

MANUAL

**ODT-HH-MAH120-HD &
ODT-HH-MAH120-WH-HD
HANDHELD - HIGH DENSITY**



CE

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.

The most important instructions can be found in the following chapters:

- Cable connection: see chapter 5.2
- Basic operation: see chapter 6
- Optimization and configuration of handheld: see chapter 7

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
Fax: +49 621 776-274411
E-Mail: fa-info@pepperl-fuchs.com



2 Declaration of conformity

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



Note!

A Declaration of Conformity can be requested from the manufacturer.

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



3 Safety

3.1 Symbols relevant to safety



Danger!

This symbol indicates a warning about a possible danger.

In the event the warning is ignored, the consequences may range from personal injury to death.



Warning!

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

In the event the warning is ignored, the consequences may course personal injury or heaviest property damage.



Caution!

This symbol warns of a possible fault.

Failure to observe the instructions given in this warning may result in the devices and any connected facilities or systems develop a fault 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 was designed for identifying 1D and 2D codes and should be used for this purpose only. The handheld is flexible and can therefore be used to decode codes in many branches of industry, such as the logistics sector.

3.3 General notes on safety

The operator of the system is responsible in terms of planning, mounting, commissioning, operating and maintenance.

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

Protection of operating personnel and the system is not ensured if the product is not used in accordance with its intended purpose.

Only use recommended original accessories.

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.

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.

3.4 Disposal

Devices, packaging material, and possibly contained batteries must be disposed of in compliance with the applicable laws and guidelines of the corresponding country.

4 Product description

4.1 ODT-HH-MAH120-HD - use and application

The ODT-HH-MAH120-HD is a robust and inexpensive handheld for all standard bar codes and 2D codes. The Megapixel-CMOS image sensor facilitates in conjunction with the specially developed optical system an extremely large reading range, relating to both the reading distance and the image window. Thus the reading range begins already at 2 cm and ends at approx. 30 cm, depending on the size of the code or the modules. Thanks to automatic dynamic optimization, the handheld recognizes the most varied codings and enables you to work efficiently. A target projection distinguished by color in the form of a sectional image is used as an aid to orientation; this projection helps to support optimum guidance during visual positioning. Using the handheld under difficult ambient conditions is made easier by the sturdy design of the MAH120-HD, which can withstand a fall from a height of 2 m onto a solid floor/ground without its functions being impaired. Confirmation of a successful reading is effected by optical, acoustic or tactile means (vibration). USB, PS/2 or RS 232 is available as the standard interface, depending on which connecting cable you choose. You can program the ODT-HH-MAH120-HD handheld using convenient programs or configuration code. There is also an additional option of creating customer-specific solutions with a JavaScript editor. Furthermore, the Linux core of the operating system opens up still further options.

4.2 Field of vision and resolution

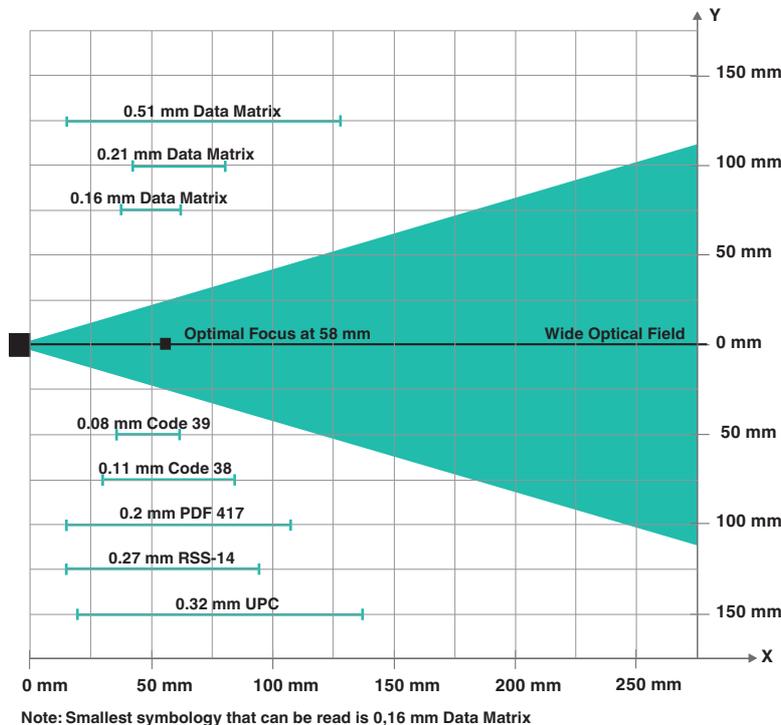


Figure 4.1: Field of vision of handheld ODT-HH-MAH120-HD

4.3 Indicators and control elements



- 1 Status LED
- 2 Camera, lighting LEDs
- 3 Trigger button
- 4 8-pin connecting jack

Reading Confirmation from handheld

The following table contains all the confirmation indicators which are communicated by the handheld by means of LED, tactile and acoustic signals.

Action	Tactile/acoustic signal	LED
handheld successfully switched on	1 signal tone/vibration	Flashes yellow, green, yellow
Connection using USB connecting cable successful	1 signal tone/vibration	-
Reading successful, data have been sent to the computer	1 signal tone/vibration	Flashes green
Configuration code successfully read, configuration performed	1 signal tone/vibration Short break 1 signal tone/vibration	Flashes green
Unknown configuration code, configuration not performed	1 short signal tone/vibration Short break 1 short signal tone/vibration	Flashes green



4.4 Accessories

Various accessories are available.

4.4.1 Connecting cable

The following connecting cables are available as an option:

Designation	Description
ODZ-MAH-CAB-B14	Connecting cable USB interface, length approx. 180 cm
ODZ-MAH-CAB-B14-3.7m	Connecting cable USB interface, length approx. 370 cm
ODZ-MAH-CAB-R2	Connecting cable RS 232 interface, length approx. 120 cm
ODZ-MAH-CAB-R6	Connecting cable PS/2 interface, length approx. 120 cm

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.

5.2 Connection

You have the opportunity to connect the handheld to the following PC interfaces:

- USB
- RS 232
- PS/2



Attaching the connecting cable to the handheld

1. Slide the protective cap over the 8-pin DIN plug.



2. Align the 8-pin plug so that it fits into the socket on the handheld.



3. Press the 8-pin DIN plug and protective cap onto the socket.





4. Use a screwdriver and the screws provided to fasten the protective cap onto the bottom of the handle.



5.2.1 Connection via USB



Connecting USB connecting cable to computer

1. Insert the USB plug of the connecting cable in a free USB port on your computer. This can be done during operation.

The handheld turns itself on automatically once you have connected it to the computer.

2. Scan the code **USB Keyboard Mode**:



M134_02

3. Scan the code **Save Settings**:



M188_02

Further USB configuration options, see chapter 7.3.1.

5.2.2 Connection via RS 232



Connecting RS 232 connecting cable to computer

1. Power off the computer.
2. Connect the RS 232 plug of the connecting cable to the RS 232 port of the computer.
3. Connect the low-voltage plug of the power-supply unit to the low-voltage jack of the RS 232 connecting cable.
4. Connect the mains power plug of the power-supply unit to the mains power supply.
5. Power on the computer.

The handheld turns itself on automatically once you have turned the computer on.

6. Scan the code **RS 232 1 Way Mode**:



M131_01

7. Scan the code **Save Settings**:



M188_02

The handheld uses the following RS 232 factory settings:

- RS 232 1 Way Mode
- 57600 baud
- 2 stop bits
- 8 data bits
- No parity

Further RS 232 configuration options, see chapter 7.3.2.



5.2.3

Connection via PS/2



Connecting PS/2 connecting cable to computer

1. Power off the computer.
2. Disconnect the connection to the computer if an external keyboard is connected to the computer.
3. If you are using a USB keyboard, connect the keyboard with an appropriate adapter to the PS/2 connecting jack of the connecting cable. If you are using a keyboard with PS/2 plug, connect the plug directly to the PS/2 connecting jack of the connecting cable.
4. Connect the PS/2 plug of the connecting cable to the computer's PS/2 port for keyboards.
5. Power on the computer.

The handheld turns itself on automatically once you have turn the computer on.

6. Scan the code **PS/2 Mode**:



M126_01

7. Scan the code **Save Settings**:



M188_02

6 Commissioning

6.1 Positioning and reading techniques

This handheld uses digital camera technology to record an image of the code to be read. After an image has been recorded, the handheld uses highly developed evaluation procedures to evaluate the data contained in the recording.

This handheld supports you with target projections in the form of two squares distinguished by color when codes are sighted and focused. This projection is realized by one red and one green LED on the handheld. Precise positioning becomes increasingly important in the case of small codes or codes with a high information density.



- 1 Handheld too far away from the code
- 2 Handheld positioned too close to the code
- 3 Handheld optimally positioned (optimum distance: 5.8 cm)



Note!

Because of the large detection area of the handheld, we advise to cover the codes you don't want to scan. Thus you prevent to set a wrong setting inadvertently.



Sighting and reading 1D and 2D codes

1. With the trigger button pressed, aim the red square at the code to be read.
2. Alter the distance between the handheld and the code, depending on the position of the green square: the code is optimally sighted as soon as the two squares overlap.

The code is read automatically. In the event of successful decoding, the acoustic and tactile signal sounds and the status LED flashes green once (depending on the configuration of the handheld).



7 Optimizing the handheld

7.1 Programming different code symbologies



Note!

Code Save Settings

Always scan the code **Save Settings** after reading a configuration code. Thus the configuration code is saved permanently.

7.1.1 Aztec

Aztec On



Aztec Off (Default)



Save Settings



Example:



7.1.2 Codabar

Codabar On (Default)



Codabar Off



Save Settings



Example:



7.1.3 Codablock F

Codablock F On



Codablock F Off (Default)



Save Settings



Example:





7.1.4 Code 11

Code 11 On (Default)



M394_01

Code 11 Off



M393_01

Code 11 Checksum 1 digit



M395_01

Code 11 Checksum 1 digit & Strip from result



M397_01

Code 11 Checksum 2 digit & Strip from result



M396_01

Save Settings



M188_02

Example:



7.1.5 Code 39

Code 39 On (Default)



M235_01

Code 39 Off



M234_01

Code 39 Enable Checksum



M237_01

Code 39 Enable Checksum & Strip from result



M238_01

Disable Checksum (Default)



M236_01

Code 39 Extended Full ASCII On



M233_01

Code 39 Extended Full ASCII Off (Default)



M232_01

Code 39 Short Margin On



M390_01

Code 39 Short Margin Off (Default)



M389_01

Code 39 Trioptic On (Default)



M671_01

Code 39 Trioptic Off



M670_01

Save Settings



M188_02

Example: Code 39



Example: Trioptic Code 39





7.1.6 Code 93

Code 93 On (Default)



Code 93 Off



Save Settings



Example:



7.1.7 Code 128

Code 128 On (Default)



Code 128 Off



Code 128 Short Margin On



Code 128 Short Margin Off (Default)



Save Settings



Example:



7.1.8 Composite

Composite On



Composite Off (Default)



Save Settings





7.1.9 Data Matrix

Data Matrix Rectangle On



M242_01

Data Matrix Rectangle Off (Default)



M241_01

Data Matrix Inverse On



M239_01

Data Matrix Inverse Off (Default)



M240_01

Save Settings



M188_02

Example Data Matrix:



Example Data Matrix Rectangle:



7.1.10 GoCode

GoCode is a two-dimensional symbol in miniature format. GoCode was developed in such a way that it fits into one text line and has a multidimensional adaptable matrix pattern which can be reproduced practically on any surface. GoCode is a private symbology and can be used by obtaining a fixed-term license. GoCode has many important advantages when compared with usual linear bar codes and 2D symbols. Please contact Pepperl+Fuchs if you require any further information on the advantages of a private symbology.





7.1.11 Interleaved 2 of 5

Int 2 of 5 On (Default)



M244_01

Int 2 of 5 Off



M243_01

Int 2 of 5 Two Digits On



M246_01

Int 2 of 5 Two Digits Off (Default)



M245_02

Int 2 of 5 Four Digits On



M248_01

Int 2 of 5 Four Digits Off (Default)



M247_01

Save Settings



M188_02

Example:



7.1.12 Maxicode

Maxicode On



M289_04

Maxicode Off (Default)



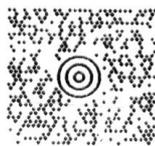
M288_01

Save Settings



M188_02

Example:



7.1.13 Matrix 2 of 5

Matrix 2 of 5 On (Default)



M675_01

Matrix 2 of 5 Off



M674_01

Save Settings



M188_02

Example:





7.1.14 Micro PDF417

Micro PDF417 On



M301_01

Micro PDF417 Off (Default)



M300_01

Save Settings



M188_02

Example:



7.1.15 MSI Plessey

MSI Plessey On



M291_01

MSI Plessey Off (Default)



M290_01

Save Settings



M188_02

Example:



7.1.16 NEC 2 of 5

NEC 2 of 5 On



M673_01

NEC 2 of 5 Off (Default)



M672_01

Save Settings



M188_02

7.1.17 PDF417

PDF417 On (Default)



M293_01

PDF417 Off



M292_01

Macro PDF 417 On



M287_01

Macro PDF 417 Off (Default)



M286_01

Save Settings



M188_02

Example:





7.1.18 Pharmacode

An explanation of the Pharmacode settings and all programming codes can be obtained from Pepperl+Fuchs.

7.1.19 Post Codes

All post codes (zipcodes) are deactivated as standard. Scan the following codes to activate the corresponding post symbology.



Note!

If you wish to change the activated symbologies, first scan the code **Disable all Postal Codes** and then the post codes for the desired symbology.

Australian Post On



M252_01

Japan Post On



M253_01

KIX



M254_01

Planet On



M256_01

Postnet On



M257_01

Planet & Postnet On



M255_01

Royal Mail On



M258_01

4-State CB On
(Intelligent Mail)



M748_01

Disable all Postal Codes



M261_01

Save Settings



M188_02

Example:





7.1.20 QR Code

QR Code On



QR Code Off (Default)



Enable Checksum



Disable Checksum (Default)



QR Code Inverse On



Both Inverse and Standard On



All QR On (includes Micro QR)



Inverse QR and Micro QR On



Save Settings



Example QR Code



Example Micro QR



7.1.21 GS1 data bar

GS1 Limited On



GS1 14 and GS1 14 Truncated On



GS1 14 Stacked On



GS1 Expanded On



All GS1 On



All GS1 Off (Default)



Save Settings



Example GS1 Limited Code



Example GS1 14 Code



Example GS1 14 Truncated Code



Example GS1 14 Stacked Code



204646 2010-09



7.1.22 Telepen

Telepen On (Default)



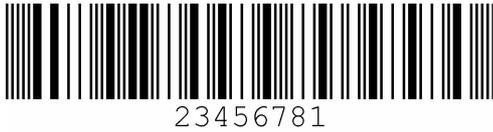
Telepen Off



Save Settings



Example:



7.1.23 UPC/EAN/JAN

UPC On (Default)



UPC Off



UPC Short Margin Enabled



UPC Short Margin Disabled (Default)



UPC Extension On



UPC Extension Off



Save Settings



Example:



7.2 Optimization of the decoding performance

7.2.1 Reading high-density data matrix codes

This handheld is suitable for reading very small data matrix codes with an extremely high information density (high-density data matrix codes).



Note!

Note the color of the illumination LEDs.

Please note the different data matrix codes for handhelds with white and red illumination LEDs. Always scan the correct code for the relevant model. Failure to do so may cause malfunctions.



Optimizing the handheld for high-density data matrix codes



Note!

Data loss

All other settings are deleted when the code is scanned. Change all the settings again if necessary.

To optimize the handheld to read high-density data matrix codes, scan the relevant data matrix code:

For handhelds with red LEDs, please use the following data matrix code:



CC000620_02

For handhelds with white LEDs, please use the following data matrix code:



Near Field White

Scan the code **Save Settings** after selection:



M188_02



7.3 Handheld configuration



Locking handheld to prevent modifications to settings

Once you have adjusted all the necessary settings of the handheld, you have the option of locking the settings to prevent further modifications. To do so, proceed as follows:

1. Scan the code **Reader Settings Locked:**



M429_01

2. To unlock the handheld, scan the code **Reader Settings Unlocked:**



M428_01

3. Scan the code **Save Settings:**



M188_02



7.3.1 USB operating modes



Changing USB operating modes

There are 3 operating modes for USB operation of the handheld.

To change the USB operating mode, scan the relevant code in the following table.

USB Keyboard Mode	
Scan this code to transmit all the scanned data from the handheld to the computer. The data transmitted by the handheld are handled by the computer as data which have been input via a USB keyboard.	 M134_02
USB Downloader	
Scan this code to transmit unformatted, unpacked data via the USB interface to the handheld.	 M133_01
USB Virtual COM 1 Way Mode	
Scan this code to port USB keyboard data to a serial application. You will also need a Virtual Com driver, which can be found at www.pepperl-fuchs.com .	 M668_01
Reset to USB Factory Defaults	
Scan this code to reset the handheld to the USB factory settings.	 M049_03
	Save Settings:  M188_02



7.3.2 RS 232 operating modes



Changing RS 232 communication parameters

Scan the respective code to change the individual RS 232 connection settings.

RS 232 communication settings

Setting data bit			
7 data bits  M100_01	8 data bits (default)  M101_01		
Setting stop bit			
2 stop bits (default)  M106_01	1 stop bit  F001_01		
Setting baud rate			
1200  M092_01	2400  M093_01	4800  M094_01	9600  M095_01
19200  M096_01	38400  M097_01	57600 (Default)  M098_01	115200  M099_01
Setting parity			
Even  M102_01	Odd  M104_01	None  M103_01	
Scan this code to reset the handheld to the RS 232 default settings:	 M418_02		

Scan the code **Save Settings** after selection:



7.3.3 Volume and vibration setting

Vibration mode		
Vibration & Beep on  M107_01	Vibration on/Beep off  M109_01	Vibration off/Beep on (Default)  M108_01
Volume mode		
Beep off  M110_01	Beep low  M111_01	Beep High (Default)  M112_01

Scan the code **Save Settings** after selection:



7.3.4 Configuration of LED target projection



Changing LED target projections

To change the LED target projection, scan the relevant code in the following table.

Red target LED on  M732_01	Red target LED off  M733_01
Green target LED on  M734_01	Green target LED off  M735_01

Scan the code **Save Settings** after selection:





7.3.5 Continuous reading

In addition to the option of pressing the trigger button to start a reading, you also have the option of using the reader in continuous mode and perform an unlimited number of readings. Several configuration options are available here.



Configuring continuous reading

To activate continuous operation and configure continuous reading mode, scan the relevant codes in the following table.

Activating/Deactivating continuous operation		
Activating  M140_01		Deactivating (default)  M141_02
Reading delay		
Defines the time interval between the individual readings.		
0 seconds (default)  M142_01	1 second  M143_01	3 seconds  M144_01
Double code reading delay		
Defines the time interval during which the codes that were already decoded during a previous reading are deleted.		
0 seconds (default)  M222_01	1 second  M223_01	3 seconds  M224_01
Motion detection scan settings		
Activating  M701_01		Deactivating (Default)  M702_01

Scan the code **Save Settings** after selection:





7.3.6 Lighting

<p>Activating continuous lighting</p>  <p>M580_02</p>	<p>Deactivating continuous lighting</p>  <p>M579_02</p>
--	--

Scan the code **Save Settings** after selection:



7.3.7 Keyboard settings

<p>US English Keyboard - No leading 0 (Default)</p>  <p>M172_01</p>	<p>US English Keyboard - Leading 0</p>  <p>M602_01</p>	<p>US English - ctrl+char for Non-Printable ASCII</p>  <p>M606_01</p>
<p>French</p>  <p>M609_03</p>	<p>German</p>  <p>M604_01</p>	<p>Japanese</p>  <p>M605_01</p>
<p>Universal Keyboard</p>  <p>M173_01</p>		<p>Custom Keyboard</p>  <p>M171_01</p>
<p>Alternative OS enable (Windows CE / MAC / Unix / Linux)</p>  <p>M585_02</p>		<p>Alternative OS disable (Windows CE / MAC / Unix / Linux)</p>  <p>M584_02</p>

Scan the code **Save Settings**: after delection:





7.3.8 Mirror decoding

As soon as you activate mirror decoding, the handheld can read codes that have been inverted. Furthermore, all other code reading functions are deactivated.



Activating/Deactivating mirror decoding

1. To activate mirror decoding, scan the code **Mirroring on**:



M182_01

2. Scan the mirrored code **Save Settings**:



3. To deactivate mirror decoding, scan the code **Mirroring off (Default)**:



M181_02

4. Scan the code **Save Settings**:



M188_02

7.3.9 Prefix and suffix settings



Caution!

Risk of data loss

If you scan one of the following codes, data loss may result

First save the settings on your handheld before scanning one of the following codes.



Defining prefix

For presentation of the read data, we recommend - besides the use of suffixes - the use of prefixes as separators between the individual data records. You can select between several separators. Combining several separators is also possible (e.g. a comma followed by a space, followed by the data record).

To define a prefix, scan the corresponding data matrix code in the following table.

Comma as a prefix



M159_02

Space as a prefix



M164_02

Tabulator as a prefix (USB mode)



M166_01

Tabulator as a prefix (RS 232 mode)



M218_02

Carriage return line feed (RS 232 mode)



M214_02



Deleting a prefix

To delete all prefixes, scan the data matrix code **Prefix - Erase:**



M404_01



Defining suffix

For presentation of the read data, we recommend - besides the use of prefixes - the use of suffixes as separators between the individual data records. You can select between several separators. Combining several separators is also possible (e.g. a comma followed by a space, followed by the data record). Proceed as follows to define a suffix:

To define a suffix, scan the corresponding data matrix code in the following table.

Comma as a suffix



M160_04

Space as a suffix



M165_04

Carriage return as a suffix
(RS 232 mode)



M168_04

Line feed as a suffix
(RS 232 mode)



M169_04

Carriage return line feed
(RS 232 mode)



M170_04

Line break as a suffix (USB
mode)



M161_04

Tabulator as a suffix (USB
mode)



M167_04

Tabulator as a suffix
(RS 232 mode)



M219_04



Deleting a suffix

To delete all suffixes, scan the code **Suffix - Erase**:



M405_02



Deleting prefixes and suffixes

To delete all prefixes and suffixes, scan the code **Erase Prefix & Suffix Data**:



M406_02



7.3.10 Text command function



Activating/deactivating text command function

Scan one of the following codes to activate or deactivate the text command function.

Activate text command	Deactivate text command (default)
 M198_01	 M197_02

Scan the code **Save Settings** after selection:



7.3.11 OCR A and B



The handheld gives you the option of performing optical text identification.

Activating/Deactivating OCR

Scan one of the following codes to activate or deactivate OCR.

Activating OCR	Deactivating OCR (default)
 M713_01	 M712_01

Scan the code **Save Settings** after selection:



Note!

You require an OCR license to use OCR functions. For further information, please contact Pepperl+Fuchs.



7.3.12 Information on firmware and serial number of the reader

You have the option of displaying information on firmware and the serial number of the reader.

The information is structured as follows:

Xap/iVVVVVWWWWXXXXSSSSSSSSSPXXX-XX+XX-

Abbreviation	Character	Meaning
Xap/i	-	Internal ID
VVVV	4	Version number of application firmware
WWWW	4	Version number of bootloader firmware
XXXX	4	Version number of Bluetooth firmware
SSSSSSSSSS	10	Serial number of the reader
P	1	A for application firmware, B for bootloader firmware
XXX-XX+XX-	-	Internal ID



Reading firmware and serial numbers

To read information on firmware and the serial number of the reader, proceed as follows:

1. Open the text editing program (e.g., Notepad, Microsoft Word, etc.).
2. Scan the code **Reader ID and Firmware:**



Information on firmware and the serial numbers of the reader is transferred from the internal reader memory and displayed in the text editing program.



Note!

Current firmware and upgrades

Pepperl+Fuchs regularly releases new firmware for readers. Contact Pepperl+Fuchs for information on current firmware versions or upgrades.

FACTORY AUTOMATION – SENSING YOUR NEEDS



Pepperl+Fuchs sets the standard in quality and innovative technology for the world of automation. Our expertise, dedication, and heritage of innovation have driven us to develop the largest and most versatile line of industrial sensor technologies and interface components in the world. With our global presence, reliable service, and flexible production facilities, Pepperl+Fuchs delivers complete solutions for your automation requirements – wherever you need us.

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