

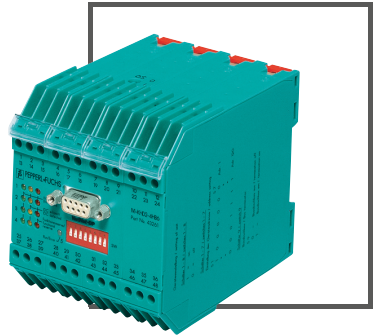
MANUAL

IC-KP-B6-V15B

IC-KP-B6-2V15B

IC-KP-B6-SUBD

Communication in "IRI-B6"
and "IVI-B6" mode



iDENTControl

With regard to the supply of products, the current issue of the following document is applicable: The General Terms of Delivery for Products and Services of the Electrical Industry, published by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und Elektroindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause: "Expanded reservation of proprietorship"

- 1 Introduction..... 4**
- 2 Communication in "IRI-B6" mode and "IVI-B6" mode 5**
- 3 Communication in "IRI-B6" mode..... 7**
 - 3.1 PROFIBUS DP communication parameters (GSD file) for IRI-B6.....7
 - 3.2 Device identification/software version message for PROFIBUS DP7
 - 3.3 Communication direction: from PROFIBUS-DP to control interface7
 - 3.4 Communication direction: from the control interface to the PROFIBUS-DP ..9
 - 3.5 PROFIBUS-DP command sequence 11
- 4 Communication in "IVI-B6" mode 14**
 - 4.1 PROFIBUS DP communication parameters (GSD file) for IVI-B6..... 14
 - 4.2 Device identification/software version message for PROFIBUS DP 15
 - 4.3 Communication direction: from PROFIBUS-DP to control interface 15
 - 4.4 Communication direction: from the control interface to the PROFIBUS-DP 19
 - 4.5 PROFIBUS-DP command sequence22
- 5 ASCII table..... 25**

1

Introduction

Congratulations

You have chosen a device manufactured by Pepperl+Fuchs. Pepperl+Fuchs develops, produces and distributes electronic sensors and interface modules for the market of automation technology on a worldwide scale.

Before installing this equipment and put into operation, read this manual carefully. This manual contains instructions and notes to help you through the installation and commissioning step by step. This makes sure bring such a trouble-free use of this product. This is for your benefit, since this:

- ensures the safe operation of the device
- helps you to exploit the full functionality of the device
- avoids errors and related malfunctions
- avoids costs by disruptions and any repairs
- increases the effectiveness and efficiency of your plant

Keep this manual at hand for subsequent operations on the device.

After opening the packaging please check the integrity of the device and the number of pieces of supplied.

Symbols used

The following symbols are used in this manual:



Note!

This symbol draws your attention to important information.



Handling instructions

You will find handling instructions beside this symbol

Contact

If you have any questions about the device, its functions, or accessories, please contact us at:

Pepperl+Fuchs GmbH
Lilienthalstraße 200
68307 Mannheim
Telephone: +49 621 776-4411
Fax: +49 621 776-274411
E-Mail: fa-info@pepperl-fuchs.com

2

Communication in "IRI-B6" mode and "IVI-B6" mode

You can replace the control interface IRI KHD2-4HB6 and IVI-KHD2 4HB6 with the control interface IC-KP-B6-SUBD, IC-KP-B6-2V15B or IC-KP-B6-V15B. Operate one of these control interfaces in the operation mode **IRI-B6** or **IVI-B6**. The commands can be found on the following pages. Details on the individual commands and the structure of the codes you find in the manuals for the control interface units IRI KHD2-4HB6 and IVI-KHD2 4HB6.

The modes **IRI-B6** and **IVI-B6** can be selected via the multifunctional display and push buttons on the control interface unit (see manual for the control interface IDENTControl).

As GSD files you can use the original GSD files of the evaluating IRI KHD2-4HB6 and IVI-KHD2 4HB6.

In order to be able to read transponders of type ICC ... or read and write transponders of type IDC ..., you need to use read / write heads of type ISH The transponder of type IMC ... are not supported.

**Note!**

Note that the timing of the control interface units IC-KP-B6 * can be different compared to the timing of the control interface units IRI-KHD2-4HB6 and IVI-KHD2-4HB6.

System P

You can also operate the System P (LF with 125 kHz) in the IRI / IVI mode. Connect the corresponding read / write heads. If you connect other read / write heads, commands are answered with an error message. The state 4 is then inserted into the response.

If you use the System P, the only data carrier supported is the type 03 (transponder IPC03-...). Each first data word (4 bytes) is read as a fixed code. This data word must be written onto the transponder first, using normal write commands.

In System P (transponder type 03) you must also adjust the mode Default Read so that the first data word is read (see "Special commands for the transponder IPC03" in the manual of the control interface unit IC-KP-B6 *). The addresses for the beginning and end of the reading area are based on the absolute word address of the transponder, not on the <WordAddr>. With the setting "beginning of reading area" = 03h and "end of reading area" = 03h the read / write head accurately reads the first data word on the transponder.

Since the IRI / IVI-mode only defines a 28 bit long fixed code, only the 28 least significant bits of the first data word of the System P are masked and outputted as a fixed code. The number format is not converted. A check for invalid values will not occur.

Control Word		
Bit	Meaning	Byte
0 ... 7	Beginning of reading area	0
8 ... 15	End of read area	1
16	Password mode on / off	2
17	Mode "Read-after-Write" on / off	
18 ... 23	freely usable	
24 ... 31	freely usable	3



Configure read range

1. Enable the password mode (command set password mode)
2. Write into the Control Word the "beginning of the reading area" = 03h and "end of the reading area" = 03h with the commands single write configuration or enhanced buffered write configuration
3. Disable the password mode (command set password mode)
 - ↳ You can check the data area with address information reading 0000h and word count reading 00h.

3 Communication in "IRI-B6" mode

Only use "IRI-B6" and "IVI-B6" modes if you intend to operate the control interface as a replacement for a control interface with the designation "IRI-KH*-4HB6" or "IVI-KH*-4HB6".

3.1 PROFIBUS DP communication parameters (GSD file) for IRI-B6

The GSD file name for "IRI-B6" mode is: P&F_00d2.gsd.

Two modules are defined, one for input data (reading) and the other for output data (command, transfer). The identification bytes of the modules are defined as follows:

- Data consistency along the entire length
- Word structure
- Input data ("10 Words Input" module) and output data ("1 Word Output" module)

One word has 16 bits in "IRI-B6" mode.

The following two chapters describe the structure of the data words for communication from the DP master to the control interface and from the control interface to the DP master.

3.2 Device identification/software version message for PROFIBUS DP

The device identification and the software version are transferred via the DP function "Device-Related Diagnostics".

Header byte <IDENTIFIER><SW BUS>	
Header byte, length of diagnostic data in bytes incl. header byte, here "13"	
<IDENTIFIER>	6 characters, "IRI-B6"
<SW BUS>	6 characters, software creation date of the bus system (DDMMYY)

3.3 Communication direction: from PROFIBUS-DP to control interface

In a direction from the PROFIBUS-DP master to the control interface, the words are structured as follows:

Word 0	Commands and parameters															
Bit no.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Description	B4	B3	B2	B1	DS	0	0	0	0	0	0	0	K3	K2	K1	T

The commands and command parameters are transferred in word 0.

Toggle flag (T)

The toggle flag is used to uniquely identify a new valid command. The control interface only accepts and executes a new command if this flag has a different status to the previous command, i.e. when it is toggled.

When the control interface on the DP master is acknowledged, the toggle flag is not changed and indicates to the user that the control interface has received and processed the command.

**Note!**

The command is only executed if the execution counter $\neq 0$.

Command identifier (B4 ... B1)

Command parameters B4 ... B1 are used to define the relevant command.

Command identifier B4 ... B1				
15	14	13	12	Bit no.
B4	B3	B2	B1	Meaning
0	0	0	0	No command
0	0	0	1	SF
0	0	1	0	AF
0	0	1	1	BF
0	1	0	0	Not def.
0	1	0	1	Not def.
0	1	1	0	Not def.
0	1	1	1	Not def.
1	0	0	0	Not def.
1	0	0	1	Not def.
1	0	1	0	Not def.
1	0	1	1	Not def.
1	1	0	0	Not def.
1	1	0	1	EF
1	1	1	0	Not def.
1	1	1	1	Not def.

Double side mode (DS)

This function enables double-sided reading. If this bit is set (DS = 1), type ICC-50, IDC-50 and IDC-CARD read only tags can be read from both sides. Otherwise read only tags can only be read from the labeled side.

Head number (K3 ... K1)

Parameters K3 ... K1 are used to define which reading head is addressed.

Head number K3 ... K1			
3	2	1	Bit no.
K3	K2	K1	Head
0	0	0	1
0	0	1	2
0	1	0	3
0	1	1	4
1	0	0	All
1	0	1	All
1	1	0	All
1	1	1	All

3.4 Communication direction: from the control interface to the PROFIBUS-DP

In a direction from the control interface to the PROFIBUS master, the 10 data words are structured as follows:

Word 0	Command, parameter and toggle flag mirrored															
Bit no.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Description	B4	B3	B2	B1	DS	0	0	0	0	0	0	0	K3	K2	K1	T

Word 1	Status/execution counter/head number															
Bit no.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Description	-	K3	K2	K1	A4	A3	A2	A1	H4	H3	H2	H1	S4	S3	S2	S1

Word 2 ... 9	Read data															
--------------	-----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

The previously sent commands and command parameters are repeated in word 0 as confirmation.

Word 1 contains status information, the execution counter and the number of the assigned head.

Bits H4 ... H1 are only used for the EF command in "Enhanced buffered auto read fix code" operating mode. This means:

- H(i) = 1 head detected as connected,
- H(i) = 0 no head connected to this channel.

Words 2 ... 9 contain the read data.

Head number (K3 ... K1)

000b = head 1

001b = head 2

010b = head 3

011b = head 4

If "all" heads are addressed, the heads are read in succession in the sequence 1, 2, 3 and 4.

Execution counter (A4 ... A1)

The execution counter is reset when the command is executed and increases every time new status words or data becomes available.

**Note!**

The fields for the head number, status and words 2 to 9 do not contain valid data if the counter indicates 0.

Status display (S4 ... S1)

Parameters S4 ... S1 define the general status and fault messages.

Status display S4 ... S1				
3	2	1	0	Bit no.
S4	S3	S2	S1	Status
0	0	0	0	Command has been executed without error
0	1	0	0	Incorrect command, invalid parameter or timeout
0	1	0	1	Read or write error
0	1	1	0	Hardware error (reading head faulty)

Word 2 ... 9: reading numbers/read data

A data field of 2 words is reserved for each of the four reading heads:

Word 2 / 3: Reading head 1

Word 4 / 5: Reading head 2

Word 6 / 7: Reading head 3

Word 8 / 9: Reading head 4

Each data field has the following structure:

Words 2 / 4 / 6 / 8

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	ERR	L3	L2	L1	C28	C27	C26	C25	C24	C23	C22	C21	C20	C19	C18	C17

Words 3 / 5 / 7 / 9

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	C16	C15	C14	C13	C12	C11	C10	C9	C8	C7	C6	C5	C4	C3	C2	C1

ERR: Read error flag, head-related

For commands SF, AF, BF: Flag is always 0.

For command EF: The read error is set when a code carrier is not located within the detection range.

- L3 ... 1: 3-bit reading number, head-related
The reading numbers of all active heads are set to 0 when the command is executed and increase when the corresponding head receives data or a status message.
In contrast, the execution counter in word 1 increases every time the identification system sends a data or status message, irrespective of the head number.
- C28 ... 1: 28-bit read only code data, packed in hexadecimal format
The identification system sends the read only code as an ASCII string with 7 characters in so-called data format 10. The first three characters of the string form a hexadecimal number and the remaining four characters form a decimal number.
The first three characters appear directly in bits C28 to C17 following ASCII hex conversion. The following four characters are displayed in hexadecimal format. In order to compare them with data format 10, they must be converted into a four-digit decimal number:
e.g.: code A764325 (ASCII): C28 ... C1 = xAh, 76h, 10h, E5 (x = ERR, L3 ... 1).

3.5 PROFIBUS-DP command sequence

Execution of the command begins as soon as a valid command is written using toggled flag "T". When the command is received, this flag is sent to the master together with the remaining fields of word 0 as confirmation.

Initial state:

Head number (K3 ... 1)	0
Execution counter (N4 ... 1)	0
Status (S4 ... 1)	0
4 x read error flags (ERR)	0 for SF, AF, BF and 1 for EF
4 x reading numbers (L3 ... 1)	0
4 x read only code data (C28 ... 1)	0

The execution counter increases every time the identification system sends a message. At the same time, the head number, status, read error flag, reading numbers and read only code data fields are set according to the message from the identification system. The read error flags are treated differently, depending on the command.

The reading numbers increase when the identification system receives read data (status 0). Only the reading number in the data field assigned to the head number sent by the information system is increased. The reading numbers does not increase if the identification system reports an error (status 4, 5, 6).

The read error flag is deactivated for the **SF**, **AF** and **BF** commands and always remains 0.

The following applies for the **EF** command: The read error flag is reset (=0) as soon as the identification system receives some read data (status 0). The read error flag is set as soon as the identification system reports a read error (status 5) and remains unchanged with other fault messages (status 4, 6).

The following example shows a command sequence.

Command: Single read read only code with head 2, without double side mode

DP master sequence

Command (B4 ... B1)	0001b	SF (Single read read only code)
Double side (DS)	0b	Double side mode OFF
Head number (K3 ... K1)	001b	Head number 2 is addressed
Toggle flag (T)	1b	(or 0, depending on the previous state after initial command or switching on = 1)

Word 0	Commands and parameters															
	B4	B3	B2	B1	DS	0	T2	T1	N4	N3	N2	N1	K3	K2	K1	T
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1

= 1003hex

Response from the control interface on the DP master

Single commands are executed once and the result (success or failure) is output.

	Word 0	Word 1	Word 2	Word 3	Word 4	Word 5	Word 6 ... 9	
	1003 (hex)	1105 (hex)	xxxx	xxxx	xxxx	xxxx	xxxx	If no read only tag in front of head
or	1003 (hex)	1106 (hex)	xxxx	xxxx	xxxx	xxxx	xxxx	If head not connected or defective.
or	1003 (hex)	1100 (hex)	0000 (hex)	0000 (hex)	1B54 (hex)	0E3A (hex)	0000 ... 0000 (hex)	If read only tag content "B543642" (ASCII) in front of head

Word 0: Command and parameter mirrored

Word 1: Status/execution counter/head number (see below)

Word 2 ... 9: Corresponding data from read only tag if reading successful

Word 1	Status/execution counter/head number															
	-	K3	K2	K1	A4	A3	A2	A1	-	-	-	-	S4	S3	S2	S1
	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	1
or	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0
or	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0

Head number (K3 ... K1)

001b

Read with head 2

Execution counter (A4 ... A1)

0001b

Executed once

Status (S4 ... S1)

0101b

Read error

or

0110b

Hardware error

or

0000b

Command executed without error

4 Communication in "IVI-B6" mode

Only use "IRI-B6" and "IVI-B6" modes if you intend to operate the control interface as a replacement for a control interface with the designation "IRI-KH*-4HB6" or "IVI-KH*-4HB6".

4.1 PROFIBUS DP communication parameters (GSD file) for IVI-B6

The GSD file name for "IVI-B6" mode is: P&F_0840.gsd.

An input module and output module are defined to transfer input data (reading, data from slave to DP master) and output data (writing, data from DP master to slave).

The size of the input and output modules is variable so that the transferred data volume can be optimized for the relevant application. This prevents loading the bus unnecessarily with unused data.

The GSD file P&F_0840.GSD is required to utilize the variable module lengths. Input modules with lengths of 2 to 16 words and output modules with lengths of one to 16 words are predefined in this file, each in graduations of one word.



Note!

During programming, only one input module and one output module can be selected from the list of modules.

One word has 16 bits in "IVI-B6" mode.

The number of modules required depends on the relevant application. The output module (i.e. the data from the DP master to the slave) consists of one or two command data words and a maximum of 14 usable data words.

The input module (data from the slave to the DP master) always consists of two status data words and a maximum of 14 usable data words.

Examples:

Command single/auto/buffered read fixcode:

Only one command data word and command parameter must be transferred. A data carrier word address and write data are omitted. The module "1 Word Output" can therefore be used here.

The length of the read only code data read by the code carrier is 4 words. Because two status data words are always transferred in addition, the minimum size of the input module must be 6 words, i.e. module "6 Words Input" must be selected.

Command single/auto/buffered write, write data length e.g. 14 words:

Two words are required for the command data here (command, parameter and data carrier word address). Together with the 14 write data words, the maximum output module length is 16 words (16 Words Output).

For write commands, the control interface only responds with a status message i.e. an input module size of two words is sufficient (2 Words Input).

Command single/auto/buffered read, read data length e.g. 8 words:

Two words are required to transfer the read command (command, command parameter and data carrier word address), i.e. module "2 Words Output" is sufficient.

Um die gelesenen Daten und die zwei Worte Statusdaten zu übertragen, sind insgesamt 10 Worte erforderlich, d. h. Modul "10 Words Input" ist passend.

The following two chapters describe the structure of up to 16 data words for communication from the DP master to the control interface and from the control interface to the DP master.

4.2 Device identification/software version message for PROFIBUS DP

The device identification and the software version are transferred via the DP function "Device-Related Diagnostics".

This is structured as follows:

Byte	Meaning
0	Station status 1
1	Station status 2
2	Station status 3
3	Master station number
4	Manufacturer code (high byte)
5	Manufacturer code (low byte)
from 6	Other slave-specific diagnostics (header byte, length of subsequent entries)
7 ... 12	"IVI-B6"
13 ... 18	Software creation date of the bus system (DDMMYY)

4.3 Communication direction: from PROFIBUS-DP to control interface

The data that is transferred depends on the length of the selected output module.

Only the structure of the required words is shown in the following section. Valid data is not allocated to any other words related to the selected module size.

Reading read only codes

Word 0	Commands and parameters															
Bit no.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Description	B4	B3	B2	B1	DS	0	T2	T1	N4	N3	N2	N1	K3	K2	K1	T

The commands and command parameters are transferred in word 0.

Reading data

Word 0	Commands and parameters															
Bit no.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Description	B4	B3	B2	B1	DS	0	T2	T1	N4	N3	N2	N1	K3	K2	K1	T

Word 1	Word address/block addresses (for block commands SB/AB/BB)
--------	--

The commands and command parameters are transferred in word 0.

Word 1 contains the start memory address of the data carrier, from which point data is read.

Writing data

Word 0	Commands and parameters															
Bit no.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Description	B4	B3	B2	B1	DS	0	T2	T1	N4	N3	N2	N1	K3	K2	K1	T

Word 1	Word address/block addresses (for block commands SB/AB/BB)
--------	--

Word 2 ... 15	Write data
---------------	------------

The maximum number of words is 16 depending on the selected module size.

The commands and command parameters are transferred in word 0.

Word 1 contains the start memory address of the data carrier, from which point data is written.

Words 2 to a maximum of 15 contain the data written for write commands.

Toggle flag (T)

The toggle flag is used to uniquely identify a new valid command. The control interface only accepts and executes a new command if this flag has a different status to the previous command, i.e. when it is toggled.

When the control interface on the DP master is acknowledged, the toggle flag is not changed and indicates to the user that the control interface has received and processed the command.



Note!

The command is only executed if the execution counter $\neq 0$.

Command identifier (B4 ... B1)

Command parameters B4 ... B1 are used to define the relevant command.

Command identifier B4 ... B1				
15	14	13	12	Bit no.
B4	B3	B2	B1	Meaning
0	0	0	0	No command
0	0	0	1	SF
0	0	1	0	AF
0	0	1	1	BF
0	1	0	0	SR
0	1	0	1	AR
0	1	1	0	BR
0	1	1	1	SW
1	0	0	0	AW
1	0	0	1	BW
1	0	1	0	SB
1	0	1	1	AB
1	1	0	0	BB
1	1	0	1	EF
1	1	1	0	ER
1	1	1	1	EW

Double side mode (DS)

This function enables double-sided writing/reading. If this bit is set (DS = 1), type ICC-50, IDC-50 and IDC-CARD read only and read/write tags can be read and written from both sides. Otherwise read only and read/write tags can only be read from the labeled side.

**Note!**

In double side mode, the execution time of the read/write commands increases.

Tag type (T2, T1)

The tag type is defined by parameters T1 and T2.

Tag type T1, T2		
9	8	Bit no.
T2	T1	Type
0	0	IDC-1k
0	1	IPC03
1	0	IQC21
1	1	Reserved

Number of words (N4 ... N1)

Parameters N4 ... N1 define the number of words to be read or written (maximum 14 words).

Number of words N4 - N1				
7	6	5	4	Bit no.
N4	N3	N2	N1	Word count
0	0	0	0	Not defined
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	0	0	0	8
1	0	0	1	9
1	0	1	0	10
1	0	1	1	11
1	1	0	0	12
1	1	0	1	13
1	1	1	0	14
1	1	1	1	Not defined

Head number (K3 ... K1)

Parameters K3 ... K1 are used to define which R/W head is addressed.

Head number K3 ... K1			
3	2	1	Bit no.
K3	K2	K1	Head
0	0	0	1
0	0	1	2
0	1	0	3
0	1	1	4
1	0	0	All
1	0	1	All
1	1	0	All
1	1	1	All

Word address (word 1)

The start memory address for the data to be read or written in the data carrier is specified in this word.

Tag type	Address range (hex)	
	Word address (word 1)	Block address (SB/AB/BB)
IDC-1k	0000 ... 003F	0000 ... 003F

The tag type IMC-40 is no longer supported.

4.4 Communication direction: from the control interface to the PROFIBUS-DP

The data that is transferred depends on the length of the selected input module.

Only the structure of the required words is shown in the following section. Valid data is not allocated to any other words related to the selected module size.

Reading read only codes

Word 0	Command, parameter and toggle flag mirrored															
Bit no.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Description	B4	B3	B2	B1	DS	0	T2	T1	N4	N3	N2	N1	K3	K2	K1	T

Word 1	Status/execution counter/head number															
Bit no.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Description	-	K3	K2	K1	A4	A3	A2	A1	H4	H3	H2	H1	S4	S3	S2	S1

Word 2 ... 15	Read data
----------------------	------------------

The previously sent commands and command parameters are repeated in word 0 as confirmation.

Word 1 contains status information, the execution counter and the number of the assigned head.

Bits H4 ... H1 are only used for the EF command in **Enhanced buffered read read only code** operating mode. This means:

- H(i) = 1 head detected as connected,
- H(i) = 0 no head connected to this channel.

Words 2 ... 15 contain the read data for read commands. With write commands, words 2 ... 15 do not contain valid data.

Reading data

Word 0	Command, parameter and toggle flag mirrored															
Bit no.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Description	B4	B3	B2	B1	DS	0	T2	T1	N4	N3	N2	N1	K3	K2	K1	T

Word 1	Status/execution counter/head number															
Bit no.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Description	-	K3	K2	K1	A4	A3	A2	A1	H4	H3	H2	H1	S4	S3	S2	S1

Word 2 ... n	Read data
---------------------	------------------

n is maximum of 15 depending on the selected module size.

The previously sent commands and command parameters are repeated in word 0 as confirmation.

Word 1 contains status information, the execution counter and the number of the assigned head.

Bits H4 ... H1 are only used for the ER command in **Enhanced buffered read** operating mode. This means:

- H(i) = 1 head detected as connected,
- H(i) = 0 no head connected to this channel.

Words 2 ... 15 contain the read data.

Writing data

Word 0	Command, parameter and toggle flag mirrored															
Bit no.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Description	B4	B3	B2	B1	DS	0	T2	T1	N4	N3	N2	N1	K3	K2	K1	T

Word 1	Status/execution counter/head number															
Bit no.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Description	-	K3	K2	K1	A4	A3	A2	A1	H4	H3	H2	H1	S4	S3	S2	S1

The previously sent commands and command parameters are repeated in word 0 as confirmation.

Word 1 contains status information, the execution counter and the number of the assigned head.

Head number (K3 ... K1)

000b = head 1

001b = head 2

010b = head 3

011b = head 4

If "all" heads are addressed, the heads are read or written in succession in the sequence 1, 2, 3 and 4.

Execution counter (A4 ... A1)

Note!

The execution counter is reset when the command is executed and increases every time new status words or data becomes available. The fields for the head number, status and words 2 to 15 do not contain valid data if the counter indicates 0.

Head activity (H4 ... H1)

Bits H4 ... H1 are only used for the EW command in **Enhanced buffered write** operating mode. This means:

- H(i) = 1 head detected as connected,
- H(i) = 0 no head connected to this channel.

Status display (S4 ... S1)

Parameters S4 ... S1 define the general status and fault messages.

Status display S4 ... S1				
3	2	1	0	Bit no.
S4	S3	S2	S1	Status



Status display S4 ... S1				
0	0	0	0	Command has been executed without error
0	1	0	0	Incorrect command, invalid parameter or timeout
0	1	0	1	Read or write error
0	1	1	0	Hardware error (reading head faulty)

4.5 PROFIBUS-DP command sequence

Execution of the command begins as soon as a valid command is written using toggled flag "T". When the command is received, this flag is sent to the master together with the remaining fields of word 0 as confirmation.

Initial state:

Head number (K3 ... 1)	0
Execution counter (N4 ... 1)	0
Status (S4 ... 1)	0
4 x read error flags (ERR)	0 for SF, AF, BF and 1 for EF
4 x reading numbers (L3 ... 1)	0
4 x read only code data (C28 ... 1)	0

The execution counter increases every time the identification system sends a message. At the same time, the head number, status, read error flag, reading numbers and read only code data fields are set according to the message from the identification system. The read error flags are treated differently, depending on the command.

The reading numbers increase when the identification system receives read data (status 0). Only the reading number in the data field assigned to the head number sent by the information system is increased. The reading numbers does not increase if the identification system reports an error (status 4, 5, 6).

The read error flag is deactivated for the **SF**, **AF** and **BF** commands and always remains 0.

The following applies for the **EF** command: The read error flag is reset (=0) as soon as the identification system receives some read data (status 0). The read error flag is set as soon as the identification system reports a read error (status 5) and remains unchanged with other fault messages (status 4, 6).

The following example shows a command sequence.

Command: Single read read only code with head 2, without double side mode

DP master sequence

Command (B4 ... B1)	0001b	SF (Single read read only code)
Double side (DS)	0b	Double side mode OFF
Tag type (T2, T1)	00b	IDC-1k
Number of words (N4 ... N1)	0100b	4 words = 8 bytes (because read only code consists of 7 bytes, the 8th byte has no meaning)
Head number (K3 ... K1)	001b	Head number 2 is addressed
Toggle flag (T)	1b	(or 0, depending on the previous state after initial command or switching on = 1)

Word 0	Commands and parameters															
	B4	B3	B2	B1	DS	0	T2	T1	N4	N3	N2	N1	K3	K2	K1	T
	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	1

Table 4.1 = 1043hex



Note!

Words 1 ... 15 do not contain valid data. However, this only applies for read only codes. In the case of read/write tags, word 1 would contain the start memory address and words 2 ... 15 (for write commands) the data to be written.

Response from the control interface on the DP master

Singlecommands are executed once and the result (success or failure) is output.

	Word 0	Word 1	Word 2	Word 3	Word 4	Word 5	
	1043 (hex)	1105 (hex)	xxxx	xxxx	xxxx	xxxx	If no read only tag in front of head
or	1043 (hex)	1106 (hex)	xxxx	xxxx	xxxx	xxxx	If head not connected or defective.
or	1043 (hex)	1100 (hex)	4235 (hex)	3433 (hex)	3634 (hex)	32xx (hex)	If read only tag content "B543642" (ASCII) in front of head

Word 0: Command and parameter mirrored

Word 1: Status/execution counter/head number (see below)

Word 2 ... 5: If reading is successful, the corresponding data of the read only tag appears here.

Word 6 ... 15: No valid data

Word 1	Status/execution counter/head number															
	-	K3	K2	K1	A4	A3	A2	A1	-	-	-	-	S4	S3	S2	S1
	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	1
or	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0
or	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0

Head number (K3 ... K1)

001b

Read with head 2

Execution counter (A4 ... A1)

0001b

Executed once

Status (S4 ... S1)

0101b

Read or write error

or

0110b

Hardware error

or

0000b

Command executed without error

5 ASCII table

hex	dec	ASCII	hex	dec	ASCII	hex	dec	ASCII	hex	dec	ASCII
00	0	NUL	20	32	Space	40	64	@	60	96	'
01	1	SOH	21	33	!	41	65	A	61	97	a
02	2	STX	22	34	"	42	66	B	62	98	b
03	3	ETX	23	35	#	43	67	C	63	99	c
04	4	EOT	24	36	\$	44	68	D	64	100	d
05	5	ENQ	25	37	%	45	69	E	65	101	e
06	6	ACK	26	38	&	46	70	F	66	102	f
07	7	BEL	27	39	'	47	71	G	67	103	g
08	8	BS	28	40	(	48	72	H	68	104	h
09	9	HT	29	41	)	49	73	I	69	105	i
0A	10	LF	2A	42	*	4A	74	J	6A	106	j
0B	11	VT	2B	43	+	4B	75	K	6B	107	k
0C	12	FF	2C	44	,	4C	76	L	6C	108	l
0D	13	CR	2D	45	-	4D	77	M	6D	109	m
0E	14	SO	2E	46	.	4E	78	N	6E	110	n
0F	15	SI	2F	47	/	4F	79	O	6F	111	o
10	16	DLE	30	48	0	50	80	P	70	112	p
11	17	DC1	31	49	1	51	81	Q	71	113	q
12	18	DC2	32	50	2	52	82	R	72	114	r
13	19	DC3	33	51	3	53	83	S	73	115	s
14	20	DC4	34	52	4	54	84	T	74	116	t
15	21	NAK	35	53	5	55	85	U	75	117	u
16	22	SYN	36	54	6	56	86	V	76	118	v
17	23	ETB	37	55	7	57	87	W	77	119	w
18	24	CAN	38	56	8	58	88	X	78	120	x
19	25	EM	39	57	9	59	89	Y	79	121	y
1A	26	SUB	3A	58	:	5A	90	Z	7A	122	z
1B	27	ESC	3B	59	;	5B	91	[	7B	123	{
1C	28	FS	3C	60	<	5C	92	\	7C	124	|
1D	29	GS	3D	61	=	5D	93	]	7D	125	}
1E	30	RS	3E	62	>	5E	94	^	7E	126	~
1F	31	US	3F	63	?	5F	95	_	7F	127	DEL

FACTORY AUTOMATION – SENSING YOUR NEEDS



Worldwide Headquarters

Pepperl+Fuchs GmbH
68307 Mannheim · Germany
Tel. +49 621 776-0
E-mail: info@de.pepperl-fuchs.com

USA Headquarters

Pepperl+Fuchs Inc.
Twinsburg, Ohio 44087 · USA
Tel. +1 330 4253555
E-mail: sales@us.pepperl-fuchs.com

Asia Pacific Headquarters

Pepperl+Fuchs Pte Ltd.
Company Registration No. 199003130E
Singapore 139942
Tel. +65 67799091
E-mail: sales@sg.pepperl-fuchs.com

www.pepperl-fuchs.com

 **PEPPERL+FUCHS**
SENSING YOUR NEEDS