

COMBICOM



PROFIBUS-DP-Operator

D



Seite D 3 D 42

GB



Page GB 3 GB 42

Table of Contents

1.	General	5
1.1	Product description	5
1.1.1	PROFIBUS-DP-Operator	6
2.	Hardware Description	6
2.1	PROFIBUS-DP-Operator	6
2.1.1	Summary	6
2.1.2	Technical Data	7
2.1.3	Slide Switch S1	7
2.2	PROFIBUS - Specifications	8
2.2.1	Transmission Medium	8
3.	Connection	9
3.1	Connection of PROFIBUS	9
4.	Software	10
4.1	PROFIBUS Services	10
4.2	The 3 Function Blocks	10
4.2.1	Process Output Data Processing	10
4.2.2	Handling of the Process-Input-Data	11
4.2.3	Parameter Request Processing	11
4.3	Process Data and it's Mapping	11
4.4	Adaption of the Process-Data-Assignment (from SW V3.3)	13
4.4.1	Reset with the Slide Switch S1	14

- 5. The Specifications of KEB-PROFIBUS-DP-Interface 15**
 - 5.1 PROFIBUS-DP-Diagnosis Data 15**
 - 5.2 PROFIBUS-DP-Parameter Data 15**
 - 5.3 PROFIBUS-DP-Configuration Data 16**
 - 5.4 User Data for KEB-PROFIBUS-DP-Interface 17**
 - 5.4.1 Coding of User-Data from DP-Master to KEB-DP-Interface 17
 - 5.4.2 Coding of the User-data from the KEB-DP-Interface to the Master 19
 - 5.5 Realization of the Parameter-Channel Protocols with the Master 21**
 - 5.5.1 Examples for a Telegram Sequence of the Parameter Channel 22

- 6. PROFIBUS-DP-Operating Parameter 24**
 - 6.1 Station Address 24**
 - 6.2 Baudrate 24**

- 7. Application Parameters 25**
 - 7.1 Internal Inverter Parameters 25**
 - 7.2 Configuration Parameters 26**
 - 7.3 DRIVECOM Profile Parameter in Index Range 6000h to 604Dh 32**

- 8. Annex 41**
 - 8.1 Error Messages of the Parameter Channels 41**
 - 8.2 Device Master Data of KEB-PROFIBUS-DP-Interface 41**
 - 8.3 Accessories 41**

1. General

This manual as well as the hardware and software are developments of the Karl E. Brinkmann GmbH. Errors and omissions excepted! The Karl E. Brinkmann GmbH prepared the documentation, software and hardware to the best of its knowledge, but no guarantee is given that the specifications will bring the user the efficiency aimed at. The Karl E. Brinkmann GmbH reserves the right to change the specifications without obligation. All rights reserved!

The Karl E. Brinkmann GmbH develops, manufactures and distributes static frequency inverters worldwide in the industrial power range. Within the scope of automation, systems are needed which are more powerful and flexible. Thus the the Karl E. Brinkmann GmbH inverter is equipped with a serial UART-interface. The protocol is based on the standard DIN66019 (ANSI X3.28) and is called KEB-DIN66019. The KEB-DIN66019 protocol can be adapted to higher-level transmission mediums.

1.1 Product description

PROFIBUS-DP is a process-controlled field bus for decentral peripheral.

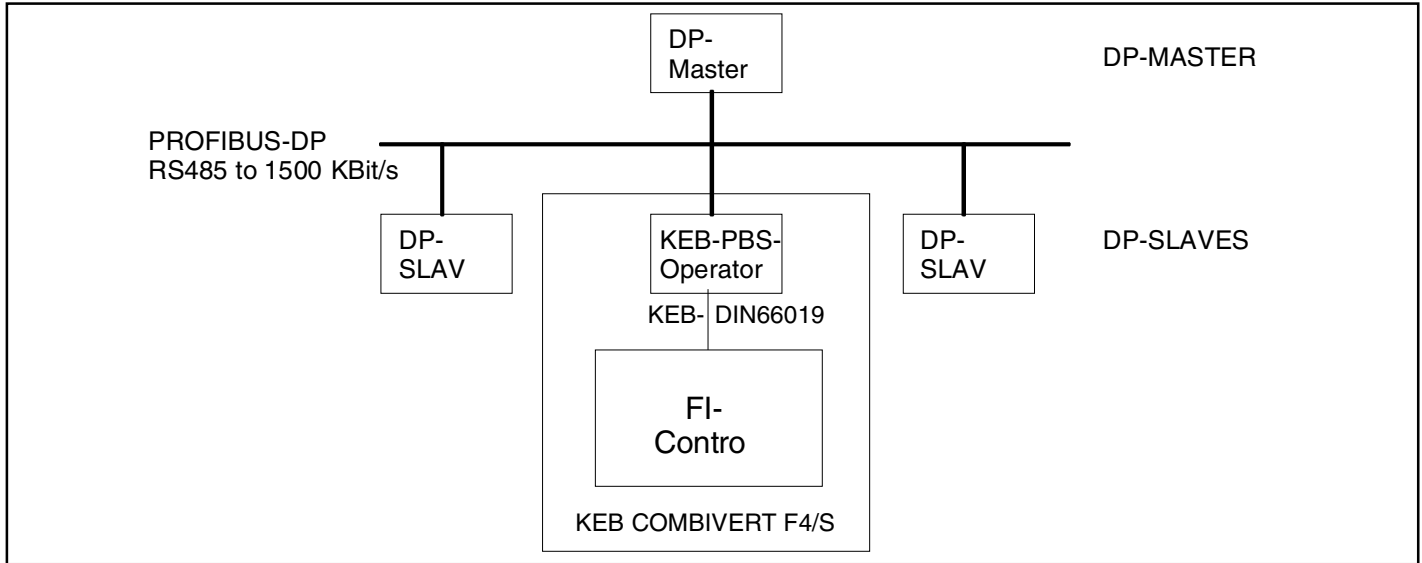
KEB-DIN66019-protocol be converted onto PROFIBUS-DP as follows:



1.1.1 PROFIBUS-DP-Operator

The PROFIBUS-DP-Operator

- converts the PROFIBUS-DP-protocol onto KEB-DIN66019
- is a passive subscriber (DP-Slave) on the PROFIBUS side
- connects **one** KEB COMBIVERT F4/S4 with PROFIBUS-DP
- is placed on KEB COMBIVERT instead of the Operator
- needs an external voltage supply

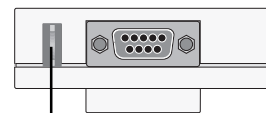
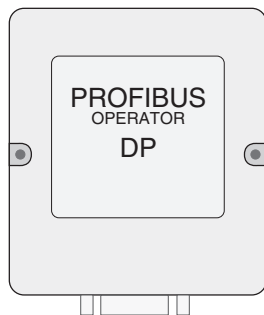


Principle of PROFIBUS-DP-Operators

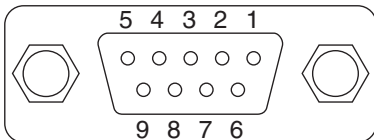
2. Hardware Description

2.1 PROFIBUS-DP-Operator

2.1.1 Summary



PE earth potential connection



PIN	Signal	Significance
1-2	-	reserved
3	RxD/TxD-P	transmission and receiving signal P
4	-	reserved
5	DGND	data ground
6	VP	voltage supply for matching resistor
7	-	reserved
8	RxD/TxD-N	transmission and receiving signal N
9	-	reserved

2.1.2 Technical Data

Mounting:	Installation in KEB COMBIVERT F4/S4
Voltage supply:	From KEB COMBIVERT
Isolation:	Safe isolation in accordance with VDE 0160
Temperature limits:	0...+40 °C during operation -25...+70 °C storage
Relative humidity:	max. 95% without condensation

2.1.3 Slide Switch S1

(not available for all operator versions)

The slide switch S1 cannot be reached from the outside. The housing of the PROFIBUS-operator must be removed to operate the slide switch. The PROFIBUS-DP-operator activates its standard adjustment (delivery state) with the slide switch S1 and their values are stored non-volatile. All non-volatile stored parameters are set to their standard value including the process-data-assignment of the operator.



Position A



Position B

Position A: The DP-operator activates the standard adjustments of all non-volatile stored parameters and stores these non-volatile.

Position B: The DP-operator operates with his unchanged non-volatile parameters.

Attention!

Do not leave switch S1 permanently in position A, because the lifetime of the non-volatile memory will be reduced.

2.2 PROFIBUS - Specifications

2.2.1 Transmission Medium

Transmission and physical medium:

RS485; shielded, twisted two-wire

Cable parameter for - cable A to PROFIBUS-DP:

Surge impedance	135-165 W (3 - 20 MHz)
Capacitance per unit length	< 30 pF/km
Loop resistance	< 110 W/km
Wire diameter	> 0.64 mm
Wire section	> 0.34 mm ²

- Cable B in accordance with DIN 19245 Part 1

Surge impedance	100-120 W (f > 100kHz)
Capacitance per unit length	< 60 nF/km
Loop resistance	< 160 W/km
Wire diameter	> 0.53 mm
Wire section	> 0.22 mm ²

Cable length dependent on the baudrate:

Baudrate in kbit/	9,6	19,2	93,75	187,5	500	1500
with line A in m	1200	1200	1200	1000	400	200
with line B in m	1200	1200	1200	600	200	-

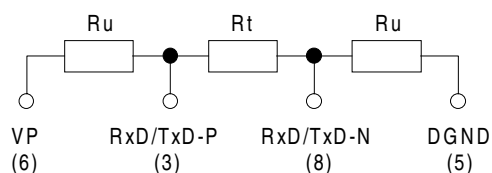
Spur lines with cable
 $A \leq 0,3 \text{ m}$
 $B \leq 6,6 \text{ m}$

The spur lines count as part of the total length!

Number of

Bus subscribers: 32 (active, passive subscriber and line amplifier)

Bus termination: Must occur on every cable on the first and last BUS-subscriber



R_u : 390 Ohm

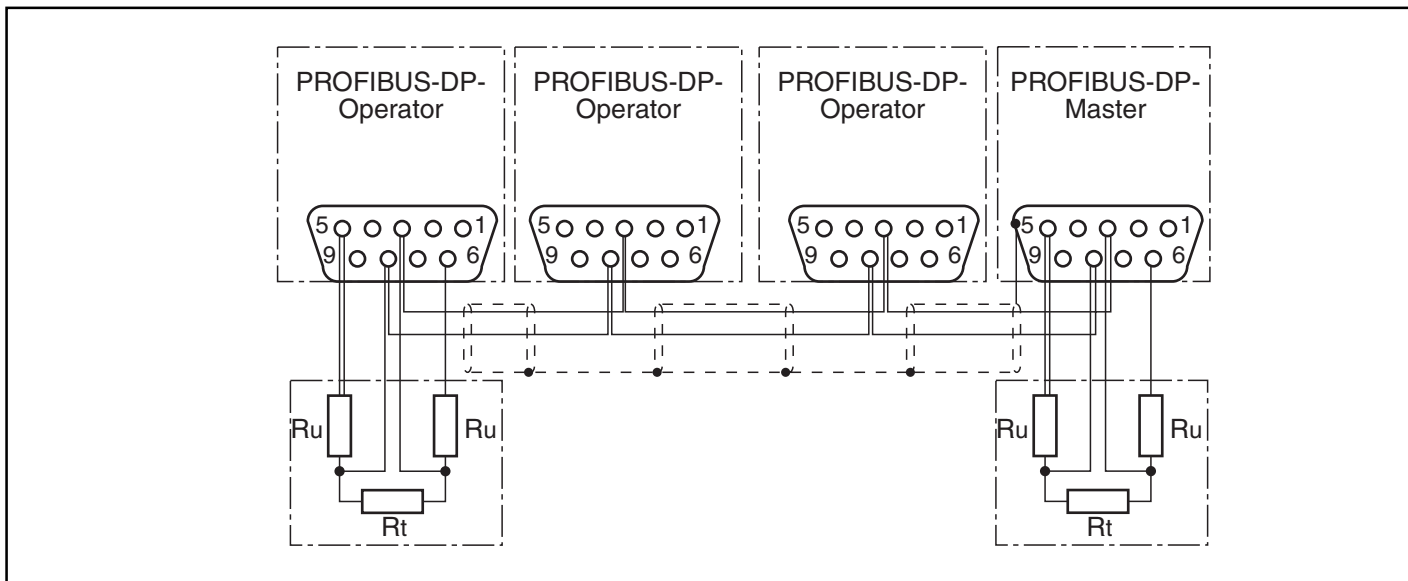
R_t : 220 Ohm (with cable A)

R_t : 150 Ohm (with cable B)

3. Connection

- Due to the high transmission speed the following must be done:
- install the cable with great care
 - terminate the Bus with the terminal resistance on both sides of every line
 - keep the spur lines small

3.1 Connection of PROFIBUS



The values for the terminal resistances are dependent on the transmission medium (see 2.3.1)

4. Software

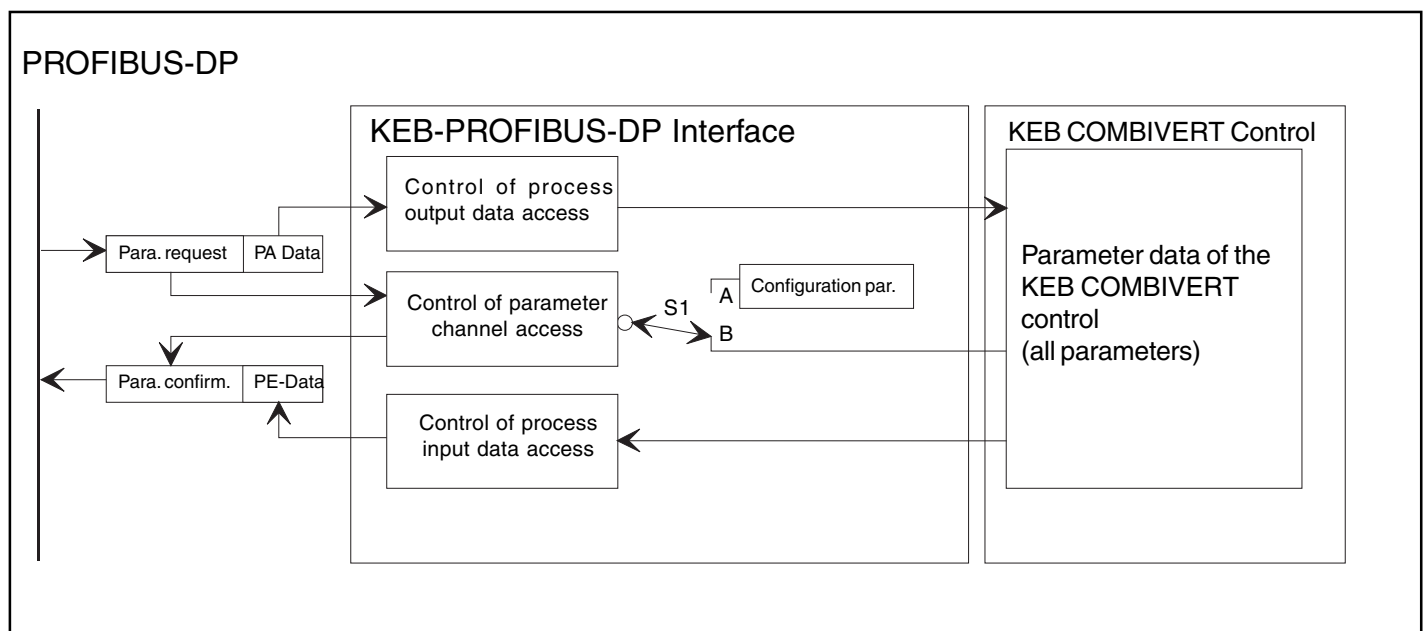
The KEB PROFIBUS-DP-interfacing has the following services/functions:

4.1 PROFIBUS Services

Data_Exchange	'Transfers input-/output data
RD_Inp	'Reads the inputs of a slave
RD_Outp	'Reads the outputs of a slave
Slave_Diag	'Reads DP-Slave diagnosis information
Set_Prm	'Sends parameter data
Chk_Cfg	'Checks configuration data
Get_Cfg	'Reads out configuration data
Global_Control	'Control commands

GB

4.2 The 3 Function Blocks



4.2.1 Process Output Data Processing

The (process) **output data** received from PROFIBUS-DP-Master are transferred, when changes occur, to parameters which were previously specified. The processing of the output data can be switched on/off by changing the parameter **Process-Output Data Released**. The process output data mapping is executed in the PROFIBUS-Interface. The target for the output data is determined with parameter **process-output data-description** (see parameter description in this instruction manual).

4.2.2 Handling of the Process-Input-Data

The values are determined cyclic from parameters which were previously defined and sent as (process) **input data** to the PROFIBUS-DP-Master. This is done cyclically in a definite and adjustable time. The activation of the input data can be switched on/off by changing the parameter **PE-Enabled**.

The process-input-data mapping is executed in the PROFIBUS-DP Interface. The source of the process-input-data is determined by parameter **process-input-data-description**. (see parameter description in this instruction manual).

4.2.3 Parameter Request Processing

This function extends the flexibility of the KEB-PROFIBUS-DP interfacing. It makes it possible for the PROFIBUS-DP-Master to change (**write**) or inquire (**read**) every parameter value in the KEB COMBIVERT via the PROFIBUS-DP protocol. This additional function requires more software-work on the DP-Master side (e.g. PLC), because a small protocol has to be realized on the netto data. This makes it possible to carry out so called **parameter requests**.

The **software-switch S1** in the diagram indicates the transfer between the configuration parameters of PROFIBUS-DP-interfacing and the parameters of the inverter control. The configuration parameters are triggered via indexes in a range of **5FXXh to 6002h**. The parameters of the frequency inverter control are in the index range of **2000h to 5FXXh**.

4.3 Process Data and it's Mapping

This chapter describes the difference between process data and parameterize data. Process data are only user data, without any addressing. The PROFIBUS-DP-Master presets new values to the KEB COMBIVERT via process-output data. The actual values of certain parameters are announced to the PROFIBUS-DP-Master via process-input data. Since the process data not contain any addresses these have to be determined first via an additional configuration between DP-Master and DP-Slave, because the process data not contain parameter addresses. This agreement is called process data mapping.

Parameter **process-output-data-description (DRIVECOM-PROFIL)**. specify the target for the output-process- data. In the same way parameter **process-input-data-description (DRIVECOM-PROFIL)** specify the source of the process-input-data.

The length of the PROFIBUS-DP user data is fixed as follows:

User data length of the DP-Master to the KEB-DP-Slave =
(8 + process-output data-length) byte,
with process-output data-length addressable via
index=6001h, subindex=1

User data length of the KEB-DP-Slave to the DP-Master =
(8 + process-input data-length) byte,
with process-input data-length addressable via
index=6000h, subindex=1

After delivery the process-output-data-length and the process-input-data-length display the value 4. Consequently the standard-user-data-length for the KEB-DP-Slave is 12 byte.

The parameterization channel is handled in the first 8 byte user data. This 8 byte contains :

- one **managment byte** for the correct handling of requirement and confirmation,
- **Parameter address** (index,subindex),
- **Service requirement** (write or read),
- and **data length** of the parameter (max. 4 byte data can be changed)

The code of the data are desriped at the bottom of the page.

4.4 Adaption of the Process-Data-Assignment (from SW V3.3)

The standard-process-data-assignment is not suitable for all KEB COMBIVERT, because not all KEB COMBIVERT types support the DRIVECOM-profil parameters. From software version 3.3 the initialization phase of the PROFIBUS-DP-operator is extended, so the user has the possibility to operate exclusively via process-data with PROFIBUS. The operator adjusts automatically his process-data-assignment to the control of the connected KEB COMBIVERT. After delivery this automatic adaption is activated, but this adjustment can be deactivated via the parameter channel (Parameter Auto_Pdmap_Adapt). The sequence of the automatic adaption of the process-data-assignment is described as follows:

1. First of all the inverter control type must be defined. There are three different KEB COMBIVERT types:
 - KEB COMBIVERT F4-C,
 - Servo (S4) and KEB COMBIVERT F4-F,
 - KEB COMBIVERT F4-S.

2. The last connected inverter control (inverter-type) is stored non-volatile.

3. If there are differences between actual and last connected inverter type and when the automatic adaption of the process-data-assignment is active, the standard-process-data-assignment for the actual inverter type is activated and stored non-volatile. If the automatic adaption is not active or the inverter type has not changed, the stored process-data-assignment is not changed.

The following standard-process-data-assignments with 2 parameters for the process-output-data and process-input-data are defined:

KEB COMBIVERT	Process-Output-Data PROFIBUS ⇒ KEB		Process-Input-Data KEB ⇒ PROFIBUS	
	1.Parameter	2.Parameter	1.Parameter	2.Parameter
F4-C	Pr.06	Pr.08	Pr.07	Pr.09
Servo(S4) / F4-F	SP.03	SP.01	ru.00	ru.01
F4-S	oP.03	oP.01	ru.00	ru.03

GB

Important Note:

The automatic adaption of the PD-assignment has the consequence that a PROFIBUS-DP-operator makes PROFIBUS-communication on different KEB COMBIVERT types with different PD-assignments. This is very important for the software of the PROFIBUS-DP-Master control, because this must know the meaning of all process data. Of course it is possible to read out the active process data mapping via the parameter channel. These parameters are called process-output data-description and process-input data-description.

To make a clear statement which PD-assignment is active without reading this via the parameter channel, the user must know the inverter type which operates with the PROFIBUS-DP-operator, and also the inverter type in which the operator has operated before. Also you must know if the process-data-assignment was changed by the user.

The following two examples shall make clear the connections. In all examples it is safe to assume that the automatic adaption of the process data- assignment is active:

Example1: F4-C ⇒ S4/F4-F:

A PROFIBUS-DP-operator operates up to now in a KEB COMBIVERT F4-C and now the operator shall operate in a S4/KEB COMBIVERT F4-F. Then the operator activates the standard-process-data-assignment for a S4/KEB COMBIVERT F4-F and these are stored non-volatile.

Example2: F4-C ⇒ F4-C:

A PROFIBUS-DP-operator operates up to now in a KEB COMBIVERT F4-C and now the operator shall operate in another KEB COMBIVERT F4-C. The process-data-assignment was changed by the user and there are differences to the standard assignment. In this case the non-volatile stored process-data-assignment is unchanged active in the new KEB COMBIVERT F4-C inverter.

4.4.1 Reset with the Slide Switch S1

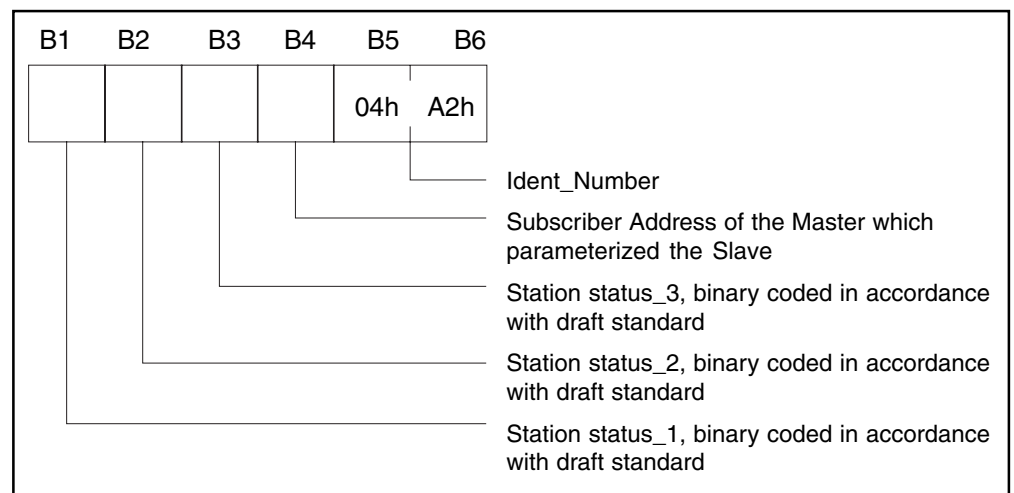
If you don't know the inverter type in which the operator works before or if the PD-assignment was changed by the user, the standard adjustment of the non-volatile stored parameters can be activated with the PROFIBUS-operator (see hardware-description of the slide switch S1). If you have activated the standard adjustment of the operator by this way, you only must know the inverter type the PROFIBUS-DP-operator is plugged-on to know the PD-assignment of the operator.

5. The Specifications of KEB-PROFIBUS-DP-Interface

The KEB-PROFIBUS-DP interface realizes a passive PROFIBUS-DP-Subscriber (Slave). This means that the KEB-PROFIBUS-DP interface receives data from a Master and only sends data to it when requested. The PROFIBUS-DP-protocol defines different operating conditions, which have to be executed, before the user-data can be exchanged. The DP-Master must **parameterize** and **configure** all DP-Slaves connected. When this is successfully completed the **cyclical exchange of user-data** can begin.

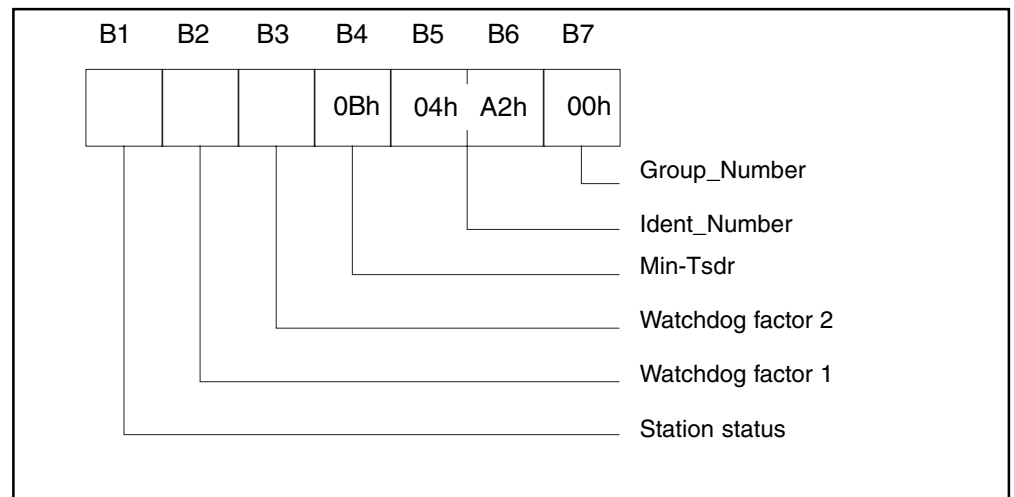
5.1 PROFIBUS-DP-Diagnosis Data

When the diagnosis data is requested by a PROFIBUS-DP-Master the KEB-PROFIBUS-DP-interface answers with **6 byte diagnosis data (no user diagnosis)**, they correspond to the draft standard DIN19245 part3 and are constructed as follows:



5.2 PROFIBUS-DP-Parameter Data

To successfully parameterize KEB-PROFIBUS-interface, the DP-Master must send **7 byte parameter data** to it, which is set up as follows:



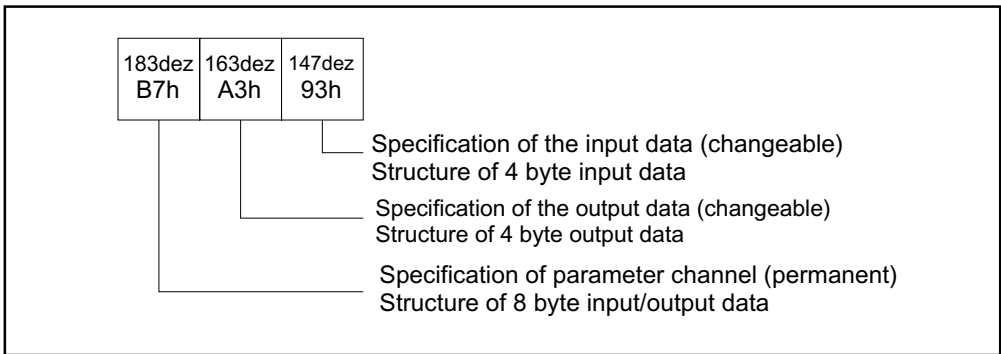
When the KEB-DP-interfacing does not receive any data from the Master within the watchdog time (T_{WD}), even though the watchdog time is switched on, the output data are then set to 0. The watchdog time can be switched on/off and parameterized by the Master. This time consists of the following factors:

$$T_{WD} = \text{Watchdog-factor-1} * \text{Watchdog-factor-2} * 10 \text{ ms.}$$

5.3 PROFIBUS-DP-Configuration Data

GB

The DP-Master specifies the configuration data for the DP-Slave. When this coincides with the data from the KEB-PROFIBUS-DP-interface then the Master starts the cyclical data-transfer phase with this slave. The configuration data of the KEB-DP-interface are not permanently defined. This makes it possible for an adaptation onto the respective application. Refer to **Process-Output Data-Description** or **Process-Input-Data-Description** in this manual for information about changing the configuration. Below the standard configuration is described in accordance with the draft standards.



This configuration means, that every KEB-PROFIBUS-DP-interface consists of **three modules (= function blocks)**:

- Module 1 = **Parameter channel**
Here 8 byte user data are transferred from the DP-Master to KEB-DP-Slave and 8 byte user data from the KEB-DP-Slave to DP-Master. This is why in this module the configuration is specified with input and output data.
- Module 2 = (process) **output data**
Output data means, that these data are divided from the DP-Master to KEB-DP-interface Here up to 8 bytes of user-data are sent from the DP-Master to DP-Slave. Thus, the term input data in the configuration.

- Module 3 = (process) **input data**.
Input data means, that these data are divided from the KEB-DP-interface to DP-Master. Here up to 8 byte user data are sent to the DP-Master. Thus the term input data in the configuration.

This triple function is found in the PROFIBUS-DP in the form of two user-data telegrams:

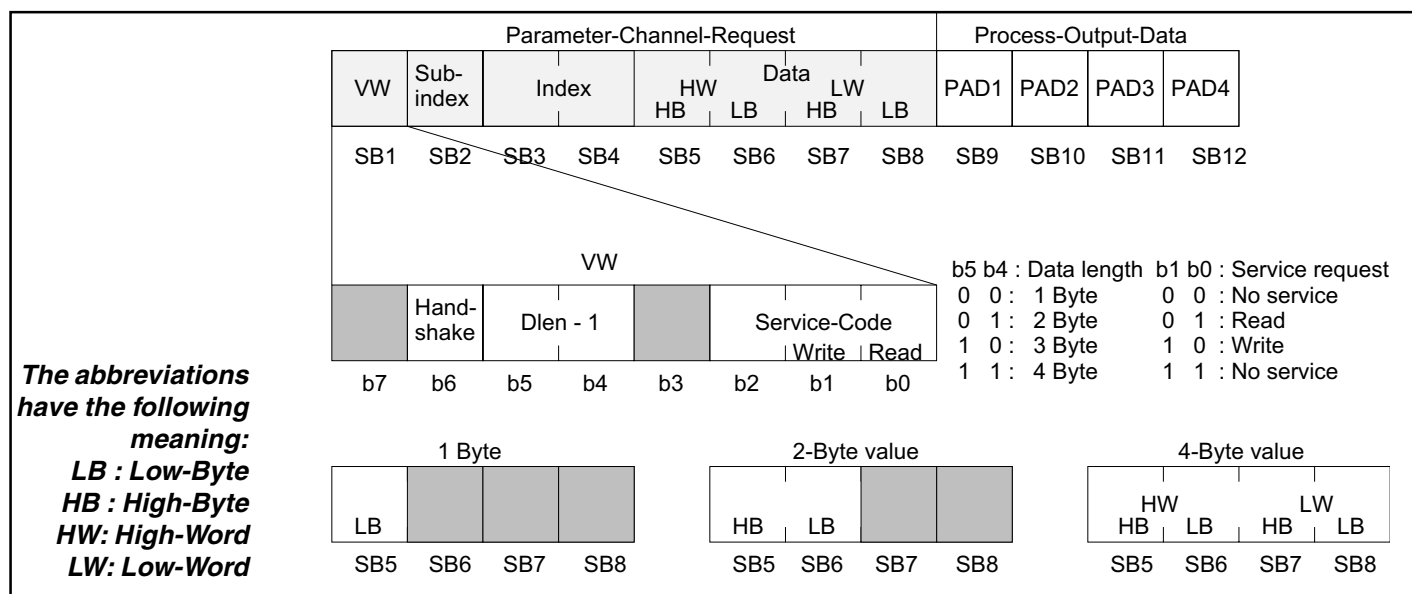
- The user-data telegram from DP-Master to KEB-PROFIBUS-DP-Slave. This contains the **parameter-channel-request** and the (process) **output data**.
- The user-data telegram from KEB-PROFIBUS-DP-Slave to DP-Master. This contains the **parameter-channel-confirmation** and the (process) **input data**.

GB

5.4 User Data for KEB-PROFIBUS-DP-Interface

Every user-data telegram from the DP-Master to the KEB-DP-Slave has a **user-data length of 12 bytes** in the standard setting. All user-data telegrams have the same user-data length from KEB-DP-Slave to DP-Master.

5.4.1 Coding of User-Data from DP-Master to KEB-DP-Interface



The first **8 bytes** contain the **parameter-channel request**. Request means, that the DP-Master can inform the DP-Slave during this part of the telegram, that either the value of the parameter should be changed (**write**) or the value of a parameter should be inquired (**read**). This part of the telegram cannot be changed by changing the configuration. The addressing of the parameter occurs via the 16-bit-**Index** and the 8-bit-**subindex**. The **data-length of the parameter**, which can be accessed by these parameter channels is limited to **4 bytes**.

Restrictions

Some complex parameters cannot be read/written via KEB-PROFIBUS-DP-interface by one parameter request. When accessing these parameters the user must register every part of the parameter/object separately (via the subindex).

The first byte of the parameter-channel request has a special significance (see figure p.17). The parameter requests are handled by this control byte. This additional service is necessary so that the parameter requests can be treated separately from the exchange of the PROFIBUS-DP-user data. The control byte has one **Handshake-Bit for this**. This bit must be inverted by the DP-Master every time it wants to send a new parameter-channel-request.

Furthermore, 2-bit information is found in the control byte. This specifies the data-length of the parameter accessed. If the value of a parameter must be read, then both bits should be set at 0. When changing the value of a parameter, note that the data length -1 is entered here (see above). The bits b0 and b1 contain the service-coding. If the DP-Master wants to inquire the value of the parameter from the KEB-DP-Slave (**read**), then the bit **b0 = 1** and the bit **b1 = 0**.

Otherwise, the bit **b0 = 0** and the bit **b1 = 1** must be set, when the value of a parameter should be changed (**write**).

Important!

If both service-bits (b0,b1) are set, the KEB-PROFIBUS-DP-Slave ignores these parameter-channel requests.

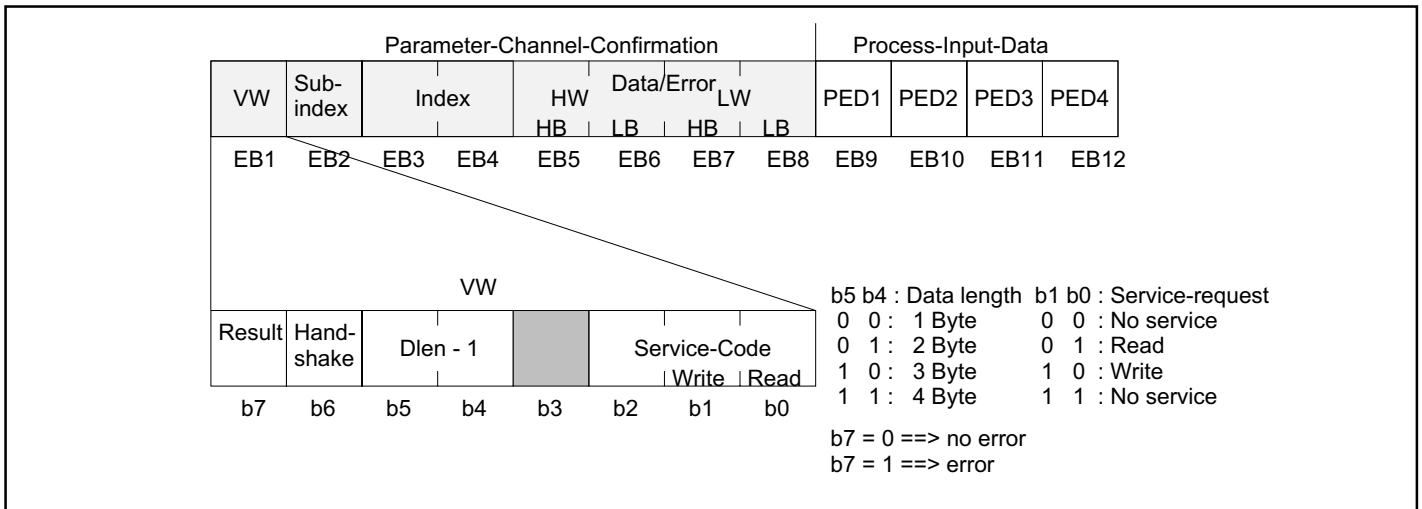
To address the parameter, the index and subindex must be set. In case of a write request, additional data lengths must be entered as well as the data described above.

The second part of the user-data telegram contains the (process-) **Output data**. This data is not addressed, i.e. it only contains the data not parameter addresses. Where these data are mapped to is described in the chapter about the function KEB-PROFIBUS-DP-Interface.

Important!

Process-ouput data are only actualized to the KEB COMBIVERT when they have changed!

5.4.2 Coding of the User-data from the KEB-DP-Interface to the Master



The first **8 bytes** contain the **parameter-channel-confirmation**. This means the DP-Master is informed whether the service it requested could be completed without any errors.

This part of the telegram cannot be changed by changing the configuration.

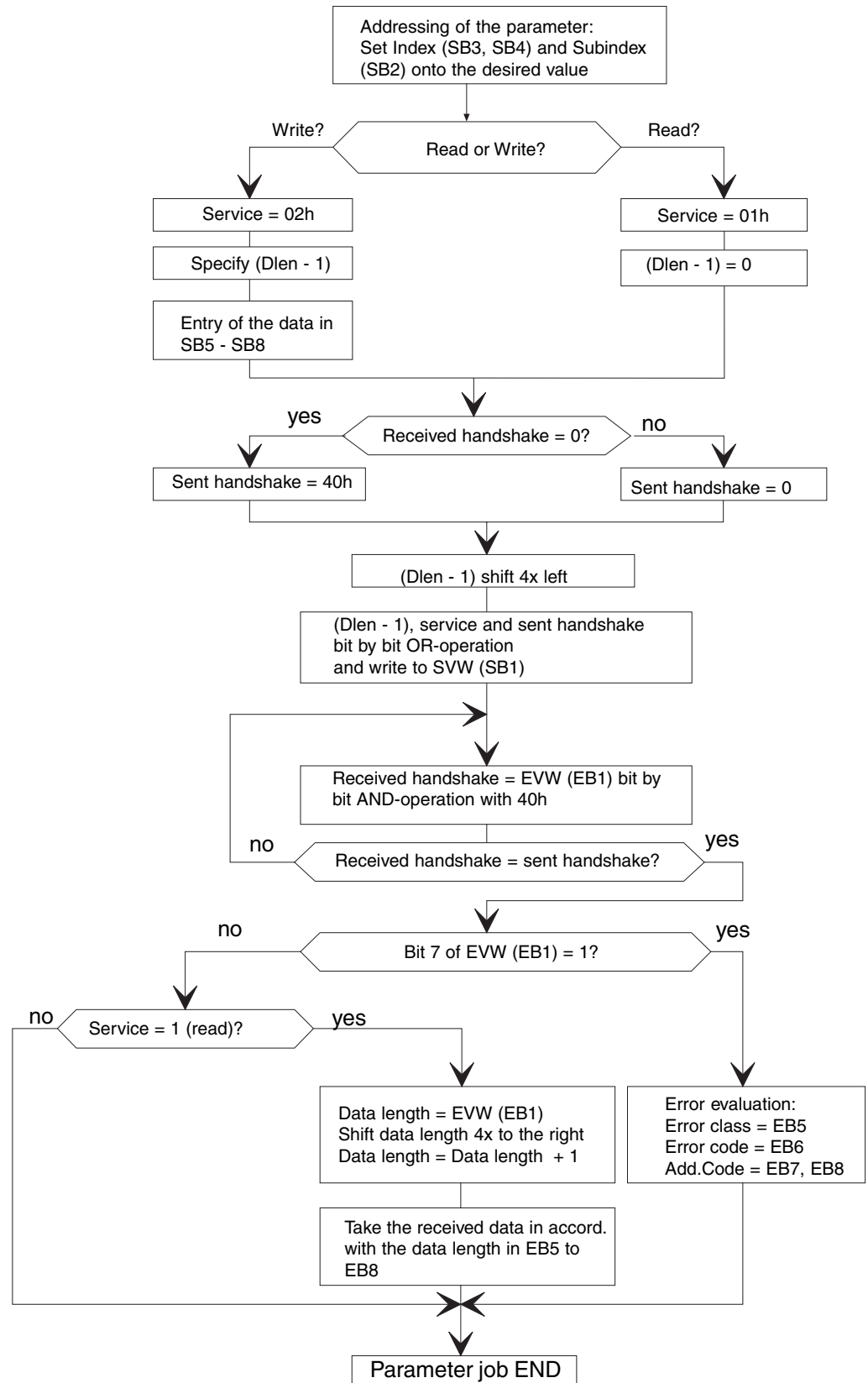
Even here the first byte, the control byte, has a special significance. The bit6 (handshake) shows, whether the requested service was completed. When b6 has the same value as the request, then the service is completed and the confirmation can be evaluated. Bit b7 shows whether the requested service could be completed without an error (b7=0) or if an error occurred (b7=1). In case of an error the data/error field (bytes EB5 to EB8) is to be read as an error description. The error is divided into the error-class (EB5), error code (EB6) and additional code (EB7, EB8). The meaning of each error code is found in the annex. If no error occurs and the DP-Master requested the reading of a parameter value, the data/error field contains the data read-out. In this case the length of the data can be taken from the bits b4, b5 (see above). The data are filed on the left side in Motorola format (see above).

Note: With a write-request the written data is taken from the request into the confirmation, when no error occurs. In this case the DP-Master can read back the data to check it. The data length cannot be taken from the confirmation, while this is permanently set at 0 in a write-confirmation.

The 2nd part of the telegram contains the values of the (process) **input data**. These are previously specified and then entered in the PROFIBUS-DP-telegram. The input data are read cyclical with an adjustable cycle time. How the mapping of the process-input data occurs is described in the chapter about the function of KEB-PROFIBUS-DP-Interface.

5.5 Realization of the Parameter-Channel Protocols with the Master

The following flow chart shows the necessary procedures that a PROFIBUS-DP-Master must support, to use the parameter channel of KEB-PROFIBUS-DP-Operator.



GB

5.5.1 Examples for a Telegram Sequence of the Parameter Channel

For a better understanding of the sequence of parameter channel orders, the following examples describe possible telegram contents. Three successive parameter orders are listed. The complete PROFIBUS-telegrams are not displayed here. Only the user data of the parameter channel in the telegrams are displayed here. The first column contains a telegram identifier. A 'S' with trailing digit displays 'transmission message from the master'. An 'E' displays 'receive message of the master'. The examples display that a parameter order can require different telegrams. The cause is the PROFIBUS-DP-protocol and also different times for the execution of a parameter channel service in the KEB-PROFIBUS-DP-interface.

The following examples describe the parameter orders :

- Example 1:**
- Request from the master: writing (index=4100h, subindex=0, Dlen=2, value=000Bh/11d)
 - Confirmation from the KEB-slave: error (errir-class=8, error code=0, Add-code=0030h)

E0: 00h	00h	00h	00h	00h	00h	00h	00h
	B1	B2	B3	B4	B5	B6	B7
S1: 52h	00h	41h	00h	00h	0Bh	00h	00h
E1: 00h	00h	00h	00h	00h	00h	00h	00h
S2: 52h	00h	41h	00h	00h	0Bh	00h	00h
E2: 00h	00h	00h	00h	00h	00h	00h	00h
S3: 52h	00h	41h	00h	00h	0Bh	00h	00h
E3: C2h	00h	41h	00h	08h	00h	00h	30h

S1 contains the first request from the master. In this telegram the handshake-bit must be set, because the actual handshake of the slave (see E0) = is 0.

The confirmation of this request is displayed in E3. The handshake-bit and the request have the same value. Besides Bit7 is set in the first Byte - an error message is displayed. In this case the Bytes B5 to B7 must be interpreted as error message (see above). The error (8,0,0030h) means, that the value is unvalid and therefore the value is not accepted.

- Example 2:**
- Request from the master: writing (index=4100h, subindex=0, Dlen=2, value=0003h/3d)
 - confirmation from the KEB-slave: OK.

S4: 12h	00h	41h	00h	00h	03h	00h	00h
E4: C2h	00h	41h	00h	08h	00h	00h	30h
S5: 12h	00h	41h	00h	00h	03h	00h	00h
E5: 02h	00h	41h	00h	00h	03h	00h	30h

S4 contains the request of the master (first time) with handshake-Bit=0. The confirmation of the slave is coming first in parameter E5. Bit7 is not set here ⇒ no error.

- Example 3:**
- Request from the master: reading (index=4000h, subindex=0)
 - Confirmation from the KEB-slave: OK (index=4000h, subindex=0, Dlen=2, data=0046h/70d)

S6: 41h	00h	40h	00h	00h	03h	00h	00h
E6: 02h	00h	41h	00h	00h	03h	00h	30h
S7: 41h	00h	40h	00h	00h	03h	00h	00h
E7: 51h	00h	40h	00h	00h	46h	00h	30h

S6 contains the request of the master (first time) with handshake-Bit=1. The confirmation of the slave is first included in parameter E7. Because of this is a reading service, the bytes B5 to B8 in accordance with the data length in B1 must be interpreted as value. Here Dlen = 2, value = 0046h/70d.

6. PROFIBUS-DP-Operating Parameter

6.1 Station Address For the PROFIBUS-DP-Operator the PROFIBUS-user-address corresponds with the parameter value ud.06 (inverter address) of the connected KEB COMBIVERT. The standard address of all KEB COMBIVERT and also the PROFIBUS-address after delivery is $T_s = ud.06 = 1$. A change is done here by interface operator, via keyboard or via the PROFIBUS-parameter channel. Attention! For the last possibility via the parameter channel a changed PROFIBUS-user-address is only active after the next POWER-ON. (see parameter description 'PROFIBUS-Station-Address')

GB

6.2 Baudrate

The PROFIBUS-DP-Operator only works with automatic Bitrate-identification on PROFIBUS.

The coding of the baudrate index is compatible to DIN 19245 part 2:

Baudrate index	Baudrate
0	9.6 kBit/s
1	19.2 kBit/s
2	93.75 kBit/s
3	187.5 kBit/s
4	500 kBit/s
5	38.4 kBit/s are not supported
6	1500 kBit/s

The minimum deceleration time as responder **Min_Tsdr= 11 Bit**

7. Application Parameters

As previously mentioned the parameters or objects of PROFIBUS-DP-interface and the KEB COMBIVERT connected are addressed via the index and subindex in the parameter channel. The KEB-PROFIBUS-DP-interface supports the DRIVECOM-profile for power transmission. This profile reserves the index range from **2000 (hex) to 5FFF (hex)** for user-oriented objects. Furthermore, it defines some parameters in the index range **6000 (hex) to 9FFF (hex)** as profile parameters.

The first group of parameters is subdivided in 2 groups:

- The group of internal parameters in the KEB COMBIVERT, which are localized in the inverter connected.
- The group of parameters, which are directly organized in the PROFIBUS-DP-interface. Furthermore, the parameters with index 6000h to 6002h are organized in the PROFIBUS-DP-interface. All parameters, which are localized in the DP-interface are also called **configuration parameters** in this manual.

GB

7.1 Internal Inverter Parameters

In this index range KEB-internal parameters are found. Not every parameter in this range exists for every inverter type.

For access to these parameters the following is valid: the parameter address is determined by subtracting **2000h** from the index. This means a parameter read/write request on an index in the range **2000h to 5FXXh** is converted by PROFIBUS-interface onto a read or write service to the KEB COMBIVERT with the

Parameter address = PROFIBUS-Index - 2000h
--

Important!

- To access the parameters in this index range the Subindex=0 !!!
- The data length for all parameters in this range is = 2 bytes (Dlen - 1 = 1) !!!




Example:

The value of the parameter with **Index =2213 (hex)** and **Subindex=0 (read)**. This service is converted from the PROFIBUS-interface as a read request onto the parameter with **Address=0213 (hex)** on the KEB COMBIVERT.

The answer received is then sent through the parameter-channel-confirmation to the DP-Master that requested the information.

7.2 Configuration Parameters

These parameters determine the configuration of the KEB-PROFIBUS-DP interface and thus are realized in this. This means a parameter request for this type of parameter is done directly in the PROFIBUS-interface and **not** actualized on the inverter control. Important! Access to parameters in this index-range must always occur with subindex = 0!!!

	This symbol means a parameter is immediately, permanently stored and becomes active!
	This symbol means a parameter is immediately active but not stored!
	This symbol means, a parameter is immediately, permanently stored and is first active after a Power-On-Reset! (Error code 6,5,1).

KEB-DIN66019-Baud



This parameter contains the index for the Baudrate on the KEB-DIN66019-side of the PROFIBUS-interface. The coding of this parameter is compatible with the parameter **Baudrate** with KEB-COMBIVERT.

In the initialization phase the PROFIBUS-DP-Operator adjusts a fixed transmission speed for the communication between inverter control and Operator (Auto_Ansibaud != FFh) or the highest possible speed, which supports the Operator as well as the inverter control. The parameter *KEB-DIN66016-Baud* is write-protected.

Index	5FFBh
Data Length	1 Byte
Coding	0 : 1200 Bit/s 1 : 2400 Bit/s 2 : 4800 Bit/s 3 : 9600 Bit/s (Standard) 4 : 19200 Bit/s * 5 : 38400 Bit/s * * Attention, KEB-COMBIVERT does not support all these

Process Data Mapping No mapping on process data

**KEB-DIN66019-Slave
Address**

The value of this parameter specifies which Slave (KEB COMBIVERT) on the KEB-DIN66019-side receives access to the KEB COMBIVERT internal parameters.

This parameter is write-protected.

Index

5FFDh

Data Length

1 Byte

Coding

0....239 (dez) for direct inverter access (Standard: 1)
224...254 for Multicast access
255 for Broadcast access

Process Data Mapping

Mapping on the process output and input data.

GB

KEB-DIN66019-Timeout



Determines the timeout time for the communication via KEB-DIN66019 coded in 10ms. The time measured is from the end of the request-telegram until the answer-telegram is completely received.

This parameter is write-protected. The fixed adjusted time-out times are:

KEB-DIN66019 time-out time = 340 ms at 1200 Bit/s

KEB-DIN66019 time-out time = 200 ms at 2400 Bit/s

KEB-DIN66019 time-out time = 110 ms at 4800 Bit/s

KEB-DIN66019 time-out time = 70 ms at 9600 Bit/s

KEB-DIN66019 time-out time = 70 ms at 19200 Bit/s

KEB-DIN66019 time-out time = 70 ms at 38400 Bit/s

Index 5FFFh

Data Length 1 Byte

Process Data Mapping No mapping on process-data.

PE-Enabled



Determines whether the (process-) **input data** is cyclically read from actual addressed KEB COMBIVERT or not.


Index 5FF8h

Data Length 1 Byte

Coding FFh: The process-input-data processing is switched on. (standard).

other values: The process-input-data processing is switched off. In this case the input data are no longer actualized to PROFIBUS-DP.

Process Data Mapping No mapping on process-data.


PE-Cycle  Cycle time for reading the process-input data from the addressed KEB COMBIVERT.

Index 5FFAh

Data Length 1 Byte

Coding 0...255 (*10 ms) = 0...2.55 s (standard value 20)

Process-Data-Mapping No mapping on process-data.

Internal Status-Word  Determines whether the DRIVECOM status-word is cyclically read from the KEB COMBIVERT or emulated by the DP-interface. The value of the DRIVECOM-status-word determines the part of the PROFIBUS-DP-diagnosis of the DP-interface.

Mapping of the DRIVECOM-Statusword to the PROFIBUS-DP-Diagnosis:
 PBS-DP-Diagnosis. Ext_Diag=DRIVECOM_Statusword.Bit3 (Error)
 PBS-DP-Diagnosis.Station_Not_Ready =
 Inverted Value of DRIVECOM_Statusword.Bit0


Index 5FF7h

Data Length 1 Byte

Coding **0:** The DRIVECOM status-word is cyclically read from the KEB COMBIVERT and the value is mapped on the Bits Diag.Ext_Diag as well as Diag.Station_Not_Ready. Observe that in this case the quickest possible cycle time for the input of new values via PROFIBUS-DP can be extended, while an additional read cycle is entered in the program sequence.

FFh: The DRIVECOM-status word is emulated by the PROFIBUS-DP-interface (standard)

Process-Data-Mapping No mapping on process-data.

Status-Word Cycle  Is only relevant when **internal status-word = 0**. The value of this parameter determines the cycle time in the which the DRIVECOM status word is read.

Index 5FF9h

Data Length 1 Byte

Coding 0...255 (*10ms) = 0... 2.55 s (Standard: 30)

Process-Data-Mapping No mapping on the process data.

GB

Auto_Ansibaud

Determines how the value is adjusted during the initialization phase. Either the transmission speed is adjusted to the highest possible value (*Auto_Ansibaud* = FFh) in KEB-DIN66019 automatically or adjusted a certain value (*Auto_Ansibaud* != FFh).



Note ! With inverters that do not support the parameter *Baudrate*, the value of the parameter *Auto_Ansibaud* does not have an effect. In this case the standard transmission speed is adjusted onto KEB-DIN66019.

Index 5FF6h

Data Length 1 Byte

Coding FFh: Automatically detects the highest possible KEB-DIN66019-Bitrate. (Standard)

- 0: KEB-DIN66019 transmission speed = 1200 Bit/s.
- 1: KEB-DIN66019 transmission speed = 2400 Bit/s.
- 2: KEB-DIN66019 transmission speed = 4800 Bit/s.
- 3: KEB-DIN66019 transmission speed = 9600 Bit/s.
- 4: KEB-DIN66019 transmission speed = 19200 Bit/s.
- 5: KEB-DIN66019 transmission speed = 38400 Bit/s

Profibus-Station Address (Ts)

This parameter specifies in which Station address the operator can be reached in Profibus.

(can be written in as of software version 2.0)



Note ! As of SW-Version 2.1 of the PROFIBUS-operator the parameters PROFIBUS-slave-address (Index=5FFeh) and the inverter address are identical. If the PROFIBUS-slave-address is changed by the parameter channel (Index 5FFeh), this value is also accepted by the KEB COMBIVERT in the parameter inverter address (ud.06)

Index 5FFEh

Data Length 1 Byte

Coding 0...125 dez (0...7Dh)

Auto_Pdmap_Adapt (from SW V3.3) Determines if the automatic adaption of the process-data-assignment to the inverter control type is activated or not.



Index 5FEFh

Data Length 1 Byte

Coding 0 : automatic adaption of the PD-assignment **NOT** active.
otherwise: automatic adaption of the PD-assignment **ACTIVE**.

Standard Adjustment FFh (**ACTIVE**).

Inverter Typ (from SW V3.3) Displays the determined inverter control type. This parameter can only be read.

Index 5FEEh

Data Length 1 Byte

Coding 0 : F4-C.
1 : S4 or F4-F.
2 : F4-S

Standard Adjustment In accordance to the connected inverter type.

7.3 DRIVECOM Profile Parameter in Index Range 6000h to 604Dh

In this index range the parameters are found which are compatible to profile **21** for the power transmission of the **DRIVECOM** user group association with the stand of **16.12.1991** and the **Implementation Guideline V1.3** from **28.07.1993**.

Note ! **COMBIVERT F4-S** does not support the DRIVECOM-profile parameter. For this reason access to indexes as of 6003h and up for these control types are **not allowed**.

Process-Input Data Description
(Configuration Parameter)

Determines the assignment of the process input data. This means these complex parameters specify, which parameter is read from the actual addressed KEB COMBIVERT, during the process-input data processing and where the values of these parameters are found in the user data telegram. The parameter has a maximum of 17d elements (Subindex=1 to 17d), because a maximum of 8 byte process-input data are possible with KEB- PROFIBUS-DP-Slave.

Index 6000h

Subindex = 1 **Process-Input Data-Length (n)**

Data Length Subindex = 1 1 Byte

Coding Subindex = 1 1 Byte

Subindex = n * 2 **Index for Mapping of Byte n**
(for n = 1...8)

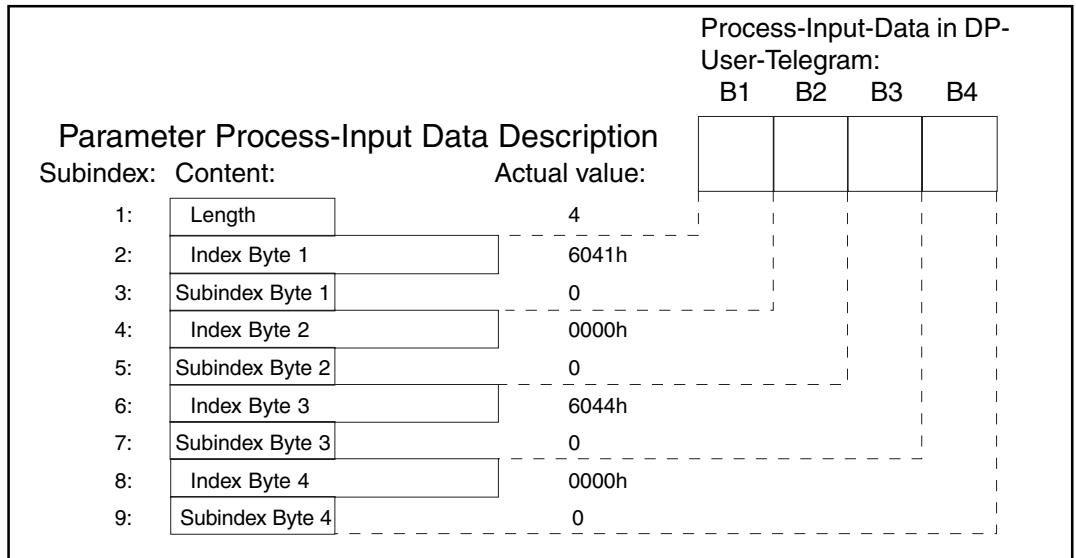
Data Length Subindex = n * 2 2 Byte
(for n = 1...8)

Subindex = (n * 2) + 1 **Subindex for Mapping of Byte n**
(for n = 1...8)

Data Length Subindex = (n * 2) + 1 1 Byte
(for n = 1...8)

Process Data Mapping

Generally, all elements of this parameter can't be mapped on the process data. The following diagram shows the structure of the parameter process-input data description. The example shows a standard adjustment:



The process data description is done byte per byte. If the process-data assignment exceeds one process data byte, then the description is only written in the first byte. The index and subindex receive the value 0 for all other bytes that belong to this assignment (see diagram). All process data are generally filed in motorola format.

The process input data has the following meaning:

- Byte 1 of the PE-data are filled with the High-Byte of the DRIVECOM status word parameter.
- Byte 2 of the PE-data are filled with the Low-Byte of the DRIVECOM-status word parameter.
- Byte 3 of the PE-data are filled with the High-Byte of the DRIVECOM-actual speed parameter.
- Byte 4 of the PE-data are filled with the Low-Byte of the DRIVECOM-actual speed parameter.

GB

**Process-Output-Data
Description
(Configuration
Parameter)**

Determines the assignment of the process-output data. This means this complex parameter specifies which parameter is written to the actual addressed KEB COMBIVERT during the process-output data processing and where the values of these parameters are taken from in the user data telegram. The parameter has a maximum of 17d elements (Subindex=1 to 17d), because a maximum of 8 byte process-output data are possible with KEB-PROFIBUS-DP-Slave.

- Index* 6001h
- Subindex = 1*
- Data Length Subindex = 1*
- Coding Subindex = 1*
- Subindex = n * 2
(for n = 1...8)*
- Data Length Subindex = n * 2
(for n = 1...8)*
- Subindex = (n * 2) + 1
(for n = 1...8)*
- Data Length Subindex =
(n * 2) + 1
(for n = 1...8)*
- Process Data Mapping*

Process-Output-Data-Length (n)

- 1 Byte
- 1 Byte

Index for Mapping of Byte n

2 Byte

Subindex for Mapping of Byte n

1 Byte

Generally all elements of this parameter cannot be mapped on the process data.

Parameter Process-Output Data Description			Process-Output-Data in DP-User-Telegram:			
Subindex:	Content:	Actual value:	B1	B2	B3	B4
1:	Length	4				
2:	Index Byte 1	6040h				
3:	Subindex Byte 1	0				
4:	Index Byte 2	0000h				
5:	Subindex Byte 2	0				
6:	Index Byte 3	6042h				
7:	Subindex Byte 3	0				
8:	Index Byte 4	0000h				
9:	Subindex Byte 4	0				

The process-input data description is set up analog to the process-output data description:

- Byte 1 of the PA-data are written as High-Byte to the DRIVECOM control-word parameter
- Byte 2 of the PA-data are written as Low-Byte to the DRIVECOM-control-word parameter
- Byte 3 of the PA-data are written as High-Byte to the DRIVECOM-set speed parameter
- Byte 4 of the PA-data are written as Low-Byte to the DRIVECOM-set speed parameter

Example: This example describes the reprogramming of the process-data-assignment.

Following three parameters shall be displayed on the process-output-data:

- digital rotation presetting (op.03) in Byte1 and Byte2
- absolute digital setpoint input (op.01) in Byte3 and Byte4
- acceleration time (op.11) in Byte5 and Byte6

Following three parameters shall be displayed on the process-input-data:

- inverter status (ru.00) in Byte1 and Byte2
- actualn frequency display (ru.03) in Byte3 and Byte4
- peak load (ru.08) in Byte5 and Byte6

Required parameter-channel orders for the change of the process-output-data-assignment:

Writing on Index	Subindex	Data Length	Value	Comment
6001h	1	1	6	PA-length
6001h	2	2	4103h	Assignment of PA-Byte1
6001h	3	1	0	Assignment of PA-Byte1
6001h	4	2	0000h	Assignment of PA-Byte2
6001h	5	1	0	Assignment of PA-Byte2
6001h	6	2	4101h	Assignment of PA-Byte3
6001h	7	1	0	Assignment of PA-Byte3
6001h	8	2	0000h	Assignment of PA-Byte4
6001h	9	1	0	Assignment of PA-Byte4
6001h	10	2	410Bh	Assignment of PA-Byte5
6001h	11	1	0	Assignment of PA-Byte5
6001h	12	2	0000h	Assignment of PA-Byte6
6001h	13	1	0	Assignment of PA-Byte6
6002h	0	1	FFh	Activation of the PA-processing

Required parameter-channel orders for the change of the process-input-data-assignment:

Writing on Index	Subindex	Data Length	Value	Comment
6000h	1	1	6	PE-Length
6000h	2	2	4000h	Assignment of PE-Byte1
6000h	3	1	0	Assignment of PE-Byte1
6000h	4	2	0000h	Assignment of PE-Byte2
6000h	5	1	0	Assignment of PE-Byte2
6000h	6	2	4003h	Assignment of PE-Byte3
6000h	7	1	0	Assignment of PE-Byte3
6000h	8	2	0000h	Assignment of PE-Byte4
6000h	9	1	0	Assignment of PE-Byte4
6000h	10	2	4008h	Assignment of PE-Byte5
6000h	11	1	0	Assignment of PE-Byte5
6000h	12	2	0000h	Assignment of PE-Byte6
6000h	13	1	0	Assignment of PE-Byte6
5FF8h	0	1	FFh	Activation of the PE-processing

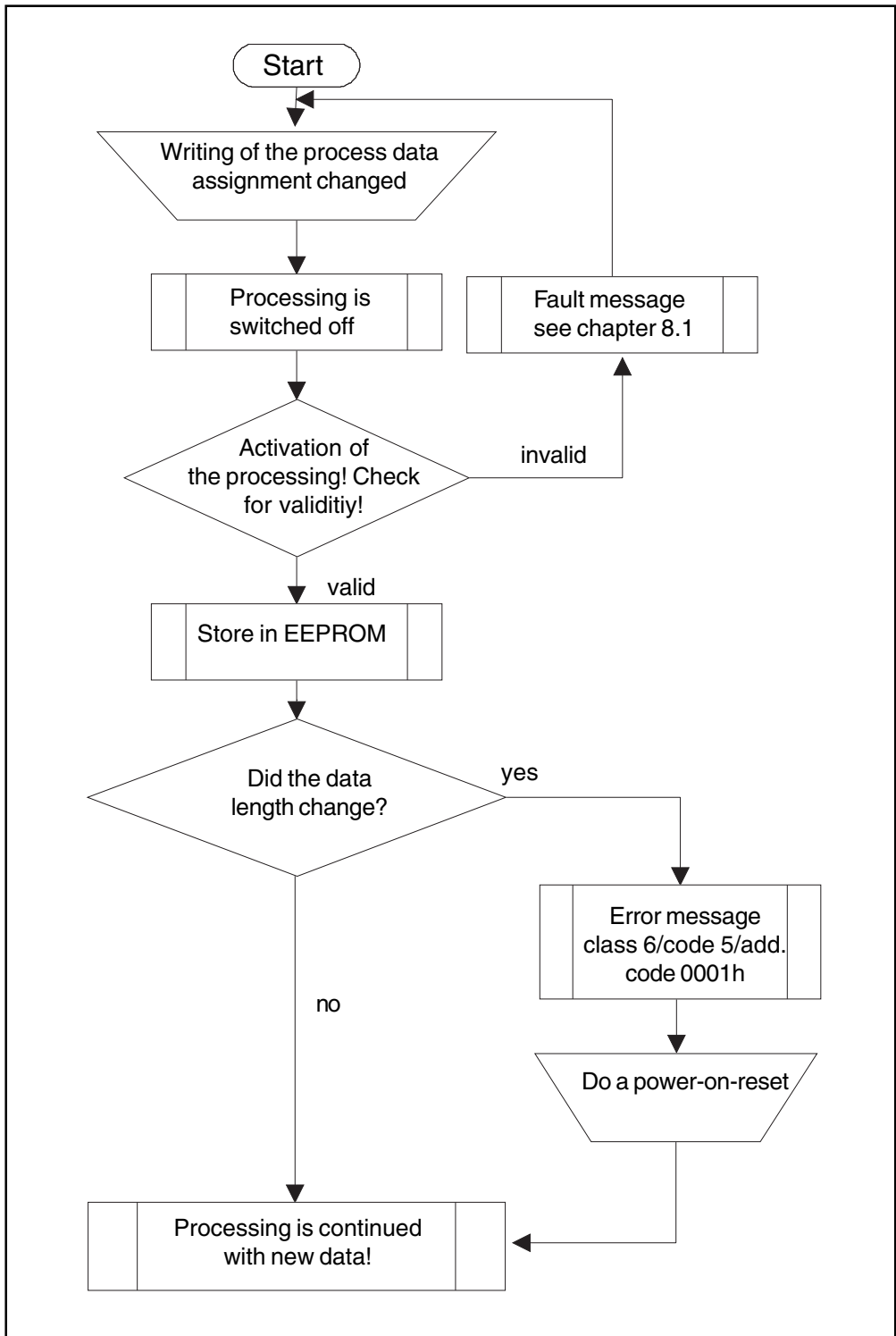
Attention ! The process-data-length was changed to 6 bytes by this reprogramming:
 – To each writing order for the activation of the PD-processing the user receives an error message from the KEB-PROFIBUS-DP-Operator error class=6, error code=5, additional code=0001h, even though the PD-assignment is correct. This error message means that the new PD-assignment is only active at the next POWER-ON (see also table error messages of the parameter channel).

- The configuration in the PROFIBUS-DP-Master interface must be changed for the just reprogrammed PROFIBUS-DP-Slave to the actual valid value.

Changed PROFIBUS-DP-Configuration:

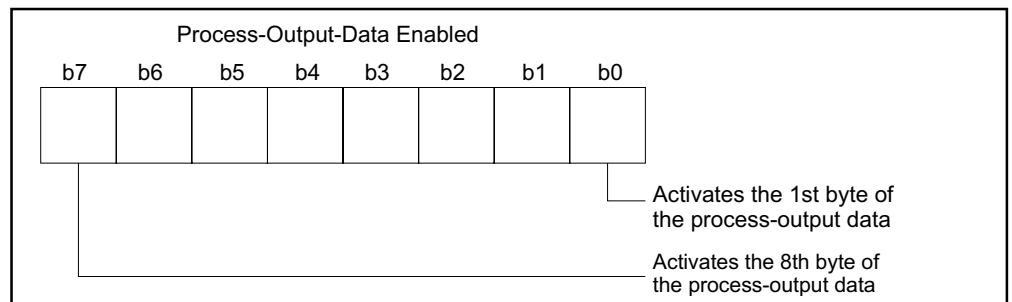
Byte1 = B7h = 183d Byte2 = A5h = 165d Byte3 = 95h = 149d

Flow Chart to Change the Process-Data-Assignment



GB

Process-Output-Data-Enable
(Configuration Parameter)



Activates the process-output-data byte by byte. The parameter is bit-coded. A **logical 1** at a certain bit position enables the respective process-output-data byte. If the process-data mapping occupies several bytes, then only the first bit in this mapping is relevant for the activation/deactivation of the respective process-output data.

Example: In the standard-output-data description the bytes 0 and 1 of the output data are mapped on the parameter DRIVECOM control word. To activate this mapping it is sufficient to set bit 0 of the parameter process-output-data release onto 1. The process-data mapping is deactivated by a **logical 0** in bit 0, regardless of the value of bit 1.

Index 6002h

Subindex 0

Data Length 1 Byte

Coding Bit coded bit 0 ==> 1st byte etc. (Standard: 0Fh)

Process-Data-Mapping Generally, NO mapping on process-data.

Malfunction Code Provides the error code of KEB-COMBIVERT when a malfunction occurs. This parameter can only be read.

Index 603Fh

Subindex 0

Data Length 2 Byte

Coding See instruction manual for the respective KEB-COMBIVERT for parameter malfunction code (pr.05 with parameter address 0105 (hex).

Process-Data-Mapping Can be mapped on process-input data.

Control Word This bit coded parameter controls the operating conditions of the KEB COMBIVERT. It is possible to start/stop the KEB COMBIVERT via the control word. (see state diagram for control-status word in the manual for KEB COMBIVERT).

Index 6040h

Subindex 0

Data Length 2 Byte

Coding Bit 0 : 1 = start , 0 = stop	Bit 8 : Reserved
Bit 1 : 0 = block voltage	Bit 9 : Reserved
Bit 2 : 0 = quick stop	Bit 10: Reserved
Bit 3 : 1 = release operation	Bit 11: Reserved
Bit 4 : 0 = block speed ramp	Bit 12: Reserved
Bit 5 : 0 = stop speed ramp	Bit 13: Reserved
Bit 6 : 0 = speed ramp zero	Bit 14: Reserved
Bit 7 : 0->1 = reset malfunction	Bit 15: Reserved

Process-Data-Mapping Can be mapped on process-input data.

Status Word This bit coded parameter signals the operating conditions of KEB COMBIVERT. (see state diagram for control status word in the manual for KEB COMBIVERT)

Index 6041h

Subindex 0

Data Length 2 Byte

Coding Bit 0: 1 = Ready to start	Bit 8: Reserved
Bit 1: 1 = Started	Bit 9: 1 = Remote operation active (Parameter can be changed via Bus)
Bit 2: 1 = Operation released	Bit 10: 1 = Nominal value reached
Bit 3: 1 = Malfunction	Bit 11: 1 = Limit value (limitation active)
Bit 4: 0 = Voltage blocked	Bit 12: Reserved
Bit 5: 0 = Quick stop	Bit 13: Reserved
Bit 6: 1 = Starting lock-out	Bit 14: Reserved
Bit 7: 1 = Warning	Bit 15: Reserved

Process-Data-Mapping Can be mapped on the process output data.
For the status machine for control and status word see the diagram in the instruction manual of the respective KEB COMBIVERT. This manual explains the control commands for each unit condition.

Note! Controlling KEB-COMBIVERT via the control word is only possible, when the parameter **Control Word Activation** (see parameter description of KEB-COMBIVERT) is switched on „ON“.

Nominal Speed Specifies the nominal value for KEB-COMBIVERT.
Index **6042h**
Subindex 0
Data Length 2 Bytes
Coding 1 min⁻¹, values ≥ 0 ==> forward , values < 0 ==> reverse
Process-Data-Mapping Can be mapped on process-input data and process-output data

Speed-Reference-Variable Provides the current value for the speed-reference variable.
Index **6043h**
Subindex 0
Data Length 2 Bytes
Coding 1 min⁻¹, values ≥ 0 ==> forward , values < 0 ==> reverse
Process-Data-Mapping Can be mapped on process-input data

Actual Speed Provides the current actual speed of KEB COMBIVERT.
Index **6044h**
Subindex 0
Data Length 2 Bytes
Coding 1 min⁻¹, values ≥ 0 ==> forward , valeus < 0 ==> reverse
Process-Data-Mapping Can be mapped on process-input data

Speed-Min-Max-Amount Determines the upper/lower limits for the speed. With PROFIBUS-DP you can only access every single element of this parameter (subindex ! = 0). When the complete object should be changed/read, two parameter jobs must be carried out.

Index **6046h**
Number of Elemente 2
Data Length per Element 4 Byte
Coding 1 min⁻¹
Value Range 0...0000FFFFh
Subindex = 1 **Speed-Min-Amount**
Subindex = 2 **Speed-Max-Amount**
Example of Access to 1st Element Parameter channel-read request on Index=6046h,Subindex=1) gives the 4-byte value Speed-Min-amount back.
Process-Data-Mapping Both elements can be mapped on the process-input and output data.

Speed	Determines the speed of KEB-COMBIVERT.
Acceleration	
<i>Index</i>	6048h
<i>Number of Elements</i>	2
<i>Subindex = 1</i>	Delta speed
<i>Data Length Subindex = 1</i>	4 Bytes
<i>Coding Subindex = 1</i>	1 min ⁻¹
<i>Subindex = 2</i>	Delta time
<i>Data Length Subindex = 2</i>	2 Bytes
<i>Coding Subindex = 2</i>	1 s
<i>Example for access on 2nd Element</i>	Parameter-write-request on Index=6048h,Subindex=2 with a 2 byte data length and the value 0004h, changes the value of the speed-acceleration-data time to 4 seconds.
<i>Process-Data-Mapping</i>	Both elements can be mapped on the process-input and output data.

Speed	Determines the speed deceleration of KEB-COMBIVERT.
Deceleration	
<i>Index</i>	6049h
<i>Number of Elements</i>	2
<i>Subindex = 1</i>	Delta speed
<i>Data Length Subindex = 1</i>	4 bytes
<i>Coding Subindex = 1</i>	1 min ⁻¹
<i>Subindex = 2</i>	Delta time
<i>Data Length Subindex = 2</i>	2 bytes
<i>Coding Subindex = 2</i>	1 s
<i>Example for access on 2nd Element</i>	Parameter-read-request on Index=6049h,Subindex=1 returns 4 data bytes, which indicate the speed-deceleration and delta-speed.
<i>Process-Data-Mapping</i>	Both elements can be mapped on the process-input and output data.

8. Annex

8.1 Error Messages of the Parameter Channels

The following error messages are generated by KEB-PROFIBUS-DP-Slave.

Error-Class (EB5)	Error-Code (EB6)	Additional-Code (EB7, EB8)	Significance
6	2	0000 (hex)	No connection to FI
6	3	0000 (hex)	Object/parameter write-protected or read via multicast/broadcast
6	4	0000 (hex)	Invalid parameter address
6	5	0000 (hex)	Process-data processing cannot be switched on due to non-realizable process-data description
6	5	0010 (hex)	Invalid data length
6	5	0001 (hex)	Value is 1st active after a power-on reset
6	5	0011 (hex)	Invalid subindex
6	7	0000 (hex)	Object does not exist
8	0	0022 (hex)	Inverter busy
8	0	0030 (hex)	Data invalid

8.2 Device Master Data of KEB-PROFIBUS-DP-Interface

The draft of the standard **DIN 19245 Part 3 from October 1994** plans that every PROFIBUS-DP-slave supplies a so-called device master data. The construction and the syntax of this data is fixed. The GSD-data for the KEB-PROFIBUS-DP-interface is available on the disk of the demo program as ASCII-Text (**KEB204A2.GSD**). The data contains the following.

```
#Profibus_DP
Vendor_Name      = "KEB Antriebstechnik"
Model_Name       = "KEB DP_F4_OP(04A2h)"
Revision         = "V2.0"
Ident_Number     = 1186           ; 0x04A2
Protocol_Ident   = 0
Station_Type     = 0           ; DP-Slave
FMS_supp         = 0
Hardware_Release = "V2.0"
Software_Release = "V2.0"
9.6_supp        = 1
```

19.2_supp	= 1	
93.75_supp	= 1	
187.5_supp	= 1	
500_supp	= 1	
1.5M_supp	= 1	
MaxTsdr_9.6	= 60	
MaxTsdr_19.2	= 60	
MaxTsdr_93.75	= 60	
MaxTsdr_187.5	= 60	
MaxTsdr_500	= 100	
MaxTsdr_1.5M	= 150	
Redundancy	= 0	
Repeater_Ctrl_Sig	= 0	
24V_Pins	= 0	
Freeze_Mode_supp	= 1	
Sync_Mode_supp	= 1	
Auto_Baud_supp	= 1	
Set_Slave_Add_supp	= 0	
User_Prm_Data_Len	= 0	
Min_Slave_Intervall	= 50	; 5.0 ms
Modular_Station	= 1	
Max_Module	= 3	
Max_Input_Len	= 16	
Max_Output_Len	= 16	
Max_Data_Len	= 32	
Module	= „Parameter channel“	0xB7
EndModule		
Module	= „Process-output data“	0xA3
EndModule		
Module	= „Process-input data“	0x93
EndModule		

8.3 Accessories

The accessory described in the following is not available at KEB.

PROFIBUS
Bus Connector
Siemens AG
Part no.: 6GK1500-0EA02



The bus connector is suitable for a fast and good cabling of profibus systems. It can be used as terminating connector or as through connector.

Gender Changer
Elektronik-Kontor
Part no.: EB410MF



The Gender changer extends the bus connector, so in the case of control boards with a double-row terminal strip (size 05-12) the upper row of terminals can be used.



Ges. m.b.H.

KEB-Antriebstechnik Ges.m.b.H.
Ritzstraße 8 • A - 4614 Marchtrenk
Tel.: 0043 / 7243 / 53586 - 0 • FAX: 0043 / 7243 / 53586-21



KEBCO Inc.
1335 Mendota Heights Road
USA - Mendota Heights, MN 55120
Tel.: 001 / 651 / 4546162 • FAX: 001 / 651 / 4546198



KEB (UK) Ltd.
6 Chieftain Business Park, Morris Close
Park Farm, Wellingborough, GB - Northants, NN8 6 XF
Tel.: 0044 / 1933 / 402220 • FAX: 0044 / 1933 / 400724



KEB - YAMAKYU Ltd.
711 Fukudayama, Fukuda
J - Shinjo City, Yamagata (996-0053)
Tel.: 0081 / 233 / 29 / 2800 • FAX: 0081 / 233 / 29 / 2802



KEB Italia S.r.l.
Via Newton, 2 • I - 20019 SETTIMO MILANESE (Milano)
Tel.: 0039 / 02 / 33500782 • FAX: 0039 / 02 / 33500790



Société Française KEB
Z.I. de la Croix St Nicolas • 14, rue Gustave Eiffel
F - 94510 LA QUEUE EN BRIE
Tél.: 0033 / 1 / 49620101 • FAX: 0033 / 1 / 45767495



Karl E. Brinkmann GmbH
Försterweg 36 - 38 • D - 32683 Barntrup
Telefon 0 52 63 / 4 01 - 0 • Telefax 4 01 - 116
Internet: www.keb.de • E-mail: info@keb.de