Your Global Automation Partner

TURCK

PD20-UHF
RFID Handheld

Instructions for Use

Contents

1 About these Instructions

This manual describes the setup, the functions and use of the product and helps you to operate the product for its intended use. Read the instructions carefully prior to using the product. This will prevent the risk of personal injury and damage to property. Keep these instructions safe during the service life of the product. If the product is passed on, pass on these instructions as well.

1.1 Target groups

This document is written for specially trained personnel , and must be read carefully by anyone who is responsible for the mounting, commissioning, operation, maintenance, disassembly or disposal of the device.

1.2 Explanation of symbols

The following symbols are used in these instructions:

	**DANGER** DANGER indicates an immediate hazardous situation, which, if not avoided, will result in death or serious injury.
	**WARNING** WARNING indicates a possible hazardous situation with the risk of death or serious injury if it is not prevented.
	**NOTICE** NOTICE indicates a situation that may cause possible damage to property if it is not prevented.
	**NOTE** NOTE indicates tips, recommendations and important information. The notes simplify work, contain information on particular operating steps and help to avoid additional work resulting from incorrect procedures.
▶	**MANDATORY ACTION** This symbol denotes actions that the user must carry out.
⇨	**RESULT OF ACTION** This symbol denotes the relevant results of actions and procedures.

1.3 Other documents

Besides this document the following material can be found on the Internet at www.turck.com:

- Operating instructions
- Data sheet

1.4 Naming convention

Common synonyms for "data carriers" include "tag", "transponder", and "mobile storage device". Read/write heads are also described as "transceivers" or "readers".

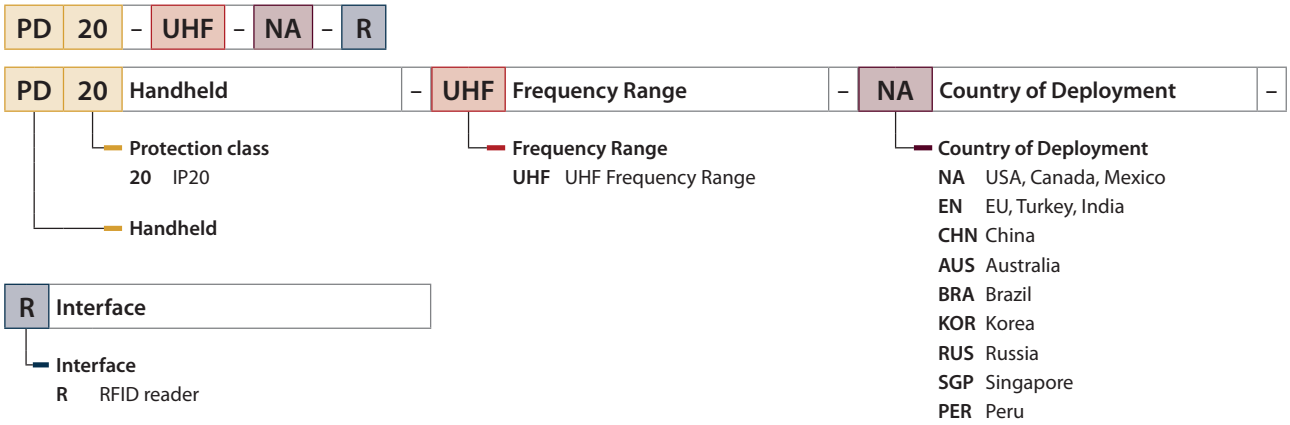
1.5 Feedback about these instructions

We make every effort to ensure that these instructions are as informative and as clear as possible. If you have any suggestions for improving the design or if some information is missing in the document, please send your suggestions to techdoc@turck.com.

2 Notes on the Product

2.1 Product Identification

These instructions apply to the following UHF handhelds:



The device versions for Australia, Brazil, Korea, Russia, Singapore, and Peru are available on request.

2.2 Scope of Delivery

The following are included in the scope of delivery:

- Handheld
- USB charging cable
- Power supply unit
- Quick start guide

2.3 Legal Requirements

The devices are subject to the following directives:

Device	Region	Directives
PD20-UHF-EU-R	Europe	■ 2014/30/EU (electromagnetic compatibility) ■ 2014/35/EC (low voltage) ■ 2014/53/EU (RED Directive)
PD20-UHF-NA-R	USA	■ FCC Rules Part 15
	Canada	■ Industry Canada RSS-210
PD20-UHF-CHN-R	China	■ SRRC

More information on other variants is available on request.

2.4 Manufacturer and service

Hans Turck GmbH & Co. KG
Witzlebenstraße 7
45472 Mülheim an der Ruhr
Germany

Turck supports you in your projects – from the initial analysis right through to the commissioning of your application. The Turck product database offers you several software tools for programming, configuring or commissioning, as well as data sheets and CAD files in many export formats. You can access the Product Database directly via the following address:
www.turck.de/products
For further inquiries in Germany contact the Sales and Service Team on:

- Sales: +49 208 4952-380
- Technical: +49 208 4952-390

For overseas inquiries contact your national Turck representative.

3 For Your Safety

The product is designed according to state of the art technology. Residual hazards, however, still exist. Observe the following warnings and safety regulations in order to prevent danger to persons and property. Turck accepts no liability for damage caused by failure to observe these warnings and safety instructions.

3.1 Intended Use

The devices are designed solely for use in industrial applications.
The PD20-UHF handhelds are used for wireless exchange of data with RFID UHF tags. The handhelds can be used to read and write tags.
A mobile device with the Turck RFID app is required to operate the handheld. The handheld can be connected to the mobile device via the audio port. The Turck RFID app is available for the iOS and Android operating systems.

The operating frequency of the devices is described in the following table:

Type designation	Operating frequency
PD20-UHF-EU-R	865.7…867.5 MHz
PD20-UHF-NA-R	902.75…927.25 MHz
PD20-UHF-CHN-R	920.25…924.75 MHz
PD20-UHF-AUS-R	920.25…925.75 MHz
PD20-UHF-BRA-R	902…907.5 MHz and 915…928 MHz
PD20-UHF-KOR-R	917…920.5 MHz
PD20-UHF-RUS-R	916…921 MHz
PD20-UHF-SGP-R	920…925 MHz
PD20-UHF-PER-R	916…928 MHz

The devices may be operated only in countries in which the relevant frequency range is approved for the use of UHF-RFID.
The device must only be used as described in these instructions. Any other use is not in accordance with the intended use. Turck accepts no liability for any resulting damage.

3.2 Obvious Misuse

The device works only in conjunction with the Turck RFID app. It is not possible to connect it to the audio input of PCs, radios, etc.

3.3 General Safety Instructions

- The device only fulfills the EMC requirements for industrial applications and is not suitable for use in residential areas.
- The device must only be fitted, installed, operated, parameterized and maintained by trained and qualified personnel.
- Only use the device in compliance with the applicable national and international regulations, standards and laws.
- Any extended stay within the area of radiation of UHF devices may be harmful to health. Maintain a minimum distance from the actively radiating surface of the UHF read/write head:

Region	Max. Permissible Radiation Output Power	Safety Distance
Europe, Russia, China	2 W ERP (according to ETSI)	0.24 m
USA, Canada, Mexico	30 dBm ERP	> 0.22 m

The minimum distances for other regions are available from Turck on request.

- The radiation of UHF devices may impair the operation of electrically controlled medical equipment. Maintain an additional distance from active radiation sources up to the maximum transmission distance.

4 Product Description

The UHF-RFID handhelds in the PD20-UHF series have protection class IP20 and are contained in a plastic housing. A mobile device with the Turck RFID app is required for operation. The devices are equipped with a cable with a jack plug to connect to the audio port of mobile devices.

Handhelds are available for use in the following regions:

- Europe
- North America (USA, Canada, Mexico)
- China

Other country variants are available on request.
The Turck RFID app is free of charge for the iOS (from the App Store) and Android (from the Play Store) operating systems.

4.1 Device Overview

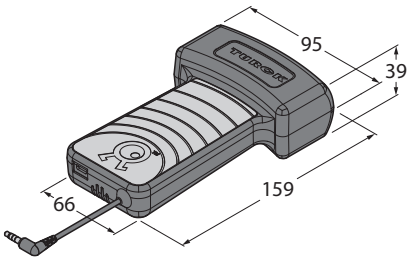


Fig. 1: Dimensions

4.2 Properties and Characteristics

- Mobile reading and writing of RFID tags
- Handheld with UHF antenna
- Connection to the host device via audio connection
- Including Turck RFID app (iOS, Android) for the reading and writing of tags
- Customer-specific app on request
- WLAN 802.11a/b/g/n and mobile interface via connected host device
- Protection class IP20
- Fall protection for multiple drops onto smooth concrete from 1.5 m height
- Fixed lithium-ion battery (1800 mAh), approx. 2 hours active scanning
- Incl. Micro-B USB cable and power supply

4.3 Functional Principle

RFID (Radio Frequency Identification) is a contactless working method for the automatic identification of resting or moving objects using electromagnetic alternating fields. To do this, the serial number of the object, for example, is saved on a mobile tag and read out by a read/write device via wireless communication from a distance of up to several meters. RFID technology also makes it possible for several objects to be identified at the same time, since a direct line-of-sight between the tags and the read/write device is not required.

4.4 Functions and Operating Modes

The devices can be used to read and write passive UHF storage media in any location. To do this, the devices form a transmission zone. The size and expansion of this zone may vary on account of several conditions, for example the tags used and the application conditions. The devices can only be operated with the Turck RFID app.

4.4.1 Transmission Frequency

The Turck BL ident® UHF system works with country-specific transmission frequencies between the tags and the read/write heads. These country-specific UHF transmission frequencies are derived from the individual allocation of frequency ranges by the respective national regulatory bodies.

For example, the operating frequencies of the devices in the UHF band are 865…868 MHz for Europe and 902…928 MHZ for the USA. Before use, make sure that the BL ident® handhelds comply with the region's specific UHF band. Any application in regions other than the accredited ones is not permitted. Since BL ident® UHF tags do not emit their own radio waves, they may be used worldwide.

In order to achieve the biggest possible communication range, Turck offers tags which are optimally tuned to country-specific frequency bands. Alternatively, broadband multi-area tags are also available for international use.

The different Turck handhelds support the following transmission frequencies:

- 865.7…867.5 MHz (Europe)
- 902.75…927.25 MHz (USA, Canada and Mexico)
- 920.25…924.75 MHz (China)
- 920.25…925.75 MHz (Australia)
- 902…907.5 MHz and 915…928 MHz (Brazil)
- 917…920.5 MHz (Korea)
- 916…921 MHz (Russia)
- 920…925 MHz (Singapore)
- 916…928 MHz (Peru)

All the country-specific details concerning UHF, such as frequency band, power supply, and any national regulations are available at:
http://www.gs1.org/docs/epcglobal/UHF_Regulations.pdf
For more information, please contact the corresponding national authorities of the country in which you want to deploy the UHF RFID system.

HF RFID systems can be operated in parallel with UHF RFID systems in a single system.

5 Connection

5.1 Battery Charging

NOTE
The charging time depends on the charging method selected. Turck recommends that the device should be charged for at least two hours before the first commissioning.

- ▶ Connect the micro USB end of the supplied charging cable to the handheld.
- ▶ Connect the USB A end of the charging cable to an available USB port of a PC or laptop.

or

- ▶ Connect the USB A end of the charging cable to the supplied power adapter.
- ▶ Connect the power adapter to an appropriate power outlet.

5.2 Connect the handheld to the mobile device

- ▶ Connect the jack plug on the handheld to the audio port of the mobile device.

6 Commissioning

The devices can be operated only with the Turck RFID app. The Turck RFID app is available free-of-charge for Android and iOS devices in the Play Store or the App Store. Search for "Turck RFID".

- Android devices: Download the Turck RFID app from the Play Store and install it on your mobile device.
- IOS devices: Download the Turck RFID app from the App Store and install it on your mobile device.

Fig. 2: Icon for the Turck RFID app in the App Store

7 Operation

The handheld can be operated only with the Turck RFID app.

- ▶ Never leave the audio cable plugged in to the mobile device when not in use as it will deplete the battery of the handheld.
- ▶ To operate the handheld while charging, you must use a charger that supplies 600 mA or less.

7.1 Start the Turck RFID app

- ▶ Open the Turck RFID app on your mobile device.
- ▶ Set the volume of the mobile device to maximum.
- ⇨ The handheld can be operated via the Turck RFID app.

7.2 Home Screen — Overview

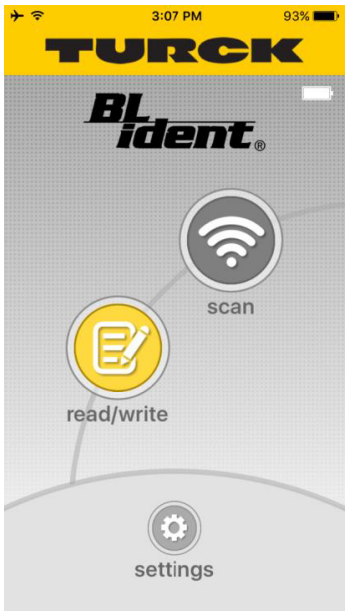


Fig. 3: Turck RFID App: Home Screen

The home screen provides access to the following elements:

- Battery and supply indicator
- "Scan" button to start the scan process
- "Read/Write" button for reading and writing data
- "Settings" button for setting and configuring the handheld

7.3 Perform Scan

- ▶ Press the "Scan" button on the home screen.
- ⇨ The handheld begins searching for UHF tags within the detection range. The Turck RFID app switches to the "Scan" screen.
- ⇨ The handheld acknowledges each tag found with an acoustic signal.
- ⇨ The EPCs of tags found are displayed and can be processed. For more information, see the section "Reading and Writing Tags".

Fig. 4: Turck RFID App: "Scan" Screen

Changing the Signal Volume and Transmission Power

- ▶ Press the controller button in the upper right-hand corner.
- ▶ Adjust the signal volume and transmission power according to the following table.

Icon	Description
	Changes the transmission power and signal volume. The respective maximum values are set as defaults.
	Transmission power and signal volume below the maximum value.

Changing to Scan Mode

NOTE
The current scan mode is displayed in the lower right corner of the screen.

The handheld can be used in the operating modes "Single" and "Geiger". In "Single" mode, each of the tags found is confirmed once with an acoustic signal. "Single" mode is suited for inventory commands, for example, if there are multiple tags within the detection range.

In "Geiger" mode, the handheld emits a signal every time a tag is detected. If a tag is read several times, the handheld emits a continuous acoustic signal, even if there is only one tag within the detection range. The tag list will show a graphic display indicating how often a tag has already been read. "Geiger" mode is suited to searching for tags, for example.

- ▶ Change the operating mode by pressing "Single" or "Geiger".

Send Read Data via Email

The EPCs that have been read can be sent as a list via email. This requires an email program to be installed on the mobile device and for the mobile device to be connected to the Internet.

- ▶ Interrupt the scan by pressing "Pause".
- ▶ Press the "E-Mail" button.
- ⇨ The read EPCs are sent to the email address stored in the settings.
- ⇨ If no email address is stored in the settings, a window opens automatically to allow the email address to be entered.

Interrupt Scan

- ▶ Press the "Pause" button.
- ⇨ The scan is interrupted and can be continued at a later time. The displayed time continues to run.

Abort the Scan

- ▶ Press the "Stop" button.
- ⇨ The scan is aborted. The displayed time restarts when the next scan begins. The read EPCs are stored and can be sent via email.

7.4 Reading and Writing Tags

Using the "Read/Write" window, tags can be read, written, protected, or permanently disabled.

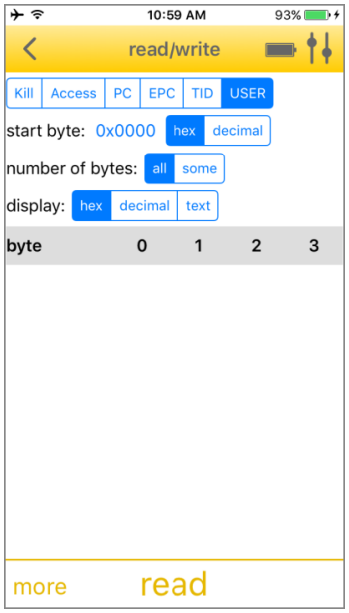


Fig. 5: Turck RFID App: "Read/Write" screen

The "Read/Write" screen provides access to the following elements:

- EPC: Shows the EPC of the selected tag.
- Selection of the memory bank on the tag
- Start byte for the desired action (hexadecimal and decimal formats can be selected)
- Number of bytes: When selecting "All", as many bytes will be read as are available in the respective memory bank of the tag. When selecting "Some", a certain number of bytes must be specified.
- Display of user data (hexadecimal, decimal, and ASCII formats can be selected)
- User data: The read data is displayed and can be edited.
- "More" button: Opens the menu for further functions
- "Read" button: Starts the read process
- "Write" button: Starts the write process

7.4.1 Reading and Writing Tags — Advanced Features

The following advanced features can be performed:

- Use tag access password: Uses the access password when accessing tags
- Change the lock/unlock status: Locks or unlocks the selected memory area. The following statuses can be selected:

Status	Description
Writable	Tags can be written with and without an access password (default setting)
Permanently writable	Tags can be written with and without an access password. The condition "Permanently writable" cannot be changed.
Writing restricted	Tags can be written only with an access password
Permanently unwritable	Tags cannot be written (status cannot be changed)

- Send data via email: Send read data via email
- Load data: Load previously saved data from the memory of the handheld
- Save data: Save data on the handheld for later use
- Kill tag: Deactivate tag irrevocably

▶ Open advanced features: On the "Read/Write" screen, press the "More" button.

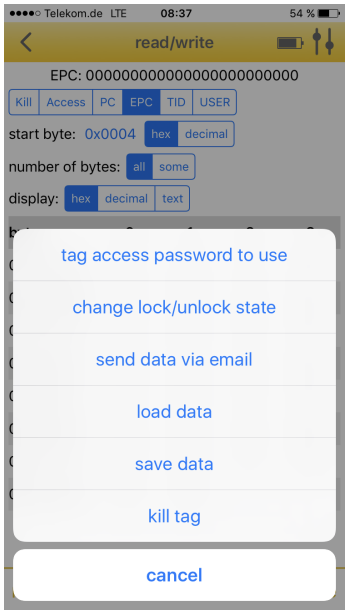


Fig. 6: Turck RFID App: Advanced Features

7.4.2 Example: Read Data

A read process can be started either from the home screen or from the "Scan" screen.

Start Read Process from the Home Screen

If no EPC has been selected, the device reads a randomly selected tag within the field. The tag chosen to be read is not affected by the distance between the tag and the handheld.

- ▶ On the home screen, press "Read/Write".

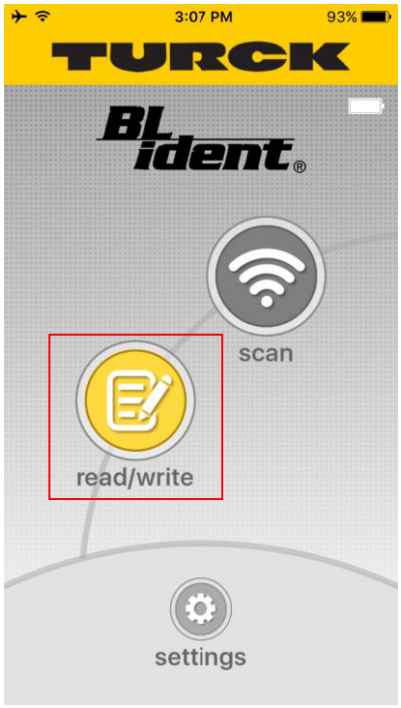


Fig. 7: Select "Read/Write"

- Select the memory bank that is to be read.

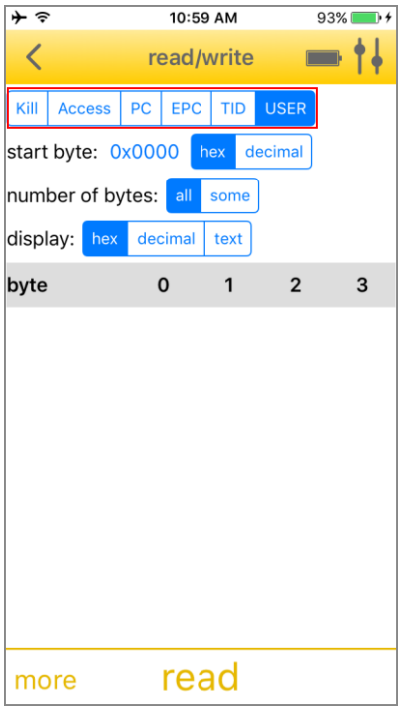


Fig. 8: Select memory bank

- Select the preferred format for the display of the start byte.

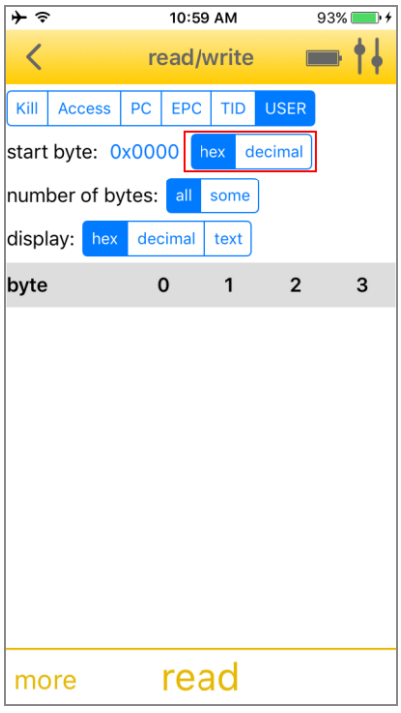


Fig. 9: Select format

- Specify the start byte for the read process: Tap the current start byte and enter the new start byte in the following window.

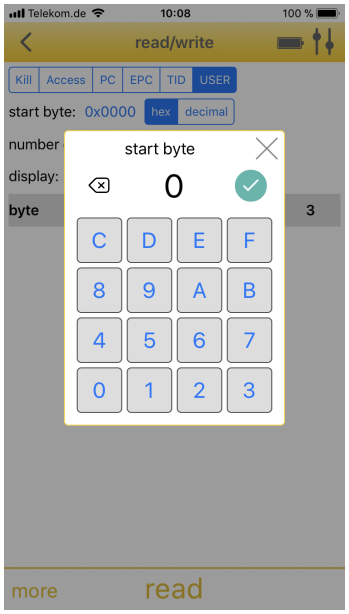


Fig. 10: Specify start byte

- Select the number of bytes to be read. When selecting "Some", enter the number in the following window. When selecting "All", all the bytes that are available in the respective memory bank of the tag are written.

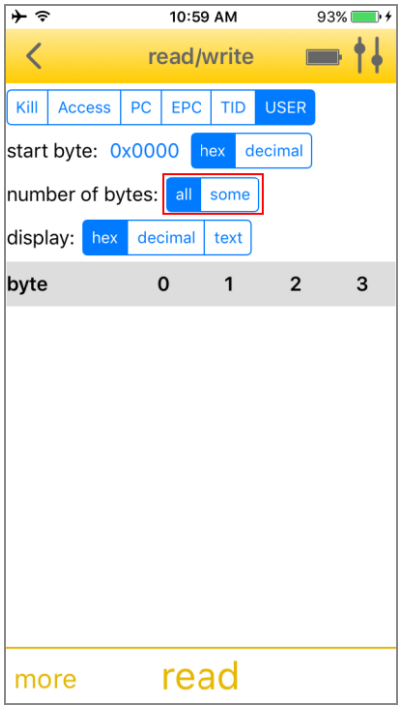


Fig. 11: Select number of bytes

- Select the display format for the read data.

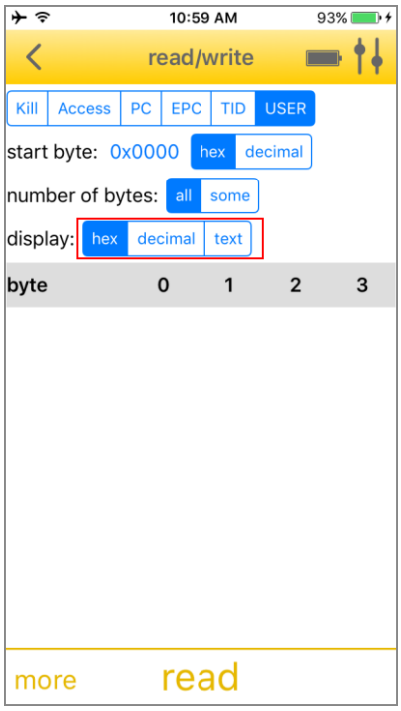


Fig. 12: Select data format

- Press "Read".

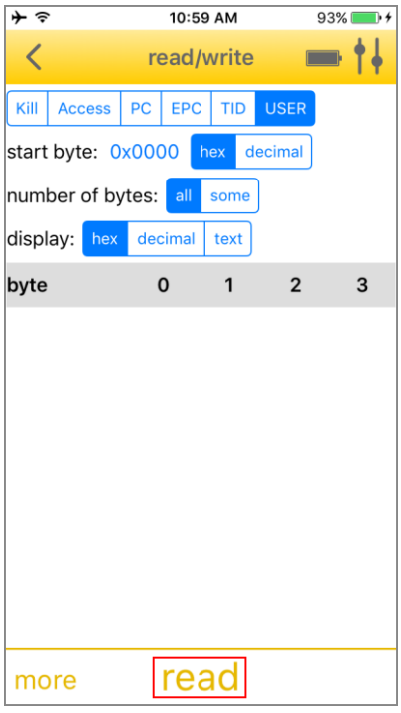


Fig. 13: "Read"

⇨ The handheld starts the read process. The read data is displayed on the screen.

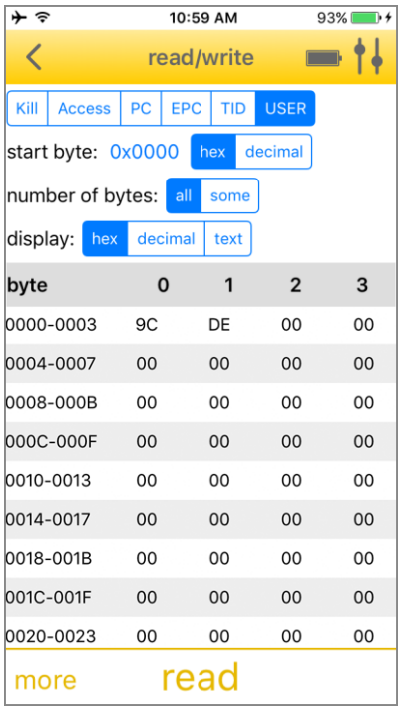


Fig. 14: Read data

Start the read process from the "Scan" screen

When a read process is started from the "Scan" screen, a tag with a specific EPC is read.

- ▶ Start the scan on the home screen.
- ▶ Select the tags to be read from the EPC list.
- ⇨ The "Read/Write" screen opens.

- ▶ Select the memory bank that is to be read.
- ▶ Select the preferred format for the display of the start byte.
- ▶ Specify the start byte for the read process: Tap the current start byte and enter the new start byte in the following window.
- ▶ Select the number of bytes to be read. When selecting "Some", enter the number in the following window. When selecting "All", all the bytes that are available in the respective memory bank of the tag are written.
- ▶ Select the display format for the read data.
- ▶ Press "Read".
- ⇨ The handheld starts the read process. The read data is displayed on the screen.

7.4.3 Example: Write Data

A write process can be started either from the home screen or from the "Scan" screen.

Starting the Write Process from the Home Screen

If no EPC has been selected, the device writes a randomly selected tag within the field. The tag chosen to be written is not affected by the distance between the tag and the handheld.

- ▶ On the home screen, press "Read/Write".

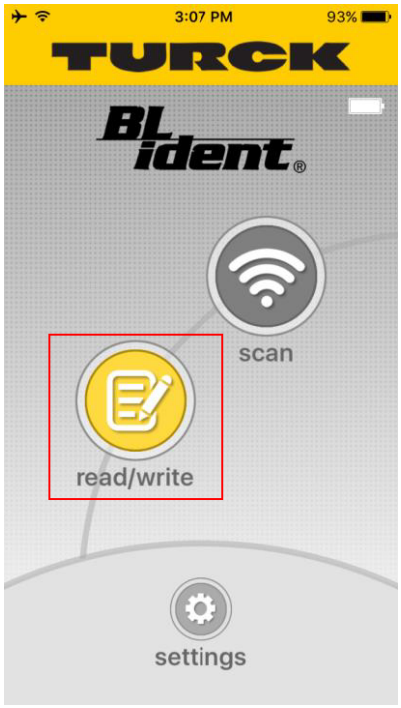


Fig. 15: Select "Read/Write"

▶ Select the memory bank to be written

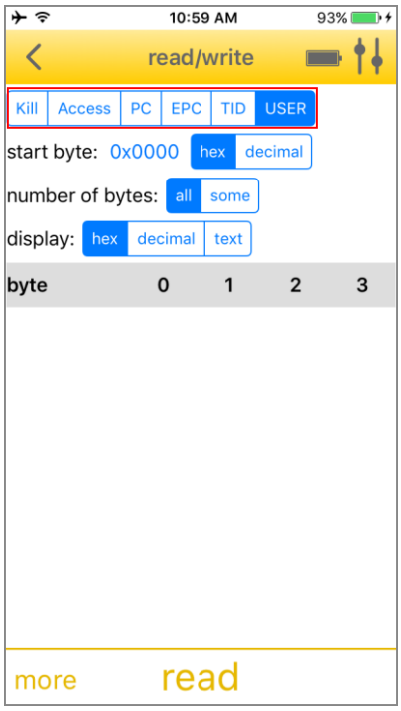


Fig. 16: Select memory bank

▶ Select the preferred format for the display of the start byte.

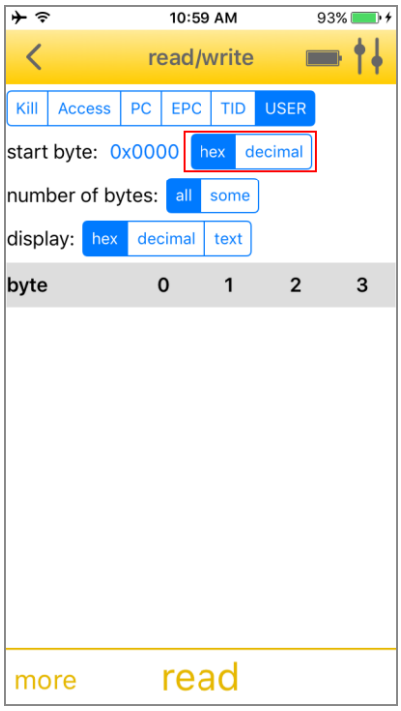


Fig. 17: Select format

- Specify the start byte for the write process: Tap the current start byte and enter the new start byte in the following window.

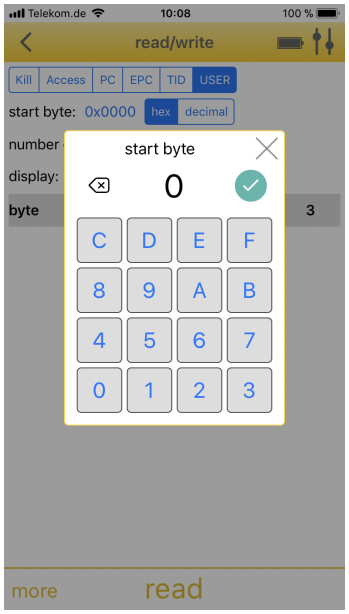


Fig. 18: Specify start byte

- Select the number of bytes to be written. When selecting "Some", enter the number in the following window. When selecting "All", all the bytes that are available in the respective memory bank of the tag are written.

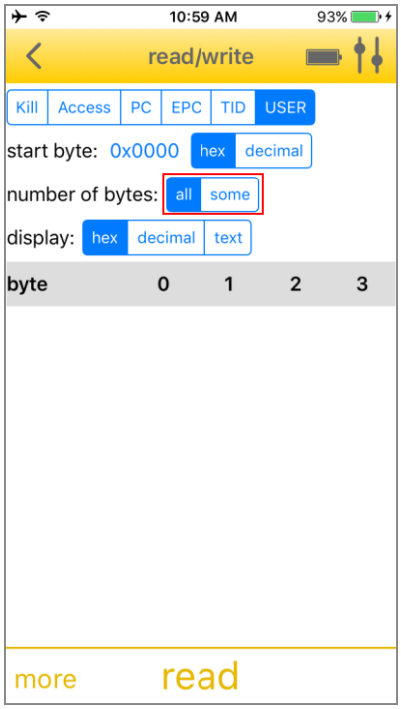


Fig. 19: Select number of bytes

▶ Select the display format for the write data.

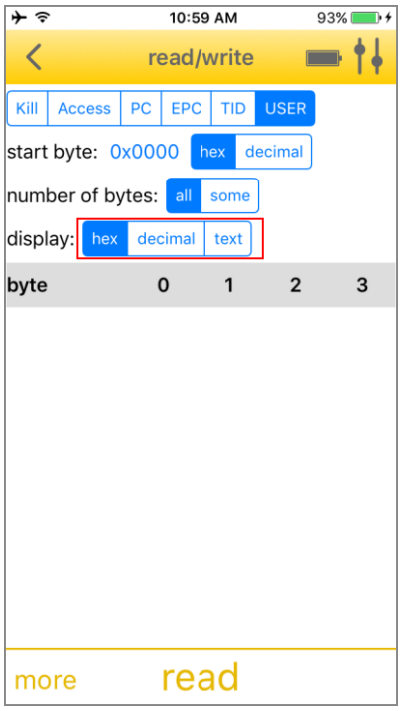


Fig. 20: Select data format

▶ Press "Read".

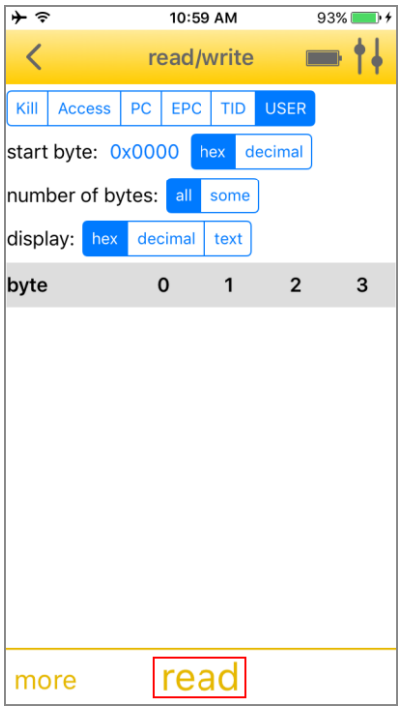


Fig. 21: "Read"

▶ Adjust the data in the table.

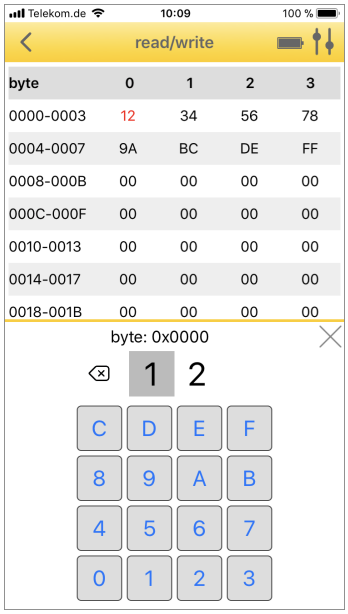


Fig. 22: Adjust data

▶ Press "Write".

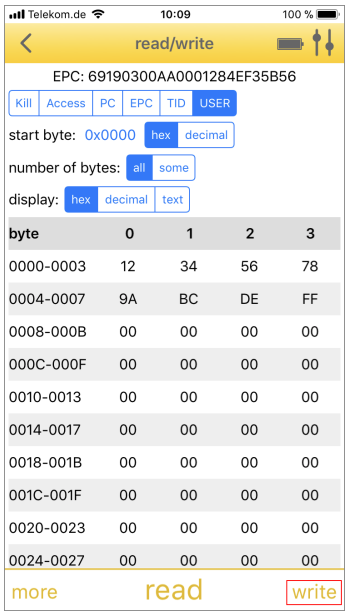


Fig. 23: Write

⇨ The handheld starts the write process. The written data is displayed on the screen.

Starting the Write Process from the "Scan" Screen

When a write process is started from the "Scan" screen, a tag with a specific EPC is written.

- ▶ Start the scan on the home screen.
- ▶ Select the tag to be written from the EPC list.
- ⇨ The "Read/Write" screen opens.
- ▶ On the home screen, press "Read/Write".
- ▶ Select the memory bank to be written
- ▶ Select the preferred format for the display of the start byte.
- ▶ Specify the start byte for the write process: Tap the current start byte and enter the new start byte in the following window.
- ▶ Select the number of bytes to be written. When selecting "Some", enter the number in the following window. When selecting "All", all the bytes that are available in the respective memory bank of the tag are written.
- ▶ Select the display format for the write data.
- ▶ Press "Read".
- ▶ Adjust the data in the table.
- ▶ Press "Write".
- ⇨ The handheld starts the write process. The written data is displayed on the screen.

7.5 Battery and Connection Display

The battery and connection display provides information about the charging status of the battery, the connection between the handheld and the mobile devices, and for temperature diagnostics.

Icon	Description
	No handheld is connected
	Establishing a connection to the handheld
	The handheld is connected, the handheld battery status is displayed
	Handheld is connected, battery is charging
	Handheld is connected to the mobile device and mains power, the battery is fully charged

Icon	Description
	Temperature warning: Handheld is warm
	Temperature warning: Handheld is overheating, communication with tag is not possible.

8 Setting

- ▶ Call up the home page of the Turck RFID app.
- ▶ Press the "Settings" button.
- ⇨ The settings screen opens.

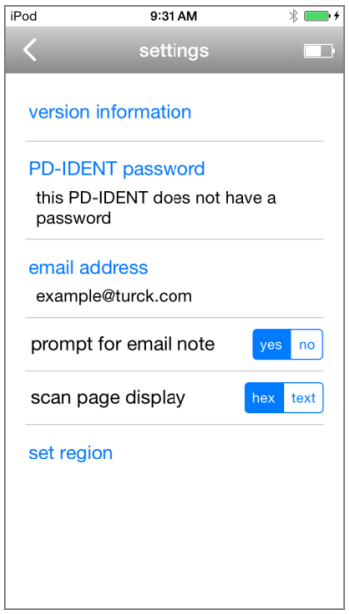


Fig. 24: Turck RFID App: Settings

The settings screen provides access to the following elements:

- Information about the version: Displays the version of the Turck RFID app, type, serial number, firmware, and battery status of the handheld.
- PD20 password: Password for the handheld
- Email address to use for the send function in scan mode
- Request for email messages: Asks whether a message should be displayed on the handheld before sending an email.
- Scan page display: Defines the display format of the data on the scan screen

8.1 Assign password

NOTE
The password must be entered before each read, write, or erase process.

- ▶ Open the settings screen.
- ▶ Select "PD20 password".
- ▶ Enter the password.
- ⇨ The password is stored on the handheld.

9 Eliminating Interference

If the device does not function as expected, check whether there is any ambient interference. If there is no ambient interference, check the connections of the handheld and the mobile device for errors.

If there are no errors, there is a device malfunction. Device malfunctions can be caused by the following:

- The handheld is not charged. If the charge level is too low, communication errors between the handheld and the mobile device can occur. Recharge the handheld.
- The firmware of the handheld is out of date.
- The audio port of the mobile device is dirty. Clean the audio port.

10 Maintenance

10.1 Carrying out a Firmware Update

The Turck RFID app automatically reports an outdated firmware version.

- ▶ Confirm the message.
- ⇨ The update will start automatically.

11 Repair

The device must not be repaired by the user. The device must be decommissioned if it is faulty. Observe our return policy when returning the device to Turck.

11.1 Returning devices

If a device has to be returned, bear in mind that only devices with a decontamination declaration will be accepted. This is available at
http://www.turck.de/en/retoure-service-6079.php
and must be completely filled in, and affixed securely and weather-proof to the outside of the packaging.

12 Disposal

The devices must be disposed of correctly and must not be included in normal household garbage.

13 Technical Data

Technical Data	
Ambient temperature	-10…+55 °C
Storage temperature	-20…+60 °C
Output power	5…30 dBm, adjustable
Antenna polarization	Simulated circular
Memory	Depending on the connected host device
Display	Depending on the connected host device
Battery capacity	1800 mAh
Communication	Via 3.5-mm jack plug
Included software	Turck RFID app, available free of charge
Operating system	iOS, Android
Dimensions	159 × 95 × 39 mm
Weight	170 g
Housing material	Plastic, black
Protection class	IP20

14 EU declaration of conformity

Hans Turck GmbH & Co. KG hereby declares that the radio equipment type PD20-UHF-EU-R corresponds to Directive 2014/53/EU. The full text of the EU Declaration of Conformity is available on the Internet at the following address: **www.turck.com**

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