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PROFIBUS DP

5.19 Profibus-DP

5.19.1 Technical Description

TesiMod operating terminals allow for a simple connection to the Profibus-DP thus making TesiMod operating terminals the perfect man-machine-interface for systems using the Profibus-DP.
Moreover it is possible to connect multiple operating terminals to one master controller.

The speed-optimized PROFIBUS-DP is a variant of PROFIBUS that has been particularly tailored to suit the communication between automation systems and decentral peripherals.

The Profibus-DP implemented in the operating terminal complies with the standard DIN 19245 part 1 and part 3 as well as the European field bus standard EN 50170.

The TesiMod operating terminal complies with the conditions specified by the standards thus allowing its trouble-free integration into the Profibus-DP as a slave.

An additional hardware is used to connect the operating terminal to the Profibus. Located on this hardware is the ASIC SPC3 which handles the entire PROFIBUS-DP protocol, thus allowing transmission speeds of up to 12 MBaud.

The operating terminal is employed on the bus as if it were a decentral module with up to 32 inputs and outputs and therefore occupies between 8 and 32 bytes IN-data and between 8 and 32 bytes OUT-data. Via the bus, the input and output statuses are exchanged between the master and operating terminal at cyclic intervals.

The Profibus-DP protocol is a manufacturer or controller-neutral data transmission protocol.
Because no hardware input and output statuses are transmitted in the operating terminal, a data profile must be specified between master and slave which allows the corresponding partner to identify the type of the data that have been transmitted.

All services required for the operation of the operating terminal are initiated by the operating terminal. The operating terminal has a client functionality.
The controller simply reacts to requests from the operating terminal. The controller has a server-functionality.

If the operating terminal is integrated into the Profibus-DP, the master module needs to interpret the arriving data in accordance with the specified profile and also needs to respond in accordance with the profile.
This is generally accomplished by a FB (function block) in the controller, which is capable of reading the request from the IN-data and of writing a response to the OUT-data.

5.19.2 Specification within the Profibus-DP

The specification of the operating terminal in the PROFIBUS-DP is determined by the supplied device-master-data-file SUET081A.GSD (refer to chapter *5.19.11 Device-Master-Data-File*).

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Telegram Length
The data length can be between 8 and 32 bytes or 4 and 16 words respectively. A fixed setting of this length can be specified by means of the TesiMod programming software and must be set in the master accordingly.

Station Address
The station address can be preset by means of the TesiMod programming software or can be set via the operating terminal to a value between 3 and 124.

Baud Rate
The transmission rate is automatically detected. The maximum rate is 12 MBaud.

Diagnosis
The station-oriented diagnosis is implemented in the operating terminal.
Five bytes of user diagnosis data are transmitted
- 1st byte Error number
  1 = Communication Error at OperatingTerminal
- 2nd and 3rd byte Communication Error Code
- 4th and 5th byte Communication Error Subcode

Communication Code and Subcode are values that are also displayed at the operating terminal.

5.19.3 Data Profile

To allow a direct data access to the various data areas within a controller, a data profile must be determined between master and slave.

The first 4 bytes of the specified telegram length are used as follows:
- Control and length of the telegram,
- definition of the access and
- definition of the data area

5.19.3.1 Structure of the Profile

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6		Byte n
Number User Data	Access	Offset Low	Offset High	User Data 1st Byte	User Data 2nd Byte		User Data nth Byte

Figure 5.19-1: Request-telegram

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6		Byte n
Number User Data	Access	0x00	Returncode Error	User Data 1st Byte	User Data 2nd Byte		User Data nth Byte

Figure 5.19-2: Response-Telegram

5.19.3.2 Control Bytes

a) Byte 1

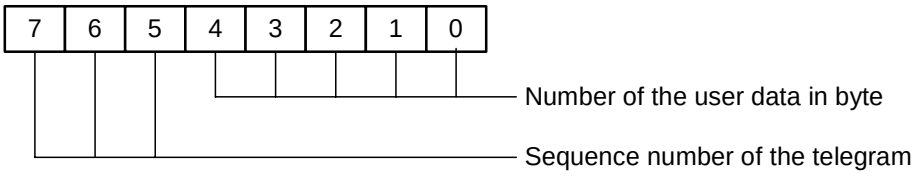


Figure 5.19-3: Structure of control byte 1

Number:
Contains the number of the user data transmitted.

Sequence Number:
Allows the controller program to recognize whether a new request has arrived from the operating terminal.

b) Byte 2

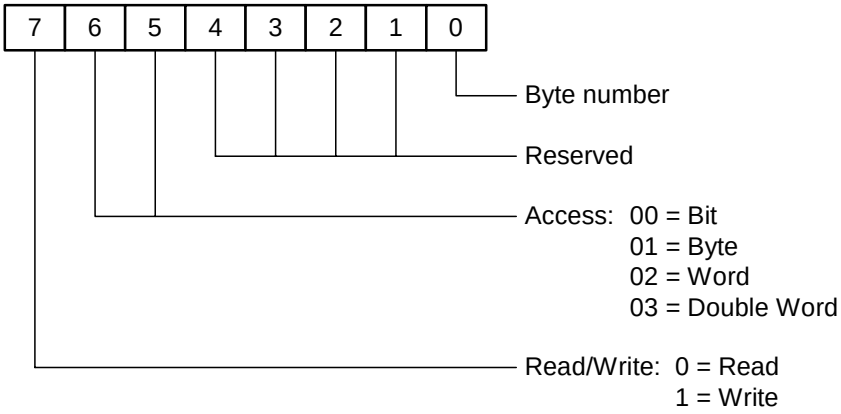


Figure 5.19-4: Structure of control byte 2

Byte Number:
The first (0) or second (1) byte is addressed for byte access on a word address.

Access:
This value indicates whether bits, bytes, words or double words are read or written from the specified data area.

Data Direction:
Bit 7 marks the data direction, i.e. whether the controller is read from or written to.

c) Bytes 3 and 4
These bytes are used to transmit the offset within the specified data area.

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5.19.3.3 User Data

The user data as of byte 5 up to telegram length are assigned in accordance with the access.

5.19.3.3.1 Reading and Writing Bytes

During read and write operations up to 28 bytes of user data can be transmitted - depending on the telegram length and access.
During write operations, the user data are located in the request telegram from byte 5 onwards.
During read operations, the user data are located in the response telegram from byte 5 onwards as well.

Byte 5	Byte 6		Byte n
User Data 1. Byte	User Data 2. Byte		User Data n. Byte

Figure 5.19-5: Structure of request telegram

5.19.3.3.2 Reading Bits

During bit read-operations, a bit, a byte, a word or a double word is read depending on the address width of the data area to be read (refer to chapter *5.19.3.3.1 Reading and Writing Bytes*). The requested bits are then masked out and displayed by the operating terminal.

5.19.3.3.3 Writing Bits

Only one bit is set or deleted at one time.
The controller receives a bit mask and a logic information via the request telegram. The operating terminal uses this bit mask and the logic information to set or delete the bit at the destination address. The byte-order of the bit mask in the case of word addresses complies with the protocol parameter BYTE-ORDER.

Byte 5	Byte 6
Bit Mask	Logic Instruction 0 = AND/ 1 = OR

Figure 5.19-6: Writing bits to a byte address

Byte 5	Byte 6	Byte 7
Bit Mask Low	Bit Mask High	Logic Instruction 0 = AND / 1 = OR

Figure 5.19-7: Writing bits to a word address

5.19.4 Tasks of the Control Program

The control program, generally consisting of a function block, is required to handle the requests from the operating terminal in accordance with the data profile.

This process is controller-specific and is therefore described in the following chapters in a controller-specific manner.

5.19.5 Connection to Siemens-PLC S5

The program of the PLC communicates with the Profibus-DP via the I/O-peripheral area.

An IN and OUT-data channel is assigned to every Profibus-station, to every connected operating terminal.
The assignment is performed via the parameterization of the Siemens PLCs Profibus-DP master module.
Two modules, the IM308B and IM308C, are used in the Siemens-S5 PLCs.

5.19.5.1 Parameterization of the IM308B

To parameterize the IM308B, a device-type-file is available for the COMET200 programming software. (BT081ATD.200)

The element "Configuration" allows the DP-Slave, i.e. the operating terminal, to be configured.
The following parameters are set:

1. Location of the operating terminal in the peripheral area, i.e. the I/O-addresses to be occupied by the operating terminal.
2. The DP-identifier via module 0
   – I/O: X
   – Length: 4, 6, 8, 12, 14 and 16
   – Format: Word
   – Consistency: 0
3. Data for the parameterization telegram are not required, no entry.

This configuration is loaded to the IM308B by means of an EPROM-module. This EPROM also contains the entire parameterization of the master module.

5.19.5.1.1 Data Consistency

A data consistency over the entire specified length is required regarding the exchange of data between the operating terminal and the master module.
The master module IM308B and IM308C ensure a consistency only up to a maximum data length of 1 word.
The selection of appropriate settings in the Profibus-DP driver of the TesiMod operating terminals, however, allow a consistency of up to the maximum selectable data length of 32 bytes.

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5.19.5.2 PLC Program

Evaluation of the Control Bytes
The peripheral area assigned to the operating terminal must be polled by the PLC program at cyclic intervals. By means of the sequence number, the PLC Program is capable of determining whether a new request has been received from the operating terminal.

This task is performed by the function block FB110.
FB110 is parameterized with the peripheral address of every operating terminal, thus only one FB is required even if multiple operating terminals are connected.

FB110 is also responsible for *copying bytes 1 and 2* (without any changes) from the request telegram to the response telegram and for writing *0x00* to *byte 3.*

Processing the user data
The processing of the user data is performed by separate read and write FBs that are called by the FB110. The read and write FBs process the user data in accordance with the data profile.

Error Handling
Any errors that have occurred can be entered in the return code, i.e. in byte 4 of the response telegram. If no error has occurred, byte 4 must be deleted.
Possible error: DB does not exist.

5.19.5.2.1 FB110 - Evaluation Block

The function block (FB) uses the flag words (FW) 246 - 254 as scratch flags.

Furthermore, the FB requires one (any) data word of a DB as parameter which is evaluated when the FB is called. This data word is used to store the telegram number.

FB110 checks the contents of byte 1 - bit 5 to 7 at cyclic intervals.
If it contains the value 0, the telegram number memory is reset.
A new request telegram has arrived from the operating terminal that must be evaluated and responded to if byte 1 - bit 5 to 7 does not correspond with the contents of the telegram number memory.

For each operating terminal, the FB110 is called cyclically in the organization block OB1 with the corresponding parameters.

FB110 is called

```
Block OB1

     :SPA  FB 110
Name :PROFIBUS
PEIN :     KF +00128        Peripheral address inputs
PAUS :     KF +00128        Peripheral address outputs
DBNR :     DB 5             Auxiliary data word block
WDNR :     DW 0             Auxiliary data word
     :
     :SPA  FB 110
Name :PROFIBUS
PEIN :     KF +00136        Peripheral address inputs
PAUS :     KF +00136        Peripheral address outputs
DBNR :     DB 5             Auxiliary data word block
WDNR :     DW 1             Auxiliary data word
     :
     :BE
```

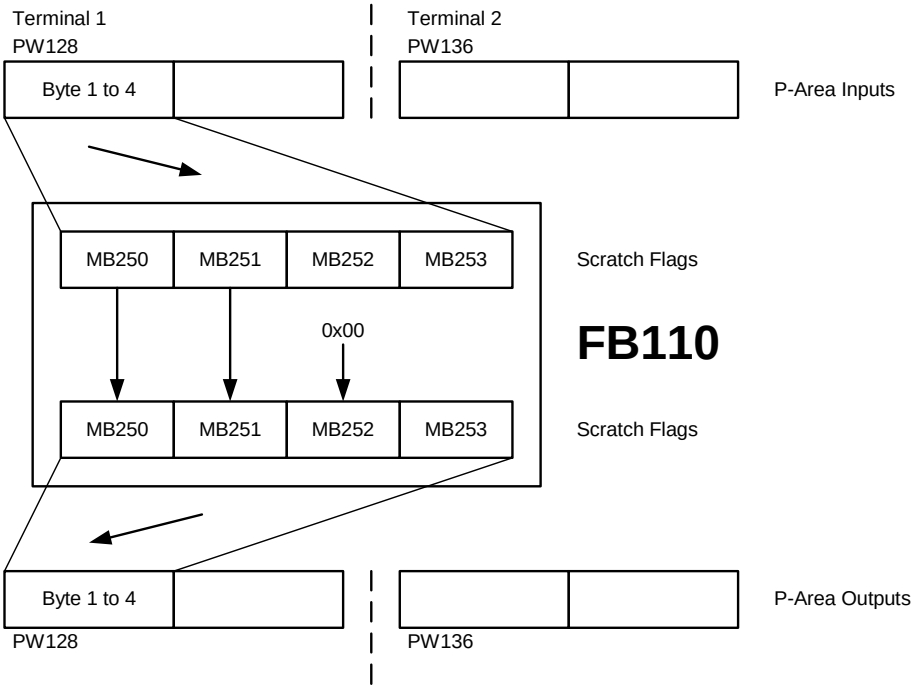


Figure 5.19-8: Structure of the FB110

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5.19.5.2.2 FB111 - Reading from Data Block

The description of this function block is valid from version 2.0 (PROF02ST.SSD) on.

The FB interprets the bytes 3 and 4 of the telegram as follows:
– Byte 3 contains the data block number,
– Byte 4 contains the data word number within the DB.
Bit 0 from the 2nd byte is interpreted as a byte identifier for a byte access on a word address.
0 = DL - high byte
1 = DR - low byte
The numbering of the bytes within the telegram is shown in figure 5.19-1 and 5.19-2.

5.19.5.2.3 FB112 - Writing to Data Block

The description of this function block is valid from version 2.0 (PROF02ST.SSD) on.

The FB interprets the bytes 3 and 4 of the telegram as follows:
– Byte 3 contains the data block number,
– Byte 4 contains the data word number within the DB.
Bit 0 from the 2nd byte is interpreted as a byte identifier for a byte access on a word address.
0 = DL - high byte
1 = DR - low byte

For writing of a bit in a data word the byte 5 and 6 contain the bit mask and byte 7 contains the link command.
The numbering of the bytes within the telegram is shown in figure 5.19-1 and 5.19-2.

5.19.5.2.4 Protocol Parameters for Siemens S5

– Address width = 2
– Byte order is high-low = active

5.19.6 Connection to Bosch-PLC (MD-DP12)

The program of the PLC communicates with the Profibus-DP via the I/O-peripheral area.

An IN and OUT-data channel is assigned to every Profibus-station, every connected operating terminal.
The assignment is performed via the parameterization of the Bosch PLCs Profibus-DP master module.
The module MP-DP12 is used in Bosch-PLCs.

5.19.6.1 Parameterization of the BM_DP12

The parameterization of the BM_DP12 is performed with the Bosch DP-software.
The supplied device-master-data-file SUET081A.GSD is read-in by the DP-software.
This makes the data required for the parameterization of the BT-series available in the DP-software.

The BT-series must be configured with a data length of 8, 12 or 16 **bytes**.

5.19.6.2 PLC Program

Evaluation of the Control Bytes
The peripheral area assigned to the operating terminal must be polled by the PLC program at cyclic intervals. By means of the sequence number, the PLC Program is capable of determining whether a new request has been received from the operating terminal.

This task is performed by the supplied PB - BT_MAIN.
The BT_MAIN is parameterized with the peripheral address of every operating terminal, thus only one BT_MAIN is required even if multiple operating terminals are connected.

BT_MAIN is also responsible for *copying bytes 1 and 2* (without any changes) from the request telegram to the response telegram and for writing *0x00* to *byte 3.*

Processing of the user data
The processing of the user data is performed by separate read and write PBs that are called by the BT_MAIN.

The read and write PBs process the user data in accordance with the data profile.

Error Handling
Any errors that occurred can be entered in the return code, i.e. in byte 4 of the response telegram.
If no error has occurred, byte 4 must be deleted.
Possible error: DB does not exist.

5.19.6.2.1 BT_MAIN - Evaluation Block

The description of this function block is valid from version 1.0 on.

The FB uses the flag words MW246 to MW254 as scratch flags.

Furthermore, the FB requires one (any) data word of a DB as parameter which is evaluated when the PB is called. This data word is used to store the telegram number.

The BT_MAIN checks the contents of byte 1 - bit 5 to 7 at cyclic intervals.
If it contains the value 0, the telegram number memory is reset.
A new request telegram has arrived from the operating terminal that must be evaluated and responded to if byte 1 - bit 5 to 7 does not correspond with the contents of the telegram number memory.

For every operating terminal, the BT_MAIN is called cyclically in the OB1 with the corresponding parameters.

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BT_MAIN is called

```
; OB1  Organization Block
; ******************************************************
; Profibus-DP-Communication with Suetron Operating Terminal
; Example for integration into OB1
; ******************************************************

; Commands required for Profibus
L    W  EZ2,A     ; Address must comply with coupling address
T    W  A,AZ2

; Call once for each operating terminal
BA      -BT_MAIN,4        ;Call for first operating terminal
;                    +---+
P0   W  K10        ; <   ! Address of the input area
P1   W  K10        ; <   ! Address of the output area
P2   W  DB0        ; <   ! Number of the data block
P3   W  D0         ; <   ! Data word number
;                    +---+
PE
```

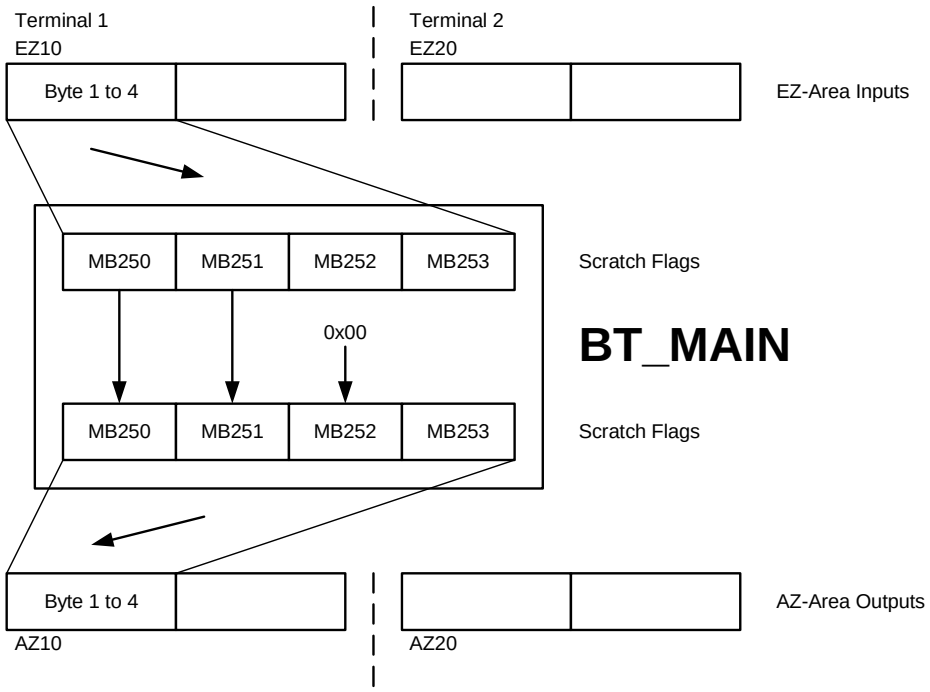


Figure 5.19-9: Structure of the BT_MAIN

5.19.6.2.2 BT_READ - Reading from Data Block

The description of this function block is valid from version 1.0 on.

The FB interpretes the bytes 3 and 4 in the telegram as follows:
– Byte 3 contains the data block number,
– Byte 4 contains the data word number within the DB (0 to 255).

The FB doubles the date word number in order to receive an even-numbered byte number in the DB. Bit 0 in the 2nd byte is interpreted as a byte number for byte access on a word address.
0 = even address - low byte
1 = odd address - high byte

The numbering of the bytes within the telegram is shown in figure 5.19-1 and 5.19-2.

5.19.6.2.3 BT_WRITE - Writing to Data Block

The description of this function block is valid from version 1.0 on.

The FB interprets the bytes 3 and 4 in the telegram as follows:
– Byte 3 contains the data block number,
– Byte 4 contains the data word number within the DB (0 to 255).

The FB doubles the date word number in order to receive an even-numbered byte number in the DB. Bit 0 in the 2nd byte is interpreted as a byte number for byte access on a word address.
0 = even address - low byte
1 = odd address - high byte

During a bit access to the data byte, bytes 5 and 6 contain the bit mask and byte 7 contains the logic instruction.

The numbering of the bytes within the telegram is shown in figure 5.19-1 and 5.19-2.

5.19.6.2.4 Protocol Parameters for Bosch MP-DP12

– Address width = 2
– Byte order is high-low = inactive

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5.19.7 General Protocol Parameters

5.19.7.1 Parameter Maximum Waiting Time for Response

This parameter indicates the minimum intervals of time at which the operating terminal must be polled by the master.
Permitted values are in the range of 0 ms to 65535 ms.
The default value is 1000 ms.

5.19.7.2 Parameter Delay Until Connection Setup

This parameter indicates the period of time after which the operating terminal must be polled by the master for the first time.
Permitted values are in the range of 0 ms to 65535 ms.
The default value is 5000 ms.

5.19.7.3 Parameter Station Number

Any station number between 3 and 124 can be selected.
The default value is 3.

5.19.7.4 Parameter Telegram Length

This parameter must comply with the configuration of the master module.
Permitted values are in the range of 8 bytes to 32 bytes.
The default value is 20 bytes.

5.19.7.5 Floating Point Numbers in the Siemens Format

If you mark this control box, the 4 byte number is interpreted in accordance with the IEEE format. Otherwise the 4 byte number is interpreted in accordance with the Siemens format for floating point numbers.
The default setting for “floating point numbers in the Siemens format” = inactive (unmarked).

5.19.7.6 Parameter Byte Order is High-Low

You can set the byte order to HIGH-LOW otherwise it is set to LOW-HIGH by the programming software.
If the selection box in TSwin remains unmarked, the byte order of the controller is as follows:

within a word
HIGH-byte is located on the LOW-address and
LOW-byte is located on the HIGH-address.
within a double word
HIGH-word is located on the LOW-address and
LOW-word is located on the HIGH-address.

If you mark the selection box in TSwin, the byte order of the controller is as follows:

within a word
HIGH-byte is located on the HIGH-address and
LOW-byte is located on the LOW-address.
within a double word
HIGH-word is located on the HIGH-address and
LOW-word is located on the LOW-address.

5.19.7.7 Parameter Address Width

The address width specifies the number of bytes per address.
1 = byte address
2 = word address
4 = double word address

The default value is 2 = word address.

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5.19.8 Additional Functions

In addition to the random read and write access to PLC variables, a memory area comprising 12 bytes (default) is specified in the mask definition as the poll area.

Only marginal conditions regarding this memory area:
– the PLC must be able to access in bit-mode and the operating terminal in word-mode
– the memory area must be contiguous.
The address location of this memory area is specified in TSwin.

This area must be read using a **word access**.

Example: The cyclic poll area is set to DW100 in TSwin.

Word Address	Reference	High Byte	Low Byte
Word Address + 0	DW100	Write Coordination Byte	Reserved
Word Address + 1	DW101	Message Channel High Byte	Message Channel Low Byte
Word Address + 2	DW102	Function Keys LED 1 to 4	Function Keys LED 5 to 8
Word Address + 3	DW103	Function Keys LED 9 to 12	Function Keys LED 13 to 16
Word Address + 4	DW104	Function Keys LED 17 to 20	Function Keys LED 21 to 24
Word Address + 5	DW105	Function Keys LED 25 to 28	Function Keys LED 29 to 32

Table 5.19-1: Word structured poll area

5.19.9 Physical Interfacing

The interface complies with the standard for PROFIBUS-DP.

Pin	Designation	Function
1	nc	not connected
2	nc	not connected
3	RxD/TxD-P	Receive / Transmit Data Plus
4	CNTR-P	Controller Signal for Repeater Plus
5	DGND	Data Reference Potential
6	VP	Power Supply for the Termination Resistors Plus
7	nc	not connected
8	RxD/TxD-N	Receive / Transmit Data Minus
9	CNTR-N	Controller Signal for Repeater Minus

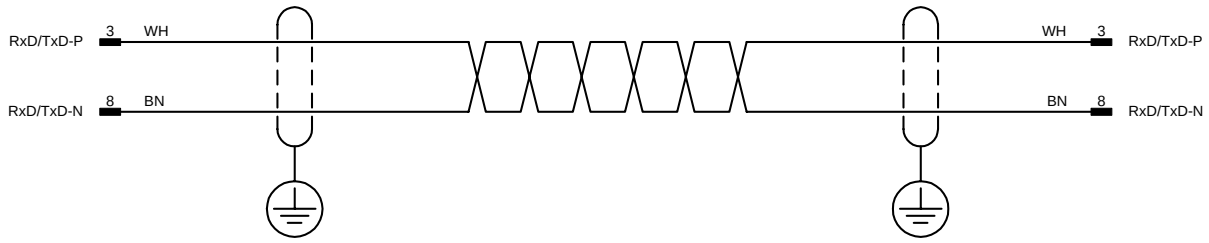
Table 5.19-2: Pin assignment of the PROFIBUS interface

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5.19.9.1 Connecting Cable PROFIBUS-DP

TesiMod
Operating terminal

PROFIBUS-DP
Bus unit



D-Subminiature
Male connector
9-pin

D-Subminiature
Male connector
9-pin

If the wiring is performed in accordance with the figure shown above, the potential difference between the data reference potential DGND of all connections is not allowed to exceed +/- 7 Volts. If this can not be ensured, provisions must be made for a potential equalization.

As bus cable we recommend:
For standard applications the Siemens company's cable order no. 6XV1 830-0AH10.
For drag chain applications the Siemens company's cable order no. 6XV1 830-3BH10.

As connector we recommend:
The Siemens company's connector order no. 6ES79-0BA20-0XA0.

5.19.9.2 Baud Rates and Cable Length

The data traffic via the PROFIBUS can occur with different baud rates. With increasing baud rate the maximally permissible line length decreases.
The following table sets up the tunable baud rates opposite the maximal possible line lengths, that are feasible without repeaters.
These values depend on the cable type A, specified by DIN E 19 245 part 3.

Baud Rate (Bits/s)	Cable Length (m)
9 600	1200
19 200	1200
93 750	1200
187 500	1000
500 000	400
1 500 000	200
3 000 000	100
6 000 000	100
12 000 000	100

Table 5.19-3: Baud rates versa cable length

5.19.9.3 Shielding Recommandations

Generally shielded cables that correspond to the specifications of the Profibus DP should be used for the data bus connections.

In case of use of a shielded data bus cable it is recommended to connect the shielding with the protective ground both ways low-inductively. This encreases ESD protection. An exception concerns separate potentials as they are to be encountered in EX-protected areas. Here only a single-sided protective grounding is permissible.

Preferably the connection between the cable shielding and the protective ground over a metallic equipment case and the screw coupling of the D- subminiature connectors is practised. If this type of shielding is not permissible, the derivation can occur via pin 1 of the connector. We recommend that the derivation via pin 1 is not an optimal solution.

In the sense of an optimal ESD it is better, to lay open the shielding at a suitable column and to connect it onto protective ground with a maximally low-inductive cable connection (e.g. onto the metallic control cabinet). This can occur for example with a cord grip in front of the bus connector.

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5.19.10 Error Messages

Code 1			
Subcode			
	1	E_SLAVE_NOT_READY	Slave not ready
	2	E_PROTOKOL	Sequence of the packets
	3	E_FRAME	Protocol frame error
	4	E_TIMEOUT	Timeout error
	5	E_CRC_BCC	CRC error
	6	E_PARITIY	Parity error
	7	E_SEND_ABORT	Send process aborted
	8	R_REC_ABORT	Receive process aborted
	9	E_BUF_SIZE	Insufficient cyclic buffer
	10	E_NO_DEFINE	No cyclic data defned
	12	E_DEFINE	Cyclic data already defined
	15	E_NO_PROTOCOL	Selected protocol is not supported
	16	E_OVERRUN	Receive overrun
	40	E_SYS_ADDRESS	Undefined system variable
Code 50	Error during initialisation of the SPC3		
Subcode			
	1	IO_LENGTH_ERROR	Buffer too large
	2	INIT_ERROR	No Initialisation of SPC3
	4	MEM_FREE_ERROR	No memory available for message buffer
Code 60		E_CONFIG_ERROR	No configuration of master
	61	E_CONFIG_INPUT_LENGTH	Input-length invalid
	62	E_CONFIG_OUTPUT_LENGTH	Output-length invalid
	63	E_CONFIG_FAULT	Faulty configuration data. New parameterization is necessary.
	64	E_CONFIG_UPDATE	Protocol chip needs update of configuration data. New parameterization is necessary.
	65	E_GO_OFFLINE	No communication via the protocol chip. New parameterization is necessary.

66 E_MAC_RESET ..... Reset from protocol chip. New parameterization is necessary.

67 E_WD_TIMEOUT ..... Watchdog timer error. New parameterization is necessary.

70 E_NO_POLL_TIMEOUT ..... Operating terminal is not polled

Subcode
- 0 Differentiation for manufacturer
- 1 Differentiation for manufacturer

Code 71 E_NO_RESPONSE_TIMEOUT ..... Order is not responded to

Code 100 E_DATA_ERROR ..... Base no. for error from PLC-FB. PLC error is added to 100

Subcode Contains the offset value of the access upon which the error occurred.
e.g.:
102 Access to DB via FB111/FB112
DB does not exist

5.19.11 Device-Master-Data-File

```
;=======================================================================
;===                                                                 ===
;===   Fa. Sütron electronic GmbH                                    ===
;===   Kurze Straße 29                                               ===
;===   70794 Filderstadt                                             ===
;===   Tel.: 0711 / 77098-0                                          ===
;===   Your contact: W. Ebinger, Extention 23                        ===
;===                                                                 ===
;=======================================================================
;===                                                                 ===
;===   Device-Master-Data-File:    SUET081A.GSD                      ===
;===                                                                 ===
;===   Revision Level: GV1.0 - 15 July 1996                          ===
;===                                                                 ===
;=======================================================================
;===                                                                 ===
;===   Bus station, connecting an operating terminal                 ===
;===   of the BT-series                                              ===
;===                                                                 ===
;=======================================================================
;===                                                                 ===
;===   Attention:                                                    ===
;===   ==================                                            ===
```

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```
;===   Improper modification of the parameters may lead to        ===
:===   an undefined system behaviour of the Profibus-DP-bus       ===
;===   and is done at one's own risk.                             ===
;===                                                              ===
;==================================================================
;==================================================================
;
#Profibus_DP
;
;*****************************************************************
; General Data
;*****************************************************************
;
; DP-Device Type
Station_Type = 0
;
; Name of the Manufacturer
Vendor_Name = "Suetron electronic, Filderstadt"
;
; Name of the Device
Model_Name = "BT-Serie"
;
; Revision Level of the DP-Device
Revision = "1.0"
;
; Version Identifier of the DP-Device
Revision_Number = 0x01
;
; Type Number
Ident_Number = 0x081A
;
; Release of the Hardware
Hardware_Release = "SWV1.0"
;
; Release of the Software
Software_Release = "HWV1.0"
;
; Protocol Identifier
Protocol_Ident = 0
;
; Supported Baud Rates
9.6_supp = 1
19.2_supp = 1
93.75_supp = 1
187.5_supp = 1
500_supp = 1
1.5M_supp = 1
3M_supp = 1
6M_supp = 1
12M_supp = 1
;
```

```
; Maximum Protocol Processing Time
MaxTsdr_9.6 = 11
MaxTsdr_19.2 = 11
MaxTsdr_93.75= 11
MaxTsdr_187.5 = 11
MaxTsdr_500 = 11
MaxTsdr_1.5M = 11
MaxTsdr_3M = 11
MaxTsdr_6M = 25
MaxTsdr_12M = 50
;
;Level of the Repeater Control Signal CNTR-P
Repeater_Ctrl_Sig = 2
;
;=============================================================================
; Specific Data of the Bus Station
;=============================================================================
;
; Automatic Recognition of the Baud Rate
Auto_Baud_supp = 1
;
; Type of Bus Station (modular or compact)
Modular_Station = 1
;
; Maximum Number of Modules of a Modular Bus Station
Max_Module = 1
;
; Maximum Length of the Input Data of the Bus Station in Bytes
Max_Input_Len = 32
;
; Maximum Length of the Output Data of the Bus Station in Bytes
Max_Output_Len = 32
;
; Maximum Length of the Input- and Output Data (Sum) in Bytes
Max_Data_Len = 64
;
; Module Identifier
;
Module = "8 Byte Daten E/A" 0x37
EndModule
;
Module = "10 Byte Daten E/A" 0x39
EndModule
;
Module = "12 Byte Daten E/A" 0x3B
EndModule
;
Module = "14 Byte Daten E/A" 0x3D
EndModule
;
Module = "16 Byte Daten E/A" 0x3F
```

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```
EndModule
;
Module = "4 Worte Daten E/A" 0x73
EndModule
;
Module = "6 Worte Daten E/A" 0x75
EndModule
;
Module = "8 Worte Daten E/A" 0x77
EndModule
;
Module = "10 Worte Daten E/A" 0x79
EndModule
;
Module = "12 Worte Daten E/A" 0x7B
EndModule
;
Module = "14 Worte Daten E/A" 0x7D
EndModule
;
Module = "16 Worte Daten E/A" 0x7F
EndModule
;
; DP-Device does not support the Freeze-Mode
Freeze_Mode_supp = 0
;
; DP-Device does not support the Sync-Mode
Sync_Mode_supp = 0
;
; DP-Device does not Support the Bus Station Addressing
Set_Slave_Add_supp = 0
;
; Minimum Interval between two Accesses to the Bus Station
Min_Slave_Intervall = 100
;
; Maximum Length of the Diagnosis Information (DiagData)
Max_Diag_Data_Len = 12
;
; Class of Function: I/O
Slave_Family = 3
;============ End of Device-Master-Data-File============================
```