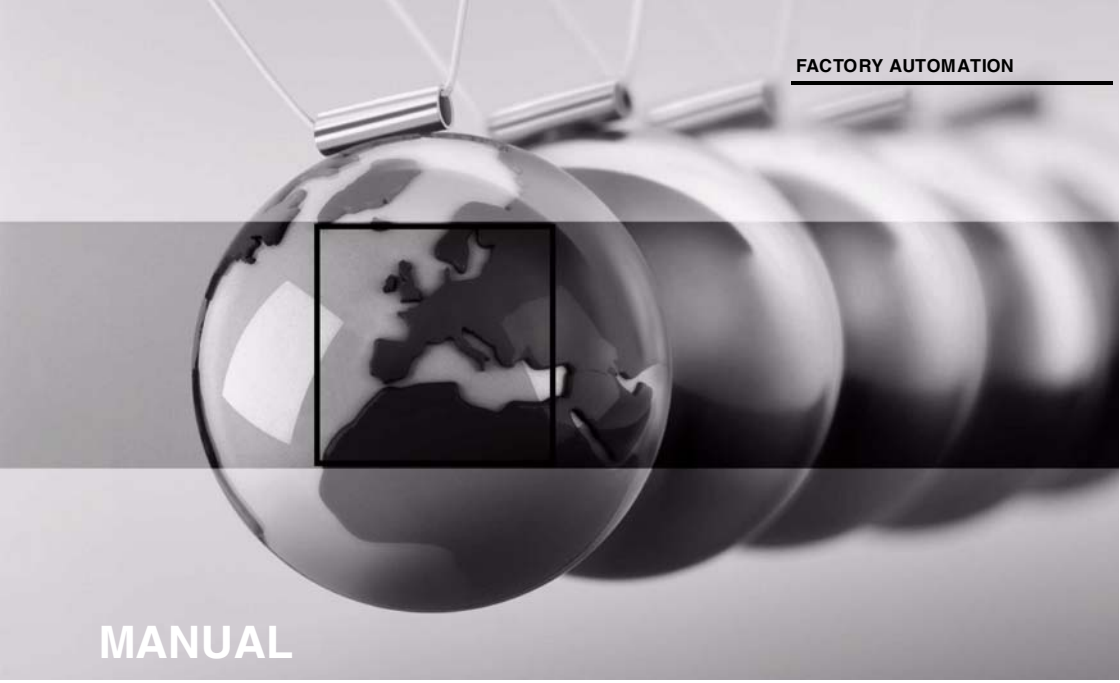
FACTORY AUTOMATION



MANUAL

IC-HH20-V1
Handheld

CE

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"

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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 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 downtimes 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:

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68307 Mannheim
Telephone: +49 621 776-4411
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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.

2.2 Declaration of Conformity

The device has been tested for compliance with FCC regulations Tests confirmed that all valid FCC rules and regulations have been complied with.

Note!

The device may not be used in the vicinity or in combination with another antenna or a transmitter in order to meet the requirements stipulated in FCC RF exposure guidelines.

3 Safety

3.1 Symbols relevant to safety

Danger!
This symbol indicates a warning about an immediate 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 indicates a warning about 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

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.

The handheld device was designed to identify RFID code and data carriers within a defined frequency range and should be used for this purpose only. The devices are used, for instance, to manually control quality or verify maintenance.

Caution!
Modified or independent JavaScript programs

The processes involved in the reading and writing of data are susceptible to external influences and interference.

- Do not modify JavaScript programs from the manufacturer.
- If you write your own JavaScript programs, check that the identification function is not affected.

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3.3 General safety instructions

Installation and commissioning of all devices must be performed by a trained professional only.

When packing the device for storage or transport, use materials that will protect the device from bumps and impacts and protect against moisture. The original packaging provides the best protection. Also take into account the permitted ambient conditions.

Do not open, burn or short-circuit the battery. The battery may ignite, explode, leak or heat up and become irreparably damaged.

Always charge the battery using approved cables.

Only use recommended original accessories.

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

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.

Do not dispose of storage batteries with the household refuse.

Consumers are obliged by law to dispose of used storage batteries in accordance with regulations. You can hand in your used batteries at public collection points in your area or sales points where batteries of that particular kind are sold. You can also send your used batteries directly to us for disposal. Please remember that this service is only available within the scope of normal use. If you wish to send back your used batteries, please affix sufficient postage stamps and send to our address. There are no extra charges for disposal.

4 Product Description

4.1 Use and Application

Handheld

The IDENTControl system from Pepperl+Fuchs is an established, proven solution for stationary RFID applications. A mobile device for process control (read/write functions, initializing read/write tags) is provided with this handheld as an ideal enhancement to this system.

The cell-phone-style design with keyboard and display screen offers an intuitive operating concept. The device features two unassigned keys that can be programmed with frequently repeated actions. These actions can be executed at the touch of a button. To further enhance user functionality, a familiar, cross-platform programming language is provided in JavaScript.

A lithium-ion battery, large nonvolatile memory and the option to communicate wirelessly within the 2.45 GHz frequency band, based on the Bluetooth standard, mean that the device is fully portable.

The M12 socket gives you the option of connecting IDENTControl read/write heads of all frequency ranges to the handheld, thus making the system more flexible.

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.

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Read/write tag 250 kHz (inductive)

Data carriers from this frequency range achieve a higher reading speed than 125 kHz data carriers. ICC ... code carriers with a 28 bit fix code and IDC ... data carriers with a memory capacity of 1 kBit are available in various designs.

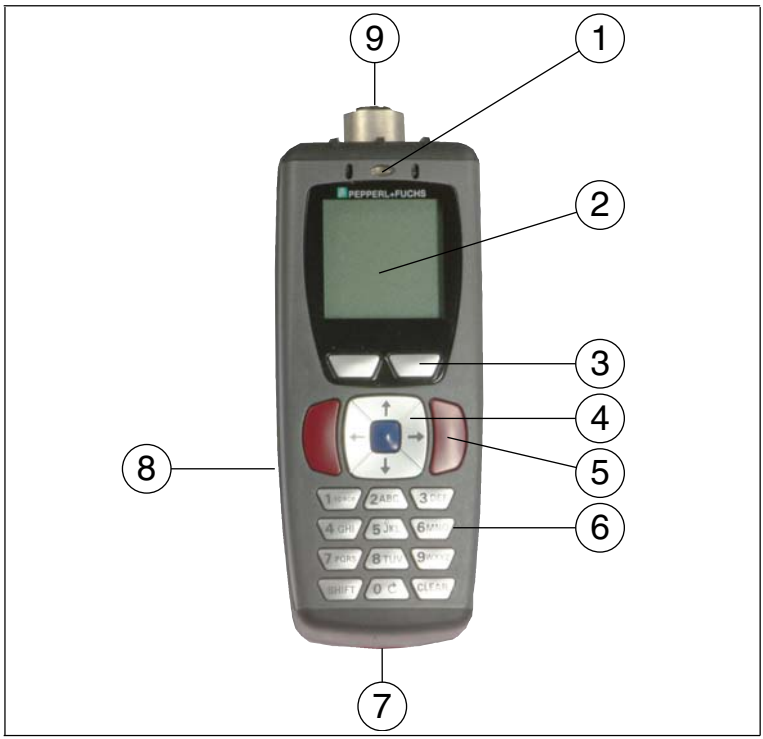
Read/write tag 13.56 MHz (inductive)

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.

4.2 Displays and Controls

The device is equipped with the following displays and controls:



1 Status LED
2 LC display
3 Softkeys
4 Navigation keys
5 Trigger keys
6 Keypad
7 Interface
8 Battery compartment
9 M12 connection for read/write head

4.2.1 Status LED

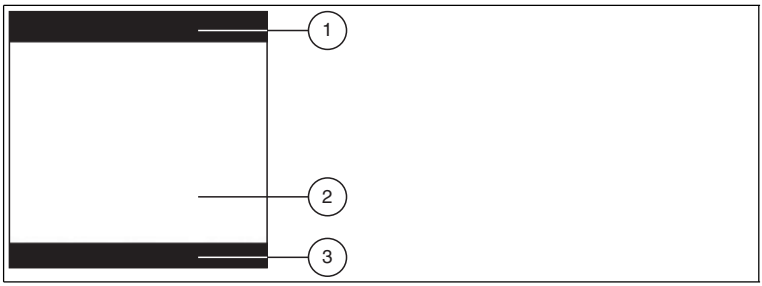
The status LED indicates the following states:

Meaning of status LED

Status	Description
Green	■ The handheld device is switched on. ■ The interface has been changed. ■ Data has been read or written.
Yellow flashing	The handheld device has executed a read or write command successfully.
Red flashing	The handheld device has executed a read or write command unsuccessfully and indicates an error.
Off	Read/write head is inactive

4.2.2 Display

The display on the device consists of different areas:



1 Toolbar
2 Display
3 Softkey bar

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The following table lists all the symbols in the status bar and explains what they mean:

Symbols in the status bar

Symbol	Description
Charge state	
	The battery capacity is between 50 % and 100 %.
	The battery capacity is between 20 % and 50 %.
	The battery capacity is between 0 % and 20 %. Charge the battery.
	Battery is charging.
Connection status	
	The handheld device is connected to an interface.
	RS 232 is the preset interface.
	PS/2 is the preset interface.
	USB is the preset interface.
	Bluetooth is the preset interface.
Data transfer	
	Data transfer in one direction: Data is sent from the handheld device to the computer. A response from the computer is not required.
	Data transfer in two directions: Data is sent from the handheld device to the computer. The handheld device then waits for a response from the computer.
	Keyboard mode: The handheld device is connected to the computer via a USB or PS/2 interface.
	Virtual COM port mode: The handheld device emulates an RS 232 interface via the USB interface to allow communication from the computer to the handheld device as well. A response from the computer is not required.
	Secure mode
Memory status	
	0 % to 25 % of the internal memory is occupied.
	25 % to 50 % of the internal memory is occupied.
	50 % to 75 % of the internal memory is occupied.
	75 % to 100 % of the internal memory is occupied.

Symbol	Description
	The internal memory is full. There internal memory has no more space to store data.
	Batch mode inactive. Data is not cached in the internal memory.
Input mode	
	Numerical input mode - data entered using the input keys appears in the numerical form.
	Alphabetical input mode - data entered using the input keys appears in alphabetical form.
	Alphabetical input mode - data entered using the input keys appears in the form of lowercase letters.
	Symbol input mode - data entered using the input keys appears in the form of symbols.

4.2.3 Button overview

The following table lists all the buttons on the device and their names:

Selection buttons

Button	Description
	Left selection button
	Right selection button

Navigation keys

Keys	Designation
	Up navigation key
	Down navigation key
	Left navigation key
	Right navigation key
	Enter navigation key

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Function buttons

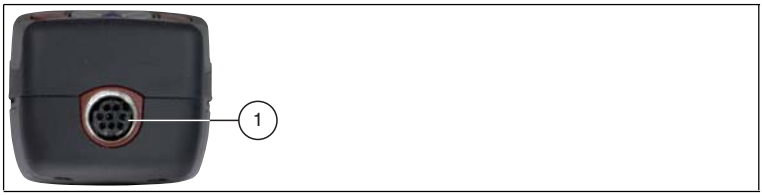
Button	Description
	Left function button (= left trigger button)
	Right function button (= right trigger button)

Input keys

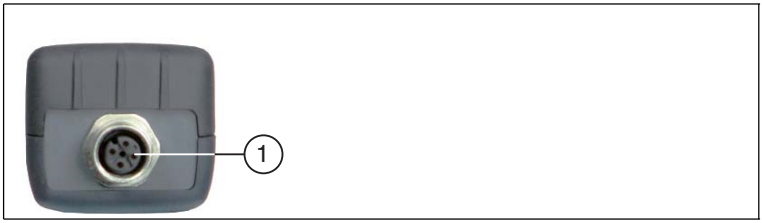
Keys	"Numerical" mode	"Alphanumerical upper case" mode	"Alphanumerical lower case" mode	"Symbols" mode
SHIFT	Switches between "Numerical", "Alphanumerical upper case", "Alphanumerical lower case" and "Symbols" mode.			
1 space	1	Space, 1	Space, 1	Space) < _
2 ABC	2	A, B, C, 2	a, b, c, 2	! * = `
3 DEF	3	D, E, F, 3	d, e, f, 3	" + > {
4 GHI	4	G, H, I, 4	g, h, i, 4	# , ? |
5 JKL	5	J, K, L, 5	j, k, l, 5	$ - @ }
6 MNO	6	M, N, O, 6	m, n, o, 6	% . [~
7 PQRS	7	P, Q, R, S, 7	p, q, r, s, 7	& / \ Space
8 TUV	8	T, U, V, 8	t, u, v, 8	' :] Space
9 WXYZ	9	W, X, Y, Z	w, x, y, z	(; ^ Space
0	0	0	0	Scrolls through the different symbol pages
CLEAR	For data input fields: delete the last character. Otherwise: ESC function (exits the menu without adopting the current settings.)			

4.3 Connections

The handheld features the following connections:



1 8-pin connecting socket



1 4-pin M12 socket

4.4 Scope of Delivery

The following elements are included in the scope of delivery:

- Handheld device without battery or battery compartment cover
- CD with documentation (manual)

Note!

To complete the device, some other components are required in addition to the handheld included in the scope of delivery. The basic equipment includes: handheld, battery, double-ended cordset for handheld/read/write head, and charger. All components can be obtained from Pepperl+Fuchs.

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5 Installation

5.1 Preparation

Unpacking the unit

1. Check that all package contents are present and undamaged.

   ↳ If anything is damaged, inform the shipper and contact the supplier.

2. Check that all items are present and correct based on your order and the shipping documents.

   ↳ If you have any questions, please contact Pepperl+Fuchs.

3. Keep the original packing material in case you need to store or ship the unit at a later time.

Fitting the battery

Fit the battery as follows:

1. Turn the battery so that you can remove it as shown in the illustration.

2. Slide the plastic tab on the battery into the corresponding recess on the Handheld.

3. Push the locking device upwards and push in the battery.

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4. Push the battery in the Handheld, hold in position and release the locking device so that the battery engages.

Charging the battery

Charge the battery as follows:

1. Connect the handheld device with battery to an interface cable.
2. Make sure the computer is switched on and then connect the interface cable to computer.

   ↳ When the handheld device is switched on, the symbols displayed in the status bar on the handheld device indicate the charge state. See table "Symbols in the status bar" on page 13

Note!

If you are operating the handheld via an RS 232 interface, connect the RS 232 interface power supply unit to the socket to charge the battery.

Note!

Completely discharged storage batteries

If the storage battery is completely discharged, you will have to wait at least 10 minutes before the Handheld is ready for operation again.

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5.2 Handle attachment

Attaching the standard handle

Proceed as follows to attach the grip to the handheld device:

1. Insert the handheld device with battery into the bracket on the handle.

2. Slide back the handheld device until the connector on the handle engages in the cable connector socket on the handheld device.
3. Push the handheld device firmly onto the connector until it is flush with the handle.

↳ The handheld device is attached to the handle.

Fitting a handle with cable connection

Fit the handle to the Handheld as follows:

1. Remove the battery from the battery compartment of the Handheld if necessary.
2. Carefully pull the rear, flexible part of the handle attached to the plug downwards.
3. Attach the cable connection socket on the Handheld to the plug on the handle.
4. Slide the plastic tab on the battery into the corresponding recess on the Handheld.

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↳ The Handheld is now fitted to the handle.

5. Push down the Handheld carefully until the locking device on the Handheld engages in the handle.
6. Connect the interface cable to the cable connection socket underneath the handle.

↳ The Handheld is now ready for operation.

Fitting a handle with integrated storage battery

A handle with integrated battery is also available for this Handheld as an optional accessory. Fit the handle to the Handheld as follows:

1. Remove the battery from the battery compartment of the Handheld if necessary.
2. Slide the plastic tab on the battery into the corresponding recess on the Handheld.
3. Push down the Handheld carefully until the locking device on the Handheld engages in the handle.

↳ The Handheld is now fitted to the handle.

Securing the interface cable to prevent inadvertent removal

You have the option of attaching a cord grip to prevent the interface cable from being pulled out inadvertently. Proceed as follows:

1. Secure the interface cable to the cable connection socket on the handle.
2. Guide the cable through the slot on the cord grip and slide the cord grip towards the cable connection socket.
3. Make sure that you slide the cord grip over the interface cable and into the correct position.
4. Screw the cord grip to the handle using the screws provided.

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↳ The interface cable is secured against inadvertent removal.

Note!

We recommend mounting the handheld device using the screws provided for extra security. There are two screw holes in the lower section of the handle (see illustration).

Removing the handle

Remove the handle as follows:

1. If you have secured the handheld with screws on the handle, remove the screws.
2. Push the locking device in the direction of the arrow and press the handheld out of the retainer.

↳ The handle is removed.

6 Commissioning

6.1 Switching on/off

Switching on the handheld device

Switch on the handheld device as follows:

Press and hold either the left function button () or the right function button () for approx.1 second.

↳ The handheld device switches on.

Note!

The Handheld switches into standby automatically 2 minutes after the last keystroke.

Note!

If you connect the device to the USB or PS/2 interface of your PC, the device switches on automatically.

Switching off the Handheld

The Handheld switches off automatically if it remains idle for more than 2 hours.

6.2 Basic operation

6.2.1 Navigating through menus

Button	Function
Up navigation button ()	Scroll up through different menus and submenus
Down navigation button ()	Scroll down through different menus and submenus
Enter navigation button ()	Select menus, submenus and individual menu entries
Left selection button ()	Function depends on the menu. This button is usually used to confirm a command (e.g., OK) or execute a command (e.g., read).
Right selection button ()	Function depends on the menu. This button is usually used to stop or cancel a command (e.g., ESC).

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Activating/Deactivating a menu entry

Activate/deactivate a menu entry as follows:

1. Scroll to the menu entry of your choice using the up navigation button () or the down navigation button ().

   ↳ The menu entry currently selected is highlighted black.

2. Press the Enter navigation button to activate the menu entry ().

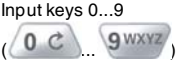
   ↳ A star appears in front of the activated menu entry.

3. Press the Enter navigation button again to deactivate the menu entry ().

   ↳ The star no longer appears in front of the deactivated menu entry.

4. Press the left selection button to confirm your selection ().

6.2.2 Data input

Button	Function
Input keys 0...9 ()	Enter numerical or alphanumerical values (depending on the mode selected).
SHIFT input button ()	Switch between the different input modes. (The selected mode is indicated in the symbol bar of the handheld device on the right.)
CLEAR input button ()	For data input fields: delete the character last entered. Within menus: Exit the menu.

6.3 Connecting a Read/Write Head

You can connect various read/write heads for IDENTControl to the handheld. Connect the read/write heads to the 4-pin M12 socket on the front of the handheld using the V1-G-0.5/2.5M-PUR-V1-G double-ended cordset.

The double-ended cordset can be obtained from Pepperl+Fuchs.

Tip

Connect the read/write head before switching on the handheld. When switched on, the handheld automatically detects the read/write head.

If you connect a new read/write head while the handheld is switched on, you must Teach-in the new read/write head. See chapter 7.1.

6.4 Operating modes

Caution!
Data loss

An incorrectly preset interface may lead to data loss.

Make sure that the Handheld is connected to the interface (USB, RS 232, Bluetooth) preset in the Handheld. If necessary, use another interface cable or modify the settings in the Handheld.

6.4.1 Wireless operation (batch mode)

Wireless operation of the handheld device is recommended for certain applications. As soon as you remove the interface cable (USB, RS 232 cable) or move outside the range of a Bluetooth connection, the handheld device switches automatically to "Batch mode": In this mode, the read data is stored in the internal memory of the handheld device. You then have the option of transferring the data stored in the handheld device to the computer at a later time.

Note!

Using batteries

You will require a battery or a handle with integral battery to operate the handheld device using a wireless connection or a cable via an RS 232 interface.

A battery is not normally required for cable operation via USB. However, this depends on the current strength that the computer supplies via the USB connection. If the computer does not supply sufficient power to the USB port, you will require a USB hub with a separate power supply or will have to fit a battery to the handheld device.

If you wish to operate the handheld device without a handle using a cable via the USB port, you must fit a battery compartment cover ODZ-MAH-BLANK to the device.

This optional accessory is available from Pepperl+Fuchs.

6.4.2 Cable operation: RS 232

Configuring the RS 232 interface on the handheld device

Configure the RS 232 command interface on the handheld device as follows:

1. Select **Settings** > **Interface**
2. Activate the **RS 232** interface.

   ↳ The **RS 232** submenu opens.
3. Edit the relevant parameters.
4. Press the left selection button to confirm your entries ().

   ↳ The interface is now active.
5. Press the right selection button to exit the menu ().

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Tip

Further information on interface settings see chapter 9.3.7

Connecting the interface cable to the Handheld

To connect the interface cable to the Handheld, proceed as follows:

1. Turn the 8-pin DIN plug so that the arrows on the plug are pointing downwards.
2. Hold the Handheld in your hand with the controls facing upwards.
3. Insert the plug into the corresponding cable connection socket on the Handheld.
4. Press the plug firmly into the cable connection socket until the locking device audibly engages.

   ↳ The interface cable is now connected to the Handheld.

Connecting the Handheld to the computer via the RS 232 interface cable

Connect the Handheld to the computer as follows:

1. Switch off the computer.
2. Connect the RS 232 plug on the interface cable to the RS 232 interface on the computer.
3. Connect the low-voltage plug on the power supply unit to the low-voltage socket on the RS 232 interface cable.
4. Connect the power supply unit to the mains power supply.
5. Switch on the computer.

   ↳ The Handheld switches on automatically once you have connected it to the computer. The symbols  and  are displayed in the toolbar.

6.4.3 Cable operation: PS/2

Configuring the PS/2 interface on the handheld device

Configure the PS/2 command interface on the handheld device as follows:

1. Select **Settings > Interface**
2. Activate the **PS2** interface.

   ↳ You are prompted to select whether you wish to operate the handheld device in PS2 mode.

3. Press the left selection button to confirm your selection ().

   ↳ The interface is now active.

4. Press the right selection button to exit the menu ().

Note!

Required PS/2 interface cable

You will require a PS/2 interface cable with the following connectors to connect the Handheld to the computer:

- **8-pin DIN connector** for connection to the Handheld.
- **PS/2 socket** for connecting an external keyboard.
- **PS/2 connector** for connection to the computer.

Connecting the interface cable to the Handheld

To connect the interface cable to the Handheld, proceed as follows:

1. Turn the 8-pin DIN plug so that the arrows on the plug are pointing downwards.
2. Hold the Handheld in your hand with the controls facing upwards.
3. Insert the plug into the corresponding cable connection socket on the Handheld.
4. Press the plug firmly into the cable connection socket until the locking device audibly engages.

   ↳ The interface cable is now connected to the Handheld.

Note!

Connection cable with fitted grip

If you have mounted the Handheld to the optional grip, connect the interface cable to the cable connection socket on the grip.

Connecting the handheld device to the computer using a PS/2 interface cable

Connect the handheld device to the computer as follows:

1. Switch off the computer.
2. If an external keyboard is connected to the computer, disconnect from the computer.
3. If you are using a USB keyboard, connect the keyboard to the PS/2 socket on the interface cable using a corresponding adapter. If you are using a keyboard with PS/2 plug, connect the plug directly to the PS/2 socket on the interface cable.
4. Connect the PS/2 plug on the interface cable to the keyboard port on the computer.
5. Switch on the computer.

   ↳ After you have connected the handheld device to the computer, it switches on automatically. The symbols  and  appear in the status bar.

Power is supplied to the handheld device via the PS/2 interface. This is why you do not require an additional power supply.

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6.4.4 Cable operation: USB

Configuring the USB interface on the handheld device

Configure the USB command interface on the handheld device as follows:

1. Select **Settings > Interface**
2. Activate the **USB** interface.

   ↳ The **USB** submenu opens.
3. Press the Enter navigation button to activate the required mode ().
4. Press the left selection button to confirm your entries ().

   ↳ The interface is now active.
5. Press the right selection button to exit the menu ().

Tip

Further information on interface settings see chapter 9.3.7

Connecting the interface cable to the Handheld

To connect the interface cable to the Handheld, proceed as follows:

1. Turn the 8-pin DIN plug so that the arrows on the plug are pointing downwards.
2. Hold the Handheld in your hand with the controls facing upwards.
3. Insert the plug into the corresponding cable connection socket on the Handheld.
4. Press the plug firmly into the cable connection socket until the locking device audibly engages.

   ↳ The interface cable is now connected to the Handheld.

Note!

Connection cable with fitted grip

If you have mounted the Handheld to the optional grip, connect the interface cable to the cable connection socket on the grip.

Connecting the Handheld to the computer via the USB interface cable

Connect the Handheld to the computer as follows:

Insert the USB plug on the interface cable into a free USB port on the computer. It does not matter whether the computer is switched on or off.

↳ The Handheld switches on automatically once you have connected it to the computer. The symbols  and  are displayed in the toolbar.

6.4.5 Operating with Bluetooth

This handheld device is equipped with a class 1 wireless Bluetooth interface incorporating a radio system that enables wireless point-to-point communication with other Bluetooth-compatible devices. If the other Bluetooth-compatible device also has a class 1 radio system, a sensing range of approx. 100 m is achieved in a free field. If the handheld device is connected to a class 2 or 3 Bluetooth-compatible device, the sensing range decreases accordingly.

If the handheld device is located outside the sensing range, it stores the read data in the internal memory. The handheld device attempts to send the read data until the connection with the Bluetooth-compatible device is established again. As soon as the handheld device sends data to the Bluetooth-compatible device, it is deleted from the internal memory automatically.

Note!

You will require a MAC address to connect the handheld device to a Bluetooth-compatible device. The MAC address is usually printed on the Bluetooth device next to the serial number or appears in the manual accompanying your Bluetooth device.

Connecting the handheld device via Bluetooth

Connect the handheld device to a Bluetooth-compatible device (e.g., laptop with corresponding Bluetooth USB dongle) as follows:

1. Select **Settings > Interface**.
2. Activate the **Bluetooth** interface.

   ↳ The **Bluetooth** submenu opens.
3. Press the Enter navigation button to activate the required mode ( ).
4. Enter the MAC address in the file input field of the BD_MAC menu entry. The address consists of 12 digits, e.g., 000A3A72C2D0.
5. Press the left selection button to confirm your entries ( ).

   ↳ A connection is established between the two devices. The connection may take a few moments to establish under certain circumstances. The symbols and appear in the status bar.

Tip

Further information on interface settings see chapter 9.3.7

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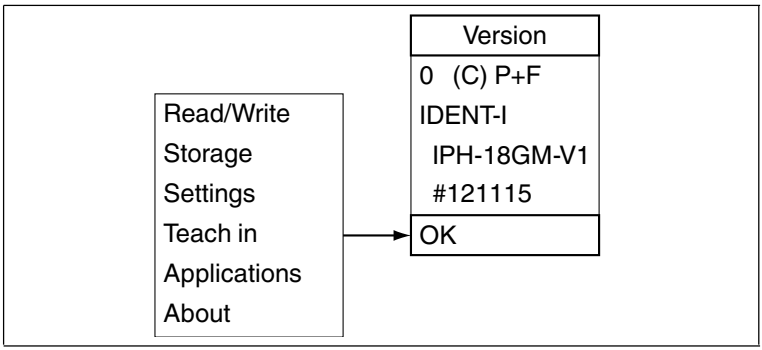
7 Operation

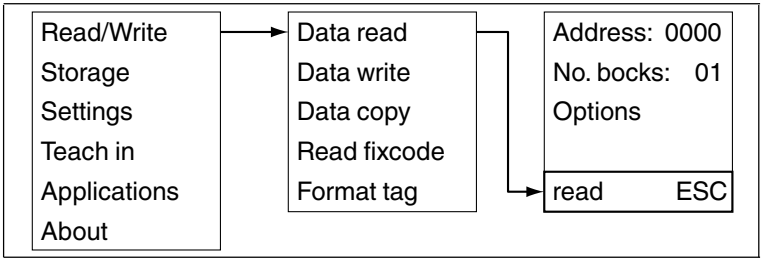
7.1 Teaching In



Once you have connected a read/write head to the handheld, the type of data for the read/write head must be taught in on the handheld. To do so, select the **Teach-in** menu item in the main menu. To start the Teach-in process, press the "Enter" navigation button ( ).

Once the Teach-in process has completed successfully, the data for the connected read/write head appears on the display. If the Teach-in process fails, an error message is displayed. See see chapter 8

7.2 Read Data



Before the handheld can read the data stored on a tag, you must configure the correct **Tag type**. Overview of available settings .

The data that is read is saved on the handheld and/or sent to the PC, depending on the setting configured under **Settings > Send/save** (see chapter 6.4).

If you want to add a time stamp to the data read, go to the **Settings > Time stamp** menu and check the **ON** option.

Address

In the data input field of the **Address** menu entry, you have the option of changing the start address.

Start addresses specify the location of the individual data blocks on data carriers. You can read out specific data blocks and transfer data by changing the start address.

Defining the start address

Define the start address as follows:

1. Select **Address**.
2. Enter the start address using the input buttons.
3. Press the left selection button to confirm your entry ().

If the read operation is successful, the status LED initially flashes yellow before lighting up green. If you selected the buzzer and the vibration alarm in the "Settings" menu, you will hear an audible signal and the handheld will vibrate. The read-in data will then be displayed in the selected data format. If the transmission fails, the status LED flashes briefly red and an error message is output. See see chapter 8

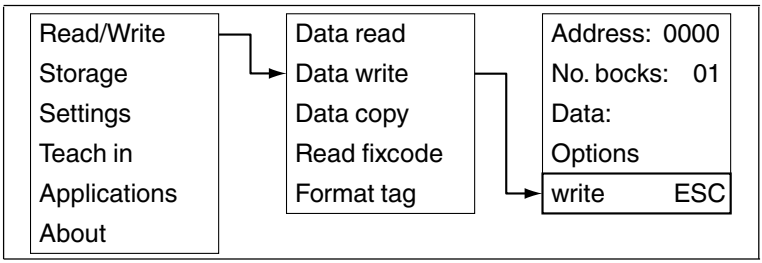
Tip

Additional options see chapter 9.1.1

Note!

All data is displayed in the format chosen in the "Data format" submenu (ASCII, HEX, DEC).

7.3 Write Data



The table below shows you how to input data into the handheld.

Data formats

Data format	Notes	Block quantity (maximum 32)	Format	Example
ASCII	In ASCII format, numbers 0 to 9, letters A to Z and special characters stored in the Handheld are available.	01	xxxx	HAND
		02	xxxx xxxx	HAND HELD
		03	...	

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Data format	Notes	Block quantity (maximum 32)	Format	Example
HEX (hexa-decimal)	In hexadecimal data format, numbers 0 to 9 and letters A to F are available.	01	xx xx xx xx (spaces are not required)	11 22 11 22
		02	xx xx xx xx xx xx xx xx	11 22 11 22 1A 2B 3C 4D
		03	...	
DEC (decimal)	In decimal data format, numbers 0 to 255 are available.	01	xxx xxx xxx xxx (spaces are not required)	111 222 111 222
		02	xxx xxx xxx xxx xxx xxx xxx xxx	111 222 111 222 010 020 030 040
		03	...	

Setting the data format

1. Select **Read/Write > Write data > Options > Data format**.
2. Press the Enter navigation button to select the required data format ().
3. Press the left selection button to confirm your selection ()
4. Press the right selection button to exit the options ().

Transferring data to data carriers

To transfer data to data carriers, proceed as follows:

1. Select **Read/Write > Write data > Data**.

   ↳ One or more data input fields are displayed (the number of data input fields displayed is based on the number of blocks.)
2. Navigate to the individual data input fields using the up navigation button () and the down navigation button ().
3. Enter the required data with the correct syntax for the selected data format using the input buttons.
4. Press the CLEAR input button to delete individual characters (). In principle, you can only delete the character last entered, not individual characters within the string.
5. Press the left selection button to confirm your entry ().

   ↳ If the format of the entered characters differs from the specified data format, a fault message is issued and the value is not adopted.
6. Position the read/write head on the handheld device directly in front of the data carrier.

7. Press the left selection button to write the data to the data carrier ( ).

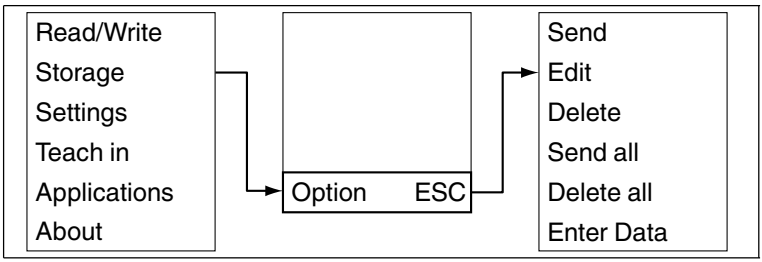
   ↳ If the write operation is successful, OK appears on the display and the status LED flashes green. If you selected the buzzer and the vibration alarm in the Settings menu, you will also hear an acoustic signal and the handheld will vibrate. If the transmission fails, the status LED flashes briefly red and a fault message is output.

Note!

Observe the input format

Data bytes in hexadecimal data format must always contain 2 characters and data bytes in decimal data format must contain 3 characters.

7.4 Editing or Entering Data Manually



Editing data manually

To edit data that has already been read in, proceed as follows:

1. Select **Memory**.
2. Scroll to the required data set using the left navigation button ( ) or the right navigation button ( ).
3. Press the left selection button ( ) to access the options.
4. Select **Modify**.
5. Press the CLEAR button to delete individual characters. In principle, you can only delete the character last entered, not individual characters within the string.
6. Enter the required changes using the input buttons.
7. Press the left selection button to confirm your changes ( ).

   ↳ The value in the memory is modified.

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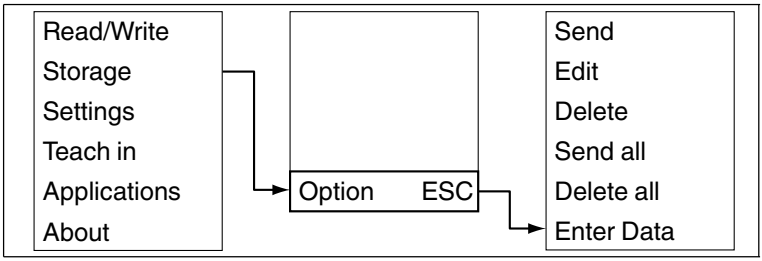
Note!

Observe the input format

Data bytes in hexadecimal data format must always contain 2 characters and data bytes in decimal data format must contain 3 characters.



Entering data manually

Enter a new value as follows:

1. Select **Memory** .
2. Press the left selection button ( ) to access the options.
3. Select **Enter data**.
4. Enter the data set using the input buttons.
5. Press the Enter navigation button to confirm your entry ( ) .

   ↳ The value is stored as a new data set.

Note!

Observe the input format

Data bytes in hexadecimal data format must always contain 2 characters and data bytes in decimal data format must contain 3 characters.

8 Troubleshooting

8.1 Error Message "Unknown System"

Possible Cause	Error Repair
Unknown system	Connect and Teach-in the read/write head for the IDENTControl system.

8.2 "No transponder" fault message

Possible cause	Solution
No transponder in the detection range	Position the handheld device correctly or move transponder into the detection range.
Incorrect transponder type setting	Select the correct transponder type.

8.3 "No connection!" fault message

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Possible cause	Solution
Incorrect interface setting	Select the correct interface and configure correctly.
No interface available	Connect the correct interface cable.

8.4 "No saved data" fault message

Possible cause	Solution
All data sent and "Autom. del." mode selected.	-
No data in memory	Read or enter data manually.

8.5 "No data to copy" fault message

Possible cause	Solution
No data was read in beforehand.	In the "Copy data" menu, you can only copy data that you have just read in. Data in the memory cannot be copied. Read in data in the "Copy data" menu and copy this data directly from the menu.

9 Software description PF_Ident

9.1 Menu **Read/Write**

The **Read/Write** menu offers the following options:

- Read in data from a data carrier. (**Read data**)
- Write data to a data carrier. (**Write data**)
- Read the data from a data carrier and write to other data carriers. (**Copy data**)
- Read the read only code from a data carrier. (**Read fixcode**)
- Overwrite the data from a data carrier. (**Format data carr.**)
- Write a new command file or modify/delete an existing command file. (**Command files**)

Note!

Save power

The read/write head consumes more power when switched on.

The read/write head on the handheld device switches on when you execute a command in the **Read/Write** menu. The green LED indicates that the head is switched on. The read/write head only switches off again when you exit the relevant submenu.

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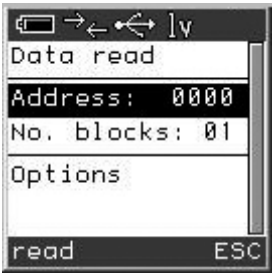
9.1.1 Read/Write > Read data

In this menu, you have the option of reading data stored on a data or code carrier.

Read data menu



Submenu	**Options**
Menu entry	Address Number of blocks

Description of menu entries

Address

In the data input field of the **Address** menu entry, you have the option of changing the start address.

Start addresses specify the location of the individual data blocks on data carriers. You can read out specific data blocks and transfer data by changing the start address.

Defining the start address

Define the start address as follows:

1. Select **Address**.
2. Enter the start address using the input buttons.
3. Press the left selection button to confirm your entry ().

Number of blocks

In the data input field of the **No. blocks** menu entry, you have the option of changing the number of blocks.

The number of blocks determines how many data blocks the Handheld reads from the data carrier and how many data blocks are written to the data carrier. Each address block contains 4 bytes, i.e. in ASCII format, you can enter 4 characters for each block in the data input field of the **Data** menu entry, in hexadecimal data format 8 characters (2 characters each) and in decimal data format 12 characters (3 characters each).

Changing the number of blocks

Change the number of blocks as follows:

1. Select **Number of blocks**.
2. Press the CLEAR input button to delete the current entry (CLEAR).
3. Enter the number of blocks using the input buttons.

Options submenu

Submenu	**Data format** **Assign button**
Menu entry	Copy

Description of menu entries

Copy

You can use the **Copy** menu entry to transfer the data currently being read to the **Data write** menu.

Copy data

Use this option to copy data as follows:

1. Read the data from a data carrier.
2. Press the right selection button after the last read data carrier to exit read mode ( ).
3. Select **Options** > **Copy**.

   ↳ If the copy operation is successful, "Data transferred" appears on the display and the status LED lights up green. If the copy operation fails, a fault message is output. See see chapter 8

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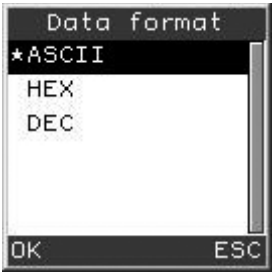
Data format submenu



Submenu	--
Menu entry	ASCII HEX DEC

Description of the submenu

Data format

In the **Data format** submenu, you can define the data format in which the data is read or written.

Description of menu entries

Data formats

Data format	Notes	Format
ASCII	In ASCII format, numbers 0 to 9, letters A to Z and special characters stored in the Handheld are available.	xxxx (per block)
HEX	In hexadecimal data format, numbers 0 to 9 and letters A to F are available.	xx xx xx xx (spaces are not required) (per block)
DEC	In decimal data format, numbers 0 to 255 are available.	xxx xxx xxx xxx (spaces are not required) (per block)

Note!

Changing the data format

Changes to the data format in this menu modify the basic settings **Settings > Data format** of the handheld device. Read and written data adopts the data format selected in this menu.

Assign button submenu

Submenu	--
Menu entry	Left Right Handle

Description of the submenu

Assign button

In the **Assign button** submenu, you can assign the command from the higher level menu to the function buttons on the handheld device and the buttons on the handle.

Caution! The function buttons remain disabled until you exit the **Assign button** submenu.

Description of menu entries

Button	Description
Left	The command from the higher level menu is assigned to the left function button ( ).
Right	The command from the higher level menu is assigned to the right function button ( ).
Handle	The command from the higher level menu is assigned to the function button on the handle.

Information on the Read data function

Read data

When the **Read** option is selected in the selection button function bar, the handheld device executes the **Read data** function via the read/write head. The data stored on a data carrier or code carrier is read and either transferred to the handheld device memory or sent directly to a computer, depending on the setting.

Detailed instructions, see chapter 7.2.

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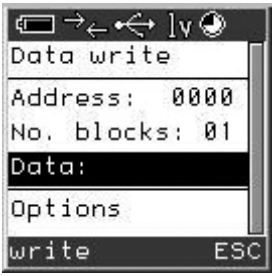
9.1.2 Read/Write > Write data

In this menu, you have the option of writing data to a data carrier.

Write data menu



Submenu	**Options**
Menu entry	Address Number of blocks Data

Description of menu entries

Address

In the data input field of the **Address** menu entry, you have the option of changing the start address.

Start addresses specify the location of the individual data blocks on data carriers. You can read out specific data blocks and transfer data by changing the start address.

Defining the start address

Define the start address as follows:

1. Select **Address**.
2. Enter the start address using the input buttons.
3. Press the left selection button to confirm your entry ().

Number of blocks

In the data input field of the **No. blocks** menu entry, you have the option of changing the number of blocks.

The number of blocks determines how many data blocks the Handheld reads from the data carrier and how many data blocks are written to the data carrier. Each address block contains 4 bytes, i.e. in ASCII format, you can enter 4 characters for each block in the data input field of the **Data** menu entry, in hexadecimal data format 8 characters (2 characters each) and in decimal data format 12 characters (3 characters each).

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Changing the number of blocks

Change the number of blocks as follows:

1. Select **Number of blocks**.
2. Press the CLEAR input button to delete the current entry (CLEAR).
3. Enter the number of blocks using the input buttons.

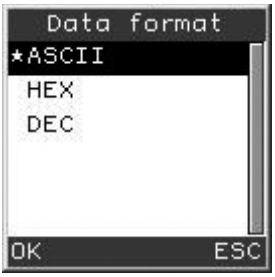
Data

In the data input field of the **Data** menu entry, you have the option of entering data that you wish to write to the data carrier.

Options submenu

Submenu	**Data format** **Assign button**
Menu entry	--

Data format submenu



Submenu	--
Menu entry	ASCII HEX DEC

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Description of the submenu

Data format

In the **Data format** submenu, you can define the data format in which the data is read or written.

Description of menu entries

Data formats

Data format	Notes	Format
ASCII	In ASCII format, numbers 0 to 9, letters A to Z and special characters stored in the Handheld are available.	xxxx (per block)
HEX	In hexadecimal data format, numbers 0 to 9 and letters A to F are available.	xx xx xx xx (spaces are not required) (per block)
DEC	In decimal data format, numbers 0 to 255 are available.	xxx xxx xxx xxx (spaces are not required) (per block)

Note!

Changing the data format

Changes to the data format in this menu modify the basic settings **Settings > Data format** of the handheld device. Read and written data adopts the data format selected in this menu.

Assign button submenu

Submenu	--
Menu entry	Left Right Handle

Description of the submenu

Assign button

In the **Assign button** submenu, you can assign the command from the higher level menu to the function buttons on the handheld device and the buttons on the handle.

Caution! The function buttons remain disabled until you exit the **Assign button** submenu.

Description of menu entries

Button	Description
Left	The command from the higher level menu is assigned to the left function button ().
Right	The command from the higher level menu is assigned to the right function button ().
Handle	The command from the higher level menu is assigned to the function button on the handle.

Information on the Write data function

Writing data

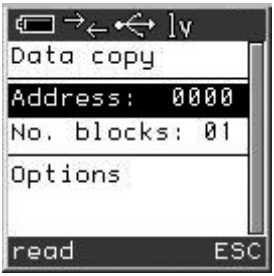
When the **Write** option is selected in the selection button function bar, the left selection button () is assigned the function **Write data** via the read/write head. You can use the left selection button to write data to a data carrier that you entered in the handheld device beforehand.

Detailed instructions, see chapter 7.3.

9.1.3 Read/Write > Copy data

In this menu, you have the option of copying a data set you have just read in to one or more different data carriers.

Copy data menu



Submenu	**Options**
Menu entry	Address Number of blocks

Description of menu entries

Address

In the data input field of the **Address** menu entry, you have the option of changing the start address.

Start addresses specify the location of the individual data blocks on data carriers. You can read out specific data blocks and transfer data by changing the start address.

Defining the start address

Define the start address as follows:

1. Select **Address**.
2. Enter the start address using the input buttons.
3. Press the left selection button to confirm your entry ().

Number of blocks

In the data input field of the **No. blocks** menu entry, you have the option of changing the number of blocks.

The number of blocks determines how many data blocks the Handheld reads from the data carrier and how many data blocks are written to the data carrier. Each address block contains 4 bytes, i.e. in ASCII format, you can enter 4 characters for each block in the data input field of the **Data** menu entry, in hexadecimal data format 8 characters (2 characters each) and in decimal data format 12 characters (3 characters each).

Changing the number of blocks

Change the number of blocks as follows:

1. Select **Number of blocks**.
2. Press the CLEAR input button to delete the current entry (CLEAR).
3. Enter the number of blocks using the input buttons.

Options submenu

Submenu	**Data format**
Menu entry	Copy

Description of menu entries

Copy

You can use the **Copy** menu entry to transfer the data currently being read to the **Data write** menu.

Copy data

Use this option to copy data as follows:

1. Read the data from a data carrier.
2. Press the right selection button after the last read data carrier to exit read mode ( ).
3. Select **Options** > **Copy**.

   ↳ If the copy operation is successful, "Data transferred" appears on the display and the status LED lights up green. If the copy operation fails, a fault message is output. See see chapter 8

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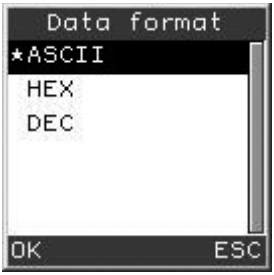
Data format submenu



Submenu	--
Menu entry	ASCII HEX DEC

Description of the submenu

Data format

In the **Data format** submenu, you can define the data format in which the data is read or written.

Description of menu entries

Data formats

Data format	Notes	Format
ASCII	In ASCII format, numbers 0 to 9, letters A to Z and special characters stored in the Handheld are available.	xxxx (per block)
HEX	In hexadecimal data format, numbers 0 to 9 and letters A to F are available.	xx xx xx xx (spaces are not required) (per block)
DEC	In decimal data format, numbers 0 to 255 are available.	xxx xxx xxx xxx (spaces are not required) (per block)

Note!

Changing the data format

Changes to the data format in this menu modify the basic settings **Settings > Data format** of the handheld device. Read and written data adopts the data format selected in this menu.

Information on the Copy data function

Copying data

To copy a data set from one data carrier to another data carrier, proceed as follows:

1. Select **Read/Write > Copy data**.
2. Position the read/write head on the handheld device directly in front of the data carrier that you wish to copy the data set from.
3. Press the left selection button ( ).

   ↳ The data set appears on the display.
4. Then position the read/write head on the handheld device directly in front of the data carrier to which you wish to copy the data set.
5. Press the right selection button ( ).

   ↳ "OK" appears on the display.
6. Press the CLEAR input button to exit the function (CLEAR).

9.1.4 Read/Write > Read fixcode

In this menu, you have the option of reading the read only code on a data carrier.

Read fixcode menu

Submenu	**Options**
Menu entry	--

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Options submenu

Submenu	**Data format** **Assign button**
Menu entry	--

Data format submenu

Submenu	--
Menu entry	ASCII HEX DEC

Description of the submenu

Data format

In the **Data format** submenu, you can define the data format in which the data is read or written.

Description of menu entries

Data formats

Data format	Notes	Format
ASCII	In ASCII format, numbers 0 to 9, letters A to Z and special characters stored in the Handheld are available.	xxxx (per block)
HEX	In hexadecimal data format, numbers 0 to 9 and letters A to F are available.	xx xx xx xx (spaces are not required) (per block)
DEC	In decimal data format, numbers 0 to 255 are available.	xxx xxx xxx xxx (spaces are not required) (per block)

Note!

Changing the data format

Changes to the data format in this menu modify the basic settings **Settings > Data format** of the handheld device. Read and written data adopts the data format selected in this menu.

Assign button submenu

Submenu	--
Menu entry	Left Right Handle

Description of the submenu

Assign button

In the **Assign button** submenu, you can assign the command from the higher level menu to the function buttons on the handheld device and the buttons on the handle.

Caution! The function buttons remain disabled until you exit the **Assign button** submenu.

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Description of menu entries

Button	Description
Left	The command from the higher level menu is assigned to the left function button ().
Right	The command from the higher level menu is assigned to the right function button ().
Handle	The command from the higher level menu is assigned to the function button on the handle.

Information on the Read fixcode function

Reading a read only code

To read the read only code from a data carrier, proceed as follows:

1. Select **Read/Write > Read fixcode**.
2. Position the read/write head on the handheld device directly in front of the data carrier.
3. Press the left selection button ().

   ↳ If the read operation is successful, the status LED will initially flash yellow before switching to a steady green. If you selected the buzzer and the vibration alarm in the Settings menu, you will also hear an acoustic signal and the handheld will vibrate. The read-in data will then be displayed in the selected format. If the transmission fails, the status LED flashes briefly red and a fault message is output. See see chapter 8
4. Press the right selection button to exit the function ().

9.1.5 Read/Write > Format data car.

In this menu, you have the option of formatting or deleting the complete data carrier by overwriting it with a self-defined character string.

Format data carr. menu

Submenu	**Options**
Menu entry	Data

Description of menu entries

Data

In the **Data** field, you can enter the byte (length = 1 byte) that you wish to write to the data carrier.

Options submenu

Submenu	**Data format** **Assign button**
Menu entry	--

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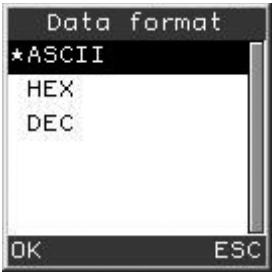
Data format submenu



Submenu	--
Menu entry	ASCII HEX DEC

Description of the submenu

Data format

In the **Data format** submenu, you can define the data format in which the data is read or written.

Description of menu entries

Data formats for the "Overwrite data carrier" function

Data format	Notes	Format
ASCII	Numbers 0 to 9, letters A to Z and special characters stored in the handheld device are available in ASCII format.	x ASCII characters that cannot be displayed: /DEC (e.g., "/013" for CR)
HEX	Numbers 0 to 9 and letters A to F are available in hexadecimal data format.	xx (Spaces are not essential)
DEC	Numbers 0 to 255 are available in decimal data format.	xxx (Spaces are not essential)

Note!

Changing the data format

Changes to the data format in this menu modify the basic settings **Settings > Data format** of the handheld device. Read and written data adopts the data format selected in this menu.

Assign button submenu

Submenu	--
Menu entry	Left Right Handle

Description of the submenu

Assign button

In the **Assign button** submenu, you can assign the command from the higher level menu to the function buttons on the handheld device and the buttons on the handle.

Caution! The function buttons remain disabled until you exit the **Assign button** submenu.

Description of menu entries

Button	Description
Left	The command from the higher level menu is assigned to the left function button ( ).
Right	The command from the higher level menu is assigned to the right function button ( ).
Handle	The command from the higher level menu is assigned to the function button on the handle.

Information on the Overwrite data carrier function

Overwriting data carriers

1. Select **Read/Write > Overwrite data carrier > Data**.
2. Press the CLEAR input button to delete individual characters (CLEAR). In principle, you can only delete the character last entered, not individual characters within the string.

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3. Enter the value with which you wish to overwrite the data carrier using the input buttons. Make sure the correct data format is selected.
4. Press the left selection button to confirm the entry ( ).

   ↳ If the format of the entered characters differs from the specified data format, a fault message is issued. The value is not adopted.
5. Position the read/write head on the handheld device directly in front of the data carrier.
6. Press the left selection button ( ).

If the read operation is successful, "OK" appears on the display and the status LED flashes green. If you selected the buzzer and the vibration alarm in the Settings menu, you will also hear an acoustic signal and the handheld will vibrate. The read-in data will then be displayed in the selected format. If the transmission fails, the status LED flashes briefly red and a fault message is output. See see chapter 8

9.1.6 IP* Read/Write Heads

Operating frequency: 125 kHz.

Read/Write > Write fixcode

In this menu, you have the option of writing a fix code to the writable area of data carrier types 11 and 14.

Write fixcode menu

Submenu	**Options**
Menu entry	Fix type Data

Description of menu entries

Fix type

In the data input field of the **Fix type** menu entry, you have the option of determining whether the fix code written to the data carrier can be modified or overwritten.

Permanent fix code	"02"
Rewritable fix code	Data carrier type, e.g. "11" for IPC11

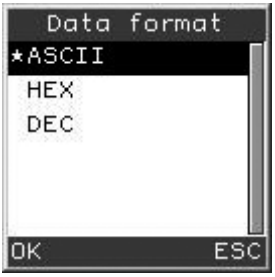
Data

In the **Data** field, you have the option of entering data that you wish to write to the data carrier.

Options submenu

Submenu	**Data format** **Assign button**
Menu entry	--

Data format submenu



Submenu	--
Menu entry	ASCII HEX DEC

Description of the submenu

Data format

In the **Data format** submenu, you can define the data format in which the data is read or written.

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Description of menu entries

Data formats for the fixcode

Data format	Notes	Format
ASCII	In ASCII format, numbers 0 to 9, letters A to Z and special characters stored in the handheld are available.	xxxxx
HEX	In hexadecimal data format, numbers 0 to 9 and letters A to F are available.	xx xx xx xx xx (spaces are not required)
DEC	In decimal data format, numbers 0 to 255 are available.	xxx xxx xxx xxx xxx (spaces are not required)

Note!

Changing the data format

Changes to the data format in this menu modify the basic settings **Settings > Data format** of the handheld device. Read and written data adopts the data format selected in this menu.

Assign button submenu

Submenu	--
Menu entry	Left Right Handle

Description of the submenu

Assign button

In the **Assign button** submenu, you can assign the command from the higher level menu to the function buttons on the handheld device and the buttons on the handle.

Caution! The function buttons remain disabled until you exit the **Assign button** submenu.

Description of menu entries

Button	Description
Left	The command from the higher level menu is assigned to the left function button ().
Right	The command from the higher level menu is assigned to the right function button ().
Handle	The command from the higher level menu is assigned to the function button on the handle.

Instructions on Write fixcode function

Write fixcode

Write a fixcode to a data carrier as follows:

1. Select **Read/Write > Write fixcode > Fix type**.
2. Press the CLEAR input key () to delete the default value.
3. Depending on whether you wish to set a variable or rewritable fixcode, enter the relevant value using the input keys. See see "Fix type" on page 55
4. Press the left softkey () to confirm your entry.
5. Select **Data**.
6. Enter the relevant data in the correct syntax for the data format selected using the input keys. The length of the fixcode is 5 bytes.
7. Press the left softkey () to confirm the entry.

   ↳ If the character entered does not correspond with the syntax of the data format, a fault indication is issued and the value is not accepted.
8. Position the read/write head on the Handheld directly beside the data carrier.
9. Press the left softkey () to confirm the entry.

If the write process is successful, "OK" appears on the display and the status LED flashes green. If you have activated the buzzer and the vibration alarm in the **Settings** menu, an acoustic signal sounds and the Handheld vibrates. If the transfer was unsuccessful, the status LED briefly flashes red and a fault indication is issued. See see chapter 8

Note!

Observe the input format

Data bytes in hexadecimal data format must always contain 2 characters and data bytes in decimal data format must contain 3 characters.

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Read/Write > Read Register

In the **Read register** menu, you have the option of reading specific configuration areas on the read/write tag.

For further information on configuring IPC03 read/write tags, see chapter 10.5.

Read register menu

Submenu	**Protection** **Control**
Menu entry	--

Protection submenu

Submenu	**Options**
Menu entry	Read protect (start/end) Write protect (start/end)

Description of Menu Entries

Read Protection

The start and end address configured for the read-protected data point is displayed in the **Read protection** menu entry.

Write protect

In the **Write protection** menu entry, you can view the start and end address for the write-protected data area.

Note!

The data points can be read out or written only when password mode is activated and the correct password is sent.

Options submenu

Submenu	**apply to key**
Menu entry	--

Assign button submenu

Submenu	--
Menu entry	Left Right Handle

Description of the Submenu

Assign button

In the **Assign button** submenu, you can assign the command from the higher level menu to the function buttons on the handheld device and the buttons on the handle.

Caution! The function buttons remain disabled until you exit the **Assign button** submenu.

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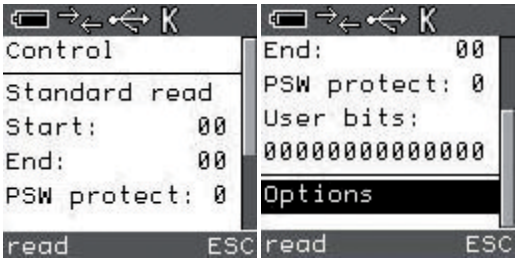
Description of Menu Entries

Button	Description
Left	The command from the higher level menu is assigned to the left function button ( ).
Right	The command from the higher level menu is assigned to the right function button ( ).
Handle	The command from the higher level menu is assigned to the function button on the handle.

Control submenu



Submenu	**Options**
Menu entry	Standard read (start/end) PSW protect User bits

Description of Menu Entries

Standard read

In the **Standard read** menu entry, you can view the start and end address settings for the reading area.

Password protect

In the data input field of the **Password protect** menu entry, you can see whether password mode has been activated or deactivated.

User bits

In the data input field of the **User bits** menu entry, you can view the entered user information.

Options submenu

Submenu	**apply to key**
Menu entry	--

Assign button submenu

Submenu	--
Menu entry	Left Right Handle

Description of the Submenu

Assign button

In the **Assign button** submenu, you can assign the command from the higher level menu to the function buttons on the handheld device and the buttons on the handle.

Caution! The function buttons remain disabled until you exit the **Assign button** submenu.

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Description of Menu Entries

Button	Description
Left	The command from the higher level menu is assigned to the left function button ( ).
Right	The command from the higher level menu is assigned to the right function button ( ).
Handle	The command from the higher level menu is assigned to the function button on the handle.

Read/Write > Write Register

In the **Write register** menu, you have the option of writing specific configuration areas on the read/write tag.

For further information on configuring IPC03 read/write tags, see see chapter 10.5.

Write register menu

Submenu	**Protection** **Control**
Menu entry	Password

Description of the Submenu

Password

In the data input fields of the **Password** menu entry, you have the option of changing an existing password.

Protection submenu

Submenu	**Options**
Menu entry	Read protect (start/end) Write protect (start/end)

Description of Menu Entries

Read protect

In the **Read protect** menu entry, you have the option of setting the start and end areas (in bits) for read protection in the file entry fields.

Write protect

In the data input fields in the **Write protect** menu entry, you have the option of defining the start and end address of the write-protected data area.

Options submenu

Submenu	**apply to key**
Menu entry	--

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Assign button submenu

Submenu	--
Menu entry	Left Right Handle

Description of the Submenu

Assign button

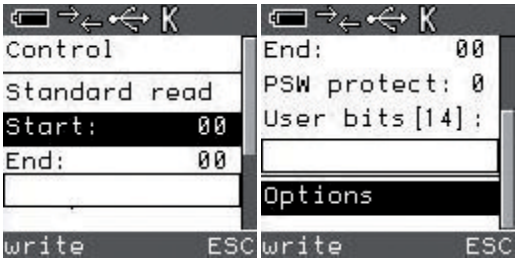
In the **Assign button** submenu, you can assign the command from the higher level menu to the function buttons on the handheld device and the buttons on the handle.

Caution! The function buttons remain disabled until you exit the **Assign button** submenu.

Description of Menu Entries

Button	Description
Left	The command from the higher level menu is assigned to the left function button ( ).
Right	The command from the higher level menu is assigned to the right function button ( ).
Handle	The command from the higher level menu is assigned to the function button on the handle.

Control submenu



Submenu	**Options**
Menu entry	Standard read (starts/end) PSW protect User bits

Description of Menu Entries

Standard read

In the data input fields in the **Standard read** menu entry, you have the option of defining the start and end address of the data area you wish to read.

Password protect

If password protection is deactivated, data can be written to all data words located outside of the write-protected area. If you wish to write to a word in this area, the "word protection" setting must be modified accordingly. If password protection is activated, data can be written to all data words located outside of the write-protected area on the condition that the correct password is set and password mode is activated.

If password protection is deactivated, all data words can be read. If password protection is activated, the read-protected area is active, i.e. this area can only be read if the correct password was set using the "Password set" command and password mode was activated using the "Password mode" command. If the read-protected area is read when password mode is deactivated, the data is set to "0 x 000".

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Options submenu

Submenu	**apply to key**
Menu entry	--

Assign button submenu

Submenu	--
Menu entry	Left Right Handle

Description of the Submenu

Assign button

In the **Assign button** submenu, you can assign the command from the higher level menu to the function buttons on the handheld device and the buttons on the handle.

Caution! The function buttons remain disabled until you exit the **Assign button** submenu.

Description of Menu Entries

Button	Description
Left	The command from the higher level menu is assigned to the left function button ().
Right	The command from the higher level menu is assigned to the right function button ().
Handle	The command from the higher level menu is assigned to the function button on the handle.

9.1.7 IS* Read/Write Heads

Operating frequency: 250 kHz.

Read/Write > Make ICC

In this menu, you have the option of programming IDC-...-1K read/write tags to behave like ICC read-only tags.

Make ICC

The read-only tags used with the inductive read-only system are assigned a unique code during the manufacturing process. The manufacturer guarantees that each code number is assigned only once. This approach is necessary in security-related applications that require protection against forgery. Protecting against forgery is not an issue in other applications. However, read-only tags with the same code are required to replace defective read-only tags without having to change the control software. In some applications, the control process is simplified when several identical codes are used. In such applications, it must be possible for the read-only tags and the read/write tags to be interchanged. This means that a read command is used that reads both the read-only tags and the read/write tags. In the read/write system, separate commands exist for reading read-only tags and read/write tags. When a read command for read/write tags is executed, read-only tags are not read, and vice versa.

Make ICC menu

Submenu	**Options**
Menu entry	Data

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Description of Menu Entries

Data

In the data input field of the **Data** menu entry, you have the option of entering data that you wish to write to the data carrier.

Options submenu

Submenu	**Data format** **Assign button**
Menu entry	--

Assign button submenu

Submenu	--
Menu entry	Left Right Handle

Description of the Submenu

Assign button

In the **Assign button** submenu, you can assign the command from the higher level menu to the function buttons on the handheld device and the buttons on the handle.

Caution! The function buttons remain disabled until you exit the **Assign button** submenu.

Description of Menu Entries

Button	Description
Left	The command from the higher level menu is assigned to the left function button ().
Right	The command from the higher level menu is assigned to the right function button ().
Handle	The command from the higher level menu is assigned to the function button on the handle.

Information on the "Make ICC" Function

Programming Read/Write Tags

To program the read/write tag to behave like a read-only tag, proceed as follows:

1. Select **Read/Write > Make ICC > Data**.
2. The length of the data to be entered is 7 bytes. Use the input buttons to enter the first three characters in hexadecimal format. Enter the last four digits in decimal format. Also use this data format when a different format is selected in the **Data format** submenu.
3. Position the read/write head on the handheld device directly in front of the read/write tag.
4. To program the read/write tag, press the left soft key ().

   ↳ If the format of the characters entered differs from the specified data format, an error message is issued and the value is not adopted.

If the write operation is successful, "OK" appears on the display and the status LED flashes green. If you selected the buzzer and the vibration alarm in the "Settings" menu, you will hear an audible signal and the handheld will vibrate. The read-in data will then be displayed in the selected data format. If the transmission fails, the status LED flashes briefly red and an error message is output. See see chapter 8

Read/Write > Read spec. fix

In this menu, you have the option of reading the special fixcode for a data carrier.

Special fixcode

Type IDC ... 1K data carriers can be programmed to read 24-bit information (the so-called "special fixcode") extremely quickly. This feature is useful for identifying containers in fully automatic storage facilities, for example.

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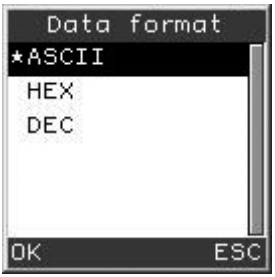
Read spec. fix menu

Submenu	**Options**
Menu entry	--

Options submenu

Submenu	**Data format** **Assign button**
Menu entry	--

Data format submenu



Submenu	--
Menu entry	ASCII HEX DEC

Description of the submenu

Data format

In the **Data format** submenu, you can define the data format in which the data is read or written.

Description of menu entries

Data formats for the special fixcode

Data format	Notes	Format
ASCII	In ASCII format, numbers 0 to 9, letters A to Z and special characters stored in the Handheld are available.	xxxxxx (per block)
HEX	In hexadecimal data format, numbers 0 to 9 and letters A to F are available.	xx xx xx xx xx xx (spaces are not required) (per block)
DEC	In decimal data format, numbers 0 to 255 are available.	xxx xxx xxx xxx xxx xxx (spaces are not required) (per block)

Note!

Changing the data format

Changes to the data format in this menu modify the basic settings **Settings > Data format** of the handheld device. Read and written data adopts the data format selected in this menu.

Assign button submenu

Submenu	--
Menu entry	Left Right Handle

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Description of the submenu

Assign button

In the **Assign button** submenu, you can assign the command from the higher level menu to the function buttons on the handheld device and the buttons on the handle.

Caution! The function buttons remain disabled until you exit the **Assign button** submenu.

Description of menu entries

Button	Description
Left	The command from the higher level menu is assigned to the left function button ().
Right	The command from the higher level menu is assigned to the right function button ().
Handle	The command from the higher level menu is assigned to the function button on the handle.

Instructions on Read spec. fix function

Read special fixcode

Read the special fixcode of a data carrier as follows:

1. Select **Read/Write > Read spec. fix**.
2. Position the read/write head on the Handheld directly beside the data carrier.
3. Press the left softkey () to read the special fixcode.

   ↳ If the read process is successful, the status LED lights up yellow and then green. If you have activated the buzzer and the vibration alarm in the Settings menu, an acoustic signal sounds and the Handheld vibrates. The read data is then displayed in line with the selected data format. If the transfer was unsuccessful, the status LED briefly flashes red and a fault indication is issued. See see chapter 8

Read/Write > Single Program Special Fix Code

In this menu, you have the option of writing a special read-only code to a read/write tag.

Special fixcode

Type IDC ... 1K data carriers can be programmed to read 24-bit information (the so-called "special fixcode") extremely quickly. This feature is useful for identifying containers in fully automatic storage facilities, for example.

Write spec. fix menu

Submenu	**Options**
Menu entry	Data

Description of Menu Entries

Data

In the **Data** field, you have the option of entering the data that you wish to write to the read/write tag.

Options submenu

Submenu	**Data format** **Assign button**
Menu entry	--

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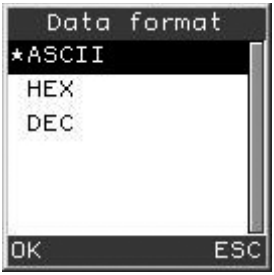
Data format submenu



Submenu	--
Menu entry	ASCII HEX DEC

Description of the Submenu

Data format

In the **Data format** submenu, you can define the data format in which the data is read or written.

Description of Menu Entries

Data formats for the special fixcode

Data format	Notes	Format
ASCII	In ASCII format, numbers 0 to 9, letters A to Z and special characters stored in the Handheld are available.	xxxxxx (per block)
HEX	In hexadecimal data format, numbers 0 to 9 and letters A to F are available.	xx xx xx xx xx xx (spaces are not required) (per block)
DEC	In decimal data format, numbers 0 to 255 are available.	xxx xxx xxx xxx xxx xxx (spaces are not required) (per block)

Note!

Changing the data format

Changes to the data format in this menu modify the basic settings **Settings > Data format** of the handheld device. Read and written data adopts the data format selected in this menu.

Assign button submenu

Submenu	--
Menu entry	Left Right Handle

Description of the Submenu

Assign button

In the **Assign button** submenu, you can assign the command from the higher level menu to the function buttons on the handheld device and the buttons on the handle.

Caution! The function buttons remain disabled until you exit the **Assign button** submenu.

Description of Menu Entries

Button	Description
Left	The command from the higher level menu is assigned to the left function button ( ).
Right	The command from the higher level menu is assigned to the right function button ( ).
Handle	The command from the higher level menu is assigned to the function button on the handle.

Information on the "Single Program Special Fix Code" Function

Single Program Special Fix Code

To write a special read-only code to a read/write tag, proceed as follows:

1. Select **Read/Write > Single program special fix code > Data**.
2. Use the input buttons to enter the required data in the correct syntax for the selected data format. The length of the data to be entered is 6 bytes.

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3. To confirm the entry, press the left soft key ().

   ↳ If the format of the characters entered differs from the specified data format, an error message is issued and the value is not adopted.

4. Position the read/write head on the handheld device directly in front of the read/write tag.

5. To write the special read-only code to the read/write tag, press the left soft key ().

If the write operation is successful, "OK" appears on the display and the status LED flashes green. If you selected the buzzer and the vibration alarm in the "Settings" menu, you will hear an audible signal and the handheld will vibrate. The read-in data will then be displayed in the selected data format. If the transmission fails, the status LED flashes briefly red and an error message is output. See see chapter 8

Note!

Once an IDC-...-1K read/write tag is assigned with a special read-only code, the read/write tag is locked. If you wish to write to the read/write tag again using standard commands, the **Initialize data carrier** command must be used to unlock the tag.

Note!

Observe the input format

Data bytes in hexadecimal data format must always contain 2 characters and data bytes in decimal data format must contain 3 characters.

Read/Write > Initialise tag

In this menu, you have the option of resetting the attribute bit of the data carrier. This function also lifts the block for conventional writing and reading of type IDC-...-1K data carriers that were set with a special fixcode.

Initialise tag menu

Submenu	**Options**
Menu entry	--

Description of menu entries

Options submenu

Submenu	**Data format** **Assign button**
Menu entry	--

Data format submenu

Submenu	--
Menu entry	ASCII HEX DEC

Description of the submenu

Data format

In the **Data format** submenu, you can define the data format in which the data is read or written.

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Assign button submenu

Submenu	--
Menu entry	Left Right Handle

Description of the submenu

Assign button

In the **Assign button** submenu, you can assign the command from the higher level menu to the function buttons on the handheld device and the buttons on the handle.

Caution! The function buttons remain disabled until you exit the **Assign button** submenu.

Description of menu entries

Button	Description
Left	The command from the higher level menu is assigned to the left function button ( ).
Right	The command from the higher level menu is assigned to the right function button ( ).
Handle	The command from the higher level menu is assigned to the function button on the handle.

Instructions on Init. tag function

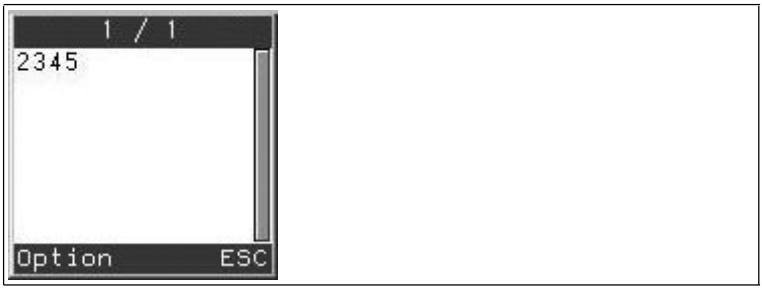
Resetting the attribute bit of a data carrier

Reset the attribute bit of a data carrier as follows:

1. Select **Read/Write > Initialise tag**.
2. Position the read/write head on the Handheld directly beside the data carrier.

3. Press the left softkey ( ) to reset the attribute bit of the data carrier.

9.2 Menu **Memory**



All data sets that you have read in are stored in the **Memory** menu. The **Memory** menu offers the following options:

- Browsing through stored data sets.
- Sending individual/all data sets.
- Editing data sets.
- Deleting individual/all data sets.
- Entering new data sets.

Selecting data sets

The number of stored data sets appears in the symbol bar on the display (current data set/total data sets).

1. Press the left navigation button ( ) or the right navigation button ( ) to scroll through the list of stored data sets.
2. Press the left selection button to access the options ( ).

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9.2.1 Memory > Options

In this menu, you have the option of sending, modifying, deleting or entering data manually.

Options

Submenu	--
Menu entry	Send Modify Delete Send all Delete all Input data

Description of menu entries

Send

This command gives you the option of sending the data record currently selected to the computer via the preset interface.

Sending data sets

In order to send a data set to the computer via a preset interface, you must select an interface beforehand in the **Settings > Interface** menu. Connect the handheld device to the computer using the interface cable.

1. Press the left navigation button ( ) or the right navigation button ( ) to access the required data set.
2. Press the left selection button ( ) to access the options.
3. Select the option **Send**.

   ↳ If the transfer process is successful, "#[Data set number] sent" appears in the status bar on the display.
4. Press the left navigation button ( ) or the right navigation button ( ) to access another data set.

5. Press the right selection button to exit the **Memory** menu ().

Edit

This command gives you the option of modifying the data record currently selected.

Note!

Observe the input format

Data bytes in hexadecimal data format must always contain 2 characters and data bytes in decimal data format must contain 3 characters.

Modifying data sets

Modify a data set as follows:

1. Press the left navigation button () or the right navigation button () to access the required data set.
2. Press the left selection button () to access the options.
3. Select **Modify**.
4. Press the CLEAR input button to delete individual characters (). In principle, you can only delete the character last entered, not individual characters within the string.
5. Enter the required data with the correct syntax for the selected data format using the input buttons.
6. Press the left selection button to confirm your selection ().
7. Press the right selection button to exit the Memory menu ().

Delete

This command gives you the option of deleting the data record currently selected.

Deleting data sets

Delete a data set as follows:

1. Press the left navigation button () or the right navigation button () to access the required data set.
2. Press the left selection button () to access the options.
3. Select **Delete**.

   ↳ If the delete operation is successful, a confirmation message does not appear on the display. The total number of data sets in the status line on the display decreases by one.

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4. Press the left navigation button () or the right navigation button () to access another data set.

5. Press the right selection button to exit the Memory menu ().

Send all

This command gives you the option of sending all data sets to the computer via the preset interface.

Sending all data

To send all data, proceed as follows:

1. Press the left selection button () to access the options.
2. Select **Send all**.

   ↳ The data sets are displayed and sent in extremely quick succession.

3. Press the right selection button to exit the Memory menu ().

Delete all

This command gives you the option of deleting all data sets.

Deleting all data

To delete all data sets, proceed as follows:

1. Press the left selection button () to access the options.
2. Select **Delete all**.

   ↳ "Delete all data?" appears on the display.

3. Press the left selection button to confirm the prompt ().

   ↳ "No saved data" appears on the display.

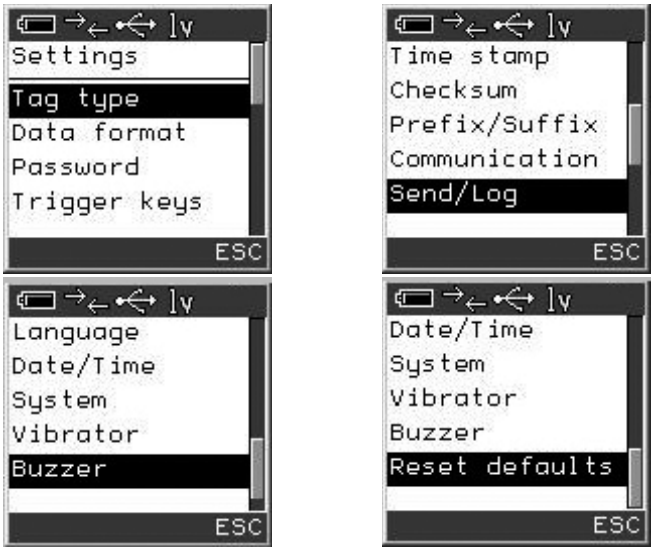
4. Press the right selection button to exit the Memory menu ().

Input data

This command gives you the option of entering additional data manually.

Detailed instructions, see chapter 7.4

9.3 Menu **Settings**



You can configure the following basic settings in the **Settings** menu.

- Change the transponder type.
- Change the data format.
- Activate or deactivate password mode (IP* read/write heads only, operating frequency 125 kHz)
- Assign functions to the function buttons on the handheld device and handle (= trigger buttons).
- Switch the time stamp on and off.
- Select the interface.
- Define the send/memory options.
- Select the menu language.
- Set the date/time.
- Configure the display settings.
- Set the vibration alarm.
- Adjust the buzzer volume.
- Restore the default settings.

Tip

Press the left soft key to permanently adopt the settings when exiting a submenu

( ).

Press the right soft key to discard the settings when exiting a submenu

( ).

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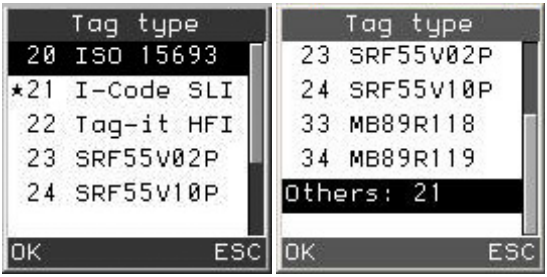
9.3.1 Settings > Tag Type

In the **Tag type** menu, you have the option of selecting the tag type in use. The corresponding tag types become available for selection, depending on the operating frequency of the read/write head connected. In the example menu screenshots below, the process for selecting 13.56 MHz is described. All other tag types are shown in the tables that follow.

Transponder type menu



Submenu	--
Menu entry	ISO 15693 I-Code SLI Tag-it HFI SRF55V02P SRF55V10P MB89R118 MB89R119 Other

Description of Menu Entries

Tag types 125 kHz

Tag type	Chip type	Details	Desig-nation P+F	Access	Bit	Fix code length
02	EM4102	Unique, EM Microelectronic	IPC02	Fix code	40	5
03	EM4450	Titan, EM Microelectronic	IPC03	R/W fix code	928 32	 4
11	Q5	Sokymat	IPC11	R/W	40	-
12	FRAM	P+F	IPC12	R/W fix code	64k 32	 4
14	AT5557	Atmel	IPC14	R/W	40	-
Other:						

Selecting the entry **Other** gives you the option of entering a tag type manually. All tag types from 00 to 99 can be entered.

Tag types 250 kHz

Tag type	Chip type	Designation P+F	Access	Bit	Fix code length
50	P+F	IDC-...1K	R/W fix code	1K 32	4
52	P+F	ICC ...	Fix code	28	7
Other:					

Selecting the entry **Other** gives you the option of entering a tag type manually. All tag types from 00 to 99 can be entered.

13.56 MHz transponder types

Tag type	Chip type	Details	Desig-nation P+F	Access	Bit	Block address [HEX]
20	Conforms with ISO 15693	All ISO compliant data carriers	1)	RW read only code	- 64	- -
21	I-Code SLI	Philips	IQC21	RW read only code	896 64	0...1B -
22	Tag-it HF-I	'Plus' from Texas Instruments	IQC22	R/W read only code	2k 64	0...3F -
23	SRF55V02 P	my-D from Infinion	IQC23	R/W read only code	2k 64	0...38 -
24	SRF55V10 P	my-D from Infinion	IQC24	R/W read only code	10k 64	0...F7 -
33	MB89R118	LSI FerVID from Fujitsu	IQC33	R/W read only code	2k 48	0...F9 FA...FF
34	MB89R119	LSI FerVID from Fujitsu	IQC34	R/W read only code	232 24	0...39 3A...3F
Other:						

Table 9.1 13.56 MHz transponder types

1) This transponder type is used to read the UID (read only code) of all Pepperl+Fuchs supported transponders compliant with ISO 15693.

If you select the entry **Other** , you can enter a transponder type manually. Transponder types 00 to 99 are available.

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Selecting the transponder type

1. Select **Settings > Transponder type**.
2. Press the Enter navigation button to activate the required transponder type ( ).

   ↳ An asterisk appears in front of the activated menu entry.
3. Press the left selection button to confirm your selection ( ).
4. Press the right selection button to exit the menu without selecting a transponder type ( ).

9.3.2 Settings > Data format

In the **Data format** submenu, you can specify whether to read and write the data in ASCII, hexadecimal or decimal format.

Data format submenu

Submenu	--
Menu entry	ASCII HEX DEC

Description of menu entries

Data formats

Data format	Notes
ASCII	In ASCII format, numbers 0 to 9, letters A to Z and special characters stored in the Handheld are available.
HEX	In hexadecimal data format, numbers 0 to 9 and letters A to F are available.
DEC	In decimal data format, numbers 0 to 255 are available.

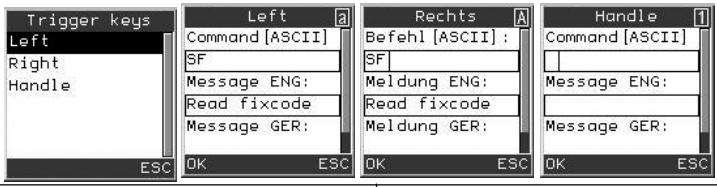
Note!

You can access this menu at any time by pressing the right and left function buttons simultaneously.

9.3.3 Settings > Trigger buttons

In the **Trigger buttons** submenu, you have the option of assigning commands to the function buttons on the handheld device and the buttons on the handle. Overview of available commands see chapter 10.4.1

Trigger buttons menu



Submenu	Command [ASCII] Command [ASCII] Command [ASCII]
Menu entry	Left Right Handle

Description of menu entries

Button	Description
Left	The command entered in the data input field is assigned to the left function button ( ). **When the left function button is pressed, GER or ENG appears depending on the preset menu language.**
Right	The command entered in the data input field is assigned to the right function button ( ). **When the right function button is pressed, GER or ENG appears depending on the preset menu language.**
Handle	The command entered in the data input field is assigned to the function button on the handle. **When the function button on the handle is pressed, GER or ENG appears depending on the preset menu language.**

Caution! The function buttons are disabled as soon as you open the **Settings** menu.

9.3.4 Settings > Time stamp

In the **Time stamp** menu, you can switch the time stamp on and off. The current date and time are allocated automatically to the read data sets in the format YYYY-MM-DD HH:MM:SS either before the save process or before the data sets are sent automatically to the computer.

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Note!

Correct time stamp

Set the current date and time under **Settings > Date/time** to generate a correct time stamp.

Time stamp menu

Submenu	--
Menu entry	On Off

9.3.5 Settings > Check sum

In the **Check sum** you can specify a check sum for the data to be transferred. This check sum is inserted in front of the suffix character. You can use the check sum to verify whether the data was transferred without error.

Check sum menu

Submenu	--
Menu entry	On Off

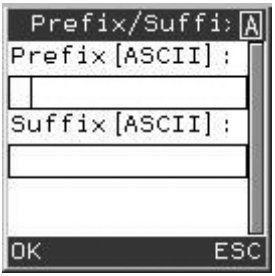
9.3.6 Settings > Prefix/suffix

In the **Prefix/suffix** menu, you can attach a suffix to the data (after the time stamp) or place a prefix in front of the data prior to transfer. Single characters or character strings can be added (in ASCII format). You can enter special characters in ASCII format via `\ddd` . `d` is replaced by the decimal number of the special character, ä for example corresponds to `\228`.

Note!

ASCII table see chapter 11

Prefix/suffix menu



Submenu	--
Menu entry	Prefix Suffix

9.3.7 Settings > Interface

In the **Interface** submenu, you can configure the interfaces and their parameters.

Interface menu

Submenu	**RS 232** **PS2** **USB** **Bluetooth** **Options**
Menu entry	--

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Description of menu entries

You can configure these parameters for the individual interfaces in different operating modes:

Interface and operating modes	Description
RS 232	
Baud	Specify the required baud rate here. Select from the following values: ■ 1200 ■ 2400 ■ 4800 ■ 9600 ■ 19200 ■ 38400 ■ 57600 ■ 115200
Data bits	Specify the required number of data bits here. Select from the following values: ■ 7 ■ 8
Stop bits	Specify the required number of stop bits here. Select from the following values: ■ 1 ■ 2
Parity	Specify the required parity here. Select from the following values: ■ none ■ odd ■ even
ACK	Select the signal for confirming a data transfer here (ACKnowledgement). Select from the following values: ■ 1way ■ 2way
PS2	
-	-
USB	
Keyboard	In **Keyboard** mode, data is sent from the reader to the control interface, where it is evaluated. During the transfer process, the handheld device behaves as if a USB keyboard were being used to input data.
Downloader	**Downloader** mode is used to transfer unformatted, unpacked data via the USB interface. This mode is used to upgrade the software on the handheld device.
Native 2way	**Native 2way** mode is used to establish two-way communication between the handheld device and the application via the USB interface. This mode uses a handshake protocol. Software that understands this protocol must be installed on the PC.

Interface and operating modes	Description
VCOM 1way	**VCOM 1way** mode is used to address the handheld device via the USB in the same way as a serial interface. A V-Com driver must be installed on the PC.
Bluetooth	
1way range	One-way communication from the handheld device to the computer. This operating mode enables a larger sensing range but with a lower degree of reliability. Only use this operating mode if you intend to use the handheld device within a specific sensing range or connect the handheld device to a device without an operating system (e.g., printer). Even though the connection is stable, one-way communication may result in a loss of data.
1way reliab.	One-way communication from the handheld device to the control interface. This operating mode offers a higher degree of reliability but a smaller sensing range. Only use this operating mode if you intend to use the handheld device within a specific sensing range or connect the handheld device to a device without an operating system (e.g., printer). Even though the connection is stable, one-way communication may result in a loss of data.
2way	Two-way communication between the handheld device and the control interface. The data is transferred in packets using the protocol, which guarantees the reliability of the transfer because the handheld device always waits for a response from the control interface before deleting data from the internal memory. If necessary, the data is transferred again automatically. In addition, the two devices continually check whether the connection with the respective end device still exists (end-to-end handshake). Pepperl+Fuchs offers "XML Router - BE" software for XML Bluetooth modems. This software is suitable for Windows PCs and Windows Pocket PCs. "XML Router - BE" also offers Bluetooth to keyboard wedge communication for applications that require a keyboard port. You must use **2way** mode when operating the XML Bluetooth modem.
BD_MAC	BD_ADDR of the Bluetooth receiver

Options submenu

Submenu	--
Menu entry	Autom. conn. Autom. disc. Timeout

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Description of the submenu

Options

In the **Options** submenu, you can specify whether to connect or disconnect the interface automatically. You can also configure the timeout (in ms) for the V commands.

Description of menu entries

Autom. conn.

If the menu entry **Autom. conn.** is enabled, the handheld device is connected to the computer automatically via the interface when the interface cable is connected.

Autom. disc.

If the menu entry **Autom. disc.** is enabled, the handheld device is disconnected from the computer automatically after the data is transferred.

Enable this menu item if you intend to send data from several devices to the same Bluetooth modem.

Timeout

In the data input field of the **Timeout** menu entry, you have the option of entering the timeout time [in ms] for the V commands. V commands are used to send commands from the PC directly to the read/write unit on the handheld device. Any terminal program and interface can be used here. A timeout preset in the communication menu of the HH20 detects the end of the command. The default setting is 500 ms, i.e., if no further characters are received after the last character during this timeout, the command is evaluated and sent to the handheld device.

9.3.8 Settings > Send/Save

In the **Send/Save** submenu, you can decide what to do with the read data.

Send/Save menu

Submenu	--
Menu entry	Always send Always save Autom. del. Autom. upl.

Description of menu entries

Function	Explanation
Always send	Read or entered data is sent immediately from the handheld device to the connected computer. The data is transferred irrespective of the **Always save** setting.
Always save	Read or entered data is saved in the memory of the handheld device, regardless of whether it was sent to a computer.
Autom. del.	Data from the memory of the handheld device is deleted if it was sent to a computer. If read or entered data is sent from the handheld device to the computer directly after reading and the **Autom. del.** option is enabled, the data is transferred and deleted immediately.
Autom. upl.	When a connection with the computer is established again, data from the memory of the handheld device is sent immediately . This option is only active when the handheld device is operating in batch mode.

9.3.9 Settings > Language

You can select the menu language in the **Language** submenu.

Language menu

Submenu	--
Menu entry	English German

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9.3.10 Settings > Date/time

You can set the date and time in the **Date/time** submenu.

Date/time menu

Submenu	
Menu entry	Year Month Day Hours Minutes

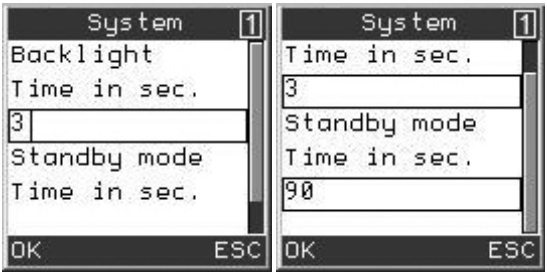
Entering the date and time

1. Navigate to the individual data input fields using the up navigation button ( ) and the down navigation button ( ).
2. Press the CLEAR input button to delete previously entered numbers ( ).
3. Enter numbers using the input buttons.
4. Press the left selection button to confirm your entries ( ).

9.3.11 Settings > System

You can set the illumination time of the display and define the time that elapses before the device switches to standby mode in the **System** submenu.

System menu



Submenu	--
Menu entry	Illumination/time in sec. Standby mode/time in sec.

Setting the illumination and standby time

1. Navigate to the individual data input fields using the up navigation button ( ) and the down navigation button ( ).
2. Press the CLEAR input button to delete previously entered numbers ( ).
3. Enter numbers using the input buttons.
4. Press the left selection button to confirm your entries ( ).

9.3.12 Settings > Vibration

In the **Vibration** submenu, you can switch the vibration alarm for the device on and off.

Vibration menu

Submenu	--
Menu entry	On Off

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9.3.13 Settings > Buzzer

In the **Buzzer** submenu, you can adjust the volume of the buzzer (in percent) and the buzzer duration after a successful read or write command or after successfully executing a command using the function buttons (in ms).

Buzzer menu

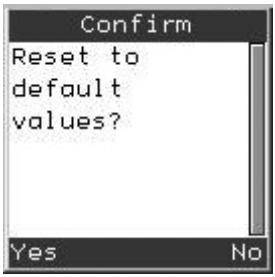
Submenu	--
Menu entry	Volume [0...100%] Read time [ms] Write time [ms] Trigger time [ms]

Adjusting the buzzer volume and buzzer times

1. Navigate to the individual data input fields using the up navigation button ( ) and the down navigation button ( ).
2. Press the CLEAR input button to delete previously entered numbers ( ).
3. Enter numbers using the input buttons.
4. Press the left selection button to confirm your entries ( ).

9.3.14 Settings > Default settings

You can reset all the settings to default using the "Default settings" command.



Default settings

Function	Default value
Assignment of trigger buttons right, left button and handle	SF Message ENG: "Read fixcode" Message GER: "Fixcode lesen"
Data format ASCII/HEX/DEC	ASCII
Password mode	off
Password	00000000
Time stamp on/off	off
Check sum on/off	off
Interface	USB -> VCOM 1way
Interface -> Connect autom.	on
Interface -> Disconnect autom.	off
Interface -> Timeout for V commands	500 ms
Interface -> MAC address	""
Send / save --> Always send	on
Send / save --> Always save	off
Send / save --> Autom. del.	on
Send / save --> Autom. upl.	on
Language	English
Background illumination time	3 seconds
Standby mode	90 seconds
Vibration	on
Buzzer -> Volume	100 %
Buzzer -> Read time	200 ms
Buzzer -> Write time	400 ms
Buzzer -> Trigger time	200 ms

Resetting settings to default

1. Select **Settings > Default sett.**

   ↳ "Reset to default settings?" appears on the display.

2. Press the left selection button to confirm the prompt ().

Press the right selection button to exit the menu without resetting the settings to default ().

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9.3.15 IP* Read/Write Heads

Operating frequency: 125 kHz.

Settings > Password

For further information on **Password mode**, see see chapter 10.5

Password submenu

Submenu	--
Menu entry	PSW mode Password [ASCII]

Description of Menu Entries

PSW mode

In the **PSW mode** menu entry, you have the option of activating or deactivating password mode.

In password mode, the password is transferred to the data carrier every time a command is issued. If a data carrier is activated with an incorrect password, accessing data areas without write protection is no longer possible.

Activating/Deactivating Password Mode

1. Select **Password**.
2. To activate or deactivate password mode, press the "Enter" navigation button ().

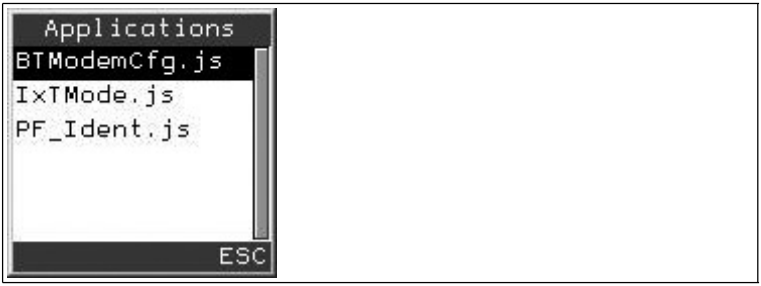
Password

In the data input field of the **Password** menu entry, you have the option of assigning a password.

The default password for the read heads and the data carriers is 00000000 (hexadecimal format) on delivery. The password in the read/write head is temporary and the password in the data carrier is permanent, which means that the password in the read/write head is deleted if the power supply is interrupted.

The value range for password entry is 00000000_h...$FFFFFFFF_h$.

9.4 Menu **Applications**



All Java applications stored on the device are displayed in the **Application** menu. The programs IxTmode.js and PF_Ident.js are both required to operate the unit as a handheld device.

You can configure the Bluetooth modem using the application BTModemCfg.js.

After selecting a JavaScript application by pressing the Enter navigation button (), you can

- Start the script (**Start**)
- Display information on the script version (**Version**)
- Delete the script (**Löschen**)
- Set the script as the default application (**As default**)
  The script is started automatically when the device is restarted

Caution!
Modified or independent JavaScript programs

The processes involved in the reading and writing of data are susceptible to external influences and interference.

- Do not modify JavaScript programs from the manufacturer.
- If you write your own JavaScript programs, check that the identification function is not affected.

Note!

Creating a separate user interface

If you wish to create your own user interface, please contact Pepperl+Fuchs.

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9.5 Menu **Info**

The **Info** menu contains additional information on:

- Manufacturer
- Model number
- Part number (**PrtNo**)
- Version of firmware for read/write head (**FW**)
- Version of PF_Ident.js software (**SW**)
- Hardware version (**HW**)
- Serial number of the device (**Reader ID**)
- MAC address of the Bluetooth modem (**BD Addr**)
- Software number of the handheld firmware (**App**)
- Software number of the handheld boot software (**Boot**)
- Software number of the Bluetooth software (**Radio**)
- (**OEM ID**)

10 Commands

10.1 General Information about Command References

The handheld makes the relevant command set available depending on the connected read/write head. Once the handheld has detected the connected read/write head, the software is adjusted to the operating frequency of the read/write head. In the following sections, you will find the command references corresponding to the operating frequency.

10.2 IP* Read/Write Heads

Operating frequency: 125 kHz.

10.2.1 Command Reference

Command	Description
SR	Read data
SW	Write data
SF	Read read-only code
SX	Write read-only code
SG	Read configuration area (register)
SC	Write configuration area (register)
S#	Overwrite read/write tag
GS	Read tag type
CT	Configure tag type
PM	Activate and deactivate password mode
PS	Set the password
PC	Change the password

Single Read Words (SR)

Command: **SR**<WordAddr><WordNum>

Response: <Status><Data>

Only one attempt is made to read <WordNum> data blocks from block address <WordAddr>.

Single Write Words (SW)

Command: **SW**<WordAddr><WordNum><Data>

Response: <Status>

Only one attempt is made to write <WordNum> data blocks from block address <WordAddr>.

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Single Read Fixcode (SF)

Command: **SF**

Response: <Status><Data>

Only one attempt is made to read fixcode. The specified length of the fixcode depends on the data carrier type.

Single write fix code (SX)

Command: **SX** <FixType> <FixLen> <Data>

Response: <Status>

Only possible with data carrier types IPC11 and IPC14.

Only one attempt is made to write a fix code. The specified length of the fix code is always 5 bytes

Single get configuration (SG)

Command: **SG**<ConfAddr>

Response: <Status><Data>

Only possible with data carrier types IPC03 and IPC12.

Only one attempt is made to read a word in the configuration area ("protection word" or "control word") from address <ConfAddr>.

Single write configuration (SC)

Command: **SC**<ConfAddr><Data>

Response: <Status>

Only one attempt is made to write a word to the configuration area ("protection word" or "control word") from address <ConfAddr>.

Password mode must be activated in the read head to write to the configuration area.

Fill Data Carrier (S#)

Command: **S#**<WordAddr><WordNum><FillSign>

Response: <Status>

The data carrier is filled with <WordNum> data blocks described by fill signs <FillSign> from the specified block address <WordAddr>.

Get State (GS)

Command: **GS**

Response: TT: <TagType>, TO:<Timeout>, BD:<Baud>

This command is used to read out permanently stored read/write head settings.

Change Tag (CT)

Command: **CT**<TagType>

Response: <Status>

This command tells the read/write head which data carrier type it is communicating with. This setting is stored permanently.

Password mode (PM)

Command: **PM**<Mode>

Response: <Status>

Activates (mode = "1") and deactivates (mode = "0") password mode for the read station. In password mode, the password is transferred to the data carrier prior to each read/write access. If a data carrier is activated with an incorrect password, accessing data areas without write protection is no longer possible.

Password set (PS)

Command: **PS**<Password>

Response: <Status>

Sets the password that the read station transferred to the data carrier in password mode.

Password change (PC)

Command: **PC**<Password old> <Password new>

Response: <Status>

Changes the password of a data carrier. The old password must be entered followed by the new password. If the password is successfully accepted, the password in the read station is also changed. The "Password set" command is no longer required.

Legends for variables

<Baud>	4-6 characters in the preset data format Baud rate [in bit/s]
<ConfAddr>	1 character [ASCII], word start address in the configuration area of the data carrier. The following applies for IPC03: 01= Protection word 02= Control word
<Data>	<WordNum> times 4 bytes in the preset data format When communicating a data block, the bytes are transferred chronologically starting with the highest value and ending with the lowest value.
<FillSign>	1 character [ASCII]
<FixLen>	Character [ASCII] '05' Length of the fix code in bytes
<FixType>	2 characters [ASCII]
<Status>	1 character [ASCII] '': command was executed without error. 'No tag': fault indication

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<TagType> 2 characters in the preset data format
Value indicates the number of the data carrier type.

<Timeout> 3 characters in the preset data format
Interface timeout [in ms]. A fault indication is issued when this time elapses.
'000' deactivates the timeout

<WordAddr> 4 characters [ASCII]
Block start address in the data carrier for the relevant command. Range from '0000' to 'FFFF' depending on the data carrier type.

<WordNum> 2 characters [ASCII]
Number of data blocks to read or write. Range from '00' to 'FF' depending on the data carrier type.

[1] On the IC-HH20-V1, the status message appears on the display in clear text:

Status	German display text	English display text
0	OK	OK
1	unbekannter Fehler	unknown error
2	Einschaltmeldung	switch-on message
3	unbekannter Fehler	unknown error
4	falscher Befehl	command error
5	kein Transponder	no tag
6	Hardwarefehler	hardware error
7	Softwarefehler	software error
8	Service-Schnittstelle	service interface
9	unbekannter Fehler	unknown error

10.3 IS* Read/Write Heads

Operating frequency: 250 kHz.

10.3.1 Command Reference

Command	Description
SR	Read data
SW	Write data
SF	Read read-only code
SX	Make ICC
SS	Read special read-only code
SP	Write special read-only code
SI	Initialize data carrier
S#	Overwrite read/write tag
GS	Read tag type
CT	Configure tag type

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Single Read Words (SR)

Command: **SR**<WordAddr><WordNum>

Response: <Status><Data>

Only one attempt is made to read <WordNum> data blocks from block address <WordAddr>.

Single Write Words (SW)

Command: **SW**<WordAddr><WordNum><Data>

Response: <Status>

Only one attempt is made to write <WordNum> data blocks from block address <WordAddr>.

Single Read Fixcode (SF)

Command: **SF**

Response: <Status><Data>

Only one attempt is made to read fixcode. The specified length of the fixcode depends on the data carrier type.

Single write fix code/make ICC (SX)

Command: **SX** <FixType> <FixLen> <Data>

Response: <Status>

Only one attempt is made to write a fix code. The specified length of the fix code depends on the data carrier type.

Single read special fix code (SS)

Command: **SS**

Response: <Status><Data>

Only one attempt is made to read a "special fix code".

Single program special fix code (SP)

Command: **SP**<FixLen> <Data>

Response: <Status>

Only one attempt is made to write a "special fix code".

Initialize data carrier (SI)

Command: **SI**

Response: <Status>

This command lifts the block for conventional writing and reading for IDC-...-1K data carriers that were set with the SP command.

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Fill Data Carrier (S#)

Command: **S#**<WordAddr><WordNum><FillSign>

Response: <Status>

The data carrier is filled with <WordNum> data blocks described by fill signs <FillSign> from the specified block address <WordAddr>.

Get State (GS)

Command: **GS**

Response: TT: <TagType>, TO:<Timeout>, BD:<Baud>

This command is used to read out permanently stored read/write head settings.

Change Tag (CT)

Command: **CT**<TagType>

Response: <Status>

This command tells the read/write head which data carrier type it is communicating with. This setting is stored permanently.

Key to variables

<Baud>	4-6 characters in the preset data format Baud rate [in bit/s]
<Data>	<WordNum> times 4 bytes in the preset data format When communicating a data block, the highest value byte is transferred first and the lowest value byte last.
<FillSign>	1 character [ASCII]
<Status>	1 character [ASCII] 0 ... 9, status of the read/write head [1)]
<TagType>	2 characters in the preset data format Value indicates the number of the data carrier type.
<Timeout>	3 characters in the preset data format Interface timeout [in ms]. A fault message is issued when this time elapses. '000' deactivates the timeout.
<WordAddr>	4 characters [ASCII] Block start address in the data carrier for the respective command. Range from '0000' to 'FFFF', depending on data carrier type.
<WordNum>	2 characters [ASCII] Number of data blocks to be read or written. Range from '00' to 'FF', depending on data carrier type.

[1)] On the IC-HH20-V1, the status message appears on the display in clear text:

Status	German display text	English display text
0	OK	OK
1	unbekannter Fehler	unknown error
2	Einschaltmeldung	switch-on message
3	unbekannter Fehler	unknown error

Status	German display text	English display text
4	falscher Befehl	command error
5	kein Transponder	no tag
6	Hardwarefehler	hardware error
7	Softwarefehler	software error
8	Service-Schnittstelle	service interface
9	unbekannter Fehler	unknown error

10.4 IQ* Read/Write Heads

Operating frequency: 13.56 MHz.

10.4.1 Command reference

Command	Description
SR	Read data
SW	Write data
SF	Read fixcode
S#	Format data carrier
GS	Read data carrier type
CT	Set data carrier type

Single Read Words (SR)

Command: **SR**<WordAddr><WordNum>

Response: <Status><Data>

Only one attempt is made to read <WordNum> data blocks from block address <WordAddr>.

Single Write Words (SW)

Command: **SW**<WordAddr><WordNum><Data>

Response: <Status>

Only one attempt is made to write <WordNum> data blocks from block address <WordAddr>.

Single Read Fixcode (SF)

Command: **SF**

Response: <Status><Data>

Only one attempt is made to read fixcode. The specified length of the fixcode depends on the data carrier type.

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Fill Data Carrier (S#)

Command: **S#**<WordAddr><WordNum><FillSign>

Response: <Status>

The data carrier is filled with <WordNum> data blocks described by fill signs <FillSign> from the specified block address <WordAddr>.

Get State (GS)

Command: **GS**

Response: TT: <TagType>, TO:<Timeout>, BD:<Baud>

This command is used to read out permanently stored read/write head settings.

Change Tag (CT)

Command: **CT**<TagType>

Response: <Status>

This command tells the read/write head which data carrier type it is communicating with. This setting is stored permanently.

Key to variables

<Baud> 4-6 characters in the preset data format
Baud rate [in bit/s]

<Data> <WordNum> times 4 bytes in the preset data format
When communicating a data block, the highest value byte is transferred first and the lowest value byte last.

<FillSign> 1 character [ASCII]

<Status> 1 character [ASCII] 0 ... 9, status of the read/write head [1)]

<TagType> 2 characters in the preset data format
Value indicates the number of the data carrier type.

<Timeout> 3 characters in the preset data format
Interface timeout [in ms]. A fault message is issued when this time elapses. '000' deactivates the timeout.

<WordAddr> 4 characters [ASCII]
Block start address in the data carrier for the respective command. Range from '0000' to 'FFFF', depending on data carrier type.

<WordNum> 2 characters [ASCII]
Number of data blocks to be read or written. Range from '00' to 'FF', depending on data carrier type.

[1)] On the IC-HH20-V1, the status message appears on the display in clear text:

Status	German display text	English display text
0	OK	OK
1	unbekannter Fehler	unknown error
2	Einschaltmeldung	switch-on message
3	unbekannter Fehler	unknown error

Status	German display text	English display text
4	falscher Befehl	command error
5	kein Transponder	no tag
6	Hardwarefehler	hardware error
7	Softwarefehler	software error
8	Service-Schnittstelle	service interface
9	unbekannter Fehler	unknown error

10.5 Special Command Modes for IPC03 Read/Write Tags

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.

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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).

The password in the R/W head and on the read/write tag can be changed with the command **PC**.

If the password mode is deactivated, every data word on the read/write tag can be read and written as necessary.

To read and write the words 1 “Protection Word” and 2 “Control Word”, the correct password is always required and therefore the password mode must be active (see the commands **SC** or **EC**).

In addition, the access to the read/write tag can be limited via read- and write-protected ranges. To achieve this, each mutually independent start and end of a read-protected and a write-protected range can be defined in the "Protection Word".

In the factory default condition of the reading heads and the read/write tag IPC03, the password is 00000000h. In the reading head, the password is stored in a volatile manner and in the read/write tag IPC03 in a non-volatile manner.

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.

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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.

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.

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.

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11 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**

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