

# LF/HF RFID App for IC-HH51/HH52 Handhelds

Manual



Your automation, our passion.

 **PEPPERL+FUCHS**

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- 1 Introduction..... 4**
  - 1.1 Content of this Document..... 4**
  - 1.2 Manufacturer ..... 4**
  - 1.3 Target Group, Personnel ..... 4**
  - 1.4 Symbols Used ..... 5**
  
- 2 Product Description ..... 6**
  - 2.1 Intended Use of the App ..... 6**
  
- 3 Installation..... 7**
  
- 4 Operation..... 8**
  - 4.1 Description ..... 8**
  - 4.2 Starting the App..... 8**
  - 4.3 General ..... 8**
  - 4.4 Main Menu ..... 13**
    - 4.4.1 Scan Tags..... 14
    - 4.4.2 Read / Writing Tags..... 16
    - 4.4.3 Commands..... 21
    - 4.4.4 Setting the Tag Type..... 24
    - 4.4.5 Special Features..... 26
  
- 5 Glossary ..... 28**
  - 5.1 ASCII Table ..... 28**

# 1 Introduction

## 1.1 Content of this Document

This document contains information required to use the product in the relevant phases of the product life cycle. This may include information on the following:

- Product identification
- Delivery, transport, and storage
- Mounting and installation
- Commissioning and operation
- Maintenance and repair
- Troubleshooting
- Dismounting
- Disposal



### Note

For full information on the product, refer to the further documentation on the Internet at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).



### Note

For specific device information such as the year of construction, scan the QR code on the device. As an alternative, enter the serial number in the serial number search at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

The documentation comprises the following parts:

- This document
- Datasheet

In addition, the documentation may comprise the following parts, if applicable:

- EU-type examination certificate
- EU declaration of conformity
- Attestation of conformity
- Certificates
- Control drawings
- Instruction manual
- Other documents

## 1.2 Manufacturer

Pepperl+Fuchs Group Lilienthalstraße 200, 68307 Mannheim, Germany
--

Internet: <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a>
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## 1.3 Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismantling lies with the plant operator.

Only appropriately trained and qualified personnel may carry out mounting, installation, commissioning, operation, maintenance, and dismantling of the product. The personnel must have read and understood the instruction manual and the further documentation.

Prior to using the product make yourself familiar with it. Read the document carefully.

## 1.4 Symbols Used

This document contains symbols for the identification of warning messages and of informative messages.

### Warning Messages

You will find warning messages, whenever dangers may arise from your actions. It is mandatory that you observe these warning messages for your personal safety and in order to avoid property damage.

Depending on the risk level, the warning messages are displayed in descending order as follows:



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#### **Danger!**

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.

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#### **Warning!**

This symbol indicates a possible fault or danger.

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

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#### **Caution!**

This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.

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### Informative Symbols



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#### **Note**

This symbol brings important information to your attention.

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#### **Action**

This symbol indicates a paragraph with instructions. You are prompted to perform an action or a sequence of actions.

## 2 Product Description

### 2.1 Intended Use of the App

This app is used to control the LF and HF read/write heads IPH-HH50 and IQH1-HH50 with the modular handhelds IC-HH51 and IC-HH52 from Pepperl+Fuchs.

The app supports:

- Scanning multiple tags
- The reading and writing of all memory banks of LF or HF tags



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#### Note

The manual for the IC-HH51/HH52 modular handhelds can be found on our website [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

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### 3 Installation

The RFID demo app is preinstalled on the start page of the modular handhelds from Pepperl+Fuchs.

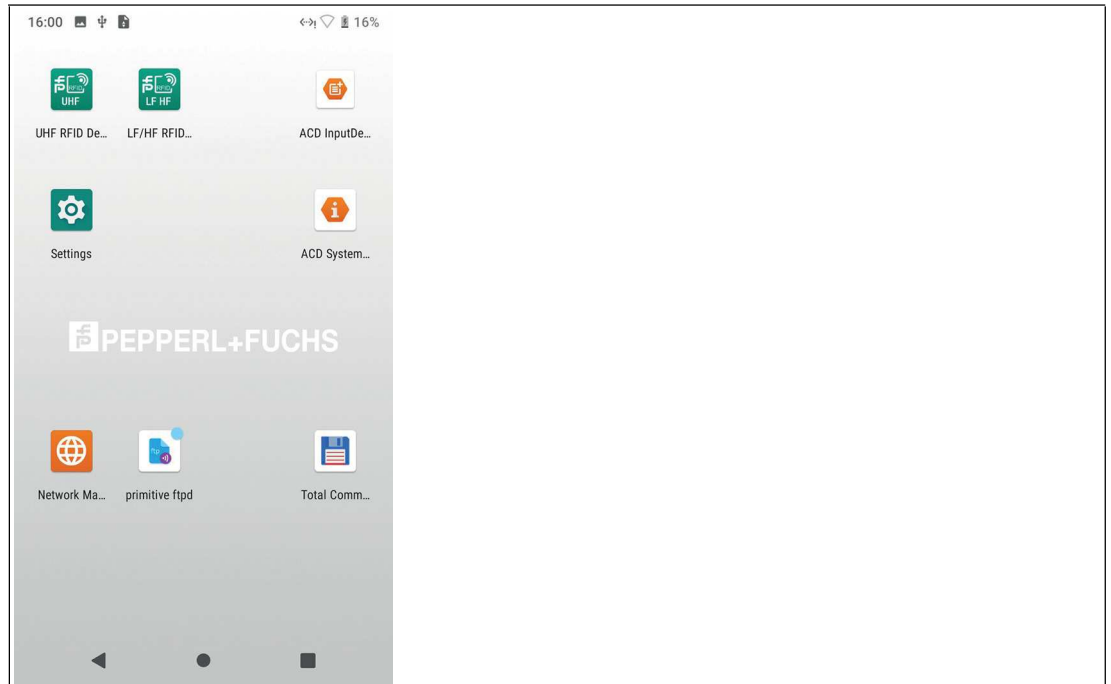


Figure 3.1

Future versions of the app are available as an .apk file on the Pepperl+Fuchs website. There you will also find instructions on how to perform the update. The app can be installed using a USB memory or via the LAN connection on the docking station.

The described app is version 1.08.

## 4 Operation

### 4.1 Description

The operating languages of the app are English and German. The language settings from your handheld are copied over. You can change the language of your handheld in the Android settings in the "System" submenu.

The app functions are outlined below.

For additional functions, Pepperl+Fuchs can create customized apps tailored to specific applications.

#### Directory Structures

Files are saved to a specified directory structure via the Log or Export function.

In the "lf-hf-rfid" folder,<sup>1</sup> you will find the files in the following subfolders:

- exports
- tag write
- logs
- commands

### 4.2 Starting the App



#### Starting

1. Click the RFID LF/HF app symbol on the handheld screen.



Figure 4.1

↳ The app will start.

### 4.3 General

Some fields or functions are available in several menus and are described in general terms.

#### Virtual Keyboard

To input data, click in the appropriate field. The virtual keyboard appears automatically.



#### Tip

If the virtual keyboard does not appear automatically, select the keyboard symbol on the right-hand side of the bottom toolbar.

<sup>1</sup> In TotalCommander, for example as "Internal shared memory"



## Orange Function Key

There are two orange function keys on the sides of the handheld.  
In some menus, both function keys are assigned the main function.



### Example

In the "Scan Tags" menu, both function keys are assigned the function "Scan" or "Stop".  
In the "Read & Write Tags" menu, both function keys are assigned the "Read" function.

## Settings



You can use the "Settings" symbol in the top right corner of each menu to set the filter and transmission power of the mounted module.



### Note

The default settings are optimal for most applications. Advanced users may select other parameters here.

## Data

In the "Data" submenu, you can set the tag type, the display format, and the representation of the data.

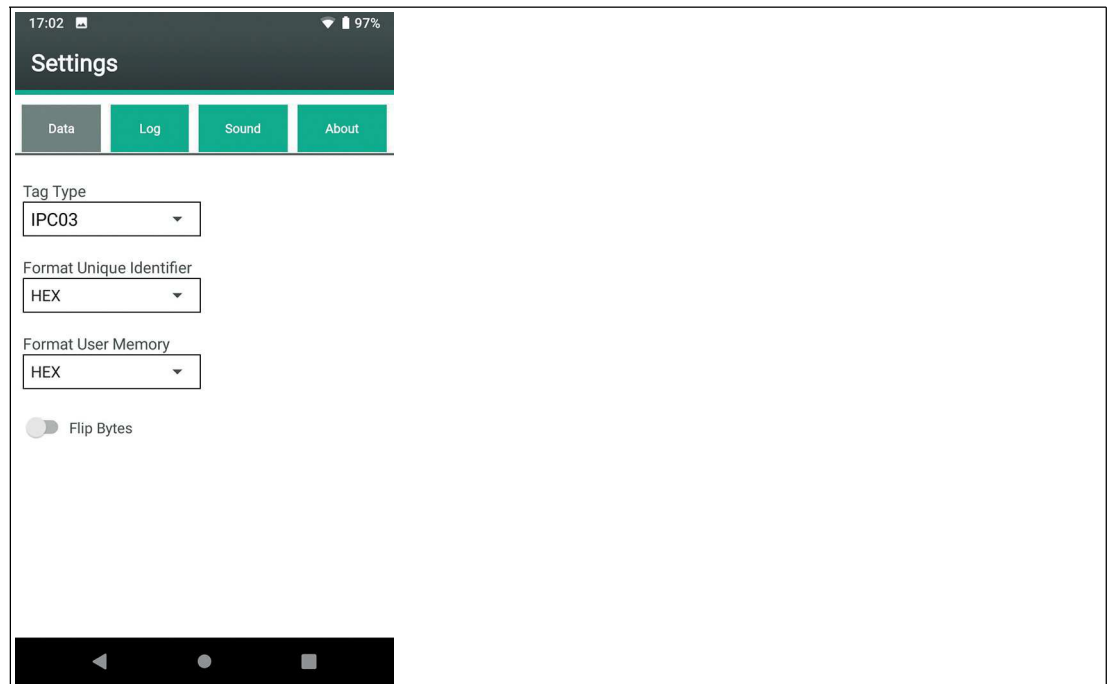


Figure 4.2

### Setting the Tag Type

The following tag types are supported with the IPH-HH50 read / write head:

Designation	Chip type	Read-only code length [bytes]	Writable memory [bytes]	Block size [bytes]
IPC02	EM4102	5	-	4
IPC03	EM4450	4	116	4
IPC11	Q5 (Sokymat)	-	5	4

Table 4.1

The following tag types are supported with the IQH1-HH50 read / write head:

Designation	Chip type	Read-only code length [bytes]	Writable memory [bytes]	Block size [bytes]
IQC21	I-Code SLI(X) (NXP)	8	112	4
IQC22	Tag-It HF-I Plus (Texas Instruments)	8	256	4
IQC23	my-d SRF55V02P (Infineon)	8	224	4
IQC24	my-d SRF55V10P (Infineon)	8	992	4
IQC27	EM4135 (EM Microelectronic Marin)	8	288	4
IQC31	Tag-It HF-I Standard (Texas Instruments)	8	32	4
IQC32	Tag-It HF-I Pro (Texas Instruments)	8	32	4
IQC33	MB89R118 (Fujitsu)	8	2000	8
IQC34	MB89R119 (Fujitsu)	8	232	4
IQC35	I-Code SLI-S (NXP)	8	256	4
IQC36	I-Code SLI-L (NXP)	8	32	4
IQC37	MB89R112 (Fujitsu)	8	8192	32

Table 4.2

### Read-Only Code Format (TID) and User Memory Format

You can choose between HEX and ASCII as the data display format.

#### Byte Display

Use the "Flip Bytes" option to rotate the individual data blocks in the user memory. This reverses the order of the four bytes of each block.



#### Example

A user memory with a block size of four bytes is 1234 5678. Use the "Flip Bytes" option to display the user memory as 4321 8765.

This option allows you to read out and modify read/write tags that have been written in reverse notation.

## Log

In the "Log" submenu, you can activate and deactivate the writing of a log file.

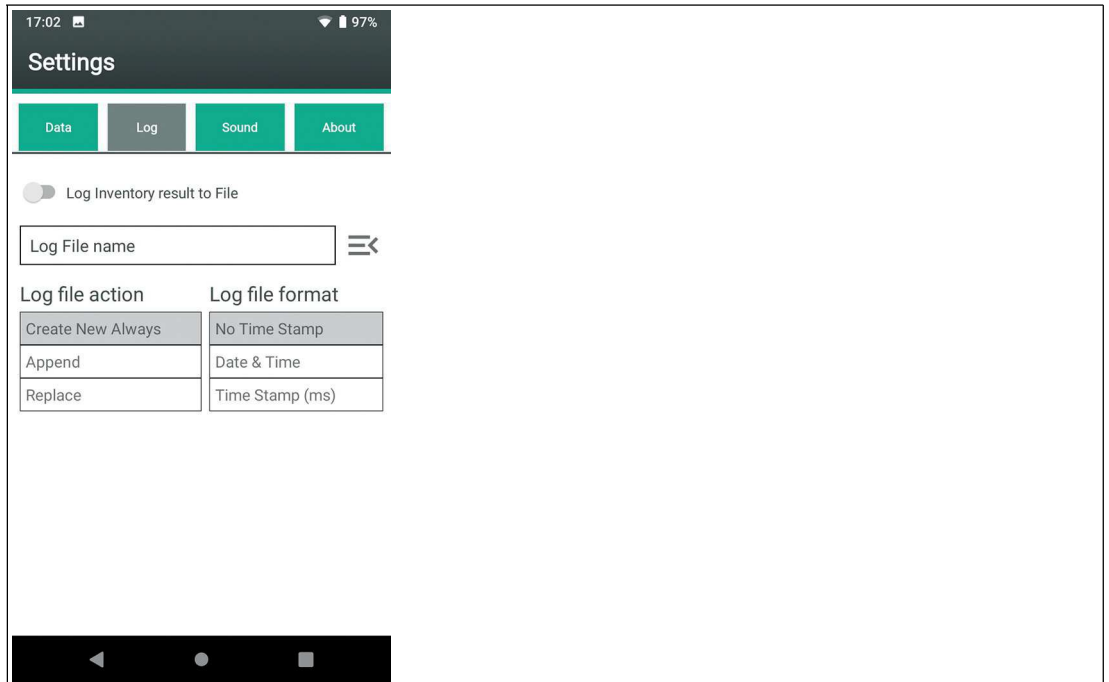


Figure 4.3

If you want to write a log file, enable the option "Log Inventory result to File". Type a file name in the text box.

If this option is enabled, the recorded data is saved to a CSV file with the entered name each time the "Scan Tags" menu is called up.



### Example

Sample data from a generated CSV file:

0	2021-12-08 11:49:35:772	00 1C 5A 03	41 41 41 41	1
1	2021-12-08 11:49:38:286	9D 54 61 03	41 41 41 41	1
2	2021-12-08 11:49:41:048	7E 36 61 03	00 00 00 00	1
3	2021-12-08 11:49:45:317	02 3D 61 03	30 30 30 30	1

The following is displayed:

- Sequence number
- Timestamp
- UID
- User memory
- Read counter

## Sound

In the "Sound" submenu, you can control the app's audible signals.

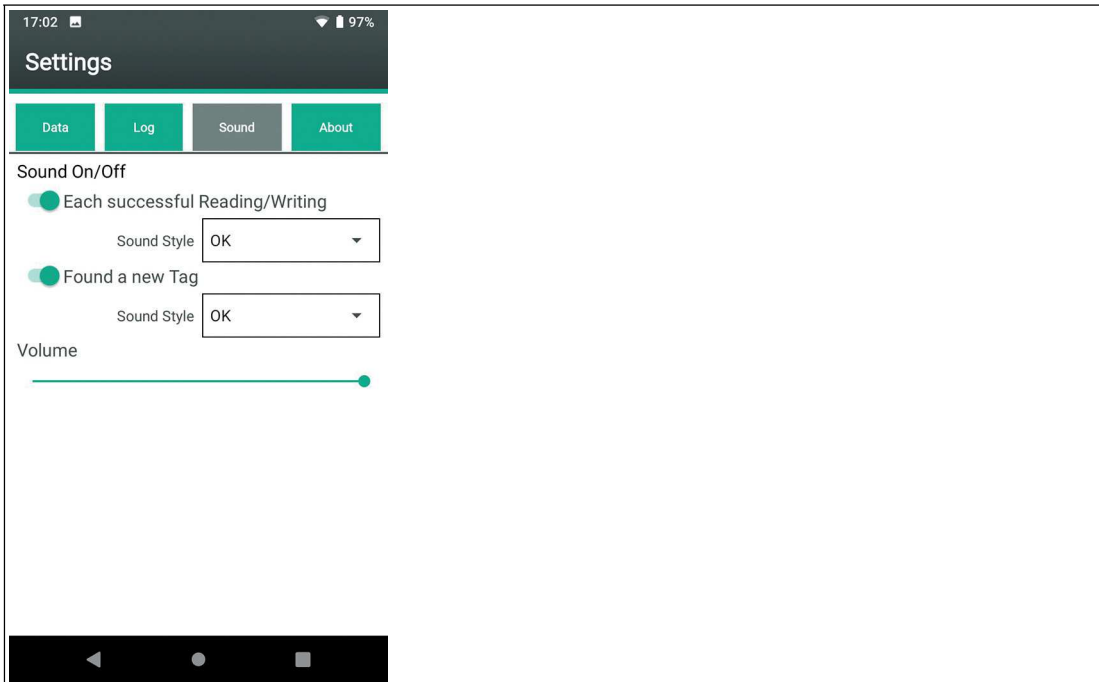


Figure 4.4

Select the option "Each successful Reading/Writing" to activate the selected sound as an audible signal for each successful write or read operation.

Select the option "Found a new Tag" to activate the selected sound as an audible signal for each new tag found.

## About

The "About" submenu displays the versions of the hardware and software components.

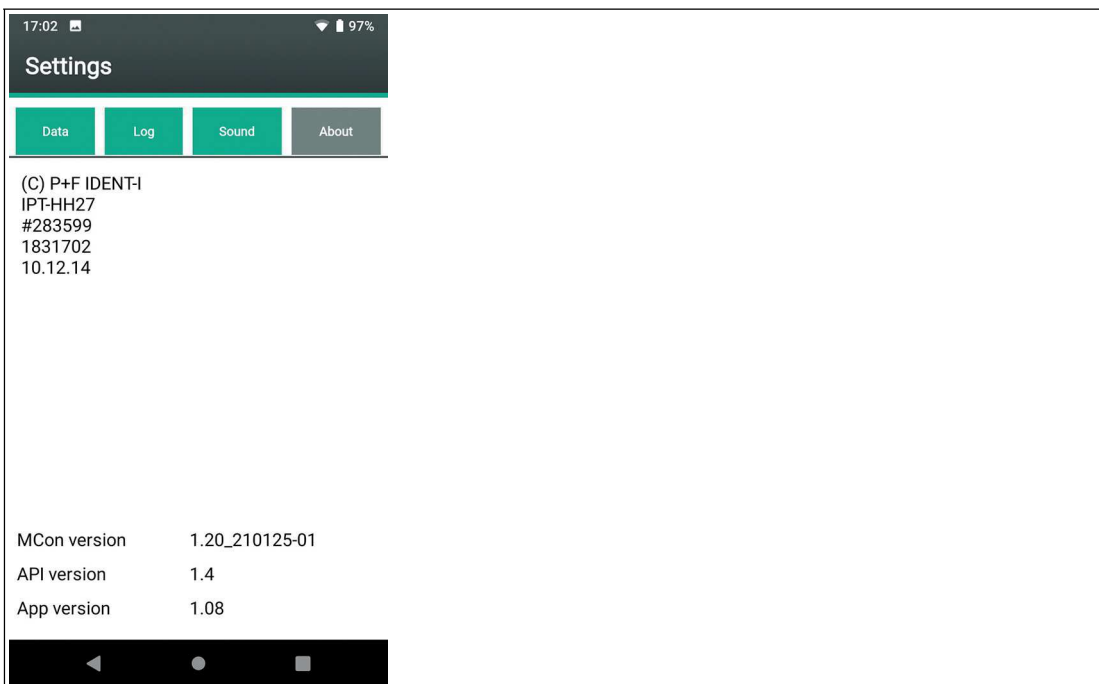


Figure 4.5

2022-03

## 4.4 Main Menu

Once the app is started, the main menu appears on the screen.

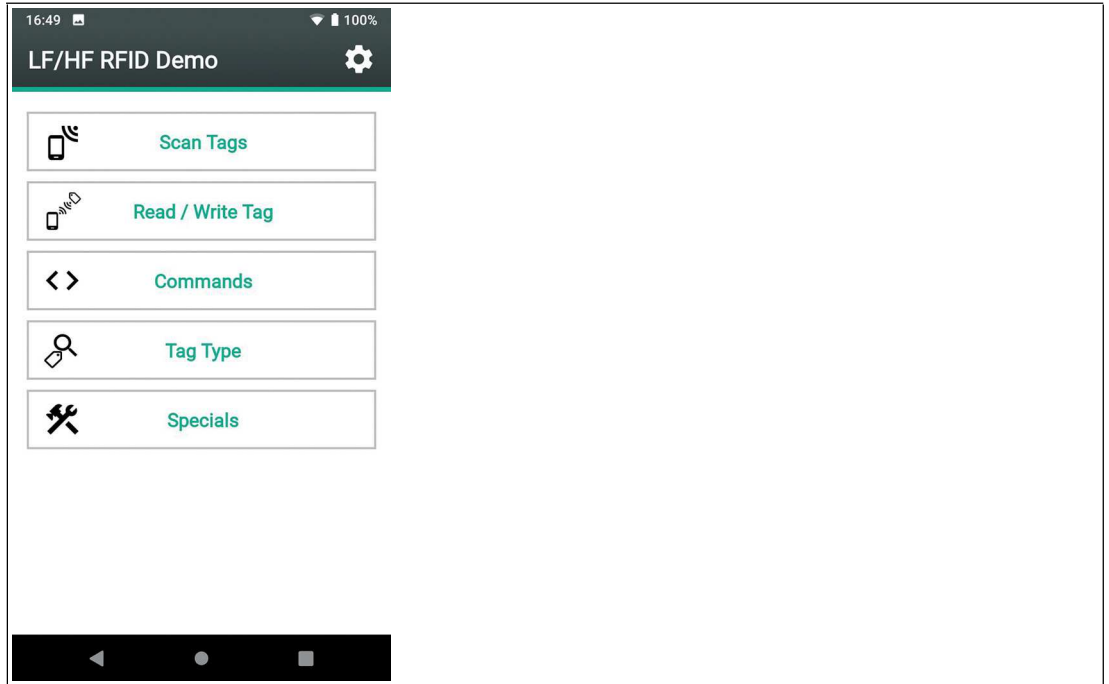
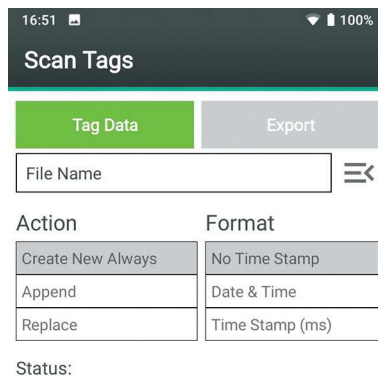


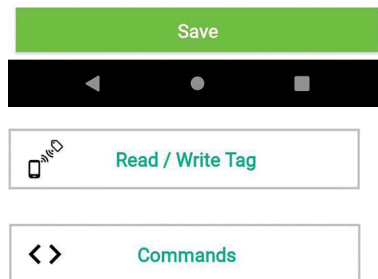
Figure 4.6 Hauptmenü

The main menu has the following options to select from:



Pressing the "Scan Tags" button causes the handheld to detect tags in the sensing range. You can save a list of tags.

See chapter 4.4.1



Press the "Read / Write Tag" button to read out and write detected and selected tags.

See chapter 4.4.2

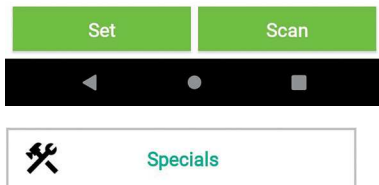
Press the "Commands" button to create, save in a list, execute, and delete individual commands.

See chapter 4.4.3



Press the "Tag Type" button to read out the chip type of a detected and selected tag.

See chapter 4.4.4



Press the "Specials" button to execute commands that are only available for individual chip types.

See chapter 4.4.5

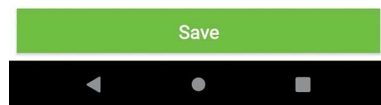
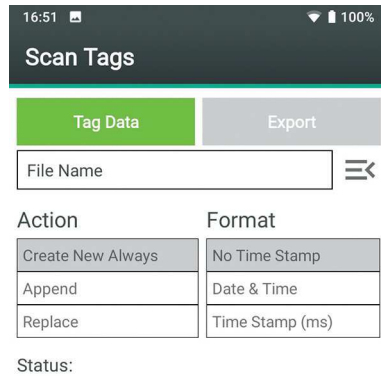
### 4.4.1 Scan Tags

Pressing the "Scan Tags" button causes the handheld to detect tags in the sensing range. You can save a list of tags.



#### Scanning Tags

1. Click the "Scan Tags" button



↳ The "Scan Tags / Tag Data" menu opens.

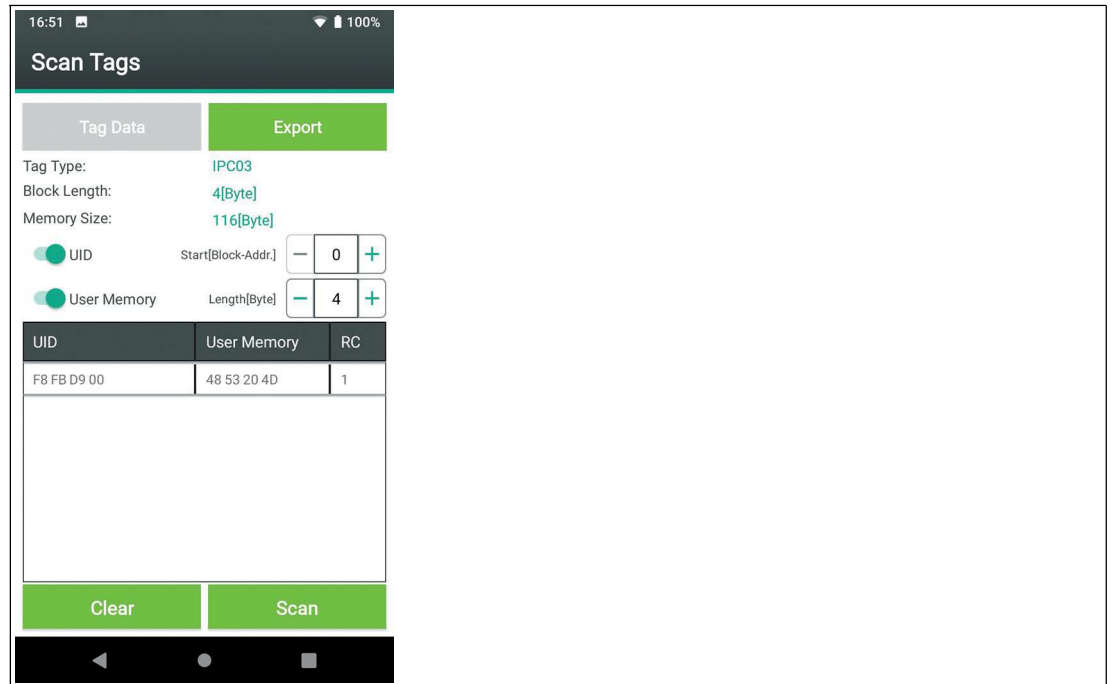


Figure 4.7

2. Click the "Scan" button.

↳ The handheld scans all tags in the sensing range and displays the result in a list.



**Note**

Depending on the settings, the list of detected tags lists the contents of the read/write memory and a counter. The counter counts the read operations of the handheld on the tag.

3. Click the "Stop" button to stop the search. The "Stop" button appears instead of the "Scan" button when the scan is running.

↳ All tags in the sensing range are displayed.



### Saving the Tag List

1. Click the "Export" button

↳ The "Scan Tags / Export" menu opens.

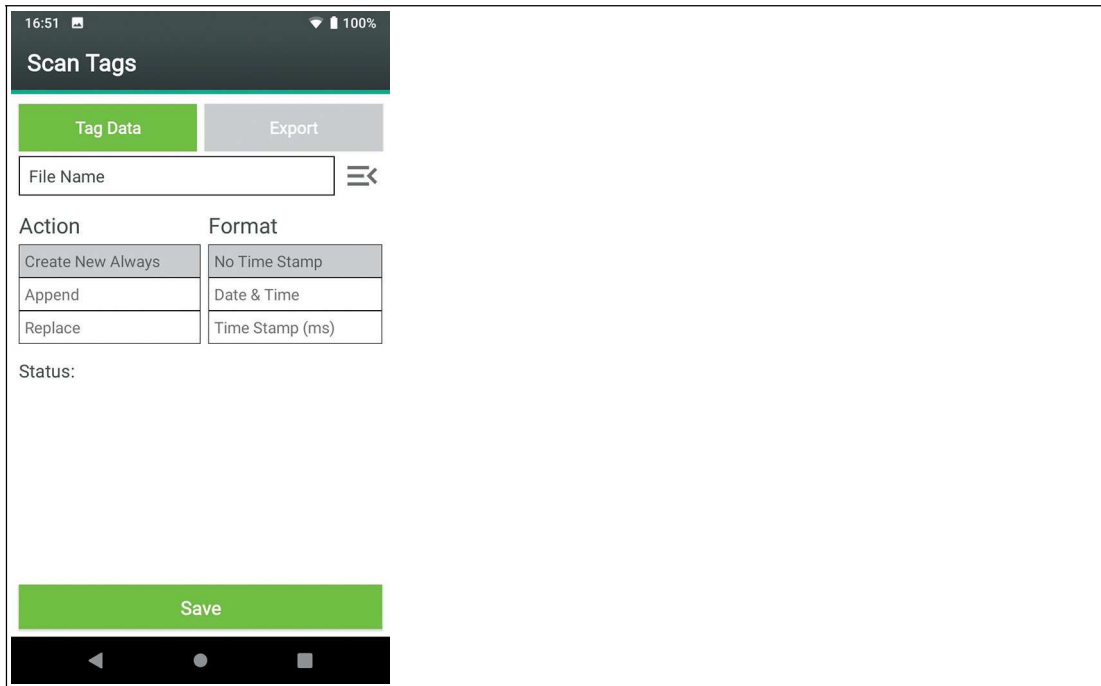


Figure 4.8

2. Type a file name in the text box.
3. Select a storage action and an optional timestamp.
4. Click the "Save" button

↳ A file with the entered name is saved in the set format. See chapter 4.3.



### 4.4.2 Read / Writing Tags

Press the "Read / Write Tag" button to read out and write detected and selected tags.



#### Reading out Tags

1. Click the "Read / Write Tag" button.



↳ The "Read / Write Tag" menu opens.

2. Click the "Tag Data" button.

↳ The "Tag Data" submenu in the "Read / Write Tag" menu opens.

↳ The tag type, the block size, and the memory size of the tag are displayed.

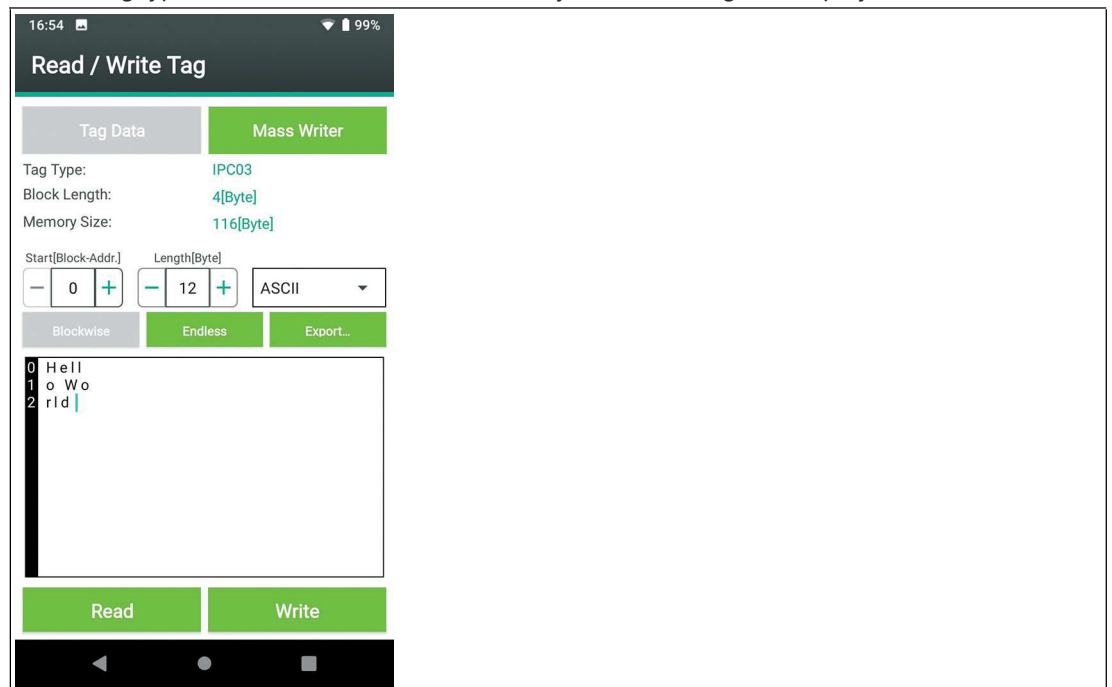


Figure 4.9

3. Select the starting point, length, and format of the desired data in the user memory using the fields "Start[Block-Addr.]", "Length[Byte]", and the selection field for the data format. You can choose the following formats for the data:
  - **HEX**  
All hexadecimal characters are allowed. Four characters always result in a word. Hyphens are inserted automatically.
  - **Decimal**  
All numbers from 0 to 255 are allowed.
  - **ASCII**  
All ASCII characters are allowed.
4. Click the "Read" button.
 

↳ The read data is displayed in the "Blockwise" window. The data on the tags is organized block by block. Each line corresponds to a data block.
5. Click the "Endless" button.
 

↳ The "Endless" window opens.

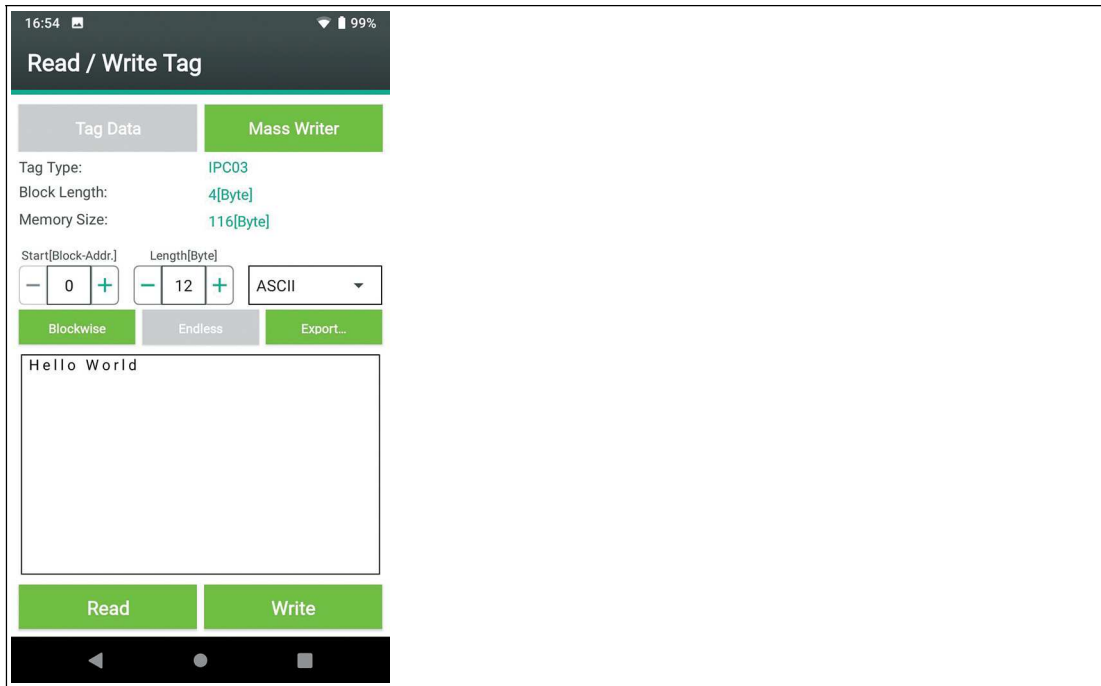


Figure 4.10

↳ The read data is displayed in the "Endless" window. The data is displayed without a break.



**Tip**

Select the "Endless" window for displaying text.



**Writing Tags**

1. Read out the tag data.

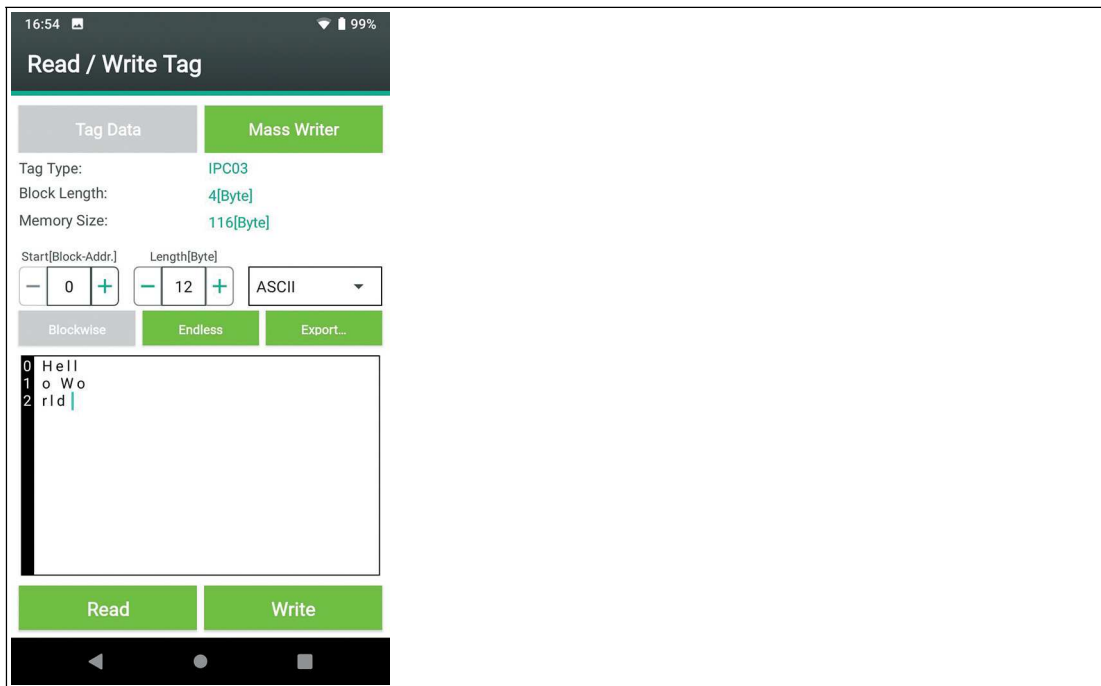


Figure 4.11

2022-03

2. Select the data block you want to write to.
3. Use the virtual keyboard to overwrite the data.



**Note**

You can only write complete data blocks.

4. Click the "Write" button.
  - ↳ The entered data is stored in the user memory on the tag with the selected starting point and selected length.



**Write tag from file**

Press the "Mass Writer" button to write identical data from a file to one or more tags. You must create the required file and save it to your handheld according to your specifications. See "Write Data Format" on page 20.

1. Click the "Mass Writer" button.
  - ↳ The "Mass Writer" menu opens.

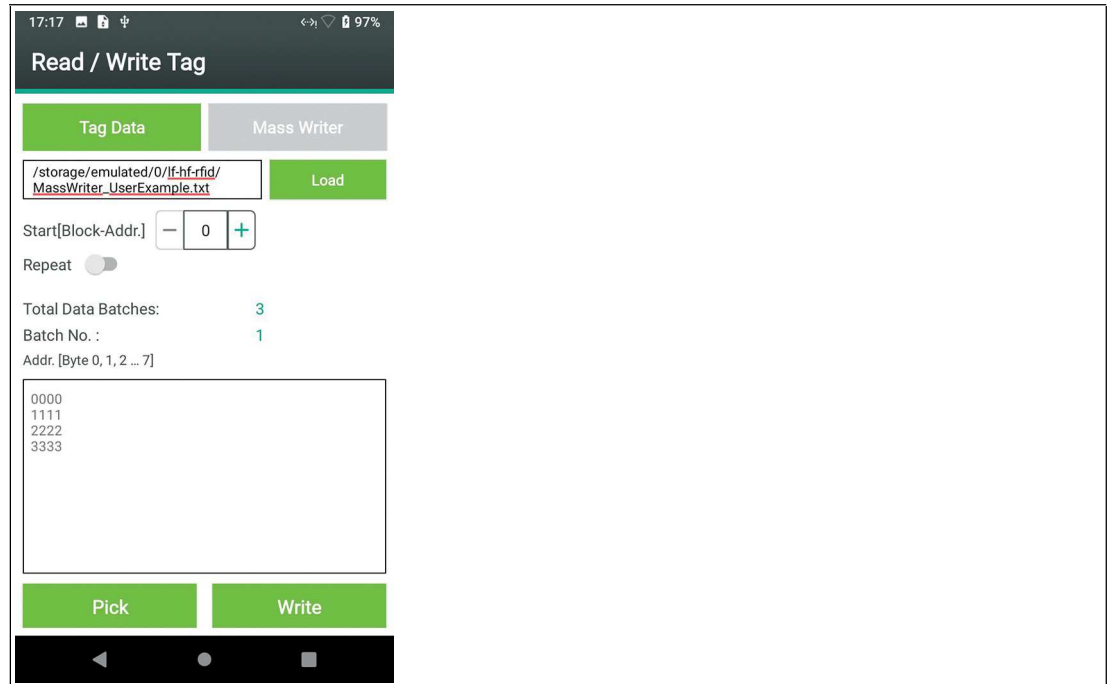


Figure 4.12

2. Click the "Load" button.
3. Select the saved write data file.
  - ↳ The data blocks are downloaded individually from the app.
  - ↳ The data blocks can be written to one or more tags.
4. Click the "Pick" button.
  - ↳ The first data block is copied to the display window. For example: 0000 ... 3333.
5. Click the "Write" button.
  - ↳ The displayed data block is written to a tag.
6. Click the "Pick" button.

↳ The next data block is copied to the display window. For example: 4444 ... 7777.

7. Repeat the writing and picking process for all required or existing data blocks.

### Write Data Format

A write data file is a text file .txt with characters in ASCII format. See chapter 5.1. The text file contains write data in block form. Each data block starts with the tag <DataBatch/> and ends with the tag <\DataBatch>.




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#### Example

A "MassWriter\_UserExample.txt" file contains the following text in ASCII format:

```
<DataBatch/>
0 0 0 0
1 1 1 1
2 2 2 2
3 3 3 3
<\DataBatch>
<DataBatch/>
4 4 4 4
5 5 5 5
6 6 6 6
7 7 7 7
<\DataBatch>
<DataBatch/>
A A A A B B B B C C C C D D D D
<\DataBatch>
```

---



### Saving Operation Data

Press the "Export..." button to save a log file of the existing communication.

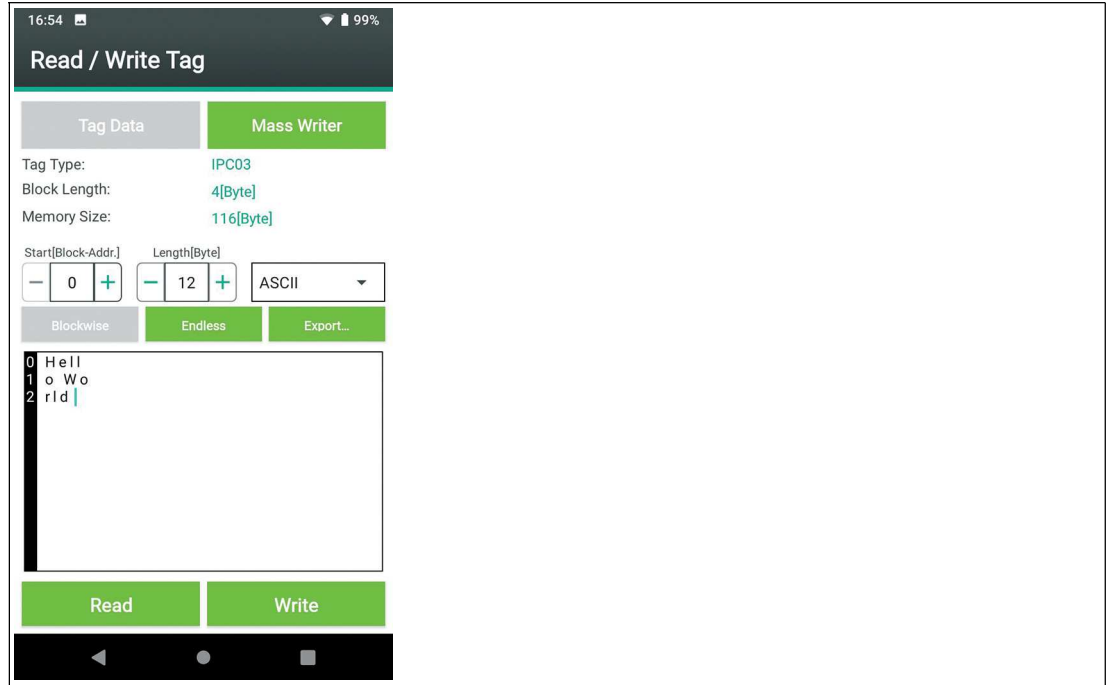


Figure 4.13

1. Click the "Export" button.
2. Enter a file name and click "Save".

↳ The file is stored in the specified file structure in the "exports" directory. See chapter 4.1.

#### 4.4.3 Commands

Press the "Commands" button to create, save in a list, execute, and delete individual commands.



### Commands

1. Click the "Commands" button.



↳ The "Commands" menu opens.



## Execute the command

1. Click the "Commands" button.

↳ The "CMDs" submenu opens.

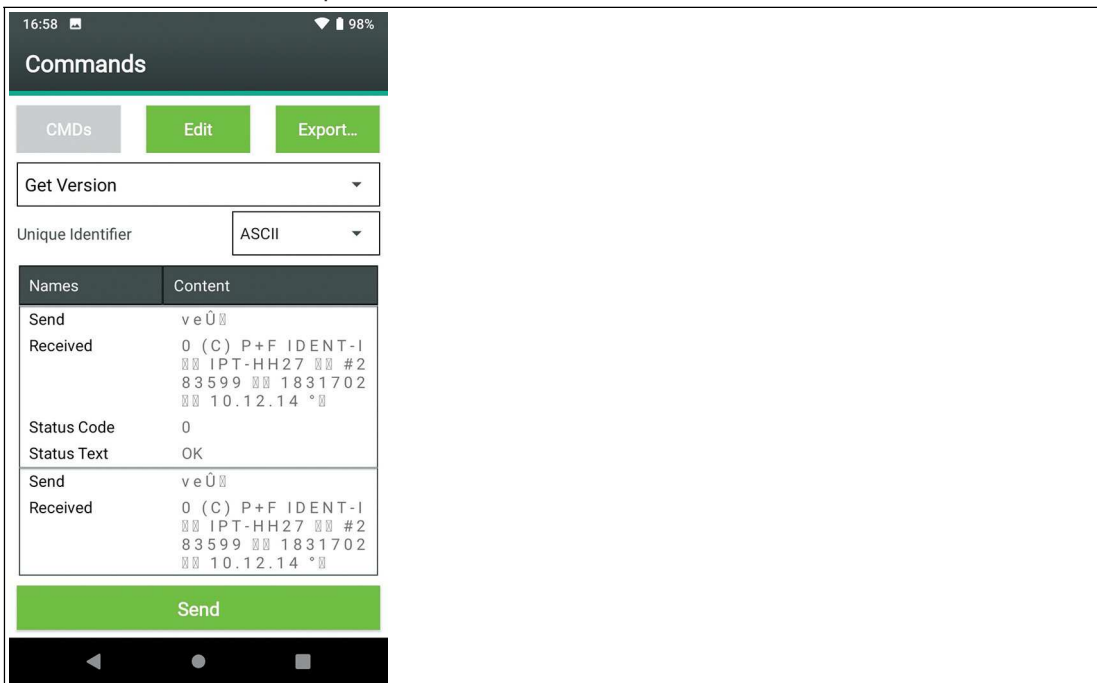


Figure 4.14

2. In the selection field, select the command you want to execute.
3. Click the "Send" button.

↳ The selected command is executed.



## Creating, Editing, Saving, and Deleting a Command

1. Click the "Edit" button.

↳ The "Edit" submenu opens.

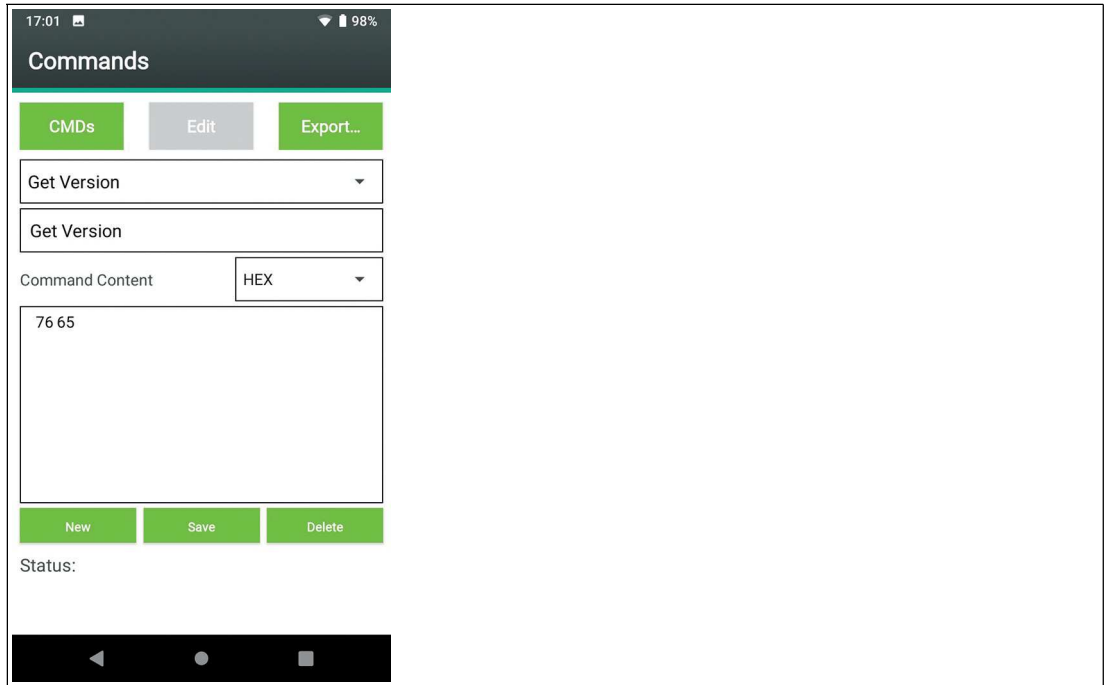


Figure 4.15

2. Click the "New" button to **create** a new command.
3. Select the display format.  
↳ You can create content.
4. Click the "Save" button to save the created command.
5. In the selection field, select the **command** you want to **edit**.
6. Select the display format.  
↳ You can edit the content.
7. Click the "Save" button to save the edited command.
8. In the selection field, select the **command** you want to **delete**.
9. Click the "Delete" button to delete the command.



## Saving Commands and Responses

Press the "Export" button to save a log file of the existing communication.

1. Click the "Export" button.

↳ The "Export..." submenu opens.

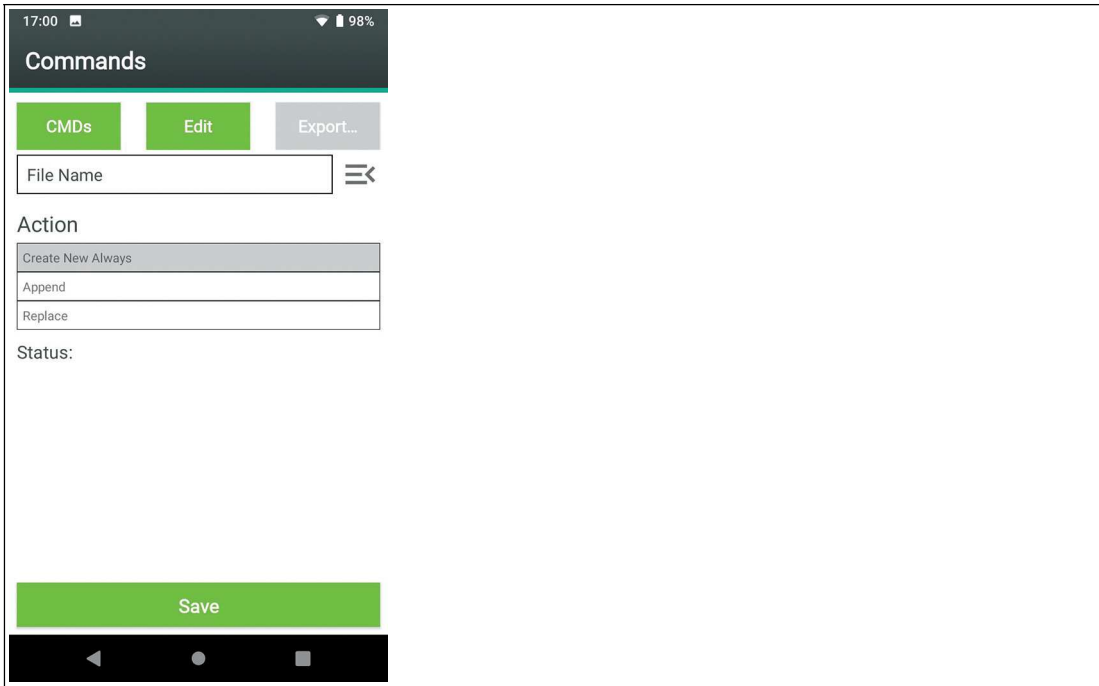


Figure 4.16

2. Enter a file name.
3. Press "Action" to select what happens when you save the file.
4. Click "Save".

↳ The file is stored in the specified file structure in the "exports" directory. See chapter 4.1.



### 4.4.4 Setting the Tag Type

Press the "Tag Type" button to read out the chip type of a detected and selected tag.



#### Reading out the Tag Type

1. Click the "Tag Type" button.



#### Example Tag Type

Chip Type: IPC03  
Fix Code Size: 40 Bit  
Memory Size: 116 Byte  
Frequency: 125kHz  
Block Size: 4 Byte  
Access: R/W, Fixcode



↳ The "Tag Type" menu opens.

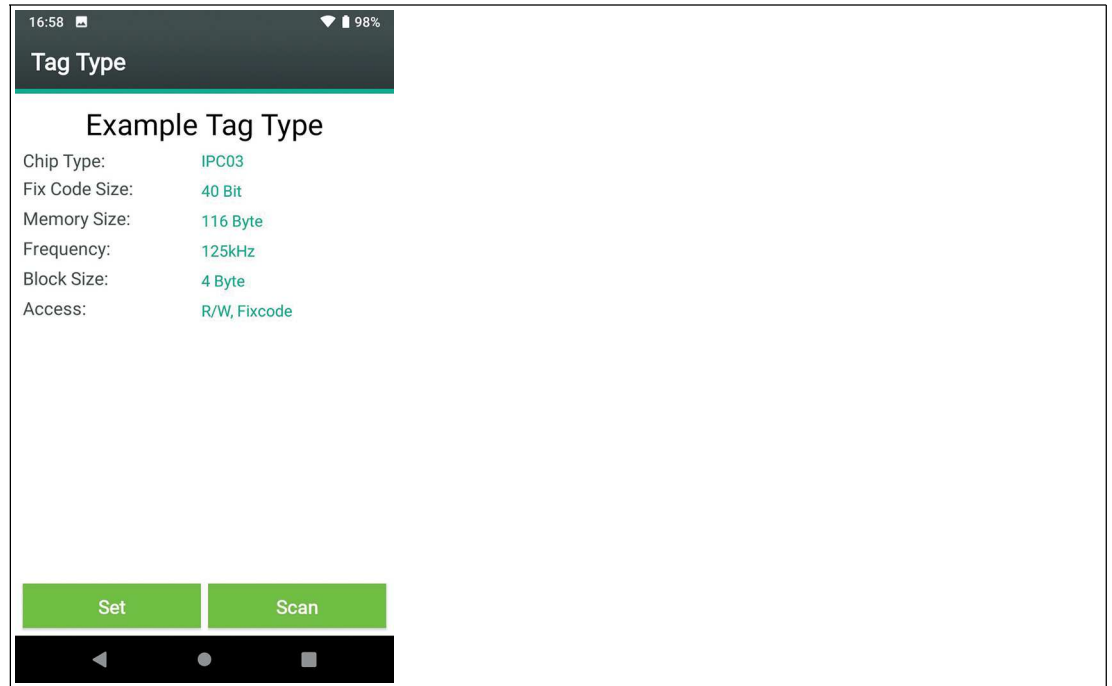


Figure 4.17

2. Click the "Scan" button.

- ↳ The tag is scanned.
- ↳ The data of the detected tag is displayed.



### Setting the "Tag Type"

You can set the tag type of a detected tag as the tag type for further read/write operations. See "Data" on page 9.

1. Read out the tag type.
  2. Click the "Set" button.
- ↳ The tag type read out is applied as the tag type for further write/read operations.

## 4.4.5 Special Features

Press the "Specials" button to execute commands that are only available for individual tag types.



### Tag Type IPC11—Enter Read-Only Code

1. Click the "Specials" button.



↳ The "Specials" menu opens.

2. Click the "Tag Data" button.

↳ The "Tag Data" submenu opens.

↳ The tag type, the block size, and the memory size of the tag are displayed.

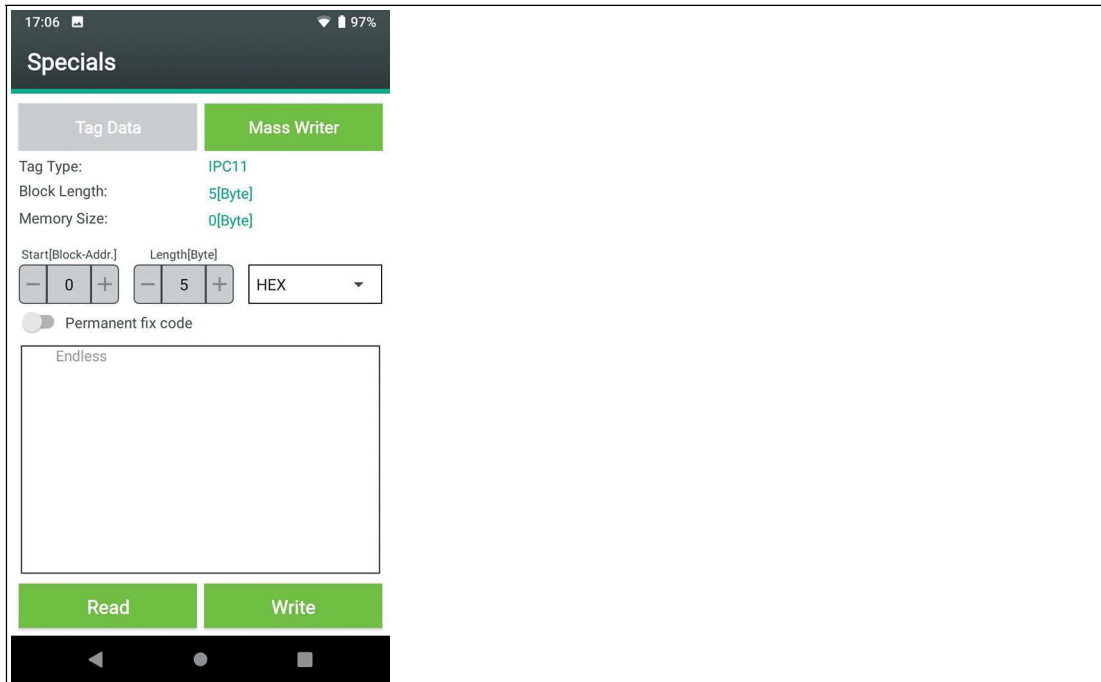


Figure 4.18

3. Select the format of the desired data of the read-only code with the selection field for the data format. You can choose the following formats for the data:
  - **HEX**  
All hexadecimal characters are allowed. Four characters always result in a word. Hyphens are inserted automatically.
  - **ASCII**  
All ASCII characters are allowed.
4. The start point and the length are preset.
5. Click the "Read" button.
  - ↳ The read data is displayed in the "Endless" window.
6. Use the virtual keyboard to overwrite the data.



**Note**

Use the "Permanent fix code" switch to lock the read-only code against further changes

7. Click the "Write" button.
  - ↳ The read-only code is stored on the tag as a locked or editable read-only code.



### Tag Type IPC11—Read in Read-Only Code from File

Press the "Mass Writer" button to write identical read-only codes from a file to one or more tags. You must create the required file and save it to your handheld according to your specifications. See "Write Data Format" on page 20.

1. Click the "Mass Writer" button.
  - ↳ The "Mass Writer" menu opens.
2. Click the "Load" button.
3. Select the saved write data file.
  - ↳ The read-only code is downloaded from the app.
  - ↳ The read-only code can be written to one or more tags.
4. Click the "Pick" button.
  - ↳ The read-only code is copied to the display window. For example: 00000.
5. Click the "Write" button.
  - ↳ The read-only code is written to a tag.

### Write Data Format

A write data file is a text file .txt with characters in ASCII format. See chapter 5.1. The text file contains write data in block form. Each data block starts with the tag <DataBatch/> and ends with the tag <\DataBatch>.



**Example**

A "MassWriter\_UserExample.txt" file contains the following text in ASCII format:

```
<DataBatch/>
0 0 0 0 0
<\DataBatch>
```

## 5 Glossary

ASCII	The American standard code for ASCII information exchange is an 8-bit character encoding
RSSI	The received signal strength indicator RSSI indicates the signal strength (in dBm) that the reader receives from a tag.
Word	A word or data word is the smallest amount of data that is read or written in a read or write operation of a tag.

### 5.1 ASCII table

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

# Your automation, our passion.

## Explosion Protection

- Intrinsic Safety Barriers
- Signal Conditioners
- FieldConnex® Fieldbus
- Remote I/O Systems
- Electrical Ex Equipment
- Purge and Pressurization
- Industrial HMI
- Mobile Computing and Communications
- HART Interface Solutions
- Surge Protection
- Wireless Solutions
- Level Measurement

## Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Fieldbus Modules
- AS-Interface
- Identification Systems
- Displays and Signal Processing
- Connectivity

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