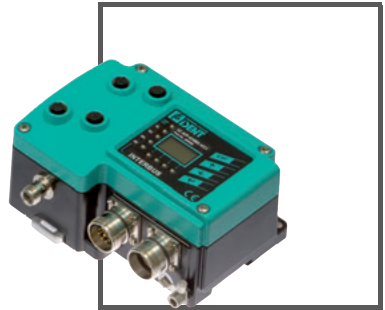


MANUAL

IC-KP-B5-V23 IDENT*Control* interface with Interbus interface



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"

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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 Declaration of conformity

2.1 Declaration of conformity

This product was developed and manufactured under observance of the applicable European standards and guidelines.



Note!

A Declaration of Conformity can be requested from the manufacturer.

The product manufacturer, Pepperl+Fuchs GmbH, D-68307 Mannheim, has a certified quality assurance system that conforms to ISO 9001.



3 Safety

3.1 Symbols relevant to safety



Danger!

This symbol indicates a warning about a possible danger.

In case of ignoring the consequences may range from personal injury to death.



Warning!

This symbol indicates a warning about a possible fault or danger.

In case of ignoring the consequences may cause personal injury or heaviest property damage.



Caution!

This symbol warns of a possible fault.

In case of ignoring the devices and any connected facilities or systems may be interrupted or fail completely.

3.2 Intended use

The IDENTControl IC-KP-B5-V23 is a control interface including an INTERBUS interface for identification systems. The device can be used as a control cabinet module or for field applications. Besides the INTERBUS connection, suitable inductive R/W heads, microwave antennas or trigger sensors can be connected. Wiring suitable for the system design must be used.

3.3 General notes on safety

Only instructed specialist staff may operate the device in accordance with the operating manual.

User modification and or repair are dangerous and will void the warranty and exclude the manufacturer from any liability. If serious faults occur, stop using the device. Secure the device against inadvertent operation. In the event of repairs, return the device to your local Pepperl+Fuchs representative or sales office.

The connection of the device and maintenance work when live may only be carried out by a qualified electrical specialist.

The operating company bears responsibility for observing locally applicable safety regulations.

Store the not used device in the original packaging. This offers the device optimal protection against impact and moisture.

Ensure that the ambient conditions comply with regulations.



Note!

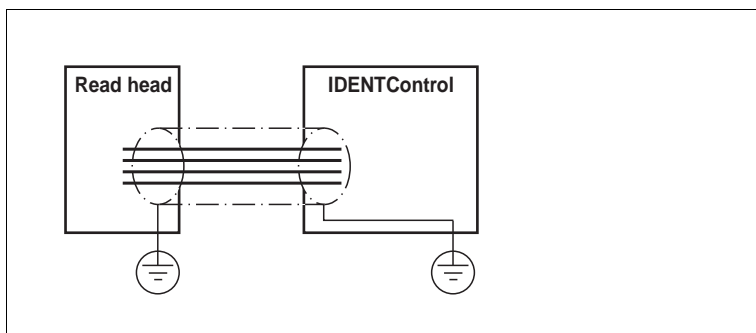
Disposal

Electronic waste is hazardous waste. When disposing of the equipment, observe the current statutory requirements in the respective country of use, as well as local regulations.

3.4

Contact protection

Our housings are manufactured using components made partly or completely from metal to improve noise immunity.



Danger!

Electric shock

The metallic housing components are connected to ground to protect against dangerous voltages that may occur in the event of a fault in the SELV power supply!

See chapter 5.4.4

4 Product Description

4.1 Range of application

The system is suited for the following applications:

- Automation
- Material flow control in production
- Acquisition of operating data
- Access control
- Identification of storage vessels, pallets, work piece carriers, refuse containers, tanks, containers, etc.

4.2 Device characteristics

- Up to 4 R/W heads can be connected
- Alternatively up to 2 R/W heads and 2 trigger sensors can be connected
- LCD indicator with background illumination
- Direct operation using 4 function keys
- LED status indicator for bus communication and R/W heads

4.3 Product family

The IDENTControl brand name represents a complete identification system. The system consists of an IDENTControl interface including bus interface, inductive R/W heads (125 kHz and 13.56 MHz) and accompanying code and data carriers in many different designs. The IDENTControl can be connected to other identification systems.

The system is equally well suited for use in the switching cabinet and for field use in IP67. The interface to the controlling fieldbus is integrated into the enclosure and all connections are implemented as plugs. This enables simple installation and quick, correct replacement in case of device failure. The consistent EMC design (metal enclosure, grounding, shielded wires) offers a high degree of noise immunity. Function buttons are available for parameterization and entering commands directly into the IDENTControl.

4.3.1 R/W heads

There are different R/W heads available for the IDENTControl in different designs. You can connect inductive R/W heads (125 kHz and 13.56 MHz) depending on your particular application.

4.3.2 Code / data carrier

Code / data carrier 125 kHz (inductive)

A wide range of code and data carrier designs are available for this frequency range, from a 3 mm thin glass tube to a transponder 100 mm in diameter. Data carriers are available for temperatures up to 300 °C (max. 5 min) in chemical-resistant housings for installation in metal and in degree of protection IP68/IP69K. IPC02-... code carriers offer 40-bit read only codes. IPC03-... data carriers have

928 bits of programmable memory and a non-variable read only code of 32 bits. With IPC11-... code carriers, you can generate individually definable 40-bit read only codes, which you can use as permanent read only codes or continually redefine. The IPC12 data carrier with 64 kBit FRAM memory and a 32 bit read only code is available for larger volumes of data.

Data carrier 13.56 MHz (inductive)

Data carriers in this frequency range can store large quantities of data and offer a reading speed superior to that of data carriers from the 125 kHz system. A larger antenna also achieves a sensing range of up to 300 mm. The R/W heads IQH-* and IQH1-* from Pepperl+Fuchs are compatible with most existing data carriers that comply with standard ISO 15693. With the R/W heads IQH2-* you can use data carriers complying with standard ISO 14443.

The 13.56 MHz technology even allows so-called smart labels (data carriers in the form of adhesive labels with printed barcode). Currently available data carriers have a memory capacity of 64 bits of read only code and a maximum of 2 kByte of programmable memory.

4.3.3

Handhelds

There are various handheld read/write devices available for controlling processes (write/read functions, initialization of data carriers).

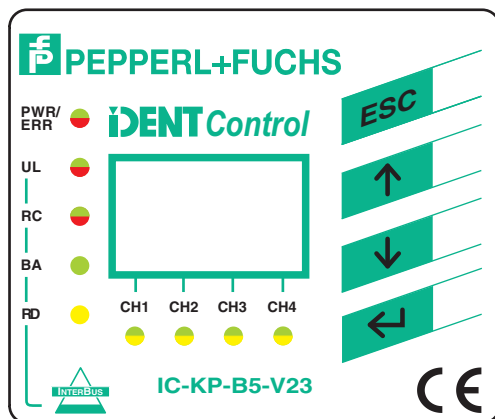


Figure 4.1

Handheld	Frequency range
IPT-HH20	125 kHz
IST-HH20	250 kHz
IQT1-HH20	13.56 MHz
IC-HH20-V1	depending on the read/write head

4.4 Displays and controls

The following displays and controls are located on the control interface.



LED indicators

PWR/ERR	Power on Hardware error	green red
1, 2, 3, 4	Status display for R/W heads Command on R/W head is active Command executed successfully (approx. 1 second)	green yellow
UL	Interface ready for operation	green
RC	Incoming remote bus connected correctly.	green
BA	Telegrams are transmitted.	green
RD	Intermediate remote bus is deactivated.	Yellow

Display

Two-line multifunction display with 12 characters per line for displaying different status and operating information and four pictograms for displaying connected reading heads.

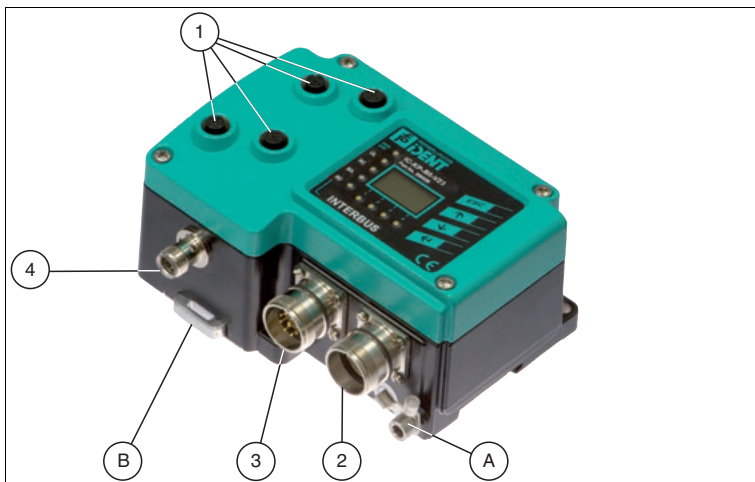
Push buttons

Push buttons are used for controlling the display and selecting commands when programming the control interface.

	Return to higher level
	Up menu item
	Down menu item
	RETURN (confirm input)

4.5 Interfaces and connections

The following interfaces and connections are located on the control interface IC-KP-B5-V23.



Connections

- 1** M12 connector for R/W heads (sockets) - V1
- 2** 9-pin M23 round plug connector, outgoing bus interface - M23
- 3** 9-pin M23 round plug connector, incoming bus interface - M23
- 4** M12 connector for power supply (plug) - V1

Other accessories

- A** Screw for ground
- B** Metal latches for mounting the DIN rail

Accessories

Accessories see chapter 4.7.

4.6 Delivery package

The delivery package contains:

- 1 IDENTControl control interface
- 1 quick start guide
- 1 grounding screw (already fitted)
- 1 serrated lock washer (already fitted)
- 2 crimp connectors (already fitted)

4.7 Connection accessories

4.7.1 Connection cable for R/W heads and trigger sensors

Compatible connection cables with shielding are available for connecting the R/W heads and trigger sensors.



Figure 4.2

Accessories	Description
2 m long (straight female, angled male)	V1-G-2M-PUR-ABG-V1-W
5 m long (straight female, angled male)	V1-G-5M-PUR-ABG-V1-W
10 m long (straight female, angled male)	V1-G-10M-PUR-ABG-V1-W
20 m long (straight female, angled male)	V1-G-20M-PUR-ABG-V1-W
Field attachable female connector, straight, shielded	V1-G-ABG-PG9
Field attachable male connector, straight, shielded	V1S-G-ABG-PG9
Field attachable female connector, angled, shielded	V1-W-ABG-PG9
Field attachable male connector, angled, shielded	V1S-W-ABG-PG9
Dummy plug M12x1	VAZ-V1-B

4.7.2 Cable connectors for the power supply

Compatible M12 sockets with an open cable end for connecting the IDENTControl to a power supply are available in different lengths.



Figure 4.3

Accessories	Designation
Length 2 m (straight socket)	V1-G-2M-PUR
Length 5 m (straight socket)	V1-G-5M-PUR
Length 10 m (straight socket)	V1-G-10M-PUR

5 Installation

5.1 Storage and transport

For storage and transport purposes, package the unit using shockproof packaging material and protect it against moisture. The best method of protection is to package the unit using the original packaging. Furthermore, ensure that the ambient conditions are within allowable range.

5.2 Unpacking

Check the product for damage while unpacking. In the event of damage to the product, inform the post office or parcel service and notify the supplier.

Check the package contents with your purchase order and the shipping documents for:

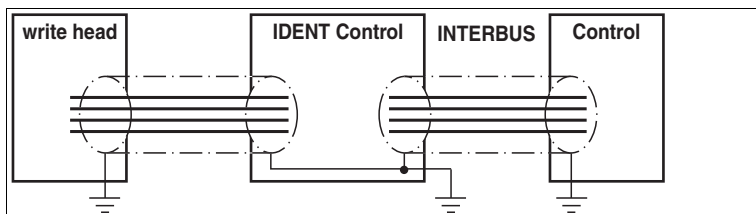
- Delivery quantity
- Device type and version in accordance with the type plate
- Accessories
- Quick start guide

Retain the original packaging in case you have to store or ship the device again at a later date.

Should you have any questions, please contact Pepperl+Fuchs.

5.3 EMC concept

The outstanding noise immunity of the IDENTControl against emission and immission is based on its consistent shielding design, which uses the principle of the Faraday cage. Interference is caught in the shield and safely diverted via the ground connections.



The screening of cables provides for the discharge of electromagnetic interference. When screening a cable, both sides of the screen must be connected to the earth with low resistance and low inductance.



Note!

If cables with double shields are used, e.g. wire mesh and metalized foil, the both shields must be connected together, with low resistance, at the ends when making up the cable.

Power supply cables are the source of much interference, e.g. from the supply lines of 3-phase electric motors. For this reason, the parallel laying of power supply cables with data and signal cables should be avoided, particularly in the same cable duct.

The metal enclosure of the IDENTControl and the metal enclosure of the R/W heads complete the consistent shielding concept.

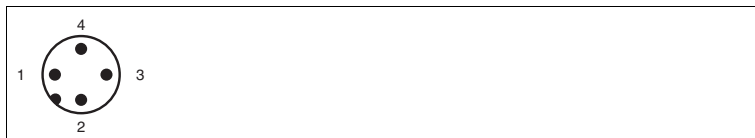
The most important issue here is that the shields are connected to ground with low resistance and low inductance. The metal enclosure ensures that the shielding is not interrupted, i.e. the complete electronics system and all routed cables are located within a Faraday cage.

5.4 Device connection

Electrical connection using plug connectors makes installation simple.

5.4.1 Power supply

Connect the power supply via an M12 connector with integrated voltage and reverse polarity protection indicator (green: correct polarity, red: reverse polarity). A plug with the following pin assignment is located on the housing:



- 1 + 24 V
- 2 NC
- 3 GND
- 4 NC

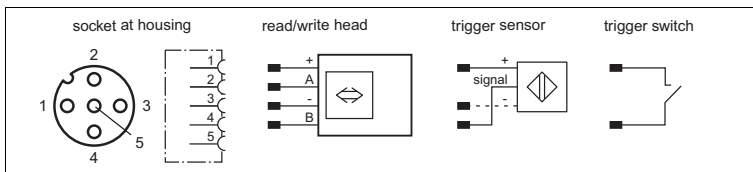
Compatible connecting cable see chapter 4.7.2.

5.4.2 R/W head and trigger sensors

You can connect a maximum of four R/W heads to the IDENTControl.

You can connect a maximum of two trigger sensors to sockets 3 and 4 instead of the R/W heads. A trigger sensor can only be assigned to a R/W head. The trigger sensors must be PNP.

The R/W heads and trigger sensors are connected to the top of the enclosure via M12 connectors with sockets.



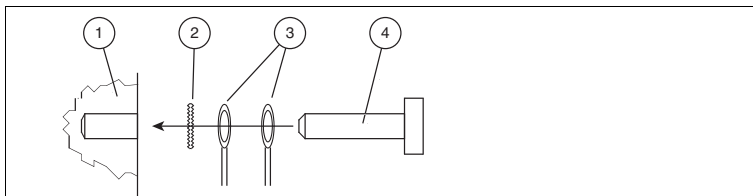
Compatible R/W heads see chapter 4.3.1 and compatible connecting cables see chapter 4.7.1.

5.4.3 Cable length between control interface and R/W heads

The maximum cable length between the control interface and a connected R/W head is 1000 meters. If you wish to attain the maximum possible cable length, select a suitably large cable cross-section. see chapter 4.7.1

5.4.4 Ground connection

The ground connection of the IDENTControl is located at the lower right of the connector array. The ground conductor is screwed to the housing with a crimp connector. In order to guarantee safe grounding, the serrated washer must be mounted between the crimp connector and the housing.

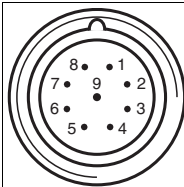


- 1 Housing
- 2 Serrated lock washer
- 3 Crimp connector
- 4 Lock screw

A cross-section of at least 4 mm² is recommended for the ground conductor lead.

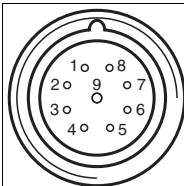
5.4.5 INTERBUS connection guide

Round connector: Connector - incoming interface



- 1 DO1
- 2 /DO1
- 3 DI1
- 4 /DI1
- 5 GND
- 6 NC
- 7 NC
- 8 NC
- 9 NC

Round connector: Socket - outgoing interface



- 1 DO2
- 2 /DO2
- 3 DI2
- 4 /DI2
- 5 GND
- 6 NC
- 7 NC
- 8 NC
- 9 /RBST

5.4.6

Cables

The following INTERBUS remote bus cables should be used:

Parameter	Standard	Highly flexible	Suitable for laying underground
Cable construction	Twisted pairs/i.e. 2-core, common screening		
Conductor cross-section	3 x 2 x 0.22 mm ²	3 x 2 x 0.25 mm ²	3 x 2 x 0.22 mm ²
Operating capacity	60pF/m		
Impedance	120 W at 64 KHz/100 W at 1 MHz		

Use only screened cables constructed as twisted pairs. The best possible EMC interference immunity can only be achieved by using screened cables.

5.4.7

Cable lengths

Depending on the type of cable used and the magnitude of the external interference, the distance between two devices can be up to 400 meters. The total expansion of an INTERBUS system can be up to 12.8 kilometers. The number of devices connected to the bus is limited to 512.

5.4.8

INTERBUS ring termination

A characteristic of the INTERBUS system is its physical ring structure. Each connected device lies in the bus between two other stations. If this is not the case, for example, at the end of a branch with a bus terminal, then the ring line must be closed.

The ring line on the IDENTControl is automatically closed. If the network of the remote bus is extended at the outgoing socket using a suitable cable, the ring line is opened automatically for the following devices.

6 Commissioning

6.1 Connection



Warning!

Before commissioning, check once again that the connections are correct.

Before commissioning, familiarize yourself with the system of communication between your interface module and the read/write station (see chapter 7).

Commissioning requires accurate knowledge of INTERBUS and the programming of your master device.

After the supply voltage is connected, the green LED in the voltage connector and the PWR and UL LEDs on the display panel must light up. If the LED in the connector lights up red, the polarity of the power supply is reversed.

6.2 Preliminary considerations

Due to the complexity of field bus programming with the INTERBUS it is unfortunately very difficult to make generally valid statements about commissioning.

One very important aspect of the operation of an extended identification system on the INTERBUS is the time response of the overall system. The question "How long after the positioning of a data carrier in front of a R/W head will the read data be available in my computer?" is answered with the aid of knowledge of the INTERBUS protocol structure and the following formula:

$$t_t = [13 * (6 + n) + 1.5 * m] * t_{bit} + t_{sw} + t_{PH}$$

t_t = transfer time

n = number of usable data bytes (per node, only apply input or output data byte), here: 10 bytes

m = number of remote bus stations installed

t_{bit} = bit duration, where $t_{bit} = 2 \mu s$ at 500 kBit/s or $t_{bit} = 0.5 \mu s$ at 2 MBit/s

t_{sw} = software run time, where $t_{sw} = 200 \mu s$

t_{PH} = runtime on the transmitting medium, on copper $t_{PH} = 0.016 ms^*/km$ where l is the length of the remote bus cable in km.

On large projects, or if you have little experience of programming an INTERBUS system, you should always construct a laboratory set up of your application and test the data transfer to the INTERBUS master before installing the system in the plant.



Note!

The "CMD" manufacturer-independent program is available for planning, commissioning and diagnosing INTERBUS networks.

Details of this program and information on the general theme of INTERBUS are available from:

INTERBUS-S-Club

Postfach 1108

D-32817 Blomberg, Germany

<http://www.interbusclub.com/de>

Tel. +49 52 35 / 34 21 00

Fax +49 52 35 / 34 12 34

6.3

Device settings



Caution!

Device not configured or configured incorrectly

System failure caused by incorrectly configured device

Configure the device prior to commissioning.

You must set the various parameters prior to commissioning.

The parameters are volatile and non-volatile parameters. Volatile parameters are reset to their default setting when the system is switched off and on again.

Non-volatile parameters

Parameter	Default setting	Value range
General		
LCD contrast	50	36 ... 71
LCD light	On	On / off
Language	English	English / German
Multiplex mode	off	On / off
R/W head		
Trigger mode	off	On / off
Tag type	99	00 ... FF
INTERBUS interface		
Baud rate	500 kBits/s	500k / 2M
Data hold time	0d x 10 ms	0d ... 255d x 10 ms

Volatile parameters

Parameter	Default setting	Value range
R/W head		
Password mode	Off	on / off
Password	00000000	00000000 ... FFFFFFFF

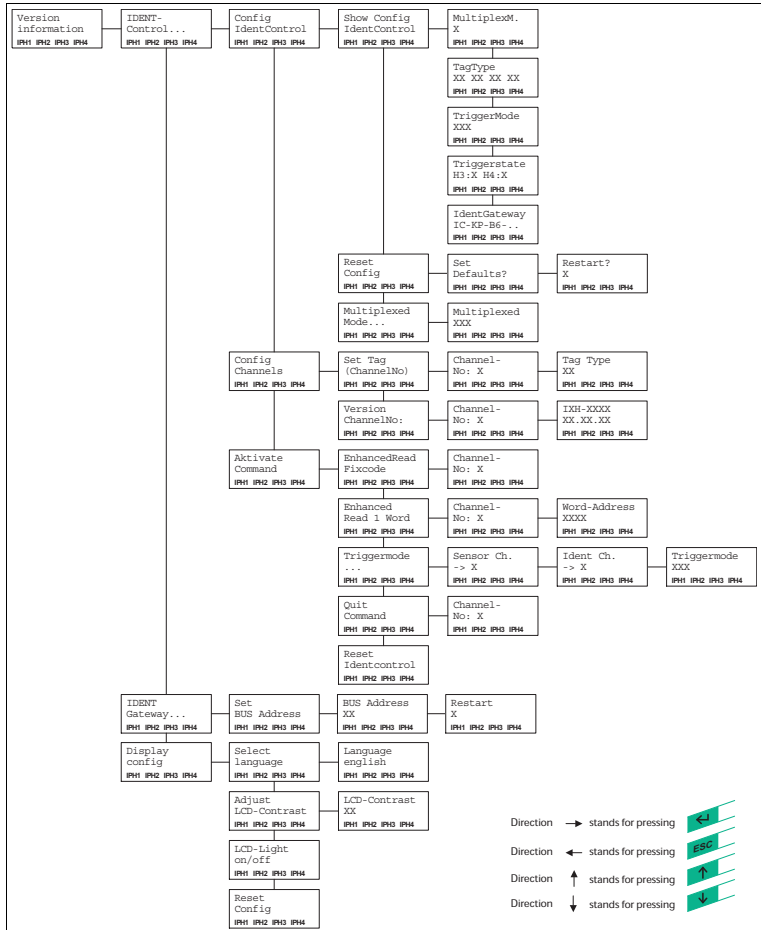
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Configure the read/write station with the described system commands (see chapter 7.4). “99” is preset as the tag type.

6.3.1

Operating the device

The following illustration shows how the device is operated directly:



6.4

Output of the contents of read data carriers on the display

In the first menu level, the IDENTControl shows the contents of read data carriers on the display. Information messages of this kind are marked with a bell icon (🔔) in the top right corner of the display to distinguish them from menu items.

A maximum of the first 12 characters of the read data set can be displayed. The following characters may be excluded.

The view on the display can be toggled by pressing the arrow buttons. The following display variants are available:

- HEX (hexadecimal with decimal delimiter)
- HEX2 (hexadecimal without decimal delimiter)
- ASCII (ASC)



Note!

Data carrier content from commands that are activated manually on the IDENTControl are always displayed, irrespective of the menu level that was just displayed.

6.4.1 Setting the transfer rate



Setting the transfer rate

Select the transfer rate for your plant and configure via the display using the function buttons as follows:

1. Select the Gateway/INTERBUS settings.
2. Select the baud rate.
3. Select the baud rate 500K / 2M.
4. Press return to adopt the settings and complete the process.

The device must be switched off and back on again or restarted using the function buttons on the display for the INTERBUS component to adopt the new transfer rate setting.

6.4.2 Setting the data hold time



Setting the data hold time

The data hold time value defines the minimum duration that data is retained on the bus before it is overwritten with new data. Preset this time via the display using the function buttons as follows:

1. Select the Gateway/INTERBUS settings.
2. Select the data hold time.
3. Select the data hold time xxx x 10 ms.
4. Press return to adopt the settings and complete the process.

The time is adjusted in increments of 10 ms. A setting of 20, for example, means 20 x 10 ms = 200 ms.

The default setting for the data hold time is 0, i.e. new data that becomes available is sent immediately to the bus, where it overwrites the old data.

The device must be switched off and back on again or restarted using the function buttons on the display for the INTERBUS component to adopt the new data hold time setting.

7 Commands

7.1 General information on INTERBUS

The INTERBUS is a standardized field bus, which enables data exchange between PLCs, PCs, operating and observation devices and also sensors and actuators.

An extensive introduction to INTERBUS would go well beyond the limits of these operating instructions. For detailed information, refer to the INTERBUS standard DIN 19258 and to the current literature on the subject.



Note!

The INTERBUS Club publishes information brochures and an INTERBUS product catalog.

7.1.1 Outline of the commands and data on the INTERBUS

The IDENTControl IC-KP-B5-V23 assigns 5 words to each set of 16 bits (10 bytes) in the framework protocol of the INTERBUS in both communication directions.

It is restricted in this to the cyclic transfer of the process data channel. This means:

- Even the instructions for the adjustment of the device are updated on every cycle.
- The parameter channel of the INTERBUS is not used.
- The IDENTControl is designed as a remote bus station. The ID code is 03.

7.2 General command information

7.2.1 Software information

A command consists of the command code, a specified number of parameters, the toggle flag and the data relating to the command. The command is entered in the output data field.

A response is read from the input data field and consists of the echo of the command code, a parameter, the toggle flag, the status, a reply counter and the read data.

Some commands do not use all parameter and data fields. The device ignores the not used data fields. The input and output data fields are structured as follows:

Output data field (command):

Byte 0	Command code
Byte 1	Parameter/Toggle flag
Byte 2	Parameter
Byte 3	Parameter
Byte 4	Write data
...	...
Byte N (N is defined by module selection)	Write data

Input data field (response):

Byte 0	Command code (Echo)
Byte 1	Parameter/Toggle flag
Byte 2	Status
Byte 3	Reply counter
Byte 4	Read data
...	...
Byte N (N is defined by module selection)	Read data

In order to send a new command to the device, the INTERBUS master must write a command in the output data field. The new command is executed when the data has changed relative to the last read-in. If the same command is to be executed a number of times, the toggle flag must be inverted so that the device recognizes that a new command has to be processed.

Upon detection of a new command "Status" is set to FFh.

After the identification system processes commands, the "Status" is output in accordance with the status/fault message table (see chapter 7.9).

The first byte of the response corresponds to the first byte of the command call-up (command code).

The toggle bit of the response is the same as the toggle bit of the command.

If the status is FFh (command detected), the second byte of the response also corresponds to the second byte of the command call-up. In the actual response (status not FFh), the second byte contains the parameters for the response, i.e. the number of words in the response and the channel used to transmit the response. After a read command is issued, a response with the status 00 in the "Word count" response parameter then contains the number of words in the response telegram (which is also the command call-up). The number of words in a response to a write command is 0000b because the response only contains the status and not (useful) data. Here, the second byte of the response is not the same as the second byte of the command call-up. With read only code commands, the word count in the response is always 0000b. 3 responses are issued for commands to all connected R/W heads (channel = 111b): The first response (status = FFh) is followed up by 2 other responses that contain the status of the individual channels. The "Channel" parameter in the response telegram contains the number of the relevant channel (001, 010).

If new response data is available, the previous data is overwritten. The configurable data hold time value defines the minimum duration that old data is retained before it may be overwritten with new data. The default setting for the timer value is 0.

New commands may only be issued to the device once the answer was retrieved from the previously issued command.

Enhanced commands are executed repeatedly as long as the commands remain in the output data field. Execution stops only when a new command for the channel on which the **Enhanced** command was executed is written to the output data field.

When the system is switched on, the value on the reply counter is 00h. This value increases every time the response data field is modified. This also applies if the status changes to FFh or from 00h to 05h (with **enhanced** commands: tag leaves the detection range).

In the event of an overrun, the counter skips from FFh to 01h.

7.3 Command types

When using commands, a distinction is always made between the two command types **single mode** and **enhanced mode**.

Single mode

The command is executed once. A response is issued immediately.

Enhanced mode

The command remains permanently active until it is interrupted by the user or by an error message. A response is issued immediately.

The command remains active after the response is issued. Data is only transferred if read/write tags change. Read/write tags are not read twice. If a read/write tag leaves the read range, the status '5' is output.

7.4 Command overview

The commands in the list are described in detail on the following pages.

System commands

Command code		Command description	Abbreviation
4d	04h	See "Change tag (CT)" on page 28	CT
2d	02h	See "Quit (QU)" on page 31	QU
3d	03h	See "Version (VE):" on page 32	VE
23d	17h	See "Configuration store (CS)" on page 34	CS
22d	16h	See "Reset (RS)" on page 35	RS
155d	9Bh	See "Set multiplexed mode (MM):" on page 36	MM
156d	9Ch	See "Set trigger mode (TM):" on page 37	TM

Standard read/write commands

Fixcode

Command code		Command description	Abbreviation
1d	01h	See "single read fixcode (SF)" on page 39	SF
29d	1Dh	See "Enhanced buffered fixcode (EF)" on page 40	EF

Read data

Command code		Command description	Abbreviation
16d	10h	See "single read words (SR)" on page 41	SR
25d	19h	See "enhanced buffered read words (ER)" on page 42	ER

Write data

Command code		Command description	Abbreviation
64d	40h	See "single write words (SW)" on page 43	SW
26d	1Ah	See "enhanced buffered write words (EW)" on page 44	EW

Special command modes

Password mode with IPC03

Command code		Command description	Abbreviation
24d	18h	See "Set password mode (PM)" on page 47	PM
65d	41h	See "Change password (PC)" on page 48	PC
66d	42h	See "Set password (PS)" on page 49	PS

Configuration IPC03

Command code		Command description	Abbreviation
97d	61h	See "Single get configuration (SG)" on page 51	SG
104d	68h	See "Enhanced buffered get configuration (EG)" on page 52	EG
18d	12h	See "Single write configuration (SC)" on page 53	SC
102d	66h	See "Enhanced buffered write configuration (EC)" on page 55	EC

Writing fixcode IPC11 and IDC-...-1K

Command code		Command description	Abbreviation
31d	1Fh	See "Single write fixcode (SX)" on page 56	SX
36d	24h	See "Enhanced buffered write fixcode (EX)" on page 58	EX
188d	BCh	See "Set tag ID code (TI)" on page 60	TI
170d	AAh	See "Fill data carrier (S#)" on page 61	S#

Extended commands for type IDC-...-1K read/write tags

Command code		Command description	Abbreviation
10d	0Ah	See "Single read special fixcode (SS)" on page 62	SS
113d	71h	See "Enhanced read special fixcode (ES)" on page 63	ES
13d	0Dh	See "Single program special fixcode (SP)" on page 64	SP
117d	75h	See "Enhanced program special fixcode (EP)" on page 65	EP
107d	6Bh	See "Initialize data carrier (SI)" on page 66	SI

Extended commands for type IDC-...-1K and IQC... read/write tags

Command code		Command description	Abbreviation
71d	47h	See "single write words with lock (SL)" on page 67	SL
72d	48h	See "Enhanced write words with lock (EL)" on page 68	EL

Extended commands for IQH2-... read/write heads

Command code		Command description	Abbreviation
190d	BEh	See "read param (RP)" on page 69	RP
191d	BFh	See "write param (WP)" on page 70	WP

7.5

System commands

Change tag (CT)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (04h)	0	0	0	0	0	1	0	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>		<T>	
Byte 2	Data carrier type in ASCII	<TagType> (high byte)							
Byte 3	Data carrier type in ASCII	<TagType> (low byte)							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (04h)	0	0	0	0	0	1	0	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>		<T>	
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

This command tells the read/write head on the relevant channel which tag type to communicate with. This setting is stored in the non-volatile memory on the unit.

Supported tag types

Tag type		P+F designation	Chip type	Access	Writable memory [bytes]	Read only code length [byte]	Frequency range
High byte	Low byte						
'0'	'2'	IPC02	Unique, EM4102 (EM Microelectronic)	fixcode	5	5	125 kHz
'0'	'3'	IPC03	EM4450 (EM Microelectronic), Titan	R/W fixcode	116	4	125 kHz
'1'	'1'	IPC11	Q5 (Sokymat)	R/W	5	-	125 kHz

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Tag type		P+F designation	Chip type	Access	Writable memory [bytes]	Read only code length [byte]	Frequency range
High byte	Low byte						
'1'	'2'	IPC12	P+F FRAM	R/W fixcode	8k	4	125 kHz
'2'	'0'	IQC20 ¹⁾	All tags conforming to ISO 15693	R/W fixcode	8	8	13.56 MHz
'2'	'1'	IQC21	I-Code SLI (NXP)	R/W fixcode	112	8	13.56 MHz
'2'	'2'	IQC22	Tag-it HF-I Plus (Texas Instruments)	R/W fixcode	250	8	13.56 MHz
'2'	'3'	IQC23	my-D (Infineon) SRF55V02P	R/W fixcode	224	8	13.56 MHz
'2'	'4'	IQC24	my-D (Infineon) SRF55V10P	R/W fixcode	928	8	13.56 MHz
'3'	'1'	IQC31	Tag-it HF-I Standard (Texas Instruments)	R/W fixcode	32	8	13.56 MHz
'3'	'3'	IQC33 ²⁾	Fujitsu FRAM MB89R118	R/W fixcode	2k	8	13.56 MHz
'3'	'4'	IQC34	Fujitsu FRAM MB89R119	R/W fixcode	29	8	13.56 MHz
'3'	'5'	IQC35	I-Code SLI-S (NXP)	R/W fixcode	160	8	13.56 MHz
'4'	'0'	IQC40	All tags conforming to ISO 14443A	fixcode	-	4/7	13.56 MHz
'4'	'1'	IQC41	Mifare UltraLight MF0 IC U1	R/W fixcode	48	7	13.56 MHz
'4'	'2'	IQC42 ³⁾	Mifare Classic MF1 IC S50	R/W fixcode	752	4	13.56 MHz
'4'	'3'	IQC43 ³⁾	Mifare Classic MF1 IC S70	R/W fixcode	3440	4	13.56 MHz
'5'	'0'	IDC-...-1K	P+F	R/W fixcode	125	4	250 kHz
'5'	'2'	ICC-...	P+F	fixcode	28	7	250 kHz
'7'	'0'	All tags conforming to ISO 18000-6B and EPC Class 1 Gen 2		-	-	-	868 MHz
'7'	'2'	IUC72 ⁴⁾	NXP UCode-EPC-G2XM	R/W fixcode	64	8	868 MHz
'7'	'3'	IUC73 ⁴⁾	Alien Higgs-2	fixcode	-	96	868 MHz
'7'	'4'	IUC74 ⁴⁾	NXP UCode-EPC-G2	R/W fixcode	28	96	868 MHz
'7'	'5'	IUC75 ⁴⁾	Impinj Monza 2.0	fixcode	-	96	868 MHz
'7'	'6'	IUC76 ⁴⁾	Alien Higgs-3	R/W fixcode	56	240	868 MHz
'9'	'9'	Depends on read head ⁵⁾		-	-	-	-

- 1) IQC20 is not an actual tag type, but is used to read the UID (read only code) of all ISO 15693 compliant tags.
- 2) You can only use the tag IQC33 in combination with a read/write head IQH1-... The memory is divided into 8-byte blocks (instead of 4-byte blocks). You must therefore enter an integral initial address for write commands SR, ER, SW, and EW. <WordNum> specifies the number of 8-byte blocks (max. 7 here) and must be even-numbered.

- 3) The memory can be encrypted per sector (1 sector = 4 blocks of 16 bytes).
The default key in the transponder and the read head is FF FF FF FF FF_{ASCII}. The key in the read head can be read with the command Read param and written with the command Write param (see System commands) . Thus, only the key in the read head is changed, not in the transponder!
The key in the read head is stored in permanent memory.
- 4) You can only use the IUC7* type tags with the read/write head IUH-F117-V1 in combination with certain evaluation units.
- 5) The tag type configured in the read/write head as the default is selected.



Note!

In a plant where only one tag type is used, it is advantageous to permanently configure that tag type so that the read/write head detects the tag quicker.

Default tag type:

In the factory default condition, the tag type 99 is preset in the IDENTControl (depending on the reading head type), thus the tag type preset on the reading head is used.

Quit (QU)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (02h)	0	0	0	0	0	0	1	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>		<T>	
Byte 2	not used	-	-	-	-	-	-	-	-
Byte 3	not used	-	-	-	-	-	-	-	-
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (02h)	0	0	0	0	0	0	1	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

The command running on this channel is interrupted.

Version (VE):

Byte	Contents	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code	0	0	0	0	0	0	1	1
Byte 1	Reserved/Toggle bit	-	-	-	-	-	-	-	<T>
Byte 2	Parameter	<Parameter>							
Byte 3	Not relevant	-	-	-	-	-	-	-	-
...	...	-	-	-	-	-	-	-	-
Byte 9	Not relevant	-	-	-	-	-	-	-	-

Response:

Byte	Contents	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code	0	0	0	0	0	0	1	1
Byte 1	Reserved/Toggle bit	-	-	-	-	-	-	-	<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	Data 00h ... FFh	<Version data> part 1							
...	Data 00h ... FFh	<Version data> part ...							
Byte 9	Data 00h ... FFh	<Version data> part 6							

This command transfers the software version. The complete software version message cannot be transferred with one command due to its length. The individual parts of the software version message are transferred by repeated execution of the command with the appropriate parameters.

<Parameter>	Meaning <Version data>	Example
0; >22	Incorrect parameter, Status '04h' Data = 0	000000
1	IDENTControl - type	KPB5-V
2	IDENTControl - part number	200639
3	Identification system - software number	30373_
4	Identification system - software date	240806
5	Bus system - software number	31072_
6	Bus system - software date	160107
7	Head 1 - type	ISH-18
8	Head 1 - part number	181881
9	Head 1 - software number	30597_
10	Head 1 - software date	300606

<Parameter>	Meaning <Version data>	Example
11	Head 2 - type	__no__
12	Head 2 - part number	head 2
13	Head 2 - software number	000000
14	Head 2 - software date	000000
15	Head 3 - type	IPH-L2
16	Head 3 - part number	119321
17	Head 3 - software number	30420_
18	Head 3 - software date	040706
19	Head 4 - type	__no__
20	Head 4 - part number	head 4
21	Head 4 - software number	000000
22	Head 4 - software date	000000

Configuration store (CS)

Command:

Byte	Contents	Bit no.							
		7	6	5	4	3	2	1	0
Byte 2	Command code (17h)	0	0	0	1	0	1	1	1
Byte 3	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>		<T>	
Byte 4	Mode	0	0	0	0	0	0	0	<Mode>
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-
Byte 8	not used	-	-	-	-	-	-	-	-
Byte 9	not used	-	-	-	-	-	-	-	-

Response:

Byte	Contents	Bit no.							
		7	6	5	4	3	2	1	0
Byte 2	Command code (17h)	0	0	0	1	0	1	1	1
Byte 3	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>		<T>	
Byte 4	Status	<Status>							
Byte 5	Reply counter	<ReplyCounter>							
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-
Byte 8	not used	-	-	-	-	-	-	-	-
Byte 9	not used	-	-	-	-	-	-	-	-

The configuration store (CS) command allows you to store the last command sent to the R/W head in the non-volatile memory of the IDENTControl Compact. The R/W head executes the command automatically again if the power supply is interrupted or the IDENTControl Compact is reset.

<Mode>='1' activates the mode.

<Mode>='0' deactivates the mode.

Configuration store is deactivated by default.

Reset (RS)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (16h)	0	0	0	1	0	1	1	0
Byte 1	Reserved/Channel/Toggle bit	-	-	-	-	-	-	-	<T>
Byte 2	not used	-	-	-	-	-	-	-	-
Byte 3	not used	-	-	-	-	-	-	-	-
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

This command terminates all active commands. The device settings are reloaded from the non-volatile memory.

This confirmation is issued for this command (status FFh) instead of a response. The device resets the hardware and then restarts.

Set multiplexed mode (MM):

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (9Bh)	1	0	0	1	1	0	1	1
Byte 1	Reserved/Toggle bit	-	-	-	-	-	-	-	<T>
Byte 2	Multiplex mode	0	0	0	0	0	0	0	<F>
Byte 3	unused	-	-	-	-	-	-	-	-
Byte 4	unused	-	-	-	-	-	-	-	-
Byte 5	unused	-	-	-	-	-	-	-	-
Byte 6	unused	-	-	-	-	-	-	-	-
Byte 7	unused	-	-	-	-	-	-	-	-

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (9Bh)	1	0	0	1	1	0	1	1
Byte 1	Reserved/Toggle bit	-	-	-	-	-	-	-	<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	unused	-	-	-	-	-	-	-	-
Byte 5	unused	-	-	-	-	-	-	-	-
Byte 6	unused	-	-	-	-	-	-	-	-
Byte 7	unused	-	-	-	-	-	-	-	-

This command switches multiplex mode on and off. In multiplex mode, the R/W heads are controlled according to the time multiplex process, i.e. only one R/W head is active. The procedure minimizes mutual interference between R/W heads, allowing two R/W heads to be mounted side by side.

Each IDENT channel sends a response in reply to an MM command.

Multiplex mode <F>='0': Mode off
 <F>='1': Mode on

If a R/W head is not connected to a channel, the response telegram receives the status "06h" (hardware fault) from this channel.

Set trigger mode (TM):

Byte	Contents	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (9Ch)	1	0	0	1	1	1	0	0
Byte 1	Ident channel/sensor channel/toggle bit	0	<Ident channel>			<Sensor channel>		<T>	
Byte 2	Trigger mode	<Trigger mode>							
Byte 3	not used	-	-	-	-	-	-	-	-
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

Response:

Byte	Contents	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (9Ch)	1	0	0	1	1	1	0	0
Byte 1	Reserved/sensor channel/toggle bit	0	<Ident channel>			<Sensor channel>		<T>	
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

Permitted parameters:

<Sensor channel>	3 (011b), 4 (100b)
<Ident channel>	1 (0001b), 2 (0010b), 3 (0011b), 4 (0100b) (but not <Sensor channel>)
<Trigger mode>	0 (00000000b): Trigger mode off 1 (00000001b): Trigger mode on 2 (00000010b): Trigger mode inverted

Activating trigger mode interrupts a command running on the <Ident channel>.

If trigger mode is activated with <Trigger mode>=1 (=2), dampening the trigger sensor generates the status 0 (5) and after changing to undamped state, generates the status 5 (0) as a response to the <Sensor channel>. Activating trigger mode generates a response that includes the current status of the sensor on the <Sensor channel>.

If a read/write command is sent to the triggered channel <Ident channel> when trigger mode is active, this command is always activated if the <Sensor channel> transmits status 0. <Ident channel> transmits status 0 to confirm receipt of this command.

If you set <Ident channel> 0, the signal is transferred without influencing a reading head.

The command activated by the <Sensor channel> initiates execution as if it had just been restarted by the host.

The command is deactivated again if the status of the <Sensor channel> changes to 5 or trigger mode is deactivated.

If the <Sensor channel> requests a version message, the response contains the status 0 and no other information.

<Ident channel>=0 allows you to assign the trigger signal to channel '0' so that the trigger signal is transmitted to the controller and not to a read head.

This function can be used to monitor functions via the PLC if trigger signals and reading of data cannot occur simultaneously for application related reasons. Correlation must take place in the PLC.

If a trigger command has assigned channel '0' (000b) for <Identchannel>, this change in the status of the trigger sensor (status 0x00 and 0x05) is transmitted to the controller via the sensor channel

This function can be used to monitor functions via the controller if trigger signals and reading of data cannot occur simultaneously for application related reasons. Correlation must take place in the controller.

7.6

Standard read/write commands

single read fixcode (SF)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (01h)	0	0	0	0	0	0	0	1
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>		<T>	

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (01h)	0	0	0	0	0	0	0	1
Byte 1	Reserved/Channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	ID code 00h ... FFh	<ID-Code>							
Byte 5	ID code 00h ... FFh	<ID-Code>							
...	ID code 00h ... FFh	<ID-Code>							
Byte N ¹⁾	ID code 00h ... FFh	<ID-Code>							

Table 7.1: 1) N = <FixLen> + 3

The R/W head makes only one attempt to read a read only code.

The length of the read only code that is output depends on the tag type. See table "Supported tag types" on page 28.

Enhanced buffered fixcode (EF)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (1Dh)	0	0	0	1	1	1	0	1
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>		<T>	
Byte 2	not used	-	-	-	-	-	-	-	-
Byte 3	not used	-	-	-	-	-	-	-	-
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (1Dh)	0	0	0	1	1	1	0	1
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	ID code 00h ... FFh	<ID code>							
Byte 5	ID code 00h ... FFh	<ID code>							
...	ID code 00h ... FFh	<ID code>							
Byte N ¹⁾	ID code 00h ... FFh	<ID code>							

Table 7.2: 1) N = <FixLen> + 3

The R/W head makes attempts until successful to read a read only code. Only data that changes is transferred via the interface, i.e. the R/W head transfers data whenever it reads a new read/write tag or whenever it reads a read/write tag where there was previously no read/write head within the detection range.

The status '05h' (read command) is output whenever a read/write tag leaves the detection range.

The length of the read only code that is output depends on the tag type. See table "Supported tag types" on page 28.

single read words (SR)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (10h)	0	0	0	1	0	0	0	0
Byte 1	Word number/Ident channel/Toggle bit	<WordNum>				<Channel>		<T>	
Byte 2	Word address	<WordAddr> (high byte)							
Byte 3	Word address	<WordAddr> (low byte)							
Byte 4	unused	-	-	-	-	-	-	-	-
Byte 5	unused	-	-	-	-	-	-	-	-
Byte 6	unused	-	-	-	-	-	-	-	-
Byte 7	unused	-	-	-	-	-	-	-	-

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (10h)	0	0	0	1	0	0	0	0
Byte 1	Word number/Ident channel/Toggle bit	<WordNum>				<Channel>		<T>	
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	Data 00h ... FFh	<Data>							
Byte 5	Data 00h ... FFh	<Data>							
Byte 6	Data 00h ... FFh	<Data>							
Byte 7	Data 00h ... FFh	<Data>							
...	Data 00h ... FFh	<Data>							
Byte N ¹⁾	Data 00h ... FFh	<Data>							

Table 7.3: 1) $N = 4 \times \text{<WordNum>} + 3$

The R/W head makes one attempt to read <WordNum> 32-bit words from the address<WordAddr>.

enhanced buffered read words (ER)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (19h)	0	0	0	1	1	0	0	1
Byte 1	Word number/Ident channel/Toggle bit	<WordNum>				<Channel>			<T>
Byte 2	Word address	<WordAddr> (high byte)							
Byte 3	Word address	<WordAddr> (low byte)							
Byte 4	unused	-	-	-	-	-	-	-	-
Byte 5	unused	-	-	-	-	-	-	-	-
Byte 6	unused	-	-	-	-	-	-	-	-
Byte 7	unused	-	-	-	-	-	-	-	-

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (19h)	0	0	0	1	1	0	0	1
Byte 1	Word number/Ident channel/Toggle bit	<WordNum>				<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	Data 00h ... FFh	<Data>							
Byte 5	Data 00h ... FFh	<Data>							
Byte 6	Data 00h ... FFh	<Data>							
Byte 7	Data 00h ... FFh	<Data>							
...	Data 00h ... FFh	<Data>							
Byte N ¹⁾	Data 00h ... FFh	<Data>							

Table 7.4: 1) $N = 4 \times \text{<WordNum>} + 3$

The R/W head makes attempts until successful, to read <WordNum> 32-bit words from the address <WordAddr>. Only modified data is transferred via the interface.

When a read/write tag leaves the detection range, the status '05h' (read command) is output.

single write words (SW)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (40h)	0	1	0	0	0	0	0	0
Byte 1	Word number/Ident channel/Toggle bit	<WordNum>				<Channel>			<T>
Byte 2	Word address	<WordAddr> (high byte)							
Byte 3	Word address	<WordAddr> (low byte)							
Byte 4	Data 00h ... FFh	<Data>							
...	Data 00h ... FFh	<Data>							
Byte N ¹⁾	Data 00h ... FFh	<Data>							

Table 7.5: 1) $N = 4 \times \text{<WordNum>} + 3$

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (40h)	0	1	0	0	0	0	0	0
Byte 1	Word number/Ident channel/Toggle bit	<WordNum>				<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	unused	-	-	-	-	-	-	-	-
Byte 5	unused	-	-	-	-	-	-	-	-
Byte 6	unused	-	-	-	-	-	-	-	-
Byte 7	unused	-	-	-	-	-	-	-	-

The R/W head makes one attempt to write <WordNum> 32-bit words from the address<WordAddr>.

enhanced buffered write words (EW)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (1Ah)	0	0	0	1	1	0	1	0
Byte 1	Word number/Ident channel/Toggle bit	<WordNum>				<Channel>			<T>
Byte 2	Word address	<WordAddr> (high byte)							
Byte 3	Word address	<WordAddr> (low byte)							
Byte 4	Data 00h ... FFh	<Data>							
...	Data 00h ... FFh	<Data>							
Byte N ¹⁾	Data 00h ... FFh	<Data>							

Table 7.6: 1) $N = 4 \times \text{<WordNum>} + 3$

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (1Ah)	0	0	0	1	1	0	1	0
Byte 1	Word number/Ident channel/Toggle bit	<WordNum>				<Channel>		<T>	
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	unused	-	-	-	-	-	-	-	-
Byte 5	unused	-	-	-	-	-	-	-	-
Byte 6	unused	-	-	-	-	-	-	-	-
Byte 7	unused	-	-	-	-	-	-	-	-

The read/write head repeatedly attempts to write <WordNum> 32-bit words from the address <WordAddr> until successful. After each successful write, the head sends the response and then switches to continuous read. The read/write head then reads the same tag until the tag has left the detection range or a new tag appears within the detection range. At this point, the read/write head again starts write attempts.

The status '05h' is only output when a tag leaves the detection range or is not yet within the detection range.

If two tags enter the read range one immediately after the other, the status '05h' is not issued between the two readings.

7.7

Special commands

**Note!**

You can only use the commands in this section for the data carrier type '03' (IPC03).

IPC03 Configuration

The storage of a data carrier IPC03 is organized by word. A data word is defined with a length of 32 bits. For the normal data range, 29 words from addresses 3 through 31 (<WordAddr> = 00h ... 1Ch) are available.

Address	Meaning	<WordAddr>	<ConfAddr>	Note
Word 0	Password	-	-	Write only
Word 1	Protection word	-	1	Read/write
Word 2	Control word	-	2	Read/write
Word 3 ...31	Data range	00h ... 1Ch	-	Read/write
Word 32	Device Serial Number	1Dh	-	Read only
Word 33	Device identification	1Eh	-	Read only

Word 0 contains the password. The password can only be written.

With word 1, the "Protection Word", you can define a read-protected and a write-protected range. The "Protection Word" can only be read and written with the correct password.

With word 2, the "Control Word", you can set various operating modes and the read range for the operating mode "Default Read". The "Control Word" can only be read and written with the correct password.

If you would like to use the "Protection Word" and the "Control Word", you must first activate the password mode.

The individual bits have the following meanings:

Protection word		
Bit	Meaning	Byte
0 ... 7	First read-protected word	0
8 ... 15	Last read-protected word	1
16 ... 23	First write-protected word	2
24 ... 31	Last write-protected word	3

Control word		
Bit	Meaning	Byte
0 ... 7	Read range start	0
8 ... 15	Read range end	1
16	Password mode on/off	2
17	"Read after write" operating mode on/off	
18 ... 23	Open	
24 ... 31	Open	3

IPC03 password mode

If the password mode in the data carrier is activated, the data range of the data carrier is read and write-protected and can only be read or written if the R/W head sends the correct password to the data carrier.

If the password mode in the data carrier is deactivated, every data word on the data carrier can be read or written.

The default password of the R/W heads and the data carrier is 00000000h. In the R/W head, the password is stored in the volatile memory and in the data carrier, the password is stored in the non-volatile memory.

To read or write the "Protection Word" and the "Control Word", you must first enter the password in the password mode (see the commands **SC** or **EC**).

You can also limit access to the data carriers by defining the start and end of a read-protected and a write-protected range in the Protection Word.

Setting the password

1. Enter the correct password once with the command **PS** (set password).
2. Activate the password mode with the command **PM** (set password mode).

Changing the password

To change the password in the R/W head and on the read/write tag, use the command **PC**.

Set password mode (PM)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (18h)	0	0	0	1	1	0	0	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>		<T>	
Byte 2	Password mode	0	0	0	0	0	0	0	<P>
Byte 3	not used	-	-	-	-	-	-	-	-
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (18h)	0	0	0	1	1	0	0	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

The command **PM** activates and deactivates the password mode of the relevant channel. In the password mode, the password is transferred to the data carrier before each read/write access. If a data carrier is addressed with the wrong password, then even the other data areas on the data carrier can no longer be accessed.

Password mode "off": <P>=0 (0b) (deactivated)

Password mode "on": <P>=1 (1b) (activated)

Change password (PC)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (41h)	0	1	0	0	0	0	0	1
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Old password 00h ... FFh	<PSW> (byte 3)							
Byte 3	Old password 00h ... FFh	<PSW> (byte 2)							
Byte 4	Old password 00h ... FFh	<PSW> (byte 1)							
Byte 5	Old password 00h ... FFh	<PSW> (byte 0)							
Byte 6	New password 00h ... FFh	<PSW> (byte 3)							
Byte 7	New password 00h ... FFh	<PSW> (byte 2)							
Byte 8	New password 00h ... FFh	<PSW> (byte 1)							
Byte 9	New password 00h ... FFh	<PSW> (byte 0)							

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (41h)	0	1	0	0	0	0	0	1
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

The command **PC** changes the password in a tag. Enter the old and then the new password <PSW> here. If the password has been successfully written, the password in the read/write head also changes and the **set password** command is no longer required. The password of the IPC03 can also be changed if the password mode is deactivated.

Set password (PS)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (42h)	0	1	0	0	0	0	1	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>		<T>	
Byte 2	Reserved	-	-	-	-	-	-	-	-
Byte 3	Reserved	-	-	-	-	-	-	-	-
Byte 4	Password 00h ... FFh	<PSW> (byte 3)							
Byte 5	Password 00h ... FFh	<PSW> (byte 2)							
Byte 6	Password 00h ... FFh	<PSW> (byte 1)							
Byte 7	Password 00h ... FFh	<PSW> (byte 0)							

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (42h)	0	1	0	0	0	0	1	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

The command **PS** sets the password, which the R/W head communicates to the data carrier in password mode.

Operating mode "Default Read"

In "default read" operating mode, 1 or 2 words are read extremely quickly. The area of memory earmarked for reading is already specified on the tag. The R/W head does not have to identify the memory area for the tag.

The start and end of the read range are stored in the bytes 0 and 1 of the control word. As soon as power is supplied to the tag, it sends data from the data range defined by the start and end of the read range. The data range between read range start and end is read with the read commands **SR** (Single read words) and **ER** (enhanced buffered read words) when <WordAddr> is set to 0000h and <WordNum> to 00h.

The advantage of "default read" operating mode is the readout speed. The readout of one data word (4 bytes) is twice as fast in this mode as the other modes. The readout of two words takes approx. 1/3 less time. No more time advantages can be gained after three data words because "default read" mode is designed to read a maximum of two words (= 8 bytes). Reading larger data ranges can lead to error messages if the reading head does not respond within the planned reaction time.



Note!

The addresses for the start and end of the read range are based on the absolute word address of the read/write tag, not on <WordAddr>.

Example: With the setting read range start 03h and read range end 03h, the R/W head only reads the first data word in the read/write tag.



Setting "Default Read"

1. Activate the password mode.
2. Write the read range start and end into the "Control Word".
3. Deactivate the password mode.
4. Read the data range with address designation 0000h and word count 0h.

IPC03 configuration

Single get configuration (SG)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (61h)	0	1	1	0	0	0	0	1
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Reserved	-	-	-	-	-	-	-	-
Byte 3	Address in the configuration range	<ConfAddr>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (61h)	0	1	1	0	0	0	0	1
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	Data 00h ... FFh	<Data>							
Byte 5	Data 00h ... FFh	<Data>							
Byte 6	Data 00h ... FFh	<Data>							
Byte 7	Data 00h ... FFh	<Data>							

The R/W head makes exactly one attempt to read a word in the configuration range ("Protection Word" or "Control Word") from the address <ConfAddr>.

Enhanced buffered get configuration (EG)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (68h)	0	1	1	0	1	0	0	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Reserved	-	-	-	-	-	-	-	-
Byte 3	Address in the configuration range	<ConfAddr>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (68h)	0	1	1	0	1	0	0	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	Data 00h ... FFh	<Data>							
Byte 5	Data 00h ... FFh	<Data>							
Byte 6	Data 00h ... FFh	<Data>							
Byte 7	Data 00h ... FFh	<Data>							

The R/W head attempts to read a word in the configuration range from the address <ConfAddr> until successful. Only data that changes is transferred via the interface, i.e. the R/W head transfers data whenever it reads a new data carrier or whenever it reads a data carrier where there was previously no R/W head within the detection range.

The status '05h' (read/write command) is output when the data carrier leaves the detection range or if the data carrier is not yet within the detection range when the command is executed.

If two data carriers enter the read range one immediately after the other, the status '05h' is not issued between the two readings.

Single write configuration (SC)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (12h)	0	0	0	1	0	0	1	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>		<T>	
Byte 2	Reserved	-	-	-	-	-	-	-	-
Byte 3	Address in the configuration range	<ConfAddr>							
Byte 4	Data 00h ... FFh	<Data byte 3>							
Byte 5	Data 00h ... FFh	<Data byte 2>							
Byte 6	Data 00h ... FFh	<Data byte 1>							
Byte 7	Data 00h ... FFh	<Data byte 0>							

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (12h)	0	0	0	1	0	0	1	0
Byte 1	Reserved/Ident channel/Toggle bit	0	0	0	0	<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

The R/W head makes exactly one attempt to write a word to the configuration range ("Protection Word" or "Control Word") from the address <ConfAddr>.

The password mode must be active so that the R/W head can write to the configuration range.

If the password mode is deactivated, every data word outside of the write-protected range can be written to. If you would like to modify the write-protected range, you must modify the "Protection Word" accordingly.

For example:

With the R/W head on channel 1, one data word (4 bytes) that does not contain details of the address and data length should be transferred during each read command (accessed with 00 byte and address 0000). Password mode must be activated beforehand by transmitting the command **Set password mode**.

Byte	Bit no.									
	7	6	5	4	3	2	1	0		
Byte 0	0	0	0	1	0	0	1	0	Single write configuration	12h
Byte 1	-	-	-	-	0	0	1	<T>	Channel (=1)	02h/03h
Byte 2	-	-	-	-	-	-	-	-	-	-
Byte 3	0	0	0	0	0	0	1	0	Word address in the configuration range (=control word)	02h
Byte 4	0	0	0	0	0	0	0	0	Bits 16 to 31 of the control word	00h
Byte 5	0	0	0	0	0	0	0	0		00h
Byte 6	0	0	0	0	0	0	1	1	Address of the last data word to write	03h
Byte 7	0	0	0	0	0	0	1	1	Address of the first data word to write	03h

The address of the first and last data word to be written is based on the absolute address of the read/write tag (not the <WordAddr>). The address 03h is therefore the first available word in the data range.

Enhanced buffered write configuration (EC)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (66h)	0	1	1	0	0	1	1	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Reserved	-	-	-	-	-	-	-	-
Byte 3	Address in the configuration range	<ConfAddr>							
Byte 4	Data 00h ... FFh	<Data byte 3>							
Byte 5	Data 00h ... FFh	<Data byte 2>							
Byte 6	Data 00h ... FFh	<Data byte 1>							
Byte 7	Data 00h ... FFh	<Data byte 0>							

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (66h)	0	1	1	0	0	1	1	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

The R/W head attempts to write a word in the configuration range to the address <ConfAddr> until successful. After each write, the status is evaluated and the system waits until a new data carrier is within the detection range. The command then starts again from the beginning. In order to write in the configuration range, the password mode must be active.

The status '05h' (read/write command) is only output when a data carrier leaves the detection range or is not yet within the detection range when the command is executed.

If two data carriers enter the read range one immediately after the other, the status '05h' is not issued between the two readings.

Write read only code IPC11 and IDC-...-1K

"Read-after-write" operating mode is not used.

Tags IPC11 can be programmed to behave like the IPC02 read only tag. To do this, use the commands **SX** and **EX**. The code is read when tag type '02' or '11' is set with the commands **SF** and **EF**.

Tags IDC-...- 1K can be programmed to behave like the ICC read only tag. This programming occupies the first 8 bytes in the tag and occurs when the tag type '50' is set with the commands **SX** or **EX**.

This code is read when tag type '52' is set with the commands **SF** or **EF**. If you use the command **SF** or **EF** when tag type '50' is selected, the 4-byte read only code of the tag is issued.

Single write fixcode (SX)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (1Fh)	0	0	0	1	1	1	1	1
Byte 1	FixLen/Ident channel/Toggle bit	<FixLen>				<Channel>			<T>
Byte 2	FixType	<FixType> (high byte)							
Byte 3	FixType	<FixType> (low byte)							
Byte 4	Data 00h ... FFh	<Data>							
...	Data 00h ... FFh	<Data>							
Byte N ¹⁾	Data 00h ... FFh	<Data>							

Table 7.7: 1) N = <FixLen> + 3

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (1Fh)	0	0	0	1	1	1	1	1
Byte 1	FixLen/Ident channel/Toggle bit	<FixLen>				<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

The R/W head makes only one attempt to write a read only code.

IPC11:	<FixLen>	=	5
	<FixType>	=	'02' ASCII (30h 32h), the read only code cannot be changed '11' ASCII (31h 31h), the read only code can be overwritten
IDC-...-1K:	<FixLen>	=	7 The first 3 bytes are hexadecimal (0h ... Fh), the last 4 bytes are decimal (0d ... 9d).
	<FixType>	=	'52' ASCII (35h 32h), the read only code can be overwritten
	<Data>	=	(Byte 1 to 3): 0x30 ... 0x39; 0x41...0x46 (Byte 4 to 7): 0x30...0x39

Type IDC-...-1K tags can be programmed in such a way that they are compatible with the type ICC-... read only carriers. This programming occupies the first 8 bytes in the tag. The read/write commands can be used to access the remaining memory.

You must set the tag type '50' in order to program type IDC-...-1K tags. To do this, transmit the command **SX** or **EX**.

The value range contains 7 characters:

- the first 3 characters contain the values 0 ... F (hexadecimal code)
- the last 4 characters contain the values 0 ... 9 (decimal code)

You must select the tag type '50' (ICC-...) beforehand in order to read out this code. If a "read only code" command is executed when the tag type '50' (IDC-...-1K) is set, the 4-byte read only code for this tag is issued.

Enhanced buffered write fixcode (EX)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (24h)	0	0	1	0	0	1	0	0
Byte 1	FixLen/Ident channel/Toggle bit	<FixLen>				<Channel>			<T>
Byte 2	FixType	<FixType> (high byte)							
Byte 3	FixType	<FixType> (low byte)							
Byte 4	Data 00h ... FFh	<Data>							
...	Data 00h ... FFh	<Data>							
Byte N ¹⁾	Data 00h ... FFh	<Data>							

Table 7.8: 1) N = <FixLen> + 3

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (24h)	0	0	1	0	0	1	0	0
Byte 1	FixLen/Ident channel/Toggle bit	<FixLen>				<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

The R/W head constantly attempts to write a read only code. After each successful write, the response is sent and the system waits until a new tag is within the detection range. The command then starts again from the beginning.

IPC11: <FixLen> = 5
 <FixType> = '02' ASCII (30h 32h), the read only code cannot be changed
 '11' ASCII (31h 31h), the read only code can be overwritten

IDC-...-1K: <FixLen> = 7
 The first 3 bytes are hexadecimal (0h ... Fh), the last 4 bytes
 are decimal (0d ... 9d).
 <FixType> = '52' ASCII (35h 32h), the read only code can be overwritten
 <Data> = (Byte 1 to 3): 0x30 ... 0x39; 0x41...0x46
 (Byte 4 to 7): 0x30...0x39

Type IDC-...-1K tags can be programmed in such a way that they are compatible with the type ICC-... read only carriers. This programming occupies the first 8 bytes in the tag. The read/write commands can be used to access the remaining memory.

You must set the tag type '50' in order to program type IDC-...-1K tags. To do this, transmit the command **SX** or **EX**.

The value range contains 7 characters:

- the first 3 characters contain the values 0 ... F (hexadecimal code)
- the last 4 characters contain the values 0 ... 9 (decimal code)

You must select the tag type '50' (ICC-...) beforehand in order to read out this code. If a "read only code" command is executed when the tag type '50' (IDC-...-1K) is set, the 4-byte read only code for this tag is issued.

Set tag ID code (TI)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (BCh)	1	0	1	1	1	1	0	0
Byte 1	ID length/Channel/Toggle bit	<ByteNum>				<Channel>		<T>	
Byte 2	Data	<ID code>							
Byte 3	Data	<ID code>							
Byte 4	Data	<ID code>							
Byte 5	Data	<ID code>							

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (BCh)	1	0	1	1	1	1	0	0
Byte 1	Reserved/Channel/Toggle bit	<ByteNum>				<Channel>		<T>	
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							

This command restricts the execution of all other read/write commands to the read/write tag with the specified ID code. This also applies if another read/write tag is located within the detection range. A targeted response is achieved from the read/write tag as a result.

<ByteNum> = 0h: Do not make a selection. An ID code is not specified in the telegram.

<ByteNum> = 8h (System IQ): Make a selection. An ID code must be specified in the telegram.

<ByteNum> = 0h deletes this filter.



Note!

The TI command only adjusts a setting in the reading head. There is no HF communication with the read/write tags.

Fill data carrier (S#)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (AAh)	1	0	1	0	1	0	1	0
Byte 1	Reserved/Ident channel/Toggle bit	<Reserved>				<Channel>			<T>
Byte 2	Start address	<WordAddr> (high byte)							
Byte 3	Start address	<WordAddr> (low byte)							
Byte 4	Word count	<WordNum> (high byte)							
Byte 5	Word count	<WordNum> (low byte)							
Byte 6	Character	<Fill sign>							

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (AAh)	1	0	1	0	1	0	1	0
Byte 1	Reserved/Ident channel/Toggle bit	<Reserved>				<Channel>		<T>	
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							

The word number <WordNum> of fill signs <Fill Sign> is written to the read/write tag from the specified start address <WordAddr>.

Extended commands for type IDC-... and IUC... tags

Type IDC-...-1K tags can be programmed to read 24-bit information (so-called **special read only code**) very quickly. This is useful for detecting containers in automated warehouses.

Length of the **special read only code**:

- Tag of the type IDC-...-1K: 48 bit
- Tag of the type IUC: 96 ... 240 bit

To write the **special read only code** use the commands **SP** and **EP**; to read it out, use the commands **SS** and **ES**.

If **SP** or **EP** is used to write to an IDC-...-1K tag, the tag is then locked. If you wish to write to the tag again using standard commands, unlock it using the command **SI**.

Single read special fixcode (SS)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (0Ah)	0	0	0	0	1	0	1	0
Byte 1	FixLen/Ident channel/Toggle bit	<FixLen>				<Channel>		<T>	
Byte 2	not used	-	-	-	-	-	-	-	-
Byte 3	not used	-	-	-	-	-	-	-	-
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (0Ah)	0	0	0	0	1	0	1	0
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>		<T>	
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	ID code 00h ... FFh	<ID code>							
Byte 5	ID code 00h ... FFh	<ID code>							
Byte 6	ID code 00h ... FFh	<ID code>							
Byte 7	ID code 00h ... FFh	<ID code>							
Byte 8	ID code 00h ... FFh	<ID code>							
Byte 9	ID code 00h ... FFh	<ID code>							

The R/W head makes only one attempt to read a **special read only code**.



Note!

The <FixLen> of IDC-...-1K read/write tags is always 6 bytes.

Enhanced read special fixcode (ES)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (71h)	0	1	1	1	0	0	0	1
Byte 1	Word number/Ident channel/Toggle bit	<FixLen>				<Channel>		<T>	
Byte 2	not used	-	-	-	-	-	-	-	-
Byte 3	not used	-	-	-	-	-	-	-	-
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (71h)	0	1	1	1	0	0	0	1
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	ID code 00h ... FFh	<ID code>							
Byte 5	ID code 00h ... FFh	<ID code>							
Byte 6	ID code 00h ... FFh	<ID code>							
Byte 7	ID code 00h ... FFh	<ID code>							
Byte 8	ID code 00h ... FFh	<ID code>							
Byte 9	ID code 00h ... FFh	<ID code>							

The R/W head attempts to read a **special read only code** until successful. Only data that changes is transferred via the interface, i.e. the R/W head transfers data whenever it reads a new data carrier or whenever it reads a data carrier where there was previously no R/W head within the detection range.

The status '05h' (read command) is output whenever a data carrier leaves the detection range.



Note!

The <FixLen> of IDC-...-1K read/write tags is always 6 bytes.

Single program special fixcode (SP)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (0Dh)	0	0	0	0	1	1	0	1
Byte 1	Word number/Ident channel/Toggle bit	<FixLen>				<Channel>		<T>	
Byte 2	Reserved	0	0	0	0	0	0	0	0
Byte 3	Reserved	0	0	0	0	0	0	0	0
Byte 4	ID code 00h ... FFh	<ID code>							
Byte 5	ID code 00h ... FFh	<ID code>							
Byte 6	ID code 00h ... FFh	<ID code>							
Byte 7	ID code 00h ... FFh	<ID code>							
Byte 8	ID code 00h ... FFh	<ID code>							
Byte 9	ID code 00h ... FFh	<ID code>							

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (0Dh)	0	0	0	0	1	1	0	1
Byte 1	FixLen/Ident channel/Toggle bit	<FixLen>				<Channel>		<T>	
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

The R/W head makes only one attempt to write a **special read only code**.



Note!

The <FixLen> of IDC-...-1K read/write tags is always 6 bytes.

Enhanced program special fixcode (EP)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (75h)	0	1	1	1	0	1	0	1
Byte 1	FixLen/Ident channel/Toggle bit	<FixLen>				<Channel>		<T>	
Byte 2	Reserved	0	0	0	0	0	0	0	0
Byte 3	Reserved	0	0	0	0	0	0	0	0
Byte 4	ID code 00h ... FFh	<ID code>							
Byte 5	ID code 00h ... FFh	<ID code>							
Byte 6	ID code 00h ... FFh	<ID code>							
Byte 7	ID code 00h ... FFh	<ID code>							
Byte 8	ID code 00h ... FFh	<ID code>							
Byte 9	ID code 00h ... FFh	<ID code>							

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (75h)	0	1	1	1	0	1	0	1
Byte 1	FixLen/Ident channel/Toggle bit	<FixLen>				<Channel>		<T>	
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

The R/W head attempts to write a **special read only code** until successful. After each successful write, the head sends the response and then switches to continuous reading. Then the R/W head reads the same data carrier until it has left the detection range or a new data carrier appears within the detection range. The command then starts again with write attempts.

The status '05h' (read/write command) is output when the data carrier leaves the detection range or if the data carrier is not yet within the detection range when the command is executed.

If two data carriers enter the read range one immediately after the other, the status '05h' is not issued between the two readings.


Note!

The <FixLen> of IDC-...-1K read/write tags is always 6 bytes.

Initialize data carrier (SI)
Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (6Bh)	0	1	1	0	1	0	1	1
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (6Bh)	0	1	1	0	1	0	1	1
Byte 1	Reserved/Ident channel/Toggle bit	-	-	-	-	<Channel>			<T>
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-
Byte 8	not used	-	-	-	-	-	-	-	-

This command allows conventional reading and writing of IDC-...-1K read/write tags that were configured using the **EP** or **SP** commands.

Extended commands for type IQC-... read/write tags.

single write words with lock (SL)

Command:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (47h)	0	1	0	0	0	1	1	1
Byte 1	Word number/Ident channel/Toggle bit	<WordNum>				<Channel>			<T>
Byte 2	Word address	<WordAddr> (high byte)							
Byte 3	Word address	<WordAddr> (low byte)							
Byte 4	Data 00h ... FFh	<Data>							
Byte 5	Data 00h ... FFh	<Data>							
...	Data 00h ... FFh	<Data>							
Byte N ¹⁾	Data 00h ... FFh	<Data>							

Table 7.9: 1) N = 4 x <WordNum> + 3

Response:

Byte	Content	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (47h)	0	1	0	0	0	1	1	1
Byte 1	Word number/Ident channel/Toggle bit	<WordNum>				<Channel>		<T>	
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	unused	-	-	-	-	-	-	-	-
Byte 5	unused	-	-	-	-	-	-	-	-
Byte 6	unused	-	-	-	-	-	-	-	-
Byte 7	unused	-	-	-	-	-	-	-	-

This command is the same as a normal write command. The data is write-protected at the end of the write process, provided the read/write tags offer this function.

This applies for 13.56 MHz read/write tags of the type 21, 22, 24, 33 and 35 as well as for LF read/write tags IDC-...-1K. Write protection is only activated for memory blocks involved in the write process. Data can continue to be written to all other memory blocks.

The R/W head makes one attempt to write <WordNum> 32-bit words from the address<WordAddr>.

Enhanced write words with lock (EL)

Command:

Byte	Contents	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (48h)	0	1	0	0	1	0	0	0
Byte 1	Word number/Ident channel/Toggle bit	<WordNum>				<Channel>		<T>	
Byte 2	Word address	<WordAddr>(high byte)							
Byte 3	Word address	<WordAddr> (low byte)							
Byte 4	Data 00h ... FFh	<Data>							
Byte 5	Data 00h ... FFh	<Data>							
...	Data 00h ... FFh	<Data>							
Byte N ¹⁾	Data 00h ... FFh	<Data>							

Table 7.10: 1) 4 x <WordNum> + 6

Response:

Byte	Contents	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0	Command code (48h)	0	1	0	0	1	0	0	0
Byte 1	Word number/Ident channel/Toggle bit	<WordNum>				<Channel>		<T>	
Byte 2	Status	<Status>							
Byte 3	Reply counter	<ReplyCounter>							
Byte 4	not used	-	-	-	-	-	-	-	-
Byte 5	not used	-	-	-	-	-	-	-	-
Byte 6	not used	-	-	-	-	-	-	-	-
Byte 7	not used	-	-	-	-	-	-	-	-

This command is the same as a normal write command. The data is write-protected at the end of the write process, provided the tags offer this function.

This applies for 13.56 MHz tags of the type 21, 22, 24, and 33 as well as for LF tags IDC-...-1K. Write protection is only activated for memory blocks involved in the write process. Data can continue to be written to all other memory blocks.

The R/W head repeatedly attempts to write <WordNum> 32-bit words from the address <WordAddr> until successful. After each successful write, the head sends the response and then switches to continuous reading. Then the R/W head reads the same tag until it has left the detection range or a new tag appears within the detection range. The command then starts again with write attempts.

The status '05h' is only output when a tag leaves the detection range or is not yet within the detection range. If two tags enter the read range one immediately after the other, the status '05' is not issued between the two readings.

Extended commands for IQH2-... read/write heads

read param (RP)

Command:

Byte	Contents	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0 ¹⁾	Telegram length, high byte	0	0	0	0	0	0	0	0
Byte 1 ¹⁾	Telegram length, low byte	0	0	0	0	0	1	0	0
Byte 2	Command code (BEh)	1	0	1	1	1	1	1	0
Byte 3	Reserved/Ident channel/Toggle bit	-				<Channel>		<T>	
Byte 4	System code	<SystemCode> (high byte)							
Byte 5	System code	<SystemCode> (low byte)							
Byte 6	Parameter type	<ParamTyp> (high byte)							
Byte 7	Parameter type	<ParamTyp> (low byte)							

- 1) This byte is only used with the TCP/IP and MODBUS TCP/IP protocol.

Response:

Byte	Contents	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0 ¹⁾	Telegram length, high byte	0	0	0	0	0	0	0	0
Byte 1 ¹⁾	Telegram length, low byte	0	0	0	0	1	0	1	1
Byte 2	Command code (BEh)	1	0	1	1	1	1	1	0
Byte 3	Reserved/Ident channel/Toggle bit	0				<Channel>		<T>	
Byte 4	Status	<Status>							
Byte 5	Reply counter	<ReplyCounter>							
Byte 6	Data 00 ... FFh	<Data>							
...	Data 00 ... FFh	<Data>							
Byte N ²⁾	Data 00 ... FFh	<Data>							

- 1) This byte is only used with the TCP/IP and MODBUS TCP/IP protocol.
2) $N = \text{DataLength} + 6$

write param (WP)

Command:

Byte	Contents	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0 ¹⁾	Telegram length, high byte	0	0	0	0	0	0	0	0
Byte 1 ¹⁾	Telegram length, low byte	0	0	0	0	0	1	0	0
Byte 2	Command code (BFh)	1	0	1	1	1	1	1	1
Byte 3	Reserved/Ident channel/Toggle bit	-				<Channel>		<T>	
Byte 4	System code	<SystemCode> (high byte)							
Byte 5	System code	<SystemCode> (low byte)							
Byte 6	Parameter type	<ParamTyp> (high byte)							
Byte 7	Parameter type	<ParamTyp> (low byte)							
Byte 8	Length 00 ... FFh	<DataLength (Byte)>							
Byte 9	Data 00 ... FFh	<Data>							
...	Data 00 ... FFh	<Data>							
Byte N ²⁾	Data 00 ... FFh	<Data>							

1) This byte is only used with the TCP/IP and MODBUS TCP/IP protocol.

2) $N = \text{<DataLength>} + 6$

Response:

Byte	Contents	Bit no.							
		7	6	5	4	3	2	1	0
Byte 0 ¹⁾	Telegram length, high byte	0	0	0	0	0	0	0	0
Byte 1 ¹⁾	Telegram length, low byte	0	0	0	0	1	0	1	1
Byte 2	Command code (BFh)	1	0	1	1	1	1	1	1
Byte 3	Reserved/Ident channel/Toggle bit	0				<Channel>			<T>
Byte 4	Status	<Status>							
Byte 5	Reply counter	<ReplyCounter>							

1) This byte is only used with the TCP/IP and MODBUS TCP/IP protocol.

IQH2-...: <SystemCode> = 'Q2' ASCII (51_h 32_h)
 <ParamTyp> = 'K1' ASCII (4B_h 31_h)
RP: reads the key (12 characters ASCII from 0 ... F) from the transponder and the read head
WP: writes the key (12 characters ASCII from 0 ... F) into the read head
 Default key = 'FF FF FF FF FF FF' ASCII (46_h46_h46_h46_h46_h46_h46_h46_h46_h46_h46_h)

IUH-...: See handbook of the read / write head



Note!

Toggle bit

If you send two commands with the same SystemCode and same ParamTyp in succession on the bus interface, you must change the toggle bit in the second command in order for the node to detect the command.

7.8

Legend

<Battery condition 1> : 1 byte, first digit of battery status (percentage, decimal, ASCII encoded). 30h, 31h
 <Battery condition 2> : 1 byte, second digit of battery status (percentage, decimal, ASCII encoded). 30h, 39h
 <Battery condition 3> : 1 byte, third digit of battery status (percentage, decimal, ASCII encoded). 30h, 39h
 <ByteNum> : 4 bits, length of <ID code>;
 System MV: 4 characters (04h)
 System IQ: 8 characters (08h)
 <Channel> : 3 bits, channel
 Channel 1 (001b), channel 2 (010b),
 channel 3 (011b), channel 4 (100b), all channels (111b)
 <ConfAddr> : 1 ASCII character, word starting address in configuration area of data carrier. The following applies for IPC03:
 01h = Protection Word
 02h = Control Word
 <Data> : <WordNum> times 4 bytes. When communicating a word, the highest value byte is transferred first and the lowest value byte last.
 <F> : 1 bit, multiplex mode, 0 (0b): Mode off, 1 (1b): Mode on
 <Fill Sign> : 1 ASCII character
 <FixLen> : 4 bits, length of the read only code in bytes, see "This command tells the read/write head on the relevant channel which tag type to communicate with. This setting is stored in the non-volatile memory on the unit." on page 28
 <FixType> : 2 ASCII characters, for example: '02' for IPC02
 <IDCode> : 4 bytes, 6 bytes or 8 bytes (depending on the tag type)
 <Ident channel> : 3 bits, channel
 1 (001b), 2 (010b), 3 (011b), 4 (100b), all channels (111b) (but not <Sensor channel> in trigger mode)

<Month>	: 2 bytes ASCII, hexadecimal encoding, 01 ... 0C (01=January, 0C=December)
<P>	: 1 bit, password mode, 0 (0b): Mode off, 1 (1b): Mode on
<PSW>	: 4 bytes HEX, password
<ReplyCounter>	: 1 byte, increases by 1 after each response and confirmation. The reply counter starts from 0 after the system is switched on. When the maximum value is reached, the counter skips the value 0 (from 255 to 1).
<Sensor channel>	: 3 bits, channel 3 (011b) or 4 (100b)
<Status>	: 1 byte (see chapter 7.9)
<T>	: 1 bit, toggle bit
<TagType>	: 2 ASCII characters, for example: '02' for IPC02
<Trigger mode>	: 8 bits 0 (00000000b): Trigger mode off 1 (00000001b): Trigger mode on 2 (00000010b): Trigger mode inverted
<WordAddr>	: 2 bytes, word start address in the data carrier, range from 0000h to FFFFh, depending on tag type.
<WordNum>	: 4 bits, number of words to be read or written, range from 0h to Fh, depending on tag type. The following applies for IPC03: The word count 0h is used with the word address 0000h to read the preset data range on the read/write tag ("Default Read").
<Year>	: 2 bytes ASCII, hexadecimal encoding, 00h ... 63h

7.9

Fault/Status messages

Status	Meaning
00h	The command has been executed without error.
FFh	The command is processing.

Error messages which triggered the identification system

Status	Meaning
01h	The battery of the read/write tag is weak.
02h	Reserved
03h	Reserved
04h	Incorrect or incomplete command or parameter not in the valid range.
05h	No data carrier in the detection range.
06h	Hardware error, e.g. error during self-test or R/W head defect.
07h	Internal device error.
08h	Reserved
09h	The parameterized tag type is not compatible with the connected reading head.
0Ah	Several tags in the detection range (UHF).

2011-05

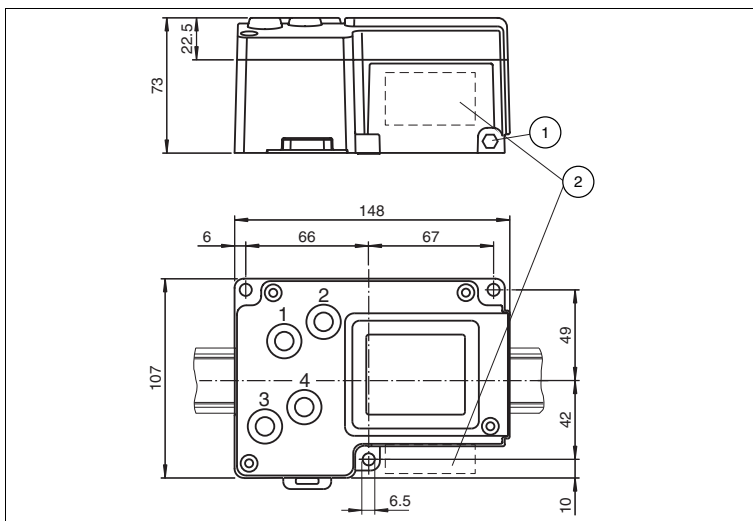
Status	Meaning
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Internal buffer overflow.
0Fh	Reserved

Error messages sent by the bus connection

Status	Meaning
10h	Reserved
20h	Reserved
40h	Incorrect or incomplete command or parameter not in the valid range. TCP/IP: The specified length of the message does not match the actual length.

8 Technical specifications

8.1 Dimensions



- 1 Ground
- 2 Connector array

8.2 General data

General data

Number of R/W heads	max. 4 alternatively 2 R/W heads and 2 trigger sensors
---------------------	---

Display/controls

LEDs 1, 2, 3, 4	Status display for R/W heads green: Command to R/W head active yellow: Approx. 1 second if command executed successfully
LED PWR/ERR	green: Power on red: Hardware error
LED UL	green: Voltage logic. Interface power ON/OK
LED RC	green: Remote bus check. Incoming remote bus connected correctly; interface module not in reset.
LED BA	green: Bus active. Telegrams are transmitted.
LED RD	Yellow: Remote bus disable. Intermediate remote bus is deactivated.

LC Display	Two-line multifunction display with 12 characters per line Configuration of the control interface and display of connected R/W heads as additional pictograms Simple, direct command input and addressing possible
Buttons	4 buttons: ESC, up, down and return

Electrical data

Rated operational voltage U_e	20 ... 30 V DC , PELV
Ripple	$\leq 10\%$ at 30 V DC
Current consumption	≤ 2 A incl. R/W heads
Power consumption P_0	3.5 W without R/W heads
Galvanic isolation	Basic insulation in accordance with DIN EN 50178, rated insulation voltage 50 V _{eff}

Interface

Physical	RS 485
Protocol	INTERBUS remote bus
ID code	03
Transfer rate	500 kBit/s or 2 MBit/s can be switched internally

Conformity

Electromagnetic compatibility	EN 61000-6-2, EN 61000-6-4,
Degree of protection	EN60529

Ambient conditions

Ambient temperature	-25 ... 70 °C (248 ... 343 K)
Storage temperature	-30 ... 80 °C (243 ... 353 K)
Climatic conditions	Max. relative humidity 96%
Shock and impact resistance	Oscillation (sine): 5 g, 10 ... 1000 Hz to EN 60068-2-6 Shock (half-sine): 30 g, 11 ms to EN 60068-2-27

Mechanical data

Degree of protection	IP65 in accordance with EN 60529
Connection	R/W heads: Shielded, 4-pin, M12 connector Power supply: M12 connector Ground: M6 grounding screw INTERBUS: Connector, male: Incoming interface Socket: Outgoing interface
Housing material	Aluminum, powder-coated
Mounting	Snap on to 35 mm DIN mounting rail or screw mounting
Weight	Approx. 1000 g

9 Troubleshooting

9.1 Fault location

Fault source	Possible cause	Remedy
The operating voltage LED (PWR/ERR) does not light up.	Power supply is interrupted.	Ensure that the power supply is connected to a 24 V DC source.
The LED on the M12 plug lights up red.	The polarity of the screw terminal type M12 socket is reversed.	Ensure that the connection layout is correct.
The icon in the display (e.g. IPH1) does not appear even though the R/W head is connected to port 1.	The cable is defective or not connected correctly.	Check the cable and repair if necessary.
	The R/W head is defective.	Check the R/W head and repair if necessary.
A read command (e.g. SR ...) gives the status 4 even though the syntax is correct.	An incorrect tag type is selected for the relevant channel (e.g. IPC02). The read commands only function with data carriers and not with code carriers.	Preset the correct tag type (e.g. IPC03) or "Autodetect" using the CT ... command or via the display (IDENT Control .../ Config Channels).
The LEDs in the reading head and the IPHx icon on the IDENT Control display are flashing.	The connected reading head does not support the preset tag type.	Select a tag type that the reading head supports.
The SG or EG command (Get configuration) gives the status 4 even though the syntax is correct.	IPC03 is not selected for the relevant channel. The configuration commands only function if the data carrier IPC03 is selected and not in autodetect mode.	Preset the tag type IPC03 using the CT ... command or via the display (IDENT Control.../ Config Channels).
The "RC" LED does not light up. The station cannot be accessed.	No connection to the interface module or the status of the interface module is RESET.	Check the cable and connections and repair if necessary.
		Start the interface module.
The following stations cannot be accessed.	An unsuitable cable has been used. Pins 5 + 9 in the connector on the intermediate cable must be linked together.	Use a suitable cable or install a bridge between pins 5 + 9 in the intermediate cable connector.
The message "Access denied" appears when the settings are adjusted on the display.	The master has already started to communicate and access via the display is disabled.	Interrupt or prevent the master from communicating. Switch the device off and back on again. Configure the device via the display. Activate communication again.

This table will be updated and extended if necessary. Visit www.pepperl-fuchs.de to download the latest version of the manual

10 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



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