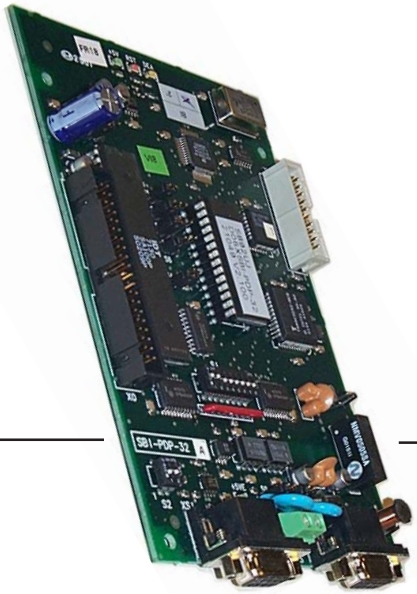
Profibus-DP

SBI-PDP-32



SBI-PDP-32

Interface card

..... Instruction manual

GEFRAN

Thank you for choosing this Gefran.

We will be glad to receive any possible information which could help us improving this manual. The e-mail address is the following: techdoc@gefran.com.

Before using the product, read the safety instruction section carefully.

Keep the manual in a safe place and available to engineering and installation personnel during the product functioning period.

Gefran spa has the right to modify products, data and dimensions without notice.

The data can only be used for the product description and they can not be understood as legally stated properties.

Table of Contents

1.0 Introduction

This manual describes the optional SBI-PDP-32 card for connecting of inverters and converters to Profibus-DP networks.

Drives belonging to TPD32 series can be connected in network through the SBI-PDP-32 card.

This manual is intended for design engineeres and technicians responsible for the maintenance, commissioning and operation of Profibus-DP systems. A basic knowledge of Profibus-DP is assumed and may be found in the “Draft Standard DIN 19245 Part 3” manual.

When using the TPD32 with firmware version v9.200 or later you can choose whether to use 6 PDC cyclic exchange words or 4 (see Section 9.2). With earlier versions you can only use 4 PDC words, to ensure compatibility with existing installations.

1.1 About this manual

Chapter 2	Mechanical Card mounting, electrical connections and switches setting
Chapter 3	Master - Slave transmission data
Chapter 4	Assignment of the drive parameter to the Process Data Channel
Chapter 5	Profibus-DP diagnostic handling
Chapter 6	Error code
Chapter 7	Assignment of the drive parameter to the virtual digital I/O
Chapter 8	Keypad drive menu
Chapter 9	Identification number and codes for Bus connection
Chapter 10	Glossary
Chapter 11	Abbreviations
Chapter 12	References

1.2 Overview of Profibus-DP

Profibus-DP is a field Bus designed for a fast data exchange relating to sensors / actuators; the communication is established between a Master central unit (PLC or PC) and Slave units, i.e. sensors, actuators, drives, etc.

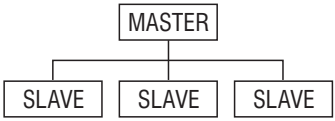
The data exchange is cyclic; the Master unit reads the Slaves input data and writes the Slaves output data. The Bus cycle time is shorter than the cycle time of the central unit; the Baud Rates for the Profibus-DP interface card are from 9,6 kbit/s to 12 Mbit/s according to Profibus-DP standard part. 3.

Il supporto fisico è quello standard Profibus-DP; al Bus possono essere collegati un numero massimo di 125 Slave.

The total cycle time depends on the number of Slaves connected; the 1.5-Mbit/s Baud Rate allows 8 drives to be polled in 6 milliseconds.

The physical support is standard Profibus-DP; the max. number of Slaves connected to the Bus is 125.

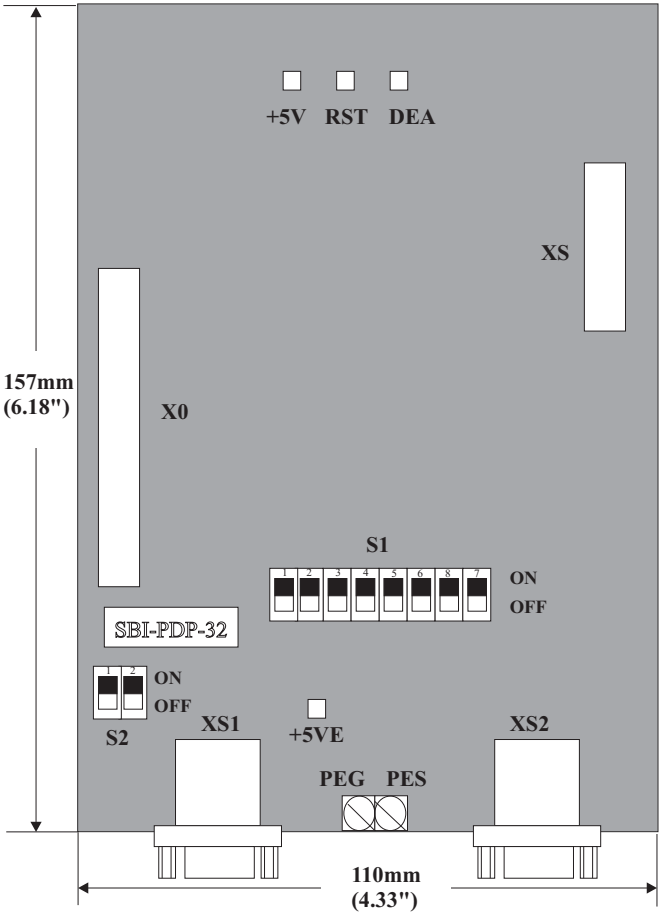
Example of Mono-Master Profibus-DP system.



Profibus-DP allows a Multi-Master system as well. For further information please refer to chapters 6 and 7 of the “Draft Standard DIN 19245 Part 3” manual.

2.0 Hardware Description

2.1 Dimensions, weight, degree of protection

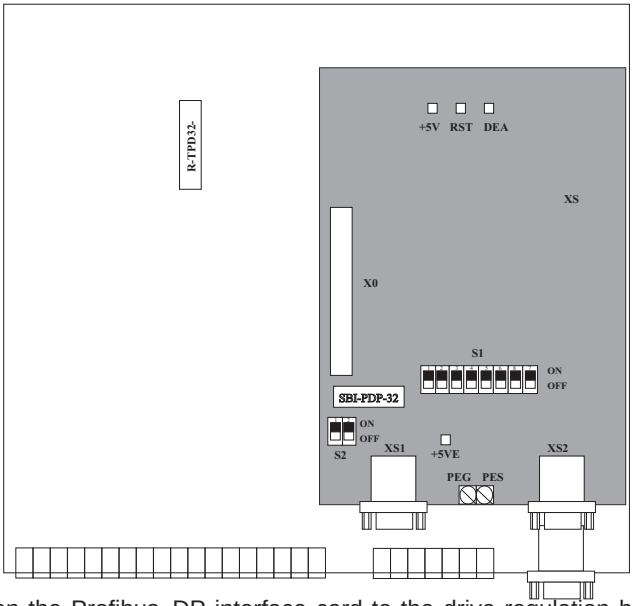


Dimensions	[mm/inches] 157/6.18” (H) x 110/4.33” (L) x 23/1” (D)
Weight	200 g (7.1 oz)
Degree of protection	IP00

2.2 Mounting

The Profibus-DP interface card is supplied with a kit including 4 spacers, 4 screws, washers and a 40-pole flat cable provided with connectors.

1. Switch the drive off.



2. Fasten the Profibus–DP interface card to the drive regulation board by means of screws and spacerers. The Bus connectors have the same direction of the regulation card terminals.
3. The Bus connectors have the same direction of the regulation card terminals.
4. The BUS terminating resistances are connected or disconnected through the S2 dip switch.

   The last physical card in network shall have such resistances connected in case the connector in use should not contain terminating resistances itself.

   ON = connected, OFF = disconnected.
5. The S1 dip switch determines the Slave address.

   The addresses “0” and “1” are reserved to the Master and can not be used. The switch S1-8 is not significant for the address and must always be set to OFF. The address is only detected when the card is switched on. If the

address has been modified, the Profibus-DP interface card has first to be switched off and then on in order assume the new address.

6. Connect the Bus cable to XS1 or XS2 connectors.
7. Switch on the drive.
8. The LEDs +5V and +5VE light up.
9. The LED DEA lights up when the communication enters in the Data Exchange Phase.

2.3 Power supply

The Power supply is provided by the XO connector, which is also used to link data between the Profibus-DP interface card and the drive regulation card.

Current draw 350mA.

2.4 Connectors

Connectors **PEG:**	It allows to connect set point of External Supply Ground (GNDE) to the ground (PE).
Connectors **XS**	It allows to connect the ground (PE) at the Profibus cables shield

2.5 Dip Switches

S3 Selection of interrupt source (INT1 / INT2) from S5 jumper to the 8032 microcontroller or the Dual Port Ram interrupt input (INTR). Default position A (interrupt from the Dual Port Ram).

S4 Synchronization connection of the SBI-PDP card reset signal to the drive regulation card reset signal. Default position ON.

S5 It is used to connect the INT_OPZ signal to the INT1 signal (S5 B) or to the INT2 signal (S5 A). At the moment only the setting (default setting) of the interface card as Option 1 is allowed, therefore INT_OPZ is connected to the INT1 signal (default position A).

S6 It is used to connect the OUT_OPZ signal to the OUT1 (S6.A) or OUT2 (S6.B) signal. Default position A.

S7 It is used to connect the CEM_OPZ signal to the OPZ1 (S7.A) or OPZ2 (S7.B) signal. The default setting of the SBI-PDP card is Option 1, therefore the CEM_OPZ signal is connected to the OPZ1 signal. Default position A.

S8 Connection of the Dual Port Ram BUSY signal to RDY_EXT signal. Default position ON.

S9 It is used for ibrid connection for communication. It allows to connect the capacitor C3 (10nF 2kV) in case the connection is too long

S10 It used for ibrid connection of the ground. It allows to connect the capacitor C4 (10nF 2kV) in case the connection is too l**ong.**

2.6 LEDs

+5V +5V power supply.

RST Reset active.

DEA Data Exchange Phase active.

+5VE +5V power supply on the RS 485 driver side galvanic isolated.

2.7 Technical specification

Storage temperature: -20°... +70°C (-68...+158°F)

Operating temperature: 0°... +55°C (32...+131°F)

These temperatures are adequate to those of the drive, to which the cards are connected.

2.8 Interface

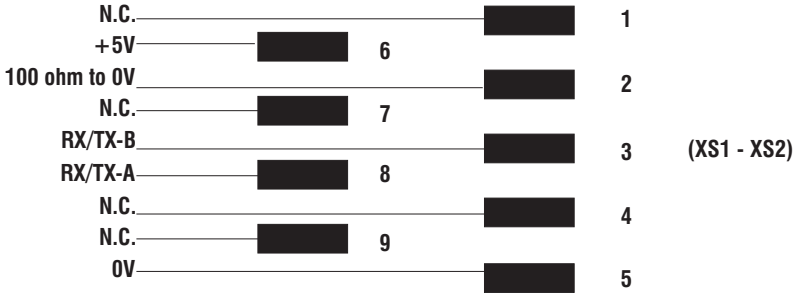
The card shall be installed on the regulation card, so that the Profibus-DP interface card X0 connector and the regulation card X0 connector are near to each other always keeping connectors to the Profibus-DP line directed downwards.

For the mechanical connection please use the kit supplied with the card.

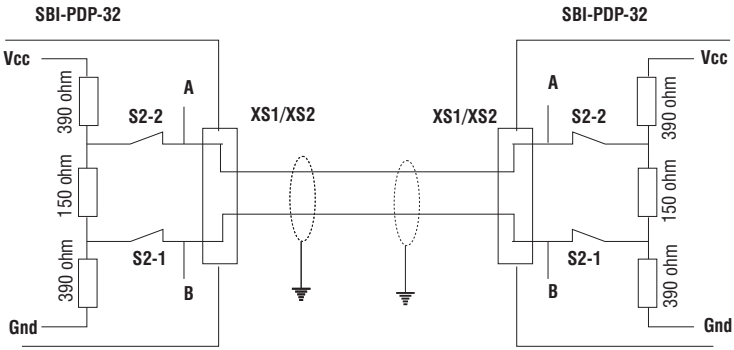
For the electrical connection please use a 40-pin flat cable, also supplied.

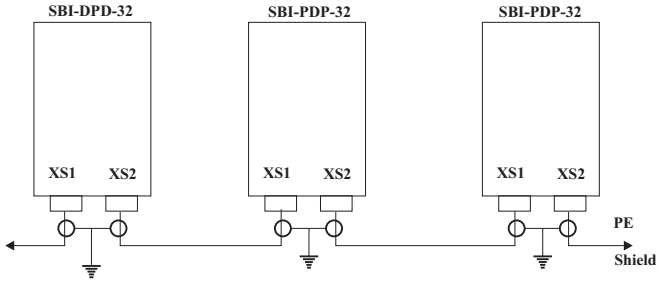
For the connection to the Bus please use a shielded duplex cable.

The pinout of the Bus connectors are the following:



The connection among the single cards is implemented by a shielded cable as shown in the following diagrams:

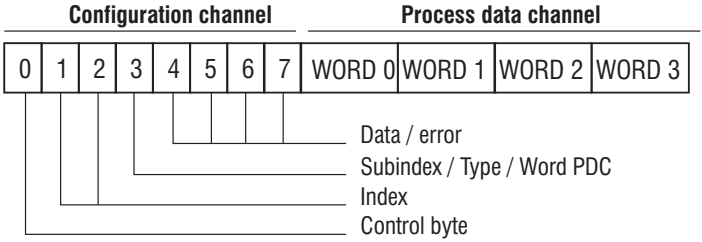




3.0 Bytes Assignment for Data Exchange

The SBI card uses a 20-byte frame (16 for TPD32 with firmware versions earlier than v9.200). The first 8 bytes represent the configuration channel for the non-cyclic data exchange, the other 12 (8) are the process data channel for cyclic exchange.

The bytes assignment is as follows:



As to the Data/Error and Index fields, the data format is arranged from the least to the most significant byte. The meaning of the fields is the following:

A) Data frame from Master to Slave:

1) Data / Error

IThe content of this field depends on the kind of service carried out: in case of writing it contains the parameter value, in case of reading it has no meaning.

2) Subindex/Type/ Word PDC

It contains the parameter subindex, if any. If the parameter has no subindexes it has to be set to 0. For parameters with subindex, this has to be set from 1 to the max. number of parameter elements; the value 0 is not accepted and rejected. It is not possible to read the whole object, but only its single elements. In case of service carried out towards the APC (DGFC) option, this field should contain the data type. In case of Process Data Channel configuration (see chapter 4), this field contains the number of the PDC Word involved in the operation. In case of virtual digital input/ output configuration (see chapter 7), this field contains the number of the digital channel involved in the operation .

3) Index

Index of the parameter involved in the operation with format low byte - high byte.

4) Control byte

The meaning of this byte is described in 3.1.

B) Data frame from Slave to Master:

1) Data / Error

The content of this field depends on the kind of service carried out. In case of writing it contains the operation result (2 bytes). In case of reading it contains the parameter value if the reading had positive result; if not, it contains the detailed error code, still occupying 4 bytes. As to the error codes and operation result, please refer to 6.0.

2) Subindex/Type/ Word PDC.

It contains the parameter subindex, if any. If the parameter has no subindexes it has to be set to 0. For parameters with subindex, this must be set from 1 to the max. number of parameter elements; the value 0 is not accepted and rejected. It is not possible to read the whole object, but only its single elements. In case of service carried out towards the APC (DGFC) option, this field contains the data type. In case of Process Data Channel configuration (see chapter 5), this field contains the number of the PDC Word involved in the operation. In case of virtual digital input/ output configuration (see chapter 7), this field contains the number of the digital channel involved in the operation .

3) Index

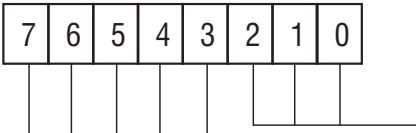
Index of the parameter involved in the operation with format low byte - high byte.

4) Control byte

The meaning of this byte is described in 3.1.

In case of service towards APC (DGFC) option, please refer to the APC (DGFC) manual for error codes.

3.1 Control byte setting



Service

Bit			Meaning
2	1	0	
0	0	0	**No request communications**
0	0	1	Drive parameter reading
0	1	0	Drive parameter writing
1	1	0	APC (DGFC) option parameter reading
1	1	1	APC (DGFC) option parameter writing

Reserved

Data/Lenght

Bit		Meaning
5	4	
0	0	**1 Byte Data/Error**
0	1	**2 Bytes Data/Error**
1	0	**3 Bytes Data/Error**
1	1	**4 Bytes Data/Error**

Handshake

Status

Bit	Meaning
7	
0	**Service carrier out without errors**
1	**Error occoured**

The status bit is only used by the Slave, therefore it has a meaning only during the transmission from Slave to Master; in the transmisson from Master to Slave it has always to be set to 0.

3.2 Meaning of Handshake

The Handshake bit prevents the same service request from being carried out more than once and its function is the same both in the direction from Master to Slave and from Slave to Master. The explanation below refers to the direction Master to Slave, but the same considerations may be applied for the opposite direction.

The default value of this Bit is 0. Every time that a transition of this Bit occurs, both from 0 to 1 (positive edge) and from 1 to 0 (negative edge), the Slave carries out the service requested by the Master through the data frame previously set. Therefore, this Bit acts as a Trigger, through which the Master indicates the Slave that the data for the requested service are ready.

The Slave responds to the Master in the same way, by causing a Handshake Bit transition (both positive or negative).

Consequently, the Master is able to send a service on the Bus only if its Handshake Bit is equal to the one received by the Slave.

During the initialization and in case the Master does not receive the Slave response within a Timeout of 500 mSec, the Master shall send a no-request service (all Bits are set to 0), thus allowing the Slave to perform a communication Reset. This causes the reset of the Slave Handshake Bit.

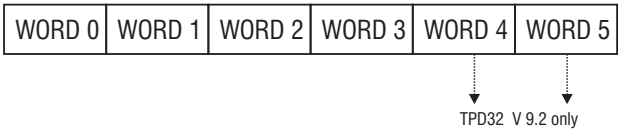
The Timeout for the service towards the APC (DGFC) option shall be longer (1.5 sec). The Master should therefore have two different Timeouts: one for the services towards the drive and one for those towards the APC (DGFC) option.

4.0 Process Data Channel Control

This function allows the assignment of the drive parameter to the Process Data Channel Words.

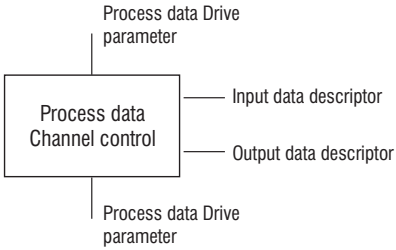
The SBI card uses six words for the Process Data Channel (four for TPD32 with firmware versions earlier than v9.200); (abbr. PDC Process Data Channel).

The Process Data Channel for the SBI-PDP-32 card has the following configuration



The Slave can both read and write Process Data Channel data.

The data read from Profibus-DP by the Slave are referred to as output data; the data written in Profibus-DP by the Slave are referred to as input data

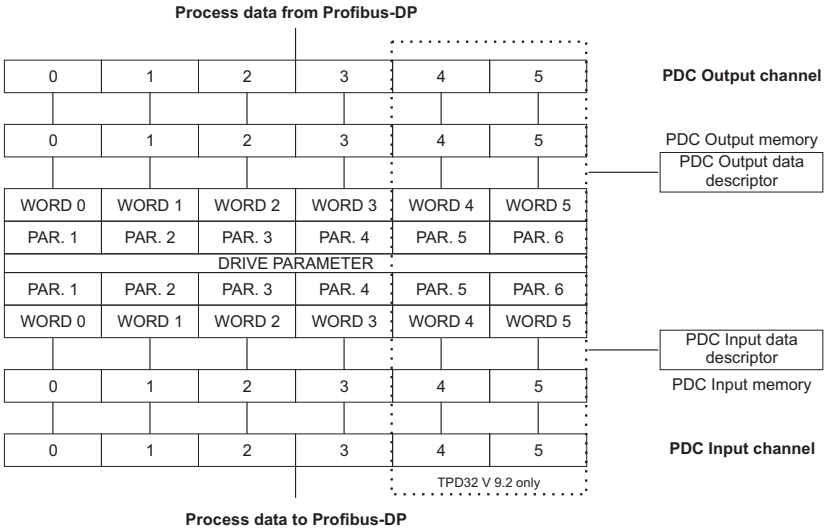


The Slave parameters are cyclically read by the Master by assigning drive parameters to the “PDC input data descriptor” communication object.

The Master cyclically transmits drive parameters to the Slave by assigning drive parameters to the “PDC output data descriptor” communication object.

The process data assignment to specific drive parameters must be set. The “PDC input data descriptor” and “PDC output data descriptor” communication objects are used for this aim.

Operating modes:



The “PDC input data descriptor” communication object (input data for the Master) sets the drive parameters assigned to the Process Data Channel Words. The “PDC output data descriptor” communication object (output data for the Master) sets the Process Data Channel Word assigned to the drive parameters.

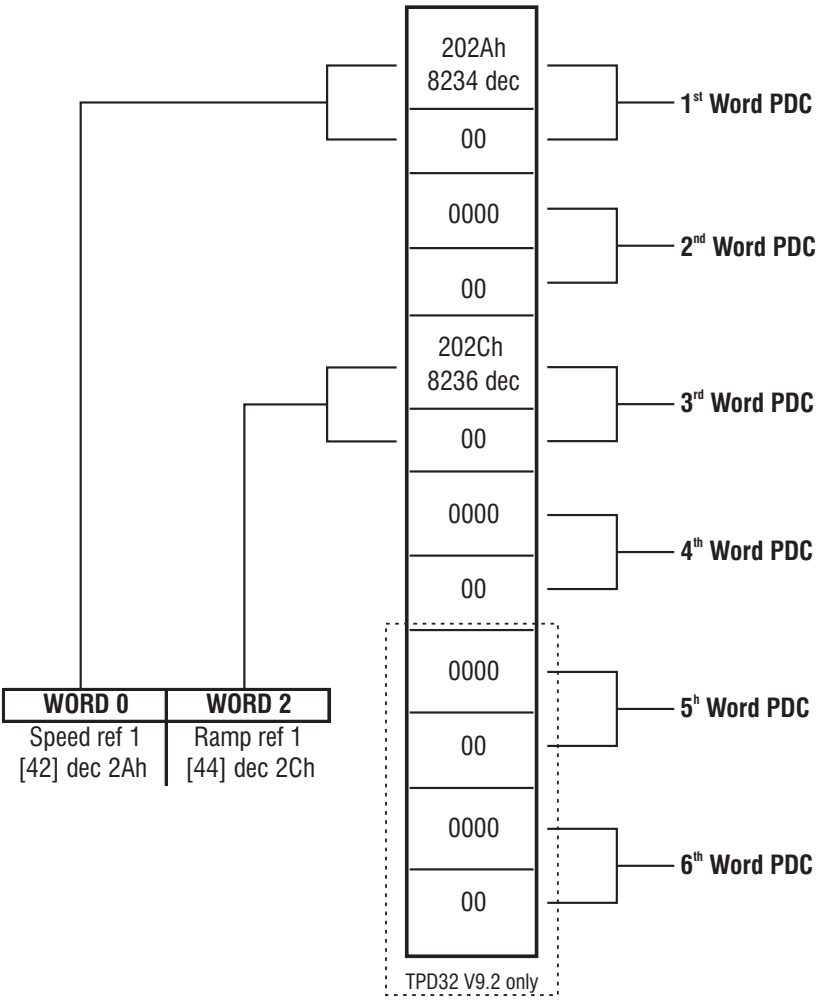
The drive parameters assignment to the Process Data Channel Words is carried out by means of the index and the subindex of the parameter itself.

Only drive parameters with a 16-Bit width (1 Word) may be assigned to the Process Data Channel.

NOTE : The offset 2000h (8192 dec) must be added to the drive parameter index in order to obtain the number of the parameter to be assigned via field bus.

Output data descriptor of the Process Data Channel:

PDC Output data descriptor



NOTE: Parameters with index 0000 mean that the Word is not

assigned to any drive parameter.

Example of drive parameters assignment to the “PDC output data descriptor” and “PDC input data descriptor” objects in case of Profibus-DP interface card with two 16-Bit drive parameters.

1 -	Drive Parameter A	Data type: Unsigned16
2 -	Not used	
3 -	Drive Parameter B	Data type: Unsigned16
4 -	Not used	
5 -	Not used	
6 -	Not used	

Subindex of the 'PDC input data descriptor' object	Meaning of the object element	Process data channel word number
0	Index of the drive parameter A (16 bits)	0
0	Subindex of the drive parameter A	0
1	Not used Index=0000	1
1	Not used Subidex=00	1
2	Index of the drive parameter B (16 bits)	2
2	Subindex of the drive parameter B	2
3	Not used Index=0000	3
3	Not used Subidex=00	3
4	Not used Index=0000	4
4	Not used Subidex=00	4
5	Not used Index=0000	5
5	Not used Subidex=00	5

t4100

4.1 Example of PDC configuration data frame setting

Example n. 1:

The **Ramp Ref 1** parameter of the TPD32 drive must be assigned to the Word No. 1 of the PDC output data. Because this parameter is an Unsigned 16, it has a 16-Bit width and can be therefore assigned to a Process Data Channel.

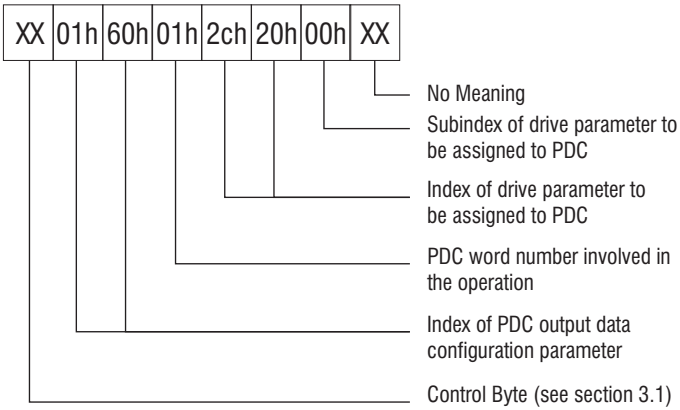
The required numerical information is :

1) Index of the PDC output data configuration parameter : 6001h.

2) Word Number involved : 1.

3) **Ramp ref 1** parameter index of the TPD32 drive : 202Ch.

4) **Ramp Ref 1** parameter subindex of the TPD32 drive : 0h.



Example n. 2:

The **Actual speed** parameter of the TPD32 drive must be assigned to the Word No. 2 of the PDC input data. Because this parameter is an Unsigned 16, it has a 16-Bit width and can be therefore assigned to a Process Data Channel.

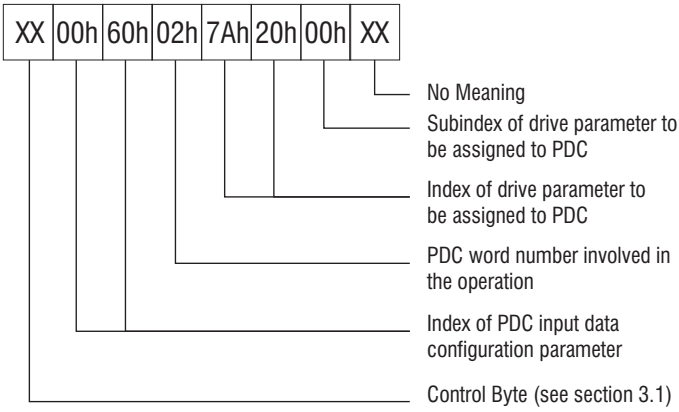
The required numerical information is :

1) Index of the PDC input data configuration parameter : 6000h.

2) Word Number involved: 2.

3) **Actual speed** parameter index of the TPD32 drive : 207Ah.

4) **Actual speed** parameter subindex of the TPD32 drive : 0h.



4.2 PDC Input Data Descriptor

This communication object contains the information for the assignment of the PDC input data to the drive parameters. In case of conflict between index and subindex, the assignment is not carried out and an error message is generated.

Description of the “PDC input data descriptor” communication object:

Object attribute	Value	Meaning
Index	6000h	PDC input data descriptor
Password	00	Non-existing
Access group	00	Non-existing
Access rights	--	Read/Write
Local address	XXXX	Manufacturer specific

sb4200

Descriptor data type :

- Subindex 0 : Unsigned 16 - Unsigned 8
- Subindex 1 : Unsigned 16 - Unsigned 8
- Subindex 2 : Unsigned 16 - Unsigned 8
- Subindex 3 : Unsigned 16 - Unsigned 8
- Subindex 4 : Unsigned 16 - Unsigned 8
- Subindex 5 : Unsigned 16 - Unsigned 8

4.3 PDC Output Data Descriptor

This communication object contains the information for the assignment of the drive parameters to the PDC Master output data. In case of conflict between index and subindex, the assignment is not carried out and an error message is generated.

Description of the “PDC output data descriptor” communication object:

5.0 Alarms

5.1 Profibus-DP Alarms

The alarms indicated to the drive by the Profibus-DP interface card through the Dpram are the following:

1 - Bus loss: if an accidental interruption of the connection occurs, this alarm is generated.

2 - SBI Hardware Fault: if the Profibus-DP interface card is faulted, this alarm is generated.

3 - SBI Ram Fault: this alarm is generated if there is a fault in the Dual-Port-Ram of the Profibus-DP interface card.

The alarm handling carried out by the drive depends on the drive itself and how the alarms are configured.

If the Master is switched off before the Slave, the Bus-Loss alarm occurs; the drive handles this event by not storing the alarm in order to avoid having the alarm annunciated when the drive is next switched on.

The communication between Master and Slave can only be carried out if the initialization of the drive and of the Profibus-DP interface card is successfully terminated; if not, it is not possible to determine the cause of the erroneous initialization using the Bus.

5.2 Drive Alarms Handling

The drive reports automatically its status to the Profibus-DP interface card, if an alarm condition occurs.

When the communication is established, the drive status is sent to the Master in at the moment in which the drive initialization has terminated.

Every time the Drive changes its status, the Profibus-DP interface card sends the updated drive status to the Master by means of a diagnostic message (please refer to “Draft Standard DIN 19245 Part 3” sect. 8.3.1).

The information are contained in the ‘User Specific Diagnostic Data’ field of the diagnostic message.

This field is made up of three Bytes. The first contains the ‘User Specific Diagnostic Data Length (in bytes)’ and is set to three. The second and the third contains the code of the drive status (for the code please refer to the drive manual). When a drive alarm occurs, also the ‘Ext_Diag’ bit in the first Byte of the ‘Diagnostic Data’ is set to 1.

6.0. Service Error Codes and Operation Result

The following table shows the different error codes that may occur during the execution of a service.

RESULT	VALUE
OK no error	0000H
Parameter not exist	0001H
Reserved	0002H
Control Access denied	0003H
Reserved	0004H
Attribute Access denied	0005H
Type value error	0006H
Reserved	0007H-000FH
Destination option not exist	0010H
Parameter Access Conflict	0011H
Value out of the maximun range	0012H
Value out of the minimun range	0013H
Value not supported	0014H
Parameter Configuration Conflict	0015H
Command Submitted	0016H
Reserved	0017H
Unknown Command	0018H
Read only Parameter	0019H
Write not allowed	001AH
Value out of constant limits	001BH
State not correct	001CH
Password	001DH
Type Unknown	001EH
Hardware Fail	0030H
Checksum Fail	0031H
Reserved	001FH-007CH
Reserved	0082H-00FCH
NOK generic	00FFH
User defined	0100H-FFFFH

t6000

Explanation:

Parameter not exist	The specified parameter does not exist
Control Access denied	The access is denied because of the control status

Attribute Access denied	The parameter attributes do not allow the access
Type value error	The specified type value is incorrect
Destination option not exist	The destination option does not exist at node
Parameter Access Conflict	The addressed parameter can not be accessed (for example if the command is write and parameter is connected to an external input)
Value out of the max range	Value is out of the maximum range
Value out of the min range	Value is out of the minimum range
Value not supported	Value is in range but not allowed
Parameter Configuration Conflict	The addressed parameter can not be accessed for sistem configuration conflict (for example try to connect an input source to a parameter that is already connected to an input source)
Command Submitted	Command has been submitted but is not possible to know if it has been executed
Unknown Command	The command is not known
Read only Parameter	The parameter has read only attribute
Write not allowed	Write operation is not allowed for the slave conditions
Value out of constant limits	Value is out of constant fixed limits
State not correct	The control state doesn't allow the command execution
Password	The command is not executed because the password is active
Type Unknown	The parameter type is not known
Hardware Fail	The access is denied because of an hardware failure
Checksum Fail	The access is aborted because of an error in cheksum control
NOK generic	The access is aborted because of an indeterminated error

7.0 Virtual Digital Input / Output Control

The control of the drive virtual digital I/O is carried out through configuration parameter and parameter for control sending.

Please note that in this chapter the virtual digital inputs/outputs are referred to the drive, i.e. in these cases the Master can "write" the virtual digital inputs and "read" the virtual digital outputs.

7.1 Virtual digital input

As to the virtual digital input the parameters involved are:

- Parameter index 5EFCh: virtual digital input configuration.
- Parameter index 5EFEh: writing of virtual digital input values.

Parameter 5EFCh: 16-element array Unsigned Int.

This array is used to configure the virtual digital input and shall therefore be written before using these inputs. It contains the drive parameter index assigned to the input. These inputs are then written through the parameter 5EFEh - type Unsigned Int - where the single Bit status indicates the command to be sent to the virtual digital input. Such command has been previously assigned by means of the configuration array.

Example:

The 0 element of the 5EFCh parameter array contains the 2159h parameter index referred to the TPD32 drive, which means **Ramp in = 0**.

The operation is the following: after configuring the 0 element of the 5EFCh parameter with the 2159h parameter index, the TPD32 drive function **Ramp in = 0** is controlled by the Bit 0 of the 5EFEh parameter.

7.1.1 Virtual digital input descriptors

The 5EFCh parameter is used for the virtual digital input configuration and can be written/read by single element.

Object attribute	Value	Meaning
Index	5EFCh	Virtual digital input configuration
Number of elements	16	16 Virtual digital input channels
Type	--	Unsigned16
Password	00	Non-existing
Access group	00	Non-existing
Access rights	--	Read/Write
Local Address	XXXX	Manufacturer specific

sb7000

The 5EFEh parameter is used to control the virtual digital input previously configured; the single Bit status controls the virtual digital input assigned to the Bit during the configuration.

Object attribute	Value	Meaning
Index	5EFEh	Value (command) of virtual digital input
Type data index	--	The single Bit status controls the virtual digital input assigned to it
Length	02	2 Bytes
Password	00	Non-existing
Access group	00	Non-existing
Access rights	--	Write only
Local Address	XXXX	Manufacturer specific

sb7010

7.2 Virtual digital output

As to the virtual digital output the parameters involved are:

- Parameter index 5EFDh: virtual digital output configuration.
- Parameter index 5EFFh: reading of virtual digital output values.

Parameter 5EFDh: 16-element array Unsigned Int.

This array is used to configure the virtual digital output and shall therefore be written before using these outputs. It contains the drive parameter index assigned to the output. These outputs are then controlled through the 5EFFh parameter- type Unsigned Int - where the single Bit status corresponds to the status of the virtual digital output assigned through the configuration array.

Example:

The 0 element of the 5EFDh parameter array contains the 215Ah parameter index referred to the TPD32 drive, which means **Ramp+**.

The operation is the following: after configuring the 0 element of the 5EFDh parameter with the 215Ah parameter index, the **Ramp+** status of the TPD32 drive is read through the Bit 0 of the 5EFFh parameter.

7.2.1 Virtual digital output descriptors

The 5EFDh parameter is used for the virtual digital output configuration and can be written/read by single element.

Object attribute	Value	Meaning
Index	5EFDh	Virtual digital output configuration
Number of elements	16	16 virtual digital output channels
Type	--	Unsigned16
Password	00	Non-existing
Access group	00	Non-existing
Access rights	--	Read/Write
Local Address	XXXX	Manufacturer specific

sb7020

The 5EFFh parameter is used to read the virtual digital output previously configured; the single Bit status corresponds to the status of the virtual digital output assigned to the Bit during the configuration.

Object attribute	Value	Meaning
Index	5EFFh	Value (present status) of the virtual digital output
Type data index	--	The single Bit status corresponds to the virtual digital output status assigned to it
Length	02	2 Bytes
Password	00	Non-existing
Access group	00	Non-existing
Access rights	--	Read only
Local Address	XXXX	Manufacturer specific

sb7030

7.3 Example of setting for virtual digital I/O configuration data frame

Example No. 1:

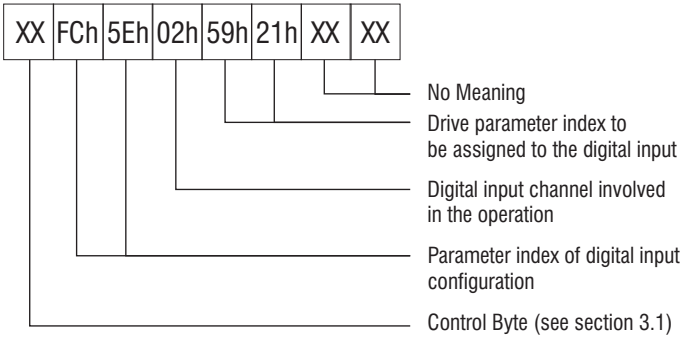
The Ramp in = 0 parameter of the TPD32 converter must be assign to the channel No. 0 of the virtual digital input ; such parameter has the index 2159h.

The initial conditions are the following:

1) Parameter index of virtual digital input configuration: 5EFCh.

2) Virtual digital input channel to be configured: 2.

3) TPD32 drive parameter index corresponding to Ramp in = 0 : 2159h.



Example No. 2:

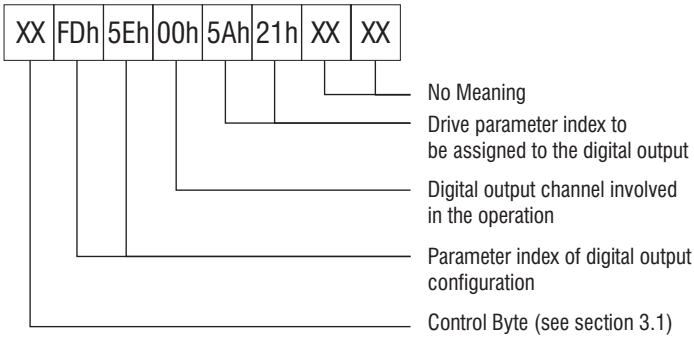
The **Ramp+** parameter of the TPD32 converter must be assigned to the channel No. 0 of the virtual digital output ; such parameter has the index 215Ah.

The initial conditions are the following:

1) Parameter index of virtual digital output configuration: 5EFDh.

2) Virtual digital output channel to be configured: 0.

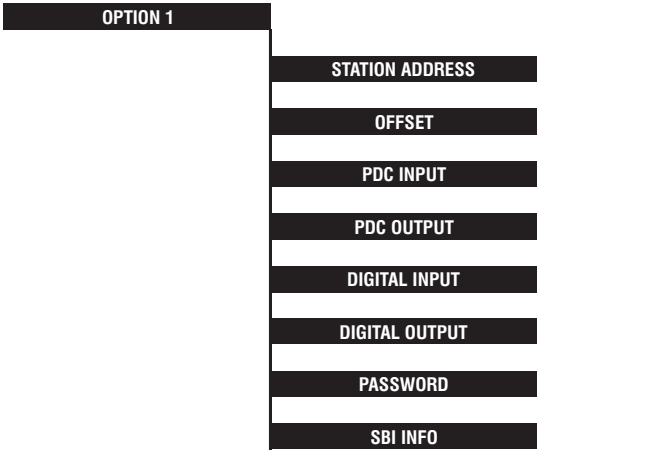
3) TPD32 drive parameter index corresponding to **Ramp+** : 215Ah.


XX
FDh
5Eh
00h
5Ah
21h
XX
XX
No Meaning
Drive parameter index to
be assigned to the digital output
Digital output channel involved
in the operation
Parameter index of digital output
configuration
Control Byte (see section 3.1)

8.0 Keyboard Interface

8.1 Main Menu Structure

This structure appears when the Enter key is pressed and “OPTION1” is displayed; in this case, keypad control passes to the SBI card.



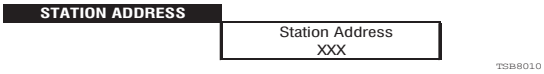
Move between the Menus by pressing the Cursor-Up/Cursor-Down keys and use the Enter key to enter the currently displayed Menu. Pressing the Cancel key in any displayed menu causes the “OPTION1” Menu to appear and keypad control returns to the Drive.

8.1.2 Warning and error message handling

Warning and error messages can be displayed on the first and second rows of the keypad’s display; a maximum of 16 characters can be displayed per line. The Cancel key must be pressed in order to clear these messages, at this point the system automatically returns to the immediately superior Menu level.

8.2 Address Menu

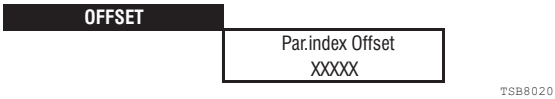
The Address Menu is composed of the following:



The current station address, as set via the dip switches, is displayed; when the “Station Address” Menu is shown and the Cancel key is pressed, the system automatically returns to the immediately superior Menu level.

8.3 Menu Offset

The Offset Menu is composed of the following:



The displayed Offset will be added to the index parameter specified in the following Menus:

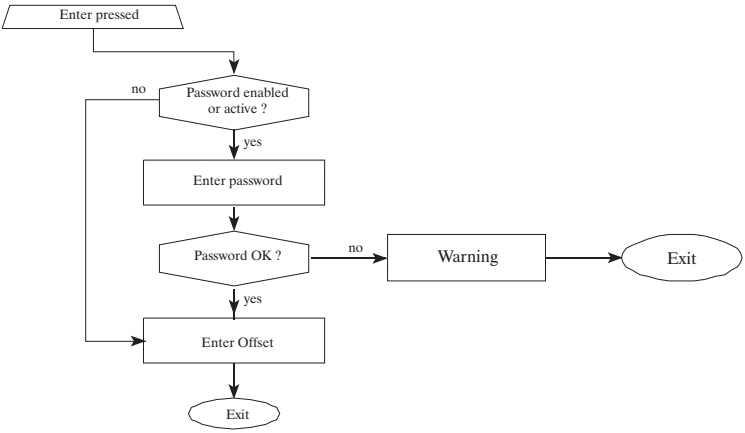
- PDC Input
- PDC Output
- Digital Input
- Digital Output

The Offset value consists of five digits.

Pressing the Enter key will result in the “Enter Offset” message being displayed on the first row; the value is entered on the second row.

8.3.1 Offset Editing

The flowchart illustrating Offset Editing is shown below. Note that pressing Cancel at any time returns to the previous Menu or cancels the operation in course. Refer to chapter 8.9 for Editing.

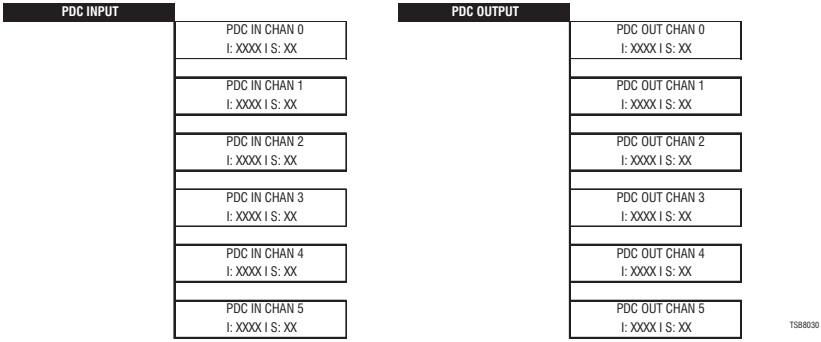


The Default Offset value is 0 (zero). The entered value is not stored in non-volatile memory and therefore only remains active until such time as power is removed; the Offset is however maintained active when the SBI main menu is exited.

Refer to section 8.7.1 for messages regarding Password entry..

8.4 PDC Menu

The PDC Menus (Input and Output) have the following structure:



The indices (with or without Offset - see chapter 8.3) and sub-indices for the Drive parameters assigned to the PDC channels are displayed.

Move between the Menus by pressing the Cursor-Up/Cursor-Down keys. The Cancel key is used to return to the immediately superior Menu level. Pressing the Enter key enters the PDC Channel Edit mode.

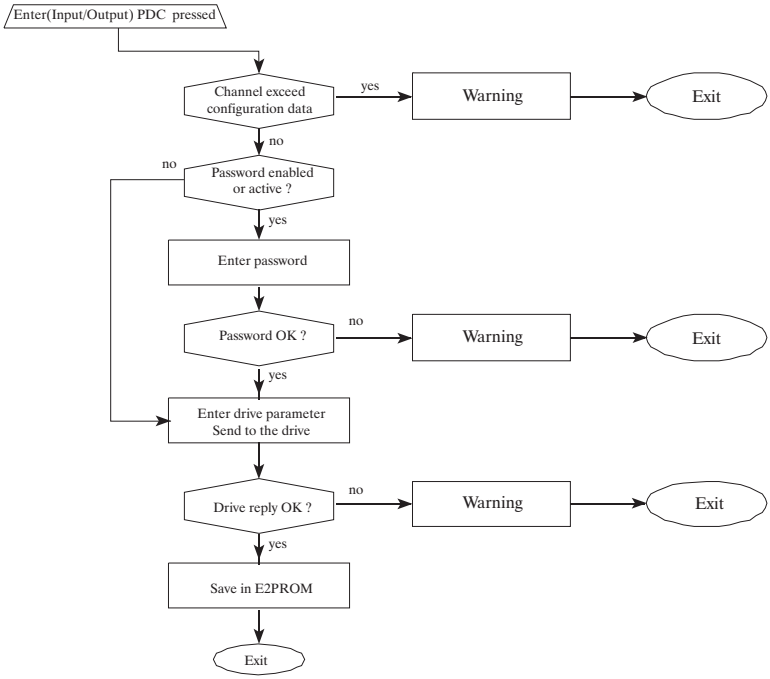
Drive parameter indices are displayed as 5-digit integers; sub-indices are displayed as 2-digit integers.

The parameter index and sub-index are not automatically refreshed. In other words, if a new assignment is performed by a Master while the index and sub-index are currently on display, the new values will not automatically be shown - it is necessary to exit and re-enter the PDC Menu.

The PDC IN CHAN 4 and 5 and PDC OUT CHAN 4 and 5 settings are only significant for TPD32 with firmware versions v9.200 or later, using the “Compact Device 20Byte I/O cons” module. In other cases (earlier versions or 16-byte module) these channels must not be set.

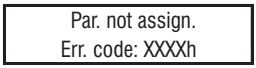
8.4.1 Drive parameter assignment to PDC Editing

The flowchart illustrating Editing of Drive parameter assignments to PDCs, both for Input and Output, is shown below. Note that pressing Cancel at any time returns to the previous Menu or cancels the operation in course. Refer to chapter 8.9 for Editing.



The validity of the specified Drive parameters is checked by the Drive.

If the Drive returns with an error code, the following message will be displayed on the keypad screen:



TSB8040

The error code generated by the Drive is displayed in hexadecimal format; error codes are listed in chapter 6.0.

If data entry is correct, the following message will be displayed:

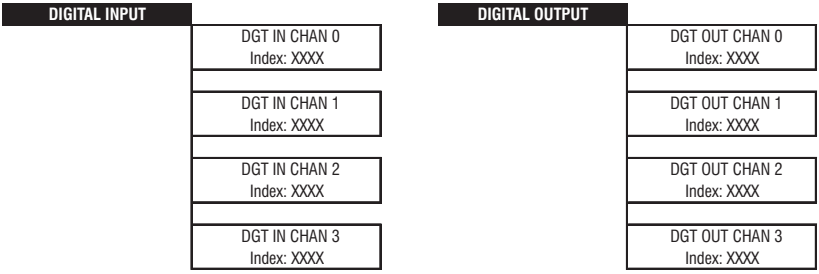
TSB8050

This message automatically disappears after two seconds, or upon pressing the Cancel key.

Refer to chaper 8.7.1 for messages regarding Password entry.

8.5 Virtual Digital I/O menu

The Virtual Digital I/O Menu (Input and Output) has the following structure:



The indices (with or without Offset - see chapter 8.3) for the Drive parameters assigned to the Virtual Digital Input/Output Channels are displayed.

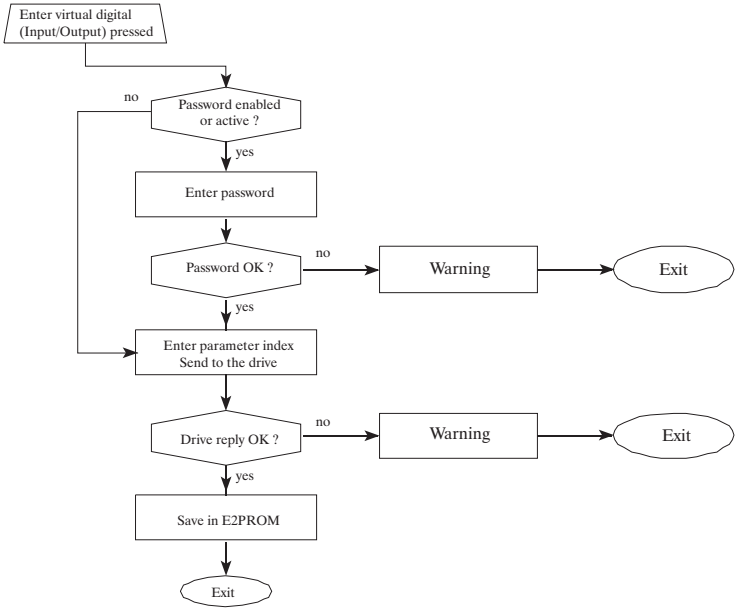
Move between the Channel Menus by pressing the Cursor-Up/Cursor-Down keys. The Cancel key is used to return to the immediately superior Menu level. Pressing the Enter key enters the Virtual Digital I/O Edit mode.

Drive parameter indices are displayed as 5-digit integers.

The parameter index is not automatically refreshed. In other words, if a new assignment is performed by a Master while the index is currently on display, the new value will not automatically be shown - it is necessary to exit and re-enter the Digital I/O Menu.

8.6 Drive virtual digital I/O parameter assignment

The flowchart illustrating Editing of Drive parameter assignments to Virtual Digital I/O is shown below. Note that pressing Cancel at any time returns to the previous Menu or cancels the operation in course. Refer to chapter 8.9 for Editing.



The validity of the specified Drive parameters is checked by the Drive.

If the Drive returns with an error code, the following message will be displayed on the keypad screen:

Par. not assign. Err. code: XXXXh

TSB8040

The error code generated by the Drive is displayed in hexadecimal format; error codes are listed in chapter 6.0.

If parameter specification is correct, the following message will be displayed:

ENTER OK !

TSB8050

This message automatically disappears after two seconds, or upon pressing the Cancel key.

Refer to section 8.7.1 for messages regarding Password entry.

8.7 Password Menu

Password setup is handled by a Menu with the following structure:

Pressing the Cancel key returns to the immediately superior Menu level. Pressing the Enter key enters the Password Edit mode.

The Password is requested when a protected Menu or menu item has being accessed.

This request is also dependent on the current Password Status. In consequence, four possible cases can be identified:

a) **Password enabled:** this means that a password has been set up via the corresponding Menu; **a zero (0) value (default) disables the Password**.

b) **Password active**: if the Password is enabled, it becomes active as soon as the SBI card's Main Menu is displayed. It is deactivated by correctly entering its value when first setting a parameter that is protected by it. The Password is automatically reactivated upon leaving the SBI card Main Menu.

c) **Password disabled**: value is zero (default condition).

d) **Password inactive**: the Password has already been requested and correctly entered.

The Password is an unsigned integer number and therefore has a maximum of five digits; if a shorter number is entered, the remaining digits are assumed zeroes.

8.7.1 Password Request

The Password is requested when it is enabled and active and it is attempted to access a protected Menu or menu item. In this situation, the following message is displayed:

The Password is entered in Edit mode (see chapter 8.9), with the Password's digits being shown.

There is also a universal password with a value of 78622.

If the Password is correct, the following message will be displayed:

This message automatically disappears after two seconds, or upon pressing the Cancel key.

If the Password is incorrect, the following message will flash:

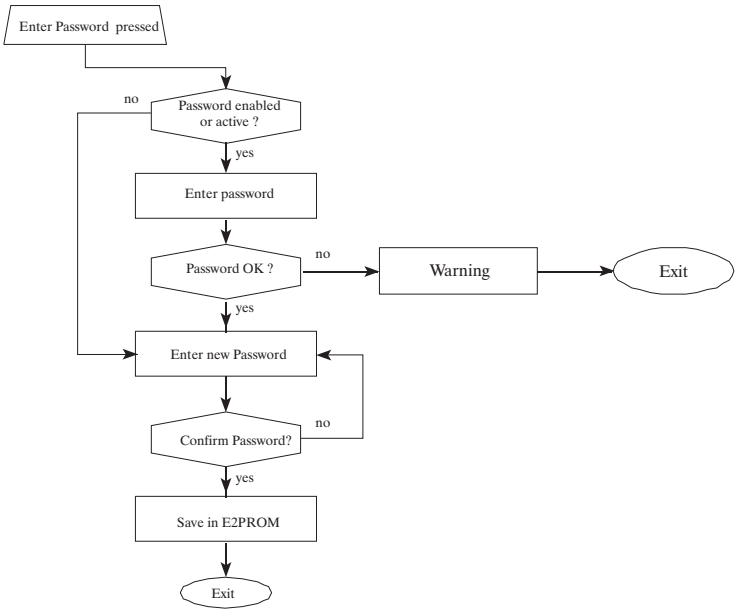
This message is removed by pressing the Cancel key.

8.7.2 Password Setup Editing

The flowchart illustrating Password Setup Editing is shown below. Note that pressing Cancel at any time returns to the previous Menu or cancels the operation in course. Refer to chapter 8.9 for Editing.

This menu is used to set the Password. Please note the following:

1) The default value is 0 (zero) and is equivalent to disabling the Password.
2) Entering a non-zero value via this Menu automatically enables the Password.
3) Enter 0 (zero) to disable the Password.
4) If the Password is enabled, it also becomes active when the “OPTION1” menu is accessed. As soon as it is attempted to access a Password protected Menu or menu item, the Password will be requested. If the Password is correctly entered, it will be deactivated from that moment on, i.e. it is possible to access other protected Menus and/or menu items without having to specify the password again.
5) The Password is automatically reactivated when the SBI card Main Menu is exited.



The following message is displayed to confirm the Password:

Password: XXXXX
Conf. (+yes / -no)

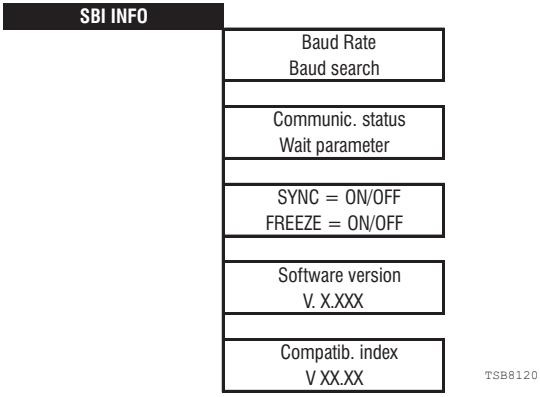
TSB8110

Pressing the “+” key confirms the Password and the system returns to the immediately superior Menu level; from this moment on, the Password is enabled if a non-zero value was entered or disabled if zero was specified.

Pressing the “-” key returns to Password Edit mode.

8.8 SBI Info Menu

This Menu is used to display various information about the SBI card; all data items are strictly read-only.



Move between the Menu items by pressing the Cursor-Up/Cursor-Down keys; use the Cancel key to return the immediately superior Menu level.

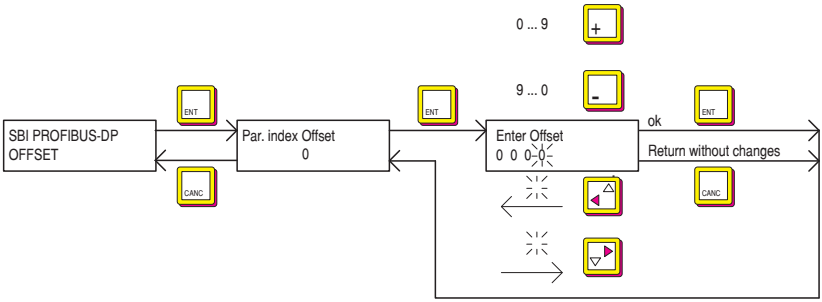
The first three data items are automatically refreshed.

8.9 Edit

The Editing phase is activated by pressing the Enter key when positioned on an item that can be set; during this phase, the functions of the keys are as follows:

1) The Right/Left Cursor keys are used to move along the number being specified; the number of permitted digits depends on the type of data item being operated on.
2) The “+” and “-” keys are used to increment/decrement the value of the selected digit; permitted values are in the range 0 to 9.
3) Enter key confirms the setting.
4) Cancel key cancels the setting operation.

During Editing, the digit being set will flash.



The above figure shows an example of editing a value and the effect of keys during this phase.

9.0 Identification Codes

9.1 Drive identification number

The PROFIBUS-DP protocol requires an identification number for every kind of devices that can be connected to the Bus.

The identification number assigned to the SBI-PDP-32 card by the Profibus Nutzerorganisation is the following:

009Ah hexadecimal corresponding to **154** decimal

TSB8130

9.2 Card configuration codes

The Profibus-DP interface card does not require user parameter data.

The configuration data consist of 2 Bytes made up as follows.

- Use with "Compact Device 16 Byte I/O cons" module. (necessary for TPD32 with firmware versions earlier than v9.200)

Byte	Value decimal-hexadecimal
1	183 - B7
2	183 - B7

Tsb8140

- Use with "Compact Device 20 Byte I/O cons" module. (only for TPD32 with firmware version v9.200 or later)

Byte	Value decimal-hexadecimal
1	183 - B7
2	187 - BB

Tsb8145

For the meaning of these bytes please refer to the paragraph 8.3.5 of the “Draft Standard PROFIBUS -DP DIN 19245 Part 3” manual.

9.3 Data type and GSD file

On our web site www.gefran.com are available for download the type and GSD files suitable for the Profibus-DP network configurator.

The files contained in the TYPEFILE directory have to be copied in the directory where the configurator program is installed.

The file contained in the WINCOM directory has to be copied in the directory where the configurator for WINDOWS™ environment is installed.

10. Glossary

- Master	PLC or PC device controlling the Profibus-DP; it has the right to access the Bus.
- Slave	Drive or Input/Output modules without rights to access the Bus.
- Process Channel	Channel for the fast, cyclic and high-priority data transfer of parameters previously configured.
- Configuration Channel	Channel for the non-cyclic and low-priority data transfer used, for instance, for the drive configuration.

11. Abbreviations

- **PDC** Process Data Channel.
- **DP** Decentralized Peripherals.

12. References

1 - Draft Standard PROFIBUS-DP DIN 19245 Part 3. Ed. 1994 by Profibus Nutzeroganisation e. V.

2 - Optiona manual APC (DGFC)

3 - TPD32 Converter manual.

Gefran worldwide

GEFRAN BENELUX
Lammerdries-Zuid, 14A
B-2250 OLEN
Ph. +32 (0) 14248181
Fax. +32 (0) 14248180
info@gefran.be

GEFRAN BRASIL ELETROELETRÔNICA
Avenida Dr. Altino Arantes,
377/379 Vila Clementino
04042-032 SÃO PAULO - SP
Ph. +55 (0) 1155851133
Fax +55 (0) 1132974012
gefran@gefran.com.br

GEFRAN DEUTSCHLAND
Philipp-Reis-Straße 9a
63500 SELIGENSTADT
Ph. +49 (0) 61828090
Fax +49 (0) 6182809222
vertrieb@gefran.de

SIEI AREG - GERMANY
Gottlieb-Daimler-Strasse 17/3
D-74385 Pleidelsheim
Ph. +49 7144 89 736 0
Fax +49 7144 89 736 97
info@sieiareg.de

GEFRAN - FRANCE
4, rue Jean Desparmet - BP 8237
69355 LYON Cedex 08
Ph. +33 (0) 478770300
Fax +33 (0) 478770320
commercial@gefran.fr

GEFRAN SUISSE SA
Rue Fritz Courvoisier 40
2302 La Chaux-de-Fonds
Ph. +41 (0) 329684955
Fax +41 (0) 329683574
office@gefran.ch

GEFRAN SIEI - UK Ltd.
7 Pearson Road, Central Park
TELFORD, TF2 9TX
Ph. +44 (0) 845 2604555
Fax +44 (0) 845 2604556
sales@gefran.co.uk

GEFRAN INC
Sensors and Automation
8 Lowell Avenue
WINCHESTER - MA 01890
Toll Free 1-888-888-4474
Ph. +1 (781) 7295249
Fax +1 (781) 7291468
info@gefraninc.com

Motion Control
14201 D South Lakes Drive
NC 28273 - Charlotte
Ph. +1 704 3290200
Fax +1 704 3290217
salescontact@sieiamerica.com

GEFRAN INDIA PRIVATE LIMITED
Survey No.: 129/1, Nandan Park
Plot No.: 6, Chakankar Mala
Baner-Balewadi Road, Baner
Pune 411045, MH, INDIA
Ph. +91 20 66400400
Fax +91 20 66400401

GEFRAN SIEI - ASIA
Blk. 30 Loyang way
03-19 Loyang Industrial Estate
508769 SINGAPORE
Ph. +65 6 8418300
Fax. +65 6 7428300
info@gefransiei.com.sg

GEFRAN SIEI Electric
Block B, Gr.Flr, No.155, Fu Te Xi Yi Road,
Wai Gao Qiao Trade Zone
200131 Shanghai - CHINA
Ph. +86 21 5866 7816
Ph. +86 21 5866 1555
gefransh@online.sh.cn

GEFRAN SIEI DRIVES TECHNOLOGY
No.1265, Beihe Road,
Jiading District
201821 Shanghai - CHINA
Ph. +86 21 69169898
Fax +86 21 69169333
info@gefransiei.com.cn

GEFRAN

GEFRAN S.p.A.
Via Sebina 74
25050 Provaglio d'Iseo (BS)
ITALY
Ph. +39 030 98881
Fax +39 030 9839063
info@gefran.com
www.gefran.com

Drive & Motion Control Unit
Via Carducci 24
21040 Gerenzano (VA)
ITALY
Ph. +39 02 967601
Fax +39 02 9682653
infomotion@gefran.com

Technical Assistance :
technohelp@gefran.com

Customer Service :
motioncustomer@gefran.com
Ph. +39 02 96760500
Fax +39 02 96760278

Manuale SBI PDP32 /EN
Rev. 0.1 - 29-9-09
1S5E25