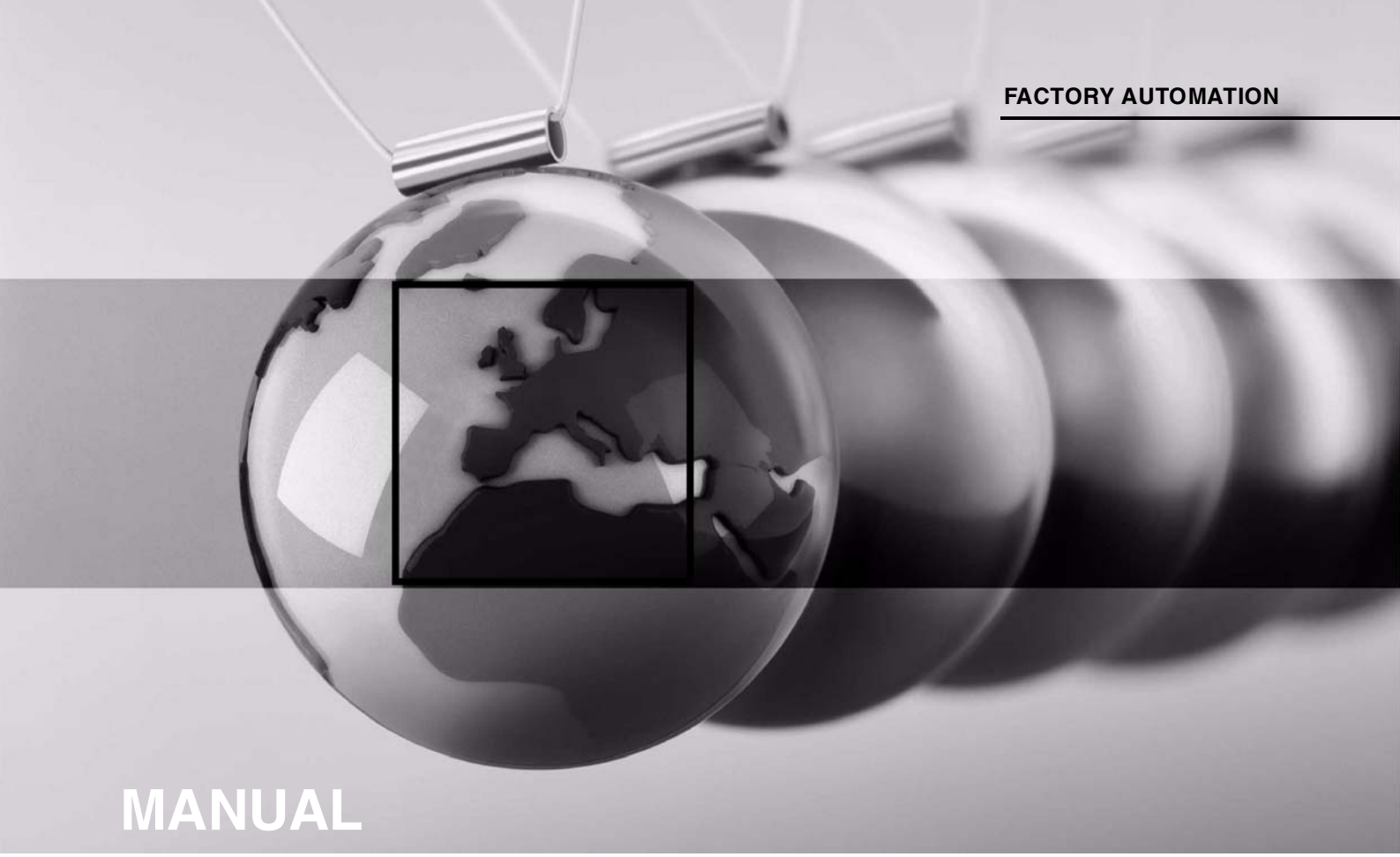


MANUAL

IC-KP2-1HRX-2V1

IDENTControl Compact unit with serial interface

PEPPERL+FUCHS
SENSING YOUR NEEDS

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

1 Introduction

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 you install this device and put it into operation, please read the operating instructions thoroughly. The instructions and notes contained in this operating manual will guide you step-by-step through the installation and commissioning procedures to ensure trouble-free use of this product. By doing so, you:

- guarantee safe operation of the device
- can utilize the entire range of device functions
- avoid faulty operation and the associated errors
- reduce costs from downtime and incidental repairs
- increase the effectiveness and operating efficiency of your plant.

Store this operating manual somewhere safe in order to have it available for future work on the device.

After opening the packaging, please ensure that the device is intact and that the package is complete.

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

2014-03

2 Declaration of conformity

2.1 CE 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.

3 Safety

3.1 Symbols relevant to safety

Danger!

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.

Warning!

This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.

Caution!

This symbol indicates a possible fault.

Non-observance could interrupt devices and any connected facilities or systems, or result in their complete failure.

3.2 Intended use

The IDENTControl Compact IC-KP2-1HRX-2V1 is a control unit with integral serial interfaces RS 232 and RS 485 designed for identification systems. The IDENTControl Compact can be used as a control cabinet module or for field applications. You can connect a suitable inductive R/W head or a microwave antenna to the IDENTControl Compact. However, wiring suitable for the system design must always be used.

Read through these instructions thoroughly. Familiarize yourself with the device before installing, mounting, or operating.

Always operate the device as described in these instructions to ensure that the device and connected systems function correctly. The protection of operating personnel and plant is only guaranteed if the device is operated in accordance with its intended use.

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!

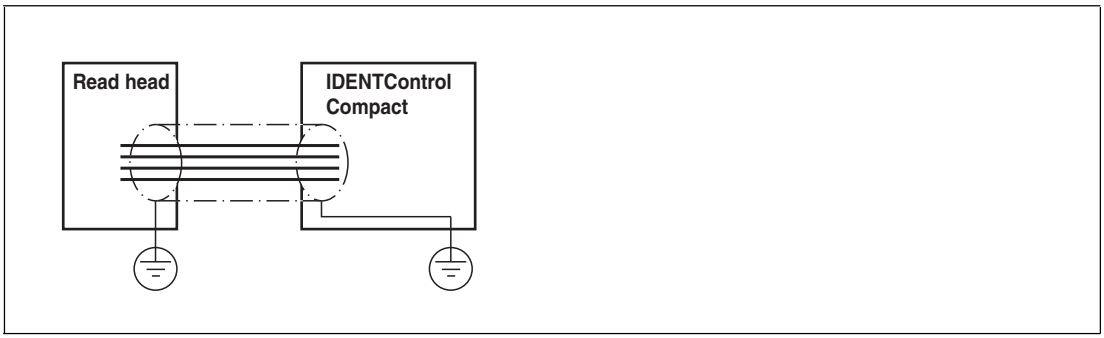
Disposal

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.

2014-03

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 5.3.3

4 Product Description

4.1 Product family

The brand name, IDENTControl, represents a complete identification system. The system consist of an IDENTControl Compact unit including a serial interface, inductive R/W heads (125 kHz and 13.56 MHz), inductive R/W heads with electromagnetic coupling (UHF with 868 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.

4.1.1 R/W heads

There are different R/W heads available for the IDENTControl Compact in different designs. You can connect an inductive R/W head (125 kHz and 13.56 MHz) or a R/W head with electromagnetic coupling (UHF with 868 MHz).

4.1.2 Read Only Tags/Read/Write Tags

Read only / read/write tag 125 kHz (inductive)

A wide range of read only and read/write tag designs are available for this frequency range, from a 3 mm thin glass tube to a transponder 50 mm in diameter. Read/write tags 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-... read only tags offer 40-bit read only codes. IPC03-... read/write tags have a 928-bit freely programmable memory bank and an unmodifiable 32-bit read only code. You can define 40-bit read only codes with IPC11-... read only tags. You can use these as permanent read only codes or continually redefine them.

Read/write tag 13.56 MHz (inductive)

Read/write tags in this frequency range save larger quantities of data and offer a considerably higher reading speed than read/write tags of the 125 kHz system. IQH-* and IQH1-* read/write heads from Pepperl+Fuchs are compatible with most existing read/write tags that comply with standard ISO 15693. With the IQH2-* read/write heads you can use read/write tags that comply with standard ISO 14443A.

The 13.56 MHz technology even allows smart labels (read/write tags in the form of adhesive labels with printed barcode). Currently available read/write tags have a memory capacity of 64 bits of read only code and a maximum 2 KB of programmable memory.

Data carrier 868 MHz (UHF)

Data carriers in this frequency range can be passive as well as active (with battery) and use a specially-shaped rod antenna as the resonance element. The passive transponders can be produced very cheaply and have a range of several meters.

As material handling and the automotive sector requires ranges of 1 to 5 meters, this system represents a low-cost alternative to microwave systems, particularly because of its low transponder costs. The high carrier frequency supports large data volumes and extremely short read times.

4.1.3 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

4.2 Connection accessories

4.2.1 Connecting Cable to the Read/Write Head

Compatible connecting cables with shielding are available for connecting the read/write head.

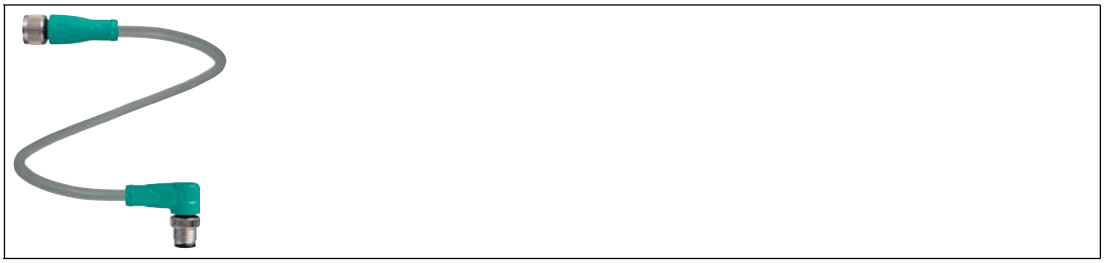


Figure 4.2

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-B3

2014-03

4.2.2 Cable connectors for the power supply

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

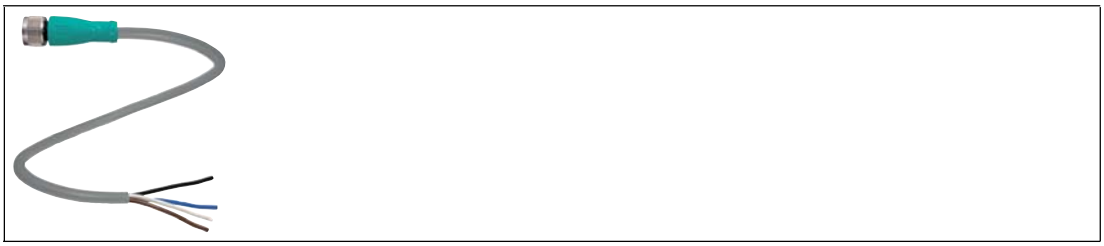


Figure 4.3

Accessories	Model number
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

4.2.3 Connection cable to the serial interface

The IDENTControl Compact has a M12 socket and is connected to the host using a suitable cable.

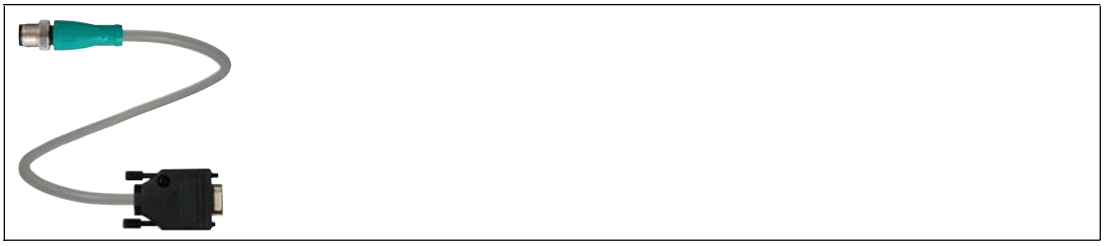


Figure 4.4

Accessories	Designation
Adapter cable, M12 to Sub-D (for connection to a PC using a null modem cable)	V1S-G-0,15M-PUR-ABG-SUBD

4.2.4 Mounting aid

An aid for mounting the IDENTControl Compact to a DIN mounting rail is available.

Accessories	Model number
Mounting aid	ICZ-MH05-SACB-8

4.3 Delivery package

The delivery package contains:

- 1 IDENTControl Compact unit
- 1 Quick start guide
- 2 grounding screws
- 2 serrated lock washers
- 2 crimp connectors

4.4 Range of application

The system is suited for the following applications:

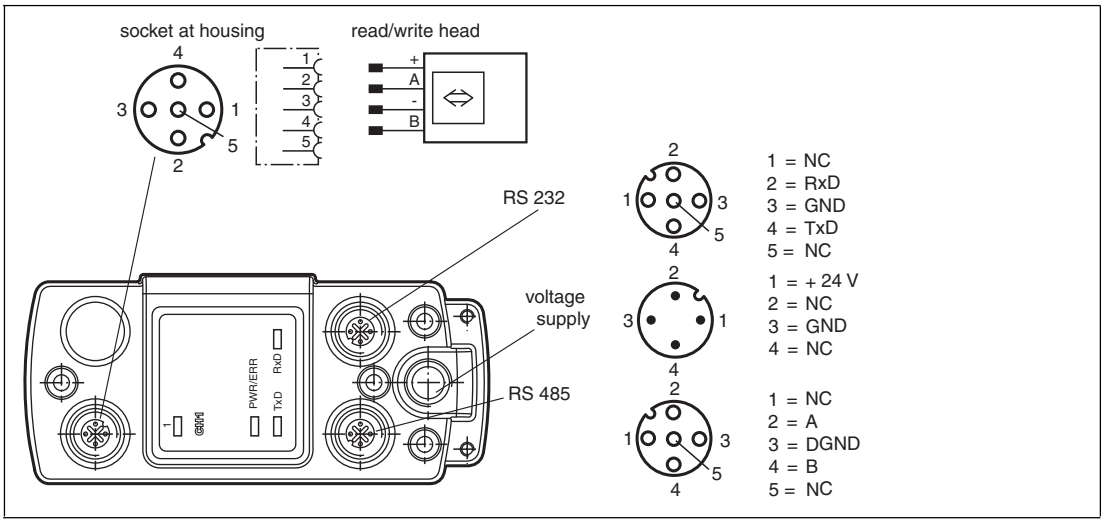
- Automation
- Material flow control in production
- Acquisition of operating data
- Access control
- Identification of storage vessels, pallets, work piece carriers, refuse containers, tanks, containers, etc.

4.5 Device characteristics

- 1 R/W head can be connected
- LED status indicators for communication and R/W head

4.6 Interfaces and connections

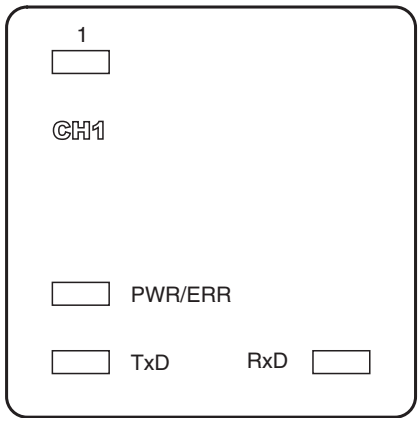
The control unit IC-KP2-1HRX-2V1 has the following interfaces and connections:



2014-03

PEPPERL+FUCHS

4.7 Displays and controls



LEDs

Description	Function	Status description
1	Status display of the R/W head	LED lights up **green** when there is an active command on the R/W head. LED lights up **yellow** for approx. 1 second when a command is executed successfully.
CH1	Indicates that a R/W head is connected	LED lights up **green** when a R/W head is connected. LED lights up **red** when a configuration error occurs.
PWR/ERR	Status display for IDENTControl Compact	LED lights up **green** when the IDENTControl Compact is connected to a power supply and the interface is ready for operation. LED lights up **red** when a hardware fault occurs.
TxD	Send data status display	LED flashes **green** at the speed in which the IDENTControl Compact sends the data during the data transfer process.
RxD	Receive data status display	LED flashes **green** at the speed in which the IDENTControl Compact receives the data during the data transfer process.

5 Installation

5.1 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:

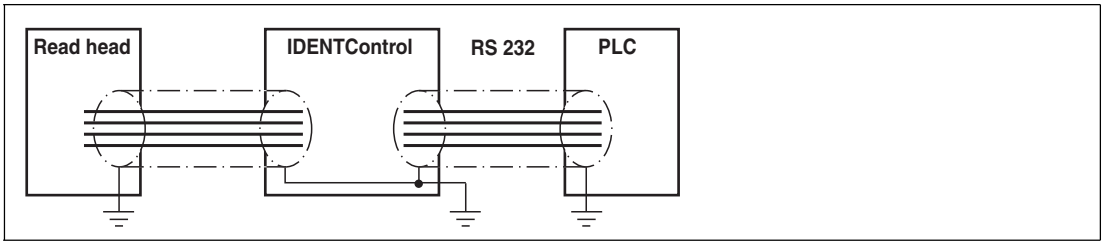
- Delivery quantity
- Device type and version in accordance with the type plate
- Accessories
- Quick start guide

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.

5.2 EMC concept

The outstanding noise immunity of the IDENTControl Compact 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 with the ground connections.



The cable shielding is used to discharge electromagnetic interference. When shielding a cable, you must connect both sides of the shield to ground 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 Compact and the metal enclosure of the R/W heads complete the consistent shielding concept.

You must establish a low resistance and low inductance connection between the shields and ground so that the shielding is not interrupted by the metal enclosure. The complete electronics system and all routed cables are therefore located within a Faraday cage.

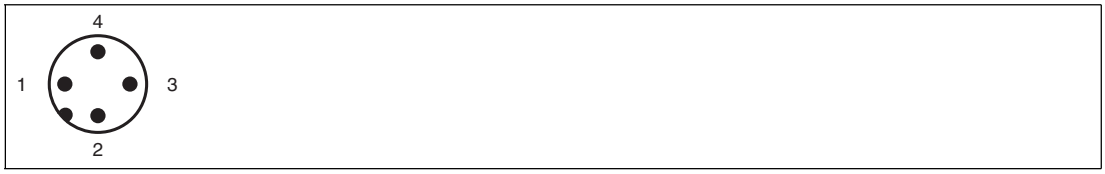
2014-03

5.3 Device connection

Electrical connection using plug connectors makes installation simple.

5.3.1 Power Supply

Connect the power supply using an M12 connector. A plug with the following pin assignment is located on the enclosure:

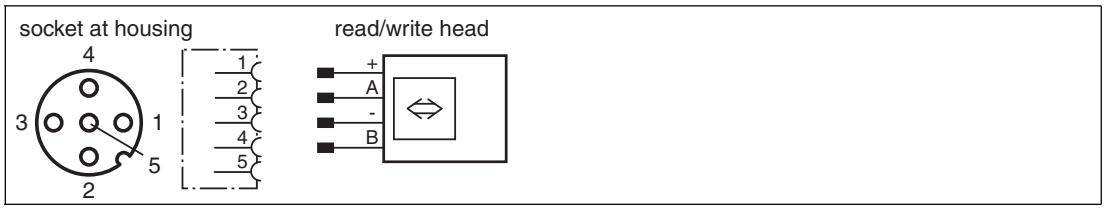


1 + 24 V
2 NC
3 GND
4 NC

Compatible connecting cable see chapter 4.2.2.

5.3.2 R/W head

You can connect either an inductive R/W head (125 kHz or 13.56 MHz) or an inductive R/W head with electromagnetic coupling (UHF with 868 MHz) to the IDENTControl Compact.



Compatible R/W head see chapter 4.1.1.

Connecting the R/W head

Connect the R/W head with compatible connecting cable to the socket on the top of the enclosure via the M12 connector.

Compatible connecting cables see chapter 4.2.1.

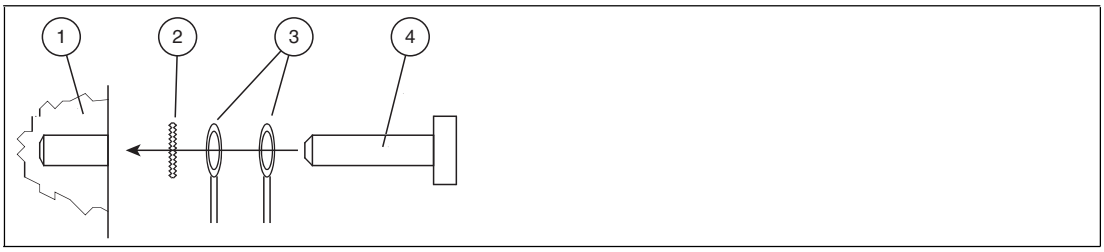
5.3.3 Ground connection

Connect the IDENTControl Compact unit to ground via a screw on the right under the housing.

Note!

In order to guarantee safe grounding, mount the serrated washer between the crimp connector and the housing.

Use a ground conductor lead with a cross-section of at least 4 mm^2.



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

Connecting the IDENTControl Compact to ground

Screw the ground conductor to the housing with a crimp connector.

5.3.4 Instructions for connecting the communication interface

The IDENTControl Compact is fitted with serial interfaces RS 232 and RS 485.

The maximum length of the cable between the control unit and the higher level computer or the controller depends on the transfer rate and the noise level. We recommend the following guide value:

Standard	Max cable length
RS 232	15 m
RS 485	1200 m

Select the transfer rate (baud rate) using the software.

The following transfer rates are available:

- 1200, 2400, 4800, 9600, 19200, 38400 bits/s

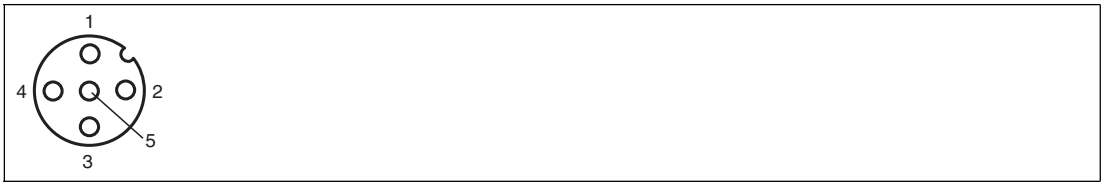
The status is preset at 38400 Mbit/s on delivery.

The device operates with the following parameters (permanent):

- 8 data bits
- 1 start bit
- 1 stop bit
- No parity

Connect the **RS 232** interface with the M12 socket. You must place the cable shield on the thread in the connector plug.

2014-03

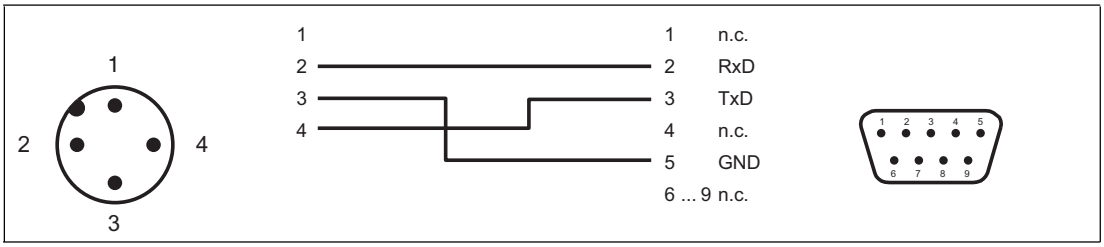


Pin assignment of the M12 socket for RS 232

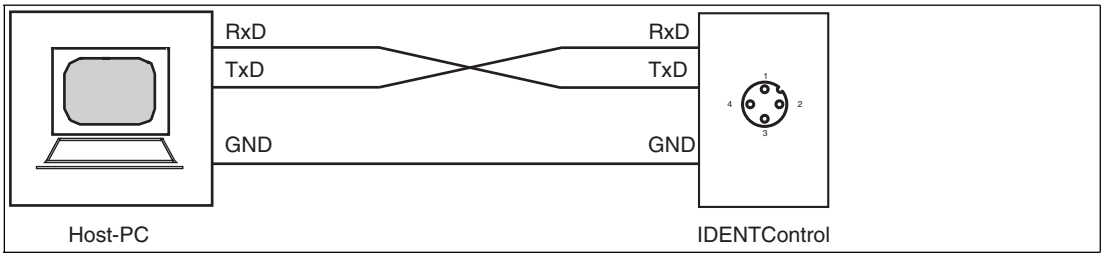
1 NC
2 RxD
3 GND
4 TxD
5 NC

You can use adapter V1S G-0.15M-PUR-SUBD for the connection.

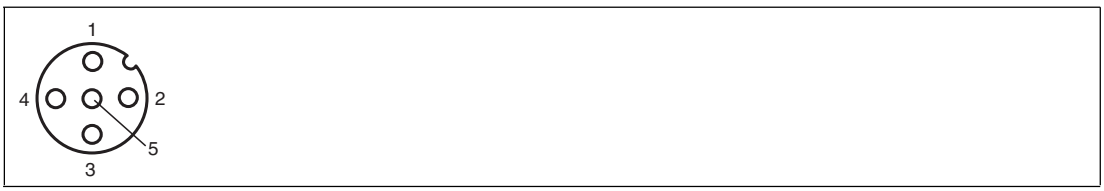
Connection layout of the adapter for the RS 232 interface



Connection example RS 232



Connect the **RS 485** interface with the M12 socket. You must place the cable shield on the thread in the connector plug.



Pin assignment of the M12 socket for RS 485

1 NC
2 A
3 DGND
4 B
5 NC

6 Commissioning

6.1 Connection

Caution!

Uncontrolled triggered processes

Before commissioning the device, make sure that all processes are running smoothly; otherwise damage may occur in the plant.

Warning!

Incorrect electrical connection

Damage to the device or plant caused by incorrect electrical connection.

Check all connections in the plant before commissioning the device.

When the supply voltage is connected, the LED in the voltage connector and the PWR/ERR LED on the device light up green. If the LEDs on the voltage connector and the device light up red, either the power supply is connected incorrectly or there is a device fault.

6.2 Device settings

Warning!

Device not configured or configured incorrectly

Configure the device prior to commissioning. A device that has not been configured or configured incorrectly may lead to faults in the plant.

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
R/W head		
Data carrier type	99	00 ... FF
RS 232 interface		
Baud rate	38400 bit/s	1200, 2400, 4800, 9600, 19200, 38400 bits/s
Timeout	0 ms	0 ... 100 ms

Volatile parameters

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

Configure the read/write head with the described system commands. “99” is preset as the data carrier type.

2014-03

6.3 Operating with the communication interface

This section contains information on how to commission the IDENTControl Compact. The commissioning procedure described relates to the RS 232 interface and involves a PC. It is assumed that the IDENTControl Compact is in factory default condition when the following steps are performed.

The factory-set transfer rate is 38400 bits/s and no timeout. '99' is the preset data carrier type (depending on the reading head).

The IDENTControl Compact must be connected to an RS 232 interface.

Select the transfer rate (baud rate) using the software (see chapter 5.3.4).

Commissioning the IDENTControl Compact

1. Start a terminal program on the PC (e.g. "Hyperterminal" or the command input window program supplied with the "RFIDControl" software).
2. Set the interface configuration on the terminal program to 38400 baud, 8 data bits, no parity, 1 stop bit, no protocol/handshake.
3. Switch the device operating voltage off and on.

   ↳ The following message appears on the terminal when the voltage is switched on:
   2 0 b <ETX>
   "2" = Status
   "0" = R/W head number
   "b" = Check sum
   "<ETX>" = End character
   Communication between the device and the terminal program is active. The device is ready for operation.
4. Send the version command **VE#<CR>** to the device as confirmation.

   ↳ The device name, the article number and the software version are displayed.
   Example:
   00 P+F IDENT<CR><LF>
   IC-KP2-2HRX-2V1<CR><LF>
   #204980<CR><LF>
   1830373 <CR><LF>
   01.07.05 #<CR>
   (the software number and the software date may vary. for a description of the **VE** command.)
   Details of connected R/W heads follow.

If you receive a different response, communication between your PC and the device has failed. Check the installation and repeat the steps for commissioning the device.

Note!

The device makes no distinction between commands entered in upper and lower case. Make sure that there are **no spaces** in all parameters that come after the command.

6.4 Protocol with check sum

All commands conclude with the characters <CHCK> = "check sum" and <ETX> = "end of text" (<ETX> = 03h). This serves to secure the data of the serial transfer.

For simplified usage with a standard terminal, the control unit also accepts a #<CR> [<LF>] in place of <CHCK><ETX>.

Note!

Use of the check sum increases data security to the interface.

Check sums are formed simply by adding all preceding characters, without overrun.

The following is an example of check sum calculation:

The check sum should be defined for telegrams **VE#<CR>** or **ve#<CR>** without a check sum.

First the hexadecimal values for the characters "V"=56h and "E"=45h or "v"=76h and "e"=65h are required from an ASCII table. Adding these values produces the following results.

- "V" = 56h plus "E" = 45h produces the sum 9Bh or
- "v" = 76h plus "e" = 65h produces the sum DBh.

The check sum for the telegram is therefore

- VE<9Bh><ETX> or
- ve<DBh><ETX>.

If a longer telegram is transferred, the check sum will most likely overrun, which essentially means that calculated values can no longer be represented by a single byte when added together. The overrun is not transmitted.

Transferring the telegram **ER1000702#<CR>** with check sum produces the following check sum:

- 45h + 52h + 31h + 30h + 30h + 30h + 37h + 30h + 32h = 1F1h.

When the overrun is removed, the following check sum remains:

- ER1000702<F1h><ETX>.

Note!

The device makes no distinction between commands entered in upper and lower case. However, remember that upper and lower case characters produce different check sums.

7 Commands

7.1 General information on the serial interface

The serial RS 232 interface enables the quick and easy connection of the IDENTControl Compact to a PC or PLC. To configure the device, select the required baud rate. You do not need to configure the device address. You can send commands to the IDENTControl Compact using any terminal program.

7.1.1 Command examples

1st example: Setting the data carrier type

Data carrier IPC02 is preset on delivery.

Send the command **Change tag** described in the **Command** table to select the data carrier type IPC03 for the connected R/W head.

↳ You should receive one of the responses described in the **Response** table.

Command:

CT 1 03 # <CR>	
CT	**Change tag** command
1	Channel 1
03	Data carrier type IPC03
#	End character
<CR>	End character

Response:

0 1 # <CR>	
0	Status
1	Channel 1
#	End character
<CR>	End character

The response indicates that the R/W head on channel 1 has received the command (status = '0').

Note!

The data carrier is stored in the non-volatile memory.

2nd example: Writing two double words from address 7 with R/W head

1. Position an IPC03 data carrier in front of the R/W head.
2. Send the command **Single write words** described in the **Command** table.

Command:

SW 1 0007 02 ABCDEFGH # <CR>	
SW	**Single write words** command
1	Channel 1
0007	Address (in hexadecimal format)
02	Number of double words (4-byte words)
ABCDEFGH	Data
#	End character
<CR>	End character

If the data carrier is within the detection range, you will receive the response **01#<CR>**.

If a data carrier is not within the detection range, you will receive the response **51#<CR>**. The two double words cannot be written (data carrier is not within the detection range): Status = '5').

LED 1 on the IDENTControl Compact and the LED on the R/W head briefly light up green when the reading command is activated and then yellow if the command is executed successfully.

3rd example: Reading two double words from address 7 with R/W head

1. Send the read command **Enhanced buffered read words** described in the **Command** table.
2. Move a data carrier into the detection range. The R/W head reads the data on the data carrier. You should receive the responses described in the **Response** table.

Command:

ER 1 0007 02 # <CR>	
ER	**Enhanced buffered read words** command
1	Channel 1
0007	Address (in hexadecimal format)
02	Number of double words
#	End character
<CR>	End character

Response:

0 1 ABCDEFGH # <CR>	
0	Status
1	Channel 1
ABCDEFGH	Data
#	End character
<CR>	End character

7.2 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.

7.2.1 Command overview

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

System commands

Command description	Abbreviation
See "Version (VE):" on page 25	**VE**
See "Change tag (CT):" on page 25	**CT**
See "Quit (QU):" on page 27	**QU**
See "Configure interface (CI):" on page 27	**CI**
See "Configuration store (CS):" on page 27	**CS**
See "Get state (GS):" on page 28	**GS**
See "Reset (RS):" on page 28	**RS**
See "Reset to defaults (RD):" on page 28	**RD**

Standard read/write commands

Fixcode

Command description	Abbreviation
See "Single read read only code (SF):" on page 28	**SF**
See "Enhanced buffered read read only code (EF):" on page 28	**EF**

Read data

Command description	Abbreviation
See "Single read words (SR):" on page 29	**SR**
See "Enhanced buffered read words (ER):" on page 29	**ER**

Write data

Command description	Abbreviation
See "Single write words (SW):" on page 29	**SW**
See "Enhanced buffered write words (EW):" on page 29	**EW**

Special command modes

Password mode with IPC03

Command description	Abbreviation
See "Set password mode (PM):" on page 31	**PM**
See "Change password (PC):" on page 31	**PC**
See "Set password (PS):" on page 31	**PS**

Configuration IPC03

Command description	Abbreviation
See "Single get configuration (SG):" on page 32	**SG**
See "Enhanced buffered get configuration (EG):" on page 32	**EG**
See "Single write configuration (SC):" on page 33	**SC**
See "Enhanced buffered write configuration (EC):" on page 33	**EC**

2014-03

Extended commands for tag types IPC11 und IDC-..-1K

Command description	Abbreviation
See "Single write read only code (SX):" on page 34	**SX**
See "Enhanced buffered write read only code (EX):" on page 35	**EX**

Extended commands for tag type IDC-...-1K

Command description	Abbreviation
See "Single read special read only code (SS):" on page 36	**SS**
See "Enhanced read special read only code (ES):" on page 36	**ES**
See "Single program special read only code (SP):" on page 36	**SP**
See "Enhanced program special read only code (EP):" on page 37	**EP**
See "Initialize data carrier (SI):" on page 37	**SI**

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

Command description	Abbreviation
See "Single write words with lock (SL)" on page 37	**SL**
See "Enhanced write words with lock (EL)" on page 37	**EL**

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

With the commands **WriteParam WP** and **ReadParam RD** you can configure the IUH-F117-V1 read/write head using different parameters. The parameters are described in the manual for the read/write head.

Command description	Abbreviation
See "Read Parameters" on page 38	**RP**
See "Write Parameters" on page 38	**WP**

Note!

In the following descriptions, the commands are highlighted in bold. Text that appears in < ... > is explanatory text for the command sequence.

Note!

The device makes no distinction between commands entered in upper and lower case. Make sure that there are **no spaces** in all parameters that come after the command.

2014-03

7.2.2 System commands

Version (VE):

Command:	**VE** <CHCK><ETX>
Response:	<Status> P+F IDENT <Model type> #<Part no.> <SW no.> <SW date> <CHCK> <ETX>
(Channel 1)	<Status> <Ident channel> <LkName> #<Part no.> <SW no.> <SW date> <CHCK> <ETX>

This command transfers the device names and the date of the software versions.

If there is no R/W head connected, the R/W head information is omitted and
6<Ident channel><CHCK><ETX>
is displayed to indicate that the R/W head was unavailable (status = '6').

Change tag (CT):

Command:	**CT** <Ident channel><TagType><CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

This command tells the R/W head which data carrier type to communicate with. This setting is stored in the non-volatile memory of the control unit. The following data carrier types are supported:

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)	Read only code	5	5	125 kHz
'0'	'3'	IPC03	EM4450 (EM microelectronic), Titan	Read/write read only code	116	4	125 kHz
'1'	'1'	IPC11	Q5 (Sokymat)	Read/write	5	-	125 kHz
'1'	'2'	IPC12	P+F FRAM	Read/write read only code	8k	4	125 kHz
'2'	'0'	IQC20[1)]	All ISO 15693 compliant read/write tags	Read/write read only code	8	8	13.56 MHz
'2'	'1'	IQC21	I-Code SLI (NXP)	Read/write read only code	112	8	13.56 MHz
'2'	'2'	IQC22	Tag-it HF-I Plus (Texas Instruments)	Read/write read only code	250	8	13.56 MHz
'2'	'3'	IQC23	my-D SRF55V02P (Infinion)	Read/write read only code	224	8	13.56 MHz
'2'	'4'	IQC24	my-D SRF55V10P (Infinion)	Read/write read only code	928	8	13.56 MHz
'3'	'1'	IQC31	Tag-it HF-I Standard (Texas Instruments)	Read/write read only code	32	8	13.56 MHz
'3'	'3'	IQC33[2)]	FRAM MB89R118 (Fujitsu)	Read/write read only code	2k	8	13.56 MHz

2014-03

Tag type		P+F designation	Chip type	Access	Writable memory [bytes]	Read only code length [byte]	Frequency range
High byte	Low byte						
'3'	'4'	IQC34	FRAM MB89R119 (Fujitsu)	Read/write read only code	29	8	13.56 MHz
'3'	'5'	IQC35	I-Code SLI-S (NXP)	Read/write read only code	160	8	13.56 MHz
'4'	'0'	IQC40	All ISO 14443A compliant read/write tags	Read only code	-	4/7[6)]	13.56 MHz
'4'	'1'	IQC41	Mifare UltraLight MF0 IC U1 (NXP)	Read/write read only code	48	7	13.56 MHz
'4'	'2'	IQC42[3)]	Mifare Classic MF1 IC S50 (NXP)	Read/write read only code	752	4/7[6)]	13.56 MHz
'4'	'3'	IQC43[3)]	Mifare Classic MF1 IC S70 (NXP)	Read/write read only code	3440	4/7[6)]	13.56 MHz
'5'	'0'	IDC-...-1K	P+F	Read/write read only code	125	4	250 kHz
'5'	'2'	ICC-...	P+F	Read only code	28	7	250 kHz
'7'	'2'	IUC72[4)]	UCode-EPC-G2XM (NXP)	Read/write read only code	64	8	868 MHz
'7'	'3'	IUC73[4)]	Higgs-2 (Alien)	Read only code	-	96	868 MHz
'7'	'4'	IUC74[4)]	UCode-EPC-G2 (NXP)	Read/write read only code	28	96	868 MHz
'7'	'5'	IUC75[4)]	Monza 2.0 (Impinj)	Read only code	-	96	868 MHz
'7'	'6'	IUC76[4)]	Higgs-3 (Alien)	Read/write read only code	56	240	868 MHz
'8'	'0'	All Class 1 Gen 2 compliant read/write tags		-	-	Max. 96	868 MHz
'9'	'9'	Depends on the reader [5)]		-	-	-	-

1) IQC20 is not an actual tag type as such, but is used to read the UID (read only code) of all ISO 15693 compliant read/write tags.

2) Read/write tag IQC33 can only be used in combination with a IQH1-... read/write head. The memory is divided into 8-byte blocks (instead of 4-byte blocks). You must enter a continuous initial address for write commands SR, ER, SW and EW.
<WordNum> specifies the number of 8-byte blocks (here, max. 7) and must be an even number.

3) Read/write tags IQC40–IQC43 can only be used in combination with a IQH2-... read/write head.
<WordNum> specifies the number of 16-byte blocks and must be a multiple of 4.
The memory can be encrypted for each sector (1 sector = 4 blocks of 16 bytes).
The default key in the tag and reader is FF FF FF FF FF FF_{ASCII}. The key in the reader can be read using the `Read param` command and written using the `Write param` command (see System Commands). The key is only changed in the reader during this process and not in the tag!
The key in the reader is stored in the non-volatile memory.

4) IUC7* type read/write tags can only be used with read/write head IUH-F117-V1 in combination with certain control interfaces.

5) The tag type configured in the read/write head as the default is selected.

6) Read/write tags can have 4-byte (older versions) or 7-byte UIDs. IQC42 and IQC43 type read/write tags from Pepperl+Fuchs generally have 7-byte UIDs.

2014-03

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:	**QU** <Ident channel><CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

The command running on this channel is interrupted.

Configure interface (CI):

Command:	**CI** <Timeout>,<Baud><CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

This command sets the timeout and the baud rate. The values are stored in the non-volatile memory of the control unit.

Note!

The device settings stored in the non-volatile memory always become active after a reset.

The timeout command indicates the amount of time after which the device no longer waits for more characters in a command. After the timeout expires, the user receives an error message. To deactivate the timeout, you must set the time to "0".

The number of data bits is always 8. A parity bit is never used. The following settings are possible:

<Timeout>: "**0**"... “100” (x 100 ms, timeout in 100 ms steps)

<Baud>: "1200" ,"2400" , "4800" , "9600" , "19200", "**38400**"

The default values are a timeout of "**0**" and a baud rate of "**38400**".

Configuration store (CS):

Command:	**CS** <Ident channel><Mode><CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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.

Get state (GS):

Command:	**GS** <CHCK><ETX>
Response:	<Status><Ident channel> TO:<Timeout> BD:<Baud> HD1:<Status><TagType><CHCK><ETX>

This command is used to read the settings stored in the non-volatile memory of the control unit. These settings become active after the next system reset.

Reset (RS):

Command:	**RS** <CHCK><ETX>
Response:	2<Ident channel><CHCK><ETX>

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

Reset to defaults (RD):

Command:	**RD** <CHCK><ETX>
Response:	0<Ident channel><CHCK><ETX>

This command terminates all active commands. The control unit is reset to the factory settings.

Note!

The device settings stored in the non-volatile memory always become active after a reset.

7.2.3 Standard read/write commands

Single read read only code (SF):

Command:	**SF** <Ident channel><CHCK><ETX>
Response:	<Status><Ident channel><Data><CHCK><ETX>

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 25.

Enhanced buffered read read only code (EF):

Command:	**EF** <Ident channel><CHCK><ETX>
Response:	<Status><Ident channel><Data><CHCK><ETX>

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 25.

2014-03

Single read words (SR):

Command:	**SR** <Ident channel><WordAddr><WordNum><CHCK><ETX>
Response:	<Status><Ident channel><Data><CHCK><ETX>

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

Enhanced buffered read words (ER):

Command:	**ER** <Ident channel><WordAddr><WordNum><CHCK><ETX>
Response:	<Status><Ident channel><Data><CHCK><ETX>

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:	**SW** <Ident channel><WordAddr><WordNum><Data> <CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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

Enhanced buffered write words (EW):

Command:	**EW** <Ident channel><WordAddr><WordNum><Data> <CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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.

7.2.4 Special commands for the read/write tag IPC03

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

2014-03

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:	**PM** <Ident channel><P><CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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:	**PC** <Ident channel><OldPW><NewPW><CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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:	**PS** <Ident channel><PW><CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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:	**SG** <Ident channel><ConfAddr><CHCK><ETX>
Response:	<Status><Ident channel><Data><CHCK><ETX>

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:	**EG** <Ident channel><ConfAddr><CHCK><ETX>
Response:	<Status><Ident channel><Data><CHCK><ETX>

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.

2014-03

Single write configuration (SC):

Command:	**SC** <Ident channel><ConfAddr><Data><CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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 **Single configuration**.

SC 1 2 <00_h><00_h><03_h><03_h> # <CR>	
SC	**Single write configuration** command
1	Channel (=1)
2	Word address in the configuration range (=control word)
00_h 00_h	Bits 16 ... 31 of the control word
03_h	Address of the last data word to write
03_h	Address of the first data word to write
#	End character
<CR>	End character

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

Enhanced buffered write configuration (EC):

Command:	**EC** <Ident channel><ConfAddr><Data><CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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.

7.2.5 Special commands

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 read only code (SX):

Command:	**SX** <Ident channel><FixType><FixLen><Data><CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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.

2014-03

For example:

The following command describes an MCV60 data carrier with the four-digit ID code '1234' on channel 1:

SX 1 60 04 1234 # <CR>	
SX	**Single write read only code** command
1	Channel 1
60	Read only code type
04	Read only code length
1234	Read only code
#	End character
<CR>	End character

Enhanced buffered write read only code (EX):

0 1 # <CR>	
0	Status
1	Channel 1
#	End character
<CR>	End character

Command:	**EX** <Ident channel><FixType><FixLen><Data><CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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.

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 read only code (SS):

Command:	**SS** <Ident channel><FixLen><CHCK><ETX>
Response:	<Status><Ident channel><ID code><CHCK><ETX>

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 read only code (ES):

Command:	**ES** <Ident channel><FixLen><CHCK><ETX>
Response:	<Status><Ident channel><Data><CHCK><ETX>

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 read only code (SP):

Command:	**SP** <Ident channel><FixLen><Data><CHCK> <ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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.

2014-03

Enhanced program special read only code (EP):

Command:	**EP** <Ident channel><FixLen><Data><CHCK> <ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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:	**SI** <Ident channel><CHCK><ETX>
Response:	<Status><Ident channel><Data><CHCK><ETX>

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:	**SL** <Ident channel><WordAddr><WordNum><Data> <CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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

This applies for 13.56 MHz data carriers of the type 21, 22, 24, 33 and 35 as well as for LF data carriers 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:	**EL** <Ident channel><WordAddr><WordNum><Data> <CHCK><ETX>
Response:	<Status><Ident channel><CHCK><ETX>

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

This applies for 13.56 MHz data carriers of the type 21, 22, 24, 33 and 35 as well as for LF data carriers 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 until successful to write <WordNum> 32-bit words from the address <WordAddr>. 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' is only output when a data carrier leaves the detection range or is not yet within the detection range. If two data carriers enter the read range one immediately after the other, the status '05' is not issued between the two readings.

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

Read Parameters

The RP command reads configuration parameters from the read/write head.

Command:	RP <ChanNo> <SystemCode> <ParamTyp> <DataLength> <Data> <CHCK> <ETX>
Response:	<Status> <ChanNo> <Data> <CHCK> <ETX>

<SystemCode> = U_{ASCII} for IUH-*

<ParamTyp> = 2 bytes ASCII

<DataLength> = Length of <Data> in command, 2 bytes binary

<Data> = Optional additional information

Example:

RP1UE5.00.00 outputs the number of unsuccessful read attempts until status 5.

Syntax

RP	<SystemCode><ParamTyp>

Write Parameters

Command WP writes configuration parameters to the read/write head.

Command:	WP <ChanNo> <SystemCode> <ParamTyp> <DataLength> <Data> <CHCK> <ETX>
Response:	<Status> <ChanNo> <CHCK> <ETX>

<SystemCode> = U_{ASCII} for IUH-*

<ParamTyp> = 2 bytes ASCII

<DataLength> = Length of <Data>, 2 bytes binary

<Data> = Optional additional information

Example:

WP1UE5.00.01.05 sets the number of unsuccessful read attempts to status 5 on 5 attempts.

Syntax

WP	<SystemCode><ParamTyp><Length><Wert>

7.3 Legend

<AltesPW>	:	4 bytes HEX, old password
<BatteryConditon 1>	:	1 byte, first digit of battery status (percentage, decimal, ASCII encoded).
<BatteryConditon 2>	:	1 byte, second digit of battery status (percentage, decimal, ASCII encoded).
<BatteryConditon 3>	:	1 byte, third digit of battery status (percentage, decimal, ASCII encoded).
<Baud>	:	Baud rate: 2400, 4800, 9600, 19200, 38400 (bit/s)
<ByteNum>	:	2 bytes ASCII, length of <IDCode>; System MV: 4 characters (04h) System IQ: 8 characters (08h)

2014-03

<ChanNo>	:	IDENTControl channel
<CHCK>	:	1 byte HEX, 8-bit check sum with the addition of all preceding characters, without overrun.
<ConfAddr>	:	1 ASCII character, word starting address in configuration range of data carrier. The following applies for IPC03: '1' = Protection Word '2' = Control Word
<CR>	:	1 ASCII character, 13d, carriage return
<Data>	:	<WordNum> times 4 bytes. When communicating a word, the highest value byte is transferred first and the lowest value byte, or bytes, last.
<ETX>	:	1 ASCII character, 03d, end of text
<Fill Sign>	:	1 ASCII character
<FixLen>	:	2 ASCII characters from '0' to 'F', length of the read only code in bytes,
<FixType>	:	2 ASCII characters, for example: '02' for IPC02
<IDCode>	:	4 bytes, 6 bytes or 8 bytes (depending on the data carrier type)
<Identchannel>	:	1 ASCII character, (channel '0', '1') '0' = To or from control, '1' = To or from read/write head
<Length>	:	2 $ASCII_{hex}$ characters = number of data bytes When writing the UII segment + 1: Range "03", "05", "07" ... (read) "00" (write)
<LkName>	:	n ASCII characters (depending on the type designation)
<LF>	:	1 ASCII character, 10d, line feed
<Mode>	:	1 ASCII character, '0': Configuration store off '1': Configuration store on
<Model-Type>	:	Product order code: IC-KP2-2HRX-2V1
<Month>	:	2 bytes ASCII, hexadecimal encoding, 01 ... 0C (01=January, 0C=December)
<NeuesPW>	:	4 bytes HEX, new password
<P>	:	1 bit, password mode, 0 (0b): Mode off, 1 (1b): Mode on
<ParamTyp>	:	Parameter type, 2 ASCII characters
<Part-Nr>	:	Article number, 6 ASCII characters '0' to '9'
<PW>	:	4 bytes HEX, password
<Status>	:	1 ASCII character (see chapter 7.4)
<SW-Nr>	:	Application software number
<SW-Datum>	:	Application software version date
<SystemCode>	:	= U0
<TagType>	:	2 ASCII characters, for example: '02' for IPC02
<Timeout>	:	1 to 3 ASCII characters Timeout of interface in (0 ... 100) x 100 ms, an error message is sent after this time runs out. '0' deactivates the timeout
<WordAddr>	:	4 ASCII characters, word start address in the data carrier, range from '0000h' to 'FFFFh', depending on data carrier type.

<WordNum>	:	2 ASCII characters, number of words to be read or written, range from '00' to '20' (128 bytes) or '00' to '1D' (116 bytes) for IPC03 ... data carriers The following applies for IQC33: The word count parameter must be even-numbered because of the block size of 8 bytes. The word address then indicates the offset in 8-byte increments.
<Year>	:	2 bytes ASCII, hexadecimal encoding, 00h ... 63h

2014-03

7.4 Fault/status messages

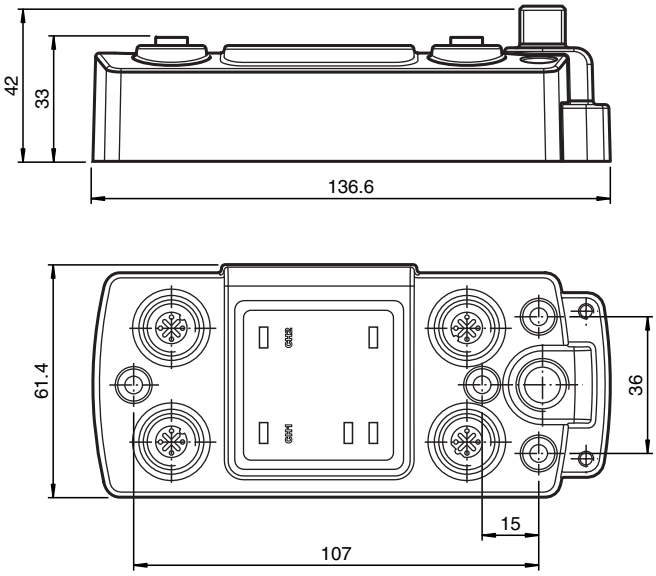
Status	Meaning
0	The command has been executed without error.
1	The command is processing.

Error messages triggered by the identification system

Status	Meaning
1	Reserved
2	Switch-on message, reset has been executed.
3	Reserved
4	Incorrect or incomplete command or parameter not in the valid range.
5	No data carrier in the detection range.
6	Hardware error, e.g. error during self-test or read/write head defective.
7	Internal device error.
8	Reserved
9	The parameterized data carrier type is not compatible with the connected read head.
A	There are several transponders in the detection range (UHF).
B	Reserved
C	Reserved
D	Reserved
E	The internal cache is full.
F	Reserved

8 Technical Specifications

8.1 Dimensions



8.2 Technical data

General specifications

Number of read/write heads	max. 1

Functional safety related parameters

$MTTF_d$	160 a
Mission Time (T_M)	10 a
Diagnostic Coverage (DC)	0 %

Indicators/operating means

LED 1	Status indicator for read/write head green: command at read/write head active yellow: approx. 1 second long, if command was successfully executed
LED CH1	green: read head detected red: Configuration error
LED PWR/ERR	green: power on red: Hardware fault
LED TxD	green: flashes in rhythm with the transmitted data
LED RxD	green: flashes in rhythm of receiving data

Electrical specifications

Rated operational voltage	20 ... 30 V DC , PELV
Ripple	≤ 10 % at 30 V DC
Current consumption	≤ 2 A incl. read/write head
Power consumption	2 W Without read/write head
Electrical isolation	basic insulation acc. to DIN EN 50178, rated insulation voltage of 50 V_{eff}

2014-03

Interface 1

Interface type	serial
Physical	RS 485
Protocol	ASCII
Transfer rate	1200; 2400; 4800; 9600; 19200; 38400 Bit/s

Interface 2

Interface type	serial
Physical	RS 232
Protocol	ASCII
Transfer rate	1200; 2400; 4800; 9600; 19200; 38400 Bit/s

Compliance with standards and directives

Directive conformity	
EMC Directive 2004/108/EC	EN 61000-6-2:2006, EN 61000-6-4:2007
Standard conformity	
Protection degree	IEC 60529:2001

Ambient conditions

Ambient temperature	-25 ... 70 °C (-13 ... 158 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Climatic conditions	air humidity max. 96 % Salt spray resistant to EN 60068-2-52
Shock and impact resistance	Oscillation (Sine): 5 g, 10 - 1000 Hz to EN 60068-2-6 Shock (Half-sine): 30 g, 11 ms in accordance with EN 60068-2-27

Mechanical specifications

Protection degree	IP67
Connection	read/write head: M12 plug connection, 4-pin, screened, Power supply: M12 connector Protective earth: M4 earthing screw RS 232: M12 plug connection RS 485: M12 connector
MaterialHousing	Powder coated zinc
Installation	screw fixing
Mass	approx. 500 g

9 Fault location

Fault source	Possible cause	Remedy
The operating voltage LED (PWR/ERR) does not light up.	The power supply is not connected properly.	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.
A read command (e.g. **SR** ...) gives the status 4 even though the syntax is correct.	An incorrect data carrier 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 data carrier type using the **CT**... command (e.g. PC03).
The LED in the reading head flashes.	The connected reading head does not support the preset data carrier type.	Select a data carrier 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 data carrier type IPC03 using the **CT** command.

Table 9.1 This table will be updated and extended if necessary. Visit www.pepperl-fuchs.com to view 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**	**I**
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**	**I**
1D	29	GS	**3D**	**61**	**=**	5D	93	]	**7D**	**125**	**}**
1E	30	RS	**3E**	**62**	**>**	5E	94	^	**7E**	**126**	**~**
1F	31	US	**3F**	**63**	**?**	5F	95	_	**7F**	**127**	**DEL**

FACTORY AUTOMATION – SENSING YOUR NEEDS

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

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

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

www.pepperl-fuchs.com

PEPPERL+FUCHS
SENSING YOUR NEEDS

/ DOCT1747E
03/2014