TURCK

TRFID – RFID-MANAGER FOR *BL IDENT* HANDHELD-COMPUTER

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General

The **tRFID** software (Turck RFID Manager) allows convenient management of **13.56 MHz RFID tags** on a *BL ident*-**Handheld Handheld Computer** (Ident-no. 1542331) with the operating system **Microsoft Windows CE .NET**.

RFID (Radio Frequency Identification) is a wireless communications technology for transfer of digital data. The data is stored in so-called RFID tags and then read out from these tags. RFID tags operate without an external power source, because they take the required energy from the alternating magnetic field produced by the write/read unit allowing them to be designed very small and compactly.

The user surface and control of tRFID was based on already existing Windows PC software. Since the *BL ident*-Handheld hardware and software resources are significantly lower than those of a PC, tRFID was developed with particular care for optimum utilization of the limited resources.

Performance Characteristics

The special performance features of tRFID are listed in the following summary:

- **Database:**
  The tag data read is automatically stored in a database developed especially for this purpose (this feature can also be deactivated by the user). The tRFID database is a pure text file and can be processed with numerous programs. The file has been optimized particularly for **Microsoft Excel** and can be imported very easily into Excel (with Drag&Drop!). Here, it can be further processed and then exported again for use in tRFID. However, a simple text editor is sufficient to read or edit the database (such as the text editor **Microsoft WordPad** available on the *BL ident*-Handheld).

- **Selective loading of data records**
  tRFID automatically loads the data records from a database selectively, i.e. only the data records are loaded which have the same tag ID as a tag within the reach of the *BL ident*-Handheld when the database is opened.

- **Data comparison:**
  By using a double buffer tRFID can recognize and display differences in the data from two RFID tags read in sequentially. Moreover, tRFID has a logic feature to reduce the data quantity occurring from multiple tag reading and ensure that the database is supplemented only with new data.

- **Integrated editor with four display modes:**
  The editor integrated into tRFID allows the tag data to be edited directly on the unit. This allows tags to be read, changes performed and then transferred back to the tags. The editor allows display and entry of the data in hexadecimal, ASCII, decimal and binary representation.

- **Block protection:**
  Individual blocks or block areas can be protected by passwords at the software level. This ensures that read or write operations in protected areas are possible only after entering a password.

- **Quick access to system functions:**
  The most important system functions and applications such as ActiveSync, WordPad and the Windows CE system control can be called directly in tRFID. This means that the most important system settings can be made without having to close tRFID first.

- **Automatic reading:**
  tRFID can also be operated in a mode in which a recognized tag is read in automatically. For this purpose, the environment is scanned cyclically. During this operation, the read cycle is indicated visually and, as an option, acoustically as well.

- **Supports ISO 15693 tags with up to 2 kB storage capacity:**
  tRFID supports ISO 15693 tags with a capacity up to 2048 bytes. The number of bytes, which can be transferred per read/write order is limited to 64 bytes for technical reasons. Nevertheless, tRFID allows large quantities of data to be read and written by subdividing the job into individual packages and automatically generating the number of individual jobs actually required. This is accomplished in a completely transparent manner for the user.

System Requirements

The following components are required for proper operation of tRFID:

- *BL ident*-**Handheld Computer** (Ident-no. 1542331)

- **Microsoft .NET CompactFramework** (CF), Version 1.0 or higher

- **32 MB RAM** under Windows CE

- Approx. **350 kB of free memory on the installation drive** (not including database and help files)

- **Touch screen**

- System libraries **JETTrfidp.dll** and **JETTce.dll**.
  A version of JETTrfidp.dll tested with tRFID is provided. JETTce.dll is a part of the system and therefore pre-installed.

Moreover, the following components are recommended for processing the database generated by tRFID:

- *BL ident*-Handheld **ActiveSync cable**

- A **Windows PC** with Microsoft Windows 2000/XP

- Microsoft **ActiveSync 3.7** or higher

- Microsoft **Excel** 97 or higher

Operation

Starting tRFID

tRFID is ready for operation immediately after installation. It can be started either by double-clicking the tRFID icon on the desktop or selecting the tRFID link in the menu **Start > Programs** (see also Chapter "Installation").

After starting, tRFID first reads the configuration settings, performs configuration according to the settings and then initializes the RFID device. Then, the so-called **Splash screen** is loaded (example):

The splash screen includes important information on the software and hardware. The **Version** field shows the current version of tRFID together with the build code. The version and build code clearly identify a certain software development status. The **firmware version** indicates the version number of the loadable firmware in the RFID device.

At this point, continue by clicking the **<Close>** button. tRFID then completes its lasts initialization phase and is then ready for operation.

User Surface

The tRFID user surface consists of five primary areas: **Menu bar**, **Toolbar**, **Editor**, **Control block** and **Status bar**.
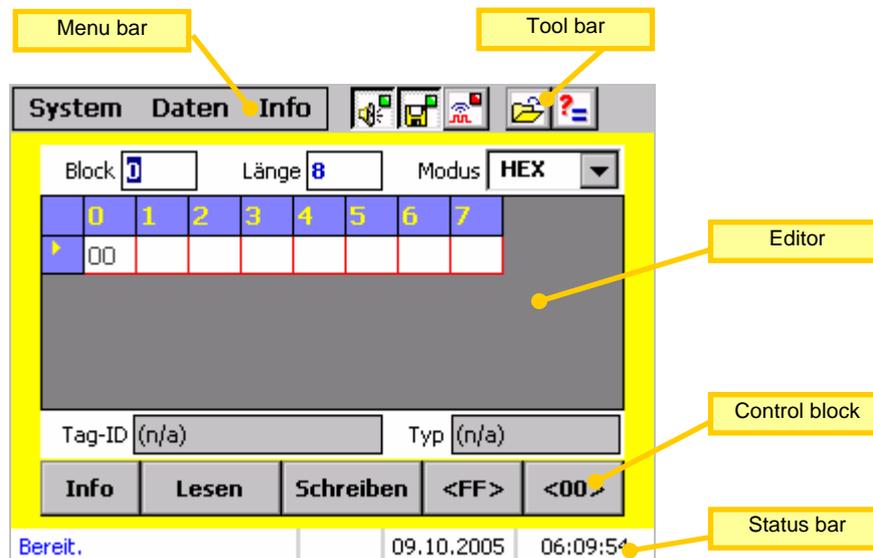
Menu bar:
The menu bar contains the menus and submenus with functions not used frequently such as settings or running system applications. It is also possible to exit tRFID in the menu.

Toolbar:
The toolbar allows certain individual menu features to be called quickly. This includes important and useful features which you would otherwise have to look for in the menu.

Editor:
The editor visualizes and allows editing of the read tag data and up to four different display modes: The editor area also provides information on the current tag, such as the tag ID and tag type.

Control block:
All buttons required for reading and writing a tag are located in the control block. Their size and arrangement have been optimized to facilitate your work.

Status bar:
tRFID status messages are displayed in the status bar. The relative offset to the data start is also displayed here. This information is supplemented by the current date and time.

Menu

This section provides detailed information on the tRFID features which can be called over the menu. Information on corresponding buttons in the toolbar is also provided when this option exists for a feature.

"System" menu
This menu includes the system functions.
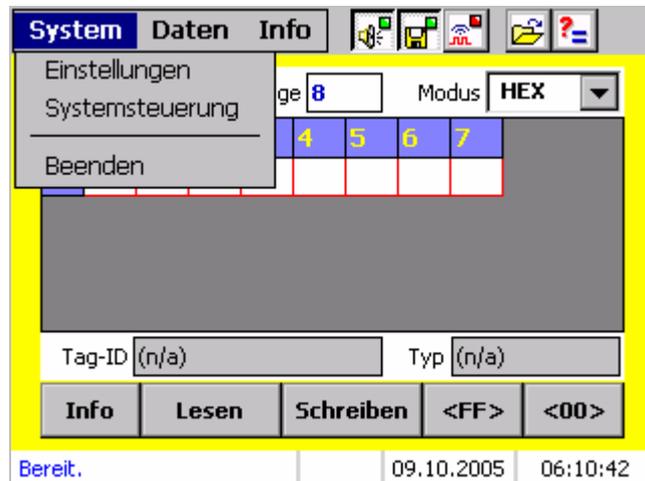
System > Settings
Loads the tRFID configuration page. Serves for definition of basic and security settings.

The configuration options and their descriptions, available in the current version of tRFID are listed in the table below:

Group	Configuration	Description	Default
Basic settings	Language	Defines the user surface language A change is effective immediately after closing the configuration box. The language set here has no influence on the operating system.	English
	Activate sound	Activates acoustics signals which sound when reading and writing tags. A corresponding button in the toolbar allows this setting to be changed temporarily [▣/▣].	Yes
	Update database	Activate automatic updating of the standard database **tRFIDdb.txt** in the basic directory when a tag is read. A corresponding button in the tool bar allows this setting to be changed temporarily [▣/▣].	Yes
	Activate automatic read	Activates automatic tag reading. The environment is scanned cyclically and any tag within the reach of the *BL ident*-Handheld is read automatically. The minimum cycle time is set to a default value of approx. 500 ms. However, the actual cycle time is longer, because it is necessary to check, read a tag and edit the data read. A corresponding button in the toolbar allows this setting to be changed temporarily [▣/▣].	No
Security	Password	Allows definition of a password to protect certain program features	Not defined
	Protected blocks	Allows definition of individual blocks or block areas which are not to be read or written. If a password has been defined and activated, this setting can only be changed after entering the password. Individual blocks and block areas are separated by a comma [,]. Block areas are defined with a dash [-]. Example: 1,2,5-10 -> Defines blocks 1, 2 and 5 to 10 as protected. **NOTE:** Avoid overlaps and individual, sequential block numbers. In such cases, define a block area. Note that tRFID cannot accept a read/write request if the block area is even partially in a protected area.	None

<u>System > System control</u>
Loads Windows CE system control. The system control allows configuration of the entire system, such as display and network.
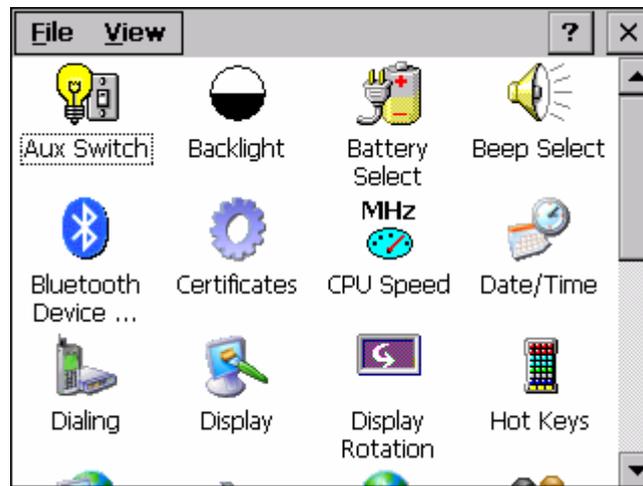
<u>System > Quit</u>
Separates the connection to the RFID unit, releases resources previously reserved and terminates tRFID.

"Data" menu
The "Data" menu includes features for managing the tag data and also offers the possibility for convenient connection to a PC over ActiveSync.
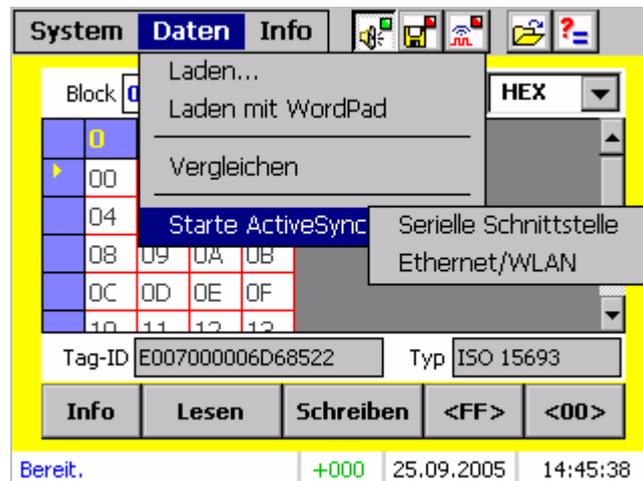
<u>Data > Load...</u>
Allows data records to be loaded selectively from a database file in tRFID format (see Chapter "tRFID database"). The name of the database file can be selected as desired. For example, a number of databases may be saved on a *BL ident*-Handheld, and sorted according to categories (one database for RFID data records for marking foods and another for

personal authentification). The suffix for a database is predefined and is always **.TXT**.
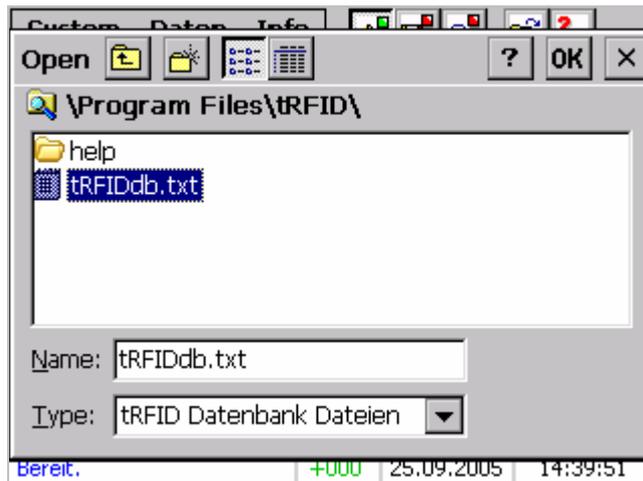
NOTE:
tRFID operates as a matter of principle with the standard database **tRFIDdb.txt**, located in the basic directory. This means read tag data is always appended to this database as a data record.

After a database has been loaded, the data records are edited and displayed in a database browser. As already mentioned, data records are loaded selectively from a database. This means only data records are loaded which have the same tag ID as a (readable) tag within the reach of the *BL ident*-Handheld when the database is opened. If no (readable) tags are located within the reach of the *BL ident*-Handheld, all data records are loaded. tRFID selects a suitable view for the data records in each case, depending on whether they were loaded selectively or completely. The following illustrations show possible views (the example database shown contains a total of three entries):

- Data records loaded selectively:
  (Tag ID: E007000006C842F2)
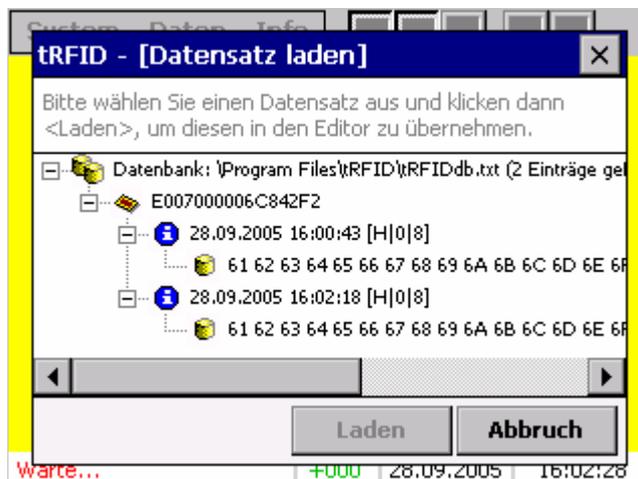
- Data records loaded completely:
  (Tag IDs: E007000006C842F2)
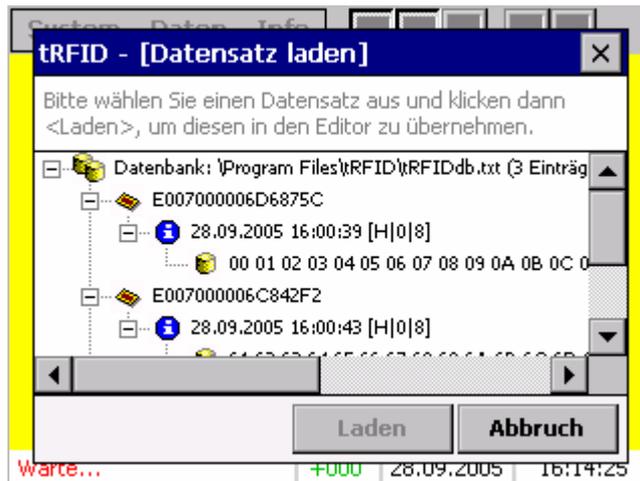
NOTE:
If only one valid data record is present in the database, the display is identical following selective loading as well as complete loading. If the data records have been loaded completely, they are **not** grouped according to tag IDs; the data records are always displayed separately with the associated tag ID. The data records are displayed in the sequence in which they are stored in the database and are not sorted. The database browser always scrolls to the last data record when it is opened.

After the data records have been loaded in the database browser, a data record can be transferred to the Editor by selecting the **Tag data** and clicking the **<Load>** button. The **<Load>** button is available only when a tag data line has been selected as shown in the illustration below:

A corresponding toolbar button **[📂]** allows accelerated loading of a data record. In contrast to the menu function, no question or selection boxes are displayed; the standard database is loaded automatically.

After transferring the selected data lines to the editor, the table is laid out according to the tag memory organization.

NOTE:
With selective loading, the number of bytes per tag block (see also Chapter "Working with tags") is also used for formatting the table: The number of columns in the table corresponds to the number of bytes per block. However, this information is not available following complete loading. For this reason, tRFID always assumes 8 bytes/block, when it is not possible to determine any tag information. In this case, more data cells may be displayed in the editor as the actual number of data bytes loaded from the database.

The following illustrations each show a loaded data record with 4 bytes of data read from a tag with 4 bytes/block (one read block). The first illustration shows the table layout after selective loading, the second after complete loading.
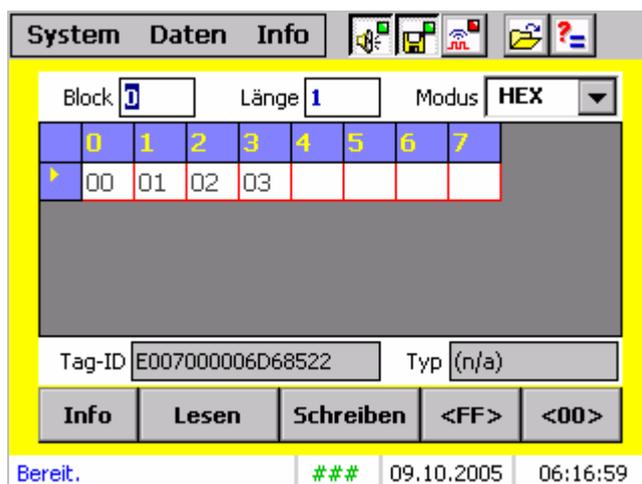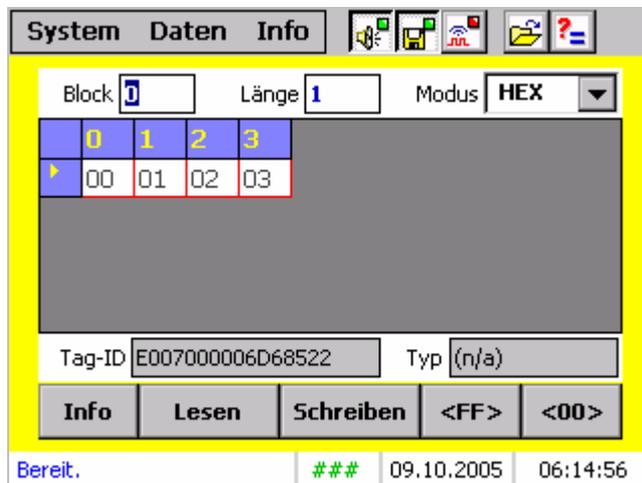
In the second case, it is not possible to edit the last four data cells, because actually only four bytes of data were loaded.

Data > Load with WordPad
Load the standard database with the Microsoft WordPad editor. This function is suitable for viewing details in the database. Editing the database here is **not** recommended, because the contents of the database may be destroyed by the WordPad formatting functions.

Data > Compare
tRFID manages a so-called double-buffer internally. Tag data read or loaded is first transferred into the primary buffer where it is processed. If new data is then read or loaded, the contents of the primary buffer is first transferred to the secondary buffer. The comparison feature allows the contents of the two buffers to be compared. After tRFID has compared the two buffers, the differences are displayed as follows in a list:

Each entry in the list shows a difference between the two buffers and is therefore called a difference line. The contents of a difference line is formatted as follows:

an HexOfs [DecOfs]: HexValue0 [DecValue0] -> HexValue1 [DecValue1]

HexOfs: Offset in hex, at which a difference was found
DecOfs: Offset in decimal, at which a difference was found
HexValue0: Value in hex previously
DecValue0: Value in decimal previously
HexValue1: Current value in hex
DecValue1: Current value in decimal

tRFID can indicate the exact position of a different automatically in the editor. In this case, mark the desired difference line and confirm with the **<Show>** button. In the previous example illustration, the difference is shown in the editor as follows:
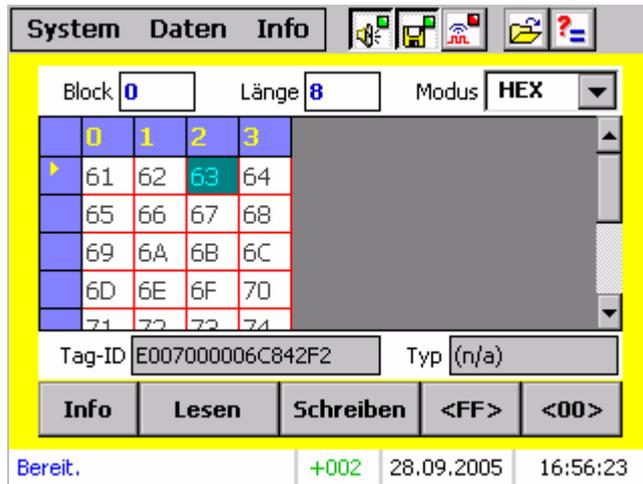
The comparison function can also be activated with the corresponding toolbar button **[?=]**.

Data > Start ActiveSync over... > serial interface
Starts ActiveSync for communication with the PC over the serial interface (see also Chapter "Installation"). The *BL ident*-Handheld **ActiveSync cable** is required for serial connection.

Data > Start ActiveSync over... > Ethernet/WLAN
Starts ActiveSync for communication with the PC over a LAN or WLAN link (see also Chapter "Installation"). A LAN or WLAN link can be realized with the *BL ident*-Handheld, for example, with the aid of an accessory card for the CF slot.

"Info" menu
This menu combines all software information features. The help feature can also be called here.
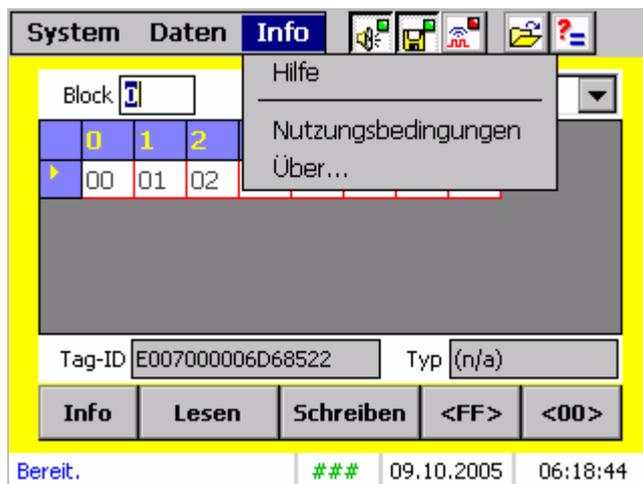
Info> Help

Loads Online help for tRFID. These help pages consist of HTML files as used in the Internet. For this reason, the Microsoft Internet Explorer is used to display the help pages.

NOTE:

After installation, only the main pages required for all languages supported are stored. These consist of template pages which do not contain any help text.

Info> Conditions of use

Displays the TURCK conditions for use.
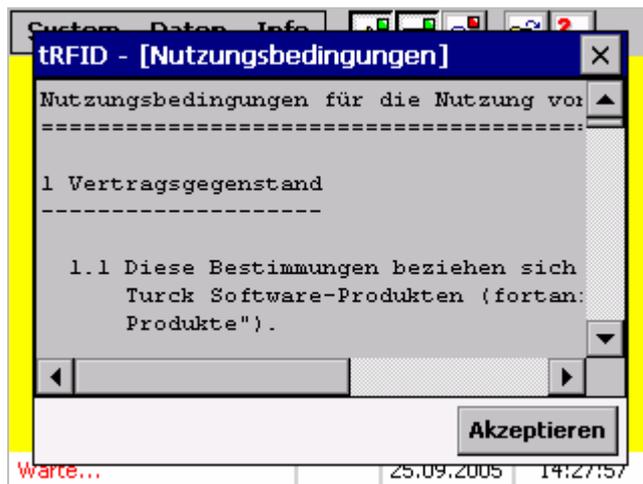
Info> About...

Loads and displays the so-called tRFID splash screen, which is also displayed automatically when the program is started.

Working with Tags

The editor located in the center of the tRFID user surface, together with the control block, allows you to work with the tags efficiently. The data read in is displayed immediately and can also be edited and written back.

Tags are digital data carriers which provide a certain memory capacity for user data. The memory in most tags is divided up into blocks with a certain number of data bytes – typically 4 bytes/block or 8 bytes/block (for some types of tags, a certain number of data blocks is also consolidated to form sectors). The entire memory is not always available for user data. Some types of tags have a reserve area which can be read out, however, not written over. As an option, blocks can be programmed so that they cannot be changed later. More complex types of tags also allows reading or writing only with a certain code used for authentification.

NOTE:
tRFID does not support authentification or block protection at the hardware level (however block protection is possible at the software level; see Chapter "Operation").

The tags have an Ident., the so-called **Tag ID** for clear identification. This unchangeable Ident. corresponds to the Ethernet address (or MAC address) for network cards.
With tRFID, this additional information is simply read out and displayed.

The control block is described in detail in the following section. The control block contains the buttons for all read/write operations and is therefore an essential area in tRFID.

Control Block

All active buttons for reading and writing tags are consolidated in the control block area.

<Info> button:
Detailed information on a tag can be called with this button. An interactive box appears as shown in the illustration below (example):
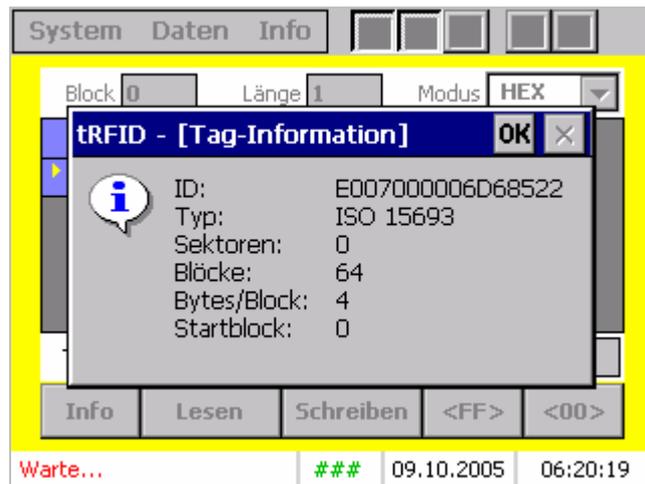
Information	Description
ID	Clear identification of tag (Tag ID).
Type	Type of tag. The type indicates the specifications with which the tag is compatible.
Sectors	Number of sectors. If the number of sectors is 0, the blocks cannot be grouped into sectors.
Blocks	Number of blocks.
Bytes/block	Number of bytes per block.
Start block	Start number of the block beginning with which the data can be read/written. Sectors with sector numbers smaller than the number indicated here are reserved and cannot be written and/or read.

NOTE:
It is recommendable to always call the tag information before reading or writing a tag to be familiar with the properties of the present tag. The information displayed is helpful when working with a tag and can prevent incorrect entries.

<Read> button:
This button starts a read operation in context with the **Block** and **Length** fields in the editor area. Before reading, it is necessary to enter the start block in the **Block** field and the number of blocks to be read in the **Length** field. Ensure that the start block as well as the length is within the available storage range of the tag (see "Info button"). Incorrect entries lead to an error message and no data is read.

The following illustrations show the correct sequence for reading out a tag.

1) Tag information call (optional, recommended for first read operation):
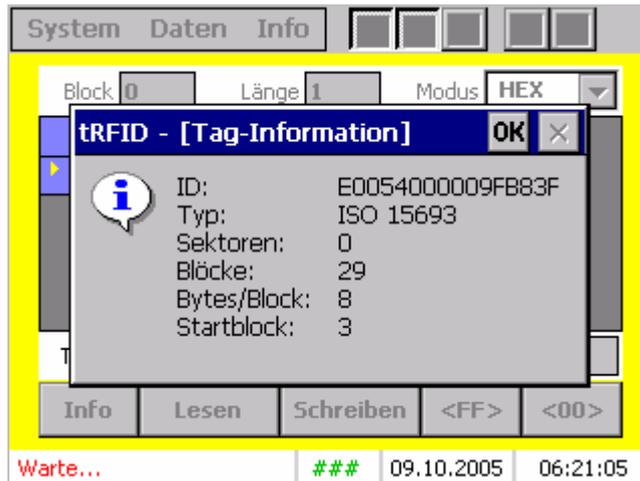
2) Enter start block and length and select desired display mode. For the tag used, blocks 0 to 2 are reserved. The tag has a total of 29 blocks. Therefore, a maximum of 26 blocks can be read, beginning with block 3 (29 blocks – 3 reserved blocks = 26 blocks for user data):
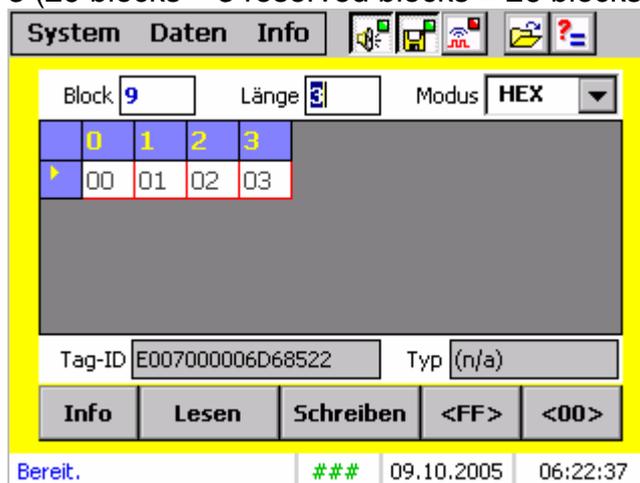
3) Now start the read operation with the <Read> button (in example start block 9, number of blocks 3, HEX mode):
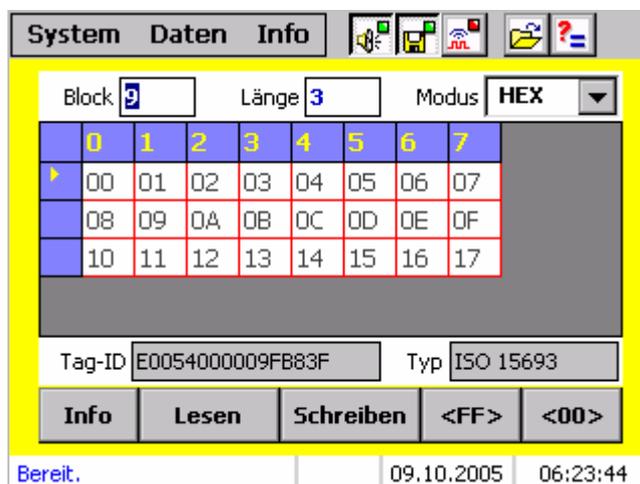
After reading, the data appears immediately in the editor. One block is always displayed per line. In the example above, three lines are therefore visible for the three blocks read with eight columns each, because the tags used had 8 bytes per block.

The data read is simultaneously stored in the database unless this option has been deactivated (see Chapter "Operation").

NOTE:
The data is always stored in the database in the **Mode** entered under mode in the editor area. If a certain format is intended for a data record in the database, it is necessary to set the desired mode **before reading**.

If one tag is read a number of times in sequence, the data read is rejected and a message output.

<Write> button:
This button starts a write operation in context with the **Block** and **Length** fields in the editor area. Before writing, it is necessary to enter the start block in the **Block** field and the number of blocks to be written in the **Length** field. Ensure that the start block as well as the length is within the available storage range of the tag (see "Info button"). Incorrect entries lead to an error message and no data is written.

A write operation should always be executed after a read operation. tRFID compares the tag ID of the tag to be written automatically with the tag ID determined previously while reading or loading a data record from the database. If the data loaded in the editor was not read from the current tag or a data record from a different tag was loaded from the database, a warning message is output. Writing data from the one tag into another tag is not recommended even though tRFID allows this, particularly not when the tags have different memory geometries. Writing of different tags is, however, admissible for tags with identical memory geometry.

The following illustrations show the correct procedure for reading out a tag.

1) Tag information call (optional, recommended for first write operation):
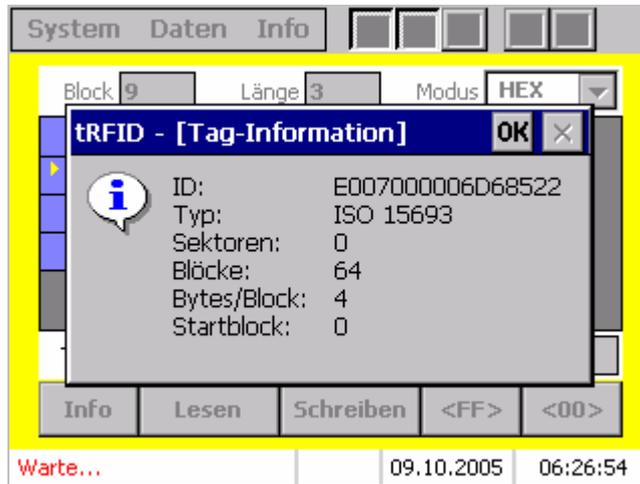
2) Enter start block and length and select desired display mode. The tag used has a total of 64 blocks. For this reason, a maximum of 64 blocks can be read beginning with block 0.
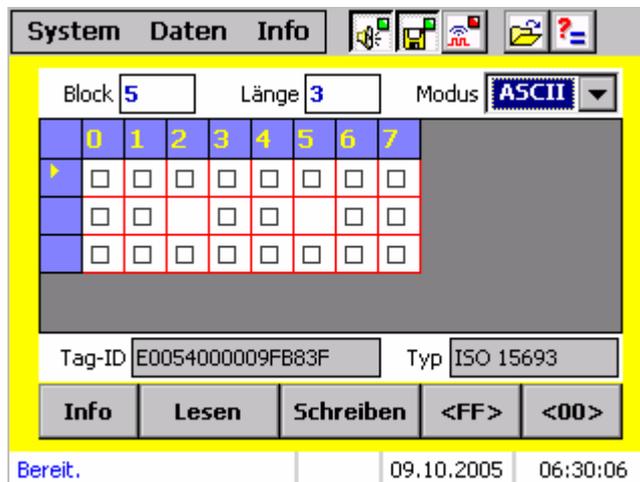
3) Now start the read operation with the <Read> button (in example start block 5, number of blocks 3, ASCII mode):
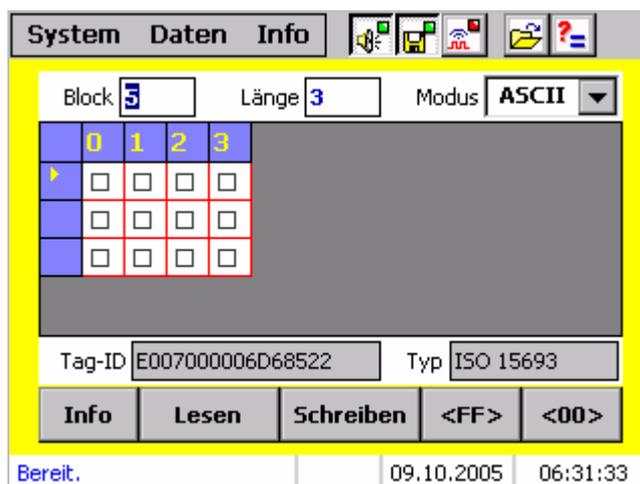
NOTE:
Characters which cannot be displayed in the ASCII mode are shown as "boxes".

4) Edit data as required and then actuate <Write> button.
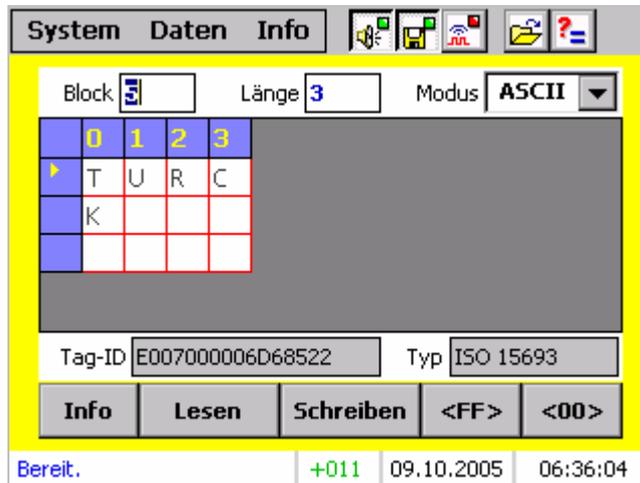
After the write operation, tRFID automatically reads the tag and transfers the data to the editor. This allows the data actually written to be checked. Please note that in this case, the data read is **not** written into the database. To do this, it is necessary to read the tag manually.

<u>\<FF\></u> and **<u>\<00\></u>** buttons:

In some cases, it may be desirable to write a common initialization value 00h (0d) or FFh (255d) into the blocks of a tag. In order to accelerate this operation, tRFID allows initialization of the table contents displayed in the editor with the aid of these two buttons. If the \<FF\> button is actuated, all data is written over with the value FFh. The data can be initialized with \<00\> by actuating the button 00h. In this case, the tag contents is **not** changed. To transfer the contents of the initialized table into a tag, it is necessary to start the write operation manually.

The two illustrations below show the tag contents after initialization in the HEX mode (four blocks were read from a tag previously):
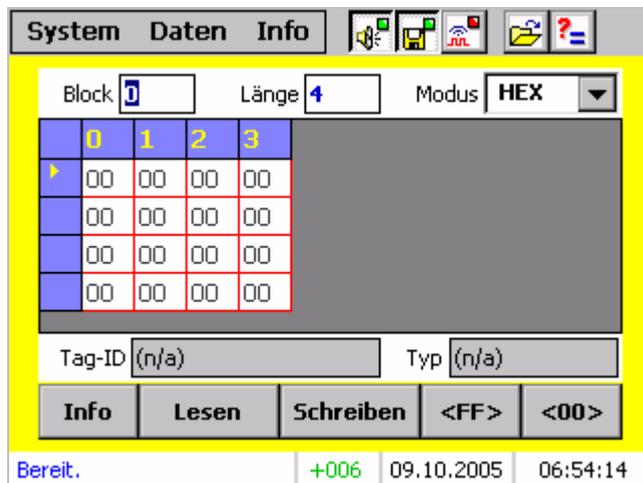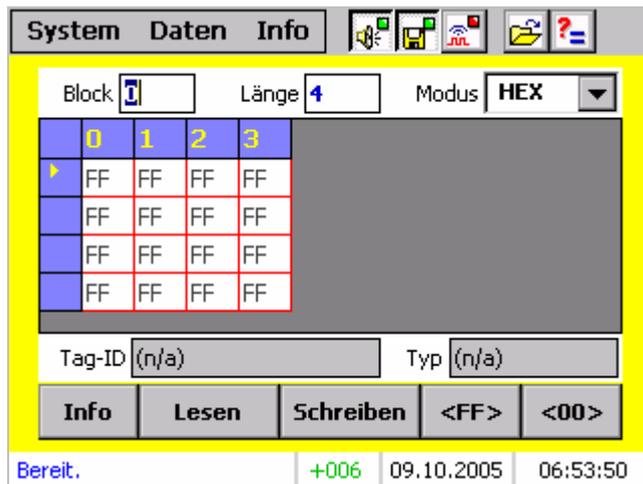
Automatic (Cyclic) Reading

As already mentioned in the previous chapters, tRFID offers a feature for reading tags automatically. With this particular form of reading, no messages are output and no interaction with the user is required. An integrated timer with a set cycle time of at least 500 ms automatically triggers the read operation (internally, a 250 ms timer is used, which, however, only triggers the read operation, each second time). If a (readable) tag is present within the reach of *BL ident*-Handheld, it is read automatically, the data is edited and displayed in the editor. The data read is written to the database when this option has been activated. This function is virtually identical with the manual read operation. This also means that it is necessary to specify the start block and the number of blocks to be read before activating this function. The values specified should be valid for all tags which could be read during the automatic read operation.

The "Automatic read" feature can be activated in the menu **System > Settings** or temporarily with the corresponding button in the toolbar (see Chapter "Operation"). When a new read cycle is started, an acoustic (optional) signal and a visual signal are output initially. The visual signal is shown in the form of a box at the top left corner of the <Read> button. A read cycle starts when the signal is read. When a tag has been recognized and read, the data is first edited and stored in the database. It is then output to the editor. During editing of the data read successfully, the visual signal turns yellow as shown in the illustrations below:

Start of read cycle:
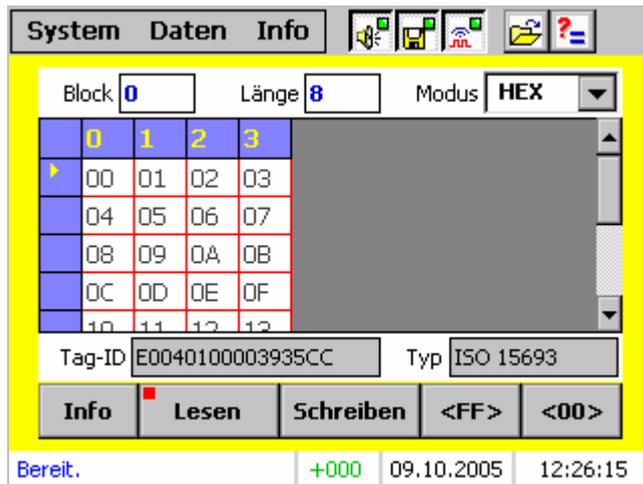
Data has been read successfully and is being edited:
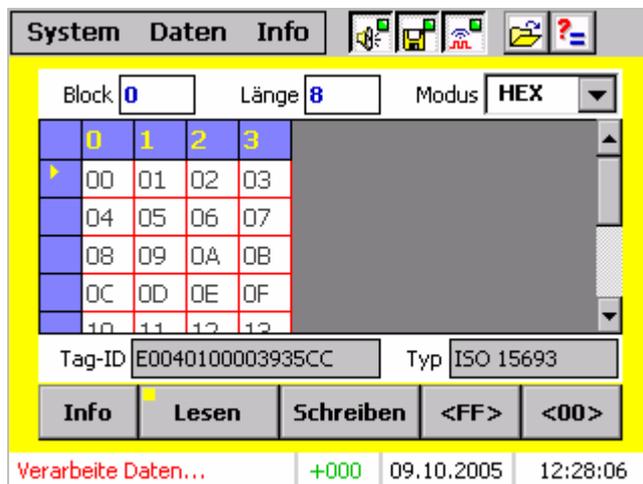
As with a manual read operation, the data is rejected when the same tag is read during automatic reading as well.

NOTE:
This feature is automatically deactivated for the following events: **Reading of a database, call of comparison feature, call of feature with the control block, use of the editor, reading of a block from the protected area**.

tRFID Database

tRFID uses a database for storing the tag data read. It is located in the same directory as the program file "tRFID.exe" and has the name **tRFIDdb.txt**. This database was developed especially for tRFID and designed optimally to allow quick access without complex software modules while simultaneously offering the user numerous features going beyond the operating system for evaluating, modifying the supplementing the database contents.

The tRFID database is a text file. The suffix **.TXT** was selected consciously, because most operating systems offer an application for files with this suffix (usually a text editor).

The database format has been optimized for use in **Microsoft Excel**.

Format

The illustration below shows the typical format for a tRFID database:

```
# tRFID Database
# Created by tRFID, Version 1.0 on Sunday, 25. September 2005 @ 14:50:55
# File: "\Program Files\tRFID\tRFIDdb.txt"

H    25.09.2005 14:50:55    E007000006D68522 0    1    00    01    02    03
A    25.09.2005 14:50:59    E007000006C842F2 0    1    "abcd"
D    25.09.2005 14:51:04    E007000006D68522 0    1    000    001    002    003
B    25.09.2005 14:51:10    E007000006C842F2 0    1    01100001 01100010 01100011
```

tRFID automatically generates a database when not already present and the option "Update database" has not been activated (see Chapter "Operation"). The first four lines of the database are always formatted as follows:

Line	Designation	Description
1	Identification	Identifies database This value is constant and always "# **tRFID Database**".
2	Time created	Indicates the time at which the database was created.
3	Location created	Indicates the position (including name) in the file system at which the database was created. The position (path) is identical with the location of the program file "tRFID.exe".
4	Empty line	This line is always empty.

The so-called **Header** (at the top of the database) is followed by the actual data records. Each line corresponds to one data record. The data fields in a data record are separated from one another with **TAB (09h, 9d)**. The end of the data record is marked with the character **CR (0Dh, 13h)** and **LF (0Ah, 10d)**.

A data record is therefore formatted as follows:

Type [TAB] **Date/Time** [TAB] **Tag ID** [TAB] **Block** [TAB] **Length** [TAB] **Data(*)** [CR] [LF]

(*)   The individual data bytes in the data field are separated from one another by a TAB (except in ASCII mode (type A)).

Data field	Description
Type	The type indicates the display mode set when reading a tag in the editor. Possible values are: **H** – Hexadecimal **A** – ASCII **D** – Decimal **B** – Binary All database lines, which do not start with one of the type values are ignored by tRFID during the read operation. This makes it possible to make entries, such as comments, in the database. If a data record is loaded, tRFID automatically sets the display mode corresponding to the type indicated here.
Date/Time	The time at which the entry was made in the database is indicated in the form date and time. The format varies for the different countries and depends on the language set. This value is not used in tRFID and serves exclusively as information for the user.
Tag ID	Indicates the tag ID of the tag from which the subsequent data was read. This value is displayed in the editor as well as used for internal check operations.
Block	This value defines the start block beginning with which the subsequent data was read. It was only transferred into the **Block** entry field in the editor, however, is not relevant for data editing.
Length	This value defines the number of blocks read. It was only transferred into the **Length** entry field in the editor, however, is not relevant for data editing.
Data	This field contains the data bytes in the display format as specified in the "Type" field. They are separated from one another by a TAB, when type H, D or B is specified. For type A, the data is stored as text in quotation marks (see example above).

Microsoft Excel: Importing/Exporting

This section provides step for step instructions on how to import a database created with tRFID into Excel, edit and supplement it there and then export it again and write it to a tag with tRFID. Microsoft Excel 97 (English) is used in the example. The sequence may differ slightly depending on the Excel version used and the configuration of the PC. The working habits of the user may also affect the sequence. The quickest and simplest method is described here. The following conditions are assumed:

- ActiveSync has been installed on the PC and is ready for operation. A partnership has been configured with *BL ident*-Handheld and a connection completed to the *BL ident*-Handheld.

- tRFID has been exited and a database has not yet been created. The database update feature is active in tRFID.

- Excel has not yet been started on the PC.

- Moreover, it is assumed that the user is familiar with use of Excel.

Task:

It is intended to read out two memory areas of a tag each in the HEX and ASCII modes, edit them in Excel and transfer them back to the tag. An additional data record is to be added in Excel in ASCII format. At the end, three different areas of the tag are to be written.

Procedure:

1) Start tRFID and wait until the read operation and initialization are completed. After the splash screen has appeared, continue with <Close>.

2) Determine the tag information so that you are familiar with the tag properties:
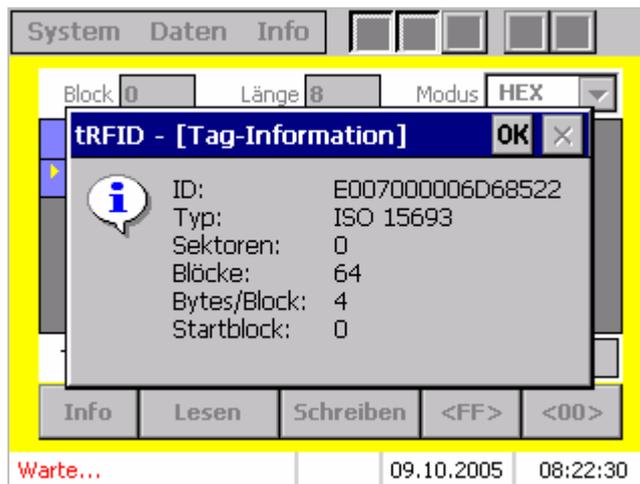
After checking the properties, close the interactive box with <OK>.

3) Now, a total of 2 blocks starting with block 5 are read in the HEX mode. After the read operation, the editor appears as follows:
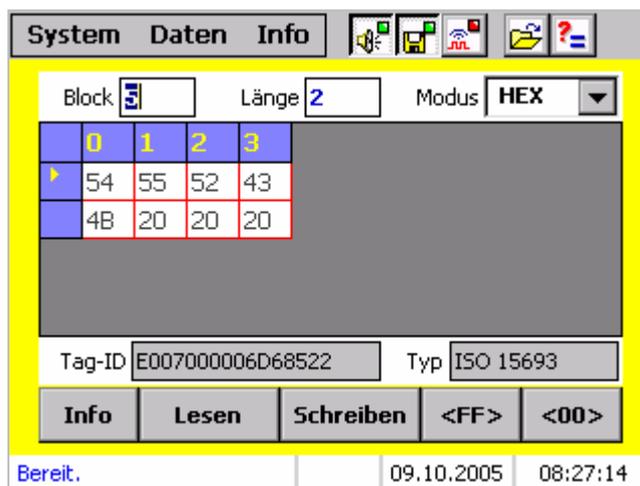
4) The second area is then read. In the example, this begins with block 50 and has block length of 5. Reading is accomplished in the ASCII mode. After this read operation, the editor appears as follows:
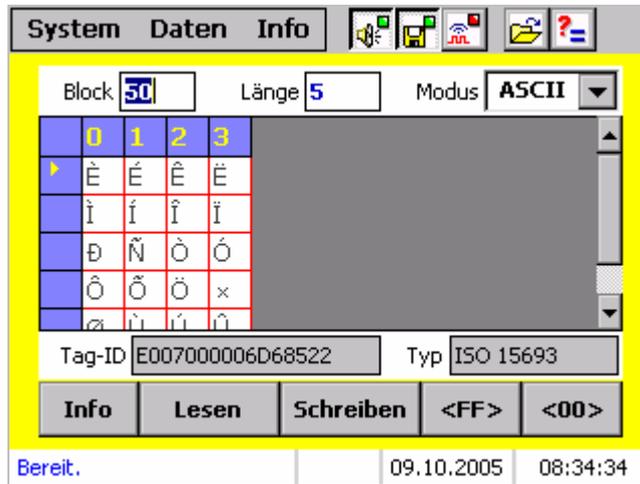
5) Start Excel on the PC. An empty work folder is created automatically. Run the data browser in ActiveSync by actuating the **<Explore>** button. Locate the tRFID database **tRFIDdb.txt** in the *BL ident-*Handheld data system. This is normally located under **\Program Files\tRFID**:
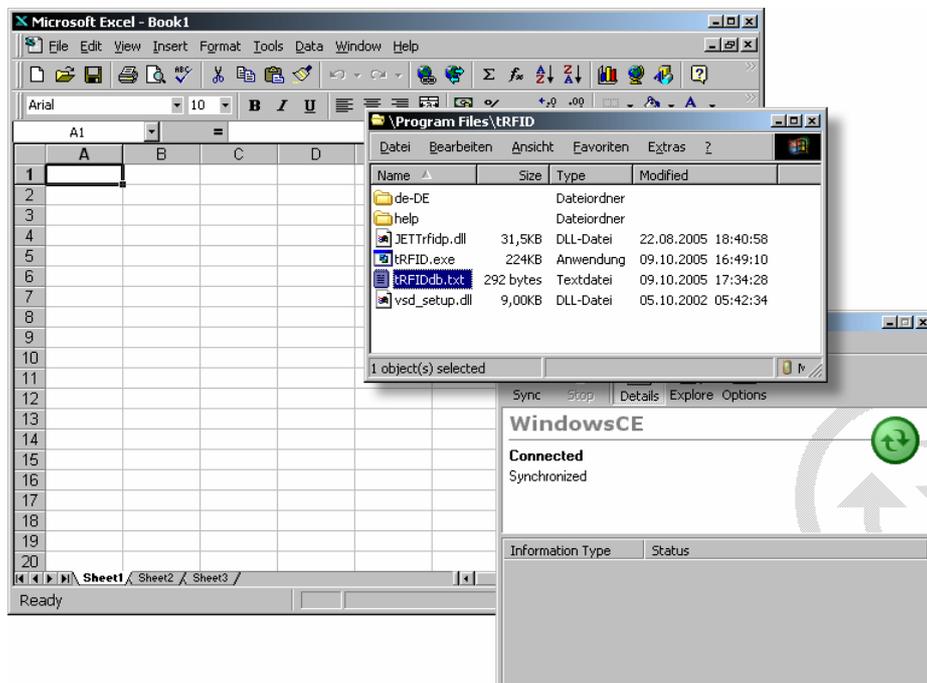
First, it is necessary to copy the database to the PC. For this purpose, mark the file "tRFIDdb.txt" in the ActiveSync data browser and execute the **Copy** command in the **Edit** menu. Now press the left mouse key at a free area on the PC desktop and execute the command **Insert** in the menu displayed. The database can then be imported into Excel very simply with **Drag&Drop**. For this purpose, mark the copy of the database just placed on the desktop, "hold down" the left mouse key and "drag" to Excel. Release the mouse key there.

After completion of this operation, the Excel contents should appear in a manner similar to the illustration below:

Adapt the width of applicable cells by double-clicking the separating line between the cell headings to adapt the Excel cells optimally to the most important fields. In some cases, the width of the cells can also be adjusted manually.

Then, make the following changes to the database:

a) 4 additional HEX bytes 17h, 11h, 71h, CCh are appended to the first data record. Change the block length from 2 to 3 to ensure that tRFID

displays the block length correctly (remember: 2 blocks were read. For a tag with 4 bytes/block, this is a total of 8 bytes. After adding 4 additional bytes, exactly 3 blocks are required: 12 bytes / 4 bytes/block = 3 blocks).

b) The entire ASCII value in the second data record is replaced completely by the text "Hans Turck GmbH & Co. KG". Exactly 24 bytes were required for this text. With the present tag, this corresponds to a block length of 6 (24 bytes/4 bytes/block = 6 blocks). Therefore, the block length also requires correction here.

c) A new data record is added as the last step. Since the data record is also an ASCII type, it is possible to first copy the second data record and then make the required changes. It is not necessary to adapt the date and time; this data is not used by tRFID. The tag ID can remain the same, because the data is to be written back to the same tag.

The new data record is to be written beginning with block 0. The value "TURCK is to be written. 5 bytes are required for this. With a block size of 4 bytes, 2 blocks are required (the data bytes not required in the second block can be filled with spaces or with 00h later in the HEX mode in the tRFID editor). It is then necessary to adapt the start block and block length accordingly.

6) The modified database is then stored. When saving, Excel 97 automatically recommends a text file, using tabs as separating characters. If this is not the case with other Excel versions, <u>always</u> ensure that this format is specified for saving!

To maintain the original database, the name "tRFIDdb_neu.txt" is used for saving the modified database and it is saved on the desktop.

7) Then the new database can be copied to *BL ident*-Handheld. For this purpose, mark the file "tRFIDdb_neu.txt" on the desktop and use the **Copy** feature with the left mouse key. Locate the directory in the ActiveSync data browser from which the original database was previously copied. Execute the **Insert** command in the **Edit** menu in the directory. The directory should then appear as follows:

NOTE:
Naturally, the database can also be copied into any desired directory. In this example, the installation directory for tRFID was selected consciously to facilitate locating the two databases later.

8) The new database can now be loaded in tRFID. For this purpose, execute the **Load...** function in the **Data** menu.

NOTE:
A database with a designation other than "tRFIDdb.txt" can only be loaded with the menu. The standard database is always loaded with the toolbar (see also Chapter "Operation").

To load the data records selectively, answer the question at this point with **<Yes>** or **<No>**. The file browser is then displayed.

Now locate the database in the file browser. This should be located in the folder in which it was copied via ActiveSync.
After loading the database, the database browser appears as follows:

Now the first data record can be loaded and written to the tag:
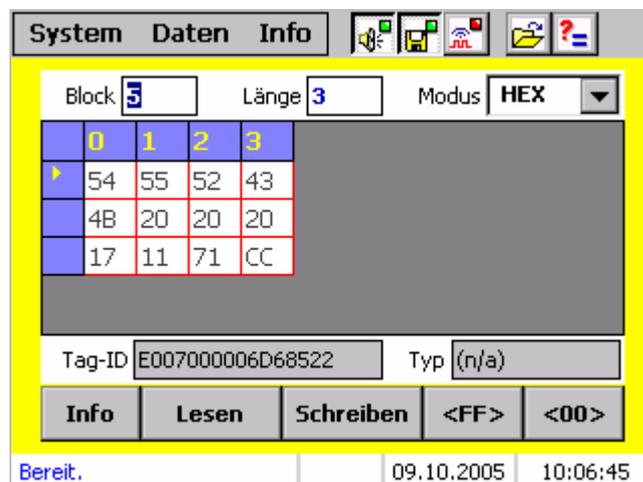
Repeat this operation with the remaining data records:

Data record 2:
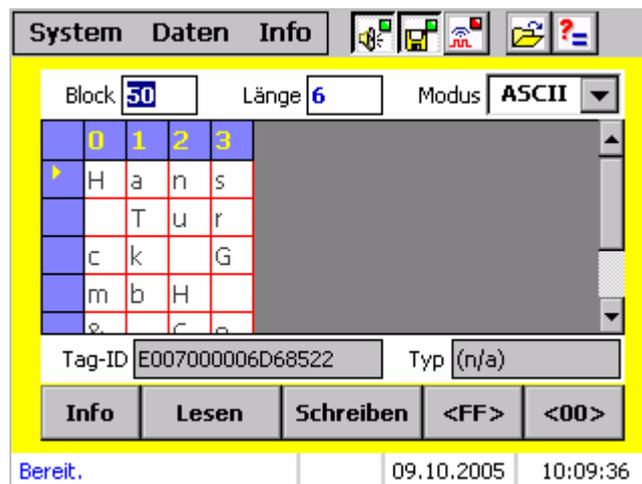
Data record 3:
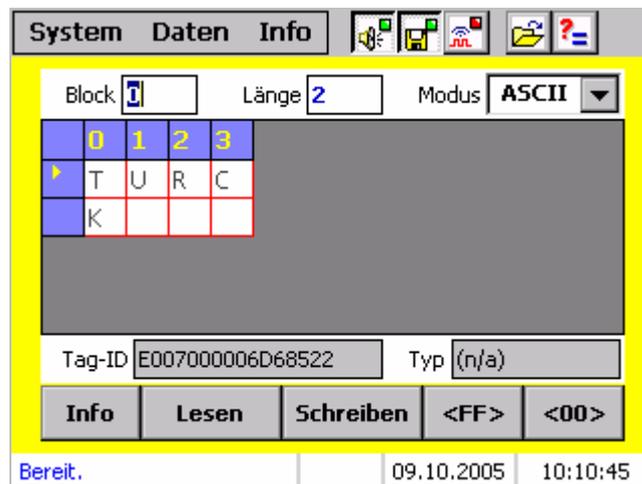
IMPORTANT!

- As mentioned in the Section "Format" in the Chapter "tRFID database", tRFID puts the data in quotation marks in the ASCII mode. These quotation marks are removed when the data is imported into Excel or exported from Excel. tRFID does not necessarily require the quotation marks. However, if leading or trailing spaces are contained in the data, it is necessary to add the quotation marks manually after exporting to allow the data to be read correctly and completely in tRFID. An editor such as **notepad** (Windows 2000) can be used for such corrections.

- Do not use the ASCII mode to read tags when the values of the data bytes are less than 20h (32d). Data stored in this manner can contain control characters (e.g. TAB's, used as separator), which can lead to erroneous results and interpretations when displayed in ASCII format in text editors or Excel.

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