

SIPROTEC

Distance protection
7SD5, 7SD610

Communication module

PROFIBUS-DP
Bus mapping

Preface

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The information in this manual is checked periodically, and necessary corrections will be included in future editions.

We appreciate any suggested improvements.

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Preface

Purpose of this manual

This manual describes the data in the PROFIBUS-DP messages of the SIPROTEC devices 7SD5, 7SD610 and is divided into the following topics:

- Data of 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 modul 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 European Standard EN 50170:

- PROFIBUS Specification
Normative Parts of PROFIBUS-FMS, -DP, -PA
According to the European Standard
EN 50170, Volume 2
PROFIBUS Nutzerorganisation e.V.

Validity

This manual is valid for the SIPROTEC devices:

- 7SD5, 7SD610 (firmware version 4.20 or higher)

with

- PROFIBUS-DP communication module version 03.01.03 or higher.

For device parameterization have to be used:

- DIGSI 4.30 or higher,
- DIGSI 4.21 considering the preconditions explained in the manual “SIPROTEC Communication module, PROFIBUS-DP - Communication profile” (ref. to page 3),
- PROFIBUS-DP standard mappings 3-1 to 3-n (n = device type dependent number of standard mappings).

Additional Support

For questions regarding SIPROTEC4 devices, please contact your Siemens representative.

Training courses

Individual course offerings may be found in our Training Catalog and questions can be directed to our Training Centre. Please contact your Siemens representative.

Target audience

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.



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
	1.0	First edition, Doc.-No.: C53000-L1840-B014-03 June 19 th , 2003
general Chap. 1.4, 3		<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 with event list Dec. 10 th , 2004

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Data of the PROFIBUS-DP messages

This chapter delivers explanations to the data descriptions of the standard mappings 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.

Chapter 3 defines the data area of the PROFIBUS-DP messages for data transfer between the PROFIBUS-DP slave of the SIPROTEC devices 7SD5, 7SD610 and the PROFIBUS-DP master.

The columns "Designation of the SIPROTEC objects" contain the names 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.
8	Ia =	Current in phase A	3276.7 A	601

The measured value "Ia" is assigned to data byte 8 (most significant byte of the measured value) and data byte 9 (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.
5 / 7	Relay TRIP	1 = Relay GENERAL TRIP command	511

The single-point indication "Relay TRIP" is located in byte 5, bit position 2^7 .



Note:

The definition of the data types (single-point indication, double-point indication, measured value etc.) 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).



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 annunciations, measurands and meter values to the PROFIBUS-DP master.

1.3.1 Annunciations



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 annunciations (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 1103):

→ 100.01 ... 1000 kV

Full Scale Current (parameter address 1104):

→ 10.01 ... 1000 A

Product of:

- Rated Primary Voltage (parameter address 0203) and
- Matching ration Phase-VT to Open-Delta-VT (parameter address 0211):
→ 100.01 ... 1000 kV

Product of:

- CT Rated Primary Current (parameter address 0205) and
- Matching ration I_e/I_{ph} for CT's (parameter address 0221):
→ 100.01 ... 1000 kV

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 adaption of 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 3-1: ref. to chap. 3.2.2

1.4 Configuration data of the standard mappings

There are two standard mapping (standard mapping 3-1) available for the SIPROTEC devices 7SD5, 7SD610 which differ in the available data size in the PROFIBUS-DP messages.

Standard mapping 3-1 *The standard mapping 3-1 contains:*

Output direction:

- 2 Double commands
- 14 Single commands

Input direction:

- 2 Double-point indications
- 60 Single-point indications
- 20 Measured values (Integer)

Standard mapping 3-2 *The standard mapping 3-2 contains:*

Output direction:

- Handshake byte for event list via PROFIBUS-DP
- 2 Double commands
- 14 Single commands

Input direction:

- 2 Double-point indications
- 76 Single-point indications
- 20 Measured values (Integer)
- Handshake byte and three message blocks for event list via PROFIBUS-DP

Configuration data *Standard mapping 3-1: 1FH 1FH 1FH 23H*

(48 bytes input-, 4 bytes output direction)

Standard mapping 3-2: 1FH 1FH 1FH 11H DFH 25H

(82 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 are to select the following modules for the 7SD5, 7SD610 standard mappings and to allocate associated addresses in the I/O addressing range of the PROFIBUS-DP master:

Standard mapping 3-1:

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	Output - 4 Bytes		Adr_Ox

Standard mapping 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 - 2 Bytes	Adr_lx + 48	
4	Input - 16 Words, consistent	Adr_lx + 50	
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).

1.5 Notes to SIPROTEC objects

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



Note:

- The descriptions of the standard mappings (ref. to chap. 2 and 3) contain the pre-allocation of the mapping files *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).
 - If a mapping file is assigned to a SIPROTEC device and if the data size of the PROFIBUS-DP message of this SIPROTEC device is changed by choice of a new mapping file then assignments which are not available in the existing mapping file remain unassigned furthermore.
-

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 is 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. 2.1.2

Standard mapping 3-2: not pre-allocated

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. 2.1.2

Standard mapping 3-2: ref. to chap. 3.1.3

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 transferred furthermore.

The annunciation "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. 2.2.1.3

Standard mapping 3-2: ref. to chap. 3.2.1.5

Standard mapping 3-1

This chapter describes the data in the PROFIBUS-DP messages between the PROFIBUS-DP master and the SIPROTEC devices 7SD5, 7SD610 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 indication 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	<user-defined> OFF	not pre-allocated	-
0 / 1	<user-defined> ON		
0 / 2	<user-defined> OFF	not pre-allocated	-
0 / 3	<user-defined> ON		

2.1.2 Internal commands

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

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
0 / 4	79 OFF	Deactivation of “Autoreclosing”	2782
0 / 5	79 ON	Activation of “Autoreclosing”	
0 / 6	Protection OFF	Deactivation of protection functions	52
0 / 7	Protection ON	Activation of protection functions	
1 / 0	Test 87 OFF	Deactivation of test state of 87	3190
1 / 1	Test 87 ON	Activation of test state of 87	
1 / 2	Commiss.87 OFF	Deactivation of Commissioning state of 87	3191
1 / 3	Commiss.87 ON	Activation of Commissioning state of 87	
1 / 4	Logout OFF	Deactivation of Logout state	3484
1 / 5	Logout ON	Activation of Logout state	
1 / 6	Mode REMOTE	Control mode REMOTE = LOCKED	-
1 / 7	Mode REMOTE	Control mode REMOTE = UNLOCKED	
2 / 0	Setting group A		-
2 / 1	Setting group A	Activation of setting group A	

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
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	

2.1.3 Single commands

- User-defined commands and taggings (single-point) 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.
3 / 0	<user-defined> OFF	not pre-allocated	-
3 / 1	<user-defined> ON		
3 / 2	<user-defined> OFF	not pre-allocated	-
3 / 3	<user-defined> ON		
3 / 4	<user-defined> OFF	not pre-allocated	-
3 / 5	<user-defined> ON		
3 / 6	<user-defined> OFF	not pre-allocated	-
3 / 7	<user-defined> ON		

2.2 Message in input direction

2.2.1 Annunciations

2.2.1.1 Double-point indications

- User-defined double-point indications (e.g. checkback indications of double commands) 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	<user-defined> OFF	not pre-allocated	-
0 / 1	<user-defined> ON		
0 / 2	<user-defined> OFF	not pre-allocated	-
0 / 3	<user-defined> ON		

2.2.1.2 Single-point indications

- User-defined protection annunciations, single-point indications and taggings (single-point) 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.
0 / 4	<user-defined>	not pre-allocated	-
0 / 5	<user-defined>	not pre-allocated	-
0 / 6	<user-defined>	not pre-allocated	-
0 / 7	<user-defined>	not pre-allocated	-
1 / 0	<user-defined>	not pre-allocated	-
1 / 1	<user-defined>	not pre-allocated	-
1 / 2	<user-defined>	not pre-allocated	-
1 / 3	<user-defined>	not pre-allocated	-
1 / 4	<user-defined>	not pre-allocated	-
1 / 5	<user-defined>	not pre-allocated	-
1 / 6	<user-defined>	not pre-allocated	-
1 / 7	<user-defined>	not pre-allocated	-
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	-

2.2.1.3 Status indications

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

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
2 / 4	ProtActive	1 = At least one protection function is active	52
2 / 5	Settings Calc.	1 = Setting calculation is running	70
2 / 6	79 ON	1 = 79 Auto recloser is switched ON	2782
2 / 7	Test mode	1 = Test mode is active	-
3 / 0	DataStop	1 = Stop data transmission is active	-
3 / 1	Group A	1 = Setting group A is active	-
3 / 2	Group B	1 = Setting group Bis active	-
3 / 3	Group C	1 = Setting group Cis active	-
3 / 4	Group D	1 = Setting group D is active	-
3 / 5	Control Auth.	Control Authority (0 = REMOTE, 1 = LOCAL)	-
3 / 6	ModeLOCAL	Controlmode LOCAL (0 = LOCKED, 1 = UNLOCKED)	-
3 / 7	ModeREMOTE	Controlmode REMOTE (0 = LOCKED , 1 = UNLOCKED)	-
4 / 0	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 Monitoring information

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
4 / 1	Error Sum Alarm	1 = Error with a summary alarm	140
4 / 2	Alarm Sum Event	1 = Alarm Summary Event	160
4 / 3	Fail I Superv.	1 = Failure: General Current Supervision	161
4 / 4	Fail V Superv.	1 = Failure: General Voltage Supervision	164
4 / 5	>FAIL:Feeder VT	1 = Binary input "Failure: Feeder VT (MCB tripped)" is active	361
4 / 6	Emer. mode	1 = Emergency mode	2054

2.2.1.5 Fault indications

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
4 / 7	Relay PICKUP	1 = Relay PICKUP	501
5 / 0	Relay PICKUP Ph A	1 = Relay PICKUP Phase A	503
5 / 1	Relay PICKUP Ph B	1 = Relay PICKUP Phase B	504
5 / 2	Relay PICKUP Ph C	1 = Relay PICKUP Phase C	505
5 / 3	Relay PICKUP G	1 = Relay PICKUP GROUND	506
5 / 4	Relay TRIP Ph A	1 = Relay TRIP command Phase A	507
5 / 5	Relay TRIP Ph B	1 = Relay TRIP command Phase B	508
5 / 6	Relay TRIP Ph C	1 = Relay TRIP command Phase C	509
5 / 7	Relay TRIP	1 = Relay GENERAL TRIP command	511
6 / 0	50(N)-B1 TRIP	1 = 50(N)-B1 TRIP	7221
6 / 1	50(N)-B2 TRIP	1 = 50(N)-B2 TRIP	7222
6 / 2	87 active	1 = 87 Active	3120
6 / 3	87 Gen. Fault	1 = 87 Fault detection	3132
6 / 4	87 Fault in A	1 = 87 Fault detection in phase A	3133
6 / 5	87 Fault in B	1 = 87 Fault detection in phase B	3134
6 / 6	87 Fault in C	1 = 87 Fault detection in phase C	3135
6 / 7	87 Ground Fault	1 = 87 Ground fault detection	3136
7 / 0	87 General TRIP	1 = 87 General TRIP	3141
7 / 1	87 is blocked	1 = 87 is blocked	3148
7 / 2	87 is OFF	1 = 87 is switched off	3149

2.2.1.6 Auto reclose function

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 3	79 Close	1 = 79 - Close command	2851
7 / 4	79 Close 2.Cyc	1 = 79: Close command 2nd cycle (and higher)	2854
7 / 5	79 not ready	1 = 79: Auto recloser is not ready	2784
7 / 6	79 Successful	1 = 79 - cycle successful	2862
7 / 7	Definitive Trip	1 = Definitive Trip	2863

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.
8	Ia =	Ia	3276.7 A	601
10	Ib =	Ib	3276.7 A	602
12	Ic =	Ic	3276.7 A	603
14	3I0 =	3I0 (zero sequence)	3276.7 A	610
16	Freq =	Frequency	327.67 Hz	644
18	IDiff A =	IDiff A (% Operational nominal current)	327.67 %	7742
20	IDiff B =	IDiff B (% Operational nominal current)	327.67 %	7743
22	IDiff C =	IDiff C (% Operational nominal current)	327.67 %	7744
24	IRest A =	IRest A (% Operational nominal current)	327.67 %	7745
26	IRest B =	IRest B (% Operational nominal current)	327.67 %	7746
28	IRest C =	IRest C (% Operational nominal current)	327.67 %	7747
30	<user-defined>	not pre-allocated	-	-
32	<user-defined>	not pre-allocated	-	-
34	<user-defined>	not pre-allocated	-	-
36	<user-defined>	not pre-allocated	-	-
38	<user-defined>	not pre-allocated	-	-
40	PI1A/m	Prot. Interface 1: Availability per min.	327.67 %	7753
42	PI1A/h	Prot. Interface 1: Availability per hour	327.67 %	7754
44	PI2A/m	Prot. Interface 2: Availability per min.	327.67 %	7755
46	PI2A/h	Prot. Interface 2: Availability per hour	327.67 %	7756

Standard mapping 3-2

This chapter describes the data in the PROFIBUS-DP messages between the PROFIBUS-DP master and the SIPROTEC devices 7SD5, 7SD610 if standard mapping 3-2 is selected.

3.1	Message in output direction	30
3.2	Message in input direction	32

3.1 Message in output direction

3.1.1 Event list

- Information regarding the handshake bytes as well as the retrieval methods of the event list via PROFIBUS-DP can be found in the manual "SIPROTEC Communication module, PROFIBUS-DP - Communication profile".

Offset	Designation	Comments	Internal object no.
0	Control_O	Handshake byte for event list via PROFIBUS-DP	-
1	SPARE	reserved for future use (the value at this position is ignored)	-

3.1.2 Double commands

- User-defined double commands (with double-point indication 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.
2 / 0	<user-defined> OFF	not pre-allocated	-
2 / 1	<user-defined> ON		
2 / 2	<user-defined> OFF	not pre-allocated	-
2 / 3	<user-defined> ON		

3.1.3 Internal commands

- Ref. to chap. 1.5.2 for notes regarding Changing the setting group.

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

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
3 / 6	<user-defined> OFF	not pre-allocated	-
3 / 7	<user-defined> ON		
4 / 0	Setting group A	Activation of setting group A	-
4 / 1	Setting group A		
4 / 2	Setting group B	Activation of setting group B	-
4 / 3	Setting group B		
4 / 4	Setting group C	Activation of setting group C	-
4 / 5	Setting group C		
4 / 6	Setting group D	Activation of setting group D	-
4 / 7	Setting group D		

3.1.4 Single commands

- User-defined commands and taggings (single-point) 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.
5 / 0	<user-defined> OFF	not pre-allocated	-
5 / 1	<user-defined> ON		
5 / 2	<user-defined> OFF	not pre-allocated	-
5 / 3	<user-defined> ON		
5 / 4	<user-defined> OFF	not pre-allocated	-
5 / 5	<user-defined> ON		
5 / 6	<user-defined> OFF	not pre-allocated	-
5 / 7	<user-defined> ON		

3.2 Message in input direction

3.2.1 Annunciations

3.2.1.1 Double-point indications

- User-defined double-point indications (e.g. checkback indications of double commands) 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	<user-defined> OFF	not pre-allocated	-
0 / 1	<user-defined> ON		
0 / 2	<user-defined> OFF	not pre-allocated	-
0 / 3	<user-defined> ON		

3.2.1.2 Single-point indications

- User-defined protection annunciations, single-point indications (e.g. checkback indications of single commands) and taggings (single-point) 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.
0 / 4	79 ON	1 = 79 Auto recloser is switched ON	2782
0 / 5	<user-defined>	not pre-allocated	-
0 / 6	<user-defined>	not pre-allocated	-
0 / 7	<user-defined>	not pre-allocated	-
1 / 0	<user-defined>	not pre-allocated	-
1 / 1	<user-defined>	not pre-allocated	-
1 / 2	<user-defined>	not pre-allocated	-
1 / 3	<user-defined>	not pre-allocated	-

3.2.1.3 Setting group

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
1 / 4	Group A	1 = Group A is active	-
1 / 5	Group B	1 = Group B is active	-
1 / 6	Group C	1 = Group C is active	-
1 / 7	Group D	1 = Group D is active	-

3.2.1.4 Diagnosis

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
2 / 0	<user-defined>	not pre-allocated	-
2 / 1	ProtActive	1 = At least one protection function is active	52
2 / 2	Settings Calc.	1 = Settings calculation is running	70
2 / 3	Error Sum Alarm	1 = Error with a summary alarm ON	140
2 / 4	Alarm Sum Event	1 = Alarm summary event ON	160
2 / 5	Relay PICKUP	1 = Relay PICKUP (group signal)	501
2 / 6	Relay TRIP	1 = Relay GENERAL TRIP command	511
2 / 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.)	-

3.2.1.5 Device status

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

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
3 / 0	Test mode	1 = Test mode is active	-
3 / 1	DataStop	1 = Stop data transmission is active	-
3 / 2	<user-defined>	not pre-allocated	-
3 / 3	<user-defined>	not pre-allocated	-
3 / 4	ModeREMOTE	Controlmode REMOTE (0 = LOCKED , 1 = UNLOCKED)	-
3 / 5	<user-defined>	not pre-allocated	-
3 / 6	<user-defined>	not pre-allocated	-
3 / 7	<user-defined>	not pre-allocated	-
4 / 0	>FAIL:Feeder VT	1 = Binary input “Failure: Feeder VT (MCB tripped)” is active	361
4 / 1	<user-defined>	not pre-allocated	-
4 / 2	<user-defined>	not pre-allocated	-
4 / 3	<user-defined>	not pre-allocated	-

3.2.1.6 Measurement supervision

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
4 / 4	Failure SumI	1 = Alarm: Current summation supervision	289
4 / 5	Fail I balance	1 = Failure: Current balance	163
4 / 6	Fail V balance	1 = Failure: Voltage balance	167
4 / 7	<user-defined>	not pre-allocated	-

3.2.1.7 Auto reclosing and Differential protection indications

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
5 / 0	79 not ready	1 = 79: Auto recloser is not ready	2784
5 / 1	79 Successful	1 = 79 - cycle successful	2862
5 / 2	79 Close	1 = 79 - Close command	2851
5 / 3	79 Close 2.Cyc	1 = 79: Close command 2nd cycle (and higher)	2854
5 / 4	87 is OFF	1 = 87 is switched off	3149
5 / 5	87 is blocked	1 = 87 is blocked	3148
5 / 6	87 active	1 = 87 Active	3120
5 / 7	<user-defined>	not pre-allocated	-

3.2.1.8 Protection pickup indications

- User-defined protection annunciations, single-point indications and taggings can be routed on the positions “<user-defined>” as “Destination system interface” using the **DIGSI Configuration matrix**.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
6 / 0	Relay PICKUP Ph A	1 = Relay PICKUP Phase A	503
6 / 1	Relay PICKUP Ph B	1 = Relay PICKUP Phase B	504
6 / 2	Relay PICKUP Ph C	1 = Relay PICKUP Phase C	505
6 / 3	Relay PICKUP G	1 = Relay PICKUP GROUND	506
6 / 4	87 Gen. Fault	1 = 87 Fault detection	3132
6 / 5	87 Fault in A	1 = 87 Fault detection in phase A	3133
6 / 6	87 Fault in B	1 = 87 Fault detection in phase B	3134
6 / 7	87 Fault in C	1 = 87 Fault detection in phase C	3135
7 / 0	87 Ground Fault	1 = 87 Ground fault detection	3136
7 / 1	<user-defined>	not pre-allocated	-
7 / 2	<user-defined>	not pre-allocated	-
7 / 3	<user-defined>	not pre-allocated	-

3.2.1.9 Protection trip indications

- User-defined protection annunciations, single-point indications and taggings can be routed on the positions "<user-defined>" as "Destination system interface" using the **DIGSI Configuration matrix**.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 4	Relay TRIP Ph A	1 = Relay TRIP command Phase A	507
7 / 5	Relay TRIP Ph B	1 = Relay TRIP command Phase B	508
7 / 6	Relay TRIP Ph C	1 = Relay TRIP command Phase C	509
7 / 7	50(N)-B1 TRIP	1 = 50(N)-B1 TRIP	7221
8 / 0	50(N)-B2 TRIP	1 = 50(N)-B2 TRIP	7222
8 / 1	87 General TRIP	1 = 87 General TRIP	3141
8 / 2	Definitive TRIP	1 = Relay Definitive TRIP	536
8 / 3	<user-defined>	not pre-allocated	-
8 / 4	<user-defined>	not pre-allocated	-
8 / 5	<user-defined>	not pre-allocated	-
8 / 6	<user-defined>	not pre-allocated	-
8 / 7	<user-defined>	not pre-allocated	-

3.2.1.10 User-defined annunciations

- User-defined protection annunciations, single-point indications and taggings can be routed on these positions as "Destination system interface" using the **DIGSI Configuration matrix**.

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

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.
10	Ia =	Ia	3276.7 A	601
12	Ib =	Ib	3276.7 A	602
14	Ic =	Ic	3276.7 A	603
16	3I0 =	3I0 (zero sequence)	3276.7 A	610
18	Freq =	Frequency	327.67 Hz	644
20	IDiff A =	IDiff A (% Operational nominal current)	327.67 %	7742
22	IDiff B =	IDiff B (% Operational nominal current)	327.67 %	7743
24	IDiff C =	IDiff C (% Operational nominal current)	327.67 %	7744
26	IRest A =	IRest A (% Operational nominal current)	327.67 %	7745
28	IRest B =	IRest B (% Operational nominal current)	327.67 %	7746
30	IRest C =	IRest C (% Operational nominal current)	327.67 %	7747
32	PI1A/m	Prot. Interface 1: Availability per min.	327.67 %	7753
34	PI1A/h	Prot. Interface 1: Availability per hour	327.67 %	7754
36	PI2A/m	Prot. Interface 2: Availability per min.	327.67 %	7755
38	PI2A/h	Prot. Interface 2: Availability per hour	327.67 %	7756
40	<user-defined>	not pre-allocated	-	-
42	<user-defined>	not pre-allocated	-	-
44	<user-defined>	not pre-allocated	-	-
46	<user-defined>	not pre-allocated	-	-
48	<user-defined>	not pre-allocated	-	-

3.2.3 Event list

- Information regarding the handshake bytes as well as the retrieval methods of the event list via PROFIBUS-DP can be found in the manual "SIPROTEC Communication module, PROFIBUS-DP - Communication profile".

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
50	Control_I	Handshake byte for event list via PROFIBUS-DP	-
51	SPARE	reserved for future use (the value 0 is transmitted at this position)	-
52	Message block #1	Identification #1	-
53		Value #1	
54 -		Time stamp #1	
61			
62	Message block #2	Identification #2	-
63		Value #2	
64 -		Time stamp #2	
71			
72	Message block #3	Identification #3	-
73		Value #3	
74 -		Time stamp #3	
81			

Glossary

CFC	Continuous Function Chart
DC	Double command
DDB file / GSD file	<p>The DDB file contains the Device Data Base (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	Term from EN 50170, 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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