	x	0	
6575	Voltage Transformer Fuse Failure (VT Fuse Failure)	x	x	x	x	x	1	0	
6530	Undervoltage protection switched OFF (Undervolt. OFF)	1	0	0	0	0	0	0	
	UNDERVOLTAGE (P4001) = Block relay	x	1	0	0	0	0	0	
PTUV1.Mod.stVal		5	4	2	2	2	2	1	

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

PTUV1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTUV1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

PTUV1.Str

No.	Information		
6533	Undervoltage U< picked up (U< picked up)	0	1
PTUV1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PTUV1.Op

No.	Information		
6539	Undervoltage U< TRIP (U< TRIP)	0	1
PTUV1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PTUV2.Mod

No.	Information							
6532	Undervoltage protection is ACTIVE (Undervolt. ACT)	x	x	0	x	x	x	1
6508	>BLOCK undervoltage protection U<< (>BLOCK U<<)	x	x	x	1	x	x	0
361	>Failure: Feeder VT (MCB tripped) (>FAIL:Feeder VT)	x	x	x	x	1	x	0
6575	Voltage Transformer Fuse Failure (VT Fuse Failure)	x	x	x	x	x	1	0
6530	Undervoltage protection switched OFF (Undervolt. OFF)	1	0	0	0	0	0	0
	UNDERVOLTAGE (P4001) = Block relay	x	1	0	0	0	0	0
PTUV2.Mod.stVal		5	4	2	2	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

3.16 Overvoltage Protection (PTOV1, PTOV2)

PTOV1.Mod

No.	Information					
6567	Overvoltage protection is ACTIVE (Overvolt. ACT)	x	x	x	0	1
6516	>BLOCK overvoltage protection U> (>BLOCK U>)	x	x	1	x	0
6565	Overvoltage protection switched OFF (Overvolt. OFF)	1	0	0	0	0
	OVERVOLTAGE (P4101) = Block relay	x	1	0	0	0
PTOV1.Mod.stVal		5	4	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTOV1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTOV1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTOV1.Str

No.	Information		
6568	Overvoltage U> picked up (U> picked up)	0	1
PTOV1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PTOV1.Op

No.	Information		
6570	Overvoltage U> TRIP (U> TRIP)	0	1
PTOV1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PTOV2.Mod

No.	Information					
6567	Overvoltage protection is ACTIVE (Overvolt. ACT)	x	x	x	0	1
6517	>BLOCK overvoltage protection U>> (>BLOCK U>>)	x	x	1	x	0
6565	Overvoltage protection switched OFF (Overvolt. OFF)	1	0	0	0	0
	OVERVOLTAGE (P4101) = Block relay	x	1	0	0	0
PTOV2.Mod.stVal		5	4	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTOV2.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTOV2.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTOV2.Str

No.	Information		
6571	Overvoltage U>> picked up (U>> picked up)	0	1
PTOV2.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PTOV2.Op

No.	Information		
6573	Overvoltage U>> TRIP (U>> TRIP)	0	1
PTOV2.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.17 Frequency Protection

3.17.1 Overfrequency Protection (PTOF1 - PTOF4)

PTOF1.Mod

No.	Information							
5213	Frequency protection is ACTIVE (Freq. ACTIVE)	x	x	x	x	x	0	1
5206	>BLOCK stage f1 (>BLOCK f1)	x	x	x	x	1	x	0
5211	Frequency protection is OFF (Freq. OFF)	x	x	1	0	0	0	0
	O/U FREQUENCY (P4201) = Block relay	x	x	x	1	0	0	0
	f1 PICKUP (P4202/4203) = Rated Frequency (P270)	x	1	x	0	0	0	0
	f1 PICKUP (P4202/4203) < Rated Frequency (P270)	1	x	x	0	0	0	0
PTOF1.Mod.stVal		5	5	5	4	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTOF1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTOF1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTOF1.Str

No.	Information				
5232	f1 picked up (f1 picked up)	0	0	1	1
	f1 PICKUP (P4202/4203) < Rated Frequency (P270)	0	1	0	1
PTOF1.Str.general		0	0	1	0

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PTOF1.Op

No.	Information				
5236	f1 TRIP (f1 TRIP)	0	0	1	1
	f1 PICKUP (P4202/4203) < Rated Frequency (P270)	0	1	0	1
PTOF1.Op.general		0	0	1	0

device annunciation / setting: 1 - ON / TRUE IEC Status Op.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PTOF1.BIkV

No.	Information				
5214	Frequency protection undervoltage Blk (Freq UnderV Blk)	0	x	x	1
	f1 PICKUP (P4202/4203) < Rated Frequency (P270)	x	1	x	0
	f1 PICKUP (P4202/4203) = Rated Frequency (P270)	x	x	1	0
PTOF1.BIkV.stVal		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status BlkV.stVal: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE
 x - irrelevant

PTOF2.Str

No.	Information				
5233	f2 picked up (f2 picked up)	0	0	1	1
	f2 PICKUP (P4205/4206) < Rated Frequency (P270)	0	1	0	1
PTOF2.Str.general		0	0	1	0

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PTOF2.Op

No.	Information				
5237	f2 TRIP (f2 TRIP)	0	0	1	1
	f2 PICKUP (P4205/4206) < Rated Frequency (P270)	0	1	0	1
PTOF2.Op.general		0	0	1	0

device annunciation / setting: 1 - ON / TRUE IEC Status Op.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PTOF2.BIkV

No.	Information				
5214	Frequency protection undervoltage Blk (Freq UnderV Blk)	0	x	x	1
	f2 PICKUP (P4205/4206) < Rated Frequency (P270)	x	1	x	0
	f2 PICKUP (P4205/4206) = Rated Frequency (P270)	x	x	1	0
PTOF2.BIkV.stVal		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status BlkV.stVal: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE
 x - irrelevant

PTOF4.Str

No.	Information				
5235	f4 picked up (f4 picked up)	0	0	1	1
	f4 PICKUP (P4211/4212) < Rated Frequency (P270)	0	1	0	1
PTOF4.Str.general		0	0	1	0

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
0 - OFF / FALSE 1 - TRUE

PTOF4.Op

No.	Information				
5239	f4 TRIP (f4 TRIP)	0	0	1	1
	f4 PICKUP (P4211/4212) < Rated Frequency (P270)	0	1	0	1
PTOF4.Op.general		0	0	1	0

device annunciation / setting: 1 - ON / TRUE IEC Status Op.general: 0 - FALSE
0 - OFF / FALSE 1 - TRUE

PTOF4.BIkV

No.	Information				
5214	Frequency protection undervoltage Blk (Freq UnderV Blk)	0	x	x	1
	f4 PICKUP (P4211/4212) < Rated Frequency (P270)	x	1	x	0
	f4 PICKUP (P4211/4212) = Rated Frequency (P270)	x	x	1	0
PTOF4.BIkV.stVal		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status BlkV.stVal: 0 - FALSE
0 - OFF / FALSE 1 - TRUE
x - irrelevant

3.17.2 Underfrequency Protection (PTUF1 - PTUF4)

PTUF1.Mod

No.	Information							
5213	Frequency protection is ACTIVE (Freq. ACTIVE)	x	x	x	x	x	0	1
5206	>BLOCK stage f1 (>BLOCK f1)	x	x	x	x	1	x	0
5211	Frequency protection is OFF (Freq. OFF)	x	x	1	0	0	0	0
	O/U FREQUENCY (P4201) = Block relay	x	x	x	1	0	0	0
	f1 PICKUP (P4202/4203) = Rated Frequency (P270)	x	1	x	0	0	0	0
	f1 PICKUP (P4202/4203) < Rated Frequency (P270)	0	x	x	1	1	1	1
PTUF1.Mod.stVal		5	5	5	4	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTUF1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTUF1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTUF1.Str

No.	Information				
5232	f1 picked up (f1 picked up)	0	0	1	1
	f1 PICKUP (P4202/4203) < Rated Frequency (P270)	0	1	0	1
PTUF1.Str.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
0 - OFF / FALSE 1 - TRUE

PTUF1.Op

No.	Information				
5236	f1 TRIP (f1 TRIP)	0	0	1	1
	f1 PICKUP (P4202/4203) < Rated Frequency (P270)	0	1	0	1
PTUF1.Op.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Op.general: 0 - FALSE
0 - OFF / FALSE 1 - TRUE

PTUF1.BIkV

No.	Information				
5214	Frequency protection undervoltage Blk (Freq UnderV Blk)	0	x	x	1
	f1 PICKUP (P4202/4203) < Rated Frequency (P270)	x	0	x	1
	f1 PICKUP (P4202/4203) = Rated Frequency (P270)	x	x	1	0
PTUF1.BIkV.stVal		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status BlkV.stVal: 0 - FALSE
0 - OFF / FALSE 1 - TRUE
x - irrelevant

PTUF2.Str

No.	Information				
5233	f2 picked up (f2 picked up)	0	0	1	1
	f2 PICKUP (P4205/4206) < Rated Frequency (P270)	0	1	0	1
PTUF2.Str.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PTUF2.Op

No.	Information				
5237	f2 TRIP (f2 TRIP)	0	0	1	1
	f2 PICKUP (P4205/4206) < Rated Frequency (P270)	0	1	0	1
PTUF2.Op.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Op.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PTUF2.BIkV

No.	Information				
5214	Frequency protection undervoltage Blk (Freq UnderV Blk)	0	x	x	1
	f2 PICKUP (P4205/4206) < Rated Frequency (P270)	x	0	x	1
	f2 PICKUP (P4205/4206) = Rated Frequency (P270)	x	x	1	0
PTUF2.BIkV.stVal		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status BlkV.stVal: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE
 x - irrelevant

PTUF3.Mod

No.	Information								
5213	Frequency protection is ACTIVE (Freq. ACTIVE)	x	x	x	x	x	0	1	
5208	>BLOCK stage f3 (>BLOCK f3)	x	x	x	x	1	x	0	
5211	Frequency protection is OFF (Freq. OFF)	x	x	1	0	0	0	0	
	O/U FREQUENCY (P4201) = Block relay	x	x	x	1	0	0	0	
	f3 PICKUP (P4208/4209) = Rated Frequency (P270)	x	1	x	0	0	0	0	
	f3 PICKUP (P4208/4209) < Rated Frequency (P270)	0	x	x	1	1	1	1	
PTUF3.Mod.stVal		5	5	5	4	2	2	1	

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTUF3.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTUF3.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTUF3.Str

No.	Information				
5234	f3 picked up (f3 picked up)	0	0	1	1
	f3 PICKUP (P4208/4209) < Rated Frequency (P270)	0	1	0	1
PTUF3.Str.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PTUF3.Op

No.	Information				
5238	f3 TRIP (f3 TRIP)	0	0	1	1
	f3 PICKUP (P4208/4209) < Rated Frequency (P270)	0	1	0	1
PTUF3.Op.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Op.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PTUF3.BIkV

No.	Information				
5214	Frequency protection undervoltage Blk (Freq UnderV Blk)	0	x	x	1
	f3 PICKUP (P4208/4209) < Rated Frequency (P270)	x	0	x	1
	f3 PICKUP (P4208/4209) = Rated Frequency (P270)	x	x	1	0
PTUF3.BIkV.stVal		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status BlkV.stVal: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE
 x - irrelevant

PTUF4.Str

No.	Information				
5235	f4 picked up (f4 picked up)	0	0	1	1
	f4 PICKUP (P4211/4212) < Rated Frequency (P270)	0	1	0	1
PTUF4.Str.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
0 - OFF / FALSE 1 - TRUE

PTUF4.Op

No.	Information				
5239	f4 TRIP (f4 TRIP)	0	0	1	1
	f4 PICKUP (P4211/4212) < Rated Frequency (P270)	0	1	0	1
PTUF4.Op.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Op.general: 0 - FALSE
0 - OFF / FALSE 1 - TRUE

PTUF4.BIkV

No.	Information				
5214	Frequency protection undervoltage Blk (Freq UnderV Blk)	0	x	x	1
	f4 PICKUP (P4211/4212) < Rated Frequency (P270)	x	0	x	1
	f4 PICKUP (P4211/4212) = Rated Frequency (P270)	x	x	1	0
PTUF4.BIkV.stVal		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status BlkV.stVal: 0 - FALSE
0 - OFF / FALSE 1 - TRUE
x - irrelevant

3.18 Overexcitation (U/f) Protection (PVPH1, PVPH2)

PVPH1.Mod

No.	Information				
5363	Overexcitation prot. is ACTIVE (U/f> ACTIVE)	x	x	0	1
5361	Overexcitation prot. is switched OFF (U/f> OFF)	1	0	0	0
	OVEREXC. PROT. (P4301) = Block relay	x	1	0	0
PVPH1.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PVPH1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PVPH1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PVPH1.Str

No.	Information		
5370	Overexc. prot.: U/f> picked up (U/f> picked up)	0	1
PVPH1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PVPH1.Op

No.	Information		
5372	Overexc. prot.: TRIP of th. stage (U/f> th.TRIP)	0	1
PVPH1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PVPH2.Mod

No.	Information				
5363	Overexcitation prot. is ACTIVE (U/f> ACTIVE)	x	x	0	1
5361	Overexcitation prot. is switched OFF (U/f> OFF)	1	0	0	0
	OVEREXC. PROT. (P4301) = Block relay	x	1	0	0
PVPH2.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PVPH2.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PVPH2.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PVPH2.Str

No.	Information		
5373	Overexc. prot.: U/f>> picked up (U/f>> pick.up)	0	1
PVPH2.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PVPH2.Op

No.	Information		
5371	Overexc. prot.: TRIP of U/f>> stage (U/f>> TRIP)	0	1
PVPH2.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PTUV3.Str

No.	Information		
6526	Inv. Undervoltage $U_{p<}$ -char. picked up ($U_{p<}$ ch. pick.up)	0	1
PTUV3.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PTUV3.Op

No.	Information		
6527	Inverse Undervoltage $U_{p<}$ TRIP ($U_{p<}$ TRIP)	0	1
PTUV3.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.20 Rate-of-Frequency-Change Protection df/dt

3.20.1 2 df/dt Stages (PFRC1, PFRC2)

PFRC1.Mod

No.	Information							
5513	df/dt is ACTIVE (df/dt ACTIVE)	x	x	x	0	x	1	
5504	>BLOCK df1/dt stage (>df1/dt block)	x	x	x	x	1	0	
5511	df/dt is switched OFF (df/dt OFF)	x	1	0	0	0	0	
	df/dt Protect. (P4501) = Block relay	x	x	1	0	0	0	
	STAGE df1/dt (P4503) = ∞	1	x	0	0	0	0	
PFRC1.Mod.stVal		5	5	4	2	2	1	

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PFRC1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PFRC1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PFRC1.Str

No.	Information		
5516	Stage df1/dt picked up (df1/dt pickup)	0	1
PFRC1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PFRC1.Op

No.	Information		
5520	Stage df1/dt TRIP (df1/dt TRIP)	0	1
PFRC1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PFRC1.BIkV

No.	Information				
5514	df/dt is blocked by undervoltage (df/dt U< block)	0	0	1	1
	STAGE df1/dt (P4503) = ∞	1	0	1	0
PFRC1.BIkV.stVal		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status BIkV.stVal: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PFRC2.Mod

No.	Information							
5513	df/dt is ACTIVE (df/dt ACTIVE)	x	x	x	0	x	1	
5505	>BLOCK df2/dt stage (>df2/dt block)	x	x	x	x	1	0	
5511	df/dt is switched OFF (df/dt OFF)	x	1	0	0	0	0	
	df/dt Protect. (P4501) = Block relay	x	x	1	0	0	0	
	STAGE df2/dt (P4507) = ∞	1	x	0	0	0	0	
PFRC2.Mod.stVal		5	5	4	2	2	1	

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PFRC2.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PFRC2.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PFRC2.Str

No.	Information		
5517	Stage df2/dt picked up (df2/dt pickup)	0	1
PFRC2.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PFRC2.Op

No.	Information		
5521	Stage df2/dt TRIP (df2/dt TRIP)	0	1
PFRC2.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PFRC2.BikV

No.	Information				
5514	df/dt is blocked by undervoltage (df/dt U< block)	0	0	1	1
	STAGE df2/dt (P4507) = ∞	1	0	1	0
PFRC2.BikV.stVal		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status BikV.stVal: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PFRC3.Op

No.	Information		
5522	Stage df3/dt TRIP (df3/dt TRIP)	0	1
PFRC3.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PFRC3.BIkV

No.	Information				
5514	df/dt is blocked by undervoltage (df/dt U< block)	0	0	1	1
	STAGE df3/dt (P4511) = ∞	1	0	1	0
PFRC3.BIkV.stVal		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status BlkV.stVal: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE

PFRC4.Mod

No.	Information							
5513	df/dt is ACTIVE (df/dt ACTIVE)	x	x	x	0	x	1	
5507	>BLOCK df4/dt stage (>df4/dt block)	x	x	x	x	1	0	
5511	df/dt is switched OFF (df/dt OFF)	x	1	0	0	0	0	
	df/dt Protect. (P4501) = Block relay	x	x	1	0	0	0	
	STAGE df4/dt (P4515) = ∞	1	x	0	0	0	0	
PFRC4.Mod.stVal		5	5	4	2	2	1	

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PFRC4.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PFRC4.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

PFRC4.Str

No.	Information		
5519	Stage df4/dt picked up (df4/dt pickup)	0	1
PFRC4.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
0 - OFF 1 - TRUE

PFRC4.Op

No.	Information		
5523	Stage df4/dt TRIP (df4/dt TRIP)	0	1
PFRC4.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
0 - OFF 1 - TRUE

PFRC4.BikV

No.	Information				
5514	df/dt is blocked by undervoltage (df/dt U< block)	0	0	1	1
	STAGE df4/dt (P4515) = ∞	1	0	1	0
PFRC4.BikV.stVal		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status BikV.stVal: 0 - FALSE
0 - OFF / FALSE 1 - TRUE

3.21 Jump of Voltage Vector (GAPC5)

GAPC5.Mod

No.	Information				
5584	Vector Jump is ACTIVE (VEC JUMP ACTIVE)	x	x	0	1
5582	Vector Jump is switched OFF (VEC JUMP OFF)	1	0	0	0
	VECTOR JUMP (P4601) = Block relay	x	1	0	0
GAPC5.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

GAPC5.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
GAPC5.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

GAPC5.Str

No.	Information		
5586	Vector Jump picked up (VEC JUMP pickup)	0	1
GAPC5.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

GAPC5.Op

No.	Information		
5587	Vector Jump TRIP (VEC JUMP TRIP)	0	1
GAPC5.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.22 Stator Earth Fault Protection (PTOV3, PSDE1)

PTOV3.Mod

No.	Information				
5183	Stator earth fault protection is ACTIVE (S/E/F ACTIVE)	x	x	0	1
5181	Stator earth fault prot. is switched OFF (S/E/F OFF)	1	0	0	0
	S/E/F PROT. (P5001) = Block relay	x	1	0	0
PTOV3.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

PTOV3.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTOV3.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

PTOV3.Str

No.	Information		
5186	Stator earth fault: U0 picked up (U0> picked up)	0	1
PTOV3.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
0 - OFF 1 - TRUE

PTOV3.Str.phsA

No.	Information		
5189	Earth fault in phase L1 (Uearth L1)	0	1
PTOV3.Str.phsA		0	1

device annunciation: 1 - ON IEC Status Str.phsA: 0 - FALSE
0 - OFF 1 - TRUE

PTOV3.Str.phsB

No.	Information		
5190	Earth fault in phase L2 (Uearth L2)	0	1
PTOV3.Str.phsB		0	1

device annunciation: 1 - ON IEC Status Str.phsB: 0 - FALSE
 0 - OFF 1 - TRUE

PTOV3.Str.phsC

No.	Information		
5191	Earth fault in phase L3 (Uearth L3)	0	1
PTOV3.Str.phsC		0	1

device annunciation: 1 - ON IEC Status Str.phsC: 0 - FALSE
 0 - OFF 1 - TRUE

PTOV3.Op

No.	Information				
5187	Stator earth fault: U0 stage TRIP (U0> TRIP)	0	0	1	1
5193	Stator earth fault protection TRIP (S/E/F TRIP)	0	1	0	1
PTOV3.Op.general		0	1	1	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PSDE1.Mod

No.	Information							
5183	Stator earth fault protection is ACTIVE (S/E/F ACTIVE)	x	x	x	x	0	1	
5176	>Switch off earth current detec.(S/E/F) (>S/E/F IEE off)	x	x	1	0	0	0	
5181	Stator earth fault prot. is switched OFF (S/E/F OFF)	1	x	x	0	0	0	
	S/E/F PROT. (P5001) = Block relay	x	x	x	1	0	0	
	S/E/F PROT. (P150) = Non-dir. U0	x	1	x	0	0	0	
PSDE1.Mod.stVal		5	5	5	4	2	1	

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PSDE1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PSDE1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PSDE1.Str

No.	Information		
5188	Stator earth fault: I0 picked up (3I0> picked up)	0	1
PSDE1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.23 Sensitive Earth Current Protection (PTOC6, PTOC7)

PTOC6.Mod

No.	Information					
1234	Earth current prot. is ACTIVE (IEE ACTIVE)	x	x	x	0	1
1203	>BLOCK IEE> (>BLOCK IEE>)	x	x	1	x	0
1232	Earth current prot. is switched OFF (IEE OFF)	1	0	0	0	0
	O/C PROT. IEE (P5101) = Block relay	x	1	0	0	0
PTOC6.Mod.stVal		5	4	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTOC6.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTOC6.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTOC6.Str

No.	Information		
1224	IEE> picked up (IEE> picked up)	0	1
PTOC6.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PTOC6.Op

No.	Information		
1226	IEE> TRIP (IEE> TRIP)	0	1
PTOC6.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

PTOC7.Mod

No.	Information					
1234	Earth current prot. is ACTIVE (IEE ACTIVE)	x	x	x	0	1
1202	>BLOCK IEE>> (>BLOCK IEE>>)	x	x	1	x	0
1232	Earth current prot. is switched OFF (IEE OFF)	1	0	0	0	0
	O/C PROT. IEE (P5101) = Block relay	x	1	0	0	0
PTOC7.Mod.stVal		5	4	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTOC7.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTOC7.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTOC7.Str

No.	Information		
1221	IEE>> picked up (IEE>> picked up)	0	1
PTOC7.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
0 - OFF 1 - TRUE

PTOC7.Op

No.	Information		
1223	IEE>> TRIP (IEE>> TRIP)	0	1
PTOC7.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
0 - OFF 1 - TRUE

PHIZ2.Str

No.	Information		
5567	SEF with 3.Harm. picked up (SEF 3H pick.up)	0	1
PHIZ2.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PHIZ2.Op

No.	Information		
5568	SEF with 3.Harm. TRIP (SEF 3H TRIP)	0	1
PHIZ2.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.25 100%-Stator Earth Fault Protection (PHIZ4)

PHIZ4.Mod

No.	Information				
5483	Stator earth ft. prot. 100% is ACTIVE (SEF100 ACTIVE)	x	x	0	1
5481	Stator earth ft. prot. 100% is swit.OFF (SEF100 OFF)	1	0	0	0
	100% SEF-PROT. (P5301) = Block relay	x	1	0	0
PHIZ4.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

PHIZ4.Health

No.	Information				
51	Device is Operational and Protecting (Device OK)	1	1	0	0
5486	Stator earth ft. prot. 100% Failure (SEF100 Failure)	0	1	1	0
PHIZ4.Health.stVal		1	3	3	3

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

PHIZ4.Str

No.	Information		
5488	Stator earthflt. prot.100% picked up (SEF100 pickup)	0	1
PHIZ4.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PHIZ4.Op

No.	Information		
5489	Stator earthflt. prot.100% TRIP (SEF100 TRIP)	0	1
PHIZ4.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.26 Sensitive Earth Current Protection B

3.26.1 IEE-B> (PTOC9)

PTOC9.Mod

No.	Information				
25074	Earth current prot. B is ACTIVE (IEE-B ACTIVE)	x	x	0	1
25072	Earth current prot. B is switched OFF (IEE-B OFF)	1	0	0	0
	O/C PROT IEE-B (P5401) = Block relay	x	1	0	0
PTOC9.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

PTOC9.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTOC9.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

PTOC9.Str

No.	Information		
25077	IEE-B> picked up (IEE-B> pickup)	0	1
PTOC9.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
0 - OFF 1 - TRUE

PTOC9.Op

No.	Information		
25079	IEE-B> TRIP (IEE-B> TRIP)	0	1
PTOC9.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
0 - OFF 1 - TRUE

3.26.2 IEE-B< (PTUC2)

PTUC2.Mod

No.	Information					
25074	Earth current prot. B is ACTIVE (IEE-B ACTIVE)	x	x	x	0	1
25072	Earth current prot. B is switched OFF (IEE-B OFF)	x	1	0	0	0
	O/C PROT IEE-B (P5401) = Block relay	x	x	1	0	0
	EE-B< (P5404) = 0	1	x	0	0	0
PTUC2.Mod.stVal		5	5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTUC2.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTUC2.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTUC2.Str

No.	Information		
25078	IEE-B< picked up (IEE-B< pickup)	0	1
PTUC2.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PTUC2.Op

No.	Information		
25080	IEE-B< TRIP (IEE-B< TRIP)	0	1
PTUC2.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.27 Interturn Protection (PTOV5)

PTOV5.Mod

No.	Information				
5423	Interturn fault protection is ACTIVE (I/T ACTIVE)	x	x	0	1
5421	Interturn fault prot. is switched OFF (I/T OFF)	1	0	0	0
	INTERTURN PROT (P5501) = Block relay	x	1	0	0
PTOV5.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTOV5.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTOV5.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTOV5.Str

No.	Information		
5426	Interturn fault protection picked up (I/T picked up)	0	1
PTOV5.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PTOV5.Op

No.	Information		
5427	Interturn fault protection TRIP (I/T TRIP)	0	1
PTOV5.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.28 Rotor Earth Fault Protection R, fn (PHIZ1)

PHIZ1.Mod

No.	Information					
5393	Rotor earth fault prot. (R,fn) is ACTIVE (R/E/F AKTIVE)	x	x	x	0	1
5394	Rot. earth flt. prot. (R,fn) block by U< (R/E/F U< block)	x	x	1	x	0
5391	Rotor earth fault prot. (R,fn) swit. OFF (R/E/F OFF)	1	0	0	0	0
	ROTOR E/F (P6001) = Block relay	x	1	0	0	0
PHIZ1.Mod.stVal		5	4	2	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PHIZ1.Health

No.	Information				
51	Device is Operational and Protecting (Device OK)	1	0	1	0
5400	Failure rotor earth fault prot. (R,fn) (Failure R/E/F)	0	1	1	0
PHIZ1.Health.stVal		1	3	2	3

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PHIZ1.Str

No.	Information		
5398	Rot. earthflt.prot. (R,fn) Re<< pick.up (R/E/F picked up)	0	1
PHIZ1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PHIZ1.Op

No.	Information		
5399	Rotor earth fault prot. (R,fn) Re<< TRIP (R/E/F TRIP)	0	1
PHIZ1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.29 Rotor Earth Fault Protection with 1-3 Hz (PHIZ3)

PHIZ3.Mod

No.	Information				
5389	REF protection (1-3Hz) is ACTIVE (REF 1-3Hz ACT)	x	x	0	1
5387	REF protection (1-3Hz) is switched OFF (REF 1-3Hz OFF)	1	0	0	0
	REF 1-3Hz (P6101) = Block relay	x	1	0	0
PHIZ3.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

PHIZ3.Health

No.	Information				
51	Device is Operational and Protecting (Device OK)	1	1	0	0
5401	Failure REF protection (1-3Hz) (Fail REF 1-3Hz)	0	1	1	0
PHIZ3.Health.stVal		1	3	3	3

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

PHIZ3.Str

No.	Information		
5406	REF prot. (1-3Hz) Re<< picked up (REF 1-3Hz Fault)	0	1
PHIZ3.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
0 - OFF 1 - TRUE

PHIZ3.Op

No.	Information		
5407	REF prot. (1-3Hz) Re<< TRIP (REF 1-3Hz Trip)	0	1
PHIZ3.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
0 - OFF 1 - TRUE

3.30 Motor Starting Time Supervision (PMSS1)

PMSS1.Mod

No.	Information				
6813	Starting time supervision is ACTIVE (START-SUP ACT)	x	x	0	1
6811	Starting time supervision switched OFF (START-SUP OFF)	1	0	0	0
	STARTUP MOTOR (P6501) = Block relay	x	1	0	0
PMSS1.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PMSS1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PMSS1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PMSS1.Str

No.	Information		
6823	Starting time supervision picked up (START-SUP PU)	0	1
PMSS1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PMSS1.Op

No.	Information		
6821	Starting time supervision TRIP (START-SUP TRIP)	0	1
PMSS1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.32 Breaker Failure Protection (RBRF1)

RBRF1.Mod

No.	Information				
1453	Breaker failure is ACTIVE (BkrFail ACTIVE)	x	x	0	1
1451	Breaker failure is switched OFF (BkrFail OFF)	1	0	0	0
	BREAKER FAILURE (P7001) = Block relay	x	1	0	0
RBRF1.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

RBRF1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
RBRF1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

RBRF1.Str

No.	Information		
1455	Breaker failure protection: picked up (B/F picked up)	0	1
RBRF1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
0 - OFF 1 - TRUE

RBRF1.OpIn

No.	Information				
1471	Breaker failure TRIP (BrkFailure TRIP)	0	0	1	1
1443	Breaker fail. started intern (int. start B/F)	0	1	0	1
RBRF1.OpIn.general		0	0	0	1

device annunciation: 1 - ON IEC Status OpIn.general: 0 - FALSE
0 - OFF 1 - TRUE
x - irrelevant

RBRF1.OpEx

No.	Information				
1471	Breaker failure TRIP (BrkFailure TRIP)	0	0	1	1
1443	Breaker fail. started intern (int. start B/F)	0	1	1	0
RBRF1.OpEx.general		0	0	0	1

device annunciation: 1 - ON IEC Status OpEx.general: 0 - FALSE
0 - OFF 1 - TRUE

3.33 Inadvertent Energization (PVOC2)

PVOC2.Mod

No.	Information					
5543	Inadvert. Energ. prot. is ACTIVE (I.En. ACTIVE)	x	x	x	0	1
5541	Inadvert. Energ. prot. is switched OFF (I.En. OFF)	x	1	0	0	0
	INADVERT. EN. (P7101) = Block relay	x	x	1	0	0
	I STAGE (P7102) = ∞	1	x	0	0	0
PVOC2.Mod.stVal		5	5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PVOC2.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PVOC2.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PVOC2.Str

No.	Information		
5547	Inadvert. Energ. prot. picked up (I.En. picked up)	0	1
PVOC2.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
0 - OFF 1 - TRUE

PVOC2.Op

No.	Information		
5548	Inadvert. Energ. prot. TRIP (I.En. TRIP)	0	1
PVOC2.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
0 - OFF 1 - TRUE

3.34 DC Voltage/DC Current Protection

3.34.1 DC Voltage Protection (PTOV4, PTUV4)

PTOV4.Mod

No.	Information						
5303	DC protection is ACTIVE (DC Prot. ACTIVE)	x	x	x	x	0	1
5301	DC protection is switched OFF (DC Prot. OFF)	x	x	1	0	0	0
	DC PROTECTION (P7201) = Block relay	x	x	x	1	0	0
	TRANSDUCER 1 (P295) = 10V	x	0	x	1	1	1
	DC >/< (P7203) = DC>	0	x	x	1	1	1
PTOV4.Mod.stVal		5	5	5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
0 - OFF / FALSE 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

PTOV4.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTOV4.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

PTOV4.Str

No.	Information				
5306	DC protection picked up (DC Prot.pick.up)	0	x	x	1
	TRANSDUCER 1 (P295) = 10V	x	0	x	1
	DC >/< (P7203) = DC>	x	x	0	1
PTOV4.Str.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE
 x - irrelevant

PTOV4.Op

No.	Information				
5307	DC protection TRIP (DC Prot. TRIP)	0	x	x	1
	TRANSDUCER 1 (P295) = 10V	x	0	x	1
	DC >/< (P7203) = DC>	x	x	0	1
PTOV4.Op.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Op.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE
 x - irrelevant

PTUV4.Mod

No.	Information						
5303	DC protection is ACTIVE (DC Prot. ACTIVE)	x	x	x	x	0	1
5301	DC protection is switched OFF (DC Prot. OFF)	x	x	1	0	0	0
	DC PROTECTION (P7201) = Block relay	x	x	x	1	0	0
	TRANSDUCER 1 (P295) = 10V	x	0	x	1	1	1
	DC >/< (P7203) = DC<	0	x	x	1	1	1
PTUV4.Mod.stVal		5	5	5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTUV4.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTUV4.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTUV4.Str

No.	Information				
5306	DC protection picked up (DC Prot.pick.up)	0	x	x	1
	TRANSDUCER 1 (P295) = 10V	x	0	x	1
	DC >/< (P7203) = DC<	x	x	0	1
PTUV4.Str.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE
 x - irrelevant

PTUV4.Op

No.	Information				
5307	DC protection TRIP (DC Prot. TRIP)	0	x	x	1
	TRANSDUCER 1 (P295) = 10V	x	0	x	1
	DC >/< (P7203) = DC<	x	x	0	1
PTUV4.Op.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Op.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE
 x - irrelevant

PTOC5.Op

No.	Information				
5307	DC protection TRIP (DC Prot. TRIP)	0	x	x	1
	TRANSDUCER 1 (P295) = 4-20 mA or 20 mA	x	0	x	1
	DC >/< (P7203) = DC>	x	x	0	1
PTOC5.Op.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Op.general: 0 - FALSE
 0 - OFF / FALSE 1 - TRUE
 x - irrelevant

PTUC1.Mod

No.	Information							
5303	DC protection is ACTIVE (DC Prot. ACTIVE)	x	x	x	x	0	1	
5301	DC protection is switched OFF (DC Prot. OFF)	x	x	1	0	0	0	
	DC PROTECTION (P7201) = Block relay	x	x	x	1	0	0	
	TRANSDUCER 1 (P295) = 4-20 mA or 20 mA	x	0	x	1	1	1	
	DC >/< (P7203) = DC<	0	x	x	1	1	1	
PTUC1.Mod.stVal		5	5	5	4	2	1	

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTUC1.Health

No.	Information				
51	Device is Operational and Protecting (Device OK)	1	1	0	0
5308	Failure DC protection (Failure DC Prot)	0	1	1	0
PTUC1.Health.stVal		1	3	3	3

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTUC1.Str

No.	Information				
5306	DC protection picked up (DC Prot.pick.up)	0	x	x	1
	TRANSDUCER 1 (P295) = 4-20 mA or 20 mA	x	0	x	1
	DC >/< (P7203) = DC<	x	x	0	1
PTUC1.Str.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Str.general: 0 - FALSE
0 - OFF / FALSE 1 - TRUE
x - irrelevant

PTUC1.Op

No.	Information				
5307	DC protection TRIP (DC Prot. TRIP)	0	x	x	1
	TRANSDUCER 1 (P295) = 4-20 mA or 20 mA	x	0	x	1
	DC >/< (P7203) = DC<	x	x	0	1
PTUC1.Op.general		0	0	0	1

device annunciation / setting: 1 - ON / TRUE IEC Status Op.general: 0 - FALSE
0 - OFF / FALSE 1 - TRUE
x - irrelevant

3.35 External Trip Coupling

3.35.1 External Trip Function 1 (GAPC1)

GAPC1.Mod

No.	Information				
4533	External trip 1 is ACTIVE (Ext 1 ACTIVE)	x	x	0	1
4531	External trip 1 is switched OFF (Ext 1 OFF)	1	0	0	0
	EXTERN TRIP 1 (P8601) = Block relay	x	1	0	0
GAPC1.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

GAPC1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
GAPC1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

GAPC1.Str

No.	Information		
4536	External trip 1: General picked up (Ext 1 picked up)	0	1
GAPC1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

GAPC1.Op

No.	Information		
4537	External trip 1: General TRIP (Ext 1 Gen.TRP)	0	1
GAPC1.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.35.2 External Trip Function 2 (GAPC2)

GAPC2.Mod

No.	Information				
4553	External trip 2 is ACTIVE (Ext 2 ACTIVE)	x	x	0	1
4551	External trip 2 is switched OFF (Ext 2 OFF)	1	0	0	0
	EXTERN TRIP 2 (P8701) = Block relay	x	1	0	0
GAPC2.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

GAPC2.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
GAPC2.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

GAPC2.Str

No.	Information		
4556	External trip 2: General picked up (Ext 2 picked up)	0	1
GAPC2.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

GAPC2.Op

No.	Information		
4557	External trip 2: General TRIP (Ext 2 Gen.TRIP)	0	1
GAPC2.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.35.3 External Trip Function 3 (GAPC3)

GAPC3.Mod

No.	Information				
4573	External trip 3 is ACTIVE (Ext 3 ACTIVE)	x	x	0	1
4571	External trip 3 is switched OFF (Ext 3 OFF)	1	0	0	0
	EXTERN TRIP 3 (P8801) = Block relay	x	1	0	0
GAPC3.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

GAPC3.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
GAPC3.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

GAPC3.Str

No.	Information		
4576	External trip 3: General picked up (Ext 3 picked up)	0	1
GAPC3.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

GAPC3.Op

No.	Information		
4577	External trip 3: General TRIP (Ext 3 Gen.TRIP)	0	1
GAPC3.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.35.4 External Trip Function 4 (GAPC4)

GAPC4.Mod

No.	Information				
4593	External trip 4 is ACTIVE (Ext 4 ACTIVE)	x	x	0	1
4591	External trip 4 is switched OFF (Ext 4 OFF)	1	0	0	0
	EXTERN TRIP 4 (P8901) = Block relay	x	1	0	0
GAPC4.Mod.stVal		5	4	2	1

device annunciation / setting: 1 - ON / TRUE IEC Status Mod.stVal: 1 - ON
 0 - OFF / FALSE 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

GAPC4.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
GAPC4.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

GAPC4.Str

No.	Information		
4596	External trip 4: General picked up (Ext 4 picked up)	0	1
GAPC4.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

GAPC4.Op

No.	Information		
4597	External trip 4: General TRIP (Ext 4 Gen.TRIP)	0	1
GAPC4.Op.general		0	1

device annunciation: 1 - ON IEC Status Op.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.36 Tripping Logic of the Entire Device (PTRC1)

PTRC1.Mod

No.	Information		
55	At Least 1 Protection Funct. is Active (ProtActive)	1	0
PTRC1.Mod.stVal		1	5

device annunciation: 1 - ON IEC Status Mod.stVal: 1 - ON
 0 - OFF 2 - BLOCKED
 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

PTRC1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
PTRC1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

PTRC1.Str

No.	Information		
501	Relay PICKUP (Relay PICKUP)	0	1
PTRC1.Str.general		0	1

device annunciation: 1 - ON IEC Status Str.general: 0 - FALSE
 0 - OFF 1 - TRUE

PTRC1.Tr

No.	Information		
511	Relay GENERAL TRIP command (Relay TRIP)	0	1
PTRC1.Tr.general		0	1

device annunciation: 1 - ON IEC Status Tr.general: 0 - FALSE
 0 - OFF 1 - TRUE

3.37 Measurement

3.37.1 Operational Measured Values Current Side 1(MMXU1)

MMXU1.Mod

No.	Information	
55	Reset Device (Reset Device)	x
MMXU1.Mod.stVal		1

device annunciation: 1 - ON IEC Status Mod.stVal: 1 - ON
 0 - OFF 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

MMXU1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
MMXU1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

MMXU1.A

No.	Information	Value		
721	Operat. meas. current L1 side 1 [%] is (IL1S1=)	MMXU1.A.phsA.cVal.mag.f	Measured value	Absolute value
		MMXU1.A.phsA.units.SIUnit	5	A (Ampere)
		MMXU1.A.phsA.units.multiplier	3	Kilo
7740	Phase angle in phase IL1 side 1 (φ IL1S1=)	MMXU1.A.phsA.cVal.ang.f	Measured Value	Phase angle in °

No.	Information	Value		
722	Operat. meas. current L2 side 1 [%] is (IL2S1=)	MMXU1.A.phsB.cVal.mag.f	Measured value	Absolute value
		MMXU1.A.phsB.units.SIUnit	5	A (Ampere)
		MMXU1.A.phsB.units.multiplier	3	Kilo
7741	Phase angle in phase IL2 side 1 (φ IL2S1=)	MMXU1.A.phsB.cVal.ang.f	Measured Value	Phase angle in °

No.	Information	Value		
723	Operat. meas. current L3 side 1 [%] is (IL3S1=)	MMXU1.A.phsC.cVal.mag.f	Measured value	Absolute value
		MMXU1.A.phsC.units.SIUnit	5	A (Ampere)
		MMXU1.A.phsC.units.multiplier	3	Kilo
7749	Phase angle in phase IL3 side 1 (φ IL3S1=)	MMXU1.A.phsC.cVal.ang.f	Measured Value	Phase angle in °

No.	Information	Value		
828	Sensitive Earth Current 1 (IEE1=)	MMXU1.A.neut.cVal.mag.f	Measured value	Absolute value
		MMXU1.A.neut.units.SIUnit	5	A (Ampere)
		MMXU1.A.neut.units.multiplier	0	1

3.37.2 Operational Measured Values Current Side 2 (MMXU2)

MMXU2.Mod

No.	Information	
55	Reset Device (Reset Device)	x
MMXU2.Mod.stVal		1

device annunciation: 1 - ON IEC Status Mod.stVal: 1 - ON
 0 - OFF 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

MMXU2.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
MMXU2.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

MMXU2.A

No.	Information	Value		
724	Operat. meas. current L1 side 2 [%] is (IL1S2=)	MMXU2.A.phsA.cVal.mag.f	Measured value	Absolute value
		MMXU2.A.phsA.units.SIUnit	5	A (Ampere)
		MMXU2.A.phsA.units.multiplier	3	Kilo
7750	Phase angle in phase IL1 side 2 (φ IL1S2=)	MMXU2.A.phsA.cVal.ang.f	Measured Value	Phase angle in °
No.	Information	Value		
725	Operat. meas. current L2 side 2 [%] is (IL2S2=)	MMXU2.A.phsB.cVal.mag.f	Measured value	Absolute value
		MMXU2.A.phsB.units.SIUnit	5	A (Ampere)
		MMXU2.A.phsB.units.multiplier	3	Kilo
7759	Phase angle in phase IL2 side 2 (φ IL2S2=)	MMXU2.A.phsB.cVal.ang.f	Measured Value	Phase angle in °
No.	Information	Value		
726	Operat. meas. current L3 side 2 [%] is (IL3S2=)	MMXU2.A.phsC.cVal.mag.f	Measured value	Absolute value
		MMXU2.A.phsC.units.SIUnit	5	A (Ampere)
		MMXU2.A.phsC.units.multiplier	3	Kilo
7760	Phase angle in phase IL3 side 2 (φ IL3S2=)	MMXU2.A.phsC.cVal.ang.f	Measured Value	Phase angle in °
No.	Information	Value		
829	Sensitive Earth Current 2 (IEE2=)	MMXU2.A.neut.cVal.mag.f	Measured value	Absolute value
		MMXU2.A.neut.units.SIUnit	5	A (Ampere)
		MMXU2.A.neut.units.multiplier	0	1

3.37.3 Operational Measured Values (MMXU3)

MMXU3.Mod

No.	Information	
55	Reset Device (Reset Device)	x
MMXU3.Mod.stVal		1

device annunciation: 1 - ON IEC Status Mod.stVal: 1 - ON
 0 - OFF 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

MMXU3.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
MMXU3.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

MMXU3.TotW

No.	Information	Value		
641	P (active power) ($P =$)	MMXU3.TotW.mag.f	Measured value	Absolute value
		MMXU3.TotW.units.SIUnit	62	W (Watt)
		MMXU3.TotW.units.multiplier	3	Kilo

MMXU3.TotVAr

No.	Information	Value		
642	Q (reactive power) ($Q =$)	MMXU3.TotVAr.mag.f	Measured value	Absolute value
		MMXU3.TotVAr.units.SIUnit	63	VAr
		MMXU3.TotVAr.units.multiplier	3	Kilo

MMXU3.TotVA

No.	Information	Value		
645	S (apparent power) ($S =$)	MMXU3.TotVA.mag.f	Measured value	Absolute value
		MMXU3.TotVA.units.SIUnit	61	VA
		MMXU3.TotVA.units.multiplier	3	Kilo

MMXU3.TotPF

No.	Information	Value		
901	Power Factor ($PF =$)	MMXU3.TotPF.mag.f	Measured value	Absolute value
		MMXU3.TotPF.units.SIUnit	1	NONE
		MMXU3.TotPF.units.multiplier	0	1

MMXU3.Hz

No.	Information	Value		
644	Frequency (Freq=)	MMXU3.Hz.mag.f	Measured value	Absolute value
		MMXU3.Hz.units.SIUnit	33	Hz
		MMXU3.Hz.units.multiplier	0	1

MMXU3.PPV

No.	Information	Value		
624	U L12 (UL12=)	MMXU3.PPV.phsAB.cVal.mag.f	Measured value	Absolute value
		MMXU3.PPV.phsAB.units.SIUnit	29	V (Volt)
		MMXU3.PPV.phsAB.units.multiplier	3	Kilo

No.	Information	Value		
625	U L23 (UL23=)	MMXU3.PPV.phsBC.cVal.mag.f	Measured value	Absolute value
		MMXU3.PPV.phsBC.units.SIUnit	29	V (Volt)
		MMXU3.PPV.phsBC.units.multiplier	3	Kilo

No.	Information	Value		
626	U L31 (UL31=)	MMXU3.PPV.phsCA.cVal.mag.f	Measured value	Absolute value
		MMXU3.PPV.phsCA.units.SIUnit	29	V (Volt)
		MMXU3.PPV.phsCA.units.multiplier	3	Kilo

MMXU3.PhV

No.	Information	Value		
621	U L1-E (UL1E=)	MMXU3.PhV.phsA.cVal.mag.f	Measured value	Absolute value
		MMXU3.PhV.phsA.units.SIUnit	29	V (Volt)
		MMXU3.PhV.phsA.units.multiplier	3	Kilo

No.	Information	Value		
622	U L2-E (UL2E=)	MMXU3.PhV.phsB.cVal.mag.f	Measured value	Absolute value
		MMXU3.PhV.phsB.units.SIUnit	29	V (Volt)
		MMXU3.PhV.phsB.units.multiplier	3	Kilo

No.	Information	Value		
623	U L3-E (UL3E=)	MMXU3.PhV.phsC.cVal.mag.f	Measured value	Absolute value
		MMXU3.PhV.phsC.units.SIUnit	29	V (Volt)
		MMXU3.PhV.phsC.units.multiplier	3	Kilo

No.	Information	Value		
627	Displacement voltage UE (UE =)	MMXU3.PhV.neut.cVal.mag.f	Measured value	Absolute value
		MMXU3.PhV.neut.units.SIUnit	29	V (Volt)
		MMXU3.PhV.neut.units.multiplier	0	1

MSQI1.SeqA

No.	Information	Value		
605	I1 (positive sequence) (I1 =)	MSQI1.SeqA.c1.cVal.mag.f	Measured value	Absolute value
		MSQI1.SeqA.c1.units.SIUnit	5	A (Ampere)
		MSQI1.SeqA.c1.units.multiplier	3	Kilo

No.	Information	Value		
606	I2 (negative sequence) (I2 =)	MSQI1.SeqA.c2.cVal.mag.f	Measured value	Absolute value
		MSQI1.SeqA.c2.units.SIUnit	5	A (Ampere)
		MSQI1.SeqA.c2.units.multiplier	3	Kilo

No.	Information	Value		
831	3I0 (zero sequence) (3I0 =)	MSQI1.SeqA.c3.cVal.mag.f	Measured value	Absolute value
		MSQI1.SeqA.c3.units.SIUnit	5	A (Ampere)
		MSQI1.SeqA.c3.units.multiplier	3	Kilo

MSQI1.SeqV

No.	Information	Value		
629	U1 (positive sequence) (U1 =)	MSQI1.SeqV.c1.cVal.mag.f	Measured value	Absolute value
		MSQI1.SeqV.c1.units.SIUnit	29	V (Volt)
		MSQI1.SeqV.c1.units.multiplier	3	Kilo

No.	Information	Value		
630	U2 (negative sequence) (U2 =)	MSQI1.SeqV.c2.cVal.mag.f	Measured value	Absolute value
		MSQI1.SeqV.c2.units.SIUnit	29	V (Volt)
		MSQI1.SeqV.c2.units.multiplier	3	Kilo

No.	Information	Value		
832	U0 (zero sequence) (U0 =)	MSQI1.SeqV.c3.cVal.mag.f	Measured value	Absolute value
		MSQI1.SeqV.c3.units.SIUnit	29	V (Volt)
		MSQI1.SeqV.c3.units.multiplier	3	Kilo

3.37.5 General Measured Values (M1_GGIO1)

M1_GGIO1.Mod

No.	Information	
55	Reset Device (Reset Device)	x
M1_GGIO1.Mod.stVal		1

device annunciation: 1 - ON IEC Status Mod.stVal: 1 - ON
 0 - OFF 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

M1_GGIO1.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
M1_GGIO1.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

M1_GGIO1.AnIn1

No.	Information	Value		
		M1_GGIO1.AnIn1.cVal.mag.f	Measured value	Absolute value
902	Power angle (PHI=)	M1_GGIO1.AnIn1.units.SIUnit	9	° (Degree)
		M1_GGIO1.AnIn1.units.multiplier	0	1

M1_GGIO1.AnIn2

No.	Information	Value		
		M1_GGIO1.AnIn2.cVal.mag.f	Measured value	Absolute value
765	(U/Un) / (f/fn) (U/f =)	M1_GGIO1.AnIn2.units.SIUnit	1	none
		M1_GGIO1.AnIn2.units.multiplier	0	1

M1_GGIO1.AnIn3

No.	Information	Value		
			Measured value	Absolute value
650	UE 3rd harmonic (UE3h =)	M1_GGIO1.AnIn3.cVal.mag.f		
		M1_GGIO1.AnIn3.units.SIUnit	29	V (Volt)
		M1_GGIO1.AnIn3.units.multiplier	0	1

M1_GGIO1.AnIn4

No.	Information	Value		
			Measured value	Absolute value
903	Resistance (R=)	M1_GGIO1.AnIn4.cVal.mag.f		
		M1_GGIO1.AnIn4.units.SIUnit	30	Ω
		M1_GGIO1.AnIn4.units.multiplier	0	1

M1_GGIO1.AnIn5

No.	Information	Value		
			Measured value	Absolute value
904	Reactance (X=)	M1_GGIO1.AnIn5.cVal.mag.f		
		M1_GGIO1.AnIn5.units.SIUnit	30	Ω
		M1_GGIO1.AnIn5.units.multiplier	0	1

M1_GGIO1.AnIn6

No.	Information	Value		
			Measured value	Absolute value
909	Excitation voltage (Uexcit.=)	M1_GGIO1.AnIn6.cVal.mag.f		
		M1_GGIO1.AnIn6.units.SIUnit	29	V (Volt)
		M1_GGIO1.AnIn6.units.multiplier	0	1

3.37.6 DC-Measured Values (M2_GGIO2)

M2_GGIO2.Mod

No.	Information	
55	Reset Device (Reset Device)	x
M2_GGIO2.Mod.stVal		1

device annunciation: 1 - ON IEC Status Mod.stVal: 1 - ON
0 - OFF 2 - BLOCKED
x - irrelevant 3 - TEST
4 - TEST/BLOCKED
5 - OFF

M2_GGIO2.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
M2_GGIO2.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
0 - OFF 2 - WARNING
3 - ALARM

M2_GGIO2.AnIn1

No.	Information	Value		
		M2_GGIO2.AnIn1.cVal.mag.f	Measured value	Absolute value
894	DC voltage (U DC =)	M2_GGIO2.AnIn1.units.SIUnit	29	V(Volt)
		M2_GGIO2.AnIn1.units.multiplier	0	1

M2_GGIO2.AnIn2

No.	Information	Value		
		M2_GGIO2.AnIn2.cVal.mag.f	Measured value	Absolute value
662	DC Current (I DC =)	M2_GGIO2.AnIn2.units.SIUnit	5	A (Ampere)
		M2_GGIO2.AnIn2.units.multiplier	-3	Milli

3.37.7 REF (1-3 Hz)-Measured Values (M3_GGIO3)**M3_GGIO3.Mod**

No.	Information	
55	Reset Device (Reset Device)	x
M3_GGIO3.Mod.stVal		1

device annunciation: 1 - ON IEC Status Mod.stVal: 1 - ON
 0 - OFF 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

M3_GGIO3.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
M3_GGIO3.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

M3_GGIO3.AnIn1

No.	Information	Value		
		M3_GGIO3.AnIn1.cVal.mag.f	Measured value	Absolute value
755	REF(1-3Hz): Freq. of square-wave gen. (fgen =)	M3_GGIO3.AnIn1.units.SIUnit	33	Hz
		M3_GGIO3.AnIn1.units.multiplier	0	1

M3_GGIO3.AnIn2

No.	Information	Value		
		M3_GGIO3.AnIn2.cVal.mag.f	Measured value	Absolute value
757	REF(1-3Hz): Volt. of square-wave gen. (Ugen =)	M3_GGIO3.AnIn2.units.SIUnit	29	V (Volt)
		M3_GGIO3.AnIn2.units.multiplier	0	1

M3_GGIO3.AnIn3

No.	Information	Value		
758	REF(1-3Hz): Curr. of rotor meas. circuit (I _{meas.} =)	M3_GGIO3.AnIn3.cVal.mag.f	Measured value	Absolute value
		M3_GGIO3.AnIn3.units.SIUnit	5	A (Ampere)
		M3_GGIO3.AnIn3.units.multiplier	-3	Milli

M3_GGIO3.AnIn4

No.	Information	Value		
759	REF(1-3 Hz): Charge at polarity rev.(Q _c) Q _c =)	M3_GGIO3.AnIn4.cVal.mag.f	Measured value	Absolute value
		M3_GGIO3.AnIn4.units.SIUnit	68	As
		M3_GGIO3.AnIn4.units.multiplier	-3	Milli

M3_GGIO3.AnIn5

No.	Information	Value		
761	REF(1-3Hz): Fault Resistance (R earth) (R earth=)	M3_GGIO3.AnIn5.cVal.mag.f	Measured value	Absolute value
		M3_GGIO3.AnIn5.units.SIUnit	30	Ω
		M3_GGIO3.AnIn5.units.multiplier	3	Kilo

M4_GGIO4.AnIn3

No.	Information	Value		
764	SEF100%: Stator earth resistance (R SEF=)	M4_GGIO4.AnIn3.cVal.mag.f	Measured value	Absolute value
		M4_GGIO4.AnIn3.units.SIUnit	30	Ω
		M4_GGIO4.AnIn3.units.multiplier	0	1

M4_GGIO4.AnIn4

No.	Information	Value		
760	SEF100%: Prim. stator earth resistance (RSEFp=)	M4_GGIO4.AnIn4.cVal.mag.f	Measured value	Absolute value
		M4_GGIO4.AnIn4.units.SIUnit	30	Ω
		M4_GGIO4.AnIn4.units.multiplier	3	Kilo

M4_GGIO4.AnIn5

No.	Information	Value		
995	SEF100%: Phase angle in stator circuit (φ SEF=)	M4_GGIO4.AnIn5.cVal.mag.f	Measured value	Absolute value
		M4_GGIO4.AnIn5.units.SIUnit	9	° (Degree)
		M4_GGIO4.AnIn5.units.multiplier	0	1

3.37.9 REF (R, fn)-Measured Values (M5_GGIO5)

GGIO5.Mod

No.	Information	
55	Reset Device (Reset Device)	x
M5_GGIO5.Mod.stVal		1

device annunciation: 1 - ON IEC Status Mod.stVal: 1 - ON
 0 - OFF 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

M5_GGIO5.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
M5_GGIO5.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

M5_GGIO5.AnIn1

No.	Information	Value		
		M5_GGIO5.AnIn1.cVal.mag.f	Measured value	Absolute value
693	REF(R,fn): Total Resistance (R total) (R _{tot} =)	M5_GGIO5.AnIn1.units.SIUnit	30	Ω
		M5_GGIO5.AnIn1.units.multiplier	3	Kilo

M5_GGIO5.AnIn2

No.	Information	Value		
		M5_GGIO5.AnIn2.cVal.mag.f	Measured value	Absolute value
696	REF(R,fn): Total Reactance (X total) (X _{tot} =)	M5_GGIO5.AnIn2.units.SIUnit	30	Ω
		M5_GGIO5.AnIn2.units.multiplier	3	Kilo

M5_GGIO5.AnIn3

No.	Information	Value		
697	REF(R,fn): Phase Angle of Z total (φ Ztot=)	M5_GGIO5.AnIn3.cVal.mag.f	Measured value	Absolute value
		M5_GGIO5.AnIn3.units.SIUnit	9	° (Degree)
		M5_GGIO5.AnIn3.units.multiplier	0	1

M5_GGIO5.AnIn4

No.	Information	Value		
896	REF(R,fn): Injected Voltage (U RE) (U RE =)	M5_GGIO5.AnIn4.cVal.mag.f	Measured value	Absolute value
		M5_GGIO5.AnIn4.units.SIUnit	29	V (Volt)
		M5_GGIO5.AnIn4.units.multiplier	0	1

M5_GGIO5.AnIn5

No.	Information	Value		
897	REF(R,fn): Curr. in the Circuit (I RE) (I RE =)	M5_GGIO5.AnIn5.cVal.mag.f	Measured value	Absolute value
		M5_GGIO5.AnIn5.units.SIUnit	5	A (Ampere)
		M5_GGIO5.AnIn5.units.multiplier	-3	Milli

M5_GGIO5.AnIn6

No.	Information	Value		
700	REF(R,fn): Fault Resistance (R earth) (Re =)	M5_GGIO5.AnIn6.cVal.mag.f	Measured value	Absolute value
		M5_GGIO5.AnIn6.units.SIUnit	30	Ω
		M5_GGIO5.AnIn6.units.multiplier	3	Kilo

M6_GGIO6.AnIn3

No.	Information	Value		
803	Temperature rise for phase L2 ($\Theta/\Theta_{\text{tripL2}}=$)	M6_GGIO6.AnIn3.cVal.mag.f	Measured value	Absolute value
		M6_GGIO6.AnIn3.units.SIUnit	1	none
		M6_GGIO6.AnIn3.units.multiplier	0	1

M6_GGIO6.AnIn4

No.	Information	Value		
804	Temperature rise for phase L3 ($\Theta/\Theta_{\text{tripL3}}=$)	M6_GGIO6.AnIn4.cVal.mag.f	Measured value	Absolute value
		M6_GGIO6.AnIn4.units.SIUnit	1	none
		M6_GGIO6.AnIn4.units.multiplier	0	1

M6_GGIO6.AnIn5

No.	Information	Value		
911	Cooling medium temperature (AMB.TEMP =)	M6_GGIO6.AnIn5.cVal.mag.f	Measured value	Absolute value
		M6_GGIO6.AnIn5.units.SIUnit	23	°C
		M6_GGIO6.AnIn5.units.multiplier	0	1

3.37.11 Thermal Measured Values (M7_GGIO7)

M7_GGIO7.Mod

No.	Information	
55	Reset Device (Reset Device)	x
M7_GGIO7.Mod.stVal		1

device annunciation: 1 - ON IEC Status Mod.stVal: 1 - ON
 0 - OFF 2 - BLOCKED
 x - irrelevant 3 - TEST
 4 - TEST/BLOCKED
 5 - OFF

M7_GGIO7.Health

No.	Information		
51	Device is Operational and Protecting (Device OK)	0	1
M7_GGIO7.Health.stVal		3	1

device annunciation: 1 - ON IEC Status Health.stVal: 1 - OK
 0 - OFF 2 - WARNING
 3 - ALARM

M7_GGIO7.AnIn1

No.	Information	Value		
		M7_GGIO7.AnIn1.cVal.mag.f	Measured value	Absolute value
910	Calculated rotor temp. (unbal. load) (ThermRep.=)	M7_GGIO7.AnIn1.units.SIUnit	1	none
		M7_GGIO7.AnIn1.units.multiplier	0	1

M7_GGIO7.AnIn2

No.	Information	Value		
		M7_GGIO7.AnIn2.cVal.mag.f	Measured value	Absolute value
766	Calculated temperature (U/f) (U/f th. =)	M7_GGIO7.AnIn2.units.SIUnit	1	none
		M7_GGIO7.AnIn2.units.multiplier	0	1

M7_GGIO7.AnIn3

No.	Information	Value		
805	Temperature of Rotor ($\Theta_R/\Theta_{Rmax} =$)	M7_GGIO7.AnIn3.cVal.mag.f	Measured value	Absolute value
		M7_GGIO7.AnIn3.units.SIUnit	1	none
		M7_GGIO7.AnIn3.units.multiplier	0	1

M7_GGIO7.AnIn4

No.	Information	Value		
661	Threshold of Restart Inhibit ($\Theta_{REST.} =$)	M7_GGIO7.AnIn4.cVal.mag.f	Measured value	Absolute value
		M7_GGIO7.AnIn4.units.SIUnit	1	none
		M7_GGIO7.AnIn4.units.multiplier	0	1

MMTR1.SupWh

No.	Information	Value		
924	Wp Forward (Wp+=)	MMTR1.SupWh.actVal	Metered value	Current value of accumulated interrupted current = actVal × pulsQty
		MMTR1.SupWh.units.SIUnit	72	Wh
		MMTR1.SupWh.units.multiplier	6	Mega
		MMTR1.SupWh.pulsQty	3.464200e-005	Wh / Metered value

MMTR1.SupVARh

No.	Information	Value		
925	Wq Forward (Wq+=)	MMTR1.SupVARh.actVal	Metered value	Current value of accumulated interrupted current = actVal × pulsQty
		MMTR1.SupVARh.units.SIUnit	73	VARh
		MMTR1.SupVARh.units.multiplier	6	Mega
		MMTR1.SupVARh.pulsQty	3.464200e-005	VARh / Metered value

MMTR1.DmdWh

No.	Information	Value		
928	Wp Reverse (Wp-=)	MMTR1.DmdWh.actVal	Metered value	Current value of accumulated interrupted current = actVal × pulsQty
		MMTR1.DmdWh.units.SIUnit	72	Wh
		MMTR1.DmdWh.units.multiplier	6	Mega
		MMTR1.DmdWh.pulsQty	3.464200e-005	Wh / Metered value

MMTR1.DmdVARh

No.	Information	Value		
929	Wq Reverse (Wq-=)	MMTR1.DmdVARh.actVal	Metered value	Current value of accumulated interrupted current = actVal × pulsQty
		MMTR1.DmdVARh.units.SIUnit	73	VARh
		MMTR1.DmdVARh.units.multiplier	6	Mega
		MMTR1.DmdVARh.pulsQty	3.464200e-005	VARh / Metered value

RDRE1.FltNum

No.	Information	Value	
302	Fault Event (Fault Event)	RDRE1.FltNum.stVal	Present fault number

RDRE1.GriFltNum

No.	Information	Value	
301	Power System fault (Pow.Sys.Flt.)	RDRE1.GriFltNum.stVal	Network fault number

RDRE1.RcdStr

No.	Information		
30053	Fault recording is running (Fault rec. run.)	0	1
RDRE1.RcdStr.stVal		0	1

device annunciation: 1 - ON
0 - OFF

IEC Status RcdStr.stVal: 0 - FALSE
1 - TRUE

Literature

- /1/ SIPROTEC 4 Ethernet Module EN 100 IEC 61850 Electrical Interface 100 MBit, Manual
C54000-G1176-C167
- /2/ SIPROTEC 4 System Description
E50417-H1176-C151
- /3/ SIPROTEC DIGSI, StartUP
E50417-G1176-C152
- /4/ DIGSI CFC, Manual
E50417-H1176-C098
- /5/ SIPROTEC SIGRA 4, Manual
E50417-H1176-C1100-C070
- /6/ SIPROTEC Multifunctional Generator, Motor and Transformer Protection 7UM62, Manual
C53000-G1176-C149

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