

SIPROTEC

**Numerical Overhead
Contact Line Protection for
AC Traction Power Supply
7ST61, 7ST63**

Communication Module

PROFIBUS-DP
Bus Mapping

Preface

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We have checked the contents of this manual against the hardware and software described. Exclusions and deviations cannot be ruled out; we accept no liability for lack of total agreement.

The information in this manual is checked periodically, and necessary corrections will be included in future editions. We appreciate any suggested improvements.

We reserve the right to make technical improvements without notice.

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Preface

Purpose of this manual

This manual describes the data in the PROFIBUS-DP messages of the SIPROTEC devices 7ST61, 7ST63 and is divided into the following topics:

- Data in the PROFIBUS-DP Messages → Chapter 1,
- Standard Mapping 3-1 → Chapter 2,
- Standard Mapping 3-2 → Chapter 3.

General details about the function, operation, assembly and commissioning of the SIPROTEC devices you find in the

- SIPROTEC4 System Manual, order no. E50417–H1176–C151.

PROFIBUS-DP communication profile documentation

The following additional manual informs you about the data types, bus specific parameters and hardware interface of the PROFIBUS-DP slave module of the SIPROTEC devices:

Manual	Order number
SIPROTEC Communication module, PROFIBUS-DP - Communication profile	C53000-L1840-B001-03

PROFIBUS-DP specification

The PROFIBUS-DP specification and the structure of the PROFIBUS-DP messages are defined in the International Standards:

- IEC 61158
“Digital data communications for measurement and control -
Fieldbus for use in industrial control systems”
Communication profile type 3
- IEC 61784
“Digital data communications for measurement and control”
Communication profile family CPF3/1

Validity	<p>This manual is valid for the SIPROTEC device:</p> <ul style="list-style-type: none">• 7ST61, 7ST63 (firmware version 4.00 or higher) <p>with</p> <ul style="list-style-type: none">• PROFIBUS-DP communication module version 03.01.03 or higher. <p>For device parameterization have to be used:</p> <ul style="list-style-type: none">• DIGSI 4.05 or higher,• PROFIBUS-DP standard mappings 3-n (n = device type dependent number of standard mappings).
Additional Support	<p>For questions regarding SIPROTEC4 devices, please contact your Siemens representative.</p>
Training courses	<p>Individual course offerings may be found in our Training Catalog and questions can be directed to our Training Centre. Please contact your Siemens representative.</p>
Target audience	<p>Protection engineers, commissioning engineers, personnel concerned with adjustment, checking and service of selective protective equipment, automatic and control facilities and personnel of electrical facilities and power plants.</p>



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 and the associated manuals as well as with the applicable safety regulations.

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

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

QUALIFIED PERSONNEL

For the purpose of this 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 graphical conventions

The following text formats are used to identify concepts giving device information described by the text flow:

Parameter names, or identifiers for configuration or function parameters that appear in the device display or on the screen of a PC (with DIGSI) are shown in mono-script (same point size) bold text. This also applies to header bars for selection menus.

Parameter conditions, or possible settings of parameters that appear in the device display or on the screen of a PC (with DIGSI), are additionally shown in italic style. This also applies to selection items for selection menus.

„Annunciations“, or identifiers for information produced by the device or required by other devices or from the switchgear is shown in mono-script (same point size) and placed into quotation marks.

For diagrams in which the identifier type results from the representation itself, text conventions may differ from the above-mentioned.



Revision Index

Listing of the changes between the editions of this manual:

Modified chapters / pages	Edition	Reasons of modification
	V01.00	First edition, Doc.-No.: C53000-L1840-B016-03 Feb. 10 th , 2004
	V01.10	Document title and Siemens address at the end of document changed March 11 th , 2004
general Chap. 1.4, 3	V02.00	<ul style="list-style-type: none">• Page numbering in the manual now continuous, not chapter-related any more• New: description of Standard mapping 3-2 October 8 th , 2009



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Data in the PROFIBUS-DP Messages

This chapter delivers explanations to the data descriptions of the standard mapping as well as notes for evaluation of selected SIPROTEC objects and for the configuration of the standard mapping in the PROFIBUS-DP master.

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1.1 Explanations



Note:

The examples shown in this chapter 1.1 do not necessarily correspond to the real allocation of the objects in the bus mapping.

Chapters 2 and 3 define the data area of the PROFIBUS-DP messages for data transfer between the PROFIBUS-DP slave of the SIPROTEC devices 7ST61, 7ST63 and the PROFIBUS-DP master.

The columns "Designation of the SIPROTEC objects" contain the texts of the SIPROTEC objects for "US English" device language.

The listed SIPROTEC objects in the PROFIBUS-DP messages' data area are sorted after byte offset, beginning with 0.

Variables with data type greater than or equal to 1 byte

The offset defines the start of the most significant byte in the message, e.g.:

Offset	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to...)	Internal object no.
12	I =	Operational measurement: I =	32767 A	668

The measured value "I =" is assigned to data byte 12 (most significant byte of the measured value) and data byte 13 (least significant byte of the measured value) in the PROFIBUS-DP message

Bit variables (SP/SC, DP/DC)

The offset indicates the byte which contains the bit value and the position of bit 0 of the bit variable, e.g. (input message):

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
0 / 0	52Breaker OFF	52Breaker	-
0 / 1	52Breaker ON		

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
5 / 1	Relay TRIP	1 = Relay GENERAL TRIP command	511

The checkback signal from the circuit breaker (as double-point indication) is located in data byte 0, bit position 2^0 (bit 0) and 2^1 (bit 1).

The single-point indication "ReLay TRIP" is located in byte 5, bit position 2^0 .



Note:

The definition of the data types (single-point indication, measured value etc.) and notes for parameterization in DIGSI are contained in the manual "SIPROTEC Communication module, PROFIBUS-DP - Communication profile" (ref. to page 3).

1.2 Messages in Output Direction: PROFIBUS-DP Master to the SIPROTEC Device

The messages in PROFIBUS-DP output direction (ref to chap. 2.1 and 3.1) allow:

- command outputs through the output relays of the SIPROTEC devices (external commands),
- manipulation of taggings (internal commands),
- transmission of measured values to the SIPROTEC device.



Note:

- The allocation of the output relays to the switching devices and to the output channels is defined during parameterization of the SIPROTEC devices.
 - Depending on the device composition there may be less than indicated output relays (and corresponding PROFIBUS-DP message positions) available in the SIPROTEC device.
-

References

Standard mapping 3-1: ref. to chap. 2.1

Standard mapping 3-2: ref. to chap. 3.1

1.3 Messages in Input Direction: SIPROTEC Device to the PROFIBUS-DP Master

The messages in PROFIBUS-DP input direction (ref. to chap. 2.2 and 3.2) allow:

- polling of switching devices' status and binary inputs,
- transmission of indications, measurands and meter values to the PROFIBUS-DP master.

1.3.1 Indications



Note:

- The allocation of the input channels to the binary inputs is defined during parameterization of the devices.
- Depending on the device composition and the existing protection packages not all of the indicated binary inputs or protection indications (and corresponding PROFIBUS-DP message positions) may be available in the SIPROTEC device.

References

Standard mapping 3-1: ref. to chap. 2.2.1

Standard mapping 3-2: ref. to chap. 3.2.1

1.3.2 Measured Values



Note:

Depending on the device composition not all of the indicated analog inputs (and corresponding PROFIBUS-DP message positions) may be available in the SIPROTEC device.

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

Full Scale Voltage (parameter address 204):

→ 1.0 ... 150.0 kV

Full Scale Current (parameter address 202):

→ 10 ... 5000 A



Note:

Changes of the scaling of the measured values are possible in adaption to the concrete installation environment.
 You find information about this in the manual "SIPROTEC Communication module, PROFIBUS-DP - Communication profile" (ref. to page 3).

References

Standard mapping 3-1: ref. to chap. 2.2.2

Standard mapping 3-2: ref. to chap. 3.2.2

1.3.3 Statistic Values and Fault Locator

The statistic and fault locator values of the SIPROTEC devices 7ST61, 7ST63 which are not pre-allocated have the following scaling:

Designation of the SIPROTEC objects	Comments	Scaling (10000 corresponds to ...)	No. of bytes in message	Internal object no.
Rpri =	Fault Locator: primary RESISTANCE	100.00 Ohm	2 or 4	1114
Rsec =	Fault Locator: secondary RESISTANCE	100.00 Ohm	2 or 4	1117
Xsec =	Fault Locator: secondary REACTANCE	100.00 Ohm	2 or 4	1118
Zsec =	Secondary fault impedance	100.00 Ohm	2 or 4	3941
d =	Fault Locator: Distance to fault	1000.0 km	2 or 4	1119
d[%] =	Fault Locator: Distance [%] to fault	1000.0 %	2 or 4	1120
d =	Fault Locator: Distance to fault	1000.0 miles	2 or 4	1122
79 1st cycle =	79 Number reclosure attempts 1st cycle	10000 (dimensionless)	2 or 4	13870
79 >1st cycle =	79 Number reclosure attempts >1st cycle	10000 (dimensionless)	2 or 4	13871
Last It =	Last It value measured	100.00 As	4	13853
Σ It =	Summation of measured It values	100.00 As	4	13851
Last I2t =	Last I2t value measured	10000 (dimensionless)	4	13854
Σ I2t =	Summation of measured I2t values	10000 (dimensionless)	4	13852
MAX I =	Max. fault current	1000.0 kA	2 or 4	13925
Σ I =	Summation of fault currents	1000.0 kA	4	13927
Σ (I / In) ² =	Summation of fault currents (I / In) ²	10000 (dimensionless)	4	1008

References

Standard mapping 3-1: ref. to chap. 2.2.3

Standard mapping 3-2: ref. to chap. 3.2.3

1.4 Configuration Data of the Standard Mappings

There are two standard mappings (Standard mapping 3-1 and Standard mapping 3-2) available for the SIPROTEC devices 7ST61, 7ST63.

Standard mapping 3-1

The standard mapping 3-1 contains:

Output direction:

- 6 double commands
- 18 single commands

Input direction:

- 6 double-point indications
- 84 single-point indications
- 12 measured values (integer)
- 4 statistic values (2 bytes)
- 6 statistic values (4 bytes)

Standard mapping 3-2

The standard mapping 3-2 contains:

Output direction:

- 8 double commands
- 16 single commands

Input direction:

- 9 double-point indications
- 110 single-point indications
- 10 measured values (integer)
- 4 statistic values (2 bytes)
- 6 statistic values (4 bytes)

Configuration data

Standard mapping 3-1: **1FH 1FH 1FH 1FH 13H 25H**
(68 bytes input-, 6 bytes output direction)

Standard mapping 3-2: **1FH 1FH 1FH 1FH 13H 25H**
(68 bytes input-, 6 bytes output direction)

**PROFIBUS-DP
master**

At the configuration of a PROFIBUS-DP slave of the SIPROTEC devices in the parameterization system of the PROFIBUS-DP masters, the following modules are to select for the 7ST61, 7ST63 standard mappings and associated addresses are to allocate in the I/O addressing range of the PROFIBUS-DP master:

Standard mappings 3-1 and 3-2:

Module	Order number	Input address	Output address
0	Input - 16 Bytes	Adr_lx	
1	Input - 16 Bytes	Adr_lx + 16	
2	Input - 16 Bytes	Adr_lx + 32	
3	Input - 16 Bytes	Adr_lx + 48	
4	Input - 4 Bytes	Adr_lx + 64	
5	Output - 6 Bytes		Adr_Ox

Adr_lx and Adr_Ox indicate arbitrary (as a rule even) addresses in the I/O addressing range of the PROFIBUS-DP master.

Adr_lx (base address of the inputs) is identical with offset 0 of the PROFIBUS-DP message data of the SIPROTEC device in input direction (ref. to chap. 2.2 and 3.2).

Adr_Ox (base address of the outputs) is identical with offset 0 of the PROFIBUS-DP message data of the SIPROTEC device in output direction (ref. to chap. 2.1 and 3.1).



Note:

There is dependently on the PROFIBUS-DP master in addition possibly the demand to put the base address of the inputs on a value divisible by four so that accesses on the four bytes long statistic values of the SIPROTEC device (ref. to chap. 2.2.3.2 and 3.2.3.2) can be correctly carried out in the PROFIBUS-DP master.

1.5 Notes to SIPROTEC Objects

This chapter contains notes for the use and evaluation of certain SIPROTEC objects.



Note:

- The description of the standard mappings (ref. to chap. 2 and 3) contains the pre-allocation of the mapping file at delivery or at first assignment of a mapping in DIGSI to the SIPROTEC device.
- Changes of the allocation and the scaling of the measured values are possible in adaptation to the concrete installation environment.
You find information about this in the manual "SIPROTEC Communication module, PROFIBUS-DP - Communication profile" (ref. to page 3).

1.5.1 Control Mode REMOTE

Control mode with control authority is REMOTE, option of unlocked control with PROFIBUS-DP.

- Changing the "Control mode REMOTE" to UNLOCKED permits one unlocked control operation via PROFIBUS-DP.
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 PROFIBUS-DP for a period of 5 minutes, then the "Control mode REMOTE" is automatically reset to LOCKED.
- If the "Control mode REMOTE" was automatically reset to LOCKED by the SIPROTEC device then this status can be recognized by the corresponding bit in the PROFIBUS-DP input message.
In this case the status of "Control mode REMOTE" in output direction has to be updated by the PROFIBUS-DP master.

References

Standard mapping 3-1: ref. to chap. 2.1.3

Standard mapping 3-2: ref. to chap. 3.1.2

1.5.2 Changing the Setting Group

In order to change the setting group, the value "10" = ON must be transmitted for the corresponding pair of bits and afterwards be reset to "00" = "Quiescent status" (controlled by an impulse from the PROFIBUS-DP master).

- Switching ON one setting group automatically switches OFF the current active setting group.
- Transmission of the value "01" = 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 PROFIBUS-DP if the parameter **Change to Another Setting Group** (parameter address = 302) has the value **Protocol**.

References *Standard mapping 3-1:* ref. to chap. 2.1.3
 Standard mapping 3-2: ref. to chap. 3.1.2

1.5.3 Stop Data Transmission

The functionality "Stop data transmission" is not supported via PROFIBUS-DP communication.

If "Stop data transmission" is active nevertheless data via PROFIBUS-DP will be transmitted furthermore.

The indication "DataStop" signals the activation of "Stop data transmission" however and can be evaluated correspondingly in the PROFIBUS-DP master.

References *Standard mapping 3-1:* ref. to chap. 2.2.1.14
 Standard mapping 3-2: not pre-allocated



Standard Mapping 3-1

This chapter describes the data in the PROFIBUS-DP messages between the PROFIBUS-DP master and the SIPROTEC devices 7ST61, 7ST63 if standard mapping 3-1 is selected.

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2.1 Message in Output Direction

2.1.1 Double Commands

- User-defined double commands with double-point indications as checkback indication can be routed on these positions as “Source system interface” using the **DIGSI Configuration matrix**.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
0 / 0	52Breaker OFF	52Breaker	-
0 / 1	52Breaker ON		
0 / 2	Disc.Swit. OFF	Disconnect Switch	-
0 / 3	Disc.Swit. ON		
0 / 4	GndSwit. OFF	Ground Switch	-
0 / 5	GndSwit. ON		
0 / 6	<user-defined> OFF	not pre-allocated	-
0 / 7	<user-defined> ON		
1 / 0	<user-defined> OFF	not pre-allocated	-
1 / 1	<user-defined> ON		
1 / 2	<user-defined> OFF	not pre-allocated	-
1 / 3	<user-defined> ON		

2.1.2 Single Commands or Taggings

- User-defined single commands or taggings can be routed on these position as “Source system interface” using the **DIGSI Configuration matrix**.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
1 / 4	<user-defined> OFF	not pre-allocated	-
1 / 5	<user-defined> ON		
1 / 6	<user-defined> OFF	not pre-allocated	-
1 / 7	<user-defined> ON		

2.1.3 Internal Commands

- Ref. to chap. 1.5.1 and 1.5.2 for additional notes regarding “Control mode REMOTE” and Changing the setting group.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
2 / 0	Setting Group A		-
2 / 1	Setting Group A	Activation of setting group A	
2 / 2	Setting Group B		-
2 / 3	Setting Group B	Activation of setting group B	
2 / 4	Setting Group C		-
2 / 5	Setting Group C	Activation of setting group C	
2 / 6	Setting Group D		-
2 / 7	Setting Group D	Activation of setting group D	
3 / 0	ProtActive OFF	Deactivation of protection functions	52
3 / 1	ProtActive ON	Activation of protection functions	
3 / 2	79 OFF	Deactivation of Auto-Reclose function	2782
3 / 3	79 ON	Activation of Auto-Reclose function	
3 / 4	ModeREMOTE LOCKED	Control mode REMOTE = LOCKED	-
3 / 5	ModeREMOTE UNLOCKED	Control mode REMOTE = UNLOCKED	
3 / 6	79 TH OFF	Deactivation of thermal Auto-Reclose function	2795
3 / 7	79 TH ON	Activation of thermal Auto-Reclose function	
4 / 0	Defrost OFF	Deactivation of Defrosting Protection	13963
4 / 1	Defrost ON	Activation of Defrosting Protection	
4 / 2	<user-defined> OFF	not pre-allocated	-
4 / 3	<user-defined> ON		

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
4 / 4	21 Z1str act OFF	21 Distance Zone Z1Stroke OFF	3916
4 / 5	21 Z1str act ON	21 Distance Zone Z1Stroke ON	
4 / 6	21 Z2str act OFF	21 Distance Zone Z2Stroke OFF	3918
4 / 7	21 Z2str act ON	21 Distance Zone Z2Stroke ON	
5 / 0	21 Z3str act OFF	21 Distance Zone Z3Stroke OFF	3992
5 / 1	21 Z3str act ON	21 Distance Zone Z3Stroke ON	
5 / 2	Cat. 1 active OFF	49 O/L Catenary 1 OFF	6616
5 / 3	Cat. 1 active ON	49 O/L Catenary 1 ON	
5 / 4	Cat. 2 active OFF	49 O/L Catenary 2 OFF	6617
5 / 5	Cat. 2 active ON	49 O/L Catenary 2 ON	
5 / 6	Cat. 3 active OFF	49 O/L Catenary 3 OFF	6618
5 / 7	Cat. 3 active ON	49 O/L Catenary 3 ON	

2.2 Message in Input Direction

2.2.1 Indications

2.2.1.1 Double-point Indications

- User-defined double-point indications (e.g. checkback indications of double commands) can be routed on the position <user-defined> as "Destination system interface" using the **DIGSI Configuration matrix**.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
0 / 0	52Breaker OFF	52Breaker	-
0 / 1	52Breaker ON		
0 / 2	Disc.Swit. OFF	Disconnect Switch	-
0 / 3	Disc.Swit. ON		
0 / 4	GndSwit. OFF	Ground Switch	-
0 / 5	GndSwit. ON		
0 / 6	<user-defined> OFF	not pre-allocated	-
0 / 7	<user-defined> ON		
1 / 0	<user-defined> OFF	not pre-allocated	-
1 / 1	<user-defined> ON		
1 / 2	<user-defined> OFF	not pre-allocated	-
1 / 3	<user-defined> ON		
1 / 4	<user-defined> OFF	not pre-allocated	-
1 / 5	<user-defined> ON		
1 / 6	<user-defined> OFF	not pre-allocated	-
1 / 7	<user-defined> ON		

2.2.1.2 Single-point Indications or Taggings

- User-defined protection indications, single-point indications or taggings (internal single-point indications) can be routed on these position as “Destination system interface” using the **DIGSI Configuration matrix**.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
2 / 0	<user-defined>	not pre-allocated	-
2 / 1	<user-defined>	not pre-allocated	-
2 / 2	<user-defined>	not pre-allocated	-
2 / 3	<user-defined>	not pre-allocated	-
2 / 4	<user-defined>	not pre-allocated	-
2 / 5	<user-defined>	not pre-allocated	-
2 / 6	<user-defined>	not pre-allocated	-
2 / 7	<user-defined>	not pre-allocated	-
3 / 0	<user-defined>	not pre-allocated	-
3 / 1	<user-defined>	not pre-allocated	-
3 / 2	<user-defined>	not pre-allocated	-
3 / 3	<user-defined>	not pre-allocated	-
3 / 4	<user-defined>	not pre-allocated	-
3 / 5	<user-defined>	not pre-allocated	-
3 / 6	<user-defined>	not pre-allocated	-
3 / 7	<user-defined>	not pre-allocated	-
4 / 0	<user-defined>	not pre-allocated	-
4 / 1	<user-defined>	not pre-allocated	-
4 / 2	<user-defined>	not pre-allocated	-
4 / 3	<user-defined>	not pre-allocated	-

2.2.1.3 Diagnosis

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
4 / 4	Device OK	1 = Update of the device replica in the SIPROTEC device completed after initial start or restart	51
4 / 5	ProtActive	1 = At least one protection function is active	52
4 / 6	Settings Calc.	1 = Setting calculation is running	70
4 / 7	Error Sum Alarm	1 = Error with a summary alarm ON	140
5 / 0	Alarm Sum Event	1 = Alarm summary event ON	160
5 / 1	Relay TRIP	1 = Relay GENERAL TRIP command	511
5 / 2	Protection PU	1 = General protective PICKUP of device	13991
5 / 3	Protection TRIP	1 = General protective TRIP of device	13992
5 / 4	Data valid	1 = Data in the PROFIBUS-DP message are valid. (This indication is created by the PROFIBUS-DP slave; not available in DIGSI and not relocatable.)	-

2.2.1.4 Distance Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
5 / 5	21 PICKUP	1 = 21 PICKED UP	3671
5 / 6	21 TRIP	1 = 21 Distance General TRIP command	3801
5 / 7	21 Z1 act	1 = 21 Zone Z1 is active	3915
6 / 0	21 Z1str act	1 = 21 Zone Z1 stroke is active	3916
6 / 1	21 Z2 act	1 = 21 Zone Z2 is active	3917
6 / 2	21 Z2str act	1 = 21 Zone Z2 stroke is active	3918
6 / 3	21 Z3 act	1 = 21 Zone Z3 is active	3991
6 / 4	21 Z3str act	1 = 21 Zone Z3 stroke is active	3992
6 / 5	21 Dis.Trip Z1	1 = 21 Trip in Zone Z1	3810
6 / 6	21 TRIP Z1B	1 = 21 TRIP in Zone Z1B	13900
6 / 7	21 TRIP Z1L	1 = 21 TRIP in Zone Z1L	13901
7 / 0	21 Trip Z2K	1 = 21 Trip in zone Z2 (short circuit)	3930
7 / 1	21 Trip Z2L	1 = 21 Trip in zone Z2 (overload)	3931
7 / 2	21 TRIP Z3K	1 = 21 TRIP in Zone Z3K	13903
7 / 3	21 TRIP Z3L	1 = 21 TRIP in Zone Z3L	13904

2.2.1.5 High-Speed O/C Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 4	50HS PICKUP	1 = 50HS PICKED UP	4281
7 / 5	50HS Gen. TRIP	1 = 50HS General TRIP	4293

2.2.1.6 Emergency O/C Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 6	Emer.Gen.Flt	1 = Emerg. O/C protection: General fault detect.	2061
7 / 7	Emer.Gen.Trip	1 = Emerg. O/C protection: General Trip	2141

2.2.1.7 Overcurrent Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
8 / 0	5X-B PICKUP	1 = 50(N)/51(N) Overcurrent PICKED UP	7161
8 / 1	5X-B TRIP	1 = 50(N)/51(N) General TRIP command	7211
8 / 2	50-STUB TRIP	1 = 50-STUB TRIP	7235
8 / 3	50(N)-B1 TRIP	1 = 50(N)-B1 TRIP	7221
8 / 4	50(N)-B2 TRIP	1 = 50(N)-B2 TRIP	7222
8 / 5	51 TRIP	1 = 51 TRIP	1825

2.2.1.8 Thermal Overload Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
8 / 6	49 O/L Θ Alarm	1 = 49 Thermal Overload Alarm	1516
8 / 7	49 Th O/L TRIP	1 = 49 Thermal Overload TRIP	1521

2.2.1.9 Defrosting Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
9 / 0	Defrost PICKUP	1 = Defrosting Protection PICKED UP	13966
9 / 1	Defrost TRIP	1 = Defrosting Protection TRIP	13967
9 / 2	87 TRIP	1 = 87 Differential Protection TRIP	13975
9 / 3	50-B1 IX TRIP	1 = 50-B1 Defrosting current IX TRIP command	13972
9 / 4	50-B2 IX TRIP	1 = 50-B2 Defrosting current IX TRIP command	13973

2.2.1.10 Undervoltage / Overvoltage Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
9 / 5	27/59 PICKED UP	1 = 27/59 Over/Undervoltage prot. picked up	13834
9 / 6	27/59 TRIP	1 = 27/59 Over/Undervoltage prot. TRIP command	13839
9 / 7	59-2 TRIP	1 = 59-2 Overvoltage TRIP command	4336
10 / 0	59-1 TRIP	1 = 59-2 Overvoltage TRIP command	4335
10 / 1	27-2 TRIP	1 = 27-2 Undervoltage TRIP command	13838
10 / 2	27-1 TRIP	1 = 27-1 Undervoltage TRIP command	13837

2.2.1.11 Circuit Breaker Failure Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
10 / 3	50BF pickup	1 = 50BF picked up	1455
10 / 4	50BF TRIP	1 = 50BF TRIP	1471

2.2.1.12 Trip Coil Monitor

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
10 / 5	74TC Trip cir.	1 = 74TC Failure Trip Circuit	6865

2.2.1.13 Circuit Breaker Test

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
10 / 6	CB-TEST TRIP M	1 = CB-Test: TRIP command main trip element	13862
10 / 7	CB-TEST TRIP B	1 = CB-Test: TRIP command backup trip element	13863
11 / 0	CB-TEST CLOSE M	1 = CB-Test: CLOSE command main trip element	13864
11 / 1	CB-TEST CLOSE M	1 = CB-Test: CLOSE command backup trip element	13865

2.2.1.14 Status Indication

- Ref. to chap. 1.5.3 for additional notes regarding “Stop data transmission“.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
11 / 2	DataStop	1 = Stop data transmission is active	-
11 / 3	Test mode	1 = Test mode is active	-
11 / 4	Cntrl Auth (device 7ST63) ¹	Control authority (0 = REMOTE, 1 = LOCAL)	-
11 / 5	ModeLOCAL (device 7ST63) ¹	Control mode LOCAL (0 = LOCKED, 1 = UNLOCKED)	-
11 / 6	Cntrl Auth (device 7ST61) ²	Control authority (0 = REMOTE, 1 = LOCAL)	-
11 / 7	ModeLOCAL (device 7ST61) ²	Control mode LOCAL (0 = LOCKED, 1 = UNLOCKED)	-

1 Not used in the 7ST61.
 2 Not used in the 7ST63.

2.2.2 Measured Values

- Ref. to chap. 1.3.2 for notes regarding scaling of measured values.

Offset	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to ...)	Internal object no.
12	I =	Operational measurement: I =	32767 A	668
14	V =	Operational measurement: V=	3276.7 kV	678
16	IF- =	Current IF- is	32767 A	13921
18	VF- =	Voltage VF- is	3276.7 kV	13920
20	IX =	Defrosting current IX is	32767 A	13923
22	Freq =	Frequency	327.67 Hz	644
24	Tcat =	Catenary Temperature	3276.7 °C/°F	950
26	<user-defined>	not pre-allocated	-	-
28	<user-defined>	not pre-allocated	-	-
30	<user-defined>	not pre-allocated	-	-
32	<user-defined>	not pre-allocated	-	-
34	<user-defined>	not pre-allocated	-	-

2.2.3 Statistic Values and Fault Locator

- Ref. to chap. 1.3.3 for notes regarding scaling of statistic and fault locator values.
- The values “# TRIPs =” and “Last I =”, preallocated as 4 byte values, can also be allocated as 2 byte values using the **DIGSI Configuration matrix**.

2.2.3.1 Statistic and Fault Locator Values as Integer Values (2 Bytes)

Offset	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to ...)	Internal object no.
36	Xpri =	Fault Locator: primary REACTANCE	327.67 Ohm	1115
38	Fault section	Fault Locator: Fault in section	32767 (dimensionless)	1121
40	<user-defined>	not pre-allocated	-	-
42	<user-defined>	not pre-allocated	-	-

2.2.3.2 Statistic and Fault Locator Values as Long Values (4 Bytes)

Offset	Designation of the SIPROTEC objects	Comments	Scaling (10000 corresponds to ...)	Internal object no.
44	# TRIPs =	Number of breaker TRIP commands	10000 (dimensionless)	1000
48	Last I =	Last current interrupted by circuit breaker	1000.0 kA	13926
52	<user-defined>	not pre-allocated	-	-
56	<user-defined>	not pre-allocated	-	-
60	<user-defined>	not pre-allocated	-	-
64	<user-defined>	not pre-allocated	-	-

■

Standard Mapping 3-2

This chapter describes the data in the PROFIBUS-DP messages between the PROFIBUS-DP master and the SIPROTEC devices 7ST61, 7ST63 if standard mapping 3-2 is selected.

3.1	Message in Output Direction	34
3.2	Message in Input Direction	37

3.1 Message in Output Direction

3.1.1 Double Commands

- User-defined double commands with double-point indications as checkback indication can be routed on these positions as “Source system interface” using the **DIGSI Configuration matrix**.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
0 / 0	52Breaker OFF	52Breaker	-
0 / 1	52Breaker ON		
0 / 2	Disc.Swit. OFF	Disconnect Switch	-
0 / 3	Disc.Swit. ON		
0 / 4	GndSwit. OFF	Ground Switch	-
0 / 5	GndSwit. ON		
0 / 6	<user-defined> OFF	not pre-allocated	-
0 / 7	<user-defined> ON		
1 / 0	<user-defined> OFF	not pre-allocated	-
1 / 1	<user-defined> ON		
1 / 2	<user-defined> OFF	not pre-allocated	-
1 / 3	<user-defined> ON		
1 / 4	<user-defined> OFF	not pre-allocated	-
1 / 5	<user-defined> ON		
1 / 6	<user-defined> OFF	not pre-allocated	-
1 / 7	<user-defined> ON		

3.1.2 Internal Commands

- User-defined single commands or taggings can be routed on these position as “Source system interface” using the **DIGSI Configuration matrix**.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
2 / 0	79 OFF	Deactivation of Auto-Reclose function	2782
2 / 1	79 ON	Activation of Auto-Reclose function	
2 / 2	<user-defined> OFF	not pre-allocated	-
2 / 3	<user-defined> ON		
2 / 4	<user-defined> OFF	not pre-allocated	-
2 / 5	<user-defined> ON		
2 / 6	<user-defined> OFF	not pre-allocated	-
2 / 7	<user-defined> ON		
3 / 0	ProtActive OFF	Deactivation of protection functions	52
3 / 1	ProtActive ON	Activation of protection functions	

3.1.3 Single Commands or Taggings

- Ref. to chap. 1.5.1 and 1.5.2 for additional notes regarding “Control mode REMOTE” and Changing the setting group.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
3 / 2	Setting Group A		-
3 / 3	Setting Group A	Activation of setting group A	
3 / 4	Setting Group B		-
3 / 5	Setting Group B	Activation of setting group B	
3 / 6	Setting Group C		-
3 / 7	Setting Group C	Activation of setting group C	
4 / 0	Setting Group D		-
4 / 1	Setting Group D	Activation of setting group D	
4 / 2	<user-defined> OFF	not pre-allocated	-
4 / 3	<user-defined> ON		
4 / 4	ModeREMOTE LOCKED	Control mode REMOTE = LOCKED	-
4 / 5	ModeREMOTE UNLOCKED	Control mode REMOTE = UNLOCKED	
4 / 6	Defrost OFF	Deactivation of Defrosting Protection	13963
4 / 7	Defrost ON	Activation of Defrosting Protection	

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
5 / 0	79 TH OFF	Deactivation of thermal Auto-Reclose function	2795
5 / 1	79 TH ON	Activation of thermal Auto-Reclose function	
5 / 2	Cat. 1 active OFF	49 O/L Catenary 1 OFF	6616
5 / 3	Cat. 1 active ON	49 O/L Catenary 1 ON	
5 / 4	Cat. 2 active OFF	49 O/L Catenary 2 OFF	6617
5 / 5	Cat. 2 active ON	49 O/L Catenary 2 ON	
5 / 6	Cat. 3 active OFF	49 O/L Catenary 3 OFF	6618
5 / 7	Cat. 3 active ON	49 O/L Catenary 3 ON	

3.2 Message in Input Direction

3.2.1 Indications

3.2.1.1 Double-point Indications

- User-defined double-point indications (e.g. checkback indications of double commands) can be routed on the position <user-defined> as "Destination system interface" using the **DIGSI Configuration matrix**.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
0 / 0	<user-defined> OFF	not pre-allocated	-
0 / 1	<user-defined> ON		
0 / 2	<user-defined> OFF	not pre-allocated	-
0 / 3	<user-defined> ON		
0 / 4	<user-defined> OFF	not pre-allocated	-
0 / 5	<user-defined> ON		
0 / 6	<user-defined> OFF	not pre-allocated	-
0 / 7	<user-defined> ON		
1 / 0	<user-defined> OFF	not pre-allocated	-
1 / 1	<user-defined> ON		
1 / 2	<user-defined> OFF	not pre-allocated	-
1 / 3	<user-defined> ON		
1 / 4	<user-defined> OFF	not pre-allocated	-
1 / 5	<user-defined> ON		
1 / 6	<user-defined> OFF	not pre-allocated	-
1 / 7	<user-defined> ON		
2 / 0	<user-defined> OFF	not pre-allocated	-
2 / 1	<user-defined> ON		

3.2.1.2 Single-point Indications or Taggings

- User-defined protection indications, single-point indications or taggings (internal single-point indications) can be routed on these position as “Destination system interface” using the **DIGSI Configuration matrix**.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
2 / 2	<user-defined>	not pre-allocated	-
2 / 3	<user-defined>	not pre-allocated	-
2 / 4	<user-defined>	not pre-allocated	-
2 / 5	<user-defined>	not pre-allocated	-
2 / 6	<user-defined>	not pre-allocated	-
2 / 7	<user-defined>	not pre-allocated	-
3 / 0	<user-defined>	not pre-allocated	-
3 / 1	<user-defined>	not pre-allocated	-
3 / 2	<user-defined>	not pre-allocated	-
3 / 3	<user-defined>	not pre-allocated	-
3 / 4	<user-defined>	not pre-allocated	-
3 / 5	<user-defined>	not pre-allocated	-
3 / 6	<user-defined>	not pre-allocated	-
3 / 7	<user-defined>	not pre-allocated	-
4 / 0	<user-defined>	not pre-allocated	-
4 / 1	<user-defined>	not pre-allocated	-
4 / 2	<user-defined>	not pre-allocated	-
4 / 3	<user-defined>	not pre-allocated	-
4 / 4	<user-defined>	not pre-allocated	-
4 / 5	<user-defined>	not pre-allocated	-
4 / 6	<user-defined>	not pre-allocated	-
4 / 7	<user-defined>	not pre-allocated	-
5 / 0	<user-defined>	not pre-allocated	-
5 / 1	<user-defined>	not pre-allocated	-

3.2.1.3 Diagnosis

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
5 / 2	Device OK	1 = Update of the device replica in the SIPROTEC device completed after initial start or restart	51
5 / 3	Error Sum Alarm	1 = Error with a summary alarm ON	140
5 / 4	Alarm Sum Event	1 = Alarm summary event ON	160
5 / 5	Protection PU	1 = General protective PICKUP of device	13991
5 / 6	Protection TRIP	1 = General protective TRIP of device	13992
5 / 7	Data valid	1 = Data in the PROFIBUS-DP message are valid. (This indication is created by the PROFIBUS-DP slave; not available in DIGSI and not relocatable.)	-

3.2.1.4 Circuit Breaker Failure Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
6 / 0	50BF TRIP	1 = 50BF TRIP	1471

3.2.1.5 Trip Coil Monitor

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
6 / 1	74TC Trip cir.	1 = 74TC Failure Trip Circuit	6865

3.2.1.6 Monitoring

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
6 / 2	Failure Vmeas	1 = Measured value failure: Vmeas failed	13953
6 / 3	VT FuseFail	1 = VT Fuse Failure (alarm instantaneous)	170

3.2.1.7 Distance Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
6 / 4	21 PICKUP	1 = 21 PICKED UP	3671
6 / 5	21 TRIP	1 = 21 Distance General TRIP command	3801
6 / 6	21 TRIP Z1B	1 = 21 TRIP in Zone Z1B	13900
6 / 7	21 TRIP Z1L	1 = 21 TRIP in Zone Z1L	13901

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 0	21 Trip Z2K	1 = 21 Trip in zone Z2 (short circuit)	3930
7 / 1	21 Trip Z2L	1 = 21 Trip in zone Z2 (overload)	3931
7 / 2	21 TRIP Z3K	1 = 21 TRIP in Zone Z3K	13903
7 / 3	21 TRIP Z3L	1 = 21 TRIP in Zone Z3L	13904

3.2.1.8 High-Speed O/C Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 4	50HS PICKUP	1 = 50HS PICKED UP	4281
7 / 5	50HS Gen. TRIP	1 = 50HS General TRIP	4293

3.2.1.9 Emergency O/C Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 6	Emer.Gen.Flt	1 = Emerg. O/C protection: General fault detect.	2061
7 / 7	Emer.Gen.Trip	1 = Emerg. O/C protection: General Trip	2141

3.2.1.10 Overcurrent Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
8 / 0	5X-B PICKUP	1 = 50(N)/51(N) Overcurrent PICKED UP	7161
8 / 1	50-STUB TRIP	1 = 50-STUB TRIP	7235
8 / 2	50(N)-B1 TRIP	1 = 50(N)-B1 TRIP	7221
8 / 3	50(N)-B2 TRIP	1 = 50(N)-B2 TRIP	7222

3.2.1.11 Thermal Overload Protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
8 / 4	49 O/L Θ Alarm	1 = 49 Thermal Overload Alarm	1516
8 / 5	49 Th O/L TRIP	1 = 49 Thermal Overload TRIP	1521

3.2.1.12 Change Parameter Group

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
8 / 6	Group A	1 = Group A is active	-
8 / 7	Group B	1 = Group B is active	-

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
9 / 0	Group C	1 = Group C is active	-
9 / 1	Group D	1 = Group D is active	-

3.2.1.13 Auto-Recloser Function

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
9 / 2	79 ON	1 = 79: Auto recloser is switched ON	2782
9 / 3	79 is NOT ready	1 = 79: Auto recloser is NOT ready	2784
9 / 4	79 Lockout	1 = 79: Lockout	2863
9 / 5	79 Successful	1 = 79: Cycle successful	2862

3.2.1.14 Single-point Indications or Taggings

- User-defined protection indications, single-point indications or taggings (internal single-point indications) can be routed on these position as "Destination system interface" using the **DIGSI Configuration matrix**.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
9 / 6	<user-defined>	not pre-allocated	-
9 / 7	<user-defined>	not pre-allocated	-
10 / 0	<user-defined>	not pre-allocated	-
10 / 1	<user-defined>	not pre-allocated	-
10 / 2	<user-defined>	not pre-allocated	-
10 / 3	<user-defined>	not pre-allocated	-
10 / 4	<user-defined>	not pre-allocated	-
10 / 5	<user-defined>	not pre-allocated	-
10 / 6	<user-defined>	not pre-allocated	-
10 / 7	<user-defined>	not pre-allocated	-
11 / 0	<user-defined>	not pre-allocated	-
11 / 1	<user-defined>	not pre-allocated	-
11 / 2	<user-defined>	not pre-allocated	-
11 / 3	<user-defined>	not pre-allocated	-
11 / 4	<user-defined>	not pre-allocated	-
11 / 5	<user-defined>	not pre-allocated	-
11 / 6	<user-defined>	not pre-allocated	-

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
11 / 7	<user-defined>	not pre-allocated	-
12 / 0	<user-defined>	not pre-allocated	-
12 / 1	<user-defined>	not pre-allocated	-
12 / 2	<user-defined>	not pre-allocated	-
12 / 3	<user-defined>	not pre-allocated	-
12 / 4	<user-defined>	not pre-allocated	-
12 / 5	<user-defined>	not pre-allocated	-
12 / 6	<user-defined>	not pre-allocated	-
12 / 7	<user-defined>	not pre-allocated	-
13 / 0	<user-defined>	not pre-allocated	-
13 / 1	<user-defined>	not pre-allocated	-
13 / 2	<user-defined>	not pre-allocated	-
13 / 3	<user-defined>	not pre-allocated	-
13 / 4	<user-defined>	not pre-allocated	-
13 / 5	<user-defined>	not pre-allocated	-
13 / 6	<user-defined>	not pre-allocated	-
13 / 7	<user-defined>	not pre-allocated	-
14 / 0	<user-defined>	not pre-allocated	-
14 / 1	<user-defined>	not pre-allocated	-
14 / 2	<user-defined>	not pre-allocated	-
14 / 3	<user-defined>	not pre-allocated	-
14 / 4	<user-defined>	not pre-allocated	-
14 / 5	<user-defined>	not pre-allocated	-
14 / 6	<user-defined>	not pre-allocated	-
14 / 7	<user-defined>	not pre-allocated	-
15 / 0	<user-defined>	not pre-allocated	-
15 / 1	<user-defined>	not pre-allocated	-
15 / 2	<user-defined>	not pre-allocated	-

3.2.1.15 Status Indications

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
15 / 3	Test mode	1 = Test mode is active	-
15 / 4	Cntrl Auth (device 7ST63) ¹	Control authority (0 = REMOTE, 1 = LOCAL)	-
15 / 5	ModeLOCAL (device 7ST63) ¹	Control mode LOCAL (0 = LOCKED, 1 = UNLOCKED)	-
15 / 6	Cntrl Auth (device 7ST61) ²	Control authority (0 = REMOTE, 1 = LOCAL)	-
15 / 7	ModeLOCAL (device 7ST61) ²	Control mode LOCAL (0 = LOCKED, 1 = UNLOCKED)	-

1 Not used in the 7ST61.

2 Not used in the 7ST63.

3.2.2 Measured values

- Ref. to chap. 1.3.2 for notes regarding scaling of measured values.

Offset	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to ...)	Internal object no.
16	I =	Operational measurement: I =	32767 A	668
18	V =	Operational measurement: V=	3276.7 kV	678
20	IF- =	Current IF- is	32767 A	13921
22	VF- =	Voltage VF- is	3276.7 kV	13920
24	P =	Active Power	32767 MW	641
26	<user-defined>	not pre-allocated	-	-
28	<user-defined>	not pre-allocated	-	-
30	<user-defined>	not pre-allocated	-	-
32	<user-defined>	not pre-allocated	-	-
34	<user-defined>	not pre-allocated	-	-

3.2.3 Statistic Values and Fault Locator

- Ref. to chap. 1.3.3 for notes regarding scaling of statistic and fault locator values.
- The values “# TRIPs =” and “Last I =”, preallocated as 4 byte values, can also be allocated as 2 byte values using the **DIGSI Configuration matrix**.

3.2.3.1 Statistic and Fault Locator Values as Integer Values (2 Bytes)

Offset	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to ...)	Internal object no.
36	Xpri =	Fault Locator: primary REACTANCE	327.67 Ohm	1115
38	Fault section	Fault Locator: Fault in section	32767 (dimensionless)	1121
40	d =	Fault Locator: Distance to fault	3276.7 km	1119
42	<user-defined>	not pre-allocated	-	-

3.2.3.2 Statistic and Fault Locator Values as Long Values (4 Bytes)

Offset	Designation of the SIPROTEC objects	Comments	Scaling (10000 corresponds to ...)	Internal object no.
44	# TRIPs =	Number of breaker TRIP commands	10000 (dimensionless)	1000
48	Last I =	Last current interrupted by circuit breaker	1000.0 kA	13926
52	Sum(I/In)^2 =	Sum of fault currents (I/In)^2	1000,0 (dimensionless)	1008
56	<user-defined>	not pre-allocated	-	-
60	<user-defined>	not pre-allocated	-	-
64	<user-defined>	not pre-allocated	-	-



Glossary

CFC	Continuous Function Chart
DC	Double command
GSD file	<p>The Generic Station Description file contains the technical characteristics of the PROFIBUS-DP communication module (PROFIBUS-DP slave).</p> <p>This file is required for configuration of the PROFIBUS-DP master and is supplied together with DIGSI.</p>
DIGSI	Parameterization system / parameterization software for SIPROTEC devices
DP	Double-point indication
Input data / Input direction	Data from the PROFIBUS-DP slave to the PROFIBUS-DP master.
Octet	One octet corresponds to 8 bits.
OLM	Optical Link Module
Output data / Output direction	Data from the PROFIBUS-DP master to the PROFIBUS-DP slave.
PNO	PROFIBUS Nutzerorganisation
PROFIBUS-DP	PROFIBUS - Decentralized Peripherals
PSE	PROFIBUS interface module with (electrical) isolated RS485 interface for the SIPROTEC devices from Siemens.
PSO	PROFIBUS interface module with fibre-optical interface for the SIPROTEC devices from Siemens.
SC	Single command
SP	Single-point indication



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