

# SIPROTEC

## Multifunction protection with control 7SJ61 / 7SJ62 / 7SJ63 / 7SJ64 / 6MD63

Communication module

DNP 3.0

Bus mapping / Point lists

---

Preface

Table of Contents

---

Notes to SIPROTEC® objects

---

1

DNP V3.0 Device Profile

---

2

Point lists

---

3

Glossary

---

Index

---

Revision: 1.5

Edition: September 2004

C53000-L1840-A006-03

---

**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.

1.50.01

**Copyright**

Copyright © SIEMENS AG 2004. All rights reserved.

Copying of this document and giving it to others and the use or communication of the contents thereof, are forbidden without express authority. Offenders are liable to the payment of damages. All rights are reserved, especially in the event of grant of a patent or registration of a utility model or design.

**Registered trademarks**

SIPROTEC, SINAUT, SICAM, and DIGSI are registered trademarks of SIEMENS AG. Other names and terms can be trademarks the use of which may violate the rights of thirds.

# 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
Overcurrent, overload and motor protection with control SIPROTEC 7SJ61	Function, operation, assembly and commissioning of the SIPROTEC® device 7SJ61	C53000-G1140-C118-7
Multifunction protection with control SIPROTEC 7SJ62/7SJ63/7SJ64	Function, operation, assembly and commissioning of the SIPROTEC® device 7SJ62/7SJ63/7SJ64	C53000-G1140-C147-4
Input/Output unit with local control SIPROTEC 6MD63	Function, operation, assembly and commissioning of the SIPROTEC® device 6MD63	C53000-G1840-C101-6
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 7SJ61 / 7SJ62 / 7SJ63 / 7SJ64 / 6MD63 with
  - firmware version 4.2 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.



# Table of Contents

<b>Preface</b> .....	<b>3</b>
<b>Table of Contents</b> .....	<b>7</b>
<b>1 Notes to SIPROTEC® objects</b> .....	<b>9</b>
1.1 Binary Inputs / Annunciations.....	10
1.1.1 Error with a summary alarm .....	10
1.1.2 Alarm Summary Event.....	10
1.1.3 Stop Data Transmission .....	11
1.2 Binary Outputs / Commands .....	11
1.2.1 Single Commands .....	11
1.2.2 Control mode REMOTE.....	11
1.2.3 Changing the setting group .....	12
1.3 Analog Inputs / Measured values .....	12
1.4 Metered measurands.....	13
<b>2 DNP V3.0 Device Profile</b> .....	<b>15</b>
2.1 Implementation Table .....	16
2.2 Device Profile Document .....	18

<b>3</b>	<b>Point lists</b> .....	<b>21</b>
3.1	Binary Input Points.....	22
3.1.1	Automatic reclosure status .....	22
3.1.2	Time Overcurrent protection .....	22
3.1.3	InRush Function.....	24
3.1.4	Directional time overcurrent protection .....	24
3.1.5	Unbalanced load protection .....	25
3.1.6	Frequency protection .....	26
3.1.7	Voltage protection.....	26
3.1.8	Command Mode Information .....	27
3.1.9	Internal Mode Status.....	27
3.1.10	Highly sensitive earth fault protection .....	28
3.1.11	Circuit breaker failure protection.....	29
3.1.12	Thermal overload protection .....	29
3.1.13	Monitor start protection .....	30
3.1.14	Start-up supervision.....	30
3.1.15	Trip coil monitor .....	30
3.1.16	Extension.....	30
3.1.17	Control switches return position indication(double point commands).....	30
3.1.18	Internal controls .....	31
3.1.19	Output channels return position indication (Single point commands).....	31
3.1.20	Internal controls .....	32
3.2	<b>Control Relay Output Blocks/Binary Output Status</b> .....	33
3.2.1	<b>Standard Mapping 1</b> .....	33
3.2.1.1	External commands (Double point commands).....	33
3.2.1.2	Internal commands .....	34
3.2.1.3	Output channel (user defined single point output commands) .....	34
3.2.2	<b>Standard Mapping 2</b> .....	36
3.2.2.1	External commands (Double point commands).....	36
3.2.2.2	Internal commands .....	36
3.2.2.3	Output channel (user defined single point output commands) .....	37
3.3	Counters .....	39
3.4	Analog Inputs.....	40
3.4.1	Recorded measured values.....	40
3.4.2	Min/Max values.....	41
3.4.3	Fault locator and fault currents .....	42
	<b>Glossary</b> .....	<b>43</b>
	<b>Index</b> .....	<b>45</b>



# 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	10
1.2	Binary Outputs / Commands	11
1.3	Analog Inputs / Measured values	12
1.4	Metered measurands	13



*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 3).

---

## 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. 3.1.9

### 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", "Alarm Real Time Clock",
- "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".

**Reference** ret. to chap. 3.1.9

### 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. 3.1.9

## 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. 3.2.1.3

### 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. 3.2.1.2

### 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. 3.2.1.2

## 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:

Full Scale Voltage (parameter address 1101):

- 1.01 ... 100.00 kV

Full Scale Current (parameter address 1102):

- 10.01 ... 1000.00 A

Product of:

- Rated Primary Voltage (parameter address 0202) and
  - Matching ration Phase-VT to Open-Delta-VT (parameter address 0206)
- 1.01 ... 100.00 kV

Ignd-CT rated primary current (parameter address 0217)

- 10.01 ... 1000.00 A

Power values:

- Product of Full Scale Voltage and Full Scale Current multiplies by  $\sqrt{3}$
- 10.01 ... 1000.00 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").

---

## 1.4 Metered measurands

### Scaling

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

**60000 impulses per hour for  $V = V_{nom}$  and  $I = I_{nom}$**

$V_{nom}$  = Full Scale Voltage (parameter address = 1101)

$I_{nom}$  = Full Scale Current (parameter address = 1102)

### Example

In the parameter set is configured:

$I_{nom} = 100 \text{ A}$  und  $V_{nom} = 12.00 \text{ kV}$ ,

60000 impulses correspond so that:

$1 \text{ h} * 100 \text{ A} * 12 \text{ kV} * \sqrt{3} = 2078.46 \text{ kWh}$



#### 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® 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

---

2.1	Implementation Table	16
2.2	Device Profile Document	18

---

## 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.

1

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)		
			22 (assign class)	06 (no range)		
				07, 08 (limited qty) 17, 28 (index)		
1	2	Binary Input with Status	1 (read)	00, 01 (start-stop)	129 (response)	00, 01 (start-stop)
				06 (no range)		17, 28 (index)
				07, 08 (limited qty) 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)	129 (response)	00, 01 (start-stop)
				06 (no range)		17, 28 (index)
				07, 08 (limited qty) 17, 28 (index)		
12	1	Contol Relay Output Block	3 (select)	17, 28 (index)	129 (response)	echo of response
			4 (operate)			
			5 (direct op)			
			6 (direct op noack)			
20	0	Binary Counter - Any Variations	1 (read)	00, 01 (start-stop)		
			22 (assign class)	06 (no range)		
				07, 08 (limited qty) 17, 28 (index)		
20	1	32-Bit Binary Counter (with Flag)	1 (read)	00, 01 (start-stop)	129	00, 01 (start-stop)
				06 (no range)		17, 28 (index)
				07, 08 (limited qty) 17, 28 (index)		
20	6	16-Bit Binary Counter without Flag	1 (read)	00, 01 (start-stop)	129	00, 01 (start-stop)
				06 (no range)		17, 28 (index)
				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)	129 (response)	17, 28 (index)
				07, 08 (limited qty)	130 (unsol. resp)	



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)		
			22 (assign class)	06 (no range)		
				07, 08 (limited qty)		
				17, 28 (index)		
30	1	32-Bit Analog Input with Status	1 (read)	00, 01 (start-stop)	129 (response)	00, 01 (start-stop)
				06 (no range)		17, 28 (index)
				07, 08 (limited qty)		
				17, 28 (index)		
30	2	16-Bit Analog Input with Status	1 (read)	00, 01 (start-stop)	129 (response)	00, 01 (start-stop)
				06 (no range)		17, 28 (index)
				07, 08 (limited qty)		
				17, 28 (index)		
30	3	32-Bit Analog Input without Status	1 (read)	00, 01 (start-stop)	129 (response)	00, 01 (start-stop)
				06 (no range)		17, 28 (index)
				07, 08 (limited qty)		
				17, 28 (index)		
30	4	16-Bit Analog Input without Status	1 (read)	00, 01 (start-stop)	129 (response)	00, 01 (start-stop)
				06 (no range)		17, 28 (index)
				07, 08 (limited qty)		
				17, 28 (index)		
32	0	Analog Change Event - Any Variations	1 (read)	06 (no range)		
				07, 08 (limited qty)		
32	1	32-Bit Analog Change Event without Time	1 (read)	06 (no range)	129 (response)	17, 28 (index)
				07, 08 (limited qty)	130 (unsol. resp)	
32	2	16-Bit Analog Change Event without Time	1 (read)	06 (no range)	129 (response)	17, 28 (index)
				07, 08 (limited qty)		
50	1	Time and Date	1 (read)	00, 01 (start-stop)	129 (response)	00, 01 (start-stop)
				06 (no range)		17, 28 (index)
				07 (limited qty=1)		
				08 (limit qty)		
			2 (write)	07 (limited qty = 1)		
60	1	Class 0 Data	1 (read)	06 (no range)		
60	2	Class 1 Data	1 (read)	06 (no range)		
				07, 08 (limited qty)		
			20 (enbl. unsol.)	06 (no range)		
			21 (dab. unsol.)			
			22 (assign class)			
60	3	Class 2 Data	1 (read)	06 (no range)		
				07, 08 (limited qty)		
			20 (enbl. unsol.)	06 (no range)		
			21 (dab. unsol.)			
			22 (assign class)			
60	4	Class 3 Data	1 (read)	06 (no range)		
				07, 08 (limited qty)		
			20 (enbl. unsol.)	06 (no range)		
			21 (dab. unsol.)			
			22 (assign class)			
80	1	Internal Indications	1 (read)	00,01 (start-stop)		
			2 (write)	00 (start-stop)		
				(index must = 7)		
No Object (function code only)			13 (cold restart)			
No Object (function code only)			14 (warm restart)			

## 2.2 Device Profile Document

<h1>DNP V3.0</h1> <h2>DEVICE PROFILE DOCUMENT</h2>	
Vendor Name: <b>SIEMENS AG</b>	
Device Name: <b>7SJ61 / 7SJ62 / 7SJ63 / 7SJ64 / 6MD63</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.  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 _____ 292 _____ Received _____ 292 _____	Maximum Application Fragment Size (octets): Transmitted _Configurable up to 2048 Received _____ 2048 _____
Maximum Data Link Re-tries: <input checked="" type="checkbox"/> None <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range _0_ to _255_	Maximum Application Layer Re-tries: <input checked="" type="checkbox"/> None <input type="checkbox"/> Configurable, range _____ to _____ (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: <input type="checkbox"/> Never <input type="checkbox"/> Always (not recommended) <input checked="" type="checkbox"/> When reporting Event Data (Slave devices only) <input checked="" type="checkbox"/> When sending multi-fragment responses (Slave devices only) <input type="checkbox"/> Sometimes If 'Sometimes', when? _____ <input checked="" type="checkbox"/> 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

Reports Binary Input Change Events when no specific variation requested:

Never  
 Only time-tagged  
 Only non-time-tagged  
 Configurable to send both, one or the other (attach explanation)

Reports time-tagged Binary Input Change Events when no specific variation requested:

Never  
 Binary Input Change With Time  
 Binary Input Change With Relative Time  
 Configurable (attach explanation)

<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    __20__</li> <li>                          Default Variation   __01__</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	22
3.2	Control Relay Output Blocks/Binary Output Status	33
3.3	Counters	39
3.4	Analog Inputs	40

### 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 reclosure status</b>			
0	>79 ON	>79 ON; Automatic reclosure ON; ON = 1, OFF = 0	3
1	>79 OFF	>79 OFF; ON = 1, OFF = 0	3
2	> BLOCK 79	>BLOCK 79; ON = 1, OFF = 0	3
3	>79 TRIP 1p	>79 Ext. 1pole TRIP for internal A/R; ON = 1, OFF = 0	3
4	>79 TRIP 3p	>79 Ext. 3pole TRIP for internal A/R; ON = 1, OFF = 0	3
5	>Enable ANSI#-2	>Enable 50/67-(N)-2 (override 79 blk); ON = 1, OFF = 0	3
6	>ZSC ON	>Switch zone sequence coordination ON; ON = 1, OFF = 0	3
7	>ZSC OFF	>Switch zone sequence coordination OFF; ON = 1, OFF = 0	3
8	ZSC active	Zone Sequencing is active; ON = 1, OFF = 0	3
9	ZSC ON	Zone sequence coordination switched ON; ON = 1, OFF = 0	3
10	ZSC OFF	Zone sequence coordination switched OFF; ON = 1, OFF = 0	3
11	>CB Ready	>Circuit breaker READY for reclosing; ON = 1, OFF = 0	3
12	79 OFF	79 Auto recloser is switched OFF; ON = 1, OFF = 0	2
13	79 ON	79 Auto recloser is switched ON; ON = 1, OFF = 0	2
14	CB is NOT ready	Circuit breaker is NOT ready; ON = 1, OFF = 0	2
15	79 DynBlock	79 – Auto-reclose is dynamically BLOCKED; ON = 1, OFF = 0	3
16	79 in progress	79 – in progress; ON = 1, OFF = 0	2
17	79 Close	79 – Close command; ON = 1	3
18	79 Successful	79 – cycle successful; ON = 1, OFF = 0	3
19	79 Lockout	79 – Lockout; ON = 1, OFF = 0	1
20	79 L_N Sequence	79-A/R single phase reclosing sequence; Program earthfault is running = 1, Program is deactivated = 0	3
21	79 L-L Sequence	79-A/R multi-phase reclosing sequence; ON = 1, OFF = 0	3
<b>3.1.2 Time Overcurrent protection</b>			
22	>BLOCK 50-2	>BLOCK 50-2; ON = 1, OFF = 0	3
23	>BLOCK 50-1	>BLOCK 50-1; ON = 1, OFF = 0	3
24	>BLOCK 51	>BLOCK 51; ON = 1, OFF = 0	3
25	>BLOCK 51N-2	>BLOCK 50N-2; ON = 1, OFF = 0	3
26	>BLOCK 50N-1	>BLOCK 50N-1; ON = 1, OFF = 0	3
27	>BLOCK 51N	>BLOCK 51N; ON = 1, OFF = 0	3
28	>BLK CLP stpTim	>BLOCK Cold-Load-Pickup stop timer; 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
29	50/51 PH OFF	O/C switched OFF; ON = 1, OFF = 0	3
30	50/51 PH BLK	O/C is BLOCKED; ON = 1, OFF = 0	3
31	50/51 PH ACT	50/51 O/C is ACTIVE; ON = 1, OFF = 0	3
32	50N/51N OFF	50N/51N is OFF; ON = 1, OFF = 0	3
33	50N/51N BLK	50N/51N BLK; ON = 1, OFF = 0	3
34	50N/51N ACT	50N/51N is ACTIVE; ON = 1, OFF = 0	3
35	50 (N) / 51 (N) PU	50(N)/51(N) O/C PICKUP; ON = 1, OFF = 0	2
36	50/51 Ph A PU	50/51 Phase A picked up; ON = 1, OFF = 0	2
37	50/51 Ph B PU	50/51 Phase B picked up; ON = 1, OFF = 0	2
38	50/51 Ph C PU	50/51 Phase C picked up; ON = 1, OFF = 0	2
39	50N/51NPickedup	50N/51N picked up; ON = 1, OFF = 0	2
40	50 (N)/51(N)TRIP	50(N)/51(N) TRIP; ON = 1	2
41	50-1 TRIP	50-1 TRIP; ON = 1	2
42	50-2 TRIP	50-2 TRIP; ON = 1	2
43	50N-1 TRIP	50N-1 TRIP; ON = 1	2
44	50N-2 TRIP	50N-2 TRIP; ON = 1	2
45	50-2 Time Out	50-2 Time Out; ON = 1	3
46	50-1 Time Out	50-1 Time Out; ON = 1	3
47	51 Time Out	51 Time Out; ON = 1	3
48	51 TRIP	51 TRIP; ON = 1, OFF = 0	2
49	50N-2 picked up	50N-2 picked up; ON = 1, OFF = 0	3
50	50N-2 TimeOut	50N-2 Time Out; ON = 1	3
51	50N-1 picked up	50N-1 picked up; ON = 1, OFF = 0	3
52	50N-1 TimeOut	50N-1 Time Out; ON = 1	3
53	51N picked up	51N picked up; ON = 1, OFF = 0	3
54	51N TimeOut	51N Time Out; ON = 1	3
55	51N TRIP	51N TRIP; ON = 1, OFF = 0	3
56	50-2 picked up	50-2 picked up; ON = 1, OFF = 0	3
57	50-1 picked up	50-1 picked up; ON = 1, OFF = 0	3
58	51 picked up	51 picked up; ON = 1, OFF = 0	3
59	CLP OFF	Cold-Load-Pickup switched OFF; ON = 1, OFF = 0	3
60	CLP BLOCKED	Cold-Load-Pickup is BLOCKED; Blocked = 1, Unblocked = 0	3
61	CLP running	Cold-Load-Pickup is RUNNING; ON = 1, OFF = 0	3
62	Dyn set. ACTIVE	Dynamic settings are ACTIVE; 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>			
Point Index	Name	Description	Class
<b>3.1.3 InRush Function</b>			
63	PhA InrushBlk	Phase A trip blocked by inrush detection; ON = 1, OFF = 0	3
64	PhB InrushBlk	Phase B trip blocked by inrush detection; ON = 1, OFF = 0	3
65	PhC InrushBlk	Phase C trip blocked by inrush detection; ON = 1, OFF = 0	3
66	INRUSH X-BLK	Cross blk: PhX blocked Phy; ON = 1, OFF = 0	3
67	50-1 InRushPU	50-1 InRush picked up; ON = 1, OFF = 0	3
68	50N-1 InRushPU	50N-1 InRush picked up; ON = 1, OFF = 0	3
69	51 InRushPU	51 InRush picked up; ON = 1, OFF = 0	3
70	51N InRushPU	51N InRush picked up; ON = 1, OFF = 0	3
71	67-1 InRushPU	67-1 InRush picked up; ON = 1, OFF = 0	3
72	67N-1 InRushPU	67N-1 InRush picked up; ON = 1, OFF = 0	3
73	67-TOC InRushPU	67-TOC InRush picked up; ON = 1, OFF = 0	3
74	67N-TOC InRushPU	67N-TOC InRush picked up; ON = 1, OFF = 0	3
75	Gnd InRush PU	Ground InRush picked up; ON = 1, OFF = 0	3
76	Ia InRush PU	Phase A InRush picked up; ON = 1, OFF = 0	3
77	Ib InRush PU	Phase B InRush picked up; ON = 1, OFF = 0	3
78	Ic InRush PU	Phase C InRush picked up; ON = 1, OFF = 0	3
79	InRush OFF	InRush OFF; ON = 1, OFF = 0	3
80	InRushPhBLOCKED	InRush Phase BLOCKED; ON = 1, OFF = 0	3
81	InRush Gnd BLK	InRush Ground BLOCKED; ON = 1, OFF = 0	3
<b>3.1.4 Directional time overcurrent protection</b>			
82	>BLOCK 67-1	>BLOCK 67-1; ON = 1, OFF = 0	3
83	>BLOCK 67-TOC	>BLOCK 67-TOC; ON = 1, OFF = 0	3
84	>BLOCK 67N-1	>BLOCK 67N-1; ON = 1, OFF = 0	3
85	>BLOCK 67N-TOC	>BLOCK 67N-TOC; ON = 1, OFF = 0	3
86	67/67-TOC OFF	67/67-TOC switched OFF; ON = 1, OFF = 0	3
87	67 BLOCKED	67/67-TOC is BLOCKED; blocked = 1, unblocked = 0	3
88	67 ACTIVE	67/67-TOC is ACTIVE; activate = 1, deactivate = 0	3
89	67N OFF	67N/67N-TOC switched OFF; ON = 1, OFF = 0	3
90	67N BLOCKED	67N/67N-TOC is BLOCKED; blocked = 1, unblocked = 0	3
91	67N ACTIVE	67N/67N-TOC is ACTIVE; activate = 1, deactivate = 0	3
92	67-1 picked up	67-1 picked up; ON = 1, OFF = 0	3
93	67-1 Time Out	67-1 Time Out; ON = 1, OFF = 0	3
94	67-1 TRIP	67-1 TRIP; 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
95	67-TOC pickedup	67-TOC picked up; ON = 1, OFF = 0	3
96	67-TOC Time Out	67-TOC Time Out; ON = 1, OFF = 0	3
97	67-TOC TRIP	67-TOC TRIP; ON = 1, OFF = 0	2
98	67N-1 picked up	67N-1 picked up; ON = 1, OFF = 0	3
99	67N-1 Time Out	67N-1 Time Out; ON = 1, OFF = 0	3
100	67N-1 TRIP	67N-1 TRIP; ON = 1, OFF = 0	2
101	67N-TOCPickedup	67N-TOC picked up; ON = 1, OFF = 0	2
102	67N-TOC TimeOut	67N-TOC Time Out; ON = 1, OFF = 0	2
103	67N-TOC TRIP	67N-TOC TRIP; ON = 1, OFF = 0	2
104	67/67N pickedup	67/67N picked up; ON = 1, OFF = 0	2
105	67 A picked up	67/67-TOC Phase A picked up; ON = 1, OFF = 0	2
106	67 B picked up	67/67-TOC Phase B picked up; ON = 1, OFF = 0	2
107	67 C picked up	67/67-TOC Phase C picked up; ON = 1, OFF = 0	2
108	67N picked up	67N/67N-TOC picked up; ON = 1, OFF = 0	2
109	67/67N TRIP	67/67N TRIP; ON = 1, OFF = 0	2
110	67N-2 picked up	67N-2 picked up; ON = 1, OFF = 0	3
111	67N-2 Time Out	67N-2 Time Out; ON = 1, OFF = 0	3
112	67N-2 TRIP	67N-2 TRIP; ON = 1, OFF = 0	2
113	67-2 picked up	67-2 picked up; ON = 1, OFF = 0	3
114	67-2 Time Out	67-2 Time Out; ON = 1, OFF = 0	3
115	67-2 TRIP	67-2 TRIP; ON = 1, OFF = 0	2
116	>BLOCK 67-2	>BLOCK 67-2; ON = 1, OFF = 0	3
117	>BLOCK 67N-2	>BLOCK 67N-2; ON = 1, OFF = 0	3
118	Phase A forward	Phase A forward; ON = 1, OFF = 0	3
119	Phase B forward	Phase B forward; ON = 1, OFF = 0	3
120	Phase C forward	Phase C forward; ON = 1, OFF = 0	3
121	Phase A reverse	Phase A reverse; ON = 1, OFF = 0	3
122	Phase B reverse	Phase B reverse; ON = 1, OFF = 0	3
123	Phase C reverse	Phase C reverse; ON = 1, OFF = 0	3
124	Ground forward	Ground forward; ON = 1, OFF = 0	3
125	Ground reverse	Ground reverse; ON = 1, OFF = 0	3
<b>3.1.5 Unbalanced load protection</b>			
126	>46 BLOCK	>BLOCK 46; ON = 1, OFF = 0	3
127	46 OFF	46 switched OFF; 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
128	46 BLOCKED	46 is BLOCKED; ON = 1, OFF = 0	3
129	46 ACTIVE	46 is ACTIVE; ON = 1, OFF = 0	3
130	46-2 picked up	46-2 picked up; ON = 1, OFF = 0	2
131	46-TOC pickedup	46-TOC picked up; ON = 1, OFF = 0	2
132	46 TRIP	46 TRIP picked up; ON = 1, OFF = 0	2
133	46-1 picked up	46-1 picked up; ON = 1, OFF = 0	2
<b>3.1.6 Frequency protection</b>			
134	>BLOCK 81O/U	>BLOCK 81O/U; ON = 1, OFF = 0	3
135	>BLOCK 81-1	>BLOCK 81-1; ON = 1, OFF = 0	3
136	>BLOCK 81-2	>BLOCK 81-2; ON = 1, OFF = 0	3
137	>BLOCK 81-3	>BLOCK 81-3; ON = 1, OFF = 0	3
138	>BLOCK 81-4	>BLOCK 81-4; ON = 1, OFF = 0	3
139	81 OFF	81 OFF; ON = 1, OFF = 0	3
140	81 BLOCKED	81 BLOCKED; ON = 1, OFF = 0	3
141	81 ACTIVE	81 ACTIVE; ON = 1, OFF = 0	3
142	81-1 picked up	81-1 picked up; ON = 1, OFF = 0	2
143	81-2 picked up	81-2 picked up; ON = 1, OFF = 0	2
144	81-3 picked up	81-3 picked up; ON = 1, OFF = 0	2
145	81-4 picked up	81-4 picked up; ON = 1, OFF = 0	2
146	81-1 TRIP	81-1 TRIP; ON = 1, OFF = 0	2
147	81-2 TRIP	81-2 TRIP; ON = 1, OFF = 0	2
148	81-3 TRIP	81-3 TRIP; ON = 1, OFF = 0	2
149	81-4 TRIP	81-4 TRIP; ON = 1, OFF = 0	2
<b>3.1.7 Voltage protection</b>			
150	>BLOCK 27	>BLOCK 27 undervoltage protection; ON = 1, OFF = 0	3
151	>27 I SUPRVSN	>27-Switch current supervision ON; ON = 1, OFF = 0	3
152	>BLOCK 27-1	>BLOCK 27-1 undervoltage protection; ON = 1, OFF = 0	3
153	>BLOCK 27-2	>BLOCK 27-2 undervoltage protection; ON = 1, OFF = 0	3
154	>FAIL: FEEDER VT	>Failure: Feeder VT; ON = 1, OFF = 0	3
155	>FAIL: BUS VT	>Failure: Busbar VT; ON = 1, OFF = 0	3
156	>BLCOK 59-1	>BLOCK 59-1 overvoltage protection; ON = 1, OFF = 0	3
157	<unnamed>	not used	
158	27 OFF	27 Undervoltage protection switched OFF; ON = 1, OFF = 0	3
159	27 BLOCKED	27 Undervoltage protection is BLOCKED; 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
160	27 ACTIVE	27 Undervoltage protection is ACTIVE; ON = 1, OFF = 0	3
161	27-1 picked up	27-1 Undervoltage picked up; ON = 1, OFF = 0	2
162	27-1 PU CS	27-1 Undervoltage PICKUP w/curr. superv; ON = 1, OFF = 0	3
163	27-2 picked up	27-2 Undervoltage picked up; ON = 1, OFF = 0	2
164	27-2 PU CS	27-2 Undervoltage PICKUP w/curr. superv; ON = 1, OFF = 0	2
165	27-1 TRIP	27-1 Undervoltage TRIP; ON = 1, OFF = 0	2
166	27-2 TRIP	27-2 Undervoltage TRIP; ON = 1, OFF = 0	2
167	59 OFF	59-Overvoltage protection switched OFF; ON = 1, OFF = 0	3
168	59 BLOCKED	59-Overvoltage protection is BLOCKED; ON = 1, OFF = 0	3
169	59 ACTIVE	59-Overvoltage protection is ACTIVE; ON = 1, OFF = 0	3
170	59-1 picked up	59 picked up; ON = 1, OFF = 0	2
171	<unnamed>		3
172	59-1 TRIP	59 TRIP; ON = 1, OFF = 0	2
<b>3.1.8 Command Mode Information</b>			
173	Control auth	Control authority; 0=Remote; 1=Local (Activated for devices 7SJ63/6MD63 only)	1
174	ModeLOCAL	Mode Local; 0=lokal operation with interlocking; 1=lokal operation without interlocking; (Activated for devices 7SJ63/6MD63 only)	1
175	ModeREMOTE	Mode remote; 0=remote operation with interlocking; 1=remote operation without interlocking	1
176	Control auth	Control authority; 0=Remote; 1=Local (Activated for devices 7SJ61/7SJ62 only)	1
177	ModeLOCAL	Mode Local; 0=lokal operation with interlocking; 1=lokal operation without interlocking; (Activated for devices 7SJ61/7SJ62 only)	1
<b>3.1.9 Internal Mode Status</b>			
178	>No volt	No Volt; ON = 1, OFF = 0	1
179	<unnamed>		3
180	>Trig. Wave.Cap.	>Trigger Waveform Capture; ON = 1, OFF = 0	3
181	<unnamed>	not used	3
182	>Set Group Bit0	>Setting Group Select Bit 0	3
183	>Set Group Bit1	>Setting Group Select Bit 1	3
184	Test mode	Test mode; ON = 1, OFF = 0	3
185	DataStop	Data stop; ON = 1, OFF = 0; (ref to chap. 1.1.3)	3
186	Relay OK	Relay OK; 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
187	Initial Start	Initial Start of the Relay; ON = 1	3
188	Running	Setting calculation is running; ON = 1, OFF = 0	3
189	<unnamed>		3
190	Flag Lost	Flag lost; ON = 1, OFF = 0	3
191	Error Sum Alarm	Error with a summary alarm; ON = 1, OFF = 0 (ref. to chap. 1.1.1)	2
192	Alarm Sum Event	Alarm Summary Event; ON = 1, OFF = 0 (ref. to chap. 1.1.2)	2
193	I Supervision	Failure: Current balance Supervision; ON = 1, OFF = 0	3
194	Failure \19I	Failure: Current Summation; ON = 1, OFF = 0	1
195	Failure I balance	Failure: Current Balance; ON = 1, OFF = 0	1
196	Failure V balance	Failure: Voltage Balance; ON = 1, OFF = 0	1
197	Fail Ph. Seq.	Failure: Phase Sequence; ON = 1, OFF = 0	3
198	Fail Ph. Seq. I	Failure: Phase Sequence Current; ON = 1, OFF = 0	3
199	Fail Ph. Seq. V	Failure: Phase Sequence Voltage; ON = 1, OFF = 0	3
200	<unnamed>		3
201	SP. Op Hours>	Setpoint Operation Hours; ON = 1, OFF = 0	1
202	SP. I A dmd	Set Point Phase A dmd>; ON = 1, OFF = 0	1
203	SP. I B dmd	Set Point Phase B dmd>; ON = 1, OFF = 0	1
204	SP. I C dmd	Set Point Phase C dmd>; ON = 1, OFF = 0	1
205	SP. I1dmd>	Set Point positive sequence I1dmd>; ON = 1, OFF = 0	1
206	SP.  Pdmd >	Set Point  Pdmd >; ON = 1, OFF = 0	1
207	SP.  Qdmd >	Set Point  Qdmd >; ON = 1, OFF = 0	1
208	SP.  Sdmd >	Set Point  Sdmd >; ON = 1, OFF = 0	1
209	37 alarm	37 Undercurrent alarm; ON = 1, OFF = 0	1
210	SP. cos\1A alarm	Set point 55 Power factor alarm; ON = 1, OFF = 0	1
211	>Manual Close	>Manual close command; ON = 1, OFF = 0	2
212	Relay Pickup	Relay Pickup; ON = 1, OFF = 0	1
213	Relay TRIP	General TRIP of the relay; ON = 1	1
<b>3.1.10 Highly sensitive earth fault protection</b>			
214	>Start Flt. Loc	>Start Fault Locator; ON = 1, OFF = 0	3
215	>BLOCK 64	>BLOCK 64; ON = 1, OFF = 0	3
216	>BLOCK 50Ns-2	>BLOCK 50Ns-2; ON = 1, OFF = 0	3
217	>BLOCK 50Ns-1	>BLOCK 50Ns-1; ON = 1, OFF = 0	3
218	>BLOCK 51Ns	>BLOCK 51Ns; 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
219	>BLK 50Ns/67Ns	>BLOCK 50Ns/67Ns; ON = 1, OFF = 0	3
220	50Ns/67Ns OFF	50Ns/67Ns is OFF; ON = 1, OFF = 0	3
221	50Ns/67Ns ACT	50Ns/67Ns is ACTIVE; ON = 1, OFF = 0	3
222	64 Pickup	64 displacement voltage pick up; ON = 1, OFF = 0	2
223	64 Trip	64 displacement voltage element TRIP; ON = 1, OFF = 0	2
224	50Ns-2 Pickup	50Ns-2 Pickup; ON = 1, OFF = 0	2
225	50Ns-2 TRIP	50Ns-2 TRIP; ON = 1, OFF = 0	2
226	50Ns-1 Pickup	50Ns-1 Pickup; ON = 1, OFF = 0	2
227	50Ns-1 TRIP	50Ns-1 TRIP; ON = 1, OFF = 0	2
228	51Ns Pickup	51Ns Pickup; ON = 1, OFF = 0	2
229	51Ns TRIP	51Ns TRIP; ON = 1, OFF = 0	2
230	Sens. Gnd block	Sensitive ground fault detection BLOCKED; ON = 1, OFF = 0	3
231	<unnamed>		2
232	SensGnd undef.	Sensitive Gnd fault direction undefined; ON = 1, OFF = 0	3
233	Sens. Gnd Ph A	Sensitive Ground fault picked up in Ph A; ON = 1, OFF = 0	2
234	Sens. Gnd Ph B	Sensitive Ground fault picked up in Ph B; ON = 1, OFF = 0	2
235	Sens. Gnd Ph C	Sensitive Ground fault picked up in Ph C; ON = 1, OFF = 0	2
236	SensGnd Forward	Sensitive Gnd fault in forward direction; ON = 1, OFF = 0	2
237	SensGnd Reverse	Sensitive Gnd fault in reverse direction; ON = 1, OFF = 0	2
<b>3.1.11 Circuit breaker failure protection</b>			
238	>BLOCK 50BF	BLOCK 50BF; ON = 1, OFF = 0	3
239	>50BF ext SRC	50BF initiated externally; ON = 1, OFF = 0	3
240	50BF OFF	50BF is switched OFF; ON = 1, OFF = 0	3
241	50BF BLOCK	50BF is BLOCKED; ON = 1, OFF = 0	3
242	50BF ACTIVE	50BF is ACTIVE; ON = 1, OFF = 0	3
243	50BF int Pickup	50BF (internal) PICKUP; ON = 1, OFF = 0	2
244	50BF ext Pickup	50BF (external) PICKUP; ON = 1, OFF = 0	2
245	<unnamed>		2
246	50BF int TRIP	50BF (internal) TRIP; ON = 1, OFF = 0	2
247	50BF ext TRIP	50BF (external) TRIP; ON = 1, OFF = 0	2
<b>3.1.12 Thermal overload protection</b>			
248	>49 O/L BLOCK	>BLOCK 49 Overload Protection; ON = 1, OFF = 0	3
249	>EmergencyStart	>Emergency start of motors; ON = 1, OFF = 0	3
250	49 O / L OFF	49 Overload Protection is OFF; 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
251	49 O/L BLOCK	49 Overload Protection is BLOCKED; ON = 1, OFF = 0	3
252	49 O/L ACTIVE	49 Overload Protection is ACTIVE; ON = 1, OFF = 0	3
253	49 O/L I Alarm	Overload Current Alarm (I alarm); ON = 1, OFF = 0	1
254	49 O/L \16 Alarm	49 Overload Alarm! Near Thermal Trip; ON = 1, OFF = 0	1
255	49 Windings O/L	49 Winding Overload; ON = 1, OFF = 0	3
256	49 Th O/L TRIP	49 Thermal Overload TRIP; ON = 1, OFF = 0	2
<b>3.1.13 Monitor start protection</b>			
257	>66 emer. start	>Emergency start; ON = 1, OFF = 0	3
258	66 OFF	66 Motor start protection OFF; ON = 1, OFF = 0	3
259	66 BLOCKED	66 Motor start protection BLOCKED; ON = 1, OFF = 0	3
260	66 ACTIVE	66 Motor start protection ACTIVE; ON = 1, OFF = 0	3
261	66 TRIP	66 Motor start protection TRIP; ON = 1, OFF = 0	2
<b>3.1.14 Start-up supervision</b>			
262	START-SUP OFF	Startup supervision is OFF; ON = 1, OFF = 0	3
263	START-SUP BLK	Startup supervision is BLOCKED; ON = 1, OFF = 0	3
264	START-SUP ACT	Startup supervision is ACTIVE; ON = 1, OFF = 0	3
265	START-SUP TRIP	Startup supervision TRIP; ON = 1, OFF = 0	2
266	Rotor locked	Rotor locked; ON = 1, OFF = 0	1
267	START-SUP pu	Startup supervision Pickup; ON = 1, OFF = 0	2
<b>3.1.15 Trip coil monitor</b>			
268	74TC BLOCKED	74TC Trip circuit supervision is BLOCKED; ON = 1, OFF = 0	3
269	74TC ACTIVE	74TC Trip circuit supervision is ACTIVE; ON = 1, OFF = 0	3
270	>74TC trip rel.	>74TC Trip circuit superv.: trip relay; ON = 1, OFF = 0	3
271	>74TC brk rel.	>74TC Trip circuit superv.: brk relay; ON = 1, OFF = 0	3
272	74TC OFF	74TC Trip circuit supervision OFF; ON = 1, OFF = 0	3
273	74 ProgFail	74TC blocked. Bin. input is not set; ON = 1, OFF = 0	3
274	FAIL: Trip cir.	74TCFailure Trip Circuit; ON = 1, OFF = 0	1
<b>3.1.16 Extension</b>			
275	>Door open	>Door open; ON = 1, OFF = 0	3
276	>CB wait	>Circuit breaker wait; ON = 1, OFF = 0	3
<b>3.1.17 Control switches return position indication(double point commands)</b>			
277	52 Breaker	input state of switch breaker; 0=open, 1=close	1
278	52 Breaker status	switch breaker failure status; 0=switch breaker position is open or close, 1= switch breaker is in an intermediate position or position state is incorrect.	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
279	Disconnect switch	input state of disconnect switch; 0=open, 1=close	1
280	Disconnect switch status	disconnect switch failure status; 0= disconnect switch position is open or close, 1= disconnect switch is in an intermediate position or position state is incorrect.	1
281	Gnd switch	input state of ground switch; 0=open, 1=close	1
282	Gnd switch status	ground switch failure status; 0= ground switch position is open or close, 1= ground switch is in an intermediate position or position state is incorrect.	1
283	Switch 1	input state of switch 1; 0=open, 1=close	1
284	switch 1 status	switch 1 failure status; 0= switch 1 position is open or close, 1= switch 1 is in an intermediate position or position state is incorrect.	1
285	Switch 2	input state of switch 2; 0=open, 1=close	1
286	switch 2 status	switch 2 failure status; 0= switch 2 position is open or close, 1= switch 2 is in an intermediate position or position state is incorrect.	1
287	User Switch 3 <sup>1</sup>	input state of switch 3; 0=open, 1=close	1
288	user switch 3 status	switch 3 failure status; 0= switch 3 position is open or close, 1= switch 3 is in an intermediate position or position state is incorrect.	1
289	User Switch 4	input state of switch 4; 0=open, 1=close	1
290	user switch 4 status	switch 4 failure status; 0= switch 4 position is open or close, 1= switch 4 is in an intermediate position or position state is incorrect.	1
291	User Switch 5	input state of switch 5; 0=open, 1=close	1
292	user switch 5 status	switch 5 failure status; 0= switch 5 position is open or close, 1= switch 5 is in an intermediate position or position state is incorrect.	1
293	User Switch 6	input state of switch 6; 0=open, 1=close	1
294	user switch 6 status	switch 6 failure status; 0= switch 6 position is open or close, 1= switch 6 is in an intermediate position or position state is incorrect.	1
<b>3.1.18 Internal controls</b>			
295	auto-recl.ac.	Activation / deactivation of Auto-reclosure function	1
296	protection act.	Protection activation	1
297	Group A	Protection Parameter Group A; 0 = Group A is deactivated, 1= Group A is activated and Group B,C,D are deactivated.	1
298	Group B	Protection Parameter Group B; 0 = Group B is deactivated, 1= Group B is activated and Group A,C,D are deactivated.	1
299	Group C	Protection Parameter Group C; 0 = Group C is deactivated, 1= Group C is activated and Group A,B,D are deactivated.	1
300	Group D	Protection Parameter Group D; 0 = Group D is deactivated, 1= Group D is activated and Group A,B,C are deactivated.	1
<b>3.1.19 Output channels return position indication (Single point commands)</b>			
301	>switch 1	0 = Open (off), 1= Close (on)	1
302	>switch 2	0 = Open (off), 1= Close (on)	1

<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>
303	>switch 3	0 = Open (off), 1= Close (on)	1
304	>switch 4	0 = Open (off), 1= Close (on)	1
305	>switch 5	0 = Open (off), 1= Close (on)	1
306	>switch 6	0 = Open (off), 1= Close (on)	1
307	>switch 7	0 = Open (off), 1= Close (on)	1
308	>switch 8	0 = Open (off), 1= Close (on)	1
309	>switch 9	0 = Open (off), 1= Close (on)	1
310	>switch 10	0 = Open (off), 1= Close (on)	1
311	>switch 11	0 = Open (off), 1= Close (on)	1
312	>switch 12	0 = Open (off), 1= Close (on)	1
313	>switch 13	0 = Open (off), 1= Close (on)	1
314	>switch 14	0 = Open (off), 1= Close (on)	1
315	>switch 15	0 = Open (off), 1= Close (on)	1
316	>switch 16	0 = Open (off), 1= Close (on)	1
317	>switch 17	0 = Open (off), 1= Close (on)	1
318	>switch 18	0 = Open (off), 1= Close (on)	1
319	>switch 19	0 = Open (off), 1= Close (on)	1
320	>switch 20	0 = Open (off), 1= Close (on)	1
321	>switch 21	0 = Open (off), 1= Close (on)	1
322	>switch 22	0 = Open (off), 1= Close (on)	1
<b>3.1.20 Internal controls</b>			
323	<unnamed> <sup>2</sup>	User input 1	1
324	<unnamed>	User input 2	1
325	<unnamed>	User input 3	1
326	<unnamed>	User input 4	1
327	<unnamed>	User input 5	1
328	<unnamed>	User input 6	1
329	<unnamed>	User input 7	1
330	<unnamed>	User input 8	1
331	<unnamed>	User input 9	1
332	<unnamed>	User input 10	1

1)The mapping are defined during indication allocation using parametrization softwareDIGSI® 4

2)The names are defined during indication allocation using parametrization softwareDIGSI® 4



## 3.2 Control Relay Output Blocks/Binary Output Status

### 3.2.1 Standard Mapping 1

<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>3.2.1.1 External commands (Double point commands)</b>			
0	52Breaker	Trip Breaker switch	Trip, Pulse On (On Time Fixed <sup>1</sup> )
1	52Breaker	Close Breaker switch	Close, Pulse On (On Time Fixed)
2	Disconnect	Trip Disconnect switch	Trip, Pulse On (On Time Fixed)
3	Disconnect	Close Disconnect switch	Close, Pulse On (On Time Fixed)
4	Gnd switch	Trip Ground switch	Trip, Pulse On (On Time Fixed)
5	Gnd switch	Close Ground switch	Close, Pulse On (On Time Fixed)
6	Switch 1	Trip switch 1	Trip, Pulse On (On Time Fixed)
7	Switch 1	Close switch 1	Close, Pulse On (On Time Fixed)
8	Switch 2	Trip switch 2	Trip, Pulse On (On Time Fixed)
9	Switch 2	Close switch 2	Close, Pulse On (On Time Fixed)
10	User Switch 3	Trip switch 3	Trip, Pulse On (On Time Fixed)
11	User Switch 3	Close switch 3	Close, Pulse On (On Time Fixed)
12	User Switch 4	Trip switch 4	Trip, Pulse On (On Time Fixed)
13	User Switch 4	Close switch 4	Close, Pulse On (On Time Fixed)
14	User Switch 5	Trip switch 5	Trip, Pulse On (On Time Fixed)
15	User Switch 5	Close switch 5	Close, Pulse On (On Time Fixed)

<b>Binary Output Status Points</b>			
Object Number: <b>10</b>			
Request Function Codes supported: <b>1 (Read)</b>			
Default Variation reported when variation 0 requested: <b>2 (Binary Output Status)</b>			
<b>Control Relay Output Blocks/Binary Output Status</b>			
Object Number: <b>12</b>			
Request Function Codes supported: <b>3 (select), 4 (operate), 5 (direct operate), 6 (direct operate, no ack)</b>			
Point Index	Name	Description	Supported Control Relay Output Block Fields
16	User Switch 6	Trip switch 6	Trip, Pulse On (On Time Fixed)
17	User Switch 6	Close switch 6	Close, Pulse On (On Time Fixed)
<b>3.2.1.2 Internal commands</b>			
18	auto-recl.ac.	activation of Auto-reclosure function	Latch On, Latch Off
19	Protection	Protection activation	Latch On, Latch Off
20	<unnamed>	not used	Latch On
21	Group A	Select parametergroup A and deactivate parametergroup B,C,D ref. to chap. 1.2.3	Latch On
22	Group B	Select parametergroup B and deactivate parametergroup A,C,D	Latch On
23	Group C	Select parametergroup C and deactivate parametergroup A,B,D	Latch On
24	Group D	Select parametergroup D and deactivate parametergroup A,B,C	Latch On
25	ModeREMOTE	Mode remote control; Latch On = UNLOCKED Lath Off = LOCKED (ref. to chap. 1.2.2)	Latch On; Latch Off
<b>3.2.1.3 Output channel (user defined single point output commands)</b>			
Please ref to chap. 1.2.1 for additional notes.			
26	Output 1 <sup>2</sup>	Output channel 1	Latch On, Latch Off, Pulse On
27	Output 2	Output channel 2	Latch On, Latch Off, Pulse On
28	Output 3	Output channel 3	Latch On, Latch Off, Pulse On
29	Output 4	Output channel 4	Latch On, Latch Off, Pulse On
30	Output 5	Output channel 5	Latch On, Latch Off, Pulse On
31	Output 6	Output channel 6	Latch On, Latch Off, Pulse On
32	Output 7	Output channel 7	Latch On, Latch Off, Pulse On
33	Output 8	Output channel 8	Latch On, Latch Off, Pulse On
34	Output 9	Output channel 9	Latch On, Latch Off, Pulse On

<b>Binary Output Status Points</b>			
Object Number: <b>10</b>			
Request Function Codes supported: <b>1 (Read)</b>			
Default Variation reported when variation 0 requested: <b>2 (Binary Output Status)</b>			
<b>Control Relay Output Blocks/Binary Output Status</b>			
Object Number: <b>12</b>			
Request Function Codes supported: <b>3 (select), 4 (operate), 5 (direct operate), 6 (direct operate, no ack)</b>			
<b>Point Index</b>	<b>Name</b>	<b>Description</b>	<b>Supported Control Relay Output Block Fields</b>
35	Output 10	Output channel 10	Latch On, Latch Off, Pulse On
36	Output 11	Output channel 11	Latch On, Latch Off, Pulse On
37	Output 12	Output channel 12	Latch On, Latch Off, Pulse On
38	Output 13	Output channel 13	Latch On, Latch Off, Pulse On
39	Output 14	Output channel 14	Latch On, Latch Off, Pulse On
40	Output 15	Output channel 15	Latch On, Latch Off, Pulse On
41	Output 16	Output channel 16	Latch On, Latch Off, Pulse On
42	Output 17	Output channel 17	Latch On, Latch Off, Pulse On
43	Output 18	Output channel 18	Latch On, Latch Off, Pulse On
44	Output 19	Output channel 19	Latch On, Latch Off, Pulse On
45	Output 20	Output channel 20	Latch On, Latch Off, Pulse On
46	Output 21	Output channel 21	Latch On, Latch Off, Pulse On
47	Output 22	Output channel 22	Latch On, Latch Off, Pulse On

1The On-Time is fixed within theSIPROTEC® parameter package for each command object. The Control Relay Output Block information on-time will be ignored.

2The names are defined during indication allocation using parametrization softwareDIGSI® 4

### 3.2.2 Standard Mapping 2

Point Index	Name	Description	Supported Control Relay Output Block Fields
<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)			
<b>3.2.2.1 External commands (Double point commands)</b>			
0	52Breaker	Trip / Close Breaker switch	Trip, Close, Pulse On (On Time Fixed <sup>1</sup> )
1		Not used	
2	Disconnect	Trip / Close Disconnect switch	Trip, Close, Pulse On (On Time Fixed)
3		Not used	
4	Gnd switch	Trip / Close Ground switch	Trip, Close, Pulse On (On Time Fixed)
5		Not used	
6	Switch 1	Trip / Close switch 1	Trip, Close, Pulse On (On Time Fixed)
7		Not used	
8	Switch 2	Trip / Close switch 2	Trip, Close, Pulse On (On Time Fixed)
9		Not used	
10	Switch 3	Trip / Close switch 3	Trip, Close, Pulse On (On Time Fixed)
11		Not used	
12	Switch 4	Trip / Close switch 4	Trip, Close, Pulse On (On Time Fixed)
13		Not used	
14	Switch 5	Trip / Close switch 5	Trip, Close, Pulse On (On Time Fixed)
15		Not used	
16	Switch 6	Trip / Close switch 6	Trip, Close, Pulse On (On Time Fixed)
17		Not used	
<b>3.2.2.2 Internal commands</b>			
18	auto-recl.ac.	activation of Auto-reclosure function	Latch On, Latch Off
19	Protection	Protection activation	Latch On, Latch Off
20	Reset LEDs	Reset LEDs	Latch On

<b>Binary Output Status Points</b>			
Object Number: <b>10</b>			
Request Function Codes supported: <b>1 (Read)</b>			
Default Variation reported when variation 0 requested: <b>2 (Binary Output Status)</b>			
<b>Control Relay Output Blocks/Binary Output Status</b>			
Object Number: <b>12</b>			
Request Function Codes supported: <b>3 (select), 4 (operate), 5 (direct operate), 6 (direct operate, no ack)</b>			
<b>Point Index</b>	<b>Name</b>	<b>Description</b>	<b>Supported Control Relay Output Block Fields</b>
21	Group A	Select parametergroup A and deactivate parametergroup B,C,D (ref. to chap. 1.2.3)	Latch On
22	Group B	Select parametergroup B and deactivate parametergroup A,C,D	Latch On
23	Group C	Select parametergroup C and deactivate parametergroup A,B,D	Latch On
24	Group D	Select parametergroup D and deactivate parametergroup A,B,C	Latch On
25	ModeREMOTE	Mode remote control; Latch On = UNLOCKED Lath Off = LOCKED (ref. to chap.1.2.2 )	Latch On; Latch Off
<b>3.2.2.3 Output channel (user defined single point output commands)</b>			
Please ref to chap. 1.2.1 for additional notes.			
26	Output 1 <sup>2</sup>	Output channel 1	Latch On, Latch Off, Pulse On
27	Output 2	Output channel 2	Latch On, Latch Off, Pulse On
28	Output 3	Output channel 3	Latch On, Latch Off, Pulse On
29	Output 4	Output channel 4	Latch On, Latch Off, Pulse On
30	Output 5	Output channel 5	Latch On, Latch Off, Pulse On
31	Output 6	Output channel 6	Latch On, Latch Off, Pulse On
32	Output 7	Output channel 7	Latch On, Latch Off, Pulse On
33	Output 8	Output channel 8	Latch On, Latch Off, Pulse On
34	Output 9	Output channel 9	Latch On, Latch Off, Pulse On
35	Output 10	Output channel 10	Latch On, Latch Off, Pulse On
36	Output 11	Output channel 11	Latch On, Latch Off, Pulse On
37	Output 12	Output channel 12	Latch On, Latch Off, Pulse On
38	Output 13	Output channel 13	Latch On, Latch Off, Pulse On
39	Output 14	Output channel 14	Latch On, Latch Off, Pulse On

<b>Binary Output Status Points</b>			
Object Number: <b>10</b>			
Request Function Codes supported: <b>1 (Read)</b>			
Default Variation reported when variation 0 requested: <b>2 (Binary Output Status)</b>			
<b>Control Relay Output Blocks/Binary Output Status</b>			
Object Number: <b>12</b>			
Request Function Codes supported: <b>3 (select), 4 (operate), 5 (direct operate), 6 (direct operate, no ack)</b>			
<b>Point Index</b>	<b>Name</b>	<b>Description</b>	<b>Supported Control Relay Output Block Fields</b>
40	Output 15	Output channel 15	Latch On, Latch Off, Pulse On
41	Output 16	Output channel 16	Latch On, Latch Off, Pulse On
42	Output 17	Output channel 17	Latch On, Latch Off, Pulse On
43	Output 18	Output channel 18	Latch On, Latch Off, Pulse On
44	Output 19	Output channel 19	Latch On, Latch Off, Pulse On
45	Output 20	Output channel 20	Latch On, Latch Off, Pulse On
46	Output 21	Output channel 21	Latch On, Latch Off, Pulse On
47	Output 22	Output channel 22	Latch On, Latch Off, Pulse On

1The On-Time is fixed within theSIPROTEC® parameter package for each commond object. The Control Relay Output Block information on-time will be ignored.

2The names are defined during indication allocation using parametrization softwareDIGSI® 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+=	Wp Forward (metered measurand derived from measured value)	$2^{32}-1$ impulses
1	Wq+=	Wq Forward (metered measurand derived from measured value)	$2^{32}-1$ impulses
2	Wp-=	Wp Reverse (metered measurand derived from measured value)	$2^{32}-1$ impulses
3	Wq-=	Wq Reverse (metered measurand derived from measured value)	$2^{32}-1$ impulses
4	Wp(puls) =	Pulsed Energy Wp (active)(metering impulses at binary input)	$2^{32}-1$ impulses
5	Wq(puls) =	Pulsed Energy Wq (reactive)(metering impulses at binary input)	$2^{32}-1$ 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=	Current phase a	3276.7 A	1
1	Ib=	Current phase b	3276.7 A	1
2	Ic=	Current phase c	3276.7 A	1
3	I0=	Current I0	3276.7 A	1
4	Va=	Voltage phase a	32.767 kV	1
5	Vb=	Voltage phase b	32.767 kV	1
6	Vc=	Voltage phase c	32.767 kV	1
7	Va-b=	Voltage phase a to phase b	32.767 kV	1
8	Vb-c=	Voltage phase b to phase c	32.767 kV	1
9	Vc-a=	Voltage phase c to phase a	32.767 kV	1
10	V=	Voltage Ground	32.767 kV	1
11	P=	Active power	32767 kW	1
12	Q=	Reactive power	32767 kVar	1
13	S=	Apparent power	32767 kVar	1
14	Freq=	frequency	327.67 Hz	1
15	cos $\phi$ =	power factor	3.2767	1
16	IEE real=	earth fault current active	3276.7 A	1
17	IEE reactive=	earth fault current reactive	3276.7 A	1
18	I1=	Positive sequence current	3276.7 A	2
19	I2=	Negative sequence current	3276.7 A	2
20	I0=	Zero sequence current	3276.7 A	2
21	V1=	Positive sequence voltage	32.767 kV	2
22	V2=	Negative sequence voltage	32.767 kV	2
23	V0=	Zero sequence voltage	32.767 kV	2
24	I1dmd=	Positive sequence Demand	3276.7 A	2
25	$\Theta$ / $\Theta$ Rotor=	Temperature rise of Rotor	327.67 %	2
26	$\Theta$ / $\Theta$ Stator=	Temperature rise of Stator	327.67 %	2
27	Td1=	Transducer 1=	32.767 mA	2
28	Td2=	Transducer 1=	32.767 mA	2
29	Ia dmd=	Phase A demand	3276.7 A	2



<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
30	lb dmd=	Phase B demand	3276.7 A	2
31	lc dmd=	Phase C demand	3276.7 A	2
32	Pdmd=	Real Power Demand	3276.7 kW	2
33	Qdmd=	Reactive Power Demand	3276.7 kVar	2
34	Sdmd=	Apparent Power Demand	3276.7 kVar	2
35	P phase a=	Reserved for active power phase a	3276.7 kW	2
36	P phase b=	Reserved for active power phase b	3276.7 kW	2
37	P phase c=	Reserved for active power phase c	3276.7 kW	2
38	Q phase a=	Reserved for reactive power phase a	3276.7 kVar	2
39	Q phase b=	Reserved for reactive power phase b	3276.7 kVar	2
40	Q phase c=	Reserved for reactive power phase c	3276.7 kVar	2
41	cos $\phi$ phase a=	Reserved for phase angle a	3.2767	2
42	cos $\phi$ phase b=	Reserved for phase angle b	3.2767	2
43	cos $\phi$ phase c=	Reserved for phase angle c	3.2767	2
<b>3.4.2 Min/Max values</b>				
44	la Min=	Current phase a minimum	3276.7 A	3
45	la Max=	Current phase a maximum	3276.7 A	3
46	lb Min=	Current phase b minimum	3276.7 A	3
47	lb Max=	Current phase b maximum	3276.7 A	3
48	lc Min=	Current phase c minimum	3276.7 A	3
49	lc Max=	Current phase c maximum	3276.7 A	3
50	I1 Min=	Minimum Strommitsystem I1	3276.7 A	3
51	I1 Max=	Maximum Strommitsystem I1	3276.7 A	3
52	Va-n Min=	Voltage phase a minimum	32.767 kV	3
53	Va-nMax=	Voltage phase a maximum	32.767 kV	3
54	Vb-nMin=	Voltage phase b minimum	32.767 kV	3
55	Vb-nMax=	Voltage phase b maximum	32.767 kV	3
56	Vc-nMin=	Voltage phase c minimum	32.767 kV	3
57	Vc-nMax=	Voltage phase c maximum	32.767 kV	3
58	Va-bMin=	Voltage phase a to phase b minimum	32.767 kV	3
59	Va-bMax=	Voltage phase a to phase b maximum	32.767 kV	3
60	Vb-cMin=	Voltage phase b to phase c minimum	32.767 kV	3
61	Vb-cMax=	Voltage phase b to phase c maximum	32.767 kV	3

<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
62	Vc-aMin=	Voltage phase c to phase a minimum	32.767 kV	3
63	Vc-aMax=	Voltage phase c to phase a maximum	32.767 kV	3
64	Vn Min=	Voltage neutral minimum	32.767 kV	3
65	Vn Max=	Voltage neutral maximum	32.767 kV	3
66	V1 Min=	Positive Sequence Voltage Minimum	32.767 kV	3
67	V1 Max=	Positive Sequence Voltage Maximum	32.767 kV	3
68	P Min=	Active power minimum	3276.7 kW	3
69	P Max=	Active power maximum	3276.7 kW	3
70	Q Min=	Reactive power minimum	3276.7 kVar	3
71	Q Max=	Reactive power maximum	3276.7 kVar	3
72	S Min=	Apparent power minimum	3276.7 kVar	3
73	S Max=	Apparent power maximum	3276.7 kVar	3
74	f Min=	frequency Minimum	327.67 Hz	3
75	f Max=	frequency Maximum	327.67 Hz	3
76	cos $\phi$ min=	Power factor minimum	3.2767	3
77	cos $\phi$ max=	Power factor maximum	3.2767	3
<b>If Object 30 Variation 01 (32-Bit Analog Input) requesten, additional:</b>				
<b>3.4.3 Fault locator and fault currents</b>				
78	(0)Ia=	Trip Current phase a	327.67 kA	1
79	(0)Ib=	Trip Current phase b	327.67 kA	1
80	(0)Ic=	Trip Current phase c	327.67 kA	1
81	(0)Xsec=	Fault impedance	3.2767 k $\Omega$	1
82	(0)dist=	Fault location	327.67 miles	1

# Glossary

<b>AME</b>	Asynchronous interface module with (electrical) isolated RS485 interface for the SIPROTEC devices from Siemens.
<b>AMO</b>	Asynchronous interface module with optical interface for the SIPROTEC devices from Siemens.
<b>AR</b>	Automatic Recloser
<b>CFC</b>	Continuous Function Chart
<b>DC</b>	Double Command
<b>DIGSI</b>	Parameterization system for SIPROTEC devices
<b>DNP</b>	Distributed Network Protocol
<b>DP</b>	Double-point 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>	Remote Terminal Unit
<b>SC</b>	Single Command
<b>SP</b>	Single-point Indication



# Index

## A

Additional support .....	4
Alarm summary event .....	10
Analog Inputs .....	12, 40
Applicability of manual .....	4

## B

Binary Input Points .....	10, 22
Binary Outputs / Commands .....	11, 33, 36

## C

Caution (definition) .....	4
Command output .....	11
continuous output .....	11
Control authority .....	11
Control mode .....	11
Copyright .....	2
Counters .....	39

## D

Danger (definition) .....	4
Device Profile Document .....	18
DNP messages .....	3
DNP V3.0 specification .....	3

## I

Implementation Table .....	16
----------------------------	----

## M

Metered measurands .....	13
--------------------------	----

## N

Note (definition) .....	4
-------------------------	---

## P

Parameter names .....	5
Parameter options .....	5
Pulse output .....	11
pulse output .....	11

## Q

Qualified personnel (definition) .....	5
--	---

## S

Scaling of the metered measurands .....	13
Scaling values .....	12
Setting group .....	12
Stop data transmission .....	11
Subset Level 2 .....	16
Subset Level 3 .....	16
Summary alarm .....	10
Symbol conventions .....	5

## T

Target audience of manual .....	3
Typographic conventions .....	5

## V

Validity .....	4
----------------	---

## W

Warning (definition) .....	4
----------------------------	---



**To**

Siemens AG  
Dept. PTD PA D PSN  
D-13623 Berlin  
Germany

**From**

Name:

Company/Dept.:

Address:

Phone no.:

Fax no.:

Dear reader,

printing errors can never be entirely eliminated: therefore, should you come across any when reading this manual, kindly enter them in this form together with any comments or suggestions for improvement that you may have.

**Corrections/Suggestions**

Subject to technical alteration

---

Siemens Aktiengesellschaft

Copying of this document and giving it to others and the use or communication of the contents thereof, are forbidden without express authority. Offenders are liable to the payment of damages. All rights are reserved in the event of the grant of a patent or the registration of a utility model or design.

Order-no.: C53000-L1840-A006-03  
Available from: LZF Fürth-Bislohe  
Printed in Germany/Imprimé en Allemagne  
AG 0101 0.2 FO 123 En