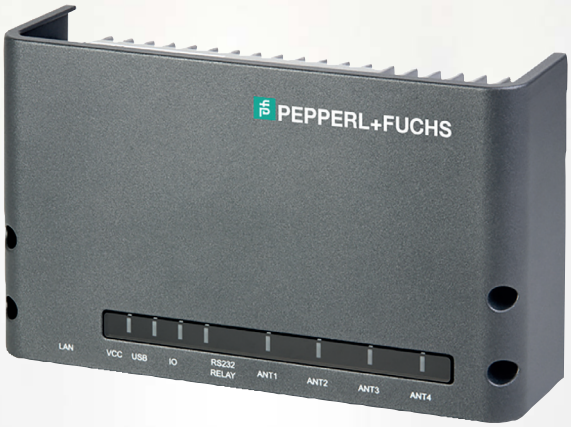
RFID Gate-Control

Demo program for IUR-F800-V1D-4A* RFID read/write device

Version 11.08.02

Manual



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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.

The documentation comprises the following parts:

- This document
- Datasheet
- Programming manual

The documentation may also comprise the following parts, if applicable:

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

1.2 Target Group, Personnel

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

Only appropriately trained and qualified personnel may carry out mounting, installation, commissioning, operation, maintenance, and dismounting 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.

1.3 Intended Use

Always operate the device as described in these instructions. Only in this way, the safe function of the device and the connected systems is guaranteed.

The protection of operating personnel and plant is only given if the device is used in accordance with its intended use.

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:

Danger!

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.

Warning!

This symbol indicates a possible fault or danger.

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

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.

Informative Symbols

Note

This symbol brings important information to your attention.

Action

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

1.5 General

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

Installation and commissioning of all devices may be performed only by trained and qualified personnel.

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

Observe the applicable laws and regulations regarding the intended use of the device. The devices are only approved for proper use for the intended purpose. Improper use will void any warranty and liability claims.

The corresponding datasheets, declarations of conformity, and/or EC-type examination certificates form an integral part of this document. The data sheet contains the electronic data of the EC-type-examination certificate.

These documents can be found at www.pepperl-fuchs.com or contact your local Pepperl+Fuchs representative.

2 Product Description

2.1 Software

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit.
(http://www.openssl.org/)
Copyright (c) 1998-2008 The OpenSSL Project. All rights reserved.

This product includes software written by Tim Hudson (tjh@cryptsoft.com)
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Please direct any questions pertaining to this agreement to:

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2.4 Product description

Use and Application

The RFID Gate-Control demo program has been developed to familiarize you with the functionality of the Pepperl+Fuchs IUR-F800-V1D-4A* RFID read/write device.
With this software, you can do the following:

- Test communication with UHF transponders.
- Read out and modify the configuration of the Pepperl+Fuchs IUR-F800-V1D-4A* RFID read/write device.
- Activate a firmware upgrade.

The transmission protocols between the PC and the device are displayed on the screen for each action. This transparency guides you to the software interface of the Pepperl+Fuchs IUR-F800-V1D-4A* RFID read/write device. Refer to the relevant system manuals for interpretation of the protocols and to study the device characteristics.

RFID Gate-Control has the following unique features:

- The **Reader Editor** for editing the parameters of the Pepperl+Fuchs IUR-F800-V1D-4A* RFID read/write device. You can open any number of reader files and “link” them to different interface types.
- The **Protocol Editor** for manual protocol entry and editing.
- The **Protocol Windows** to visualize the communication.
- Test the automatic device modes such as the following modes:
  - **Buffered Read Mode**
  - **Scan Mode**
  - **Notification Mode**

This manual provides a brief introduction to the RFID Gate-Control program. Some special features and help in using the program can be accessed via context menus that can be opened with the right mouse button. If you have any questions regarding this program, please contact Pepperl+Fuchs SE for additional information.

3 Installation

3.1 System Requirements

The system has the following requirements:

- Windows®Vista (32/64Bit) or Windows® 7 or 8 or 10 (32/64Bit) or 11 with Intel x86 CPU.
- Hard disk with at least free 50 MB memory space.
- Minimum graphics resolution: 800x600. (1024x768 or higher recommended).

RFID Gate-Control can only be installed on a computer using the supplied setup program. Start the **SETUP.EXE** installation program and follow the instructions.

Note

The setup program will not update a previous version of RFID Gate-Control.
The new RFID Gate-Control can be installed in parallel with older versions.

Note

On Windows® Vista and Windows® 7 or 8 or 10 or 11, you must have administrative rights. Consult your network administrator if necessary.

4 Commissioning

4.1 Supported RFID read/write devices

RFID Gate-Control supports the following device types:

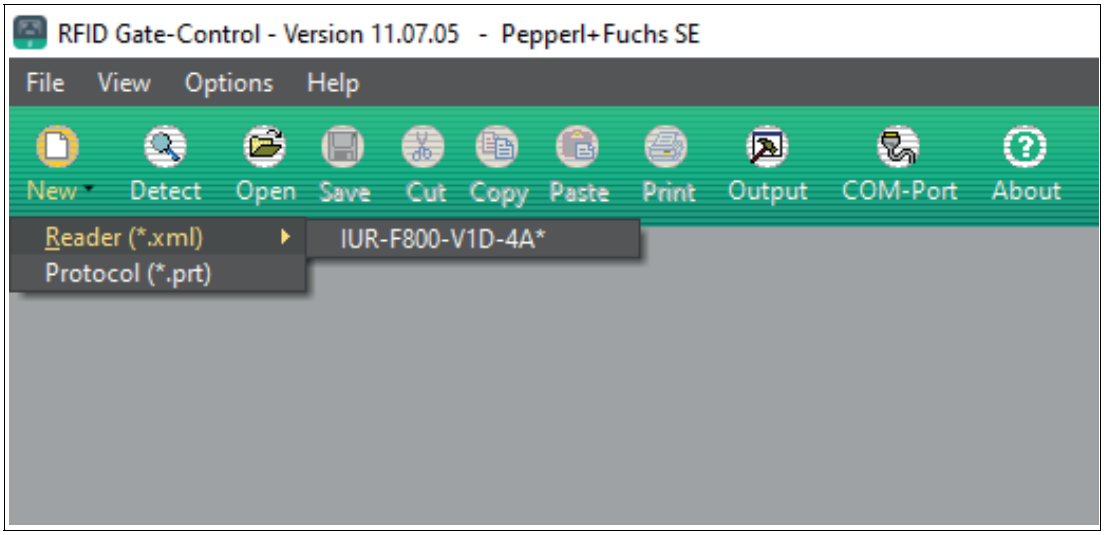

Figure 4.1

4.2 Connection

After successful installation of RFID Gate-Control and before starting the program, you can immediately connect a Pepperl+Fuchs IUR-F800-V1D-4A* RFID read/write device to the serial port COM1[1], USB or the LAN/WLAN interface on your PC. The **Quick Start Wizard** will guide you through a quick configuration of the device.

Connect a Pepperl+Fuchs IUR-F800-V1D-4A* RFID read/write device using the Quick Start Wizard by doing the following:

1. Start the RFID Gate-Control demo program. In the default configuration of the program, the **Quick Start Wizard** will be started automatically, which will help you to detect and configure the device.
2. Select the type of interface used.

1. COM1 is preset. All other serial ports are initially not in the search list. To change this, open the **Program Options** dialog box in the options menu and select your preferred serial port, see chapter 5.2.

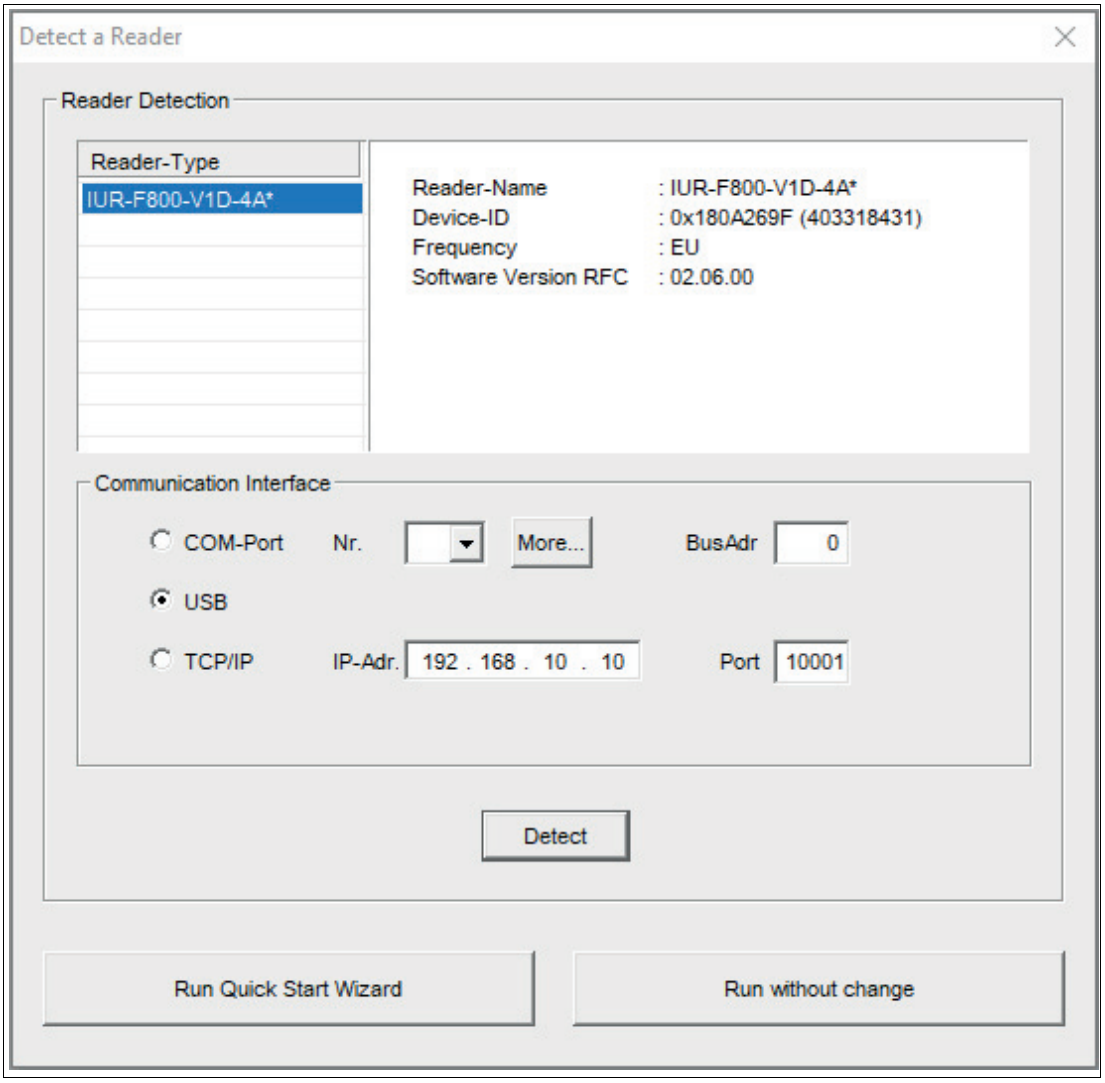

Figure 4.2

3. Click **Detect**.
4. If the connected device is successfully detected, you can use the **Quick Start Wizard** by clicking **Run Quick Start Wizard** and following the instructions on the next pages.

Note

If the connected and activated device does not appear in the list, check the interface settings, see chapter 6.

The **Quick Start Wizard** will change the existing device configuration.

If you want to leave the existing device configuration unchanged, click **Run without change**. Now the existing device configuration is read without any changes.

5. Read the information notice.

Figure 4.3

6. Continue with UHF / RAIN RFID.

Figure 4.4

7. Select the desired **Reader Mode**.

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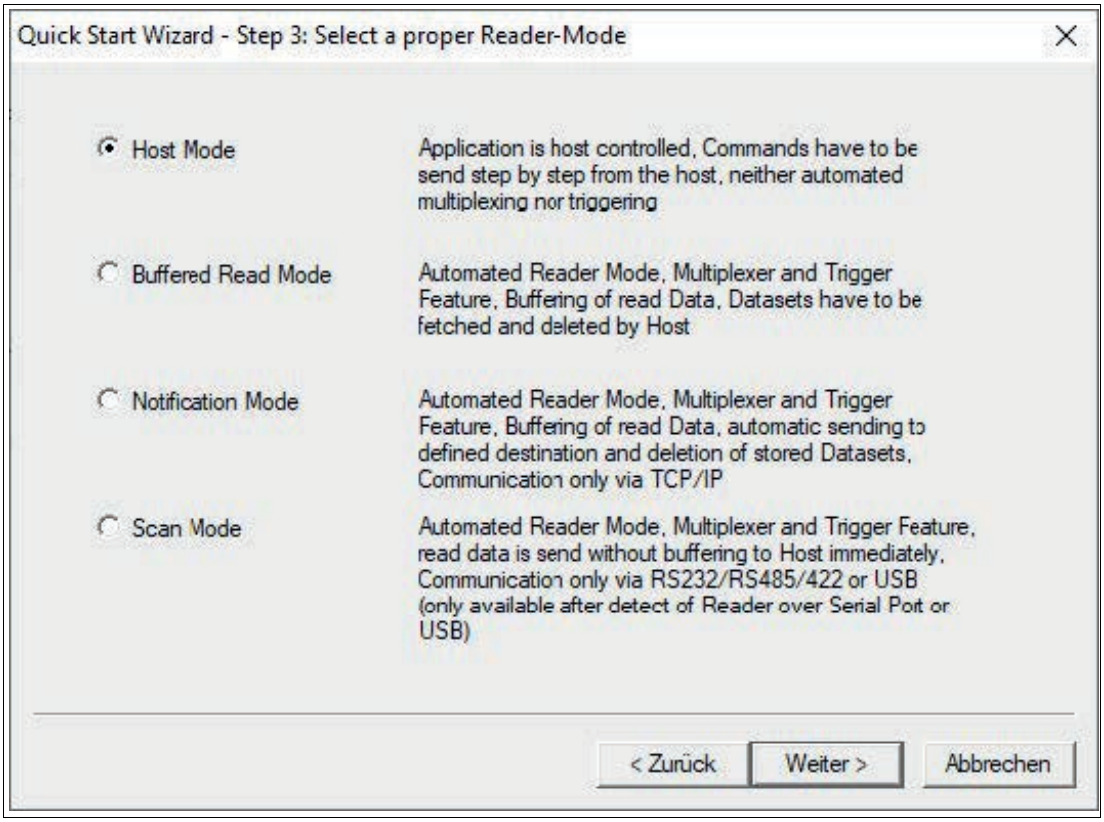

Figure 4.5

8. Click **Next**.
9. Make antenna settings.

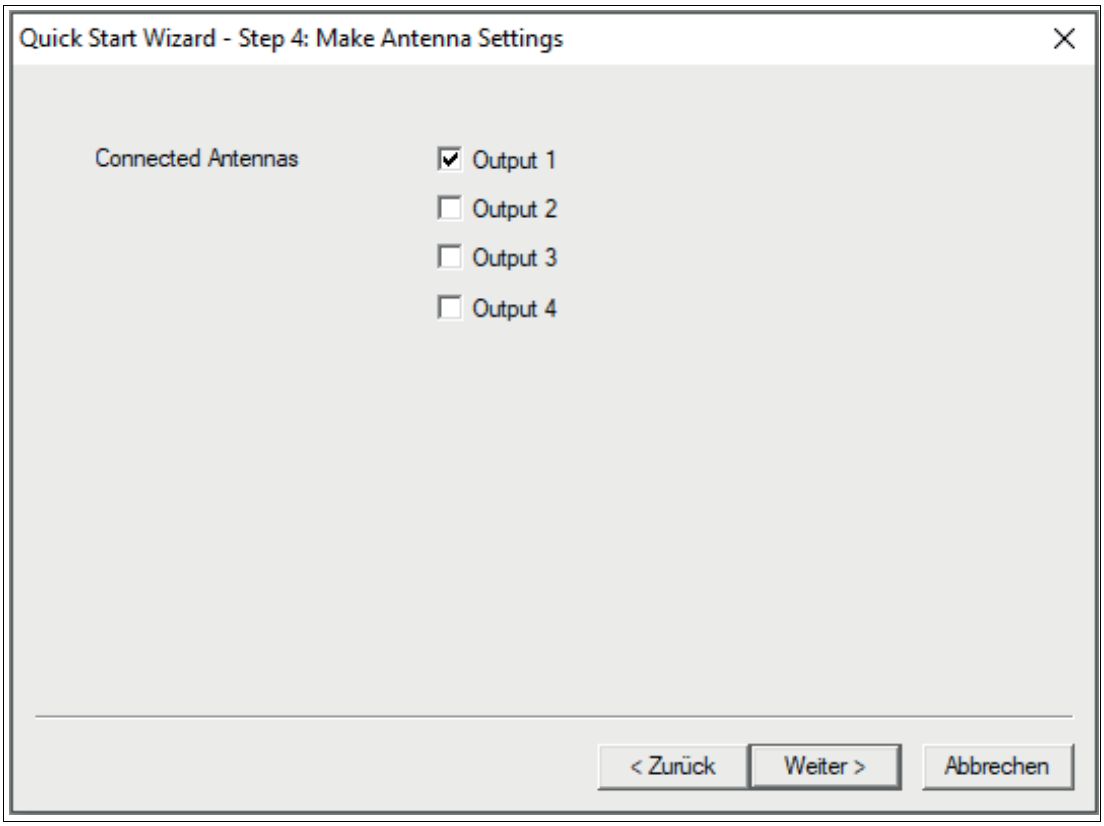

Figure 4.6

10. Select the connected antenna outputs.
11. Click **Next**.
12. Verification Results.

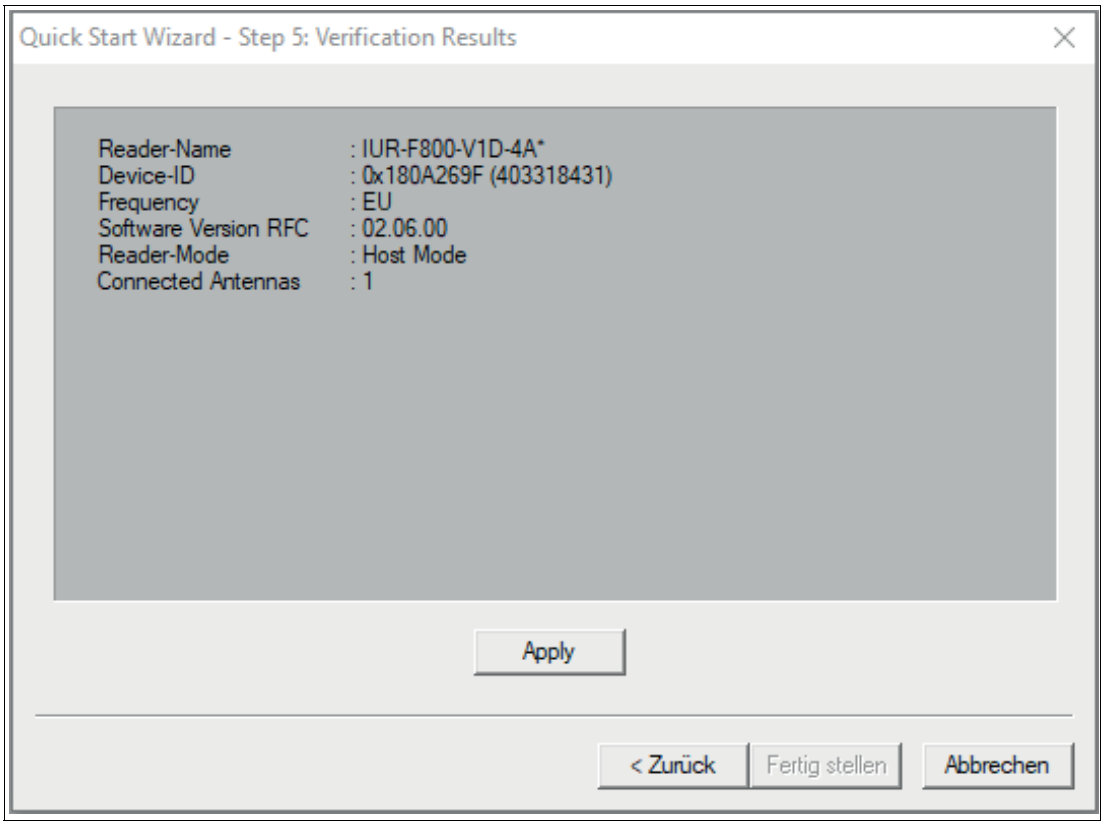

Figure 4.7

13. Click **Apply** to confirm.

↳ The wizard configures the device and displays the verification results.

Figure 4.8

14. Click **Finish**.

↳ You have succesfully connected a Pepperl+Fuchs IUR-F800-V1D-4A* RFID read/write device using the **Quick Start Wizard**.

5 Operation

5.1 Program structure

The graphic below illustrates the data-oriented structure of the program. Each data type has a special visual editor that can be used to edit, save and send the data or protocols to the Pepperl+Fuchs IUR-F800-V1D-4A* RFID read/write device. The protocols transported through the interfaces are displayed in the **Protocol Window**.

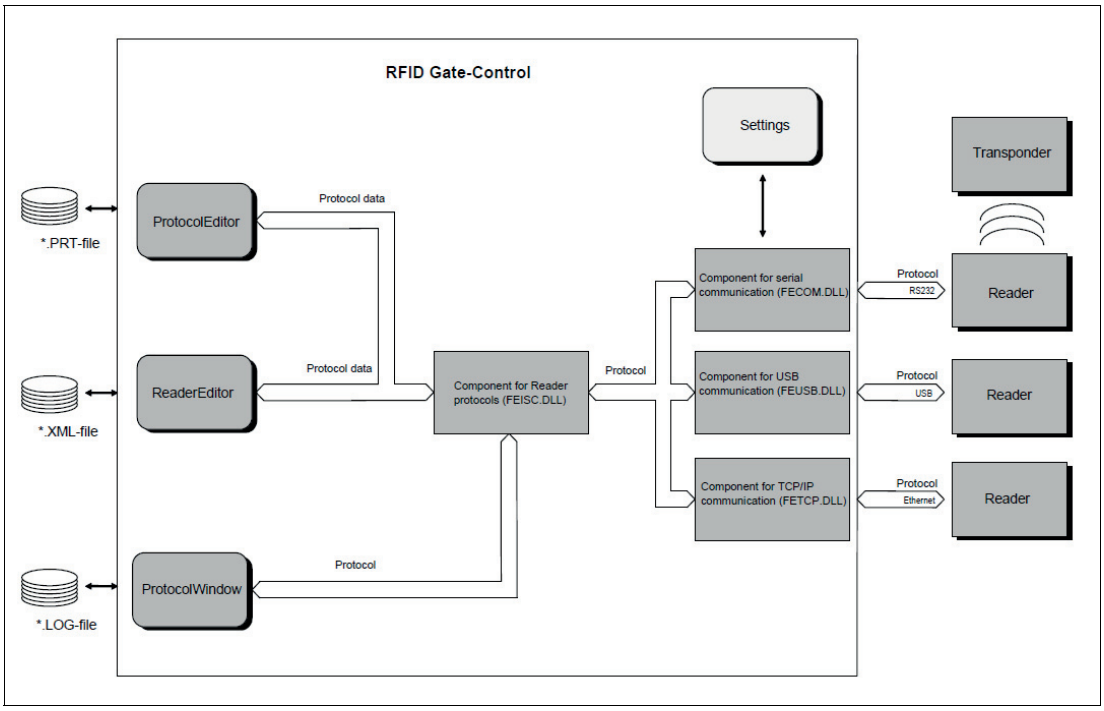

Figure 5.1

Note

If the communication was faulty or if the Pepperl+Fuchs IUR-F800-V1D-4A* RFID read/write device signals an error status in the response protocol the demo program does not use error messages in separate notification windows.

All output is sent to the **Protocol Window** with a comment. To interpret the response protocols, refer to the system manual.

Note

The **ID FECOM**, **ID FEUSB**, **ID FETCP** and **ID FEISC** components are special **DLLs** (**Dynamic Link Library**) for communication and are available together in a **Software Development Kit** (**SDK**) to support your own program development.

5.2 Program Settings

The program can be customized by doing the following:

1. Click **Options**.
2. Click **Program**.

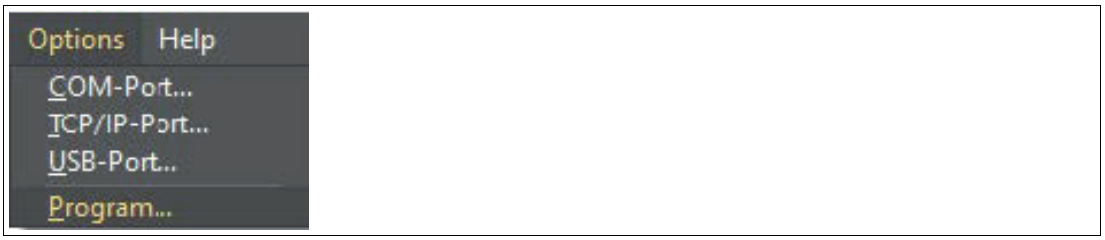

Figure 5.2

↳ You can now customize the program settings.

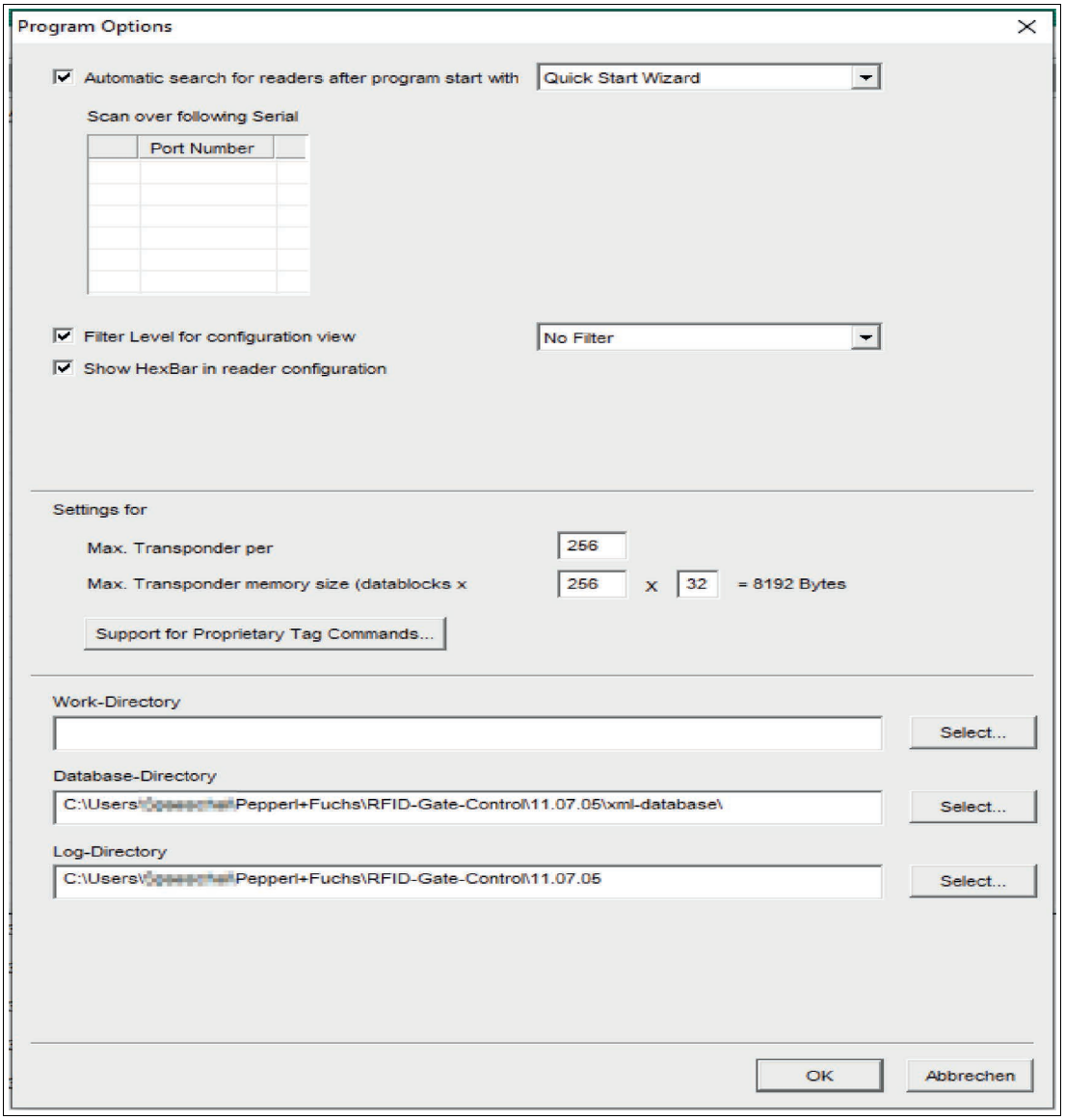

Figure 5.3

The following settings are available:

- **Automatic search for readers after program start**
  This option enables the automatic scanning for devices after program start. The search for devices is limited to the serial ports in the list below and to USB devices.
- **Scan over following Serial Ports**
  This option enables / disables COM-Ports for automatic scanning for the device.
- **Filter Level for configuration view**
  You can select from the following filter levels:
  - **Standard**
  - **Expert**
  - and **No Filter**

Level	Description	User
Standard	Limited view of key parameters	Beginners
Expert	Additional parameters are displayed for experts	Experienced user
No Filter	All device parameters are displayed	Professional user

Table 5.1

- **Show HexBar in reader configuration**
  This option displays the **Hex Edit** bar in the configuration pages when the **Physical View** is used.

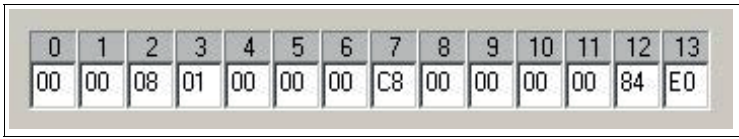

Figure 5.4

- **Settings for Host Mode**
  The maximum number of tags per inventory can be set. The maximum transponder memory size can be adjusted.
  Support for custom commands must be enabled before use with the dialog box below.

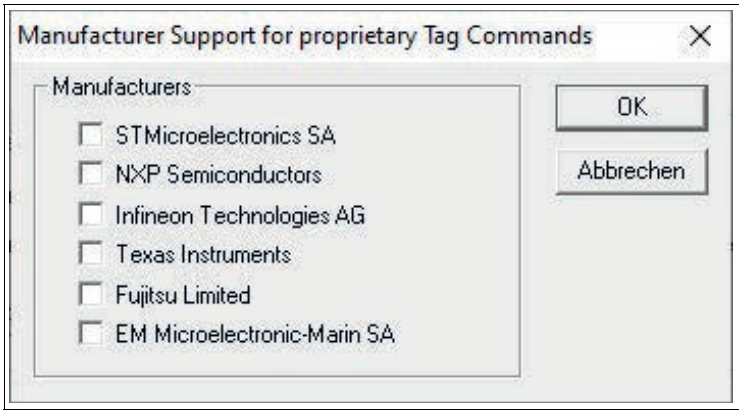

Figure 5.5

- **Work Directory**
  Location where the last device configuration XML file was stored.
- **Database Directory**
  Location where the various device definition files are stored. Should not be changed.
- **Log Directory**
  Location where the log files should be stored.

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5.3 Communication Ports

5.3.1 Settings for Physical Serial Port and Virtual COM Ports (Bluetooth / USB Converter)

RFID Gate-Control supports up to four simultaneously opened serial ports which can be assigned to any editor. Each port can also use an RS232/485-converter[1] to operate a data bus to which several Pepperl+Fuchs IUR-F800-V1D-4A* RFID read/write devices can be connected. In this way, it is possible to have many **Reader Editors** active at the same time, each one connected to a port. These serial ports are managed through the **COM-Port** dialog box.

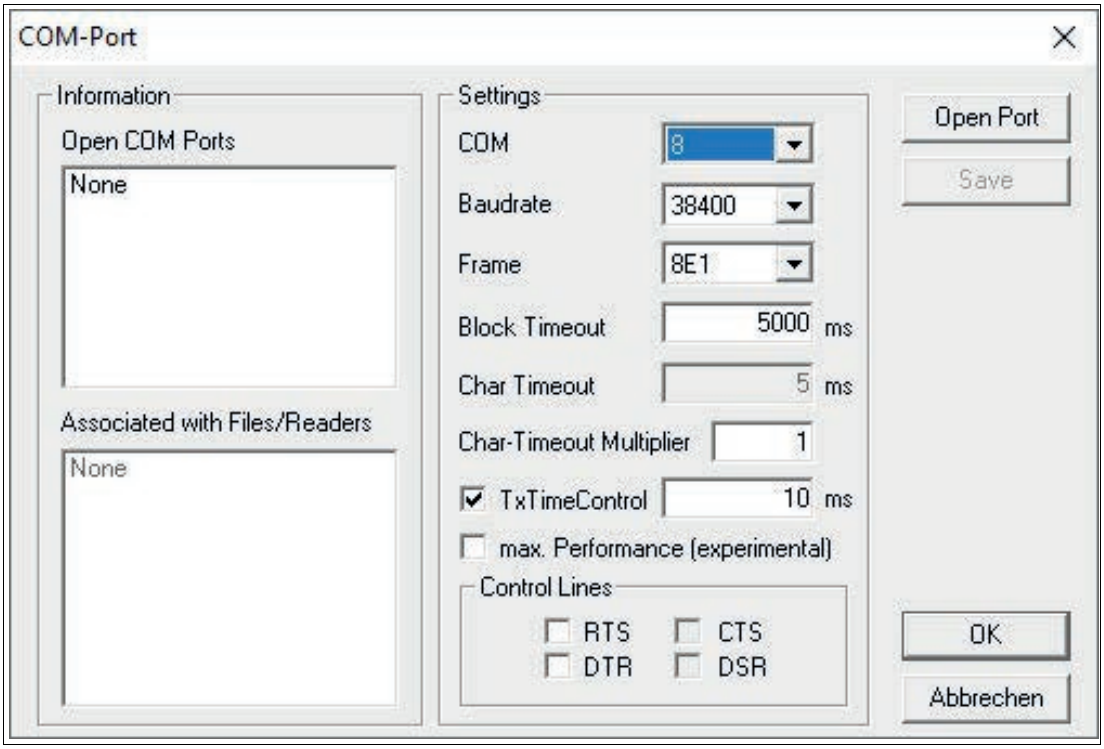

Figure 5.6

- Open the **COM-Port** dialog box by clicking the **COM-Port** button in the toolbar or by using the **Options/COM-Port** menu.
- Use this dialog box to open or close a port, or to change its configuration. In addition, the two list boxes on the left give you an overview of which ports are already open and which files or editors are using a port.

Note

If you try to close a port that is still being used by files or editors, you will get a message and the affected editors will go offline.

Open ports are automatically closed when you quit the program, and automatically reopened with the same parameters when you restart the program.

Note

Serial ports are unique system resources that can only be assigned once by the operating system.
If a port cannot be opened, first make sure that the port is not being used by another program.

1. Changing the data direction is not handled by RFID Gate-Control. The RS232/485 converter must be able to do this by itself.

Note

When using an RS232/TTL converter on a notebook, it is sometimes necessary to activate the **RTS** and **DTR** signals to provide the converter with sufficient power.

Block Timeout (Timeout)

Maximum wait time for the receive protocol. If this time is too short, the status message **Receive Timeout**(**-1030**) is displayed. This value depends on several other settings and conditions, such as the following:

- The number of transponders in the antenna field.
- The types of transponders used and the number of active transponder drivers.
- The **Block Timeout** should be greater than the **AirInterface.TimeLimit** (e.g. **TR Response-Time**) (see system manual of the device).

TxTimeControl

- If set (1), the output of the next transmit protocol is delayed until at least **TxDelayTime** (**ms**) after the last receive protocol has elapsed.
- If not set (0), the transmit protocol is always output as soon as possible, which may result in a **Receive Timeout** (**-1030**).

TxDelayTime

- Minimum time between the last receive protocol and the next transmit protocol. Only applicable when **TxTimeControl**=1.

5.3.2 Settings for USB

RFID Gate-Control supports simultaneously opened USB devices. These can be assigned to any editor.

Figure 5.7

Block Timeout (Timeout)

Maximum wait time for the receive protocol. If this time is too short, the status message **Receive Timeout** (**-1130**) is displayed. This value depends on several other settings and conditions, such as the following:

- The number of transponders in the antenna field.
- The types of transponders used and the number of active transponder drivers.
- The **Block Timeout** should be greater than the **AirInterface.TimeLimit** (e.g. **TR Response-Time**) (see system manual of the device).

5.3.3 Settings for TCP/IP

RFID Gate-Control supports simultaneously opened socket connections. These can be assigned to any editor.

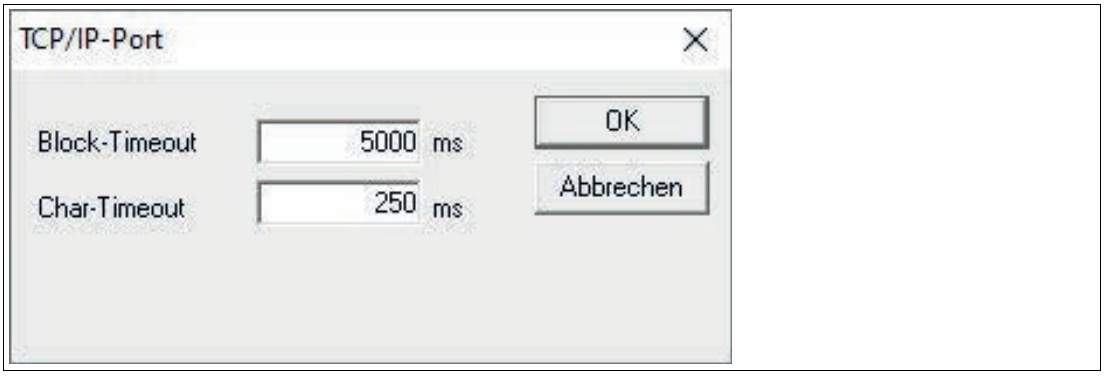

Figure 5.8

Block Timeout (Timeout)

Maximum wait time for the receive protocol. If this time is too short, the status message **Receive Timeout** (**-1230**) is displayed. This value depends on several other settings and conditions, such as the following:

- The number of transponders in the antenna field.
- The types of transponders used and the number of active transponder drivers.
- The **Block Timeout** should be greater than the **AirInterface.TimeLimit** (e.g. **TR Response-Time**) (see system manual of the device).

5.4 The Reader Editor

The Reader Editor is divided into the four panes shown below:

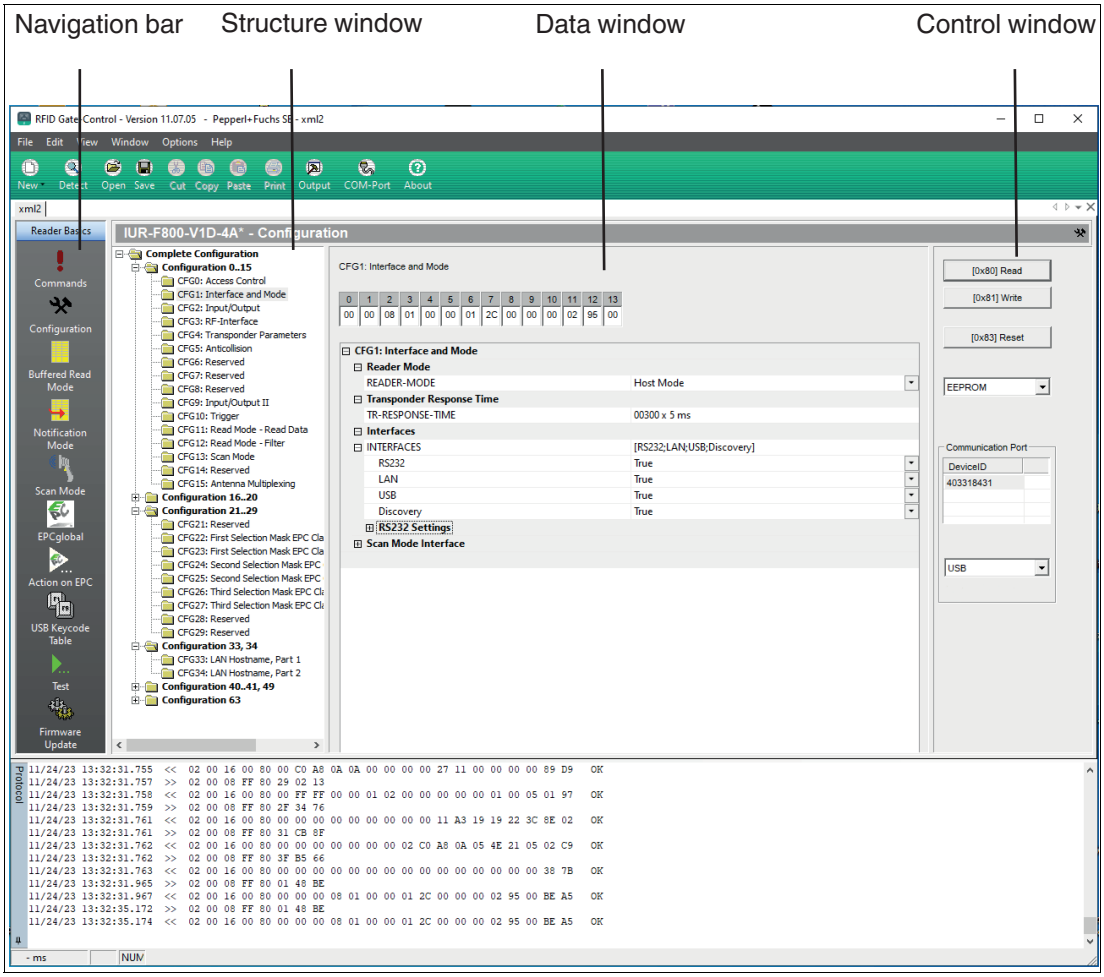

Figure 5.9

Pane	Function
Navigation bar	For selecting a function group
Structure window	For subdividing the protocols and configurations
Data window	For displaying and/or editing device and transponder data
Control window	For activating the communication

Table 5.2

The function of the parameters in the input windows can be found in the respective system manuals.

When a new reader file is created, a serial or USB port is assigned to it and is visible in the control window. If more than one serial port is open at the same time, the **COM** list box in the control window can be used to change the port at any time. If a "-" character is visible in **COM**, there is no connection to a device and no protocols can be exchanged.

The current bus address of the device is set in the text field **BusAdr** in the control window (above **COM**). If this address is unknown, the value **255** can be used. This will address any device, regardless of which bus address is currently used with the device.

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- If a USB device is used, it is automatically detected and the **DeviceID** is displayed in the **Communication Port** window.
  If multiple devices of the same type are detected, each **DeviceID** is displayed in the list and can be selected.
  Different device types are displayed in separate **Reader Editor** windows.

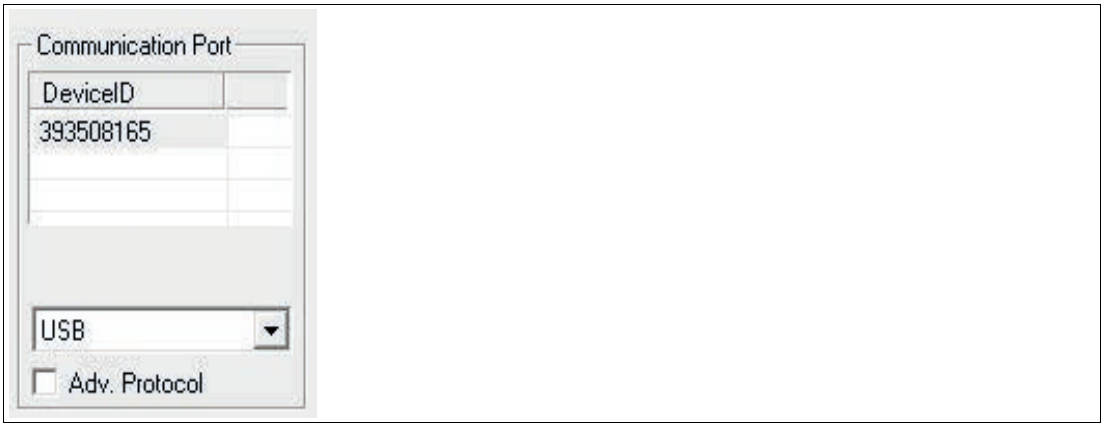

Figure 5.10

- If a device is connected through an Ethernet adapter, you can enter the IP address and port number in the **Communication Port** window. The IP address and port used should be enabled by the system administrator.

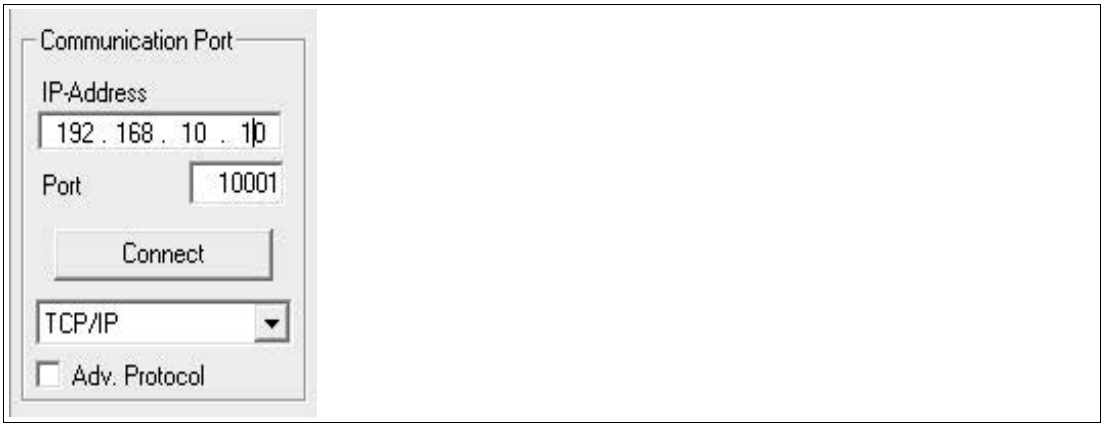

Figure 5.11

5.4.1 Commands

The **Commands** window contains all device protocols associated with the device and the **Host Commands** for communicating with transponders in **Host Mode**.

Figure 5.12

- The protocol is sent to the device by selecting a protocol and clicking **Send**.
- Some protocols allow parameters to be entered in the data window and sent to the device.
- For detailed protocol descriptions, refer to the system manual for the device.

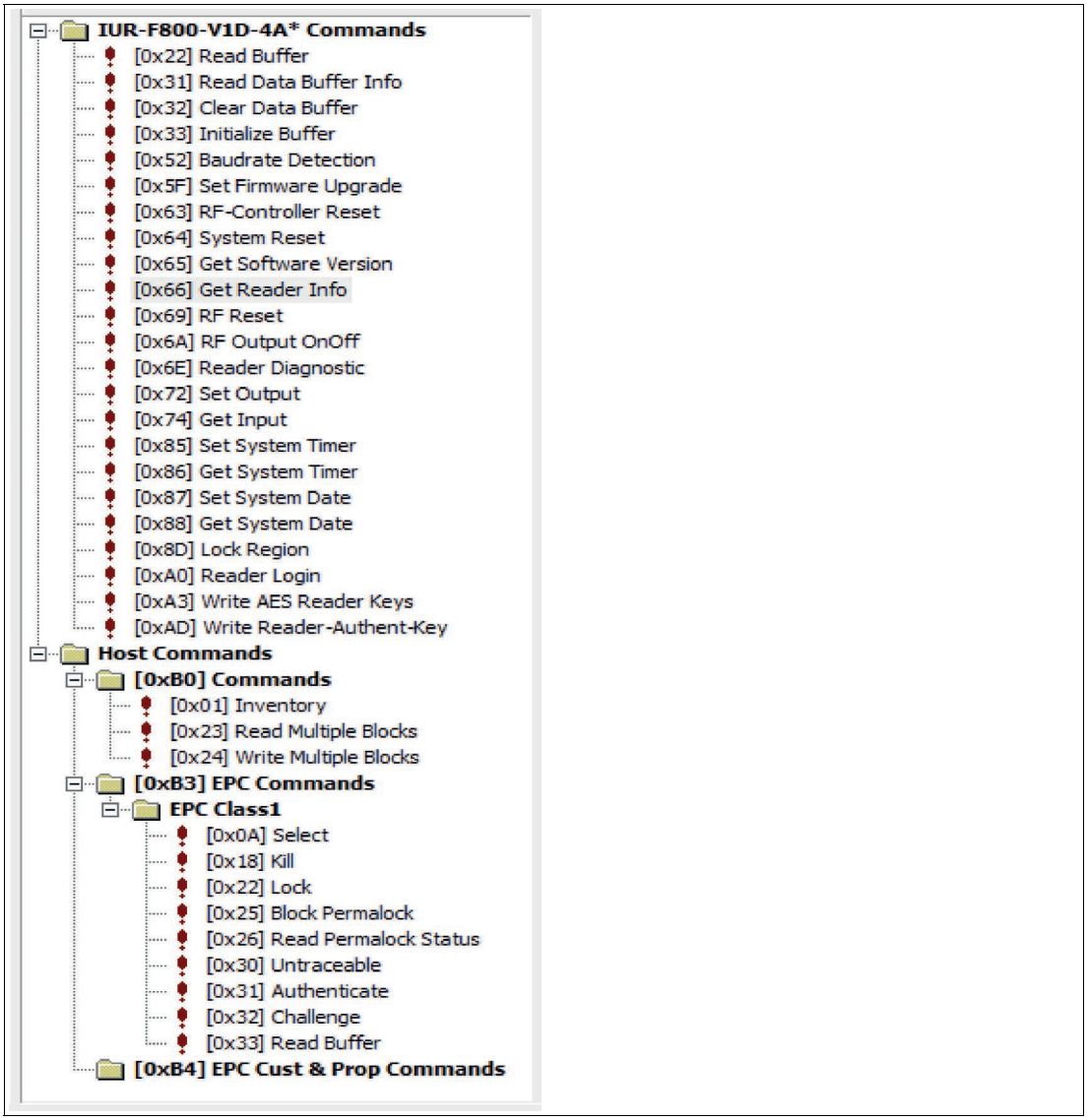

Figure 5.13

5.4.1.1 Reading the serial number (UID) of a transponder

Before each data exchange with the transponder, a reader file must first be opened and the **[0x01] Inventory (Read Serial Number) Host Command** must be executed. The report with the collected serial numbers (**UID**) of the transponders is shown below.

```
4 Transponder in Protocol
   1. Transponder
     TR-TYPE....: 0x84 (UHF / RAIN RFID GS1-coded)
     PC.........: 1400
     SNR........: 30303234
   2. Transponder
     TR-TYPE....: 0x84 (UHF / RAIN RFID GS1-coded)
     PC.........: 3400
     SNR........: 000124800000000000001F36
   3. Transponder
     TR-TYPE....: 0x84 (UHF / RAIN RFID GS1-coded)
     PC.........: 3400
     SNR........: 000124800000000000001F35
   4. Transponder
     TR-TYPE....: 0x84 (UHF / RAIN RFID GS1-coded)
     PC.........: 3000
     SNR........: 30396062C391D100000A6FD2
```

Figure 5.14

After that, any other action (e.g. reading and writing data blocks) can be performed with the transponder.see chapter 5.4.1.2.

5.4.1.2 Read/write Transponder Data

After selecting the **[0x23] Read Multiple Blocks** (**[0x24] Write Multiple Blocks**) **Host Command** you can make the following necessary settings:

- **Addressed Mode**: the selection of the address mode depends on the transponder type.
  - In **Addressed Mode**, the **UID** must be selected.
  - In **Addressed Mode** with **UIDs** other than 8 bytes, the **Length** field must contain the number of bytes and the **Length Flag** must be enabled.
- The **Extended Address Mode** flag is reserved for UHF transponders.
- The **Bank** field is reserved for UHF transponders and HF GEN2 transponders.
- The **Address** and **No. of Blocks** fields specify the range and number of transponder data.
- The **Blocksize** field is read from the transponder with the **[0x23] Read Multiple Blocks** command, but for **[0x24] Write Multiple Blocks** the **Blocksize** must be set.
- The **Access Password** flag is reserved for UHF transponders.

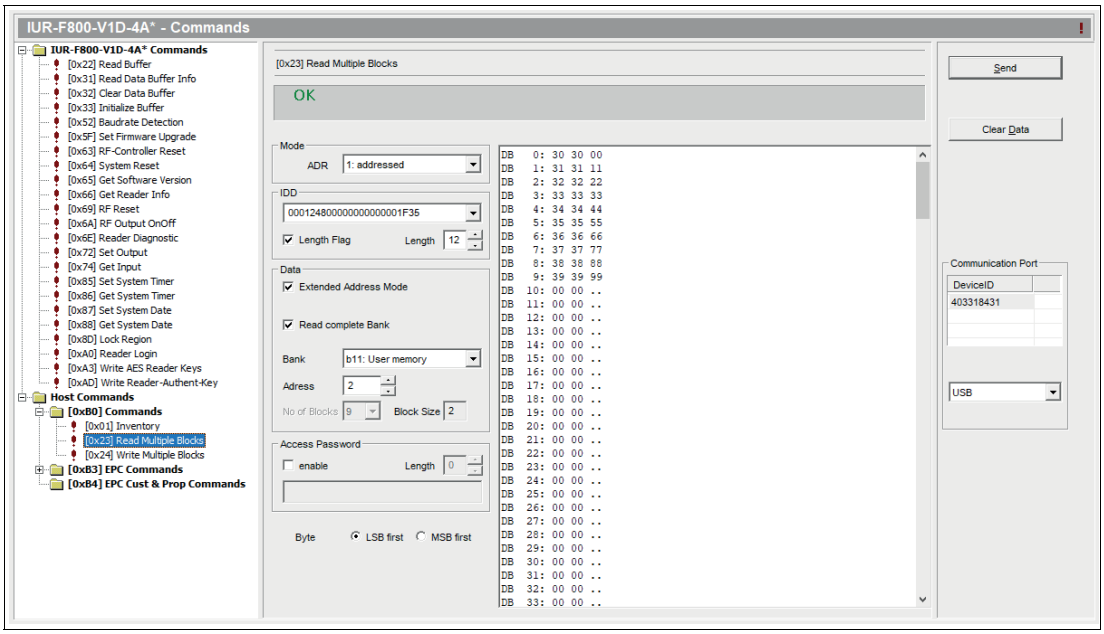

Figure 5.15

5.4.2 Configuration

5.4.2.1 Physical View and Logical View

RFID Gate-Control can display the configuration area in the following two different modes:

Physical View

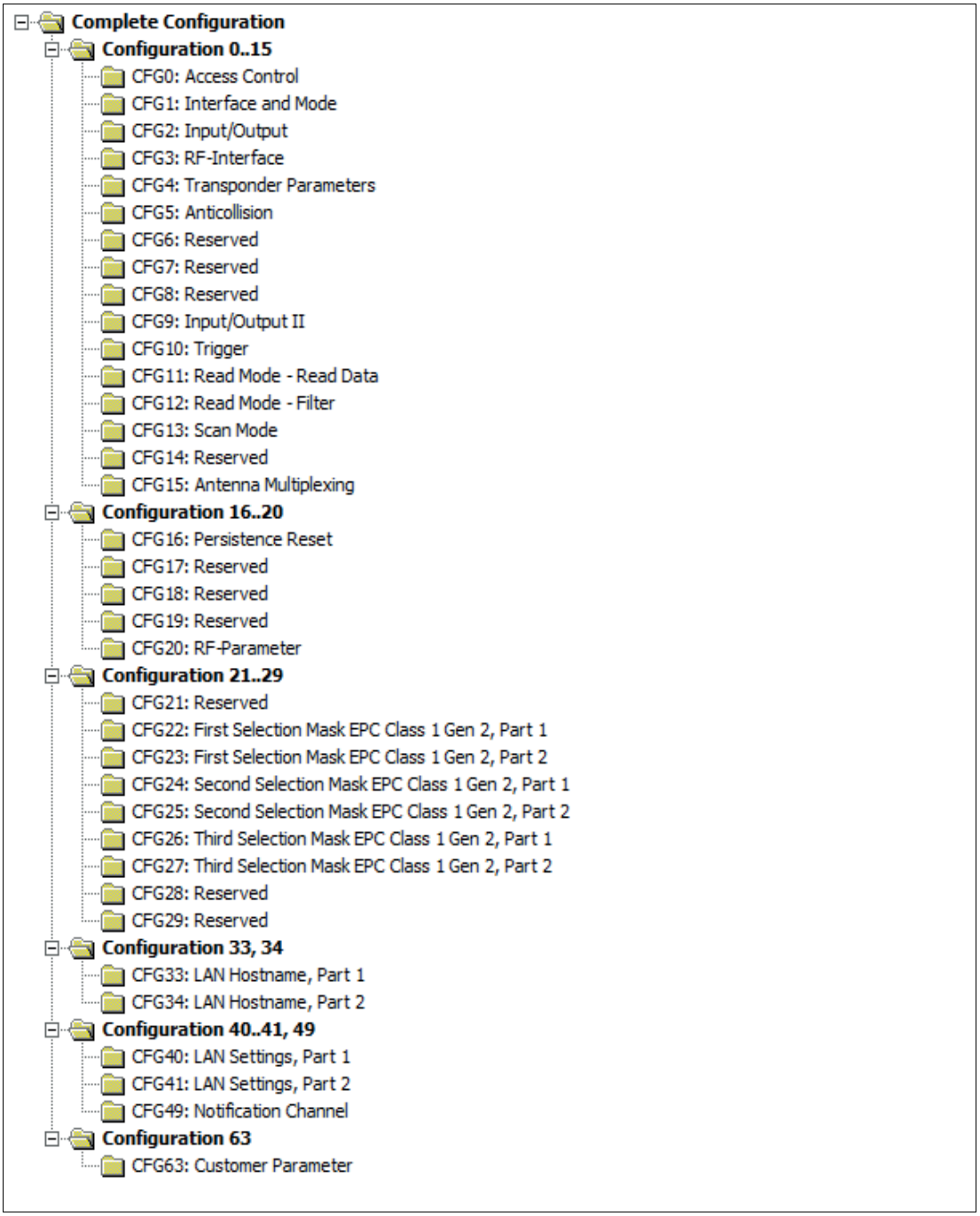

Figure 5.16

The configuration parameters are sorted by physical location and addressing.

Logical View

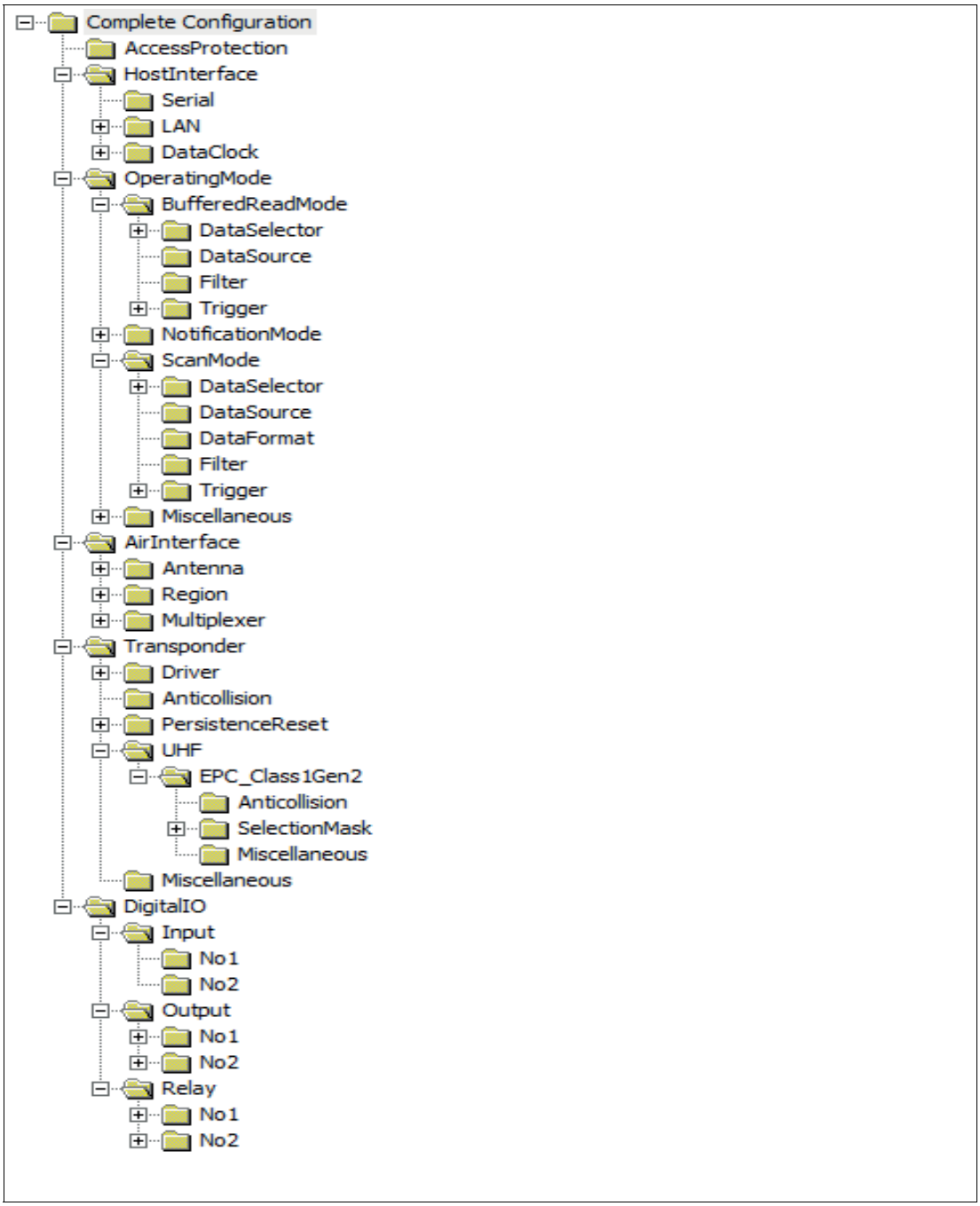

Figure 5.17

The configuration parameters are arranged according to the logical grouping of the parameters.

You can change the View Mode at any time by doing the following:

1. Click **View**.
2. Click **Configuration Presentation**.
3. Choose between the following two options:
   - **Logical View** or
   - **Physical View**

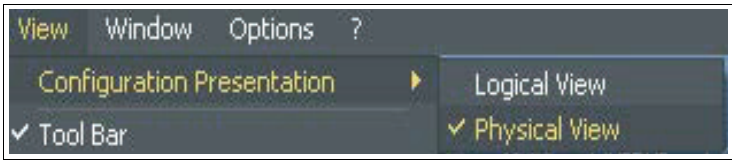

Figure 5.18

↳ You have successfully changed the **View Mode**.

5.4.2.2 Changing Configuration Settings

The **Configuration** window is used to read, modify and reset the current device configuration.

Figure 5.19

The **Configuration** control window contains a control element for selecting the memory type of the device. Depending on the text in the list box (**RAM** or **EEPROM**), the corresponding parameter data in the device will be affected. This selection also changes the configuration data in the current data window. Mixing of **RAM** and **EEPROM** data is therefore impossible.

Note

As a rule, the entire configuration of the device should be read out first, then modified, and then written back. RFID Gate-Control prevents writing configuration data if the configuration has not been read before.

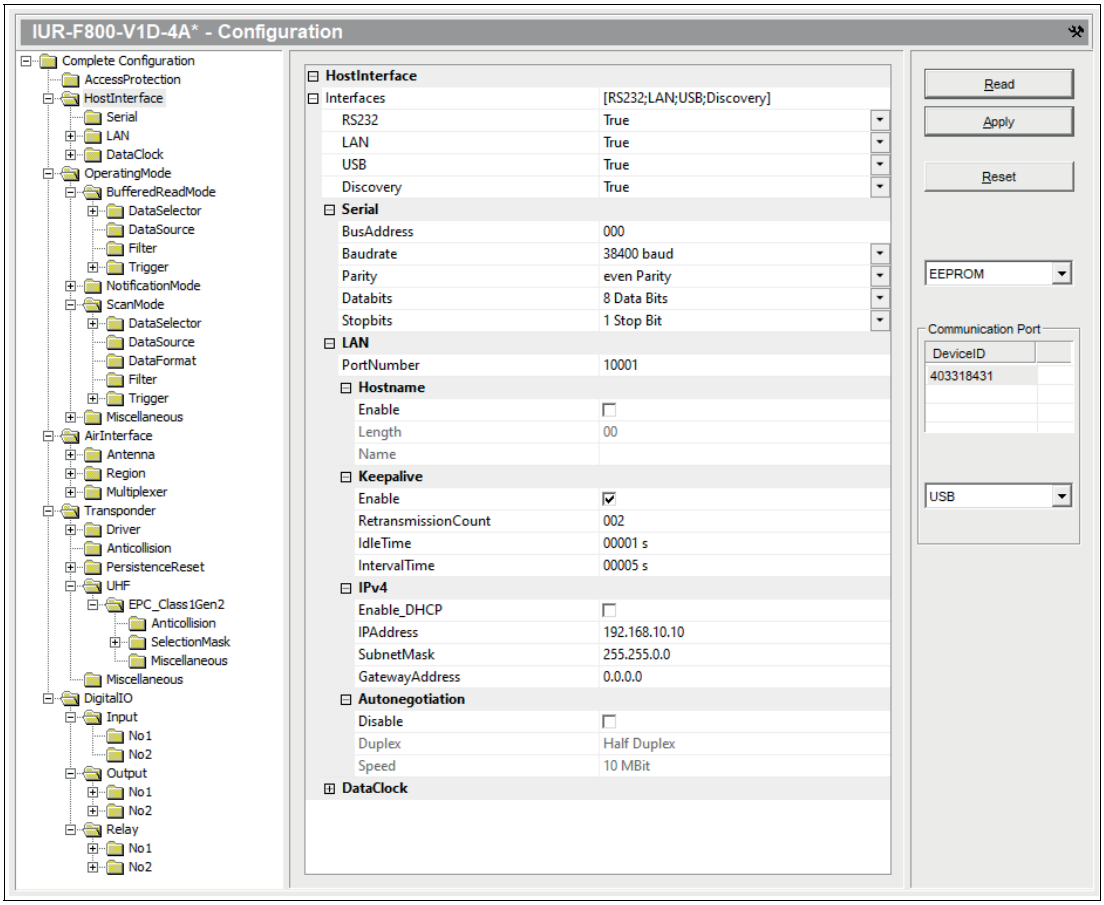

Figure 5.20

- Click **Read** to read the selected configuration page of the device. To read the entire device configuration, select the first item (e.g., **Complete Configuration**) in the structure window.
- Click **Apply** to write modified parameters to **EEPROM** or **RAM**. When writing to the **EEPROM**, the program automatically performs a **[0x63] CPU-Reset** to apply the change to **RAM** as well.
- Click **Reset** to reset the entire configuration to the default values (factory settings).

Note

For information on each parameter, refer to the device's system manual.

Note

Depending on the selected **Reader Mode**, the unused parameters can't be modified in the **Logical View** of the configuration, they are displayed in gray letters.

5.4.2.3 Saving and loading a complete device configuration in an XML file

After reading and/or changing the device configuration in RFID Gate-Control, it is possible to save the complete device configuration in an XML file.

Save a configuration in an XML file by doing the following:

1. Click **File**.
2. Click **Save As**.

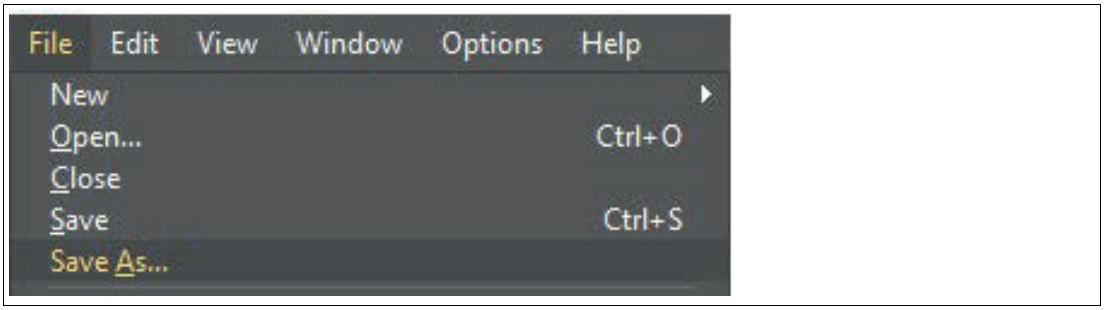

Figure 5.21

3. Select a location and file name, and click **Save**.

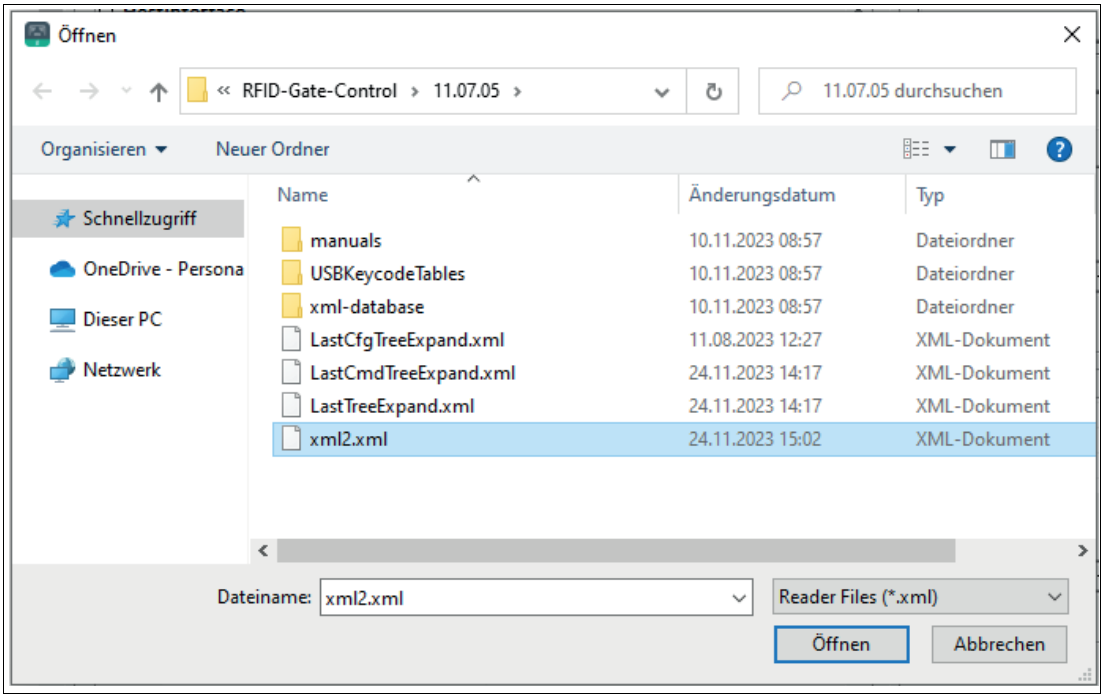

Figure 5.22

↳ The configuration is now stored in an XML file.

Load a configuration XML file into RFID Gate-Control and store it on the device by doing the following:

1. Click **File**.
2. Click **Open**.

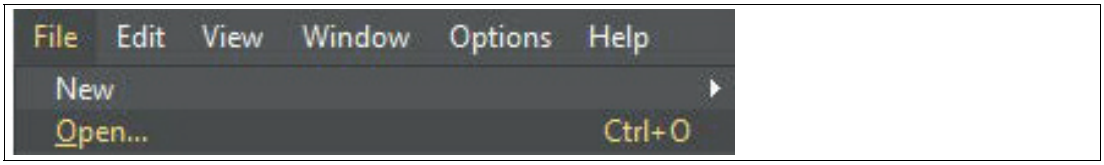

Figure 5.23

3. Select the configuration file you want to load into RFID Gate-Control.

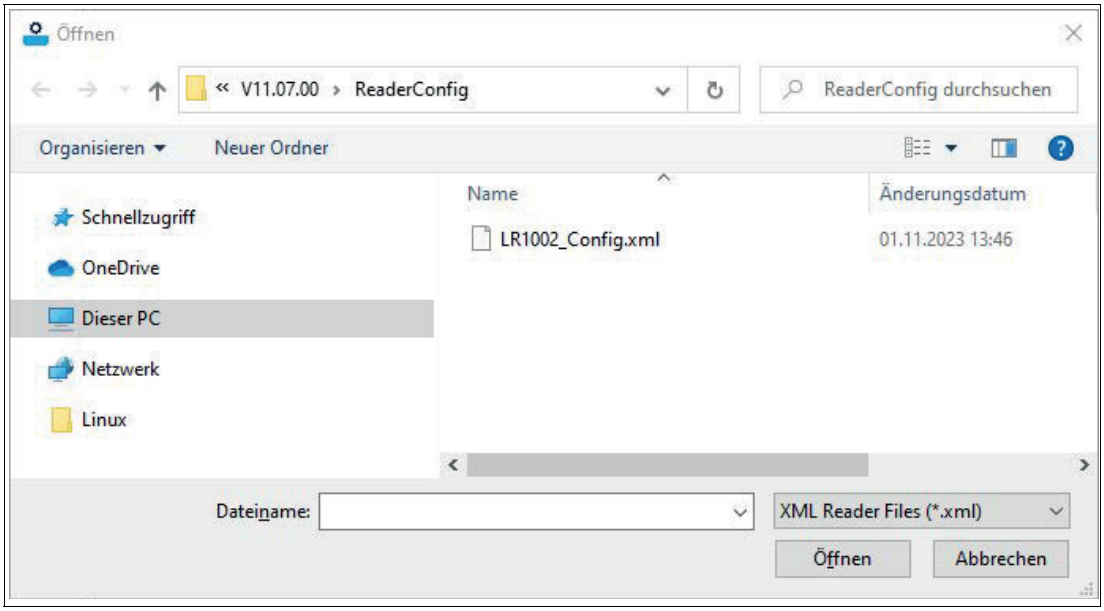

Figure 5.24

↳ The configuration is now visible in RFID Gate-Control.

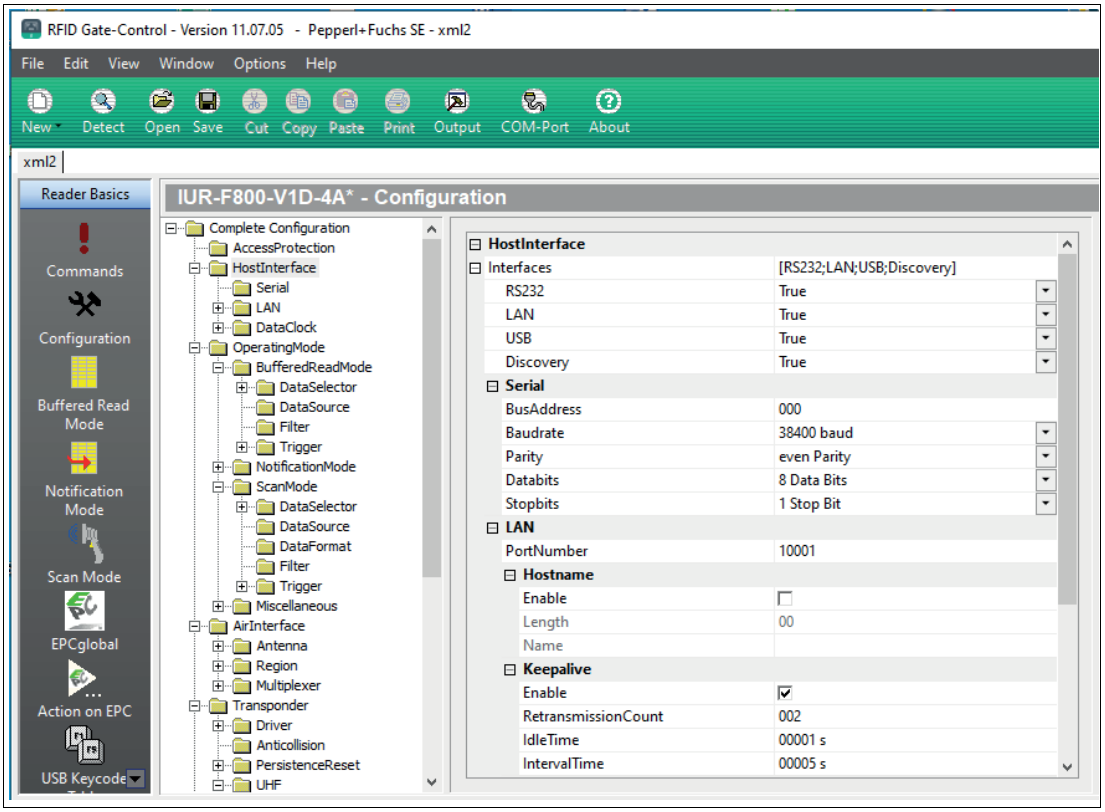

Figure 5.25

Note

You can use the **Write** command to store the new configuration on the device.

4. Select the **Complete Configuration** folder and click **Apply** in the **EEPROM**.

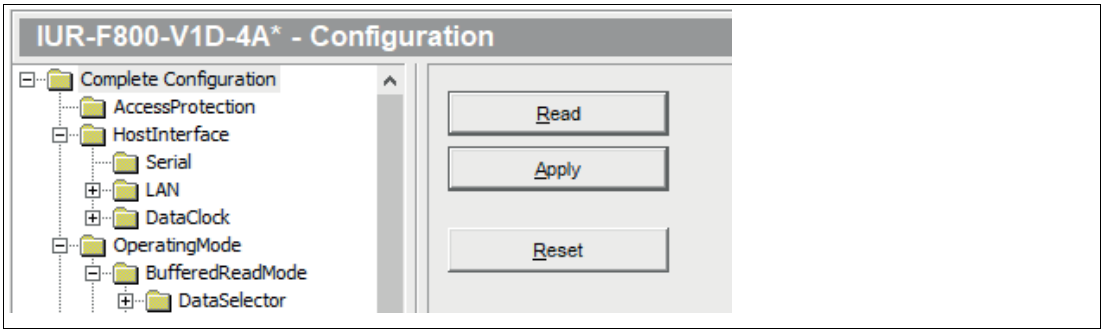

Figure 5.26

↳ The complete device configuration is now stored on the device.

5.4.3 Buffered Read Mode

If the device is configured to work in **Buffered Read Mode**, the **Buffered Read Mode** button can be used to open a window to read out the data stored in the buffer.

Figure 5.27

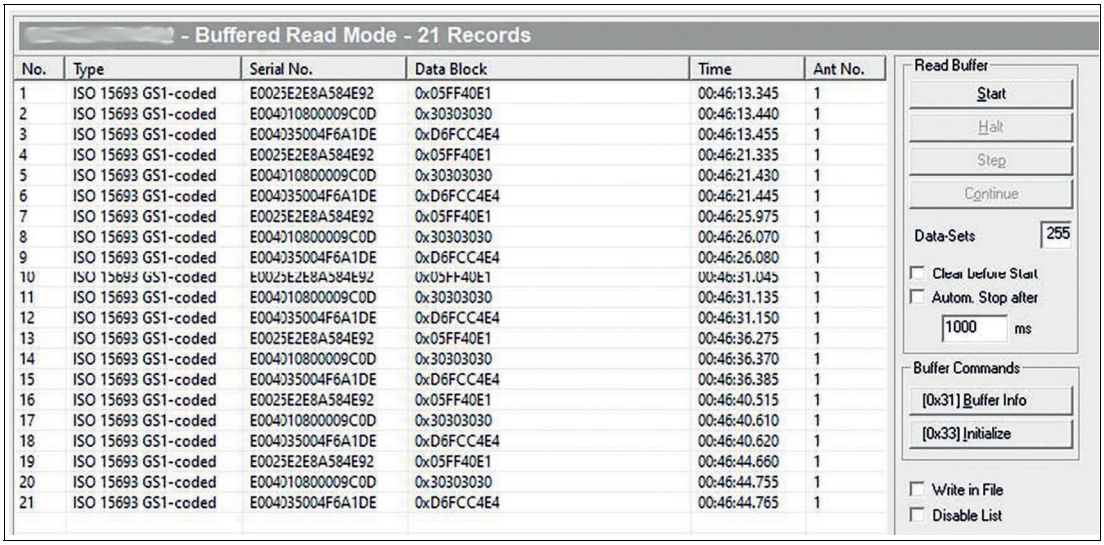

Figure 5.28

The following order is recommended:

1. The **[0x33] Initialize** command clears and initializes the device's internal buffer.
2. Click **Start**.

   ↳ The **[0x21] Read** or **[0x22] Read** command executes the reading of the stored transponder data.

   Note

   The edit box can be used to specify the number of **Data-Sets** to read. The actual number of **Data-Sets** in the response protocol depends on the amount of data per **Data-Set**. A maximum of 255 bytes of standard protocol length[1] can be sent with a read command.

1. The maximum number of bytes with extended protocol length depends on the device hardware and can be 4096 or 65535 bytes.

3. After reading out the **Data-Sets**, the **[0x32] Clear** acknowledgement command clears the transferred data records in the internal buffer of the device. Otherwise, the same records will be transmitted again.

   ↳ The **Read** and **Clear** command is now automatically executed when you click **Start**.

   Note

   Information on the current status of the buffer (number of records stored) can be obtained using the **[0x31] Buffer Info** command.

5.4.4 Notification Mode

If the device is configured to operate in **Notification Mode**, the **Notification Mode** button can be used to open a window to receive and display notifications. The **Notification Mode** is an extended mode of the **Buffered Read Mode**. Therefore, the structure of the notified data is the same.

Figure 5.29

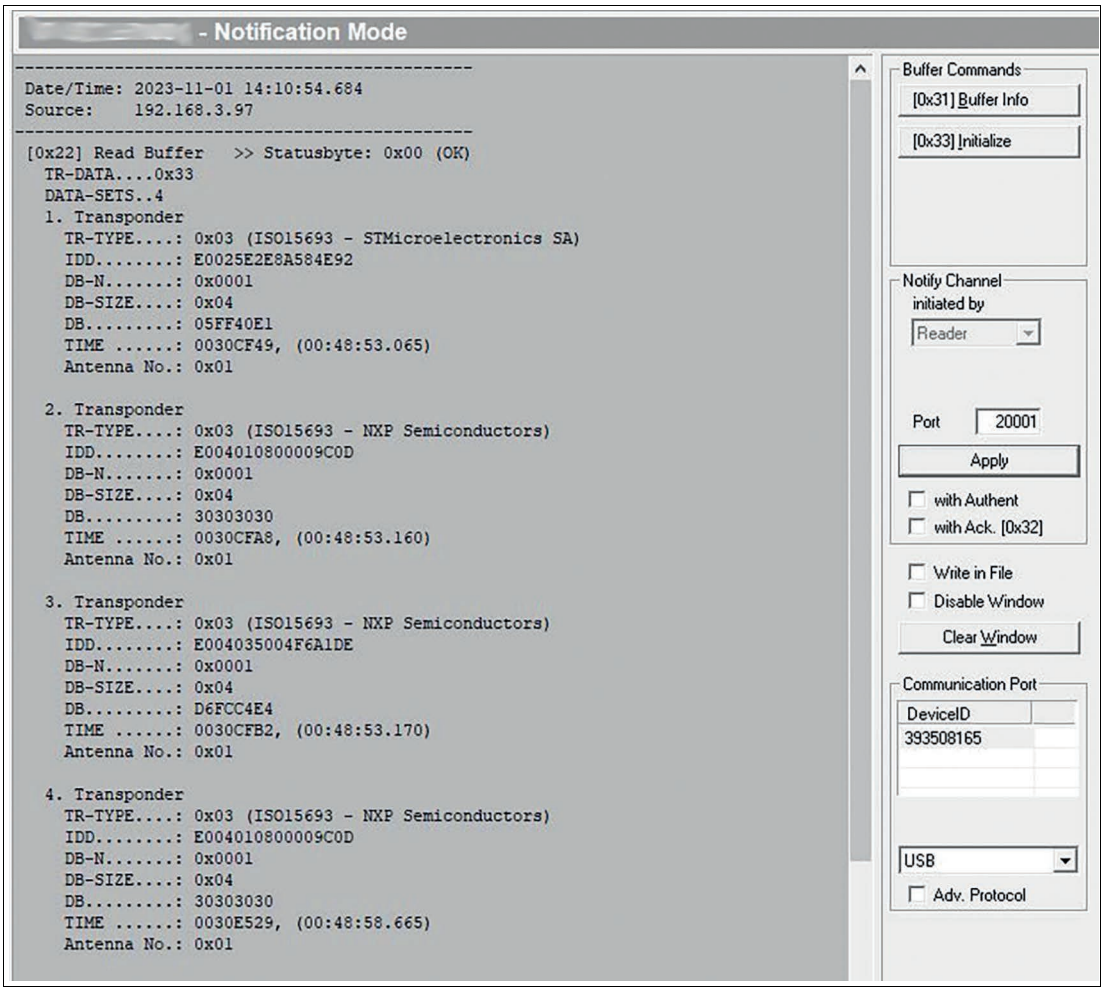

Figure 5.30

The following order is recommended:

1. The **[0x33] Initialize** command clears and initializes the device's internal buffer.
2. Click **Apply**.

   ↳ The receive process starts and incoming messages are displayed in the text window.

Note

The port number must be the same as configured in the device's configuration.

If configured in the device, notification acknowledgement must be enabled. Otherwise, the device will always report the same data.

Information about the current status of the buffer (number of **Data-Sets** stored) can be obtained with the **[0x31] Buffer Info** command.

5.4.5 Scan Mode

If the device is configured to work in **Scan Mode**, the **Scan Mode** button can be used to open a window that displays the transponder data sent by the device.

Figure 5.31

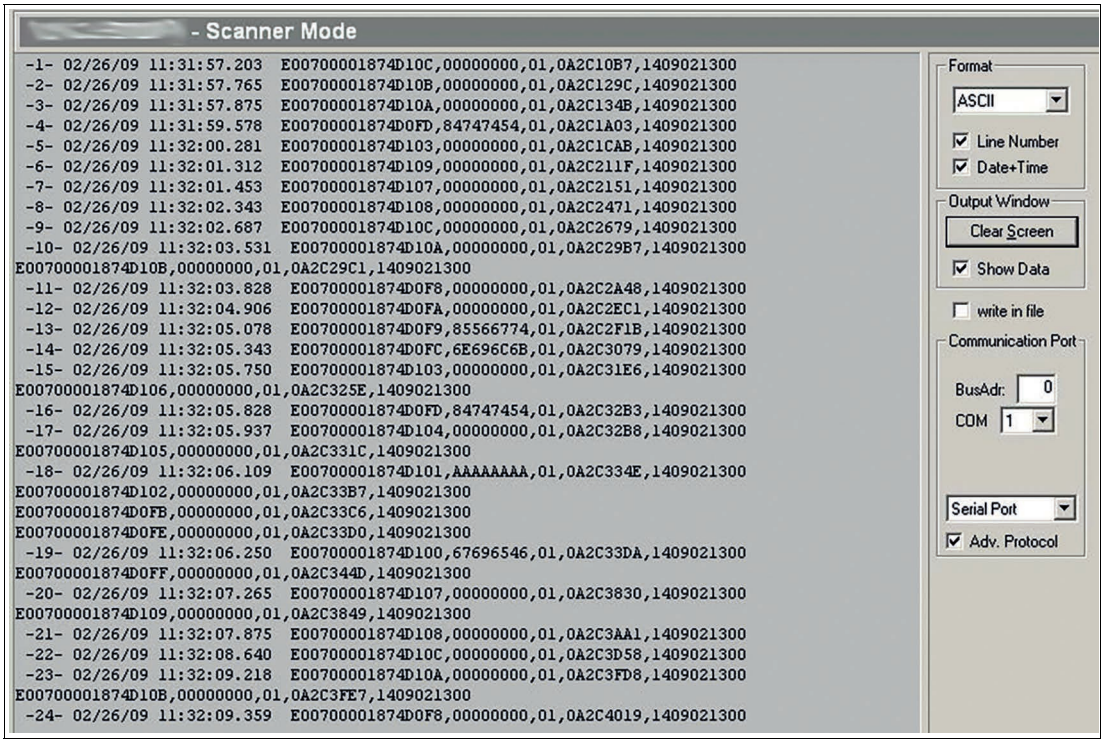

Figure 5.32

The following order is recommended:

1. To receive **Scan Mode** data, the communication port type **Serial Port** must be selected. All other port types are not supported.
2. The **Display Format** must be set to match the device's format setting. In addition, a line number and date and time to each data record can be added.

Note

For long runs, the data display should be turned off. **Show Data** controls data output. Failure to do so may reduce performance and/or cause the PC to run out of memory.

3. When the **write in file** function is enabled the scanned data can be saved in a file. The file name consists of the prefix **Scan** followed by the date, e.g. Scan060317.txt.

Note

USB readers working in **Scan Mode** send data to the HID kernel driver of the PC and act like a keyboard.
The data can be viewed in this gray window by positioning the cursor in this window.
The data can also be viewed in any other Windows® application where the cursor is positioned.

5.4.6 USB Keycode Table

As described in the chapter **Scan Mode**, USB readers working in **Scan Mode** send data to the HID kernel driver of the PC and act like a keyboard. Depending on the keyboard layout, some keys have different key codes. For example, "Z" and "Y" are swapped in the German and English keyboard layouts. This makes it necessary to change the keycodes used by the device. This can be done using the **Keycode table**. The keycodes for the German, French and English keyboard can be found in the installation path of RFID Gate-Control (RFID Gate-Control\11.08.02\USBKeycodeTables). With the **Load Table** button one of the keycode tables can be opened with RFID Gate-Control. With the **Transfer** button the table can be sent to the device. The 127 characters of the ASCII table can be edited in RFID Gate-Control and saved as a text file by clicking the **Save Table** button and then loaded into another device.

Figure 5.33

Note

The keycode is limited to 128 characters and cannot be extended.

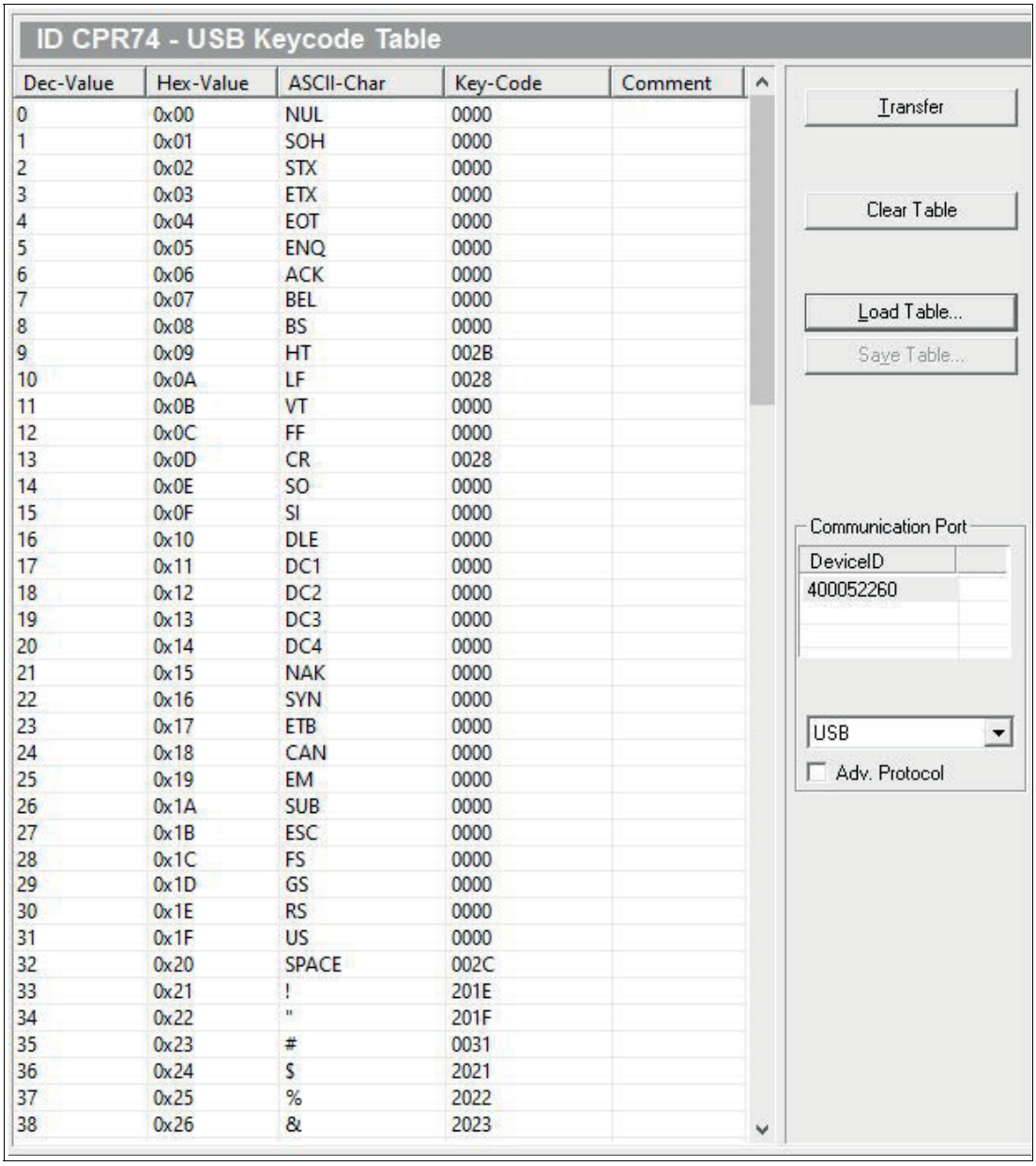
ID CPR74 - USB Keycode Table
Dec-Value
Hex-Value
ASCII-Char
Key-Code
Comment
0 0x00 NUL 0000
1 0x01 SOH 0000
2 0x02 STX 0000
3 0x03 ETX 0000
4 0x04 EOT 0000
5 0x05 ENQ 0000
6 0x06 ACK 0000
7 0x07 BEL 0000
8 0x08 BS 0000
9 0x09 HT 002B
10 0x0A LF 0028
11 0x0B VT 0000
12 0x0C FF 0000
13 0x0D CR 0028
14 0x0E SO 0000
15 0x0F SI 0000
16 0x10 DLE 0000
17 0x11 DC1 0000
18 0x12 DC2 0000
19 0x13 DC3 0000
20 0x14 DC4 0000
21 0x15 NAK 0000
22 0x16 SYN 0000
23 0x17 ETB 0000
24 0x18 CAN 0000
25 0x19 EM 0000
26 0x1A SUB 0000
27 0x1B ESC 0000
28 0x1C FS 0000
29 0x1D GS 0000
30 0x1E RS 0000
31 0x1F US 0000
32 0x20 SPACE 002C
33 0x21 ! 201E
34 0x22 " 201F
35 0x23 # 0031
36 0x24 $ 2021
37 0x25 % 2022
38 0x26 & 2023
Transfer
Clear Table
Load Table...
Save Table...
Communication Port
DeviceID
400052260
USB
Adv. Protocol

Figure 5.34

5.4.7 EPCglobal

If the device is configured to work in **Host Mode**, the **EPCglobal** button can be used to open a window to work with EPC (UHF) Class 1 GEN2 or 18000-6-B/C transponders.

Figure 5.35

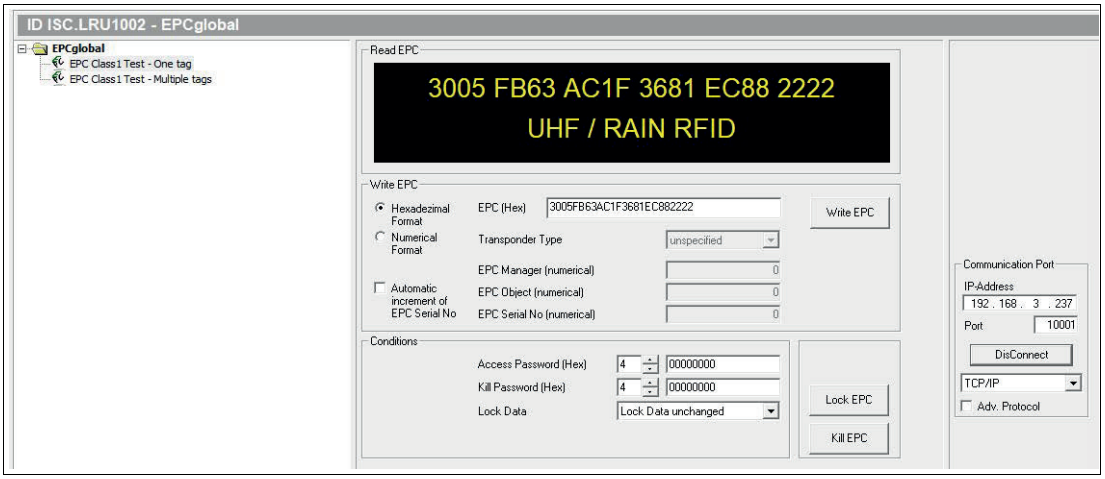

Figure 5.36

To work with an EPC transponder, select **EPC Class 1 Test - One Tag**. The dialog box allows you to **Write**, **Lock** and **Kill** a UHF EPC transponder. For HF EPC transponders, only the **Write** button is available.

Warning!

Irreversible damage to the EPC transponder

These functions should be used with care as they can cause irreversible damage to the EPC transponder. For more information about the access and kill password and the lock data, refer to the **EPCglobal** specification **EPCglobal Class-1 Generation-2 UHF RFID Protocol V2.1.pdf**, which can be downloaded from the **GS1** website at www.gs1.org.

5.4.8 Action on EPC

The **Action on EPC** group provides the ability to define rules for automatic output events.

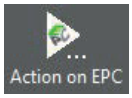

Figure 5.37

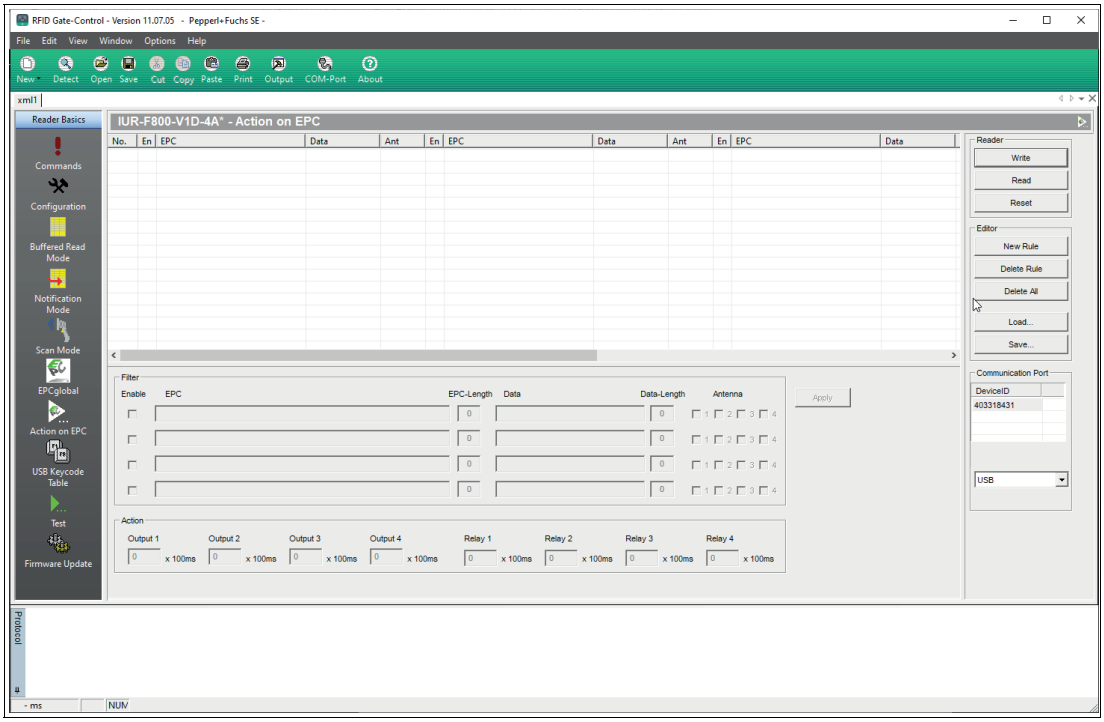

Figure 5.38

- The **Action on EPC** function provides the ability to perform automatic output events when a specific rule is met.
- Up to 70 rules can be defined in the device. The rules are "**or**" linked.
- Each rule can consist of 4 conditions.
- A condition can require the reading of an EPC number, the reading of data blocks and the reading on a specific antenna. A filter on the EPC number can have a maximum length of 32 bytes.
- Filtering of data blocks is possible with a length of 16 bytes. The conditions are linked with "**and**", i.e. a rule is set true only if all conditions are met and all requested data are read within one sequence.
- If a rule is met, all available outputs of a device can be affected. The output active time can be configured individually for each output.
- A typical application where this feature is used is in sorting machines. These can be found in logistics for sorting packages or in rental systems for returning items. In logistics, parcels are sorted according to their destination. The postal code of the destination address could be part of the serial number or stored as additional data in the transponder's user memory. Depending on the data read, an output is affected that controls the sorting machine to direct the package in one direction or the other.

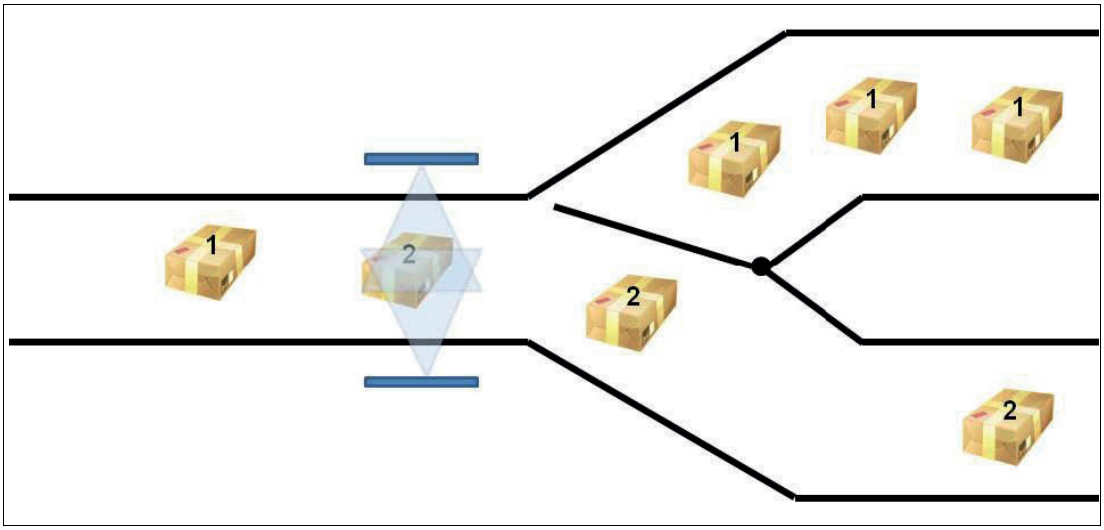

Figure 5.39

5.4.8.1 Configuration requirements

The following requirements must be met:

- The device must be configured in **Buffered Read Mode** or **Notification Mode** (**CFG11**). This is the only way the **Action on EPC** functionality will be available.
- The antenna number must be stored in the generated transponder data sets. Therefore, the **Number of Antenna** parameter in **CFG11** must be enabled.
- The **Antenna Store** (**CFG11**) parameter must be configured to the value **Collect transponder data from all antennas in one record**. This is the only way the device can verify that all data to be verified has been read from all requested antennas.
- The **Action on EPC** function must be enabled in **CFG11** of the configuration.
- Data block reading must be enabled in **CFG11**, if data blocks are to be used to create a rule.
- The following information for the data location definition must be provided:
  - Data from which memory bank should be read?
  - From which start address within the memory bank should the information be retrieved?
  - How many blocks should be read from the selected bank?

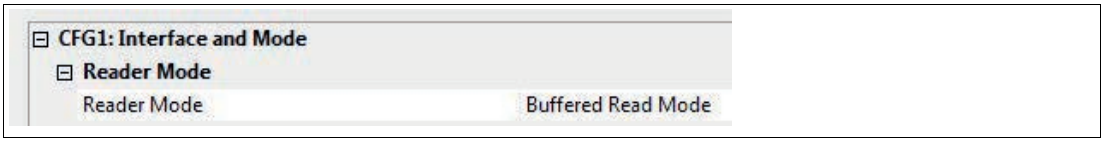

Figure 5.40

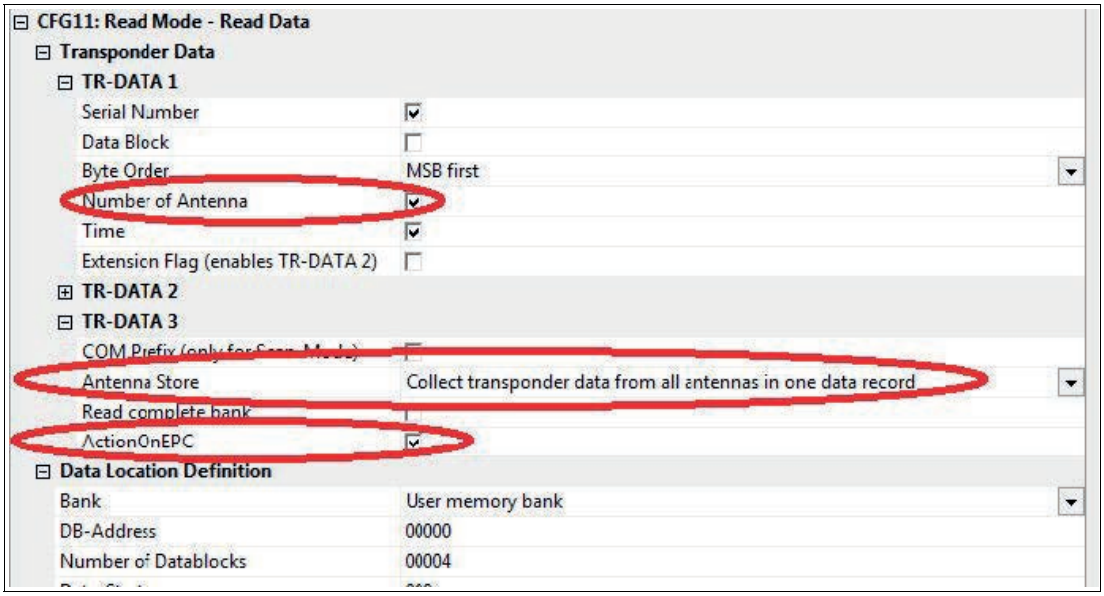

Figure 5.41

5.4.8.2 Defining Rules with RFID Gate-Control

A special menu is available in RFID Gate-Control for defining rules. **Action on EPC** is supported by RFID Gate-Control 2014 version 09.08.00 or higher.

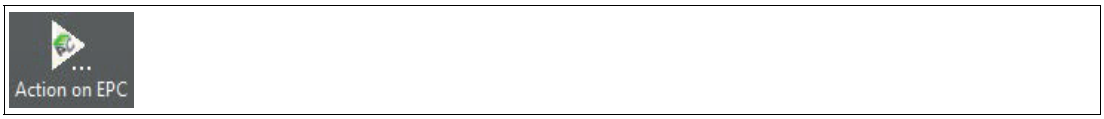

Figure 5.42

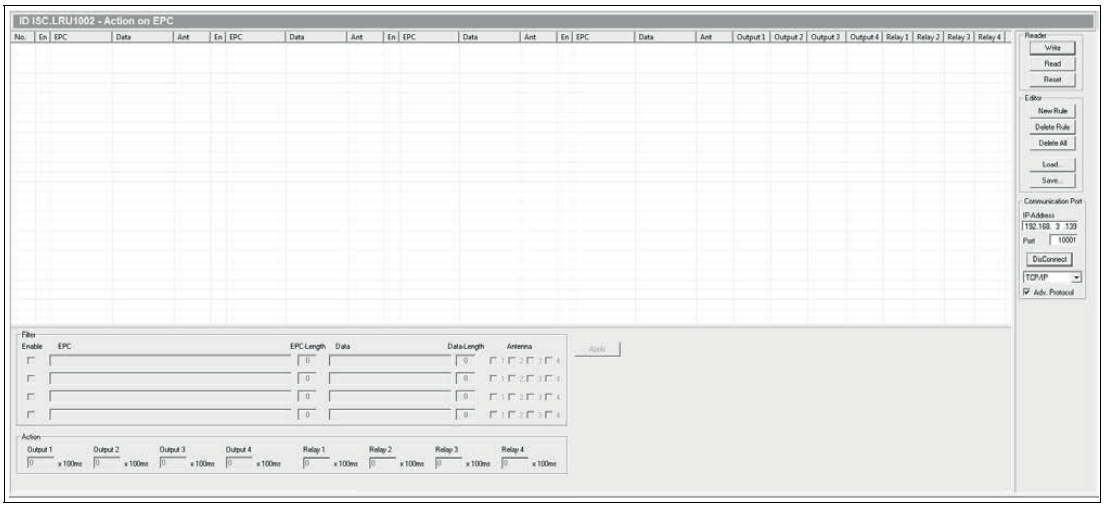

Figure 5.43

5.4.8.3 Control Buttons

Rules can be created and managed on the device using the **Control** button on the right side of the window.

Figure 5.44

Control buttons	Function
Write	Transfers the generated rule table to the memory of the device.
Read	Reads the currently installed rule table from the device's memory.
Reset	Deletes the currently installed rule table from the device's memory.
New Rule	Adds a new rule to the rule table.
Delete Rule	Deletes the selected element from the rule table.
Delete All	Deletes all elements from the current rule table.
Load	Opens a stored rule table.
Save	Saves the generated rule table to the selected directory.

Table 5.3

5.4.8.4 Creating new Rules

Up to 70 rules can be defined inside the device, linked with "**or**". Each rule can consist of 4 conditions. Conditions are linked with "**and**". To fulfill a rule, all defined conditions must be fulfilled. For each rule it is possible to define individual output events. The RFID Gate-Control software detects the number of available outputs of the connected device and offers corresponding configuration possibilities.

Create a new rule by doing the following:

1. Click **New Rule**.

↳ The edit boxes for defining conditions become active.

Note

A condition can consist of either reading EPC data, data blocks or EPC data and data blocks at one or more specific antennas.

If filtering on data blocks is enabled, the location from which the information is to be read must be configured in **CFG11** of the device configuration.

2. Click **Apply**.

↳ The newly defined rule is added to the rules table.

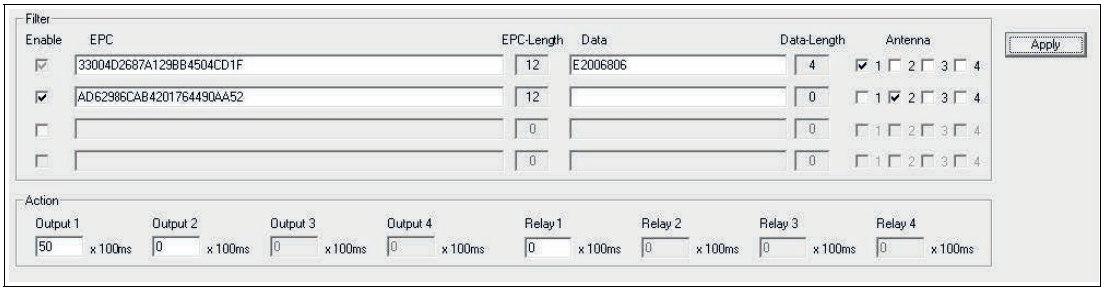

Figure 5.45

Note

EPC data to be filtered can have an even length between 2 bytes and 32 bytes.

Data blocks to be filtered can have an even length between 2 bytes and 16 bytes.

Example

The screenshot below shows an example of a sorting machine in logistics that filters for a imaginary manufacturer code in the EPC and the postal code of the destination address in the user data.
Four rules are generated to distinguish between two different regions. There are two rules for each region because of the multiple antenna orientation (2 antennas in total, one on each side of the conveyor).

- When antenna 1 or antenna 2 reads a transponder with the correct manufacturer code and user data 0035, digital **Output 1** is active for 5 seconds.
- When antenna 1 or antenna 2 reads a transponder with the correct manufacturer code and user data 0063, digital **Output 2** is active for 5 seconds.

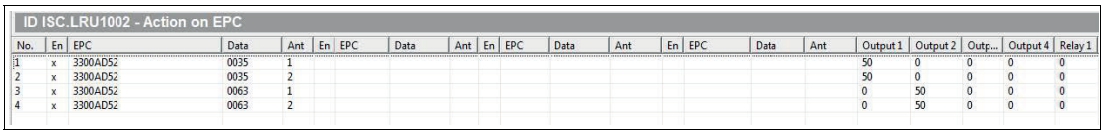

Figure 5.46

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5.4.9 Test and Measurement

The **Test and Measurement** group collects some useful functions.

Figure 5.47

Inventory

This test function can be used to continuously perform the host protocol **[0xB0][0x01] inventory**. This requires that the device is configured to operate in **Host Mode**.

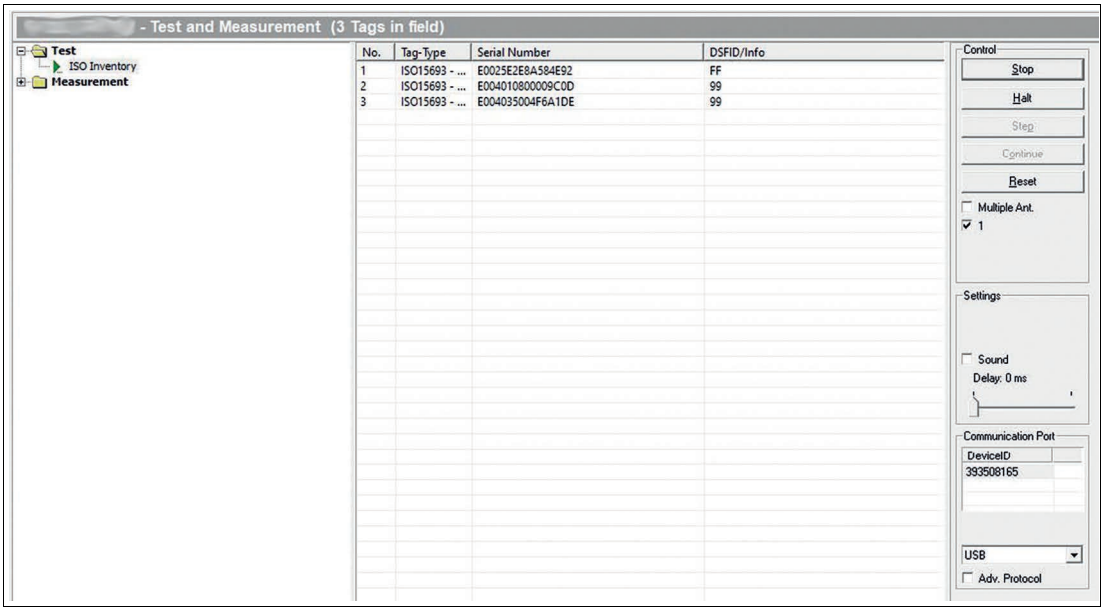

Figure 5.48

In the **Test** folder, select **Inventory** and click **Start**.

- All transponders in the antenna field are displayed in the list window with serial number and transponder type.
- The **Stop** button stops the inventory process.
- The **Halt** button puts the inventory process into a wait state to perform single steps with the **Step** button.
- The **Continue** button exits the wait state and continues the inventory process.
- The **Reset** button clears the display window.

Note

If you want to delay sending each protocol to the device, use the **Delay** slider to set the pause between protocols up to 1000ms.

5.5 The Protocol Editor

The **Protocol Editor** is a useful tool for checking the response of the Pepperl+Fuchs read/write device for faulty, new or unknown protocols. As in the case of the **Reader Editor**, a port type must be assigned to the **Protocol Editor**. In principle, this can be the same port.

With the **Protocol Editor** it is possible to collect any number of protocols and the timing of the protocol is arbitrary.

With the **Protocol Editor** you have the following options:

- The **Start**, **New**, **Edit** and **Delete** buttons transfer, create, modify and delete the entries.
- The **Record** button activates the recording of all logs sent from the **Reader Editor**. This requires the **Reader Editor** to have been opened first. The recorder can set the process state for each recorded protocol to automatic with next protocol if this option is enabled. This is useful for automatic step-by-step scheduling of protocols.

Generate and save a protocol file by doing the following:

1. Click **File**.
2. Click **New**.
3. Click **Protocol (*.prt)**.

   ↳ The **Prot1*** view appears.

   Note

   The **Prot1*** view appears next to the **xml1*** view. You can switch between these two views.

   The **Open.*prt** button also allows you to load files diectly for later evaluation.

4. Click **File**.
5. Click **Open.*prt**.

   ↳ Files can now be loaded directly for later evaluation.

6. Select the **Prot1*** view.
7. Click **Record**.

   ↳ Recording of the operations starts.

8. Select the **xml1*** view and run some commands.
9. Switch to the **Prot1*** view.

   ↳ You will see all previously sent commands with a comment. In the example below, you can see a **Reader Info** request, an **Inventory** request and some **Read Multiple Blocks** requests. These commands have been started before in **Host Mode**.

10. Click **File**.
11. Click **Save**.

    ↳ The record can be stored in the **Work Directory**, see chapter 5.2.

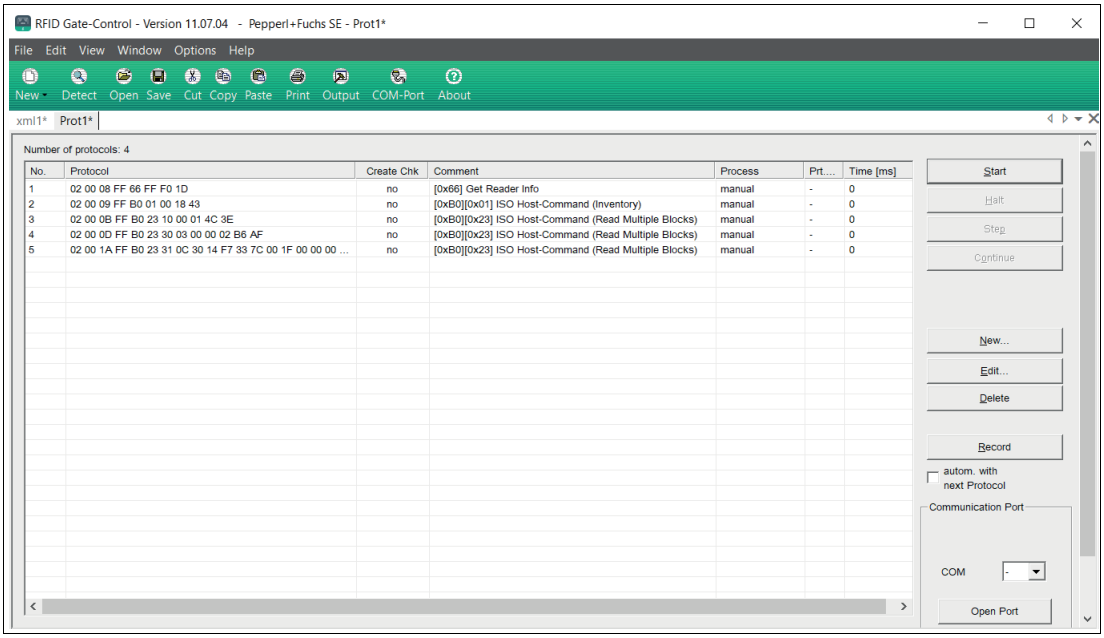

Figure 5.49

- The **Edit** button opens a dialog box for the selected protocol item.
- Each protocol item must have a unique **Item Number**. After changing this number, the protocol item can be moved up or down in the list using the context menu to have a continuously increasing order.
- The **Hex-Protocol** edit box accepts any chars, but all non-hex chars are stripped before the protocol is sent. This allows the space char to be used as a separator between each hex number.
- The **Hex-Protocol** must contain the complete protocol frame except for the checksum, which is calculated and added internally if the **calculate checksum** option is set. Recorded and unmodified protocols have a valid protocol checksum and the **calculate checksum** option must not be set.
- The **Process** drop-down box lists a number of scheduling options to organize scheduling.

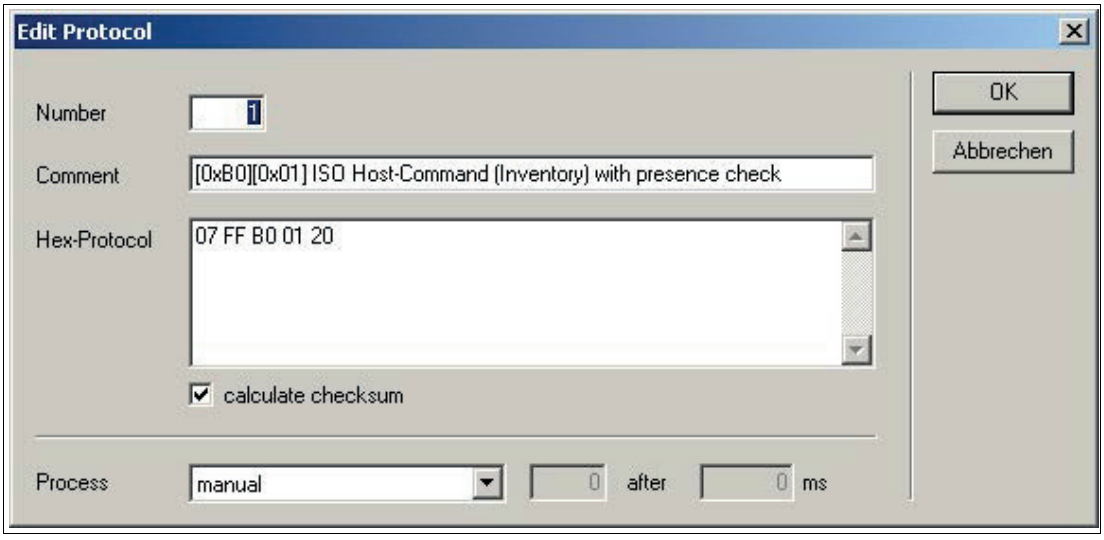

Figure 5.50

- The **manual** option disables scheduling for this protocol item. All other options enable scheduling for this protocol item.

Figure 5.51

5.6 The Protocol Window

- The **Protocol Window** lists each protocol action. All error messages related to protocol traffic are redirected to this window.
- The **Protocol Window** is a normal editor and allows you to copy lines of text to the clipboard.

Note

Use the right-click context menu. This way you can easily copy protocols into the protocol editor and manipulate them.

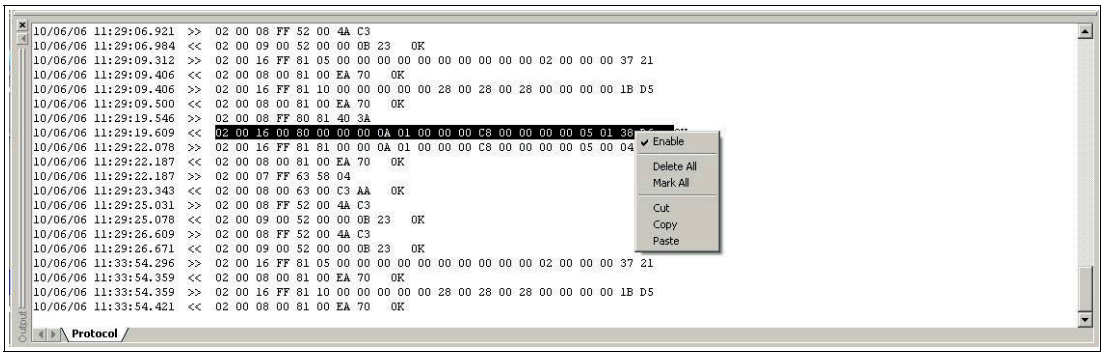

Figure 5.52

Note

For long runs of a test function or high-performance tests, the protocol window should be disabled.

6 Handling Communication Problems

If you are experiencing communication problems with the Pepperl+Fuchs read/write device, check the following:

- Is the cable properly connected to the device?
- Is the power to the device turned on?
- Is the correct port type assigned?
- If there is a series connection, is an open serial port assigned to the device file? Go to the **Reader Editor** and check the **COM** list box at the bottom right.
- If there is a series connection, is the correct bus address set in the **Reader Editor**? Try the broadcast address 255.
- For a serial connection, check the serial port settings, see chapter 5.3.1.
- In the case of an Ethernet connection, does the IP address of the device match the subnet mask of the PC?
- When using a **COM-Port**, test any change using the **[0x52] Baudrate Detection** protocol from the **Reader Editor** commands group.

7 Uninstalling RFID Gate-Control

Uninstall RFID Gate-Control by doing the following:

1. Go to the **Start Menu**.
2. Click **Settings**.
3. Click **Control Panel**.
4. Click **Add/Remove Programs**.
5. From the **Install/Uninstall** tab, locate and select RFID Gate-Control.
6. Click **Add/Remove**.
7. In the next dialog box, click **Remove** and confirm the uninstall request with **Yes**.

   ↳ All components of RFID Gate-Control will now be removed from your computer.

Your automation, our passion.

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- 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
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