SIEMENS

# SIPROTEC

# Line Differential Protection 7SD80

Communication Module

PROFIBUS DP

Bus Mapping



C53000-L2140-C347-1

**NOTE**

For your own safety, please observe the warnings and safety instructions contained in this document.



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# Preface

### Purpose of this manual

This manual describes the data in the PROFIBUS-DP messages of the SIPROTEC devices 7SD80 and is devided 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.

### 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.

### 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 devices:

- 7SD80 (firmware version 4.60 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 page 3),
- PROFIBUS-DP standard mappings 3-1 to 3-n
  (n = device type dependent number of standard mappings).

### Additional Support

Should further information on the System SIPROTEC 4 be desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, he matter should be referred to the local Siemens representative.

Our Customer Support Center provides a 24-hour service.

Phone: +49 -180 - 5 24 70 00
Fax: +49 -180 - 5 24 24 71
e-mail: support.energy@siemens.com

### Training courses

Enquiries regarding individual training courses should be addressed to our Training Center:

Siemens AG
Power Transmission and Distribution
Power Training Center
Humboldtstr. 59
90459 Nuremberg
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eMail power-academy.energy@siemens.com
Internet: www.siemens.com/energy/power-academy

## 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 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.

# Contents

# 1 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.

# 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 3 defines the data area of the PROFIBUS-DP messages for data transfer between the PROFIBUS-DP slave of the SIPROTEC devices 7SD80 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".

## 1.2 Messages in output direction

The messages in PROFIBUS-DP output direction: PROFIBUS-DP master to the SIPROTEC device (refer to chapter 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:* refer to chapter 2.1

*Standard mapping 3-2:* refer to chapter 3.1

# 1.3 Messages in input direction

The messages in PROFIBUS-DP input direction: SIPROTEC device to the PROFIBUS-DP master (refer to chapter 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:* refer to chapter 2.2.1

*Standard mapping 3-2:* refer to chapter 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:

→ 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 √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".

**References**

*Standard mapping 3-1:* refer to chapter 2.2.2

*Standard mapping 3-1:* refer to chapter 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 7SD80 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 7SD80 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 | Output - 4 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 | Input - 2 Bytes | Adr_Ix + 48 | |
| 4 | Input - 16 Words, consistent | Adr_Ix + 50 | |
| 5 | Output - 6 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 (refer to chapter 2.2 and 3.2).

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 (refer to chapter 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 (refer to chapter 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 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 automtically 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:* refer to chapter 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:* refer to chapter 2.1.2

*Standard mapping 3-2:* refer to chapter 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:* refer to chapter 2.2.1.3

*Standard mapping 3-2:* refer to chapter 3.2.1.5

# 2 Standard mapping 3-1

This chapter describes the data in the PROFIBUS-DP messages between the PROFIBUS-DP master and the SIPROTEC devices 7SD80 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 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

- Refer to chapter 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 mode OFF | Deactivation of test mode device | |
| 1 / 1 | Test mode ON | Activation of test mode device | |
| 1 / 2 | Commiss.87OFF | Deactivation of Commissioning state of 87 | 3191 |
| 1 / 3 | Commiss.87 ON | Activation of Commissioning state of 87 | |
| 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 | |
| 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 | |

| Offset | Designation of the SIPROTEC objects | Comments | Internal object no. |
|---|---|---|---|
| 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

- Refer to chapter 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 | Daten gültig | 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 / 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 |

### 2.2.1.6 Auto reclose function

- Offset 7 / 7 is available with 7SD80 V4.33 or higher.

| 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 |

## 2.2.2 Measured values

- Refer to chapter 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 | IStab3I0 = | IStab 3I0 (in I/InO) | 327,67 % | 32226 |
| 40 | PI FO A/m | Prot. Interface FO: Availability per min. | 327.67 % | 7753 |
| 42 | PI FO A/h | Prot. Interface FO: Availability per hour | 327.67 % | 7754 |
| 44 | PI Cu A/m | Prot. Interface Cu: Availability per min. | 327.67 % | 7755 |
| 46 | PI Cu A/h | Prot. Interface Cu: Availability per hour | 327.67 % | 7756 |

# 3 Standard mapping 3-2

This chapter describes the data in the PROFIBUS-DP messages between the PROFIBUS-DP master and the SIPROTEC devices 7SD80 if standard mapping 3-2 is selected.

# 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<br>(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

- Refer to chapter 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 | | |
| 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 | Setting group A | | - |
| 4 / 1 | Setting group A | Activation of setting group A | |
| 4 / 2 | Setting group B | | - |
| 4 / 3 | Setting group B | Activation of setting group B | |
| 4 / 4 | Setting group C | | - |
| 4 / 5 | Setting group C | Activation of setting group C | |
| 4 / 6 | Setting group D | | - |
| 4 / 7 | Setting group D | Activation of 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

- Refer to chapter 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 / 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 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 |

### 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 |
| 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 / 7 | 50(N)-B1 TRIP | 1 = 50(N)-B1 TRIP | 7221 |
| 8 / 0 | 50(N)-B2 TRIP | 1 = 50(N)-B2 TRIP | 7222 |
| 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

- Refer to chapter 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 | IStab3I0 = | IStab 3I0 (in I/InO) | 327,67 % | 32226 |
| 32 | PI FO A/m | Prot. Interface FO: Availability per min. | 327.67 % | 7753 |
| 34 | PI FO A/h | Prot. Interface FO: Availability per hour | 327.67 % | 7754 |
| 36 | PI Cu A/m | Prot. Interface Cu: Availability per min. | 327.67 % | 7755 |
| 38 | PI Cu A/h | Prot. Interface Cu: 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<br>(the value 0 is transmitted at this position) | - |
| 52 | Message block #1 | Identification #1 | - |
| 53 | | Value #1 | |
| 54<br>-<br>61 | | Time stamp #1 | |
| 62 | Message block #2 | Identification #2 | - |
| 63 | | Value #2 | |
| 64<br>-<br>71 | | Time stamp #2 | |
| 72 | Message block #3 | Identification #3 | - |
| 73 | | Value #3 | |
| 74<br>-<br>81 | | 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

# Index