SIPROTEC

Multifunction protection with control 7SJ61...7SJ64

Input/Output unit with local control 6MD63

Communication module

PROFIBUS-DP
Bus mapping

Revision 2.0

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Preface

Purpose of this manual

This manual describes the data in the PROFIBUS-DP messages of the SIPROTEC device 7SJ61...7SJ64, 6MD63 and is devided into the following topics:

- Data in the PROFIBUS-DP messages → Chapter 1,
- Standard mapping 3-1 → Chapter 2,
- Standard mapping 3-2 → Chapter 3,
- Standard mapping 3-3 → Chapter 4,
- Standard mapping 3-4 → Chapter 5,
- Standard mapping 3-5 → Chapter 6.

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 inteface 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 device:

- 7SJ61...7SJ64 (firmware version 4.4 or higher),
- 6MD63 (firmware version 4.4 or higher)

with

- PROFIBUS-DP communication module version 02.00.05 or higher,
- PROFIBUS-DP communication module version 03.00.03 or higher at use of
  - Standard mapping 3-5.

For device parameterization have to be used:

- DIGSI 4.3 or higher,
- DIGSI 4.21 considering the preconditions explained in the manual “SIPROTEC Communication module, PROFIBUS-DP - Communication profile” (ref. to page i),
- 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!

During operation of electrical equipment, certain parts of these devices are under high voltage. Severe personal injury or significant equipment damage could result from improper behaviour.

Only qualified personnel should work on this equipment or in the vicinity of this equipment. These personnel must be familiar with all warnings and service procedures described in this manual, as well as with safety regulations.

Prerequisites to proper and safe operation of this product are proper transport, proper storage, setup, installation, operation, and maintenance of the product, as well as careful operation and servicing of the device within the scope of the warnings and instructions of this manual.

In particular, the general facility and safety regulations for work with high-voltage equipment (e.g. ANSI, IEC, EN, or other national or international regulations) must be observed. Noncompliance may result in death, injury or significant equipment damage.

QUALIFIED PERSONNEL

Within the meaning of safety precautions of this manual and the instructions, qualified personnel are those persons who are qualified to set up, install, place into service, and operate this device, and who possess the following qualifications:

- Training and instruction (or other qualification) for switching, grounding, and designating devices and systems.
- Training or instruction in accordance with safety standards for care and use of certain safety equipment.
- First aid training.

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-B006-03 Feb 14th, 2002
Chap. 1.5 Chap. 2.2.1.10 Chap. 2.2.2.1 Chap. 2.2.4, 3.2.3, 4.2.4 Chap. 3.2.2.1 Chap. 4.2.1.3 Chap. 1.4, 6	2.0	• Note added: pre-allocated objects which are not contained in the SIPROTEC device (e.g. pre-allocated protection annunciations with a 6MD63 device) can not be rearranged • Correction: Offset 13/7 is not pre-allocated in standard mapping 3-1 • Standard mapping 3-1, offset 60: Obj.no. and text of the pre-allocated measured value corrected • Separate chapters “Statistic values” for counter of operating hours • Standard mapping 3-2, offset 30: Obj.no. and text of the pre-allocated measured value corrected • Correction: Offsets 6/1, 6/5, 6/6 are pre-allocated in standard mapping 3-3 • New: Description of standard mapping 3-5 with event list added Apr 19th, 2004

Table of contents

Data in the PROFIBUS-DP messages

1

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.

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 to 6 define the data area of the PROFIBUS-DP messages for data transfer between the PROFIBUS-DP slave of the SIPROTEC devices 7SJ61...7SJ64, 6MD63 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.
20	Ia =	Current in phase A	3276.7 A	601

The measured value "Ia" is assigned to data byte 20 (most significant byte of the measured value) and data byte 21 (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	Breaker ON/OFF OFF	Circuit breaker	-
0 / 1	Breaker ON/OFF ON		

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
5 / 6	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 2^6.

Note:

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

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, 3.1, 4.1, 5.1 and 6.1) 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.

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, 3.2, 4.2, 5.2 and 6.2) 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.

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 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 $\sqrt{3}$

  $\rightarrow$ 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 i).

1.3.3 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 A und V_{nom} = 12.00 kV,

60000 impulses correspond so that:

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

Note:

- The type of update (cyclic, with or without deletion) and the update interval must be programmed for the metered measurands with the parameterization software DIGSI.
- The scaling of the metered measurands at binary inputs (pulse counters) depends on the externally connected pulse generator.

1.4 Configuration data of the standard mappings

There are five standard mappings (standard mapping 3-1 to standard mapping 3-5) available for the SIPROTEC devices 7SJ61...7SJ64, 6MD63 which differ in the data size of the PROFIBUS-DP messages.

Standard mapping 3-1

The standard mapping 3-1 contains:

Output direction:

- 7 double commands
- 29 single commands

Input direction:

- 7 double-point indications
- 146 single-point indications
- 25 measured values (integer)
- 6 metered measurands (unsigned long)
- Fault locator: Fault location (integer)
- Counter of operating hours (unsigned long)

Standard mapping 3-2

The standard mapping 3-2 contains:

Output direction:

- 7 double commands
- 29 single commands

Input direction:

- 7 double-point indications
- 114 single-point indications
- 10 measured values (integer)
- 2 metered measurands (unsigned long)
- Counter of operating hours (unsigned long)

Standard mapping 3-3

The standard mapping 3-3 contains:

Output direction:

- 8 double commands
- 24 single commands

Input direction:

- 8 double-point indications
- 64 single-point indications
- 21 measured values (integer)
- 6 metered measurands (unsigned long)
- Counter of operating hours (unsigned long)

Standard mapping 3-4

The standard mapping 3-4 contains:

Output direction:

- 3 double commands
- 5 single commands

Input direction:

- 3 double-point indications
- 26 single-point indications
- 8 measured values (integer)
- 2 metered measurands (unsigned long)

Standard mapping 3-5

The standard mapping 3-5 contains:

Output direction:

- Handshake byte for event list via PROFIBUS-DP
- 8 double commands
- 16 single commands

Input direction:

- 8 double-point indications
- 64 single-point indications
- 15 measured values (integer)
- Counter of operating hours (unsigned long)
- 6 metered measurands (unsigned long)
- Handshake byte and three message blocks for event list via PROFIBUS-DP

PROFIBUS-DP Configuration data

Standard mapping 3-1: **1FH 1FH 1FH 1FH 1FH 1FH 13H 28H**
(100 bytes input-, 9 bytes output direction)

Standard mapping 3-2: **1FH 1FH 1FH 28H**
(48 bytes input-, 9 bytes output direction)

Standard mapping 3-3: **1FH 1FH 1FH 1FH 1FH 27H**
(80 bytes input-, 8 bytes output direction)

Standard mapping 3-4: **1FH 1BH 21H**
(28 bytes input-, 2 bytes output direction)

Standard mapping 3-5: **1FH 1FH 1FH 1FH 13H DFH 27H**
(100 bytes input-, 8 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 master are to select the following modules for the 7SJ61...7SJ64, 6MD63 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_Ix	
1	Input - 16 Bytes	Adr_Ix + 16	
2	Input - 16 Bytes	Adr_Ix + 32	
3	Input - 16 Bytes	Adr_Ix + 48	
4	Input - 16 Bytes	Adr_Ix + 64	
5	Input - 16 Bytes	Adr_Ix + 80	
6	Input - 4 Bytes	Adr_Ix + 96	
7	Output - 9 Bytes		Adr_Ox

Standard mapping 3-2:

Module	Order number	Input address	Output address
0	Input - 16 Bytes	Adr_Ix	
1	Input - 16 Bytes	Adr_Ix + 16	
2	Input - 16 Bytes	Adr_Ix + 32	
3	Output - 9 Bytes		Adr_Ox

Standard mapping 3-3:

Module	Order number	Input address	Output address
0	Input - 16 Bytes	Adr_Ix	
1	Input - 16 Bytes	Adr_Ix + 16	
2	Input - 16 Bytes	Adr_Ix + 32	
3	Input - 16 Bytes	Adr_Ix + 48	
4	Input - 16 Bytes	Adr_Ix + 64	
5	Output - 8 Bytes		Adr_Ox

Standard mapping 3-4:

Module	Order number	Input address	Output address
0	Input - 16 Bytes	Adr_Ix	
1	Input - 12 Bytes	Adr_Ix + 16	
2	Output - 2 Bytes		Adr_Ox

Standard mapping 3-5:

Module	Order number	Input address	Output address
0	Input - 16 Bytes	Adr_Ix	
1	Input - 16 Bytes	Adr_Ix + 16	
2	Input - 16 Bytes	Adr_Ix + 32	
3	Input - 16 Bytes	Adr_Ix + 48	
4	Input - 4 Bytes	Adr_Ix + 64	
5	Input - 16 Words, consistent	Adr_Ix + 68	
6	Output - 8 Bytes		Adr_Ox

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

Addr_Ix (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, 3.2, 4.2, 5.2 and 6.2).

Addr_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, 3.1, 4.1, 5.1 and 6.1).

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 metered measurands (unsigned long values, ref. to chap. 2.2.4, 3.2.3, 4.2.3, 5.2.3 and 6.2.4) 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 to 5) contains 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 enviroment.
  You find information about this in the manual "SIPROTEC Communication module, PROFIBUS-DP - Communication profile" (ref. to page i).
- *SIPROTEC objects which are pre-allocated in the selected standard mapping but not contained in the used SIPROTEC device can not be rearranged (e.g. pre-allocated protection annunciations with a 6MD63 device).*

  The associated positions in the bus mapping then are not utilizable for the SIPROTEC device.
  Another standard mapping has if necessary to be selected.
- 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.
  These must afterwards be routed again on “Source system interface” or “Destination system interface” using the **`DIGSI Configuration matrix`**.

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. 3.1.3

Standard mapping 3-3: ref. to chap. 4.1.3

Standard mapping 3-4: not pre-allocated

Standard mapping 3-5: 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. 2.1.3

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

Standard mapping 3-3: not pre-allocated

Standard mapping 3-4: ref. to chap. 5.1.3

Standard mapping 3-5: ref. to chap. 6.1.3

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 transmitted 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. 2.2.1.19

Standard mapping 3-2: ref. to chap. 3.2.1.16

Standard mapping 3-3: ref. to chap. 4.2.1.6

Standard mapping 3-4: not pre-allocated

Standard mapping 3-5: ref. to chap. 6.2.1.7

1.5.4 Fault locator: Fault location

Always the latest fault location is stored.

In the event of a fault, reading out of the fault record protocol from the SIPROTEC device is necessary for an exact diagnosis.

References

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

Standard mapping 3-2 to 3-5: not available

Standard mapping 3-1

2

This chapter describes the data in the PROFIBUS-DP messages between the PROFIBUS-DP master and the SIPROTEC devices 7SJ61...7SJ64, 6MD63 if standard mapping 3-1 is selected.

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 the positions <user-defined> as “Source system interface” using the **DIGSI Configuration matrix**.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
0 / 0	52Breaker OFF	52 Breaker, Impulse output, 3 relays (2-pole ON, 1-pole OFF)	-
0 / 1	52Breaker ON		
0 / 2	Disc.Swit. OFF	Disconnect Switch, Impulse output, 2 relays, 1-pole	-
0 / 3	Disc.Swit. ON		
0 / 4	GndSwit. OFF	Ground Switch, Impulse output, 2 relays, 1-pole	-
0 / 5	GndSwit. ON		
0 / 6	Q2 Op/Cl OFF	Impulse output, 2 relays, 1-pole	-
0 / 7	Q2 Op/Cl ON		
1 / 0	Q9 Op/Cl OFF	Impulse output, 2 relays, 1-pole	-
1 / 1	Q9 Op/Cl 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		

2.1.2 Single 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.
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		
2 / 2	<user-defined> OFF	not pre-allocated	-
2 / 3	<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 / 4	79 ON OFF	Deactivation of Auto-Reclose function	2782
2 / 5	79 ON ON	Activation of Auto-Reclose function	
2 / 6	ProtActive OFF	Deactivation of protection functions	52
2 / 7	ProtActive ON	Activation of potection functions	
3 / 0	<user-defined> OFF	not pre-allocated	-
3 / 1	<user-defined> ON		
3 / 2	ModeREMOTE LOCKED	Control mode REMOTE = LOCKED	-
3 / 3	ModeREMOTE UNLOCKED	Control mode REMOTE = UNLOCKED	
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		

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
4 / 0	Group A		-
4 / 1	Group A	Activation of setting group A	
4 / 2	Group B		-
4 / 3	Group B	Activation of setting group B	
4 / 4	Group C		-
4 / 5	Group C	Activation of setting group C	
4 / 6	Group D		-
4 / 7	Group D	Activation of setting group D	

2.1.4 User-defined single commands or taggings

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

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 6	<user-defined> OFF	not pre-allocated	-
7 / 7	<user-defined> ON		
8 / 0	<user-defined> OFF	not pre-allocated	-
8 / 1	<user-defined> ON		
8 / 2	<user-defined> OFF	not pre-allocated	-
8 / 3	<user-defined> ON		
8 / 4	<user-defined> OFF	not pre-allocated	-
8 / 5	<user-defined> ON		
8 / 6	<user-defined> OFF	not pre-allocated	-
8 / 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 the positions <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	Checkback indication 52 Breaker	-
0 / 1	52Breaker ON		
0 / 2	Disc.Swit. OFF	Checkback indication Disconnect Switch	-
0 / 3	Disc.Swit. ON		
0 / 4	GndSwit. OFF	Checkback indication Ground Switch	-
0 / 5	GndSwit. ON		
0 / 6	Q2 Op/Cl OFF	Checkback indication Q2	-
0 / 7	Q2 Op/Cl ON		
1 / 0	Q9 Op/Cl OFF	Checkback indication Q9	-
1 / 1	Q9 Op/Cl 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		

2.2.1.2 User-defined single-point indications or taggings

- User-defined protection annunciations, single-point indications or 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.
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 / 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	-

2.2.1.3 Diagnosis

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
5 / 0	Device OK	1 = Update of the device replica in the SIPROTEC device completed after initial start or restart	51
5 / 1	ProtActive	1 = At least one protection function is active	52
5 / 2	Settings Calc.	1 = Settings calculation is running	70
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	Relay PICKUP	1 = Relay PICKUP (group signal)	501
5 / 6	Relay TRIP	1 = Relay GENERAL TRIP command	511
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.)	-

2.2.1.4 Automatic recloser status

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
6 / 0	>CB Ready	1 = Binary input "Circuit breaker ready" is active	2730
6 / 1	79 OFF	1 = 79 Auto recloser is switched OFF	2781
6 / 2	79 ON	1 = 79 Auto recloser is switched ON	2782
6 / 3	79 Close	1 = 79 Auto recloser - Close command	2851
6 / 4	79 Successful	1 = 79 Auto recloser - Cycle successful	2862
6 / 5	79 Lockout	1 = 79 Auto recloser - Lockout	2863
6 / 6	<user-defined>	not pre-allocated	-
6 / 7	<user-defined>	not pre-allocated	-

2.2.1.5 Time overcurrent protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 0	50/51 PH OFF	1 = 50/51 O/C is switched OFF	1751
7 / 1	50N/51N OFF	1 = 50N/51N is switched OFF	1756
7 / 2	50(N)/51(N) PU	1 = 50(N)/51(N) O/C PICKUP	1761
7 / 3	50/51 Ph A PU	1 = 50/51 Phase A picked up	1762
7 / 4	50/51 Ph B PU	1 = 50/51 Phase B picked up	1763
7 / 5	50/51 Ph C PU	1 = 50/51 Phase C picked up	1764
7 / 6	50N/51NPickedup	1 = 50N/51N picked up	1765

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 7	50(N)/51(N)TRIP	1 = 50(N)/51(N) TRIP	1791
8 / 0	50-2 TRIP	1 = 50-2 TRIP	1805
8 / 1	50-1 TRIP	1 = 50-1 TRIP	1815
8 / 2	51 picked up	1 = 51 picked up	1820
8 / 3	51 TRIP	1 = 51 TRIP	1825
8 / 4	50N-2 TRIP	1 = 50N-2 TRIP	1833
8 / 5	50N-1 TimeOut	1 = 50N-1 TimeOut	1835
8 / 6	50N-1 TRIP	1 = 50N-1 TRIP	1836
8 / 7	51N TRIP	1 = 51N TRIP	1839

2.2.1.6 Directional time overcurrent protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
9 / 0	Phase A forward	1 = Phase A forward	2628
9 / 1	Phase B forward	1 = Phase B forward	2629
9 / 2	Phase C forward	1 = Phase C forward	2630
9 / 3	Phase A reverse	1 = Phase A reverse	2632
9 / 4	Phase B reverse	1 = Phase B reverse	2633
9 / 5	Phase C reverse	1 = Phase C reverse	2634
9 / 6	Ground forward	1 = Ground forward	2635
9 / 7	Ground reverse	1 = Ground reverse	2636
10 / 0	67-2 TRIP	1 = 67-2 TRIP	2649
10 / 1	67/67-TOC OFF	1 = Directional time overcurrent PHASE switched OFF	2651
10 / 2	67N OFF	1 = Directional time overcurrent GND is switched OFF	2656
10 / 3	67-1 TRIP	1 = 67-1 TRIP	2665
10 / 4	67-TOC TRIP	1 = 67-TOC TRIP	2675
10 / 5	67N-2 TRIP	1 = 67N-2 TRIP	2679
10 / 6	67N-1 TRIP	1 = 67N-1 TRIP	2683
10 / 7	67N-TOC TRIP	1 = 67N-TOC TRIP	2686
11 / 0	67 A picked up	1 = Directional time overcurrent Phase A picked up	2692
11 / 1	67 B picked up	1 = Directional time overcurrent Phase B picked up	2693
11 / 2	67 C picked up	1 = Directional time overcurrent Phase C picked up	2694
11 / 3	67N picked up	1 = Directional time overcurrent GROUND picked up	2695
11 / 4	67/67N TRIP	1 = Directional time overcurrent TRIP	2696

2.2.1.7 Unbalanced load protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
11 / 5	46 OFF	1 = Unbalanced load protection is switched OFF	5151
11 / 6	46 TRIP	1 = 46 TRIP	5170

2.2.1.8 Frequency protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
11 / 7	81 OFF	1 = Frequency protection is switched OFF	5211
12 / 0	81-1 TRIP	1 = 81-1 TRIP	5236
12 / 1	81-2 TRIP	1 = 81-2 TRIP	5237
12 / 2	81-3 TRIP	1 = 81-3 TRIP	5238
12 / 3	81-4 TRIP	1 = 81-4 TRIP	5239

2.2.1.9 Undervoltage and overvoltage protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
12 / 4	27 OFF	1 = Undervoltage protection is switched OFF	6530
12 / 5	27-1 TRIP	1 = 27-1 TRIP	6539
12 / 6	27-2 TRIP	1 = 27-2 TRIP	6540
12 / 7	59 OFF	1 = Overvoltage protection is switched OFF	6565
13 / 0	59-1 TRIP	1 = 59-1 TRIP	6570

2.2.1.10 Sensitive ground fault protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
13 / 1	50Ns/67Ns OFF	1 = 50Ns/67Ns is switched OFF	1211
13 / 2	64 Pickup	1 = 64 displacement voltage pick up	1215
13 / 3	64 TRIP	1 = 64 displacement voltage element TRIP	1217
13 / 4	50Ns-2 TRIP	1 = 50Ns-2 TRIP	1223
13 / 5	50Ns-1 TRIP	1 = 50Ns-1 TRIP	1226
13 / 6	51Ns TRIP	1 = 51Ns TRIP	1229
13 / 7	<user-defined>	not pre-allocated	-
14 / 0	Sens. Gnd Ph A	1 = Sensitive ground fault picked up in phase A	1272
14 / 1	Sens. Gnd Ph B	1 = Sensitive ground fault picked up in phase B	1273
14 / 2	Sens. Gnd Ph C	1 = Sensitive ground fault picked up in phase C	1274
14 / 3	SensGnd Forward	1 = Sensitive ground fault in forward direction	1276

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
14 / 4	SensGnd Reverse	1 = Sensitive ground fault in reverse direction	1277
14 / 5	SensGnd undef.	1 = Sensitive ground fault direction undefined	1278

2.2.1.11 Circuit breaker failure protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
14 / 6	50BF OFF	1 = 50BF is switched OFF	1451
14 / 7	50BF TRIP	1 = 50BF TRIP	1471

2.2.1.12 Thermal overload protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
15 / 0	49 O/L OFF	1 = 49 Overload protection is switched OFF	1511
15 / 1	49 O/L I Alarm	1 = 49 Overload current alarm (I alarm)	1515
15 / 2	49 O/L Θ Alarm	1 = 49 Overload alarm! Near thermal TRIP	1516
15 / 3	49 Windings O/L	1 = 49 Winding overload	1517
15 / 4	49 Th O/L TRIP	1 = 49 Thermal overload TRIP	1521
15 / 5	<user-defined>	not pre-allocated	-

2.2.1.13 Startup counter for motors

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
15 / 6	>66 emerg. start	1 = Binary input "Emergency start" is active	4823
15 / 7	66 OFF	1 = Motor start protection is switched OFF	4824
16 / 0	66 TRIP	1 = Motor start protection TRIP	4827

2.2.1.14 Startup supervision of motors

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
16 / 1	START-SUP OFF	1 = Startup supervision is switched OFF	6811
16 / 2	START-SUP TRIP	1 = Startup supervision TRIP	6821
16 / 3	Rotor locked	1 = Rotor locked	6822
16 / 4	START-SUP pu	1 = Startup supervision Pickup	6823

2.2.1.15 Trip circuit supervision

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
16 / 5	FAIL: Trip cir.	1 = 74TC Failure trip circuit	6865

2.2.1.16 Cold load pickup

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
16 / 6	CLP OFF	1 = Cold-load-pickup is switched OFF	1994
16 / 7	CLP BLOCKED	1 = Cold-load-pickup is BLOCKED	1995
17 / 0	CLP running	1 = Cold-load-pickup is RUNNING	1996
17 / 1	Dyn set. ACTIVE	1 = Dynamic settings are ACTIVE	1997

2.2.1.17 Measurement supervision

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
17 / 2	Fail I Superv.	1 = Failure: General current supervision	161
17 / 3	Failure Σ I	1 = Failure: Current summation	162
17 / 4	Fail Ph. Seq.	1 = Failure: Phase sequence	171
17 / 5	MeasSup OFF	1 = Measurement supervision is switched OFF	197

2.2.1.18 Set point alarms

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
17 / 6	SP. Op Hours>	1 = Set point operating hours	272
17 / 7	SP. IA dmd>	1 = Set point phase A dmd>	273
18 / 0	SP. IB dmd>	1 = Set point phase B dmd>	274
18 / 1	SP. IC dmd>	1 = Set point phase C dmd>	275
18 / 2	SP. I1 dmd>	1 = Set point positive sequence I1 dmd>	276
18 / 3	SP. |Pdmd|>	1 = Set point |Pdmd|>	277
18 / 4	SP. |Qdmd|>	1 = Set point |Qdmd|>	278
18 / 5	SP. |Sdmd|>	1 = Set point |Sdmd|>	279
18 / 6	SP. 37-1 alarm	1 = Set point 37-1 undercurrent alarm	284
18 / 7	SP. PF(55)alarm	1 = Set point 55 power factor alarm	285

2.2.1.19 Status annunciations

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

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
19 / 0	>No Volt.	1 = Binary input "No voltage (fuse blown)" is active	-
19 / 1	DataStop	1 = "Stop data transmission" is active	-
19 / 2	Test mode	1 = Test mode is active	-
19 / 3	Cntrl Auth (device 7SJ63, 7SJ641/642/645, 6MD63)[1]	Control authority (0 = REMOTE, 1 = LOCAL)	-
19 / 4	ModeLOCAL (device 7SJ63, 7SJ641/642/645, 6MD63)[1]	Control mode LOCAL (0 = LOCKED, 1 = UNLOCKED)	-
19 / 5	ModeREMOTE	Control mode REMOTE (0 = LOCKED , 1 = UNLOCKED)	-
19 / 6	Cntrl Auth (device 7SJ61, 7SJ62, 7SJ640)[2]	Control authority (0 = REMOTE, 1 = LOCAL)	-
19 / 7	ModeLOCAL (device 7SJ61, 7SJ62, 7SJ640)[2]	Control mode LOCAL (0 = LOCKED, 1 = UNLOCKED)	-

1 Not used in the 7SJ61, 7SJ62, 7SJ640.
2 Not used in the 7SJ63, 7SJ641/642/645, 6MD63.

2.2.2 Measured values

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

2.2.2.1 Recorded measured values

Offset	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to ...)	Internal object no.
20	Ia =	Ia	3276.7 A	601
22	Ib =	Ib	3276.7 A	602
24	Ic =	Ic	3276.7 A	603
26	In =	In	3276.7 A	604
28	Va-b =	Va-b	327.67 kV	624
30	Vb-c =	Vb-c	327.67 kV	625
32	Vc-a =	Vc-a	327.67 kV	626
34	VN =	VN	327.67 kV	627
36	P =	P (active power)	327.67 MW	641
38	Q =	Q (reactive power)	327.67 MVAR	642
40	S =	S (apparent power)	327.67 MVA	645
42	Freq =	Frequency	327.67 Hz	644
44	INs Real =	Resistive ground current in isol. systems	3276.7 A	701
46	INs Reac =	Reactive ground current in isol. systems	3276.7 A	702
48	PF =	Power Factor	3.2767	901
50	I1 =	I1 (positive sequence)	3276.7 A	605
52	I2 =	I2 (negative sequence)	3276.7 A	606
54	V1 =	V1 (positive sequence)	327.67 kV	629
56	V2 =	V2 (negative sequence)	327.67 kV	630
58	ΘRotor =	Temperature of Rotor	327.67 %	805
60	Θ / Θtrip =	Thermal Overload	327.67 %	807
62	Td1 =	Transducer 1	32.767 mA	996
64	Td2 =	Transducer 2	32.767 mA	997

2.2.2.2 Mean values

Offset	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to ...)	Internal object no.
66	I1dmd =	I1 (positive sequence) demand	3276.7 A	833
68	Pdmd =	Active power demand	327.67 MW	834

2.2.3 Fault locator

- Ref. to chap. 1.5.4 for additional notes.

Offset	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to ...)	Internal object no.
70	d =	Distance to fault (Fault location)	3276.7 km/miles	1119

2.2.4 Metered measurands

- Ref. to chap. 1.3.3 for additional notes regarding scaling of metered measurands.

Offset	Designation of the SIPROTEC objects	Comments	Skalierung (2^{31}-1 corresponds to ...)	Internal object no.
72	Wp(puls) =	Pulsed Energy Wp (active) (metering impulses at binary input)	2^{31}-1 impulses	888
76	Wq(puls) =	Pulsed Energy Wq (reactive) (metering impulses at binary input)	2^{31}-1 impulses	889
80	WpForward =	Wp Forward (metered measurand derived from measured values)	2^{31}-1 impulses	924
84	WqForward =	Wq Forward (metered measurand derived from measured values)	2^{31}-1 impulses	925
88	WpReverse =	Wp Reverse (metered measurand derived from measured values)	2^{31}-1 impulses	928
92	WqReverse =	Wq Reverse (metered measurand derived from measured values)	2^{31}-1 impulses	929

2.2.5 Statistic values

Offset	Designation of the SIPROTEC objects	Comments	Skalierung (2^{31}-1 corresponds to ...)	Internal object no.
96	Op.Hours =	Counter of operating hours of the primary equipment	2^{31}-1 hours	1020

Standard mapping 3-2

3

This chapter describes the data in the PROFIBUS-DP messages between the PROFIBUS-DP master and the SIPROTEC devices 7SJ61...7SJ64, 6MD63 if standard mapping 3-2 is selected.

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 the positions <user-defined> as “Source system interface” using the **DIGSI Configuration matrix**.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
0 / 0	52Breaker OFF	52 Breaker, Impulse output, 3 relays (2-pole ON, 1-pole OFF)	-
0 / 1	52Breaker ON		
0 / 2	Disc.Swit. OFF	Disconnect Switch, Impulse output, 2 relays, 1-pole	-
0 / 3	Disc.Swit. ON		
0 / 4	GndSwit. OFF	Ground Switch, Impulse output, 2 relays, 1-pole	-
0 / 5	GndSwit. ON		
0 / 6	Q2 Op/Cl OFF	Impulse output, 2 relays, 1-pole	-
0 / 7	Q2 Op/Cl ON		
1 / 0	Q9 Op/Cl OFF	Impulse output, 2 relays, 1-pole	-
1 / 1	Q9 Op/Cl 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		

3.1.2 Single 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.
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		
2 / 2	<user-defined> OFF	not pre-allocated	-
2 / 3	<user-defined> ON		

3.1.3 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 / 4	79 ON OFF	Deactivation of Auto-Reclose function	2782
2 / 5	79 ON ON	Activation of Auto-Reclose function	
2 / 6	ProtActive OFF	Deactivation of protection functions	52
2 / 7	ProtActive ON	Activation of potection functions	
3 / 0	<user-defined> OFF	not pre-allocated	-
3 / 1	<user-defined> ON		
3 / 2	ModeREMOTE LOCKED	Control mode REMOTE = LOCKED	-
3 / 3	ModeREMOTE UNLOCKED	Control mode REMOTE = UNLOCKED	
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		

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
4 / 0	Group A		-
4 / 1	Group A	Activation of setting group A	
4 / 2	Group B		-
4 / 3	Group B	Activation of setting group B	
4 / 4	Group C		-
4 / 5	Group C	Activation of setting group C	
4 / 6	Group D		-
4 / 7	Group D	Activation of setting group D	

3.1.4 User-defined single commands or taggings

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

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 6	<user-defined> OFF	not pre-allocated	-
7 / 7	<user-defined> ON		
8 / 0	<user-defined> OFF	not pre-allocated	-
8 / 1	<user-defined> ON		
8 / 2	<user-defined> OFF	not pre-allocated	-
8 / 3	<user-defined> ON		
8 / 4	<user-defined> OFF	not pre-allocated	-
8 / 5	<user-defined> ON		
8 / 6	<user-defined> OFF	not pre-allocated	-
8 / 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 the positions <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	Checkback indication 52 Breaker	-
0 / 1	52Breaker ON		
0 / 2	Disc.Swit. OFF	Checkback indication Disconnect Switch	-
0 / 3	Disc.Swit. ON		
0 / 4	GndSwit. OFF	Checkback indication Ground Switch	-
0 / 5	GndSwit. ON		
0 / 6	Q2 Op/Cl OFF	Checkback indication Q2	-
0 / 7	Q2 Op/Cl ON		
1 / 0	Q9 Op/Cl OFF	Checkback indication Q9	-
1 / 1	Q9 Op/Cl 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		

3.2.1.2 User-defined single-point indications or taggings

- User-defined protection annunciations, single-point indications or 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.
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 / 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	-

3.2.1.3 Diagnosis

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
5 / 0	Device OK	1 = Update of the device replica in the SIPROTEC device completed after initial start or restart	51
5 / 1	ProtActive	1 = At least one protection function is active	52
5 / 2	Settings Calc.	1 = Settings calculation is running	70
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	Relay PICKUP	1 = Relay PICKUP (group signal)	501
5 / 6	Relay TRIP	1 = Relay GENERAL TRIP command	511
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 Automatic recloser status

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
6 / 0	>CB Ready	1 = Binary input "Circuit breaker ready" is active	2730
6 / 1	79 OFF	1 = 79 Auto recloser is switched OFF	2781
6 / 2	79 ON	1 = 79 Auto recloser is switched ON	2782
6 / 3	79 Close	1 = 79 Auto recloser - Close command	2851
6 / 4	79 Successful	1 = 79 Auto recloser - Cycle successful	2862
6 / 5	79 Lockout	1 = 79 Auto recloser - Lockout	2863
6 / 6	<user-defined>	not pre-allocated	-
6 / 7	<user-defined>	not pre-allocated	-

3.2.1.5 Time overcurrent protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 0	50/51 PH OFF	1 = 50/51 O/C is switched OFF	1751
7 / 1	50N/51N OFF	1 = 50N/51N is switched OFF	1756
7 / 2	50(N)/51(N) PU	1 = 50(N)/51(N) O/C PICKUP	1761
7 / 3	50/51 Ph A PU	1 = 50/51 Phase A picked up	1762
7 / 4	50/51 Ph B PU	1 = 50/51 Phase B picked up	1763
7 / 5	50/51 Ph C PU	1 = 50/51 Phase C picked up	1764
7 / 6	50N/51NPickedup	1 = 50N/51N picked up	1765

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 7	50(N)/51(N)TRIP	1 = 50(N)/51(N) TRIP	1791
8 / 0	50-2 TRIP	1 = 50-2 TRIP	1805
8 / 1	50-1 TRIP	1 = 50-1 TRIP	1815
8 / 2	51 picked up	1 = 51 picked up	1820
8 / 3	51 TRIP	1 = 51 TRIP	1825
8 / 4	50N-2 TRIP	1 = 50N-2 TRIP	1833
8 / 5	50N-1 TimeOut	1 = 50N-1 TimeOut	1835
8 / 6	50N-1 TRIP	1 = 50N-1 TRIP	1836
8 / 7	51N TRIP	1 = 51N TRIP	1839

3.2.1.6 Unbalanced load protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
9 / 0	46 OFF	1 = Unbalanced load protection is switched OFF	5151
9 / 1	46 TRIP	1 = 46 TRIP	5170

3.2.1.7 Sensitive ground fault protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
9 / 2	50Ns/67Ns OFF	1 = 50Ns/67Ns is switched OFF	1211
9 / 3	50Ns-2 TRIP	1 = 50Ns-2 TRIP	1223
9 / 4	50Ns-1 TRIP	1 = 50Ns-1 TRIP	1226
9 / 5	51Ns TRIP	1 = 51Ns TRIP	1229

3.2.1.8 Circuit breaker failure protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
9 / 6	50BF OFF	1 = 50BF is switched OFF	1451
9 / 7	50BF TRIP	1 = 50BF TRIP	1471

3.2.1.9 Thermal overload protection

Offset	Bezeichnung der SIPROTEC-Objekte	Bemerkung	Interne Objektnr.
10 / 0	49 O/L OFF	1 = 49 Overload protection is switched OFF	1511
10 / 1	49 O/L I Alarm	1 = 49 Overload current alarm (I alarm)	1515
10 / 2	49 O/L Θ Alarm	1 = 49 Overload alarm! Near thermal TRIP	1516
10 / 3	49 Windings O/L	1 = 49 Winding overload	1517
10 / 4	49 Th O/L TRIP	1 = 49 Thermal overload TRIP	1521

3.2.1.10 Startup counter for motors

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
10 / 5	>66 emerg. start	1 = Binary input "Emergency start" is active	4823
10 / 6	66 OFF	1 = Motor start protection is switched OFF	4824
10 / 7	66 TRIP	1 = Motor start protection TRIP	4827

3.2.1.11 Startup supervision of motors

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
11 / 0	START-SUP OFF	1 = Startup supervision is switched OFF	6811
11 / 1	START-SUP TRIP	1 = Startup supervision TRIP	6821
11 / 2	Rotor locked	1 = Rotor locked	6822
11 / 3	START-SUP pu	1 = Startup supervision Pickup	6823

3.2.1.12 Trip circuit supervision

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
11 / 4	FAIL: Trip cir.	1 = 74TC Failure trip circuit	6865

3.2.1.13 Cold load pickup

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
11 / 5	CLP OFF	1 = Cold-load-pickup is switched OFF	1994
11 / 6	CLP BLOCKED	1 = Cold-load-pickup is BLOCKED	1995
11 / 7	CLP running	1 = Cold-load-pickup is RUNNING	1996
12 / 0	Dyn set. ACTIVE	1 = Dynamic settings are ACTIVE	1997

3.2.1.14 Measurement supervision

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
12 / 1	Messwert-Überw. I	1 = Messwertüberwachung I	161
12 / 2	Störung Σ I	1 = Störung Messwert Summe I	162
12 / 3	Stör. Ph-Folge	1 = Störung Phasenfolge	171
12 / 4	Messw. Überw. aus	1 = Messwertüberwachung ist ausgeschaltet	197

3.2.1.15 Set point alarms

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
12 / 5	SP. Op Hours>	1 = Set point operating hours	272
12 / 6	SP. IA dmd>	1 = Set point phase A dmd>	273
12 / 7	SP. IB dmd>	1 = Set point phase B dmd>	274
13 / 0	SP. IC dmd>	1 = Set point phase C dmd>	275
13 / 1	SP. I1 dmd>	1 = Set point positive sequence I1 dmd>	276
13 / 2	SP. |Pdmd|>	1 = Set point |Pdmd|>	277
13 / 3	SP. |Qdmd|>	1 = Set point |Qdmd|>	278
13 / 4	SP. |Sdmd|>	1 = Set point |Sdmd|>	279
13 / 5	SP. 37-1 alarm	1 = Set point 37-1 undercurrent alarm	284
13 / 6	SP. PF(55)alarm	1 = Set point 55 power factor alarm	285
13 / 7	<user-defined>	not pre-allocated	-

3.2.1.16 Status annunciations

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

Offset	Bezeichnung der SIPROTEC-Objekte	Bemerkung	Interne Objektnr.
14 / 0	>No Volt.	1 = Binary input "No voltage (fuse blown)" is active	-
14 / 1	DataStop	1 = "Stop data transmission" is active	-
14 / 2	Test mode	1 = Test mode is active	-
14 / 3	Cntrl Auth (device 7SJ61, 7SJ62, 7SJ640)	Control authority (0 = REMOTE, 1 = LOCAL)	-
14 / 4	ModeLOCAL (device 7SJ61, 7SJ62, 7SJ640)	Control mode LOCAL (0 = LOCKED, 1 = UNLOCKED)	-
14 / 5	ModeREMOTE	Control mode REMOTE (0 = LOCKED , 1 = UNLOCKED)	-
14 / 6	<nutzerdefiniert>	nicht vorrangiert	-
14 / 7	<nutzerdefiniert>	nicht vorrangiert	-
15 / 0	<nutzerdefiniert>	nicht vorrangiert	-
15 / 1	<nutzerdefiniert>	nicht vorrangiert	-
15 / 2	<nutzerdefiniert>	nicht vorrangiert	-
15 / 3	<nutzerdefiniert>	nicht vorrangiert	-
15 / 4	<nutzerdefiniert>	nicht vorrangiert	-
15 / 5	<nutzerdefiniert>	nicht vorrangiert	-
15 / 6	<nutzerdefiniert>	nicht vorrangiert	-
15 / 7	<nutzerdefiniert>	nicht vorrangiert	-

3.2.2 Measured values

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

3.2.2.1 Recorded measured values

Offset	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to ...)	Internal object no.
16	Ia =	Ia	3276.7 A	601
18	Ib =	Ib	3276.7 A	602
20	Ic =	Ic	3276.7 A	603
22	In =	In	3276.7 A	604
24	I1 =	I1 (positive sequence)	3276.7 A	605
26	I2 =	I2 (negative sequence)	3276.7 A	606
28	ΘRotor =	Temperature of Rotor	327.67 %	805
30	Θ / Θtrip =	Thermal Overload	327.67 %	807

3.2.2.2 Mean values

Offset	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to ...)	Internal object no.
32	I1dmd =	I1 (positive sequence) demand	3276.7 A	833
34	<user-defined>	not pre-allocated	-	-

3.2.3 Metered measurands

- Ref. to chap. 1.3.3 for additional notes regarding scaling of metered measurands.

Offset	Designation of the SIPROTEC objects	Comments	Scaling (2^{31}-1 corresponds to ...)	Internal object no.
36	Wp(puls) =	Pulsed Energy Wp (active) (metering impulses at binary input)	2^{31}-1 impulses	888
40	Wq(puls) =	Pulsed Energy Wq (reactive) (metering impulses at binary input)	2^{31}-1 impulses	889

3.2.4 Statistic values

Offset	Designation of the SIPROTEC objects	Comments	Scaling (2^{31}-1 corresponds to ...)	Internal object no.
44	Op.Hours =	Counter of operating hours of the primary equipment	2^{31}-1 hours	1020

Standard mapping 3-3

4

This chapter describes the data in the PROFIBUS-DP messages between the PROFIBUS-DP master and the SIPROTEC devices 7SJ61...7SJ64, 6MD63 if standard mapping 3-3 is selected.

4.1 Message in output direction

4.1.1 Double commands

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

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
0 / 0	52Breaker OFF	52 Breaker, Impulse output, 3 relays (2-pole ON, 1-pole OFF)	-
0 / 1	52Breaker ON		
0 / 2	Disc.Swit. OFF	Disconnect Switch, Impulse output, 2 relays, 1-pole	-
0 / 3	Disc.Swit. ON		
0 / 4	GndSwit. OFF	Ground Switch, Impulse output, 2 relays, 1-pole	-
0 / 5	GndSwit. ON		
0 / 6	Q2 Op/Cl OFF	Impulse output, 2 relays, 1-pole	-
0 / 7	Q2 Op/Cl ON		
1 / 0	Q9 Op/Cl OFF	Impulse output, 2 relays, 1-pole	-
1 / 1	Q9 Op/Cl 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		

4.1.2 Single 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	<user-defined> OFF	not pre-allocated	-
2 / 1	<user-defined> ON		
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	<user-defined> OFF	not pre-allocated	-
3 / 1	<user-defined> ON		
3 / 2	<user-defined> OFF	not pre-allocated	-
3 / 3	<user-defined> ON		

4.1.3 Internal commands

- Ref. to chap. 1.5.1 for additional notes regarding “Control mode REMOTE”.

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
3 / 4	<user-defined> OFF	not pre-allocated	-
3 / 5	<user-defined> ON		
3 / 6	ModeREMOTE LOCKED	Control mode REMOTE = LOCKED	-
3 / 7	ModeREMOTE UNLOCKED	Control mode REMOTE = UNLOCKED	

4.1.4 User-defined single commands or taggings

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

4.2 Message in input direction

4.2.1 Annunciations

4.2.1.1 Double-point indications

- User-defined double-point indications (e.g. checkback indications of double commands) 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.
0 / 0	52Breaker OFF	Checkback indication 52 Breaker	-
0 / 1	52Breaker ON		
0 / 2	Disc.Swit. OFF	Checkback indication Disconnect Switch	-
0 / 3	Disc.Swit. ON		
0 / 4	GndSwit. OFF	Checkback indication Ground Switch	-
0 / 5	GndSwit. ON		
0 / 6	Q2 Op/Cl OFF	Checkback indication Q2	-
0 / 7	Q2 Op/Cl ON		
1 / 0	Q9 Op/Cl OFF	Checkback indication Q9	-
1 / 1	Q9 Op/Cl 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		

4.2.1.2 User-defined single-point indications or taggings

- User-defined protection annunciations, single-point indications or 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.
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	-
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	-
5 / 2	<user-defined>	not pre-allocated	-
5 / 3	<user-defined>	not pre-allocated	-
5 / 4	<user-defined>	not pre-allocated	-
5 / 5	<user-defined>	not pre-allocated	-
5 / 6	<user-defined>	not pre-allocated	-
5 / 7	<user-defined>	not pre-allocated	-

4.2.1.3 Diagnosis

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
6 / 0	Device OK	1 = Update of the device replica in the SIPROTEC device completed after initial start or restart	51
6 / 1	ProtActive	1 = At least one protection function is active	52
6 / 2	Settings Calc.	1 = Settings calculation is running	70
6 / 3	Error Sum Alarm	1 = Error with a summary alarm ON	140
6 / 4	Alarm Sum Event	1 = Alarm summary event ON	160
6 / 5	Relay PICKUP	1 = Relay PICKUP (group signal)	501
6 / 6	Relay TRIP	1 = Relay GENERAL TRIP command	511
6 / 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.)	-

4.2.1.4 Measurement supervision

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 0	Fail I Superv.	1 = Failure: General current supervision	161
7 / 1	Failure Σ I	1 = Failure: Current summation	162
7 / 2	Fail Ph. Seq.	1 = Failure: Phase sequence	171
7 / 3	MeasSup OFF	1 = Measurement supervision is switched OFF	197

4.2.1.5 Set point alarms

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 4	SP. Op Hours>	1 = Set point operating hours	272
7 / 5	SP. IA dmd>	1 = Set point phase A dmd>	273
7 / 6	SP. IB dmd>	1 = Set point phase B dmd>	274
7 / 7	SP. IC dmd>	1 = Set point phase C dmd>	275
8 / 0	SP. I1 dmd>	1 = Set point positive sequence I1 dmd>	276
8 / 1	SP. |Pdmd|>	1 = Set point |Pdmd|>	277
8 / 2	SP. |Qdmd|>	1 = Set point |Qdmd|>	278

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
8 / 3	SP. |Sdmd|>	1 = Set point |Sdmd|>	279
8 / 4	SP. 37-1 alarm	1 = Set point 37-1 undercurrent alarm	284
8 / 5	SP. PF(55)alarm	1 = Set point 55 power factor alarm	285
8 / 6	<user-defined>	not pre-allocated	-
8 / 7	<user-defined>	not pre-allocated	-

4.2.1.6 Status annunciations

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

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
9 / 0	>No Volt.	1 = Binary input "No voltage (fuse blown)" is active	-
9 / 1	DataStop	1 = "Stop data transmission" is active	-
9 / 2	Test mode	1 = Test mode is active	-
9 / 3	Cntrl Auth (device 7SJ63, 7SJ641/642/645, 6MD63)	Control authority (0 = REMOTE, 1 = LOCAL)	-
9 / 4	ModeLOCAL (device 7SJ63, 7SJ641/642/645, 6MD63)	Control mode LOCAL (0 = LOCKED, 1 = UNLOCKED)	-
9 / 5	ModeREMOTE	Control mode REMOTE (0 = LOCKED , 1 = UNLOCKED)	-
9 / 6	<user-defined>	not pre-allocated	-
9 / 7	<user-defined>	not pre-allocated	-

4.2.2 Measured values

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

4.2.2.1 Recorded 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	In =	In	3276.7 A	604
18	Va-b =	Va-b	327.67 kV	624
20	Vb-c =	Vb-c	327.67 kV	625
22	Vc-a =	Vc-a	327.67 kV	626
24	VN =	VN	327.67 kV	627
26	P =	P (active power)	327.67 MW	641
28	Q =	Q (reactive power)	327.67 MVAR	642
30	S =	S (apparent power)	327.67 MVA	645
32	Freq =	Frequency	327.67 Hz	644
34	PF =	Power Factor	3.2767	901
36	I1 =	I1 (positive sequence)	3276.7 A	605
38	I2 =	I2 (negative sequence)	3276.7 A	606
40	V1 =	V1 (positive sequence)	327.67 kV	629
42	V2 =	V2 (negative sequence)	327.67 kV	630
44	Td1 =	Transducer 1	32.767 mA	996
46	Td2 =	Transducer 2	32.767 mA	997

4.2.2.2 Mean values

Offset	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to ...)	Internal object no.
48	I1dmd =	I1 (positive sequence) demand	3276.7 A	833
50	Pdmd =	Active power demand	327.67 MW	834

4.2.3 Metered measurands

- Ref. to chap. 1.3.3 for additional notes regarding scaling of metered measurands.

Offset	Designation of the SIPROTEC objects	Comments	Skalierung (2^{31}-1 corresponds to ...)	Internal object no.
52	Wp(puls) =	Pulsed Energy Wp (active) (metering impulses at binary input)	2^{31}-1 impulses	888
56	Wq(puls) =	Pulsed Energy Wq (reactive) (metering impulses at binary input)	2^{31}-1 impulses	889
60	WpForward =	Wp Forward (metered measurand derived from measured value)	2^{31}-1 impulses	924
64	WqForward =	Wq Forward (metered measurand derived from measured value)	2^{31}-1 impulses	925
68	WpReverse =	Wp Reverse (metered measurand derived from measured value)	2^{31}-1 impulses	928
72	WqReverse =	Wq Reverse (metered measurand derived from measured value)	2^{31}-1 impulses	929

4.2.4 Statistic values

- Ref. to chap. 1.3.3 for additional notes regarding scaling of metered measurands.

Offset	Designation of the SIPROTEC objects	Comments	Skalierung (2^{31}-1 corresponds to ...)	Internal object no.
76	Op.Hours =	Counter of operating hours of the primary equipment	2^{31}-1 hours	1020

Standard mapping 3-4

5

This chapter describes the data in the PROFIBUS-DP messages between the PROFIBUS-DP master and the SIPROTEC devices 7SJ61...7SJ64, 6MD63 if standard mapping 3-4 is selected.

5.1 Message in output direction

5.1.1 Double commands

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
0 / 0	52Breaker OFF	52 Breaker, Impulse output, 3 relays (2-pole ON, 1-pole OFF)	-
0 / 1	52Breaker ON		
0 / 2	Disc.Swit. OFF	Disconnect Switch, Impulse output, 2 relays, 1-pole	-
0 / 3	Disc.Swit. ON		
0 / 4	GndSwit. OFF	Ground Switch, Impulse output, 2 relays, 1-pole	-
0 / 5	GndSwit. ON		

5.1.2 Single 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.
0 / 6	<user-defined> OFF	not pre-allocated	-
0 / 7	<user-defined> ON		

5.1.3 Internal commands

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

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
1 / 0	Group A		-
1 / 1	Group A	Activation of setting group A	
1 / 2	Group B		-
1 / 3	Group B	Activation of setting group B	

5.1.4 User-defined single commands or taggings

- User-defined single commands or taggings 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.
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		

5.2 Message in input direction

5.2.1 Annunciations

5.2.1.1 Double-point indications

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
0 / 0	52Breaker OFF	Checkback indication 52 Breaker	-
0 / 1	52Breaker ON		
0 / 2	Disc.Swit. OFF	Checkback indication Disconnect Switch	-
0 / 3	Disc.Swit. ON		
0 / 4	GndSwit. OFF	Checkback indication Ground Switch	-
0 / 5	GndSwit. ON		

5.2.1.2 User-defined single-point indications or taggings

- User-defined protection annunciations, single-point indications or 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.
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	-

5.2.1.3 Time overcurrent protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
2 / 0	50-2 TRIP	1 = 50-2 TRIP	1805
2 / 1	50-1 TRIP	1 = 50-1 TRIP	1815

5.2.1.4 Sensitive ground fault protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
2 / 2	50Ns-2 TRIP	1 = 50Ns-2 TRIP	1223
2 / 3	50Ns-1 TRIP	1 = 50Ns-1 TRIP	1226

5.2.1.5 Thermal overload protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
2 / 4	49 Th O/L TRIP	1 = 49 Thermal overload TRIP	1521
2 / 5	49 O/L Θ Alarm	1 = 49 Overload alarm! Near thermal TRIP	1516

5.2.1.6 Directional time overcurrent protection

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
2 / 6	67-2 TRIP	1 = 67-2 TRIP	2649
2 / 7	67-1 TRIP	1 = 67-1 TRIP	2665

5.2.1.7 Diagnosis

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
3 / 0	Device OK	1 = Update of the device replica in the SIPROTEC device completed after initial start or restart	51
3 / 1	ProtActive	1 = At least one protection function is active	52
3 / 2	Settings Calc.	1 = Settings calculation is running	70
3 / 3	Error Sum Alarm	1 = Error with a summary alarm ON	140
3 / 4	Alarm Sum Event	1 = Alarm summary event ON	160
3 / 5	Relay PICKUP	1 = Relay PICKUP (group signal)	501
3 / 6	Relay TRIP	1 = Relay GENERAL TRIP command	511
3 / 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.)	-

5.2.2 Measured values

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

Offset	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to ...)	Internal object no.
4	Va-b =	Va-b	327.67 kV	624
6	Ia =	Ia	3276.7 A	601
8	Ib =	Ib	3276.7 A	602
10	Ic =	Ic	3276.7 A	603
12	INs Reac =	Reactive ground current in isol. systems	3276.7 A	702
14	P =	P (active power)	327.67 MW	641
16	Q =	Q (reactive power)	327.67 MVAR	642
18	PF =	Power Factor	3.2767	901

5.2.3 Metered measurands

- Ref. to chap. 1.3.3 for additional notes regarding scaling of metered measurands.

Offset	Designation of the SIPROTEC objects	Comments	Skalierung (2^{31}-1 corresponds to ...)	Internal object no.
20	WpForward =	Wp Forward (metered measurand derived from measured value)	2^{31}-1 impulses	924
24	WqForward =	Wq Forward (metered measurand derived from measured value)	2^{31}-1 impulses	925

Standard mapping 3-5

6

This chapter describes the data in the PROFIBUS-DP messages between the PROFIBUS-DP master and the SIPROTEC devices 7SJ61...7SJ64, 6MD63 if standard mapping 3-5 is selected.

6.1 Message in output direction

6.1.1 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)	-

6.1.2 Double commands

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

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
2 / 0	52Breaker OFF	52 Breaker, Impulse output, 3 relays (2-pole ON, 1-pole OFF)	-
2 / 1	52Breaker ON		
2 / 2	Disc.Swit. OFF	Disconnect Switch, Impulse output, 2 relays, 1-pole	-
2 / 3	Disc.Swit. ON		
2 / 4	Q2 Op/Cl OFF	Impulse output, 2 relays, 1-pole	-
2 / 5	Q2 Op/Cl 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		

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
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		

6.1.3 Internal commands

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

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
4 / 0	Group A		-
4 / 1	Group A	Activation of setting group A	
4 / 2	Group B		-
4 / 3	Group B	Activation of setting group B	
4 / 4	Group C		-
4 / 5	Group C	Activation of setting group C	
4 / 6	Group D		-
4 / 7	Group D	Activation of setting group D	

6.1.4 User-defined single commands or taggings

- User-defined single commands or taggings 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.
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		
6 / 0	<user-defined> OFF	not pre-allocated	-
6 / 1	<user-defined> ON		

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

6.2 Message in input direction

6.2.1 Annunciations

6.2.1.1 Double-point indications

- User-defined double-point indications (e.g. checkback indications of double commands) 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.
0 / 0	52Breaker OFF	Checkback indication 52 Breaker	-
0 / 1	52Breaker ON		
0 / 2	Disc.Swit. OFF	Checkback indication Disconnect Switch	-
0 / 3	Disc.Swit. ON		
0 / 4	GndSwit. OFF	Checkback indication Ground Switch	-
0 / 5	GndSwit. ON		
0 / 6	Q2 Op/Cl OFF	Checkback indication Q2	-
0 / 7	Q2 Op/Cl 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		

6.2.1.2 Trip indications

- User-defined protection annunciations, single-point indications or 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.
2 / 0	50(N)/51(N)TRIP	1 = 50(N)/51(N) TRIP	1791
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	-

6.2.1.3 Alarms

- User-defined protection annunciations, single-point indications or 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.
3 / 4	50(N)/51(N) PU	1 = 50(N)/51(N) O/C PICKUP	1761
3 / 5	SP. PF(55)alarm	1 = Set point 55 power factor alarm	285
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	-

6.2.1.4 External signals

- User-defined protection annunciations, single-point indications or 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.
4 / 6	<user-defined>	not pre-allocated	-
4 / 7	>SF6-Loss	1 = Binary input "SF6-Loss" is active	-
5 / 0	<user-defined>	not pre-allocated	-
5 / 1	<user-defined>	not pre-allocated	-
5 / 2	<user-defined>	not pre-allocated	-
5 / 3	<user-defined>	not pre-allocated	-

6.2.1.5 Setting group

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

6.2.1.6 Diagnosis

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
6 / 0	Device OK	1 = Update of the device replica in the SIPROTEC device completed after initial start or restart	51
6 / 1	ProtActive	1 = At least one protection function is active	52
6 / 2	Settings Calc.	1 = Settings calculation is running	70
6 / 3	Error Sum Alarm	1 = Error with a summary alarm ON	140
6 / 4	Alarm Sum Event	1 = Alarm summary event ON	160
6 / 5	Relay PICKUP	1 = Relay PICKUP (group signal)	501
6 / 6	Relay TRIP	1 = Relay GENERAL TRIP command	511
6 / 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.)	-

6.2.1.7 Device status

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

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
7 / 0	Test mode	1 = Test mode is active	-
7 / 1	DataStop	1 = "Stop data transmission" is active	-
7 / 2	<user-defined>	not pre-allocated	-
7 / 3	<user-defined>	not pre-allocated	-
7 / 4	ModeREMOTE	Control mode REMOTE (0 = LOCKED , 1 = UNLOCKED)	-
7 / 5	MeasSup OFF	1 = Measurement supervision is switched OFF	197
7 / 6	<user-defined>	not pre-allocated	-
7 / 7	<user-defined>	not pre-allocated	-
8 / 0	>NoVolt.	1 = Binary input "No Voltage (Fuse blown)" is active	
8 / 1	FAIL: Trip cir.	1 = 74TC Failure trip circuit	6865

6.2.1.8 Measurement supervision

Offset	Designation of the SIPROTEC objects	Comments	Internal object no.
8 / 2	Failure Σ I	1 = Failure: Current Summation	162
8 / 3	Fail I balance	1 = Failure: Current Balance	163
8 / 4	Fail V balance	1 = Failure: Voltage Balance	164
8 / 5	Fail Ph. Seq.	1 = Failure: Phase Sequence	171
8 / 6	Fail Ph. Seq. I	1 = Failure: Phase Sequence Current	175
8 / 7	Fail Ph. Seq. V	1 = Failure: Phase Sequence Voltage	176

6.2.1.9 User-defined single-point indications or taggings

- User-defined protection annunciations, single-point indications or 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	-

6.2.2 Measured values

- Ref. to chap.1.3.2 for additional 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	In =	In	3276.7 A	604
18	Va-b =	Va-b	327.67 kV	624
20	Vb-c =	Vb-c	327.67 kV	625
22	Vc-a =	Vc-a	327.67 kV	626
24	VN =	VN	327.67 kV	627
26	P =	P (active power)	327.67 MW	641
28	Q =	Q (reactive power)	327.67 MVAR	642
30	S =	S (apparent power)	327.67 MVA	645
32	Freq =	Frequency	327.67 Hz	644
34	PF =	Power Factor	3.2767	901
36	<user-defined>	not pre-allocated	-	-
38	<user-defined>	not pre-allocated	-	-

6.2.3 Statistic values

Offset	Designation of the SIPROTEC objects	Comments	Skalierung (2^{31}-1 corresponds to ...)	Internal object no.
40	Op.Hours =	Counter of operating hours of the primary equipment	2^{31}-1 hours	1020

6.2.4 Metered measurands

- Ref. to chap. 1.3.3 for additional notes regarding scaling of metered measurands.

Offset	Designation of the SIPROTEC objects	Comments	Skalierung (2^{31}-1 corresponds to ...)	Internal object no.
44	<user-defined>	not pre-allocated	-	-
48	<user-defined>	not pre-allocated	-	-
52	WpForward =	Wp Forward (metered measurand derived from measured values)	2^{31}-1 impulses	924
56	WqForward =	Wq Forward (metered measurand derived from measured values)	2^{31}-1 impulses	925
60	WpReverse =	Wp Reverse (metered measurand derived from measured values)	2^{31}-1 impulses	928
64	WqReverse =	Wq Reverse (metered measurand derived from measured values)	2^{31}-1 impulses	929

6.2.5 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.
68	Control_I	Handshake byte for event list via PROFIBUS-DP	-
69	SPARE	reserved for future use (the value 0 is transmitted at this position)	-
70	Message block #1	Identification #1	-
71		Value #1	
72 - 79		Time stamp #1	
80	Message block #2	Identification #2	-
81		Value #2	
82 - 89		Time stamp #2	
90	Message block #3	Identification #3	-
91		Value #3	
92 - 99		Time stamp #3	

Glossary

CFC	Continuous Function Chart
DC	Double command
DDB file / GSD file	The DDB file contains the Device Data Base (technical characteristics) of the PROFIBUS-DP communication module (PROFIBUS-DP slave). This file is required for configuration of the PROFIBUS-DP master and is supplied together with DIGSI.
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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