

# SIPROTEC

## Breaker Management Relay 7VK61

Communication module

DNP 3.0

Bus mapping / Point lists

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**Liability statement**

We have checked the contents of this manual against the described hardware and software. Nevertheless, deviations may occur so that we cannot guarantee the entire harmony with the product.

The contents of this manual will be checked in periodical intervals, corrections will be made in the following editions. We look forward to your suggestions for improvement.

We reserve the right to make technical improvements without notice.

1.00.01

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# Preface

**Aim of This Manual** The manual is divided into the following topics:

- Notes to SIPROTEC® objects
- DNP V3.0 Device Profile
- Point lists

General information about design, configuration, and operation of SIPROTEC® devices are laid down in the SIPROTEC® 4 system manual, order no. E50417-H1176-C151.

**Target Audience** Protection engineers, commissioning engineers, persons who are involved in setting, testing and service of protection, automation, and control devices, as well as operation personnel in electrical plants and power stations.

**Additional literature** This manual describes the DNP 3.0 Device Profile of the SIPROTEC® devices.

The following additional manuals inform you about the DNP point lists and the function, operation, assembly and commissioning of the SIPROTEC® devices:

Manual	Contents	Order number
Breaker Management Relay SIPROTEC 7VK61	Function, operation, assembly and commissioning of the SIPROTEC® device 7VK61	C53000-G1176-C159
DNP 3.0 Communication Database	DNP communication database of the SIPROTEC® devices	C53000-L1840-A001-03

The DNP V3.0 specification and the structure of the DNP messages are defined in:

- > DNP V3.00 Subset Definitions  
Edition 2.00, November 1995  
DNP Users Group,  
Document Nr.: P009-OIG.SUB
- > DNP V3.00 Data Object Library  
Edition 0.02, July 1997  
DNP Users Group  
Document Nr.: P009-OBL
- > DNP V3.00 Data Link Layer  
Edition 0.02, May 1997  
DNP Users Group  
Document Nr.: P009-OPD.DL

- > DNP V3.00 Application Layer  
Edition 0.03, May 1997  
DNP Users Group  
Document Nr.: P009-OPD.APP
- > DNP V3.00 Transport Functions  
Edition 0.01, May 1997  
DNP Users Group  
Document Nr.: P009-OPD.TF

**Applicability of this Manual**

This manual is valid for

- SIPROTEC® devices 7VK61 with
  - firmware version 4.0 or higher and
  - DNP communication module version 02.00.01 or higher.

For device parameterization **DIGSI® 4 version 4.3 or higher** and DNP standard mappings 3-1 to 3-n (n = device type dependent number of standard mappings) have to be used.

**Additional Support**

Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, the matter should be referred to the local Siemens representative.

**Training Courses**

Individual course offerings may be found in our Training Catalogue, or questions may be directed to our training center. Please contact your Siemens representative.

**Instructions and Warnings**

The warnings and notes contained in this manual serve for your own safety and for an appropriate lifetime of the device. Please observe them!

The following terms are used:

**DANGER**

indicates that death, severe personal injury or substantial property damage will result if proper precautions are not taken.

**Warning**

indicates that death, severe personal injury or substantial property damage can result if proper precautions are not taken.

**Caution**

indicates that minor personal injury or property damage can result if proper precautions are not taken. This particularly applies to damage on or in the device itself and consequential damage thereof.

*Note*

indicates information about the device or respective part of the instruction manual which is essential to highlight.



## Warning!

Hazardous voltages are present in this electrical equipment during operation. Non-observance of the safety rules can result in severe personal injury or property damage.

Only qualified personnel shall work on and around this equipment after becoming thoroughly familiar with all warnings and safety notices of this manual as well as with the applicable safety regulations.

The successful and safe operation of this device is dependent on proper handling, installation, operation, and maintenance by qualified personnel under observance of all warnings and hints contained in this manual.

In particular the general erection and safety regulations (e.g. IEC, DIN, VDE, EN or other national and international standards) regarding the correct use of hoisting gear must be observed. Non-observance can result in death, personal injury or substantial property damage.

### QUALIFIED PERSONNEL

For the purpose of this instruction manual and product labels, a qualified person is one who is familiar with the installation, construction and operation of the equipment and the hazards involved. In addition, he has the following qualifications:

- Is trained and authorized to energize, de-energize, clear, ground and tag circuits and equipment in accordance with established safety practices.
- Is trained in the proper care and use of protective equipment in accordance with established safety practices.
- Is trained in rendering first aid.

### Typographic and Symbol Conventions

The following text formats are used when literal information from the device or to the device appear in the text flow:

**Parameter names**, i.e. designators of configuration or function parameters which may appear word-for-word in the display of the device or on the screen of a personal computer (with operation software DIGSI<sup>®</sup> 4), are marked in bold letters of a monospace type style.

**Parameter options**, i.e. possible settings of text parameters, which may appear word-for-word in the display of the device or on the screen of a personal computer (with operation software DIGSI<sup>®</sup> 4), are written in italic style, additionally.

“Annunciations”, i.e. designators for information, which may be output by the relay or required from other devices or from the switch gear, are marked in a monospace type style in quotation marks.

Deviations may be permitted in drawings when the type of designator can be obviously derived from the illustration.



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# Notes to SIPROTEC<sup>®</sup> objects

# 1

This chapter contains notes for the use and evaluation of certain SIPROTEC<sup>®</sup> objects which are available via DNP3.0 communication.

1.1	Binary Inputs / Annunciations	1-2
1.2	Binary Outputs / Commands	1-3
1.3	Analog Inputs / Measured values	1-4
1.4	Metered measurands	1-5



*Note*

The description of the standard mappings / point lists (ref. to chap. 3) contains the pre-allocation of the mapping files at delivery or first assignment of a mapping in DIGSI® 4 to the SIPROTEC® device.

Changes of the allocation and the scaling of the measured values are possible in adaptation to the concrete installation environment (ref. to page i).

---

## 1.1 Binary Inputs / Annunciations



*Note*

Depending on the device composition and the existing protection packages not all of the indicated binary inputs or protection annunciations (and corresponding DNP points) may be available in the SIPROTEC® device

---

### 1.1.1 Error with a summary alarm

The "Error with a summary alarm" is ON if at least one of the following internal alarms assumes the value ON:

- "Error 5V", "Error neutral CT", "Error 1A/5A wrong", "Error A/D converter".

**Reference** ref to chap. 3.1.7

### 1.1.2 Alarm Summary Event

The "Alarm summary event" is indicated, if at least one of the following internal alarms assumes the ON status:

- "Error Board 1", "Error Board 2", "Error Board 3", "Error Board 4", "Error Board 5", "Error Board 6", "Error Board 7",
- "Alarm NO calibration", "Failure Battery",
- "Failure Phase Sequence", "VT Fuse Failure", "Failure Voltage Balance", "Failure Voltage Summation Phase – Ground", "Failure General Voltage Supervision",
- "Failure Current Balance", "Failure Current Summation", "Failure General Current Supervision",
- ">Failure: Feeder VT (MCB tripped)".

**Reference** ret. to chap. 3.1.7

### 1.1.3 Stop Data Transmission

The functionality "Stop data transmission" is not supported via DNP communication. If "Stop data transmission" is active nevertheless data via DNP will be transmitted furthermore.

The annunciation "DataStop" signals the activation of "Stop data transmission" however and can be evaluated correspondingly in the DNP master.

**Reference** ref. to chap. 3.1.8

## 1.2 Binary Outputs / Commands



### Note

The allocation of the output relays to the switching devices and to the output channels is defined during parametrization of the SIPROTEC® devices.

Depending on the device composition there may be less than indicated output relays (and corresponding DNP message points) available in the SIPROTEC® device.

### 1.2.1 Single Commands

The command output mode (*pulse output*, *continuous output*) is changeable for the single commands using parametrization software DIGSI® 4.

The switching direction OFF for single commands with *pulse output* is not permitted and is rejected in the SIPROTEC® device.

**Reference** ref. to chap. 3.2.2

### 1.2.2 Control mode REMOTE

Control mode with control authority is REMOTE, option of unlocked control with DNP.

- Changing the Control mode REMOTE“ to UNLOCKED permits one unlocked control operation via DNP. After execution of the command, the “Control mode REMOTE“ in the SIPROTEC® device will automatically be reset to LOCKED.
- A programmed test “Switch in position“ for unlocked control operations will always be executed.

If, after changing the “Control mode REMOTE“ to UNLOCKED, no command is received via DNP for a period of 5 minutes, then the “Control mode REMOTE“ is automatically reset to LOCKED.

**Reference** ref. to chap. 3.2.1

### 1.2.3 Changing the setting group

Switching on one setting group automatically switches off the current active setting group. Transmission of the value OFF is insignificant for the change of the setting group and is refused by the device.

A change of the setting group is only possible via DNP if the parameter **CHANGE TO ANOTHER SETTING GROUP** (parameter address = 302) has the value "Protocol".

**Reference** ref. to chap. 3.2.1

## 1.3 Analog Inputs / Measured values



#### Note

Depending on the device composition not all of the indicated analog inputs (and corresponding DNP message points) may be available in the SIPROTEC® device.

---

The given scaling values for the measured values in the standard mapping apply to installations with the following nominal operating values:

Measurement: Full Scale Voltage (parameter address 1103):

- >100 ... 1000 kV

Measurement: Full Scale Current (parameter address 1104):

- >10 ... 1000 A

Product of:

- Transformers – Rated Primary Voltage (parameter address 0203) and
- Ratio factor  $V_{ph}/V_{\Delta}$  (parameter address 0211)

- >100 ... 1000 kV

Product of:

- Transformers– CT Rated primary current (parameter address 0205) and
- Ratio factor  $I_4/I_{ph}$  (parameter address 0221)

- >10 ... 1000 A

Power values:

- Product of Full Scale Voltage and Full Scale Current multiplied by  $\sqrt{3}$
  - >100 ... 1000 MW (MVAR)
- 



#### Note

Changes of the scaling of the measured values are possible in adaptation to the concrete installation environment (ref. to manual "DNP 3.0 Communication Database").

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## 1.4 Metered measurands

### Scaling

The scaling of the metered measurands, which are derived from measured values, refers to:

**60000 impulses per hour for V = V<sub>prim</sub> and I = I<sub>prim</sub>**

V<sub>prim</sub> = **Full Scale Voltage**  
(parameter address = 1103)

I<sub>prim</sub> = **FULL SCALE CURRENT**  
parameter address = 1104)

### Example

In the parameter set is configured:

I<sub>prim</sub> = 1000 A and V<sub>prim</sub> = 400.0 kV,

60000 impulses correspond so that:

$1 \text{ h} * 1000 \text{ A} * 400 \text{ kV} * \sqrt{3} = 692.82 \text{ MWh}$



#### Note

- The type of the update (cyclic, with or without deletion) and the update interval must be programmed for the metered measurands with the parametrization software DIGSI<sup>®</sup> 4.
  - The scaling of the metered measurands at binary inputs ("Wp(puls)" and "Wq(puls)") depends on the externally connected pulse generator.
-



# DNP V3.0 Device Profile

# 2

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## 2.1 Implementation Table

The following table gives a list of all objects recognized and returned by the SIPROTEC® device.

For static objects, requests sent with qualifiers 00, 01, 06, 07 or 08 will be responded with qualifiers 00 or 01.

Requests sent with qualifiers 17 or 28 will be responded with qualifiers 17 or 28.

For change-event objects, qualifiers 17 or 28 are always responded.

In the table below text shaded 00, 01 (start stop) indicates Subset Level 3 functionality (beyond Subset Level 2), text shaded as 07, 08 (limited qty) indicates functionality beyond Subset Level 3.

OBJECTS			REQUEST		RESPONSE	
Object	Variation	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
1	0	Binary Input - Any Variations	1 (read)	00, 01 (start-stop) 06 (no range) 07, 08 (limited qty) 17, 28 (index)		
1	2	Binary Input with Status	1 (read)	00, 01 (start-stop) 06 (no range) 07, 08 (limited qty) 17, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)
2	0	Binary Input Change - Any Variations	1 (read)	06 (no range) 07, 08 (limited qty)		
2	2	Binary Input Change with Time	1 (read)	06 (no range) 07, 08 (limited qty)	129 (response) 130 (unsol. resp)	17, 28 (index)
10	0	Binary Output - Any Variations	1 (read)	00, 01 (start-stop) 06 (no range) 07, 08 (limited qty) 17, 28 (index)		
10	2	Binary Output with Status	1 (read)	00, 01 (start-stop) 06 (no range) 07, 08 (limited qty) 17, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)
12	1	Contol Relay Output Block	3 (select) 4 (operate) 5 (direct op.) 6 (dir. op. noack)	00, 01 (start-stop) 07, 08 (limited qty) 17, 28 (index)	129 (response)	echo of response
20	0	Binary Counter - Any Variations	1 (read)	00, 01 (start-stop) 06 (no range) 07, 08 (limited qty) 17, 28 (index)		
20	1	32-Bit Binary Counter (with Flag)	1 (read)	00, 01 (start-stop) 06 (no range) 07, 08 (limited qty) 17, 28 (index)		
22	0	Counter Change Event - Any Variations	1 (read)	06 (no range) 07, 08 (limited qty)		
22	1	32-Bit Counter Change Event without Time	1 (read)	06 (no range) 07, 08 (limited qty)		



OBJECTS			REQUEST		RESPONSE	
Object	Variation	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
30	0	16-Bit Analog Input - Any Variations	1 (read)	00, 01 (start-stop) 06 (no range) 07, 08 (limited qfy) 17, 28 (index)		
30	1	32-Bit Analog Input with Status	1 (read)	00, 01 (start-stop) 06 (no range) 07, 08 (limited qfy) 17, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)
30	2	16-Bit Analog Input with Status	1 (read)	00, 01 (start-stop) 06 (no range) 07, 08 (limited qfy) 17, 28 (index)	129 (response)	00, 01 (start-stop) 17, 28 (index)
32	0	Analog Change Event - Any Variations	1 (read)	06 (no range) 07, 08 (limited qfy)		
32	1	32-Bit Analog Change Event without Time	1 (read)	06 (no range) 07, 08 (limited qfy)	129 (response) 130 (unsol. resp)	17, 28 (index)
32	2	16-Bit Analog Change Event without Time	1 (read)	06 (no range) 07, 08 (limited qfy)	129 (response) 130 (unsol. resp)	17, 28 (index)
50	1	Time and Date	2 (write)	07 (limited qfy = 1)		
60	1	Class 0 Data	1 (read)	06 (no range)		
60	2	Class 1 Data	1 (read)	06 (no range) 07, 08 (limited qfy)		
60	3	Class 2 Data	1 (read)	06 (no range) 07, 08 (limited qfy)		
60	4	Class 3 Data	1 (read)	06 (no range) 07, 08 (limited qfy)		
80	1	Internal Indications	2 (write)	00 (start-stop) (index must = 7)		

## 2.2 Device Profile Document

<h1 style="margin: 0;">DNP V3.0</h1> <h2 style="margin: 0;">DEVICE PROFILE DOCUMENT</h2>	
Vendor Name: <b>SIEMENS AG</b>	
Device Name: <b>7VK61</b>	
Highest DNP Level Supported: For Requests    DNP-L2 For Responses   DNP-L2	Device Function: <input type="checkbox"/> Master <input checked="" type="checkbox"/> Slave
Notable objects, functions, and/or qualifiers supported in addition to the Highest DNP Levels Supported (the complete list is described in the attached table):  For static (non-change-event) object requests, request qualifier codes 00 and 01 (start-stop), 07 and 08 (limited quantity), and 17 and 28 (index) are supported in addition to request qualifier code 06 (no range). Static object requests sent with qualifiers 00, 01, 06, 07, or 08, will be responded with qualifiers 00 or 01. Static object requests sent with qualifiers 17 or 28 will be responded with qualifiers 17 or 28. For change-event object requests, qualifiers 17 or 28 are always responded.  16-bit Analog Change Events with Time may be requested.  The write function code for Object 50 (Time and Date), variation 1, is supported.  The features outlined within this Device Profile have successfully passed DNP Conformance Test of Subset Level 2 outlined in DNP3-2000 IED Certification Procedure.	
Maximum Data Link Frame Size (octets): Transmitted <u>  292  </u> Received <u>  292  </u>	Maximum Application Fragment Size (octets): Transmitted <u>  Configurable up to 2048  </u> Received <u>  2048  </u>
Maximum Data Link Re-tries: <input checked="" type="checkbox"/> None <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range <u>  0  </u> to <u>  255  </u>	Maximum Application Layer Re-tries: <input checked="" type="checkbox"/> None <input type="checkbox"/> Configurable, range <u>      </u> to <u>      </u> (Fixed is not permitted)
Requires Data Link Layer Confirmation: <input type="checkbox"/> Never <input type="checkbox"/> Always <input type="checkbox"/> Sometimes If 'Sometimes', when? _____ <input checked="" type="checkbox"/> Configurable If 'Configurable', how? by the protection data processing program DIGSI® 4	

Requires Application Layer Confirmation:

- Never
- Always (not recommended)
- When reporting Event Data (Slave devices only)
- When sending multi-fragment responses (Slave devices only)
- Sometimes If 'Sometimes', when? \_\_\_\_\_
- Configurable If 'Configurable', how? by the protection data processing program DIGSI® 4

Timeouts while waiting for:

- |                         |  |   |                                   |  |
|-------------------------|--|---|-----------------------------------|--|
| Data Link Confirm       | <input type="checkbox"/> None            | <input type="checkbox"/> Fixed at _____ | <input type="checkbox"/> Variable | <input checked="" type="checkbox"/> Configurable |
| Complete Appl. Fragment | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Fixed at _____ | <input type="checkbox"/> Variable | <input type="checkbox"/> Configurable            |
| Application Confirm     | <input type="checkbox"/> None            | <input type="checkbox"/> Fixed at _____ | <input type="checkbox"/> Variable | <input checked="" type="checkbox"/> Configurable |
| Complete Appl. Response | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Fixed at _____ | <input type="checkbox"/> Variable | <input type="checkbox"/> Configurable            |

Others: Default value are configurable by the protection data processing program DIGSI® 4

Sends/Executes Control Operations:

- |                         |   |  |                                    |                                       |
|-------------------------|---|--|------------------------------------|---------------------------------------|
| WRITE Binary Outputs    | <input checked="" type="checkbox"/> Never | <input type="checkbox"/> Always            | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |
| SELECT/OPERATE          | <input type="checkbox"/> Never            | <input checked="" type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |
| DIRECT OPERATE          | <input type="checkbox"/> Never            | <input checked="" type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |
| DIRECT OPERATE - NO ACK | <input type="checkbox"/> Never            | <input checked="" type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |
| Count > 1               | <input checked="" type="checkbox"/> Never | <input type="checkbox"/> Always            | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |
| Pulse On                | <input type="checkbox"/> Never            | <input checked="" type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |
| Pulse Off               | <input checked="" type="checkbox"/> Never | <input type="checkbox"/> Always            | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |
| Latch On                | <input type="checkbox"/> Never            | <input checked="" type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |
| Latch Off               | <input type="checkbox"/> Never            | <input checked="" type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |
| Queue                   | <input checked="" type="checkbox"/> Never | <input type="checkbox"/> Always            | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |
| Clear Queue             | <input checked="" type="checkbox"/> Never | <input type="checkbox"/> Always            | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |

Note:

CONTROL RELAY OUTPUT BLOCK parameters (count, on-time, off-time) are ignored.

TimeSync Information:

a.) TimeSync Period

- Never
- Fixed at \_\_\_\_\_seconds
- Configurable, range \_\_\_1\_\_\_ to \_\_86400\_\_seconds

b.) Maximum time base drift over 10 minute interval: \_\_\_\_\_30\_\_ms

c.) Maximum Internal Time Reference Error when set via DNP: \_\_\_\_\_1\_\_ms

d.) Maximum Delay Measurement error: \_\_\_\_\_20\_\_ms

e.) Maximum response time: \_\_\_\_\_100\_\_ms

c.) Event data time-tag error – if different than (c):

- Binary Input Change Events \_\_\_\_\_ms
- Counter Change Events \_\_\_\_\_ms
- Frozen Counter Change Events \_\_\_\_\_ms
- Analog Change Events \_\_\_\_\_ms
- Frozen Analog Change Events \_\_\_\_\_ms

<p>Reports Binary Input Change Events when no specific variation requested:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Never</li> <li><input checked="" type="checkbox"/> Only time-tagged</li> <li><input type="checkbox"/> Only non-time-tagged</li> <li><input type="checkbox"/> Configurable to send both, one or the other (attach explanation)</li> </ul>	<p>Reports time-tagged Binary Input Change Events when no specific variation requested:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Never</li> <li><input checked="" type="checkbox"/> Binary Input Change With Time</li> <li><input type="checkbox"/> Binary Input Change With Relative Time</li> <li><input type="checkbox"/> Configurable (attach explanation)</li> </ul>
<p>Sends Unsolicited Responses:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Never</li> <li><input checked="" type="checkbox"/> Configurable (Unsolicited data response mode are switched on/off via the configuration tool )</li> <li><input type="checkbox"/> Only certain objects</li> <li><input type="checkbox"/> Sometimes (attach explanation)</li> <li><input checked="" type="checkbox"/> ENABLE/DISABLE UNSOLICITED Function codes supported</li> </ul>	<p>Sends Static Data in Unsolicited Responses:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Never</li> <li><input type="checkbox"/> When Device Restarts</li> <li><input type="checkbox"/> When Status Flags Change</li> </ul> <p>No other options are permitted.</p>
<p>Default Counter Object/Variation:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No Counters Reported</li> <li><input type="checkbox"/> Configurable (attach explanation)</li> <li><input checked="" type="checkbox"/> Default Object <u>  20  </u></li> <li>                  Default Variation <u>  01  </u></li> <li><input type="checkbox"/> Point-by-point list attached</li> </ul> <p>Sends 32-Bit counters.</p>	<p>Counters Roll Over at:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No Counters Reported</li> <li><input type="checkbox"/> Configurable (attach explanation)</li> <li><input type="checkbox"/> 16 Bits</li> <li><input checked="" type="checkbox"/> 32 Bits</li> <li><input type="checkbox"/> Other Value _____</li> <li><input type="checkbox"/> Point-by-point list attached</li> </ul>
<p>Sends Multi-Fragment Responses: <input checked="" type="checkbox"/> Yes    <input type="checkbox"/> No</p>	

# Point lists

# 3

3.1	Binary Input Points	3-2
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### 3.1 Binary Input Points

<b>Binary Input Points</b>			
Static (Steady-State) Object Number: 1			
Change Event Object Number: 2			
Request Function Codes supported: 1 (read)			
Static Variation reported when variation 0 requested: 1 (Binary Input with status)			
Change Event Variation reported when variation 0 requested: 2 (Binary Input Change with Time)			
Point Index	Name	Description	Class
<b>3.1.1 Automatic recloser</b>			
0	79 OFF	79 Auto recloser is switched OFF; ON=1, OFF=0	2
1	79 ON	79 Auto recloser is switched ON; ON=1, OFF=0	2
2	79 is blocked	79: Auto recloser is blocked; ON=1, OFF=0	2
3	79 not ready	79: Auto recloser is not ready; ON=1, OFF=0	2
4	CB not ready	79: Circuit breaker 1 not ready; ON=1, OFF=0	2
5	79 T-CBreadyExp	79: CB ready monitoring window expired; ON=1, OFF=0	3
6	79 in progress	79 - in progress; ON=1, OFF=0	2
7	79 Evolving Flt	79: Evolving fault recognition; ON=1, OFF=0	3
8	79 Close	79 - Close command; ON=1, OFF=0	2
9	79 Remote Close	79 Remote close signal send; ON=1, OFF=0	3
10	79 ADT run.	79 cycle is running in ADT mode; ON=1, OFF=0	3
11	79 Program1pole	79 is set to operate after 1p trip only; ON=1, OFF=0	3
12	79 Tdead 1pTrip	79 dead time after 1pole trip running; ON=1, OFF=0	3
13	79 Tdead 3pTrip	79 dead time after 3pole trip running; ON=1, OFF=0	3
14	79 Tdead 1pFlt	79 dead time after 1phase fault running; ON=1, OFF=0	3
15	79 Tdead 2pFlt	79 dead time after 2phase fault running; ON=1, OFF=0	3
16	79 Tdead 3pFlt	79 dead time after 3phase fault running; ON=1, OFF=0	3
17	79 Close1.Cyc1p	79: Close command after 1pole, 1st cycle; ON=1, OFF=0	3
18	79 Close1.Cyc3p	79: Close command after 3pole, 1st cycle; ON=1, OFF=0	3
19	79 Close 2.Cyc	79: Close command 2nd cycle (and higher) ; ON=1, OFF=0	3
20	79 1stCyc. run.	79 1st cycle running; ON=1, OFF=0	3
21	79 2ndCyc. run.	79 2nd cycle running; ON=1, OFF=0	3
22	79 3rdCyc. run.	79 3rd cycle running; ON=1, OFF=0	3
23	79 4thCyc. run.	79 4th or higher cycle running; ON=1, OFF=0	3
24	79 1.CycZoneRel	79 1st cycle zone extension release; ON=1, OFF=0	3
25	79 T-Recl. run.	79: Reclaim time is running; ON=1, OFF=0	3
26	79 Successful	79 - cycle successful; ON=1, OFF=0	3
27	Definitive Trip	Definitive TRIP; ON=1, OFF=0	2
28	79 1p Trip Perm	79: 1pole trip permitted by internal AR; ON=1, OFF=0	3
29	79 Sync.Request	79: 1pole trip permitted by internal AR; ON=1, OFF=0	3
30	79 2.CycZoneRel	79 2nd cycle zone extension release; ON=1, OFF=0	3

<b>Binary Input Points</b>			
Static (Steady-State) Object Number: 1			
Change Event Object Number: 2			
Request Function Codes supported: 1 (read)			
Static Variation reported when variation 0 requested: 1 (Binary Input with status)			
Change Event Variation reported when variation 0 requested: 2 (Binary Input Change with Time)			
Point Index	Name	Description	Class
31	79 3.CycZoneRel	79 3rd cycle zone extension release; ON=1, OFF=0	3
32	79 TRIP 3pole	79: TRIP command 3pole; ON=1, OFF=0	2
33	79 4.CycZoneRel	79 4th cycle zone extension release; ON=1, OFF=0	3
34	79 Zone Release	79 zone extension (general) ; ON=1, OFF=0	3
35	79 T-Start Exp	79: Start-signal monitoring time expired; ON=1, OFF=0	3
36	79 TdeadMax Exp	79: Maximum dead time expired; ON=1, OFF=0	3
37	79 Td. evol.Flt	79 dead time after evolving fault; ON=1, OFF=0	3
<b>3.1.2 Synchronism check</b>			
38	25 Sync. OFF	25 Synchronism check is switched OFF; ON=1, OFF=0	3
39	25 Sync. BLOCK	25 Synchronism check is BLOCKED; ON=1, OFF=0	3
40	25 Sync. faulty	25: Synchro-check function faulty; ON=1, OFF=0	3
41	25 Sy.Tsup.Exp	25: Synchro-check supervision time exp. ; ON=1, OFF=0	3
42	25 Sy. running	25: Synchronization is running; ON=1, OFF=0	3
43	25 Sy. Override	25: Synchro-check override/bypass; ON=1, OFF=0	3
44	25 Synchronism	25: Synchronism detected; ON=1, OFF=0	2
45	25 Vsyn< Vline>	25: Sync. dead bus / live line detected; ON=1, OFF=0	3
46	25 Vsyn> Vline<	25: Sync. live bus / dead line detected; ON=1, OFF=0	3
47	25 Vsyn< Vline<	25: Sync. dead bus / dead line detected; ON=1, OFF=0	3
48	25 Sync. Vdiff>	25: Sync. Volt. diff. greater than limit; ON=1, OFF=0	3
49	25 Sync. fdiff>	25: Sync. Freq. diff. greater than limit; ON=1, OFF=0	3
50	25 Sync.PHldiff>	25: Sync. Angle diff. greater than limit; ON=1, OFF=0	3
51	25 Sync.Release	25: Synchronism release (to ext. AR) ; ON=1, OFF=0	2
52	25 Sy. CloseCmd	25: Close command from synchro-check; ON=1, OFF=0	2
<b>3.1.3 Voltage protection</b>			
53	59-Vphg OFF	59-Vphg Overvolt. is switched OFF; ON=1, OFF=0	3
54	59-Vphg BLK	59-Vphg Overvolt. is BLOCKED; ON=1, OFF=0	3
55	59-Vphph OFF	59-Vphph Overvolt. is switched OFF; ON=1, OFF=0	3
56	59-Vphph BLK	59-Vphph Overvolt. is BLOCKED; ON=1, OFF=0	3
57	59-3Vo OFF	59-3Vo Overvolt. is switched OFF; ON=1, OFF=0	3
58	59-3Vo BLK	59-3Vo Overvolt. is BLOCKED; ON=1, OFF=0	3
59	59-V1 OFF	59-V1 Overvolt. is switched OFF; ON=1, OFF=0	3
60	59-V1 BLK	59-V1 Overvolt. is BLOCKED; ON=1, OFF=0	3
61	59-V2 OFF	59-V2 Overvolt. is switched OFF; ON=1, OFF=0	3
62	59-V2 BLK	59-V2 Overvolt. is BLOCKED; ON=1, OFF=0	3

<b>Binary Input Points</b>			
Static (Steady-State) Object Number: <b>1</b>			
Change Event Object Number: <b>2</b>			
Request Function Codes supported: <b>1 (read)</b>			
Static Variation reported when variation 0 requested: <b>1 (Binary Input with status)</b>			
Change Event Variation reported when variation 0 requested: <b>2 (Binary Input Change with Time)</b>			
<b>Point Index</b>	<b>Name</b>	<b>Description</b>	<b>Class</b>
63	27-Vphg OFF	27-Vphg Undervolt. is switched OFF; ON=1, OFF=0	3
64	27-Vphg BLK	27-Vphg Undervolt. is BLOCKED; ON=1, OFF=0	3
65	27-Vphph OFF	27-Vphph Undervolt. is switched OFF; ON=1, OFF=0	3
66	27-Vphph BLK	27-Vphph Undervolt. is BLOCKED; ON=1, OFF=0	3
67	27-V1 OFF	27-V1 Undervolt. is switched OFF; ON=1, OFF=0	3
68	27-V1 BLK	27-V1 Undervolt. is BLOCKED; ON=1, OFF=0	3
69	27/59 ACTIVE	27/59 Voltage protection is ACTIVE; ON=1, OFF=0	3
70	59-1-Vpg Pickup	59-1-Vphg Pickup; ON=1, OFF=0	2
71	59-2-Vpg Pickup	59-2-Vphg Pickup; ON=1, OFF=0	2
72	59-Vpg PU A	59-Vphg Pickup A; ON=1, OFF=0	2
73	59-Vpg PU B	59-Vphg Pickup B; ON=1, OFF=0	2
74	59-Vpg PU C	59-Vphg Pickup C; ON=1, OFF=0	2
75	59-Vpg TRIP	59-Vphg TRIP command; ON=1, OFF=0	2
76	59-1-Vpp Pickup	59-1-Vphph Pickup; ON=1, OFF=0	2
77	59-2-Vpp Pickup	59-2-Vphph Pickup; ON=1, OFF=0	2
78	59-Vpp PickupAB	59-Vphph Pickup A-B; ON=1, OFF=0	3
79	59-Vpp PickupBC	59-Vphph Pickup B-C; ON=1, OFF=0	3
80	59-Vpp PickupCA	59-Vphph Pickup C-A; ON=1, OFF=0	3
81	59-Vpp TRIP	59-Vphph TRIP command; ON=1, OFF=0	2
82	59-1-3Vo Pickup	59-1-3Vo Pickup; ON=1, OFF=0	3
83	59-2-3Vo Pickup	59-2-3Vo Pickup; ON=1, OFF=0	3
84	59-3Vo TRIP	59-3Vo TRIP command; ON=1, OFF=0	2
85	59-1-V1 Pickup	59-1-V1 Pickup; ON=1, OFF=0	3
86	59-2-V1 Pickup	59-2-V1 Pickup; ON=1, OFF=0	3
87	59-V1 TRIP	59-V1 TRIP command; ON=1, OFF=0	2
88	59-1-V2 Pickup	59-1-V2 Pickup; ON=1, OFF=0	3
89	59-2-V2 Pickup	59-2-V2 Pickup; ON=1, OFF=0	3
90	59-V2 TRIP	59-V2 TRIP command; ON=1, OFF=0	2
91	27-1-V1 Pickup	27-1-V1 Pickup; ON=1, OFF=0	3
92	27-2-V1 Pickup	27-2-V1 Pickup; ON=1, OFF=0	3
93	27-V1 TRIP	27-V1 TRIP command; ON=1, OFF=0	2
94	27-1-Vpg Pickup	27-1-Vphg Pickup; ON=1, OFF=0	3
95	27-2-Vpg Pickup	27-2-Vphg Pickup; ON=1, OFF=0	3
96	27-Vpg PU A	27-Vphg Pickup A; ON=1, OFF=0	2



<b>Binary Input Points</b>			
Static (Steady-State) Object Number: 1			
Change Event Object Number: 2			
Request Function Codes supported: 1 (read)			
Static Variation reported when variation 0 requested: 1 (Binary Input with status)			
Change Event Variation reported when variation 0 requested: 2 (Binary Input Change with Time)			
Point Index	Name	Description	Class
97	27-Vpg PU B	27-Vphg Pickup B; ON=1, OFF=0	3
98	27-Vpg PU C	27-Vphg Pickup C; ON=1, OFF=0	3
99	27-Vpg TRIP	27-Vphg TRIP command; ON=1, OFF=0	2
100	27-1-Vpp Pickup	27-1-Vphph Pickup; ON=1, OFF=0	3
101	27-2-Vpp Pickup	27-2-Vphph Pickup; ON=1, OFF=0	3
102	27-Vpp PU AB	27-Vphph Pickup A-B; ON=1, OFF=0	3
103	27-Vpp PU BC	27-Vphph Pickup B-C; ON=1, OFF=0	3
104	27-Vpp PU CA	27-Vphph Pickup C-A; ON=1, OFF=0	3
105	27-Vpp TRIP	27-Vphph TRIP command; ON=1, OFF=0	2
<b>3.1.4 Breaker failure protection</b>			
106	50BF OFF	50BF is switched OFF; ON=1, OFF=0	3
107	50BF BLOCK	50BF is BLOCKED; ON=1, OFF=0	3
108	50BF ACTIVE	50BF is ACTIVE; ON=1, OFF=0	3
109	50BF Start	50BF Breaker failure protection started; ON=1, OFF=0	3
110	BF T1-TRIP 1pL1	BF Trip T1 (local trip) - only phase L1; ON=1, OFF=0	3
111	BF T1-TRIP 1pL2	BF Trip T1 (local trip) - only phase L2; ON=1, OFF=0	3
112	BF T1-TRIP 1pL3	BF Trip T1 (local trip) - only phase L3; ON=1, OFF=0	3
113	BF T1-TRIP L123	BF Trip T1 (local trip) - 3pole; ON=1, OFF=0	3
114	BF TRIP Cbdefec	BF Trip in case of defective CB; ON=1, OFF=0	3
115	BF T2-TRIP(bus)	BF Trip T2 (busbar trip); ON=1, OFF=0	3
116	BF EndFlt TRIP	BF Trip End fault stage; ON=1, OFF=0	3
117	BF CBdiscr TRIP	BF Pole discrepancy Trip; ON=1, OFF=0	3
<b>3.1.5 Circuit breaker test</b>			
118	CB1-TESTtrip PhA	CB1-TEST TRIP command - Only Phase A; ON=1, OFF=0	3
119	CB1-TESTtrip PhB	CB1-TEST TRIP command - Only Phase B; ON=1, OFF=0	3
120	CB1-TESTtrip PhC	CB1-TEST TRIP command - Only Phase C; ON=1, OFF=0	3
121	CB1-TESTtripABC	CB1-TEST TRIP command ABC; ON=1, OFF=0	3
122	CB1-TEST close	CB1-TEST CLOSE command; ON=1, OFF=0	3
123	CB-TEST running	CB-TEST is in progress; ON=1, OFF=0	3
<b>3.1.6 Measurement supervision</b>			
124	Fail I Superv.	Failure: general Current Supervision; ON=1, OFF=0	3
125	Failure Sum I	Failure: Current Summation; ON=1, OFF=0	1
126	Fail I balance	Failure: Current Balance; ON=1, OFF=0	1
127	Fail V Superv.	Failure: general Voltage Supervision; ON=1, OFF=0	1

<b>Binary Input Points</b>			
Static (Steady-State) Object Number: 1			
Change Event Object Number: 2			
Request Function Codes supported: 1 (read)			
Static Variation reported when variation 0 requested: 1 (Binary Input with status)			
Change Event Variation reported when variation 0 requested: 2 (Binary Input Change with Time)			
Point Index	Name	Description	Class
128	Fail Sum V Ph-G	Failure: Voltage Summation Phase-Ground; ON=1, OFF=0	1
129	Fail V balance	Failure: Voltage Balance; ON=1, OFF=0	1
130	VT FuseFail>10s	VT Fuse Failure (alarm >10s) ; ON=1, OFF=0	1
131	Fail Ph. Seq.	Failure: Phase Sequence; ON=1, OFF=0	3
132	Fail Conductor	Failure: Broken Conductor; ON=1, OFF=0	1
133	Fuse Fail M.OFF	Fuse Fail Monitor is switched OFF; ON=1, OFF=0	3
134	MeasSup OFF	Measurement Supervision is switched OFF; ON=1, OFF=0	3
<b>3.1.7 Diagnosis / General alarms</b>			
135	Device OK	Device is operational and protecting; ON=1, OFF=0	1
136	ProtActive	At least one protection funct. is active; ON=1, OFF=0	2
137	Settings Calc.	Setting calculation is running; ON=1, OFF=0	3
138	Error Sum Alarm	Error with a summary alarm; ON=1, OFF=0 (ref. to chap. 1.1.1)	2
139	Alarm Sum Event	Alarm Summary Event; ON=1, OFF=0 (ref. to chap. 1.1.2)	2
140	Relay PICKUP	Relay PICKUP; ON=1, OFF=0	1
141	Relay PICKUP PhA	Relay PICKUP Phase A; ON=1, OFF=0	1
142	Relay PICKUP PhB	Relay PICKUP Phase B; ON=1, OFF=0	1
143	Relay PICKUP PhC	Relay PICKUP Phase C; ON=1, OFF=0	1
144	Relay PICKUP G	Relay PICKUP GROUND; ON=1, OFF=0	1
145	Relay TRIP	Relay GENERAL TRIP command; ON=1, OFF=0	1
146	Definitive TRIP	Relay Definitive TRIP; ON=1, OFF=0	1
147	Relay TRIP PhA	Relay TRIP command Phase A; ON=1, OFF=0	1
148	Relay TRIP PhB	Relay TRIP command Phase B; ON=1, OFF=0	1
149	Relay TRIP PhC	Relay TRIP command Phase C; ON=1, OFF=0	1
<b>3.1.8 Internal mode status</b>			
150	DataStop	Stop data transmission; ON=1, OFF=0 (ref. to chap. 1.1.3)	3
151	Test mode	Test mode; ON=1, OFF=0	3
152	Chatter ON	Chatter ON; ON=1, OFF=0	3
153	Man.Clos.Detect	Manual close signal detected; ON=1, OFF=0	2
154	Man.Close Cmd	CB CLOSE command for manual closing; ON=1, OFF=0	2
155	LOCKOUT	LOCKOUT is active; ON=1, OFF=0	1
156	Cntrl Auth	Control Authority; LOCAL=1, REMOTE=0	3
157	ModeLOCAL	Control mode LOCAL; UNLOCKED=1, LOCKED=0	3

<b>Binary Input Points</b>			
Static (Steady-State) Object Number: 1			
Change Event Object Number: 2			
Request Function Codes supported: 1 (read)			
Static Variation reported when variation 0 requested: 1 (Binary Input with status)			
Change Event Variation reported when variation 0 requested: 2 (Binary Input Change with Time)			
Point Index	Name	Description	Class
158	ModeREMOTE	Control mode REMOTE; UNLOCKED=1, LOCKED=0	3
<b>3.1.9 Setting group</b>			
159	Group A	Setting Group A; ON=1, OFF=0	1
160	Group B	Setting Group B; ON=1, OFF=0	1
161	Group C	Setting Group C; ON=1, OFF=0	1
162	Group D	Setting Group D; ON=1, OFF=0	1
<b>3.1.10 User-allocated single-point indications</b>			
163	<unnamed> <sup>*</sup>	User input 1	2
164	<unnamed>	User input 2	2
165	<unnamed>	User input 3	2
166	<unnamed>	User input 4	2
167	<unnamed>	User input 5	2
168	<unnamed>	User input 6	2
169	<unnamed>	User input 7	2
170	<unnamed>	User input 8	2
171	<unnamed>	User input 9	2
172	<unnamed>	User input 10	2
173	<unnamed>	User input 11	2
174	<unnamed>	User input 12	2
175	<unnamed>	User input 13	2
176	<unnamed>	User input 14	2
177	<unnamed>	User input 15	2

\*The names are defined during indication allocation using parametrization software DIGSI® 4

### 3.2 Control Relay Output Blocks/Binary Output Status

<b>Binary Output Status Points</b>			
Object Number: 10			
Request Function Codes supported: 1 (Read)			
Default Variation reported when variation 0 requested: 2 (Binary Output Status)			
<b>Control Relay Output Blocks/Binary Output Status</b>			
Object Number: 12			
Request Function Codes supported: 3 (select), 4 (operate), 5 (direct operate), 6 (direct operate, no ack)			
Point Index	Name	Description	Supported Control Relay Output Block Fields
<b>3.2.1 Internal commands</b>			
0	79 ON	Activation / deactivation of Auto-reclosure function	Latch On, Latch Off
1	ProtActive	Protection activation / deactivation	Latch On, Latch Off
2	Group A	Select setting group A and deactivate setting group B,C,D (ref. to chap. 1.2.3)	Latch On
3	Group B	Select setting group B and deactivate setting group A,C,D	Latch On
4	Group C	Select setting group C and deactivate setting group A,B,D	Latch On
5	Group D	Select setting group D and deactivate setting group A,B,C	Latch On
6	ModeREMOTE	Mode remote control; UNLOCKED=1, LOCKED=0 (ref. to chap. 1.2.2)	Latch On; Latch Off
<b>3.2.2 User-allocated single commands</b>			
Please ref. to chap. 1.2.1 for additional notes.			
7	<unnamed>*	User output 1	Latch On, Latch Off
8	<unnamed>	User output 2	Latch On, Latch Off
9	<unnamed>	User output 3	Latch On, Latch Off
10	<unnamed>	User output 4	Latch On, Latch Off
11	<unnamed>	User output 5	Latch On, Latch Off
12	<unnamed>	User output 6	Latch On, Latch Off
13	<unnamed>	User output 7	Latch On, Latch Off
14	<unnamed>	User output 8	Latch On, Latch Off
15	<unnamed>	User output 9	Latch On, Latch Off
16	<unnamed>	User output 10	Latch On, Latch Off
17	<unnamed>	User output 11	Latch On, Latch Off
18	<unnamed>	User output 12	Latch On, Latch Off
19	<unnamed>	User output 13	Latch On, Latch Off
20	<unnamed>	User output 14	Latch On, Latch Off
21	<unnamed>	User output 15	Latch On, Latch Off

\*The names are defined during indication allocation using parametrization software DIGSI® 4

### 3.3 Counters

<b>Counters</b>			
Static (Steady-State) Object Number: <b>20</b>			
Change Event Object Number: <b>22</b>			
Request Function Codes supported: <b>1 (read)</b>			
Static Variation reported when variation 0 requested: <b>1 (32-Bit Counter with Flag)</b>			
Change Event Variation reported when variation 0 requested: <b>1 (32-Bit Counter without Time)</b>			
<b>Point Index</b>	<b>Name</b>	<b>Description</b>	<b>Scaling(<math>2^{32}-1</math> of the unsigned long-value corresponds to...)</b>
0	Wp(puls)	Pulsed Energy Wp (active)(metering impulses at binary input)	$2^{32}-1$ impulses
1	Wq(puls)	Pulsed Energy Wq (reactive)(metering impulses at binary input)	$2^{32}-1$ impulses
2	Wp+=	Wp Forward (metered measurand derived from measured value)	$2^{32}-1$ impulses
3	Wq+=	Wq Forward (metered measurand derived from measured value)	$2^{32}-1$ impulses
4	Wp-=	Wp Reverse (metered measurand derived from measured value)	$2^{32}-1$ impulses
5	Wq-=	Wq Reverse (metered measurand derived from measured value)	$2^{32}-1$ impulses

### 3.4 Analog Inputs

<b>Analog Inputs</b>				
Static (Steady-State) Object Number: <b>30</b>				
Change Event Object Number: <b>32</b>				
Request Function Codes supported: <b>1 (read)</b>				
Static Variation reported when variation 0 requested: <b>02 (16-Bit Analog Input)</b>				
Change Event Variation reported when variation 0 requested: <b>02 (Analog Change Event without Time)</b>				
Point Index	Name	Description	Scaling(32767 corresponds to ...)	Default Change Event assigned Class
<b>3.4.1 Recorded measured values</b>				
0	Ia =	Ia	3276.7 A	1
1	Ib =	Ib	3276.7 A	1
2	Ic =	Ic	3276.7 A	1
3	3Io =	3Io (zero sequence)	3276.7 A	2
4	Va =	Va	3276.7 kV	1
5	Vb =	Vb	3276.7 kV	1
6	Vc =	Vc	3276.7 kV	1
7	Va-b=	Va-b	3276.7 kV	1
8	Vb-c=	Vb-c	3276.7 kV	1
9	Vc-a=	Vc-a	3276.7 kV	1
10	3Vo =	3Vo (zero sequence)	3276.7 kV	2
11	Vdiff =	V-diff (line-bus)	3276.7 kV	2
12	Vline =	V-line	3276.7 kV	2
13	Vbus =	V-bus	3276.7 kV	2
14	P =	P (active power)	3276.7 MW	1
15	Q =	Q (reactive power)	3276.7 MVAR	1
16	PF =	Power Factor	3.2767	1
17	Freq=	Frequency	327.67 Hz	1
18	S =	S (apparent power)	3276.7 MVAR	2
19	F-bus =	Frequency (busbar)	327.67 Hz	2
20	F-diff=	Frequency (difference line-bus)	327.67 Hz	2
21	PHI-diff=	Angle (difference line-bus)	3276.6 <sup>0</sup>	2
22	F-line=	Frequency (line)	327.67 Hz	2
23	<unnamed>	User input 1		
24	<unnamed>	User input 2		
25	<unnamed>	User input 3		
26	<unnamed>	User input 4		
27	<unnamed>	User input 5		

<b>Analog Inputs</b>				
Static (Steady-State) Object Number: <b>30</b>				
Change Event Object Number: <b>32</b>				
Request Function Codes supported: <b>1 (read)</b>				
Static Variation reported when variation 0 requested: <b>02 (16-Bit Analog Input)</b>				
Change Event Variation reported when variation 0 requested: <b>02 (Analog Change Event without Time)</b>				
Point Index	Name	Description	Scaling(32767 corresponds to ...)	Default Change Event assigned Class
<b>If Object 30 Variation 01 (32-Bit Analog Input) requesten, additional:</b>				
<b>3.4.2 Fault locator and fault currents</b>				
28	Ia =	Primary fault current Ia	327.67 kA	3
29	Ib =	Primary fault current Ib	327.67 kA	3
30	Ic =	Primary fault current Ic	327.67 kA	3
31	Last Ia =	Last fault current Phase A	327.67 kA	3
32	Last Ib =	Last fault current Phase B	327.67 kA	3
33	Last Ic =	Last fault current Phase C	327.67 kA	3
<b>3.4.3 Statistic values</b>				
34	# TRIPs=	Number of breaker TRIP commands		3
35	# TRIPs PhA=	Number of breaker TRIP commands, Ph A		3
36	# TRIPs PhB=	Number of breaker TRIP commands, Ph B		3
37	# TRIPs PhC=	Number of breaker TRIP commands, Ph C		3
38	Sum Ia =	Accumulation of interrupted current Ph A	327.67 kA	3
39	Sum Ib =	Accumulation of interrupted current Ph B	327.67 kA	3
40	Sum Ic =	Accumulation of interrupted current Ph C	327.67 kA	3





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# Glossary

<b>AME</b>	<b>A</b> synchronous interface <b>m</b> odule with ( <b>e</b> lectrical) isolated RS485 interface for the SIPROTEC devices from Siemens.
<b>AMO</b>	<b>A</b> synchronous interface <b>m</b> odule with <b>o</b> ptical interface for the SIPROTEC devices from Siemens.
<b>AR</b>	<b>A</b> utomatic <b>R</b> ecloser
<b>CFC</b>	<b>C</b> ontinuous <b>F</b> unction <b>C</b> hart
<b>DC</b>	<b>D</b> ouble <b>C</b> ommand
<b>DIGSI</b>	Parameterization system for SIPROTEC devices
<b>DNP</b>	<b>D</b> istributed <b>N</b> etwork <b>P</b> rotocol
<b>DP</b>	<b>D</b> ouble- <b>p</b> oint Indication
<b>Input data/ input direction</b>	Data from the DNP <b>slave to the DNP master</b> .
<b>Mapping</b>	Allocation of the SIPROTEC data objects to the DNP point index.
<b>Output data/ output direction</b>	Data from the DNP <b>master to the DNP slave</b> .
<b>RTU</b>	<b>R</b> emote <b>T</b> erminal <b>U</b> nit
<b>SC</b>	<b>S</b> ingle <b>C</b> ommand
<b>SP</b>	<b>S</b> ingle- <b>p</b> oint Indication



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**Corrections/Suggestions**

Subject to technical alteration

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